WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

Report #68

Reporting Period: January 01 to March 31, 2019

April 2019

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Executive Summary

Since 1999, the Wide Area Augmentation System (WAAS) Test Team at the FAA William J. Hughes Technical Center has reported GPS performance as measured against the GPS Standard Positioning Service (SPS) Signal Specification in quarterly GPS Performance Analysis Network (PAN) Reports. In addition to the GPS PAN reports, the WAAS Test Team has provided quarterly reports on WAAS performance. The current WAAS PAN Report #68 provides WAAS performance data from the January 01 through March 31, 2019 reporting period.

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

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

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.374 meters	Denver 0.564 meters	Anchorage 0.758 meters	Bethel 0.533 meters
95% Vertical Accuracy (VPL <= 50 meters)	Atlantic City 1.794 meters	Denver 0.754 meters	Juneau 1.250 meters	Bethel 0.947 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)	Multiple Sites 100%	Miami 99.99%	Multiple Sites 100%	Barrow 99.99%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Oklahoma City 99.97%	Anchorage 100%	Barrow 99.10%
99% HPL	Cleveland 17.133 meters	Dallas 10.751 meters	Cold Bay 18.993 meters	Juneau 12.840 meters
99% VPL	Arcata 29.036 meters	Minneapolis 20.350 meters	Barrow 32.611 meters	Anchorage 21.908 meters

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1.0 INTRODUCTION

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

The objectives of this report are:

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

The evaluation uses the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN) 131 (SM9), 135 (CRW), and 138 (CRE). SM9, CRE and CRW GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service.

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

Table 1-1 WAAS Service Levels

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

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

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

Table 1-2 PA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	73	6293778
Atlantic City	81	6968423
Oklahoma City	86	7396504
WAAS:		
Albuquerque	90	7775632
Anchorage	90	7772430
Atlanta	90	7775565
Barrow	89	7680897
Bethel	90	7775214
Billings	90	7772377
Boston	90	7775854
Chicago	90	7767314
Cleveland	90	7769526
Cold Bay	89	7684884
Dallas	90	7772253
Denver	90	7766033
Fairbanks	90	7775149
Gander	90	7770383
Goose Bay	90	7775753
Houston	90	7774979
Iqaluit	90	7774197
Jacksonville	90	7775995
Juneau	90	7762765
Kansas City	90	7775985
Kotzebue	79	6794113
Los Angeles	90	7772904
Memphis	90	7774979
Merida	90	7773112
Mexico City	89	7691566
Miami	90	7771686
Minneapolis	90	7773654
New York	90	7775624
Oakland	90	7770573
Puerto Vallarta	90	7762477
Salt Lake City	90	7771944
San Jose Del Cabo	88	7586741
Seattle	90	7768141
Washington DC	90	7774772
Winnipeg	90	7775803

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Anchorage	90	7775997
Atlanta	90	7775996
Barrow	90	7741280
Bethel	90	7775198
Billings	90	7772647
Boston	90	7775998
Cleveland	90	7775999
Cold Bay	89	7684823
Fairbanks	90	7775917
Gander	90	7772250
Honolulu	90	7775902
Houston	90	7775997
Iqaluit	90	7773121
Juneau	90	7775997
Kansas City	90	7775983
Kotzebue	76	6566524
Los Angeles	90	7775999
Merida	90	7775787
Miami	90	7775895
Minneapolis	90	7775997
Oakland	90	7775997
Salt Lake City	90	7775999
San Jose Del Cabo	88	7641792
San Juan	90	7775992
Seattle	90	7775999
Tapachula	89	7672884

The report is divided by the performance category:

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

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

Table 1-4 WAAS Performance Parameters

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

1.1 Event Summary

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

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

Table 1-5 Events

Start Date	End Date	Location Satellite	Service Affected	Event Description
1/20/2019	1/20/2019	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3)	LPV200_Alaska	The Barrow WRS went offline at 05:40 GMT and came back at 13:17 GMT. The lack of observations from the BRW elevated IGP GIVEs in the region and caused minor degradation of LPV200 service coverage in Alaska from 10:20 GMT to 10:30 GMT. Please see plot(s): LPV200_1/20/2019 Cov_vs_Time_Alaska_1/20/2019

Start Date	End Date	Location Satellite	Service Affected	Event Description
1/31/2019	1/31/2019	PRN21	LPV_CONUS, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	The reduction in LPV and LPV200 service in CONUS, Alaska, and Canada was due to a GPS NANU on PRN21 (see NANU2019019) which was Unusable from 07:15 GMT to 12:45 GMT. The NANU also caused significant degradation of: (1) LPV200 service coverage in CONUS from 08:30 GMT to 09:20 GMT and from 10:10 GMT to 10:55 GMT; and (2) LPV200 service coverage in Canada from 10:00 GMT to 11:00 GMT. The NANU also caused moderate degradation of: (1) LPV service coverage in CONUS from 08:47 GMT and 09:03 GMT and from 10:30 GMT to 10:40 GMT; (2) LPV service coverage in Canada from 10:30 GMT to 10:50 GMT; and (3) LPV200 service coverage in Alaska from 10:15 GMT to 10:50 GMT. Please see plot(s): LPV_1/31/2019 LPV200_1/31/2019 Cov_vs_Time_Alaska_1/31/2019 Cov_vs_Time_Canada_1/31/2019 Cov_vs_Time_Conus_1/31/2019
02/02/2019	03/14/2019	Merida (MMD1), Merida (MMD2), Merida (MMD3), Mexico City (MMX1), Mexico City (MMX2), Mexico City (MMX3), Puerto Vallarta (MPR1), Puerto Vallarta (MPR2), Puerto Vallarta (MPR3), San Jose Del Cabo (MSD1	CONUS	Starting February 2nd, 2019, the tech center has observed more frequent OEI outages from Mexico sites. These common outages reduce the observations in the region elevating IGP GIVE values. The elevated GIVES cause minor LPV200 coverage degradation over Arizona.
2/13/2019	2/13/2019	GEO131, Santa Paula (SZ1), Southbury (DX1)	LPV200_Alaska	The Southbury and Santa Paula Ground Uplink Stations (GUS) for GEO 131 were cold started on 2/13. Santa Paula was taken offline at 05:08:49 GMT and returned at 05:45:02 GMT. Southbury was cold-started at 05:06:10 GMT and returned to backup at 21:05:02 GMT. This caused a 2182-second gap in the GEO broadcast. This caused very minor degradation of LPV200 service coverage in Alaska. TOW 277747-279929

Start Date	End Date	Location Satellite	Service Affected	Event Description
02/14/2019	02/14/2019	PRN26	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN26 (see NANU2019023) which was Unusable from 14:00 GMT to 19:30 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 19:00 GMT to 19:10 GMT (So. California) and from 20:51 GMT to 20:59 GMT (OH, WV, VA, NC). Please see plot(s): LPV200_2/14/2019
03/01/2019	03/01/2019	PRN6	LPV_CONUS, LPV200_CONUS, LPV200_Canada	The reduction in LPV service in CONUS and LPV200 service in CONUS, and Canada was due to a GPS NANU on PRN6 (see NANU2019029) which was Unusable from 02:36 GMT to 07:16 GMT. The NANU caused severe degradation of LPV200 service coverage in CONUS from 02:39 GMT to 03:08 GMT, from 05:15 GMT to 05:51 GMT, and from 06:38 GMT to 07:19 GMT. The NANU also caused moderate degradation of LPV service in CONUS (FL panhandle) from 06:48 GMT to 07:13 GMT. The NANU also caused minor degradation of LPV200 service in Canada from 04:06 GMT to 05:13 GMT. Please see plot(s): LPV_3/1/2019 LPV200_3/1/2019 Cov_vs_Time_Conus_3/1/2019
3/5/2019	3/5/2019	GEO131, Santa Paula (SZ1), Southbury (DX1)	LPV200_Alaska	The Southbury and Santa Paula Ground Uplink Stations (GUS) for GEO 131 were cold started on 3/5. Santa Paula was taken offline at 02:26:13 GMT and returned at 03:10:44 GMT. Southbury was cold-started at 02:24:49 GMT and returned to backup at 03:03:30 GMT. This caused a 2246-second gap in the GEO broadcast. This caused very minor degradation of LPV200 service coverage in Alaska. TOW 181590 -183837

Start Date	End Date	Location Satellite	Service Affected	Event Description
03/22/2019	03/22/2019	PRN29	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN29 (see NANU2019041) which was Unusable from 05:22 GMT to 11:36 GMT. The NANU caused moderate degradation of LPV200 service coverage in CONUS (So. CA, MN, WI, WV, and PA) from 06:00 GMT to 06:30 GMT. Please see plot(s): LPV200_3/22/2019
03/28/2019	03/28/2019	Washington D.C. (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska	Elevated IGP GIVE values resulted in minor degradation of LPV200 service coverage in Alaska from 05:30 GMT to 06:00 GMT. Please see plot(s): LPV200_3/28/2019 Cov_vs_Time_Alaska_3/28/2019

Table 1-6 WAAS Upgrades

Start Date	End Date	Location Satellite	Event Description
02/20/2019	02/20/2019	Washington D.C. (CnV)	SSM-52: These system support modifications (SSMs) support the cutover to Release 4. SSM-52 upgrades the safety computers at the ZDC WMS and installs build W7.243L.
02/26/2019	02/22/2019	Atlanta (CnV)	SSM-52: These system support modifications (SSMs) support the cutover to Release 4. SSM-52 upgrades the safety computer at the ZTL WMS and installs build W7.243L. On 2/27, ZTL was faulted at 18:04:33 GMT from Normal Mode while performing SSM-WAAS-055 monitoring cable installation, causing Second Level to postpone the start of ZLA WMS Upgrade.
03/06/2019	03/06/2019	POCC	SSM-52: These system support modifications (SSMs) support the cutover to Release 4. SSM-52 upgrades the POCC O&M to build W7.243L.
03/06/2019	03/06/2019	Los Angeles (CnV)	SSM-52: These system support modifications (SSMs) support the cutover to Release 4. SSM-52 upgrades the safety computer at the ZLA WMS and installs build W7.243L.
03/06/2019	03/06/2019	NOCC	SSM-52: These system support modifications (SSMs) support the cutover to Release 4. SSM-52 upgrades the NOCC O&M to build W7.243L.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
02/04/2019	02/04/2019	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site at 17:01:37 GMT. This caused a 7-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 147697-147705
02/13/2019	02/13/2019	Manual	GEO135, Littleton (APA)	None	The uplink for the CRW GEO, PRN135 switched from the Littleton uplink site to the Napa uplink site at 09:19:19 GMT. This caused a 4-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no effect on coverage. TOW 292759-292764
03/01/2019	03/01/2019	Missed Navigation Message	GEO138, Brewster-B (BRE-B), Atlanta (CnV)	None	Brewster-B had C&V Source Select from Atlanta to Los Angeles. TOW 450694-450696
03/05/2019	03/05/2019	Faulted	GEO131, Santa_Paula (SZ1)	None	GEO 131 switched to Southbury, Santa_Paula faulted. TOW 181590-183837
03/26/2019	03/26/2019	Manual	GEO138, Brewster-B (BRE-B)	None	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 07:29:50 GMT. This caused a 4-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 199807-199812
03/28/2019	03/28/2019	Manual	GEO135,Napa (APC)	None	The uplink for the CRW GEO, PRN135 switched from the Napa uplink site to the Littleton uplink site at 08:03:47 GMT. This caused a 4-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no effect on coverage. TOW 374644-374649

1.2 Report Overview

Section 2.0 provides the observed Localizer Performance with Vertical Guidance (LPV) and NPA performance for the evaluated receiver locations (see PA Evaluation Sites and NPA Evaluation Site). This section also shows tabulated

data for the 95% accuracy and the maximum inaccuracy. In addition, the daily 95% accuracy for each receiver and the histograms of vertical and horizontal error are shown.

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

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

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

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

Section 7.0 provides the GEO ranging performance for SM9, CRE and CRW.

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

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

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

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

2.0 WAAS POSITION ACCURACY

Navigation error data, collected from WAAS and NSTB reference stations, was processed to determine position accuracy at each location. This was accomplished by using the GPS/WAAS position solution tool to compute a RTCA DO-229D-weighted least squares user navigation solution and WAAS horizontal protection level (HPL) and vertical protection level (VPL) once every second. The user position calculated for each receiver was compared to the surveyed position of the antenna to assess position error associated with the WAAS signal in space (SIS) over time. The position errors were analyzed and statistics were generated for the operational service levels shown in Table 1-1.

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

- The maximum 95% CONUS horizontal LPV error was 1.374 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.794 meters observed at Atlantic City.
- The minimum 95% CONUS horizontal LPV errors was 0.564 meters observed at Denver.
- The minimum 95% CONUS vertical LPV error was 0.754 meters observed at Denver.

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	1.374	1.374	1.323	100	*	*
Atlantic City	1.212	1.212	1.794	100	*	*
Oklahoma City	0.730	0.730	1.030	100	*	*
Albuquerque	0.662	0.662	0.805	100	1.547	4.366
Anchorage	0.758	0.758	1.234	100	*	*
Atlanta	0.768	0.768	1.196	100	1.795	4.488
Barrow	0.619	0.619	1.231	100	1.514	4.264
Bethel	0.533	0.533	0.947	100	1.590	3.946
Billings	0.584	0.584	0.902	100	2.034	4.182
Boston	0.829	0.829	0.835	100	*	*
Chicago	0.881	0.881	0.801	100	*	*
Cleveland	0.751	0.751	0.833	100	2.046	4.400
Cold Bay	0.680	0.680	1.042	100	*	*
Dallas	0.612	0.612	1.153	100	*	*
Denver	0.564	0.564	0.754	100	*	*
Fairbanks	0.683	0.683	1.166	100	1.600	3.987
Gander	0.881	0.881	1.056	100	*	*
Goose Bay	0.778	0.778	0.857	100	*	*
Houston	0.612	0.612	1.228	100	*	*
Iqaluit	0.856	0.856	1.201	100	*	*
Jacksonville	0.707	0.707	1.320	100	*	*
Juneau	0.634	0.634	1.250	100	*	*
Kansas City	0.607	0.607	0.817	100	1.793	4.294
Kotzebue	0.602	0.602	1.186	99.999	1.619	4.127
Los Angeles	0.835	0.835	1.049	100	1.692	4.681
Memphis	0.578	0.578	1.002	100	*	*
Merida	0.658	0.658	1.693	100	*	*
Mexico City	0.557	0.557	1.828	100	*	*
Miami	0.824	0.824	1.590	100	1.621	4.562
Minneapolis	0.716	0.716	0.769	100	1.867	4.169
New York	0.805	0.805	0.931	100	*	*
Oakland	0.613	0.613	0.972	100	1.713	4.670
Puerto Vallarta	0.595	0.595	1.587	100	*	*
Salt Lake City	0.609	0.609	0.780	100	1.556	4.184
San Jose Del Cabo	0.600	0.600	1.760	100	*	*
Seattle	0.644	0.644	0.828	100	1.549	4.103
Washington DC	0.952	0.952	0.891	100	2.046	4.400
Winnipeg	0.576	0.576	0.917	100	*	*

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

- The maximum 95% horizontal error was 2.839 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 7.397 meters observed at Honolulu.
- The minimum 95% horizontal error was 0.934 meters observed at Iqaluit.
- The minimum 99.999% horizontal error was 1.823 meters observed at Kansas City.

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

Location	95% Horizontal (Meters)	99.999% Horizontal (Meters)	Percentage in NPA Mode (%)	Maximum Horizontal Error (Meters)
Anchorage	1.503	2.991	100	3.282
Atlanta	1.233	2.135	100	2.266
Barrow	1.068	2.260	100	2.950
Bethel	1.119	2.296	100	2.462
Billings	1.176	2.065	100	2.215
Boston	1.676	2.792	100	2.920
Cleveland	1.426	2.382	100	2.559
Cold Bay	1.088	2.358	100	2.580
Fairbanks	1.544	2.934	100	3.203
Gander	1.627	2.743	100	2.903
Honolulu	2.839	7.397	100	7.673
Houston	1.273	2.079	100	2.271
Iqaluit	0.934	2.194	100	2.999
Juneau	1.011	2.126	100	2.273
Kansas City	1.060	1.823	100	2.038
Kotzebue	1.275	2.482	100	2.613
Los Angeles	1.273	2.138	100	2.579
Merida	1.119	2.180	100	2.461
Miami	1.232	2.076	100	2.404
Minneapolis	1.323	2.893	100	3.280
Oakland	1.155	2.335	100	2.514
Salt Lake City	1.054	2.412	100	2.644
San Jose Del Cabo	1.273	2.477	100	2.820
San Juan	1.091	3.127	100	3.439
Seattle	1.110	3.351	100	4.075
Tapachula	1.395	3.087	100	3.333

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 2.591 meters occurred at Iqaluit and maximum vertical LPV error was 5.724 meters occurred at Barrow.

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/HPL Ratio	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/VPL Ratio	Vertical Maximum Ratio
Arcata	2.509	0.191	0.222	3.295	0.143	0.171
Atlantic City-a	2.583	0.093	0.210	3.765	0.208	0.209
Oklahoma City	1.692	0.172	0.175	2.579	0.110	0.181
Albuquerque	1.419	0.120	0.151	2.200	0.112	0.139
Anchorage	1.937	0.145	0.150	2.834	0.127	0.167
Atlanta	1.504	0.154	0.159	3.296	0.132	0.153
Barrow	1.826	0.127	0.155	5.724	0.131	0.244
Bethel	1.232	0.083	0.092	2.461	0.105	0.120
Billings	1.474	0.160	0.160	3.184	0.094	0.155

Boston	1.595	0.115	0.133	2.248	0.105	0.122
Chicago	1.716	0.191	0.191	2.350	0.091	0.140
Cleveland	1.689	0.065	0.145	2.697	0.069	0.141
Cold Bay	1.507	0.098	0.100	2.589	0.113	0.116
Dallas	1.256	0.129	0.157	2.464	0.122	0.172
Denver	1.310	0.144	0.144	2.244	0.091	0.130
Fairbanks	2.093	0.074	0.143	3.677	0.163	0.171
Gander	1.731	0.101	0.119	3.003	0.102	0.110
Goose Bay	1.705	0.073	0.113	2.166	0.090	0.108
Houston	1.393	0.142	0.143	3.801	0.077	0.174
Iqaluit	2.591	0.099	0.171	4.501	0.154	0.203
Jacksonville	1.637	0.151	0.151	3.012	0.175	0.175
Juneau	1.829	0.112	0.132	2.726	0.136	0.157
Kansas City	1.219	0.132	0.135	2.749	0.119	0.135
Kotzebue	1.850	0.055	0.139	3.328	0.188	0.188
Los Angeles	1.973	0.137	0.148	2.850	0.090	0.141
Memphis	1.241	0.137	0.151	2.409	0.136	0.169
Merida	2.081	0.094	0.129	4.061	0.100	0.178
Mexico City	1.476	0.059	0.108	3.505	0.131	0.154
Miami	1.688	0.111	0.133	2.950	0.109	0.177
Minneapolis	1.940	0.172	0.172	2.522	0.117	0.142
New York	1.914	0.102	0.167	2.302	0.050	0.125
Oakland	1.826	0.131	0.138	2.415	0.081	0.126
Puerto Vallarta	1.314	0.060	0.116	3.308	0.138	0.138
Salt Lake City	1.521	0.158	0.159	2.503	0.081	0.125
San Jose Del Cabo	1.449	0.070	0.109	4.059	0.090	0.173
Seattle	1.528	0.126	0.146	2.650	0.112	0.132
Washington DC	2.022	0.077	0.157	2.809	0.065	0.134
Winnipeg	1.327	0.112	0.130	2.254	0.152	0.152

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

- February 1, 2019—Position errors in CONUS and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 1.774 meters and 1.827 meters at Arcata and Atlantic City, respectively. The Kp index was 4.
- February 27 to March 1, 2019—Position errors in CONUS, Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.284 meters and 2.042 meters at Atlantic City and San Jose Del Cabo, respectively. The Kp index range was 4, 5, and 5 respectively.

Figure 2-1 LPV 95% Horizontal Accuracy

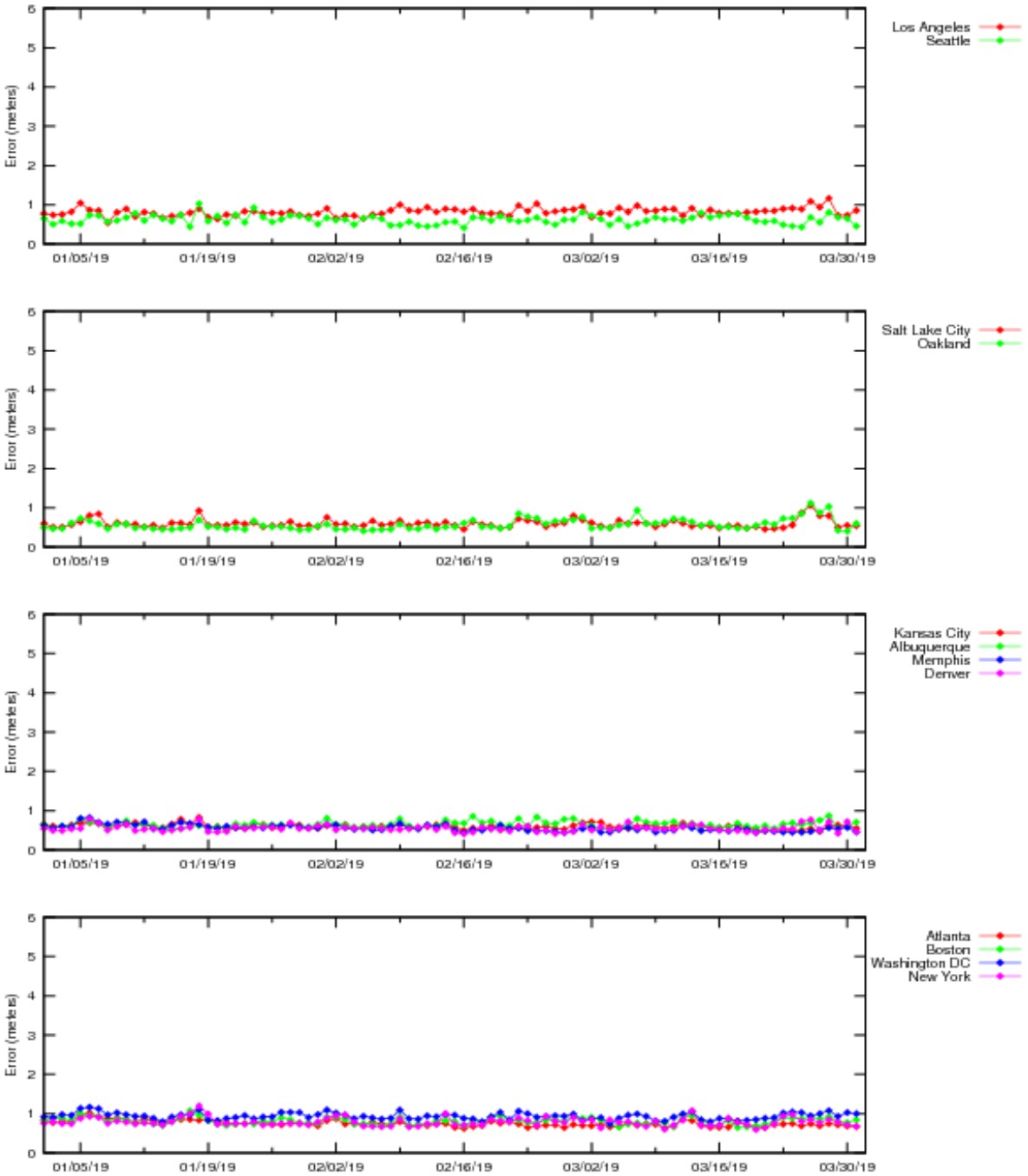


Figure 2-2 LPV 95% Horizontal Accuracy

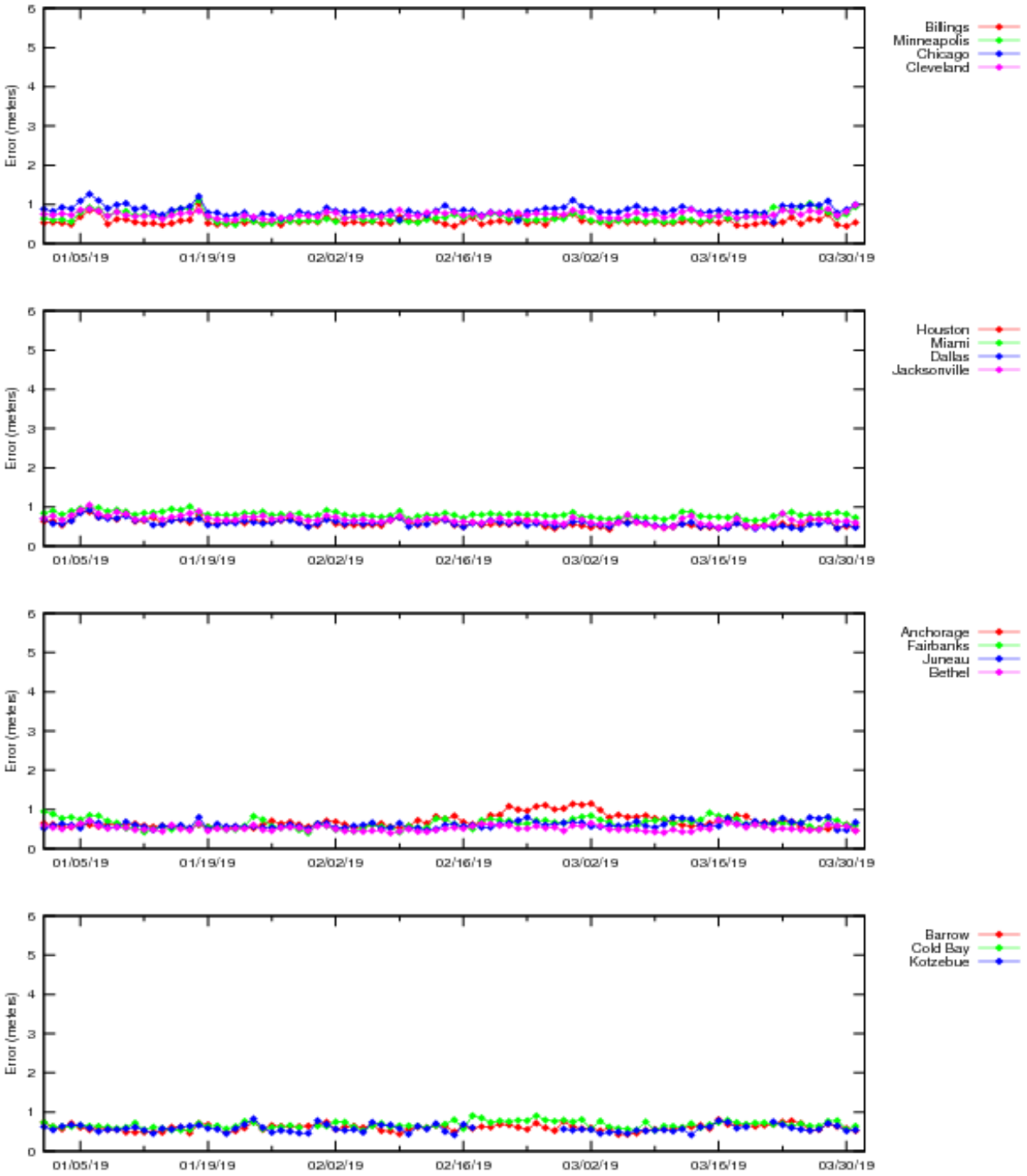


Figure 2-3 LPV 95% Horizontal Accuracy

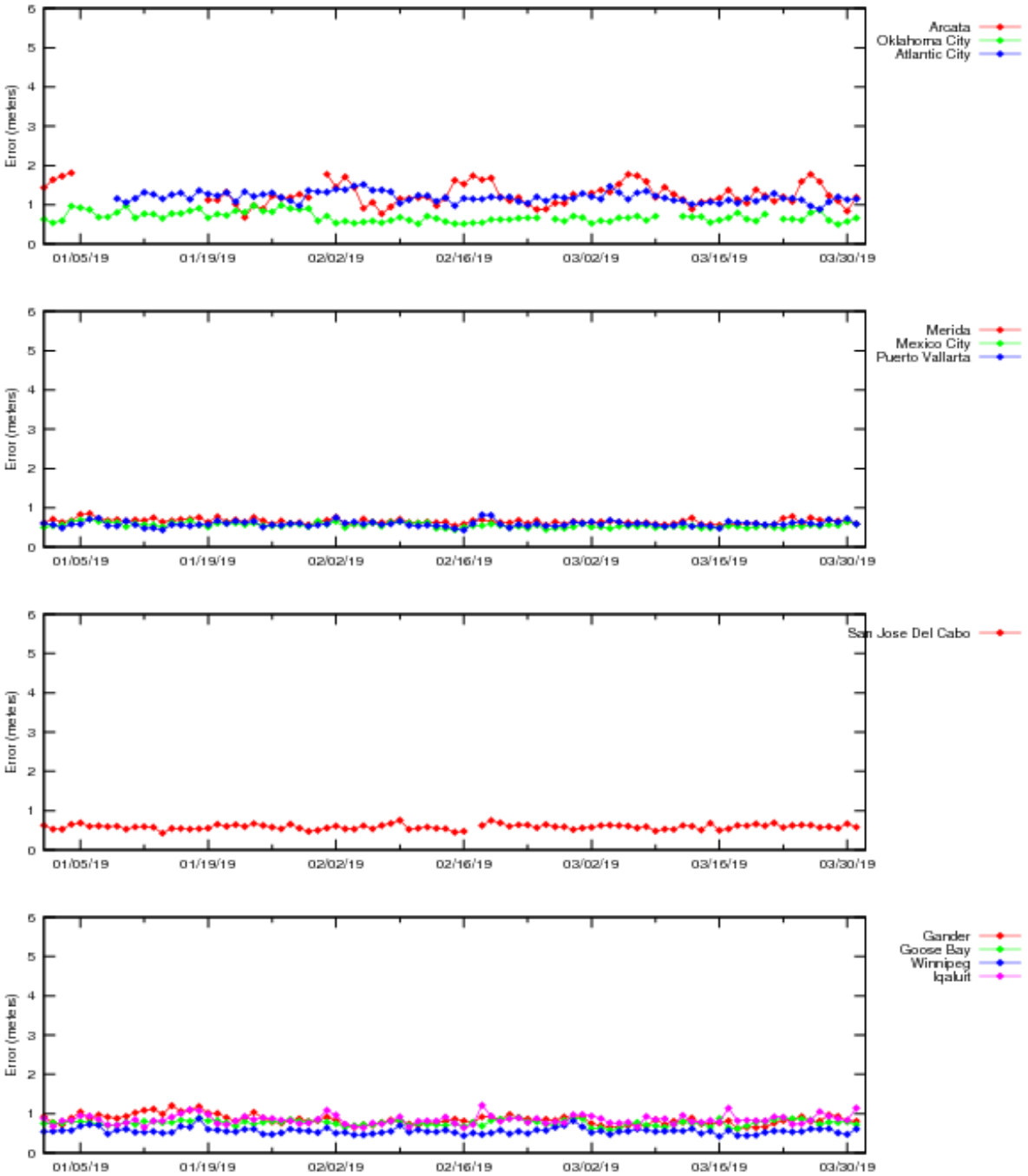


Figure 2-4 LPV 95% Vertical Accuracy

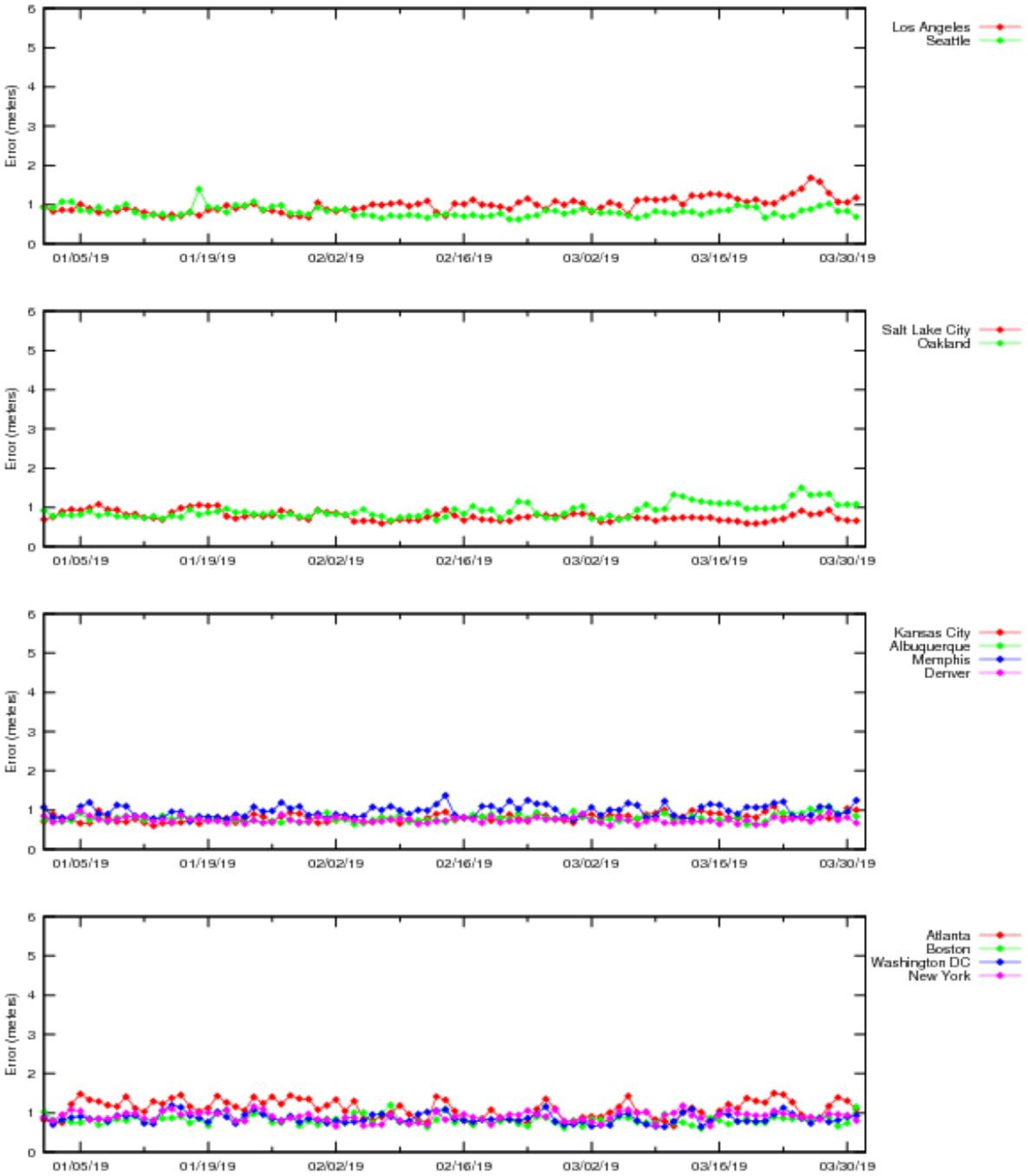


Figure 2-5 LPV 95% Vertical Accuracy

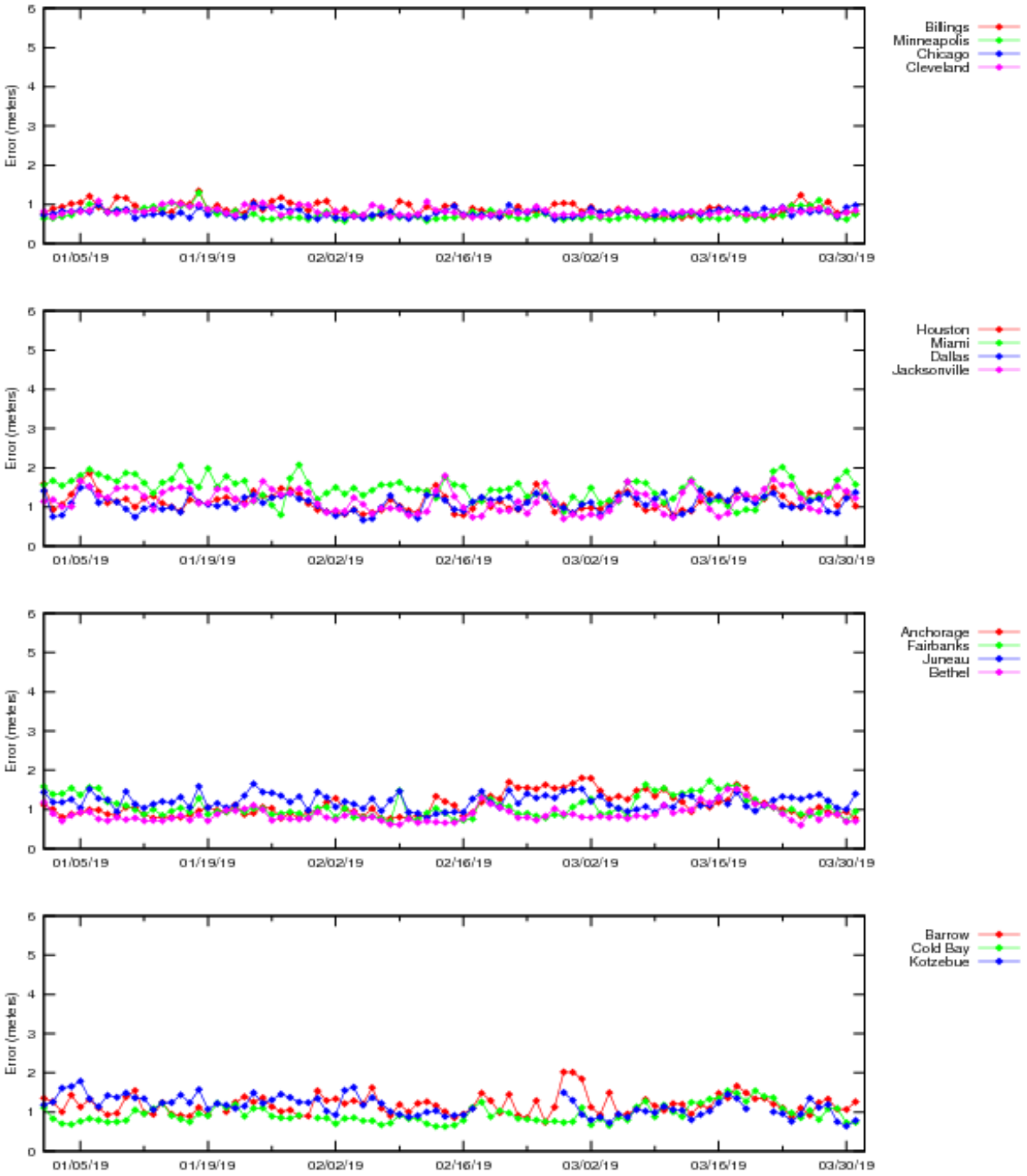


Figure 2-6 LPV 95% Vertical Accuracy

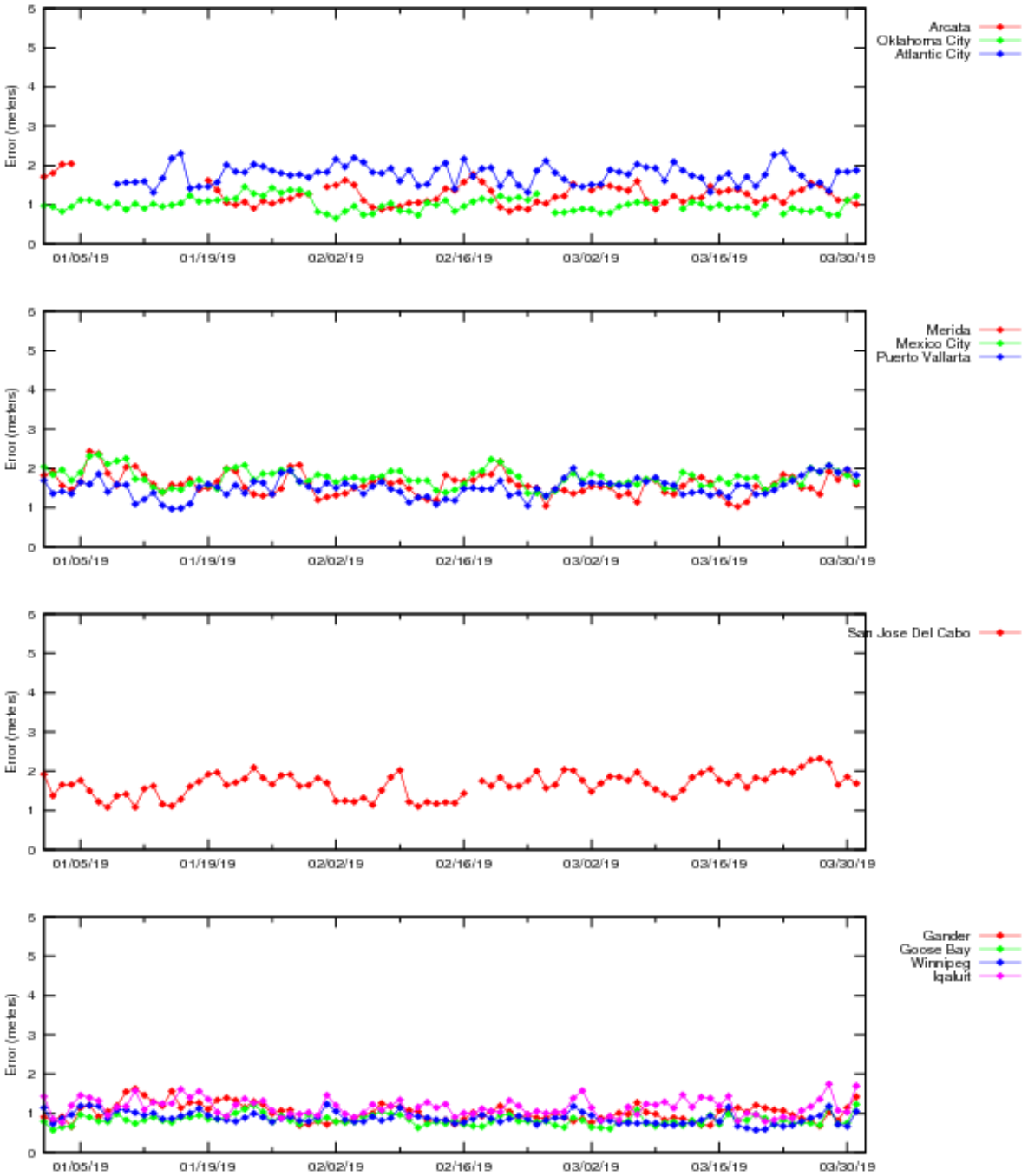


Figure 2-7 and Figure 2-8 show the daily NPA 95% horizontal accuracy at the NPA evaluation sites for the reporting period. The increases in 95% NPA position errors due to geomagnetic activity occurred on January 5, February 2, February 28, and March 1, 2019.

Figure 2-7 NPA 95% Horizontal Accuracy

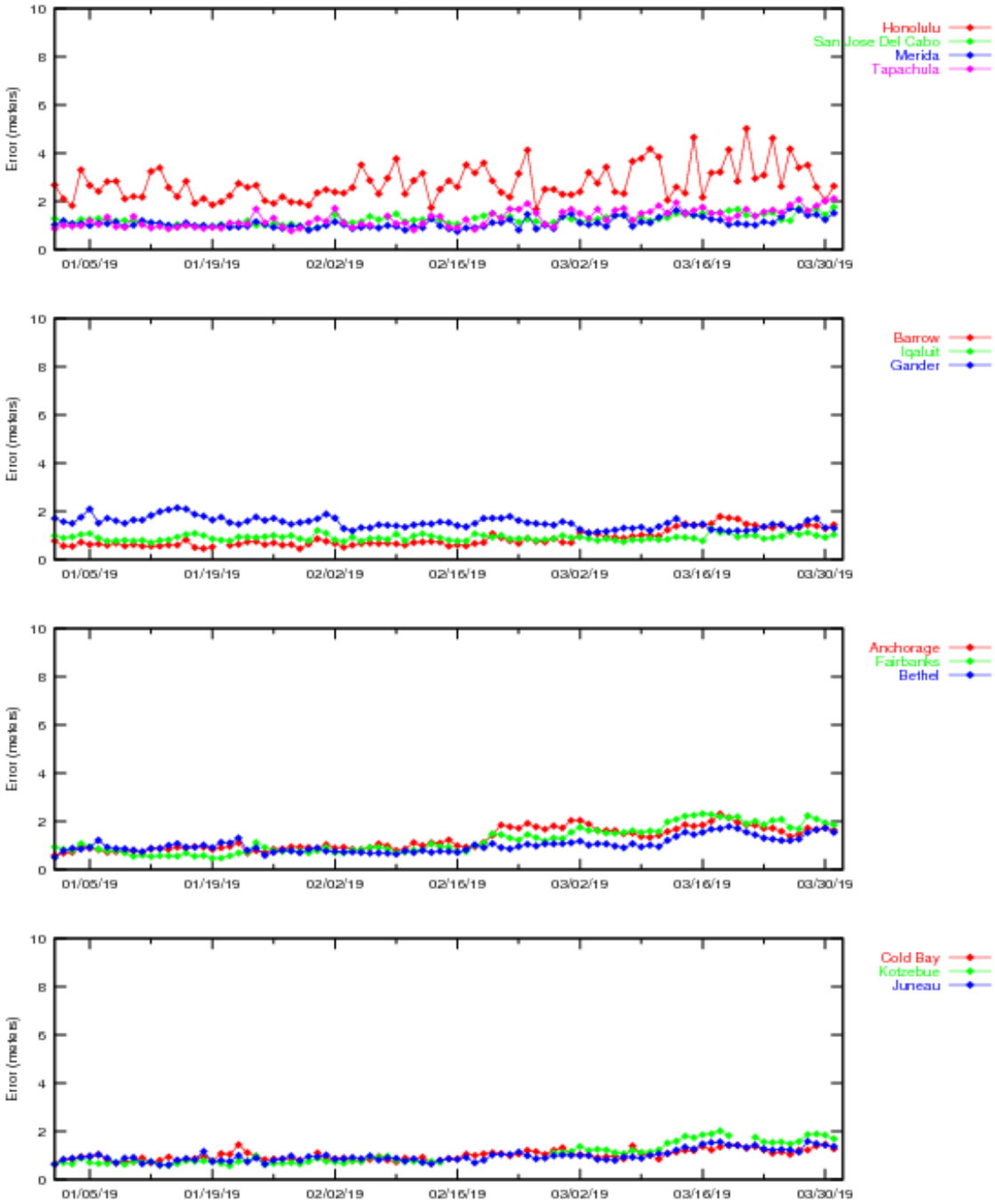


Figure 2-8 NPA 95% Horizontal Accuracy

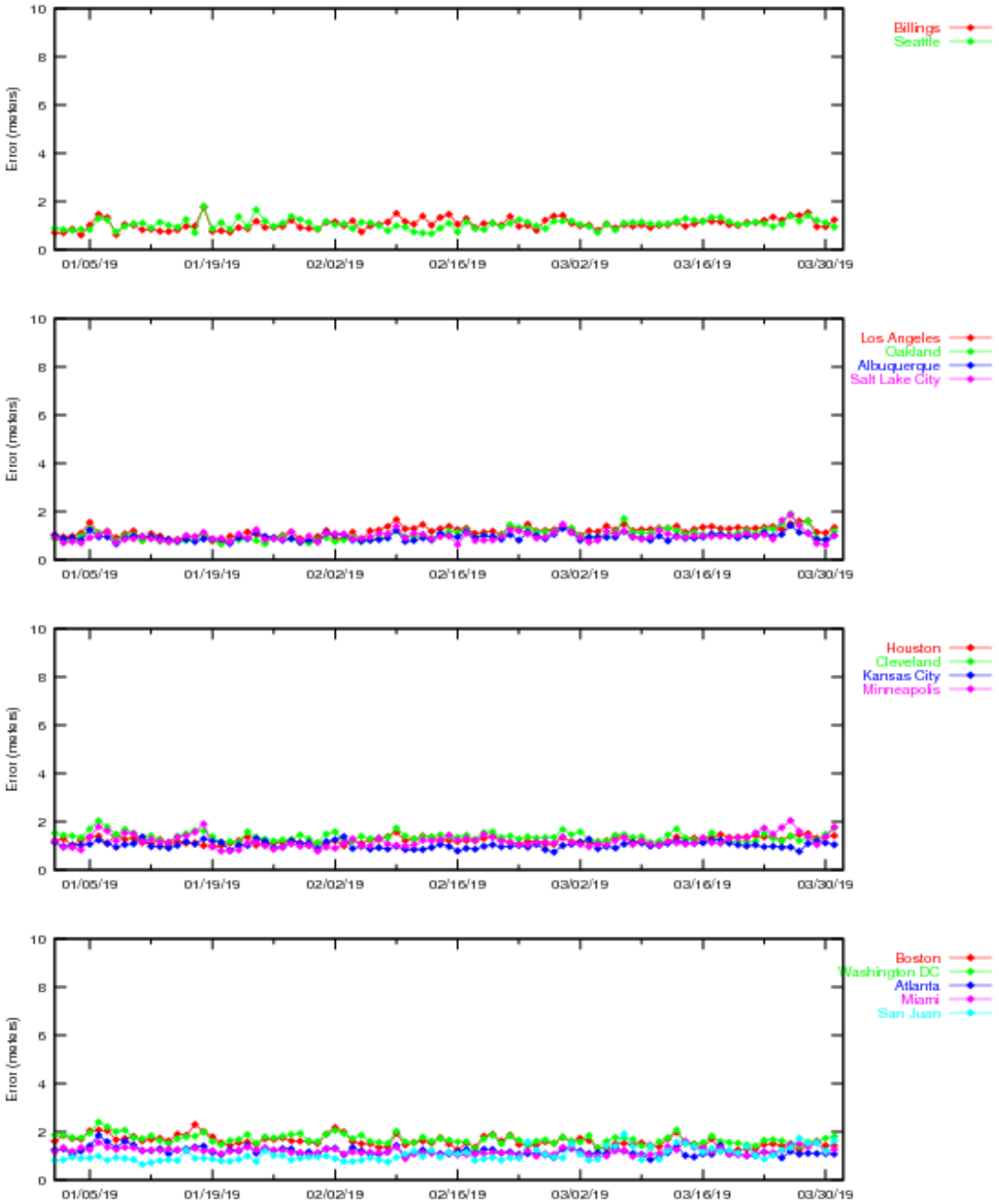


Figure 2-9 through Figure 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver for the quarter. Figure 2-9 and Figure 2-10 show the triangular distributions of vertical position error (VPE) versus VPL and horizontal position error (HPE) versus HPL: (1) the horizontal axis is the position error, (2) the vertical axis is the WAAS protection level where lower protection levels equate to better availability, (3) the diagonal line shows the point where error equals protection level, (4) above and to the left of the diagonal line show where errors are bounded (WAAS is providing integrity in the position domain), and (5) below and to the right show where errors are not bounded (HMI could be present). Figure 2-11 and Figure 2-12 show the 2-D histograms of HPE, VPE, and normalized position errors: (1) the blue trace shows the distributions of the actual HPE and VPE; (2) the horizontal axis is the position errors and the vertical axis is the total count of data samples (log scale) in each 0.1-meter bin; (3)

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

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

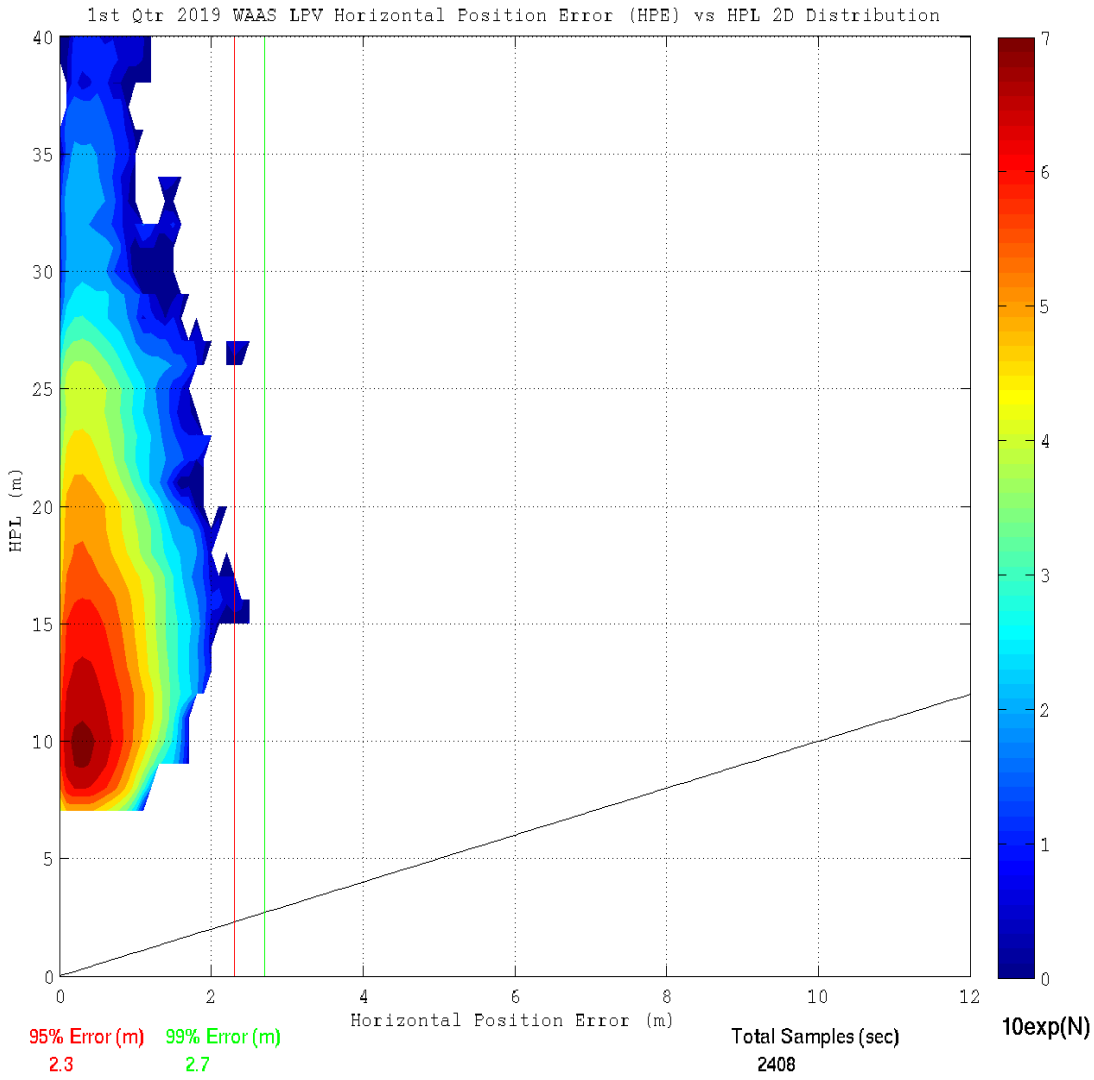


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

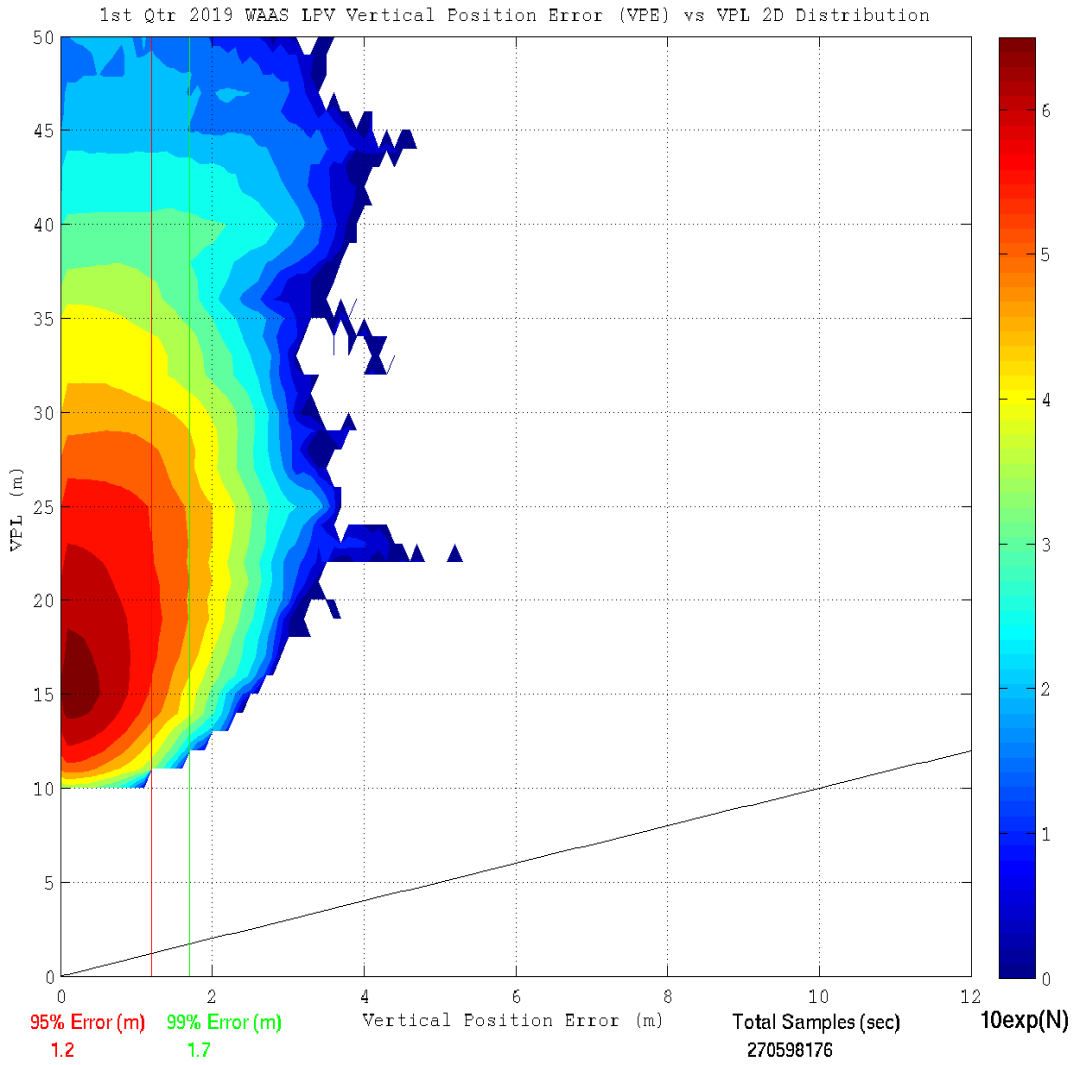


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

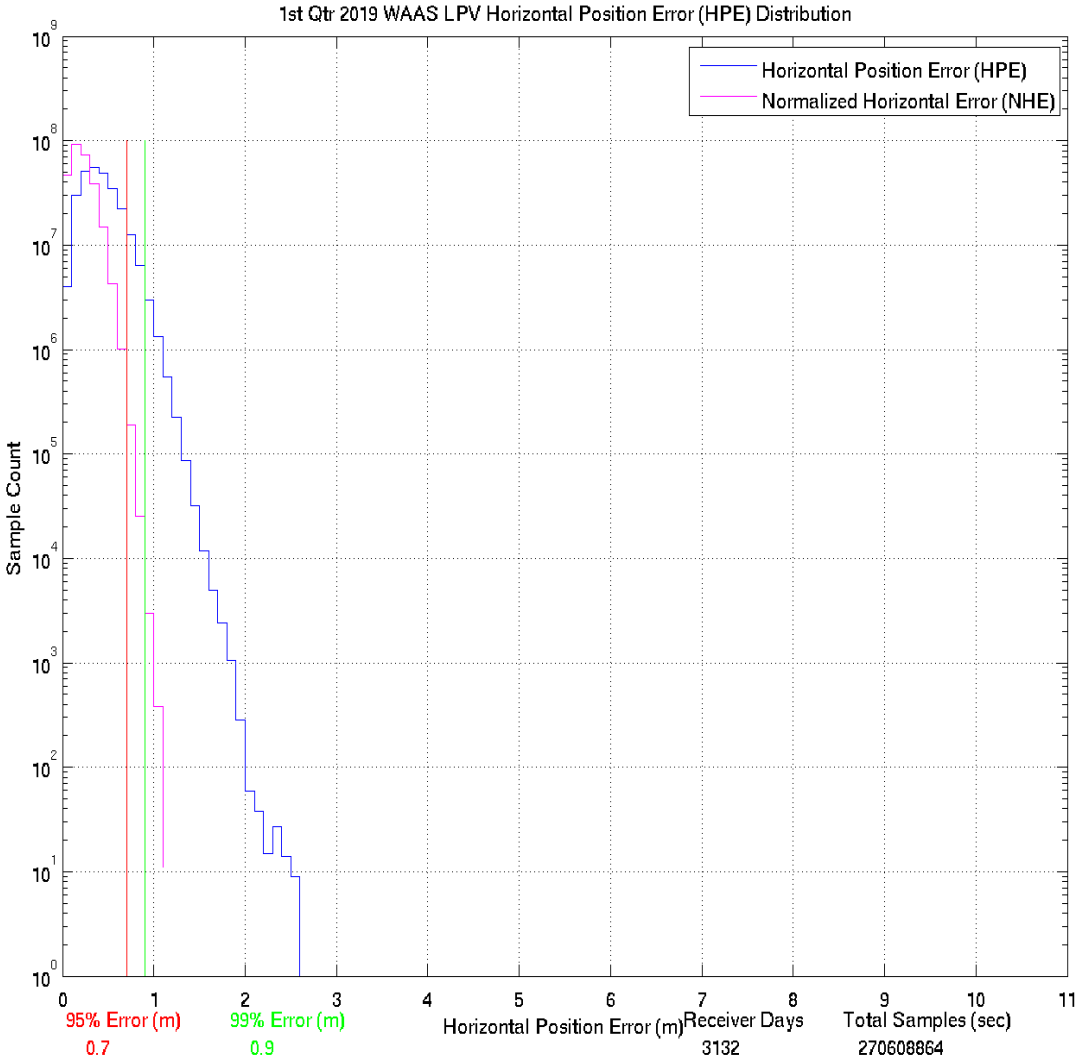
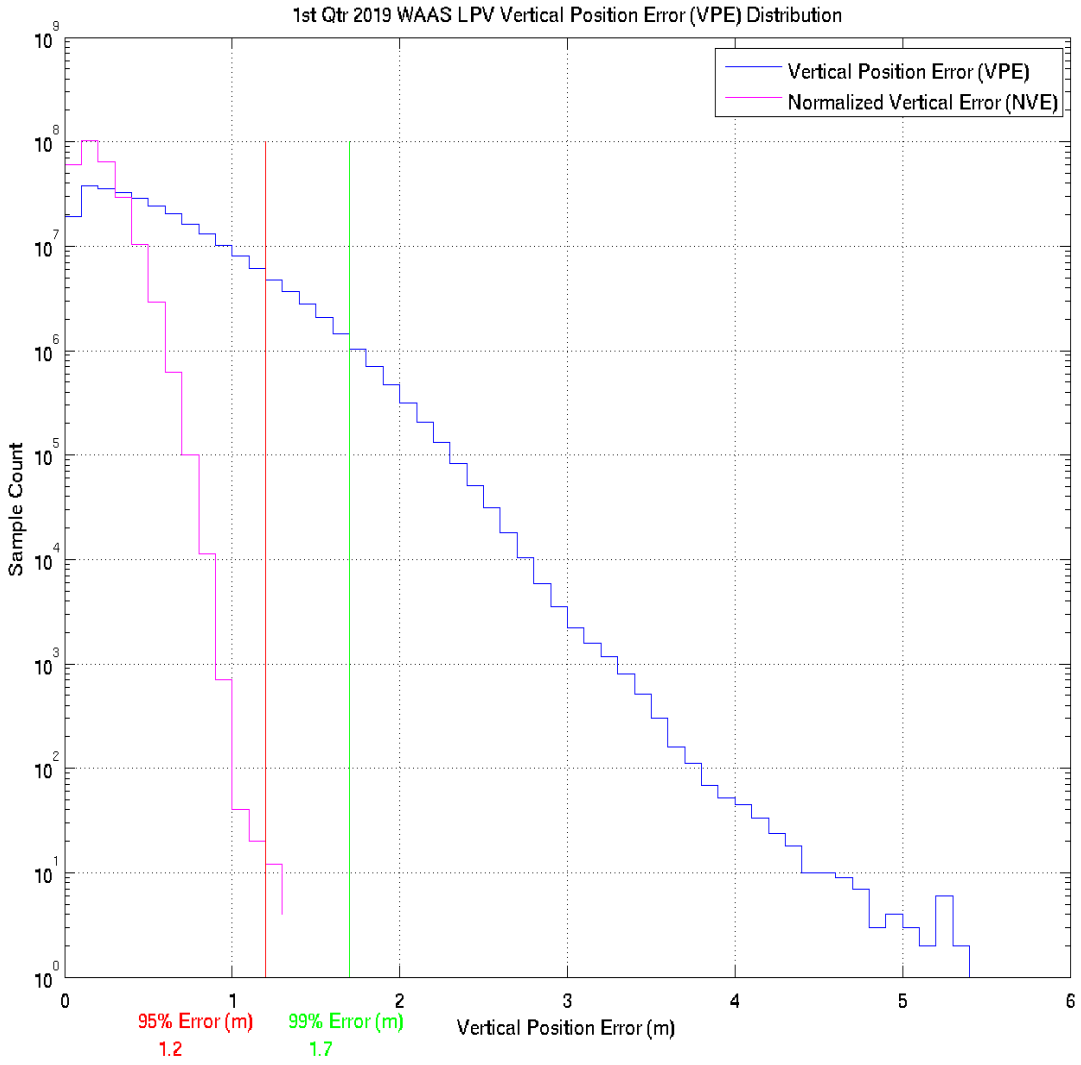


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

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

- The maximum 99% CONUS HPL was 17.133 meters observed at Cleveland
- The maximum 99% CONUS VPL was 29.036 meters observed at Arcata
- The minimum 99% CONUS HPL was 10.751 meters observed at Dallas
- The minimum 99% CONUS VPL was 20.350 meters observed at Minneapolis
- The maximum 99% Alaska HPL was 18.993 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 32.611 meters observed at Barrow
- The minimum 99% Alaska HPL was 12.840 meters observed at Juneau
- The minimum 99% Alaska VPL was 21.908 meters observed at Anchorage

Table 3-1 99% Protection Level

Location	99% HPL (Meters)	99% VPL (Meters)	Percentage in PA mode
Arcata	13.197	29.036	100
Atlantic City	16.711	24.134	100
Oklahoma City	11.307	22.928	100
Albuquerque	11.525	21.777	100
Anchorage	13.613	21.908	100
Atlanta	12.457	22.289	100
Barrow	16.776	32.611	100
Bethel	15.291	24.362	100
Billings	12.229	20.435	100
Boston	15.509	21.638	100
Chicago	12.633	20.584	100
Cleveland	17.133	24.056	100
Cold Bay	18.993	26.977	100
Dallas	10.751	23.416	100
Denver	11.430	20.426	100
Fairbanks	13.447	23.168	100
Gander	20.493	28.947	100
Goose Bay	17.000	26.576	100
Houston	11.122	24.643	100
Iqaluit	18.844	29.399	100
Jacksonville	13.215	26.377	100
Juneau	12.840	22.623	100
Kansas City	11.940	21.332	100
Kotzebue	15.567	27.249	99.999
Los Angeles	14.343	26.763	100
Memphis	11.410	20.981	100
Merida	19.408	33.057	100
Mexico City	22.055	34.256	100
Miami	15.663	27.459	100
Minneapolis	12.317	20.350	100
New York	14.678	21.415	100
Oakland	14.017	27.625	100
Puerto Vallarta	24.876	36.675	100
Salt Lake City	11.238	21.411	100
San Jose Del Cabo	21.964	33.061	100
Seattle	12.497	21.660	100
Washington DC	15.543	23.795	100
Winnipeg	13.794	21.626	100

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

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

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

Location	LP WAAS With 15 Minute Window (%)	LPV WAAS With 15 Minute Window (%)	LPV200 WAAS With 15 Minute Window (%)
Arcata	100	100	100
Atlantic City-a	100	100	100
Oklahoma City	100	100	99.97
Albuquerque	100	100	99.97
Anchorage	100	100	100
Atlanta	100	100	99.99
Barrow	100	99.99	99.1
Bethel	100	100	100
Billings	100	100	99.98
Boston	100	100	100
Chicago	100	100	100
Cleveland	100	100	99.99
Cold Bay	100	100	99.97
Dallas	100	100	99.98
Denver	100	100	99.99
Fairbanks	100	100	99.99
Gander	100	100	99.99
Goose Bay	100	100	100
Houston	100	100	99.98
Iqaluit	100	99.99	99.91
Jacksonville	100	100	99.98
Juneau	100	100	99.98
Kansas City	100	100	99.99
Kotzebue	100	100	99.95
Los Angeles	100	100	99.98
Memphis	100	100	99.99
Merida	100	99.99	99.23
Mexico City	100	99.96	99.09
Miami	100	99.99	99.97
Minneapolis	100	100	100
New York	100	100	100
Oakland	100	100	99.98
Puerto Vallarta	99.98	99.93	96.78
Salt Lake City	100	100	100
San Jose Del Cabo	99.99	99.94	99.17
Seattle	100	100	99.97
Washington DC	100	100	99.99
Winnipeg	100	100	99.99

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	0	0	0	0	0	0
Atlantic City-a	0	0	0	0	1	0.000022
Oklahoma City	0	0	1	0.000020	2	0.000041
Albuquerque	0	0	1	0.000019	2	0.000039
Anchorage	0	0	0	0	1	0.000019
Atlanta	0	0	0	0	1	0.000019
Barrow	1	0.000020	7	0.000137	111	0.002187
Bethel	0	0	0	0	2	0.000039
Billings	0	0	0	0	1	0.000019
Boston	0	0	0	0	0	0
Chicago	0	0	0	0	1	0.000019
Cleveland	0	0	0	0	1	0.000019
Cold Bay	1	0.000020	1	0.000020	4	0.000078
Dallas	0	0	0	0	2	0.000039
Denver	0	0	0	0	2	0.000039
Fairbanks	0	0	1	0.000019	4	0.000077
Gander	0	0	0	0	3	0.000058
Goose Bay	0	0	0	0	0	0
Houston	0	0	0	0	2	0.000039
Iqaluit	1	0.000019	6	0.000116	18	0.000348
Jacksonville	0	0	0	0	1	0.000019
Juneau	0	0	0	0	1	0.000019
Kansas City	0	0	0	0	1	0.000019
Kotzebue	1	0.000022	1	0.000022	12	0.000265
Los Angeles	0	0	0	0	4	0.000077
Memphis	0	0	0	0	2	0.000039
Merida	0	0	2	0.000039	109	0.002120
Mexico City	0	0	9	0.000176	184	0.003621
Miami	0	0	1	0.000019	1	0.000019
Minneapolis	0	0	0	0	1	0.000019
New York	0	0	0	0	1	0.000019
Oakland	0	0	0	0	3	0.000058
Puerto Vallarta	1	0.000019	4	0.000077	212	0.004233
Salt Lake City	0	0	0	0	2	0.000039
San Jose Del Cabo	1	0.000020	6	0.000119	176	0.003509
Seattle	0	0	0	0	1	0.000019
Washington DC	0	0	0	0	1	0.000019
Winnipeg	0	0	0	0	1	0.000019

Figure 3-1 LPV Instantaneous Availability

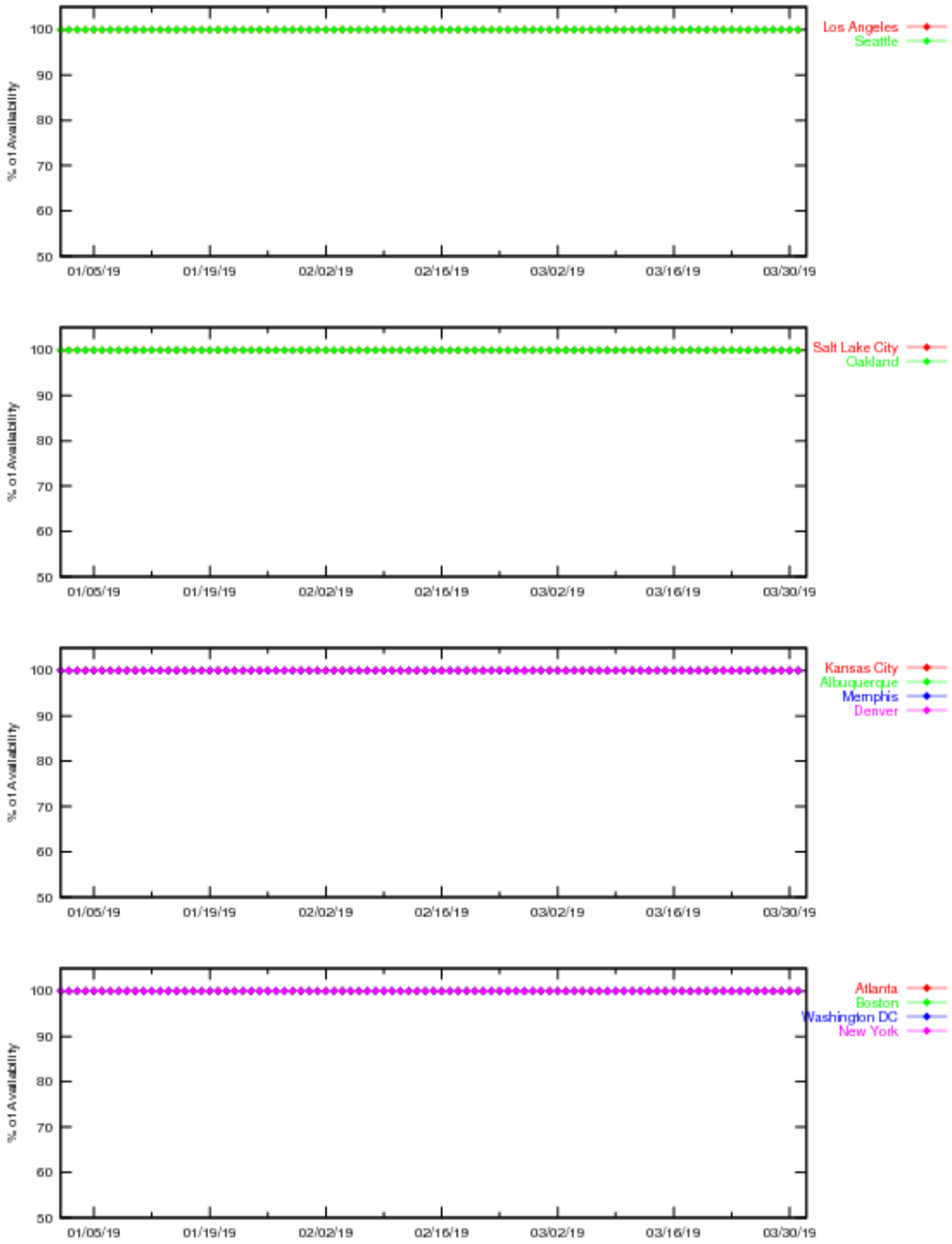


Figure 3-2 LPV Instantaneous Availability

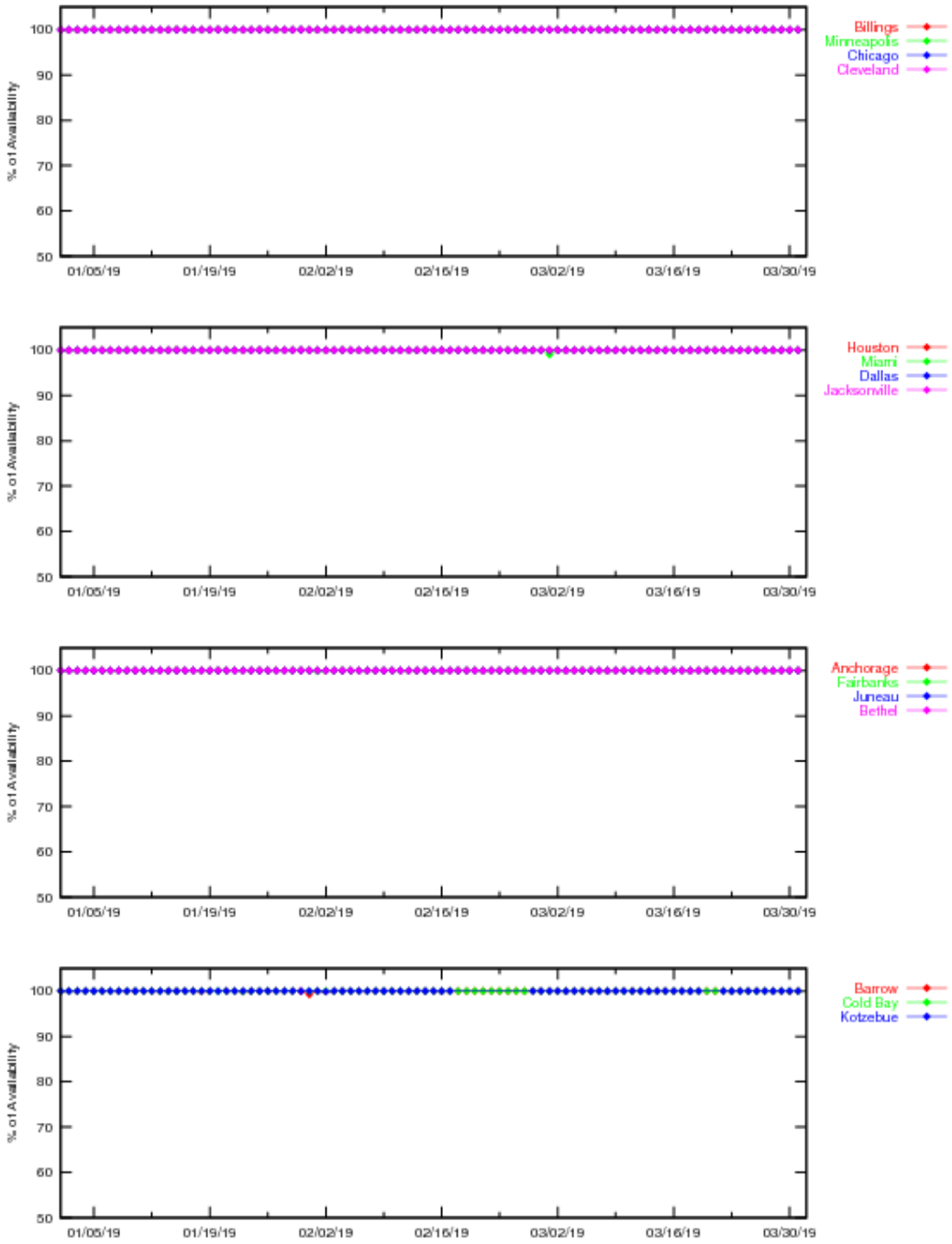


Figure 3-3 LPV Instantaneous Availability

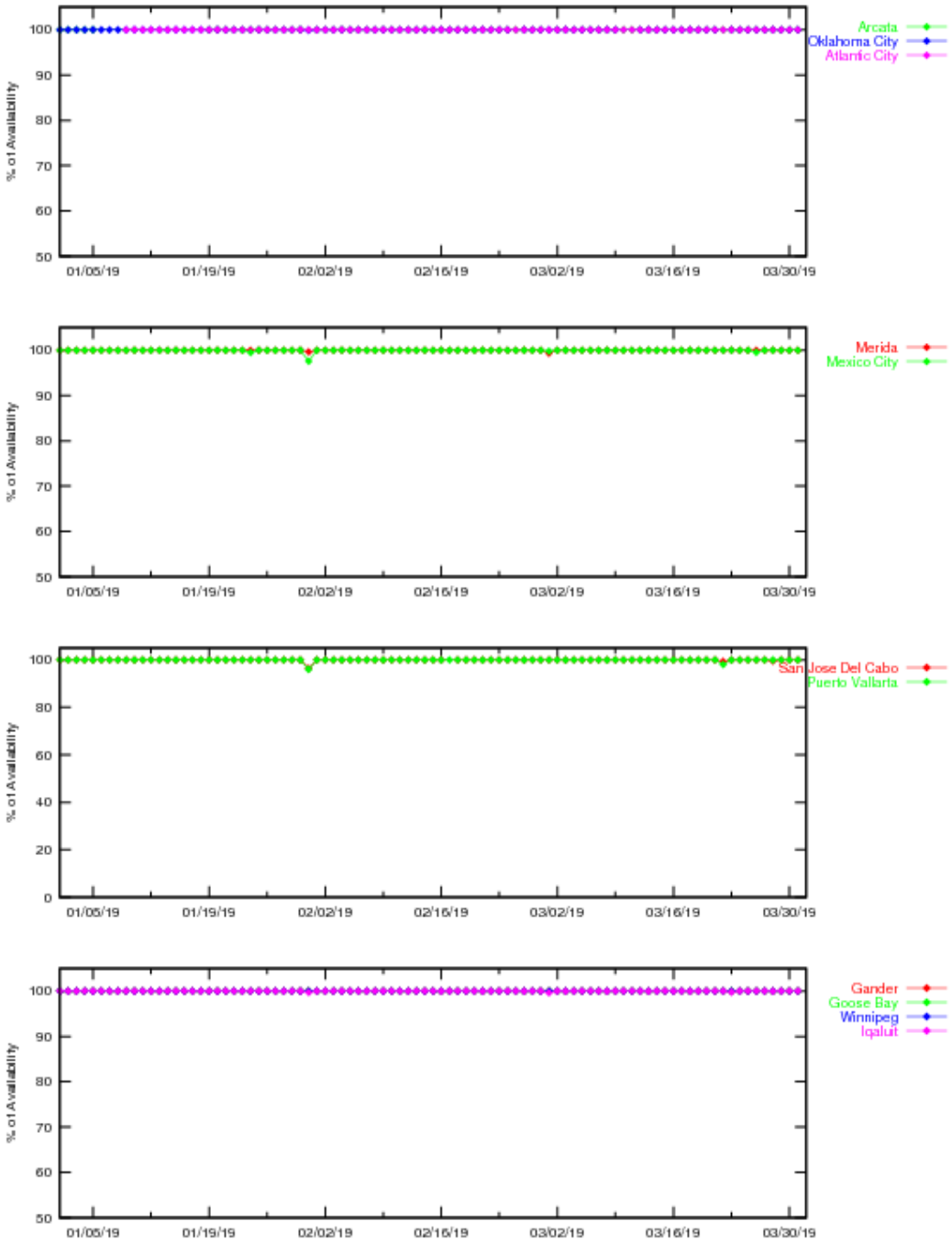


Figure 3-4 LPV200 Instantaneous Availability

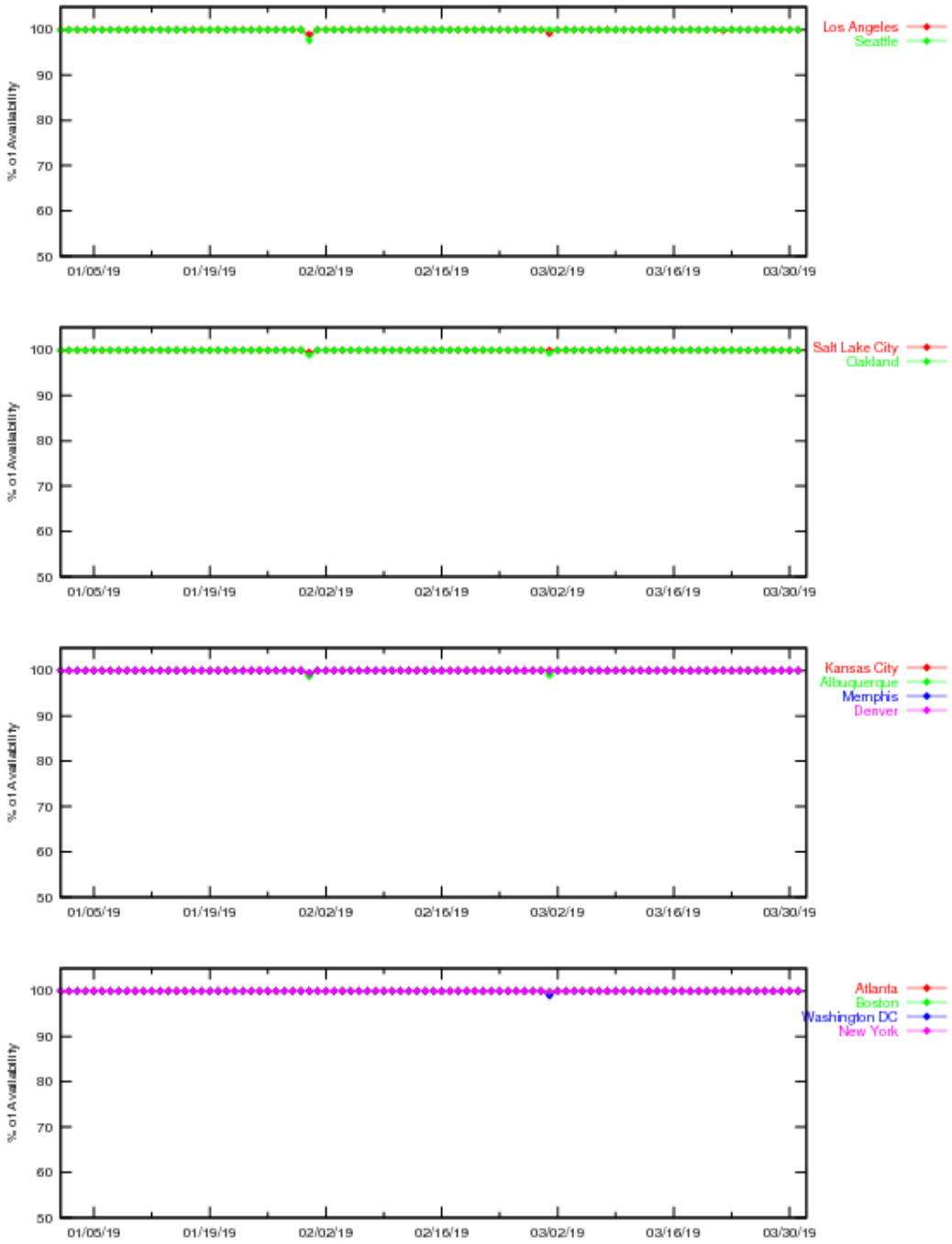


Figure 3-5 LPV200 Instantaneous Availability

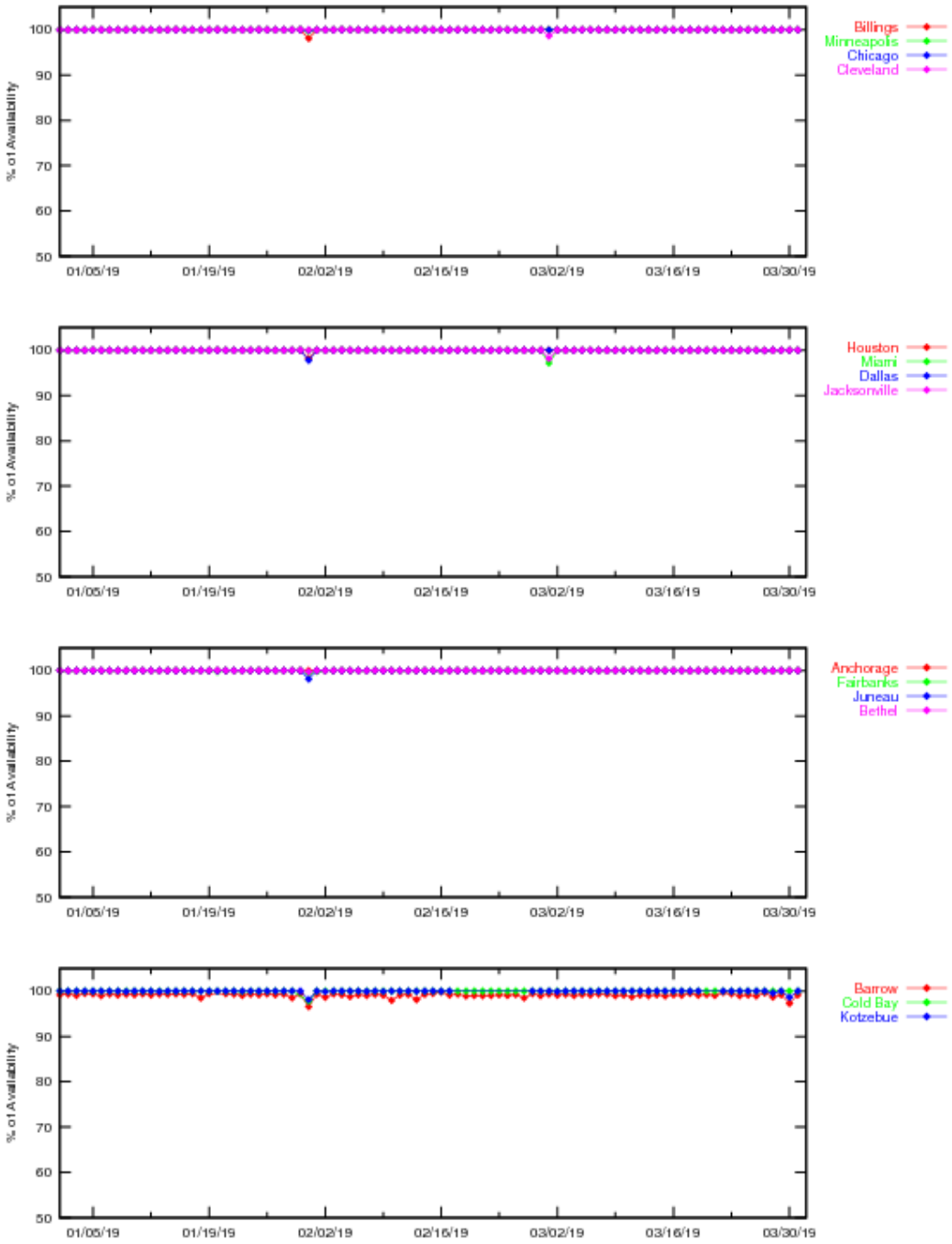


Figure 3-6 LPV200 Instantaneous Availability

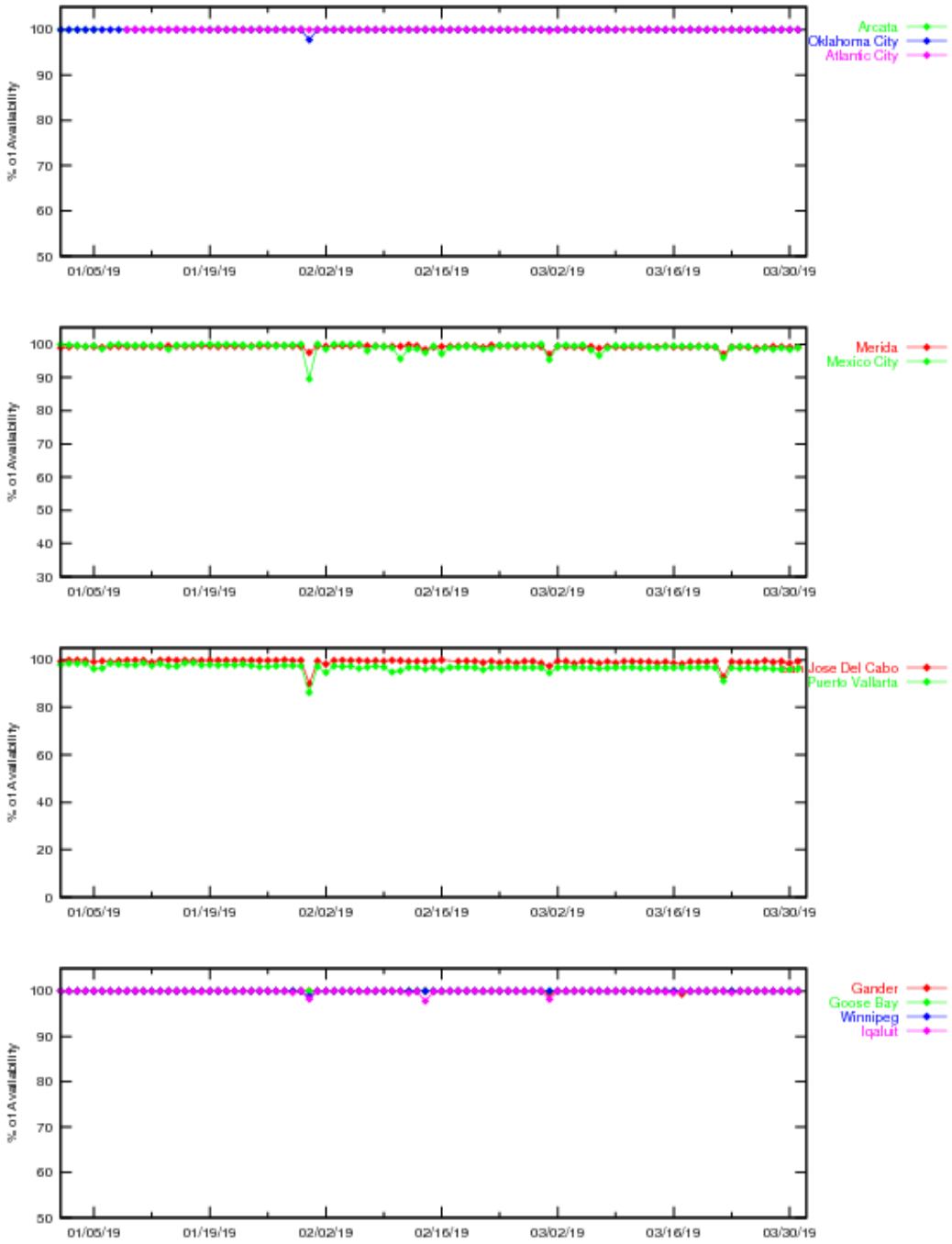


Figure 3-7 LPV Outages

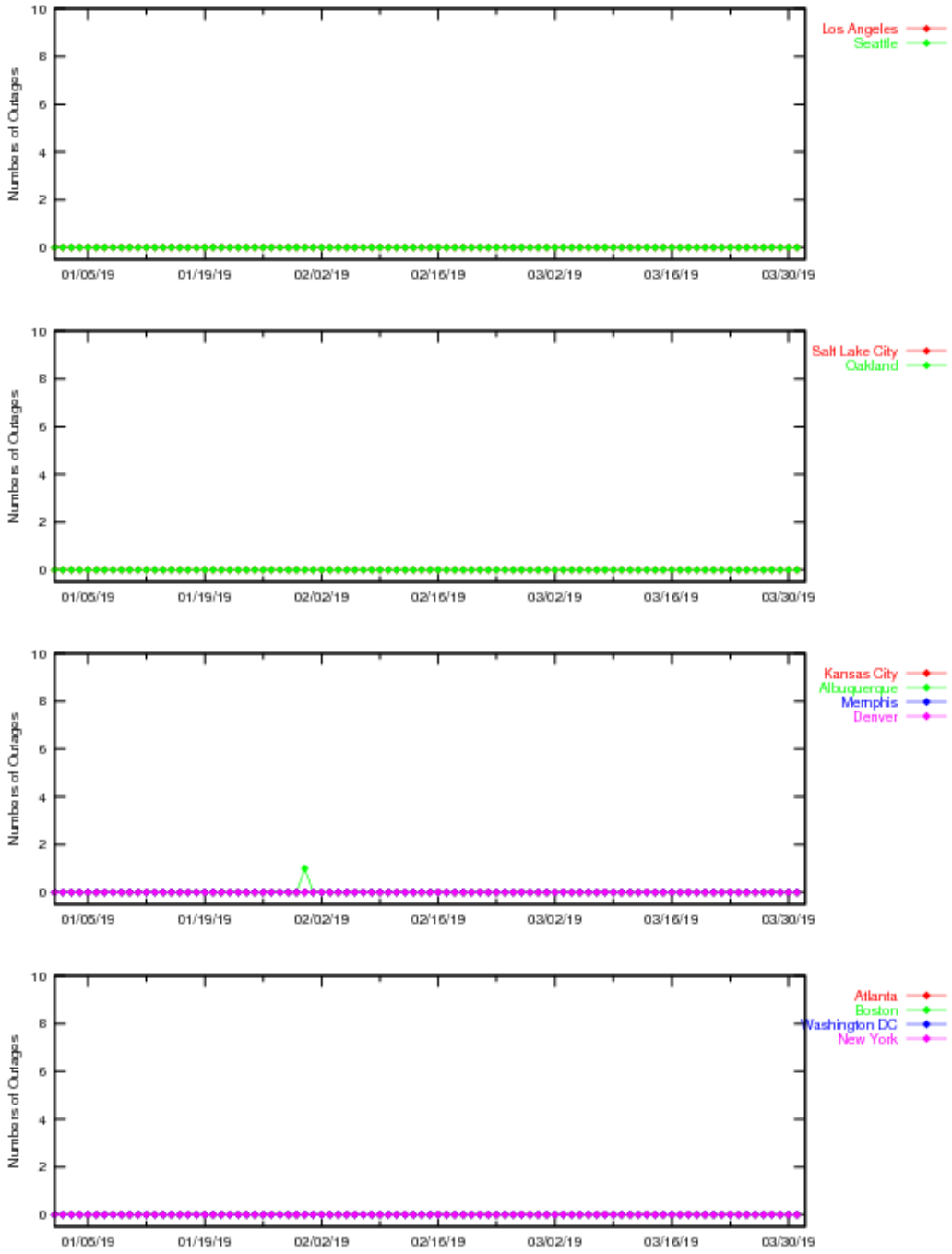


Figure 3-8 LPV Outages

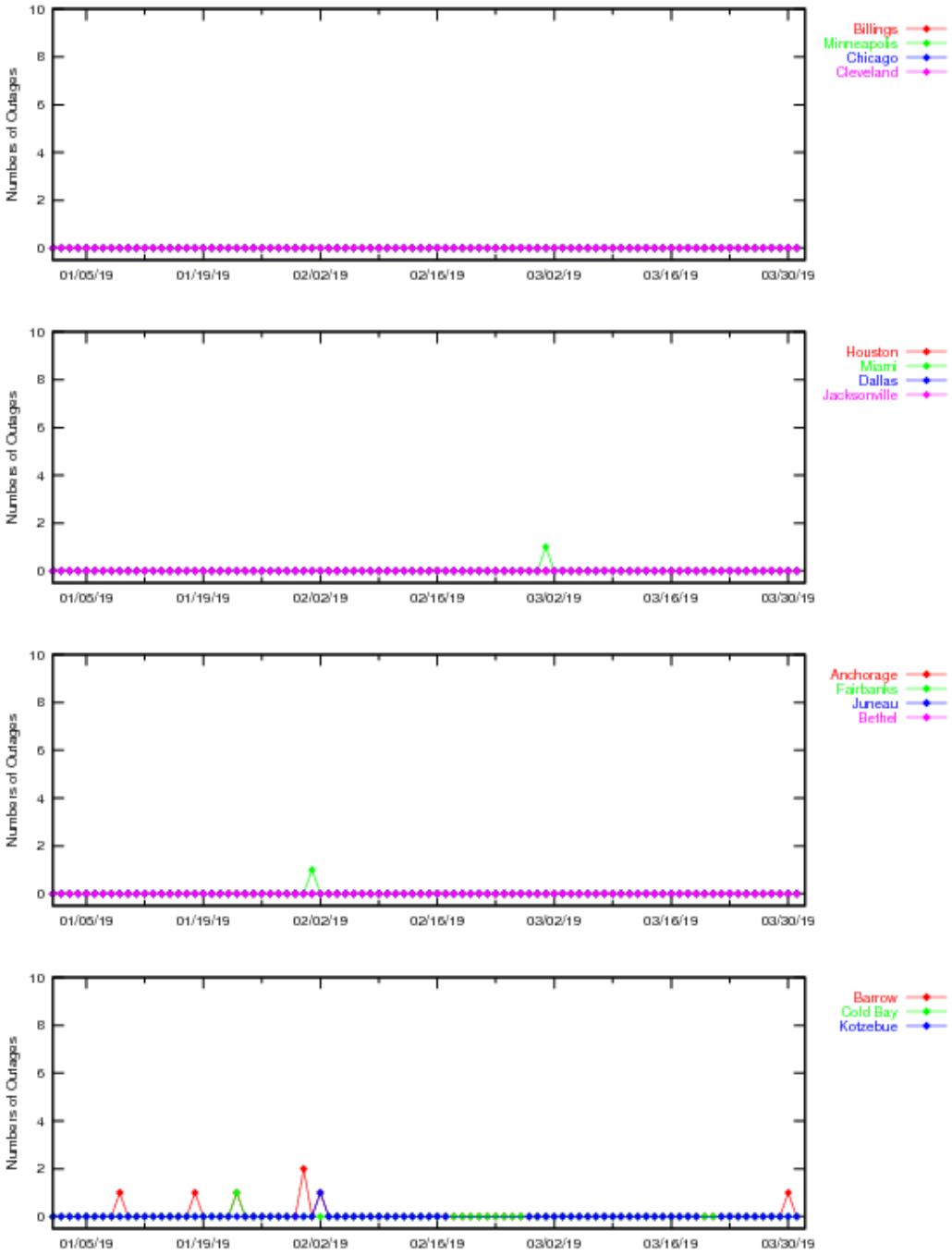


Figure 3-9 LPV Outages

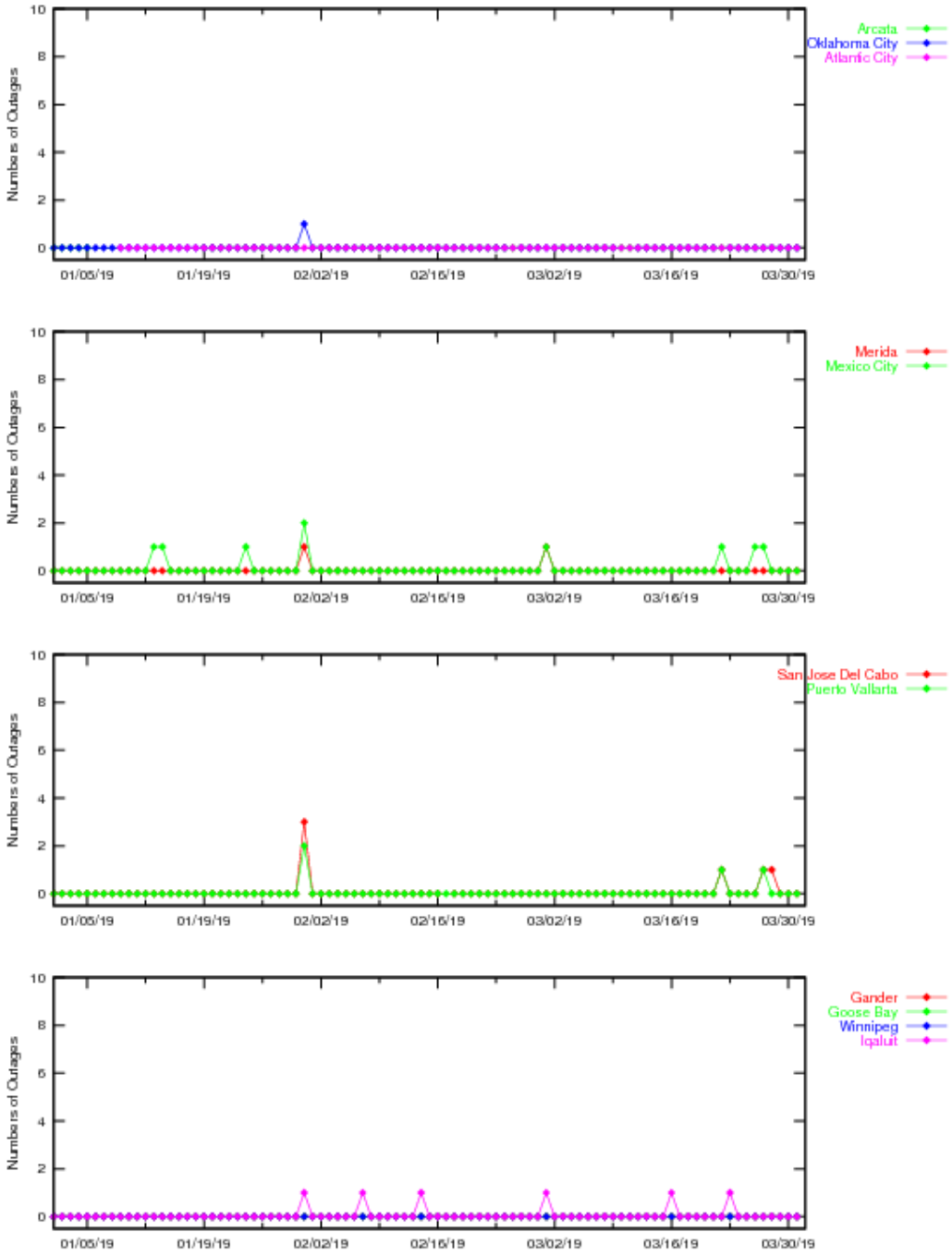


Figure 3-10 LPV200 Outages

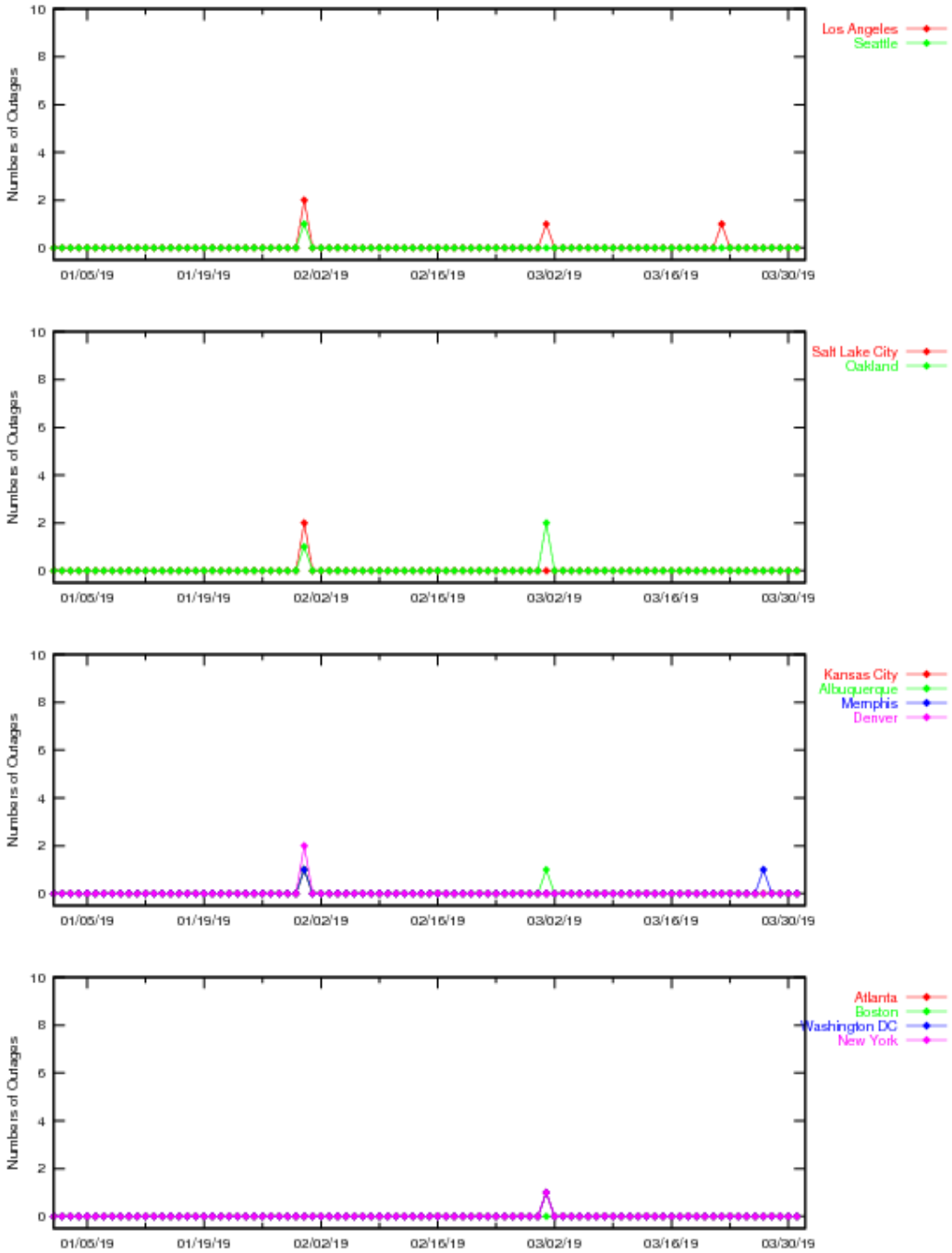


Figure 3-11 LPV200 Outages

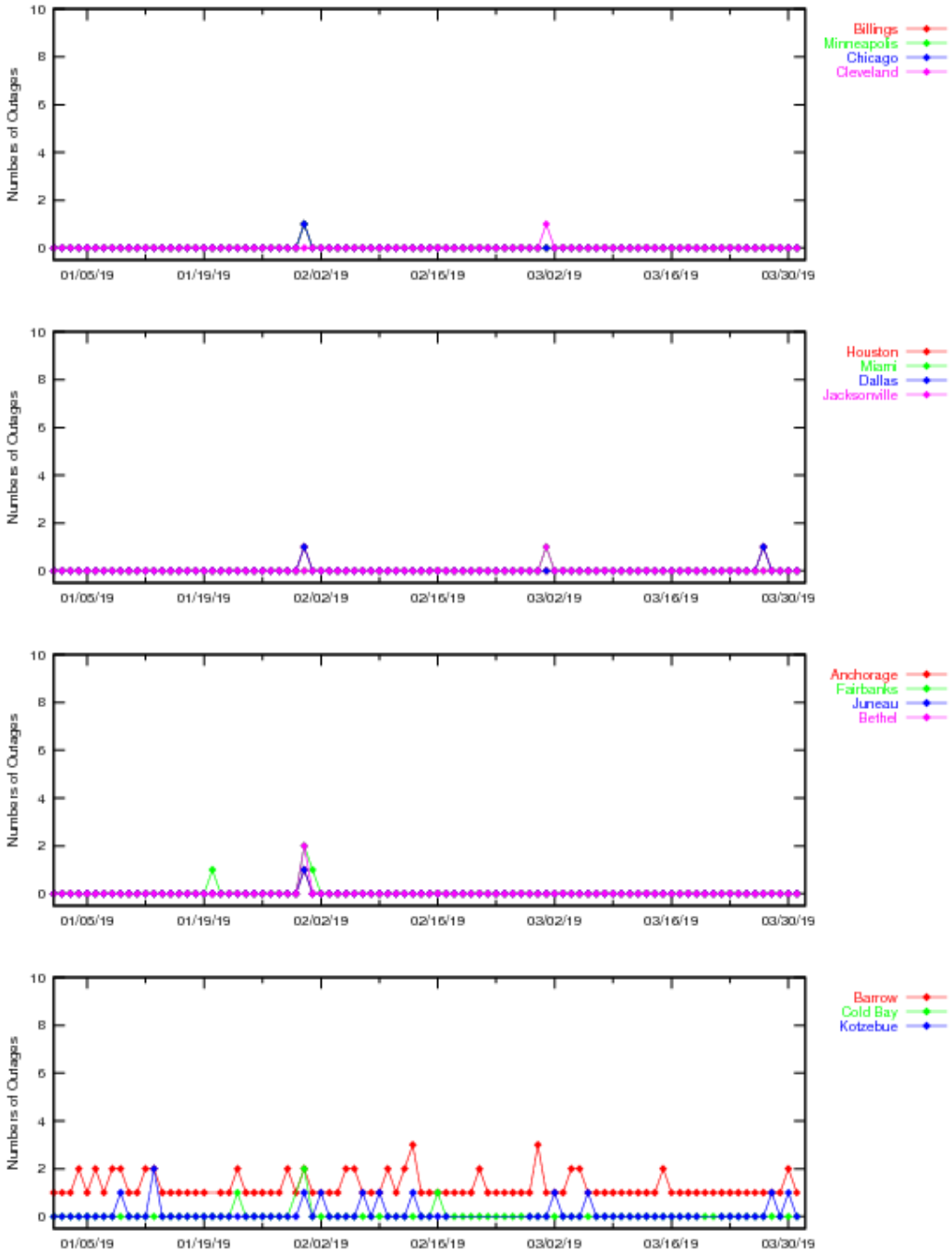
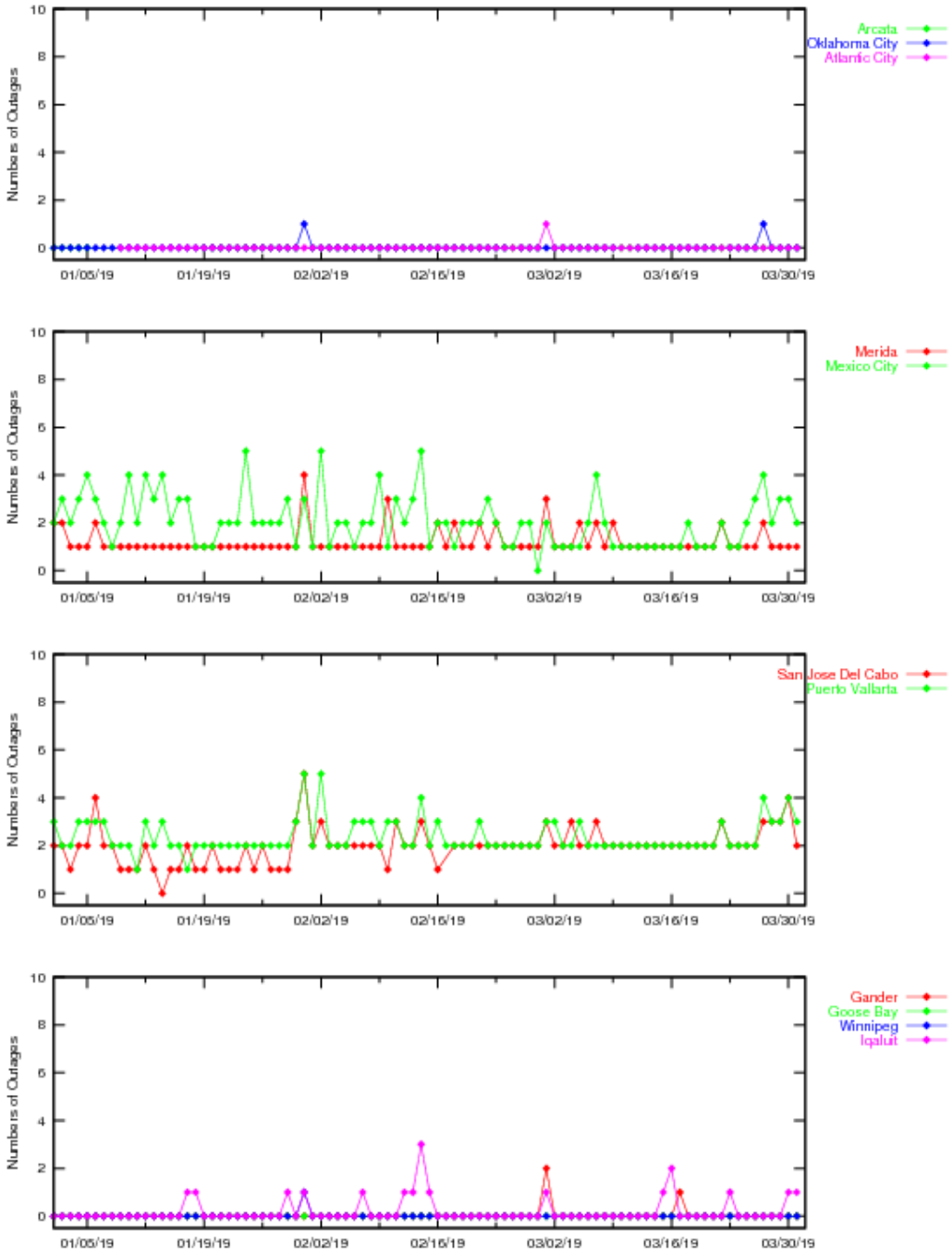


Figure 3-12 LPV200 Outages



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

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

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

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

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

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

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

- January 16 – Local RFI at Miami caused a reduction and eventual loss of space vehicle (SV) tracking. The outage occurred from 19:32:50 GMT to 19:39:06 GMT.
- January 20 – The Barrow WRS went offline. The lack of observations from BRW reduced LPV200 availability in Alaska.
- January 31 – Satellite maintenance elevated UDREs on PRN-21 and reduced LPV availability in CONUS and Canada as well as LPV200 availability in CONUS, Alaska, and Canada
- February 2 – March 31 – Data outages from Mexico sites increased IGP GIVEs and reduced LPV200 availability in CONUS (Arizona).
- February 13 – A cold-start of GEO131 reduced LPV200 availability in Alaska.
- February 14 – Satellite Maintenance elevated UDREs on PRN-26 and reduced LPV200 availability in CONUS.
- March 1 – Satellite Maintenance elevated UDREs on PRN-6 and reduced LPV availability in CONUS as well as LPV200 availability in CONUS and Canada.
- March 22 – Satellite Maintenance elevated UDREs on PRN-29 and reduced LPV200 availability in CONUS.
- March 28 – High IGP GIVEs resulted in reduced LPV200 availability in Alaska.

4.0 COVERAGE

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

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

Figure 4-1 LP North America Coverage for the Quarter

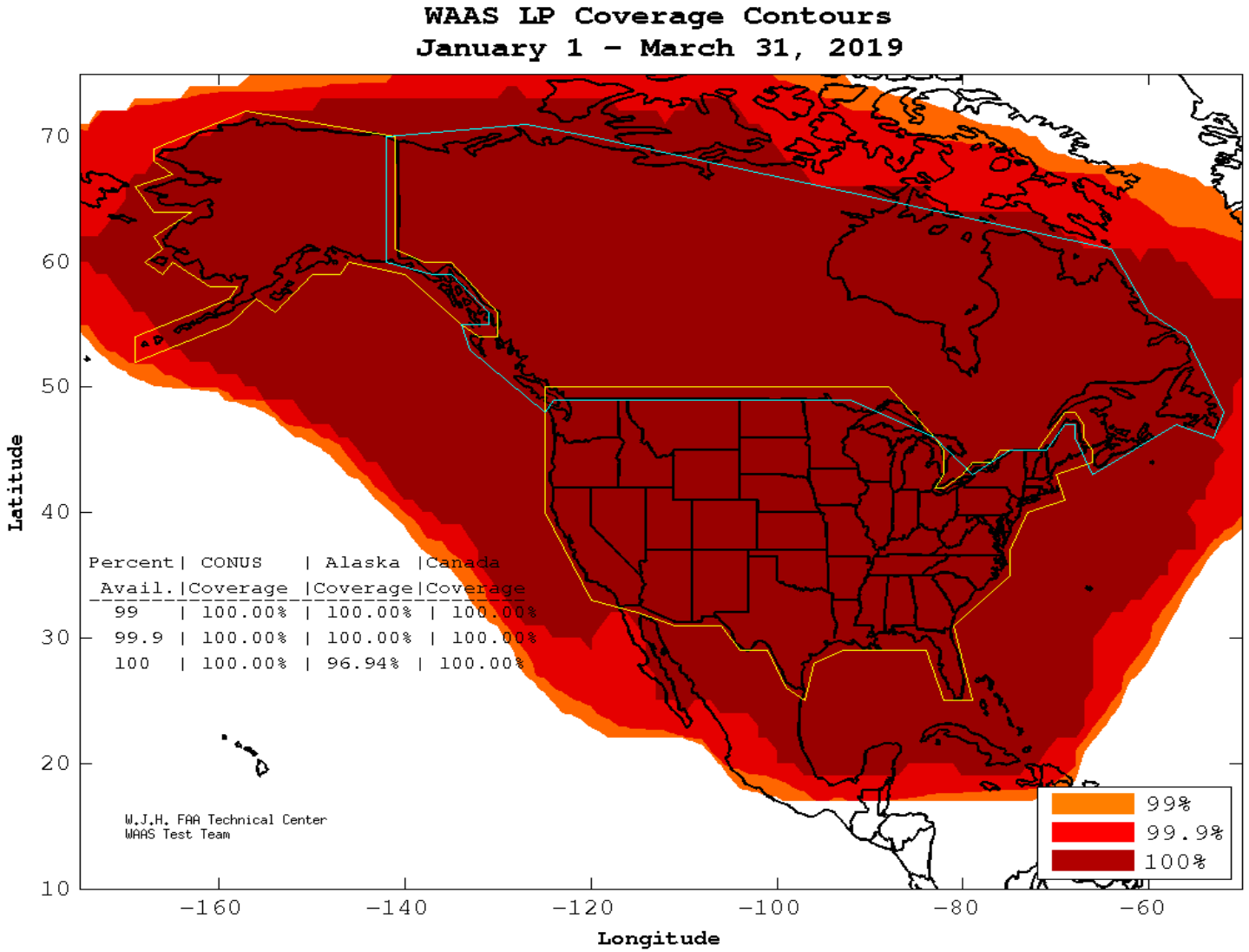


Figure 4-2 LPV North America Coverage for the Quarter

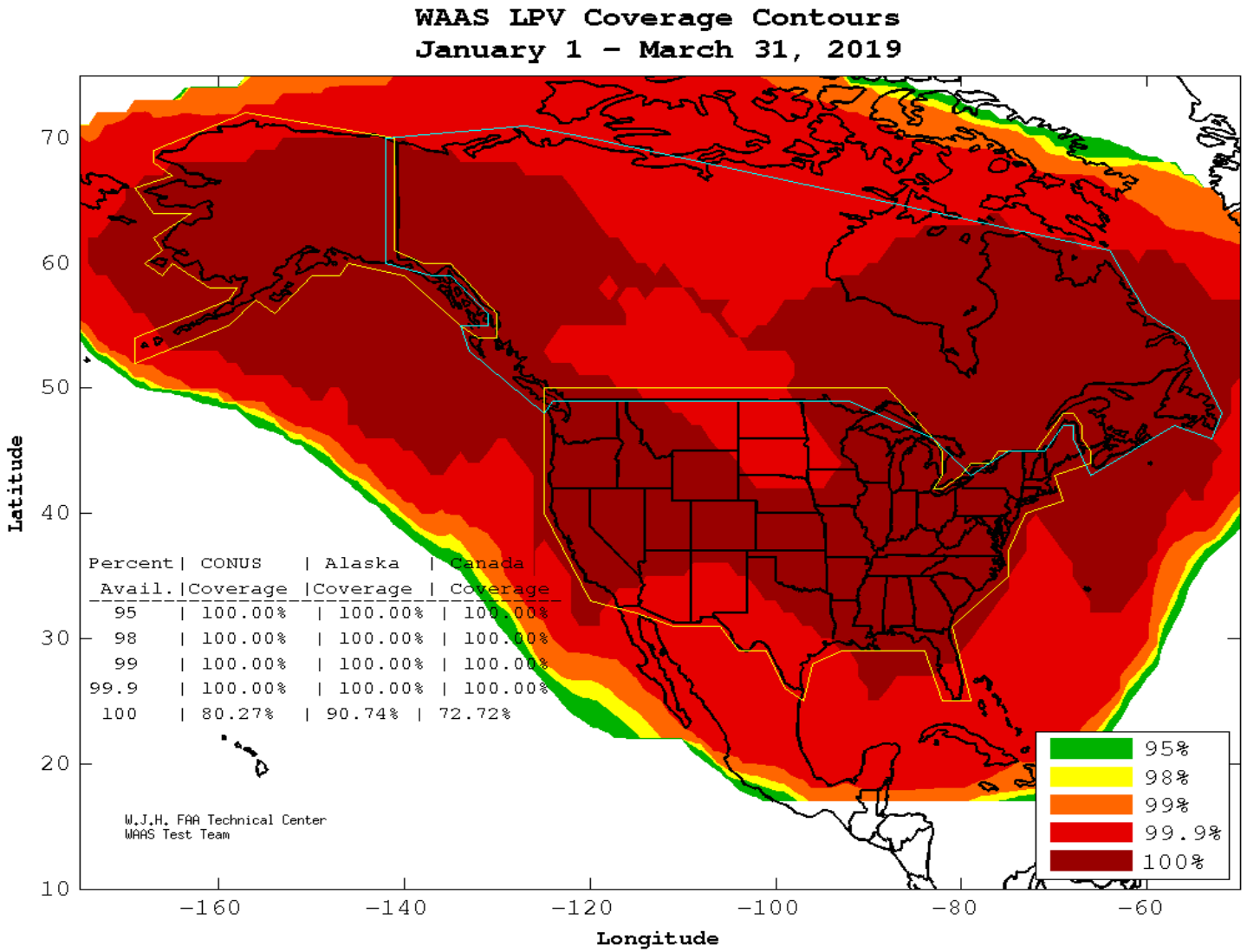


Figure 4-3 LPV200 North America Coverage for the Quarter

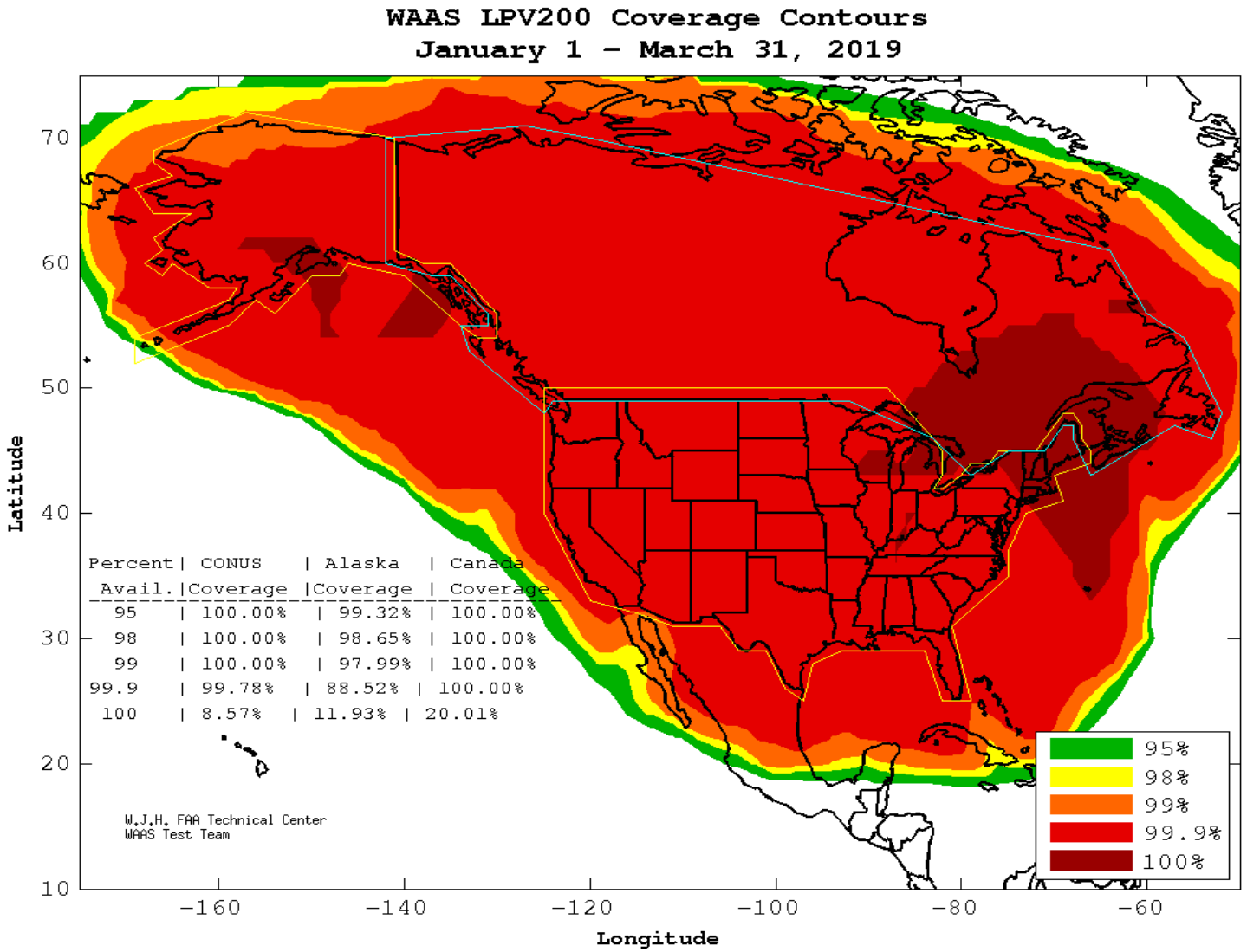


Figure 4-4 Daily LPV and LPV200 CONUS Coverage

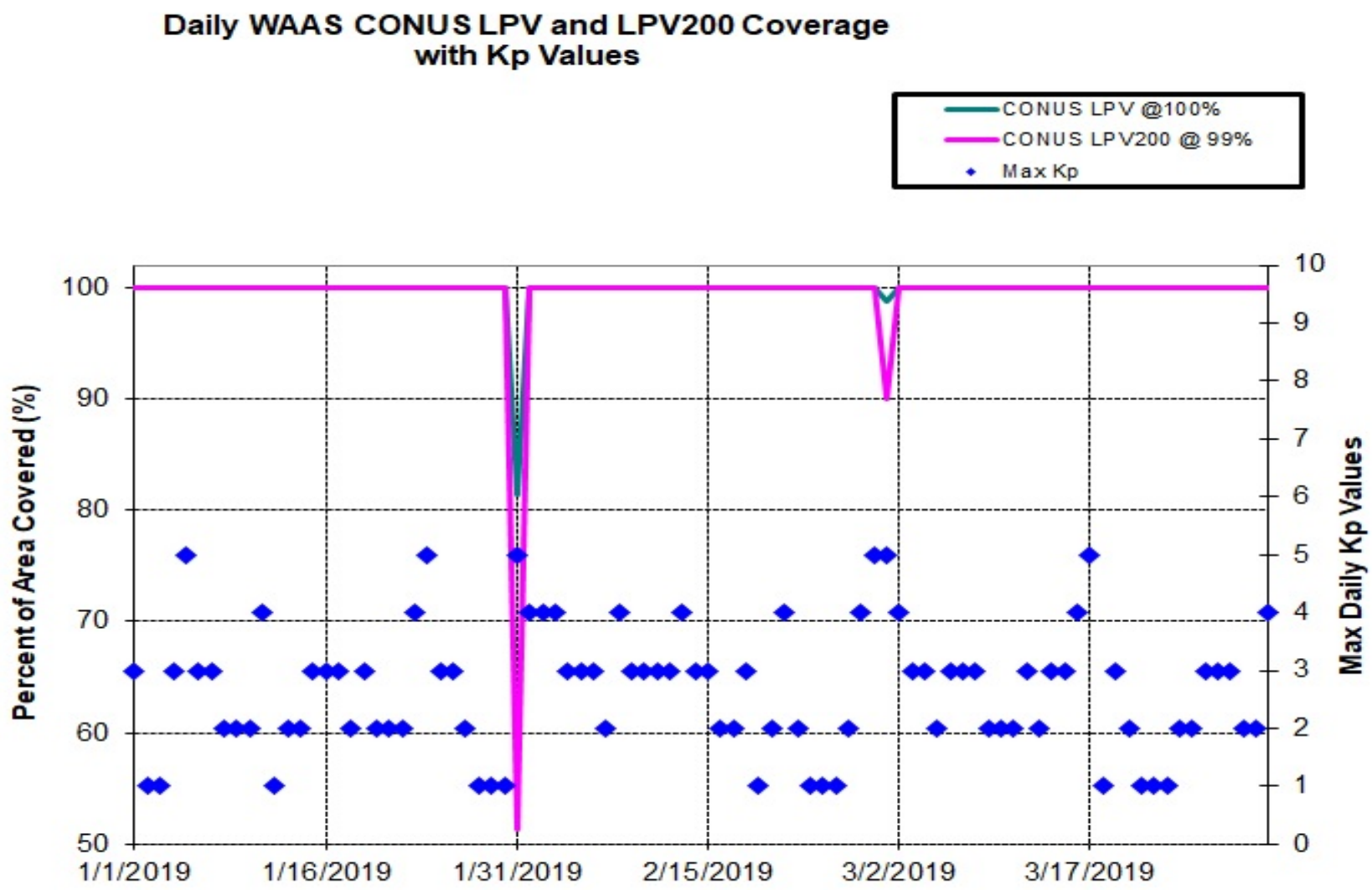


Figure 4-5 Daily LPV and LPV200 Alaska Coverage

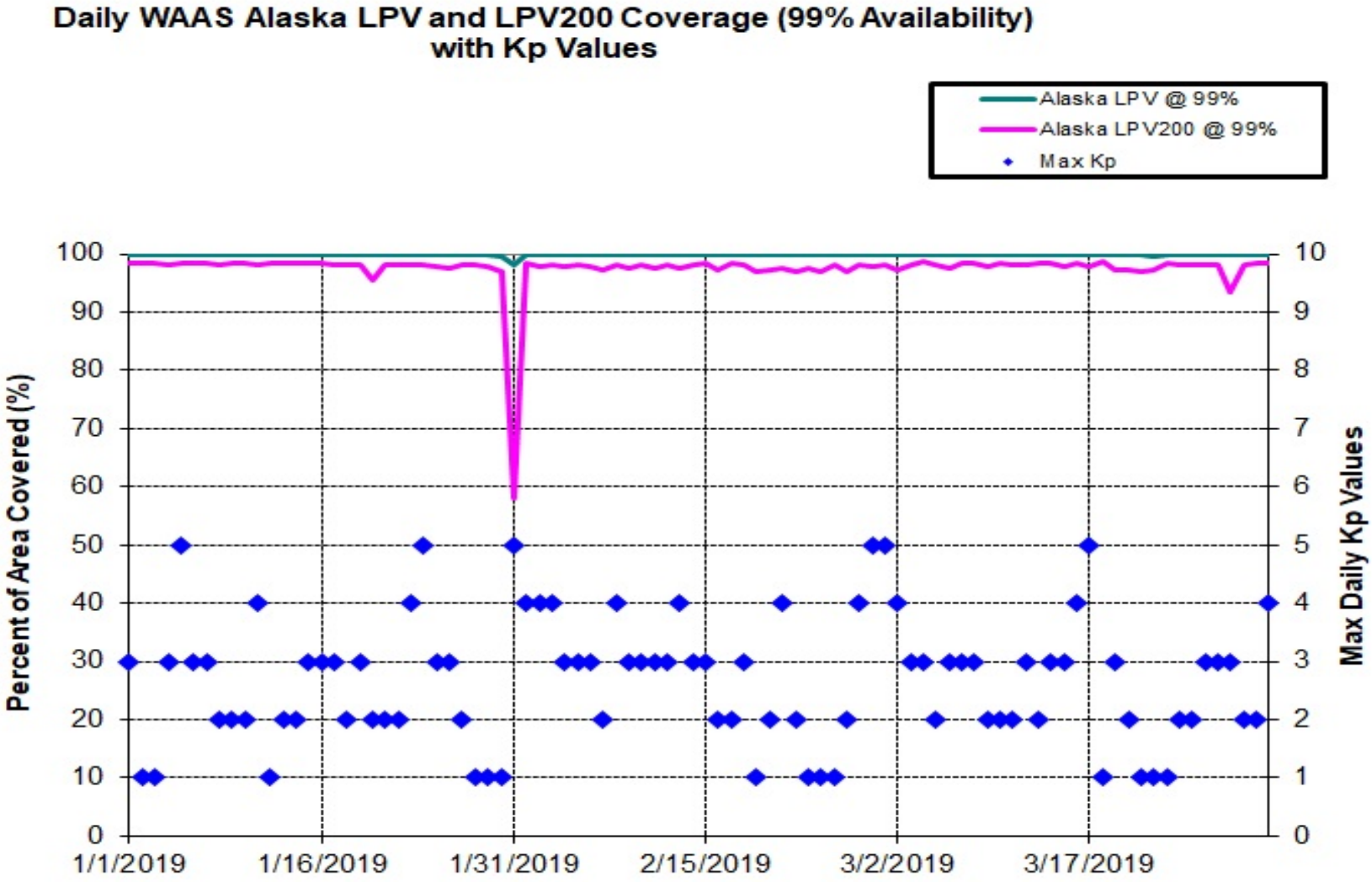
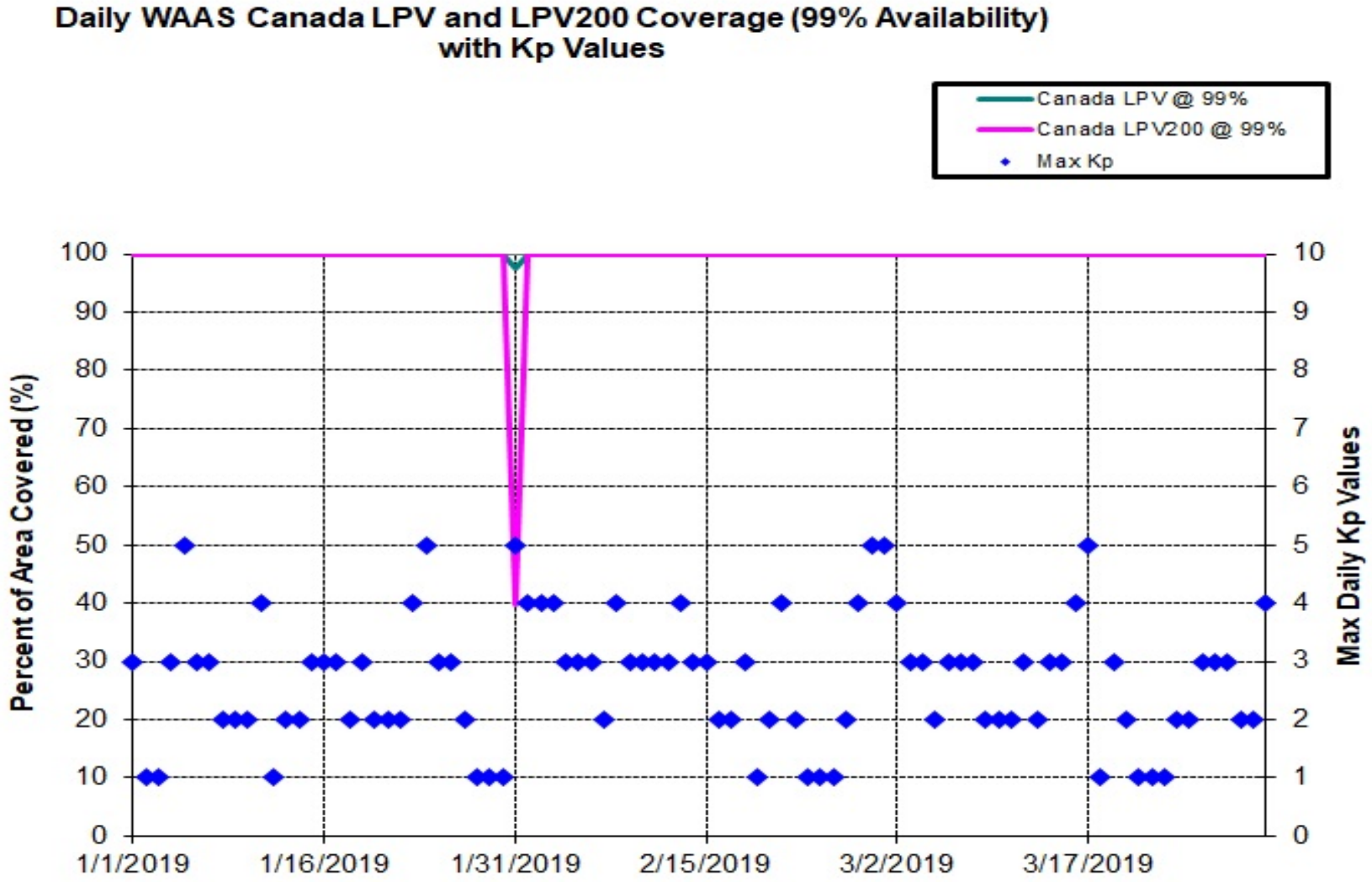


Figure 4-6 Daily LPV and LPV200 Canada Coverage



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

Figure 4-7 RNP 0.1 Coverage for the Quarter

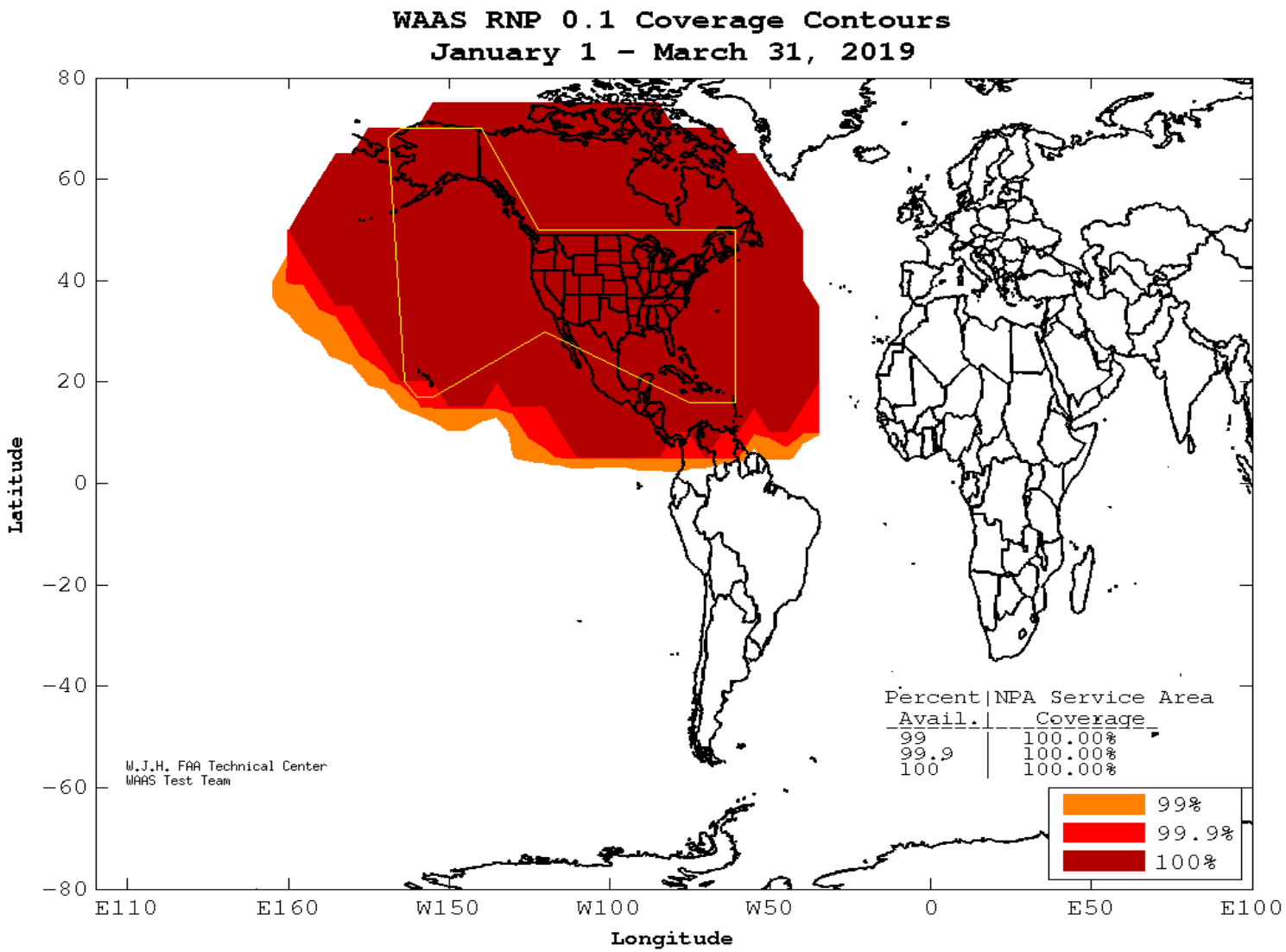


Figure 4-8 RNP 0.3 Coverage for the Quarter

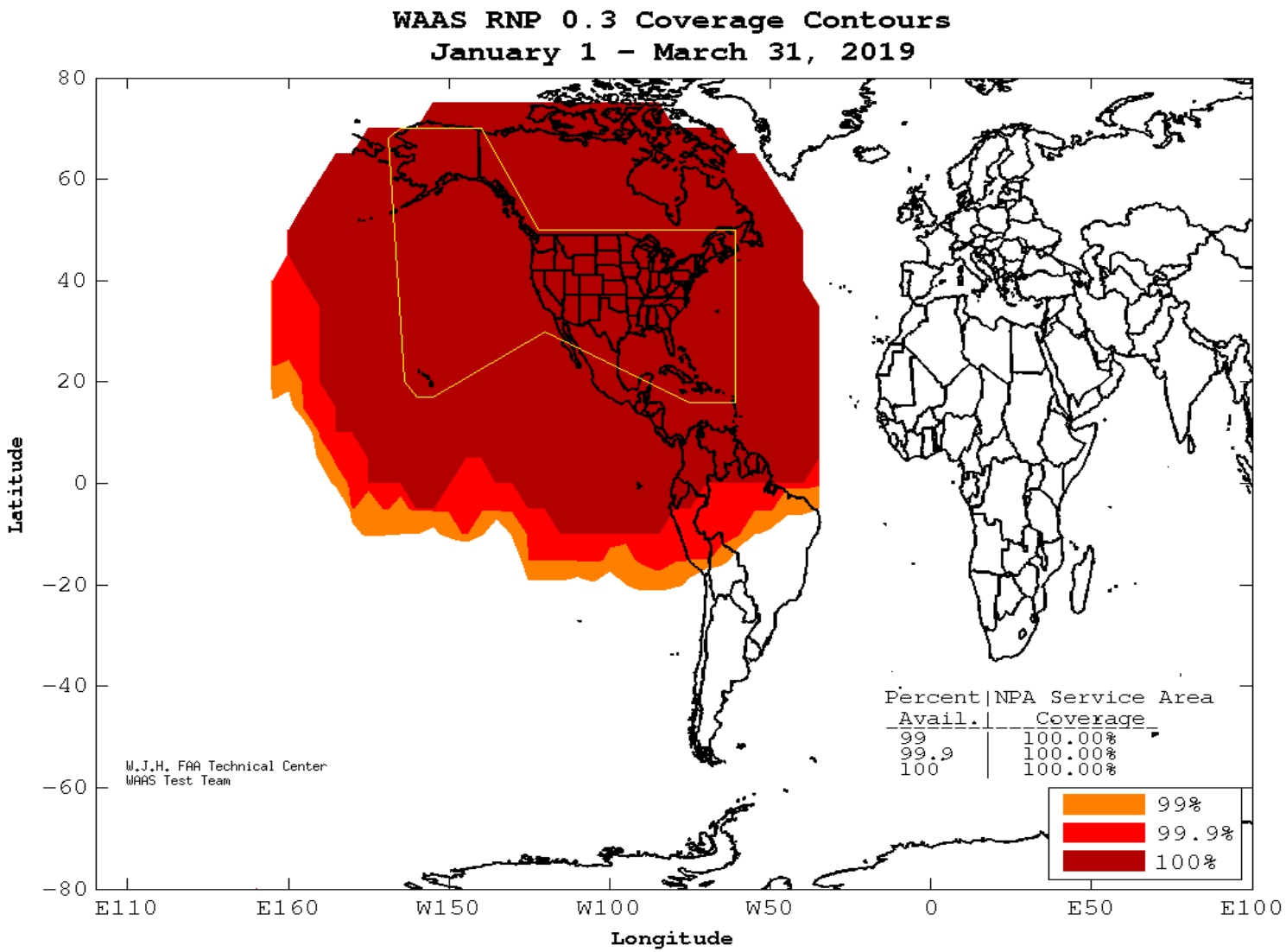
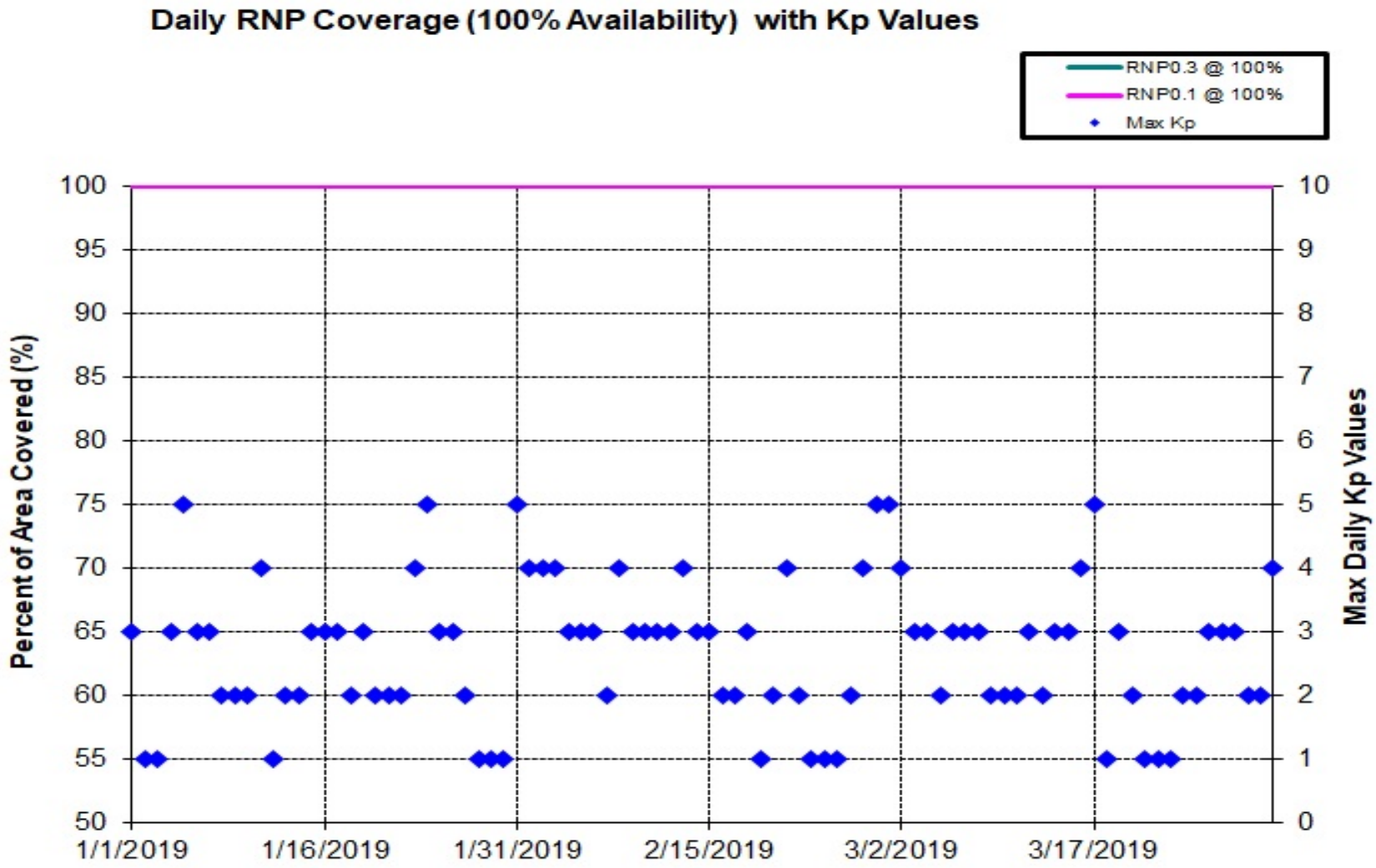


Figure 4-9 Daily RNP Coverage



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

- January 20 – The Barrow WRS went offline. The lack of observations from BRW reduced LPV200 coverage in Alaska.
- January 31 – Satellite maintenance elevated UDREs on PRN-21 and reduced LPV coverage in CONUS and Canada as well as LPV200 availability in CONUS, Alaska, and Canada
- February 2 – March 31 – Data outages from Mexico sites increased IGP GIVEs and reduced LPV200 coverage in CONUS (Arizona).
- February 13 – A cold-start of GEO131 reduced LPV200 coverage in Alaska.
- February 14 – Satellite Maintenance elevated UDREs on PRN-26 and reduced LPV200 coverage in CONUS.
- March 1 – Satellite Maintenance elevated UDREs on PRN-6 and reduced LPV coverage in CONUS as well as LPV200 availability in CONUS and Canada.
- March 22 – Satellite Maintenance elevated UDREs on PRN-29 and reduced LPV200 coverage in CONUS.
- March 28 – High IGP GIVEs resulted in reduced LPV200 coverage in Alaska.

5.0 INTEGRITY

5.1 HMI Analysis

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

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

Table 5-1 lists the safety margin index and the number of HMI events. For this reporting period, the lowest safety margin index is 4.804 at Atlantic City and there were no HMI events. There has not been an HMI event since WAAS was made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Horizontal Safety Index (meters)	Vertical Safety Index (meters)	Number of HMIs
Arcata	5.237	7.014	0
Atlantic City	10.805	4.804	0
Oklahoma City	5.823	9.068	0
Albuquerque	8.326	8.940	0
Anchorage	6.896	7.851	0
Atlanta	6.480	7.585	0
Barrow	7.879	7.617	0
Bethel	12.017	9.569	0
Billings	6.249	10.590	0
Boston	8.689	9.497	0
Chicago	5.245	10.960	0
Cleveland	15.490	14.505	0
Cold Bay	10.163	8.884	0

Location	Horizontal Safety Index (meters)	Vertical Safety Index (meters)	Number of HMIs
Dallas	7.770	8.176	0
Denver	6.964	10.967	0
Fairbanks	13.469	6.135	0
Gander	9.937	9.841	0
Goose Bay	13.712	11.089	0
Houston	7.040	12.981	0
Iqaluit	10.095	6.497	0
Jacksonville	6.609	5.725	0
Juneau	8.892	7.327	0
Kansas City	7.574	8.388	0
Kotzebue	18.035	5.316	0
Los Angeles	7.297	11.066	0
Memphis	7.287	7.375	0
Merida	10.629	9.967	0
Mexico City	16.951	7.612	0
Miami	9.034	9.138	0
Minneapolis	5.798	8.573	0
New York	9.766	19.895	0
Oakland	7.656	12.410	0
Puerto Vallarta	16.776	7.241	0
Salt Lake City	6.346	12.302	0
San Jose Del Cabo	14.365	11.143	0
Seattle	7.960	8.906	0
Washington DC	13.066	15.470	0
Winnipeg	8.901	6.599	0

5.2 Broadcast Alerts

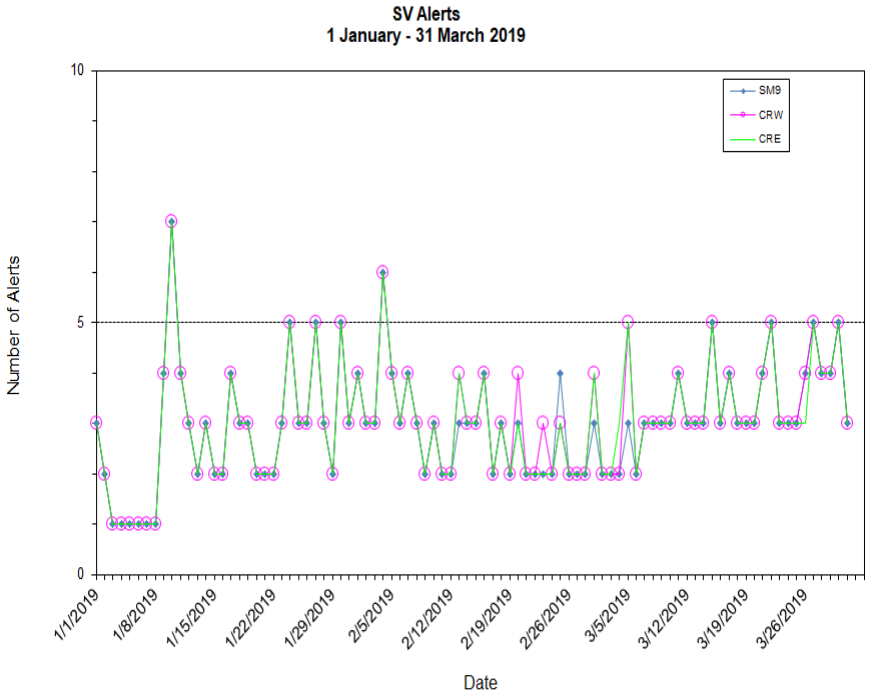
The WAAS transmits alert messages for user protection when the active WAAS corrections are no longer bound by the UDREs. Alerts increase the UDRE for one or more PRNs, which can reduce the weighting of the satellite or exclude the satellite from the navigation solution. An increase in UDREs after an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

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**SM9**	**CRW**	**CRE**	**SM9**	**CRW**	**CRE**
T2	183	185	184	2.0333	2.0556	2.0444
T3	76	76	76	0.8444	0.8444	0.8444
T4	10	13	12	0.1111	0.1444	0.1333
T5	0	0	0	0	0	0
T6	0	0	0	0	0	0
T24	0	0	0	0	0	0
T26	0	0	0	0	0	0
Total SV Alerts	269	274	272	2.9889	3.0444	3.0222
Days in Service	90	90	90			

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

Figure 5-1 SV Daily Alert Trend



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

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

Table 5-3 Update Rates for WAAS Messages

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

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

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

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	100999	5	2339
2	1295669	79	2255
3	1295415	44	2254
4	1295079	142	2253
7	94236	13	2410
9	91070	2	2303
10	94354	20	2330
17	30664	3	2445

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	48249	0	0
2	46750	0	0
3	47208	0	0
5	46808	0	0
6	46608	0	0
7	46486	0	0
8	47706	0	0
9	45728	0	0
10	46392	0	0
11	48028	0	0
12	46298	0	0
13	48258	0	0
14	45851	0	0
15	47040	0	0
16	46826	0	0
17	46759	0	0
18	47897	0	0
19	45189	1	164
20	45445	0	0
21	46804	0	0
22	47472	0	0
23	46550	0	0
24	48572	0	0
25	47726	0	0
26	46999	1	168
27	47898	1	168
28	47196	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
29	46061	0	0
30	46383	0	0
31	46765	0	0
32	45167	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	39629	1	158
2	38382	0	0
3	38778	1	210
5	38398	0	0
6	38221	1	2290
7	38173	2	173
8	39171	0	0
9	37499	0	0
10	38090	0	0
11	39468	3	168
12	38044	1	2402
13	39695	0	0
14	37665	0	0
15	38600	0	0
16	38461	0	0
17	38378	1	210
18	39318	2	168
19	37119	1	2411
20	37267	1	138
21	38463	0	0
22	39004	0	0
23	38227	1	153
24	39884	3	192
25	39185	1	2286
26	38593	0	0
27	39374	1	206
28	38748	1	2411
29	37845	0	0
30	38143	0	0
31	38364	0	0
32	37097	0	0
131	67981	3	8280
135	74429	3	4045
138	74718	2	2416

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	26980	9	2645
0	1	26973	11	2649
0	2	26980	7	2655
1	0	26966	14	2349
1	1	26968	8	2337
1	2	26979	8	2592

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	3	26966	9	2592
1	4	26972	7	2592
2	0	26985	10	2592
2	1	26972	7	2592
2	2	26982	5	2592
2	3	26970	5	2592
2	4	26972	6	2650
3	0	26995	7	2673
3	1	26968	7	2669
3	2	26978	5	2674
9	0	26973	6	2656
9	1	26968	11	2692
9	2	26972	7	2697
9	3	26985	7	2694
9	4	26974	10	2674
9	5	26979	6	2679
9	6	26969	8	2656

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	34835	2	2507
1	34819	2	2433
2	34848	2	2597
3	34835	3	2399
9	34833	2	2362

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	105169	4	169
2	1296374	80	54
3	1296107	52	48
4	1295791	142	54
7	97892	6	130
9	91098	1	174
10	97857	10	187
17	31028	1	327

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	48275	0	0
2	46791	1	171
3	47256	0	0
5	46808	1	174
6	46669	0	0
7	46447	2	150
8	47666	0	0
9	45721	0	0
10	46391	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
11	48002	0	0
12	46354	0	0
13	48216	1	185
14	45907	0	0
15	47028	0	0
16	46788	1	180
17	46804	0	0
18	47861	0	0
19	45247	0	0
20	45427	1	174
21	46760	1	149
22	47500	0	0
23	46552	0	0
24	48636	0	0
25	47778	0	0
26	46977	2	169
27	47867	1	166
28	47196	1	185
29	46104	0	0
30	46346	0	0
31	46795	0	0
32	45220	1	175

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	39637	1	144
2	38426	0	0
3	38818	0	0
5	38392	1	186
6	38266	0	0
7	38144	1	208
8	39130	0	0
9	37496	2	144
10	38076	3	206
11	39437	0	0
12	38100	0	0
13	39648	1	170
14	37715	0	0
15	38584	1	205
16	38432	0	0
17	38417	1	186
18	39285	1	168
19	37174	0	0
20	37262	2	208
21	38419	1	205
22	39031	1	145
23	38226	1	144
24	39924	2	206
25	39242	0	0
26	38567	2	201
27	39345	0	0
28	38741	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
29	37872	3	209
30	38113	0	0
31	38384	0	0
32	37149	1	154
131	67893	3	4852
135	74435	3	4116
138	74758	2	208

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	26960	12	512
0	1	26966	10	542
0	2	26965	15	537
1	0	26958	11	444
1	1	26971	6	448
1	2	26964	5	455
1	3	26958	11	425
1	4	26980	10	353
2	0	26949	10	336
2	1	26973	9	576
2	2	26963	7	581
2	3	26967	4	322
2	4	26970	10	342
3	0	26960	6	576
3	1	26952	13	576
3	2	26971	10	576
9	0	26965	12	576
9	1	26956	6	548
9	2	26956	14	531
9	3	26971	8	409
9	4	26959	12	420
9	5	26965	8	420
9	6	26962	11	432

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35366	1	457
1	35350	1	321
2	35338	3	429
3	35326	1	451
9	35306	2	412

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	98814	1	126
2	1296390	77	10
3	1296127	45	13
4	1295800	143	10
7	92410	10	127
9	91100	0	0
10	92363	11	132
17	30452	2	369

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	48261	0	0
2	46790	0	0
3	47260	0	0
5	46804	0	0
6	46661	0	0
7	46433	0	0
8	47664	0	0
9	45725	0	0
10	46389	0	0
11	47996	0	0
12	46349	0	0
13	48221	0	0
14	45909	0	0
15	47030	0	0
16	46787	0	0
17	46810	0	0
18	47855	0	0
19	45236	0	0
20	45431	0	0
21	46765	0	0
22	47498	0	0
23	46565	0	0
24	48630	0	0
25	47770	1	166
26	46971	1	166
27	47871	0	0
28	47194	0	0
29	46107	0	0
30	46343	0	0
31	46802	0	0
32	45228	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	39637	1	126
2	38421	2	168
3	38809	0	0
5	38391	0	0
6	38262	0	0
7	38150	1	138
8	39132	1	226
9	37495	1	122
10	38068	5	192
11	39447	2	162
12	38087	2	168
13	39667	1	126
14	37712	0	0
15	38592	0	0
16	38440	0	0
17	38424	0	0
18	39297	5	226
19	37166	3	192
20	37273	2	206
21	38422	0	0
22	39051	1	142
23	38251	1	122
24	39918	5	215
25	39237	1	134
26	38565	0	0
27	39342	2	240
28	38751	1	136
29	37863	0	0
30	38086	0	0
31	38411	1	122
32	37148	0	0
131	67836	3	5070
135	74450	2	4087
138	74740	0	0

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	26980	6	492
0	1	26959	9	493
0	2	26969	7	504
1	0	26981	7	509
1	1	26961	7	504
1	2	26969	7	517
1	3	26972	8	523
1	4	26961	5	511
2	0	26976	3	305
2	1	26985	2	302
2	2	26975	4	304
2	3	26968	10	329
2	4	26964	5	576

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
3	0	26975	7	333
3	1	26968	6	340
3	2	26964	6	341
9	0	26967	7	334
9	1	26982	4	341
9	2	26975	7	346
9	3	26968	6	335
9	4	26983	6	499
9	5	26952	8	577
9	6	26976	2	516

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	34580	0	0
1	34547	0	0
2	34557	0	0
3	34550	0	0
9	34558	0	0

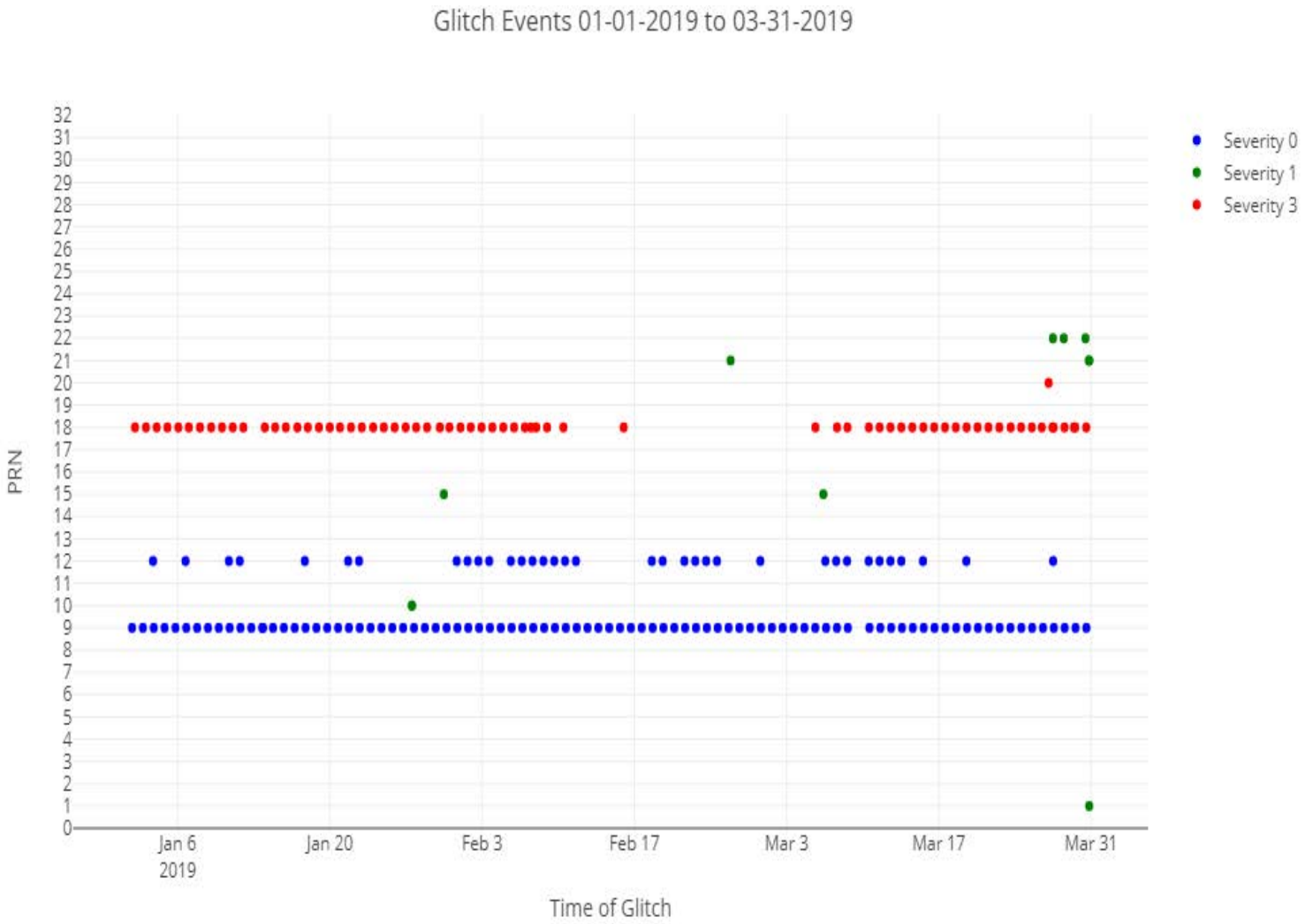
5.4 Satellite Glitches

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

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

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

Figure 5-2 SV Glitch Trend



6.0 SV RANGE ACCURACY

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

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

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

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1*	0.870	100	0.878	100	1.265	100	0.817	100	1.422	100	0.816	100
2	0.902	100	0.909	100	0.750	100	1.304	100	1.669	100	1.085	100
3*	1.025	100	1.296	100	1.528	100	0.951	100	1.391	100	1.542	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.824	100	0.952	100	0.858	100	1.254	100	0.974	100	0.914	100
6*	1.043	100	1.000	100	0.846	100	0.921	100	1.242	100	0.981	100
7	0.850	100	0.858	100	1.069	100	1.326	100	1.508	100	0.960	100
8*	1.098	100	0.904	100	1.002	100	1.552	100	1.059	100	0.930	100
9*	0.929	100	0.915	100	0.825	100	1.156	100	1.390	100	0.756	100
10	0.732	100	0.951	100	1.154	100	1.892	100	0.982	100	1.242	100
11	1.160	100	0.918	100	1.294	100	1.067	100	1.054	100	1.282	100
12	0.869	100	1.297	100	2.213	100	1.615	100	1.185	100	1.054	100
13	1.171	100	0.960	100	1.124	100	1.217	100	0.894	100	0.831	100
14	0.863	100	1.162	100	0.942	100	1.471	100	0.830	100	0.957	100
15	1.067	100	1.041	100	1.289	100	1.145	100	1.345	100	0.841	100
16	1.011	100	0.934	100	0.841	100	1.471	100	1.200	100	0.732	100
17	0.812	100	0.785	100	0.758	100	1.241	100	1.276	100	0.881	100
18	1.410	100	1.095	100	1.209	100	1.421	100	0.790	100	1.091	100
19	0.877	100	1.005	100	0.838	100	1.285	100	1.065	100	1.280	100
20	1.040	100	0.945	100	0.962	100	1.877	100	1.487	100	1.104	100
21	0.749	100	1.074	100	1.034	100	1.538	100	1.105	100	0.740	100
22	0.987	100	1.048	100	1.012	100	1.437	100	1.475	100	1.082	100
23	0.806	100	1.198	100	1.026	100	1.122	100	1.757	100	0.777	100
24*	0.862	100	0.978	100	1.009	100	1.321	100	1.784	100	1.030	100
25*	1.094	100	1.292	100	1.107	100	1.806	100	1.175	100	1.238	100
26*	1.203	100	0.931	100	1.028	100	1.321	100	1.020	100	0.861	100
27*	1.413	100	0.936	100	1.366	100	1.504	100	0.923	100	0.963	100
28	1.055	100	0.988	100	0.965	100	1.575	100	1.001	100	1.126	100
29	0.909	100	0.964	100	0.972	100	1.821	100	0.963	100	1.354	100
30*	0.879	100	0.978	100	0.879	100	1.057	100	1.225	100	0.801	100
31	1.013	100	0.918	100	0.897	100	1.520	100	1.192	100	1.092	100
32	0.838	100	1.193	100	1.162	100	1.533	100	1.098	100	1.067	100

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
131	2.583	100	2.936	100	2.088	100	2.046	100	2.828	100	3.559	100
135	2.700	100	2.125	100	1.694	100	1.539	100	1.983	100	1.868	100
138	1.791	100	1.455	100	1.830	100	1.466	100	1.383	100	1.411	100

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

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

Site	Billings		Miami		Albuquerque		Kansas City		Los Angeles		Atlanta	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1*	1.012	100	1.459	100	0.930	100	1.272	100	1.100	100	0.886	100
2	2.101	100	1.729	100	0.911	100	0.921	100	0.804	100	0.917	100
3*	1.033	100	1.581	100	1.125	100	1.499	100	1.092	100	1.038	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	1.257	100	1.227	100	1.039	100	1.153	100	0.928	100	0.986	100
6*	1.115	100	1.732	100	1.066	100	1.533	100	1.298	100	1.209	100
7	0.922	100	2.536	100	0.766	100	0.784	100	0.715	100	0.906	100
8*	1.051	100	1.223	100	0.965	100	0.886	100	1.185	100	0.837	100
9*	0.894	100	1.494	100	0.785	100	0.988	100	0.895	100	0.913	100
10	2.168	100	0.939	100	0.683	100	0.737	100	1.383	100	0.737	100
11	1.070	100	1.600	100	0.924	100	1.767	100	1.214	100	1.123	100
12	1.444	100	1.241	100	0.873	100	0.954	100	1.230	100	0.936	100
13	1.012	100	1.446	100	0.776	100	0.934	100	1.116	100	0.874	100
14	1.092	100	1.049	100	0.909	100	1.476	100	0.801	100	0.873	100
15	0.863	100	1.463	100	0.999	100	1.013	100	1.635	100	1.169	100
16	1.189	100	1.484	100	1.013	100	1.022	100	0.972	100	0.986	100
17	1.432	100	1.479	100	0.805	100	0.779	100	0.743	100	0.850	100
18	1.176	100	1.089	100	0.812	100	0.912	100	0.868	100	0.882	100
19	1.140	100	1.448	100	1.235	100	0.976	100	0.873	100	0.923	100
20	1.106	100	2.132	100	0.866	100	1.168	100	0.948	100	1.008	100
21	0.958	100	1.237	100	0.770	100	0.854	100	1.091	100	0.866	100

Site	Billings		Miami		Albuquerque		Kansas City		Los Angeles		Atlanta	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
22	1.206	100	1.081	100	1.180	100	0.876	100	0.864	100	1.020	100
23	0.849	100	1.440	100	0.780	100	0.679	100	1.278	100	0.801	100
24*	1.105	100	1.297	100	0.878	100	1.136	100	1.042	100	0.959	100
25*	1.396	100	0.980	100	0.958	100	1.101	100	1.063	100	1.000	100
26*	1.025	100	1.362	100	0.844	100	1.768	100	1.138	100	0.926	100
27*	0.943	100	1.276	100	0.804	100	0.867	100	0.918	100	0.948	100
28	1.423	100	1.699	100	0.952	100	1.164	100	0.954	100	1.009	100
29	1.198	100	1.092	100	0.928	100	1.026	100	0.975	100	0.988	100
30*	1.143	100	1.319	100	0.806	100	0.826	100	0.906	100	0.949	100
31	1.619	100	2.172	100	1.023	100	1.376	100	1.348	100	1.127	100
32	1.414	100	1.196	100	1.029	100	0.685	100	1.134	100	0.879	100
131	3.169	100	2.689	100	2.260	100	3.192	100	2.624	100	1.494	100
135	1.976	100	1.805	100	1.664	100	1.626	100	1.884	100	1.745	100
138	1.370	100	2.232	100	1.215	100	1.820	100	2.589	100	1.525	100

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

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

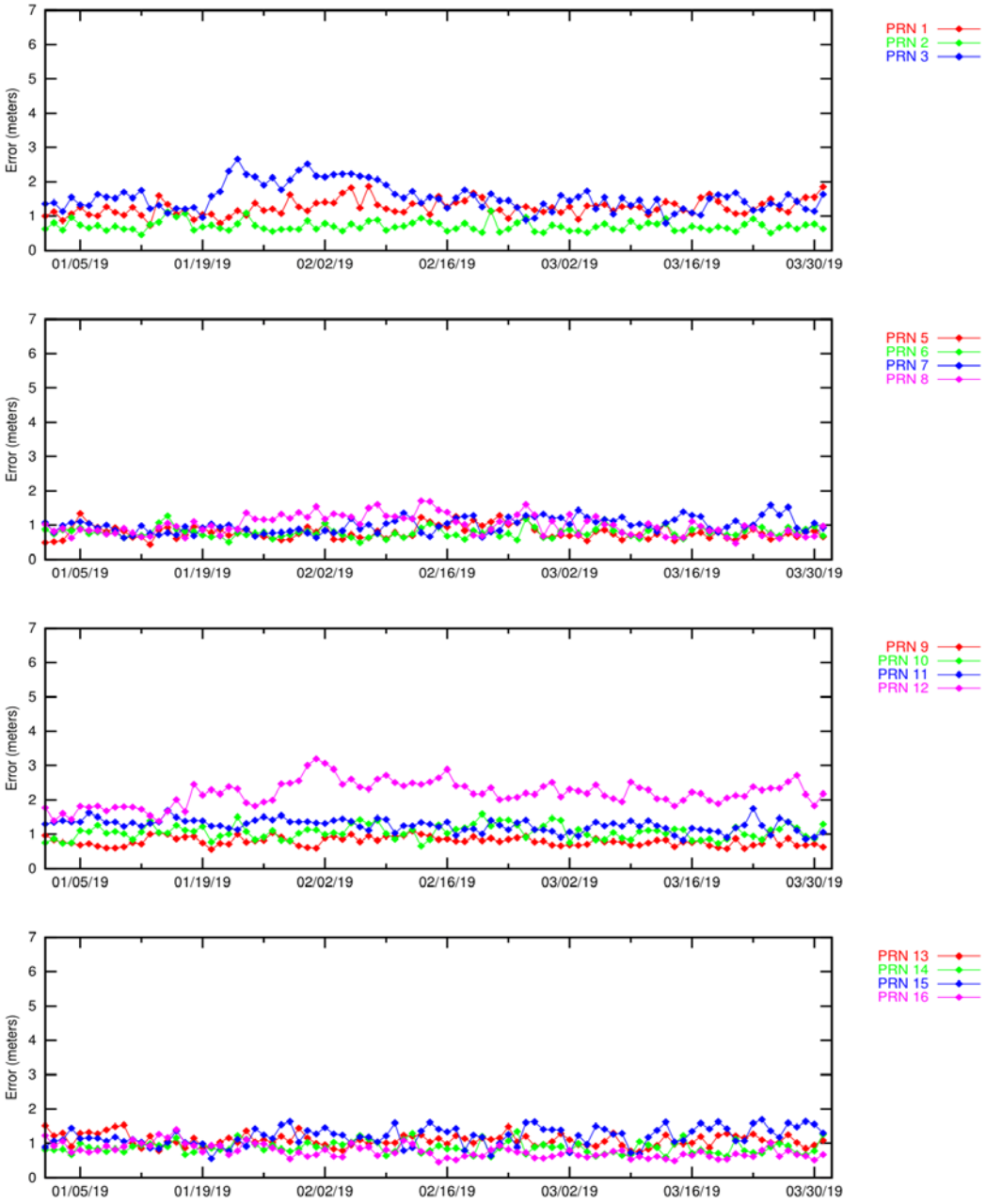
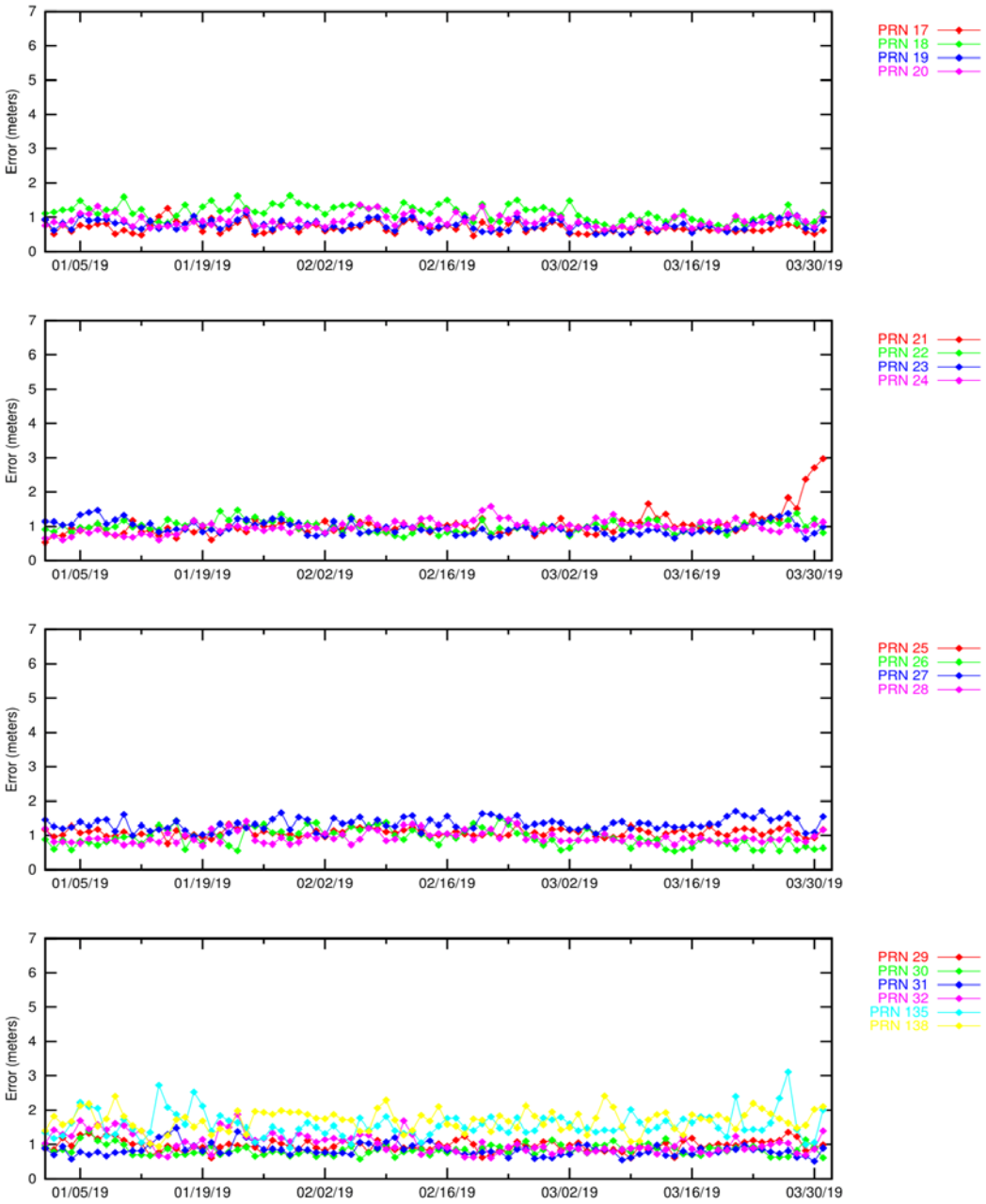


Figure 6-2 Range Error (PRN-17 – PRN-32) – Washington D.C.



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

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

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

Site	Minneapolis		Chicago		Boston		Juneau		Honolulu		Salt Lake City	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1	0.387	100	0.560	100	0.350	100	0.488	100	0.572	100	0.290	100
2	0.471	100	0.422	100	0.350	100	0.406	100	0.820	100	0.538	100
3	0.598	100	0.596	100	0.408	100	0.305	100	0.588	100	0.538	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.337	100	0.557	100	0.379	100	0.426	100	0.525	100	0.389	100
6	0.544	100	0.373	100	0.350	100	0.439	100	0.754	100	0.509	100
7	0.435	100	0.445	100	0.506	100	0.471	100	0.717	100	0.429	100
8	0.486	100	0.552	100	0.260	100	0.474	100	0.722	100	0.346	100
9	0.362	100	0.310	100	0.333	100	0.422	100	0.571	100	0.280	100
10	0.379	100	0.465	100	0.634	100	0.682	100	0.645	100	0.790	100
11	0.371	100	0.507	100	0.357	100	0.348	100	0.435	100	0.309	100
12	0.346	100	0.567	100	0.793	100	0.570	100	0.563	100	0.550	100
13	0.401	100	0.422	100	0.378	100	0.389	100	0.497	100	0.375	100
14	0.430	100	0.806	100	0.485	100	0.628	100	0.450	100	0.633	100
15	0.388	100	0.307	100	0.335	100	0.376	100	0.591	100	0.351	100
16	0.470	100	0.389	100	0.305	100	0.425	100	0.524	100	0.308	100
17	0.273	100	0.433	100	0.432	100	0.415	100	0.771	100	0.360	100
18	0.486	100	0.503	100	0.438	100	0.504	100	0.324	100	0.419	100
19	0.375	100	0.635	100	0.524	100	0.592	100	0.689	100	0.689	100
20	0.351	100	0.376	100	0.322	100	0.520	100	0.688	100	0.332	100
21	0.403	100	0.546	100	0.529	100	0.522	100	0.505	100	0.432	100
22	0.447	100	0.389	100	0.307	100	0.531	100	0.598	100	0.444	100
23	0.403	100	0.549	100	0.422	100	0.460	100	0.922	100	0.379	100
24	0.302	100	0.448	100	0.318	100	0.372	100	0.473	100	0.354	100
25	0.362	100	0.447	100	0.404	100	0.498	100	0.384	100	0.551	100
26	0.390	100	0.323	100	0.285	100	0.368	100	0.529	100	0.359	100
27	0.501	100	0.509	100	0.427	100	0.474	100	0.366	100	0.391	100
28	0.337	100	0.404	100	0.455	100	0.447	100	0.352	100	0.414	100
29	0.386	100	0.474	100	0.506	100	0.595	100	0.581	100	0.529	100
30	0.459	100	0.579	100	0.514	100	0.388	100	0.548	100	0.295	100
31	0.466	100	0.258	100	0.353	100	0.465	100	0.626	100	0.371	100
32	0.444	100	0.728	100	0.699	100	0.687	100	0.556	100	0.655	100

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

Site	Billings		Miami		Albuquerque		Kansas City		Atlanta		Los Angeles	
PRN ↓	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)	0.95 Range Error (Meters)	3.29 Sigma Bounding (%)
1	0.432	100	0.543	100	0.345	100	0.522	100	0.378	100	0.357	100
2	1.275	100	0.590	100	0.444	100	0.362	100	0.268	100	0.478	100
3	0.447	100	0.676	100	0.545	100	0.640	100	0.499	100	0.222	100
4	-	-	-	-	-	-	-	-	-	-	-	-
5	0.564	100	0.475	100	0.508	100	0.580	100	0.359	100	0.483	100
6	0.550	100	0.681	100	0.498	100	0.801	100	0.575	100	0.390	100
7	0.462	100	1.300	100	0.392	100	0.302	100	0.445	100	0.336	100
8	0.365	100	0.455	100	0.334	100	0.318	100	0.338	100	0.544	100
9	0.455	100	0.629	100	0.355	100	0.444	100	0.422	100	0.274	100
10	1.092	100	0.395	100	0.420	100	0.492	100	0.335	100	0.744	100
11	0.295	100	0.411	100	0.383	100	0.450	100	0.367	100	0.441	100
12	0.550	100	0.463	100	0.464	100	0.352	100	0.394	100	0.488	100
13	0.357	100	0.514	100	0.236	100	0.293	100	0.288	100	0.405	100
14	0.606	100	0.359	100	0.395	100	0.610	100	0.235	100	0.511	100
15	0.289	100	0.315	100	0.345	100	0.452	100	0.328	100	0.640	100
16	0.454	100	0.419	100	0.382	100	0.428	100	0.339	100	0.406	100
17	0.772	100	0.597	100	0.383	100	0.292	100	0.298	100	0.335	100
18	0.339	100	0.372	100	0.329	100	0.412	100	0.313	100	0.484	100
19	0.624	100	0.568	100	0.656	100	0.330	100	0.350	100	0.524	100
20	0.786	100	1.070	100	0.370	100	0.653	100	0.441	100	0.409	100
21	0.465	100	0.676	100	0.446	100	0.375	100	0.364	100	0.547	100
22	0.475	100	0.438	100	0.600	100	0.413	100	0.369	100	0.364	100
23	0.383	100	0.773	100	0.437	100	0.302	100	0.457	100	0.441	100
24	0.388	100	0.666	100	0.292	100	0.399	100	0.478	100	0.430	100
25	0.461	100	0.397	100	0.401	100	0.309	100	0.445	100	0.451	100
26	0.399	100	0.468	100	0.280	100	0.773	100	0.314	100	0.564	100
27	0.375	100	0.527	100	0.274	100	0.282	100	0.311	100	0.461	100
28	1.182	100	0.850	100	0.345	100	0.536	100	0.349	100	0.332	100
29	0.483	100	0.490	100	0.525	100	0.414	100	0.408	100	0.509	100
30	0.427	100	0.558	100	0.462	100	0.345	100	0.476	100	0.276	100
31	0.784	100	0.849	100	0.399	100	0.725	100	0.458	100	0.587	100
32	0.801	100	0.529	100	0.695	100	0.531	100	0.418	100	0.773	100

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

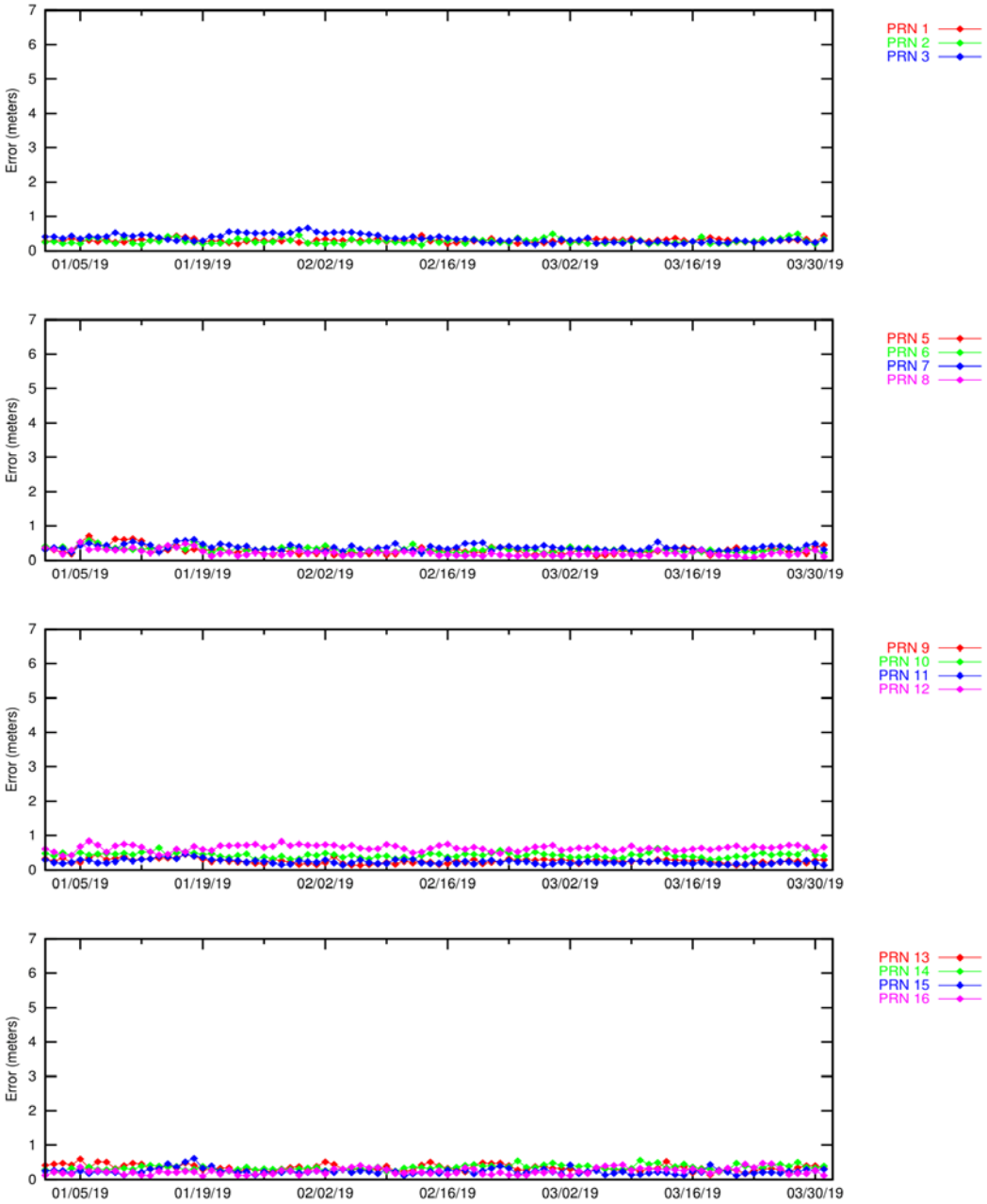
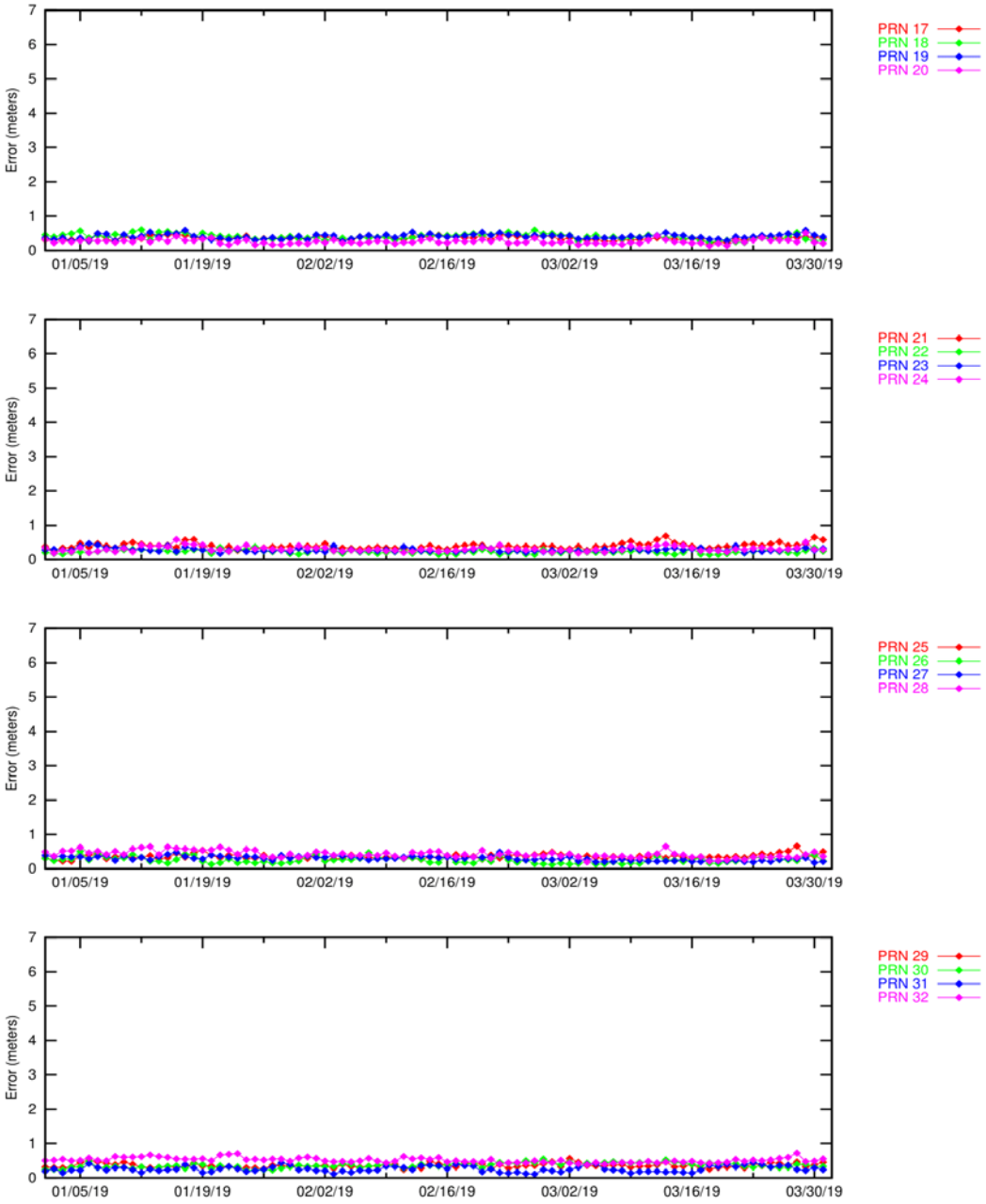


Figure 6-4 Ionospheric Error (PRN-17 – PRN-32) – Washington D.C.



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

7.0 GEO RANGING PERFORMANCE

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

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

The reductions in SM9 GEO PA, CRW GEO PA and CRE GEO PA ranging availability were due to GUS switchovers (see Figure 7-1 and Figure 7-3). Refer to Table 1-7 for detailed information on the GUS switchovers for this reporting period.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	90.05	0.74	8.76	0.44
SM9 131	CRW	99.48	0.02	0.11	0.38
SM9 131	CRE	99.87	0.01	0.12	0.00
CRW 135	SM9	90.01	0.74	8.78	0.47
CRW 135	CRW	99.53	0.02	0.07	0.38
CRW 135	CRE	99.91	0.01	0.08	0.00
CRE 138	SM9	89.98	0.74	8.81	0.47
CRE 138	CRW	99.52	0.02	0.07	0.38
CRE 138	CRE	99.91	0.01	0.08	0.00

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

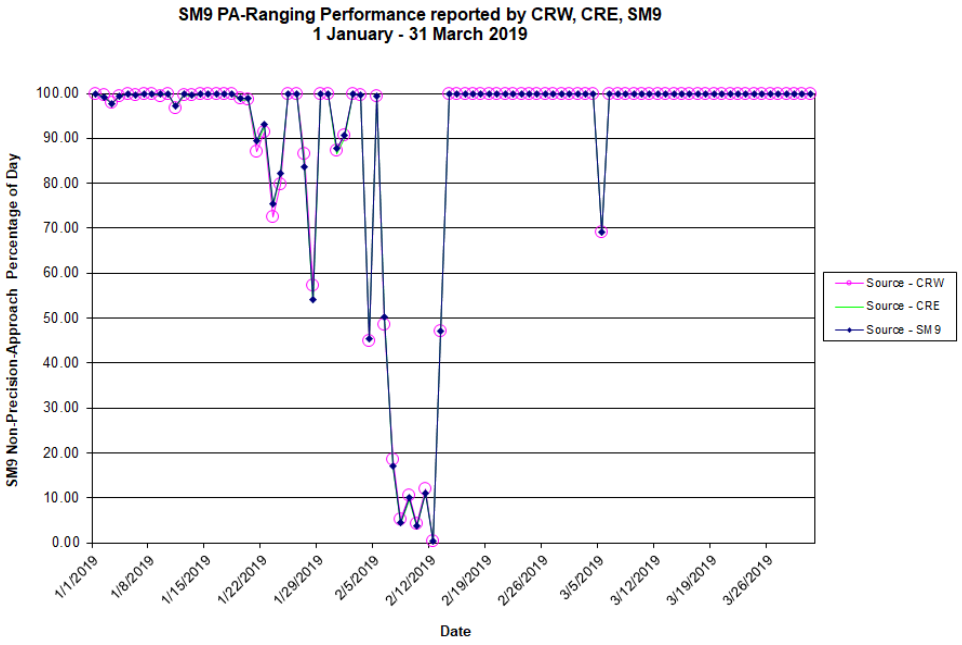


Figure 7-2 Daily PA CRW GEO Ranging Availability Trend

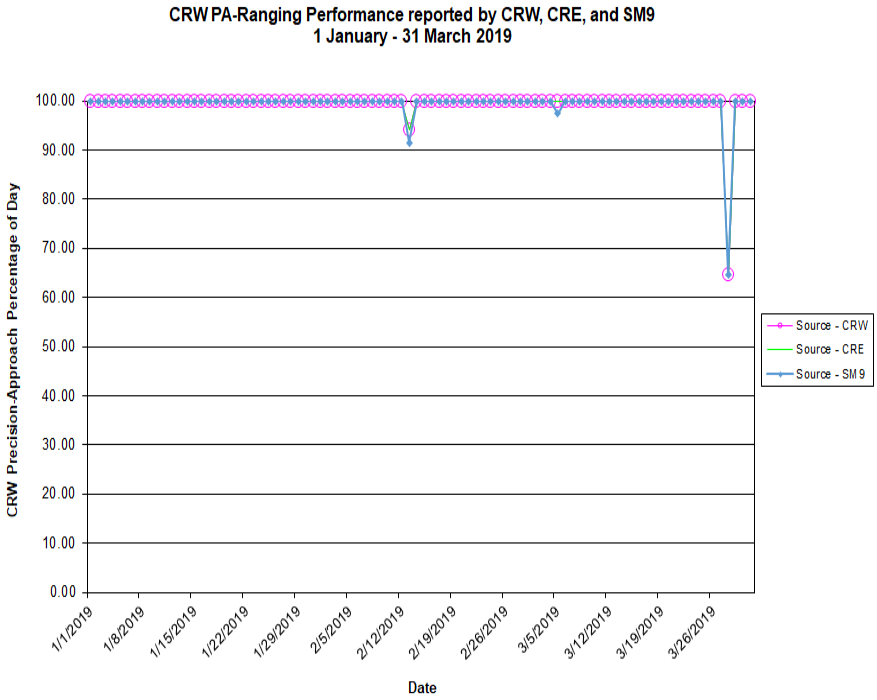
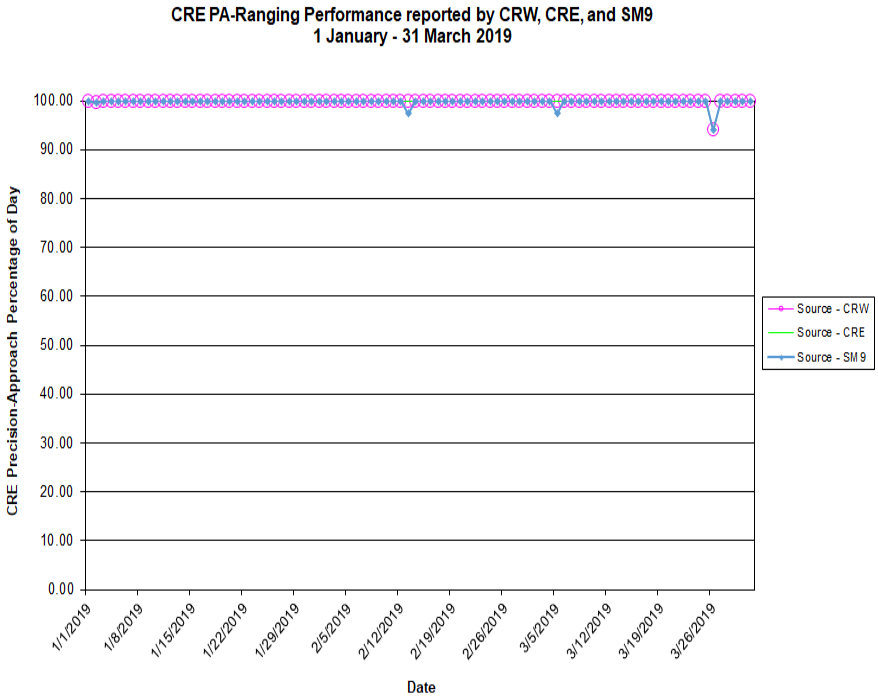


Figure 7-3 Daily PA CRE GEO Ranging Availability Trend



8.0 WAAS AIRPORT AVAILABILITY

The WAAS airport availability evaluation determines the number and length of LPV service outages at selected airports using the transmitted WAAS navigation message. The navigation messages transmitted from all GEO satellites are processed simultaneously, and WAAS protection levels (VPL and HPL) are computed at each airport

once every 30 seconds in accordance with the RTCA DO-229D. The WAAS LPV service is available for a user when the VPL is less than or equal to the VAL of 50 meters and the HPL is less than or equal to the HAL of 40 meters. If both conditions are met, WAAS LPV service is available at that airport. Consequently, if either one of the conditions are not met, the WAAS LPV service outage and its duration is recorded.

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

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

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

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CAL4	FORT MACKAY / ALBIAN AERODROME	AB	LPV	0	100	1	99.998	1	99.969
CEV3	VEGREVILLE	AB	LPV	0	100	1	99.990	1	99.968
CYEG	EDMONTON / JOSEPHBURG	AB	LPV	0	100	1	99.991	1	99.964
CYXD	EDMONTON CITY CTR	AB	LPV	0	100	1	99.991	1	99.966
2C7	SHAKTOOLIK	AK	LPV	0	100	0	100	1	99.995
6A8	ALLAKAKET	AK	LP	0	100	0	100	5	99.978
7KA	TATITLEK	AK	LP	0	100	0	100	1	99.999
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	0	100
AFM	AMBLER	AK	LPV	0	100	0	100	10	99.976
AKN	KING SALMON	AK	LPV	0	100	0	100	1	99.994
AKW	KLAWOCK	AK	LP	0	100	0	100	1	99.999
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	0	100
ANI	ANIAK	AK	LPV	0	100	0	100	0	100
AQH	QUINHAGAK	AK	LPV	0	100	0	100	1	99.997
AQT	NUIQSUT	AK	LPV	0	100	0	100	25	99.838
BET	BETHEL	AK	LPV200	0	100	0	100	1	99.997
BRW	WILEY POST-WILL ROGERS MEMORIA	AK	LPV	0	100	2	99.991	91	99.226
CDB	COLD BAY	AK	LPV200	0	100	0	100	1	99.979
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	1	99.998
CEM	CENTRAL	AK	LP	0	100	0	100	2	99.978
CLP	CLARKS POINT	AK	LPV	0	100	0	100	1	99.994
CXF	COLDFOOT	AK	LP	0	100	0	100	7	99.973
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	0	100	0	100	15	99.964
DEE	DEERING	AK	LPV	0	100	0	100	5	99.975
DLG	DILLINGHAM	AK	LPV	0	100	0	100	1	99.995
ELI	ELIM	AK	LPV	0	100	0	100	1	99.984
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	0	100
ENM	EMMONAK	AK	LPV	0	100	0	100	1	99.983
FAI	FAIRBANKS INTL	AK	LPV200	0	100	0	100	2	99.993
FYU	FORT YUKON	AK	LPV	0	100	0	100	4	99.973
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	1	99.995
GAM	GAMBELL	AK	LPV	1	99.999	1	99.999	60	99.841
GKN	GULKANA	AK	LPV	0	100	0	100	2	99.995
GST	GUSTAVUS	AK	LP	0	100	0	100	1	99.999
HLA	HUSLIA	AK	LPV	0	100	0	100	2	99.985

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HOM	HOMER	AK	LPV	0	100	0	100	0	100
HPB	HOOPER BAY	AK	LP	0	100	0	100	1	99.982
HRR	HEALY RIVER	AK	LP	0	100	0	100	1	99.997
ILI	ILIAMNA	AK	LPV	0	100	0	100	1	99.997
IYS	WASILLA	AK	LPV	0	100	0	100	0	100
KAL	KALTAG	AK	LPV	0	100	0	100	1	99.996
KSM	ST MARY'S	AK	LPV200	0	100	0	100	1	99.994
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	2	99.994
KTS	BREVIG MISSION	AK	LPV	0	100	0	100	5	99.978
KWT	KWETHLUK	AK	LPV	0	100	0	100	1	99.997
KYU	KOYUKUK	AK	LPV	0	100	0	100	1	99.995
MCG	MC GRATH	AK	LP	0	100	0	100	1	99.998
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	1	99.998
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	0	100
OME	NOME	AK	LPV	0	100	0	100	3	99.979
OOK	TOKSOOK BAY	AK	LP	0	100	0	100	1	99.982
ORT	NORTHWAY	AK	LP	0	100	0	100	2	99.991
OTZ	RALPH WIEN MEMORIAL	AK	LPV	0	100	0	100	12	99.969
PAQ	PALMER MUNICIPAL	AK	LP	0	100	0	100	0	100
PHO	POINT HOPE	AK	LPV	0	100	1	99.998	20	99.942
RBY	RUBY	AK	LPV	0	100	0	100	1	99.995
SCC	DEADHORSE	AK	LPV	0	100	0	100	25	99.844
SCM	SCAMMON BAY	AK	LP	0	100	0	100	1	99.982
SHG	SHUNGNAK	AK	LP	0	100	0	100	10	99.977
SHX	SHAGELUK	AK	LPV	0	100	0	100	1	99.998
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	0	100
SMK	ST MICHAEL	AK	LPV	0	100	0	100	1	99.995
SXQ	SOLDOTNA	AK	LP	0	100	0	100	0	100
WLK	SELAWIK	AK	LPV	0	100	0	100	7	99.981
WMO	WHITE MOUNTAIN	AK	LP	0	100	0	100	2	99.983
WNA	NAPAKIAK	AK	LPV	0	100	0	100	1	99.996
WSN	SOUTH NAKNEK NR 2	AK	LPV	0	100	0	100	1	99.994
YAK	YAKUTAT	AK	LPV200	0	100	0	100	1	99.999
02A	CHILTON COUNTY	AL	LP	0	100	0	100	1	99.995
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	100	0	100	1	99.993
09A	BUTLER-CHOCTAW COUNTY	AL	LPV	0	100	0	100	2	99.998
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	0	100	1	99.990

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
0R1	ATMORE MUNICIPAL	AL	LP	0	100	0	100	1	99.995
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	0	100	1	99.991
12J	BREWTON MUNICIPAL	AL	LPV	0	100	0	100	1	99.994
1M4	POSEY FIELD	AL	LPV	0	100	0	100	0	100
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	100	0	100	2	99.995
2R5	ST ELMO	AL	LPV	0	100	0	100	2	99.995
33J	GENEVA MUNICIPAL	AL	LP	0	100	0	100	1	99.991
3M8	NORTH PICKENS	AL	LP	0	100	0	100	2	99.999
4A9	ISBELL FIELD	AL	LPV	0	100	0	100	1	99.996
5R1	ROY WILCOX	AL	LP	0	100	0	100	2	99.996
5R4	FOLEY MUNICIPAL	AL	LPV	0	100	0	100	2	99.994
71J	BLACKWELL FIELD	AL	LPV	0	100	0	100	1	99.990
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	0	100	0	100	1	99.992
8A0	ALBERTVILLE RGNL-THOMAS J BRUM	AL	LPV	0	100	0	100	1	99.997
8A1	GUNTERSVILLE MUNICIPAL - JOE STARNE	AL	LPV	0	100	0	100	1	99.997
9A4	COURTLAND	AL	LPV200	0	100	0	100	1	99.999
A08	VAIDEN FIELD	AL	LPV	0	100	0	100	1	99.997
ALX	THOMAS C RUSSELL FLD	AL	LPV	0	100	0	100	1	99.994
ANB	ANNISTON RGNL	AL	LPV	0	100	0	100	1	99.995
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	100	0	100	1	99.995
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	100	0	100	1	99.992
BFM	MOBILE DOWNTOWN	AL	LPV200	0	100	0	100	2	99.995
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	0	100	0	100	1	99.996
CMD	CULLMAN RGNL-FOLSOM FIELD	AL	LPV	0	100	0	100	1	99.998
CQF	H L SONNY CALLAHAN	AL	LPV200	0	100	0	100	2	99.995
DCU	PRYOR FIELD RGNL	AL	LPV200	0	100	0	100	1	99.999
DHN	DOTHAN RGNL	AL	LPV200	0	100	0	100	1	99.990
DYA	DEMOPOLIS RGNL	AL	LPV	0	100	0	100	2	99.998
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	100	0	100	1	99.991
EET	SHELBY COUNTY	AL	LPV	0	100	0	100	1	99.996
EKY	BESSEMER	AL	LPV	0	100	0	100	1	99.997
EUF	WEEDON FIELD	AL	LPV	0	100	0	100	1	99.990
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	100	0	100	1	99.996
GZH	MIDDLETON FIELD	AL	LP	0	100	0	100	1	99.994
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	100	0	100	1	99.999
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	0	100	0	100	1	99.998
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JKA	JACK EDWARDS	AL	LPV200	0	100	0	100	1	99.994
M95	RICHARD ARTHUR FIELD	AL	LPV	0	100	0	100	1	99.999
MDQ	HUNTSVILLE EXECUTIVE AIRPORT T	AL	LPV200	0	100	0	100	1	99.998
MGM	MONTGOMERY RGNL (DANNELLY FIEL	AL	LPV200	0	100	0	100	1	99.994
MOB	MOBILE RGNL	AL	LPV200	0	100	0	100	2	99.995
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	0	100	0	100
PLR	ST CLAIR COUNTY	AL	LPV	0	100	0	100	1	99.995
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	0	100	0	100	1	99.995
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	100	0	100	1	99.995
SEM	CRAIG FIELD	AL	LPV200	0	100	0	100	1	99.996
TCL	TUSCALOOSA RGNL	AL	LPV	0	100	0	100	1	99.998
TOI	TROY MUNICIPAL AIRPORT AT N KENNETH	AL	LPV	0	100	0	100	1	99.992
0M0	BILLY FREE MUNICIPAL	AR	LPV	0	100	0	100	1	99.990
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	0	100	1	99.990
4A5	SEARCY COUNTY	AR	LPV	0	100	0	100	1	99.988
4M3	CARLISLE MUNICIPAL	AR	LPV	0	100	0	100	1	99.990
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	0	100	1	99.992
7M1	MC GEHEE MUNICIPAL	AR	LP	0	100	0	100	1	99.990
9M8	SHERIDAN MUNICIPAL	AR	LPV	0	100	0	100	1	99.988
ADF	DEXTER B FLORENCE MEMORIAL FIE	AR	LPV	0	100	0	100	1	99.986
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	100	0	100	1	99.991
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	100	0	100	1	99.984
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV200	0	100	0	100	1	99.994
BPK	BAXTER COUNTY	AR	LPV	0	100	0	100	1	99.988
BVX	BATESVILLE RGNL	AR	LPV	0	100	0	100	1	99.990
BYH	ARKANSAS INTL	AR	LPV200	0	100	0	100	1	99.994
CDH	HARRELL FIELD	AR	LPV	0	100	0	100	1	99.987
CXW	CANTRELL FLD	AR	LPV	0	100	0	100	1	99.988
DRP	DELTA RGNL	AR	LPV	0	100	0	100	1	99.992
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	0	100	0	100	1	99.987
FLP	MARION COUNTY RGNL	AR	LPV	0	100	0	100	1	99.988
FSM	FORT SMITH RGNL	AR	LPV200	0	100	0	100	1	99.983
FYV	DRAKE FIELD	AR	LPV	0	100	0	100	1	99.984
H34	HUNTSVILLE MUNICIPAL	AR	LPV	0	100	0	100	1	99.985
HRO	BOONE COUNTY	AR	LPV	0	100	0	100	1	99.986
JBR	JONESBORO MUNICIPAL	AR	LPV200	0	100	0	100	1	99.992
LIT	BILL AND HILLARY CLINTON NATIO	AR	LPV200	0	100	0	100	1	99.988

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
M18	HOPE MUNICIPAL	AR	LP	0	100	0	100	1	99.985
M19	NEWPORT MUNICIPAL	AR	LPV	0	100	0	100	1	99.991
M32	LAKE VILLAGE MUNICIPAL	AR	LP	0	100	0	100	1	99.991
M77	HOWARD COUNTY	AR	LP	0	100	0	100	1	99.984
MXA	MANILA MUNICIPAL	AR	LPV	0	100	0	100	1	99.993
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	100	0	100	1	99.988
PBF	GRIDER FIELD	AR	LPV	0	100	0	100	1	99.989
ROG	ROGERS EXECUTIVE - CARTER FIEL	AR	LPV	0	100	0	100	1	99.984
RUE	RUSSELLVILLE RGNL	AR	LPV	0	100	0	100	1	99.986
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	0	100	0	100	1	99.990
SLG	SMITH FIELD	AR	LPV	0	100	0	100	1	99.983
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	0	100	1	99.990
SUZ	SALINE COUNTY RGNL	AR	LPV	0	100	0	100	1	99.988
TXK	TEXARKANA RGNL-WEBB FIELD	AR	LPV	0	100	0	100	1	99.983
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	0	100	0	100	1	99.984
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	0	100	0	100	1	99.983
AVQ	MARANA RGNL	AZ	LP	0	100	2	99.991	9	99.963
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	1	99.998	4	99.970
FFZ	FALCON FLD	AZ	LP	0	100	1	99.997	4	99.967
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	2	99.991	10	99.958
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	3	99.978
GCN	GRAND CANYON NATIONAL PARK	AZ	LPV	0	100	0	100	2	99.988
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	2	99.996	4	99.967
GYR	PHOENIX GOODYEAR	AZ	LP	0	100	2	99.995	4	99.960
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	2	99.985
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	2	99.988
IGM	KINGMAN	AZ	LPV	0	100	0	100	2	99.988
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	2	99.996	5	99.965
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	1	99.996	2	99.980
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	3	99.982
P33	COCHISE COUNTY	AZ	LPV	0	100	1	99.992	3	99.973
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	2	99.990
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	2	99.996	4	99.964
PRC	ERNEST A LOVE FIELD	AZ	LPV200	0	100	0	100	4	99.974
RQE	WINDOW ROCK	AZ	LP	0	100	0	100	2	99.989
SAD	SAFFORD RGNL	AZ	LPV	0	100	1	99.993	2	99.976
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	100	1	99.998	2	99.986

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SOW	SHOW LOW RGNL	AZ	LPV	0	100	1	99.998	3	99.983
TUS	TUCSON INTL	AZ	LPV	0	100	2	99.990	9	99.961
CYBL	CAMPBELL RIVER	BC	LPV	0	100	0	100	1	99.968
CYCD	NANAIMO	BC	LPV	0	100	0	100	1	99.968
CYVR	VANCOUVER INTL	BC	LPV	0	100	0	100	1	99.969
CYXS	PRINCE GEORGE	BC	LPV	0	100	1	99.999	1	99.963
CYYJ	VICTORIA INTL	BC	LPV	0	100	0	100	1	99.969
CZBB	VANCOUVER / BOUNDARY BAY	BC	LPV	0	100	0	100	1	99.969
AAT	ALTURAS MUNICIPAL	CA	LPV	0	100	0	100	1	99.989
ACV	ARCATA	CA	LPV	0	100	0	100	1	99.979
APC	NAPA COUNTY	CA	LPV	0	100	0	100	2	99.979
APV	APPLE VALLEY	CA	LPV	0	100	0	100	3	99.978
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	2	99.984
BFL	MEADOWS FIELD	CA	LPV200	0	100	0	100	3	99.977
BLH	BLYTHE	CA	LP	0	100	1	99.999	3	99.976
BUR	BOB HOPE	CA	LP	0	100	0	100	4	99.973
C83	BYRON	CA	LPV	0	100	0	100	3	99.981
CCB	CABLE	CA	LP	0	100	0	100	4	99.976
CCR	BUCHANAN FIELD	CA	LPV	0	100	0	100	2	99.980
CEC	JACK MC NAMARA FIELD	CA	LPV	0	100	0	100	1	99.977
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	2	99.983
CMA	CAMARILLO	CA	LPV	0	100	0	100	4	99.969
CNO	CHINO	CA	LPV	0	100	0	100	4	99.975
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	0	100	6	99.956
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	0	100	3	99.981
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	3	99.985
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	2	99.981
F70	FRENCH VALLEY	CA	LPV	0	100	0	100	6	99.968
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	2	99.983
GOO	NEVADA COUNTY AIR PARK	CA	LPV	0	100	0	100	2	99.985
HAF	HALF MOON BAY	CA	LPV	0	100	0	100	3	99.978
HHR	JACK NORTHROP FIELD/HAWTHORNE	CA	LPV	0	100	0	100	4	99.969
HWD	HAYWARD EXECUTIVE	CA	LPV	0	100	0	100	3	99.980
L35	BIG BEAR CITY	CA	LP	0	100	0	100	4	99.976
LAX	LOS ANGELES INTL	CA	LPV200	0	100	0	100	4	99.969
LGB	LONG BEACH /DAUGHERTY FIELD/	CA	LPV	0	100	0	100	4	99.970
LHM	LINCOLN RGNL/KARL HARDER FIELD	CA	LPV200	0	100	0	100	2	99.981

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LLR	LITTLE RIVER	CA	LP	0	100	0	100	2	99.974
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	0	100	3	99.982
LVK	LIVERMORE MUNICIPAL	CA	LPV200	0	100	0	100	3	99.981
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	3	99.985
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	100	0	100	3	99.984
MER	CASTLE	CA	LPV200	0	100	0	100	3	99.985
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	2	99.982
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	100	0	100	3	99.978
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	100	0	100	3	99.983
MRY	MONTEREY RGNL	CA	LPV	0	100	0	100	3	99.979
MYF	MONTGOMERY-GIBBS EXECUTIVE	CA	LPV200	0	100	1	99.998	6	99.950
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	2	99.982
O02	NERVINO	CA	LPV	0	100	0	100	1	99.986
O27	OAKDALE	CA	LPV	0	100	0	100	3	99.984
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	2	99.978
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	2	99.980
OAK	METROPOLITAN OAKLAND INTL	CA	LPV200	0	100	0	100	3	99.979
ONT	ONTARIO INTL	CA	LPV200	0	100	0	100	4	99.975
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	2	99.981
OXR	OXNARD	CA	LPV	0	100	0	100	4	99.969
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	0	100	3	99.976
POC	BRACKETT FIELD	CA	LPV	0	100	0	100	4	99.975
PRB	PASO ROBLES MUNICIPAL	CA	LPV	0	100	0	100	3	99.978
PVF	PLACERVILLE	CA	LPV	0	100	0	100	2	99.985
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	0	100	4	99.974
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	1	99.983
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	1	99.983
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	0	100	3	99.980
SAC	SACRAMENTO EXECUTIVE	CA	LPV	0	100	0	100	2	99.982
SAN	SAN DIEGO INTL	CA	LPV	0	100	1	99.998	6	99.946
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	0	100	5	99.968
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	0	100	4	99.972
SCK	STOCKTON METROPOLITAN	CA	LPV200	0	100	0	100	2	99.982
SDM	BROWN FIELD MUNICIPAL	CA	LPV200	0	100	1	99.997	6	99.942
SEE	GILLESPIE FIELD	CA	LP	0	100	1	99.999	6	99.951
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	0	100	3	99.979
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	0	100	3	99.979

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	2	99.981
SMO	SANTA MONICA MUNICIPAL	CA	LPV	0	100	0	100	4	99.970
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	0	100	5	99.971
SNA	JOHN WAYNE AIRPORT-ORANGE COUN	CA	LPV200	0	100	0	100	5	99.970
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	0	100	3	99.979
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	2	99.977
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	3	99.981
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	4	99.977
TOA	ZAMPERINI FIELD	CA	LPV	0	100	0	100	4	99.968
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	1	99.987
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	0	100	3	99.979
VIS	VISALIA MUNICIPAL	CA	LPV200	0	100	0	100	3	99.981
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	0	100	3	99.976
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	100	0	100	2	99.979
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	0	100	3	99.979
1V6	FREMONT COUNTY	CO	LPV	0	100	0	100	3	99.986
20V	MC ELROY AIRFIELD	CO	LPV	0	100	0	100	2	99.995
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	0	100	0	100	3	99.985
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	0	100	3	99.988
AJZ	BLAKE FIELD	CO	LPV	0	100	0	100	2	99.993
AKO	COLORADO PLAINS RGNL	CO	LPV	0	100	0	100	2	99.993
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	0	100	3	99.986
APA	CENTENNIAL	CO	LPV200	0	100	0	100	3	99.990
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	100	0	100	3	99.993
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	0	100	3	99.990
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	100	0	100	3	99.987
DEN	DENVER INTL	CO	LPV200	0	100	0	100	3	99.993
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	100	0	100	3	99.989
FMM	FORT MORGAN MUNICIPAL	CO	LPV	0	100	0	100	2	99.994
FNL	FORT COLLINS-LOVELAND MUNICIPAL	CO	LPV200	0	100	0	100	2	99.995
FTG	FRONT RANGE	CO	LPV200	0	100	0	100	3	99.992
GJT	GRAND JUNCTION REGIONAL	CO	LPV200	0	100	0	100	3	99.993
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	2	99.995
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	1	99.996
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	2	99.990
LAA	LAMAR MUNICIPAL	CO	LPV	0	100	0	100	3	99.983
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	3	99.984

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LMO	VANCE BRAND	CO	LPV	0	100	0	100	2	99.995
MTJ	MONTROSE RGNL	CO	LPV	0	100	0	100	2	99.992
PSO	STEVENS FIELD	CO	LP	0	100	0	100	3	99.987
PUB	PUEBLO MEMORIAL	CO	LPV200	0	100	0	100	3	99.986
RIL	GARFIELD COUNTY RGNL	CO	LPV	0	100	0	100	2	99.995
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	2	99.994
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	3	99.988
4B8	ROBERTSON FIELD	CT	LP	0	100	0	100	0	100
BDL	BRADLEY INTL	CT	LPV200	0	100	0	100	0	100
BDR	IGOR I SIKORSKY MEMORIAL	CT	LPV	0	100	0	100	0	100
GON	GROTON-NEW LONDON	CT	LPV	0	100	0	100	0	100
HVN	TWEED-NEW HAVEN	CT	LPV	0	100	0	100	0	100
IJD	WINDHAM	CT	LP	0	100	0	100	0	100
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	0	100	0	100	0	100
OXC	WATERBURY-OXFORD	CT	LPV	0	100	0	100	0	100
DCA	RONALD REAGAN WASHINGTON NATIO	DC	LPV	0	100	0	100	1	99.988
HEF	MANASSAS RGNL/HARRY P DAVIS FI	DC	LPV	0	100	0	100	1	99.988
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	100	0	100	1	99.988
33N	DELAWARE AIRPARK	DE	LP	0	100	0	100	1	99.987
EVY	SUMMIT	DE	LPV	0	100	0	100	1	99.988
GED	DELAWARE COASTAL	DE	LPV	0	100	0	100	1	99.986
ILG	NEW CASTLE	DE	LPV	0	100	0	100	1	99.989
1J0	TRI-COUNTY	FL	LP	0	100	0	100	1	99.990
24J	SUWANNEE COUNTY	FL	LPV	0	100	0	100	1	99.981
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	1	99.977
40J	PERRY-FOLEY	FL	LPV	0	100	0	100	1	99.982
54J	DEFUNIAK SPRINGS	FL	LP	0	100	0	100	1	99.991
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	0	100	1	99.986
APF	NAPLES MUNICIPAL	FL	LPV	0	100	1	99.991	1	99.973
AVO	AVON PARK EXECUTIVE	FL	LPV	0	100	0	100	1	99.974
BCT	BOCA RATON	FL	LPV	0	100	1	99.989	1	99.969
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	0	100	1	99.978
BOW	BARTOW MUNICIPAL	FL	LPV	0	100	0	100	1	99.975
CEW	BOB SIKES	FL	LPV	0	100	0	100	1	99.992
CGC	CRYSTAL RIVER-CAPTAIN TOM DAVI	FL	LP	0	100	0	100	1	99.978
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	0	100	1	99.975
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	1	99.973

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CRG	JACKSONVILLE EXECUTIVE AT CRAI	FL	LPV200	0	100	0	100	1	99.978
CTY	CROSS CITY	FL	LPV	0	100	0	100	1	99.981
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	1	99.975
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FI	FL	LPV	0	100	0	100	1	99.976
DTS	DESTIN EXECUTIVE	FL	LPV	0	100	0	100	1	99.991
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	0	100	1	99.989
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	1	99.975
EYW	KEY WEST INTL	FL	LPV	0	100	1	99.987	1	99.970
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	1	99.991	1	99.970
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	0	100	1	99.978
FIN	FLAGLER EXECUTIVE	FL	LPV	0	100	0	100	1	99.976
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	0	100	1	99.988	1	99.968
FMY	PAGE FIELD	FL	LPV	0	100	1	99.993	1	99.973
FPR	TREASURE COAST INTL	FL	LPV	0	100	1	99.994	1	99.971
FXE	FORT LAUDERDALE EXECUTIVE	FL	LPV200	0	100	1	99.988	1	99.969
GIF	WINTER HAVEN'S GILBERT	FL	LPV	0	100	0	100	1	99.975
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	1	99.979
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	1	99.978
IMM	IMMOKALEE RGNL	FL	LPV	0	100	1	99.991	1	99.972
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	1	99.975
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	1	99.978
LAL	LAKELAND LINDER RGNL	FL	LPV200	0	100	0	100	1	99.976
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	0	100	1	99.980
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	1	99.976
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	1	99.989	1	99.969
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	0	100	1	99.989
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	1	99.975
MIA	MIAMI INTL	FL	LPV200	0	100	1	99.988	1	99.968
MKY	MARCO ISLAND	FL	LPV	0	100	1	99.991	1	99.972
MLB	MELBOURNE INTL	FL	LPV200	0	100	1	99.998	1	99.973
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	0	100	1	99.987	1	99.968
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	1	99.994	1	99.972
OCF	OCALA INTL-JIM TAYLOR FIELD	FL	LPV200	0	100	0	100	1	99.978
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	1	99.976
OPF	OPA-LOCKA EXECUTIVE	FL	LPV200	0	100	1	99.988	1	99.968
ORL	EXECUTIVE	FL	LPV200	0	100	0	100	1	99.975
PBI	PALM BEACH INTL	FL	LPV200	0	100	1	99.990	1	99.969

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PCM	PLANT CITY	FL	LPV	0	100	0	100	1	99.976
PGD	PUNTA GORDA	FL	LPV200	0	100	1	99.995	1	99.974
PHK	PALM BEACH CO GLADES	FL	LPV	0	100	1	99.991	1	99.971
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	0	100	1	99.977
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	1	99.988	1	99.969
PNS	PENSACOLA INTL	FL	LPV200	0	100	0	100	1	99.993
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	1	99.993	1	99.973
SEF	SEBRING RGNL	FL	LPV	0	100	1	99.996	1	99.973
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	1	99.975
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	1	99.977
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	0	100	1	99.976
SUA	WITHAM FIELD	FL	LPV	0	100	1	99.991	1	99.970
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	1	99.974
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	0	100	1	99.986
TMB	MIAMI EXECUTIVE	FL	LPV200	0	100	1	99.988	1	99.968
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	1	99.989	1	99.970
TPA	TAMPA INTL	FL	LPV200	0	100	0	100	1	99.977
TPF	PETER O KNIGHT	FL	LP	0	100	0	100	1	99.977
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	1	99.974
VDF	TAMPA EXECUTIVE	FL	LPV	0	100	0	100	1	99.977
VNC	VENICE MUNICIPAL	FL	LP	0	100	1	99.999	1	99.976
VQQ	CECIL	FL	LPV200	0	100	0	100	1	99.978
VRB	VERO BEACH MUNICIPAL	FL	LPV200	0	100	1	99.995	1	99.971
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	0	100	1	99.975
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	1	99.993	1	99.973
X23	UMATILLA MUNICIPAL	FL	LP	0	100	0	100	1	99.976
X35	MARION COUNTY	FL	LP	0	100	0	100	1	99.978
X50	MASSEY RANCH AIRPARK	FL	LP	0	100	0	100	1	99.974
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	0	100	1	99.988	1	99.968
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	0	100	1	99.976
09J	JEKYLL ISLAND	GA	LPV200	0	100	0	100	1	99.979
15J	COOK COUNTY	GA	LPV	0	100	0	100	1	99.985
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	0	100	1	99.988
18A	FRANKLIN COUNTY	GA	LPV	0	100	0	100	1	99.989
19A	JACKSON COUNTY	GA	LPV	0	100	0	100	1	99.990
2J5	MILLEN	GA	LPV	0	100	0	100	1	99.983
3J7	GREENE COUNTY RGNL	GA	LPV	0	100	0	100	1	99.988

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
48A	COCHRAN	GA	LPV	0	100	0	100	1	99.986
4A4	POLK COUNTY AIRPORT- CORNELIUS	GA	LPV	0	100	0	100	1	99.993
4J1	BRANTLEY COUNTY	GA	LPV	0	100	0	100	1	99.980
4J2	BERRIEN CO	GA	LPV	0	100	0	100	1	99.984
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	0	100	1	99.985
52A	MADISON MUNICIPAL	GA	LP	0	100	0	100	1	99.989
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	0	100	1	99.989
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	100	0	100	1	99.990
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	0	100	1	99.986
9A5	BARWICK LAFAYETTE	GA	LP	0	100	0	100	1	99.995
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	0	100	1	99.987
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	0	100	1	99.988
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	0	100	0	100	1	99.985
AHN	ATHENS/BEN EPPS	GA	LPV200	0	100	0	100	1	99.989
AJR	HABERSHAM COUNTY	GA	LPV	0	100	0	100	1	99.990
AMG	BACON COUNTY	GA	LPV	0	100	0	100	1	99.983
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	0	100	0	100	1	99.991
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	0	100	1	99.981
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	0	100	1	99.988
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	0	100	1	99.983
BIJ	EARLY COUNTY	GA	LPV	0	100	0	100	1	99.989
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	0	100	1	99.979
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	0	100	1	99.991
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	0	100	1	99.986
CNI	CHEROKEE COUNTY	GA	LPV	0	100	0	100	1	99.992
CSG	COLUMBUS	GA	LPV	0	100	0	100	1	99.991
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	0	100	1	99.993
CVC	COVINGTON MUNICIPAL	GA	LPV	0	100	0	100	1	99.990
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	100	0	100	1	99.982
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	0	100	1	99.987
CZL	TOM B DAVID FLD	GA	LPV	0	100	0	100	1	99.994
D73	MONROE-WALTON COUNTY	GA	LP	0	100	0	100	1	99.990
DBN	W H 'BUD' BARRON	GA	LPV200	0	100	0	100	1	99.986
DNN	DALTON MUNICIPAL	GA	LPV	0	100	0	100	1	99.994
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	0	100	1	99.983
EBA	ELBERT COUNTY-PATZ FIELD	GA	LP	0	100	0	100	1	99.988
EZM	HEART OF GEORGIA RGNL	GA	LPV200	0	100	0	100	1	99.985

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV200	0	100	0	100	1	99.991
FTY	FULTON COUNTY AIRPORT-BROWN FI	GA	LPV	0	100	0	100	1	99.992
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	0	100	1	99.985
GVL	LEE GILMER MEMORIAL	GA	LPV	0	100	0	100	1	99.991
HOE	HOMERVILLE	GA	LPV	0	100	0	100	1	99.982
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	100	0	100	1	99.986
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	100	0	100	1	99.988
JCA	JACKSON COUNTY	GA	LPV	0	100	0	100	1	99.990
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	0	100	1	99.981
JYL	PLANTATION ARPK	GA	LPV	0	100	0	100	1	99.982
JZP	PICKENS COUNTY	GA	LPV	0	100	0	100	1	99.993
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	100	0	100	1	99.992
LZU	GWINNETT COUNTY - BRISCOE FIEL	GA	LPV200	0	100	0	100	1	99.991
MAC	MACON DOWNTOWN	GA	LPV	0	100	0	100	1	99.988
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	100	0	100	1	99.988
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	0	100	1	99.985
MHP	METTER MUNICIPAL	GA	LPV	0	100	0	100	1	99.983
MLJ	BALDWIN COUNTY	GA	LPV	0	100	0	100	1	99.987
MQW	TELFAIR-WHEELER	GA	LPV	0	100	0	100	1	99.985
OKZ	KAOLIN FIELD	GA	LPV	0	100	0	100	1	99.986
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	0	100	1	99.990
PIM	HARRIS COUNTY	GA	LPV	0	100	0	100	1	99.991
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	100	0	100	1	99.993
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	0	100	1	99.988
RMG	RICHARD B RUSSELL REGIONAL - J	GA	LPV	0	100	0	100	1	99.995
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	0	100	0	100	1	99.983
RYY	COBB COUNTY INTL-MCCOLLUM FIEL	GA	LPV200	0	100	0	100	1	99.992
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	100	0	100	1	99.981
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	100	0	100	1	99.984
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	100	0	100	1	99.983
TMA	HENRY TIFT MYERS	GA	LPV	0	100	0	100	1	99.985
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	100	0	100	1	99.990
TVI	THOMASVILLE RGNL	GA	LPV	0	100	0	100	1	99.985
VDI	VIDALIA RGNL	GA	LPV200	0	100	0	100	1	99.984
VLD	VALDOSTA RGNL	GA	LPV	0	100	0	100	1	99.983
VPC	CARTERSVILLE	GA	LPV	0	100	0	100	1	99.993
WDR	BARROW COUNTY	GA	LPV	0	100	0	100	1	99.990

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
4C8	ALBIA MUNICIPAL	IA	LPV	0	100	0	100	1	99.995
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	100	0	100	1	99.995
ALO	WATERLOO RGNL	IA	LPV	0	100	0	100	1	99.999
AMW	AMES MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	100	0	100	1	99.996
BNW	BOONE MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	100	0	100	1	99.995
CAV	CLARION MUNICIPAL	IA	LPV	0	100	0	100	1	99.999
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	100	0	100	2	99.994
CCY	NORTHEAST IOWA RGNL	IA	LPV	0	100	0	100	1	99.998
CID	THE EASTERN IOWA	IA	LPV200	0	100	0	100	1	99.999
CIN	ARTHUR N NEU	IA	LPV	0	100	0	100	2	99.997
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	100	1	99.999	2	99.996
CSQ	CRESTON MUNICIPAL	IA	LPV	0	100	0	100	1	99.995
CWI	CLINTON MUNICIPAL	IA	LPV200	0	100	0	100	1	99.999
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	2	99.996
DSM	DES MOINES INTL	IA	LPV	0	100	0	100	1	99.996
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	100	0	100	1	99.998
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	0	100	0	100	1	99.999
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	100	0	100	2	99.999
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
EOK	KEOKUK MUNICIPAL	IA	LPV	0	100	0	100	1	99.994
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	100	1	99.998	1	99.997
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	100	0	100	1	99.996
FOD	FORT DODGE RGNL	IA	LPV200	0	100	0	100	2	99.998
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
GCT	GUTHRIE COUNTY RGNL	IA	LPV	0	100	0	100	1	99.996
GGI	GRINNELL RGNL	IA	LPV	0	100	0	100	1	99.998
HPT	HAMPTON MUNICIPAL	IA	LPV	0	100	0	100	1	99.999
I75	OSCEOLA MUNICIPAL	IA	LPV	0	100	0	100	1	99.995
ICL	SCHENCK FIELD	IA	LPV	0	100	0	100	1	99.993
IFA	IOWA FALLS MUNICIPAL	IA	LPV	0	100	0	100	2	99.999
IIB	INDEPENDENCE MUNICIPAL	IA	LP	0	100	0	100	1	99.999
IKV	ANKENY RGNL	IA	LPV200	0	100	0	100	1	99.997

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
LRJ	LE MARS MUNICIPAL	IA	LPV	0	100	1	99.999	2	99.995
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	100	0	100	1	99.998
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	0	100	0	100	1	99.999
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	100	0	100	1	99.996
MUT	MUSCATINE MUNICIPAL	IA	LPV200	0	100	0	100	1	99.997
MXO	MONTICELLO RGNL	IA	LP	0	100	0	100	2	99.999
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	100	0	100	1	99.996
OQW	MAQUOKETA MUNICIPAL	IA	LPV	0	100	0	100	1	99.999
ORC	ORANGE CITY MUNICIPAL	IA	LPV	0	100	1	99.999	2	99.995
OTM	OTTUMWA RGNL	IA	LPV	0	100	0	100	1	99.996
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	100	0	100	1	99.996
PEA	PELLA MUNICIPAL	IA	LPV	0	100	0	100	1	99.996
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	100	1	99.999	2	99.997
PRO	PERRY MUNICIPAL	IA	LPV200	0	100	0	100	1	99.997
RDK	RED OAK MUNICIPAL	IA	LPV	0	100	0	100	1	99.994
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	100	0	100	1	99.993
SHL	SHELDON RGNL	IA	LPV	0	100	1	99.998	1	99.995
SKI	SAC CITY MUNICIPAL	IA	LPV	0	100	0	100	2	99.997
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	100	1	99.999	2	99.996
SPW	SPENCER MUNICIPAL	IA	LPV200	0	100	1	99.999	1	99.996
SUX	SIOUX GATEWAY/COL BUD DAY FIEL	IA	LPV200	0	100	0	100	2	99.994
TNU	NEWTON MUNICIPAL-EARL JOHNSON FIELD	IA	LPV	0	100	0	100	1	99.997
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	100	0	100	1	99.994
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	100	0	100	1	99.998
VTI	VINTON VETERANS MEMORIAL ARPK	IA	LPV	0	100	0	100	1	99.999
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV200	0	100	0	100	1	99.988
COE	COEUR D'ALENE - PAPPY BOYINGTO	ID	LPV200	0	100	0	100	1	99.973
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	100	0	100	1	99.988
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	100	0	100	1	99.988
GNG	GOODING MUNICIPAL	ID	LPV	0	100	0	100	1	99.988
IDA	IDAHO FALLS RGNL	ID	LPV200	0	100	0	100	1	99.989
JER	JEROME COUNTY	ID	LPV	0	100	0	100	1	99.989
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	100	0	100	1	99.983
MAN	NAMPA MUNICIPAL	ID	LPV	0	100	0	100	1	99.988
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	1	99.988
PIH	POCATELLO RGNL	ID	LPV200	0	100	0	100	1	99.988

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SUN	FRIEDMAN MEMORIAL	ID	LP	0	100	0	100	1	99.988
TWF	JOSLIN FIELD - MAGIC VALLEY RG	ID	LPV200	0	100	0	100	1	99.990
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	100	0	100	1	99.988
1H2	EFFINGHAM COUNTY MEMORIAL	IL	LPV	0	100	0	100	1	99.996
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	100	0	100	1	99.994
3MY	MOUNT HAWLEY AUXILIARY	IL	LP	0	100	0	100	1	99.995
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	100	0	100	1	99.998
ALN	ST LOUIS RGNL	IL	LPV200	0	100	0	100	1	99.993
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	1	99.999
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	100	0	100	1	99.993
BMI	CENTRAL IL RGNL ARPT AT BLOOMI	IL	LPV	0	100	0	100	1	99.994
C15	PEKIN MUNICIPAL	IL	LPV	0	100	0	100	1	99.994
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	0	100	0	100	1	99.999
C75	MARSHALL COUNTY	IL	LP	0	100	0	100	1	99.996
CIR	CAIRO RGNL	IL	LP	0	100	0	100	1	99.995
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	100	0	100	1	99.996
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	100	0	100	1	99.993
CTK	INGERSOLL	IL	LPV	0	100	0	100	1	99.994
CUL	CARMI MUNICIPAL	IL	LP	0	100	0	100	1	99.998
DEC	DECATUR	IL	LPV200	0	100	0	100	1	99.995
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	100	0	100	1	99.999
DNV	VERMILION REGIONAL	IL	LPV	0	100	0	100	1	99.997
DPA	DUPAGE	IL	LPV200	0	100	0	100	1	99.999
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	100	0	100	1	99.995
EZI	KEWANEE MUNICIPAL	IL	LPV	0	100	0	100	1	99.997
FEP	ALBERTUS	IL	LPV	0	100	0	100	0	100
FOA	FLORA MUNICIPAL	IL	LPV	0	100	0	100	1	99.996
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	100	0	100	1	99.995
GRE	GREENVILLE	IL	LPV	0	100	0	100	1	99.995
HSB	HARRISBURG-RALEIGH	IL	LPV	0	100	0	100	1	99.997
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	1	99.992
IGQ	LANSING MUNICIPAL	IL	LPV	0	100	0	100	1	99.998
IKK	GREATER KANKAKEE	IL	LPV200	0	100	0	100	1	99.996
LOT	LEWIS UNIVERSITY	IL	LPV200	0	100	0	100	1	99.998
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	100	0	100	1	99.998
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	100	0	100	1	99.999
MLI	QUAD CITY INTL	IL	LPV200	0	100	0	100	1	99.998

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MQB	MACOMB MUNICIPAL	IL	LPV200	0	100	0	100	1	99.994
MTO	COLES COUNTY MEMORIAL	IL	LPV200	0	100	0	100	1	99.996
MVN	MOUNT VERNON	IL	LPV	0	100	0	100	1	99.996
MWA	WILLIAMSON COUNTY RGNL	IL	LPV200	0	100	0	100	1	99.996
OLY	OLNEY-NOBLE	IL	LPV	0	100	0	100	1	99.997
ORD	CHICAGO O'HARE INTL	IL	LPV200	0	100	0	100	1	99.999
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	0	100	0	100	1	99.995
PJY	PINCKNEYVILLE-DU QUOIN	IL	LPV	0	100	0	100	1	99.995
PNT	PONTIAC MUNICIPAL	IL	LPV	0	100	0	100	1	99.996
PRG	EDGAR COUNTY	IL	LPV	0	100	0	100	1	99.998
PWK	CHICAGO EXECUTIVE	IL	LPV	0	100	0	100	0	100
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	100	0	100	0	100
RPJ	ROCHELLE MUNICIPAL AIRPORT-KORITZ F	IL	LPV	0	100	0	100	1	99.999
RSV	CRAWFORD CO	IL	LPV	0	100	0	100	1	99.998
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	0	100	0	100	1	99.994
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	1	99.999
SLO	SALEM-LECKRONE	IL	LPV200	0	100	0	100	1	99.995
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	100	0	100	1	99.994
SQI	WHITESIDE CO ARPT-JOS H BITTOR	IL	LPV	0	100	0	100	1	99.999
TIP	RANTOUL NATL AVN CNTR-FRANK EL	IL	LPV	0	100	0	100	1	99.996
UGN	WAUKEGAN RGNL	IL	LPV	0	100	0	100	0	100
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	0	100	0	100	1	99.992
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	0	100	0	100	1	99.997
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	0	100	0	100	0	100
AID	ANDERSON MUNICIPAL-DARLINGTON FIELD	IN	LPV	0	100	0	100	0	100
ASW	WARSAW MUNICIPAL	IN	LPV	0	100	0	100	1	99.996
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	1	99.997
C65	PLYMOUTH MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
CEV	METTEL FIELD	IN	LPV	0	100	0	100	0	100
CFJ	CRAWFORDSVILLE MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
DCY	DAVIESS COUNTY	IN	LPV	0	100	0	100	1	99.999
EKM	ELKHART MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
EVV	EVANSVILLE RGNL	IN	LPV200	0	100	0	100	1	99.999
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FKR	FRANKFORT MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	100	0	100	0	100
FWA	FORT WAYNE INTL	IN	LPV200	0	100	0	100	1	99.998
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	100	0	100	1	99.995
GPC	PUTNAM COUNTY RGNL	IN	LPV	0	100	0	100	1	99.999
GSH	GOSHEN MUNICIPAL	IN	LPV	0	100	0	100	1	99.997
GWB	DE KALB COUNTY	IN	LPV	0	100	0	100	2	99.996
GYY	GARY/CHICAGO INTL	IN	LPV200	0	100	0	100	1	99.998
HFY	GREENWOOD MUNICIPAL	IN	LPV	0	100	0	100	0	100
HNB	HUNTINGBURG	IN	LPV	0	100	0	100	1	99.999
HUF	TERRE HAUTE INTL-HULMAN FIELD	IN	LPV200	0	100	0	100	1	99.999
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	1	99.999
I76	PERU MUNICIPAL	IN	LPV	0	100	0	100	1	99.995
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	1	99.999
MCX	WHITE COUNTY	IN	LP	0	100	0	100	1	99.994
MIE	DELAWARE COUNTY RGNL	IN	LPV	0	100	0	100	1	99.999
MQJ	INDIANAPOLIS RGNL	IN	LPV200	0	100	0	100	0	100
MZZ	MARION MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	100	0	100	1	99.999
OVO	NORTH VERNON	IN	LPV	0	100	0	100	0	100
OXI	STARKE COUNTY	IN	LPV	0	100	0	100	1	99.998
PLD	PORTLAND MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
PPO	LA PORTE MUNICIPAL	IN	LPV	0	100	0	100	1	99.998
RCR	FULTON COUNTY	IN	LPV	0	100	0	100	1	99.995
RID	RICHMOND MUNICIPAL	IN	LPV200	0	100	0	100	1	99.999
RWN	ARENS FIELD	IN	LPV	0	100	0	100	1	99.998
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	1	99.997
SBN	SOUTH BEND INTL	IN	LPV	0	100	0	100	1	99.998
SER	FREEMAN MUNICIPAL	IN	LPV	0	100	0	100	0	100
SIV	SULLIVAN COUNTY	IN	LPV	0	100	0	100	1	99.998
SMD	SMITH FIELD	IN	LPV	0	100	0	100	1	99.997
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	100	0	100	0	100
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UWL	NEW CASTLE-HENRY CO MUNICIPAL	IN	LPV	0	100	0	100	0	100
VPZ	PORTER COUNTY RGNL	IN	LPV	0	100	0	100	1	99.997
3AU	AUGUSTA MUNICIPAL	KS	LP	0	100	0	100	1	99.982
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	100	0	100	3	99.982
3K8	COMANCHE COUNTY	KS	LPV	0	100	0	100	2	99.982
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	3	99.985
AAO	COLONEL JAMES JABARA	KS	LPV	0	100	0	100	1	99.983
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	2	99.989
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	1	99.981
BEC	BEECH FACTORY	KS	LPV	0	100	0	100	1	99.982
CBK	SHALZ FIELD	KS	LPV	0	100	0	100	2	99.988
CNK	BLOSSER MUNICIPAL	KS	LP	0	100	0	100	2	99.988
DDC	DODGE CITY RGNL	KS	LPV200	0	100	0	100	2	99.983
EGT	WELLINGTON MUNICIPAL	KS	LPV	0	100	0	100	1	99.981
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	100	0	100	3	99.981
EMP	EMPORIA MUNICIPAL	KS	LPV	0	100	0	100	1	99.985
EQA	EL DORADO/CAPTAIN JACK THOMAS	KS	LPV200	0	100	0	100	1	99.983
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	100	0	100	1	99.984
FOE	TOPEKA RGNL	KS	LPV	0	100	0	100	1	99.987
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	100	0	100	1	99.983
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	100	0	100	2	99.985
GCK	GARDEN CITY RGNL	KS	LPV	0	100	0	100	3	99.982
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	0	100	0	100	2	99.989
HLC	HILL CITY MUNICIPAL	KS	LPV	0	100	0	100	2	99.987
HQG	HUGOTON MUNICIPAL	KS	LPV	0	100	0	100	3	99.981
HRU	HERINGTON RGNL	KS	LPV	0	100	0	100	1	99.986
HUT	HUTCHINSON RGNL	KS	LPV	0	100	0	100	1	99.985
HYS	HAYS RGNL	KS	LPV200	0	100	0	100	2	99.986
ICT	WICHITA DWIGHT D EISENHOWER NA	KS	LPV200	0	100	0	100	1	99.983
IDP	INDEPENDENCE MUNICIPAL	KS	LPV	0	100	0	100	1	99.981
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	100	0	100	1	99.987
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	0	100	0	100	2	99.988
K78	ABILENE MUNICIPAL	KS	LPV	0	100	0	100	1	99.986
K79	JETMORE MUNICIPAL	KS	LPV	0	100	0	100	2	99.983
K81	MIAMI COUNTY	KS	LPV	0	100	0	100	1	99.986
K82	SMITH CENTER MUNICIPAL	KS	LPV200	0	100	0	100	2	99.988
K88	ALLEN COUNTY	KS	LPV	0	100	0	100	1	99.984

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	0	100	0	100	3	99.982
LQR	LARNED-PAWNEE COUNTY	KS	LPV	0	100	0	100	2	99.984
LWC	LAWRENCE MUNICIPAL	KS	LPV200	0	100	0	100	1	99.988
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	2	99.985
MHK	MANHATTAN RGNL	KS	LPV200	0	100	0	100	1	99.987
MPR	MC PHERSON	KS	LPV	0	100	0	100	1	99.985
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	100	0	100	2	99.989
NRN	NORTON MUNICIPAL	KS	LPV	0	100	0	100	2	99.988
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	2	99.986
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	2	99.989
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	100	0	100	1	99.987
OWI	OTTAWA MUNICIPAL	KS	LPV	0	100	0	100	1	99.986
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	0	100	0	100	2	99.987
PPF	TRI-CITY	KS	LPV	0	100	0	100	1	99.982
PTS	ATKINSON MUNICIPAL	KS	LPV	0	100	0	100	1	99.983
PTT	PRATT RGNL	KS	LPV	0	100	0	100	2	99.983
RCP	ROOKS COUNTY RGNL	KS	LPV	0	100	0	100	2	99.987
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	100	0	100	2	99.988
RSL	RUSSELL MUNICIPAL	KS	LPV	0	100	0	100	2	99.986
SLN	SALINA RGNL	KS	LPV	0	100	0	100	1	99.986
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	2	99.990
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV200	0	100	0	100	1	99.987
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	100	0	100	3	99.985
UKL	COFFEY COUNTY	KS	LPV	0	100	0	100	1	99.985
ULS	ULYSSES	KS	LPV	0	100	0	100	3	99.981
WLD	STROTHER FIELD	KS	LPV	0	100	0	100	1	99.981
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	0	100	0	100	1	99.997
18I	MC CREARY COUNTY	KY	LP	0	100	0	100	1	99.995
27K	GEORGETOWN SCOTT COUNTY - MARS	KY	LPV200	0	100	0	100	1	99.997
2I0	MADISONVILLE RGNL	KY	LPV	0	100	0	100	1	99.999
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	0	100	0	100	1	99.998
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	0	100	0	100	0	100
5M9	MARION-CRITTENDEN COUNTY	KY	LPV	0	100	0	100	1	99.998
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	0	100	0	100	1	99.998
AAS	TAYLOR COUNTY	KY	LPV	0	100	0	100	1	99.998
BRY	SAMUELS FIELD	KY	LPV	0	100	0	100	1	99.999
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	0	100	0	100	1	99.995
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	100	0	100	1	99.997
CPF	WENDELL H FORD	KY	LPV200	0	100	0	100	2	99.993
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	0	100	0	100	1	99.999
DVK	STUART POWELL FIELD	KY	LPV	0	100	0	100	1	99.998
DWU	ASHLAND RGNL	KY	LP	0	100	0	100	2	99.993
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	100	0	100	1	99.999
EKQ	WAYNE COUNTY	KY	LPV	0	100	0	100	1	99.997
EKX	ADDINGTON FIELD	KY	LPV	0	100	0	100	0	100
FFT	CAPITAL CITY	KY	LPV	0	100	0	100	1	99.998
FGX	FLEMING-MASON	KY	LPV	0	100	0	100	1	99.996
GLW	GLASGOW MUNICIPAL	KY	LPV	0	100	0	100	1	99.999
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	100	0	100	1	99.999
IOB	MOUNT STERLING-MONTGOMERY COUN	KY	LPV	0	100	0	100	1	99.996
JQD	OHIO COUNTY	KY	LPV	0	100	0	100	0	100
K24	RUSSELL COUNTY	KY	LPV	0	100	0	100	1	99.997
K62	GENE SNYDER	KY	LP	0	100	0	100	1	99.998
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	100	0	100	0	100
LEX	BLUE GRASS	KY	LPV	0	100	0	100	1	99.998
LOU	BOWMAN FIELD	KY	LPV	0	100	0	100	0	100
LOZ	LONDON-CORBIN ARPT-MAGEE FIELD	KY	LPV	0	100	0	100	1	99.995
M21	MUHLENBERG COUNTY	KY	LP	0	100	0	100	0	100
M25	MAYFIELD GRAVES COUNTY	KY	LPV	0	100	0	100	1	99.997
OWB	OWENSBORO-DAVIESS COUNTY	KY	LPV200	0	100	0	100	0	100
PAH	BARKLEY RGNL	KY	LPV	0	100	0	100	1	99.996
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	0	100	0	100	1	99.996
SDF	LOUISVILLE INTL-STANDIFORD FIE	KY	LPV200	0	100	0	100	0	100
SJS	BIG SANDY RGNL	KY	LPV	0	100	0	100	2	99.992
SME	LAKE CUMBERLAND RGNL	KY	LPV	0	100	0	100	1	99.996
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	0	100	0	100	1	99.996
TWT	STURGIS MUNICIPAL	KY	LPV	0	100	0	100	1	99.998
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	0	100	0	100	1	99.998
0R4	CONCORDIA PARISH	LA	LPV	0	100	0	100	1	99.990
3R4	HART	LA	LPV	0	100	0	100	1	99.984
3R7	JENNINGS	LA	LPV	0	100	0	100	1	99.986
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	0	100	0	100	1	99.983
ACP	ALLEN PARISH	LA	LPV	0	100	0	100	1	99.986

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AEX	ALEXANDRIA INTL	LA	LPV200	0	100	0	100	1	99.986
APS	PORT OF SOUTH LOUISIANA EXECUT	LA	LPV	0	100	0	100	1	99.991
ARA	ACADIANA RGNL	LA	LPV200	0	100	0	100	1	99.988
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	100	0	100	1	99.989
BTR	BATON ROUGE METROPOLITAN` RYAN	LA	LPV200	0	100	0	100	1	99.990
BXA	GEORGE R CARR MEMORIAL AIR FLD	LA	LPV	0	100	0	100	1	99.994
CWF	CHENNAULT INTL	LA	LPV200	0	100	0	100	1	99.984
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	100	0	100	1	99.984
ESF	ESLER RGNL	LA	LPV200	0	100	0	100	1	99.987
F88	JONESBORO	LA	LP	0	100	0	100	1	99.986
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	0	100	0	100	1	99.992
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	100	0	100	1	99.992
HUM	HOUMA-TERREBONNE	LA	LPV200	0	100	0	100	1	99.991
HZR	FALSE RIVER RGNL	LA	LPV	0	100	0	100	1	99.990
IER	NATCHITOCHES RGNL	LA	LPV	0	100	0	100	1	99.985
IYA	ABBEVILLE CHRIS CRUSTA MEMORIA	LA	LPV	0	100	0	100	1	99.987
L39	LEESVILLE	LA	LPV	0	100	0	100	1	99.984
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	1	99.984
LFT	LAFAYETTE RGNL/PAUL FOURNET FI	LA	LPV	0	100	0	100	1	99.988
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	100	0	100	1	99.989
MLU	MONROE RGNL	LA	LPV200	0	100	0	100	1	99.988
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	0	100	0	100	1	99.993
NEW	LAKEFRONT	LA	LPV	0	100	0	100	1	99.993
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	100	0	100	1	99.987
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	100	0	100	1	99.989
REG	LOUISIANA RGNL	LA	LPV	0	100	0	100	1	99.990
RSN	RUSTON RGNL	LA	LPV	0	100	0	100	1	99.987
SHV	SHREVEPORT RGNL	LA	LPV200	0	100	0	100	1	99.983
SPH	SPRINGHILL	LA	LPV	0	100	0	100	1	99.985
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	0	100	0	100	1	99.991
UXL	SOUTHLAND FIELD	LA	LPV	0	100	0	100	1	99.983
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 RGNL	MA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EWB	NEW BEDFORD RGNL	MA	LPV200	0	100	0	100	0	100
GBR	WALTER J KOLADZA	MA	LP	0	100	0	100	0	100
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	0	100	0	100	0	100
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLAN	MA	LPV200	0	100	0	100	0	100
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	100	0	100	0	100
MVY	MARTHA'S VINEYARD	MA	LPV200	0	100	0	100	0	100
ORE	ORANGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ORH	WORCESTER RGNL	MA	LPV200	0	100	0	100	0	100
OWD	NORWOOD MEMORIAL	MA	LPV	0	100	0	100	0	100
PSF	PITTSFIELD MUNICIPAL	MA	LPV	0	100	0	100	0	100
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	0	100	0	100	0	100
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	0	100
TAN	TAUNTON MUNICIPAL - KING FIELD	MA	LPV	0	100	0	100	0	100
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	1	99.991
2W5	MARYLAND	MD	LP	0	100	0	100	1	99.986
2W6	ST MARY'S COUNTY RGNL	MD	LPV	0	100	0	100	1	99.985
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	0	100	0	100	1	99.988
CBE	GREATER CUMBERLAND RGNL	MD	LPV	0	100	0	100	1	99.991
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	0	100	0	100	1	99.986
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	0	100	0	100	1	99.990
ESN	EASTON/NEWNAM FIELD	MD	LPV200	0	100	0	100	1	99.986
FDK	FREDERICK MUNICIPAL	MD	LPV	0	100	0	100	1	99.989
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	100	0	100	1	99.988
HGR	HAGERSTOWN RGNL-RICHARD A HENS	MD	LPV200	0	100	0	100	1	99.990
MTN	MARTIN STATE	MD	LPV	0	100	0	100	1	99.988
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	100	0	100	1	99.984
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	0	100	0	100	1	99.985
W29	BAY BRIDGE	MD	LPV	0	100	0	100	1	99.987
1B0	DEXTER RGNL	ME	LP	0	100	0	100	0	100
3B1	GREENVILLE MUNICIPAL	ME	LPV	0	100	0	100	0	100
81B	OXFORD COUNTY RGNL	ME	LP	0	100	0	100	0	100
AUG	AUGUSTA STATE	ME	LPV200	0	100	0	100	0	100
BGR	BANGOR INTL	ME	LPV200	0	100	0	100	0	100
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	100	0	100	0	100
BST	BELFAST MUNICIPAL	ME	LPV	0	100	0	100	0	100
BXM	BRUNSWICK EXECUTIVE	ME	LPV200	0	100	0	100	0	100
CAR	CARIBOU MUNICIPAL	ME	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV	0	100	0	100	0	100
HUL	HOULTON INTL	ME	LP	0	100	0	100	0	100
IZG	EASTERN SLOPES RGNL	ME	LPV	0	100	0	100	0	100
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	0	100	0	100	0	100
LRG	LINCOLN RGNL	ME	LP	0	100	0	100	0	100
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	100	0	100	0	100
OWK	CENTRAL MAINE ARPT OF NORRIDGE	ME	LPV	0	100	0	100	0	100
PQI	NORTHERN MAINE RGNL ARPT AT PR	ME	LPV200	0	100	0	100	0	100
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	100	0	100	0	100
RKD	KNOX COUNTY RGNL	ME	LPV200	0	100	0	100	0	100
SFM	SANFORD SEACOAST RGNL	ME	LPV200	0	100	0	100	0	100
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	100	0	100	0	100
48D	CLARE MUNICIPAL	MI	LP	0	100	0	100	0	100
4D0	ABRAMS MUNICIPAL	MI	LP	0	100	0	100	0	100
6Y1	BOIS BLANC ISLAND	MI	LP	0	100	0	100	0	100
77G	MARLETTE	MI	LPV	0	100	0	100	0	100
9D9	HASTINGS	MI	LPV	0	100	0	100	0	100
ACB	ANTRIM COUNTY	MI	LPV	0	100	0	100	0	100
ADG	LENAWEE COUNTY	MI	LPV	0	100	0	100	1	99.997
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	1	99.998
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV	0	100	0	100	0	100
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	0	100
BIV	WEST MICHIGAN RGNL	MI	LPV	0	100	0	100	0	100
BTL	W K KELLOGG	MI	LPV200	0	100	0	100	0	100
C04	OCEANA COUNTY	MI	LPV	0	100	0	100	0	100
CAD	WEXFORD COUNTY	MI	LPV200	0	100	0	100	0	100
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	100	0	100	0	100
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	100	0	100	1	99.999
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	100	0	100	1	99.999
D95	DUPONT-LAPEER	MI	LP	0	100	0	100	0	100
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	100	0	100	1	99.998
DTW	DETROIT METROPOLITAN WAYNE COU	MI	LPV200	0	100	0	100	1	99.998
ERY	LUCE COUNTY	MI	LPV	0	100	0	100	1	99.999

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ESC	DELTA COUNTY	MI	LPV200	0	100	0	100	1	99.996
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	1	99.998
IRS	KIRSCH MUNICIPAL	MI	LPV	0	100	0	100	1	99.998
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	100	0	100	1	99.998
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	100	0	100	1	99.998
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	LPV200	0	100	0	100	1	99.999
JYM	HILLSDALE MUNICIPAL	MI	LPV	0	100	0	100	1	99.998
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	1	99.999
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	1	99.998
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	1	99.996
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	1	99.998

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TVC	CHERRY CAPITAL	MI	LPV200	0	100	0	100	1	99.999
YIP	WILLOW RUN	MI	LPV	0	100	0	100	1	99.998
16D	PERHAM MUNICIPAL	MN	LPV	0	100	0	100	2	99.992
3N8	MAHNOMEN COUNTY	MN	LPV	0	100	0	100	2	99.990
ACQ	WASECA MUNICIPAL	MN	LPV	0	100	1	99.999	1	99.997
ADC	WADENA MUNICIPAL	MN	LPV	0	100	0	100	1	99.993
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	100	0	100	1	99.998
AIT	AITKIN MUNICIPAL-STEVE KURTZ FIELD	MN	LPV	0	100	0	100	1	99.993
ANE	ANOKA COUNTY-BLAINE ARPT (JANE	MN	LPV	0	100	0	100	1	99.995
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	100	0	100	1	99.998
AXN	CHANDLER FIELD	MN	LPV	0	100	0	100	1	99.994
BBB	BENSON MUNICIPAL	MN	LPV	0	100	1	99.995	1	99.992
BDE	BAUDETTE INTL	MN	LPV	0	100	0	100	1	99.988
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV200	0	100	1	99.996	1	99.993
BJI	BEMIDJI RGNL	MN	LPV200	0	100	0	100	2	99.989
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	100	0	100	1	99.993
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	100	0	100	1	99.995
CFE	BUFFALO MUNICIPAL	MN	LPV	0	100	0	100	1	99.995
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	100	0	100	1	99.996
CKN	CROOKSTON MUNICIPAL KIRKWOOD FLD	MN	LPV	0	100	0	100	1	99.990
CNB	MYERS FIELD	MN	LPV	0	100	1	99.996	1	99.992
COQ	CLOQUET CARLTON COUNTY	MN	LPV	0	100	0	100	1	99.994
CQM	COOK MUNICIPAL	MN	LP	0	100	0	100	2	99.990
D39	SAUK CENTRE MUNICIPAL	MN	LPV	0	100	0	100	1	99.994
D42	SPRINGFIELD MUNICIPAL	MN	LP	0	100	1	99.997	1	99.995
DLH	DULUTH INTL	MN	LPV200	0	100	0	100	1	99.995
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	0	100	0	100	2	99.990
DVP	SLAYTON MUNICIPAL	MN	LP	0	100	1	99.997	1	99.995
DXX	LAC QUI PARLE COUNTY	MN	LPV200	0	100	1	99.995	1	99.992
ELO	ELY MUNICIPAL	MN	LPV200	0	100	0	100	2	99.991
ETH	WHEATON MUNICIPAL	MN	LP	0	100	1	99.994	1	99.990
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	0	100	0	100	2	99.993
FBL	FARIBAULT MUNICIPAL	MN	LPV	0	100	0	100	1	99.996
FCM	FLYING CLOUD	MN	LPV200	0	100	0	100	1	99.996
FFM	FERGUS FALLS MUNICIPAL-EINAR MICKEL	MN	LPV200	0	100	1	99.998	1	99.993
FKA	FILLMORE COUNTY	MN	LPV	0	100	0	100	1	99.999
FOZ	BIGFORK MUNICIPAL	MN	LP	0	100	0	100	2	99.989

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	100	1	99.999	1	99.997
FSE	FOSSTON MUNICIPAL	MN	LP	0	100	0	100	2	99.990
GHW	GLENWOOD MUNICIPAL	MN	LPV	0	100	1	99.999	1	99.994
GPZ	GRAND RAPIDS/ITASCA CO-GORDON	MN	LPV	0	100	0	100	2	99.991
GYL	GLENCOE MUNICIPAL	MN	LPV	0	100	0	100	1	99.995
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	0	100	1	99.999	1	99.995
HCO	HALLOCK MUNICIPAL	MN	LPV	0	100	0	100	1	99.988
HIB	RANGE RGNL	MN	LPV200	0	100	0	100	2	99.992
INL	FALLS INTL-EINARSON FIELD	MN	LPV	0	100	0	100	2	99.990
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	100	1	99.999	2	99.990
JMR	MORA MUNICIPAL	MN	LPV	0	100	0	100	1	99.994
JYG	ST JAMES MUNICIPAL	MN	LPV	0	100	1	99.998	1	99.996
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	100	0	100	1	99.995
LVN	AIRLAKE	MN	LPV200	0	100	0	100	1	99.996
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	0	100	0	100	1	99.994
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	100	1	99.998	1	99.995
MJQ	JACKSON MUNICIPAL	MN	LPV	0	100	1	99.998	1	99.996
MKT	MANKATO RGNL	MN	LPV200	0	100	1	99.999	1	99.996
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	0	100	1	99.996	1	99.993
MOX	MORRIS MUNICIPAL - CHARLIE SCHMIDT	MN	LPV	0	100	1	99.995	1	99.991
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	0	100	0	100	1	99.996
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	0	100	1	99.995	1	99.993
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	100	0	100	1	99.994
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	0	100	0	100	1	99.999
ORB	ORR RGNL	MN	LP	0	100	0	100	2	99.990
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	100	1	99.998	1	99.995
OWA	OWATONNA DEGNER RGNL	MN	LPV200	0	100	0	100	1	99.997
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	0	100	0	100	1	99.995
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	0	100	0	100	2	99.990
PQN	PIPESTONE MUNICIPAL	MN	LPV200	0	100	1	99.997	1	99.993
RGK	RED WING RGNL	MN	LPV200	0	100	0	100	1	99.998
ROS	RUSH CITY RGNL	MN	LPV	0	100	0	100	1	99.995
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIEL	MN	LPV	0	100	0	100	1	99.988
RRT	WARROAD INTL MEMORIAL	MN	LPV200	0	100	0	100	1	99.988
RST	ROCHESTER INTL	MN	LPV200	0	100	0	100	1	99.999
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	100	1	99.996	1	99.994
SAZ	STAPLES MUNICIPAL	MN	LPV	0	100	0	100	1	99.993

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SBU	BLUE EARTH MUNICIPAL	MN	LPV	0	100	1	99.999	1	99.998
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LP	0	100	0	100	1	99.996
STC	ST CLOUD RGNL	MN	LPV200	0	100	0	100	1	99.994
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	100	0	100	1	99.996
TOB	DODGE CENTER	MN	LPV	0	100	0	100	1	99.998
TVF	THIEF RIVER FALLS RGNL	MN	LPV	0	100	0	100	1	99.990
TWM	RICHARD B HELGESON	MN	LPV	0	100	0	100	1	99.995
ULM	NEW ULM MUNICIPAL	MN	LPV200	0	100	1	99.998	1	99.995
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIEL	MN	LP	0	100	1	99.995	1	99.991
Y49	WALKER MUNICIPAL	MN	LP	0	100	0	100	2	99.990
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	0	100	1	99.997	1	99.994
03D	MEMPHIS MEMORIAL	MO	LPV	0	100	0	100	1	99.993
1H0	CREVE COEUR	MO	LPV	0	100	0	100	1	99.992
1MO	MOUNTAIN GROVE MEMORIAL	MO	LP	0	100	0	100	1	99.988
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	100	0	100	1	99.985
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	1	99.993
8WC	WASHINGTON COUNTY	MO	LPV	0	100	0	100	1	99.992
94K	CASSVILLE MUNICIPAL	MO	LPV	0	100	0	100	1	99.985
AIZ	LEE C FINE MEMORIAL	MO	LPV	0	100	0	100	1	99.988
BBG	BRANSON	MO	LPV200	0	100	0	100	1	99.986
BUM	BUTLER MEMORIAL	MO	LPV	0	100	0	100	1	99.985
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	0	100	0	100	1	99.995
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	100	0	100	1	99.991
COU	COLUMBIA RGNL	MO	LPV	0	100	0	100	1	99.988
DMO	SEDALIA RGNL	MO	LPV	0	100	0	100	1	99.987
DXE	DEXTER MUNICIPAL	MO	LPV	0	100	0	100	1	99.994
EIW	COUNTY MEMORIAL	MO	LPV	0	100	0	100	1	99.995
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	100	0	100	1	99.983
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	100	0	100	1	99.992
EZZ	CAMERON MEMORIAL	MO	LPV	0	100	0	100	1	99.990
FAM	FARMINGTON RGNL	MO	LPV	0	100	0	100	1	99.993
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	0	100	0	100	1	99.989
FWB	BRANSON WEST MUNICIPAL - EMERSON FI	MO	LPV200	0	100	0	100	1	99.986
FYG	WASHINGTON RGNL	MO	LPV	0	100	0	100	1	99.991
GLY	CLINTON RGNL	MO	LPV	0	100	0	100	1	99.986
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	100	0	100	1	99.989
H79	ELDON MODEL AIRPARK	MO	LP	0	100	0	100	1	99.988

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	0	100	0	100	1	99.993
HAE	HANNIBAL RGNL	MO	LPV	0	100	0	100	1	99.991
HFJ	MONETT RGNL	MO	LPV	0	100	0	100	1	99.984
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	100	0	100	1	99.988
IRK	KIRKSVILLE RGNL	MO	LPV200	0	100	0	100	1	99.992
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	0	100	0	100	1	99.988
JLN	JOPLIN RGNL	MO	LPV	0	100	0	100	1	99.983
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	0	100	0	100	1	99.987
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	100	0	100	1	99.992
K89	MACON-FOWER MEMORIAL	MO	LPV	0	100	0	100	1	99.991
LLU	LAMAR MUNICIPAL	MO	LPV	0	100	0	100	1	99.984
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	100	0	100	1	99.986
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	100	0	100	1	99.988
M05	CARUTHERSVILLE MEMORIAL	MO	LPV	0	100	0	100	1	99.995
M12	STEELE MUNICIPAL	MO	LPV	0	100	0	100	1	99.994
M17	BOLIVAR MUNICIPAL	MO	LPV	0	100	0	100	1	99.986
M48	HOUSTON MEMORIAL	MO	LPV	0	100	0	100	1	99.989
MAW	MALDEN RGNL	MO	LPV	0	100	0	100	1	99.994
MBY	OMAR N BRADLEY	MO	LPV	0	100	0	100	1	99.990
MCI	KANSAS CITY INTL	MO	LPV200	0	100	0	100	1	99.989
MHL	MARSHALL MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	1	99.989
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV200	0	100	0	100	1	99.988
MNF	MOUNTAIN VIEW	MO	LP	0	100	0	100	1	99.990
MO3	STOCKTON MUNICIPAL	MO	LP	0	100	0	100	1	99.985
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	1	99.991
MYJ	MEXICO MEMORIAL	MO	LPV	0	100	0	100	1	99.989
NVD	NEVADA MUNICIPAL	MO	LPV200	0	100	0	100	1	99.984
OZS	CAMDENTON MEMORIAL-LAKE RGNL	MO	LPV	0	100	0	100	1	99.987
PCD	PERRYVILLE RGNL	MO	LPV	0	100	0	100	1	99.994
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	0	100	0	100	1	99.986
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	100	0	100	1	99.993
RAW	WARSAW MUNICIPAL	MO	LPV200	0	100	0	100	1	99.986
RCM	SKYHAVEN	MO	LPV	0	100	0	100	1	99.987
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	100	0	100	1	99.986
SIK	SIKESTON MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	1	99.995
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	100	0	100	1	99.990
STL	LAMBERT-ST LOUIS INTL	MO	LPV200	0	100	0	100	1	99.992

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	100	0	100	1	99.992
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	0	100	0	100	1	99.989
TKX	KENNETT MEMORIAL	MO	LPV	0	100	0	100	1	99.994
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	1	99.992
UBX	CUBA MUNICIPAL	MO	LPV	0	100	0	100	1	99.990
UNO	WEST PLAINS RGNL	MO	LPV	0	100	0	100	1	99.990
UUV	SULLIVAN RGNL	MO	LPV	0	100	0	100	1	99.991
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	100	0	100	1	99.988
VIH	ROLLA NATIONAL	MO	LPV200	0	100	0	100	1	99.990
0R0	COLUMBIA-MARION COUNTY	MS	LPV	0	100	0	100	1	99.994
17M	MAGEE MUNICIPAL	MS	LP	0	100	0	100	1	99.995
5A4	OKOLONA MUNICIPAL-RICHARD STOVALL F	MS	LPV	0	100	0	100	1	99.998
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	0	100	1	99.995
87I	YAZOO COUNTY	MS	LPV	0	100	0	100	1	99.993
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	0	100	1	99.998
CKM	FLETCHER FIELD	MS	LPV	0	100	0	100	1	99.993
CRX	ROSCOE TURNER	MS	LPV200	0	100	0	100	1	99.998
GLH	GREENVILLE MID-DELTA	MS	LPV200	0	100	0	100	1	99.991
GNF	GRENADA MUNICIPAL	MS	LPV200	0	100	0	100	1	99.995
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	100	0	100	2	99.995
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	0	100	1	99.998
GWO	GREENWOOD-LEFLORE	MS	LPV	0	100	0	100	1	99.994
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	0	100	0	100	1	99.996
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADA	MS	LPV200	0	100	0	100	1	99.990
HKS	HAWKINS FIELD	MS	LPV	0	100	0	100	1	99.993
HSA	STENNIS INTL	MS	LPV200	0	100	0	100	2	99.995
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	100	0	100	1	99.992
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	0	100	0	100	1	99.994
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	100	0	100	1	99.993
LMS	LOUISVILLE WINSTON COUNTY	MS	LPV	0	100	0	100	1	99.996
LUL	HESLER-NOBLE FIELD	MS	LPV	0	100	0	100	1	99.996
M40	MONROE COUNTY	MS	LPV	0	100	0	100	1	99.998
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	0	100	0	100	1	99.995
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	0	100	0	100	1	99.994
MBO	BRUCE CAMPBELL FIELD	MS	LP	0	100	0	100	1	99.994
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV	0	100	0	100	1	99.992
MEI	KEY FIELD	MS	LPV200	0	100	0	100	1	99.997

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	100	0	100	1	99.995
MMS	SELFS	MS	LPV	0	100	0	100	1	99.993
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	0	100	1	99.996
OLV	OLIVE BRANCH	MS	LPV200	0	100	0	100	1	99.995
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	100	0	100	1	99.995
PMU	PANOLA COUNTY	MS	LPV	0	100	0	100	1	99.995
PQL	TRENT LOTT INTL	MS	LPV200	0	100	0	100	2	99.995
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	100	0	100	1	99.992
STF	GEORGE M BRYAN	MS	LPV200	0	100	0	100	1	99.997
TUP	TUPELO RGNL	MS	LPV200	0	100	0	100	1	99.997
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	0	100	1	99.995
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	0	100	1	99.993
VKS	VICKSBURG MUNICIPAL	MS	LP	0	100	0	100	1	99.991
1S3	TILLITT FIELD	MT	LPV	0	100	0	100	1	99.977
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	1	99.996	1	99.976
6S8	LAUREL MUNICIPAL	MT	LPV	0	100	0	100	1	99.978
7S0	RONAN	MT	LPV	0	100	0	100	1	99.974
BHK	BAKER MUNICIPAL	MT	LPV	0	100	1	99.997	1	99.978
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	100	0	100	1	99.978
BTM	BERT MOONEY	MT	LPV	0	100	0	100	1	99.977
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	0	100	0	100	1	99.977
CTB	CUT BANK INTL	MT	LPV200	0	100	0	100	1	99.973
DLN	DILLON	MT	LPV	0	100	0	100	1	99.986
EKS	ENNIS - BIG SKY	MT	LPV	0	100	0	100	1	99.986
GDV	DAWSON COMMUNICIPALTY	MT	LPV	0	100	1	99.996	1	99.976
GGW	WOKAL FIELD/GLASGOW INTL	MT	LPV200	0	100	1	99.996	1	99.975
GPI	GLACIER PARK INTL	MT	LPV	0	100	0	100	1	99.972
GTF	GREAT FALLS INTL	MT	LPV200	0	100	0	100	1	99.975
HLN	HELENA RGNL	MT	LPV	0	100	0	100	1	99.977
HVR	HAVRE CITY-COUNTY	MT	LPV	0	100	1	99.999	1	99.973
LVM	MISSION FIELD	MT	LP	0	100	0	100	1	99.976
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	0	100	0	100	1	99.977
M75	MALTA	MT	LP	0	100	1	99.997	1	99.974
MLS	FRANK WILEY FIELD	MT	LPV	0	100	1	99.999	1	99.977
MSO	MISSOULA INTL	MT	LPV	0	100	0	100	1	99.974
OLF	L M CLAYTON	MT	LPV200	0	100	1	99.995	1	99.974
PO1	POPLAR MUNICIPAL	MT	LPV200	0	100	1	99.995	1	99.974

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PWD	SHER-WOOD	MT	LPV200	0	100	1	99.993	1	99.975
RPX	ROUNDUP	MT	LPV	0	100	0	100	1	99.976
SBX	SHELBY	MT	LPV	0	100	0	100	1	99.972
SDY	SIDNEY-RICHLAND MUNICIPAL	MT	LPV	0	100	1	99.994	1	99.976
WYS	YELLOWSTONE	MT	LPV200	0	100	0	100	1	99.987
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	1	99.982
ACZ	HENDERSON FIELD	NC	LPV	0	100	0	100	1	99.976
AFP	ANSON COUNTY - JEFF CLOUD FIEL	NC	LPV	0	100	0	100	1	99.982
AKH	GASTONIA MUNICIPAL	NC	LPV	0	100	0	100	1	99.985
ASJ	TRI-COUNTY	NC	LPV	0	100	0	100	1	99.979
AVL	ASHEVILLE RGNL	NC	LPV200	0	100	0	100	1	99.989
BUY	BURLINGTON-ALAMANCE RGNL	NC	LPV	0	100	0	100	2	99.982
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	100	0	100	1	99.985
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	0	100	0	100	1	99.978
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	100	0	100	1	99.978
DPL	DUPLIN CO	NC	LPV200	0	100	0	100	1	99.977
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	0	100	0	100	1	99.979
EDE	NORTHEASTERN RGNL	NC	LPV200	0	100	0	100	1	99.978
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	100	0	100	1	99.986
EQY	CHARLOTTE-MONROE EXECUTIVE	NC	LPV200	0	100	0	100	1	99.984
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	100	0	100	1	99.976
EXX	DAVIDSON COUNTY	NC	LPV	0	100	0	100	1	99.984
EYF	CURTIS L BROWN JR FIELD	NC	LPV200	0	100	0	100	1	99.978
FAY	FAYETTEVILLE RGNL/GRANNIS FIEL	NC	LPV200	0	100	0	100	1	99.979
FFA	FIRST FLIGHT	NC	LP	0	100	0	100	1	99.978
FQD	RUTHERFORD CO - MARCHMAN FIELD	NC	LPV	0	100	0	100	1	99.988
GEV	ASHE COUNTY	NC	LP	0	100	0	100	1	99.988
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	100	0	100	2	99.983
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	0	100	0	100	1	99.977
HBI	ASHEBORO RGNL	NC	LPV	0	100	0	100	1	99.983
HKY	HICKORY RGNL	NC	LPV200	0	100	0	100	1	99.987
HNZ	HENDERSON-OXFORD	NC	LPV	0	100	0	100	2	99.979
HRJ	HARNETT RGNL JETPORT	NC	LPV	0	100	0	100	1	99.979
ILM	WILMINGTON INTL	NC	LPV200	0	100	0	100	1	99.975
INT	SMITH REYNOLDS	NC	LPV200	0	100	0	100	2	99.984

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	0	100	0	100	1	99.986
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	0	100	0	100	1	99.977
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	2	99.979
JNX	JOHNSTON REGIONAL	NC	LPV	0	100	0	100	1	99.978
JQF	CONCORD RGNL	NC	LPV	0	100	0	100	1	99.985
LBT	LUMBERTON RGNL	NC	LPV	0	100	0	100	1	99.979
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	0	100	0	100	2	99.979
MCZ	MARTIN COUNTY	NC	LPV	0	100	0	100	1	99.978
MEB	LAURINBURG-MAXTON	NC	LPV200	0	100	0	100	1	99.980
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	1	99.977
MRH	MICHAEL J SMITH FIELD	NC	LPV	0	100	0	100	1	99.974
MRN	FOOTHILLS REGIONAL	NC	LPV	0	100	0	100	1	99.988
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	100	0	100	2	99.985
OAJ	ALBERT J ELLIS	NC	LPV200	0	100	0	100	1	99.975
OCW	WASHINGTON-WARREN	NC	LPV	0	100	0	100	1	99.977
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	1	99.979
PGV	PITT-GREENVILLE	NC	LPV	0	100	0	100	1	99.978
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	100	0	100	1	99.978
RCZ	RICHMOND COUNTY	NC	LPV	0	100	0	100	1	99.981
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	100	0	100	2	99.979
RHP	WESTERN CAROLINA RGNL	NC	LP	0	100	0	100	1	99.992
RUQ	ROWAN COUNTY	NC	LPV200	0	100	0	100	1	99.984
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	0	100	0	100	1	99.978
SCR	SILER CITY MUNICIPAL	NC	LPV	0	100	0	100	2	99.981
SOP	MOORE COUNTY	NC	LPV200	0	100	0	100	1	99.981
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	0	100	0	100	1	99.975
SVH	STATESVILLE RGNL	NC	LPV200	0	100	0	100	1	99.986
TDF	PERSON COUNTY	NC	LPV200	0	100	0	100	2	99.979
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	0	100	0	100	2	99.980
VUJ	STANLY COUNTY	NC	LPV200	0	100	0	100	1	99.983
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	0	100	0	100	1	99.977
ZEF	ELKIN MUNICIPAL	NC	LP	0	100	0	100	2	99.985
06D	ROLLA MUNICIPAL	ND	LPV	0	100	1	99.994	1	99.988
20U	BEACH	ND	LPV	0	100	1	99.996	1	99.978
2C8	CAVALIER MUNICIPAL	ND	LPV	0	100	0	100	1	99.989
3H4	HILLSBORO MUNICIPAL	ND	LPV	0	100	0	100	2	99.991
46D	CARRINGTON MUNICIPAL	ND	LPV	0	100	1	99.991	1	99.984

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
51D	EDGELEY MUNICIPAL	ND	LPV	0	100	1	99.993	1	99.985
5L0	LAKOTA MUNICIPAL	ND	LPV	0	100	1	99.996	1	99.990
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	100	1	99.995	2	99.991
6L3	LISBON MUNICIPAL	ND	LPV	0	100	1	99.993	1	99.987
7L2	LINTON MUNICIPAL	ND	LPV	0	100	1	99.993	1	99.984
9D7	CANDO MUNICIPAL	ND	LPV	0	100	1	99.993	1	99.989
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	100	1	99.992	2	99.988
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	100	1	99.992	1	99.981
BWP	HARRY STERN	ND	LPV	0	100	1	99.994	1	99.993
BWW	BOWMAN RGNL	ND	LPV	0	100	1	99.996	1	99.979
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	100	1	99.989	1	99.988
D55	ROBERTSON FIELD	ND	LPV	0	100	1	99.999	1	99.988
D60	TIOGA MUNICIPAL	ND	LPV	0	100	1	99.991	1	99.977
DIK	DICKINSON - THEODORE ROOSEVELT	ND	LPV200	0	100	1	99.994	1	99.979
DVL	DEVILS LAKE RGNL	ND	LPV200	0	100	1	99.993	1	99.990
FAR	HECTOR INTL	ND	LPV200	0	100	1	99.999	2	99.991
GAF	HUTSON FIELD	ND	LPV	0	100	0	100	1	99.989
GFK	GRAND FORKS INTL	ND	LPV	0	100	0	100	1	99.990
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV200	0	100	1	99.993	1	99.988
HEI	HETTINGER MUNICIPAL	ND	LPV	0	100	1	99.995	1	99.980
HZE	MERCER COUNTY RGNL	ND	LPV	0	100	1	99.992	1	99.980
ISN	SLOULIN FLD INTL	ND	LPV200	0	100	1	99.993	1	99.976
JMS	JAMESTOWN RGNL	ND	LPV200	0	100	1	99.992	2	99.984
K74	ROBERT ODEGAARD FIELD	ND	LP	0	100	1	99.995	2	99.991
MOT	MINOT INTL	ND	LPV	0	100	1	99.990	1	99.979
RUG	RUGBY MUNICIPAL	ND	LP	0	100	1	99.989	1	99.988
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	100	1	99.993	1	99.977
Y19	MANDAN MUNICIPAL	ND	LPV	0	100	1	99.992	1	99.981
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	0	100	0	100	2	99.989
08K	HARVARD STATE	NE	LPV	0	100	0	100	2	99.989
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	0	100	1	99.999	2	99.992
0C4	PENDER MUNICIPAL	NE	LPV	0	100	0	100	2	99.993
0F4	LOUP CITY MUNICIPAL	NE	LPV	0	100	0	100	2	99.989
0G3	TECUMSEH MUNICIPAL	NE	LPV	0	100	0	100	1	99.991
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	100	0	100	2	99.989
12K	SUPERIOR MUNICIPAL	NE	LPV	0	100	0	100	2	99.989
47V	CURTIS MUNICIPAL	NE	LPV	0	100	0	100	2	99.990

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	2	99.988
4V9	ANTELOPE COUNTY	NE	LPV	0	100	0	100	2	99.990
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	100	1	99.999	2	99.990
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	100	0	100	2	99.988
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	100	1	99.999	2	99.990
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	100	0	100	2	99.990
9V5	MODISETT	NE	LPV	0	100	0	100	1	99.986
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	100	0	100	2	99.992
AHQ	WAHOO MUNICIPAL	NE	LPV	0	100	0	100	2	99.991
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	100	0	100	1	99.987
ANW	AINSWORTH RGNL	NE	LPV200	0	100	1	99.999	2	99.989
AUH	AURORA MUNICIPAL - AL POTTER FIELD	NE	LPV	0	100	0	100	2	99.990
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	0	100	0	100	2	99.990
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	0	100	0	100	1	99.986
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	100	0	100	2	99.990
BTA	BLAIR MUNICIPAL	NE	LPV	0	100	0	100	2	99.993
BUB	CRAM FIELD	NE	LPV	0	100	0	100	2	99.989
BVN	ALBION MUNICIPAL	NE	LPV	0	100	0	100	2	99.990
CDR	CHADRON MUNICIPAL	NE	LPV200	0	100	0	100	1	99.985
CEK	CRETE MUNICIPAL	NE	LPV	0	100	0	100	2	99.990
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	0	100	0	100	2	99.988
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	2	99.989
EAR	KEARNEY RGNL	NE	LPV200	0	100	0	100	2	99.990
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	100	0	100	2	99.989
FET	FREMONT MUNICIPAL	NE	LPV	0	100	0	100	2	99.992
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	100	0	100	2	99.990
FNB	BRENNER FIELD	NE	LPV	0	100	0	100	1	99.991
GGF	GRANT MUNICIPAL	NE	LPV	0	100	0	100	2	99.992
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	100	0	100	2	99.990
GRN	GORDON MUNICIPAL	NE	LPV	0	100	0	100	1	99.986
HDE	BREWSTER FIELD	NE	LPV	0	100	0	100	2	99.988
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	2	99.989
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	100	0	100	2	99.996
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	2	99.991
JYR	YORK MUNICIPAL	NE	LPV	0	100	0	100	2	99.989
LBF	NORTH PLATTE RGNL AIRPORT LEE	NE	LPV200	0	100	0	100	2	99.991
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	0	100	0	100	2	99.992

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LNK	LINCOLN	NE	LPV200	0	100	0	100	2	99.991
LXN	JIM KELLY FIELD	NE	LPV	0	100	0	100	2	99.989
MCK	MC COOK BEN NELSON RGNL	NE	LPV	0	100	0	100	2	99.990
MLE	MILLARD	NE	LPV	0	100	0	100	2	99.993
ODX	EVELYN SHARP FIELD	NE	LPV	0	100	0	100	2	99.989
OFK	NORFOLK RGNL/KARL STEFAN MEMOR	NE	LPV	0	100	0	100	2	99.991
OGA	SEARLE FIELD	NE	LPV	0	100	0	100	2	99.993
OKS	GARDEN COUNTY	NE	LPV	0	100	0	100	2	99.995
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	100	0	100	2	99.990
OMA	EPPLEY AIRFIELD	NE	LPV200	0	100	0	100	2	99.993
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	0	100	1	99.999	2	99.990
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	0	100	0	100	2	99.993
RBE	ROCK COUNTY	NE	LPV	0	100	1	99.999	2	99.990
SCB	SCRIBNER STATE	NE	LPV	0	100	0	100	2	99.993
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FIELD	NE	LPV	0	100	0	100	2	99.995
SWT	SEWARD MUNICIPAL	NE	LPV	0	100	0	100	2	99.990
TIF	THOMAS COUNTY	NE	LPV	0	100	0	100	2	99.990
TQE	TEKAMAH MUNICIPAL	NE	LPV	0	100	0	100	2	99.994
VTN	MILLER FIELD	NE	LPV	0	100	1	99.998	1	99.988
ASH	BOIRE FIELD	NH	LPV200	0	100	0	100	0	100
CON	CONCORD MUNICIPAL	NH	LPV	0	100	0	100	0	100
DAW	SKYHAVEN	NH	LPV	0	100	0	100	0	100
EEN	DILLANT-HOPKINS	NH	LPV	0	100	0	100	0	100
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	100	0	100	0	100
LCI	LACONIA MUNICIPAL	NH	LPV	0	100	0	100	0	100
LEB	LEBANON MUNICIPAL	NH	LPV	0	100	0	100	0	100
MHT	MANCHESTER	NH	LPV200	0	100	0	100	0	100
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	100	0	100	0	100
47N	CENTRAL JERSEY RGNL	NJ	LP	0	100	0	100	1	99.991
4N1	GREENWOOD LAKE	NJ	LP	0	100	0	100	1	99.993
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	100	0	100	1	99.987
CDW	ESSEX COUNTY	NJ	LPV	0	100	0	100	1	99.992
EWR	NEWARK LIBERTY INTL	NJ	LPV200	0	100	0	100	1	99.991
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	100	0	100	1	99.987
MJX	OCEAN COUNTY	NJ	LPV	0	100	0	100	1	99.989
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	0	100	0	100	1	99.991
N12	LAKEWOOD	NJ	LP	0	100	0	100	1	99.990

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
N14	FLYING W	NJ	LPV	0	100	0	100	1	99.989
N40	SKY MANOR	NJ	LP	0	100	0	100	1	99.991
TEB	TETERBORO	NJ	LPV	0	100	0	100	1	99.993
TTN	TRENTON MERCER	NJ	LPV	0	100	0	100	1	99.990
VAY	SOUTH JERSEY RGNL	NJ	LP	0	100	0	100	1	99.989
WWD	CAPE MAY COUNTY	NJ	LPV	0	100	0	100	1	99.986
CYDF	DEER LAKE	NL	LPV	0	100	0	100	1	99.999
0E0	MORIARTY	NM	LPV	0	100	1	99.996	1	99.984
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	0	100	1	99.998	2	99.985
AEG	DOUBLE EAGLE II	NM	LPV200	0	100	1	99.998	2	99.985
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	0	100	1	99.994	1	99.980
ATS	ARTESIA MUNICIPAL	NM	LPV	0	100	1	99.995	1	99.980
CAO	CLAYTON MUNICIPAL ARPK	NM	LPV	0	100	0	100	3	99.983
CNM	CAVERN CITY AIR TRML	NM	LPV200	0	100	1	99.995	1	99.980
CVN	CLOVIS MUNICIPAL	NM	LPV200	0	100	0	100	1	99.981
DMN	DEMING MUNICIPAL	NM	LPV	0	100	1	99.990	2	99.975
E06	LEA COUNTY-ZIP FRANKLIN MEMORI	NM	LPV	0	100	1	99.995	1	99.981
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	3	99.989
HOB	LEA COUNTY RGNL	NM	LPV	0	100	1	99.995	1	99.981
LAM	LOS ALAMOS	NM	LP	0	100	0	100	3	99.986
LRU	LAS CRUCES INTL	NM	LPV200	0	100	1	99.991	2	99.978
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	1	99.995	2	99.983
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	100	1	99.996	1	99.981
SAF	SANTA FE MUNICIPAL	NM	LPV200	0	100	1	99.999	2	99.986
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	100	1	99.995	1	99.981
SVC	GRANT COUNTY	NM	LPV	0	100	1	99.993	2	99.978
CYHZ	HALIFAX / STANFIELD INTL	NS	LPV	0	100	0	100	0	100
CYEV	INUVIK	NT	LPV	0	100	0	100	2	99.976
05U	EUREKA	NV	LP	0	100	0	100	1	99.993
CXP	CARSON	NV	LP	0	100	0	100	1	99.987
ELY	ELY ARPT /YELLAND FLD/	NV	LPV	0	100	0	100	1	99.995
LAS	MC CARRAN INTL	NV	LPV	0	100	0	100	2	99.991
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	1	99.987
RTS	RENO/STEAD	NV	LPV	0	100	0	100	1	99.987
SPZ	SILVER SPRINGS	NV	LPV	0	100	0	100	1	99.989
TPH	TONOPAH	NV	LP	0	100	0	100	1	99.986
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	1	99.991

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
06N	RANDALL	NY	LP	0	100	0	100	1	99.995
0G7	FINGER LAKES RGNL	NY	LPV	0	100	0	100	1	99.999
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	1	99.999
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	100	0	100	0	100
5B2	SARATOGA COUNTY	NY	LPV	0	100	0	100	0	100
5G0	LE ROY	NY	LP	0	100	0	100	0	100
9G0	BUFFALO AIRFIELD	NY	LP	0	100	0	100	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	1	99.996
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	100	0	100	0	100
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	100	0	100	1	99.997
ELZ	WELLSVILLE MUNICIPAL ARPT`TARANTINE	NY	LPV	0	100	0	100	1	99.998
FOK	FRANCIS S GABRESKI	NY	LPV200	0	100	0	100	0	100
FRG	REPUBLIC	NY	LPV200	0	100	0	100	1	99.997
FZY	OSWEGO COUNTY	NY	LPV	0	100	0	100	0	100
GFL	FLOYD BENNETT MEMORIAL	NY	LPV200	0	100	0	100	0	100
GVQ	GENESEE COUNTY	NY	LPV200	0	100	0	100	0	100
HPN	WESTCHESTER COUNTY	NY	LPV	0	100	0	100	1	99.996
HTF	HORNELL MUNICIPAL	NY	LPV	0	100	0	100	1	99.998
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	1	99.999
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	100	0	100	1	99.998
JFK	JOHN F KENNEDY INTL	NY	LPV200	0	100	0	100	1	99.994
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	100	0	100	1	99.999
K09	PISECO	NY	LP	0	100	0	100	0	100
LGA	LAGUARDIA	NY	LPV	0	100	0	100	1	99.994
MAL	MALONE-DUFORT	NY	LPV	0	100	0	100	0	100
MGJ	ORANGE COUNTY	NY	LPV	0	100	0	100	1	99.996
MSS	MASSENA INTL-RICHARDS FIELD	NY	LPV	0	100	0	100	0	100
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	100	0	100	1	99.995
N23	SIDNEY MUNICIPAL	NY	LP	0	100	0	100	1	99.996

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
N66	ONEONTA MUNICIPAL	NY	LPV	0	100	0	100	1	99.997
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	1	99.997
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	100	0	100	1	99.998
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	0	100
PEO	PENN YAN	NY	LPV	0	100	0	100	1	99.999
POU	HUDSON VALLEY RGNL	NY	LPV	0	100	0	100	1	99.999
RME	GRIFFISS INTL	NY	LPV200	0	100	0	100	1	99.999
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	1	99.997
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	100	0	100	1	99.999
VGC	HAMILTON MUNICIPAL	NY	LPV	0	100	0	100	1	99.998
0G6	WILLIAMS COUNTY	OH	LPV	0	100	0	100	1	99.997
10G	HOLMES COUNTY	OH	LP	0	100	0	100	2	99.996
16G	SENECA COUNTY	OH	LPV	0	100	0	100	2	99.999
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	0	100	0	100	2	99.996
1G0	WOOD COUNTY	OH	LPV	0	100	0	100	1	99.998
1G3	KENT STATE UNIV	OH	LPV	0	100	0	100	2	99.992
2G2	JEFFERSON COUNTY AIRPARK	OH	LPV	0	100	0	100	2	99.991
4G5	MONROE COUNTY	OH	LP	0	100	0	100	3	99.990
4I3	KNOX COUNTY	OH	LPV200	0	100	0	100	2	99.993
5A1	NORWALK-HURON COUNTY	OH	LP	0	100	0	100	2	99.996
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	100	0	100	2	99.991
7G8	GEAUGA COUNTY	OH	LP	0	100	0	100	2	99.992
AKR	AKRON FULTON INTL	OH	LP	0	100	0	100	2	99.992
AOH	LIMA ALLEN COUNTY	OH	LPV200	0	100	0	100	2	99.997
AXV	NEIL ARMSTRONG	OH	LPV	0	100	0	100	2	99.998
BJJ	WAYNE COUNTY	OH	LPV	0	100	0	100	2	99.994
BKL	BURKE LAKEFRONT	OH	LPV	0	100	0	100	2	99.992
CAK	AKRON-CANTON RGNL	OH	LPV200	0	100	0	100	2	99.993
CDI	CAMBRIDGE MUNICIPAL	OH	LP	0	100	0	100	2	99.993
CGF	CUYAHOGA COUNTY	OH	LPV	0	100	0	100	2	99.992
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	2	99.993

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	0	100	0	100	2	99.994
CQA	LAKEFIELD	OH	LPV	0	100	0	100	2	99.998
CYO	PICKAWAY COUNTY MEMORIAL	OH	LPV	0	100	0	100	2	99.994
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	100	0	100	2	99.998
DLZ	DELAWARE MUNICIPAL - JIM MOORE FIEL	OH	LPV	0	100	0	100	2	99.995
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	1	99.998
EOP	PIKE COUNTY	OH	LP	0	100	0	100	2	99.993
FDY	FINDLAY	OH	LPV	0	100	0	100	3	99.998
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	100	0	100	2	99.998
GQQ	GALION MUNICIPAL	OH	LP	0	100	0	100	1	99.998
HAO	BUTLER CO RGNL-HOGAN FIELD	OH	LPV	0	100	0	100	1	99.999
HOC	HIGHLAND COUNTY	OH	LP	0	100	0	100	1	99.996
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	2	99.995
I19	GREENE COUNTY-LEWIS A JACKSON	OH	LPV	0	100	0	100	1	99.998
I40	RICHARD DOWNING	OH	LPV	0	100	0	100	1	99.995
I66	CLINTON FIELD	OH	LPV	0	100	0	100	1	99.997
I68	WARREN COUNTY/JOHN LANE FIELD	OH	LPV	0	100	0	100	1	99.998
I69	CLERMONT COUNTY	OH	LP	0	100	0	100	1	99.998
I74	GRIMES FIELD	OH	LPV	0	100	0	100	1	99.997
ILN	WILMINGTON AIR PARK	OH	LPV200	0	100	0	100	1	99.997
LCK	RICKENBACKER INTL	OH	LPV200	0	100	0	100	2	99.994
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	100	0	100	2	99.993
LNN	WILLOUGHBY LOST NATION MUNICIPAL	OH	LPV	0	100	0	100	2	99.992
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	100	0	100	2	99.993
LUK	CINCINNATI MUNICIPAL AIRPORT LUNKEN	OH	LPV	0	100	0	100	1	99.998
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	100	0	100	1	99.998
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	100	0	100	1	99.998
MNN	MARION MUNICIPAL	OH	LPV	0	100	0	100	2	99.996
MRT	UNION COUNTY	OH	LP	0	100	0	100	2	99.996
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	0	100	0	100	1	99.998
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	2	99.995
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	2	99.998
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	1	99.999
PCW	ERIE-OTTAWA INTL	OH	LPV	0	100	0	100	2	99.999
PHD	HARRY CLEVER FIELD	OH	LP	0	100	0	100	2	99.993
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	0	100	0	100	2	99.994
POV	PORTAGE COUNTY	OH	LPV	0	100	0	100	2	99.991

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RZT	ROSS COUNTY	OH	LPV	0	100	0	100	2	99.994
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	100	0	100	2	99.999
SCA	SIDNEY MUNICIPAL	OH	LPV	0	100	0	100	2	99.998
SGH	SPRINGFIELD-BECKLEY MUNICIPAL	OH	LPV200	0	100	0	100	1	99.997
TDZ	TOLEDO EXECUTIVE	OH	LPV	0	100	0	100	1	99.998
TOL	TOLEDO EXPRESS	OH	LPV200	0	100	0	100	1	99.998
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	100	0	100	2	99.991
TZR	BOLTON FIELD	OH	LPV200	0	100	0	100	2	99.995
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	2	99.990
USE	FULTON COUNTY	OH	LPV	0	100	0	100	1	99.997
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	2	99.996
VTA	NEWARK-HEATH	OH	LP	0	100	0	100	2	99.992
YNG	YOUNGSTOWN-WARREN RGNL	OH	LPV	0	100	0	100	2	99.993
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	0	100	0	100	2	99.990
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	100	0	100	1	99.976
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	0	100	0	100	1	99.982
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	1	99.978
2K4	SCOTT FIELD	OK	LPV	0	100	0	100	1	99.977
80F	ANTLERS MUNICIPAL	OK	LPV	0	100	0	100	1	99.979
ADH	ADA MUNICIPAL	OK	LPV	0	100	0	100	1	99.977
ADM	ARDMORE MUNICIPAL	OK	LPV200	0	100	0	100	1	99.976
AVK	ALVA RGNL	OK	LPV	0	100	0	100	1	99.981
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	100	0	100	1	99.977
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	100	0	100	1	99.979
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	100	0	100	1	99.979
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	100	0	100	1	99.976
CLK	CLINTON RGNL	OK	LPV	0	100	0	100	1	99.978
CSM	CLINTON-SHERMAN	OK	LPV200	0	100	0	100	1	99.977
DUA	DURANT RGNL - EAKER FIELD	OK	LPV	0	100	0	100	1	99.978
DUC	HALLIBURTON FIELD	OK	LPV	0	100	0	100	1	99.975
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	100	0	100	1	99.978
F22	PERRY MUNICIPAL	OK	LPV	0	100	0	100	1	99.978
FDR	FREDERICK RGNL	OK	LPV200	0	100	0	100	1	99.977
GCM	CLAREMORE RGNL	OK	LPV	0	100	0	100	1	99.981
GMJ	GROVE MUNICIPAL	OK	LPV	0	100	0	100	1	99.983
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	100	0	100	1	99.976
GUY	GUYMON MUNICIPAL	OK	LPV	0	100	0	100	3	99.981

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GZL	STIGLER RGNL	OK	LPV	0	100	0	100	1	99.981
H71	MID-AMERICA INDUSTRIAL	OK	LPV	0	100	0	100	1	99.981
HBR	HOBART RGNL	OK	LPV	0	100	0	100	1	99.976
HHW	STAN STAMPER MUNICIPAL	OK	LPV	0	100	0	100	1	99.979
HSD	SUNDANCE	OK	LPV	0	100	0	100	1	99.976
MKO	DAVIS FIELD	OK	LPV	0	100	0	100	1	99.981
MLC	MC ALESTER RGNL	OK	LPV	0	100	0	100	1	99.979
OJA	THOMAS P STAFFORD	OK	LPV	0	100	0	100	1	99.977
OKC	WILL ROGERS WORLD	OK	LPV200	0	100	0	100	1	99.976
OKM	OKMULGEE RGNL	OK	LPV	0	100	0	100	1	99.979
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	0	100	0	100	1	99.976
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	0	100	0	100	1	99.979
PNC	PONCA CITY RGNL	OK	LPV	0	100	0	100	1	99.979
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	100	0	100	1	99.976
PWA	WILEY POST	OK	LPV200	0	100	0	100	1	99.976
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	1	99.976
RVS	RICHARD LLOYD JONES JR	OK	LPV200	0	100	0	100	1	99.979
SNL	SHAWNEE RGNL	OK	LPV200	0	100	0	100	1	99.977
SWO	STILLWATER RGNL	OK	LPV200	0	100	0	100	1	99.977
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	100	0	100	1	99.982
TUL	TULSA INTL	OK	LPV200	0	100	0	100	1	99.979
WDG	ENID WOODRING RGNL	OK	LPV200	0	100	0	100	1	99.979
WWR	WEST WOODWARD	OK	LPV	0	100	0	100	2	99.981
CNS7	KINCARDINE	ON	LPV	0	100	0	100	0	100
CYHD	DRYDEN REGIONAL	ON	LPV	0	100	0	100	1	99.990
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	2	99.995
CYTS	TIMMINS / VICTOR M POWER	ON	LPV	0	100	0	100	0	100
CYXL	SIOUX LOOKOUT	ON	LPV	0	100	0	100	1	99.990
AST	ASTORIA RGNL	OR	LPV	0	100	0	100	1	99.967
BDN	BEND MUNICIPAL	OR	LPV	0	100	0	100	1	99.984
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	1	99.985
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	1	99.971
EUG	MAHLON SWEET FIELD	OR	LPV200	0	100	0	100	1	99.972
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	100	0	100	1	99.985
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	100	0	100	1	99.975

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	100	0	100	1	99.985
LKV	LAKE COUNTY	OR	LPV	0	100	0	100	1	99.989
LMT	CRATER LAKE-KLAMATH RGNL	OR	LPV	0	100	0	100	1	99.981
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	1	99.970
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	1	99.988
ONP	NEWPORT MUNICIPAL	OR	LPV	0	100	0	100	1	99.971
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	1	99.976
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	0	100	0	100	1	99.983
PDX	PORTLAND INTL	OR	LPV200	0	100	0	100	1	99.976
RDM	ROBERTS FIELD	OR	LPV200	0	100	0	100	1	99.984
S33	MADRAS MUNICIPALCIPAL	OR	LPV	0	100	0	100	1	99.982
S39	PRINEVILLE	OR	LP	0	100	0	100	1	99.984
SLE	MCNARY FLD	OR	LPV200	0	100	0	100	1	99.971
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	100	0	100	1	99.975
UAO	AURORA STATE	OR	LPV	0	100	0	100	1	99.976
22N	JAKE ARNER MEMORIAL	PA	LP	0	100	0	100	1	99.993
29D	GROVE CITY	PA	LP	0	100	0	100	2	99.995
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	1	99.992
6G1	TITUSVILLE	PA	LPV	0	100	0	100	1	99.998
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	1	99.998
8N8	DANVILLE	PA	LP	0	100	0	100	1	99.993
9D4	DECK	PA	LPV	0	100	0	100	1	99.991
ABE	LEHIGH VALLEY INTL	PA	LPV200	0	100	0	100	1	99.992
AFJ	WASHINGTON COUNTY	PA	LPV200	0	100	0	100	2	99.992
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	2	99.993
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	100	0	100	1	99.993
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	0	100	0	100	1	99.994
AXQ	CLARION COUNTY	PA	LPV	0	100	0	100	1	99.996
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	1	99.997
BTP	BUTLER COUNTY/K W SCHOLTER FIE	PA	LPV	0	100	0	100	2	99.995
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	2	99.993
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	1	99.991
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	1	99.996
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	0	100	0	100	2	99.998
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	100	0	100	1	99.995
FKL	VENANGO RGNL	PA	LPV	0	100	0	100	1	99.997
FWQ	ROSTRAVER	PA	LPV	0	100	0	100	1	99.994

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GKJ	PORT MEADVILLE	PA	LP	0	100	0	100	2	99.997
HMZ	BEDFORD COUNTY	PA	LPV	0	100	0	100	1	99.992
HZL	HAZLETON RGNL	PA	LPV	0	100	0	100	1	99.993
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	0	100	0	100	1	99.994
IPT	WILLIAMSPORT RGNL	PA	LPV	0	100	0	100	1	99.995
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA	PA	LPV200	0	100	0	100	1	99.993
LBE	ARNOLD PALMER RGNL	PA	LPV200	0	100	0	100	1	99.993
LNS	LANCASTER	PA	LPV200	0	100	0	100	1	99.991
LOM	WINGS FIELD	PA	LPV	0	100	0	100	1	99.990
MDT	HARRISBURG INTL	PA	LPV	0	100	0	100	1	99.991
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	0	100	0	100	1	99.993
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	100	0	100	1	99.990
N38	WELLSBORO JOHNSTON	PA	LP	0	100	0	100	1	99.996
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	100	0	100	1	99.993
N96	BELLEFONTE	PA	LPV	0	100	0	100	1	99.994
OQN	BRANDYWINE	PA	LP	0	100	0	100	1	99.990
OYM	ST MARYS MUNICIPAL	PA	LPV	0	100	0	100	1	99.996
PHL	PHILADELPHIA INTL	PA	LPV200	0	100	0	100	1	99.990
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	2	99.993
PNE	NORTHEAST PHILADELPHIA	PA	LPV	0	100	0	100	1	99.990
PSB	MID-STATE	PA	LPV	0	100	0	100	1	99.994
PTW	HERITAGE FIELD	PA	LPV	0	100	0	100	1	99.991
RDG	READING RGNL/CARL A SPAATZ FIE	PA	LPV	0	100	0	100	1	99.991
RVL	MIFFLIN COUNTY	PA	LPV	0	100	0	100	1	99.993
THV	YORK	PA	LP	0	100	0	100	1	99.990
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	100	0	100	2	99.994
UKT	QUAKERTOWN	PA	LP	0	100	0	100	1	99.991
UNV	UNIVERSITY PARK	PA	LPV200	0	100	0	100	1	99.994
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	0	100	0	100	1	99.993
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	2	99.992
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	100	0	100	1	99.994
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	100	0	100	1	99.991
ZER	SCHUYLKILL COUNTY /JOE ZERBEY/	PA	LPV200	0	100	0	100	1	99.993
CPN8	OPINACA	QC	LPV	0	100	0	100	0	100
CSR3	VICTORIAVILLE	QC	LPV	0	100	0	100	0	100
CTP9	KATTINIQ / DONALDSON	QC	LPV	0	100	0	100	1	99.986
CYEY	AMOS	QC	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYHU	MONTREAL / STHUBERT	QC	LPV	0	100	0	100	0	100
CYIF	STAUGUSTIN	QC	LPV	0	100	0	100	1	99.999
CYMX	MONTREAL (MIRABEL INTL)	QC	LPV	0	100	0	100	0	100
CYQB	QUEBEC / JEAN LESAGE INTL	QC	LPV	0	100	0	100	0	100
CYRI	RIVIEREDULOUP	QC	LPV	0	100	0	100	0	100
CYRQ	TROISRIVIERES	QC	LPV	0	100	0	100	0	100
CYVB	BONAVENTURE	QC	LPV	0	100	0	100	0	100
CYVP	KUUJJUAQ	QC	LPV	0	100	0	100	1	99.996
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	1	99.986
6J0	LEXINGTON COUNTY AT PELION	SC	LPV	0	100	0	100	1	99.983
AIK	AIKEN MUNICIPAL	SC	LPV200	0	100	0	100	1	99.984
AND	ANDERSON RGNL	SC	LPV200	0	100	0	100	1	99.988
AQX	ALLENDALE COUNTY	SC	LPV	0	100	0	100	1	99.982
ARW	BEAUFORT COUNTY	SC	LPV200	0	100	0	100	1	99.979
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	0	100	0	100	1	99.981
BNL	BARNWELL RGNL	SC	LPV	0	100	0	100	1	99.983
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	100	0	100	1	99.983
CDN	WOODWARD FIELD	SC	LPV	0	100	0	100	1	99.983
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	100	0	100	1	99.989
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	100	0	100	1	99.978
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FI	SC	LPV	0	100	0	100	1	99.981
CRE	GRAND STRAND	SC	LPV200	0	100	0	100	1	99.976
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	100	0	100	1	99.985
DYB	SUMMERVILLE	SC	LPV200	0	100	0	100	1	99.979
FDW	FAIRFIELD COUNTY	SC	LPV	0	100	0	100	1	99.984
FLO	FLORENCE RGNL	SC	LPV	0	100	0	100	1	99.980
GGE	GEORGETOWN COUNTY	SC	LPV	0	100	0	100	1	99.977
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	100	0	100	1	99.988
GRD	GREENWOOD COUNTY	SC	LPV	0	100	0	100	1	99.986
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	0	100	0	100	1	99.987
GYH	DONALDSON FIELD	SC	LPV	0	100	0	100	1	99.988
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	100	0	100	1	99.978

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	100	0	100	1	99.978
LKR	LANCASTER COUNTY-MC WHIRTER FI	SC	LPV200	0	100	0	100	1	99.984
LQK	PICKENS COUNTY	SC	LPV	0	100	0	100	1	99.989
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	100	0	100	1	99.978
LUX	LAURENS COUNTY	SC	LPV	0	100	0	100	1	99.986
MAO	MARION COUNTY	SC	LPV	0	100	0	100	1	99.979
MKS	BERKELEY COUNTY	SC	LPV	0	100	0	100	1	99.979
MYR	MYRTLE BEACH INTL	SC	LPV200	0	100	0	100	1	99.977
OGB	ORANGEBURG MUNICIPAL	SC	LPV200	0	100	0	100	1	99.982
PYG	PAGELAND	SC	LPV	0	100	0	100	1	99.983
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	100	0	100	1	99.980
SMS	SUMTER	SC	LPV200	0	100	0	100	1	99.981
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SC	LPV200	0	100	0	100	1	99.987
UDG	DARLINGTON COUNTY	SC	LPV	0	100	0	100	1	99.981
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	0	100	0	100	1	99.985
0D8	GETTYSBURG MUNICIPAL	SD	LP	0	100	1	99.995	1	99.986
49B	STURGIS MUNICIPAL	SD	LPV	0	100	1	99.999	1	99.982
8D3	SISSETON MUNICIPAL	SD	LPV	0	100	1	99.994	1	99.989
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	1	99.998	2	99.991
9D0	HIGHMORE MUNICIPAL	SD	LPV	0	100	1	99.996	1	99.988
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	0	100	1	99.998	1	99.990
9V6	MARTIN MUNICIPAL	SD	LPV	0	100	1	99.999	1	99.986
ABR	ABERDEEN RGNL	SD	LPV200	0	100	1	99.994	1	99.987
AGZ	WAGNER MUNICIPAL	SD	LPV	0	100	1	99.998	2	99.990
ATY	WATERTOWN RGNL	SD	LPV200	0	100	1	99.995	1	99.990
BKX	BROOKINGS RGNL	SD	LPV200	0	100	1	99.996	1	99.992
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	0	100	1	99.999	1	99.981
FSD	JOE FOSS FIELD	SD	LPV200	0	100	1	99.998	1	99.994
HON	HURON RGNL	SD	LPV200	0	100	1	99.996	1	99.990
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	100	0	100	1	99.983
ICR	WINNER RGNL	SD	LPV	0	100	1	99.998	1	99.989
LEM	LEMMON MUNICIPAL	SD	LPV	0	100	1	99.995	1	99.981
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	100	1	99.994	1	99.984
MDS	MADISON MUNICIPAL	SD	LPV	0	100	1	99.997	1	99.992
MHE	MITCHELL MUNICIPAL	SD	LPV	0	100	1	99.997	1	99.990
MKA	MILLER MUNICIPAL	SD	LPV	0	100	1	99.996	1	99.988
PHP	PHILIP	SD	LPV	0	100	1	99.998	1	99.985

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PIR	PIERRE RGNL	SD	LPV	0	100	1	99.996	1	99.986
RAP	RAPID CITY RGNL	SD	LPV200	0	100	1	99.999	1	99.983
SPF	BLACK HILLS-CLYDE ICE FIELD	SD	LPV	0	100	1	99.999	1	99.981
VMR	HAROLD DAVIDSON FIELD	SD	LPV	0	100	1	99.999	2	99.993
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	0	100	1	99.999	2	99.992
CKQ8	MCARTHUR RIVER	SK	LPV	0	100	1	99.997	1	99.966
CYKJ	KEY LAKE	SK	LPV	0	100	0	100	1	99.967
0A3	SMITHVILLE MUNICIPAL	TN	LPV	0	100	0	100	1	99.998
0M3	JOHN A BAKER FLD	TN	LP	0	100	0	100	1	99.999
0M4	BENTON COUNTY	TN	LPV	0	100	0	100	1	99.998
0M5	HUMPHREYS COUNTY	TN	LP	0	100	0	100	1	99.999
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	100	0	100	1	99.993
1M5	PORTLAND MUNICIPAL	TN	LPV	0	100	0	100	0	100
2A0	MARK ANTON	TN	LPV	0	100	0	100	1	99.995
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	0	100	0	100	0	100
2M8	CHARLES W BAKER	TN	LPV	0	100	0	100	1	99.995
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	0	100	0	100	1	99.993
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	100	0	100	1	99.999
8A3	LIVINGSTON MUNICIPAL	TN	LP	0	100	0	100	1	99.997
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	100	0	100	1	99.998
BNA	NASHVILLE INTL	TN	LPV200	0	100	0	100	0	100
CHA	LOVELL FIELD	TN	LPV200	0	100	0	100	1	99.995
CKV	OUTLAW FIELD	TN	LPV	0	100	0	100	1	99.999
CSV	CROSSVILLE MEMORIAL-WHITSON FI	TN	LPV200	0	100	0	100	1	99.996
DYR	DYERSBURG RGNL	TN	LPV	0	100	0	100	1	99.995
FYE	FAYETTE COUNTY	TN	LPV	0	100	0	100	1	99.996
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	100	0	100	1	99.998
GCY	GREENEVILLE-GREENE COUNTY MUNICIPAL	TN	LPV	0	100	0	100	1	99.991
GHM	CENTERVILLE MUNICIPAL	TN	LP	0	100	0	100	0	100
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	100	0	100	1	99.992
GZS	ABERNATHY FIELD	TN	LPV	0	100	0	100	0	100
HZD	CARROLL COUNTY	TN	LPV	0	100	0	100	1	99.997
JAU	CAMPBELL COUNTY	TN	LP	0	100	0	100	1	99.995
JWN	JOHN C TUNE	TN	LPV	0	100	0	100	0	100
LUG	ELLINGTON	TN	LPV	0	100	0	100	1	99.999
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	0	100	1	99.994
M08	WILLIAM L WHITEHURST FIELD	TN	LP	0	100	0	100	1	99.996

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
M53	HUMBOLDT MUNICIPAL	TN	LPV	0	100	0	100	1	99.996
M54	LEBANON MUNICIPAL	TN	LPV	0	100	0	100	1	99.999
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	100	0	100	0	100
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	100	0	100	1	99.999
MEM	MEMPHIS INTL	TN	LPV200	0	100	0	100	1	99.994
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	100	0	100	1	99.997
MMI	MCMINN COUNTY	TN	LPV	0	100	0	100	1	99.994
MNV	MONROE COUNTY	TN	LPV	0	100	0	100	1	99.994
MOR	MOORE-MURRELL	TN	LPV	0	100	0	100	1	99.992
MQY	SMYRNA	TN	LPV200	0	100	0	100	1	99.999
MRC	MAURY COUNTY	TN	LPV	0	100	0	100	0	100
NQA	MILLINGTON RGNL JETPORT	TN	LPV200	0	100	0	100	1	99.995
PHT	HENRY COUNTY	TN	LPV200	0	100	0	100	1	99.998
PVE	BEECH RIVER RGNL	TN	LPV	0	100	0	100	1	99.998
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	100	0	100	1	99.995
RNC	WARREN COUNTY MEMORIAL	TN	LPV	0	100	0	100	1	99.998
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	0	100	0	100	1	99.995
SCX	SCOTT MUNICIPAL	TN	LPV	0	100	0	100	1	99.995
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	0	100	1	99.998
SRB	UPPER CUMBERLAND RGNL	TN	LPV	0	100	0	100	1	99.997
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	0	100	0	100	1	99.999
SZY	ROBERT SIBLEY	TN	LPV	0	100	0	100	1	99.998
TGC	GIBSON COUNTY	TN	LP	0	100	0	100	1	99.996
THA	TULLAHOMA RGNL ARPT/WM NORTHER	TN	LPV	0	100	0	100	1	99.998
TRI	TRI-CITIES RGNL TN/VA	TN	LPV200	0	100	0	100	1	99.990
TYS	MC GHEE TYSON	TN	LPV200	0	100	0	100	1	99.993
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	100	0	100	1	99.996
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	1	99.999	1	99.978
2R9	KARNES COUNTY	TX	LP	0	100	1	99.993	1	99.979
3R9	LAKEWAY AIRPARK	TX	LP	0	100	1	99.996	1	99.979
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	100	1	99.998	1	99.978
45R	HAWTHORNE FIELD	TX	LP	0	100	0	100	1	99.981
4T2	KENNETH COPELAND	TX	LPV	0	100	0	100	1	99.976
50R	LOCKHART MUNICIPAL	TX	LPV	0	100	1	99.996	1	99.978
5C1	BOERNE STAGE FIELD	TX	LP	0	100	1	99.994	1	99.980
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	100	1	99.990	1	99.979
60R	NAVASOTA MUNICIPAL	TX	LPV	0	100	0	100	1	99.978

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	100	0	100	1	99.979
77F	WINTERS MUNICIPAL	TX	LP	0	100	1	99.999	1	99.980
8F3	CROSBYTON MUNICIPAL	TX	LP	0	100	0	100	1	99.980
ABI	ABILENE RGNL	TX	LPV200	0	100	0	100	1	99.979
ACT	WACO RGNL	TX	LPV200	0	100	0	100	1	99.977
ADS	ADDISON	TX	LPV	0	100	0	100	1	99.976
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	100	0	100	1	99.976
ALI	ALICE INTL	TX	LPV	0	100	1	99.990	1	99.978
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	100	0	100	2	99.980
ARM	WHARTON RGNL	TX	LPV	0	100	1	99.996	1	99.979
ASL	HARRISON COUNTY	TX	LPV	0	100	0	100	1	99.982
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	100	1	99.996	1	99.979
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	100	1	99.998	1	99.980
BAZ	NEW BRAUNFELS RGNL	TX	LPV	0	100	1	99.995	1	99.979
BBD	CURTIS FIELD	TX	LPV	0	100	1	99.997	1	99.980
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	1	99.978
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	1	99.996	1	99.981
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	1	99.981
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	0	100	1	99.988	1	99.975
BWD	BROWNWOOD RGNL	TX	LPV	0	100	0	100	1	99.979
BYY	BAY CITY RGNL	TX	LPV	0	100	1	99.996	1	99.980
CDS	CHILDRESS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.979
CFD	COULTER FIELD	TX	LPV	0	100	0	100	1	99.978
CLL	EASTERWOOD FIELD	TX	LPV200	0	100	0	100	1	99.978
CNW	TSTC WACO	TX	LPV200	0	100	0	100	1	99.977
COM	COLEMAN MUNICIPAL	TX	LPV	0	100	1	99.999	1	99.979
COT	COTULLA-LA SALLE COUNTY	TX	LPV	0	100	1	99.991	1	99.978
CPT	CLEBURNE RGNL	TX	LPV	0	100	0	100	1	99.976
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	100	1	99.991	1	99.978
CVB	CASTROVILLE MUNICIPAL	TX	LPV	0	100	1	99.993	1	99.980
CWC	KICKAPOO DOWNTOWN	TX	LPV	0	100	0	100	1	99.977
CXO	CONROE-NORTH HOUSTON RGNL	TX	LPV200	0	100	0	100	1	99.979
CZT	DIMMIT COUNTY	TX	LPV	0	100	1	99.990	1	99.979
DAL	DALLAS LOVE FIELD	TX	LPV200	0	100	0	100	1	99.976
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	0	100	0	100	1	99.976
DHT	DALHART MUNICIPAL	TX	LPV	0	100	0	100	3	99.981
DKR	HOUSTON COUNTY	TX	LP	0	100	0	100	1	99.978

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
DRT	DEL RIO INTL	TX	LPV	0	100	1	99.993	1	99.979
DTO	DENTON ENTERPRISE	TX	LPV200	0	100	0	100	1	99.976
DUX	MOORE COUNTY	TX	LPV200	0	100	0	100	2	99.981
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	100	0	100	1	99.979
E01	ROY HURD MEMORIAL	TX	LP	0	100	1	99.995	1	99.980
E11	ANDREWS COUNTY	TX	LPV	0	100	1	99.995	1	99.981
E19	GRUVER MUNICIPAL	TX	LP	0	100	0	100	2	99.982
E30	BRUCE FIELD	TX	LPV	0	100	1	99.998	1	99.980
E38	ALPINE-CASPARIS MUNICIPAL	TX	LP	0	100	1	99.991	1	99.979
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	1	99.988	1	99.976
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	100	1	99.998	1	99.978
EFD	ELLINGTON	TX	LPV200	0	100	1	99.999	1	99.980
ELA	EAGLE LAKE	TX	LP	0	100	1	99.998	1	99.979
ELP	EL PASO INTL	TX	LP	0	100	1	99.990	2	99.978
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	0	100	1	99.995	1	99.980
ETN	EASTLAND MUNICIPAL	TX	LP	0	100	0	100	1	99.978
F00	JONES FIELD	TX	LPV	0	100	0	100	1	99.978
F05	WILBARGER COUNTY	TX	LPV	0	100	0	100	1	99.977
F49	SLATON MUNICIPAL	TX	LPV	0	100	0	100	1	99.981
F98	YOAKUM COUNTY	TX	LPV	0	100	1	99.997	1	99.981
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	0	100	1	99.993	1	99.980
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	100	0	100	1	99.976
FWS	FORT WORTH SPINKS	TX	LPV200	0	100	0	100	1	99.976
GDJ	GRANBURY RGNL	TX	LPV	0	100	0	100	1	99.976
GGG	EAST TEXAS RGNL	TX	LPV	0	100	0	100	1	99.981
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	100	0	100	1	99.976
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	100	0	100	1	99.975
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	100	1	99.999	1	99.981
GNC	GAINES COUNTY	TX	LPV	0	100	1	99.995	1	99.981
GRK	ROBERT GRAY AAF	TX	LPV200	0	100	1	99.999	1	99.978
GTU	GEORGETOWN MUNICIPAL	TX	LPV	0	100	1	99.999	1	99.978
GVT	MAJORS	TX	LPV200	0	100	0	100	1	99.978
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	100	0	100	1	99.977
HBV	JIM HOGG COUNTY	TX	LPV	0	100	1	99.989	1	99.977
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	0	100	1	99.992	1	99.980
HHF	HEMPHILL COUNTY	TX	LPV	0	100	0	100	2	99.980
HOU	WILLIAM P HOBBY	TX	LPV200	0	100	1	99.999	1	99.980

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HQZ	MESQUITE METRO	TX	LPV	0	100	0	100	1	99.976
HRL	VALLEY INTL	TX	LPV200	0	100	1	99.988	1	99.976
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	100	0	100	1	99.981
HYI	SAN MARCOS REGIONAL	TX	LPV200	0	100	1	99.996	1	99.979
IAH	GEORGE BUSH INTERCONTINENTAL/H	TX	LPV200	0	100	0	100	1	99.979
IKG	KLEBERG COUNTY	TX	LPV	0	100	1	99.990	1	99.978
ILE	SKYLARK FIELD	TX	LPV200	0	100	0	100	1	99.978
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	100	0	100	1	99.976
INK	WINKLER COUNTY	TX	LPV200	0	100	1	99.995	1	99.980
IWS	WEST HOUSTON	TX	LP	0	100	1	99.999	1	99.979
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	100	0	100	1	99.982
JSO	CHEROKEE COUNTY	TX	LPV200	0	100	0	100	1	99.979
JWY	MID-WAY RGNL	TX	LPV200	0	100	0	100	1	99.976
JXI	FOX STEPHENS FIELD - GILMER MU	TX	LP	0	100	0	100	1	99.981
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	100	0	100	1	99.981
LBX	TEXAS GULF COAST RGNL	TX	LPV	0	100	1	99.998	1	99.980
LFK	ANGELINA COUNTY	TX	LPV	0	100	0	100	1	99.980
LHB	HEARNE MUNICIPAL	TX	LPV200	0	100	0	100	1	99.978
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	0	100	0	100	1	99.981
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	100	1	99.999	1	99.981
LNC	LANCASTER RGNL	TX	LPV200	0	100	0	100	1	99.976
LRD	LAREDO INTL	TX	LPV200	0	100	1	99.988	1	99.976
LUD	DECATUR MUNICIPAL	TX	LPV	0	100	0	100	1	99.976
LVJ	PEARLAND RGNL	TX	LPV	0	100	1	99.999	1	99.980
LXY	MEXIA-LIMESTONE CO	TX	LP	0	100	0	100	1	99.977
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	0	100	1	99.995	1	99.981
MDD	MIDLAND AIRPARK	TX	LPV	0	100	1	99.995	1	99.981
MFE	MC ALLEN MILLER INTL	TX	LPV200	0	100	1	99.988	1	99.975
MKN	COMANCHE COUNTY-CITY	TX	LPV	0	100	0	100	1	99.978
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	100	0	100	1	99.978
MWL	MINERAL WELLS	TX	LPV200	0	100	0	100	1	99.976
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	0	100	0	100	1	99.980
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	100	1	99.995	1	99.980
ONY	OLNEY MUNICIPAL	TX	LPV	0	100	0	100	1	99.978
ORG	ORANGE COUNTY	TX	LPV	0	100	0	100	1	99.982
PEQ	PECOS MUNICIPAL	TX	LPV200	0	100	1	99.993	1	99.980
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	100	1	99.988	1	99.976

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PKV	CALHOUN COUNTY	TX	LPV	0	100	1	99.993	1	99.979
PPA	PERRY LEFORS FIELD	TX	LPV	0	100	0	100	2	99.979
PRX	COX FIELD	TX	LPV	0	100	0	100	1	99.979
PSX	PALACIOS MUNICIPAL	TX	LPV	0	100	1	99.995	1	99.979
PVW	HALE COUNTY	TX	LPV	0	100	0	100	1	99.980
PWG	MC GREGOR EXECUTIVE	TX	LPV	0	100	0	100	1	99.976
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	0	100	0	100	2	99.981
RAS	MUSTANG BEACH	TX	LPV	0	100	1	99.991	1	99.979
RBD	DALLAS EXECUTIVE	TX	LPV	0	100	0	100	1	99.976
RBO	NUECES COUNTY	TX	LPV	0	100	1	99.991	1	99.978
RKP	ARANSAS CO	TX	LPV	0	100	1	99.992	1	99.979
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LPV	0	100	1	99.998	1	99.979
SAT	SAN ANTONIO INTL	TX	LPV200	0	100	1	99.994	1	99.980
SGR	SUGAR LAND RGNL	TX	LPV200	0	100	1	99.999	1	99.979
SJT	SAN ANGELO RGNL/MATHIS FIELD	TX	LPV	0	100	1	99.995	1	99.981
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV200	0	100	0	100	1	99.979
SNK	WINSTON FIELD	TX	LPV200	0	100	1	99.999	1	99.981
SWI	SHERMAN MUNICIPAL	TX	LP	0	100	0	100	1	99.977
SWW	AVENGER FIELD	TX	LPV	0	100	1	99.999	1	99.980
T23	ALBANY MUNICIPAL	TX	LPV	0	100	0	100	1	99.978
T41	LA PORTE MUNICIPAL	TX	LPV	0	100	1	99.999	1	99.980
T74	TAYLOR MUNICIPAL	TX	LPV	0	100	1	99.999	1	99.978
T78	LIBERTY MUNICIPAL	TX	LP	0	100	0	100	1	99.980
T82	GILLESPIE COUNTY	TX	LPV	0	100	1	99.995	1	99.980
TDW	TRADEWIND	TX	LPV	0	100	0	100	2	99.980
TFP	MCCAMPBELL-PORTER	TX	LPV	0	100	1	99.991	1	99.979
TKI	MCKINNEY NATIONAL	TX	LPV200	0	100	0	100	1	99.976
TME	HOUSTON EXECUTIVE	TX	LPV	0	100	1	99.999	1	99.979
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	0	100	0	100	1	99.977
TRL	TERRELL MUNICIPAL	TX	LPV	0	100	0	100	1	99.977
TYR	TYLER POUNDS RGNL	TX	LPV200	0	100	0	100	1	99.979
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	100	0	100	1	99.979
VCT	VICTORIA RGNL	TX	LPV200	0	100	1	99.994	1	99.979
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	100	0	100	1	99.976
41U	MANTI-EPHRAIM	UT	LPV	0	100	0	100	2	99.996
74V	ROOSEVELT MUNICIPAL	UT	LPV	0	100	0	100	2	99.993
BCE	BRYCE CANYON	UT	LPV	0	100	0	100	2	99.995

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	0	100	3	99.991
BMC	BRIGHAM CITY	UT	LP	0	100	0	100	1	99.993
CDC	CEDAR CITY RGNL	UT	LPV	0	100	0	100	1	99.998
DTA	DELTA MUNICIPAL	UT	LP	0	100	0	100	2	99.997
ENV	WENDOVER	UT	LPV	0	100	0	100	1	99.993
FOM	FILLMORE MUNICIPAL	UT	LPV	0	100	0	100	1	99.999
LGU	LOGAN-CACHE	UT	LPV	0	100	0	100	1	99.993
OGD	OGDEN-HINCKLEY	UT	LPV	0	100	0	100	1	99.993
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	0	100	0	100	3	99.995
PVU	PROVO MUNICIPAL	UT	LPV200	0	100	0	100	2	99.994
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	0	100	2	99.996
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	1	99.995
SLC	SALT LAKE CITY INTL	UT	LPV200	0	100	0	100	2	99.993
TVY	BOLINDER FIELD-TOOELE VALLEY	UT	LPV200	0	100	0	100	2	99.994
U14	NEPHI MUNICIPAL	UT	LPV	0	100	0	100	2	99.995
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	0	100	1	99.998
VEL	VERNAL RGNL	UT	LP	0	100	0	100	2	99.991
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	2	99.978
0VG	LEE COUNTY	VA	LPV	0	100	0	100	1	99.993
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	2	99.979
BCB	VIRGINIA TECH/MONTGOMERY EXECU	VA	LPV	0	100	0	100	2	99.983
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	0	100	0	100	2	99.981
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	0	100	0	100	1	99.986
CJR	CULPEPER RGNL	VA	LPV	0	100	0	100	1	99.987
CPK	CHESAPEAKE RGNL	VA	LPV200	0	100	0	100	1	99.980
DAN	DANVILLE RGNL	VA	LPV200	0	100	0	100	2	99.980
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	0	100	0	100	2	99.980
FCI	RICHMOND EXECUTIVE-CHESTERFIEL	VA	LPV	0	100	0	100	1	99.983
FKN	FRANKLIN MUNICIPAL-JOHN BEVERLY ROS	VA	LPV	0	100	0	100	1	99.981
FVX	FARMVILLE RGNL	VA	LPV	0	100	0	100	2	99.980
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	100	0	100	1	99.983
HLX	TWIN COUNTY	VA	LPV	0	100	0	100	2	99.985
HSP	INGALLS FIELD	VA	LPV	0	100	0	100	3	99.980
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	100	0	100	1	99.987
JFZ	TAZEWELL COUNTY	VA	LPV	0	100	0	100	2	99.990
JYO	LEESBURG EXECUTIVE	VA	LPV	0	100	0	100	1	99.988
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	0	100	0	100	1	99.986

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LNP	LONESOME PINE	VA	LPV	0	100	0	100	1	99.991
LUA	LURAY CAVERNS	VA	LP	0	100	0	100	1	99.988
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	0	100	0	100	2	99.978
MFV	ACCOMACK COUNTY	VA	LPV	0	100	0	100	1	99.983
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	100	0	100	1	99.988
MTV	BLUE RIDGE	VA	LPV	0	100	0	100	2	99.982
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	100	0	100	1	99.984
OKV	WINCHESTER RGNL	VA	LPV200	0	100	0	100	1	99.989
ORF	NORFOLK INTL	VA	LPV200	0	100	0	100	1	99.981
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	0	100	0	100	1	99.981
PSK	NEW RIVER VALLEY	VA	LPV200	0	100	0	100	2	99.985
PTB	DINWIDDIE COUNTY	VA	LPV	0	100	0	100	1	99.983
PVG	HAMPTON ROADS EXECUTIVE	VA	LPV200	0	100	0	100	1	99.981
RIC	RICHMOND INTL	VA	LPV200	0	100	0	100	1	99.983
RMN	STAFFORD RGNL	VA	LPV	0	100	0	100	1	99.986
ROA	ROANOKE-BLACKSBURG RGNL/WOODRU	VA	LPV	0	100	0	100	3	99.981
SFQ	SUFFOLK EXECUTIVE	VA	LPV	0	100	0	100	1	99.980
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	1	99.987
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	100	0	100	1	99.990
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	2	99.979
W96	NEW KENT COUNTY	VA	LP	0	100	0	100	1	99.983
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	0	100	0	100	1	99.983
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	100	0	100	1	99.984
BTV	BURLINGTON INTL	VT	LPV200	0	100	0	100	0	100
EFK	NEWPORT STATE	VT	LP	0	100	0	100	0	100
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	100	0	100	0	100
MPV	EDWARD F KNAPP STATE	VT	LPV	0	100	0	100	0	100
MVL	MORRISVILLE-STOWE STATE	VT	LPV	0	100	0	100	0	100
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	0	100	0	100	0	100
ALW	WALLA WALLA RGNL	WA	LPV200	0	100	0	100	1	99.982
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	100	0	100	1	99.970
BLI	BELLINGHAM INTL	WA	LPV200	0	100	0	100	1	99.969
BVS	SKAGIT RGNL	WA	LPV	0	100	0	100	1	99.969
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	100	0	100	1	99.972
CLS	CHEHALIS-CENTRALIA	WA	LPV	0	100	0	100	1	99.973
DEW	DEER PARK	WA	LPV	0	100	0	100	1	99.972
EPH	EPHRATA MUNICIPAL	WA	LPV	0	100	0	100	1	99.979

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FHR	FRIDAY HARBOR	WA	LPV	0	100	0	100	1	99.969
GEG	SPOKANE INTL	WA	LPV200	0	100	0	100	1	99.972
HQM	BOWERMAN	WA	LPV200	0	100	0	100	1	99.972
MWH	GRANT CO INTL	WA	LPV200	0	100	0	100	1	99.979
OLM	OLYMPIA RGNL	WA	LPV	0	100	0	100	1	99.973
ORS	ORCAS ISLAND	WA	LP	0	100	0	100	1	99.969
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	0	100	0	100	1	99.970
PLU	PIERCE COUNTY - THUN FIELD	WA	LPV	0	100	0	100	1	99.973
PSC	TRI-CITIES	WA	LPV200	0	100	0	100	1	99.981
PWT	BREMERTON NATIONAL	WA	LPV200	0	100	0	100	1	99.973
RLD	RICHLAND	WA	LPV	0	100	0	100	1	99.981
RNT	RENTON MUNICIPAL	WA	LPV	0	100	0	100	1	99.973
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	100	0	100	1	99.973
SFF	FELTS FIELD	WA	LPV	0	100	0	100	1	99.972
SHN	SANDERSON FIELD	WA	LPV	0	100	0	100	1	99.972
TDO	ED CARLSON MEMORIAL FIELD - SO	WA	LPV	0	100	0	100	1	99.974
TIW	TACOMA NARROWS	WA	LPV	0	100	0	100	1	99.973
YKM	YAKIMA AIR TERMINAL/MCALLISTER	WA	LPV200	0	100	0	100	1	99.980
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	0	100	0	100	1	99.998
57C	EAST TROY MUNICIPAL	WI	LPV	0	100	0	100	0	100
82C	MAUSTON-NEW LISBON UNION	WI	LP	0	100	0	100	0	100
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	100	0	100	0	100
AHH	AMERY MUNICIPAL	WI	LP	0	100	0	100	1	99.996
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	1	99.997
ATW	APPLETON INTL	WI	LPV200	0	100	0	100	0	100
AUW	WAUSAU DOWNTOWN	WI	LPV200	0	100	0	100	0	100
BCK	BLACK RIVER FALLS AREA	WI	LPV	0	100	0	100	0	100
BUU	BURLINGTON MUNICIPAL	WI	LP	0	100	0	100	0	100
C29	MIDDLETON MUNICIPAL - MOREY FIELD	WI	LPV	0	100	0	100	0	100
C35	REEDSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
C47	PORTAGE MUNICIPAL	WI	LP	0	100	0	100	0	100
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
CMY	SPARTA/FORT MC COY	WI	LPV	0	100	0	100	0	100
CWA	CENTRAL WISCONSIN	WI	LPV200	0	100	0	100	0	100
DLL	BARABOO WISCONSIN DELLS	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	100	0	100	1	99.999
EGV	EAGLE RIVER UNION	WI	LPV	0	100	0	100	0	100
ENW	KENOSHA RGNL	WI	LPV200	0	100	0	100	0	100
ETB	WEST BEND MUNICIPAL	WI	LPV	0	100	0	100	0	100
EZS	SHAWANO MUNICIPAL	WI	LPV	0	100	0	100	0	100
FLD	FOND DU LAC COUNTY	WI	LPV	0	100	0	100	0	100
GRB	GREEN BAY-AUSTIN STRAUBEL INTL	WI	LPV200	0	100	0	100	0	100
GTG	GRANTSBURG MUNICIPAL	WI	LP	0	100	0	100	1	99.995
HXF	HARTFORD MUNICIPAL	WI	LPV	0	100	0	100	0	100
HYR	SAWYER COUNTY	WI	LPV	0	100	0	100	1	99.997
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	1	99.998
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	1	99.996
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	1	99.999
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	100	0	100	0	100
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
RAC	BATTEN INTL	WI	LPV	0	100	0	100	0	100
RCX	RUSK COUNTY	WI	LPV	0	100	0	100	1	99.999
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	0	100	0	100	0	100
RNH	NEW RICHMOND RGNL	WI	LPV	0	100	0	100	1	99.996
RPD	RICE LAKE RGNL - CARL'S FIELD	WI	LPV	0	100	0	100	1	99.997
RRL	MERRILL MUNICIPAL	WI	LPV	0	100	0	100	0	100
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	0	100	0	100	0	100
STE	STEVENS POINT MUNICIPAL	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	100	0	100	1	99.999
SUW	RICHARD I BONG	WI	LP	0	100	0	100	1	99.995
TKV	TOMAHAWK RGNL	WI	LP	0	100	0	100	0	100
UBE	CUMBERLAND MUNICIPAL	WI	LPV	0	100	0	100	1	99.997
UES	WAUKESHA COUNTY	WI	LPV200	0	100	0	100	0	100
UNU	DODGE COUNTY	WI	LPV	0	100	0	100	0	100
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y50	WAUTOMA MUNICIPAL	WI	LP	0	100	0	100	0	100
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y72	BLOYER FIELD	WI	LP	0	100	0	100	0	100
3I2	MASON COUNTY	WV	LPV	0	100	0	100	2	99.989
6L4	LOGAN COUNTY	WV	LPV	0	100	0	100	2	99.988
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	100	0	100	2	99.985
BLF	MERCER COUNTY	WV	LPV	0	100	0	100	2	99.986
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	3	99.990
CRW	YEAGER	WV	LPV200	0	100	0	100	2	99.986
HLG	WHEELING OHIO CO	WV	LPV200	0	100	0	100	2	99.991
HTS	TRI-STATE/MILTON J FERGUSON FI	WV	LPV200	0	100	0	100	2	99.992
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	2	99.987
LWB	GREENBRIER VALLEY	WV	LPV	0	100	0	100	3	99.982
MGW	MORGANTOWN MUNICIPAL-WALTER L BILL	WV	LPV200	0	100	0	100	2	99.992
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	0	100	0	100	1	99.990
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	100	0	100	2	99.986
USW	BOGGS FIELD	WV	LPV	0	100	0	100	2	99.985
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	3	99.986
W35	POTOMAC AIRPARK	WV	LP	0	100	0	100	1	99.991
W99	GRANT COUNTY	WV	LPV	0	100	0	100	1	99.989
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	1	99.979
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	2	99.978
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	1	99.982
CYS	CHEYENNE RGNL/JERRY OLSON FIEL	WY	LPV	0	100	0	100	2	99.996
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	1	99.982
ECS	MONDELL FIELD	WY	LPV	0	100	0	100	1	99.981
EMM	KEMMERER MUNICIPAL	WY	LPV	0	100	0	100	2	99.993
EVW	EVANSTON-UINTA COUNTY BURNS FI	WY	LPV	0	100	0	100	2	99.993
FBR	FORT BRIDGER	WY	LP	0	100	0	100	2	99.985
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	100	0	100	1	99.979

Airport	Airport Name	State/ Provence	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GEY	SOUTH BIG HORN COUNTY	WY	LP	0	100	0	100	2	99.976
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	1	99.983
HSG	HOT SPRINGS COUNTY	WY	LPV	0	100	0	100	2	99.976
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	1	99.990
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	1	99.996
PNA	RALPH WENZ FIELD	WY	LPV	0	100	0	100	2	99.989
POY	POWELL MUNICIPAL	WY	LPV	0	100	0	100	2	99.978
RIW	RIVERTON RGNL	WY	LPV200	0	100	0	100	2	99.988
RKS	ROCK SPRINGS-SWEETWATER COUNTY	WY	LPV200	0	100	0	100	2	99.989
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	100	0	100	1	99.994
SAA	SHIVELY FIELD	WY	LPV	0	100	0	100	1	99.995
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	2	99.979
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	2	99.976
W43	HULETT MUNICIPAL	WY	LPV	0	100	0	100	1	99.980
WRL	WORLAND MUNICIPAL	WY	LPV	0	100	0	100	2	99.977
CYQH	WATSON LAKE	YT	LPV	0	100	0	100	1	99.985
CYXY	WHITEHORSE / ERIK NIELSEN INTL	YT	LPV	0	100	0	100	1	99.989

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

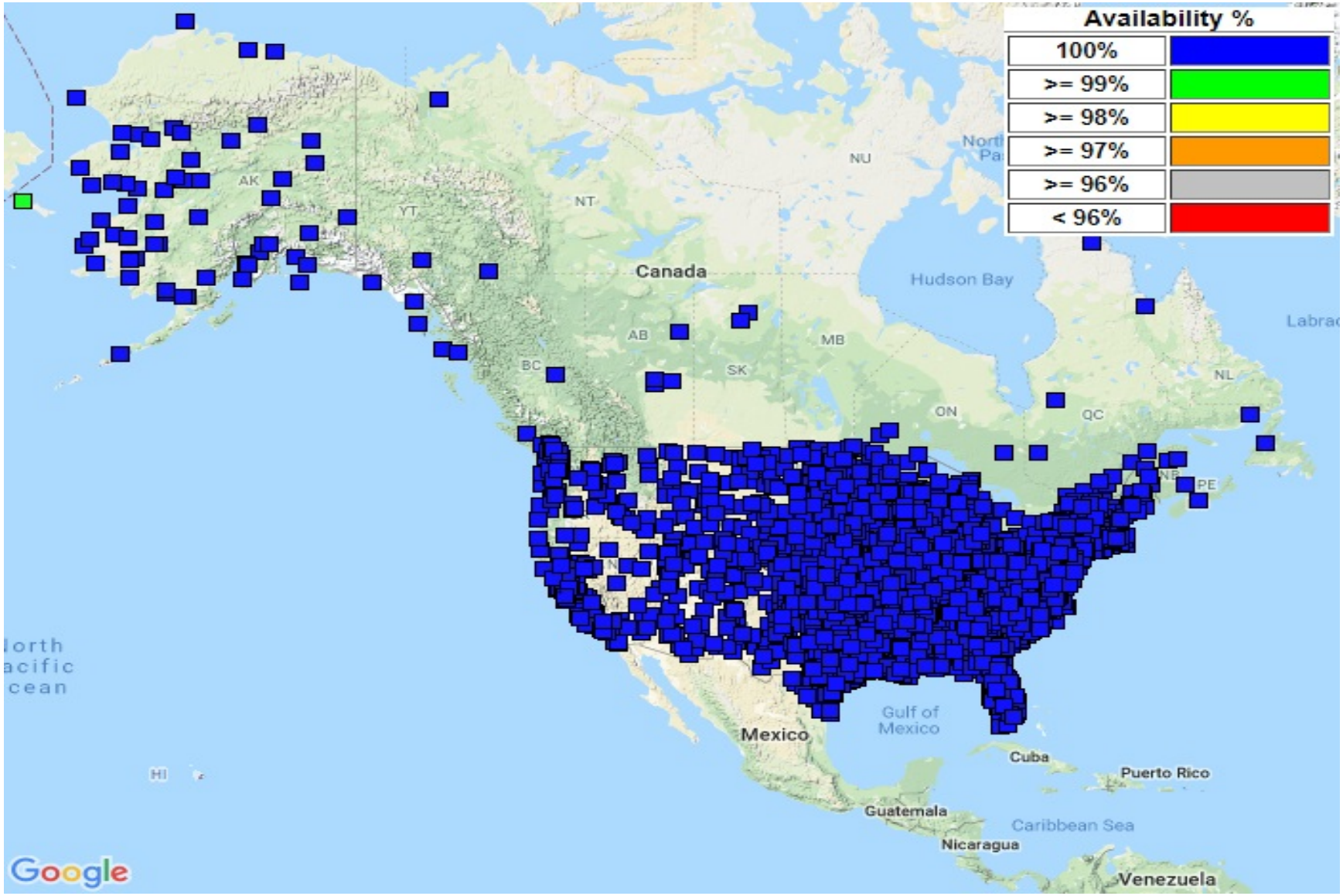


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV IAPs

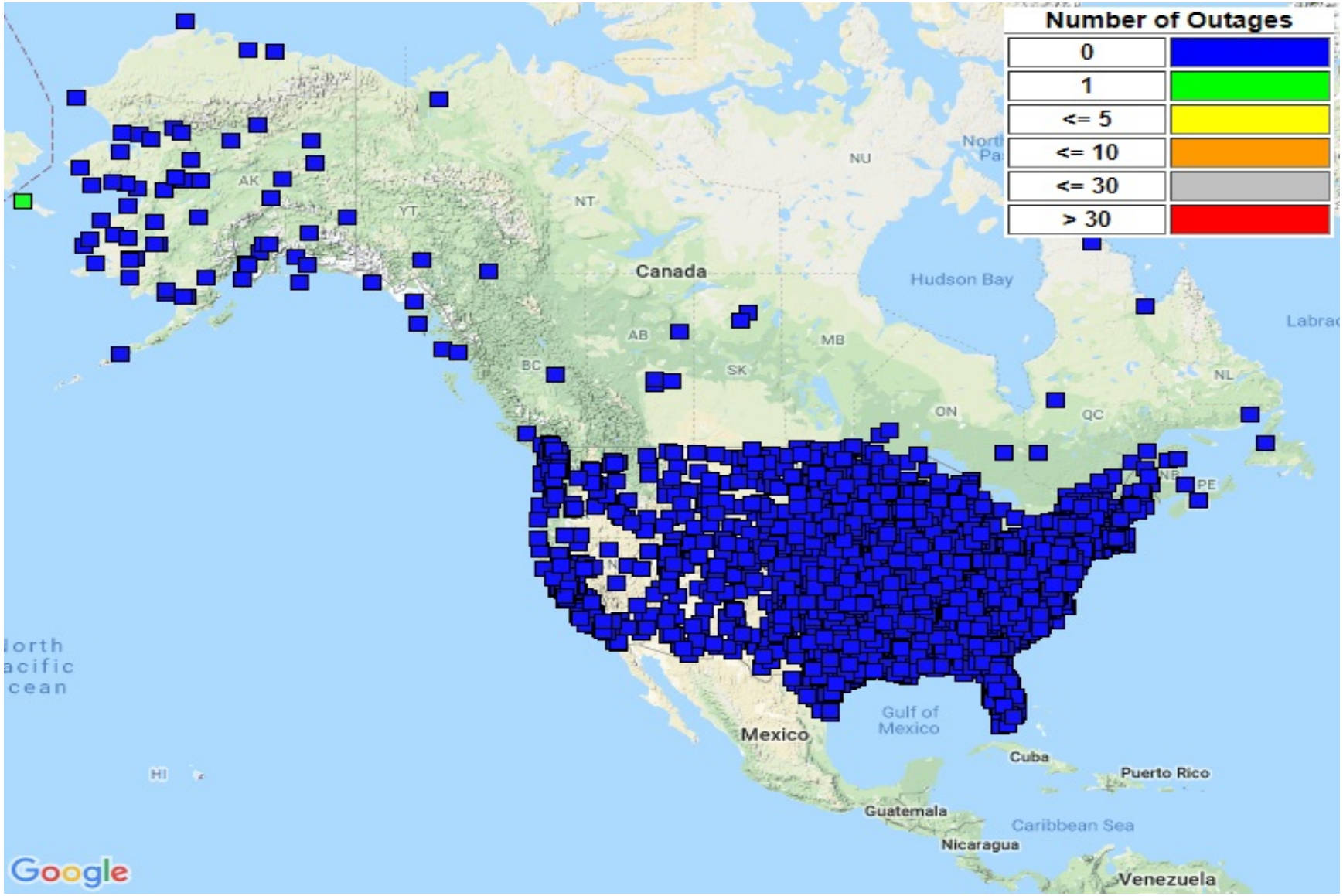


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV IAPs

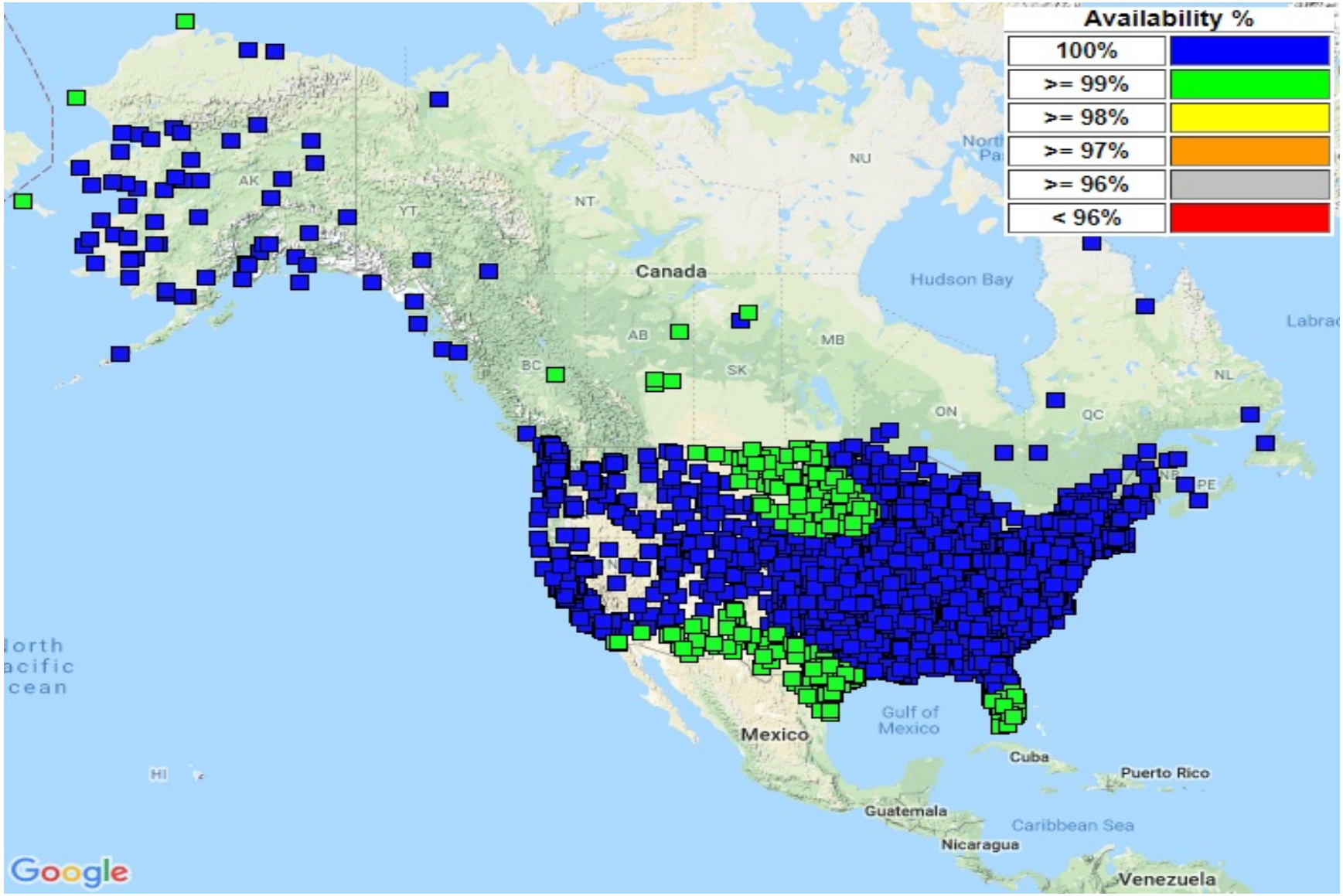


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV IAPs

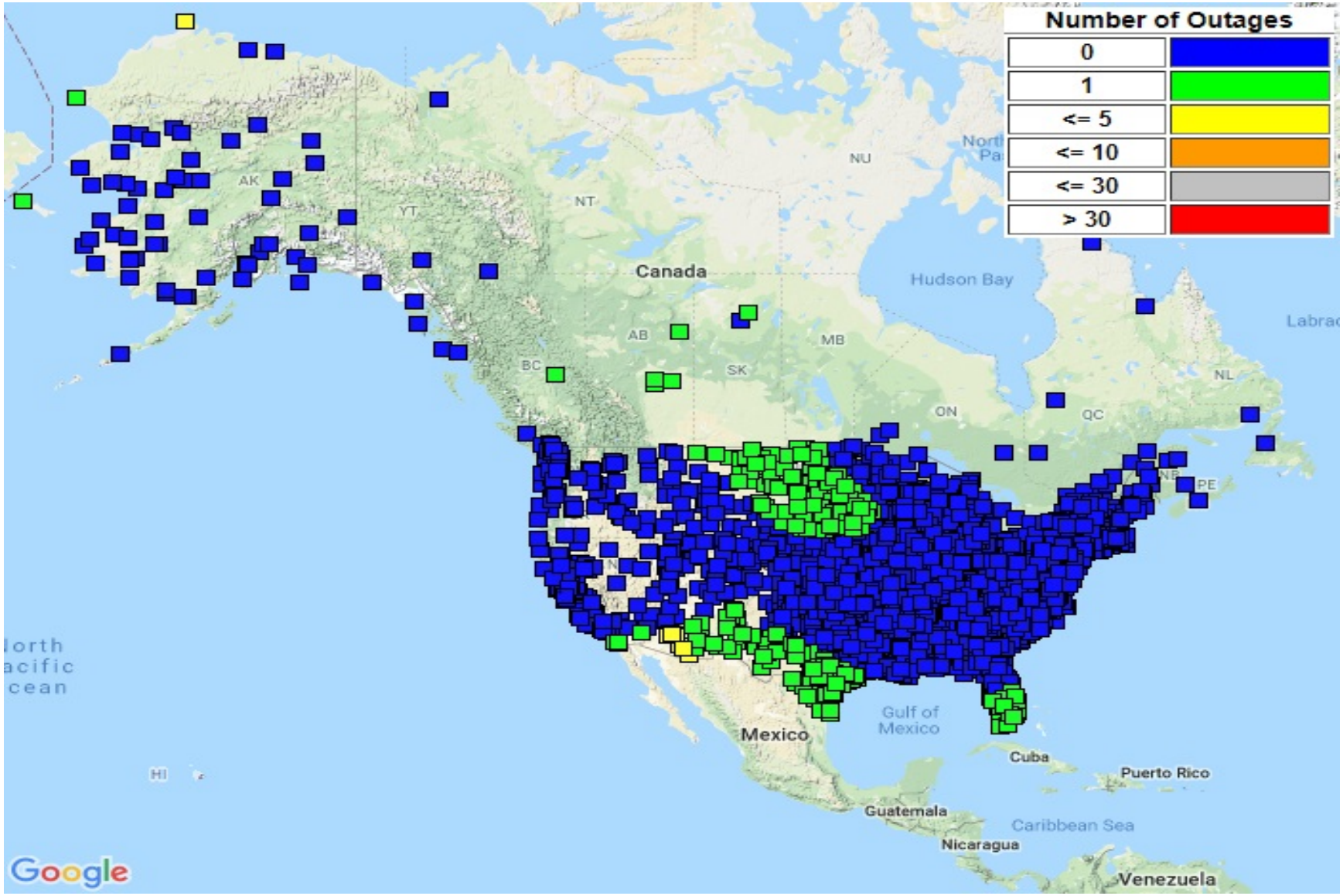


Figure 8-5 WAAS LPV200 Availability at Airports in the US and Canada with GPS RNAV IAPs

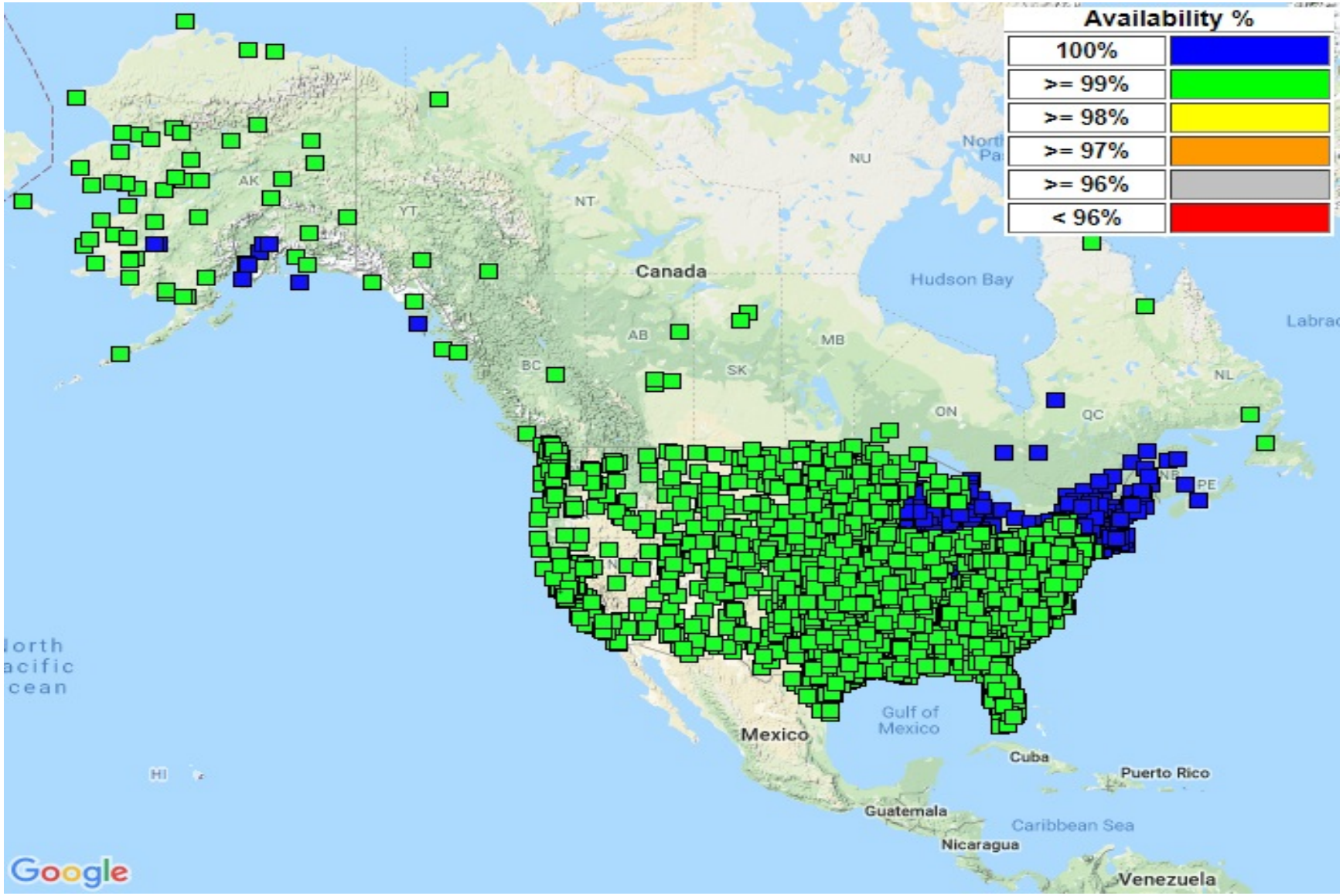
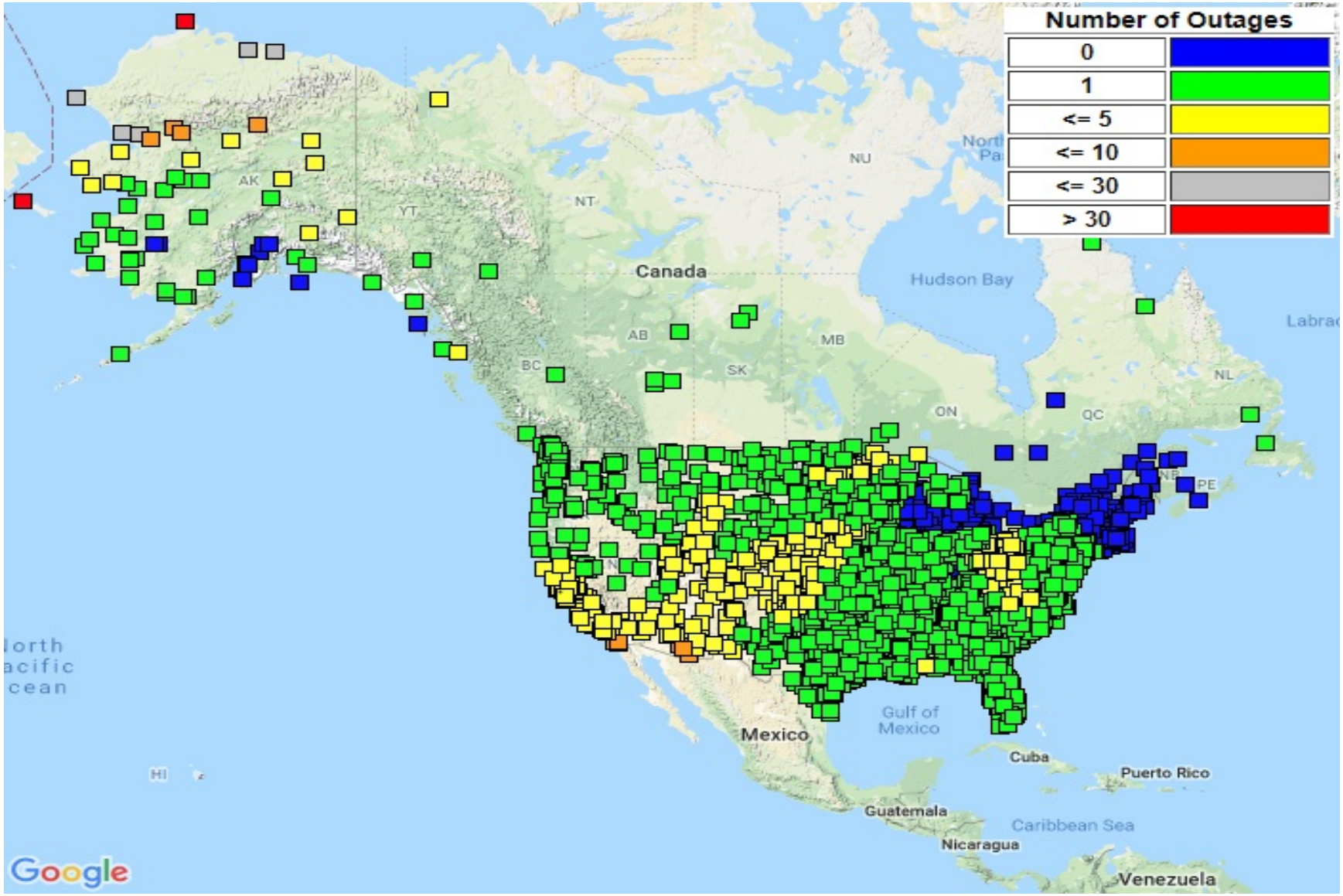


Figure 8-6 WAAS LPV200 Outages at Airports in the US and Canada with GPS RNAV IAPs



9.0 WAAS CNMP BOUNDING ANALYSIS

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

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

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

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

Figure 9-1 CNMP Bounding Statistics

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

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

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

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 24-hour sets on 03/31/2019. 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 23 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 16 mm or less. The OPUS and CSRS surveys agreed to an average of 1.9 cm with a standard deviation of 9.6 mm. The maximum of difference was 4.5 cm for Kotzebue Thread A (OTZ1).

The OPUS positions were compared to the positions in the currently fielded WAAS SSM 48, which was fielded starting in October 2017. The OPUS surveys agree with the SSM 48 to better or equal to 2.5 cm for most sites. The maximum difference excluding Mexico City was 6.94 cm at Anchorage Thread C (ZAN3). The antenna positions are interpolated forward in time.

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

Table 10-1 WAAS Antenna Positions (OPUS IGS08) as of 04/02/2017

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
BET1	-2965385.151	-972576.642	5543892.825	60.7879143	161.8417252	52.171
BET2	-2965385.919	-972580.363	5543891.766	60.7878949	161.8416647	52.169
BET3	-2965388.479	-972577.476	5543890.904	60.7878791	161.8417297	52.165
BIL1	-1416445.966	-4223577.015	4550862.111	45.8037064	108.5397241	1112.232
BIL2	-1416450.054	-4223574.868	4550862.843	45.8037158	108.5397827	1112.244
BIL3	-1416441.664	-4223574.269	4550865.969	45.8037562	108.5396829	1112.229
BRW1	-1886759.037	-809058.67	6018494.44	71.2827639	156.7899258	15.572
BRW2	-1886756.444	-809055.92	6018495.622	71.2827967	156.7899678	15.579
BRW3	-1886755.352	-809059.7	6018495.443	71.2827921	156.7898589	15.565
CDB1	-3484099.179	-1084748.774	5213678.569	55.192373	162.7064054	49.715
CDB2	-3484105.813	-1084741.579	5213675.62	55.1923269	162.7065442	49.688
CDB3	-3484112.09	-1084734.8	5213672.864	55.1922834	162.7066752	49.696
FAI1	-2304741.944	-1448715.313	5748843.692	64.809629	147.8473417	149.997
FAI2	-2304741.484	-1448706.502	5748846.085	64.8096793	147.8474936	150.001
FAI3	-2304732.96	-1448707.437	5748849.242	64.8097459	147.8473814	149.998
JNU1	-2354255.034	-2388549.68	5407043.158	58.3625739	134.5857083	16.201
JNU2	-2354252.949	-2388565.791	5407036.988	58.3624683	134.5854898	16.199
JNU3	-2354239.733	-2388568.644	5407041.449	58.3625447	134.5852947	16.197
MMD1	35070.374	-5959686.671	2264365.78	20.9319094	89.6628411	29.127
MMD2	35065.447	-5959687.051	2264364.996	20.9319016	89.6628885	29.175
MMD3	35065.111	-5959685.249	2264369.649	20.9319467	89.6628916	29.153
MMX1	-948700.86	-5943933.795	2109212.109	19.4316539	99.0683901	2233.675
MMX2	-948696.426	-5943933.619	2109214.535	19.4316772	99.0683487	2233.659
MMX3	-948705.29	-5943933.983	2109209.688	19.4316307	99.0684315	2233.703
MPR1	-1570142.262	-5759530.578	2238184.746	20.6790033	105.2492036	10.961
MPR2	-1570139.438	-5759530.093	2238188.793	20.6790414	105.2491787	11.258
MPR3	-1570143.547	-5759527.973	2238190.564	20.6790594	105.2492221	10.98
MSD1	-1979520.035	-5523222.888	2493106.946	23.1604484	109.7176515	104.301
MSD2	-1979521.602	-5523225.22	2493100.545	23.1603856	109.7176582	104.288
MSD3	-1979526.046	-5523221.946	2493104.211	23.1604216	109.7177099	104.274
MTP1	-254854.384	-6162909.139	1617805.094	14.7913663	92.3679995	54.924
MTP2	-254850.76	-6162910.182	1617801.664	14.7913343	92.3679654	54.911
MTP3	-254855.529	-6162910.284	1617800.135	14.7913202	92.3680097	54.81
OTZ1	-2396056.127	-750356.176	5843502.463	66.8873311	162.6113733	10.879
OTZ2	-2396052.956	-750354.346	5843503.984	66.8873659	162.6113916	10.875
OTZ3	-2396052.935	-750358.285	5843503.493	66.8873547	162.6113056	10.878
YFB1	1035381.327	-2634289.654	5696539.576	63.7314909	68.5431858	10.045
YFB2	1035372.119	-2634296.073	5696538.209	63.7314645	68.5434068	9.973
YFB3	1035366.044	-2634306.834	5696534.44	63.7313869	68.5436009	10.042
YQX1	2430424.552	-3419640.419	4788223.895	48.9664906	54.5976333	146.909
YQX2	2430432.494	-3419639.07	4788220.836	48.9664488	54.5975342	146.9
YQX3	2430440.398	-3419637.712	4788217.837	48.9664075	54.5974355	146.917
YWG1	-520164.5	-4083475.968	4855843.022	49.9005739	97.2593993	222.115
YWG2	-520150.629	-4083468.905	4855850.416	49.900677	97.2592202	222.129
YWG3	-520152.502	-4083478.027	4855842.597	49.9005679	97.25923	222.129
YYR1	1885341.319	-3321428.379	5091171.714	53.3086477	60.4194698	37.872
YYR2	1885344.28	-3321419.899	5091176.127	53.308714	60.4193684	37.878
YYR3	1885339.996	-3321413.082	5091182.124	53.3088041	60.4193738	37.881
ZAB1	-1488636.921	-5003946.537	3654557.686	35.1735751	106.5673506	1620.129
ZAB2	-1488631.585	-5003948.21	3654557.657	35.1735745	106.5672893	1620.179
ZAB3	-1488632.364	-5003950.806	3654553.803	35.173532	106.5672893	1620.175
ZAN1	-2659536.724	-1549114.727	5567750.722	61.2292013	149.7802524	80.686
ZAN2	-2659548.479	-1549110.772	5567746.227	61.2291176	149.7804261	80.676

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZAN3	-2659541.429	-1549106.645	5567750.701	61.2292012	149.7804264	80.666
ZAU1	138704.027	-4761244.145	4227763.933	41.7826581	88.3313378	195.89
ZAU2	138704.289	-4761248.759	4227758.768	41.7825957	88.3313362	195.893
ZAU3	138710.99	-4761248.494	4227758.848	41.7825966	88.3312556	195.894
ZBW1	1490299.128	-4448983.177	4306010.518	42.7357208	71.480427	39.112
ZBW2	1490304.241	-4448981.166	4306010.862	42.7357248	71.4803599	39.138
ZBW3	1490305.951	-4448984.789	4306006.547	42.735672	71.4803542	39.132
ZDC1	1069125.68	-4839598.986	4001126.518	39.1015961	77.5427475	80.056
ZDC2	1069128.072	-4839603.619	4001120.31	39.101524	77.542732	80.051
ZDC3	1069123.974	-4839602.708	4001122.508	39.1015495	77.542776	80.061
ZDV1	-1273628.694	-4711375.57	4094890.085	40.187303	105.1272253	1541.352
ZDV2	-1273622.991	-4711377.086	4094890.101	40.1873032	105.1271561	1541.343
ZDV3	-1273625.003	-4711380.285	4094885.814	40.1872528	105.1271691	1541.337
ZFW1	-659983.27	-5324060.759	3438276.455	32.8306496	97.0664726	155.602
ZFW2	-659988.544	-5324063.311	3438271.46	32.8305962	97.0665251	155.567
ZFW3	-659983.571	-5324063.846	3438271.669	32.8305982	97.0664717	155.613
ZHN1	-5508637.181	-2234492.891	2303722.426	21.3129925	157.9208316	24.677
ZHN2	-5508656.348	-2234483.208	2303687.182	21.3126496	157.9209875	25.023
ZHN3	-5508647.751	-2234497.144	2303694.272	21.3127182	157.9208319	25.059
ZHU1	-513864.533	-5506451.668	3166720.446	29.9618963	95.3314269	10.809
ZHU2	-513867.179	-5506455.065	3166714.282	29.9618318	95.331451	10.874
ZHU3	-513873.46	-5506457.703	3166708.682	29.9617735	95.3315132	10.858
ZJX1	772646.37	-5434462.179	3237231.75	30.6988598	81.9081859	2.122
ZJX2	772649.702	-5434463.735	3237228.355	30.6988242	81.9081537	2.117
ZJX3	772645.639	-5434466.165	3237225.243	30.6987916	81.9081993	2.105
ZKC1	-415247.597	-4954556.392	3982161.107	38.8801593	94.7908348	305.9
ZKC2	-415231.206	-4954557.715	3982161.162	38.88016	94.7906452	305.895
ZKC3	-415237.325	-4954561.061	3982155.966	38.8801018	94.7907123	305.627
ZLA1	-2474410.072	-4637294.555	3602183.582	34.6035188	118.0838971	763.523
ZLA2	-2474404.794	-4637297.351	3602183.588	34.6035189	118.083832	763.512
ZLA3	-2474411.385	-4637297.032	3602179.601	34.6034749	118.083897	763.57
ZLC1	-1808273.307	-4486410.798	4145302.995	40.7860431	111.9521787	1287.426
ZLC2	-1808274.693	-4486414.425	4145298.499	40.7859896	111.9521778	1287.428
ZLC3	-1808270.488	-4486416.125	4145298.498	40.7859895	111.9521241	1287.431
ZMA1	966042.243	-5662999.819	2761581.51	25.8246123	80.3191904	-7.595
ZMA2	966029.268	-5662999.118	2761585.995	25.8246601	80.3193167	-8.227
ZMA3	966037.346	-5662997.961	2761586.35	25.8246621	80.3192354	-7.877
ZME1	4070.814	-5226189.294	3644028.42	35.0673941	89.9553708	68.599
ZME2	4070.844	-5226186.734	3644032.543	35.0674378	89.9553705	68.872
ZME3	4064.651	-5226186.608	3644032.697	35.0674396	89.9554384	68.854
ZMP1	-249978.477	-4539297.5	4458955.047	44.6374632	93.1520867	262.655
ZMP2	-249972.673	-4539297.844	4458955.051	44.6374631	93.1520134	262.675
ZMP3	-249973.771	-4539302.122	4458950.574	44.637407	93.1520243	262.612
ZNY1	1406144.54	-4627343.992	4144322.084	40.7843289	73.0971668	6.452
ZNY2	1406146.338	-4627347.024	4144317.304	40.7842761	73.0971569	5.922
ZNY3	1406140.779	-4627348.675	4144317.33	40.7842766	73.0972256	5.911
ZOA1	-2684436.996	-4293337.27	3865351.92	37.5430546	122.0159498	-3.505
ZOA2	-2684433.991	-4293341.358	3865349.499	37.543027	122.0158964	-3.496
ZOA3	-2684438.362	-4293342.231	3865345.639	37.5429826	122.0159331	-3.423
ZOB1	650770.1	-4754715.672	4187420.76	41.2971546	82.2064457	223.679
ZOB2	650777.779	-4754714.846	4187422.779	41.2971669	82.2063536	225.179
ZOB3	650776.105	-4754719.675	4187414.984	41.2970871	82.2063812	223.459
ZSE1	-2308930.33	-3668169.67	4663526.449	47.2869929	122.1883735	82.097
ZSE2	-2308934.722	-3668175.214	4663520.039	47.2869073	122.1883836	82.156
ZSE3	-2308935.785	-3668179.488	4663516.094	47.2868556	122.1883654	82.095

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZSU1	2462589.477	-5529372.073	2003724.544	18.4313364	65.9934762	-28.102
ZSU2	2462587.549	-5529377.439	2003712.253	18.4312193	65.9935136	-28.082
ZSU3	2462594.174	-5529375.18	2003710.173	18.4311997	65.9934476	-28.141
ZTL1	529840.329	-5305248.813	3489342.853	33.3796886	84.2967268	261.133
ZTL2	529846.704	-5305247.969	3489343.136	33.3796918	84.2966577	261.116
ZTL3	529847.388	-5305251.408	3489337.903	33.3796351	84.2966541	261.151

Figure 10-1 through Figure 10-3 show the RSS of the ECEF differences between the OPUS survey antenna phase center locations and the locations in the Build WE7.164c software. Figure 10-4 through Figure 10-6 shows the OPUS surveys overall RMS quality indications.

Figure 10-1 Build WE7164c Antenna Positions Deltas OPUS Survey

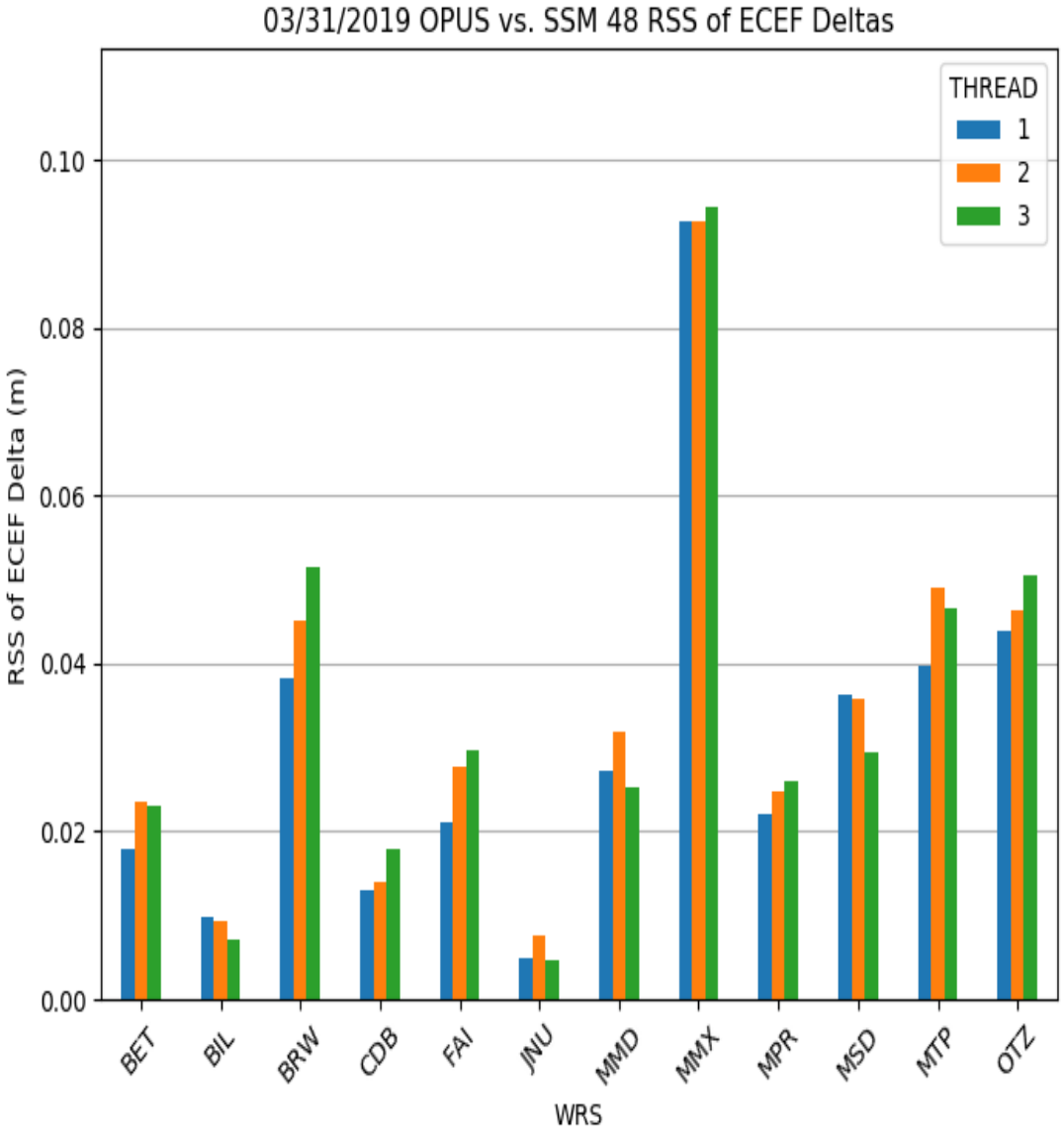


Figure 10-2 Build WE7.164c Antenna Positions Deltas OPUS Survey

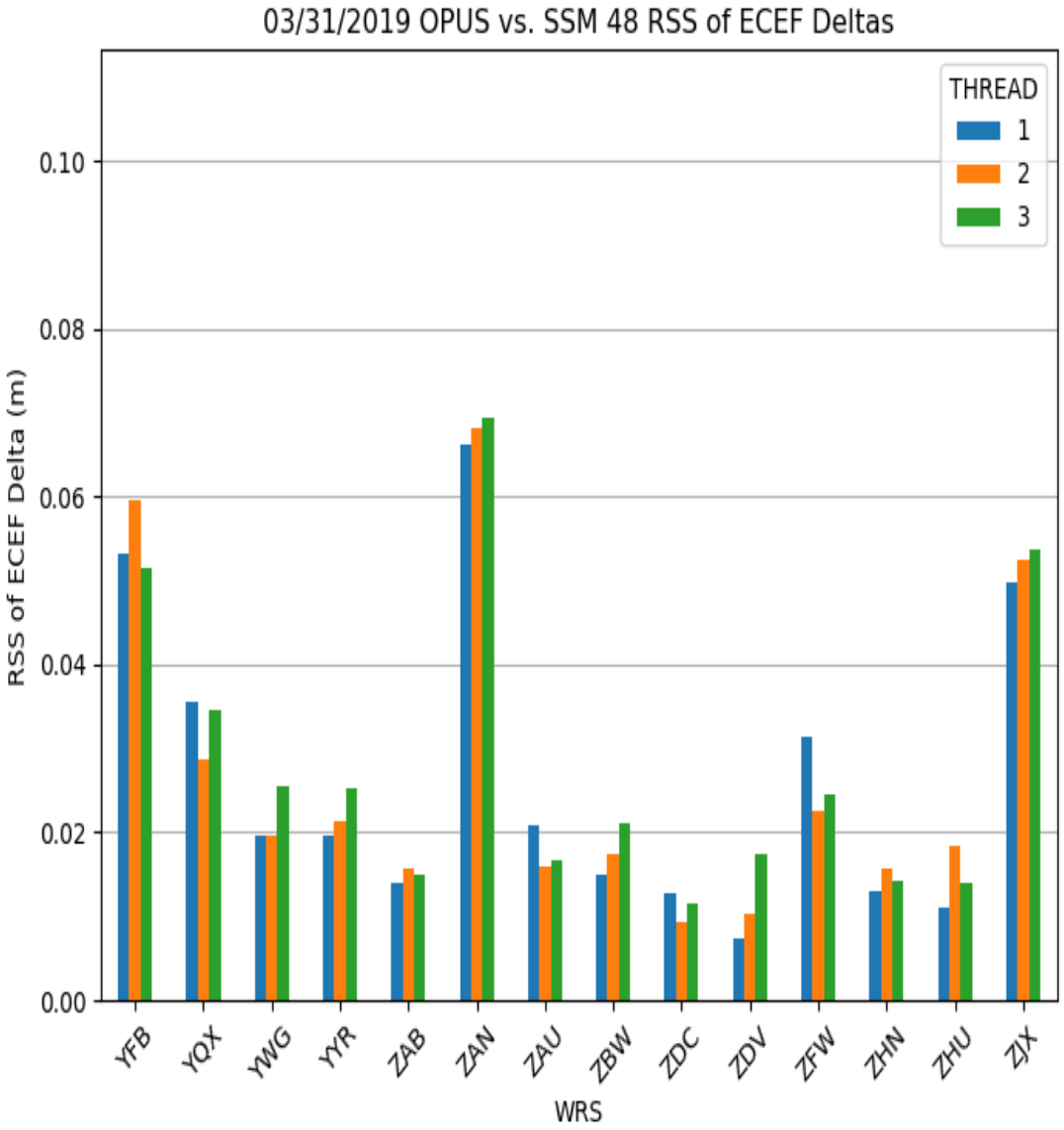


Figure 10-3 Build WE7.164c Antenna Positions Deltas OPUS Survey

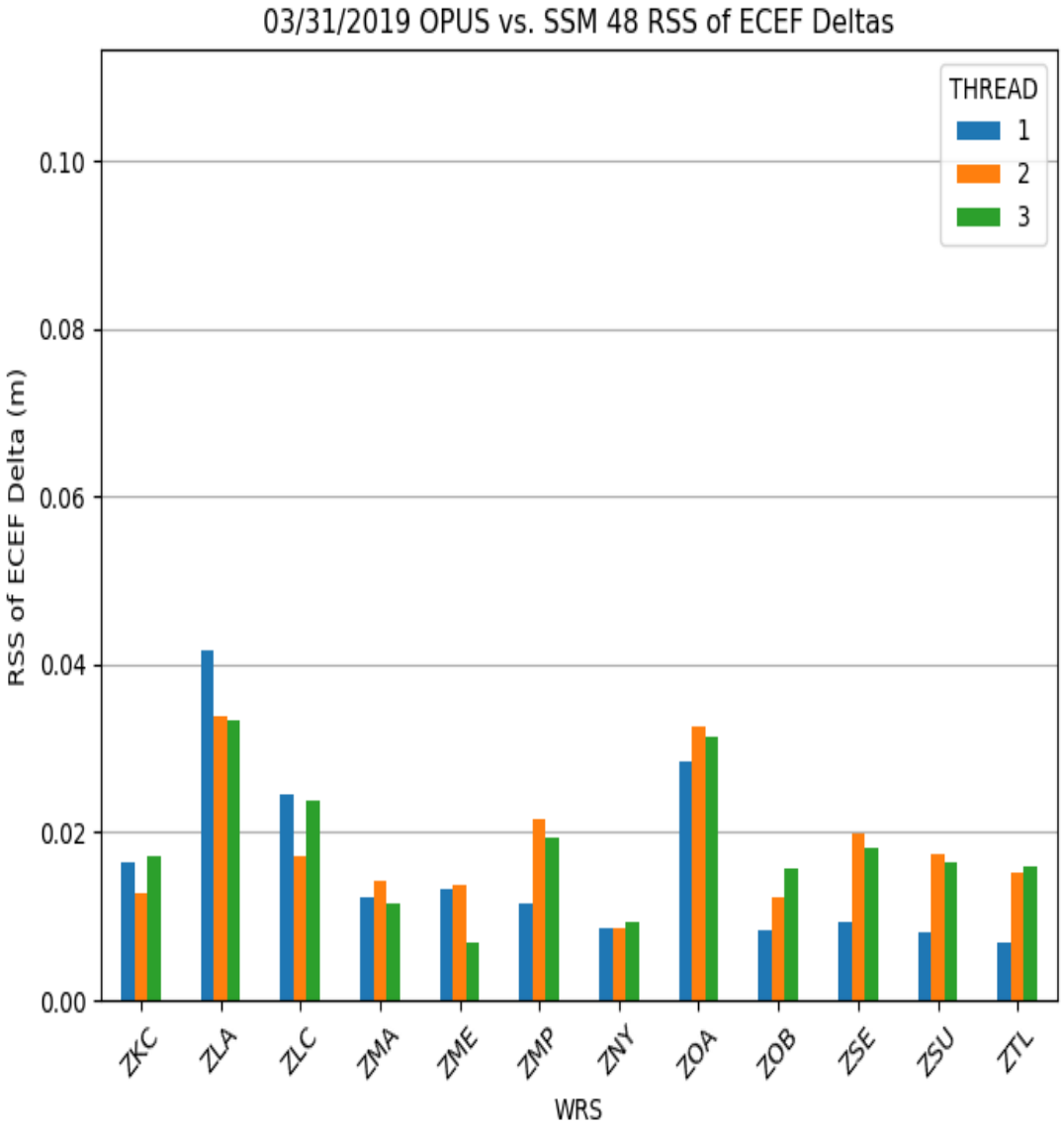


Figure 10-4 OPUS Survey Overall RMS Qualities

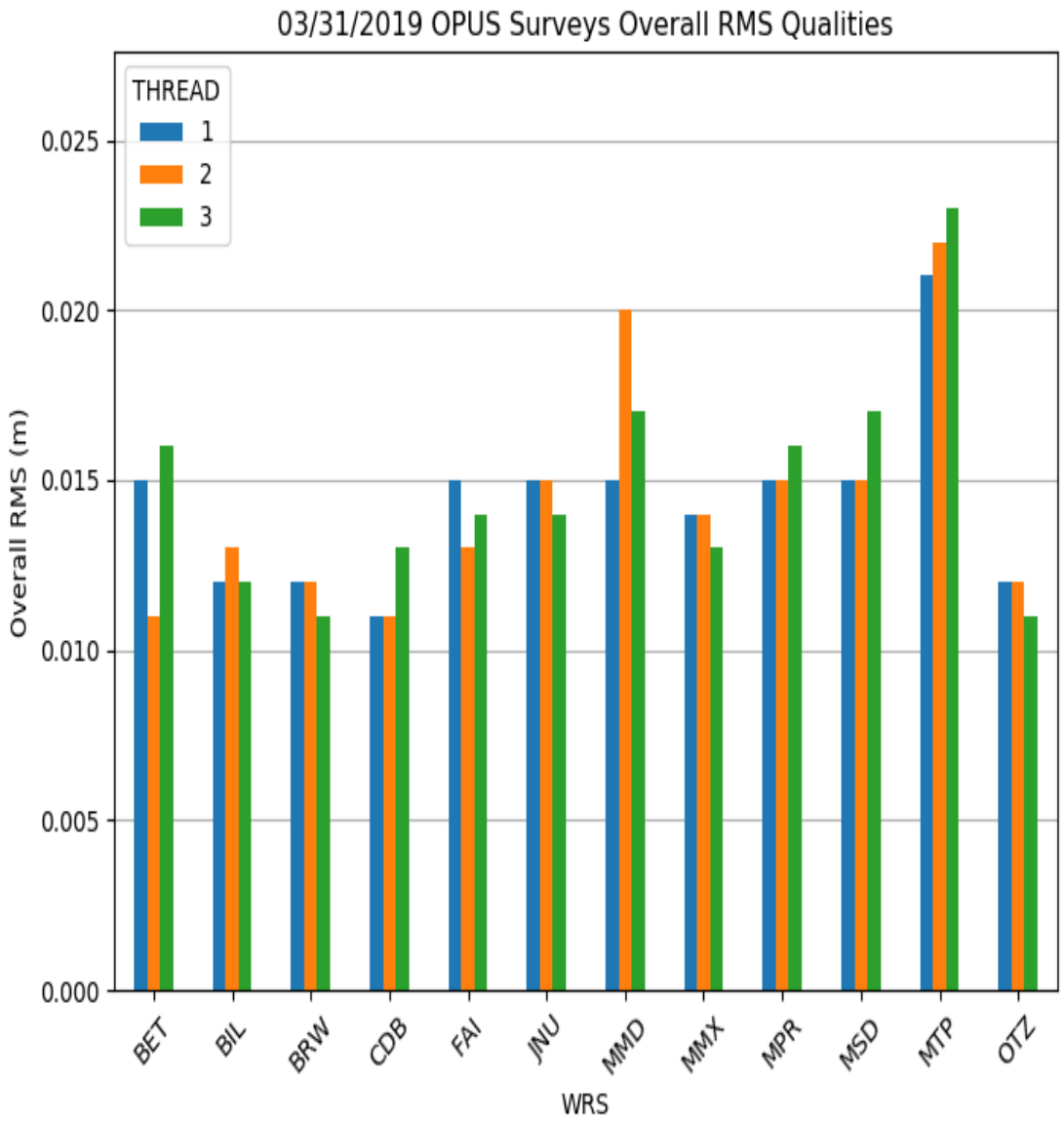


Figure 10-5 OPUS Survey Overall RMS Qualities

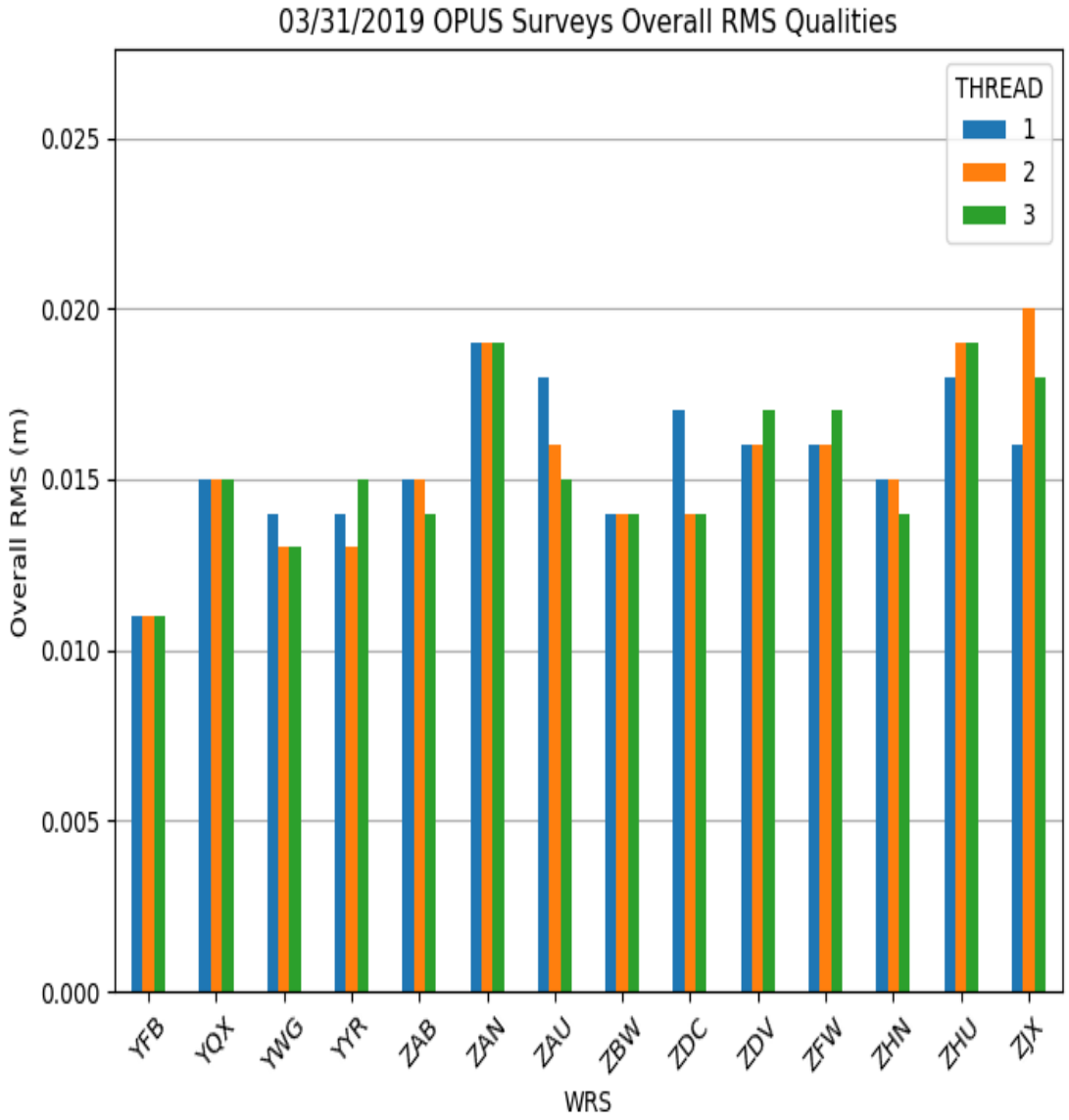
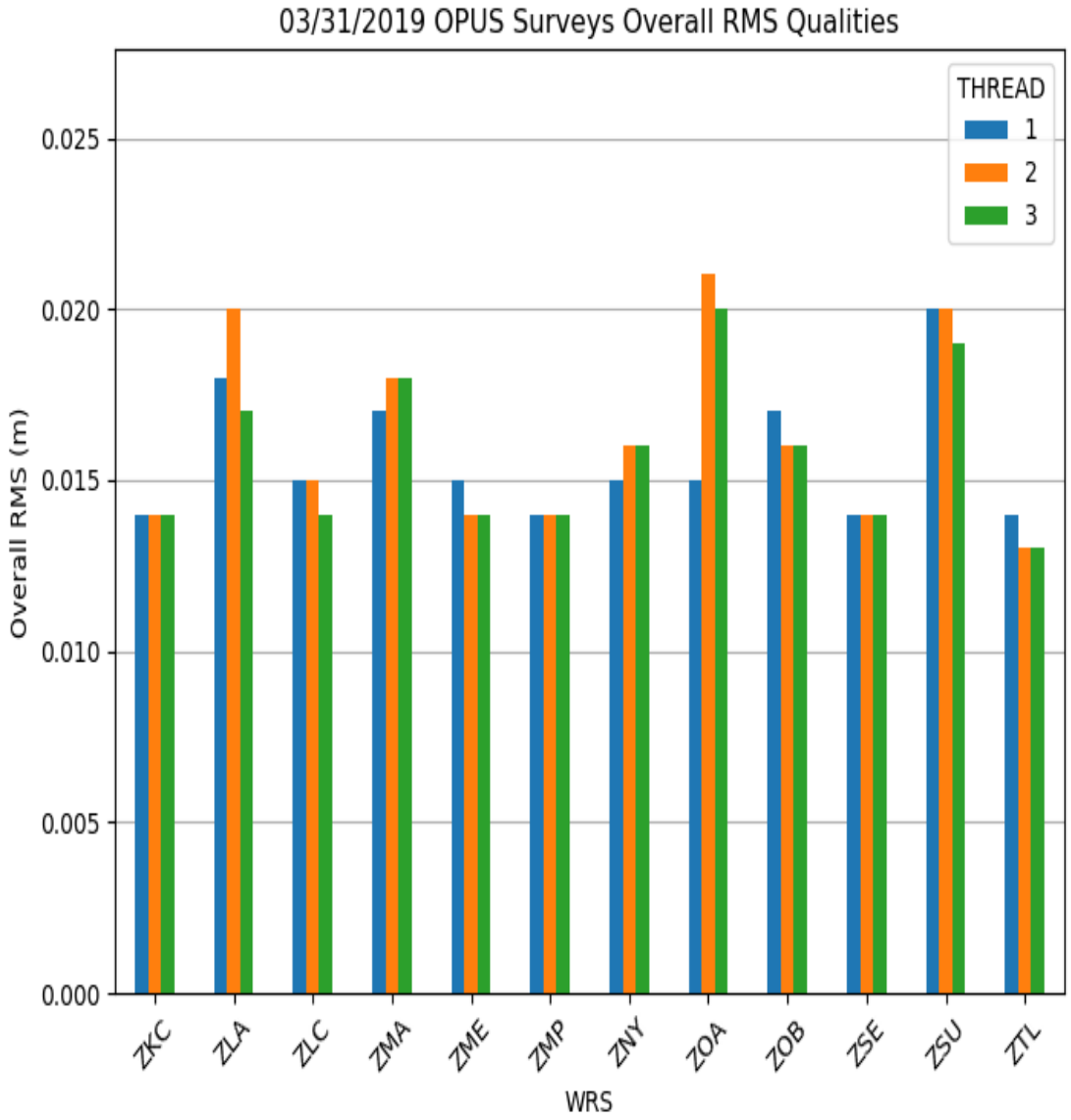


Figure 10-6 OPUS Survey Overall RMS Qualities



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

Figure 10-7 through Figure 10-9 show the RSS of the ECEF difference between the OPUS positions and the CSRS positions. Note that the OPUS positions are in IGS08 and the CSRS positions are in ITRF-2008. Figure 10-10 to Figure 10-12 show the RSS of the ECEF sigma's survey qualities reported by CSRS.

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

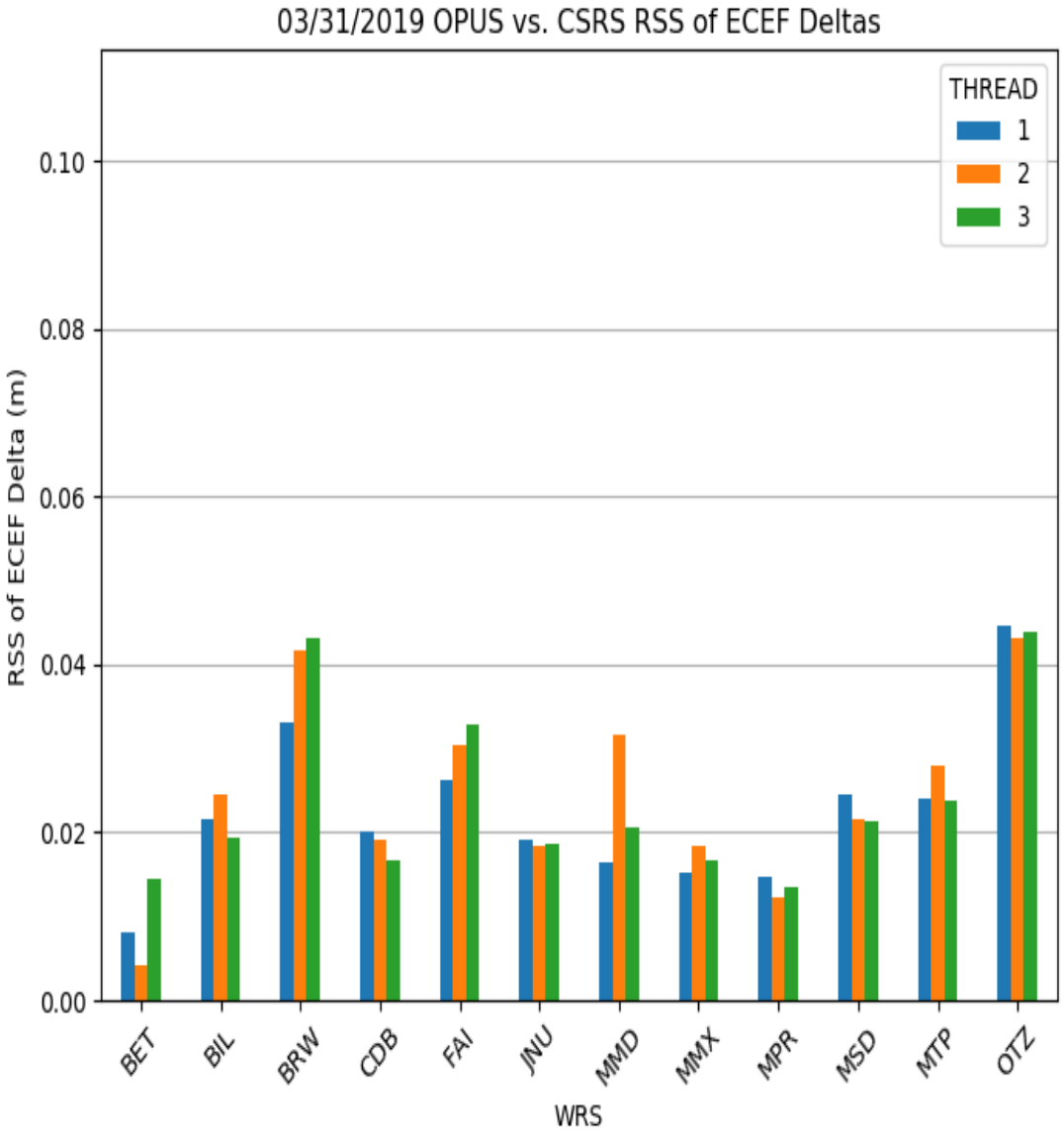


Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

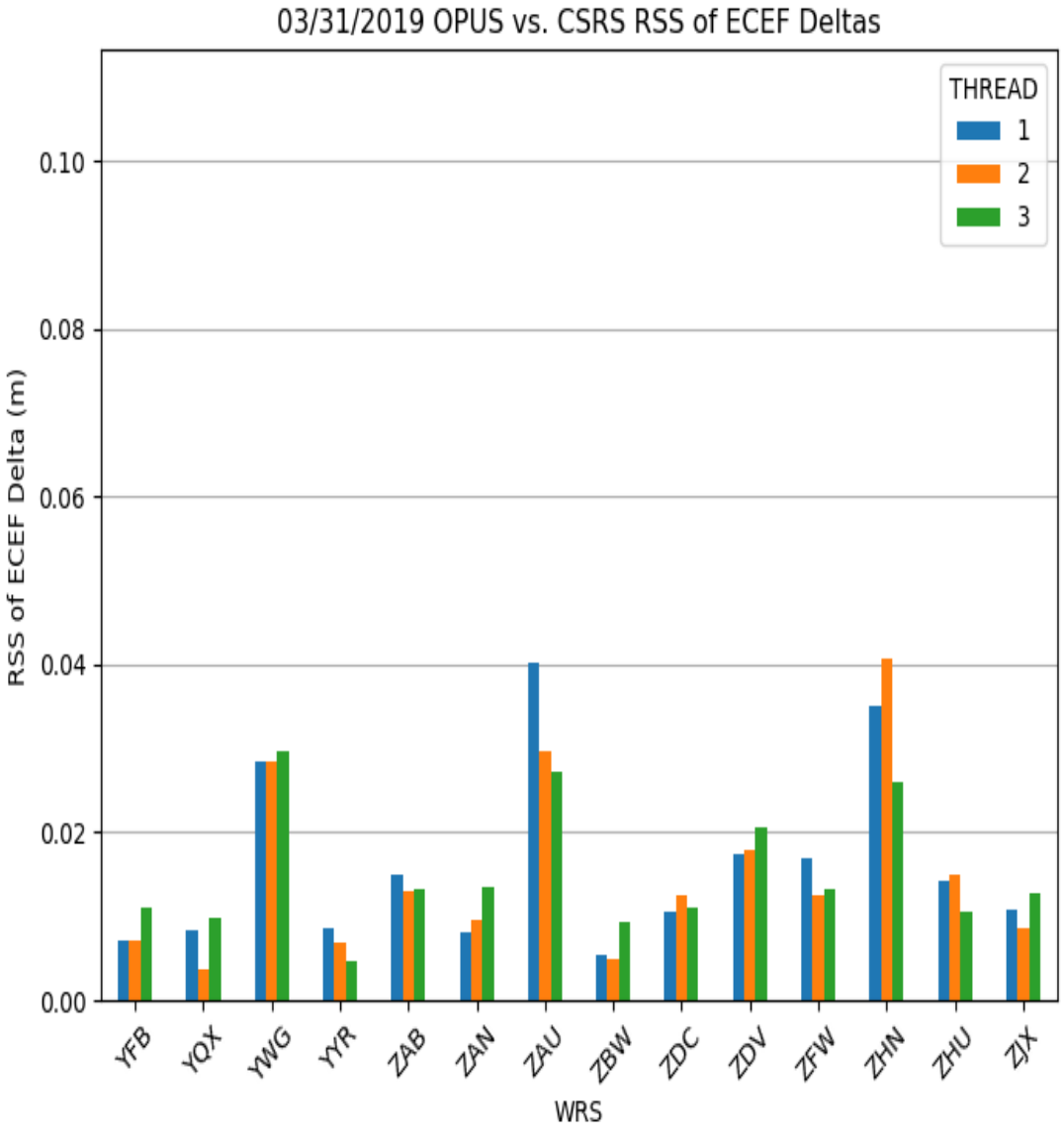


Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

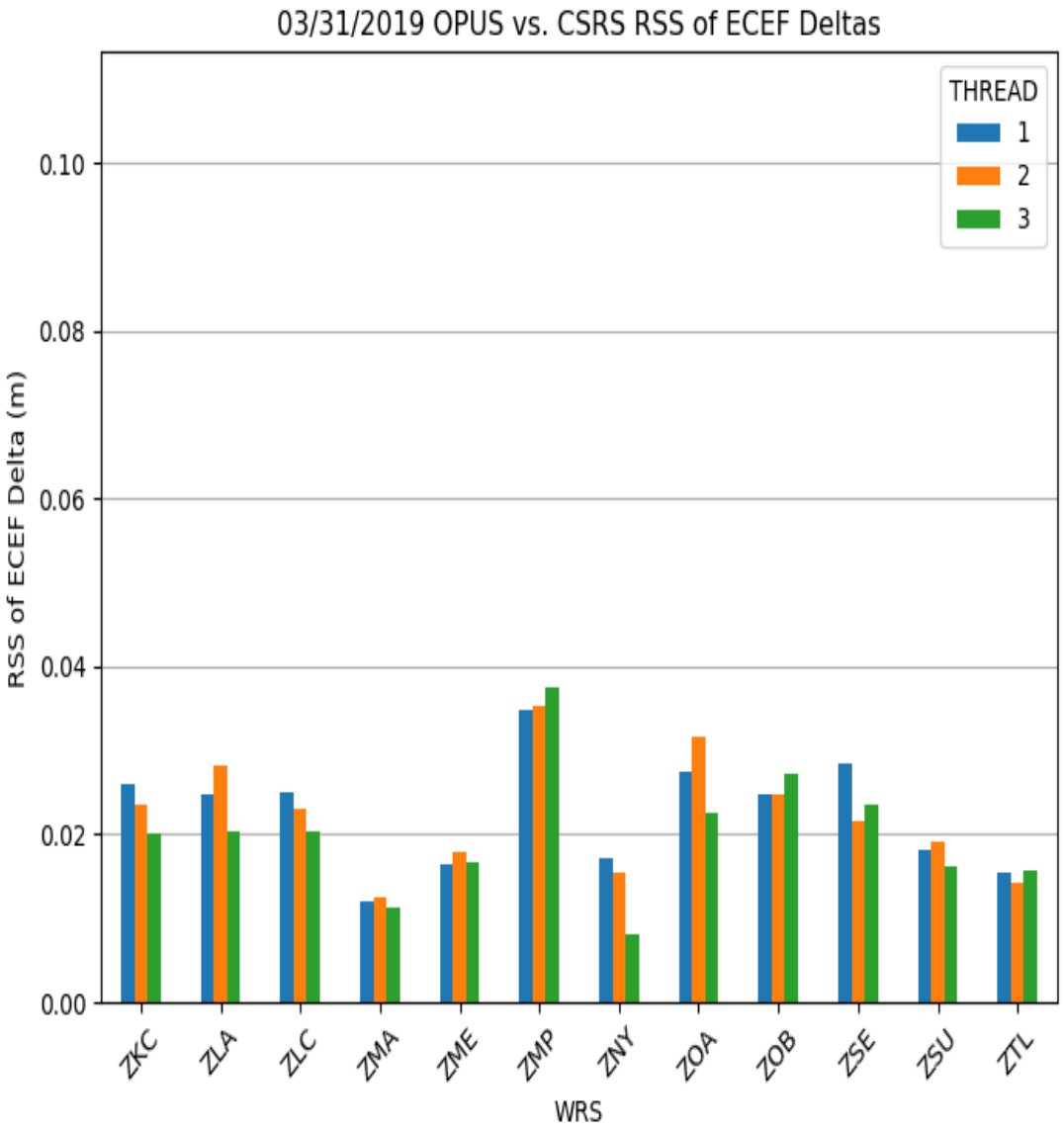


Figure 10-10 CSRS Survey Qualities

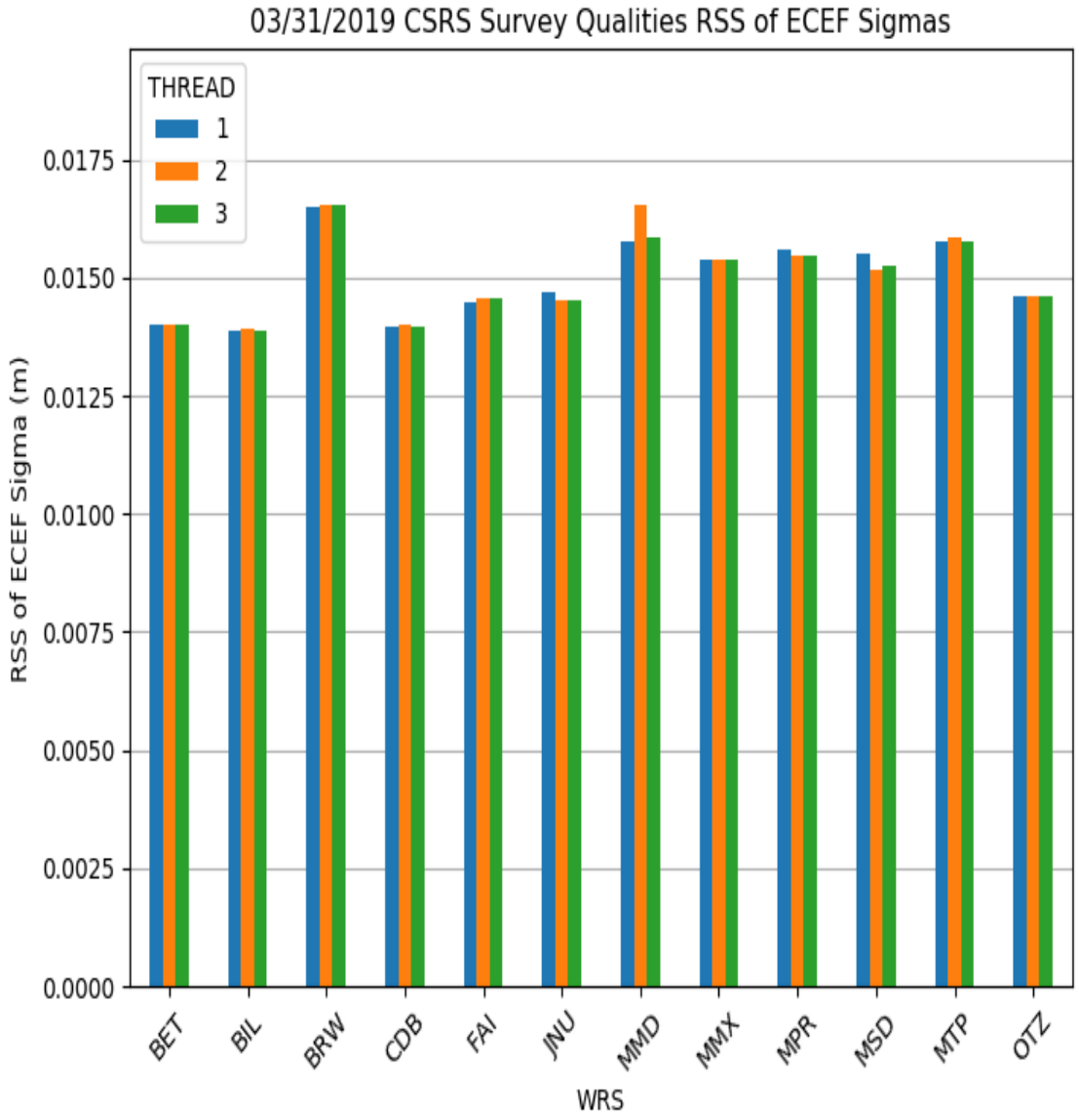


Figure 10-11 CSRS Survey Qualities

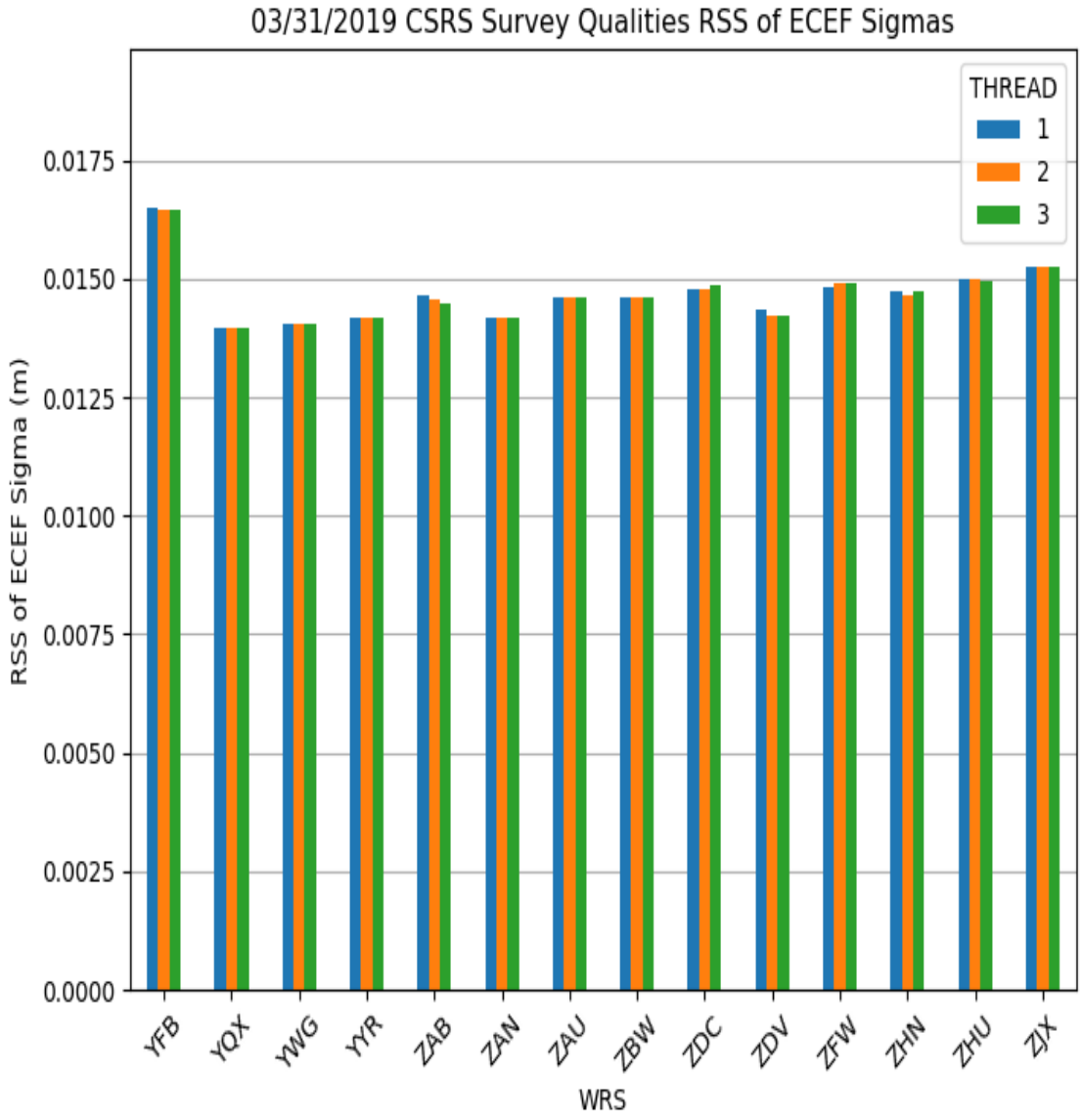
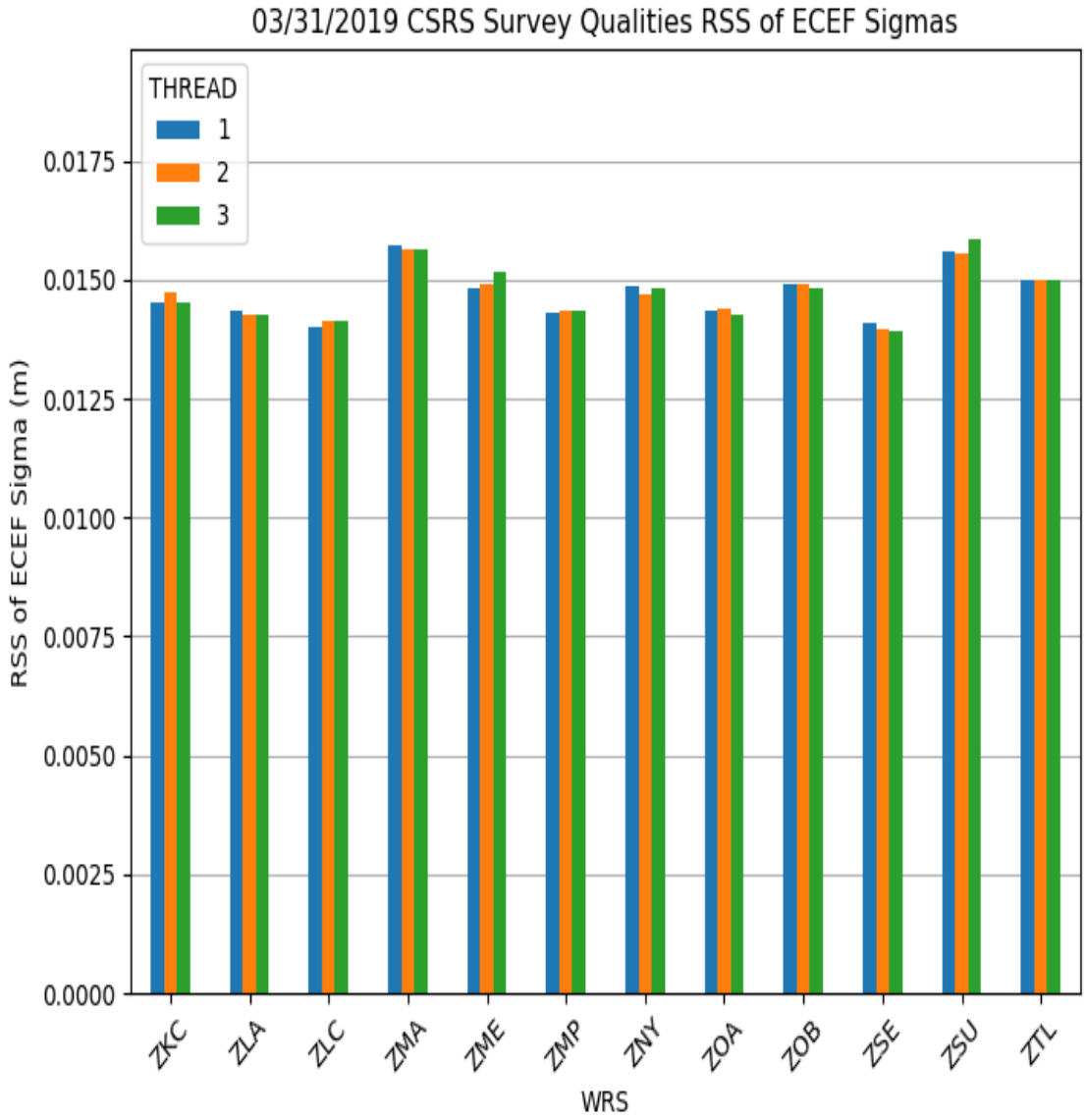


Figure 10-12 CSRS Survey Qualities



11.0 SQM

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

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

11.1 Alpha Metrics

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

Table 11-1 Alpha Metrics

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

11.2 Type Bias

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

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

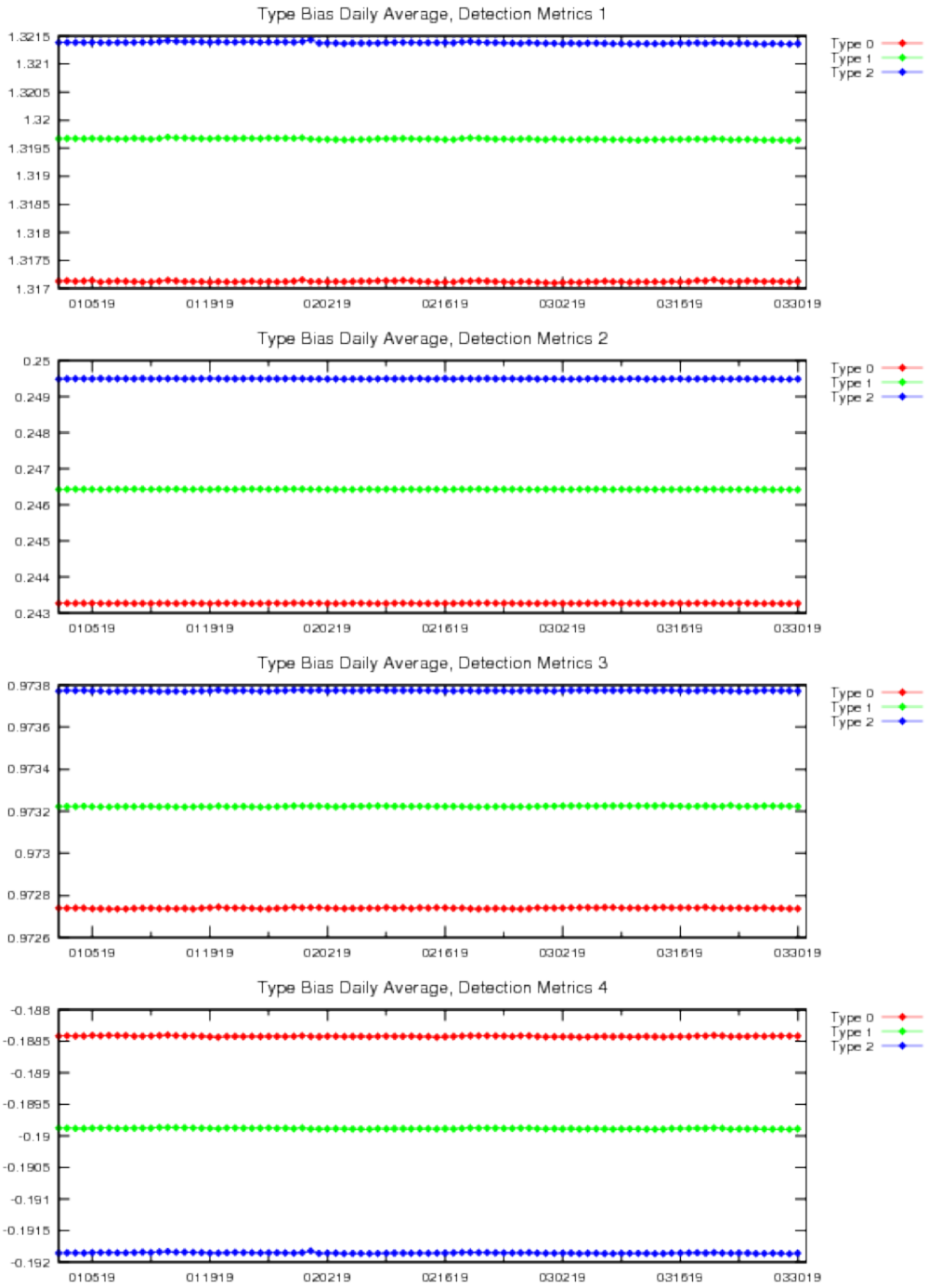
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31712	1.31966	1.32138
DM 2	0.243266	0.246432	0.249497
DM 3	0.97274	0.973224	0.973773
DM 4	-0.188422	-0.189884	-0.191855

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31977	1.32194	1.32364
DM 2	0.241552	0.244775	0.247921
DM 3	0.973052	0.973566	0.974129
DM 4	-0.186889	-0.188592	-0.190617

Figure 11-1 Type Bias Average Trend



11.3 PRN Bias

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

Table 11-4 and Figure 11-2 show the rollup PRN bias averages for the quarter with the maximum values for each detection metrics as follows: (1) the maximum average for DM1 is 0.0011620 observed on PRN-11, (2) the maximum average for DM2 is 0.0002006 observed on PRN-23, (3) the maximum average for DM3 is 0.0002046 observed on PRN-29, (4) the maximum average for DM4 is 0.0004852 observed on PRN-23.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000244234	5.97944e-05	5.72247e-05	0.000107325
2	0.000536717	0.000152006	6.69551e-05	0.000151942
3	0.000166379	4.59427e-05	5.36034e-05	0.000108747
4				
5	0.000198589	5.20596e-05	0.000137038	0.000130455
6	0.000549996	0.000101729	8.50775e-05	0.000109879
7	0.000164924	0.000106497	6.08596e-05	9.12708e-05
8	0.00043359	0.000121046	9.25674e-05	0.000140297
9	0.000191936	4.97438e-05	0.000119979	0.000203422
10	0.000162952	4.31607e-05	8.90753e-05	0.000195462
11	0.00116198	0.000195145	0.000102508	0.000276093
12	0.000154831	4.23854e-05	8.62079e-05	9.48011e-05
13	0.000505796	4.33596e-05	6.22697e-05	0.000260207
14	0.000779203	0.000143721	4.72022e-05	0.000187997
15	0.000264721	8.01562e-05	5.21045e-05	0.000102201
16	0.000155931	5.52056e-05	0.000116258	0.000227794
17	0.000224784	6.3418e-05	4.78281e-05	8.79427e-05
18	0.000182797	8.09472e-05	6.63326e-05	0.000107066
19	0.00060601	0.000199321	0.000103707	0.000110783
20	0.000165348	5.51674e-05	6.61899e-05	0.000138771
21	0.000327492	7.03966e-05	8.33663e-05	0.000430537
22	0.000155113	4.13079e-05	9.40292e-05	0.000270364
23	0.00106484	0.00020057	0.000127267	0.000485248
24	0.000223726	6.28112e-05	0.000149371	0.000232425
25	0.000595333	0.000107484	4.91854e-05	0.000220957
26	0.000268478	0.000108074	5.99494e-05	0.00014319
27	0.000432454	0.00017961	0.000122443	0.000251093
28	0.000324938	4.33966e-05	7.52112e-05	0.000144107
29	0.000257754	8.67213e-05	0.000204573	0.000344799
30	0.000223918	6.8309e-05	7.02258e-05	9.97921e-05
31	0.000335521	0.000119811	5.44888e-05	0.000162654
32	0.000179709	4.90584e-05	8.16e-05	0.000120113

Figure 11-2 PRN Bias Average for the Quarter

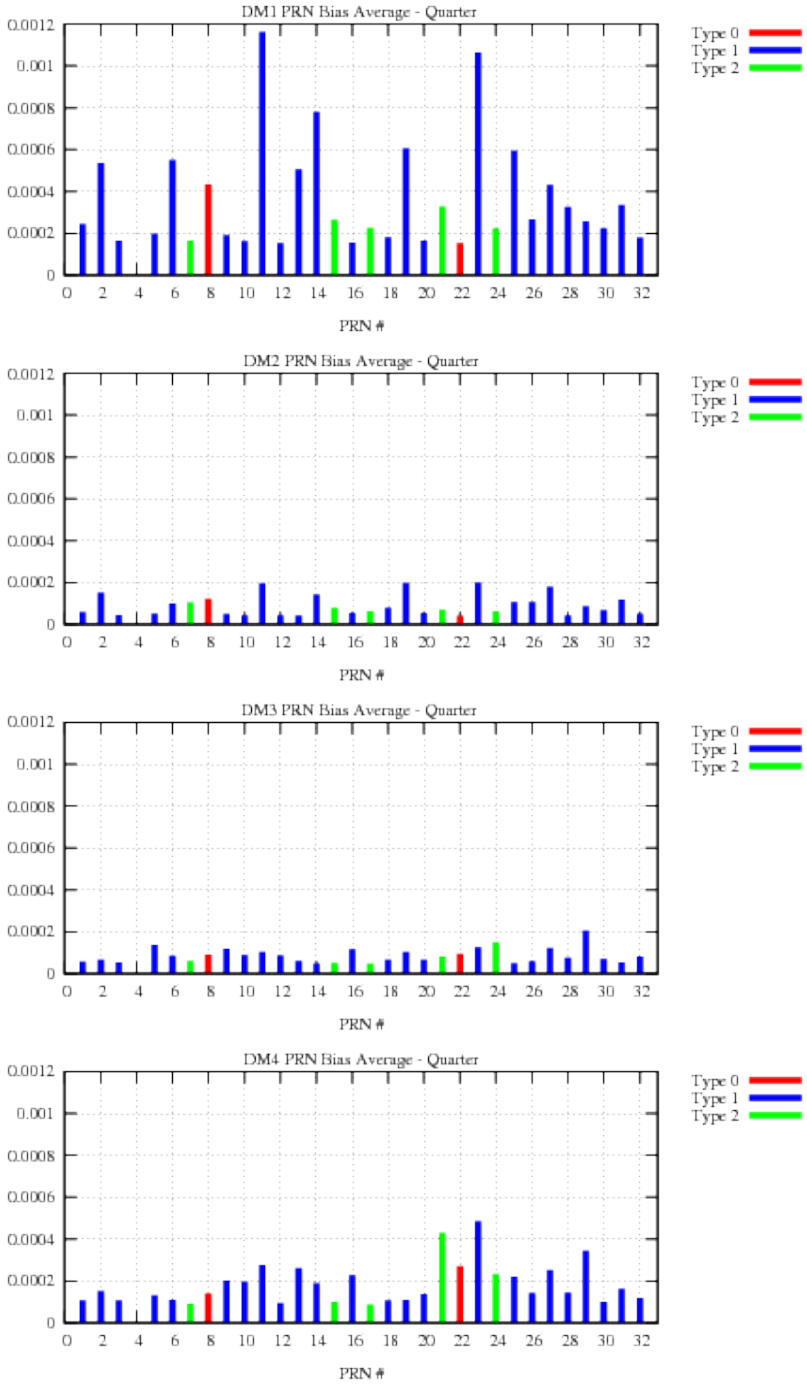


Figure 11-3 to Figure 11-10 show the daily PRN bias for each PRN, for four detection metrics. Small bumps were due to NANU's.

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

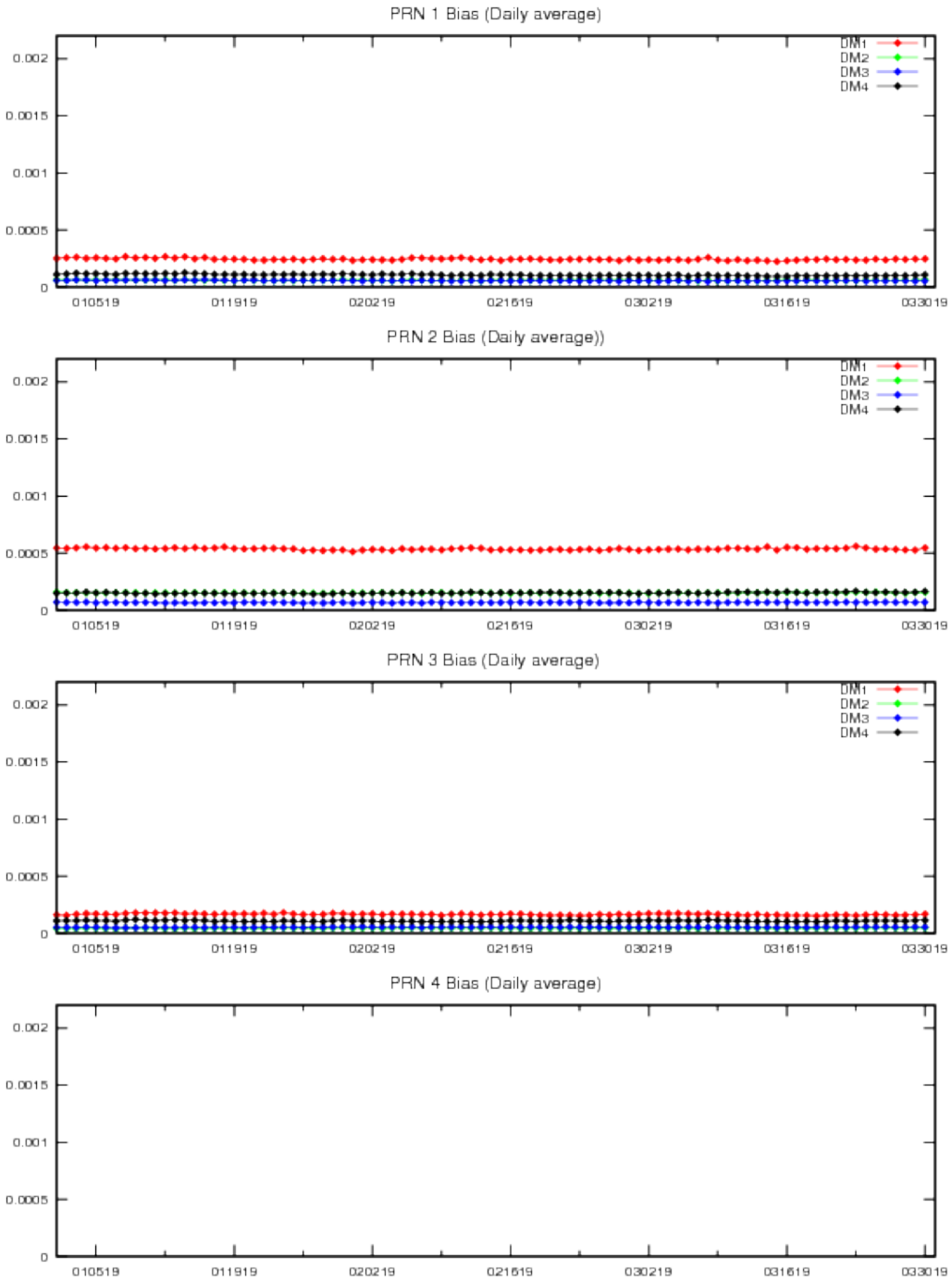


Figure 11-4 PRN Bias Average Trend (PRN-5 – PRN-8)

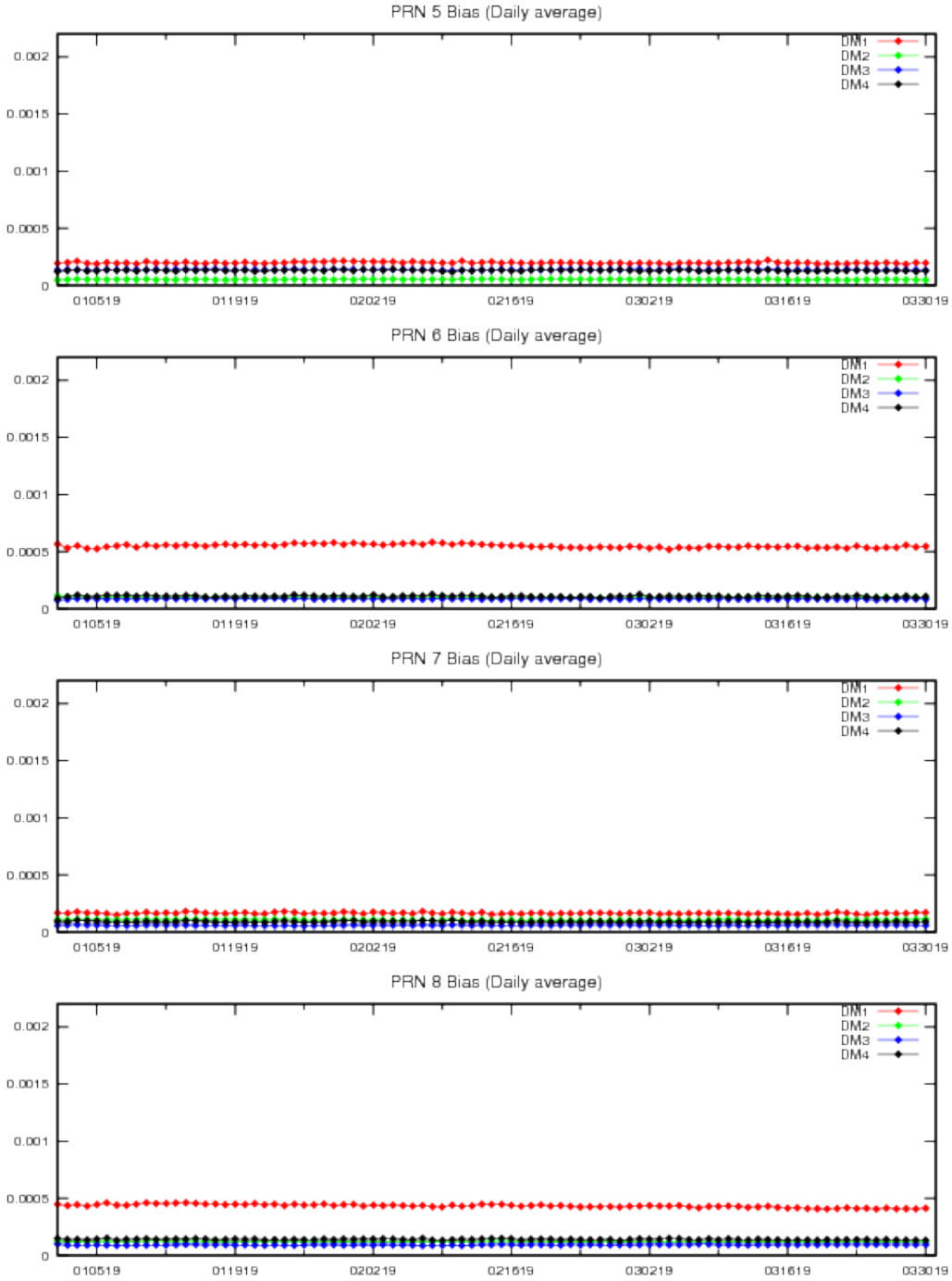


Figure 11-5 PRN Bias Average Trend (PRN-9 – PRN-12)

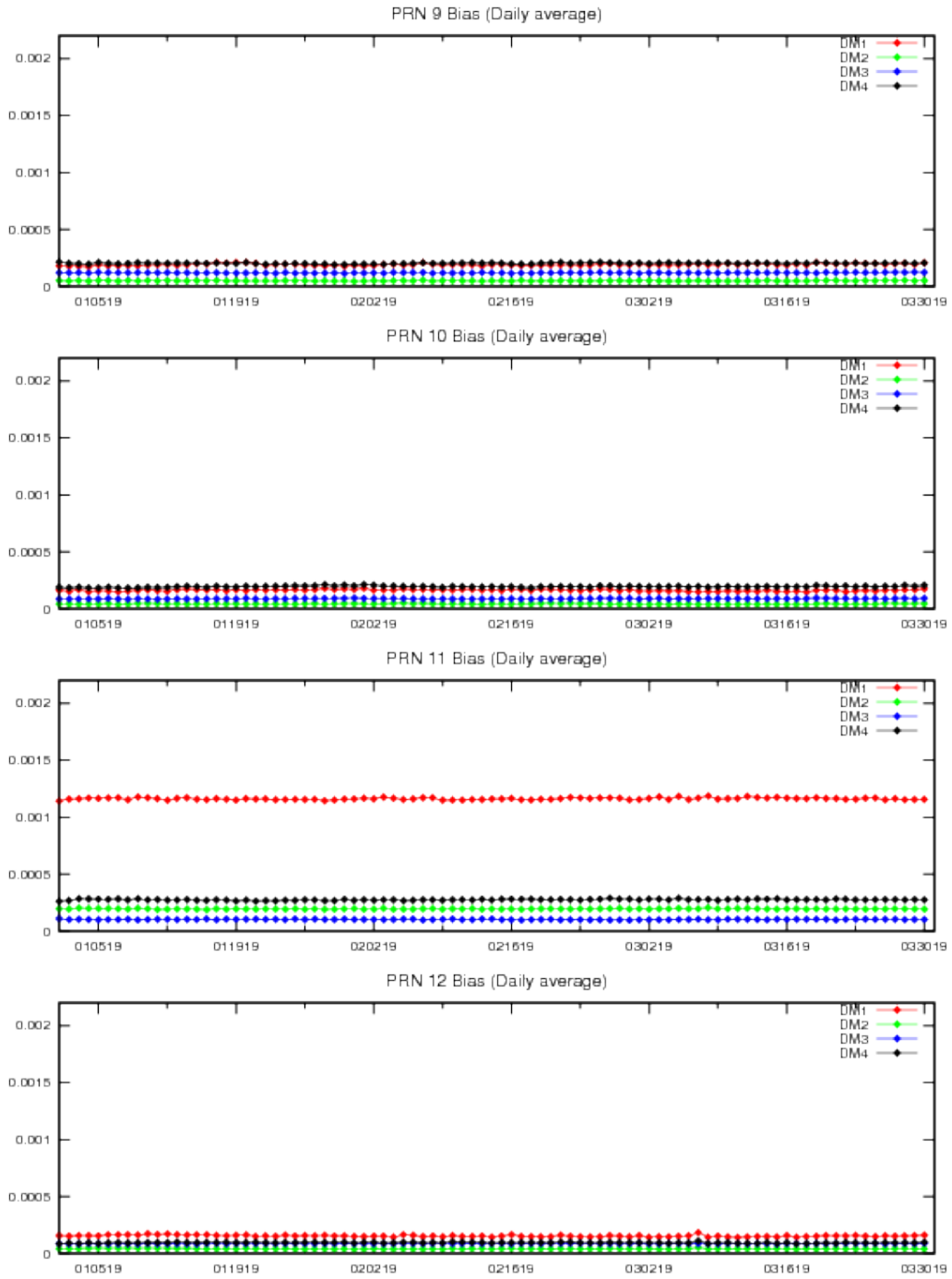


Figure 11-6 PRN Bias Average Trend (PRN-13 – PRN-16)

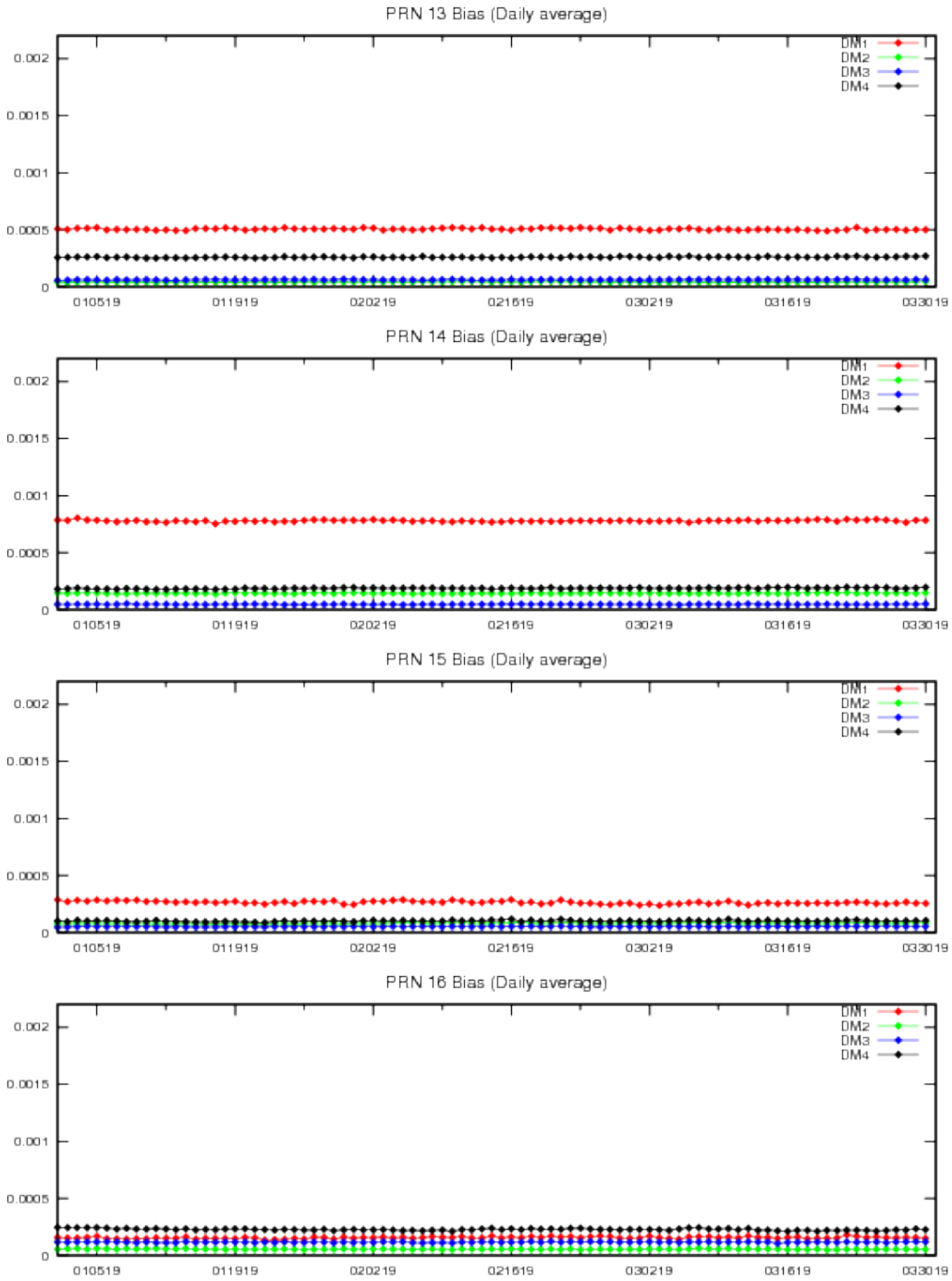


Figure 11-7 PRN Bias Average Trend (PRN-17 – PRN-20)

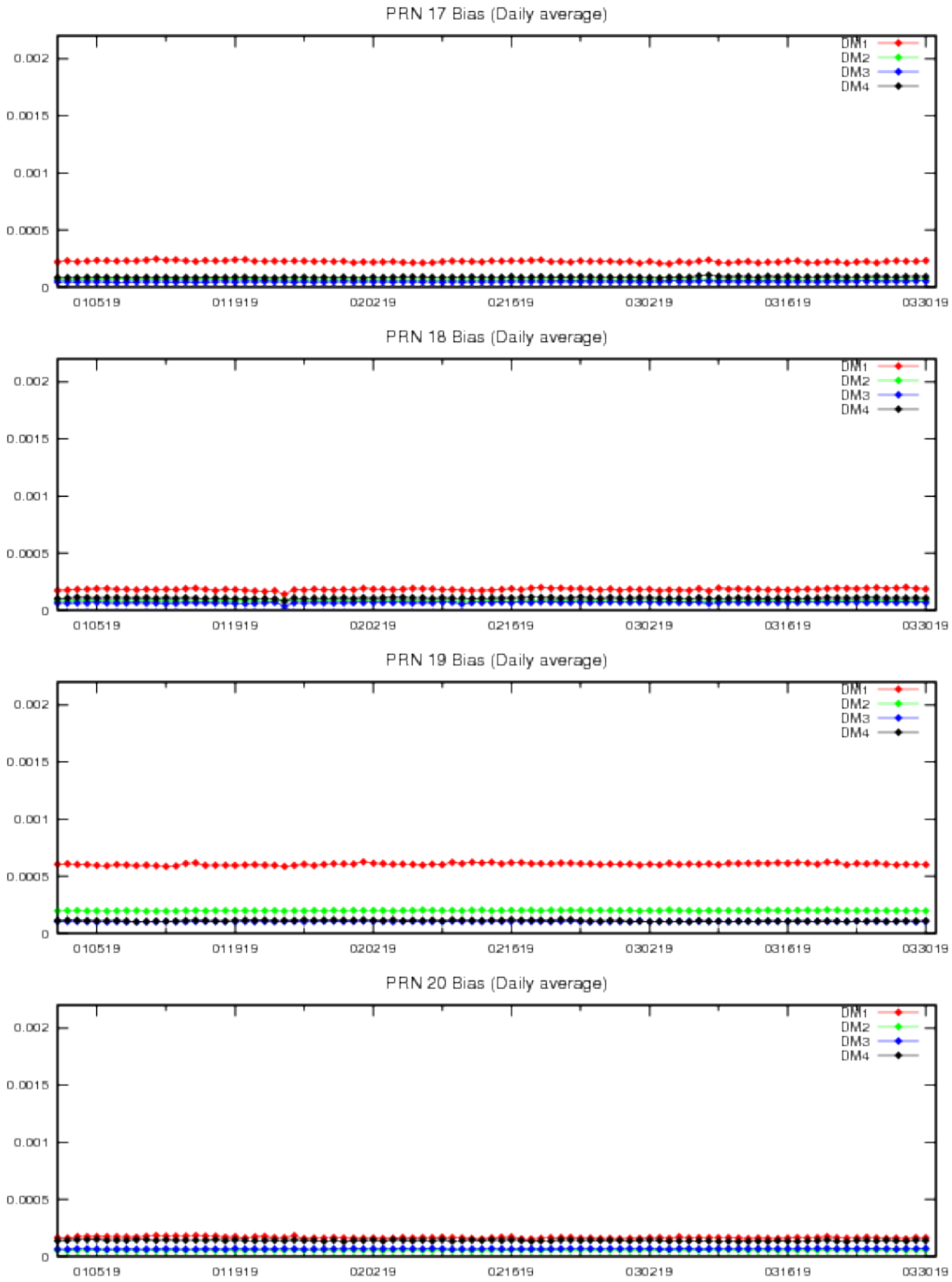


Figure 11-8 PRN Bias Average Trend (PRN-21 – PRN-24)

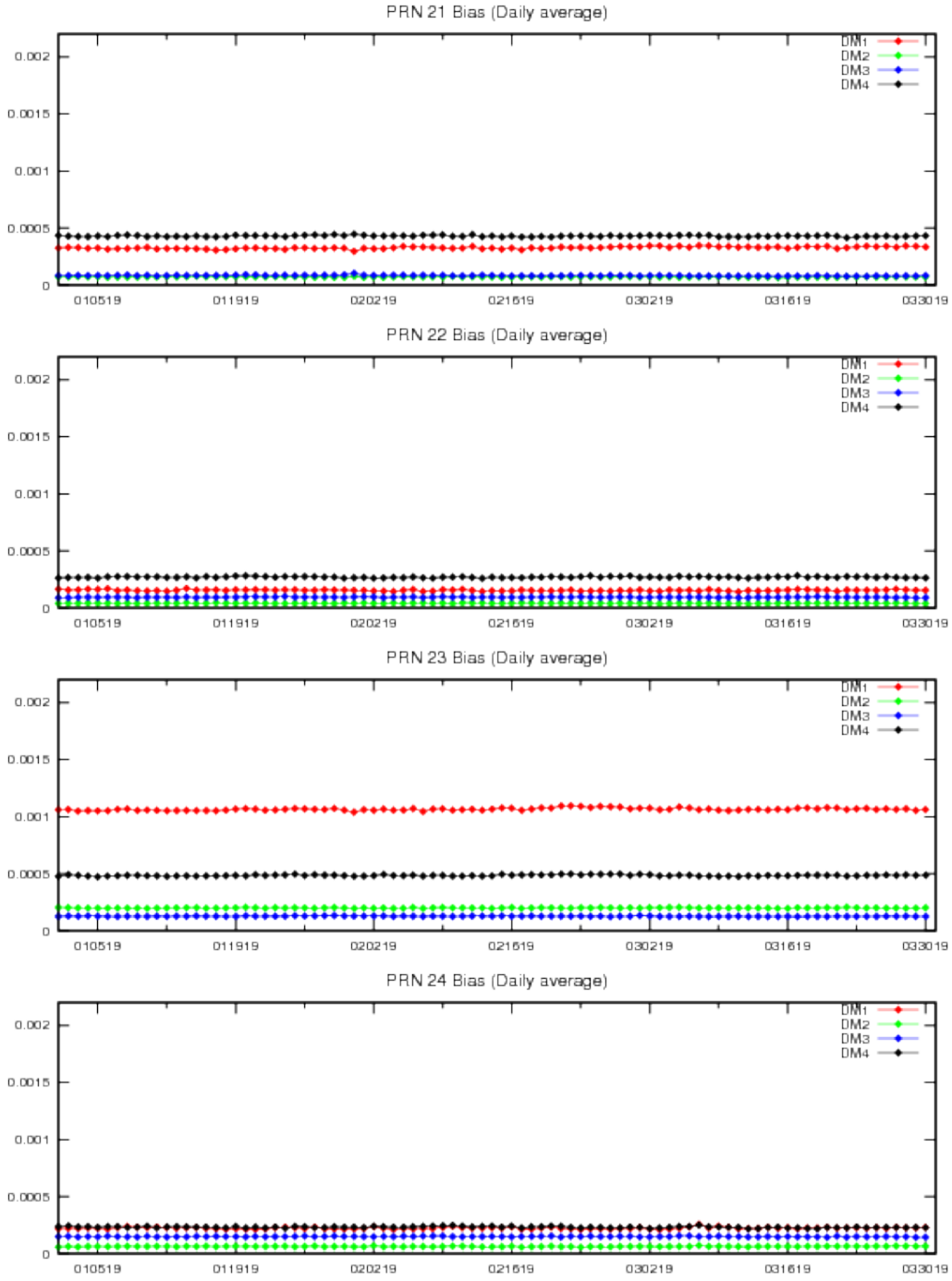


Figure 11-9 PRN Bias Average Trend (PRN-25 – PRN-28)

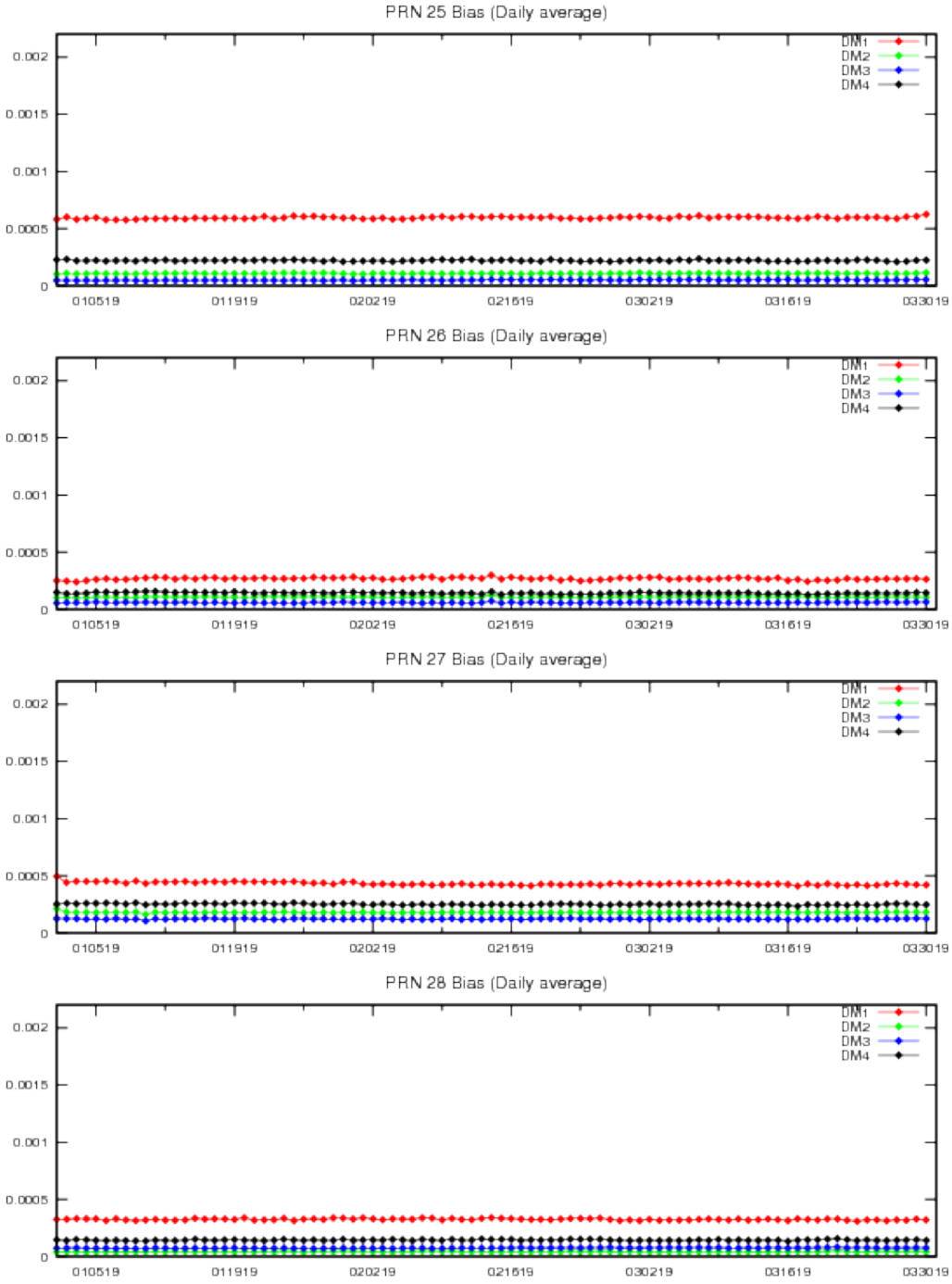
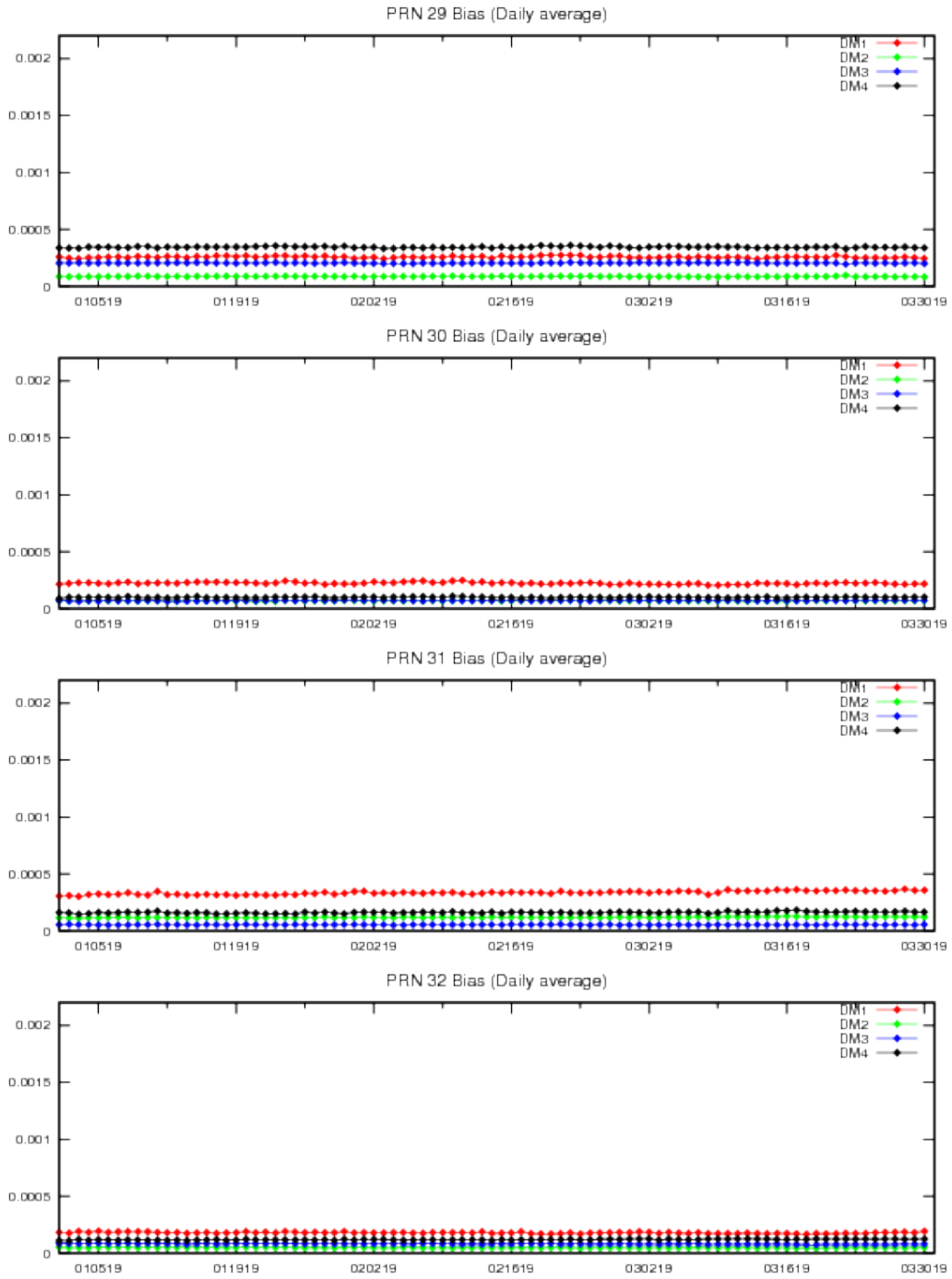


Figure 11-10 PRN Bias Average Trend (PRN-29 – PRN-32)



11.4 SQM Trips

A SQM trip occurs when the estimated deformation exceeds threshold.

Appendix A: Glossary and Acronyms

General Terms and Definitions

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

AMR. GEO PRN-133

APC. Antenna phase center

ARP. Antenna reference point

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

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

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

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

CRE. GEO PRN-138

CRW. GEO PRN-135

CSRS. Canadian Spatial Reference System

DM. Detection metrics

DR. Discrepancy Report.

ECEF. Earth-centered, Earth-fixed.

FAA. Federal Aviation Administration

FD. Fault Detection

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

GEO. Geostationary satellite

GMT. Greenwich Mean Time

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

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

GUS. Ground uplink station

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

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

HPE. Horizontal position error

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

IAP. Instrument Approach Procedures

IGS. International GPS Service.

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

Kp. Planetary index

LNAV. Lateral navigation

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

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

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

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

NAS. National Airspace System

Navigation Message. Message structure designed to carry navigation data.

NGS. National Geodetic Survey

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

NTSB. National Satellite Test Bed

OCONUS. Outside Contiguous United States

OPUS. Online Positioning Use Server

PAN. Performance Analysis Network

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

PPP. Precise Point Positioning.

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

PRN. Pseudo-random noise

RAIM. Receiver autonomous integrity monitoring

RFI. Radio frequency interference

RNAV. Area navigation

RNP. Required Navigation Performance

RSS. Residual sum of squares.

SBAS. Space Based Augmentation System

SIS. Signal in space

SM9. GEO PRN-131

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

SSM. System support modification

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

SV. Space vehicle.

SVN. Space Vehicle Number.

TOW. Time of GPS week

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

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

VPE. Vertical position error

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

VNAV. Vertical navigation

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

WIPP. WAAS Integrity Performance Panel

WJHTC. William J. Hughes Technical Center

WRE. Wide-Area Reference Equipment

WRS. WAAS reference station

Appendix B: Additional Coverage Plots

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

Figure B-1 98% CONUS LP Availability Contour

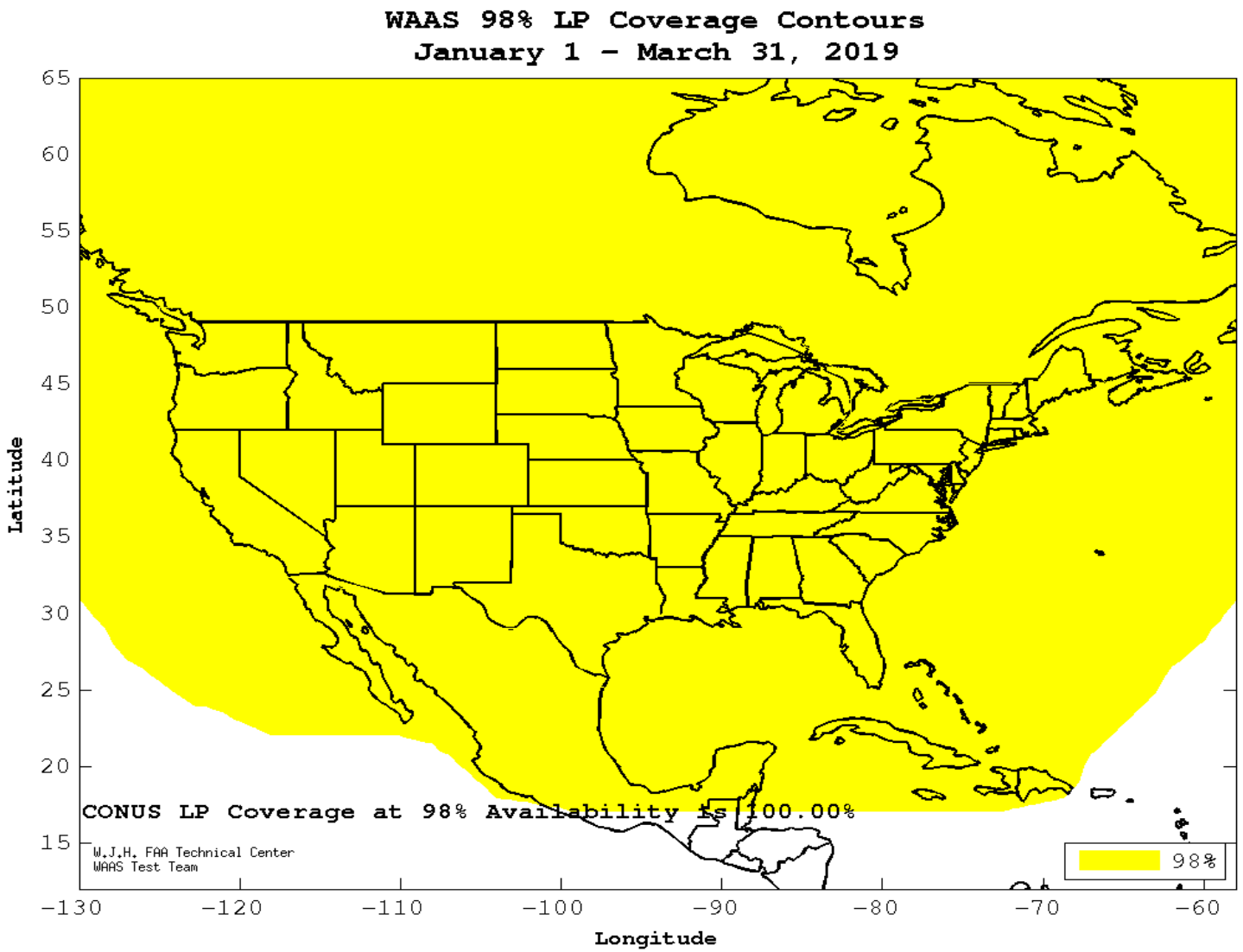


Figure B-2 98% Alaska LP Availability Contour

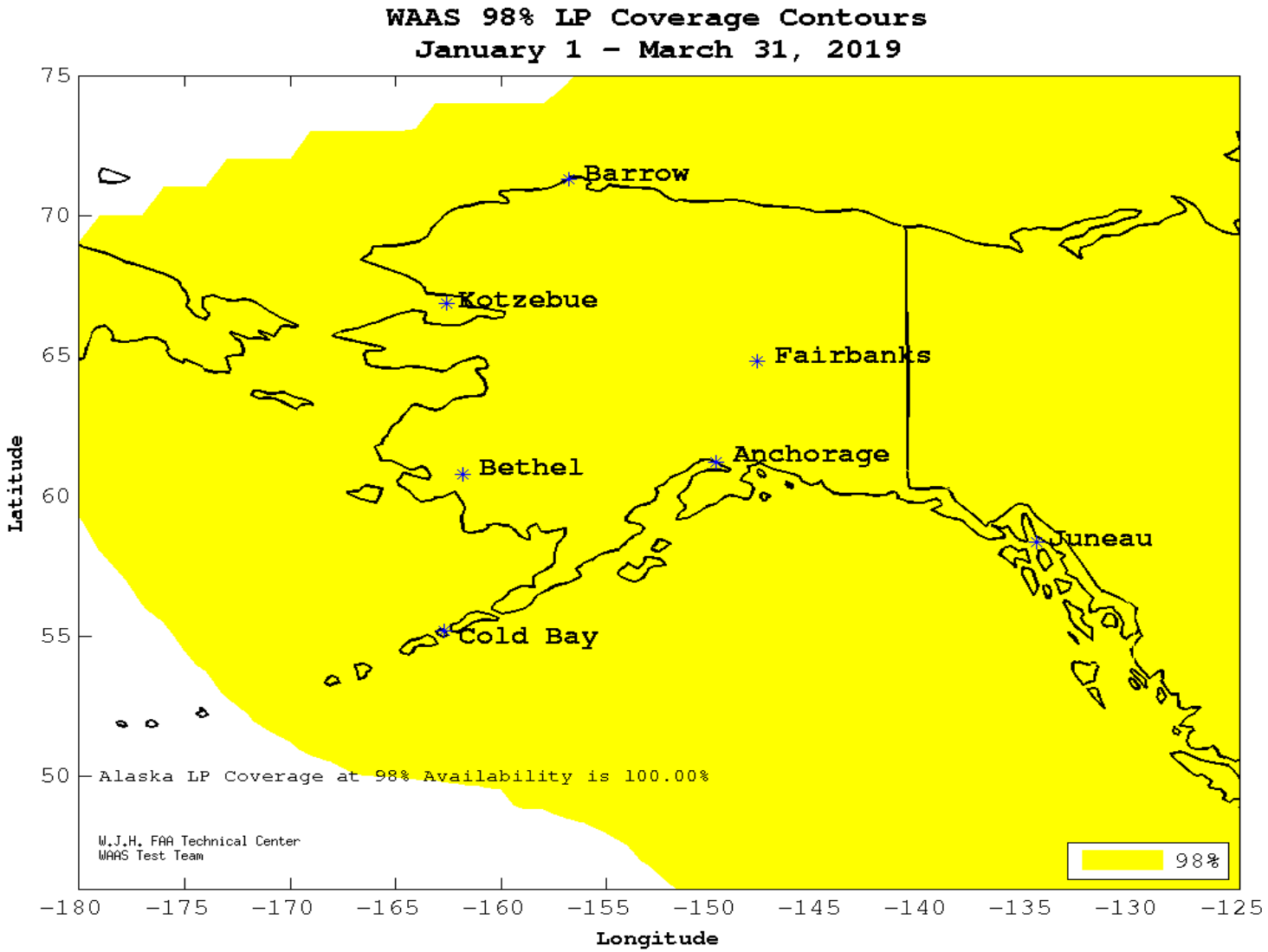


Figure B-3 98% CONUS LPV Availability Contour

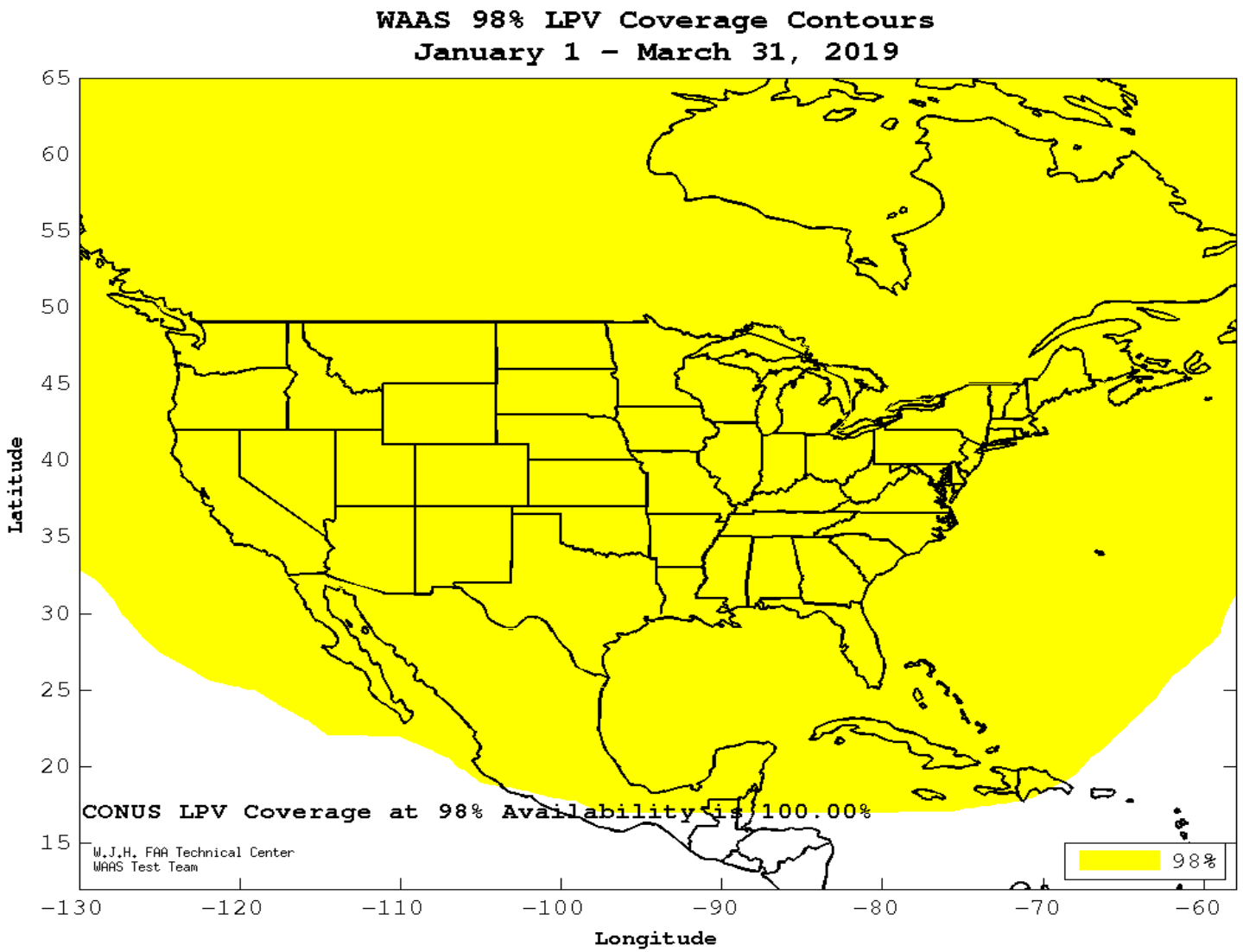


Figure B-4 98% Alaska LPV Availability Contour

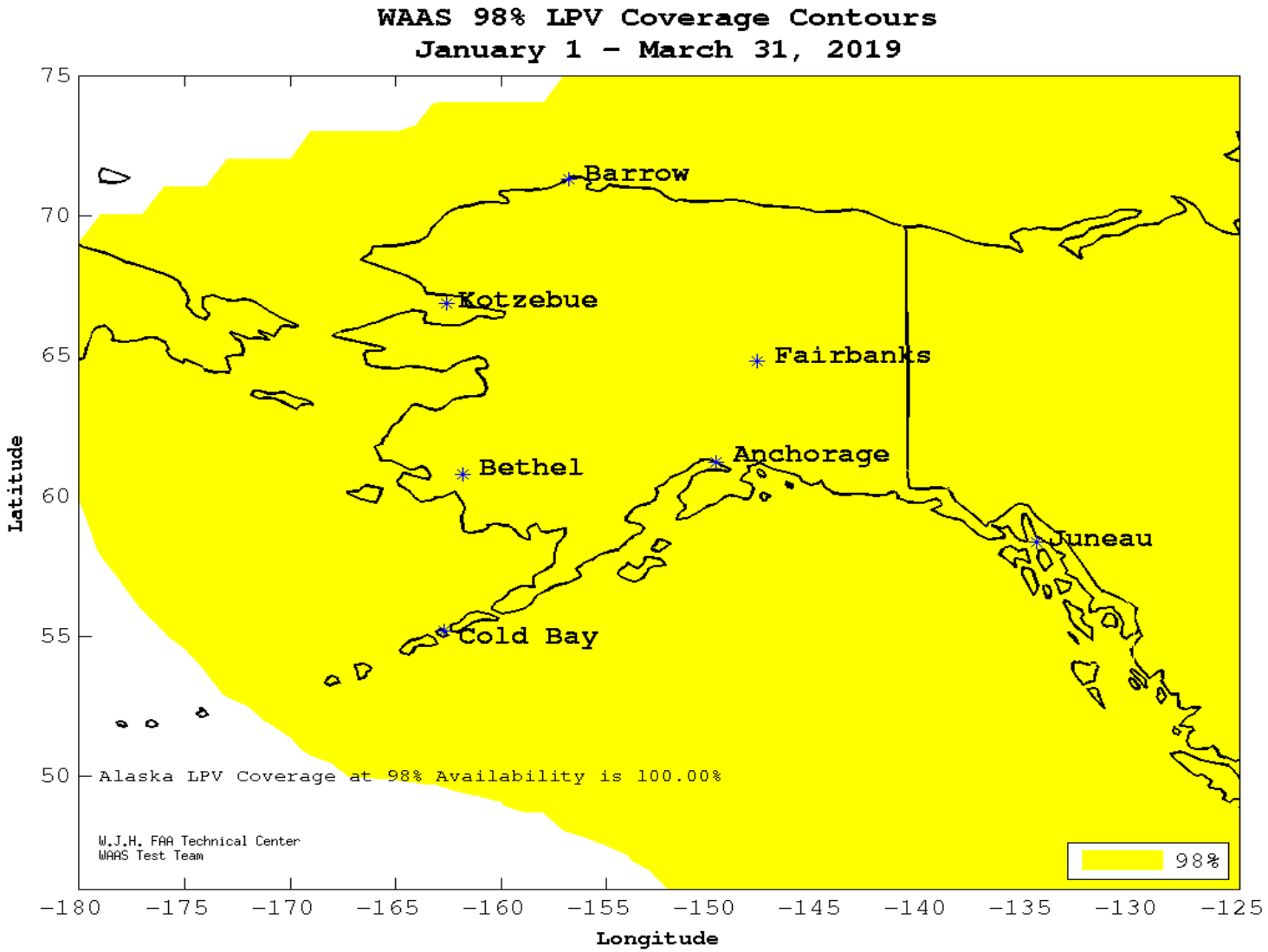


Figure B-5 98% CONUS LPV200 Availability Contour

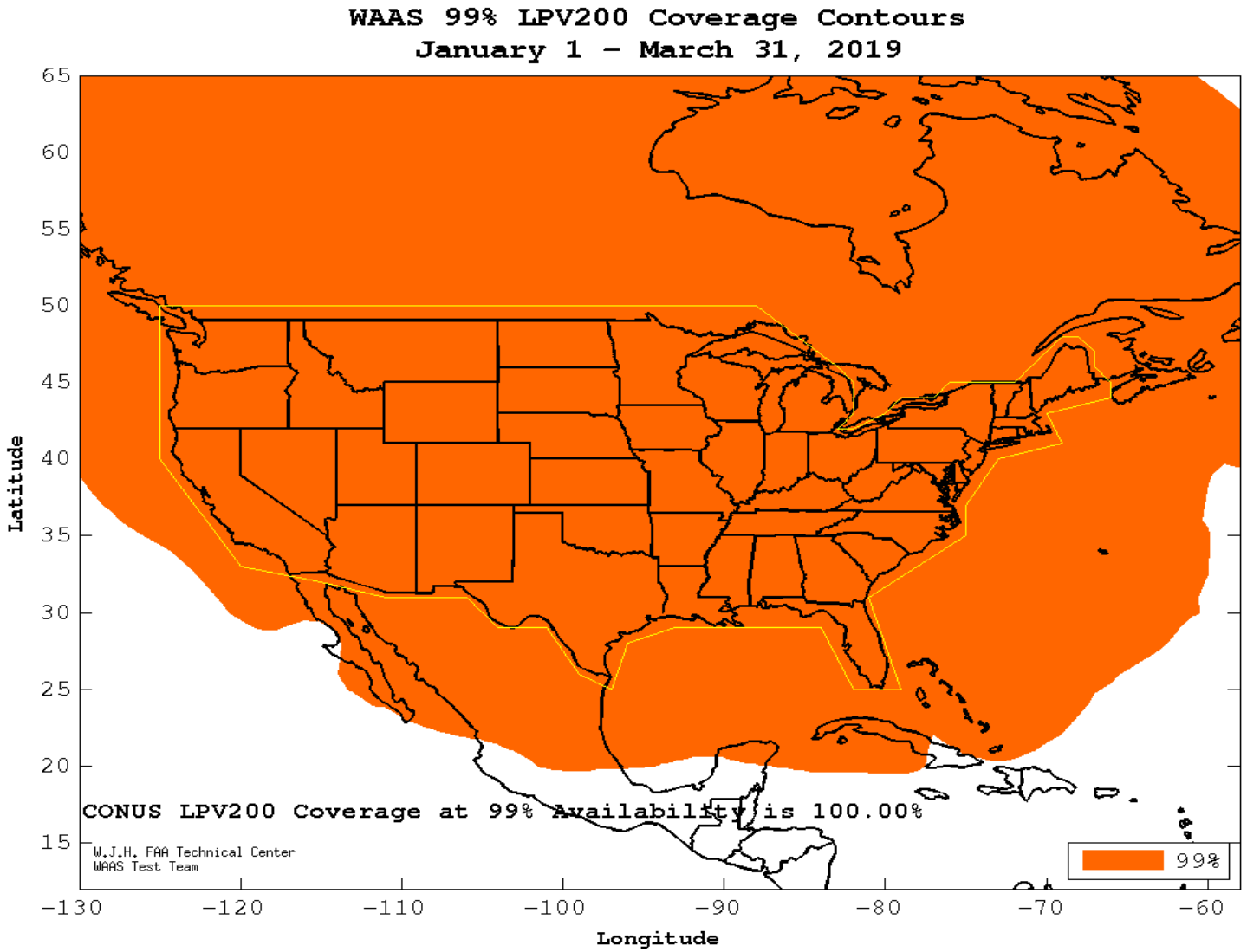


Figure B-6 98% Alaska LPV200 Availability Contour