Satellite Navigation Branch, ANG-E66
NSTB/WAAS T&E Team

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

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Reporting Period: October 01 to December 31, 2023
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FAA William J. Hughes Technical Center
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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 #87 provides WAAS performance data from the October 01 through December 31, 2023 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 five FAA's National Satellite Test Bed sites—Grand Forks, North Dakota; Atlantic City, New Jersey; Arcata, California; Elko, Nevada; and Oklahoma City, Oklahoma—are outliers due to receiver quality issues, and not because of the WAAS signal in space quality. The Arcata receiver was upgraded in November 2023and was not evaluated in this report. Arcata will be evaluated starting the first quarter of 2024.

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Atlantic City 1.219 meters	Dallas 0.614 meters	Barrow 0.879 meters	Bethel 0.668 meters
95% Vertical Accuracy (VPL <= 50 meters)	Miami 2.003 meters	Denver 0.918 meters	Barrow 1.896 meters	Juneau 1.313 meters
LP Availability (HPL <= 40 meters)	Jacksonville 100%	Boston 99.74%	Cold Bay 99.85%	Barrow 99.27%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Miami 100%	Boston 99.73%	Cold Bay 99.78%	Barrow 99.14%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Jacksonville 99.90%	Boston 99.67%	Bethel 99.47%	Barrow 98.28%
99% HPL	Miami 19.325 meters	Denver 10.902 meters	Barrow 27.774 meters	Anchorage 17.807 meters
99% VPL	Miami 29.326 meters	Kansas City 19.649 meters	Barrow 42.704 meters	Anchorage 26.230 meters

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1.0 INTRODUCTION

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

The objectives of this report are:

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

The evaluation uses the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN) 131 (SM9), 133 (S15), and 135 (G30). SM9, S15 and G30 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:		
Atlantic City	91	7893430
Elko	72	6263539
Grand Forks	38	3293148
Oklahoma City	83	7200618
WAAS:		
Albuquerque	92	7947751
Anchorage	92	7947461
Atlanta	92	7948102
Barrow	92	7945544
Bethel	92	7947829
Billings	92	7937491
Boston	92	7948520
Chicago	92	7947861
Cleveland	92	7934072
Cold Bay	92	7942050
Dallas	92	7944553
Denver	92	7944382
Fairbanks	92	7946553
Gander	92	7942991
Goose Bay	92	7946892
Houston	92	7945003
Iqaluit	92	7944533
Jacksonville	92	7930679
Juneau	92	7945388
Kansas City	92	7946370
Kotzebue	92	7944709
Los Angeles	92	7939278
Memphis	92	7948008
Merida	92	7916089
Mexico City	90	7805161
Miami	92	7945062
Minneapolis	92	7948704
New York	92	7948746
Oakland	92	7945971
Puerto Vallarta	92	7933527
Salt Lake City	92	7946520

Location	Number of Days Evaluated	Number of Samples
San Jose Del Cabo	85	7317987
Seattle	92	7945613
Washington, DC	92	7915103
Winnipeg	92	7948282

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7948795
Anchorage	92	7948796
Atlanta	92	7948756
Barrow	92	7947814
Bethel	92	7947836
Billings	92	7938900
Boston	92	7948790
Cleveland	92	7948796
Cold Bay	92	7948744
Fairbanks	92	7946860
Gander	92	7948171
Honolulu	92	7948788
Houston	92	7948790
Iqaluit	92	7948472
Juneau	92	7948794
Kansas City	83	7186378
Kotzebue	92	7946292
Los Angeles	91	7882349
Merida	65	5597332
Miami	92	7948797
Minneapolis	92	7948790
Oakland	92	7948735
Salt Lake City	92	7948794
San Jose Del Cabo	88	7620371
San Juan	92	7948796
Seattle	92	7948753
Tapachula	90	7797879
Washington, DC	92	7948798

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 Specification FAA-E-2892.

Table 1-4 WAAS Performance Parameters

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

1.1 Event Summary

Events 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
10/01/2023	10/01/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 00:10 UTC to 02:10 UTC; (2) LPV service coverage in Canada from 00:40 UTC to 01:00 UTC and from 01:15 UTC to 01:35 UTC. Please see plot(s): LPV_10/1/2023 LPV200_10/1/2023 Cov_vs_Time_Canada_10/1/2023
10/02/2023	10/02/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in CONUS (TX and FL) from 01:20 UTC to 02:00 UTC and from 02:10 UTC to 03:30 UTC. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 01:30 UTC to 02:05 UTC, 02:25 UTC to 03:20 UTC, and from 03:50 UTC to 04:05 UTC; (2) LPV service coverage in CONUS (TX and FL) from 01:20 UTC to 02:00 UTC and from 02:10 UTC to 03:30 UTC. Please see plot(s): LPV_10/2/2023 LPV200_10/2/2023 Cov_vs_Time_Canada_10/2/2023 Cov_vs_Time_Conus_10/2/2023
10/03/2023	10/03/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 15:25 UTC to 19:10 UTC, 20:20 UTC to 20:45 UTC, and from 21:05 UTC to 21:35 UTC; and (2) LPV service coverage in Canada from 16:15 UTC to 18:00 UTC. Please see plot(s): LPV_10/3/2023 LPV200_10/3/2023 Cov_vs_Time_Canada_10/3/2023
10/04/2023	10/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 20:40 UTC on 10/4 to 03:30 on 10/5. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 22:05 UTC on 10/4 to 01:35 UTC on 10/5; (2) LPV service coverage in Alaska from 22:30 UTC on 10/4 to 01:00 on 10/5; and (3) LPV service coverage in Canada from 22:00 UTC on 10/4 to 01:00 on 10/5. The elevated GIVE values also resulted in minor degradation of LPV200 in CONUS from 10:40 UTC on 10/4 to 11:05 UTC on 10/4; Please see plot(s): LPV_10/4/2023 LPV200_10/4/2023 Cov_vs_Time_Alaska_10/4/2023 Cov_vs_Time_Canada_10/4/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Conus_10/4/2023 LPV_10/5/2023 LPV200_10/5/2023 Cov_vs_Time_Alaska_10/5/2023 Cov_vs_Time_Canada_10/5/2023
10/05/2023	10/06/2023	PRN3, PRN4, PRN6, PRN11, PRN14, PRN18, PRN22, PRN23, PRN24, PRN25, PRN26, PRN27, PRN28, PRN29, PRN30	None	There was a jump in SQM on PRNs 3, 4, 6, 11, 14, 18, 22, 23, 24, 25, 26, 27, 28, 29 and 30. This was likely a result of power testing.
10/07/2023	10/07/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 20:10 UTC to 22:30 UTC and from 23:20 UTC to 23:40 UTC; and (2) LPV service coverage in Canada from 21:15 UTC to 21:30 UTC and from 21:55 UTC to 22:25 UTC. Please see plot(s): LPV_10/7/2023 LPV200_10/7/2023 Cov_vs_Time_Canada_10/7/2023
10/08/2023	10/08/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 00:20 UTC to 04:00 UTC. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 01:50 UTC to 02:40 UTC; (2) LPV service coverage in Canada from 00:55 UTC to 01:20 UTC and from 02:15 UTC to 03:00 UTC. Please see plot(s): LPV_10/8/2023 LPV200_10/8/2023 Cov_vs_Time_Alaska_10/8/2023 Cov_vs_Time_Canada_10/8/2023
10/09/2023	10/09/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 12:50 UTC to 13:15 UTC, 16:00 UTC to 16:30 UTC, and from 17:25 UTC to 19:05 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 07:10 UTC to 07:20 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 service coverage in Alaska from 12:55 UTC to 13:45 UTC;. Please see plot(s): LPV_10/9/2023 LPV200_10/9/2023 Cov_vs_Time_Alaska_10/9/2023 Cov_vs_Time_Canada_10/9/2023
10/10/2023	10/10/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:10 UTC to 22:30 UTC and from 20:40 UTC to 20:50 UTC. Please see plot(s): LPV200_10/10/2023 Cov_vs_Time_Canada_10/10/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
10/11/2023	10/11/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 1.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 20:50 UTC to 21:20 UTC and from 20:40 UTC to 20:50 UTC; and (2) LPV service coverage in Canada from 21:35 UTC to 22:40 UTC. Please see plot(s): LPV_10/11/2023 LPV200_10/11/2023 Cov_vs_Time_Canada_10/11/2023
10/13/2023	10/13/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 09:10 UTC to 20:00 UTC and from 23:10 UTC to 23:25 UTC; and (2) LPV service coverage in Canada from 16:35 UTC to 19:40 UTC. The elevated GIVE values also resulted in moderate degradation of LPV200 service coverage in Alaska from 08:50 UTC to 10:20 UTC. Please see plot(s): LPV_10/13/2023 LPV200_10/13/2023 Cov_vs_Time_Alaska_10/13/2023 Cov_vs_Time_Canada_10/13/2023
10/14/2023	10/14/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 16:55 UTC to 17:10 UTC, 19:05 UTC to 20:00 UTC, 20:25 UTC to 20:55 UTC, and from 21:25 UTC to 22:45 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 21:50 UTC to 22:35 UTC. Please see plot(s): LPV_10/14/2023 LPV200_10/14/2023 Cov_vs_Time_Canada_10/14/2023
10/17/2023	11/01/2023		None	GEO 135 (G30) entered Test Mode for a Field test on October 17th, 2023. During this time both GUS went offline for hardware and software upgrades. The test was concluded on November 1st, 2023 at 19:40 UTC. The GUS were restored to CY23 and GEO 135 returned to NORMAL.
10/18/2023	10/19/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 11:30 UTC on 10/18 to 13:15 UTC on 10/18 and from 14:35 UTC on 10/18 to 03:15 UTC on 10/19; (2) LPV service coverage in Canada from 15:55 UTC on 10/18 to 02:25 UTC on 10/19. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 coverage in Alaska from 11:25 UTC on 10/18 to 14:05 UTC on 10/18, 15:15 UTC on 10/18 to 16:50 UTC on 10/18, 18:20 UTC on 10/18 to 19:10 UTC on 10/18, and from 21:10 UTC on 10/18 to 02:45 on 10/19; (2) LPV service coverage in

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Alaska from 21:55 UTC on 10/18 to 01:35 UTC on 10/19. Please see plot(s): LPV_10/18/2023 LPV200_10/18/2023 Cov_vs_Time_Alaska_10/18/2023 Cov_vs_Time_Canada_10/18/2023 LPV_10/19/2023 LPV200_10/19/2023 Cov_vs_Time_Alaska_10/19/2023 Cov_vs_Time_Canada_10/19/2023
10/19/2023	10/19/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	None, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:05 UTC to 15:55 UTC and from 16:25 UTC to 18:05 UTC. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in CONUS (FL panhandle) from 00:10 UTC to 00:50 UTC; and (2) LPV200 service coverage in Alaska from 18:15 UTC to 19:05 UTC; Please see plot(s): LPV_10/19/2023 LPV200_10/19/2023 Cov_vs_Time_Canada_10/19/2023 Cov_vs_Time_Conus_10/19/2023
10/20/2023	10/21/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 22:15 UTC on 10/20 to 02:45 UTC on 10/21; (2) LPV200 service coverage in Canada from 18:40 UTC on 10/20 to 02:45 UTC on 10/21; (3) LPV service coverage in Canada from 20:50 UTC on 10/20 to 02:40 UTC on 10/21. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in CONUS from 00:25 UTC on 10/20 to 00:45 on 10/20; (2) LPV200 service coverage in Alaska from 22:20 UTC on 10/20 to 02:45 UTC on 10/21; and (3) LPV service coverage in Alaska from 23:15 UTC on 10/20 to 02:45 UTC on 10/21; Please see plot(s): LPV_10/20/2023 LPV200_10/20/2023 Cov_vs_Time_Alaska_10/20/2023 Cov_vs_Time_Canada_10/20/2023
10/21/2023	10/21/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV200_Alaska	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 19:15 UTC to 19:25 UTC.
10/22/2023	10/22/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 1.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 19:05 UTC to 19:15 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 service coverage in CONUS (FL) from 00:15 UTC to 00:30 UTC. Please see plot(s): LPV200_10/24/2023 Cov_vs_Time_Canada_10/24/2023 Cov_vs_Time_Conus_10/24/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
10/24/2023	10/24/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 1.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 21:05 UTC to 21:30 UTC. Please see plot(s): LPV200_10/25/2023 Cov_vs_Time_Canada_10/25/2023
10/25/2023	10/25/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 4.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 10:05 UTC to 10:50 UTC and from 11:50 UTC to 16:10 UTC; and (2) LPV200 service coverage Canada from 13:15 UTC to 15:55 UTC and from 20:55 UTC to 22:55 UTC. The elevated GIVE values also resulted in moderate degradation of: (1) LPV service coverage in Alaska from 14:05 UTC to 14:40 UTC; and (2) LPV service coverage in Canada from 13:50 UTC to 14:20 UTC. Please see plot(s): LPV_10/26/2023 LPV200_10/26/2023 Cov_vs_Time_Alaska_10/26/2023 Cov_vs_Time_Canada_10/26/2023
10/26/2023	10/26/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in CONUS (FL) from 23:35 UTC to 23:59 UTC. Please see plot(s): LPV200_10/27/2023 Cov_vs_Time_Conus_10/27/2023
10/27/2023	10/27/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:05 UTC on 10/28 to 19:00 UTC on 10/28 and from 23:35 UTC on 10/28 to 01:50 UTC on 10/29. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in CONUS (FL) from 23:20 UTC on 10/28 to 00:10 UTC on 10/29; and (2) LPV service coverage in Canada from 15:35 UTC on 10/28 to 16:45 UTC on 10/28. Please see plot(s): LPV_10/28/2023 LPV200_10/28/2023 Cov_vs_Time_Canada_10/28/2023 Cov_vs_Time_Conus_10/28/2023
10/28/2023	10/28/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 4.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:35 UTC to 16:05 UTC, 18:35 UTC to 21:30 UTC, and from 22:00 UTC to 23:00 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 18:50 UTC to 18:55 UTC. Please see plot(s): LPV_10/29/2023 LPV200_10/29/2023 Cov_vs_Time_Canada_10/29/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
10/29/2023	10/29/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 22:15 UTC on 10/20 to 02:45 UTC on 10/21; (2) LPV200 service coverage in Canada from 18:40 UTC on 10/20 to 02:45 UTC on 10/21; (3) LPV service coverage in Canada from 20:50 UTC on 10/20 to 02:40 UTC on 10/21. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in CONUS from 00:25 UTC on 10/20 to 00:45 on 10/20; (2) LPV200 service coverage in Alaska from 22:20 UTC on 10/20 to 02:45 UTC on 10/21; and (3) LPV service coverage in Alaska from 23:15 UTC on 10/20 to 02:45 UTC on 10/21; Please see plot(s): LPV_10/20/2023 LPV200_10/20/2023 Cov_vs_Time_Alaska_10/20/2023 Cov_vs_Time_Canada_10/20/2023
10/30/2023	10/30/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:20 UTC to 21:40 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 20:50 UTC to 21:00 UTC. Please see plot(s): LPV_10/30/2023 LPV200_10/30/2023 Cov_vs_Time_Canada_10/30/2023
10/31/2023	10/31/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:05 UTC to 20:50 UTC. Please see plot(s): LPV200_10/31/2023 Cov_vs_Time_Canada_10/31/2023
11/01/2023	11/01/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in CONUS (AZ, NM) from 09:05 UTC to 09:20 UTC and from 23:15 UTC to 23:55 UTC; and (2) LPV200 service coverage in Canada from 20:35 UTC to 21:30 UTC. The elevated GIVE values also resulted in minor degradation of LPV service coverage in Canada from 20:50 UTC to 21:10 UTC. Please see plot(s): LPV_11/1/2023 LPV200_11/1/2023 Cov_vs_Time_Canada_11/1/2023 Cov_vs_Time_Conus_11/1/2023
11/02/2023	11/02/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 1.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 01:00 UTC to 01:15 UTC, 17:30 UTC to 17:45 UTC,

Start Date	End Date	Location Satellite	Service Affected	Event Description
				20:10 UTC to 21:00 UTC, and from 23:10 UTC to 23:15 UTC. Please see plot(s): LPV200_11/2/2023 Cov_vs_Time_Canada_11/2/2023
11/04/2023	11/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 4.67) caused by a G3 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 20:20 UTC on 11/4 to 22:10 UTC on 11/4; (2) LPV service coverage in CONUS from 20:30 UTC on 11/4 to 22:10 UTC on 11/4; (3) LPV200 service coverage in Alaska from 20:10 UTC on 11/4 to 02:10 UTC on 11/5; (4) LPV service coverage in Alaska from 20:20 UTC on 11/4 to 01:45 UTC on 11/5; (5) LPV200 service coverage 17:40 UTC on 11/4 to 04:20 UTC on 11/5; and (6) LPV service coverage in Canada from 18:05 UTC on 11/4 to 03:00 UTC on 11/5. Please see plot(s): LPV_11/4/2023 LPV200_11/4/2023 Cov_vs_Time_Alaska_11/4/2023 Cov_vs_Time_Canada_11/4/2023 Cov_vs_Time_Conus_11/4/2023 LPV_11/5/2023 LPV200_11/5/2023 Cov_vs_Time_Alaska_11/5/2023 Cov_vs_Time_Canada_11/5/2023 Cov_vs_Time_Conus_11/5/2023
11/05/2023	11/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 7) caused by a G3 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 16:45 UTC to 23:15 UTC; (2) LPV service coverage in CONUS from 16:55 UTC to 22:40 UTC; (3) LPV200 service coverage in Alaska from 10:00 UTC to 18:40 UTC; (4) LPV service coverage in Alaska from 11:00 UTC to 18:20 UTC; (5) LPV200 service coverage in Canada from 09:45 UTC to 23:20 UTC; and (6) LPV service coverage in Canada from 10:50 UTC to 23:20 UTC. Please see plot(s): LPV_11/5/2023 LPV200_11/5/2023 Cov_vs_Time_Alaska_11/5/2023 Cov_vs_Time_Canada_11/5/2023 Cov_vs_Time_Conus_11/5/2023
11/06/2023	11/06/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 5.67) caused by a G3 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 21:25 UTC on 11/6 to 03:20 UTC on 11/7; (2) LPV200 service coverage in Canada from 17:20 UTC on 11/6 to 02:25 UTC on 11/7; and (3) LPV service coverage in Canada from 19:10 UTC on 11/6 to 01:20 UTC on 11/7. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Alaska from 21:40 UTC on 11/6 to 01:20 UTC on 11/7.

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Please see plot(s): LPV_11/6/2023 LPV200_11/6/2023 Cov_vs_Time_Alaska_11/6/2023 Cov_vs_Time_Canada_11/6/2023
11/07/2023	11/07/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 4.67) caused by a G2 Geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 17:05 UTC to 23:10 UTC; and (2) LPV service coverage in Canada from 01:25 UTC to 02:25 UTC, 17:20 UTC to 19:20 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Alaska from 01:25 UTC to 02:25 UTC. Please see plot(s): LPV_11/7/2023 LPV200_11/7/2023 Cov_vs_Time_Alaska_11/7/2023 Cov_vs_Time_Canada_11/7/2023
11/08/2023	11/09/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2.33) caused by a G2 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 18:40 UTC on 11/8 to 01:35 UTC on 11/9. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 20:05 UTC to 20:40 UTC and from 22:45 UTC to 23:00 UTC on 11/8. Please see plot(s): LPV_11/8/2023 LPV200_11/8/2023 Cov_vs_Time_Canada_11/8/2023 LPV_11/9/2023 LPV200_11/9/2023 Cov_vs_Time_Canada_11/9/2023
11/09/2023	11/09/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 3.33) caused by a G2 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 19:30 UTC to the end of the day. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 21:00 UTC to 21:45 UTC and from 22:15 UTC to 22:55 UTC. Please see plot(s): LPV_11/9/2023 LPV200_11/9/2023 Cov_vs_Time_Canada_11/9/2023
11/10/2023	11/10/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 01:35 UTC to 01:45 UTC. Please see plot(s): LPV200_11/10/2023 Cov_vs_Time_Canada_11/10/2023
11/12/2023	11/12/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 08:10 UTC to 08:20 UTC. Please see plot(s): LPV200_11/12/2023 Cov_vs_Time_Canada_11/12/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
11/13/2023	11/13/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 00:10 UTC to 00:30 UTC, 01:15 UTC to 01:35 UTC, and from 04:40 UTC to 05:10 UTC. Please see plot(s): LPV200_11/13/2023 Cov_vs_Time_Canada_11/13/2023
11/14/2023	11/14/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 17:35 UTC to 17:55 UTC, 18:20 UTC to 18:35 UTC, and from 19:15 UTC to 20:20 UTC. Please see plot(s): LPV200_11/14/2023 Cov_vs_Time_Canada_11/14/2023
11/21/2023	11/22/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:30 UTC on 11/21 to 17:25 UTC on 11/21 and from 21:30 UTC to 22:25 UTC on 11/21 and from 22:45 UTC on 11/21 to 02:45 UTC on 11/22. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 16:05 UTC on 11/21 to 17:25 UTC on 11/21. Please see plot(s): LPV_11/21/2023 LPV200_11/21/2023 Cov_vs_Time_Canada_11/21/2023 LPV_11/22/2023 LPV200_11/22/2023 Cov_vs_Time_Canada_11/22/2023
11/22/2023	11/22/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:20 UTC to 22:25 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada 01:35 UTC to 01:55 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 service coverage in Alaska from 00:50 UTC to 01:10 UTC. Please see plot(s): LPV_11/22/2023 LPV200_11/22/2023 Cov_vs_Time_Alaska_11/22/2023 Cov_vs_Time_Canada_11/22/2023
11/25/2023	11/26/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 6) caused by a G2 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 17:50 UTC on 11/25 to 23:30 UTC on 11/25; (2) LPV service coverage in CONUS from 18:15 UTC on 11/25 to 23:30 UTC on 11/25; (3) LPV200 service coverage in Alaska from 19:30 UTC on 11/25 to 23:40 UTC on 11/25; (4) LPV service coverage in Alaska from 19:45 UTC on 11/25 to 23:20 UTC on 11/25; (5)

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200 service coverage in Canada from 15:55 UTC on 11/25 to 00:10 UTC on 11/26; and (6) LPV service coverage in Canada from 16:30 UTC on 11/25 to 23:45 UTC on 11/25. Please see plot(s): LPV_11/25/2023 LPV200_11/25/2023 Cov_vs_Time_Alaska_11/25/2023 Cov_vs_Time_Canada_11/25/2023 Cov_vs_Time_Conus_11/25/2023 LPV200_11/26/2023 Cov_vs_Time_Canada_11/26/2023
11/26/2023	11/26/2023	PRN131, PRN133, PRN135	None	There was a power outage at Oklahoma City as well as an FAA network outage. As a result, maneuvers could not be entered. As a result, all three GEOs had missed maneuvers this day. GEO 131 alerted to DNU from 21:15:07 UTC to 21:55:10 UTC. GEO 133 went to Not Monitored from 00:34:53 UTC to 01:0412 UTC. GEO 135 alerted to DNU from 16:10:07 UTC to 16:55:10 UTC. There was no impact on coverage.
11/27/2023	11/27/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 16:45 UTC to 17:45 UTC, from 18:20 UTC to 18:40 UTC, and from 20:00 UTC to 22:10 UTC; and (2) LPV service coverage from 21:30 UTC to 21:50 UTC. Please see plot(s): LPV_11/27/2023 LPV200_11/27/2023 Cov_vs_Time_Canada_11/27/2023
11/28/2023	11/28/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 16:25 UTC to 22:50 UTC; and (2) LPV service coverage in Canada from 16:45 UTC to 19:25 UTC and from 21:15 UTC to 21:55 UTC. Please see plot(s): LPV_11/28/2023 LPV200_11/28/2023 Cov_vs_Time_Canada_11/28/2023
12/01/2023	12/02/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 5.33) caused by a G3 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 20:50 UTC to 22:00 UTC on 12/1; (2) LPV200 service coverage in Alaska from 12:00 UTC to 16:25 UTC on 12/1 and from 23:50 UTC on 12/1 to 04:45 UTC on 12/2; (3) LPV200 service coverage in Canada from 10:00 UTC on 12/01 to 02:25 UTC on 12/02; (4) LPV service coverage in CONUS from 21:15 UTC to 22:00 on 12/1; (5) LPV service coverage in Alaska from 12:25 UTC to 16:10 UTC on 12/1; and (6) LPV service coverage in Canada from

Start Date	End Date	Location Satellite	Service Affected	Event Description
				12:25 UTC to 16:15 UTC on 12/1, from 18:10 UTC to 20:00 UTC on 12/1, and from 23:50 UTC on 12/1 to 02:25 UTC on 12/2. Please see plot(s): LPV_12/1/2023 LPV200_12/1/2023 Cov_vs_Time_Alaska_12/1/2023 Cov_vs_Time_Canada_12/1/2023 Cov_vs_Time_Conus_12/1/2023 LPV_12/2/2023 LPV200_12/2/2023 Cov_vs_Time_Alaska_12/2/2023 Cov_vs_Time_Canada_12/2/2023 Cov_vs_Time_Conus_12/2/2023
12/04/2023	12/04/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:10 UTC to 20:45 UTC. Please see plot(s): LPV200_12/4/2023 Cov_vs_Time_Canada_12/4/2023
12/05/2023	12/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 15:10 UTC to 16:40 UTC. Please see plot(s): LPV200_12/5/2023 Cov_vs_Time_Canada_12/5/2023
12/06/2023	12/06/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada from 16:35 UTC to 16:50 UTC. Please see plot(s): LPV200_12/6/2023 Cov_vs_Time_Canada_12/6/2023
12/07/2023	12/07/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 22:10 UTC to 22:25 UTC and from 23:05 UTC to 23:40 UTC. Please see plot(s): LPV200_12/7/2023 Cov_vs_Time_Canada_12/7/2023
12/08/2023	12/08/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 01:10 UTC to 01:15 UTC, and from 20:00 UTC to 20:30 UTC. Please see plot(s): LPV200_12/8/2023 Cov_vs_Time_Canada_12/8/2023
12/15/2023	12/15/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:20 UTC to 21:30 UTC. Please see plot(s): LPV200_12/15/2023 Cov_vs_Time_Canada_12/15/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
12/16/2023	12/16/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 23:05 UTC to 23:15 UTC. Please see plot(s): LPV200_12/16/2023 Cov_vs_Time_Canada_12/16/2023
12/17/2023	12/17/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 5.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:25 UTC to 15:40 UTC, and from 16:00 UTC to 18:40 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 17:25 UTC to 18:10 UTC. Please see plot(s): LPV200_12/17/2023 Cov_vs_Time_Canada_12/17/2023
12/18/2023	12/18/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 5.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 17:05 UTC to 17:40 UTC, 19:35 UTC to 20:15 UTC, and from 21:50 to 22:00 UTC. Please see plot(s): LPV200_12/18/2023 Cov_vs_Time_Canada_12/18/2023
12/20/2023	12/20/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 15:50 UTC to 17:20 UTC. Please see plot(s): LPV200_12/20/2023 Cov_vs_Time_Canada_12/20/2023
12/21/2023	12/21/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 19:35 UTC to 20:20 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 19:45 UTC to 19:55 UTC. Please see plot(s): LPV_12/21/2023 LPV200_12/21/2023 Cov_vs_Time_Canada_12/21/2023
12/23/2023	12/23/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 15:55 UTC to 16:15 UTC. Please see plot(s): LPV200_12/23/2023 Cov_vs_Time_Canada_12/23/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
12/28/2023	12/28/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in CONUS (AZ) from 05:20 UTC to 05:25 UTC. Please see plot(s): LPV200_12/28/2023 Cov_vs_Time_Conus_12/28/2023
12/29/2023	12/29/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:10 UTC to 20:50 UTC, 20:55 UTC to 21:05 UTC, and from 21:35 UTC to 21:50 UTC. Please see plot(s): LPV200_12/29/2023 Cov_vs_Time_Canada_12/29/2023
12/30/2023	12/30/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 19:15 UTC to 19:50 UTC, and from 22:20 UTC to 22:55 UTC. Please see plot(s): LPV200_12/30/2023 Cov_vs_Time_Canada_12/30/2023
12/30/2023	1/12/2024	PRN27	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN27 (NANU2023076), which became unusable until further notice at 11:07 on 12/30. This reduction in service only occurs when accompanied by higher IGP GIVEs in the south. The NANU along with geomagnetic activity resulted in minor degradation of LPV200 service coverage in CONUS (AZ, NM, TX, FL) from 10:30 UTC to 11:00 UTC. Please see plot(s): LPV200_12/31/2023 Cov_vs_Time_Conus_12/31/2023
12/31/2023	12/31/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 1.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 17:50 UTC to 18:30 UTC, and from 19:00 UTC to 20:45 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 19:20 UTC to 20:05 UTC. Please see plot(s): LPV_12/31/2023 LPV200_12/31/2023 Cov_vs_Time_Canada_12/31/2023

Table 1-6 WAAS Upgrades

Start Date	End Date	Location Satellite	Event Description
N/A	N/A	N/A	N/A

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
10/03/2023	10/03/2023	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 07:00:47 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 198065-198069
10/19/2023	10/19/2023	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 18:32:39 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 412377-412381
10/19/2023	10/19/2023	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 16:43:37 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 405835-405839
10/23/2023	10/23/2023	Manual	GEO133, South Mountain (CM1)	None	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 19:47:50 UTC. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 157688-157693
10/24/2023	10/24/2023	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 23:06:50 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 256028-256033
11/13/2023	11/13/2023	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 07:11:23 UTC. This

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
					caused a 3-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 112301-112305
11/16/2023	11/16/2023	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 05:00:50 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 363668-363672
11/17/2023	11/17/2023	Manual	GEO133, South Mountain (CM1)	None	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 16:03:41 UTC. This caused a 3-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 489839-489843
11/28/2023	11/28/2023	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 06:54:57 UTC. This caused a 3-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 197715-197719
12/07/2023	12/07/2023	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 05:00:50 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 370905-370909
12/11/2023	12/11/2023	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 07:34:42 UTC. This caused a 3-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 113700-113704
12/27/2023	12/27/2023	Missed Navigation Message	GEO131, Santa_Paula (SZ1), Washington, DC (CnV)		Santa_Paula had CnV Source Select from Washington, DC to Atlanta. TOW 305854-305856

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 SM9, S15, and G30.

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, S15, and G30.

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. Asterisks denote that SPS accuracy is not computed for those receivers. 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 1.399 meters observed at Oklahoma City.
- The maximum 95% CONUS vertical LPV error was 2.003 meters observed at Miami.
- The minimum 95% CONUS horizontal LPV errors was 0.614 meters observed at Dallas.
- The minimum 95% CONUS vertical LPV error was 0.918 meters observed at Denver.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40 m) (m)	Horizontal (HAL=556 m) (m)	Vertical (VAL=50 m) (m)	Percentage in PA Mode (%)	SPS Accuracy	
					95% Horizontal (m)	95% Vertical (m)
Atlantic City	1.219	1.225	1.764	99.999	*	*
Oklahoma City	1.399	1.407	1.451	100	*	*
Elko	1.271	1.273	1.478	100	*	*
Grand Forks	1.198	1.198	1.593	100	*	*
Albuquerque	0.719	0.723	1.062	100	2.04	6
Anchorage	0.717	0.722	1.365	100	2.56	8.01
Atlanta	0.916	0.917	1.393	100	2.20	5.40
Barrow	0.879	0.893	1.896	100	3.02	8.83
Bethel	0.668	0.673	1.530	100	2.46	8.71
Billings	0.677	0.680	1.098	100	1.97	5.59
Boston	0.738	0.744	1.080	100	2.68	5.31
Chicago	0.795	0.799	1.034	100	*	*
Cleveland	0.726	0.731	1.096	100	2.32	5.03
Cold Bay	0.808	0.810	1.333	100	2.30	8.11
Dallas	0.614	0.616	1.454	100	*	*
Denver	0.637	0.641	0.918	100	*	*
Fairbanks	0.792	0.799	1.653	100	2.73	8.03
Gander	0.915	0.940	1.238	99.999	2.83	5.20
Goose Bay	1.001	1.046	1.372	100	*	*
Houston	0.639	0.640	1.765	100	2.21	5.65
Iqaluit	1.621	1.683	2.458	100	*	*
Jacksonville	0.701	0.701	1.714	100	*	*
Juneau	0.876	0.885	1.313	100	2.51	6.83
Kansas City	0.644	0.648	1.074	100	2.01	5.31
Kotzebue	0.791	0.797	1.704	100	2.72	8.78
Los Angeles	0.788	0.793	1.360	100	2.38	6.75
Memphis	0.633	0.637	1.309	100	*	*
Merida	0.983	0.984	2.254	100	*	*
Mexico City	1.140	1.147	2.064	99.998	*	*
Miami	0.945	0.945	2.003	100	2.78	5.72
Minneapolis	0.774	0.781	1.020	100	2.13	5.05
New York	0.794	0.797	1.156	100	*	*
Oakland	0.842	0.847	1.286	100	2.40	6.67
Puerto Vallarta	1.122	1.128	1.885	100	*	*
Salt Lake City	0.621	0.624	0.951	100	1.97	5.83
San Jose Del Cabo	0.970	0.972	2.017	99.996	4.43	6.87

Location	Horizontal (HAL=40 m) (m)	Horizontal (HAL=556 m) (m)	Vertical (VAL=50 m) (m)	Percentage in PA Mode (%)	SPS Accuracy	
					95% Horizontal (m)	95% Vertical (m)
Seattle	0.768	0.772	1.070	100	2.09	5.96
Washington, DC	0.804	0.808	1.146	100	2.56	5.26
Winnipeg	0.730	0.745	1.188	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 9.765 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 25.091 meters observed at San Juan.
- The minimum 95% horizontal error was 1.448 meters observed at Salt Lake City.
- The minimum 99.999% horizontal error was 4.851 meters observed at Bethel.

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

Location	95% Horizontal (m)	99.999% Horizontal (m)	Percentage in NPA Mode (%)	Maximum Horizontal Error (m)
Albuquerque	1.458	13.981	100	14.430
Anchorage	2.404	5.297	100	5.445
Atlanta	1.681	8.102	100	8.224
Barrow	2.922	5.817	100	5.922
Bethel	2.270	4.851	100	4.942
Billings	1.602	7.432	100	7.673
Boston	2.111	13.450	100	13.574
Cleveland	1.820	10.320	100	10.539
Cold Bay	1.949	6.296	100	6.537
Fairbanks	2.621	6.359	100	6.501
Gander	2.297	13.918	99.999	14.027
Honolulu	9.765	18.199	100	18.492
Houston	1.553	5.429	100	5.593
Iqaluit	3.756	8.193	100	8.366
Juneau	2.199	5.001	100	5.184
Kansas City	1.580	12.572	100	12.698
Kotzebue	2.667	6.141	100	6.346
Los Angeles	1.766	14.033	100	14.513
Merida	2.014	5.123	100	5.361
Miami	1.987	6.236	100	6.429
Minneapolis	1.861	13.532	100	13.686
Oakland	1.969	11.791	100	12.311

Location	95% Horizontal (m)	99.999% Horizontal (m)	Percentage in NPA Mode (%)	Maximum Horizontal Error (m)
Salt Lake City	1.448	8.860	100	9.115
San Jose Del Cabo	2.582	12.836	100	13.048
San Juan	6.475	25.091	100	27.194
Seattle	1.577	7.300	100	7.454
Tapachula	4.463	18.485	100	18.915
Washington, DC	2.008	7.351	100	7.524

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 5.651 meters occurred at San Jose Del Cabo and maximum vertical LPV error was 11.554 meters occurred at Iqaluit.

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/ HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/ VPL	Vertical Maximum Ratio
Atlantic City	3.417	0.208	0.240	5.500	0.203	0.262
Elko	2.736	0.166	0.227	3.442	0.146	0.207
Grand Forks	2.315	0.159	0.215	4.441	0.208	0.209
Oklahoma City	3.001	0.186	0.242	4.780	0.168	0.206
Albuquerque	2.386	0.198	0.219	6.268	0.163	0.213
Anchorage	2.874	0.156	0.224	6.870	0.200	0.222
Atlanta	2.336	0.195	0.225	3.744	0.197	0.197
Barrow	3.764	0.126	0.165	9.166	0.301	0.301
Bethel	3.021	0.111	0.157	6.989	0.194	0.215
Billings	2.173	0.062	0.211	4.284	0.088	0.194
Boston	4.461	0.127	0.192	6.192	0.166	0.194
Chicago	3.814	0.164	0.219	6.193	0.133	0.214
Cleveland	3.976	0.140	0.204	7.436	0.161	0.245
Cold Bay	2.576	0.071	0.131	3.729	0.154	0.154
Dallas	1.922	0.112	0.187	6.732	0.172	0.225
Denver	3.621	0.211	0.271	4.427	0.141	0.164
Fairbanks	3.062	0.081	0.274	9.550	0.297	0.315
Gander	4.345	0.124	0.153	4.616	0.094	0.150
Goose Bay	4.756	0.136	0.195	6.481	0.234	0.234
Houston	1.840	0.071	0.169	4.815	0.109	0.193
Iqaluit	4.430	0.181	0.211	11.554	0.292	0.293

Location	Horizontal Error (m)	Horizontal Error/ HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/ VPL	Vertical Maximum Ratio
Jacksonville	1.762	0.115	0.142	5.534	0.123	0.198
Juneau	3.387	0.237	0.237	7.281	0.169	0.252
Kansas City	2.596	0.195	0.263	4.947	0.107	0.187
Kotzebue	2.979	0.172	0.191	7.327	0.188	0.248
Los Angeles	3.773	0.243	0.247	3.838	0.104	0.181
Memphis	2.631	0.070	0.158	4.080	0.227	0.227
Merida	3.411	0.254	0.254	4.737	0.119	0.188
Mexico City	4.907	0.150	0.225	4.877	0.150	0.157
Miami	2.151	0.178	0.183	4.375	0.193	0.211
Minneapolis	4.749	0.236	0.279	3.878	0.127	0.192
New York	3.367	0.101	0.237	6.137	0.135	0.190
Oakland	3.902	0.108	0.196	2.858	0.123	0.172
Puerto Vallarta	4.319	0.240	0.269	7.423	0.165	0.167
Salt Lake City	3.083	0.187	0.200	2.722	0.147	0.147
San Jose Del Cabo	5.651	0.189	0.210	5.145	0.147	0.161
Seattle	4.918	0.123	0.274	3.749	0.077	0.147
Washington, DC	2.727	0.180	0.217	7.231	0.204	0.216
Winnipeg	4.026	0.223	0.223	6.391	0.167	0.203

Figures 2-1 to 2-3 show the daily LPV 95% horizontal accuracy at the PA evaluation sites, and Figures 2-4 to 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.

- November 5-6, 2023—Position errors in CONUS Alaska, and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 3.083 meters and 4.600 meters at Goose Bay and Iqaluit, respectively. The Kp index was 7.0 and 5.7, respectively.
- November 25, 2023—Position errors in CONUS, Alaska, and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 2.942 meters and 4.526 meters at Seattle and Iqaluit, respectively. The Kp index was 6.0.
- December 1-2, 2023—Position errors in CONUS, Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.197 meters and 4.086 meters at Mexico City and Goose Bay. The Kp index was 7.0 and 5.3, respectively.
- December 17-18, 2023—Position errors in CONUS and Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 1.508 meters and 2.388 meters at Grand Forks and Bethel, respectively. The Kp index was 5.3 and 6.0, respectively.

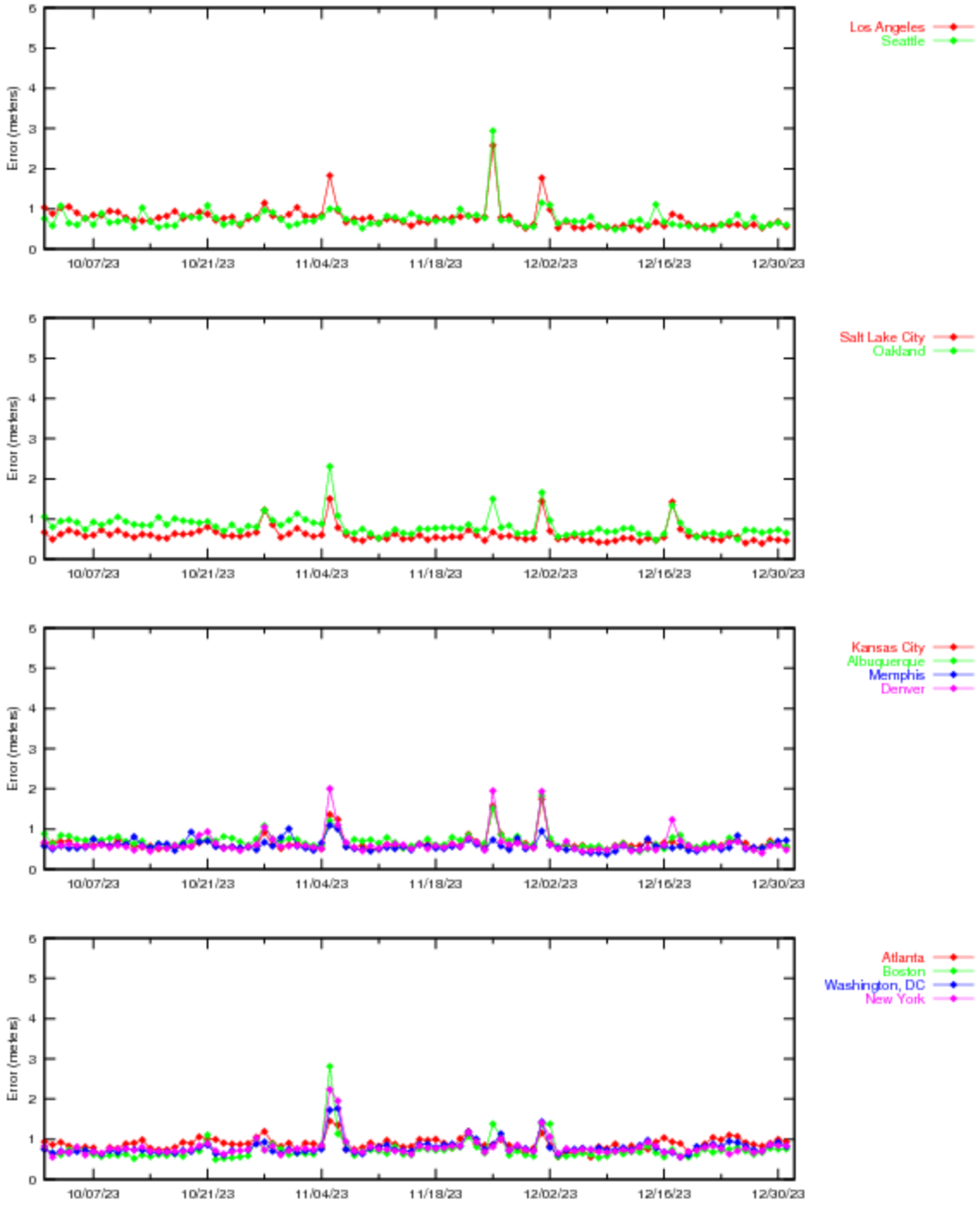

Figure 2-1 LPV 95% Horizontal Accuracy

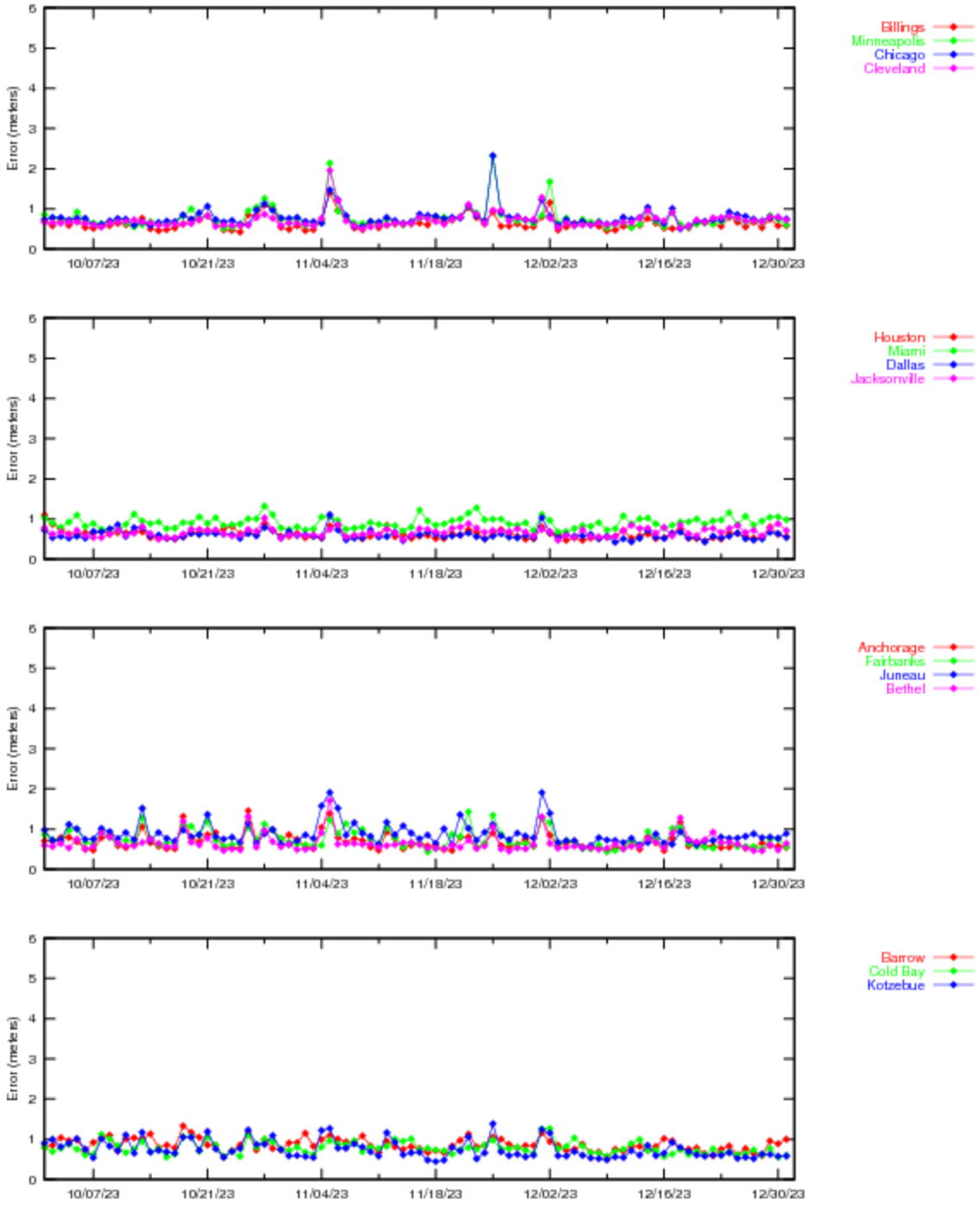

Figure 2-2 LPV 95% Horizontal Accuracy

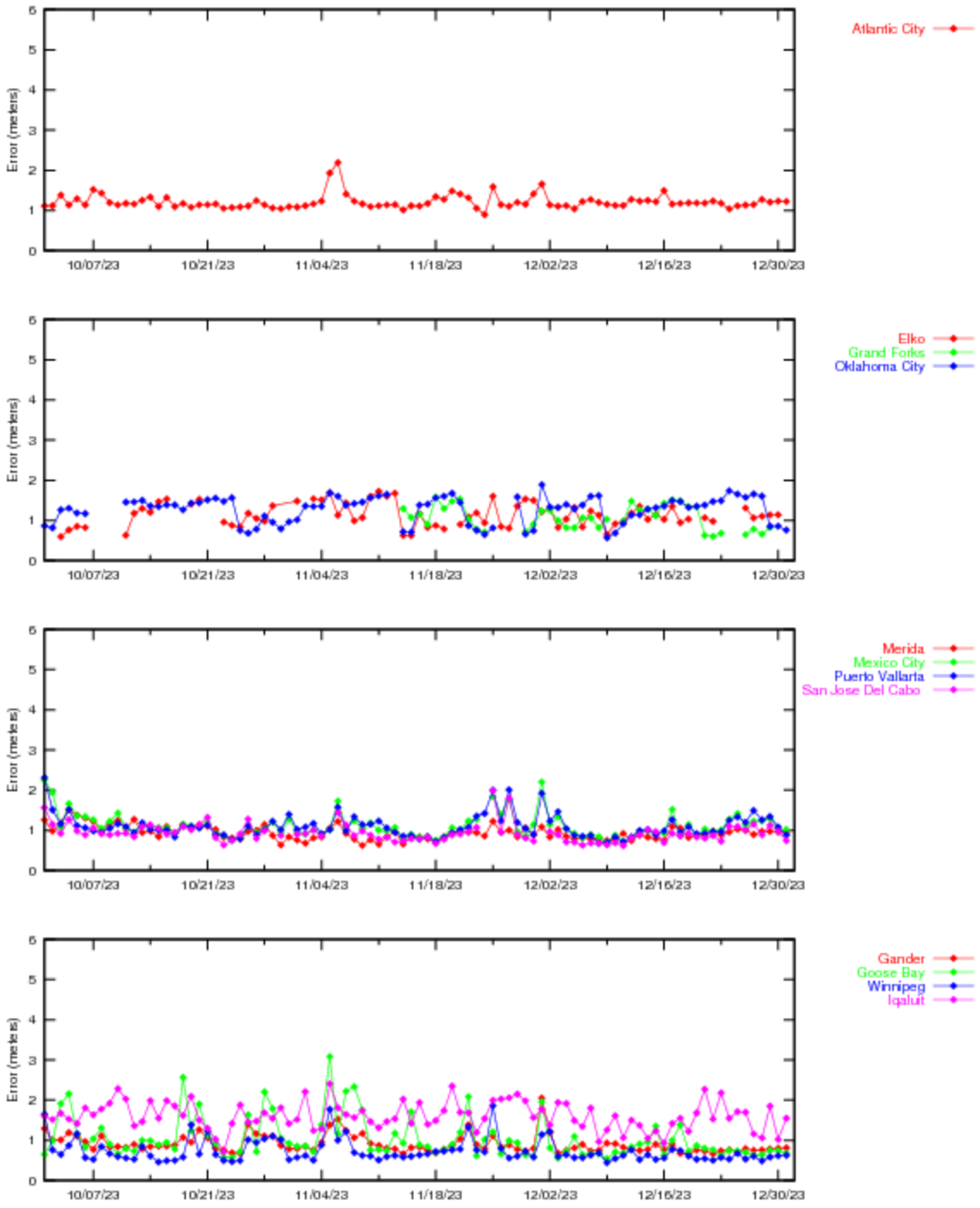

Figure 2-3 LPV 95% Horizontal Accuracy

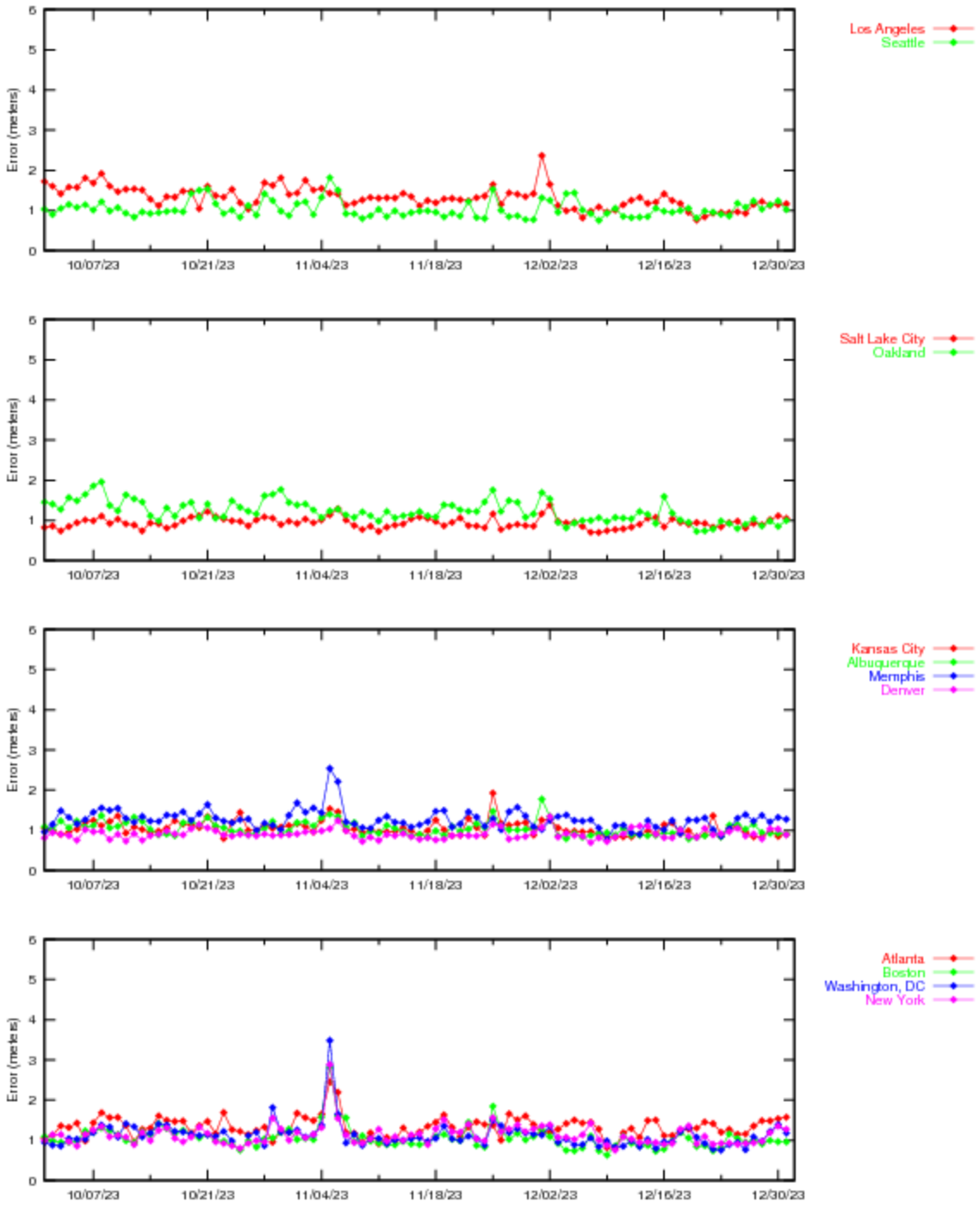

Figure 2-4 LPV 95% Vertical Accuracy

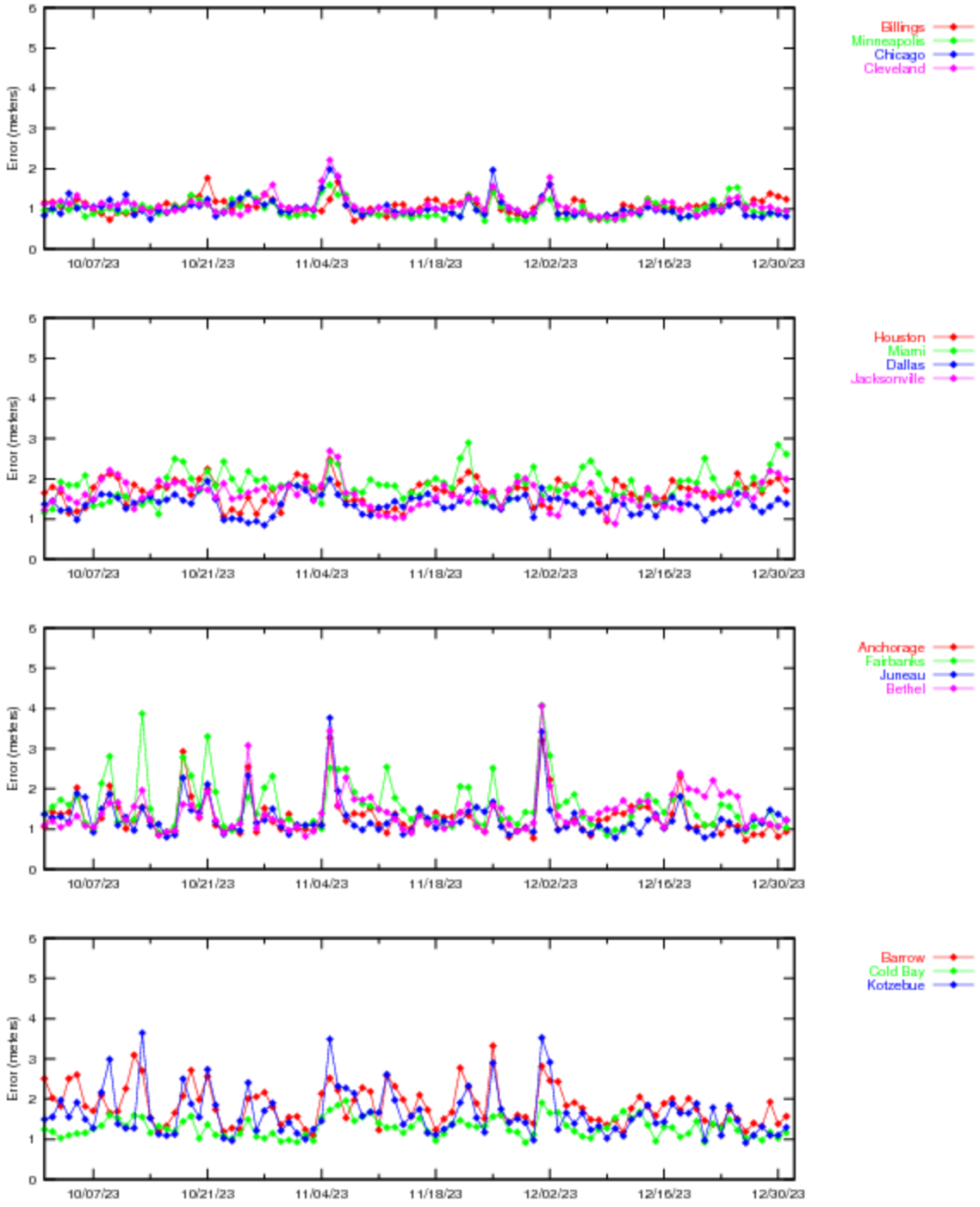

Figure 2-5 LPV 95% Vertical Accuracy

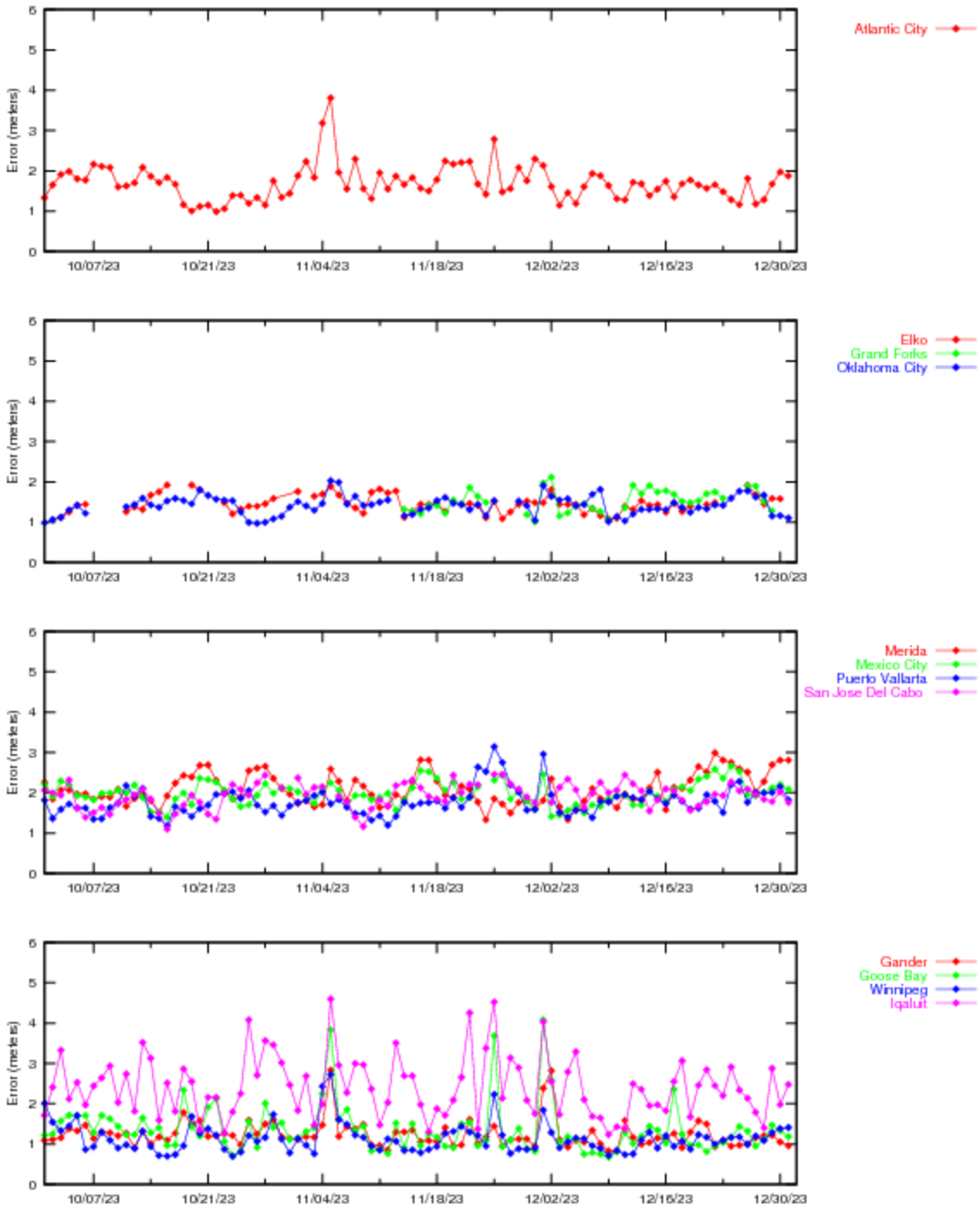

Figure 2-6 LPV 95% Vertical Accuracy

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 November 5, November 25, December 1, and December 17, 2023.

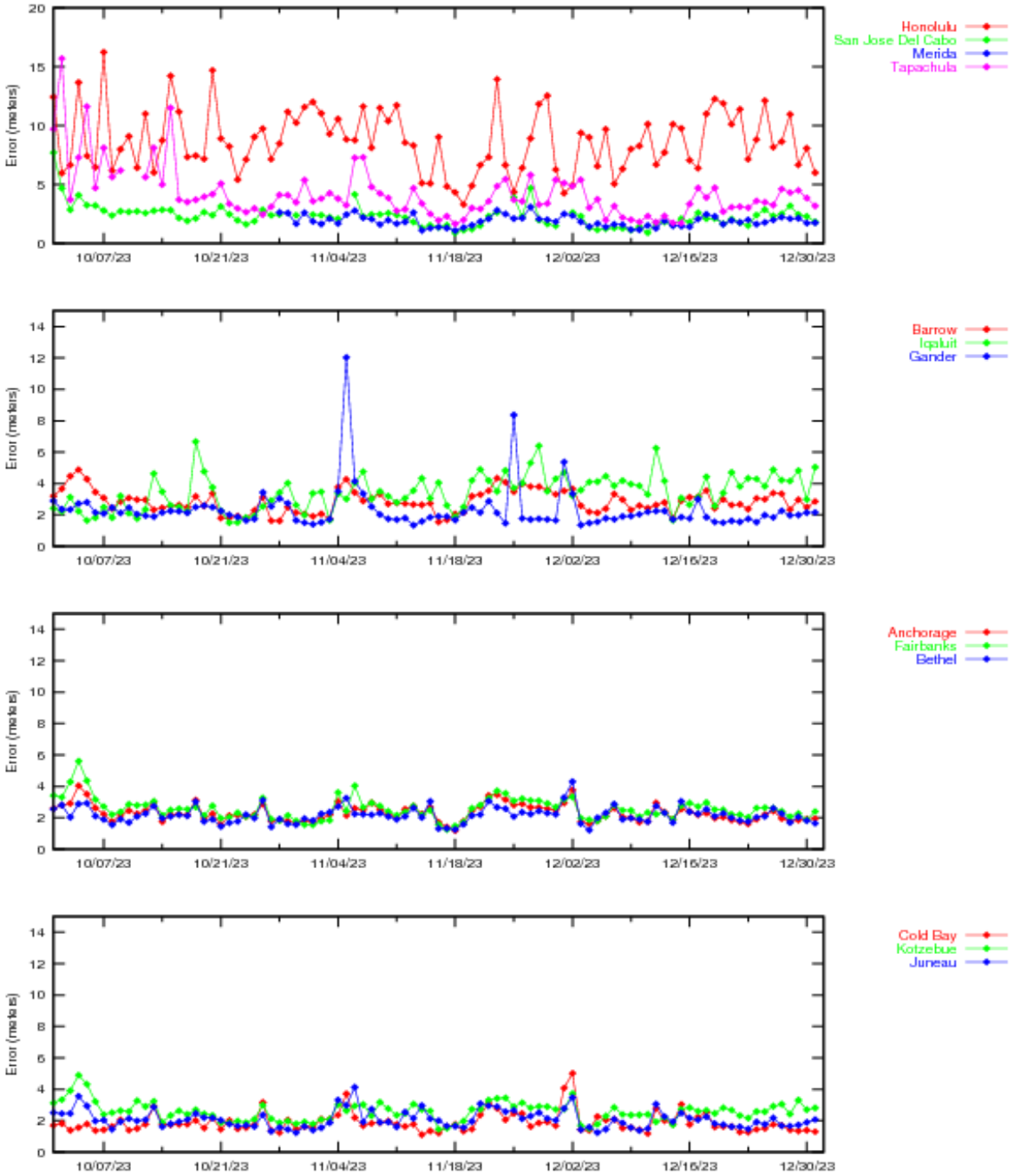

Figure 2-7 NPA 95% Horizontal Accuracy

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 locations 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.

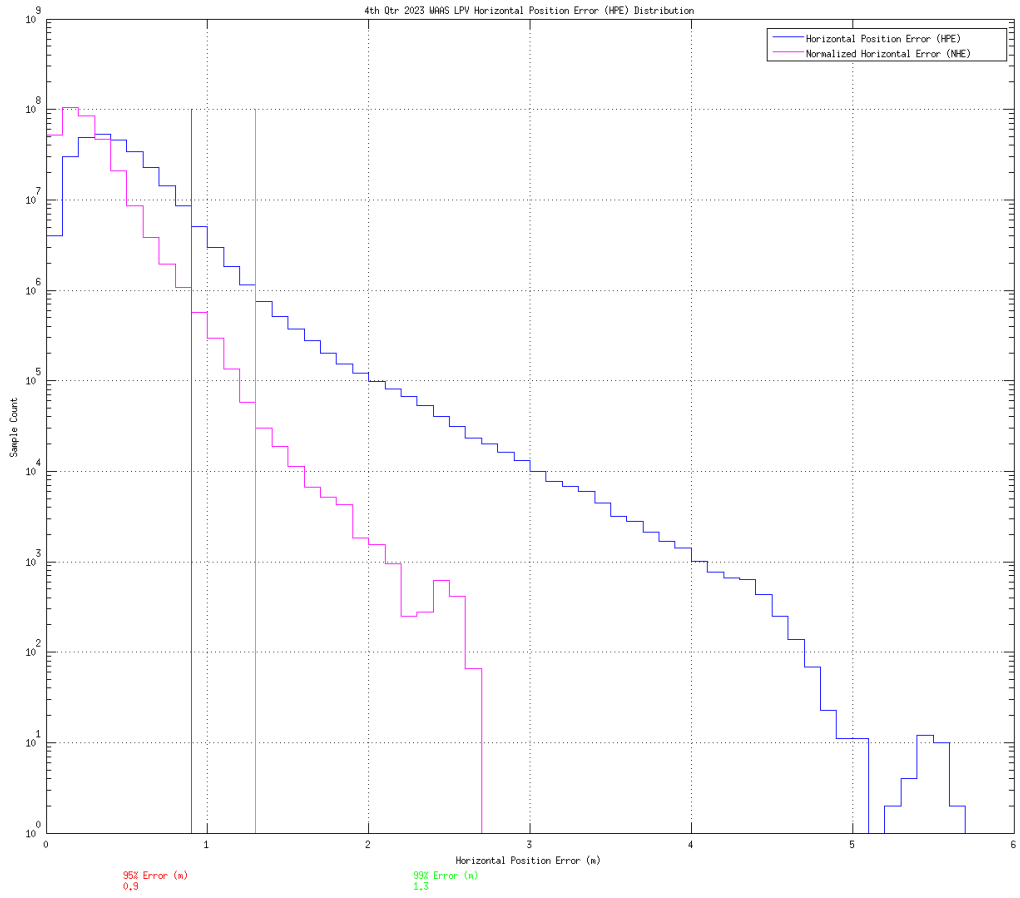

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

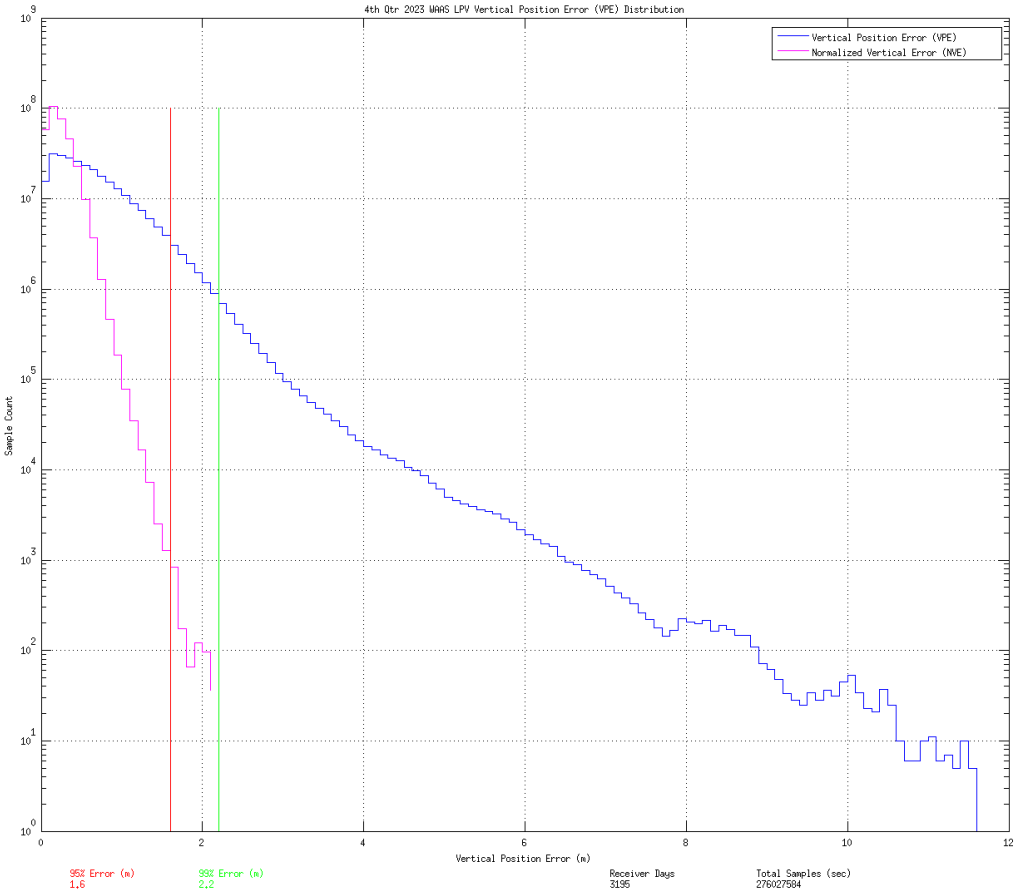

Figure 2-10 LPV Vertical Error Bounding Triangle Chart

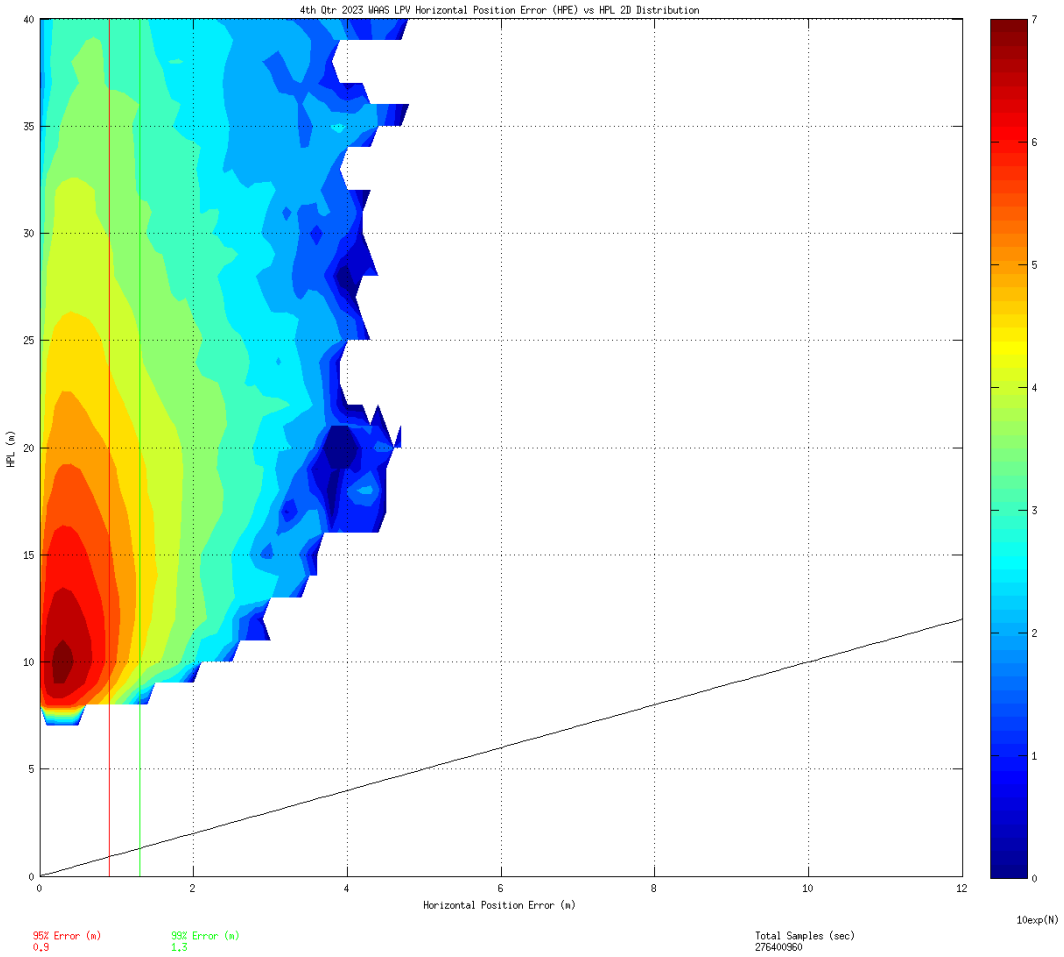

Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

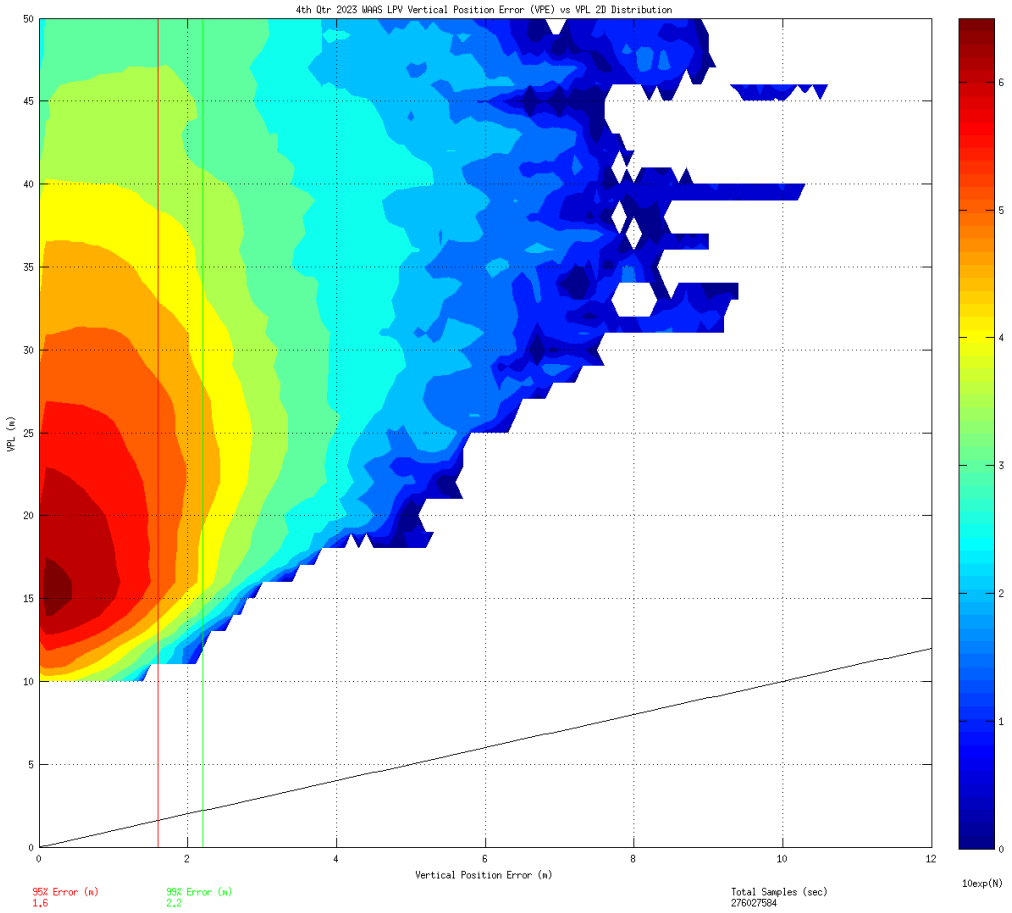

Figure 2-12 LPV 2-D Vertical Error Distribution Histogram

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 19.325 meters observed at Miami.
- The maximum 99% CONUS VPL was 29.326 meters observed at Miami.
- The minimum 99% CONUS HPL was 10.902 meters observed at Denver.
- The minimum 99% CONUS VPL was 19.649 meters observed at Kansas City.
- The maximum 99% Alaska HPL was 27.774 meters observed at Barrow.
- The maximum 99% Alaska VPL was 42.704 meters observed at Barrow.
- The minimum 99% Alaska HPL was 17.807 meters observed at Anchorage.
- The minimum 99% Alaska VPL was 26.230 meters observed at Anchorage.

Table 3-1 99% Protection Level

Location	99% HPL (m)	99% VPL (m)	Percentage in PA Mode (%)
Atlantic City	14.218	24.124	99.999

Location	99% HPL (m)	99% VPL (m)	Percentage in PA Mode (%)
Oklahoma City	13.576	23.702	100
Elko	12.997	22.471	100
Grand Forks	14.205	21.811	100
Albuquerque	12.405	25.299	100
Anchorage	17.807	26.230	100
Atlanta	12.283	22.625	100
Barrow	27.774	42.704	100
Bethel	17.827	27.510	100
Billings	12.348	20.669	100
Boston	15.602	23.716	100
Chicago	12.242	20.880	100
Cleveland	14.116	22.603	100
Cold Bay	20.830	30.598	100
Dallas	11.662	21.360	100
Denver	10.902	22.201	100
Fairbanks	22.807	31.140	100
Gander	37.123	46.607	99.999
Goose Bay	44.739	57.130	100
Houston	12.935	24.364	100
Iqaluit	67.856	98.385	100
Jacksonville	14.474	24.770	100
Juneau	20.975	30.274	100
Kansas City	11.648	19.649	100
Kotzebue	21.864	32.913	100
Los Angeles	13.981	26.766	100
Memphis	11.453	21.303	100
Merida	22.867	38.223	100
Mexico City	31.995	50.944	99.998
Miami	19.325	29.326	100
Minneapolis	12.459	21.015	100
New York	15.020	25.072	100
Oakland	13.715	26.377	100
Puerto Vallarta	34.205	57.015	100
Salt Lake City	11.485	21.361	100
San Jose Del Cabo	28.492	51.705	99.996
Seattle	14.159	22.446	100
Washington, DC	13.177	22.845	100
Winnipeg	15.002	24.360	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 (%)
Atlantic City	99.80	99.80	99.75
Elko	99.84	99.84	99.8
Grand Forks	100	100	100
Oklahoma City	99.82	99.81	99.8
Albuquerque	99.83	99.83	99.82
Anchorage	99.76	99.65	99.36
Atlanta	99.95	99.9	99.85
Barrow	99.27	99.14	98.28
Bethel	99.83	99.74	99.47
Billings	99.85	99.81	99.79
Boston	99.74	99.73	99.67
Chicago	99.83	99.81	99.73
Cleveland	99.79	99.79	99.75
Cold Bay	99.85	99.78	99.41
Dallas	99.84	99.81	99.81
Denver	99.84	99.84	99.83
Fairbanks	99.65	99.44	99.1
Gander	99.04	98.98	98.2
Goose Bay	98.86	98.8	98.17
Houston	99.88	99.87	99.8
Iqaluit	97.72	97.01	91.84
Jacksonville	100	99.99	99.9
Juneau	99.66	99.51	99.16
Kansas City	99.83	99.83	99.83
Kotzebue	99.6	99.51	99.05
Los Angeles	99.85	99.82	99.7
Memphis	99.85	99.84	99.83

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
Merida	99.86	99.82	97.05
Mexico City	99.73	98.57	85.17
Miami	100	100	99.88
Minneapolis	99.79	99.79	99.68
New York	99.78	99.78	99.72
Oakland	99.83	99.82	99.72
Puerto Vallarta	99.62	97.77	83.34
Salt Lake City	99.87	99.85	99.84
San Jose Del Cabo	99.85	98.71	91.77
Seattle	99.87	99.84	99.77
Washington, DC	99.83	99.83	99.79
Winnipeg	99.6	99.52	99.41

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
Atlantic City	3	0.000057	3	0.000057	5	0.000095
Elko	1	0.000024	2	0.000048	3	0.000072
Grand Forks	0	0.000000	0	0.000000	0	0.000000
Oklahoma City	1	0.000021	1	0.000021	1	0.000021
Albuquerque	1	0.000019	1	0.000019	1	0.000019
Anchorage	7	0.000132	10	0.000189	18	0.000342
Atlanta	1	0.000019	1	0.000019	2	0.000038
Barrow	17	0.000323	28	0.000533	66	0.001268
Bethel	5	0.000095	8	0.000151	16	0.000304
Billings	3	0.000057	2	0.000038	3	0.000057
Boston	2	0.000038	2	0.000038	5	0.000095
Chicago	1	0.000019	1	0.000019	3	0.000057
Cleveland	2	0.000038	2	0.000038	3	0.000057
Cold Bay	9	0.000170	8	0.000151	27	0.000513
Dallas	1	0.000019	1	0.000019	1	0.000019
Denver	1	0.000019	1	0.000019	1	0.000019
Fairbanks	15	0.000284	16	0.000304	29	0.000552
Gander	14	0.000267	19	0.000363	82	0.001577
Goose Bay	19	0.000363	18	0.000344	38	0.000731
Houston	1	0.000019	3	0.000057	2	0.000038
Iqaluit	58	0.001121	87	0.001693	244	0.005016
Jacksonville	0	0.000000	1	0.000019	1	0.000019
Juneau	6	0.000114	8	0.000152	20	0.000381

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Kansas City	1	0.000019	1	0.000019	1	0.000019
Kotzebue	11	0.000209	14	0.000266	44	0.000839
Los Angeles	2	0.000038	2	0.000038	5	0.000095
Memphis	1	0.000019	1	0.000019	1	0.000019
Merida	2	0.000038	9	0.000171	336	0.006560
Mexico City	14	0.000270	178	0.003470	905	0.020420
Miami	0	0.000000	0	0.000000	11	0.000208
Minneapolis	2	0.000038	3	0.000057	7	0.000133
New York	2	0.000038	2	0.000038	4	0.000076
Oakland	2	0.000038	2	0.000038	5	0.000095
Puerto Vallarta	22	0.000418	182	0.003520	872	0.019782
Salt Lake City	1	0.000019	1	0.000019	1	0.000019
San Jose Del Cabo	15	0.000308	159	0.003302	498	0.011123
Seattle	4	0.000076	3	0.000057	3	0.000057
Washington, DC	1	0.000019	1	0.000019	2	0.000038
Winnipeg	6	0.000114	5	0.000095	6	0.000114

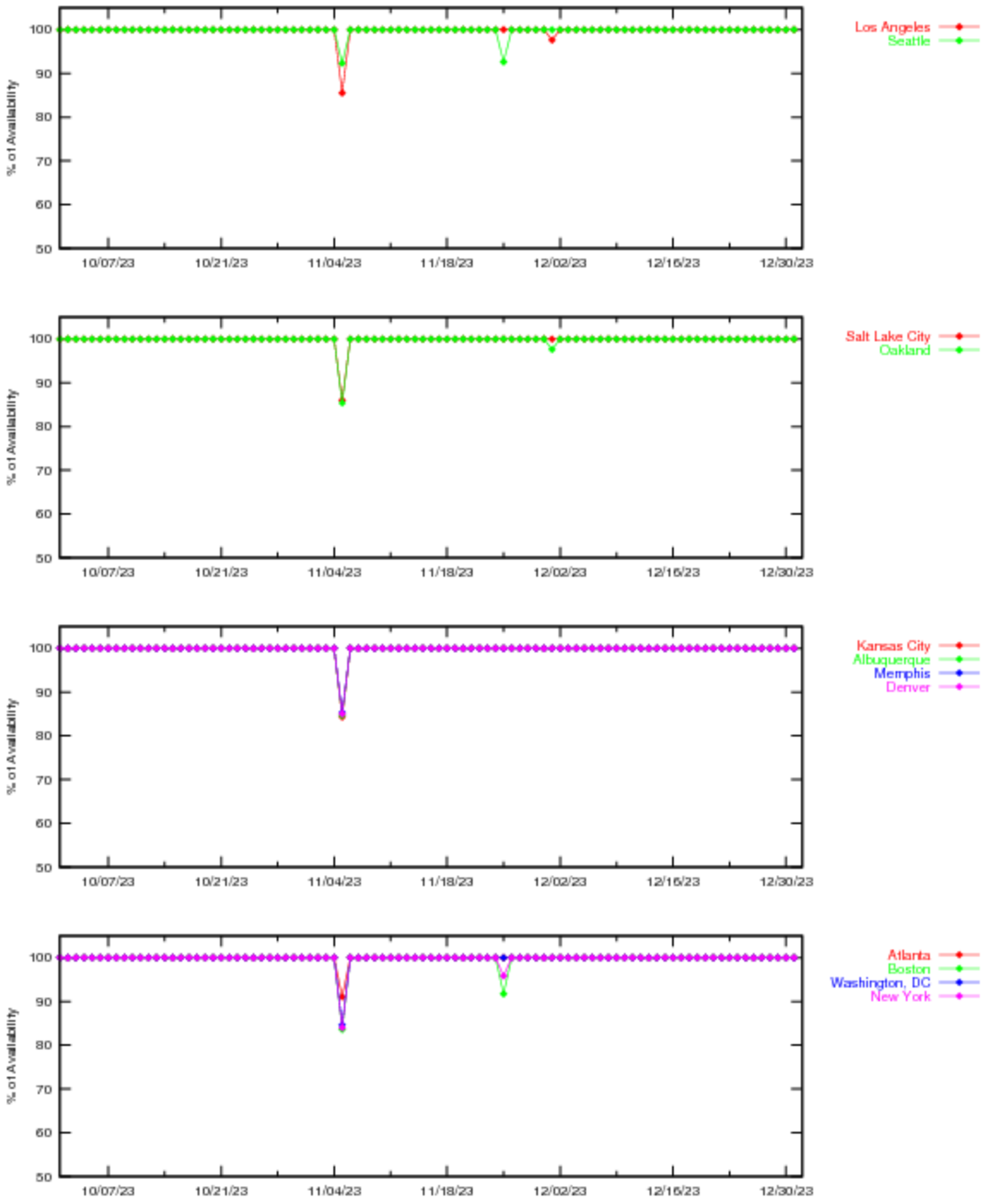

Figure 3-1 LPV Instantaneous Availability

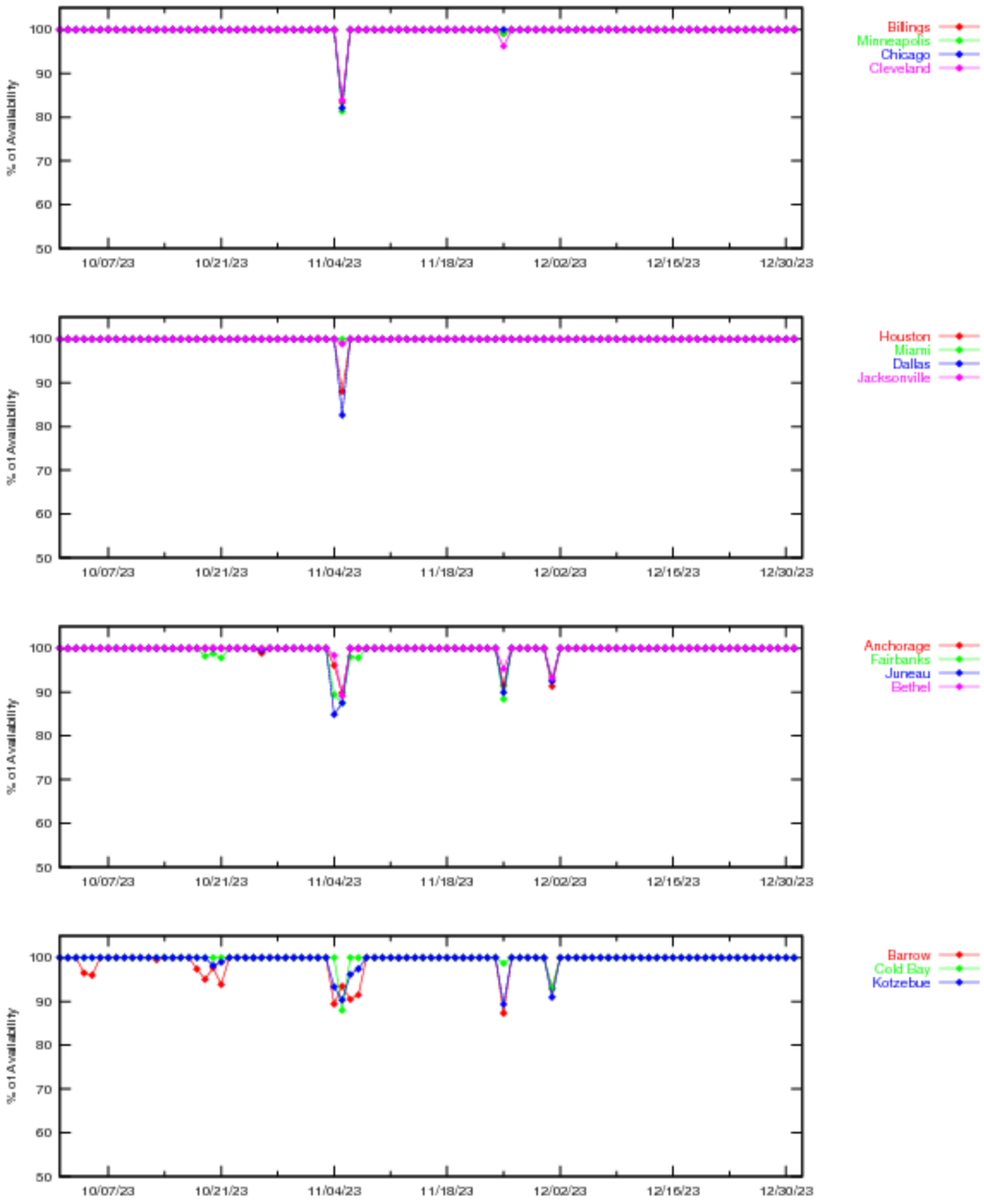

Figure 3-2 LPV Instantaneous Availability

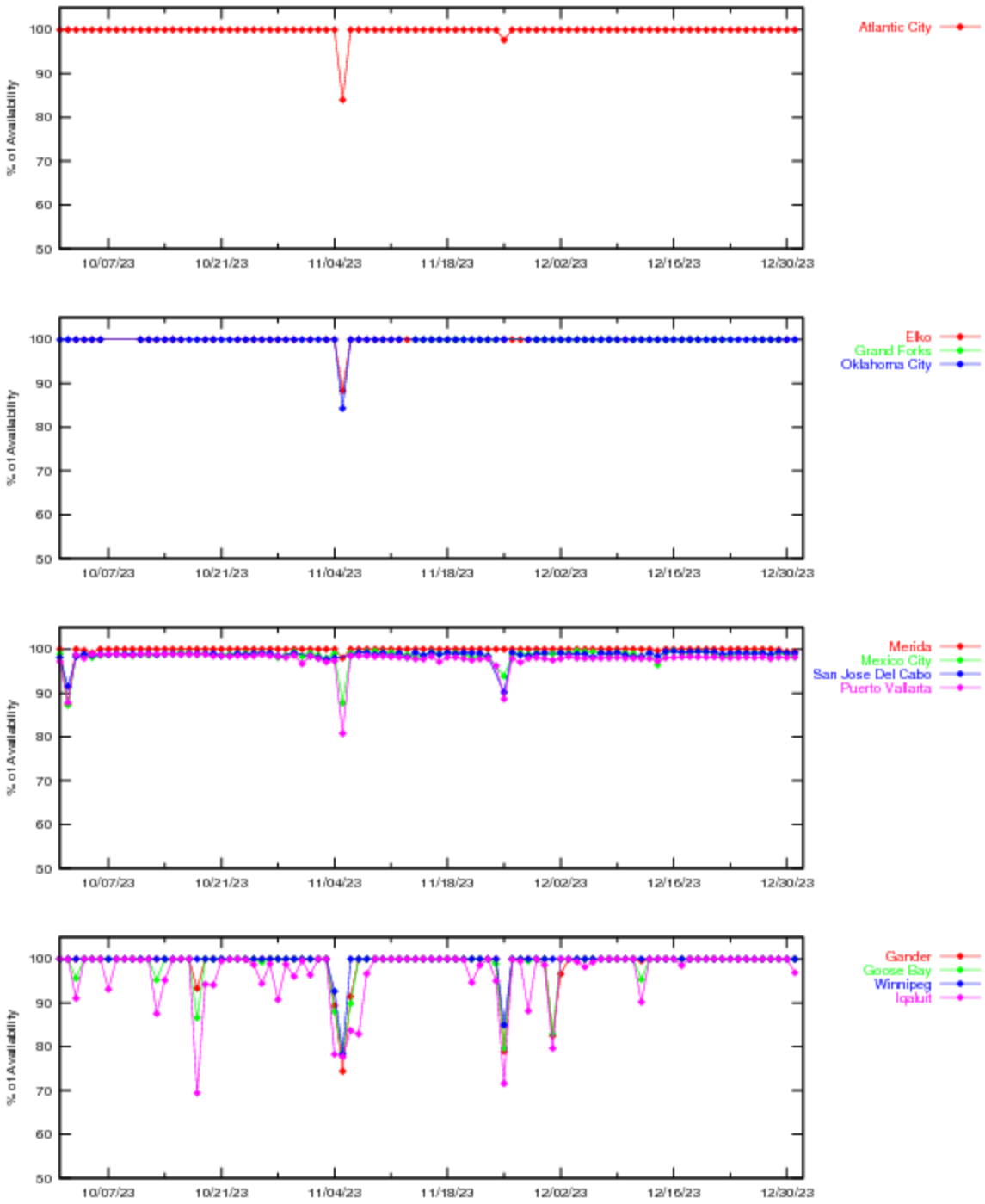

Figure 3-3 LPV Instantaneous Availability

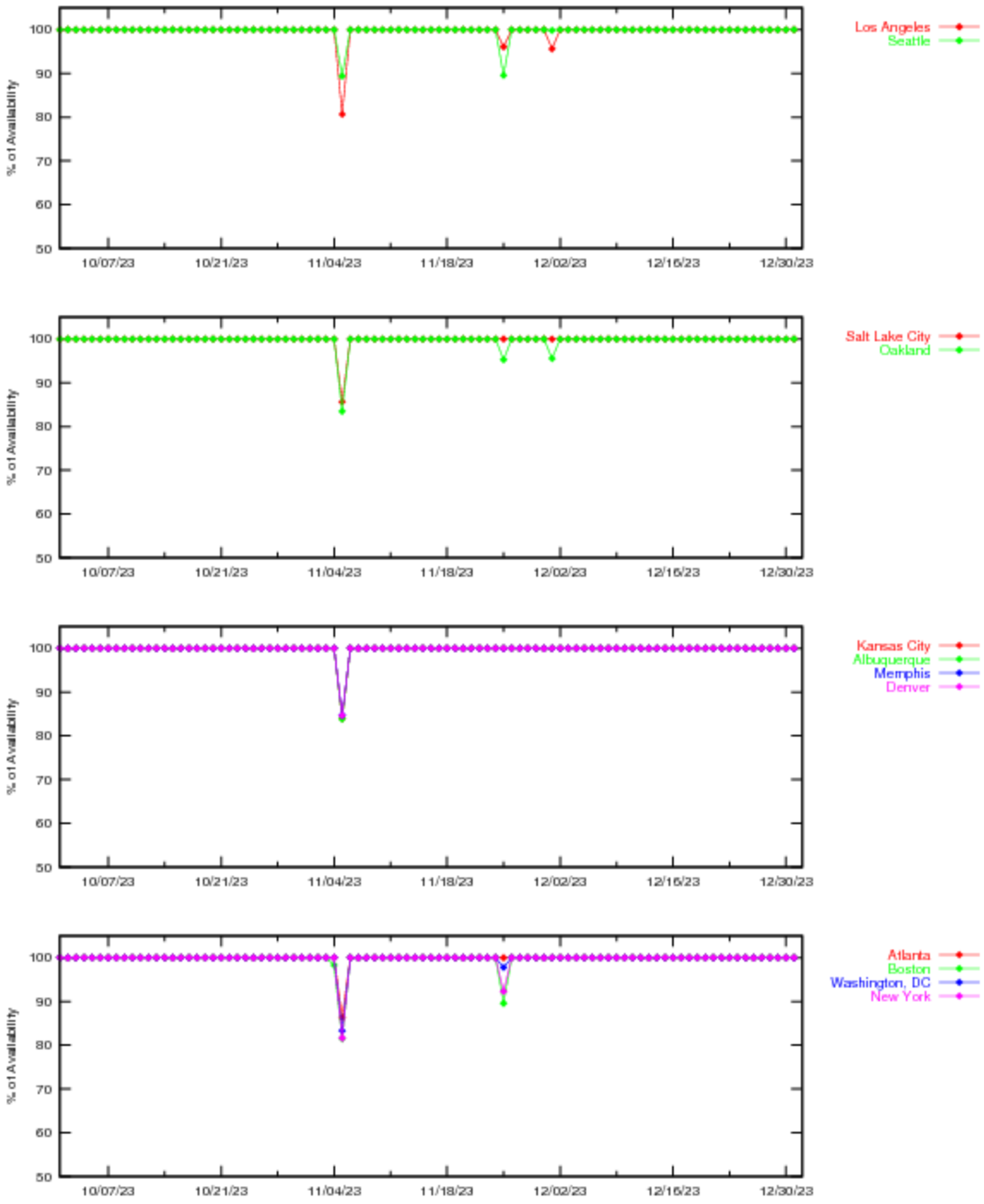

Figure 3-4 LPV200 Instantaneous Availability

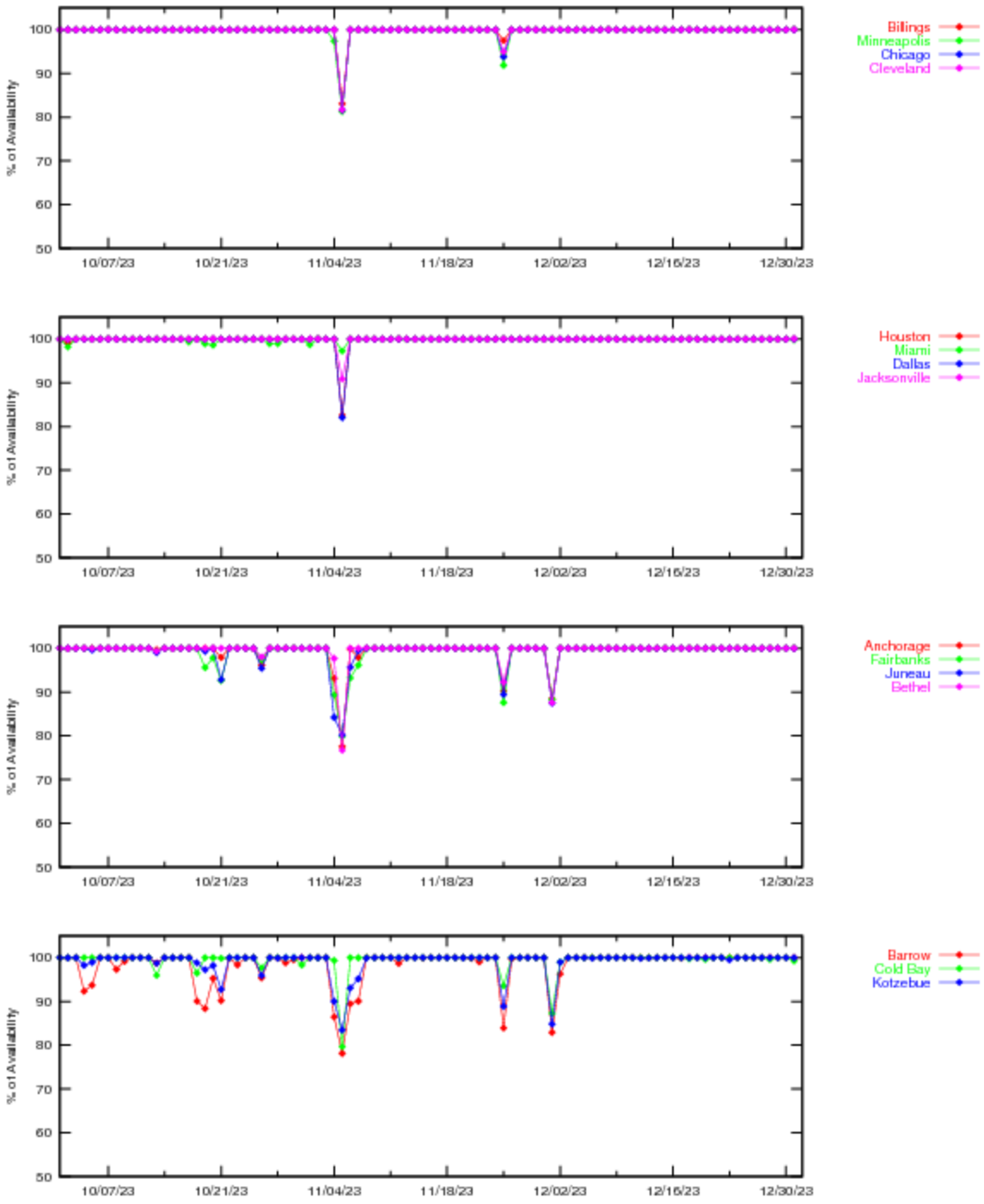

Figure 3-5 LPV200 Instantaneous Availability

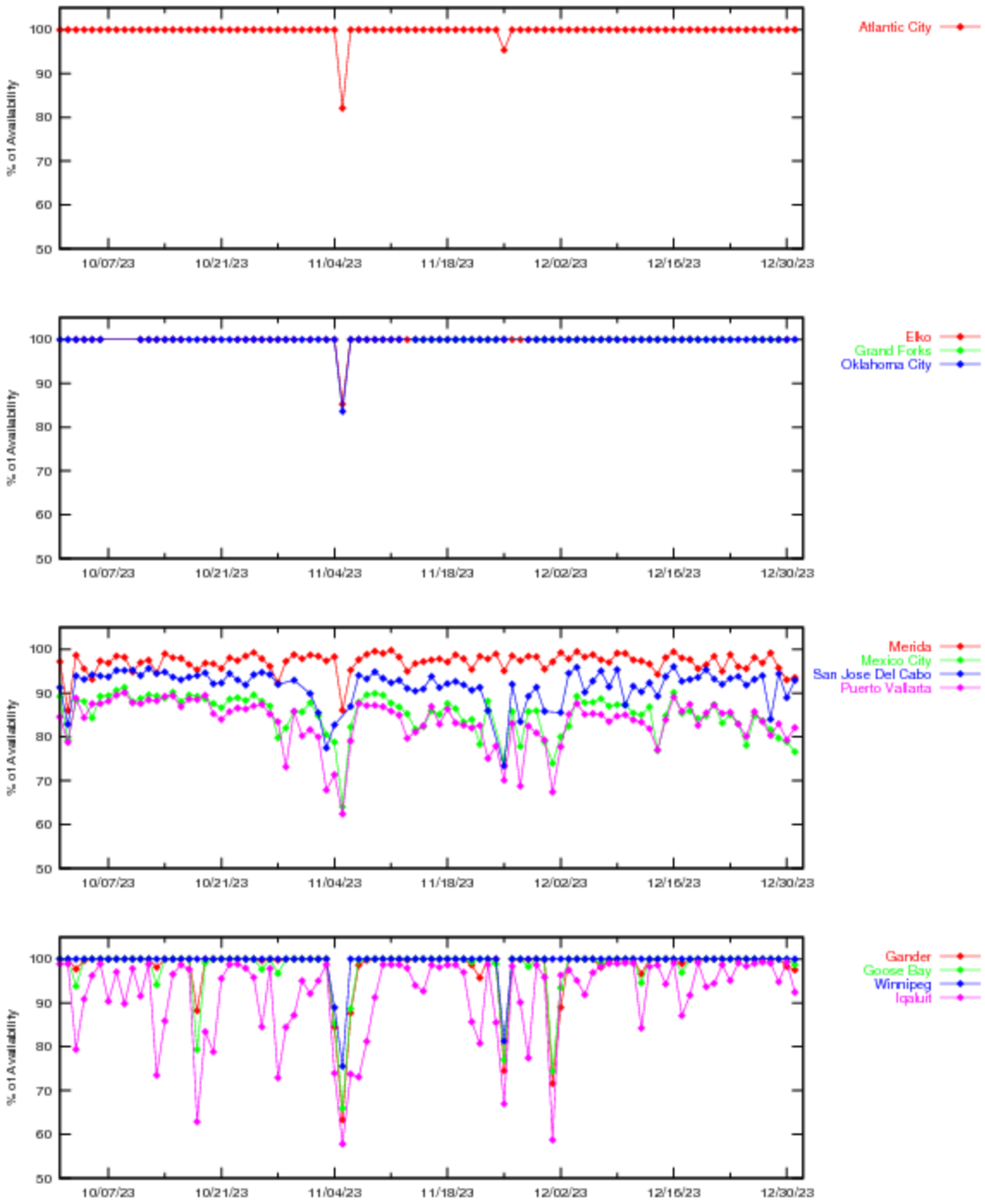

Figure 3-6 LPV200 Instantaneous Availability

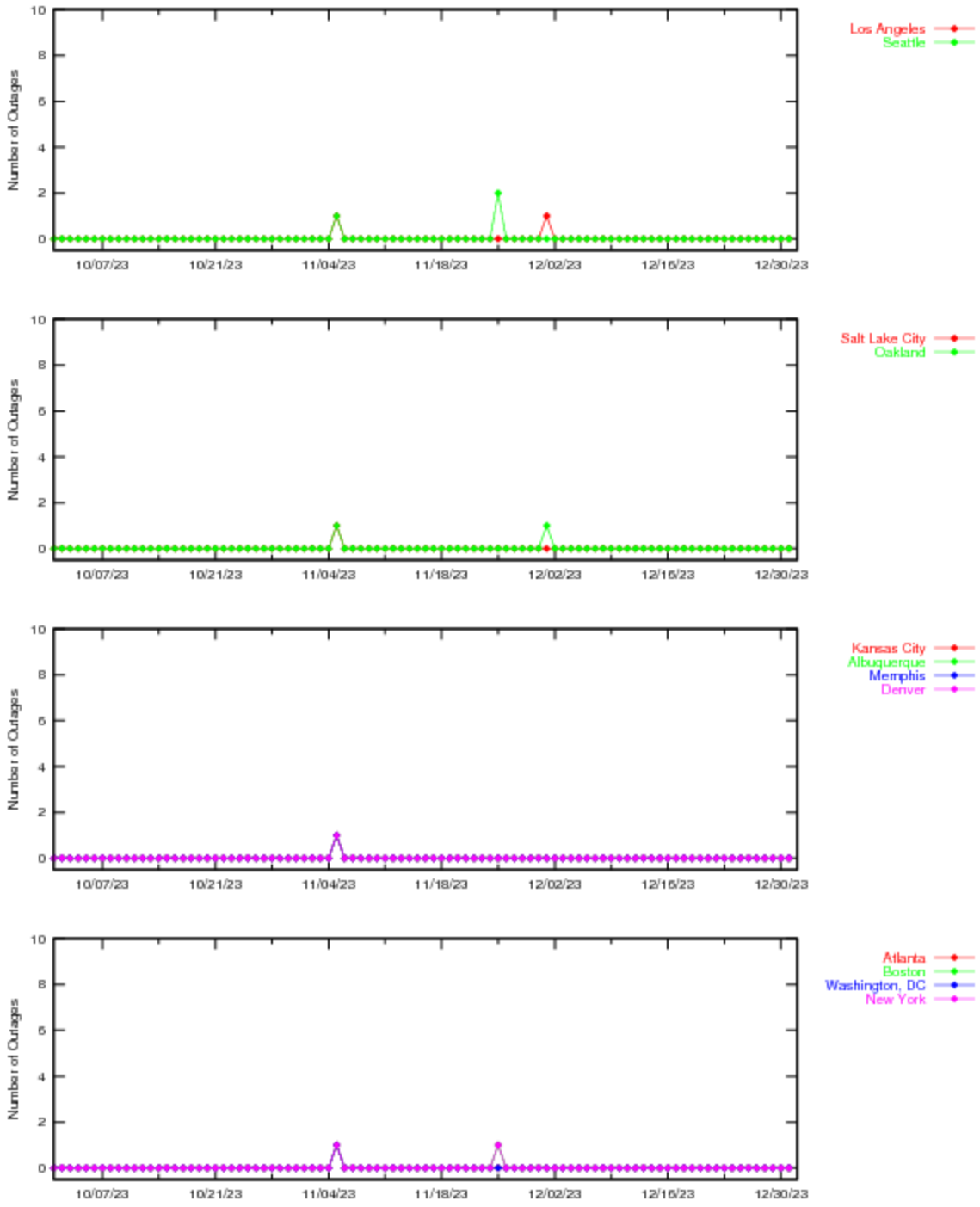

Figure 3-7 LPV Outages

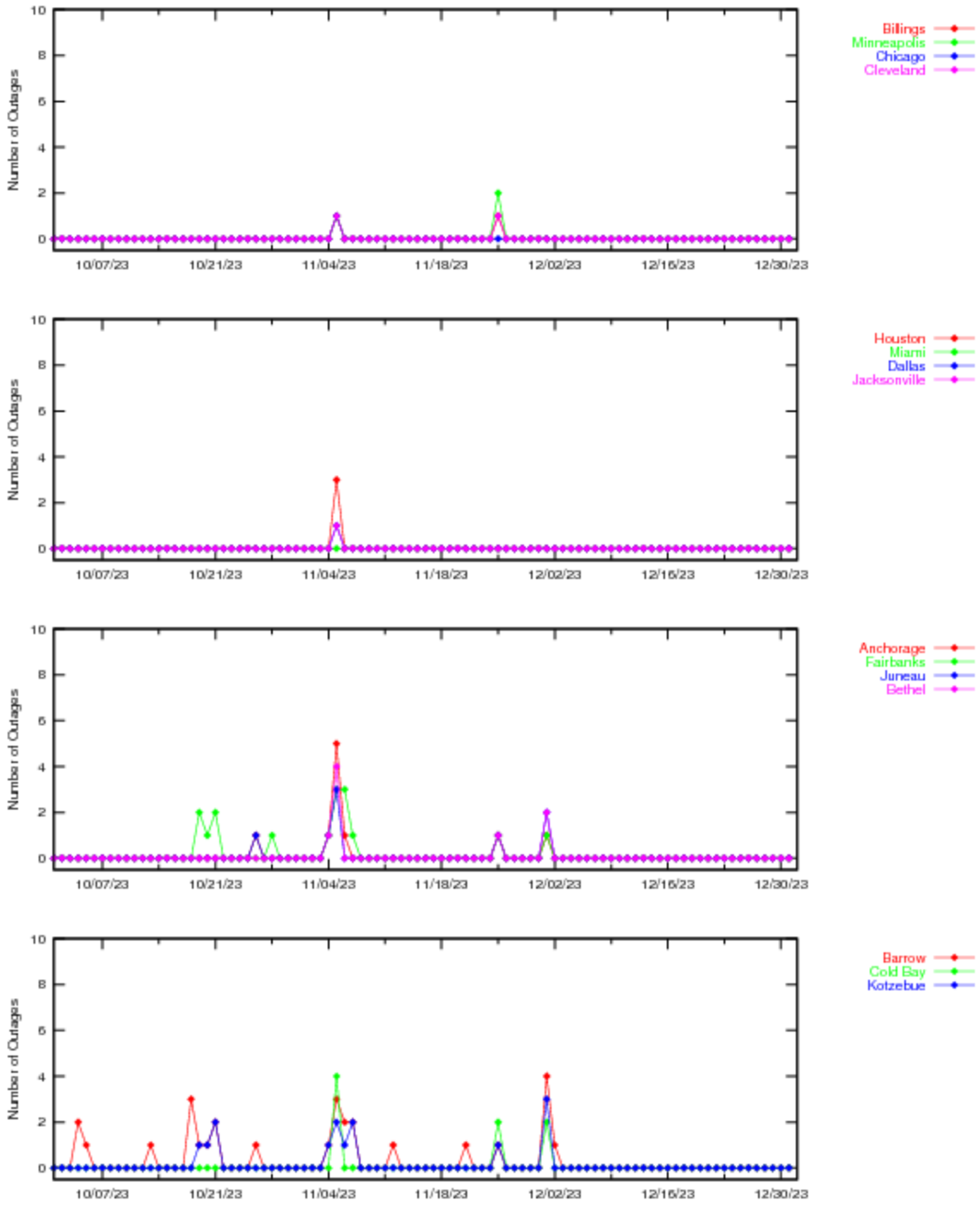

Figure 3-8 LPV Outages

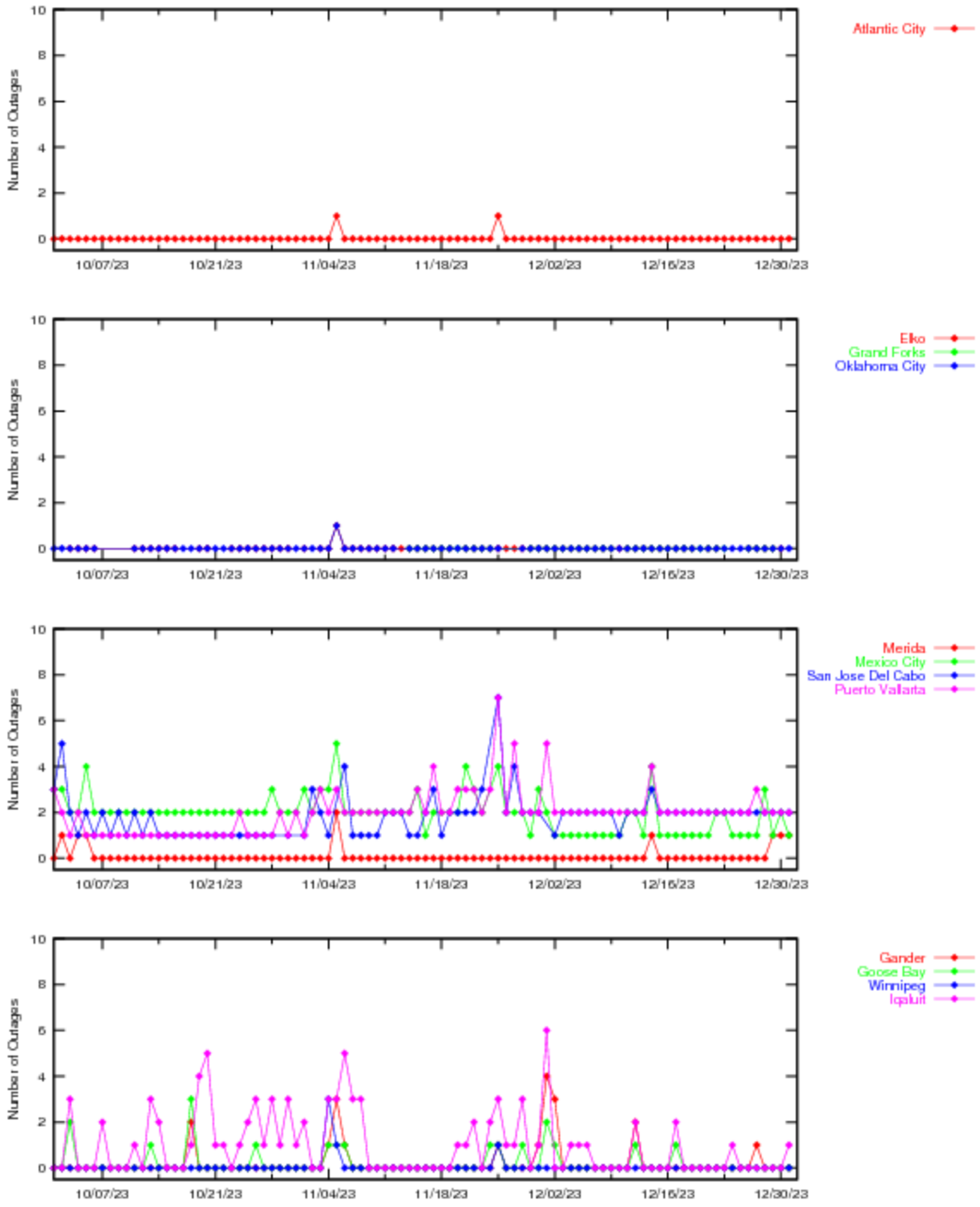

Figure 3-9 LPV Outages

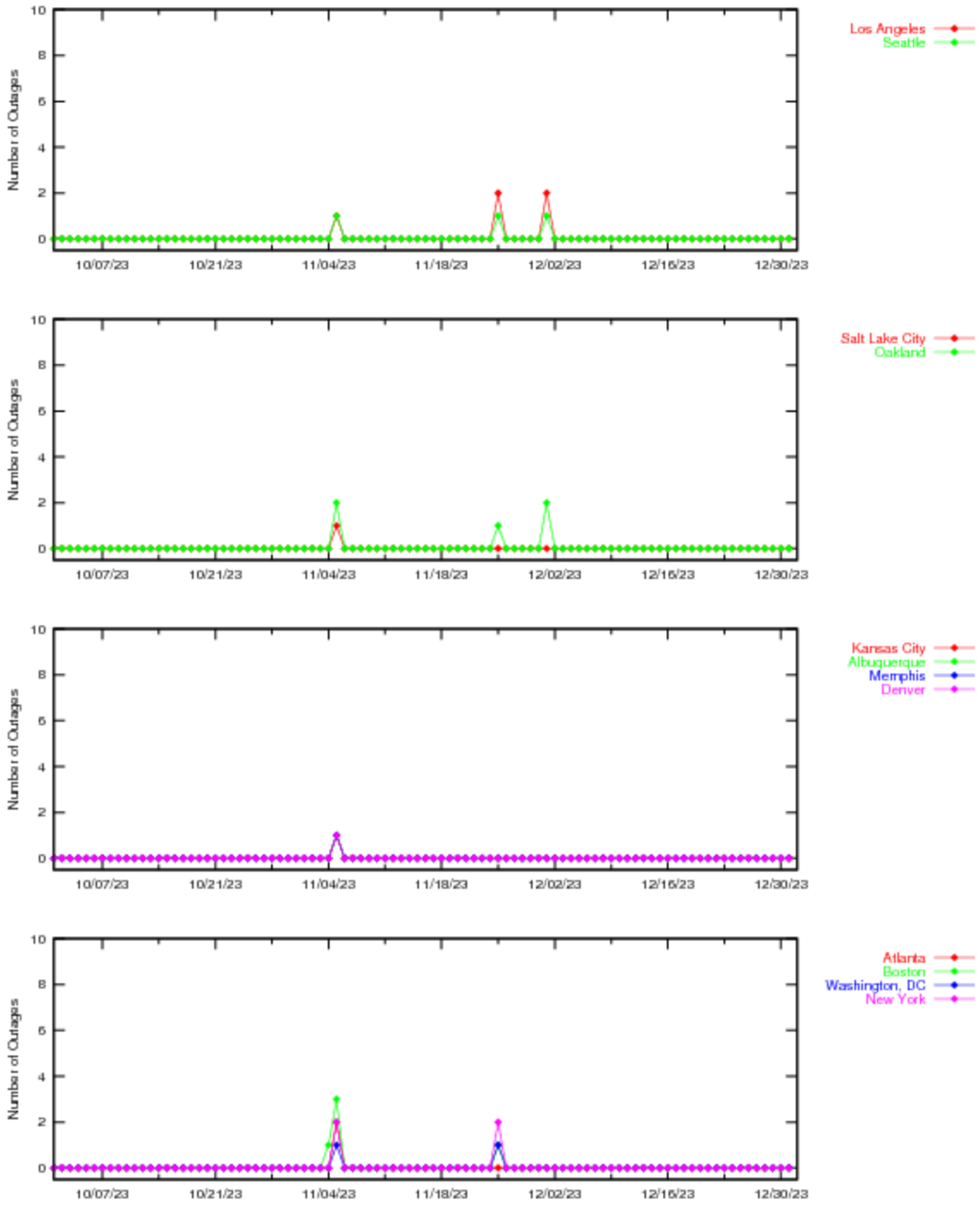

Figure 3-10 LPV200 Outages

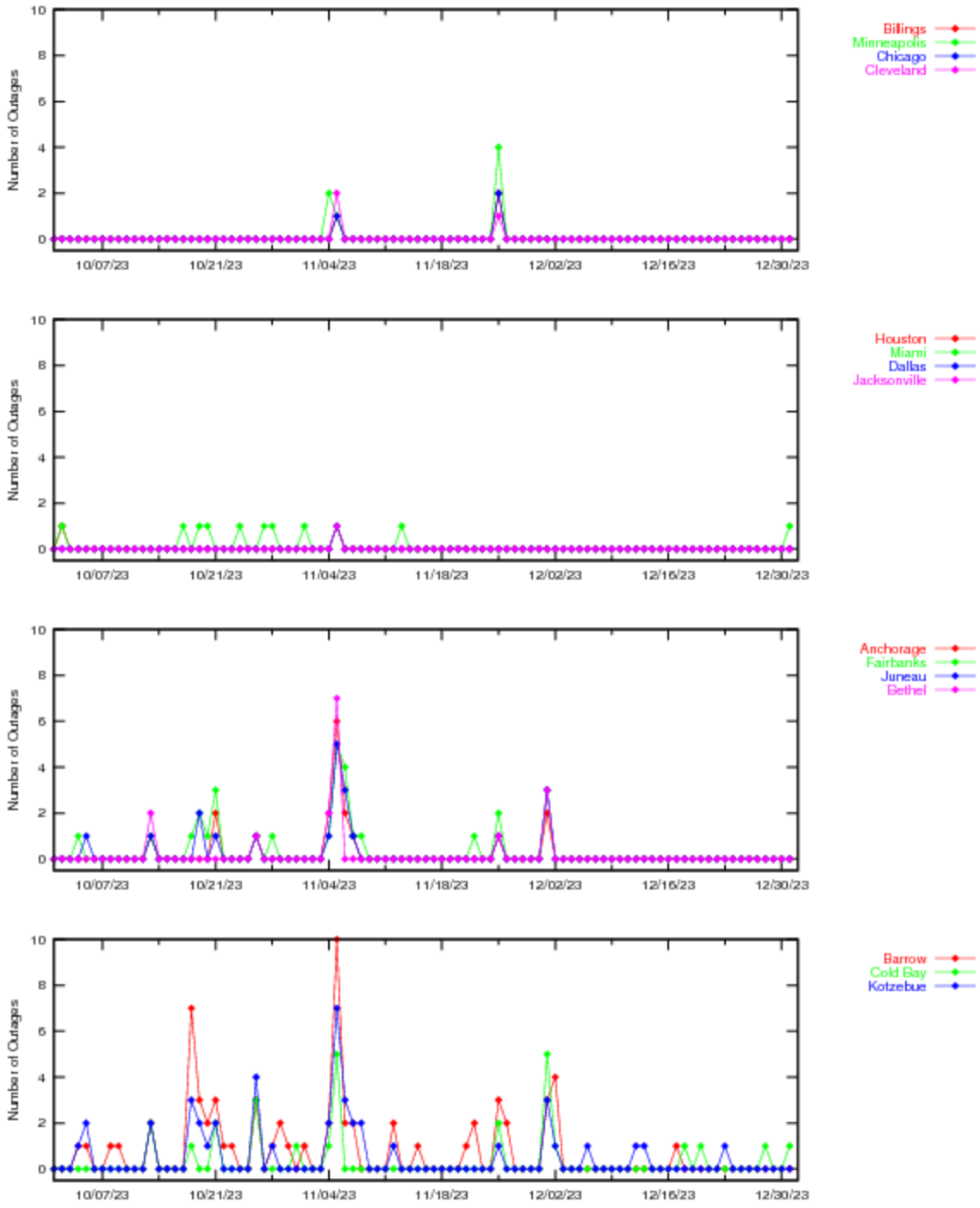

Figure 3-11 LPV200 Outages

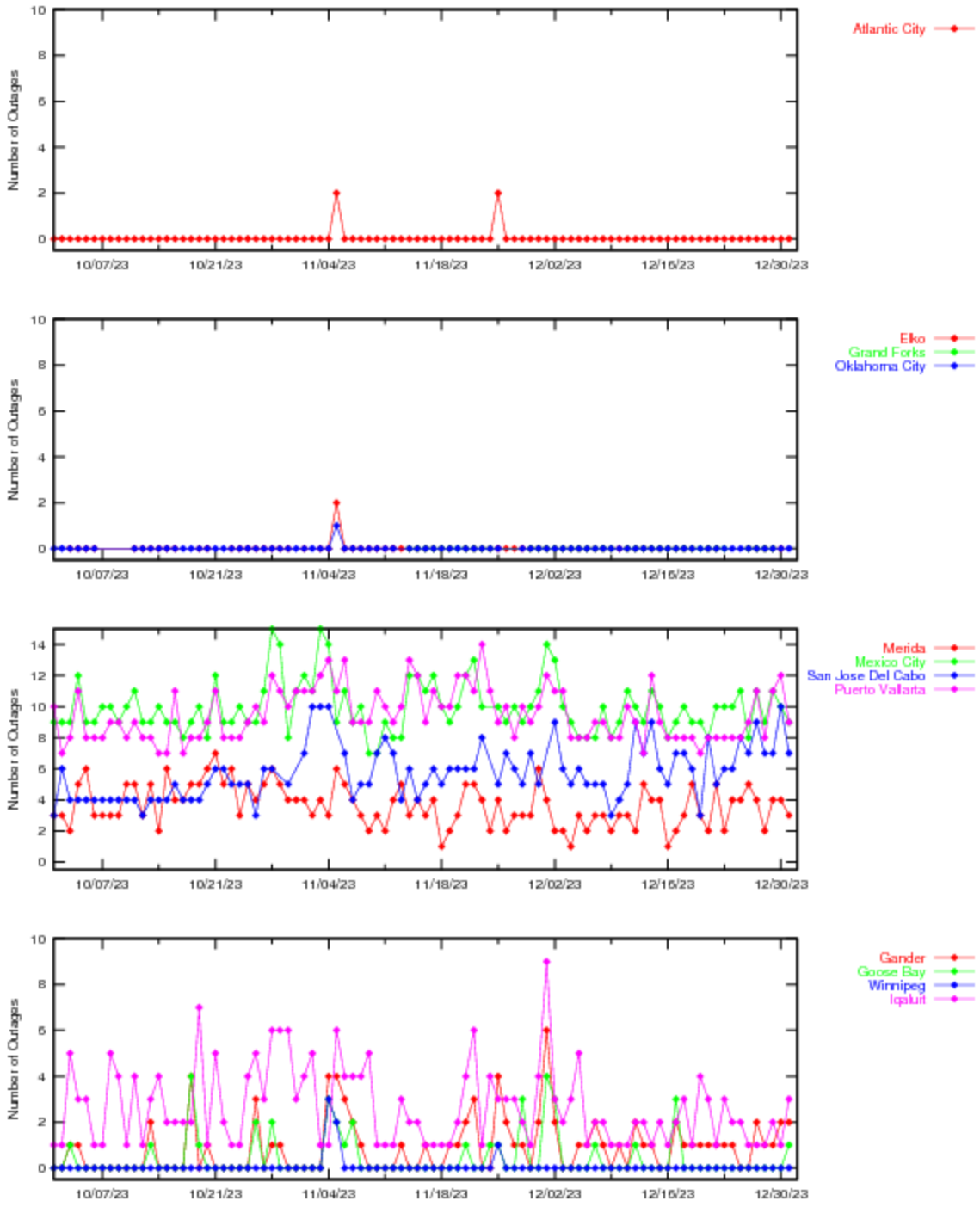

Figure 3-12 LPV200 Outages

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) (%)
Atlantic City	100
Elko	100
Grand Forks	100
Albuquerque	100
Anchorage	100
Atlanta	100
Barrow	100
Bethel	100
Billings	100
Boston	100
Cleveland	100
Cold Bay	100
Fairbanks	100
Gander	99.9999
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	1	0.000019
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0
Kotzebue	0	0
Los Angeles	0	0
Merida	0	0
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	0	0
San Juan	0	0
Seattle	0	0
Tapachula	0	0
Washington, DC	0	0

The availability decreases for this quarter were due to satellite maintenance, geomagnetic activity, and elevated UDRE values. Noteworthy events that affected availability are:

- Oct 1 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Oct 2 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS and Canada.
- Oct 3 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Oct 4 – 5 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Oct 7 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.

- Oct 8 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Oct 9 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Oct 10 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Oct 11 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Oct 13 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Oct 14 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Oct 17 – Nov 1 – GEO 135 entered test mode to facilitate a field test.
- Oct 18 – 19 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Oct 19 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS, Alaska, and Canada.
- Oct 20 – 21 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Oct 22 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Oct 24 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS and Canada.
- Oct 25 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Oct 26 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Oct 27 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS.
- Oct 28 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS and Canada.
- Oct 29 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Oct 30 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Oct 31 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Nov 1 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS and Canada.
- Nov 2 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Nov 4 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Nov 5 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Nov 6 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Nov 7 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Nov 8 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.

- Nov 9 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Nov 10 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Nov 12 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Nov 13 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Nov 14 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Nov 21 - 22 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Nov 22 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Alaska and Canada.
- Nov 25 - 26 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Nov 26 – A power outage at Oklahoma City as well as an FAA network outage resulted in the inability to input GEO maneuvers for all GEOs.
- Nov 27 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Nov 28 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Dec 1 – 2 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Dec 4 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 5 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 6 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 7 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 8 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 12 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Dec 15 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 16 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 17 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 18 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 20 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 21 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Dec 23 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 28 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS.
- Dec 29 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 30 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Dec 30 – Satellite maintenance elevated UDREs on PRN27 and reduced LPV200 availability in CONUS.
- Dec 31 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in Canada.

4.0 COVERAGE

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

Daily PA analysis was conducted for LP, LPV, and LPV200 service levels. The PA coverage plots provide 100%, 99.9%, 99%, 98%, and 95% availability contours. Figure 4-1 shows the rollup LP North America coverage, Figure 4-2shows 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.

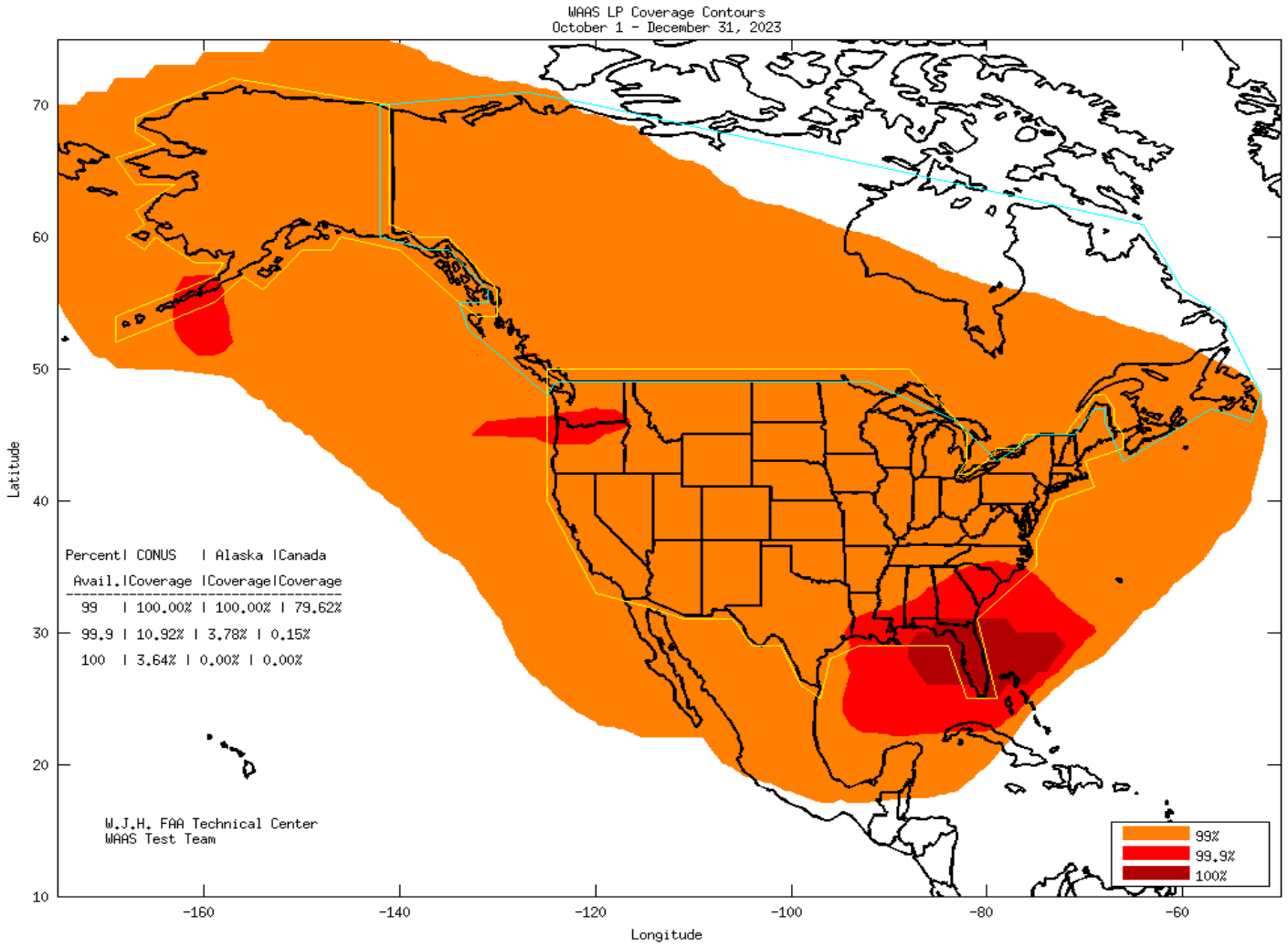

Figure 4-1 LP North America Coverage for the Quarter

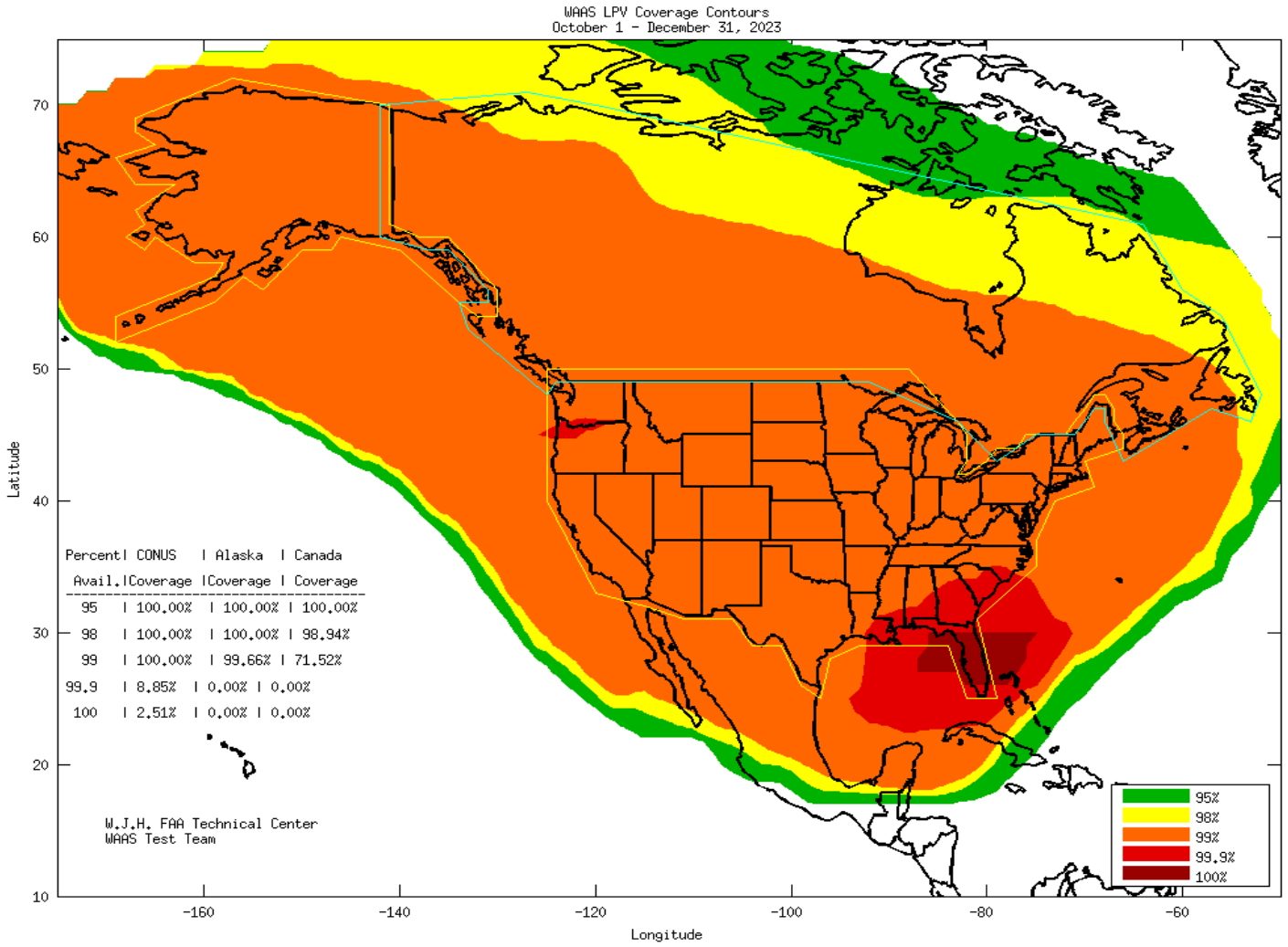

Figure 4-2 LPV North America Coverage for the Quarter

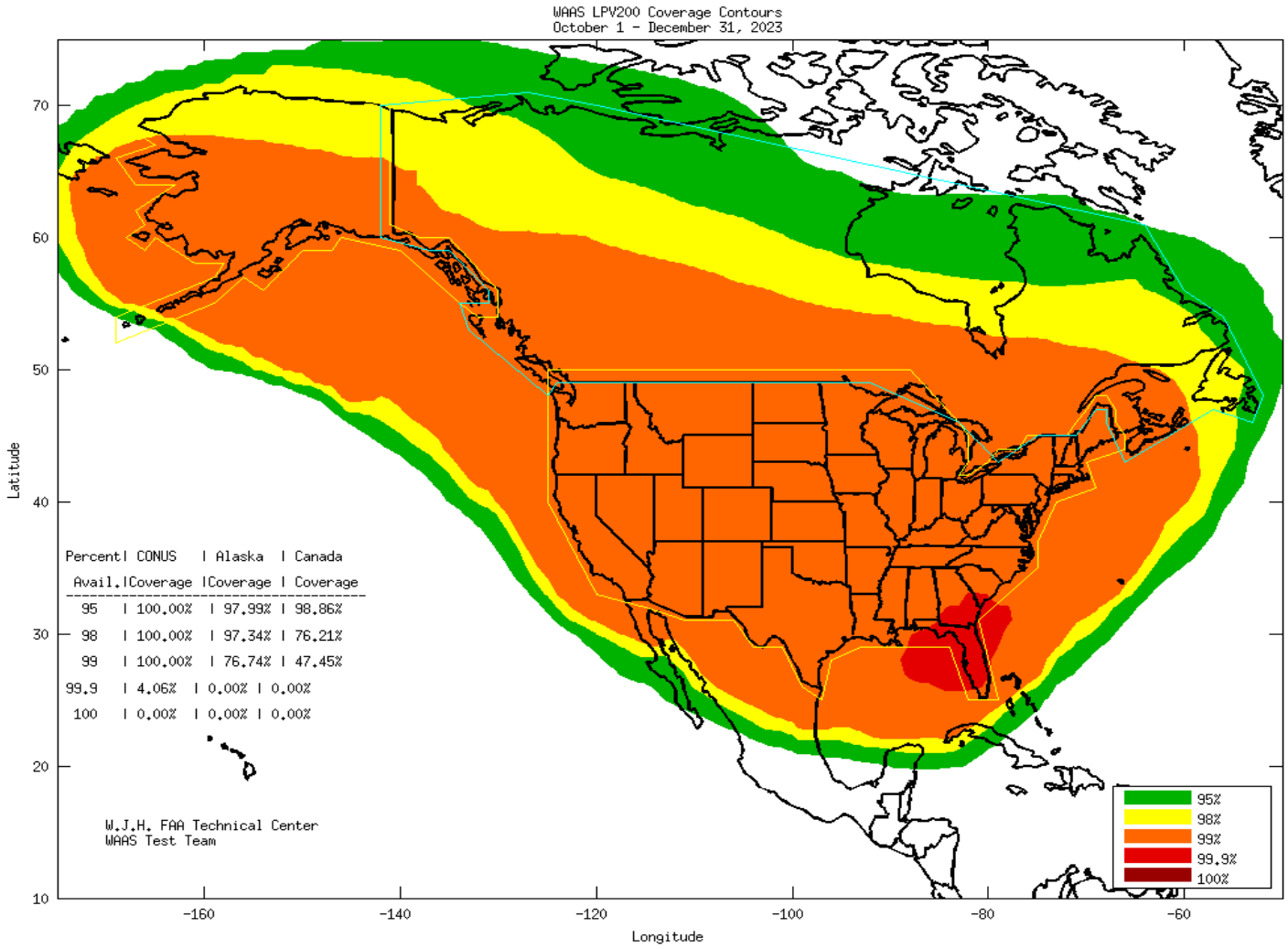

Figure 4-3 LPV200 North America Coverage for the Quarter

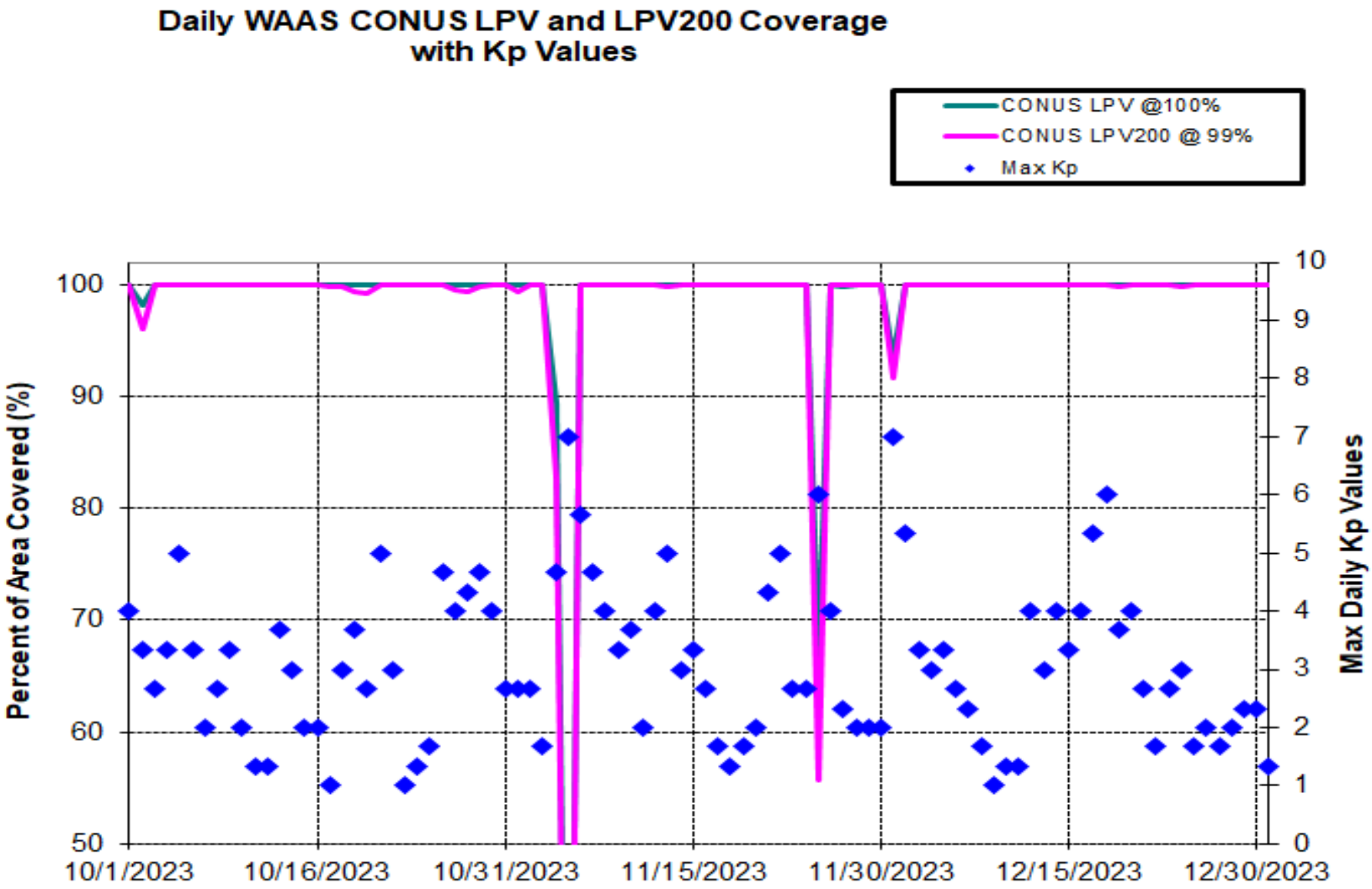

Figure 4-4 Daily LPV and LPV200 CONUS Coverage

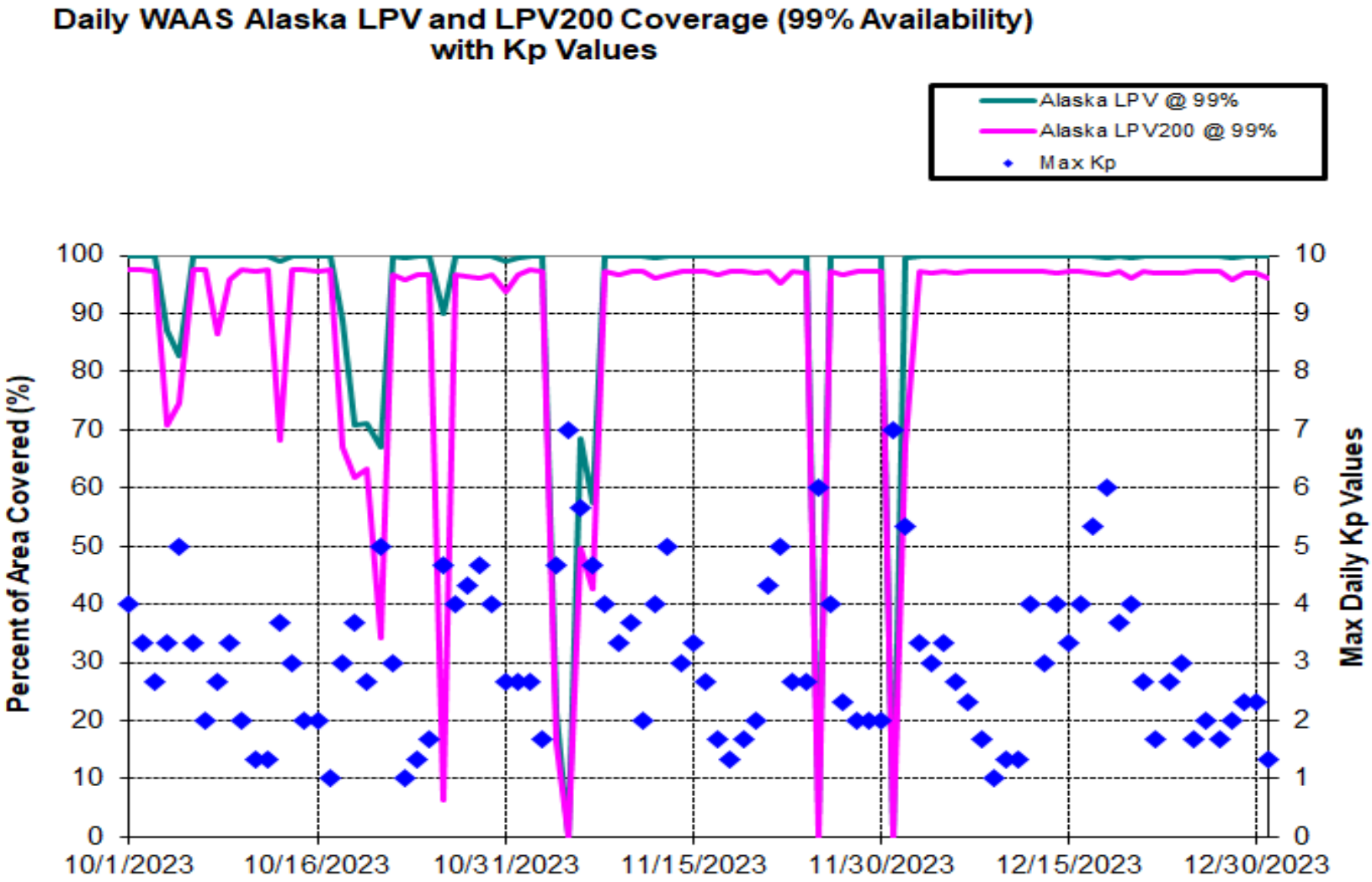

Figure 4-5 Daily LPV and LPV200 Alaska Coverage

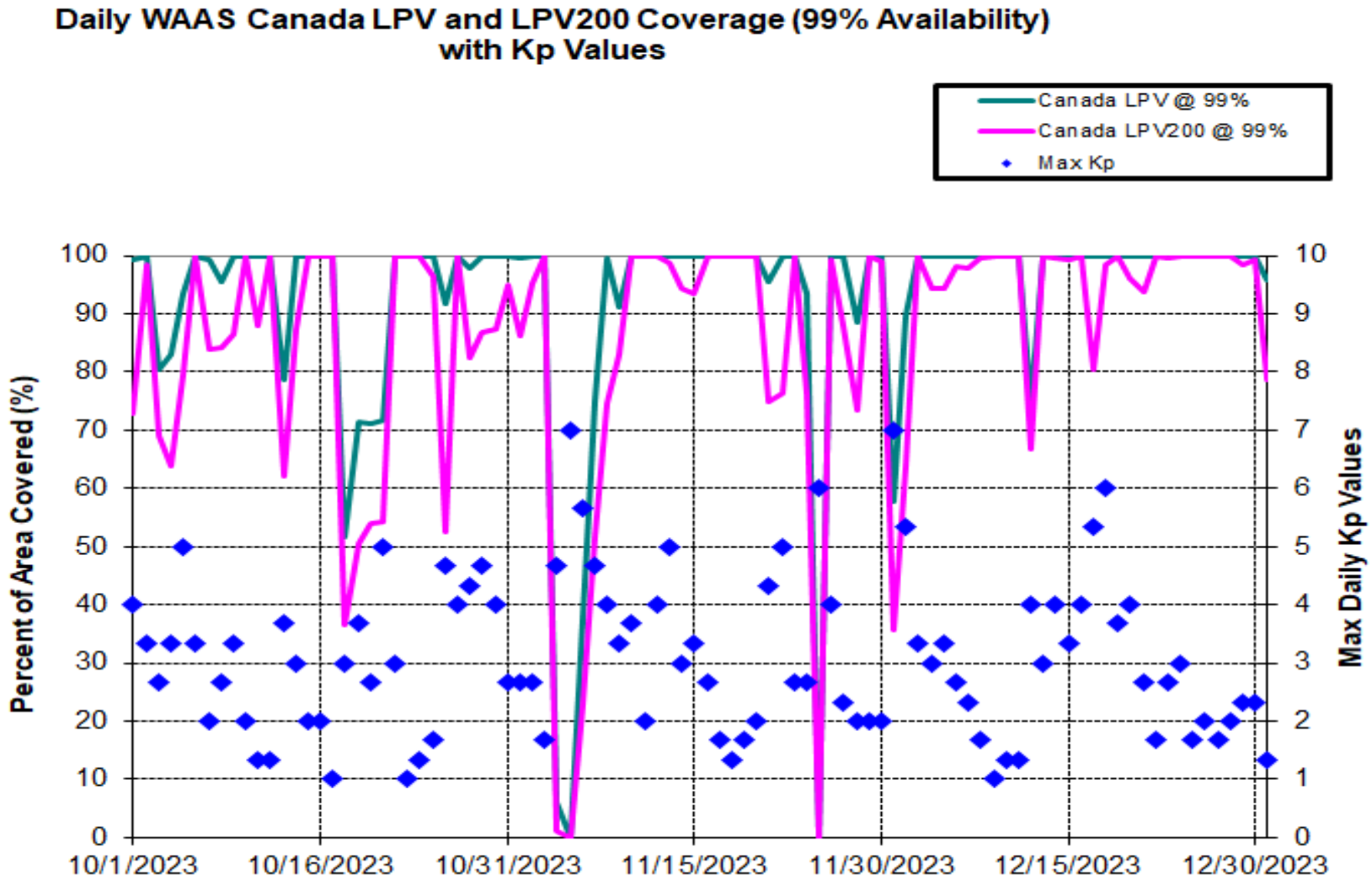

Figure 4-6 Daily LPV and LPV200 Canada Coverage

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.

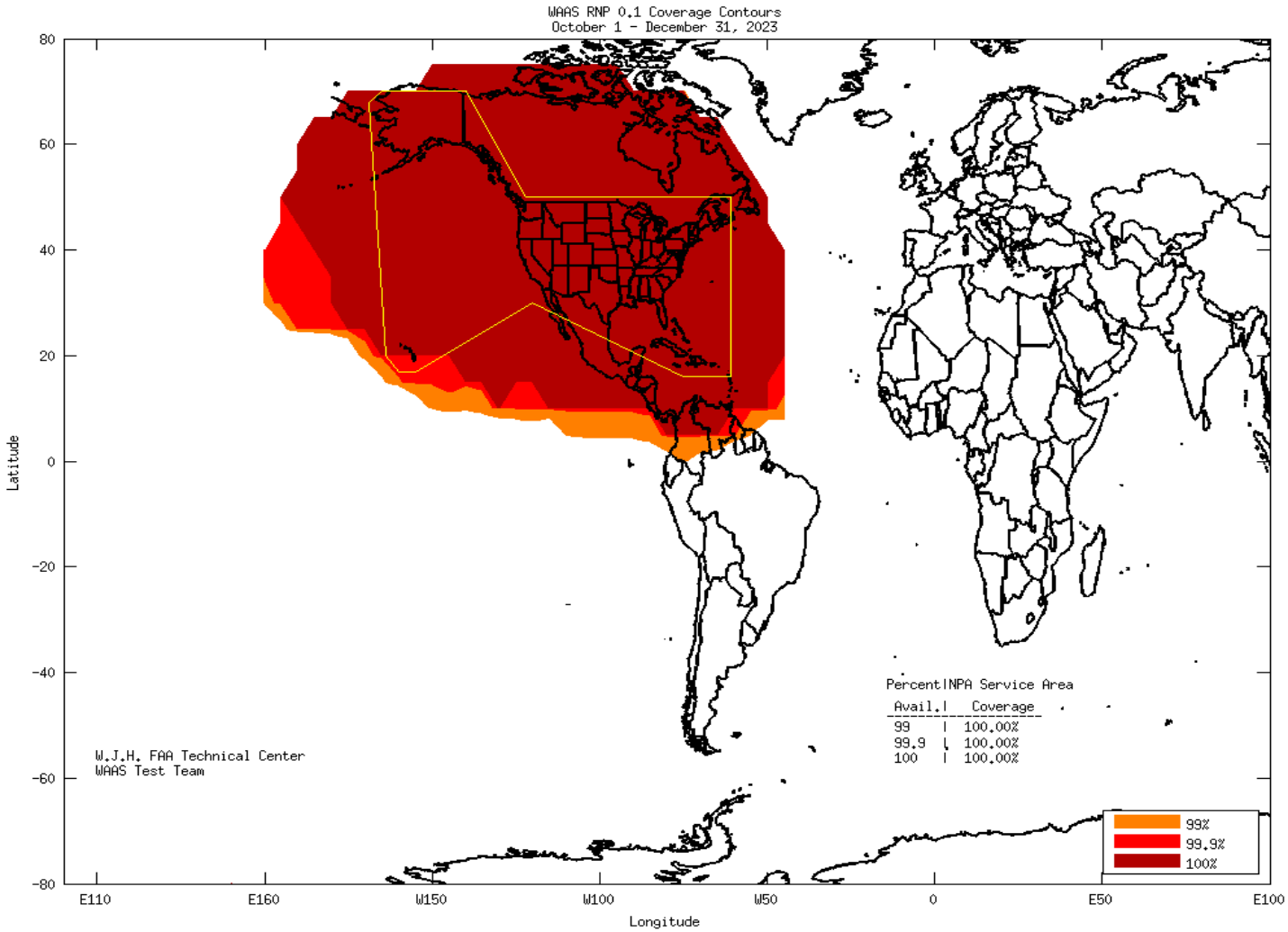

Figure 4-7 RNP 0.1 Coverage for the Quarter

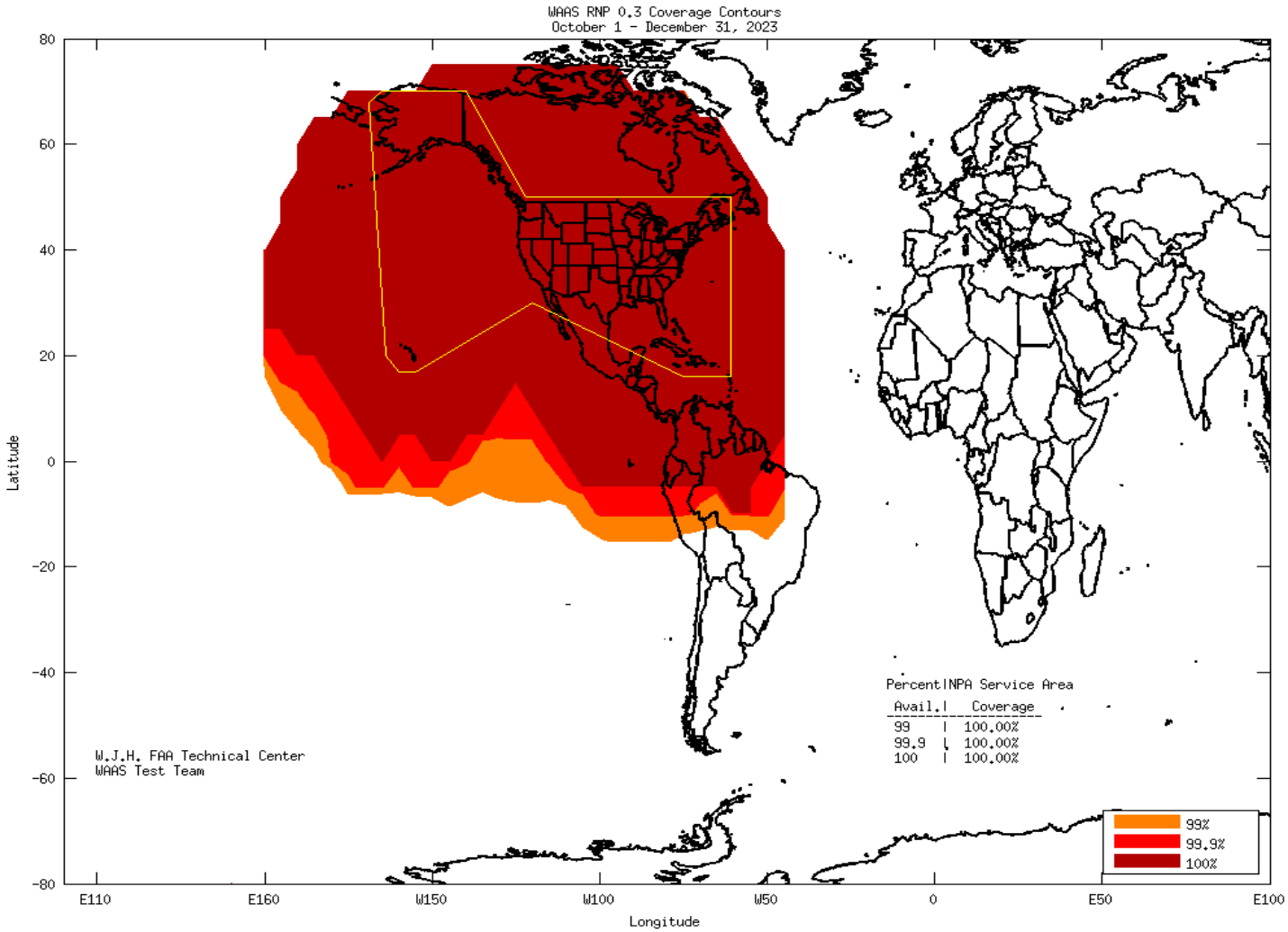

Figure 4-8 RNP 0.3 Coverage for the Quarter

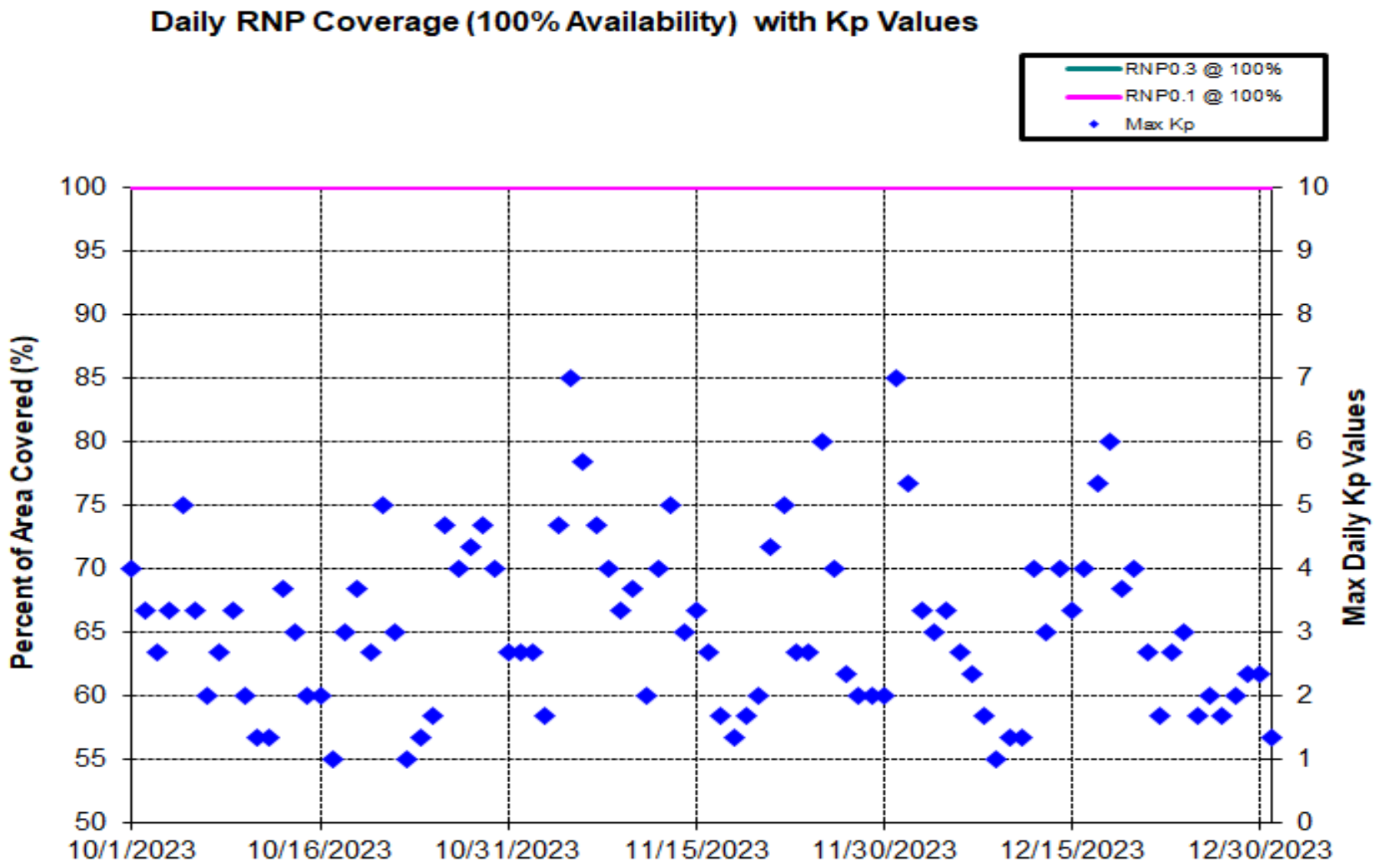

Figure 4-9 Daily RNP Coverage

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

- Oct 1 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 2 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in CONUS and Canada.
- Oct 3 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 4 – 5 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Oct 7 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 8 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Oct 9 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Oct 10 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Oct 11 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 13 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Oct 14 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 17 – Nov 1 – GEO 135 entered test mode to facilitate a field test.
- Oct 18 – 19 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Oct 19 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS, Alaska, and Canada.
- Oct 20 – 21 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Oct 22 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Oct 24 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in CONUS and Canada.
- Oct 25 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Oct 26 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Oct 27 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in CONUS.
- Oct 28 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS and Canada.
- Oct 29 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 30 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Oct 31 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Nov 1 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS and Canada.

- Nov 2 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Nov 4 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Nov 5 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Nov 6 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Nov 7 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Nov 8 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Nov 9 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Nov 10 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Nov 12 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Nov 13 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Nov 14 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Nov 21 - 22 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Nov 22 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Alaska and Canada.
- Nov 25 - 26 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Nov 26 – A power outage at Oklahoma City as well as an FAA network outage resulted in the inability to input GEO maneuvers for all GEOs.
- Nov 27 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Nov 28 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Dec 1 – 2 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Dec 4 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 5 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 6 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 7 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 8 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 12 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Dec 15 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 16 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 17 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 18 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 20 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.

- Dec 21 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Dec 23 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 28 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in CONUS.
- Dec 29 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 30 – Geomagnetic activity increased GIVEs and reduced LPV200 coverage in Canada.
- Dec 30 – Satellite maintenance elevated UDREs on PRN27 and reduced LPV200 coverage in CONUS.
- Dec 31 – Geomagnetic activity increased GIVEs and reduced LPV and LPV200 coverage in Canada.

5.0 INTEGRITY

5.1 HMI Analysis

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

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

Table 5-1 lists the safety margin index and the number of HMI events. For this reporting period, the lowest safety margin index is 3.929 at Merida, 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 (m)	Vertical Safety Index (m)	Number of HMIs
Atlantic City	4.805	4.914	0
Elko	6.04	5.368	0
Grand Forks	6.288	4.802	0
Oklahoma City	5.387	5.943	0
Albuquerque	5.041	6.125	0
Anchorage	6.407	5.003	0
Atlanta	5.129	5.064	0
Barrow	7.922	3.319	0
Bethel	8.997	5.161	0
Billings	16.238	11.306	0
Boston	7.893	6.031	0
Chicago	6.114	7.537	0

Location	Horizontal Safety Index (m)	Vertical Safety Index (m)	Number of HMIs
Cleveland	7.127	6.223	0
Cold Bay	14.050	6.512	0
Dallas	8.963	5.819	0
Denver	4.734	7.079	0
Fairbanks	12.371	3.368	0
Gander	8.036	10.651	0
Goose Bay	7.371	4.278	0
Houston	14.152	9.146	0
Iqaluit	5.537	3.423	0
Jacksonville	8.733	8.124	0
Juneau	4.222	5.915	0
Kansas City	5.123	9.336	0
Kotzebue	5.830	5.317	0
Los Angeles	4.119	9.605	0
Memphis	14.344	4.399	0
Merida	3.929	8.370	0
Mexico City	6.650	6.671	0
Miami	5.603	5.181	0
Minneapolis	4.232	7.859	0
New York	9.896	7.393	0
Oakland	9.241	8.142	0
Puerto Vallarta	4.160	6.061	0
Salt Lake City	5.347	6.819	0
San Jose Del Cabo	5.284	6.813	0
Seattle	8.105	13.041	0
Washington, DC	5.558	4.912	0
Winnipeg	4.482	6.000	0

5.2 Broadcast Alerts

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

Table 5-2 WAAS SV Alert

	Number of Alerts			Average Alerts Per Day		
Message Type	**SM9**	**S15**	**G30**	**SM9**	**S15**	**G30**
T2	28	28	18	0.3043	0.3043	0.1957
T3	19	19	19	0.2065	0.2065	0.2065
T4	32	32	23	0.3478	0.3478	0.25
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	79	79	61	0.8587	0.8587	0.663
Days in Service	92	92	92			

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

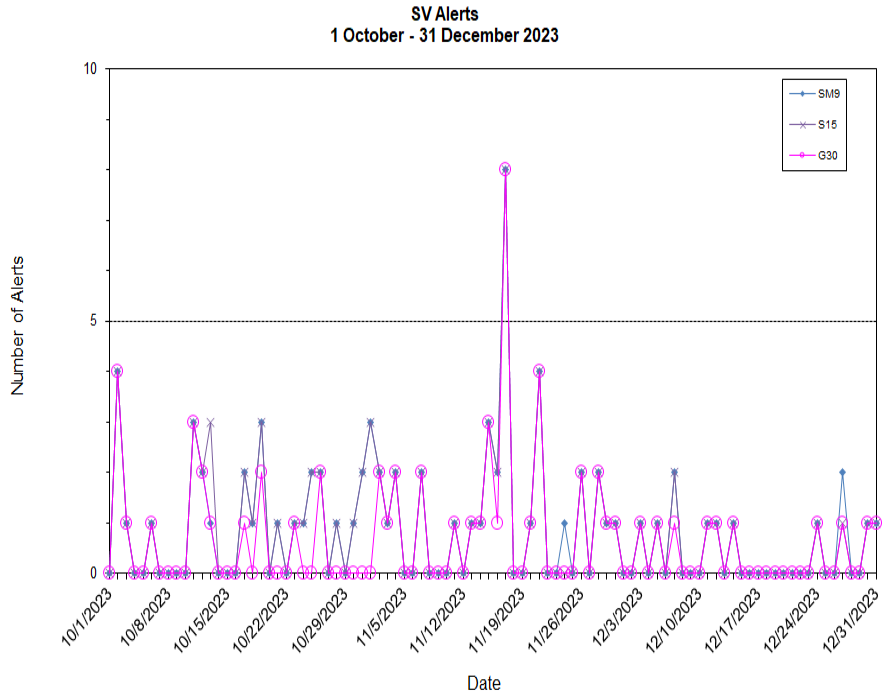

Figure 5-1 SV Daily Alert Trend

5.3 Availability of WAAS Messages (SM9, S15, and G30)

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 they 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 S15 GEO. Table 5-14 through Table 5-18 show statistics for message rates broadcasted on G30 GEO.

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	104423	5	130
2	1324817	48	12
3	1324791	49	12
4	1324828	47	12
7	97048	20	173
9	93150	0	0
10	96987	23	139
17	31389	2	384

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)
2	50134	0	0
3	47722	0	0
4	47275	0	0
5	47689	0	0
6	47770	0	0
7	47654	1	179
8	48387	1	179
9	47264	0	0
10	47608	0	0
11	47604	0	0
12	47259	0	0
13	49298	0	0
14	46839	0	0
15	47451	0	0
16	47795	0	0
17	48133	0	0
18	47304	0	0
19	46198	1	180
20	48548	0	0
21	50489	0	0
22	47951	1	150
23	47072	0	0
24	49305	0	0
25	49029	0	0
26	47987	0	0
27	48364	1	170
28	47522	1	170
29	47333	0	0
30	47481	0	0
31	47529	0	0
32	46711	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)
2	41181	4	199
3	39164	2	179
4	38847	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
5	39132	1	137
6	39244	1	128
7	39083	2	204
8	39705	2	283
9	38789	0	0
10	39066	3	210
11	39103	0	0
12	38823	0	0
13	40516	2	155
14	38463	2	144
15	38979	1	210
16	39259	0	0
17	39544	1	179
18	38832	2	137
19	37962	0	0
20	39837	3	206
21	41468	6	187
22	39436	6	216
23	38609	0	0
24	40532	0	0
25	40308	0	0
26	39416	0	0
27	39741	2	138
28	39018	2	165
29	38877	0	0
30	39032	0	0
31	38985	1	126
32	38370	0	0
131	76217	1	165
133	75678	5	5521
135	74000	2	165

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	27589	8	328
0	1	27591	9	357
0	2	27596	8	359
1	0	27593	5	352
1	1	27580	15	576

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	2	27599	13	464
1	3	27587	12	478
1	4	27587	8	471
2	0	27594	11	363
2	1	27578	10	576
2	2	27595	10	357
2	3	27598	7	352
2	4	27596	5	363
3	0	27601	5	320
3	1	27589	9	324
3	2	27597	5	336
9	0	27589	9	335
9	1	27589	8	340
9	2	27598	7	344
9	3	27596	9	362
9	4	27583	6	357
9	5	27592	9	353
9	6	27602	7	368

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35663	1	303
1	35683	1	304
2	35671	1	356
3	35673	1	306
9	35688	1	429

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	101607	3	163
2	1324788	58	13
3	1324775	56	12
4	1324826	48	12
7	94534	20	127
9	93141	1	169
10	94511	28	191
17	31152	1	301

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
2	50132	3	181
3	47719	0	0
4	47254	1	166
5	47677	0	0
6	47765	0	0
7	47635	0	0
8	48369	1	168
9	47250	0	0
10	47606	0	0
11	47603	0	0
12	47263	0	0
13	49281	0	0
14	46828	1	173
15	47455	0	0
16	47790	0	0
17	48138	2	174
18	47285	0	0
19	46194	1	166
20	48549	0	0
21	50475	0	0
22	47940	0	0
23	47070	1	168
24	49302	0	0
25	49029	0	0
26	47973	0	0
27	48354	1	166
28	47534	0	0
29	47334	0	0
30	47465	0	0
31	47528	2	180
32	46710	2	181

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
2	41192	1	121
3	39174	0	0
4	38850	0	0

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
5	39125	0	0
6	39235	1	211
7	39068	0	0
8	39700	2	210
9	38755	2	211
10	39060	1	150
11	39101	0	0
12	38819	1	204
13	40492	0	0
14	38432	1	210
15	38971	1	210
16	39249	1	210
17	39547	0	0
18	38831	1	210
19	37972	0	0
20	39798	1	208
21	41496	7	210
22	39388	5	235
23	38616	0	0
24	40537	1	152
25	40299	1	192
26	39394	1	210
27	39724	2	210
28	39016	1	204
29	38877	0	0
30	39033	0	0
31	38992	0	0
32	38358	0	0
131	76238	1	208
133	75624	3	5520
135	73995	3	9403

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	27589	7	305
0	1	27604	4	304
0	2	27593	3	306
1	0	27593	7	307
1	1	27602	1	306

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	2	27574	6	306
1	3	27590	4	576
1	4	27603	5	306
2	0	27594	8	576
2	1	27567	10	581
2	2	27599	3	305
2	3	27592	6	576
2	4	27603	2	301
3	0	27578	6	306
3	1	27581	3	304
3	2	27593	7	306
9	0	27596	8	304
9	1	27578	9	576
9	2	27603	5	305
9	3	27589	7	306
9	4	27583	5	304
9	5	27578	10	306
9	6	27587	1	301

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35320	0	0
1	35355	0	0
2	35322	2	462
3	35327	2	470
9	35288	1	436

Table 5-14 WAAS Fast Correction and Degradation Message Rates–G30

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	186422	10	60
1	105200	8	223
2	1106169	36	52
3	1292560	54	60
4	1292574	56	66
7	97603	22	165
9	90878	3	176
10	97520	20	168
17	30911	1	306

Table 5-15 WAAS Long Correction Message Rates (Type 24 and 25)–G30

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
2	48874	4	180
3	46438	3	270
4	46066	2	178
5	46600	1	181
6	46581	1	180
7	46538	1	186
8	47239	1	186
9	46066	3	180
10	46452	1	161
11	46452	3	183
12	46090	2	167
13	48221	0	0
14	45777	1	166
15	46411	1	178
16	46602	1	184
17	46943	4	180
18	46191	1	162
19	45032	3	178
20	47427	2	181
21	49228	2	180
22	46850	1	181
23	45967	0	0
24	48168	0	0
25	47763	3	166
26	46726	2	183
27	47196	2	182
28	46273	2	258
29	46154	2	258
30	46412	0	0
31	46246	1	184
32	45492	3	270

Table 5-16 WAAS Ephemeris Covariance Message Rates (Type 28)–G30

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
2	40151	0	0
3	38123	0	0
4	37862	2	210

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
5	38236	1	208
6	38256	2	312
7	38171	0	0
8	38776	3	210
9	37794	2	209
10	38106	1	150
11	38152	2	207
12	37877	1	209
13	39624	0	0
14	37588	0	0
15	38128	0	0
16	38275	1	207
17	38575	0	0
18	37953	1	204
19	37015	1	208
20	38913	1	210
21	40465	0	0
22	38515	0	0
23	37695	0	0
24	39615	0	0
25	39256	2	212
26	38368	3	209
27	38780	2	204
28	37997	0	0
29	37905	4	209
30	38163	0	0
31	37944	1	313
32	37344	2	313
131	74388	5	312
133	73798	4	5237
135	73942	1	9506

Table 5-17 WAAS Ionospheric Correction Message Rates (Type 26)–G30

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	26901	12	306
0	1	26922	10	576
0	2	26922	6	305
1	0	26919	9	306
1	1	26906	11	306

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	2	26908	7	576
1	3	26930	6	303
1	4	26898	10	576
2	0	26929	7	456
2	1	26930	5	449
2	2	26911	8	437
2	3	26916	6	576
2	4	26909	6	448
3	0	26924	11	447
3	1	26911	12	437
3	2	26910	7	579
9	0	26905	14	576
9	1	26906	16	579
9	2	26915	12	579
9	3	26913	6	576
9	4	26906	9	576
9	5	26923	9	305
9	6	26913	7	306

Table 5-18 WAAS Ionospheric Mask Message Rates (Type 18)–G30

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35201	1	366
1	35227	1	439
2	35263	0	0
3	35295	2	469
9	35221	2	453

5.4 Satellite Glitches

The GPS satellites will occasionally experience periods of signal carrier stability glitches of varying magnitude. These glitches are short degradations in the signal, which in severe cases may cause WAAS to lose track or cycle slip for some or all of the WAAS receivers. The more severe glitches will cause the WAAS-reported UDRE to increase to "Not Monitor" and result in an alert. Figure 5-2 shows the SV glitch trend for this quarter.

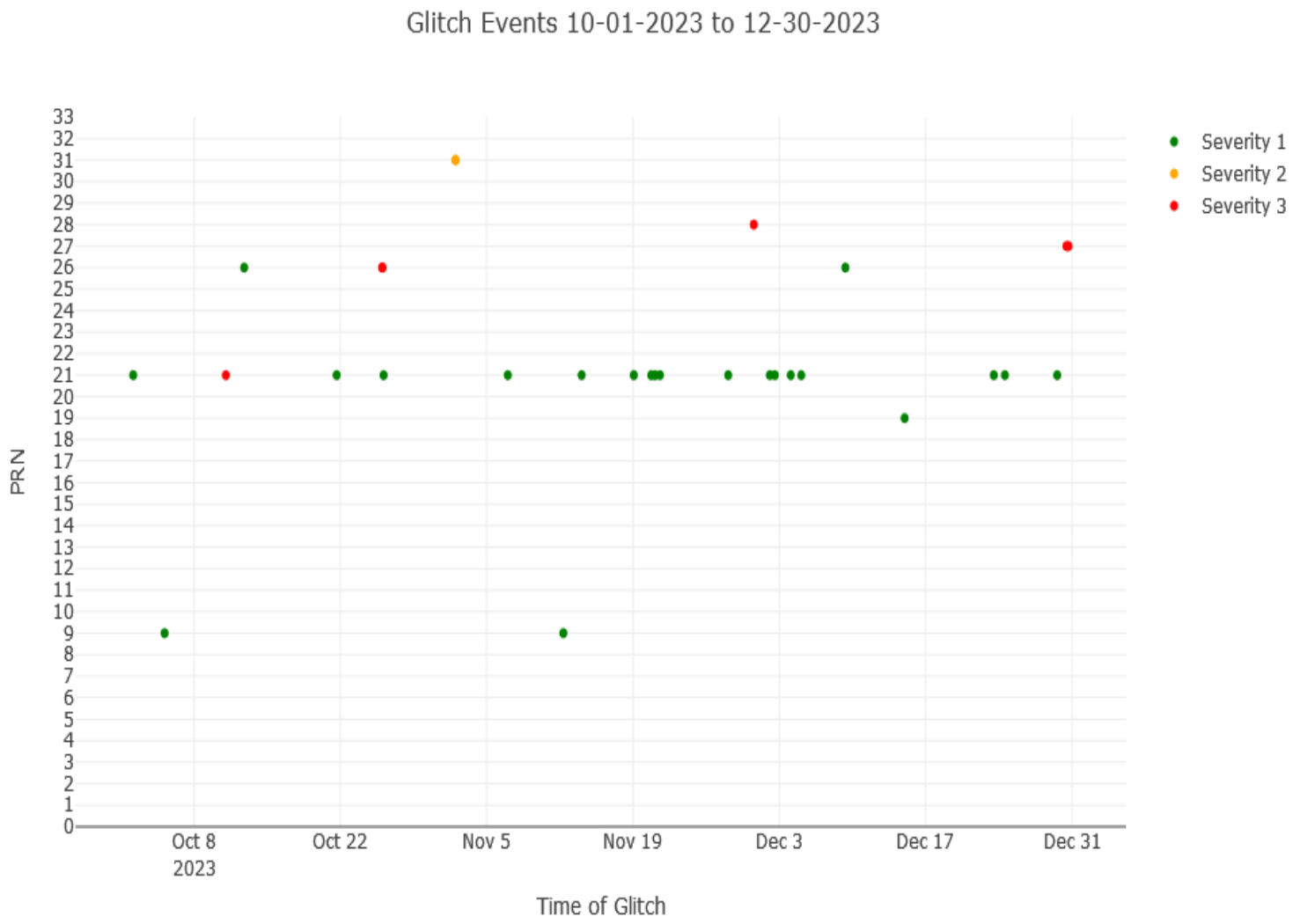

Figure 5-2 SV Glitch Trend

6.0 SV RANGE ACCURACY

WAAS transmits UDRE and GIVE values to support protection levels such that the position error is bounded 99.9999%. The position domain analysis in this report provides the information regarding how well the transmitted WAAS UDRE and GIVE values bound the position errors. A UDRE is broadcasted by the WAAS for each monitored satellite, and the 95% error bound and the maximum normalized value (divided by sigma_UDRE) 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 normalized 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, maximum range error, and maximum normalized value (divided by sigma_UDRE) at the time of the maximum range error. Figure 6-1 through Figure 6-3 show the 95% range error for each SV measured by the WAAS receivers at the Washington, DC 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 (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma
1																		
2	1.164	4.222	1.295	1.081	3.907	2.180	1.156	4.361	2.700	1.225	4.011	2.059	1.763	3.969	1.165	1.144	2.907	1.167
3	0.938	4.061	1.975	1.380	6.798	2.066	1.292	4.399	2.454	1.033	3.835	2.245	1.820	3.951	1.261	1.344	4.276	1.264
4	1.100	4.809	1.870	1.362	4.453	2.062	1.266	5.094	2.115	1.133	3.028	2.156	1.649	2.805	1.585	1.185	2.609	0.901
5	0.873	2.079	0.777	0.966	2.388	1.017	1.119	2.609	1.114	1.361	3.250	1.021	1.179	3.483	1.187	1.049	2.701	1.004
6	0.983	2.573	1.954	1.113	3.109	1.197	1.082	2.575	0.867	1.248	3.091	1.276	1.459	2.532	0.867	1.117	3.197	1.161
7	1.264	2.865	1.342	1.161	2.282	1.424	1.040	2.612	0.825	1.404	3.921	1.190	1.954	2.947	1.885	1.064	2.921	1.068
8	1.776	4.657	1.376	1.174	3.194	1.025	1.080	2.141	1.117	1.295	4.013	1.784	1.596	2.753	1.094	1.116	3.538	0.905
9	1.029	2.983	1.739	1.293	3.808	1.652	1.105	2.398	1.182	1.090	3.015	1.824	2.013	3.203	1.414	0.987	2.697	0.819
10	1.029	3.801	2.095	1.195	3.924	2.297	1.237	4.322	2.331	1.435	4.032	1.808	1.246	2.730	0.946	1.293	2.940	1.147
11	0.915	2.279	0.932	0.947	2.288	0.987	1.189	3.244	1.088	1.306	3.315	0.972	2.304	9.484	2.994	1.181	2.950	1.001
12	1.060	4.182	2.397	1.230	4.144	2.844	1.341	4.265	2.748	1.418	4.426	1.352	1.724	4.969	1.301	1.297	3.384	1.042
13	1.455	3.904	1.358	1.305	2.868	0.894	1.352	2.880	0.961	1.302	4.197	1.344	1.175	2.279	0.757	1.161	4.896	1.347
14	0.918	2.592	1.714	1.013	2.473	0.857	1.072	2.299	1.743	1.214	3.470	1.504	1.531	2.806	1.729	1.021	3.243	0.557
15	1.702	4.227	1.590	1.006	2.230	0.958	1.222	2.881	1.261	1.550	3.957	1.561	1.285	3.010	1.037	0.961	2.283	0.653
16	1.529	3.621	1.097	1.353	4.867	2.502	1.208	5.418	2.744	1.470	3.448	0.972	1.598	3.234	1.929	1.003	2.808	1.681
17	0.971	3.605	1.253	1.513	4.114	1.881	1.227	2.259	1.536	1.251	3.039	0.875	2.593	7.202	2.271	1.016	2.835	0.890
18	1.144	2.309	0.817	1.413	4.243	0.734	1.184	6.602	0.876	1.426	3.118	1.447	1.228	2.667	0.785	1.068	3.313	1.630
19	1.089	3.539	1.124	1.222	2.098	1.448	1.126	2.315	1.106	1.142	3.586	1.560	1.399	4.098	1.097	1.323	3.730	1.031
20	1.324	2.990	1.217	1.071	2.677	0.843	1.192	3.920	1.228	1.599	3.286	1.338	1.215	2.137	0.420	1.050	3.413	1.096
21	0.935	3.986	2.904	1.123	4.518	2.694	1.131	4.690	2.944	1.184	3.671	2.147	2.011	6.201	1.904	1.178	4.577	1.311
22	1.726	3.233	2.834	1.704	3.608	1.214	1.948	3.101	2.171	1.422	4.837	1.542	2.266	3.440	2.244	1.438	2.881	1.064
23	1.516	3.154	1.225	0.897	3.871	1.688	1.117	3.510	1.545	1.512	4.007	1.177	1.449	2.930	0.832	1.236	2.997	1.288
24	1.197	4.863	1.466	1.160	2.924	1.116	1.213	3.306	1.005	1.591	3.589	1.108	1.765	3.369	1.108	1.163	2.946	0.690
25	1.140	3.859	2.683	1.204	4.428	3.270	1.141	5.331	4.023	1.378	3.115	1.131	1.328	2.736	0.692	1.667	5.300	1.521
26	1.263	4.295	1.733	1.256	4.646	2.902	1.102	5.014	3.220	1.333	2.661	0.987	1.381	3.990	1.657	1.013	2.644	1.656
27	1.282	3.831	1.070	1.238	4.188	1.731	1.411	2.861	1.314	1.533	4.630	1.494	1.365	3.183	0.779	1.384	3.855	1.049
28	0.910	3.750	3.303	1.112	4.199	3.526	0.874	4.835	3.467	1.679	4.339	1.917	1.257	3.513	0.687	1.203	3.326	1.248
29	1.242	3.042	1.592	0.979	4.193	2.524	1.180	5.677	2.619	1.612	3.492	2.047	1.968	3.657	1.285	1.203	3.450	0.997
30	0.954	2.612	1.561	1.411	4.149	1.384	1.541	2.625	1.103	1.231	3.782	1.602	2.397	3.601	1.918	0.956	2.252	1.277
31	1.092	4.251	2.973	1.103	4.471	2.896	1.172	5.262	3.446	1.721	4.743	2.663	1.616	4.346	0.736	0.980	2.720	0.830
32	1.089	3.803	3.186	0.844	4.118	2.298	1.010	4.784	4.001	1.197	3.591	1.927	1.961	5.966	1.630	1.113	3.608	1.093
131	1.935	8.425	0.370	1.336	6.093	0.232	1.987	7.364	0.381	1.794	5.940	0.205	1.428	4.625	0.460	1.460	5.565	0.328
133	2.014	7.377	0.287	1.674	5.512	0.172	1.434	7.008	0.233	1.587	5.008	1.108	1.368	5.028	0.342	1.242	5.850	0.354
135	2.263	5.342	0.218	1.228	6.197	0.593	1.631	6.002	0.215	1.567	5.112	1.099	1.739	5.189	0.383	1.469	5.152	0.311

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 (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma
1																		
2	1.578	3.486	1.510	2.083	4.178	1.543	1.272	5.347	1.779	1.340	6.255	1.931	1.307	5.235	4.513	1.262	4.032	2.666
3	1.086	2.671	2.253	2.046	3.786	1.239	0.945	5.413	3.628	1.260	5.117	3.277	1.031	4.999	3.283	1.371	4.534	2.415
4	1.057	2.438	1.751	1.915	3.801	2.299	0.985	5.698	2.938	1.029	4.907	2.387	1.194	5.393	2.762	1.232	2.914	1.305
5	1.194	2.857	1.215	3.076	8.199	1.513	1.032	2.135	1.507	1.761	4.649	1.693	1.458	3.000	0.914	1.137	2.834	1.192
6	1.518	3.757	1.517	2.899	8.156	1.524	0.986	3.243	1.734	2.009	5.848	1.841	1.553	4.419	1.567	1.151	2.755	0.777
7	1.069	2.825	1.196	2.408	4.842	1.558	0.935	2.253	0.891	0.908	2.029	0.622	1.336	3.503	0.693	1.016	2.036	1.071
8	1.117	2.905	0.926	2.233	3.997	2.347	1.090	2.260	0.902	1.628	4.243	1.838	1.394	2.644	1.118	1.195	2.092	1.285
9	1.208	5.052	1.594	2.160	3.861	1.273	0.906	3.071	1.212	1.244	3.654	1.098	1.349	4.118	1.705	1.143	2.257	0.635
10	1.689	3.680	1.138	1.373	3.839	1.404	1.092	5.448	3.019	1.081	5.208	2.378	1.071	5.202	2.273	1.033	3.558	2.986
11	1.703	5.086	1.988	2.403	4.887	1.309	1.083	3.971	2.205	1.307	4.373	1.377	1.647	3.305	0.597	1.171	2.188	1.467
12	1.245	2.954	2.165	1.438	3.621	1.176	1.078	2.588	0.774	1.259	3.680	1.167	1.507	2.568	1.487	1.283	3.059	1.348
13	1.037	2.494	0.919	1.417	3.483	1.433	1.364	3.816	1.122	1.089	3.726	1.237	1.197	3.588	1.080	1.004	2.588	0.490
14	1.035	2.440	0.734	2.040	3.901	1.361	1.034	1.891	1.078	1.269	2.888	0.867	1.123	2.298	0.666	1.186	2.020	1.509
15	1.363	3.775	1.284	1.431	3.131	1.278	1.034	3.312	1.230	2.153	4.580	2.293	1.226	2.260	0.795	0.998	2.138	1.458
16	1.568	4.447	1.566	2.127	3.658	0.714	1.362	6.033	2.759	2.012	4.866	1.293	1.232	5.288	1.672	1.006	3.782	1.469
17	1.389	3.812	1.290	2.062	3.486	0.837	1.185	3.226	0.581	1.259	5.203	1.748	1.431	3.778	2.071	1.276	2.141	1.746
18	1.312	2.657	0.832	1.406	3.492	1.092	1.019	2.920	0.758	0.863	2.009	0.645	0.953	2.164	0.402	1.011	2.505	0.736
19	1.107	2.744	1.802	2.079	3.349	1.117	1.236	2.543	0.814	0.947	2.002	1.414	1.446	2.618	1.375	1.141	1.922	1.429
20	1.026	2.434	1.672	1.862	3.688	0.686	1.264	2.621	0.443	2.810	7.328	2.024	1.707	2.756	1.028	1.081	2.096	0.615
21	1.194	3.148	1.081	2.342	4.204	1.778	1.147	6.096	4.958	1.298	4.940	3.424	1.250	5.375	4.577	1.313	4.252	2.897
22	1.370	2.834	1.317	2.739	4.258	2.634	1.764	2.532	1.741	1.645	2.469	1.213	1.958	3.020	1.648	1.949	2.809	2.212
23	1.365	3.346	1.336	1.404	3.793	1.199	1.005	2.174	0.734	1.308	2.625	0.984	0.985	2.352	0.802	0.929	2.628	0.948
24	1.411	2.690	0.754	1.411	2.947	1.412	1.053	3.851	1.141	0.971	3.407	1.030	1.266	3.341	0.965	1.035	2.296	0.746
25	1.422	2.948	0.969	1.394	2.696	1.557	1.231	6.473	3.623	1.126	5.861	1.794	1.379	5.342	2.436	1.091	3.980	2.730
26	1.229	3.582	1.144	2.203	4.037	1.661	1.179	5.953	3.108	1.458	6.322	1.885	1.652	5.881	2.546	1.120	3.622	2.166
27	1.064	2.707	0.672	2.007	4.072	1.313	0.983	2.335	0.708	0.938	2.424	0.810	1.269	3.585	1.103	0.948	2.214	0.630
28	1.434	3.553	1.142	2.755	10.944	1.957	0.967	5.675	3.483	1.880	5.248	1.670	1.444	5.308	2.874	0.952	3.793	1.230
29	1.275	2.990	1.232	1.466	3.148	0.977	1.196	2.401	0.753	1.366	3.111	1.231	1.485	3.977	1.111	1.156	3.568	1.358
30	1.455	4.295	1.115	1.827	4.356	1.416	0.929	1.891	0.634	1.044	3.585	1.095	1.152	2.598	0.740	1.378	2.489	1.510
31	1.197	3.424	1.362	1.963	3.845	1.037	1.011	5.953	4.280	1.465	5.346	4.594	1.124	5.453	3.216	1.041	3.845	2.656
32	1.485	3.038	1.583	1.611	4.723	1.510	0.980	5.584	3.756	0.953	5.013	4.159	1.064	5.166	2.913	0.948	3.381	2.618
131	1.984	4.426	1.255	1.544	4.247	0.504	1.844	10.003	0.556	1.443	8.428	0.413	1.988	8.543	0.486	1.593	5.326	0.534
133	1.583	4.335	0.539	1.480	5.461	0.748	2.029	8.779	0.450	2.266	8.130	0.353	1.634	9.385	0.514	1.307	6.513	0.586
135	1.725	4.881	1.299	1.411	5.301	1.171	1.420	9.718	0.516	1.871	9.881	0.451	1.438	9.177	0.513	1.327	6.056	0.567

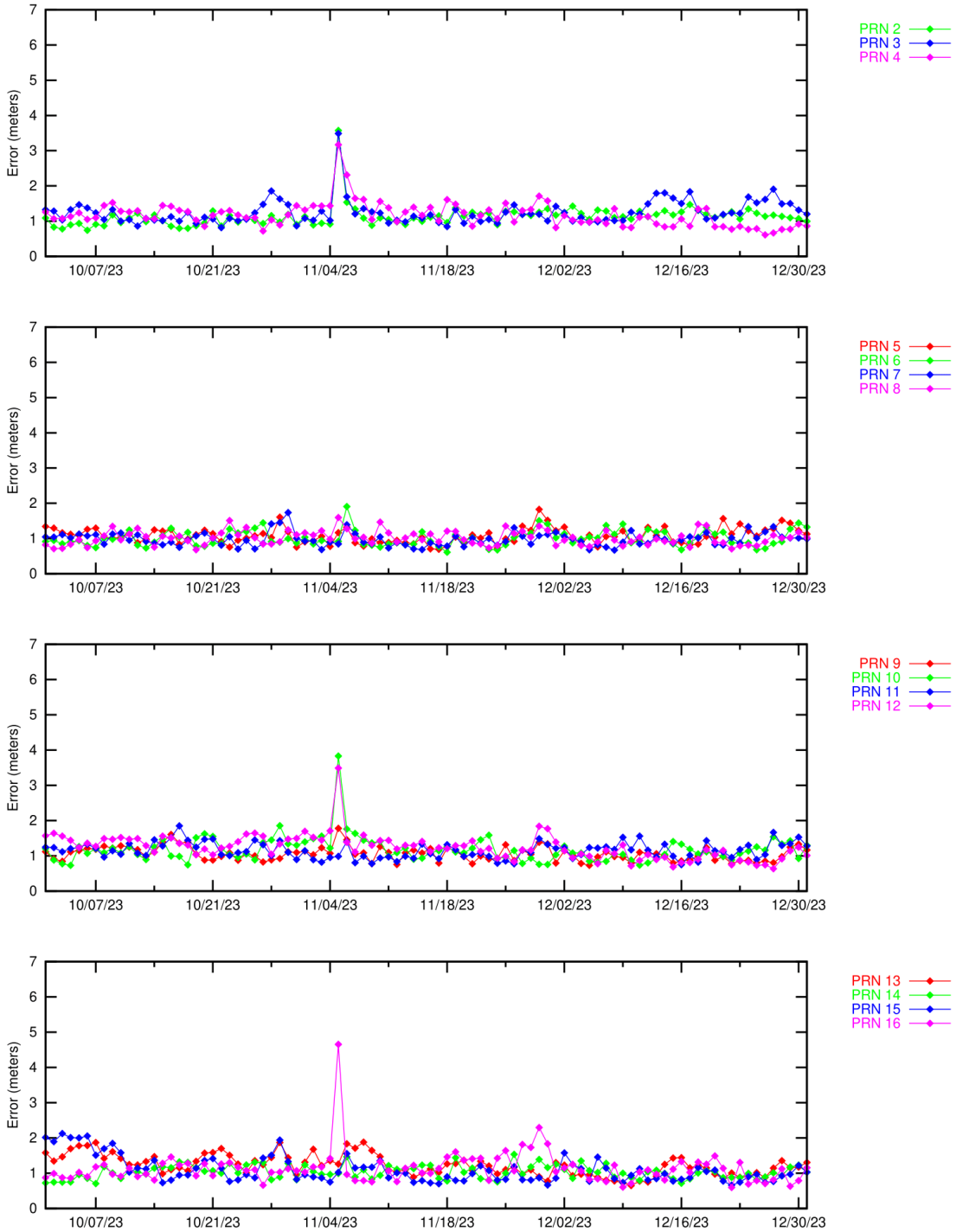

Figure 6-1 Range Error (PRN1 – PRN16) – Washington, DC

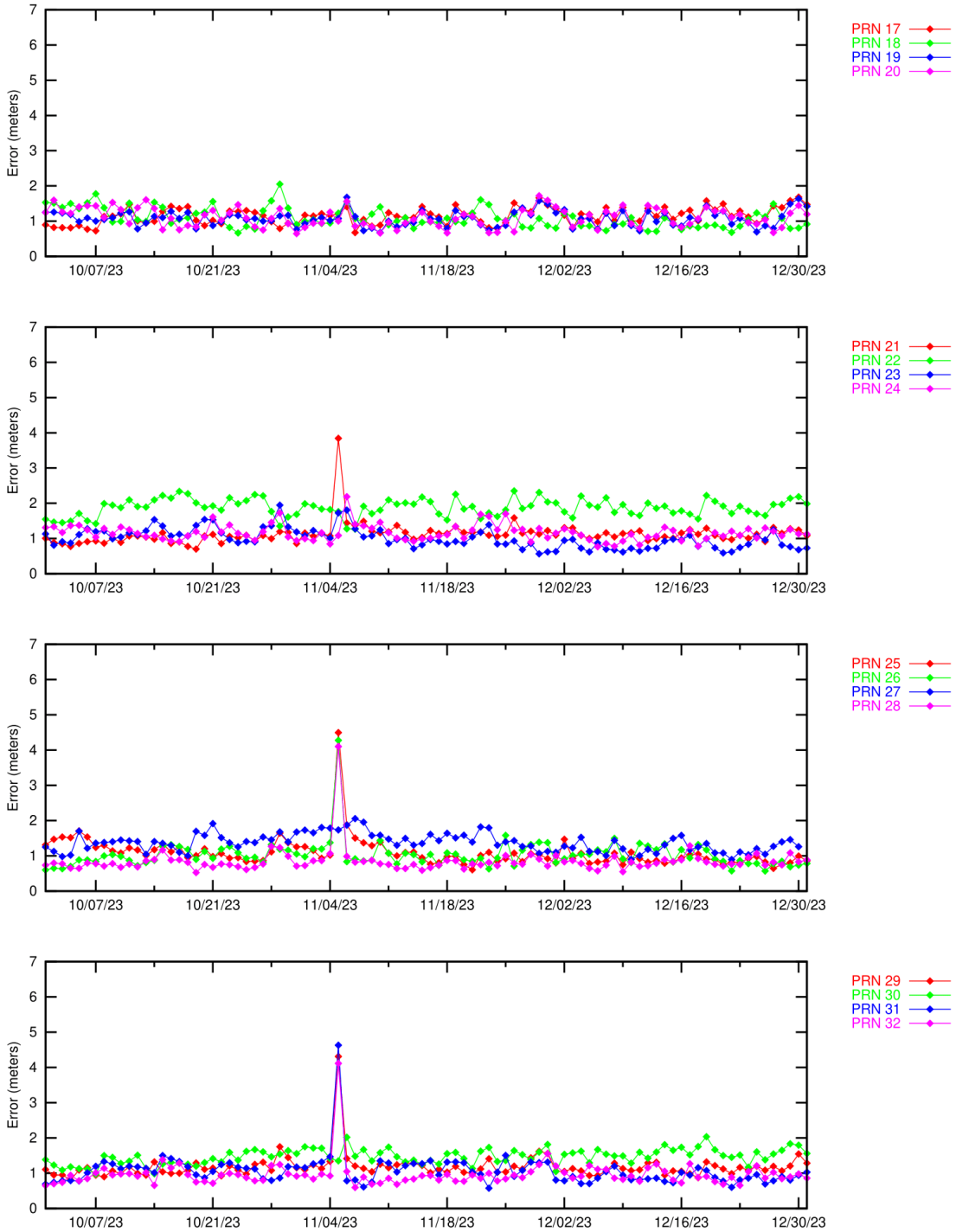

Figure 6-2 Range Error (PRN17 – PRN32) – Washington, DC

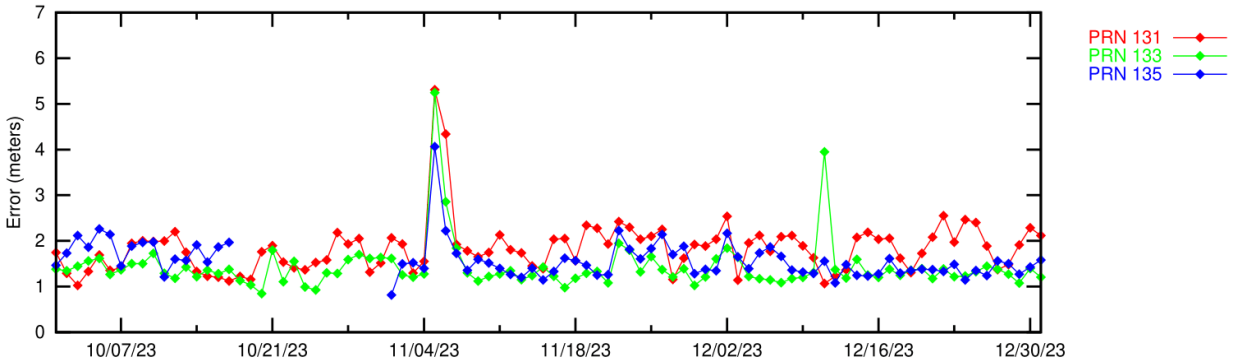

Figure 6-3 Range Error (PRN131, PRN133, and PRN138) – Washington, DC

A GIVE is broadcasted by the WAAS for each monitored IGP and the maximum normalized value (divided by sigma_UISE [User Ionospheric Slant Error]) of the ionospheric error after application of ionospheric corrections 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, maximum ionospheric error, and maximum normalized value (divided by sigma_UISE) for each SV at the selected locations. Figure 6-4 and Figure 6-5 show the 95% ionospheric error for each SV measured by the WAAS receiver at the Washington, DC 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 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma
1																		
2	0.520	3.165	0.123	0.519	2.910	0.874	0.533	1.646	0.692	0.536	2.581	0.528	0.483	2.605	0.227	0.443	2.482	0.086
3	0.506	2.992	1.159	0.674	4.091	0.203	0.549	2.800	0.200	0.529	2.528	0.531	0.740	3.578	1.089	0.528	1.875	0.542
4	0.535	2.504	0.611	0.813	5.429	0.231	0.686	3.668	0.248	0.557	3.842	0.943	0.602	2.943	0.322	0.508	2.166	0.575
5	0.426	1.879	0.915	0.628	2.136	0.733	0.438	1.953	0.496	0.587	1.858	0.595	0.772	2.424	0.577	0.464	2.075	0.482
6	0.399	2.896	0.069	0.630	2.150	0.733	0.446	1.578	0.502	0.531	2.503	0.624	0.761	2.905	0.637	0.551	2.512	0.639
7	0.680	2.541	0.715	0.808	5.233	0.247	0.742	2.034	0.124	0.781	3.988	0.884	0.811	2.041	0.634	0.420	2.445	0.337
8	0.709	2.431	0.615	0.591	2.300	0.852	0.523	2.073	0.555	0.693	3.631	0.388	0.765	6.582	1.138	0.449	1.937	0.093
9	0.488	3.400	0.888	0.751	9.603	0.565	0.512	5.425	0.577	0.504	2.176	0.435	0.610	4.423	0.155	0.526	3.499	0.098
10	0.619	2.757	0.122	0.609	2.465	0.250	0.698	2.215	0.635	0.758	2.436	0.780	0.642	2.840	0.279	0.615	2.895	0.119
11	0.392	1.537	0.632	0.621	2.348	1.093	0.404	2.145	0.677	0.718	3.503	0.723	1.364	7.877	2.188	0.519	2.450	0.691
12	0.499	2.743	0.629	0.636	3.646	0.187	0.572	2.737	0.189	0.520	2.877	1.010	0.840	2.609	0.842	0.629	2.030	0.674
13	0.584	4.708	0.890	0.589	2.940	0.586	0.505	2.295	0.655	0.611	2.428	0.807	0.537	2.670	0.723	0.401	1.766	0.640
14	0.629	2.295	0.619	0.473	2.156	0.983	0.581	1.484	0.314	0.573	2.434	0.802	0.564	2.485	0.583	0.561	2.268	0.557
15	0.634	3.187	0.631	0.485	1.656	0.427	0.556	2.325	0.614	0.663	3.452	0.634	0.631	2.533	0.548	0.493	2.670	0.519
16	0.554	4.568	0.406	0.513	2.347	0.848	0.520	3.691	0.729	0.758	3.760	0.166	0.671	4.074	0.931	0.615	3.061	0.131
17	0.446	2.082	0.768	0.940	3.647	1.312	0.446	1.972	0.617	0.554	3.109	0.856	1.206	8.102	0.210	0.510	1.837	0.560
18	0.651	1.982	0.722	0.826	3.073	0.083	0.693	4.597	0.819	0.863	4.765	0.967	0.566	2.076	0.419	0.481	1.853	0.536
19	0.556	1.504	0.778	0.434	1.805	0.567	0.562	1.629	0.975	0.491	2.010	0.742	0.928	4.131	0.990	0.925	3.934	1.023
20	0.557	8.628	0.239	0.659	2.349	1.121	0.582	2.773	0.686	0.715	3.008	0.867	1.018	2.303	0.534	0.494	2.187	0.109
21	0.397	2.479	0.532	0.446	2.459	0.560	0.441	1.812	0.235	0.502	2.511	0.629	0.859	3.123	0.295	0.453	1.932	0.681
22	1.031	2.340	0.920	0.959	2.815	0.889	0.971	2.029	0.550	0.891	2.578	0.659	0.962	3.026	0.583	0.830	1.787	0.937
23	0.780	2.193	0.962	0.506	1.593	0.411	0.650	2.795	1.168	0.788	2.875	0.722	0.601	2.942	0.839	0.756	1.902	0.604
24	0.471	2.765	0.749	0.535	2.534	0.069	0.583	1.458	0.782	0.504	2.965	0.307	0.462	1.544	0.497	0.423	1.541	0.607
25	0.507	3.438	0.172	0.505	3.759	0.153	0.431	3.081	0.127	0.631	4.209	1.046	0.427	2.067	0.074	0.848	3.974	1.019
26	0.540	5.345	0.475	0.584	2.564	0.642	0.538	2.612	0.705	0.773	5.988	0.155	0.800	2.835	1.116	0.549	2.836	0.115
27	0.562	2.965	0.736	0.514	2.478	0.532	0.596	1.922	0.617	0.793	4.038	0.137	0.567	2.881	0.772	0.483	2.567	0.138
28	0.559	2.185	0.841	0.805	3.231	0.235	0.576	2.113	0.817	0.721	4.841	0.347	0.861	2.448	0.618	0.517	1.958	0.592
29	0.610	6.773	0.182	0.531	3.704	0.098	0.666	3.366	0.103	0.701	6.247	0.585	0.925	2.677	0.864	0.480	1.627	0.367
30	0.528	3.087	0.567	0.656	2.997	0.762	0.718	2.378	0.455	0.584	2.677	0.558	0.972	2.200	0.650	0.479	2.050	0.398
31	0.437	2.740	0.201	0.535	2.610	0.118	0.399	1.908	0.247	0.774	6.568	0.223	0.773	3.349	0.717	0.571	2.468	0.478
32	0.708	2.048	0.881	0.492	3.401	0.112	0.540	2.627	0.136	0.663	2.686	0.263	0.974	4.797	1.107	0.538	3.617	0.120

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

Site	Billings			Miami			Albuquerque			Kansas City			Atlanta			Los Angeles		
PRN ↓	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma
1																		
2	0.470	1.851	0.675	0.655	3.388	0.127	0.454	2.010	1.114	0.589	2.578	0.919	0.472	2.301	0.853	0.419	1.995	0.535
3	0.468	2.542	0.089	0.834	3.203	0.137	0.591	1.900	0.553	0.552	4.345	0.204	0.700	9.025	0.245	0.482	1.922	0.318
4	0.473	2.189	0.223	0.628	3.742	0.112	0.667	4.603	0.182	0.506	4.004	0.132	0.517	2.412	0.589	0.617	3.051	0.152
5	0.655	3.535	0.113	0.980	5.136	0.967	0.646	2.785	0.631	1.100	3.288	1.330	0.542	2.293	0.567	0.663	2.951	0.646
6	0.773	2.378	0.698	0.984	5.156	1.003	0.602	2.223	0.600	1.049	3.586	0.994	0.534	2.429	0.544	0.502	2.498	0.733
7	0.523	2.757	0.756	1.253	2.978	0.863	0.466	8.426	1.374	0.538	2.730	0.271	0.588	2.678	0.173	0.517	3.036	0.351
8	0.547	2.012	0.804	0.580	2.308	0.485	0.525	1.850	0.472	0.526	2.792	0.781	0.459	1.606	0.379	0.589	2.325	0.102
9	0.579	2.658	0.795	0.962	4.608	0.141	0.577	3.431	0.101	0.792	2.420	0.077	0.658	3.341	0.152	0.511	3.255	0.130
10	0.853	3.936	0.109	0.601	2.096	0.211	0.467	2.201	0.583	0.613	1.794	0.596	0.577	1.772	0.496	0.455	2.713	0.147
11	1.091	6.486	1.145	0.567	3.237	0.566	0.472	2.627	0.680	0.552	3.328	0.969	0.427	1.927	0.501	0.472	2.223	0.247
12	0.672	4.678	0.494	0.662	8.967	2.466	0.488	1.891	0.542	0.488	2.245	0.095	0.605	2.020	0.110	0.473	2.175	0.413
13	0.495	2.115	0.799	0.658	2.291	0.648	0.559	1.577	0.624	0.519	2.203	0.505	0.544	1.919	0.503	0.429	1.762	0.572
14	0.565	2.540	0.590	1.131	3.198	0.655	0.423	1.973	0.208	0.594	2.032	0.583	0.577	1.716	0.479	0.371	3.185	0.442
15	0.563	2.502	0.908	0.552	2.152	0.674	0.555	1.818	0.444	1.158	4.084	1.031	0.627	2.539	0.592	0.574	2.292	0.497
16	0.706	3.913	0.191	0.776	2.633	0.524	0.546	1.711	0.485	1.124	3.548	0.982	0.541	4.118	0.815	0.570	4.025	0.231
17	0.585	3.344	1.103	0.635	4.905	0.434	0.637	2.723	0.602	0.870	2.187	0.572	0.513	1.833	0.502	0.508	2.411	0.518
18	0.662	1.969	0.518	0.810	2.211	0.655	0.571	1.745	0.873	0.518	1.679	0.446	0.663	1.784	0.884	0.375	1.979	0.171
19	0.606	2.959	0.911	0.821	4.909	0.871	0.583	3.319	0.746	0.596	2.825	0.880	0.405	1.564	0.346	0.560	7.103	0.704
20	0.573	1.703	0.119	0.546	4.523	0.243	0.659	2.075	0.530	1.314	3.231	0.981	0.656	3.636	0.665	0.537	2.854	0.567
21	0.414	1.391	0.495	0.761	4.249	0.156	0.414	1.984	0.596	0.552	1.942	0.707	0.496	3.562	0.132	0.540	3.140	0.156
22	0.836	1.862	0.619	1.404	3.263	1.042	1.036	2.440	0.122	0.896	2.507	0.855	0.961	3.671	0.832	0.881	3.923	0.578
23	0.575	1.679	0.606	0.655	2.495	0.724	0.560	2.478	0.680	0.772	1.768	1.059	0.499	1.952	0.661	0.450	2.147	0.696
24	0.540	2.011	0.427	0.705	1.966	0.539	0.444	1.923	0.794	0.393	1.767	0.604	0.585	1.995	0.826	0.458	1.613	0.424
25	0.544	3.321	0.108	0.633	2.666	0.069	0.622	2.657	0.184	0.563	3.354	1.289	0.531	3.070	0.079	0.418	1.803	0.613
26	0.450	4.508	0.160	0.837	1.956	0.482	0.509	3.210	0.214	0.769	3.860	0.977	0.578	1.581	0.543	0.731	3.682	1.318
27	0.486	2.343	0.666	0.568	2.336	0.393	0.406	2.350	0.148	0.454	2.597	0.412	0.472	1.631	0.404	0.424	2.051	0.549
28	0.611	2.943	0.077	1.115	6.985	1.375	0.683	2.463	0.559	1.318	3.572	0.892	0.545	2.496	0.622	0.558	2.977	0.788
29	0.693	4.455	0.116	0.671	4.476	0.619	0.443	1.506	0.385	0.543	4.591	0.117	0.548	3.036	0.080	0.563	2.716	0.211
30	0.731	4.400	1.132	0.713	3.294	0.339	0.563	2.719	0.576	0.524	2.678	0.804	0.536	2.885	0.554	0.481	2.784	0.368
31	0.521	2.050	0.547	0.792	3.745	0.103	0.509	2.587	0.654	0.755	3.103	0.845	0.409	2.421	0.606	0.641	3.185	0.672
32	0.964	4.803	0.122	0.679	3.215	0.593	0.694	2.450	0.493	0.738	2.155	0.100	0.630	1.527	0.461	0.471	2.397	0.268

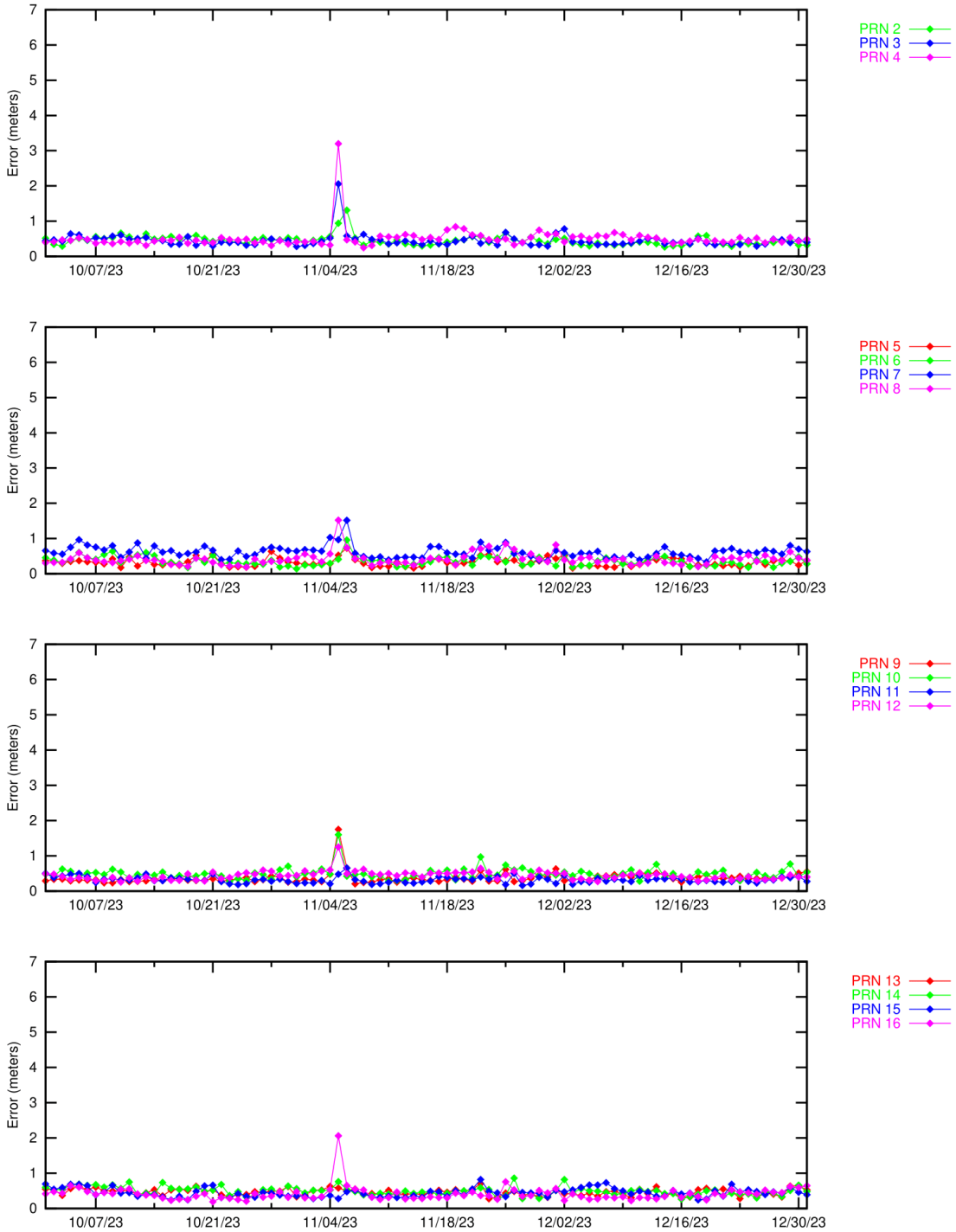

Figure 6-4 Ionospheric Error (PRN1 – PRN16) – Washington, DC

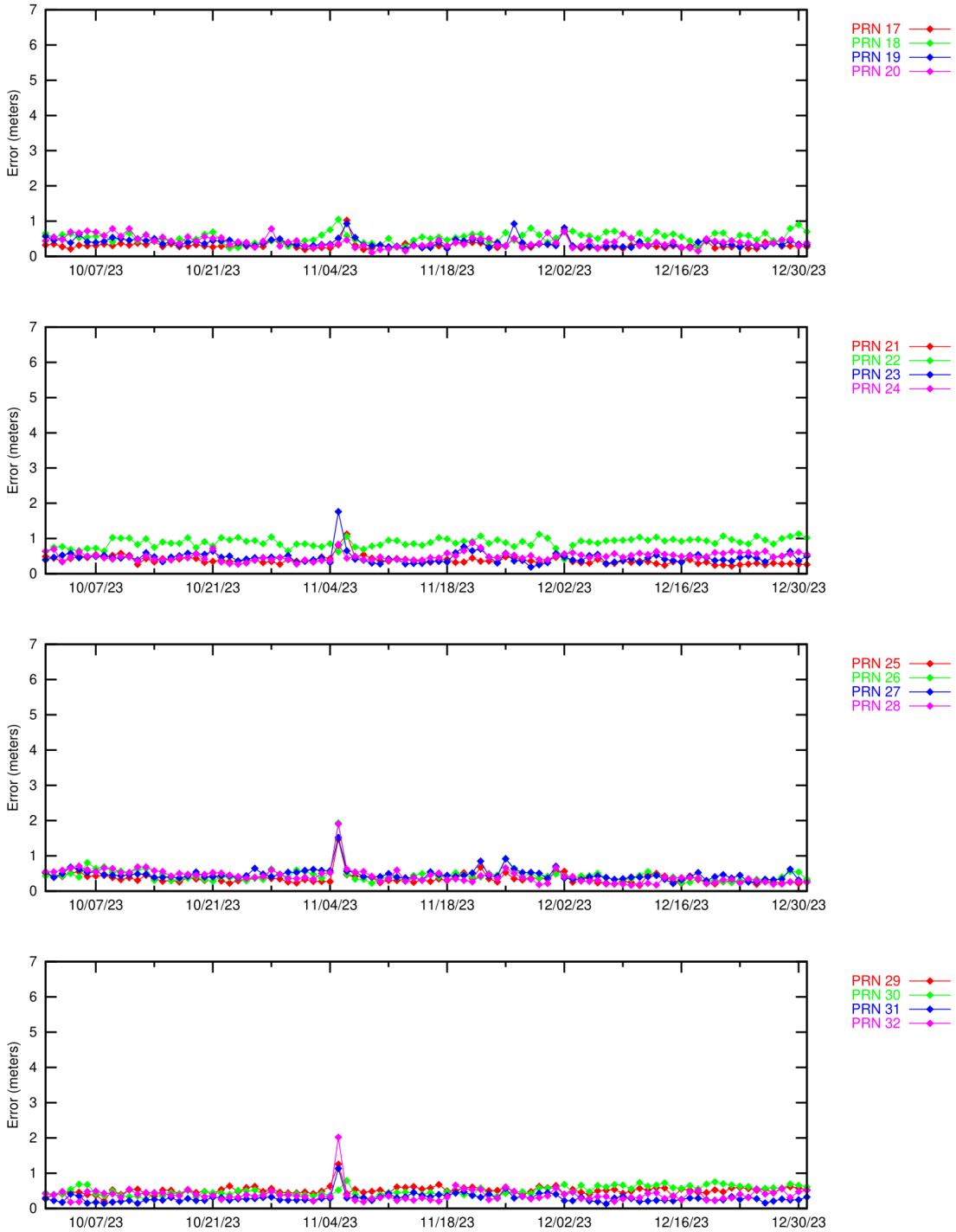

Figure 6-5 Ionospheric Error (PRN17 – PRN32) – Washington, DC

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.

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, S15, and G30 GEO PA ranging availability, respectively.

The reductions in SM9 GEO PA, S15 GEO PA, and G30 GEO PA ranging availability were due to GUS switchovers (see Figure 7-1 to Figure 7-3). Refer to Table 1-7 for detailed information on the GUS switchovers for this reporting period. G30 reductions in GEO PA ranging availability occurred during field testing from October 17, 2023 to November 1, 2023.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	99.59	0.08	0.30	0.03
SM9 131	S15	98.61	0.28	0.37	0.75
SM9 131	G30	96.62	0.29	1.76	1.33
S15 133	SM9	99.57	0.08	0.33	0.03
S15 133	S15	98.57	0.27	0.47	0.69
S15 133	G30	96.60	0.29	1.78	1.33
G30 135	SM9	99.58	0.08	0.31	0.03
G30 135	S15	98.54	0.28	0.48	0.70
G30 135	G30	98.78	0.30	0.68	0.25

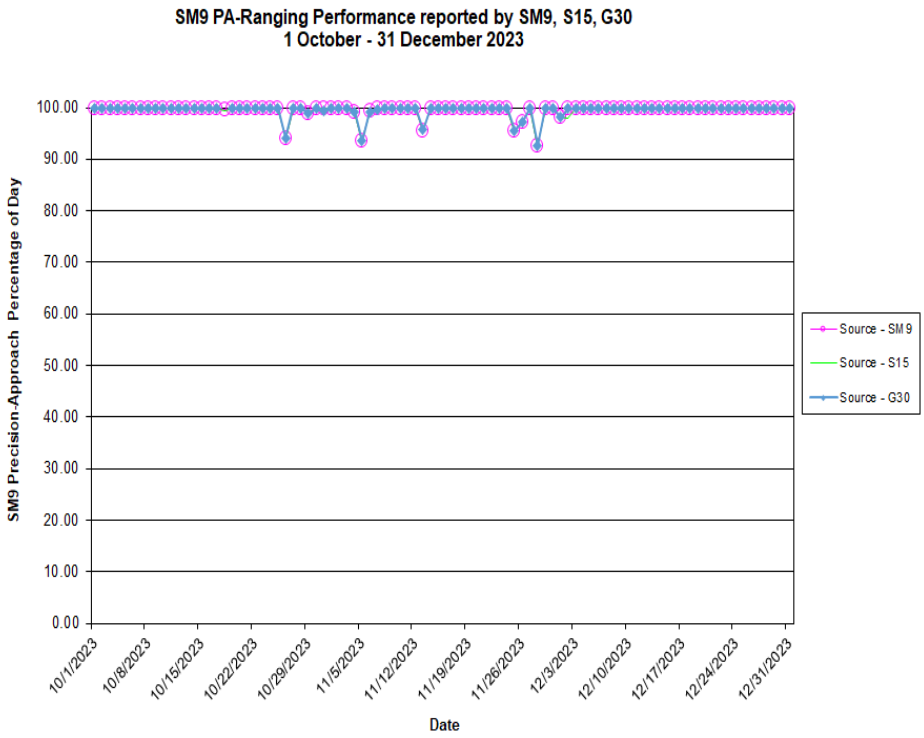

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

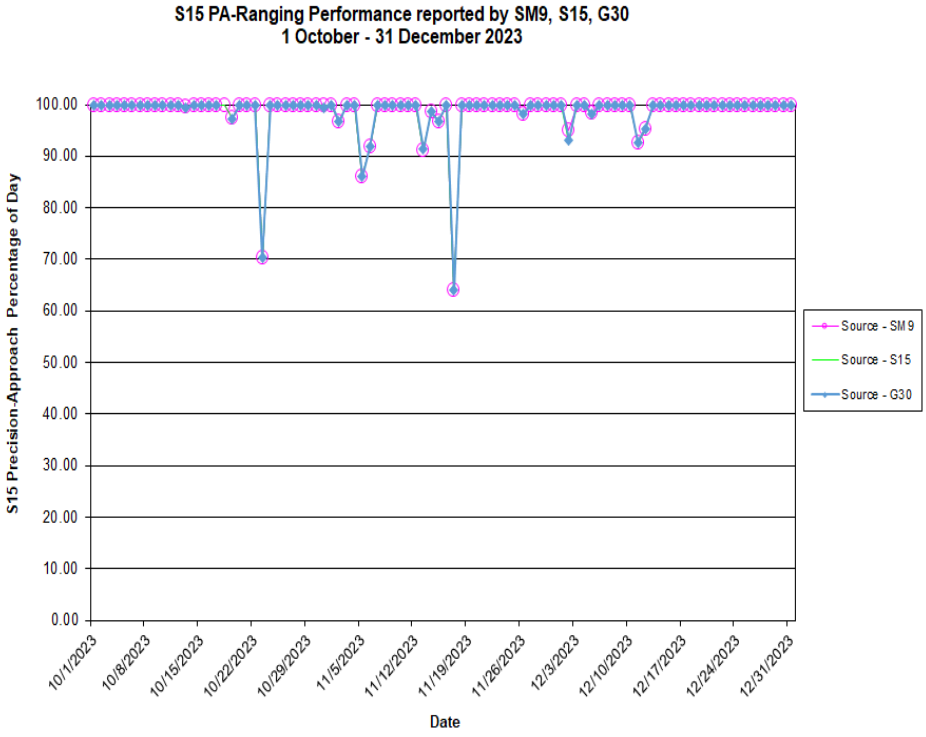

Figure 7-2 Daily PA S15 GEO Ranging Availability Trend

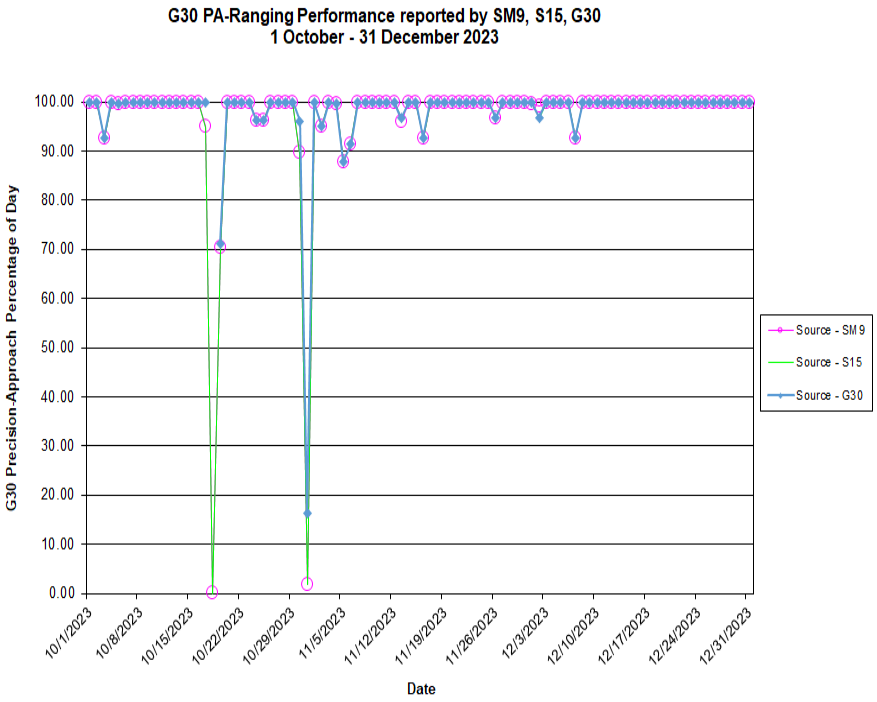

Figure 7-3 Daily PA G30 GEO Ranging Availability Trend

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 U.S. 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 U.S. 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 U.S. airports with GPS RNAV IAPs; not selecting "Show All Airports" displays only airports with approved LPV approaches, as shown in Table 8-1.

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CAL4	ALBIAN	AB	LPV	4	99.521	9	99.370	15	99.078
CEA3	OLDS-DIDSBURY	AB	LPV	4	99.738	4	99.712	7	99.559
CEB5	FAIRVIEW	AB	LPV	5	99.793	8	99.694	21	99.386
CEC4	JASPER-HINTON	AB	LP	4	99.780	5	99.763	12	99.556
CEH3	PONOKA (LABRIE FIELD)	AB	LPV	4	99.717	4	99.691	9	99.504
CEH5	RED EARTH CREEK	AB	LP	5	99.645	8	99.578	18	99.207
CEH6	PROVOST	AB	LPV	4	99.684	4	99.627	6	99.475
CEN3	THREE HILLS	AB	LPV	4	99.734	4	99.710	6	99.566
CEN5	COLD LAKE REGIONAL	AB	LPV	4	99.599	5	99.572	13	99.352
CEQ3	CAMROSE	AB	LPV	4	99.718	4	99.654	9	99.440
CET2	CONKLIN (LEISMER)	AB	LPV	5	99.577	5	99.520	15	99.233
CEV3	VEGREVILLE	AB	LPV	7	99.691	5	99.630	9	99.407
CEW3	ST. PAUL	AB	LPV	4	99.621	4	99.607	11	99.380
CEX3	WETASKIWIN REGIONAL	AB	LPV	4	99.716	5	99.679	10	99.462
CEZ3	COOKING LAKE	AB	LPV	4	99.714	4	99.650	9	99.412
CFB6	JOSEPHBURG	AB	LPV	5	99.699	4	99.646	9	99.406
CFM4	DONNELLY	AB	LPV	5	99.786	7	99.686	18	99.362
CYBF	BONNYVILLE	AB	LPV	4	99.606	4	99.577	13	99.360
CYBW	SPRINGBANK	AB	LPV	4	99.822	5	99.760	7	99.624
CYEG	EDMONTON INTL	AB	LPV200	4	99.715	4	99.656	11	99.444
CYFI	FIREBAG	AB	LPV	4	99.521	9	99.367	15	99.057
CYLB	LAC LA BICHE	AB	LPV	5	99.626	5	99.590	13	99.359
CYLL	LLOYDMINSTER	AB	LPV	4	99.620	4	99.590	12	99.415
CYMM	FORT MCMURRAY	AB	LPV200	5	99.528	9	99.470	15	99.109
CYNR	HORIZON	AB	LPV	5	99.533	9	99.362	16	99.077
CYOD	GROUP CAPTAIN R.W. MCNAIR	AB	LP	4	99.599	4	99.573	13	99.356

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYOJ	HIGH LEVEL	AB	LPV	6	99.611	13	99.430	27	99.005
CYOP	RAINBOW LAKE	AB	LPV	5	99.638	8	99.509	26	99.057
CYPE	PEACE RIVER	AB	LPV	4	99.727	9	99.666	18	99.310
CYPY	FORT CHIPEWYAN	AB	LPV	9	99.404	8	99.250	23	98.773
CYQF	RED DEER REGIONAL	AB	LPV	4	99.718	4	99.696	8	99.521
CYQL	LETHBRIDGE	AB	LPV200	3	99.809	4	99.787	3	99.699
CYQU	GRANDE PRAIRIE	AB	LPV200	3	99.814	9	99.768	14	99.503
CYWM	ATHABASCA	AB	LPV	4	99.655	5	99.615	12	99.362
CYXH	MEDICINE HAT	AB	LPV	3	99.770	3	99.753	4	99.657
CYYC	YYC CALGARY INTL	AB	LPV200	3	99.794	4	99.737	8	99.614
CYZU	WHITECOURT	AB	LPV	5	99.763	7	99.698	12	99.467
CZPC	PINCHER CREEK	AB	LPV	3	99.815	3	99.794	3	99.708
CZVL	VILLENEUVE	AB	LPV	4	99.714	4	99.653	9	99.409
2C7	SHAKTOOLIK	AK	LPV	5	99.744	9	99.658	15	99.376
6A8	ALLAKAKET	AK	LP	9	99.544	11	99.437	19	99.025
7KA	TATITLEK	AK	LP	6	99.730	9	99.626	12	99.319
9A3	CHUATHBALUK	AK	LPV	7	99.795	8	99.723	11	99.481
ADQ	KODIAK	AK	LPV	4	99.840	5	99.726	8	99.584
AFM	AMBLER	AK	LPV	9	99.524	11	99.430	21	99.007
AKN	KING SALMON	AK	LPV	5	99.827	6	99.783	10	99.632
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	6	99.758	7	99.661	11	99.393
ANI	ANIAK	AK	LPV	7	99.793	8	99.729	13	99.474
AQH	QUINHAGAK	AK	LPV	4	99.859	6	99.787	10	99.578
AQT	NUIQSUT	AK	LPV	12	99.279	15	99.131	32	98.630
ATK	ATQASUK EDWARD BURNELL SR MEML	AK	LPV	12	99.302	14	99.196	36	98.602
AWI	WAINWRIGHT	AK	LPV	13	99.320	15	99.204	42	98.579
BET	BETHEL	AK	LPV200	5	99.830	7	99.750	14	99.479

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BRW	WILEY POST-WILL ROGERS MEML	AK	LPV	12	99.281	16	99.161	42	98.523
BVK	BUCKLAND	AK	LPV	6	99.718	9	99.629	17	99.276
CDB	COLD BAY	AK	LPV200	9	99.868	8	99.800	27	99.455
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	7	99.723	8	99.616	11	99.376
CEM	CENTRAL	AK	LP	8	99.482	10	99.363	23	99.003
CLP	CLARKS POINT	AK	LPV	5	99.833	5	99.792	11	99.614
CXF	COLDFOOT	AK	LP	10	99.449	13	99.305	18	98.831
D76	ROBERT/BOB/CURTIS MEML	AK	LPV	8	99.606	11	99.512	22	99.081
DEE	DEERING	AK	LPV	7	99.705	9	99.626	19	99.279
DLG	DILLINGHAM	AK	LPV	5	99.829	5	99.787	10	99.620
ELI	ELIM	AK	LPV	4	99.725	8	99.663	17	99.378
ENA	KENAI MUNICIPAL	AK	LPV200	6	99.765	6	99.675	11	99.500
ENM	EMMONAK	AK	LPV	6	99.774	10	99.702	15	99.385
FAI	FAIRBANKS INTL	AK	LPV200	14	99.662	13	99.463	17	99.148
FYU	FORT YUKON	AK	LPV	10	99.436	13	99.291	24	98.803
GAL	EDWARD G PITKA SR	AK	LPV	7	99.757	8	99.569	15	99.364
GAM	GAMBELL	AK	LPV	5	99.767	10	99.649	32	99.080
GKN	GULKANA	AK	LPV	8	99.655	11	99.498	12	99.190
GST	GUSTAVUS	AK	LP	6	99.669	6	99.515	14	99.221
HLA	HUSLIA	AK	LPV	7	99.689	11	99.609	19	99.280
HOM	HOMER	AK	LPV	6	99.797	6	99.712	8	99.553
HPB	HOOPER BAY	AK	LP	6	99.813	9	99.726	16	99.372
HRR	HEALY RIVER	AK	LP	7	99.618	10	99.498	14	99.248
IAN	BOB BAKER MEML	AK	LPV	8	99.598	13	99.484	23	99.051
IIK	KIPNUK	AK	LPV	4	99.861	7	99.787	12	99.562
ILI	ILIAMNA	AK	LPV	5	99.816	6	99.764	10	99.601
IWK	WALES	AK	LP	7	99.703	11	99.619	28	99.241

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IYS	WASILLA	AK	LPV	6	99.747	10	99.628	11	99.329
KAL	KALTAG	AK	LPV	6	99.750	8	99.618	16	99.380
KGX	GRAYLING	AK	LP	7	99.776	8	99.696	15	99.409
KKA	KOYUK ALFRED ADAMS	AK	LP	5	99.721	8	99.657	16	99.365
KSM	ST MARY'S	AK	LPV200	6	99.785	8	99.708	15	99.439
KTN	KETCHIKAN INTL	AK	LPV	6	99.792	7	99.648	11	99.502
KTS	BREVIG MISSION	AK	LPV	6	99.710	9	99.650	22	99.297
KWT	KWETHLUK	AK	LPV	5	99.826	7	99.750	14	99.493
KYU	KOYUKUK	AK	LPV	6	99.736	8	99.568	15	99.375
MCG	MC GRATH	AK	LP	7	99.750	8	99.611	14	99.403
MDM	MARSHALL DON HUNTER SR	AK	LP	6	99.803	8	99.729	13	99.447
MDO	MIDDLETON ISLAND	AK	LP	6	99.736	6	99.624	12	99.438
MLY	MANLEY HOT SPRINGS	AK	LP	10	99.682	11	99.538	16	99.235
MOU	MOUNTAIN VILLAGE	AK	LPV200	6	99.786	8	99.712	16	99.435
MYU	MEKORYUK	AK	LPV	5	99.883	8	99.797	17	99.405
OME	NOME	AK	LPV	6	99.744	10	99.683	22	99.327
OOK	TOKSOOK BAY	AK	LP	4	99.864	7	99.779	17	99.438
ORT	NORTHWAY	AK	LP	8	99.562	12	99.367	14	99.068
OTZ	RALPH WIEN MEML	AK	LPV	8	99.601	10	99.514	25	99.091
PAQ	WARREN 'BUD' WOODS PALMER MUNICIPAL	AK	LP	6	99.747	10	99.618	10	99.308
PBV	ST GEORGE	AK	LPV	8	99.832	11	99.772	45	99.086
PHO	POINT HOPE	AK	LPV	10	99.558	15	99.381	40	98.717
PTU	PLATINUM	AK	LPV	4	99.859	6	99.815	10	99.608
RBY	RUBY	AK	LPV	8	99.744	8	99.561	12	99.333
RSH	RUSSIAN MISSION	AK	LP	6	99.800	8	99.730	14	99.487
SCC	DEADHORSE	AK	LPV200	10	99.224	14	99.056	29	98.591
SCM	SCAMMON BAY	AK	LP	7	99.803	10	99.730	17	99.391

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SDP	SAND POINT	AK	LPV	8	99.904	9	99.838	16	99.555
SHG	SHUNGNAK	AK	LP	8	99.525	10	99.444	19	99.039
SHX	SHAGELUK	AK	LPV	7	99.772	7	99.697	15	99.406
SIT	SITKA ROCKY GUTIERREZ	AK	LP	5	99.704	6	99.542	15	99.358
SLQ	SLEETMUTE	AK	LP	7	99.773	6	99.696	12	99.450
SMK	ST MICHAEL	AK	LPV	6	99.805	9	99.687	15	99.404
SXQ	SOLDOTNA	AK	LP	6	99.758	6	99.675	11	99.506
TER	TELLER	AK	LPV200	6	99.715	9	99.647	22	99.298
TKA	TALKEETNA	AK	LPV	7	99.714	10	99.559	11	99.332
TOG	TOGIAK	AK	LP	5	99.849	5	99.806	12	99.625
WLK	SELAWIK	AK	LPV	7	99.612	10	99.530	22	99.108
WMO	WHITE MOUNTAIN	AK	LPV	5	99.719	9	99.657	21	99.378
WNA	NAPAKIAK	AK	LPV	5	99.847	7	99.766	14	99.480
WSN	SOUTH NAKNEK NR 2	AK	LPV	5	99.832	6	99.784	10	99.632
WTK	NOATAK	AK	LPV	8	99.577	13	99.451	27	98.951
YAK	YAKUTAT	AK	LPV200	8	99.683	7	99.582	14	99.262
02A	CHILTON COUNTY	AL	LP	1	99.858	1	99.855	2	99.853
06A	MOTON FLD MUNICIPAL	AL	LPV	1	99.967	1	99.908	1	99.855
09A	BUTLER/CHOCTAW COUNTY	AL	LPV	2	99.879	2	99.876	1	99.837
0J6	HEADLAND MUNICIPAL	AL	LPV	1	99.993	2	99.970	2	99.894
0R1	ATMORE MUNICIPAL	AL	LPV	1	99.980	3	99.946	1	99.849
11A	CLAYTON MUNICIPAL	AL	LPV	1	99.993	2	99.954	1	99.855
12J	BREWTON MUNICIPAL	AL	LPV	1	99.993	2	99.958	1	99.855
1A9	PRATTVILLE - GROUBY FLD	AL	LPV	2	99.947	2	99.868	2	99.853
1M4	POSEY FLD	AL	LPV	1	99.855	1	99.855	1	99.841
1R8	BAY MINETTE MUNICIPAL	AL	LPV	1	99.980	3	99.940	2	99.850
2R5	ST ELMO	AL	LPV	1	99.980	3	99.958	2	99.856

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
33J	GENEVA MUNICIPAL	AL	LP	1	99.993	2	99.979	2	99.872
3M8	NORTH PICKENS	AL	LP	1	99.855	1	99.855	1	99.855
4A9	ISBELL FLD	AL	LPV	1	99.855	1	99.855	1	99.837
5R1	ROY WILCOX	AL	LP	2	99.927	2	99.897	1	99.848
5R4	FOLEY MUNICIPAL	AL	LPV	1	99.993	1	99.972	2	99.856
71J	OZARK/BLACKWELL FLD	AL	LPV	1	99.993	2	99.967	1	99.855
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	1	99.993	2	99.953	1	99.855
8A0	ALBERTVILLE RGNL/THOMAS J BRUM	AL	LPV	1	99.855	1	99.855	1	99.838
8A1	GUNTERSVILLE MUNICIPAL/JOE STARNES	AL	LPV	1	99.855	1	99.855	1	99.838
9A4	COURTLAND	AL	LPV200	1	99.855	1	99.855	1	99.841
A08	VAIDEN FLD	AL	LPV	1	99.860	1	99.855	1	99.837
ALX	THOMAS C RUSSELL FLD	AL	LPV	2	99.938	3	99.890	2	99.852
ANB	ANNISTON RGNL	AL	LPV	1	99.855	1	99.855	2	99.852
ASN	TALLADEGA MUNICIPAL	AL	LPV200	1	99.855	1	99.855	2	99.852
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	1	99.964	1	99.917	1	99.855
BFM	MOBILE DOWNTOWN	AL	LPV200	1	99.980	3	99.950	2	99.855
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	1	99.855	1	99.855	2	99.854
CMD	CULLMAN RGNL-FOLSOM FLD	AL	LPV	1	99.855	1	99.855	1	99.840
CQF	H L SONNY CALLAHAN	AL	LPV200	1	99.993	1	99.971	2	99.856
DCU	PRYOR FLD RGNL	AL	LPV200	1	99.855	1	99.855	1	99.837
DHN	DOTHAN RGNL	AL	LPV200	1	99.993	2	99.973	2	99.880
DYA	DEMOPOLIS RGNL	AL	LPV	1	99.860	1	99.858	1	99.835
EDN	ENTERPRISE MUNICIPAL	AL	LPV	1	99.993	2	99.958	1	99.855
EET	SHELBY COUNTY	AL	LPV	1	99.855	1	99.855	2	99.854
EKY	BESSEMER	AL	LPV200	1	99.855	1	99.855	2	99.854
EUF	WEEDON FLD	AL	LPV	2	99.992	2	99.934	1	99.866
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	1	99.855	1	99.855	1	99.838

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GZH	EVERGREEN RGNL/MIDDLETON FLD	AL	LP	2	99.992	3	99.929	1	99.848
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	1	99.855	1	99.855	1	99.841
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	1	99.855	1	99.855	1	99.837
JFX	WALKER COUNTY-BEVILL FLD	AL	LPV	1	99.855	1	99.855	1	99.847
JKA	GULF SHORES INTL/JACK EDWARDS	AL	LPV200	1	99.995	1	99.974	2	99.856
M95	RICHARD ARTHUR FLD	AL	LPV	1	99.855	1	99.855	1	99.848
MDQ	HUNTSVILLE EXEC TOM SHARP JR F	AL	LPV200	1	99.855	1	99.855	1	99.837
MGM	MONTGOMERY RGNL (DANNELLY FLD)	AL	LPV200	3	99.971	2	99.915	2	99.852
MOB	MOBILE RGNL	AL	LPV200	2	99.969	3	99.946	2	99.855
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	1	99.855	1	99.855	1	99.837
PLR	ST CLAIR COUNTY	AL	LPV	1	99.855	1	99.855	2	99.853
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	1	99.855	1	99.855	1	99.837
SCD	MERKEL FLD SYLACAUGA MUNICIPAL	AL	LPV	2	99.869	1	99.855	2	99.853
SEM	CRAIG FLD	AL	LPV200	3	99.929	2	99.871	2	99.852
TCL	TUSCALOOSA NTL	AL	LPV	1	99.855	1	99.855	1	99.855
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	1	99.993	2	99.945	1	99.855
0M0	BILLY FREE MUNICIPAL	AR	LPV	1	99.855	1	99.853	1	99.835
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	1	99.841	1	99.837	1	99.826
4A5	SEARCY COUNTY	AR	LPV	1	99.837	1	99.837	1	99.826
4M1	CARROLL COUNTY	AR	LP	1	99.830	1	99.829	1	99.826
4M3	CARLISLE MUNICIPAL	AR	LPV	1	99.848	1	99.841	1	99.833
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	1	99.848	1	99.848	1	99.837
7M1	MC GEHEE MUNICIPAL	AR	LP	1	99.855	1	99.854	1	99.833
9M8	SHERIDAN-GRANT COUNTY RGNL	AR	LPV	1	99.848	1	99.841	1	99.833
ADF	DEXTER B FLORENCE MEML FLD	AR	LPV	1	99.848	1	99.841	1	99.829
ARG	WALNUT RIDGE RGNL	AR	LPV200	1	99.841	1	99.837	1	99.826
ASG	SPRINGDALE MUNICIPAL	AR	LPV	1	99.830	1	99.829	1	99.826

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	1	99.848	1	99.841	1	99.833
BPK	BAXTER COUNTY	AR	LPV	1	99.837	1	99.837	1	99.826
BVX	BATESVILLE RGNL	AR	LPV	1	99.841	1	99.837	1	99.826
BYH	ARKANSAS INTL	AR	LPV200	1	99.848	1	99.837	1	99.826
CDH	HARRELL FLD	AR	LPV	1	99.855	1	99.841	1	99.825
CXW	CONWAY RGNL	AR	LPV	1	99.841	1	99.841	1	99.826
DRP	DELTA RGNL	AR	LPV	1	99.848	1	99.841	1	99.833
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	1	99.855	1	99.833	1	99.816
FLP	MARION COUNTY RGNL	AR	LPV	1	99.837	1	99.837	1	99.826
FSM	FORT SMITH RGNL	AR	LPV200	1	99.833	1	99.833	1	99.826
FYV	DRAKE FLD	AR	LPV	1	99.830	1	99.829	1	99.826
H34	HUNTSVILLE MUNICIPAL	AR	LPV	1	99.830	1	99.829	1	99.826
HEE	THOMPSON-ROBBINS	AR	LPV	1	99.848	1	99.848	1	99.841
HRO	BOONE COUNTY	AR	LPV	1	99.831	1	99.831	1	99.826
JBR	JONESBORO MUNICIPAL	AR	LPV200	1	99.843	1	99.841	1	99.829
LIT	BILL AND HILLARY CLINTON NTL/A	AR	LPV200	1	99.848	1	99.841	1	99.833
LLQ	MONTICELLO MUNICIPAL/ELLIS FLD	AR	LPV	1	99.855	1	99.848	1	99.832
M18	HOPE MUNICIPAL	AR	LP	1	99.855	1	99.833	1	99.823
M19	NEWPORT RGNL	AR	LPV	1	99.841	1	99.841	1	99.826
M32	LAKE VILLAGE MUNICIPAL	AR	LP	1	99.855	1	99.854	1	99.833
M70	POCAHONTAS MUNICIPAL	AR	LPV	1	99.841	1	99.837	1	99.826
M77	HOWARD COUNTY	AR	LP	1	99.848	1	99.835	1	99.826
MXA	MANILA MUNICIPAL	AR	LPV	1	99.848	1	99.837	1	99.828
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	1	99.848	1	99.841	1	99.833
PBF	PINEBLUFF RGNL/GRIDER FLD	AR	LPV	1	99.852	1	99.848	1	99.833
ROG	ROGERS EXEC - CARTER FLD	AR	LPV	1	99.830	1	99.829	1	99.826
RUE	RUSSELLVILLE RGNL	AR	LPV	1	99.841	1	99.837	1	99.826

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	1	99.848	1	99.848	1	99.837
SLG	SMITH FLD	AR	LPV	1	99.830	1	99.829	1	99.826
SRC	SEARCY MUNICIPAL	AR	LPV	1	99.843	1	99.841	1	99.826
SUZ	SALINE COUNTY RGNL	AR	LPV	1	99.848	1	99.841	1	99.833
TXK	TEXARKANA RGNL-WEBB FLD	AR	LPV	1	99.848	1	99.833	1	99.816
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	1	99.830	1	99.829	1	99.826
XNA	NORTHWEST ARKANSAS NTL	AR	LPV200	1	99.830	1	99.829	1	99.826
AVQ	MARANA RGNL	AZ	LP	1	99.790	2	99.750	16	99.696
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	1	99.866	1	99.847	1	99.837
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	1	99.790	2	99.767	6	99.726
CHD	CHANDLER MUNICIPAL	AZ	LPV	1	99.790	1	99.790	6	99.727
DVT	PHOENIX DEER VALLEY	AZ	LPV	2	99.809	2	99.806	5	99.734
FFZ	FALCON FLD	AZ	LP	2	99.804	1	99.790	5	99.732
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	1	99.790	2	99.750	33	99.625
FLG	FLAGSTAFF PULLIAM	AZ	LPV	1	99.837	1	99.837	1	99.830
GCN	GRAND CANYON NTL PARK	AZ	LPV	1	99.847	1	99.841	1	99.833
GEU	GLENDALE MUNICIPAL	AZ	LPV	2	99.809	2	99.800	6	99.713
GYR	PHOENIX GOODYEAR	AZ	LP	2	99.809	2	99.798	6	99.723
HII	LAKE HAVASU CITY	AZ	LPV	1	99.847	1	99.847	5	99.788
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	1	99.847	1	99.847	3	99.801
IGM	KINGMAN	AZ	LPV	1	99.847	1	99.847	2	99.830
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	1	99.790	1	99.790	6	99.731
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	2	99.807	2	99.807	3	99.775
P08	COOLIDGE MUNICIPAL	AZ	LPV	1	99.790	2	99.766	6	99.729
P20	AVI SUQUILLA	AZ	LPV	2	99.842	2	99.838	8	99.761
P33	COCHISE COUNTY	AZ	LPV	1	99.790	2	99.750	12	99.676
PGA	PAGE MUNICIPAL	AZ	LPV	1	99.847	1	99.844	1	99.833

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	2	99.807	1	99.789	6	99.724
PRC	PRESCOTT RGNL - ERNEST A LOVE	AZ	LPV200	2	99.836	2	99.836	2	99.824
RQE	WINDOW ROCK	AZ	LP	1	99.837	1	99.837	1	99.829
RYN	RYAN FLD	AZ	LPV	1	99.790	2	99.750	19	99.675
SAD	SAFFORD RGNL	AZ	LPV	1	99.790	3	99.778	5	99.723
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LPV	2	99.815	2	99.815	3	99.795
SOW	SHOW LOW RGNL	AZ	LPV200	2	99.812	2	99.812	4	99.793
TUS	TUCSON INTL	AZ	LPV	1	99.790	2	99.750	20	99.670
TYL	TAYLOR	AZ	LPV	2	99.814	2	99.814	3	99.797
CAJ4	ANAHIM LAKE	BC	LPV	2	99.863	7	99.734	7	99.585
CAJ9	FORT WARE	BC	LP	6	99.704	9	99.539	19	99.295
CAU4	VANDERHOOF	BC	LPV	4	99.819	10	99.736	9	99.530
CBN9	TSAY KEH	BC	LP	5	99.724	8	99.598	17	99.355
CBW4	BOB QUINN LAKE	BC	LP	8	99.713	8	99.583	17	99.409
CYBL	CAMPBELL RIVER	BC	LPV	2	99.863	2	99.853	6	99.720
CYCD	NANAIMO	BC	LPV	2	99.842	2	99.818	7	99.741
CYCZ	FAIRMONT HOT SPRINGS	BC	LPV	2	99.837	3	99.810	5	99.697
CYDL	DEASE LAKE	BC	LP	8	99.650	10	99.540	27	99.180
CYDQ	DAWSON CREEK	BC	LPV	4	99.813	5	99.731	15	99.472
CYKA	KAMLOOPS	BC	LPV	2	99.858	3	99.835	10	99.744
CYLW	KELOWNA	BC	LPV	2	99.850	2	99.840	5	99.788
CYPK	PITT MEADOWS	BC	LPV	2	99.844	2	99.829	6	99.744
CYPR	PRINCE RUPERT	BC	LPV	7	99.811	8	99.683	10	99.499
CYQQ	COMOX	BC	LPV200	3	99.859	3	99.849	7	99.734
CYQZ	QUESNEL	BC	LPV	4	99.820	9	99.749	8	99.579
CYVR	VANCOUVER INTL	BC	LPV200	2	99.844	2	99.829	6	99.744
CYWL	WILLIAMS LAKE	BC	LPV	4	99.840	7	99.790	8	99.624

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYXJ	FORT ST. JOHN	BC	LPV200	6	99.773	7	99.683	16	99.427
CYXS	PRINCE GEORGE	BC	LPV200	5	99.823	9	99.749	10	99.516
CYXT	TERRACE	BC	LPV	5	99.794	6	99.691	11	99.530
CYXX	ABBOTSFORD	BC	LPV	2	99.848	2	99.830	7	99.747
CYYD	SMITHERS	BC	LPV	5	99.808	7	99.706	12	99.506
CYYE	FORT NELSON	BC	LPV200	5	99.675	11	99.527	23	99.048
CYYF	PENTICTON	BC	LPV	2	99.848	2	99.841	5	99.796
CYYJ	VICTORIA INTL	BC	LPV200	3	99.859	2	99.819	5	99.746
CYZP	SANDSPIT	BC	LPV	7	99.823	7	99.689	10	99.500
CYZT	PORT HARDY	BC	LPV	2	99.898	5	99.838	7	99.696
CZBB	BOUNDARY BAY	BC	LPV	2	99.844	2	99.830	6	99.743
AAT	ALTURAS MUNICIPAL	CA	LPV	1	99.887	1	99.863	2	99.844
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	2	99.837	2	99.817	4	99.782
APC	NAPA COUNTY	CA	LPV200	2	99.833	2	99.819	4	99.724
APV	APPLE VALLEY	CA	LPV	1	99.847	2	99.818	5	99.709
AUN	AUBURN MUNICIPAL	CA	LPV	1	99.858	2	99.842	3	99.808
BFL	MEADOWS FLD	CA	LPV	1	99.851	2	99.821	5	99.701
BLH	BLYTHE	CA	LP	2	99.829	2	99.825	7	99.711
BUR	BOB HOPE	CA	LP	1	99.844	2	99.815	6	99.694
C83	BYRON	CA	LPV	2	99.829	2	99.816	6	99.743
CCB	CABLE	CA	LP	1	99.844	2	99.815	5	99.696
CCR	BUCHANAN FLD	CA	LPV	2	99.832	2	99.819	5	99.729
CEC	JACK MC NAMARA FLD	CA	LPV	2	99.855	2	99.817	3	99.786
CIC	CHICO MUNICIPAL	CA	LPV	2	99.844	2	99.817	4	99.793
CMA	CAMARILLO	CA	LPV	1	99.847	5	99.797	6	99.687
CNO	CHINO	CA	LPV	1	99.844	2	99.815	6	99.694
CPU	CALAVERAS COUNTY-MAURY RASMUSS	CA	LP	2	99.838	2	99.822	4	99.778

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CRQ	MC CLELLAN-PALOMAR	CA	LPV	1	99.844	2	99.804	5	99.636
CVH	HOLLISTER MUNICIPAL	CA	LPV	2	99.827	2	99.817	5	99.715
DAG	BARSTOW-DAGGETT	CA	LPV	1	99.859	2	99.824	5	99.735
DWA	YOLO COUNTY	CA	LPV	2	99.834	2	99.820	5	99.772
F70	FRENCH VALLEY	CA	LPV	1	99.844	2	99.809	5	99.655
FAT	FRESNO YOSEMITE INTL	CA	LPV200	1	99.851	2	99.820	5	99.753
FCH	FRESNO CHANDLER EXEC	CA	LPV	2	99.844	2	99.820	5	99.753
GOO	NEVADA COUNTY	CA	LPV	1	99.860	2	99.843	3	99.817
HAF	HALF MOON BAY	CA	LPV	2	99.830	2	99.816	4	99.708
HHR	JACK NORTHROP FLD/HAWTHORNE MU	CA	LPV	1	99.844	3	99.815	6	99.686
HJO	HANFORD MUNICIPAL	CA	LPV	1	99.851	2	99.820	5	99.737
HWD	HAYWARD EXEC	CA	LPV	2	99.830	2	99.816	4	99.714
L35	BIG BEAR CITY	CA	LP	1	99.844	2	99.818	5	99.730
LAX	LOS ANGELES INTL	CA	LPV200	1	99.844	3	99.815	6	99.686
LGB	LONG BEACH (DAUGHERTY FLD)	CA	LPV	1	99.844	3	99.815	6	99.684
LHM	LINCOLN RGNL/KARL HARDER FLD	CA	LPV200	2	99.835	2	99.820	4	99.790
LLR	LITTLE RIVER	CA	LP	2	99.823	2	99.815	4	99.754
LSN	LOS BANOS MUNICIPAL	CA	LPV	2	99.829	2	99.817	6	99.733
LVK	LIVERMORE MUNICIPAL	CA	LPV200	2	99.829	2	99.816	5	99.729
MAE	MADERA MUNICIPAL	CA	LPV	2	99.833	2	99.818	5	99.755
MCE	MERCED RGNL/MACREADY FLD	CA	LPV200	2	99.830	2	99.817	6	99.754
MER	CASTLE	CA	LPV200	2	99.830	2	99.817	6	99.756
MHR	SACRAMENTO MATHER	CA	LPV200	2	99.832	2	99.826	5	99.774
MHV	MOJAVE AIR AND SPACE PORT	CA	LP	1	99.859	2	99.821	5	99.703
MIT	SHAFTER-MINTER FLD	CA	LPV	1	99.851	2	99.821	5	99.701
MOD	MODESTO CITY-COUNTY-HARRY SHAM	CA	LPV200	2	99.829	2	99.818	6	99.747
MRY	MONTEREY RGNL	CA	LPV	2	99.826	2	99.817	4	99.696

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MYF	MONTGOMERY-GIBBS EXEC	CA	LPV200	1	99.837	3	99.804	5	99.620
MYV	YUBA COUNTY	CA	LPV200	2	99.836	2	99.820	4	99.789
NUQ	MOFFETT FEDERAL AIRFIELD	CA	LPV200	2	99.828	2	99.817	5	99.720
O02	NERVINO	CA	LPV	1	99.866	2	99.853	2	99.840
O08	COLUSA COUNTY	CA	LPV	2	99.837	2	99.820	4	99.784
O27	OAKDALE	CA	LPV	2	99.829	2	99.819	5	99.759
O32	REEDLEY MUNICIPAL	CA	LPV	1	99.859	2	99.820	5	99.742
O69	PETALUMA MUNICIPAL	CA	LPV	2	99.835	2	99.819	4	99.723
O88	RIO VISTA MUNICIPAL	CA	LP	2	99.832	2	99.819	5	99.754
OAK	METRO OAKLAND INTL	CA	LPV200	2	99.831	2	99.816	4	99.714
ONT	ONTARIO INTL	CA	LPV200	1	99.844	2	99.815	5	99.695
OVE	OROVILLE MUNICIPAL	CA	LPV	2	99.841	2	99.820	4	99.793
OXR	OXNARD	CA	LPV	1	99.847	5	99.795	6	99.687
PMD	PALMDALE USAF PLANT 42	CA	LPV200	1	99.859	2	99.818	5	99.701
POC	BRACKETT FLD	CA	LPV	1	99.844	2	99.815	5	99.694
PRB	PASO ROBLES MUNICIPAL	CA	LPV	2	99.823	3	99.817	4	99.696
PVF	PLACERVILLE	CA	LPV	1	99.856	2	99.840	3	99.797
RAL	RIVERSIDE MUNICIPAL	CA	LPV	1	99.844	2	99.815	6	99.696
RBL	RED BLUFF MUNICIPAL	CA	LPV	2	99.845	2	99.817	4	99.789
RDD	REDDING MUNICIPAL	CA	LPV	2	99.848	2	99.817	4	99.791
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	2	99.827	2	99.817	5	99.716
RIV	MARCH ARB	CA	LPV200	1	99.844	2	99.815	6	99.697
SAC	SACRAMENTO EXEC	CA	LPV	2	99.832	2	99.820	5	99.778
SAN	SAN DIEGO INTL	CA	LPV	1	99.837	3	99.803	5	99.616
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	2	99.831	5	99.812	6	99.688
SBD	SAN BERNARDINO INTL	CA	LPV	1	99.844	2	99.815	5	99.705
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	2	99.823	3	99.814	5	99.675

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SCK	STOCKTON METRO	CA	LPV200	2	99.828	2	99.821	6	99.761
SDM	BROWN FLD MUNICIPAL	CA	LPV200	1	99.837	3	99.804	7	99.618
SEE	GILLESPIE FLD	CA	LP	1	99.837	2	99.804	5	99.628
SFO	SAN FRANCISCO INTL	CA	LPV200	2	99.831	2	99.816	4	99.711
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	2	99.827	2	99.817	5	99.720
SMF	SACRAMENTO INTL	CA	LPV200	2	99.834	2	99.820	4	99.779
SMO	SANTA MONICA MUNICIPAL	CA	LPV	1	99.844	3	99.815	6	99.686
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	2	99.825	5	99.812	6	99.689
SNA	JOHN WAYNE/ORANGE COUNTY	CA	LPV200	1	99.844	2	99.812	6	99.678
SNS	SALINAS MUNICIPAL	CA	LPV200	2	99.826	2	99.817	5	99.710
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	2	99.837	2	99.818	4	99.728
TCY	TRACY MUNICIPAL	CA	LPV	2	99.827	2	99.818	6	99.747
TNP	TWENTYNINE PALMS	CA	LP	1	99.844	2	99.818	5	99.746
TOA	ZAMPERINI FLD	CA	LPV	1	99.844	3	99.814	6	99.683
TRK	TRUCKEE-TAHOE	CA	LP	1	99.866	2	99.853	3	99.835
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	1	99.841	2	99.812	4	99.685
TVL	LAKE TAHOE	CA	LP	1	99.866	2	99.837	3	99.818
VCB	NUT TREE	CA	LPV	2	99.833	2	99.820	5	99.763
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	1	99.859	2	99.818	5	99.708
VIS	VISALIA MUNICIPAL	CA	LPV	1	99.851	2	99.820	5	99.738
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	1	99.859	2	99.818	5	99.701
WLW	WILLOWS/GLENN COUNTY	CA	LPV	2	99.840	2	99.820	4	99.782
WVI	WATSONVILLE MUNICIPAL	CA	LPV	2	99.824	2	99.814	5	99.713
1V6	FREMONT COUNTY	CO	LPV	1	99.837	1	99.833	1	99.830
20V	MC ELROY AIRFIELD	CO	LPV	1	99.838	1	99.838	1	99.833
2V5	WRAY MUNICIPAL	CO	LPV200	1	99.837	1	99.833	1	99.826
2V6	YUMA MUNICIPAL	CO	LPV200	1	99.837	1	99.833	1	99.826

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
33V	WALDEN-JACKSON COUNTY	CO	LPV	1	99.840	1	99.833	1	99.833
4V0	RANGELY	CO	LPV	1	99.847	1	99.847	1	99.835
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	1	99.836	1	99.833	1	99.830
AEJ	CENTRAL COLORADO RGNL	CO	LP	1	99.837	1	99.833	1	99.833
AJZ	BLAKE FLD	CO	LPV	1	99.847	1	99.837	1	99.833
AKO	COLORADO PLAINS RGNL	CO	LPV	1	99.837	1	99.833	1	99.829
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	1	99.836	1	99.833	1	99.833
APA	CENTENNIAL	CO	LPV200	1	99.837	1	99.837	1	99.833
BJC	ROCKY MOUNTAIN METRO	CO	LPV200	1	99.837	1	99.837	1	99.835
CAG	CRAIG-MOFFAT	CO	LP	1	99.848	1	99.844	1	99.833
CEZ	CORTEZ MUNICIPAL	CO	LPV	1	99.847	1	99.837	1	99.833
CFO	COLORADO AIR AND SPACE PORT	CO	LPV200	1	99.837	1	99.837	1	99.833
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	1	99.837	1	99.833	1	99.830
DEN	DENVER INTL	CO	LPV200	1	99.837	1	99.837	1	99.833
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	1	99.837	1	99.835	1	99.830
FMM	FORT MORGAN MUNICIPAL	CO	LPV	1	99.837	1	99.833	1	99.833
FNL	NORTHERN COLORADO RGNL	CO	LPV200	1	99.837	1	99.833	1	99.833
FTG	FRONT RANGE	CO	LPV200	1	99.837	1	99.837	1	99.833
GJT	GRAND JUNCTION RGNL	CO	LPV200	1	99.847	1	99.847	1	99.833
GXY	GREELEY-WELD COUNTY	CO	LPV200	1	99.837	1	99.833	1	99.833
HDN	YAMPA VALLEY	CO	LPV200	1	99.848	1	99.844	1	99.833
ITR	KIT CARSON COUNTY	CO	LPV	1	99.837	1	99.833	1	99.829
LAA	SOUTHEAST COLORADO RGNL	CO	LPV	1	99.837	1	99.833	1	99.826
LHX	LA JUNTA MUNICIPAL	CO	LPV	1	99.836	1	99.833	1	99.826
LMO	VANCE BRAND	CO	LPV	1	99.837	1	99.837	1	99.833
MTJ	MONTROSE RGNL	CO	LPV200	1	99.847	1	99.837	1	99.833
MVI	MONTE VISTA MUNICIPAL	CO	LPV	1	99.837	1	99.833	1	99.833

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PSO	STEVENS FLD	CO	LP	1	99.837	1	99.835	1	99.829
PUB	PUEBLO MEML	CO	LPV200	1	99.835	1	99.833	1	99.830
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	1	99.837	1	99.833	1	99.833
RIL	RIFLE GARFIELD COUNTY	CO	LPV	1	99.848	1	99.841	1	99.833
STK	STERLING MUNICIPAL	CO	LPV	1	99.833	1	99.833	1	99.829
TEX	TELLURIDE RGNL	CO	LP	1	99.847	1	99.837	1	99.833
4B8	ROBERTSON FLD	CT	LP	2	99.776	2	99.772	3	99.702
BDL	BRADLEY INTL	CT	LPV200	2	99.776	2	99.772	3	99.702
BDR	IGOR I SIKORSKY MEML	CT	LPV	2	99.779	2	99.776	5	99.720
DXR	DANBURY MUNICIPAL	CT	LP	2	99.779	2	99.776	5	99.728
GON	GROTON-NEW LONDON	CT	LPV	2	99.779	2	99.776	4	99.697
HVN	TWEED/NEW HAVEN	CT	LPV	2	99.779	2	99.776	5	99.718
IJD	WINDHAM	CT	LP	2	99.779	2	99.772	3	99.696
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	2	99.778	2	99.775	3	99.703
OXC	WATERBURY-OXFORD	CT	LPV	2	99.779	2	99.776	3	99.702
DCA	RONALD REAGAN WASHINGTON NTL	DC	LPV	1	99.833	1	99.833	3	99.791
HEF	MANASSAS RGNL/HARRY P DAVIS FL	DC	LPV	1	99.833	1	99.833	2	99.795
IAD	WASHINGTON DULLES INTL	DC	LPV200	1	99.833	1	99.833	2	99.795
33N	DELAWARE AIRPARK	DE	LP	2	99.813	2	99.807	3	99.791
DOV	DOVER AFB	DE	LPV200	2	99.816	2	99.808	4	99.790
EVY	SUMMIT	DE	LPV	2	99.808	2	99.804	4	99.785
GED	DELAWARE COASTAL	DE	LPV	2	99.818	2	99.813	4	99.792
ILG	NEW CASTLE	DE	LPV	2	99.808	2	99.804	4	99.784
1J0	TRI-COUNTY	FL	LP	1	99.999	2	99.987	2	99.884
24J	SUWANNEE COUNTY	FL	LPV	0	100	0	100	2	99.918
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	3	99.952
40J	PERRY-FOLEY	FL	LPV	0	100	0	100	2	99.920

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
54J	DEFUNIAK SPRINGS	FL	LP	1	99.995	2	99.970	1	99.855
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	0	100	2	99.946
APF	NAPLES MUNICIPAL	FL	LPV	0	100	0	100	9	99.915
AVO	AVON PARK EXEC	FL	LPV	0	100	0	100	7	99.942
BCR	TRI-COUNTY	FL	LPV	1	99.999	2	99.987	2	99.884
BCT	BOCA RATON	FL	LPV	0	100	0	100	10	99.889
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	0	100	2	99.963
BOW	BARTOW EXEC	FL	LPV	0	100	0	100	6	99.952
CEW	BOB SIKES	FL	LPV	1	99.993	2	99.967	1	99.855
CGC	CRYSTAL RIVER-CAPT TOM DAVIS F	FL	LP	0	100	0	100	2	99.962
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	0	100	7	99.957
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	7	99.933
CRG	JACKSONVILLE EXEC AT CRAIG	FL	LPV200	0	100	0	100	1	99.902
CTY	CROSS CITY	FL	LPV	0	100	0	100	2	99.942
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	2	99.952
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FL	FL	LPV	0	100	0	100	2	99.953
DTS	DESTIN EXEC	FL	LPV	0	100	1	99.980	1	99.860
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	0	100	3	99.911
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	3	99.949
EYW	KEY WEST INTL	FL	LPV	1	99.983	1	99.981	32	99.800
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	0	100	8	99.907
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	1	99.994	1	99.902
FIN	FLAGLER EXEC	FL	LPV	0	100	0	100	2	99.952
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	0	100	0	100	9	99.879
FMY	PAGE FLD	FL	LPV	0	100	0	100	9	99.936
FPR	TREASURE COAST INTL	FL	LPV	0	100	0	100	7	99.906
FPY	PERRY-FOLEY	FL	LPV	0	100	0	100	2	99.920

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FXE	FORT LAUDERDALE EXEC	FL	LPV200	0	100	0	100	9	99.881
GIF	WINTER HAVEN RGNL	FL	LPV	0	100	0	100	6	99.953
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	3	99.943
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	1	99.902
IMM	IMMOKALEE RGNL	FL	LPV	0	100	0	100	8	99.918
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	6	99.948
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	1	99.902
LAL	LAKELAND LINDER INTL	FL	LPV200	0	100	0	100	5	99.960
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	0	100	1	99.904
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	2	99.957
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	0	100	10	99.898
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	2	99.989	1	99.899
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	6	99.946
MIA	MIAMI INTL	FL	LPV200	0	100	0	100	12	99.877
MKY	MARCO ISLAND EXEC	FL	LPV	0	100	0	100	9	99.910
MLB	MELBOURNE ORLANDO INTL	FL	LPV200	0	100	0	100	7	99.927
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	1	99.996	1	99.992	23	99.813
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	0	100	7	99.922
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	0	100	0	100	2	99.957
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	2	99.952
OPF	MIAMI-OPA LOCKA EXEC	FL	LPV200	0	100	0	100	11	99.879
ORL	EXEC	FL	LPV200	0	100	0	100	5	99.947
PBI	PALM BEACH INTL	FL	LPV200	0	100	0	100	10	99.899
PCM	PLANT CITY	FL	LPV	0	100	0	100	4	99.962
PGD	PUNTA GORDA	FL	LPV200	0	100	0	100	9	99.945
PHK	PALM BEACH COUNTY GLADES	FL	LPV	0	100	0	100	8	99.915
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	0	100	2	99.969

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	0	100	10	99.885
PNS	PENSACOLA INTL	FL	LPV200	1	99.994	1	99.973	1	99.860
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	0	100	9	99.934
SEF	SEBRING RGNL	FL	LPV	0	100	0	100	7	99.938
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	3	99.951
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	2	99.923
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	0	100	4	99.966
SUA	WITHAM FLD	FL	LPV	0	100	0	100	7	99.904
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	7	99.938
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	0	100	2	99.918
TMB	MIAMI EXEC	FL	LPV200	0	100	1	99.999	14	99.876
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	0	100	9	99.897
TPA	TAMPA INTL	FL	LPV200	0	100	0	100	2	99.967
TPF	PETER O KNIGHT	FL	LP	0	100	0	100	3	99.966
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	7	99.938
VDF	TAMPA EXEC	FL	LPV	0	100	0	100	3	99.965
VNC	VENICE MUNICIPAL	FL	LP	0	100	0	100	7	99.963
VQQ	CECIL	FL	LPV200	0	100	0	100	1	99.901
VRB	VERO BEACH RGNL	FL	LPV200	0	100	0	100	7	99.910
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	0	100	6	99.949
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	0	100	9	99.923
X35	MARION COUNTY	FL	LP	0	100	0	100	2	99.961
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	0	100	1	99.997	16	99.874
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	0	100	2	99.964
09J	JEKYLL ISLAND	GA	LPV200	0	100	2	99.962	1	99.901
15J	COOK COUNTY	GA	LPV	0	100	2	99.967	1	99.899
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	2	99.984	1	99.899

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
18A	FRANKLIN-HART	GA	LPV	1	99.885	1	99.885	1	99.837
19A	JACKSON COUNTY	GA	LPV	1	99.885	1	99.885	1	99.837
2J3	LOUISVILLE MUNICIPAL	GA	LPV	1	99.964	1	99.908	2	99.894
2J5	MILLEN	GA	LPV	1	99.964	1	99.908	1	99.899
3J7	GREENE COUNTY RGNL	GA	LPV	2	99.939	1	99.900	2	99.855
48A	COCHRAN	GA	LPV	2	99.985	2	99.928	1	99.899
49A	GILMER COUNTY	GA	LPV	1	99.855	1	99.855	1	99.837
4A4	POLK COUNTY/CORNELIUS MOORE FL	GA	LPV	1	99.855	1	99.855	1	99.837
4J1	BRANTLEY COUNTY	GA	LPV	0	100	2	99.959	1	99.899
4J2	BERRIEN COUNTY	GA	LPV	0	100	2	99.959	1	99.899
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	1	99.987	1	99.899
52A	MADISON MUNICIPAL	GA	LP	2	99.939	1	99.900	2	99.855
6A1	BUTLER MUNICIPAL	GA	LPV	1	99.967	1	99.917	3	99.891
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	1	99.953	1	99.905	1	99.855
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	2	99.987	1	99.899
75J	TURNER COUNTY	GA	LP	1	99.997	2	99.938	1	99.899
9A5	BARWICK LAFAYETTE	GA	LP	1	99.855	1	99.855	1	99.837
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	1	99.999	3	99.954	1	99.899
ACJ	JIMMY CARTER RGNL	GA	LPV	2	99.989	1	99.917	1	99.899
AGS	AUGUSTA RGNL AT BUSH FLD	GA	LPV200	1	99.964	1	99.902	4	99.889
AHN	ATHENS/BEN EPPS	GA	LPV200	1	99.899	1	99.899	1	99.837
AJR	HABERSHAM COUNTY	GA	LPV	1	99.880	1	99.880	1	99.837
AMG	BACON COUNTY	GA	LPV	0	100	2	99.937	1	99.899
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	2	99.931	1	99.899	2	99.854
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	2	99.959	1	99.899
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	2	99.989	1	99.899
BHC	BAXLEY MUNICIPAL	GA	LPV	1	99.998	2	99.935	1	99.899

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BIJ	EARLY COUNTY	GA	LPV	1	99.996	2	99.972	1	99.899
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	2	99.959	1	99.901
CCO	NEWNAN COWETA COUNTY	GA	LPV	1	99.953	1	99.904	1	99.855
CKF	CRISP COUNTY-CORDELE	GA	LPV	2	99.992	2	99.928	1	99.899
CNI	CHEROKEE COUNTY RGNL	GA	LPV	1	99.858	1	99.855	1	99.837
CSG	COLUMBUS	GA	LPV	1	99.967	1	99.917	2	99.875
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	1	99.877	1	99.877	2	99.852
CVC	COVINGTON MUNICIPAL	GA	LPV	2	99.923	1	99.899	2	99.854
CWV	CLAXTON-EVANS COUNTY	GA	LPV	1	99.995	2	99.932	1	99.899
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	2	99.969	1	99.899
CZL	TOM B DAVID FLD	GA	LPV	1	99.855	1	99.855	1	99.837
D73	CY NUNNALLY MEML	GA	LP	2	99.913	1	99.899	2	99.849
DBN	W H 'BUD' BARRON	GA	LPV200	1	99.967	1	99.917	1	99.899
DNL	DANIEL FLD	GA	LPV	1	99.964	1	99.901	3	99.876
DNN	DALTON MUNICIPAL	GA	LPV	1	99.855	1	99.855	1	99.837
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	3	99.952	1	99.899
EBA	ELBERT COUNTY-PATZ FLD	GA	LP	2	99.920	1	99.899	1	99.837
EZM	HEART OF GEORGIA RGNL	GA	LPV200	1	99.986	2	99.932	1	99.899
FFC	ATLANTA RGNL FALCON FLD	GA	LPV	1	99.953	1	99.903	1	99.855
FTY	FULTON COUNTY EXEC/CHARLIE BRO	GA	LPV	1	99.886	1	99.886	2	99.850
FZG	FITZGERALD MUNICIPAL	GA	LPV	1	99.997	2	99.938	1	99.899
GVL	LEE GILMER MEML	GA	LPV	1	99.880	1	99.880	1	99.837
HMP	ATLANTA SPEEDWAY	GA	LPV200	1	99.953	1	99.902	2	99.855
HOE	HOMERVILLE	GA	LPV	0	100	2	99.961	1	99.899
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	2	99.947	1	99.900	3	99.873
IIY	WASHINGTON/WILKES COUNTY	GA	LPV	2	99.938	1	99.899	1	99.838
JCA	JACKSON COUNTY	GA	LPV	1	99.885	1	99.885	1	99.837

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	2	99.952	1	99.899
JYL	PLANTATION AIRPARK	GA	LPV	1	99.967	1	99.910	1	99.899
JZP	PICKENS COUNTY	GA	LPV	1	99.855	1	99.855	1	99.837
LGC	LAGRANGE/CALLAWAY	GA	LPV200	1	99.953	1	99.908	1	99.855
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	1	99.998	2	99.936	1	99.901
LZU	GWINNETT COUNTY/BRISCOE FLD	GA	LPV200	1	99.886	1	99.886	1	99.837
MAC	MACON DOWNTOWN	GA	LPV	1	99.964	1	99.917	1	99.880
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	1	99.966	1	99.917	2	99.892
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	2	99.967	1	99.899
MHP	JOHN EDWIN JONES SR FLD/METTER	GA	LPV	1	99.979	2	99.930	1	99.899
MLJ	BALDWIN COUNTY RGNL	GA	LPV	1	99.964	1	99.908	2	99.880
MQW	TELFAIR-WHEELER	GA	LPV	1	99.994	2	99.932	1	99.899
OKZ	KAOLIN FLD	GA	LPV	1	99.964	1	99.908	3	99.892
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	1	99.964	1	99.908	1	99.855
PIM	HARRIS COUNTY	GA	LPV	1	99.964	1	99.908	1	99.855
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	2	99.874	2	99.874	1	99.837
PXE	PERRY-HOUSTON COUNTY	GA	LPV	1	99.967	1	99.917	2	99.895
RMG	RICHARD B RUSSELL RGNL - J H T	GA	LPV	1	99.855	1	99.855	1	99.837
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	1	99.996	2	99.933	1	99.899
RYY	COBB COUNTY INTL/MCCOLLUM FLD	GA	LPV200	2	99.880	2	99.880	1	99.837
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	1	99.996	2	99.936	1	99.901
SBO	EAST GEORGIA RGNL	GA	LPV	1	99.967	1	99.917	1	99.899
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	1	99.970	1	99.916	1	99.899
TMA	HENRY TIFT MYERS	GA	LPV	0	100	3	99.953	1	99.899
TOC	TOCCOA RG LETOURNEAU FLD	GA	LPV	1	99.880	1	99.880	1	99.837
TVI	THOMASVILLE RGNL	GA	LPV	0	100	2	99.986	1	99.899
VDI	VIDALIA RGNL	GA	LPV200	1	99.994	2	99.931	1	99.899

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VLD	VALDOSTA RGNL	GA	LPV	0	100	1	99.987	1	99.899
VPC	CARTERSVILLE	GA	LPV	1	99.857	1	99.855	1	99.837
WDR	BARROW COUNTY	GA	LPV	1	99.885	1	99.885	1	99.837
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	2	99.819	2	99.796	3	99.744
4C8	ALBIA MUNICIPAL	IA	LPV	1	99.812	1	99.811	1	99.801
AIO	ATLANTIC MUNICIPAL	IA	LPV	1	99.811	1	99.804	1	99.801
ALO	WATERLOO RGNL	IA	LPV200	2	99.814	2	99.800	3	99.756
AMW	AMES MUNICIPAL	IA	LPV	2	99.817	1	99.801	1	99.801
AWG	WASHINGTON MUNICIPAL	IA	LPV200	1	99.830	1	99.807	1	99.801
BNW	BOONE MUNICIPAL	IA	LPV	2	99.817	1	99.801	1	99.801
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	1	99.830	1	99.826	1	99.801
C25	WAVERLY MUNICIPAL	IA	LPV	2	99.815	2	99.797	3	99.753
CAV	CLARION MUNICIPAL	IA	LPV	2	99.815	1	99.801	3	99.786
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	1	99.811	1	99.806	1	99.801
CCY	NORTHEAST IOWA RGNL	IA	LPV	2	99.816	2	99.795	3	99.746
CID	THE EASTERN IOWA	IA	LPV200	2	99.824	1	99.801	2	99.777
CIN	ARTHUR N NEU	IA	LPV	2	99.818	1	99.802	1	99.801
CKP	CHEROKEE COUNTY RGNL	IA	LPV	2	99.816	1	99.801	2	99.800
CSQ	CRESTON MUNICIPAL	IA	LPV	1	99.812	1	99.809	1	99.801
CWI	CLINTON MUNICIPAL	IA	LPV200	1	99.826	1	99.802	3	99.773
DBQ	DUBUQUE RGNL	IA	LPV200	2	99.825	2	99.798	3	99.749
DEH	DECORAH MUNICIPAL	IA	LPV	2	99.818	2	99.776	4	99.740
DNS	DENISON MUNICIPAL	IA	LPV	2	99.820	1	99.804	1	99.801
DSM	DES MOINES INTL	IA	LPV200	1	99.812	1	99.804	1	99.801
DVN	DAVENPORT MUNICIPAL	IA	LPV200	1	99.826	1	99.801	3	99.794
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	2	99.815	1	99.801	3	99.788
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	2	99.814	1	99.801	1	99.801

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EFW	JEFFERSON MUNICIPAL	IA	LPV	2	99.818	1	99.802	1	99.801
EOK	KEOKUK MUNICIPAL	IA	LPV	1	99.830	1	99.826	1	99.806
EST	ESTHERVILLE MUNICIPAL	IA	LPV	1	99.801	1	99.801	5	99.766
FFL	FAIRFIELD MUNICIPAL	IA	LPV	1	99.830	1	99.811	1	99.801
FOD	FORT DODGE RGNL	IA	LPV200	2	99.815	1	99.801	1	99.801
FSW	FORT MADISON MUNICIPAL	IA	LPV	1	99.830	1	99.826	1	99.801
FXY	FOREST CITY MUNICIPAL	IA	LPV	2	99.813	1	99.801	4	99.766
GCT	GUTHRIE COUNTY RGNL	IA	LPV	1	99.810	1	99.804	1	99.801
GFZ	GREENFIELD MUNICIPAL	IA	LPV	1	99.812	1	99.804	1	99.801
GGI	GRINNELL RGNL	IA	LPV	1	99.812	1	99.804	1	99.801
HPT	HAMPTON MUNICIPAL	IA	LPV	2	99.815	1	99.801	3	99.777
I75	OSCEOLA MUNICIPAL	IA	LPV	1	99.812	1	99.809	1	99.801
ICL	SCHENCK FLD	IA	LPV	1	99.812	1	99.812	1	99.801
IFA	IOWA FALLS MUNICIPAL	IA	LPV	2	99.814	1	99.801	1	99.801
IIB	JAMES H CONNELL FLD AT INDEPEN	IA	LPV	2	99.821	2	99.800	3	99.756
IKV	ANKENY RGNL	IA	LPV200	1	99.811	1	99.804	1	99.801
IOW	IOWA CITY MUNICIPAL	IA	LPV	2	99.829	1	99.804	2	99.799
LRJ	LE MARS MUNICIPAL	IA	LPV	2	99.816	1	99.801	2	99.800
LWD	LAMONI MUNICIPAL	IA	LPV	1	99.812	1	99.812	1	99.801
MCW	MASON CITY MUNICIPAL	IA	LPV200	2	99.814	1	99.801	3	99.764
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	2	99.817	1	99.801	2	99.797
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	1	99.830	1	99.815	1	99.801
MUT	MUSCATINE MUNICIPAL	IA	LPV200	1	99.830	1	99.807	1	99.801
MXO	MONTICELLO RGNL	IA	LP	2	99.824	1	99.801	3	99.757
OOA	OSKALOOSA MUNICIPAL	IA	LPV	1	99.812	1	99.807	1	99.801
OQW	MAQUOKETA MUNICIPAL	IA	LPV	2	99.824	1	99.801	3	99.763
ORC	ORANGE CITY MUNICIPAL	IA	LPV	2	99.816	1	99.801	3	99.789

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OTM	OTTUMWA RGNL	IA	LPV	1	99.812	1	99.809	1	99.801
OXV	KNOXVILLE MUNICIPAL	IA	LPV	1	99.812	1	99.804	1	99.801
PEA	PELLA MUNICIPAL	IA	LPV	1	99.812	1	99.804	1	99.801
POH	POCAHONTAS MUNICIPAL	IA	LPV	2	99.815	1	99.801	3	99.792
PRO	PERRY MUNICIPAL	IA	LPV200	2	99.820	1	99.804	1	99.801
RDK	RED OAK MUNICIPAL	IA	LPV	1	99.811	1	99.811	1	99.801
RRQ	ROCK RAPIDS MUNICIPAL	IA	LP	1	99.801	1	99.801	4	99.775
SDA	SHENANDOAH MUNICIPAL	IA	LPV	1	99.812	1	99.812	1	99.801
SHL	SHELDON RGNL	IA	LPV	2	99.813	1	99.801	4	99.782
SKI	SAC CITY MUNICIPAL	IA	LPV	2	99.814	1	99.801	1	99.801
SLB	STORM LAKE MUNICIPAL	IA	LPV	2	99.815	1	99.801	2	99.800
SPW	SPENCER MUNICIPAL	IA	LPV200	2	99.814	1	99.801	4	99.776
SUX	SIOUX GATEWAY/BRIG GENERAL BUD	IA	LPV200	2	99.816	1	99.801	1	99.801
SXK	SIOUX COUNTY RGNL	IA	LPV200	2	99.816	1	99.801	3	99.790
TNU	NEWTON MUNICIPAL-EARL JOHNSON FLD	IA	LPV200	1	99.812	1	99.804	1	99.801
TVK	CENTERVILLE MUNICIPAL	IA	LPV	1	99.812	1	99.812	1	99.801
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	1	99.808	1	99.801	2	99.796
VTI	VINTON VETERANS MEML AIRPARK	IA	LPV	2	99.822	1	99.801	2	99.776
1U7	BEAR LAKE COUNTY	ID	LPV	1	99.852	1	99.851	1	99.843
BOI	BOISE AIR TRML/GOWEN FLD	ID	LPV200	1	99.887	1	99.873	1	99.863
COE	COEUR D'ALENE/PAPPY BOYINGTON	ID	LPV200	3	99.868	3	99.857	2	99.750
DIJ	DRIGGS-REED MEML	ID	LP	1	99.855	1	99.851	1	99.843
EUL	TREASURE VALLEY EXEC AT CALDWE	ID	LPV	1	99.887	1	99.873	1	99.864
GNG	GOODING MUNICIPAL	ID	LPV	1	99.884	1	99.873	1	99.855
IDA	IDAHO FALLS RGNL	ID	LPV200	1	99.880	1	99.873	1	99.848
JER	JEROME COUNTY	ID	LPV	1	99.884	1	99.873	1	99.855
LWS	LEWISTON/NEZ PERCE COUNTY	ID	LPV200	3	99.892	3	99.877	3	99.808

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MAN	NAMPA MUNICIPAL	ID	LPV	1	99.887	1	99.873	1	99.863
MYL	MC CALL MUNICIPAL	ID	LPV	1	99.888	1	99.874	1	99.869
PIH	POCATELLO RGNL	ID	LPV200	1	99.880	1	99.873	1	99.844
SUN	FRIEDMAN MEML	ID	LP	1	99.884	1	99.873	1	99.859
SZT	SANDPOINT	ID	LP	3	99.859	3	99.850	2	99.743
TWF	JOSLIN FLD/MAGIC VALLEY RGNL	ID	LPV200	1	99.884	1	99.873	1	99.855
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	1	99.887	1	99.873	1	99.863
1H2	EFFINGHAM COUNTY MEML	IL	LPV	1	99.837	1	99.837	1	99.826
3LF	LITCHFIELD MUNICIPAL	IL	LPV	1	99.839	1	99.829	1	99.826
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	1	99.833	1	99.826	1	99.802
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	1	99.841	1	99.837	1	99.829
ALN	ST LOUIS RGNL	IL	LPV200	1	99.841	1	99.833	1	99.826
ARR	AURORA MUNICIPAL	IL	LPV200	1	99.829	1	99.805	4	99.749
BLV	SCOTT AFB/MIDAMERICA ST LOUIS	IL	LPV200	1	99.841	1	99.837	1	99.826
BMI	CENTRAL IL RGNL/BLOOMINGTON-NO	IL	LPV	1	99.833	1	99.826	1	99.805
C15	PEKIN MUNICIPAL	IL	LPV	1	99.833	1	99.826	1	99.804
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	1	99.829	1	99.804	5	99.763
C75	MARSHALL COUNTY	IL	LP	1	99.833	1	99.818	2	99.801
CIR	CAIRO RGNL	IL	LP	1	99.841	1	99.837	1	99.826
CMI	UNIVERSITY OF ILLINOIS/WILLARD	IL	LPV200	1	99.836	1	99.836	1	99.826
CPS	ST LOUIS DOWNTOWN	IL	LPV200	1	99.841	1	99.833	1	99.826
CTK	INGERSOLL	IL	LPV	1	99.833	1	99.826	1	99.803
CUL	CARMI MUNICIPAL	IL	LPV	1	99.841	1	99.837	1	99.829
DEC	DECATUR	IL	LPV200	1	99.836	1	99.829	1	99.826
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	1	99.829	1	99.804	4	99.738
DNV	VERMILION RGNL	IL	LPV	1	99.836	1	99.836	2	99.814
DPA	DUPAGE	IL	LPV200	1	99.829	1	99.804	3	99.732

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ENL	CENTRALIA MUNICIPAL	IL	LPV	1	99.837	1	99.837	1	99.826
EZI	KEWANEE MUNICIPAL	IL	LPV	1	99.830	1	99.807	2	99.800
FEP	ALBERTUS	IL	LPV	1	99.826	2	99.804	4	99.730
FOA	FLORA MUNICIPAL	IL	LPV	1	99.837	1	99.837	1	99.828
GBG	GALESBURG MUNICIPAL	IL	LPV200	1	99.830	1	99.817	1	99.801
GRE	GREENVILLE	IL	LPV	1	99.841	1	99.837	1	99.826
HSB	HARRISBURG-RALEIGH	IL	LPV	1	99.841	1	99.837	1	99.828
I63	MOUNT STERLING MUNICIPAL	IL	LPV	1	99.833	1	99.826	1	99.823
IGQ	LANSING MUNICIPAL	IL	LPV	1	99.833	1	99.812	2	99.743
IKK	GREATER KANKAKEE	IL	LPV200	1	99.835	1	99.835	2	99.776
LOT	LEWIS UNIVERSITY	IL	LPV200	1	99.829	1	99.807	2	99.743
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	1	99.841	1	99.837	1	99.829
MDW	CHICAGO MIDWAY INTL	IL	LPV	1	99.829	1	99.806	3	99.736
MLI	QUAD CITIES INTL	IL	LPV200	1	99.830	1	99.806	3	99.798
MQB	MACOMB MUNICIPAL	IL	LPV200	1	99.833	1	99.826	1	99.804
MTO	COLES COUNTY MEML	IL	LPV200	1	99.837	1	99.836	1	99.827
MVN	MOUNT VERNON	IL	LPV	1	99.837	1	99.837	1	99.826
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	1	99.841	1	99.837	1	99.826
OLY	OLNEY-NOBLE	IL	LPV	1	99.837	1	99.837	1	99.829
ORD	CHICAGO O'HARE INTL	IL	LPV200	1	99.829	1	99.805	3	99.731
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	1	99.833	1	99.826	1	99.803
PJY	PINCKNEYVILLE/DU QUOIN	IL	LPV	1	99.841	1	99.837	1	99.826
PNT	PONTIAC MUNICIPAL	IL	LPV	1	99.833	1	99.830	2	99.800
PPQ	PITTSFIELD PENSTONE MUNICIPAL	IL	LPV	1	99.836	1	99.829	1	99.825
PRG	EDGAR COUNTY	IL	LPV	1	99.837	1	99.836	1	99.829
PWK	CHICAGO EXEC	IL	LPV	1	99.829	2	99.796	3	99.726
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	1	99.829	1	99.804	3	99.717

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RPJ	ROCHELLE MUNICIPAL/KORITZ FLD	IL	LPV	1	99.829	1	99.804	4	99.743
RSV	CRAWFORD COUNTY	IL	LPV	1	99.837	1	99.837	1	99.829
SAR	SPARTA COMMUNICIPALTY-HUNTER FLD	IL	LPV	1	99.841	1	99.837	1	99.826
SFY	TRI-TOWNSHIP	IL	LP	1	99.826	1	99.802	3	99.752
SLO	SALEM-LECKRONE	IL	LPV200	1	99.837	1	99.837	1	99.826
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	1	99.836	1	99.829	1	99.826
SQI	WHITESIDE COUNTY/JOS H BITTORF	IL	LPV200	1	99.826	1	99.804	4	99.786
TIP	RANTOUL NTL AVN CNTR-FRANK ELL	IL	LPV	1	99.836	1	99.836	2	99.812
UGN	WAUKEGAN NTL	IL	LPV	1	99.829	2	99.774	4	99.716
UIN	QUINCY RGNL-BALDWIN FLD	IL	LPV200	1	99.833	1	99.826	1	99.823
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	1	99.833	1	99.809	2	99.797
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	1	99.837	1	99.837	1	99.829
50I	KENTLAND MUNICIPAL	IN	LPV	1	99.836	2	99.836	2	99.784
AID	ANDERSON MUNICIPAL-DARLINGTON FLD	IN	LPV	1	99.836	1	99.836	3	99.810
ASW	WARSAW MUNICIPAL	IN	LPV200	1	99.833	3	99.815	2	99.746
BAK	COLUMBUS MUNICIPAL	IN	LPV	1	99.837	1	99.837	1	99.835
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	1	99.837	1	99.837	1	99.829
BMG	MONROE COUNTY	IN	LPV200	1	99.837	1	99.837	1	99.829
C62	KENDALLVILLE MUNICIPAL	IN	LPV	1	99.833	3	99.811	2	99.743
C65	PLYMOUTH MUNICIPAL	IN	LPV	1	99.833	3	99.825	2	99.743
CEV	METTEL FLD	IN	LPV	1	99.837	1	99.837	3	99.829
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	1	99.836	1	99.836	1	99.829
DCY	DAVIESS COUNTY	IN	LPV	1	99.842	1	99.837	1	99.829
EKM	ELKHART MUNICIPAL	IN	LPV	1	99.833	3	99.798	2	99.743
EVV	EVANSVILLE RGNL	IN	LPV200	1	99.842	1	99.837	1	99.829
EYE	EAGLE CREEK AIRPARK	IN	LPV	1	99.837	1	99.837	1	99.827
FKR	FRANKFORT CLINTON COUNTY RGNL	IN	LPV	1	99.836	1	99.836	2	99.798

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FRH	FRENCH LICK MUNICIPAL	IN	LPV	1	99.837	1	99.837	1	99.829
FWA	FORT WAYNE INTL	IN	LPV200	1	99.833	2	99.827	2	99.758
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	1	99.837	1	99.837	1	99.833
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	1	99.836	2	99.834	2	99.767
GPC	PUTNAM COUNTY RGNL	IN	LPV	1	99.837	1	99.836	1	99.829
GSH	GOSHEN MUNICIPAL	IN	LPV	1	99.833	3	99.810	2	99.743
GWB	DE KALB COUNTY	IN	LPV	1	99.833	2	99.813	2	99.744
GYY	GARY/CHICAGO INTL	IN	LPV200	1	99.833	2	99.811	2	99.743
HFY	INDY SOUTH GREENWOOD	IN	LPV	1	99.837	1	99.837	1	99.827
HNB	HUNTINGBURG	IN	LPV	1	99.842	1	99.837	1	99.829
HUF	TERRE HAUTE RGNL	IN	LPV200	1	99.837	1	99.836	1	99.829
I22	RANDOLPH COUNTY	IN	LPV	1	99.836	2	99.836	2	99.798
I76	PERU MUNICIPAL	IN	LPV	1	99.833	2	99.830	2	99.763
IMS	MADISON MUNICIPAL	IN	LPV	1	99.837	1	99.837	1	99.834
IND	INDIANAPOLIS INTL	IN	LPV200	1	99.837	1	99.837	1	99.828
JVY	CLARK RGNL	IN	LPV200	1	99.837	1	99.837	1	99.837
LAF	PURDUE UNIVERSITY	IN	LPV	1	99.836	1	99.836	2	99.797
MCX	WHITE COUNTY	IN	LP	1	99.836	2	99.835	2	99.780
MIE	DELAWARE COUNTY RGNL	IN	LPV	1	99.836	2	99.835	2	99.798
MQJ	INDIANAPOLIS RGNL	IN	LPV200	1	99.837	1	99.837	3	99.824
MZZ	MARION MUNICIPAL - MCKINNEY FLD	IN	LPV200	1	99.836	2	99.834	2	99.787
OKK	KOKOMO MUNICIPAL	IN	LPV200	1	99.836	2	99.835	2	99.785
OVO	NORTH VERNON	IN	LPV	1	99.837	1	99.837	1	99.835
OXI	STARKE COUNTY	IN	LPV	1	99.833	3	99.827	2	99.745
PLD	PORTLAND MUNICIPAL	IN	LPV	1	99.833	2	99.828	2	99.789
PPO	LA PORTE MUNICIPAL	IN	LPV	1	99.833	3	99.825	2	99.743
RCR	FULTON COUNTY	IN	LPV	1	99.833	2	99.831	2	99.757

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RID	RICHMOND MUNICIPAL	IN	LPV200	1	99.837	1	99.837	3	99.827
RWN	ARENS FLD	IN	LPV	1	99.833	2	99.832	2	99.756
RZL	JASPER COUNTY	IN	LPV	1	99.836	2	99.836	2	99.762
SBN	SOUTH BEND INTL	IN	LPV200	1	99.833	3	99.799	2	99.743
SER	FREEMAN MUNICIPAL	IN	LPV	1	99.837	1	99.837	1	99.837
SIV	SULLIVAN COUNTY	IN	LPV	1	99.837	1	99.837	1	99.829
SMD	SMITH FLD	IN	LPV	2	99.833	2	99.816	2	99.748
TEL	PERRY COUNTY MUNICIPAL	IN	LP	1	99.841	1	99.837	1	99.829
TYQ	INDIANAPOLIS EXEC	IN	LPV	1	99.836	1	99.836	3	99.812
UWL	NEW CASTLE HENRY COUNTY MARLAT	IN	LPV	1	99.837	1	99.837	3	99.820
VPZ	PORTER COUNTY RGNL	IN	LPV	1	99.833	3	99.827	2	99.743
1QK	GOVE COUNTY	KS	LPV	1	99.834	1	99.832	1	99.827
3AU	AUGUSTA MUNICIPAL	KS	LP	1	99.833	1	99.829	1	99.822
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.826
3K7	MARK HOARD MEML	KS	LPV	1	99.833	1	99.833	1	99.826
3K8	COMANCHE COUNTY	KS	LPV	1	99.829	1	99.826	1	99.826
5K2	TRIBUNE MUNICIPAL	KS	LPV	1	99.837	1	99.833	1	99.826
9K8	KINGMAN/CLYDE CESSNA FLD	KS	LP	1	99.831	1	99.829	1	99.822
AAO	COLONEL JAMES JABARA	KS	LPV	1	99.833	1	99.829	1	99.822
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	1	99.833	1	99.833	1	99.826
ANY	ANTHONY MUNICIPAL	KS	LPV	1	99.832	1	99.829	1	99.822
BEC	BEECH FACTORY	KS	LPV	1	99.833	1	99.829	1	99.822
CBK	SHALZ FLD	KS	LPV	1	99.833	1	99.833	1	99.826
CFV	COFFEYVILLE MUNICIPAL	KS	LPV	1	99.833	1	99.830	1	99.822
CNK	BLOSSER MUNICIPAL	KS	LP	1	99.833	1	99.829	1	99.822
DDC	DODGE CITY RGNL	KS	LPV200	1	99.829	1	99.826	1	99.826
EGT	WELLINGTON MUNICIPAL	KS	LPV200	1	99.833	1	99.829	1	99.822

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EHA	ELKHART-MORTON COUNTY	KS	LPV	1	99.833	1	99.830	1	99.826
EMP	EMPORIA MUNICIPAL	KS	LPV	1	99.833	1	99.830	1	99.825
EQA	EL DORADO/CAPT JACK THOMAS MEM	KS	LPV200	1	99.833	1	99.830	1	99.822
EWK	NEWTON-CITY-COUNTY	KS	LPV	1	99.833	1	99.830	1	99.823
FOE	TOPEKA RGNL	KS	LPV	1	99.829	1	99.826	1	99.823
FSK	FORT SCOTT MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.829
GBD	GREAT BEND MUNICIPAL	KS	LPV200	1	99.830	1	99.829	1	99.826
GCK	GARDEN CITY RGNL	KS	LPV	1	99.833	1	99.831	1	99.826
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	1	99.837	1	99.833	1	99.826
HLC	HILL CITY MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.826
HQG	HUGOTON MUNICIPAL	KS	LPV	1	99.833	1	99.830	1	99.826
HRU	HERINGTON RGNL	KS	LPV	1	99.833	1	99.830	1	99.826
HUT	HUTCHINSON RGNL	KS	LPV200	1	99.832	1	99.829	1	99.823
HYS	HAYS RGNL	KS	LPV200	1	99.835	1	99.829	1	99.826
ICT	WICHITA DWIGHT D EISENHOWER NT	KS	LPV200	1	99.833	1	99.829	1	99.822
IDP	INDEPENDENCE MUNICIPAL	KS	LPV200	1	99.833	1	99.830	1	99.822
IXD	NEW CENTURY AIRCENTER	KS	LPV	1	99.829	1	99.829	1	99.826
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	1	99.830	1	99.830	1	99.822
K78	ABILENE MUNICIPAL	KS	LPV	1	99.837	1	99.829	1	99.826
K79	JETMORE MUNICIPAL	KS	LPV	1	99.829	1	99.827	1	99.826
K81	MIAMI COUNTY	KS	LPV	1	99.829	1	99.829	1	99.826
K82	SMITH CENTER MUNICIPAL	KS	LPV200	1	99.830	1	99.829	1	99.822
K88	ALLEN COUNTY	KS	LPV	1	99.833	1	99.833	1	99.826
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	1	99.833	1	99.826	1	99.826
LQR	LARNED-PAWNEE COUNTY	KS	LPV	1	99.829	1	99.829	1	99.826
LWC	LAWRENCE RGNL	KS	LPV200	1	99.828	1	99.826	1	99.823
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	1	99.832	1	99.829	1	99.825

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MHK	MANHATTAN RGNL	KS	LPV200	1	99.835	1	99.830	1	99.822
MPR	MC PHERSON	KS	LPV	1	99.832	1	99.830	1	99.825
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	1	99.830	1	99.830	1	99.823
NRN	NORTON MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.822
OEL	OAKLEY MUNICIPAL	KS	LPV	1	99.835	1	99.833	1	99.828
OIN	OBERLIN MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.826
OJC	JOHNSON COUNTY EXEC	KS	LPV	1	99.829	1	99.829	1	99.826
OWI	OTTAWA MUNICIPAL	KS	LPV	1	99.829	1	99.829	1	99.826
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	1	99.833	1	99.829	1	99.822
PPF	TRI-CITY	KS	LPV	1	99.833	1	99.831	1	99.822
PTS	ATKINSON MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.829
PTT	PRATT RGNL	KS	LPV	1	99.830	1	99.829	1	99.826
RCP	ROOKS COUNTY RGNL	KS	LPV	1	99.833	1	99.829	1	99.826
RPB	BELLEVILLE MUNICIPAL	KS	LPV	1	99.830	1	99.830	1	99.822
RSL	RUSSELL MUNICIPAL	KS	LPV	1	99.835	1	99.829	1	99.826
SLN	SALINA RGNL	KS	LPV	1	99.838	1	99.829	1	99.826
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	1	99.837	1	99.833	1	99.826
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	1	99.827	1	99.826	1	99.823
TQK	SCOTT CITY MUNICIPAL	KS	LPV	1	99.833	1	99.833	1	99.826
UKL	COFFEY COUNTY	KS	LPV	1	99.833	1	99.830	1	99.826
ULS	ULYSSES	KS	LPV	1	99.833	1	99.831	1	99.826
WLD	STROTHER FLD	KS	LPV	1	99.833	1	99.829	1	99.822
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	1	99.837	1	99.837	1	99.834
18I	MC CREARY COUNTY	KY	LP	1	99.837	1	99.837	1	99.836
1M7	FULTON	KY	LPV	1	99.841	1	99.837	1	99.826
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	1	99.837	1	99.837	1	99.834
2I0	MADISONVILLE RGNL	KY	LPV	1	99.842	1	99.837	1	99.829

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	1	99.841	1	99.837	1	99.829
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	1	99.847	1	99.837	1	99.836
5M9	MARION-CRITTENDEN COUNTY JAMES	KY	LPV	1	99.841	1	99.837	1	99.829
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	1	99.837	1	99.837	1	99.835
AAS	TAYLOR COUNTY	KY	LPV	1	99.837	1	99.837	1	99.836
BRY	SAMUELS FLD	KY	LPV	1	99.837	1	99.837	1	99.836
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	1	99.840	1	99.837	1	99.837
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	1	99.837	1	99.837	1	99.836
CEY	KYLE-OAKLEY FLD	KY	LPV	1	99.841	1	99.837	1	99.829
CPF	WENDELL H FORD	KY	LPV200	1	99.837	1	99.837	1	99.836
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	1	99.837	1	99.837	1	99.833
DVK	STUART POWELL FLD	KY	LPV	1	99.837	1	99.837	1	99.835
DWU	ASHLAND RGNL	KY	LP	1	99.835	1	99.835	1	99.833
EHR	HENDERSON CITY-COUNTY	KY	LPV	1	99.841	1	99.837	1	99.829
EKQ	WAYNE COUNTY	KY	LPV	1	99.837	1	99.837	1	99.836
EKX	ADDINGTON FLD	KY	LPV	1	99.837	1	99.837	1	99.837
FFT	CAPITAL CITY	KY	LPV	1	99.837	1	99.837	1	99.834
FGX	FLEMING-MASON	KY	LPV	1	99.837	1	99.837	1	99.834
GLW	GLASGOW MUNICIPAL	KY	LPV	1	99.837	1	99.837	1	99.837
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	1	99.843	1	99.837	1	99.829
I93	BRECKINRIDGE COUNTY	KY	LPV	1	99.837	1	99.837	1	99.836
IOB	MOUNT STERLING/MONTGOMERY COUN	KY	LPV	1	99.837	1	99.837	1	99.835
JQD	OHIO COUNTY	KY	LPV	1	99.841	1	99.837	1	99.829
K24	RUSSELL COUNTY	KY	LPV	1	99.837	1	99.837	1	99.836
K62	GENE SNYDER	KY	LP	1	99.837	1	99.837	1	99.833
KY8	HANCOCK COUNTY/RON LEWIS FLD	KY	LPV	1	99.841	1	99.837	1	99.829
LEX	BLUE GRASS	KY	LPV	1	99.837	1	99.837	1	99.834

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LOU	BOWMAN FLD	KY	LPV	1	99.837	1	99.837	1	99.837
LOZ	LONDON/CORBIN/MAGEE	KY	LPV	1	99.837	1	99.837	1	99.836
M20	LEITCHFIELD-GRAYSON COUNTY	KY	LPV	1	99.837	1	99.837	1	99.837
M21	MUHLENBERG COUNTY	KY	LP	1	99.846	1	99.837	1	99.829
M25	MAYFIELD GRAVES COUNTY	KY	LPV	1	99.841	1	99.837	1	99.829
OWB	OWENSBORO/DAVIESS COUNTY RGNL	KY	LPV200	1	99.845	1	99.837	1	99.829
PAH	BARKLEY RGNL	KY	LPV200	1	99.841	1	99.837	1	99.827
PBX	PIKE COUNTY/HATCHER FLD	KY	LPV200	1	99.837	1	99.837	1	99.833
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	1	99.837	1	99.837	1	99.835
SDF	LOUISVILLE MUHAMMAD ALI INTL	KY	LPV200	1	99.837	1	99.837	1	99.837
SJS	BIG SANDY RGNL	KY	LPV	1	99.837	1	99.837	1	99.833
SME	LAKE CUMBERLAND RGNL	KY	LPV	1	99.837	1	99.837	1	99.836
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	1	99.837	1	99.837	1	99.835
TWT	STURGIS MUNICIPAL	KY	LPV	1	99.841	1	99.837	1	99.829
TZV	TOMPKINSVILLE/MONROE COUNTY	KY	LPV	1	99.837	1	99.837	1	99.837
0R4	CONCORDIA PARISH	LA	LPV	2	99.907	2	99.890	1	99.815
0R7	THE RED RIVER	LA	LPV	1	99.855	2	99.828	1	99.815
3R4	HART	LA	LPV	2	99.907	2	99.851	1	99.815
3R7	JENNINGS	LA	LPV	2	99.924	1	99.887	1	99.815
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	2	99.922	2	99.871	1	99.815
ACP	ALLEN PARISH	LA	LPV	1	99.926	2	99.868	1	99.815
AEX	ALEXANDRIA INTL	LA	LPV200	2	99.907	3	99.869	1	99.815
APS	PORT OF SOUTH LOUISIANA EXEC R	LA	LPV	2	99.927	2	99.927	3	99.826
ARA	ACADIANA RGNL	LA	LPV200	1	99.927	1	99.891	4	99.826
BQP	MOREHOUSE MEML	LA	LPV	1	99.855	1	99.855	1	99.815
BTR	BATON ROUGE METRO` RYAN FLD	LA	LPV200	1	99.927	3	99.921	3	99.829
BXA	GEORGE R CARR MEML AIR FLD	LA	LPV	1	99.928	2	99.916	2	99.832

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CWF	CHENNAULT INTL	LA	LPV200	2	99.924	2	99.887	2	99.814
DTN	SHREVEPORT DOWNTOWN	LA	LPV	1	99.848	1	99.815	1	99.815
ESF	ESLER RGNL	LA	LPV200	2	99.907	3	99.872	1	99.815
F88	JONESBORO	LA	LP	1	99.855	2	99.840	1	99.815
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	2	99.930	2	99.930	4	99.827
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	2	99.927	3	99.923	3	99.829
HUM	HOUMA-TERREBONNE	LA	LPV200	1	99.927	1	99.927	4	99.830
HZR	FALSE RIVER RGNL	LA	LPV	1	99.927	3	99.909	2	99.815
IER	NATCHITOCHES RGNL	LA	LPV	2	99.891	3	99.869	1	99.815
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	2	99.924	1	99.891	3	99.826
L39	LEESVILLE	LA	LPV	2	99.907	2	99.857	1	99.815
LCH	LAKE CHARLES RGNL	LA	LPV200	2	99.924	1	99.887	2	99.811
LFT	LAFAYETTE RGNL/PAUL FOURNET FL	LA	LPV200	1	99.927	2	99.904	2	99.831
M79	JOHN H HOOKS JR MEML	LA	LPV	1	99.855	1	99.855	1	99.815
MLU	MONROE RGNL	LA	LPV200	1	99.855	1	99.855	1	99.815
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	2	99.927	2	99.927	3	99.829
NEW	LAKEFRONT	LA	LPV	2	99.930	2	99.930	3	99.838
OPL	ST LANDRY PARISH-AHART FLD	LA	LPV	1	99.927	3	99.902	1	99.815
PTN	HARRY P WILLIAMS MEML	LA	LPV200	1	99.927	2	99.918	4	99.823
REG	LOUISIANA RGNL	LA	LPV	1	99.927	1	99.927	3	99.835
RSN	RUSTON RGNL	LA	LPV	1	99.851	1	99.851	1	99.815
SHV	SHREVEPORT RGNL	LA	LPV200	1	99.848	1	99.815	1	99.815
SPH	SPRINGHILL	LA	LPV	1	99.848	1	99.833	1	99.812
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	1	99.855	1	99.855	1	99.833
UXL	SOUTHLAND FLD	LA	LPV	2	99.924	2	99.884	2	99.811
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	2	99.776	2	99.743	3	99.692
ACK	NANTUCKET MEML	MA	LPV200	2	99.768	3	99.758	6	99.678

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BAF	WESTFIELD-BARNES RGNL	MA	LPV	2	99.776	2	99.772	4	99.694
BED	LAURENCE G HANSCOM FLD	MA	LPV200	2	99.748	2	99.736	3	99.680
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	2	99.746	2	99.725	3	99.672
BVY	BEVERLY RGNL	MA	LPV	2	99.743	2	99.723	3	99.669
EWB	NEW BEDFORD RGNL	MA	LPV200	2	99.768	3	99.742	4	99.687
GBR	WALTER J KOLADZA	MA	LP	2	99.776	2	99.772	4	99.720
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	2	99.750	2	99.725	4	99.676
HYA	CAPE COD GATEWAY	MA	LPV200	2	99.754	2	99.726	4	99.682
LWM	LAWRENCE MUNICIPAL	MA	LPV200	2	99.739	2	99.724	3	99.669
MVY	MARTHA'S VINEYARD	MA	LPV200	2	99.767	3	99.749	4	99.683
ORE	ORANGE MUNICIPAL	MA	LPV	2	99.745	2	99.740	4	99.684
ORH	WORCESTER RGNL	MA	LPV200	2	99.753	2	99.743	3	99.690
OWD	NORWOOD MEML	MA	LPV	2	99.753	2	99.729	3	99.684
PSF	PITTSFIELD MUNICIPAL	MA	LPV	2	99.776	2	99.772	3	99.699
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	2	99.750	2	99.725	4	99.664
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	2	99.750	2	99.725	4	99.680
TAN	TAUNTON MUNICIPAL - KING FLD	MA	LPV	2	99.754	3	99.741	4	99.686
CJA3	MORDEN REGIONAL	MB	LPV	6	99.666	5	99.597	7	99.478
CJJ4	DELORAINE	MB	LPV	7	99.679	7	99.646	7	99.538
CJW5	RUSSELL	MB	LPV	6	99.603	6	99.573	6	99.444
CKK7	STEINBACH (SOUTH)	MB	LPV	6	99.625	6	99.539	5	99.422
CKZ7	WINKLER	MB	LPV	6	99.666	5	99.597	7	99.477
CYAV	ST. ANDREWS	MB	LPV	6	99.603	6	99.529	6	99.403
CYBR	BRANDON MUNICIPALCIPALITY	MB	LPV	5	99.618	5	99.598	8	99.518
CYFO	FLIN FLON	MB	LPV	5	99.501	7	99.373	13	99.059
CYGX	GILLAM	MB	LPV	4	99.312	10	99.178	23	98.583
CYIV	ISLAND LAKE	MB	LPV	5	99.451	7	99.376	13	99.025

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYQD	THE PAS	MB	LPV	4	99.507	8	99.413	9	99.089
CYTH	THOMPSON	MB	LPV200	6	99.399	9	99.207	16	98.803
CYVD	R.J. (BOB) ANDREW FIELD REGIONAL	MB	LPV	5	99.625	5	99.606	6	99.494
CYWG	JAMES ARMSTRONG RICHARDSON INTL	MB	LPV200	6	99.615	6	99.535	5	99.413
CYYQ	CHURCHILL	MB	LPV	6	99.230	12	98.969	68	97.726
CZJG	JENPEG	MB	LPV	3	99.446	9	99.353	14	99.005
2G4	GARRETT COUNTY	MD	LPV	1	99.833	1	99.833	3	99.802
2W5	MARYLAND	MD	LP	1	99.833	1	99.833	4	99.804
2W6	ST MARY'S COUNTY RGNL	MD	LPV	1	99.833	1	99.833	3	99.790
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	2	99.825	2	99.824	3	99.790
CBE	GREATER CUMBERLAND RGNL	MD	LPV	2	99.830	2	99.825	2	99.801
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	2	99.823	2	99.820	3	99.792
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	2	99.822	2	99.815	3	99.793
ESN	EASTON/NEWNAM FLD	MD	LPV200	2	99.820	2	99.820	3	99.791
FDK	FREDERICK MUNICIPAL	MD	LPV	2	99.827	2	99.824	2	99.795
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	1	99.833	2	99.833	3	99.794
HGR	HAGERSTOWN RGNL/RICHARD A HENS	MD	LPV200	2	99.822	2	99.818	2	99.796
MTN	MARTIN STATE	MD	LPV	2	99.820	2	99.819	3	99.790
OXB	OCEAN CITY MUNICIPAL	MD	LPV	2	99.818	2	99.813	4	99.793
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	2	99.820	2	99.818	3	99.792
W29	BAY BRIDGE	MD	LPV	2	99.823	2	99.820	3	99.790
1B0	DEXTER RGNL	ME	LP	2	99.704	2	99.677	4	99.561
2B7	PITTSFIELD MUNICIPAL	ME	LPV	2	99.701	3	99.688	4	99.577
3B1	GREENVILLE MUNICIPAL	ME	LPV	3	99.700	3	99.651	5	99.558
59B	NEWTON FLD	ME	LP	3	99.694	4	99.672	5	99.551
81B	OXFORD COUNTY RGNL	ME	LP	2	99.721	3	99.718	4	99.623
AUG	AUGUSTA STATE	ME	LPV200	2	99.715	3	99.713	4	99.608

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BGR	BANGOR INTL	ME	LPV200	2	99.699	2	99.674	4	99.561
BHB	HANCOCK COUNTY/BAR HARBOR	ME	LPV200	2	99.700	2	99.688	3	99.563
BST	BELFAST MUNICIPAL	ME	LPV	2	99.702	3	99.701	4	99.570
BXM	BRUNSWICK EXEC	ME	LPV200	2	99.721	2	99.707	4	99.612
CAR	CARIBOU MUNICIPAL	ME	LPV	3	99.616	3	99.590	8	99.446
EPM	EASTPORT MUNICIPAL	ME	LPV	3	99.649	3	99.616	5	99.520
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV200	4	99.605	3	99.589	7	99.430
HUL	HOULTON INTL	ME	LP	3	99.636	4	99.615	5	99.480
IZG	EASTERN SLOPES RGNL	ME	LPV	2	99.721	2	99.721	3	99.627
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	2	99.721	3	99.718	4	99.615
LRG	LINCOLN RGNL	ME	LP	3	99.684	2	99.618	5	99.532
MLT	MILLINOCKET MUNICIPAL	ME	LPV	3	99.665	4	99.630	5	99.524
OWK	CENTRAL MAINE /NORRIDGEWOCK	ME	LPV	2	99.713	3	99.700	4	99.606
PQI	PRESQUE ISLE INTL	ME	LPV200	3	99.624	3	99.591	7	99.451
PWM	PORTLAND INTL JETPORT	ME	LPV200	3	99.736	2	99.721	3	99.619
RKD	KNOX COUNTY RGNL	ME	LPV200	2	99.715	3	99.713	5	99.586
SFM	SANFORD SEACOAST RGNL	ME	LPV200	3	99.737	2	99.721	3	99.631
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	2	99.713	3	99.711	4	99.595
48D	CLARE MUNICIPAL	MI	LP	4	99.772	2	99.743	6	99.683
4D0	ABRAMS MUNICIPAL	MI	LP	2	99.794	4	99.776	3	99.725
6Y1	BOIS BLANC ISLAND	MI	LP	5	99.710	4	99.684	7	99.599
77G	MARLETTE TOWNSHIP	MI	LPV	2	99.793	3	99.759	5	99.695
9D9	HASTINGS	MI	LPV	2	99.794	4	99.775	5	99.717
ACB	ANTRIM COUNTY	MI	LPV	3	99.725	3	99.701	5	99.625
ADG	LENAWEE COUNTY	MI	LPV	3	99.811	2	99.796	2	99.743
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	3	99.786	2	99.743	4	99.696
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	4	99.670	5	99.652	5	99.510

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
APN	ALPENA COUNTY RGNL	MI	LPV	2	99.740	3	99.700	5	99.624
ARB	ANN ARBOR MUNICIPAL	MI	LPV	2	99.794	2	99.790	4	99.740
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV200	2	99.823	4	99.778	3	99.729
BAX	HURON COUNTY MEML	MI	LPV	3	99.789	3	99.759	6	99.680
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	1	99.829	2	99.769	3	99.728
BIV	WEST MICHIGAN RGNL	MI	LPV200	2	99.806	3	99.758	4	99.699
BTL	BATTLE CREEK EXEC AT KELLOGG F	MI	LPV200	3	99.818	4	99.778	3	99.728
C04	OCEANA COUNTY	MI	LPV	3	99.779	4	99.745	5	99.681
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	1	99.829	2	99.772	3	99.729
CAD	WEXFORD COUNTY	MI	LPV200	3	99.755	3	99.718	5	99.670
CFS	TUSCOLA AREA	MI	LP	2	99.790	3	99.758	6	99.692
CIU	CHIPPEWA COUNTY INTL	MI	LPV	5	99.695	4	99.665	6	99.529
CMX	HOUGHTON COUNTY MEML	MI	LPV	4	99.657	7	99.600	5	99.443
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	3	99.723	3	99.697	6	99.621
D95	DUPONT-LAPEER	MI	LP	2	99.794	3	99.760	4	99.721
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	2	99.793	2	99.780	3	99.741
DTW	DETROIT METRO WAYNE COUNTY	MI	LPV200	2	99.793	2	99.793	3	99.741
ERY	LUCE COUNTY	MI	LPV	5	99.686	4	99.664	5	99.513
ESC	DELTA COUNTY	MI	LPV200	4	99.716	4	99.695	9	99.596
FFX	FREMONT MUNICIPAL	MI	LPV	3	99.780	4	99.748	5	99.685
FNT	BISHOP INTL	MI	LPV200	2	99.794	2	99.747	3	99.723
GDW	GLADWIN ZETTEL MEML	MI	LP	3	99.756	2	99.743	6	99.678
GLR	GAYLORD RGNL	MI	LPV	3	99.725	3	99.700	5	99.623
GRR	GERALD R FORD INTL	MI	LPV200	2	99.790	4	99.771	5	99.713
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	2	99.743	3	99.718	6	99.652
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	3	99.790	2	99.743	6	99.694
IKW	JACK BARSTOW	MI	LPV	3	99.786	2	99.743	6	99.690

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IMT	FORD	MI	LPV	4	99.705	4	99.689	7	99.542
IRS	KIRSCH MUNICIPAL	MI	LPV	1	99.833	3	99.796	2	99.743
ISQ	SCHOOLCRAFT COUNTY	MI	LP	4	99.705	4	99.673	8	99.558
IWD	GOGEBIC/IRON COUNTY	MI	LPV200	4	99.674	4	99.633	5	99.465
JXN	JACKSON COUNTY-REYNOLDS FLD	MI	LPV200	2	99.794	4	99.780	3	99.740
JYM	HILLSDALE MUNICIPAL	MI	LPV	3	99.824	4	99.794	2	99.743
LAN	CAPITAL REGION INTL	MI	LPV200	2	99.794	4	99.776	3	99.725
LDM	MASON COUNTY	MI	LPV	3	99.760	3	99.730	6	99.676
MBL	MANISTEE COUNTY/BLACKER	MI	LPV200	4	99.769	3	99.718	5	99.668
MBS	MBS INTL	MI	LPV200	3	99.787	2	99.743	6	99.692
MCD	MACKINAC ISLAND	MI	LPV	5	99.698	4	99.676	7	99.587
MKG	MUSKEGON COUNTY	MI	LPV200	3	99.795	3	99.758	5	99.695
MNM	MENOMINEE RGNL	MI	LPV200	4	99.744	3	99.715	5	99.627
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	4	99.780	2	99.743	5	99.690
N98	BOYNE CITY MUNICIPAL	MI	LP	3	99.723	3	99.697	5	99.621
OEB	BRANCH COUNTY MEML	MI	LPV	3	99.829	4	99.790	3	99.743
OGM	ONTONAGON COUNTY - SCHUSTER FL	MI	LPV	4	99.666	5	99.617	4	99.467
OSC	OSCODA-WURTSMITH	MI	LPV200	2	99.743	3	99.735	5	99.627
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	2	99.794	2	99.765	3	99.730
PHN	ST CLAIR COUNTY INTL	MI	LPV200	2	99.792	2	99.765	4	99.721
PLN	PELLSTON RGNL/EMMET COUNTY	MI	LPV200	4	99.722	4	99.696	6	99.616
PTK	OAKLAND COUNTY INTL	MI	LPV200	2	99.794	2	99.779	3	99.731
RMY	BROOKS FLD	MI	LP	3	99.808	4	99.780	3	99.730
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	2	99.791	2	99.746	3	99.722
RQB	ROBEN-HOOD	MI	LPV200	4	99.774	3	99.732	4	99.685
SAW	SAWYER INTL	MI	LPV200	4	99.685	4	99.658	5	99.499
SLH	CHEBOYGAN COUNTY	MI	LPV	5	99.721	4	99.695	6	99.612

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TEW	MASON JEWETT FLD	MI	LP	2	99.794	4	99.780	3	99.731
TTF	CUSTER	MI	LPV	2	99.793	2	99.793	3	99.743
TVC	CHERRY CAPITAL	MI	LPV200	2	99.743	3	99.706	5	99.638
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	2	99.743	4	99.742	6	99.656
Y70	IONIA COUNTY	MI	LPV	2	99.790	4	99.772	5	99.710
YIP	WILLOW RUN	MI	LPV200	2	99.794	2	99.790	3	99.741
16D	PERHAM MUNICIPAL	MN	LPV	4	99.742	6	99.680	7	99.527
3N8	MAHNOMEN COUNTY	MN	LPV	5	99.709	7	99.653	6	99.473
ACQ	WASECA MUNICIPAL	MN	LPV	2	99.796	3	99.793	7	99.725
ADC	WADENA MUNICIPAL	MN	LPV	4	99.746	6	99.690	8	99.547
AEL	ALBERT LEA MUNICIPAL	MN	LPV	1	99.801	1	99.801	4	99.755
AIT	AITKIN MUNICIPAL/STEVE KURTZ FLD	MN	LPV	4	99.698	5	99.643	5	99.481
ANE	ANOKA COUNTY-BLAINE (JANES FLD	MN	LPV	2	99.791	4	99.753	8	99.640
AUM	AUSTIN MUNICIPAL	MN	LPV200	1	99.801	2	99.794	5	99.739
AXN	CHANDLER FLD	MN	LPV	2	99.789	5	99.746	8	99.652
BBB	BENSON MUNICIPAL	MN	LPV	2	99.789	5	99.760	7	99.717
BDE	BAUDETTE INTL	MN	LPV	4	99.629	6	99.538	6	99.433
BDH	WILLMAR MUNICIPAL/JOHN L RICE FLD	MN	LPV200	2	99.790	5	99.776	7	99.712
BJI	BEMIDJI RGNL	MN	LPV200	5	99.694	6	99.606	6	99.459
BRD	BRAINERD LAKES RGNL	MN	LPV200	4	99.751	6	99.693	5	99.499
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	2	99.782	4	99.746	8	99.595
CFE	BUFFALO MUNICIPAL	MN	LPV	2	99.792	4	99.753	10	99.681
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	3	99.624	6	99.529	6	99.429
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	6	99.687	7	99.636	6	99.473
CNB	MYERS FLD	MN	LPV	2	99.797	4	99.790	7	99.736
COQ	CLOQUET/CARLTON COUNTY	MN	LPV	5	99.692	4	99.625	5	99.456
CQM	COOK MUNICIPAL	MN	LP	3	99.636	7	99.577	6	99.436

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
D39	SAUK CENTRE MUNICIPAL	MN	LPV	2	99.787	5	99.746	7	99.641
D42	SPRINGFIELD MUNICIPAL	MN	LP	2	99.800	3	99.795	6	99.738
DLH	DULUTH INTL	MN	LPV200	4	99.671	6	99.621	5	99.450
DTL	DETROIT LAKES/WETHING FLD	MN	LPV	4	99.738	6	99.675	6	99.507
DVP	SLAYTON MUNICIPAL	MN	LP	1	99.801	1	99.801	6	99.747
DXX	LAC QUI PARLE COUNTY	MN	LPV200	2	99.791	4	99.783	7	99.729
ELO	ELY MUNICIPAL	MN	LPV200	3	99.627	7	99.561	6	99.435
ETH	WHEATON MUNICIPAL	MN	LP	2	99.787	5	99.753	8	99.670
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	3	99.641	7	99.598	5	99.441
FBL	FARIBAULT MUNICIPAL-LIZ WALL STROHF	MN	LPV	2	99.793	3	99.789	8	99.703
FCM	FLYING CLOUD	MN	LPV200	2	99.792	3	99.787	8	99.681
FFM	FERGUS FALLS MUNICIPAL/EINAR MICKEL	MN	LPV200	2	99.761	6	99.716	8	99.585
FKA	FILLMORE COUNTY	MN	LPV	2	99.813	2	99.780	5	99.735
FOZ	BIGFORK MUNICIPAL	MN	LP	3	99.638	7	99.587	6	99.442
FRM	FAIRMONT MUNICIPAL	MN	LPV	1	99.801	1	99.801	5	99.761
FSE	FOSSTON MUNICIPAL-ANDERSON FLD	MN	LP	6	99.698	9	99.627	7	99.466
GHW	GLENWOOD MUNICIPAL	MN	LPV	2	99.789	5	99.752	8	99.659
GPZ	GRAND RAPIDS/ITASCA COUNTY-GOR	MN	LPV200	4	99.664	5	99.612	5	99.451
GYL	GLENCOE MUNICIPAL	MN	LPV	2	99.792	3	99.786	7	99.696
HCD	HUTCHINSON MUNICIPAL/BUTLER FLD	MN	LPV	2	99.791	3	99.784	8	99.695
HCO	HALLOCK MUNICIPAL	MN	LPV	7	99.670	6	99.584	5	99.450
HIB	RANGE RGNL	MN	LPV200	3	99.642	7	99.600	6	99.441
INL	FALLS INTL/EINARSON FLD	MN	LPV	4	99.626	5	99.535	6	99.429
JKJ	MOORHEAD MUNICIPAL	MN	LPV	3	99.742	6	99.676	8	99.541
JMR	MORA MUNICIPAL	MN	LPV	5	99.776	6	99.737	8	99.575
JYG	ST JAMES MUNICIPAL	MN	LPV	1	99.801	1	99.801	6	99.738
LJF	LITCHFIELD MUNICIPAL	MN	LPV	2	99.790	5	99.780	8	99.690

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LVN	AIRLAKE	MN	LPV200	2	99.793	3	99.789	7	99.687
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	4	99.778	5	99.733	9	99.600
LYV	QUENTIN AANENSON FLD	MN	LPV200	1	99.801	1	99.801	5	99.773
MJQ	JACKSON MUNICIPAL	MN	LPV	1	99.801	1	99.801	5	99.762
MKT	MANKATO RGNL	MN	LPV200	2	99.792	3	99.791	7	99.718
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	1	99.801	3	99.797	6	99.738
MOX	MORRIS MUNICIPAL/CHARLIE SCHMIDT FL	MN	LPV	2	99.788	5	99.757	6	99.691
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	2	99.793	4	99.787	8	99.679
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	2	99.789	4	99.781	7	99.728
MWM	WINDOM MUNICIPAL	MN	LPV	1	99.801	1	99.801	6	99.751
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	5	99.700	6	99.661	5	99.479
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	2	99.796	2	99.776	6	99.699
ORB	ORR RGNL	MN	LP	3	99.636	7	99.570	6	99.428
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	1	99.801	1	99.801	5	99.768
OWA	OWATONNA DEGNER RGNL	MN	LPV200	2	99.793	3	99.793	8	99.721
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	2	99.790	5	99.759	7	99.684
PKD	PARK RAPIDS MUNICIPAL/KONSHOK FLD	MN	LPV200	4	99.721	6	99.673	6	99.491
PQN	PIPESTONE MUNICIPAL	MN	LPV200	1	99.801	1	99.801	6	99.753
RGK	RED WING RGNL	MN	LPV200	2	99.794	3	99.776	7	99.683
ROS	RUSH CITY RGNL	MN	LPV	4	99.778	5	99.743	8	99.585
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FLD	MN	LPV	6	99.638	7	99.544	7	99.434
RRT	WARROAD INTL MEML	MN	LPV200	4	99.620	6	99.537	7	99.439
RST	ROCHESTER INTL	MN	LPV200	1	99.801	2	99.783	6	99.730
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	2	99.790	3	99.787	7	99.726
SAZ	STAPLES MUNICIPAL	MN	LPV	4	99.755	6	99.699	8	99.546
SBU	BLUE EARTH MUNICIPAL	MN	LPV	1	99.801	1	99.801	5	99.760
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	2	99.793	3	99.775	8	99.678

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
STC	ST CLOUD RGNL	MN	LPV200	2	99.785	5	99.742	10	99.656
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	2	99.792	3	99.757	8	99.676
TOB	DODGE CENTER	MN	LPV	2	99.799	2	99.794	7	99.728
TVF	THIEF RIVER FALLS RGNL	MN	LPV	6	99.688	9	99.617	5	99.455
TWM	RICHARD B HELGESON	MN	LPV	3	99.639	6	99.610	5	99.454
ULM	NEW ULM MUNICIPAL	MN	LPV200	2	99.791	3	99.789	7	99.718
VVV	ORTONVILLE MUNICIPAL-MARTINSON FLD	MN	LP	2	99.787	4	99.761	7	99.722
Y49	WALKER MUNICIPAL	MN	LP	4	99.709	6	99.625	5	99.471
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	2	99.769	5	99.744	8	99.644
03D	MEMPHIS MEML	MO	LPV	1	99.830	1	99.826	1	99.810
1H0	CREVE COEUR	MO	LPV	1	99.843	1	99.833	1	99.826
1MO	MOUNTAIN GROVE MEML	MO	LP	1	99.837	1	99.836	1	99.826
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	1	99.830	1	99.829	1	99.826
6M6	LEWIS COUNTY RGNL	MO	LPV	1	99.833	1	99.830	1	99.818
8WC	WASHINGTON COUNTY	MO	LPV	1	99.843	1	99.837	1	99.826
94K	CASSVILLE MUNICIPAL	MO	LPV	1	99.830	1	99.829	1	99.826
AIZ	LEE C FINE MEML	MO	LPV	1	99.837	1	99.830	1	99.826
BBG	BRANSON	MO	LPV200	1	99.830	1	99.830	1	99.826
BUM	BUTLER MEML	MO	LPV	1	99.829	1	99.829	1	99.826
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	1	99.841	1	99.837	1	99.826
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	1	99.826	1	99.826	1	99.826
COU	COLUMBIA RGNL	MO	LPV200	1	99.841	1	99.829	1	99.826
DMO	SEDALIA RGNL	MO	LPV	1	99.830	1	99.829	1	99.826
DXE	DEXTER MUNICIPAL	MO	LPV	1	99.841	1	99.837	1	99.826
EIW	COUNTY MEML	MO	LPV	1	99.841	1	99.837	1	99.826
EOS	NEOSHO HUGH ROBINSON	MO	LPV	1	99.830	1	99.829	1	99.826
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	1	99.812	1	99.812	1	99.810

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EZZ	CAMERON MEML	MO	LPV	1	99.826	1	99.826	1	99.823
FAM	FARMINGTON RGNL	MO	LPV	1	99.845	1	99.837	1	99.829
FTT	ELTON HENSLEY MEML	MO	LPV	1	99.841	1	99.829	1	99.826
FWB	BRANSON WEST MUNICIPAL - EMERSON FL	MO	LPV200	1	99.830	1	99.829	1	99.826
FYG	WASHINGTON RGNL	MO	LPV	1	99.841	1	99.833	1	99.826
GLY	CLINTON RGNL	MO	LPV	1	99.829	1	99.829	1	99.826
GPH	MIDWEST NTL AIR CENTER	MO	LPV	1	99.826	1	99.826	1	99.826
H19	BOWLING GREEN MUNICIPAL	MO	LPV	1	99.838	1	99.833	1	99.826
H79	ELDON MODEL AIRPARK	MO	LP	1	99.837	1	99.829	1	99.826
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	1	99.841	1	99.837	1	99.829
HAE	HANNIBAL RGNL	MO	LPV	1	99.833	1	99.830	1	99.825
HFJ	MONETT RGNL	MO	LPV	1	99.830	1	99.829	1	99.826
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	1	99.829	1	99.829	1	99.826
IRK	KIRKSVILLE RGNL	MO	LPV200	1	99.830	1	99.826	1	99.819
JEF	JEFFERSON CITY MEML	MO	LPV	1	99.841	1	99.830	1	99.826
JLN	JOPLIN RGNL	MO	LPV	1	99.830	1	99.829	1	99.826
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	1	99.837	1	99.830	1	99.826
K57	GOULD PETERSON MUNICIPAL	MO	LPV	1	99.812	1	99.812	1	99.806
K89	MACON-FOWER MEML	MO	LPV	1	99.833	1	99.826	1	99.826
LLU	LAMAR MUNICIPAL	MO	LPV	1	99.833	1	99.833	1	99.826
LRY	LAWRENCE SMITH MEML	MO	LPV	1	99.829	1	99.829	1	99.826
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	1	99.829	1	99.829	1	99.826
M05	CARUTHERSVILLE MEML	MO	LPV	1	99.841	1	99.837	1	99.826
M12	STEELE MUNICIPAL	MO	LPV	1	99.841	1	99.837	1	99.826
M17	BOLIVAR MUNICIPAL	MO	LPV	1	99.837	1	99.831	1	99.826
M48	HOUSTON MEML	MO	LPV	1	99.841	1	99.836	1	99.826
MAW	MALDEN RGNL	MO	LPV	1	99.841	1	99.837	1	99.826

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MBY	OMAR N BRADLEY	MO	LPV	1	99.833	1	99.827	1	99.826
MCI	KANSAS CITY INTL	MO	LPV200	1	99.826	1	99.826	1	99.826
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	1	99.829	1	99.829	1	99.826
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	1	99.827	1	99.827	1	99.826
MNF	MOUNTAIN VIEW	MO	LP	1	99.841	1	99.837	1	99.826
MO3	STOCKTON MUNICIPAL	MO	LP	1	99.833	1	99.833	1	99.826
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	1	99.833	1	99.826	1	99.826
MYJ	MEXICO MEML	MO	LPV	1	99.839	1	99.833	1	99.826
NVD	NEVADA MUNICIPAL	MO	LPV200	1	99.833	1	99.833	1	99.826
OZS	CAMDENTON MEML-LAKE RGNL	MO	LPV	1	99.837	1	99.830	1	99.826
PCD	PERRYVILLE RGNL	MO	LPV	1	99.841	1	99.837	1	99.826
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	1	99.830	1	99.829	1	99.826
POF	POPLAR BLUFF RGNL BUSINESS	MO	LPV	1	99.841	1	99.837	1	99.829
RAW	WARSAW MUNICIPAL	MO	LPV200	1	99.831	1	99.830	1	99.826
RCM	SKYHAVEN	MO	LPV	1	99.829	1	99.829	1	99.826
SGF	SPRINGFIELD-BRANSON NTL	MO	LPV	1	99.830	1	99.829	1	99.826
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	1	99.841	1	99.837	1	99.826
STJ	ROSECRANS MEML	MO	LPV200	1	99.826	1	99.826	1	99.823
STL	ST LOUIS LAMBERT INTL	MO	LPV200	1	99.841	1	99.833	1	99.827
SUS	SPIRIT OF ST LOUIS	MO	LPV200	1	99.843	1	99.833	1	99.826
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	1	99.841	1	99.836	1	99.826
TKX	KENNETT MEML	MO	LPV	1	99.841	1	99.837	1	99.826
TRX	TRENTON MUNICIPAL	MO	LPV	1	99.826	1	99.826	1	99.819
UBX	CUBA MUNICIPAL	MO	LPV	1	99.841	1	99.836	1	99.826
UNO	WEST PLAINS RGNL	MO	LPV	1	99.841	1	99.836	1	99.826
UUV	SULLIVAN RGNL	MO	LPV	1	99.841	1	99.833	1	99.826
VER	JESSE VIERTEL MEML	MO	LPV	1	99.839	1	99.829	1	99.826

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VIH	ROLLA NTL	MO	LPV	1	99.841	1	99.833	1	99.826
0R0	COLUMBIA/MARION COUNTY	MS	LPV	2	99.924	2	99.896	1	99.820
17M	MAGEE MUNICIPAL	MS	LP	2	99.895	2	99.891	1	99.837
5A4	OKOLONA MUNICIPAL/RICHARD STOVALL F	MS	LPV	1	99.855	1	99.855	1	99.841
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	1	99.855	1	99.855	1	99.835
87I	YAZOO COUNTY	MS	LPV	1	99.855	1	99.855	1	99.833
8M1	BOONEVILLE/BALDWYN	MS	LPV	1	99.855	1	99.855	1	99.841
CKM	FLETCHER FLD	MS	LPV	1	99.851	1	99.851	1	99.841
CRX	ROSCOE TURNER	MS	LPV200	1	99.851	1	99.841	1	99.837
GLH	GREENVILLE MID-DELTA	MS	LPV200	1	99.855	1	99.855	1	99.833
GNF	GRENADA MUNICIPAL	MS	LPV	1	99.855	1	99.855	1	99.840
GPT	GULFPORT-BILOXI INTL	MS	LPV200	1	99.931	1	99.931	1	99.824
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	1	99.855	1	99.855	1	99.839
GWO	GREENWOOD-LEFLORE	MS	LPV	1	99.855	1	99.855	1	99.834
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	2	99.925	2	99.897	1	99.833
HEZ	HARDY-ANDERS FLD/NATCHEZ-ADAMS	MS	LPV200	2	99.894	2	99.888	1	99.818
HKS	HAWKINS FLD	MS	LPV	1	99.855	1	99.855	1	99.833
HSA	STENNIS INTL	MS	LPV200	1	99.931	1	99.931	2	99.837
IDL	INDIANOLA MUNICIPAL	MS	LPV	1	99.855	1	99.855	1	99.833
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	1	99.855	1	99.855	1	99.833
JVW	JOHN BELL WILLIAMS	MS	LPV200	1	99.855	1	99.855	1	99.833
LMS	LOUISVILLE/WINSTON COUNTY	MS	LPV	1	99.855	1	99.855	1	99.833
LUL	HESLER-NOBLE FLD	MS	LPV	2	99.920	2	99.895	1	99.840
M11	COPIAH COUNTY	MS	LPV	2	99.889	2	99.888	1	99.836
M40	MONROE COUNTY	MS	LPV	1	99.855	1	99.855	1	99.843
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	1	99.848	1	99.848	1	99.835
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	2	99.920	2	99.894	2	99.835

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MBO	BRUCE CAMPBELL FLD	MS	LPV	1	99.855	1	99.855	1	99.833
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	2	99.925	2	99.897	1	99.818
MEI	KEY FLD	MS	LPV200	1	99.859	1	99.858	1	99.833
MJD	PICAYUNE MUNICIPAL	MS	LPV	1	99.928	2	99.925	2	99.836
MMS	SELFS	MS	LPV	1	99.855	1	99.855	1	99.840
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	1	99.855	1	99.855	1	99.833
OLV	OLIVE BRANCH/TAYLOR FLD	MS	LPV200	1	99.848	1	99.841	1	99.834
PIB	HATTIESBURG/LAUREL RGNL	MS	LPV200	2	99.922	2	99.895	2	99.846
PMU	PANOLA COUNTY	MS	LPV	1	99.855	1	99.855	1	99.841
PQL	TRENT LOTT INTL	MS	LPV200	2	99.965	2	99.953	2	99.845
RNV	CLEVELAND MUNICIPAL	MS	LPV	1	99.855	1	99.855	1	99.837
STF	GEORGE M BRYAN	MS	LPV200	1	99.855	1	99.855	1	99.837
TUP	TUPELO RGNL	MS	LPV200	1	99.855	1	99.855	1	99.841
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	1	99.855	1	99.855	1	99.840
UOX	UNIVERSITY-OXFORD	MS	LPV	1	99.855	1	99.855	1	99.840
UTA	TUNICA MUNICIPAL	MS	LPV200	1	99.848	1	99.848	1	99.841
VKS	VICKSBURG MUNICIPAL	MS	LP	1	99.855	1	99.855	1	99.833
00U	BIG HORN COUNTY	MT	LPV200	2	99.842	1	99.815	3	99.784
1S3	TILLITT FLD	MT	LPV	2	99.790	2	99.780	5	99.762
4U6	CIRCLE TOWN COUNTY	MT	LPV	2	99.765	3	99.756	5	99.664
6S0	BIG TIMBER	MT	LPV	2	99.855	2	99.833	3	99.790
6S8	LAUREL MUNICIPAL	MT	LPV	2	99.850	1	99.826	3	99.793
7S0	RONAN	MT	LPV	2	99.848	2	99.835	2	99.740
7S1	TWIN BRIDGES	MT	LPV	1	99.884	1	99.865	2	99.826
BHK	BAKER MUNICIPAL	MT	LPV	2	99.781	2	99.777	6	99.715
BIL	BILLINGS LOGAN INTL	MT	LPV200	3	99.847	2	99.810	3	99.789
BTM	BERT MOONEY	MT	LPV	2	99.882	2	99.864	3	99.812

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	1	99.858	1	99.851	3	99.813
CII	CHOTEAU	MT	LPV200	2	99.817	3	99.801	2	99.735
CTB	CUT BANK INTL	MT	LPV200	2	99.819	3	99.787	2	99.721
DLN	DILLON	MT	LPV	1	99.884	1	99.864	2	99.836
EKS	ENNIS BIG SKY	MT	LPV	1	99.869	1	99.861	2	99.832
GDV	DAWSON COMMUNICIPALTY	MT	LPV	2	99.764	3	99.751	5	99.664
GGW	WOKAL FLD/GLASGOW-VALLEY COUNT	MT	LPV200	2	99.765	4	99.755	5	99.650
GPI	GLACIER PARK INTL	MT	LPV	4	99.839	5	99.835	2	99.732
GTF	GREAT FALLS INTL	MT	LPV200	2	99.810	2	99.793	2	99.735
HLN	HELENA RGNL	MT	LPV	3	99.839	2	99.817	3	99.778
HRF	RAVALLI COUNTY	MT	LPV	2	99.865	2	99.857	3	99.799
HVR	HAVRE CITY-COUNTY	MT	LPV	2	99.801	3	99.783	2	99.715
HWQ	WHEATLAND COUNTY AT HARLOWTON	MT	LPV	2	99.818	2	99.806	3	99.770
LVM	MISSION FLD	MT	LP	1	99.855	1	99.847	3	99.816
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	2	99.811	2	99.793	3	99.750
M75	MALTA	MT	LP	2	99.766	3	99.755	5	99.676
MLS	FRANK WILEY FLD	MT	LPV	2	99.779	2	99.775	6	99.735
MSO	MISSOULA MONTANA	MT	LPV200	2	99.857	2	99.842	3	99.761
OLF	L M CLAYTON	MT	LPV200	2	99.760	3	99.740	5	99.638
PO1	POPLAR MUNICIPAL	MT	LPV200	2	99.760	4	99.732	5	99.637
PWD	SHER-WOOD	MT	LPV200	2	99.747	5	99.704	6	99.605
RPX	ROUNDUP	MT	LPV	3	99.813	3	99.797	3	99.759
RVF	RUBY VALLEY FLD	MT	LPV	1	99.884	1	99.865	2	99.826
S01	CONRAD	MT	LPV	2	99.816	3	99.790	2	99.724
SBX	SHELBY	MT	LPV	2	99.815	3	99.787	2	99.720
SDY	SIDNEY-RICHLAND RGNL	MT	LPV	2	99.758	3	99.736	5	99.616
WYS	YELLOWSTONE	MT	LPV200	1	99.858	1	99.851	1	99.845

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CCE3	JUNIPER	NB	LP	3	99.620	3	99.591	8	99.444
CCN2	GRAND MANAN	NB	LPV	3	99.652	3	99.620	5	99.522
CCR3	FLORENCEVILLE	NB	LPV	3	99.624	3	99.595	6	99.457
CDJ4	CLEARWATER	NB	LPV	3	99.613	3	99.590	8	99.425
CYCH	MIRAMICHI	NB	LPV	3	99.588	3	99.553	12	99.378
CYCL	CHARLO	NB	LPV	4	99.530	4	99.529	12	99.321
CYFC	FREDERICTON INTL	NB	LPV	3	99.635	3	99.596	5	99.456
CYQM	GREATER MONCTON ROMEO LEBLANC INTL	NB	LPV200	3	99.615	3	99.578	8	99.421
CYSJ	SAINT JOHN	NB	LPV	3	99.634	3	99.598	5	99.455
CYSL	ST. LEONARD	NB	LPV	4	99.609	3	99.588	9	99.435
CZBF	BATHURST	NB	LPV	4	99.544	4	99.533	12	99.329
43A	MONTGOMERY COUNTY	NC	LP	3	99.904	2	99.872	1	99.833
7W6	HYDE COUNTY	NC	LP	3	99.865	2	99.850	3	99.807
ACZ	HENDERSON FLD	NC	LPV	2	99.911	2	99.897	1	99.833
AFP	ANSON COUNTY/JEFF CLOUD FLD	NC	LPV	2	99.915	2	99.897	1	99.833
AKH	GASTONIA MUNICIPAL	NC	LPV	2	99.898	2	99.878	1	99.833
ASJ	TRI-COUNTY AT HENRY JOYNER FIE	NC	LPV	2	99.848	1	99.833	3	99.816
AVL	ASHEVILLE RGNL	NC	LPV200	2	99.870	2	99.852	1	99.836
BUY	BURLINGTON/ALAMANCE RGNL	NC	LPV	2	99.864	2	99.852	1	99.833
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	2	99.897	2	99.881	1	99.833
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	2	99.913	2	99.913	2	99.846
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	2	99.912	3	99.892	1	99.833
DPL	DUPLIN COUNTY	NC	LPV200	2	99.911	2	99.880	1	99.833
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	1	99.833	1	99.833	3	99.810
EDE	NORTHEASTERN RGNL	NC	LPV200	2	99.848	1	99.833	3	99.815
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	3	99.894	2	99.863	1	99.833
EQY	CHARLOTTE/MONROE EXEC	NC	LPV200	1	99.901	1	99.898	1	99.833

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EWN	COASTAL CAROLINA RGNL	NC	LPV	2	99.884	2	99.873	2	99.826
EXX	DAVIDSON COUNTY	NC	LPV	2	99.868	2	99.855	1	99.833
EYF	CURTIS L BROWN JR FLD	NC	LPV	2	99.913	2	99.913	1	99.833
FAY	FAYETTEVILLE RGNL/GRANNIS FLD	NC	LPV200	2	99.913	3	99.892	1	99.833
FFA	FIRST FLIGHT	NC	LP	1	99.833	1	99.833	3	99.814
FQD	RUTHERFORD COUNTY/MARCHMAN FLD	NC	LPV	2	99.873	2	99.855	1	99.833
GEV	ASHE COUNTY	NC	LP	2	99.855	1	99.837	1	99.833
GSO	PIEDMONT TRIAD INTL	NC	LPV200	2	99.863	2	99.852	1	99.833
GWW	WAYNE EXEC JETPORT	NC	LPV200	2	99.890	2	99.872	2	99.829
HBI	ASHEBORO RGNL	NC	LPV	3	99.887	3	99.871	1	99.833
HKY	HICKORY RGNL	NC	LPV200	2	99.866	2	99.855	1	99.833
HNZ	HENDERSON/OXFORD	NC	LPV	2	99.852	2	99.848	2	99.822
HRJ	HARNETT RGNL JETPORT	NC	LPV	2	99.892	2	99.872	1	99.833
ILM	WILMINGTON INTL	NC	LPV200	2	99.913	2	99.912	1	99.833
INT	SMITH REYNOLDS	NC	LPV200	2	99.862	2	99.852	1	99.833
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	2	99.873	2	99.855	1	99.833
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	2	99.883	2	99.873	2	99.826
IXA	HALIFAX/NORTHAMPTON RGNL	NC	LPV200	2	99.848	1	99.833	3	99.819
JNX	JOHNSTON RGNL	NC	LPV	2	99.890	2	99.872	2	99.830
JQF	CONCORD-PADGETT RGNL	NC	LPV	3	99.891	3	99.872	1	99.833
LBT	LUMBERTON RGNL	NC	LPV	2	99.913	2	99.911	1	99.833
LHZ	TRIANGLE NORTH EXEC	NC	LPV200	2	99.852	2	99.848	2	99.824
MCZ	MARTIN COUNTY	NC	LPV	2	99.849	2	99.848	2	99.819
MEB	LAURINBURG/MAXTON	NC	LPV200	2	99.916	1	99.898	1	99.833
MQI	DARE COUNTY RGNL	NC	LPV	1	99.833	1	99.833	3	99.813
MRH	MICHAEL J SMITH FLD	NC	LPV	2	99.913	2	99.878	2	99.829
MRN	FOOTHILLS RGNL	NC	LPV	2	99.864	2	99.854	1	99.833

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	2	99.858	2	99.850	1	99.833
OAJ	ALBERT J ELLIS	NC	LPV200	2	99.910	3	99.892	1	99.833
OCW	WASHINGTON-WARREN	NC	LPV	2	99.872	2	99.869	2	99.820
ONX	CURRITUCK COUNTY RGNL	NC	LPV	1	99.833	1	99.833	3	99.811
PGV	PITT-GREENVILLE	NC	LPV	2	99.872	2	99.869	2	99.820
PMZ	PLYMOUTH MUNICIPAL	NC	LP	2	99.848	1	99.833	2	99.819
RCZ	RICHMOND COUNTY	NC	LPV	2	99.916	1	99.898	1	99.833
RDU	RALEIGH-DURHAM INTL	NC	LPV200	2	99.867	2	99.852	2	99.830
RHP	WESTERN CAROLINA RGNL	NC	LP	1	99.855	1	99.837	1	99.837
RUQ	MID-CAROLINA RGNL	NC	LPV200	2	99.874	2	99.859	1	99.833
RWI	ROCKY MOUNT/WILSON RGNL	NC	LPV	2	99.852	2	99.848	2	99.821
SCR	SILER CITY MUNICIPAL	NC	LPV	2	99.887	2	99.872	1	99.833
SOP	MOORE COUNTY	NC	LPV200	3	99.909	2	99.876	1	99.833
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	2	99.913	2	99.912	2	99.861
SVH	STATESVILLE RGNL	NC	LPV200	2	99.867	2	99.855	1	99.833
TDF	RALEIGH RGNL AT PERSON COUNTY	NC	LPV200	2	99.855	2	99.848	2	99.826
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	3	99.902	2	99.872	1	99.833
UKF	WILKES COUNTY	NC	LPV200	2	99.857	2	99.850	1	99.833
VUJ	STANLY COUNTY	NC	LPV200	2	99.892	2	99.872	1	99.833
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	3	99.869	3	99.866	2	99.823
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	3	99.905	2	99.874	2	99.832
ZEF	ELKIN MUNICIPAL	NC	LP	2	99.858	2	99.850	1	99.833
06D	ROLLA MUNICIPAL	ND	LPV	7	99.686	6	99.636	7	99.539
20U	BEACH	ND	LPV	2	99.766	3	99.753	6	99.665
2C8	CAVALIER MUNICIPAL	ND	LPV	6	99.669	5	99.600	5	99.459
3H4	HILLSBORO MUNICIPAL	ND	LPV	4	99.730	6	99.650	8	99.532
46D	CARRINGTON MUNICIPAL	ND	LPV	3	99.743	6	99.673	7	99.593

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4E7	ELLENDALE MUNICIPAL	ND	LPV	2	99.763	5	99.749	6	99.674
51D	EDGELEY MUNICIPAL	ND	LPV	2	99.753	6	99.726	5	99.635
5L0	LAKOTA MUNICIPAL	ND	LPV	5	99.711	6	99.641	6	99.518
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	2	99.747	6	99.687	7	99.551
6L3	LISBON MUNICIPAL	ND	LPV	2	99.751	6	99.715	7	99.615
7L2	LINTON MUNICIPAL	ND	LPV	2	99.776	5	99.770	6	99.686
9D7	CANDO MUNICIPAL	ND	LPV	6	99.706	6	99.638	8	99.555
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	2	99.747	6	99.690	6	99.568
BIS	BISMARCK MUNICIPAL	ND	LPV200	2	99.757	6	99.721	6	99.623
BWP	HARRY STERN	ND	LPV	2	99.764	6	99.725	8	99.609
BWW	BOWMAN RGNL	ND	LPV	2	99.785	2	99.781	6	99.714
D05	GARRISON MUNICIPAL	ND	LPV	2	99.744	6	99.686	6	99.595
D09	BOTTINEAU MUNICIPAL	ND	LPV	5	99.710	6	99.649	7	99.560
D55	ROBERTSON FLD	ND	LPV	6	99.697	6	99.632	5	99.488
D57	GLEN ULLIN RGNL	ND	LPV	2	99.759	4	99.738	6	99.627
D60	TIOGA MUNICIPAL	ND	LPV	2	99.746	6	99.696	6	99.575
DIK	DICKINSON/THEODORE ROOSEVELT R	ND	LPV200	2	99.762	3	99.752	6	99.636
DVL	DEVILS LAKE RGNL	ND	LPV200	5	99.713	6	99.640	7	99.538
FAR	HECTOR INTL	ND	LPV200	4	99.741	6	99.672	8	99.542
GAF	HUTSON FLD	ND	LPV	7	99.683	7	99.631	6	99.466
GFK	GRAND FORKS INTL	ND	LPV	7	99.701	7	99.635	6	99.484
GWR	GWINNER-ROGER MELROE FLD	ND	LPV	2	99.762	6	99.741	7	99.626
HEI	HETTINGER/JB LINDQUIST RGNL	ND	LPV	2	99.791	2	99.782	6	99.720
HZE	MERCER COUNTY RGNL	ND	LPV	2	99.747	6	99.713	5	99.601
ISN	SLOULIN FLD INTL	ND	LPV200	2	99.747	5	99.703	6	99.593
JMS	JAMESTOWN RGNL	ND	LPV200	2	99.747	6	99.704	7	99.593
K74	ROBERT ODEGAARD FLD	ND	LP	3	99.750	6	99.694	7	99.563

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MOT	MINOT INTL	ND	LPV	2	99.743	6	99.668	6	99.573
RUG	RUGBY MUNICIPAL	ND	LP	5	99.717	6	99.653	6	99.571
S25	WATFORD CITY MUNICIPAL	ND	LPV	2	99.747	5	99.706	6	99.599
XWA	WILLISTON BASIN INTL	ND	LPV200	2	99.747	5	99.703	6	99.592
Y19	MANDAN RGNL/LAWLER FLD	ND	LPV	2	99.757	6	99.725	6	99.624
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	2	99.825	2	99.825	1	99.801
08K	HARVARD STATE	NE	LPV	1	99.830	1	99.826	1	99.807
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	2	99.819	1	99.804	1	99.801
0C4	PENDER MUNICIPAL	NE	LPV	2	99.822	1	99.804	1	99.801
0F4	LOUP CITY MUNICIPAL	NE	LPV	1	99.829	1	99.826	1	99.801
0G3	TECUMSEH MUNICIPAL	NE	LPV	1	99.812	1	99.812	1	99.809
0V3	PIONEER VILLAGE FLD	NE	LPV	1	99.830	1	99.826	1	99.823
12K	SUPERIOR MUNICIPAL	NE	LPV	1	99.830	1	99.830	1	99.823
47V	CURTIS MUNICIPAL	NE	LPV	1	99.829	1	99.829	1	99.824
4D9	ALMA MUNICIPAL	NE	LPV	1	99.830	1	99.830	1	99.823
4V9	ANTELOPE COUNTY	NE	LPV	2	99.825	2	99.825	1	99.801
6K3	CREIGHTON MUNICIPAL	NE	LPV	2	99.823	1	99.804	1	99.801
7V7	RED CLOUD MUNICIPAL	NE	LPV	1	99.830	1	99.830	1	99.823
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	2	99.821	2	99.821	1	99.801
93Y	DAVID CITY MUNICIPAL	NE	LPV	1	99.811	1	99.811	1	99.801
9V5	MODISETT	NE	LPV	1	99.833	1	99.833	1	99.823
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	1	99.812	1	99.812	1	99.803
AHQ	WAHOO MUNICIPAL	NE	LPV	1	99.811	1	99.811	1	99.801
AIA	ALLIANCE MUNICIPAL	NE	LPV200	1	99.833	1	99.833	1	99.828
ANW	AINSWORTH RGNL	NE	LPV200	2	99.823	2	99.823	2	99.814
AUH	AURORA MUNICIPAL - AL POTTER FLD	NE	LPV	1	99.826	1	99.826	1	99.801
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	1	99.829	1	99.826	1	99.806

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	1	99.833	1	99.833	1	99.828
BIE	BEATRICE MUNICIPAL	NE	LPV200	2	99.827	2	99.824	1	99.808
BTA	BLAIR MUNICIPAL	NE	LPV	1	99.811	1	99.804	1	99.801
BUB	CRAM FLD	NE	LPV	1	99.826	1	99.826	1	99.801
BVN	ALBION MUNICIPAL	NE	LPV	2	99.824	2	99.824	1	99.801
CDR	CHADRON MUNICIPAL	NE	LPV200	1	99.833	1	99.833	1	99.826
CEK	CRETE MUNICIPAL	NE	LPV	1	99.812	1	99.812	1	99.804
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	1	99.829	1	99.829	1	99.823
CZD	COZAD MUNICIPAL	NE	LPV	1	99.829	1	99.829	1	99.823
EAR	KEARNEY RGNL	NE	LPV200	1	99.830	1	99.826	1	99.812
FBY	FAIRBURY MUNICIPAL	NE	LPV	1	99.830	1	99.826	1	99.817
FET	FREMONT MUNICIPAL	NE	LPV	1	99.811	1	99.806	1	99.801
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	1	99.830	1	99.826	1	99.807
FNB	BRENNER FLD	NE	LPV	1	99.826	1	99.826	1	99.817
GGF	GRANT MUNICIPAL	NE	LPV	1	99.833	1	99.833	1	99.829
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	1	99.826	1	99.826	1	99.802
GRN	GORDON MUNICIPAL	NE	LPV	1	99.833	1	99.833	1	99.823
HDE	BREWSTER FLD	NE	LPV	1	99.830	1	99.830	1	99.824
HSI	HASTINGS MUNICIPAL	NE	LPV	1	99.830	1	99.826	1	99.811
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FL	NE	LPV	1	99.833	1	99.833	1	99.833
IML	IMPERIAL MUNICIPAL	NE	LPV	1	99.833	1	99.833	1	99.829
JYR	YORK MUNICIPAL	NE	LPV	2	99.823	2	99.823	1	99.801
K01	FARINGTON FLD	NE	LPV	1	99.812	1	99.812	1	99.809
LBF	NORTH PLATTE RGNL/LEE BIRD FLD	NE	LPV200	1	99.829	1	99.829	1	99.823
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	2	99.822	1	99.804	1	99.801
LNK	LINCOLN	NE	LPV200	1	99.811	1	99.811	1	99.801
LXN	JIM KELLY FLD	NE	LPV	1	99.829	1	99.829	1	99.823

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MCK	MC COOK BEN NELSON RGNL	NE	LPV	1	99.833	1	99.829	1	99.826
MLE	MILLARD	NE	LPV	1	99.811	1	99.810	1	99.801
ODX	EVELYN SHARP FLD	NE	LPV	1	99.826	1	99.826	1	99.801
OFK	NORFOLK RGNL/KARL STEFAN MEML	NE	LPV200	2	99.824	1	99.804	1	99.801
OGA	SEARLE FLD	NE	LPV	1	99.833	1	99.833	1	99.827
OKS	GARDEN COUNTY/KING RHILEY FLD	NE	LPV	1	99.833	1	99.833	1	99.828
OLU	COLUMBUS MUNICIPAL	NE	LPV	2	99.823	2	99.823	1	99.801
OMA	EPPLEY AIRFIELD	NE	LPV200	1	99.811	1	99.805	1	99.801
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	2	99.823	2	99.823	1	99.801
PMV	PLATTSMOUTH MUNICIPAL/DOUGLAS V DUE	NE	LPV	1	99.811	1	99.811	1	99.801
RBE	ROCK COUNTY	NE	LPV	2	99.821	2	99.821	1	99.801
SCB	SCRIBNER STATE	NE	LPV	2	99.823	1	99.804	1	99.801
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FLD	NE	LPV	1	99.833	1	99.833	1	99.829
SWT	SEWARD MUNICIPAL	NE	LPV	1	99.811	1	99.811	1	99.801
TIF	THOMAS COUNTY	NE	LPV	1	99.829	1	99.829	1	99.824
TQE	TEKAMAH MUNICIPAL	NE	LPV	2	99.822	1	99.804	1	99.801
VTN	MILLER FLD	NE	LPV	2	99.826	2	99.822	2	99.817
ASH	BOIRE FLD	NH	LPV200	2	99.744	2	99.736	3	99.673
CON	CONCORD MUNICIPAL	NH	LPV	2	99.738	2	99.730	3	99.657
DAW	SKYHAVEN	NH	LPV	3	99.738	2	99.721	3	99.636
EEN	DILLANT/HOPKINS	NH	LPV	2	99.743	2	99.734	4	99.678
HIE	MOUNT WASHINGTON RGNL	NH	LPV	2	99.721	3	99.720	3	99.624
LCI	LACONIA MUNICIPAL	NH	LPV	2	99.735	2	99.726	3	99.633
LEB	LEBANON MUNICIPAL	NH	LPV	2	99.743	2	99.724	3	99.649
MHT	MANCHESTER BOSTON RGNL	NH	LPV200	2	99.743	2	99.732	3	99.669
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	2	99.738	2	99.721	4	99.658
47N	CENTRAL JERSEY RGNL	NJ	LP	2	99.797	2	99.792	4	99.746

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4N1	GREENWOOD LAKE	NJ	LP	2	99.787	2	99.784	4	99.733
ACY	ATLANTIC CITY INTL	NJ	LPV200	2	99.804	2	99.801	4	99.767
CDW	ESSEX COUNTY	NJ	LPV	2	99.787	2	99.783	4	99.734
EWR	NEWARK LIBERTY INTL	NJ	LPV200	2	99.787	2	99.783	4	99.735
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	2	99.808	2	99.804	4	99.778
MJX	OCEAN COUNTY	NJ	LPV	2	99.804	2	99.801	4	99.760
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	2	99.787	2	99.783	4	99.735
N12	LAKEWOOD	NJ	LP	2	99.804	2	99.801	4	99.755
N14	FLYING W	NJ	LPV	2	99.804	2	99.801	4	99.764
N40	SKY MANOR	NJ	LP	2	99.797	2	99.793	4	99.749
TEB	TETERBORO	NJ	LPV	2	99.786	2	99.783	4	99.733
TTN	TRENTON MERCER	NJ	LPV	2	99.803	2	99.799	4	99.759
VAY	SOUTH JERSEY RGNL	NJ	LP	2	99.804	2	99.801	4	99.767
WWD	CAPE MAY COUNTY	NJ	LPV	2	99.814	2	99.807	4	99.790
CVB2	VOISEY'S BAY	NL	LPV	14	98.698	14	98.659	48	97.726
CYDF	DEER LAKE	NL	LPV200	12	99.185	12	99.178	22	98.753
CYJT	STEPHENVILLE	NL	LPV	10	99.264	9	99.234	16	98.830
CYQX	GANDER INTL	NL	LPV200	11	99.053	14	98.999	65	98.224
CYWK	WABUSH	NL	LPV	13	98.998	12	98.982	24	98.677
CYYR	GOOSE BAY	NL	LPV	18	98.868	17	98.808	36	98.216
CYYT	ST. JOHN'S INTL	NL	LPV	11	99.053	48	98.731	168	96.853
CZUM	CHURCHILL FALLS	NL	LPV	15	98.930	15	98.906	29	98.486
LFVM	MIQUELON	NL	LPV	10	99.227	10	99.225	21	98.768
LFVP	ST PIERRE	NL	LPV	9	99.215	9	99.213	22	98.748
0E0	MORIARTY MUNICIPAL	NM	LPV	1	99.833	1	99.833	1	99.823
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	1	99.833	1	99.833	1	99.823
AEG	DOUBLE EAGLE II	NM	LPV200	1	99.833	1	99.833	1	99.824

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	1	99.790	1	99.790	3	99.764
ATS	ARTESIA MUNICIPAL	NM	LPV200	1	99.800	1	99.800	1	99.786
CAO	CLAYTON MUNICIPAL AIRPARK	NM	LPV	1	99.833	1	99.833	1	99.826
CNM	CAVERN CITY AIR TRML	NM	LPV200	1	99.800	1	99.800	1	99.786
CVN	CLOVIS RGNL	NM	LPV200	1	99.833	1	99.833	1	99.822
DMN	DEMING MUNICIPAL	NM	LPV	1	99.790	1	99.790	5	99.717
E06	LEA COUNTY/ZIP FRANKLIN MEML	NM	LPV	2	99.812	1	99.800	1	99.786
FMN	FOUR CORNERS RGNL	NM	LPV200	1	99.837	1	99.837	1	99.829
HOB	LEA COUNTY RGNL	NM	LPV	1	99.800	1	99.800	1	99.786
LAM	LOS ALAMOS	NM	LP	1	99.837	1	99.833	1	99.826
LRU	LAS CRUCES INTL	NM	LPV200	1	99.790	1	99.790	3	99.724
ONM	SOCORRO MUNICIPAL	NM	LP	1	99.790	1	99.790	2	99.771
ROW	ROSWELL AIR CENTER	NM	LPV	1	99.800	1	99.800	1	99.786
SAF	SANTA FE MUNICIPAL	NM	LPV200	1	99.833	1	99.833	1	99.826
SRR	SIERRA BLANCA RGNL	NM	LPV200	1	99.790	1	99.790	2	99.777
SVC	GRANT COUNTY	NM	LPV	1	99.790	1	99.790	4	99.722
CCQ3	DEBERT	NS	LPV	4	99.576	3	99.551	7	99.394
CYHZ	STANFIELD INTL	NS	LPV200	4	99.607	3	99.583	6	99.391
CYQI	YARMOUTH	NS	LPV	4	99.671	3	99.630	5	99.532
CYQY	J.A. DOUGLAS MCCURDY	NS	LPV200	7	99.446	7	99.427	14	99.049
CYTN	TRENTON	NS	LPV	3	99.551	3	99.541	10	99.346
CYZX	GREENWOOD	NS	LP	3	99.633	3	99.598	7	99.450
CDK2	DIAVIK	NT	LPV	18	99.028	23	98.675	62	97.114
CEU9	SAMBAA K'E	NT	LPV	7	99.564	12	99.464	33	98.822
CGK2	GAHCHO KUE	NT	LPV	17	99.040	21	98.654	48	97.466
CSK6	SNAP LAKE	NT	LPV	18	99.113	22	98.719	44	97.491
CYEV	INUVIK (MIKE ZUBKO)	NT	LPV	12	99.162	15	99.007	63	98.178

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYFR	FORT RESOLUTION	NT	LPV	10	99.358	13	99.095	30	98.383
CYFS	FORT SIMPSON	NT	LPV	9	99.496	12	99.373	32	98.667
CYGH	FORT GOOD HOPE	NT	LPV	10	99.218	17	99.090	46	98.215
CYHY	MERLYN CARTER AIRPORT	NT	LPV	8	99.482	13	99.242	28	98.593
CYJP	FORT PROVIDENCE	NT	LPV	10	99.470	14	99.290	32	98.592
CYKD	FREDDIE CARMICHAEL	NT	LPV	10	99.178	13	98.983	52	98.303
CYOA	EKATI	NT	LPV	17	99.042	22	98.687	62	97.046
CYOC	OLD CROW	NT	LPV	11	99.328	13	99.085	26	98.605
CYPC	PAULATUK (NORA ALIQATCHIALUK RUBEN)	NT	LPV	11	99.013	18	98.841	75	97.200
CYSM	FORT SMITH	NT	LPV	5	99.307	10	99.182	26	98.585
CYSY	SACHS HARBOUR (DAVID NASOGALUAK JR. SAARYUAQ)	NT	LPV	13	98.933	27	98.596	126	96.419
CYUB	JAMES GRUBEN	NT	LPV	10	99.113	17	98.957	70	97.934
CYVQ	NORMAN WELLS	NT	LPV	11	99.293	16	99.190	45	98.206
CYWJ	DELINE	NT	LPV	12	99.250	15	99.165	52	98.013
CYZF	YELLOWKNIFE	NT	LPV200	12	99.266	17	98.981	38	98.134
CZFM	FORT MCPHERSON	NT	LPV	11	99.214	12	99.047	43	98.422
CZFN	TULITA	NT	LPV	11	99.289	15	99.170	45	98.194
CMB2	MEADOWBANK	NU	LPV	24	98.452	30	98.046	120	94.624
CMR2	MARY RIVER	NU	LPV	670	89.963	782	82.855	1011	55.222
CYBK	BAKER LAKE	NU	LPV	21	98.507	28	98.163	110	95.021
CYCS	CHESTERFIELD INLET	NU	LPV	24	98.338	35	98.105	114	94.866
CYEK	ARVIAT	NU	LPV	15	98.841	24	98.632	91	96.451
CYFB	IQALUIT	NU	LPV200	54	97.755	76	97.197	222	92.226
CYRB	RESOLUTE BAY	NU	LPV	230	95.722	361	90.967	1285	55.303
CYRT	RANKIN INLET	NU	LPV	21	98.451	29	98.178	107	95.291
CYSK	SANIKILUAQ	NU	LPV	13	98.921	15	98.834	53	98.062

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYTE	KINNGAIT AIRPORT	NU	LPV	40	97.885	55	97.581	161	93.537
CYYH	TALOYOAK	NU	LPV	35	97.897	58	96.922	250	90.326
05U	EUREKA	NV	LP	1	99.873	1	99.859	1	99.841
10U	OWYHEE	NV	LPV200	1	99.884	1	99.873	1	99.849
67L	MESQUITE	NV	LP	1	99.866	1	99.847	1	99.837
BAM	BATTLE MOUNTAIN	NV	LPV	1	99.880	1	99.859	1	99.842
BVU	BOULDER CITY MUNICIPAL	NV	LP	1	99.866	1	99.847	2	99.825
CXP	CARSON CITY	NV	LP	1	99.866	2	99.853	3	99.833
ELY	ELY/YELLAND FLD	NV	LPV	1	99.869	1	99.859	1	99.841
HTH	HAWTHORNE INDUSTRIAL	NV	LP	1	99.866	2	99.839	3	99.803
LAS	HARRY REID INTL	NV	LPV200	1	99.859	1	99.847	3	99.809
LOL	DERBY FLD	NV	LPV	1	99.880	1	99.851	2	99.841
RNO	RENO/TAHOE INTL	NV	LPV	1	99.877	2	99.855	2	99.836
RTS	RENO/STEAD	NV	LPV	1	99.877	2	99.856	2	99.837
SPZ	SILVER SPRINGS	NV	LPV	1	99.880	2	99.846	2	99.833
TPH	TONOPAH	NV	LP	1	99.869	2	99.840	3	99.812
VGT	NORTH LAS VEGAS	NV	LP	1	99.859	1	99.847	3	99.817
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	1	99.884	1	99.866	1	99.848
06N	RANDALL	NY	LP	2	99.781	2	99.777	3	99.733
0G7	FINGER LAKES RGNL	NY	LPV	2	99.776	2	99.772	4	99.718
1B1	COLUMBIA COUNTY	NY	LPV	2	99.776	2	99.772	4	99.721
20N	KINGSTON-ULSTER	NY	LPV	2	99.776	2	99.772	4	99.721
44N	SKY ACRES	NY	LPV	2	99.776	2	99.772	4	99.721
4B6	TICONDEROGA MUNICIPAL	NY	LPV	3	99.765	3	99.750	4	99.675
5B2	SARATOGA COUNTY	NY	LPV	2	99.776	2	99.772	4	99.696
5G0	LE ROY	NY	LP	2	99.776	2	99.772	5	99.718
9G0	BUFFALO AIRFIELD	NY	LP	2	99.776	2	99.772	4	99.727

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
9G3	AKRON/JESSON FLD	NY	LP	2	99.776	2	99.772	5	99.709
ALB	ALBANY INTL	NY	LPV200	2	99.776	2	99.772	3	99.712
ART	WATERTOWN INTL	NY	LPV200	2	99.776	3	99.770	5	99.678
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	2	99.776	2	99.773	4	99.733
BUF	BUFFALO NIAGARA INTL	NY	LPV200	2	99.775	2	99.772	4	99.710
ELM	ELMIRA/CORNING RGNL	NY	LPV200	2	99.779	2	99.775	3	99.736
ELZ	WELLSVILLE MUNICIPAL/TARANTINE FLD	NY	LPV200	2	99.791	2	99.786	3	99.755
FOK	FRANCIS S GABRESKI	NY	LPV200	2	99.779	2	99.776	4	99.721
FRG	REPUBLIC	NY	LPV200	2	99.785	2	99.781	4	99.733
FZY	OSWEGO COUNTY	NY	LPV	2	99.776	2	99.772	4	99.706
GFL	FLOYD BENNETT MEML	NY	LPV200	2	99.776	3	99.770	4	99.695
GVQ	GENESEE COUNTY	NY	LPV200	2	99.776	2	99.772	5	99.709
HPN	WESTCHESTER COUNTY	NY	LPV	2	99.786	2	99.782	4	99.729
HTF	HORNELL MUNICIPAL	NY	LPV	2	99.776	2	99.772	5	99.747
HTO	EAST HAMPTON	NY	LPV	2	99.779	2	99.776	5	99.716
HWV	BROOKHAVEN	NY	LPV	2	99.779	2	99.776	4	99.730
IAG	NIAGARA FALLS INTL	NY	LPV	2	99.773	2	99.772	4	99.701
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	2	99.784	2	99.781	4	99.731
ITH	ITHACA TOMPKINS INTL	NY	LPV	2	99.776	2	99.772	4	99.722
IUA	CANANDAIGUA	NY	LPV	2	99.776	2	99.772	4	99.718
JFK	JOHN F KENNEDY INTL	NY	LPV200	2	99.786	2	99.782	4	99.734
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	2	99.793	2	99.786	3	99.761
K09	PISECO	NY	LP	2	99.776	3	99.770	4	99.684
LGA	LAGUARDIA	NY	LPV	2	99.786	2	99.782	4	99.733
MAL	MALONE-DUFORT	NY	LPV	2	99.743	3	99.727	4	99.625
MGJ	ORANGE COUNTY	NY	LPV	2	99.780	2	99.776	3	99.733
MSS	MASSENA INTL-RICHARDS FLD	NY	LPV	3	99.759	4	99.743	4	99.638

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MSV	SULLIVAN COUNTY INTL	NY	LPV	2	99.776	2	99.773	3	99.733
N23	SIDNEY MUNICIPAL	NY	LP	2	99.776	2	99.771	4	99.733
N66	ALBERT S NADER RGNL	NY	LPV	2	99.776	2	99.772	4	99.736
NY0	FULTON COUNTY	NY	LPV	2	99.776	2	99.772	3	99.699
OGS	OGDENSBURG INTL	NY	LPV	2	99.775	3	99.766	5	99.669
OIC	LT WARREN EATON	NY	LP	2	99.776	2	99.770	4	99.727
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	3	99.791	2	99.775	3	99.759
PBG	PLATTSBURGH INTL	NY	LPV	2	99.737	2	99.723	4	99.627
PEO	PENN YAN	NY	LPV	2	99.776	2	99.772	4	99.718
POU	HUDSON VALLEY RGNL	NY	LPV	2	99.777	2	99.773	4	99.722
RME	GRIFFISS INTL	NY	LPV200	2	99.776	2	99.769	4	99.720
ROC	FREDERICK DOUGLASS/GREATER ROC	NY	LPV200	2	99.776	2	99.772	5	99.706
SCH	SCHENECTADY COUNTY	NY	LPV200	2	99.776	2	99.772	3	99.702
SDC	WILLIAMSON-SODUS	NY	LPV	2	99.776	2	99.772	5	99.706
SLK	ADIRONDACK RGNL	NY	LPV200	3	99.763	3	99.749	5	99.671
SWF	NEW YORK STEWART INTL	NY	LPV200	2	99.780	2	99.776	3	99.733
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	2	99.776	2	99.772	4	99.720
VGC	HAMILTON MUNICIPAL	NY	LPV	2	99.776	2	99.770	4	99.721
0G6	WILLIAMS COUNTY	OH	LPV	2	99.827	2	99.803	2	99.743
10G	HOLMES COUNTY	OH	LP	2	99.819	2	99.815	3	99.784
16G	SENECA COUNTY	OH	LPV	2	99.819	2	99.806	3	99.750
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	2	99.821	2	99.811	3	99.762
1G0	WOOD COUNTY	OH	LPV	2	99.821	2	99.806	3	99.745
1G3	KENT STATE UNIVERSITY	OH	LPV	2	99.804	2	99.798	2	99.761
2G2	GEARY A BATES/JEFFERSON COUNTY	OH	LPV	2	99.816	2	99.816	2	99.789
4G5	MONROE COUNTY	OH	LP	1	99.833	1	99.833	3	99.803
4I3	KNOX COUNTY	OH	LPV200	2	99.826	2	99.822	3	99.791

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
5A1	NORWALK-HURON COUNTY	OH	LP	2	99.807	2	99.800	3	99.751
6G5	BARNESVILLE-BRADFIELD	OH	LP	1	99.833	2	99.827	3	99.800
7G8	GEAUGA COUNTY	OH	LP	2	99.798	2	99.790	2	99.764
AKR	AKRON FULTON INTL	OH	LP	2	99.804	2	99.802	2	99.763
AOH	LIMA ALLEN COUNTY	OH	LPV200	2	99.829	2	99.815	2	99.766
AXV	NEIL ARMSTRONG	OH	LPV	2	99.833	2	99.825	2	99.781
BJJ	WAYNE COUNTY	OH	LPV	2	99.812	2	99.808	2	99.764
BKL	BURKE LAKEFRONT	OH	LPV	2	99.798	2	99.793	2	99.755
CAK	AKRON-CANTON RGNL	OH	LPV200	2	99.807	2	99.805	2	99.768
CDI	CAMBRIDGE MUNICIPAL	OH	LP	1	99.833	2	99.829	3	99.805
CGF	CUYAHOGA COUNTY	OH	LPV200	2	99.796	2	99.791	2	99.756
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	2	99.799	2	99.798	2	99.755
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	1	99.833	2	99.831	3	99.812
CQA	LAKEFIELD	OH	LPV	1	99.833	2	99.827	2	99.783
CYO	PICKAWAY COUNTY MEML	OH	LPV	1	99.833	1	99.833	3	99.817
DAY	JAMES M COX DAYTON INTL	OH	LPV200	1	99.836	1	99.836	2	99.817
DLZ	DELAWARE MUNICIPAL/JIM MOORE FLD	OH	LPV	2	99.829	2	99.824	3	99.795
EDJ	BELLEFONTAINE RGNL	OH	LPV	2	99.830	2	99.825	2	99.794
EOP	PIKE COUNTY	OH	LP	1	99.834	1	99.834	1	99.833
FDY	FINDLAY	OH	LPV	2	99.824	2	99.809	2	99.754
FZI	FOSTORIA METRO	OH	LPV	2	99.820	2	99.806	3	99.750
GQQ	GALION MUNICIPAL	OH	LP	2	99.820	2	99.811	3	99.762
HAO	BUTLER COUNTY RGNL/HOGAN FLD	OH	LPV	1	99.837	1	99.837	2	99.830
HOC	HIGHLAND COUNTY	OH	LP	1	99.834	1	99.834	1	99.833
HZY	NORTHEAST OHIO RGNL	OH	LPV	2	99.795	2	99.788	2	99.764
I10	NOBLE COUNTY	OH	LP	1	99.833	1	99.833	3	99.805
I19	GREENE COUNTY/LEWIS A JACKSON	OH	LPV	1	99.836	1	99.836	2	99.823

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
I40	RICHARD DOWNING	OH	LPV	2	99.823	2	99.820	3	99.787
I66	CLINTON FLD	OH	LPV	1	99.836	1	99.836	2	99.824
I68	WARREN COUNTY/JOHN LANE FLD	OH	LPV	1	99.836	1	99.836	2	99.826
I69	CLERMONT COUNTY	OH	LP	1	99.837	1	99.836	1	99.833
I74	GRIMES FLD	OH	LPV	1	99.833	2	99.829	2	99.804
ILN	WILMINGTON AIR PARK	OH	LPV200	1	99.836	1	99.836	2	99.824
LCK	RICKENBACKER INTL	OH	LPV200	1	99.833	1	99.833	3	99.812
LHQ	FAIRFIELD COUNTY	OH	LPV200	1	99.833	1	99.833	3	99.814
LNN	LAKE COUNTY EXEC	OH	LPV	2	99.795	2	99.790	2	99.756
LPR	LORAIN COUNTY RGNL	OH	LPV200	2	99.799	2	99.798	2	99.753
LUK	CINCINNATI MUNICIPAL/LUNKEN FLD	OH	LPV	1	99.837	1	99.837	1	99.833
MFD	MANSFIELD LAHM RGNL	OH	LPV200	2	99.820	2	99.810	3	99.759
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	1	99.836	1	99.836	2	99.826
MNN	MARION MUNICIPAL	OH	LPV	2	99.824	2	99.814	3	99.780
MRT	UNION COUNTY	OH	LP	1	99.833	2	99.826	3	99.798
MWO	MIDDLETOWN RGNL/HOOK FLD	OH	LPV	1	99.836	1	99.836	2	99.827
OSU	OHIO STATE UNIVERSITY	OH	LPV200	1	99.833	2	99.829	3	99.804
OWX	PUTNAM COUNTY	OH	LPV	2	99.826	2	99.811	2	99.752
OXD	MIAMI UNIVERSITY	OH	LPV	1	99.837	1	99.837	2	99.828
PCW	ERIE-OTTAWA INTL	OH	LPV	2	99.802	2	99.799	3	99.744
PHD	HARRY CLEVER FLD	OH	LP	2	99.818	2	99.816	3	99.782
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	1	99.835	1	99.835	1	99.833
POV	PORTAGE COUNTY	OH	LPV	2	99.802	2	99.798	2	99.763
RZT	ROSS COUNTY	OH	LPV	1	99.833	1	99.833	2	99.820
S24	SANDUSKY COUNTY RGNL	OH	LPV	2	99.814	2	99.802	3	99.749
SCA	SIDNEY MUNICIPAL	OH	LPV	1	99.833	2	99.828	2	99.790
SGH	SPRINGFIELD/BECKLEY MUNICIPAL	OH	LPV200	1	99.835	1	99.835	2	99.815

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TDZ	TOLEDO EXEC	OH	LPV	2	99.818	2	99.798	3	99.744
TOL	EUGENE F KRANZ TOLEDO EXPRESS	OH	LPV200	2	99.822	2	99.798	2	99.743
TSO	CARROLL COUNTY-TOLSON	OH	LP	2	99.817	2	99.814	2	99.786
TZR	BOLTON FLD	OH	LPV	1	99.833	1	99.833	3	99.813
UNI	OHIO UNIVERSITY	OH	LPV200	1	99.833	1	99.833	2	99.830
USE	FULTON COUNTY	OH	LPV	2	99.825	2	99.798	2	99.743
UYF	MADISON COUNTY	OH	LPV	1	99.833	1	99.833	2	99.815
VES	DARKE COUNTY	OH	LPV	1	99.836	2	99.833	2	99.794
VTA	NEWARK-HEATH	OH	LP	1	99.833	2	99.829	3	99.809
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	2	99.802	2	99.797	2	99.764
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	1	99.833	2	99.831	3	99.807
1F0	ARDMORE DOWNTOWN EXEC	OK	LP	1	99.833	1	99.829	1	99.823
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	1	99.830	1	99.829	1	99.826
1O4	THOMAS MUNICIPAL	OK	LPV	1	99.833	1	99.826	1	99.826
2K4	SCOTT FLD	OK	LPV	1	99.829	1	99.826	1	99.826
3F7	JONES MEML	OK	LPV	1	99.833	1	99.829	1	99.823
4O4	MC CURTAIN COUNTY RGNL	OK	LP	1	99.837	1	99.833	1	99.825
6K4	FAIRVIEW MUNICIPAL	OK	LPV	1	99.833	1	99.826	1	99.826
80F	ANTLERS MUNICIPAL	OK	LPV	1	99.833	1	99.831	1	99.823
ADH	ADA RGNL	OK	LPV	1	99.833	1	99.829	1	99.823
ADM	ARDMORE MUNICIPAL	OK	LPV	1	99.835	1	99.831	1	99.823
AVK	ALVA RGNL	OK	LPV	1	99.830	1	99.827	1	99.826
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	1	99.829	1	99.826	1	99.826
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	1	99.833	1	99.829	1	99.822
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	1	99.833	1	99.830	1	99.822
CHK	CHICKASHA MUNICIPAL	OK	LPV200	1	99.833	1	99.829	1	99.822
CLK	CLINTON RGNL	OK	LPV	1	99.829	1	99.826	1	99.826

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CSM	CLINTON/SHERMAN	OK	LPV200	1	99.829	1	99.826	1	99.826
CUH	CUSHING MUNICIPAL	OK	LPV	1	99.833	1	99.829	1	99.822
DUA	DURANT RGNL/EAKER FLD	OK	LPV	1	99.830	1	99.826	1	99.821
DUC	HALLIBURTON FLD	OK	LPV200	1	99.833	1	99.829	1	99.822
ELK	ELK CITY RGNL BUSINESS	OK	LPV	1	99.829	1	99.826	1	99.826
F22	PERRY MUNICIPAL	OK	LPV	1	99.833	1	99.829	1	99.822
FDR	FREDERICK RGNL	OK	LPV200	1	99.832	1	99.829	1	99.826
GCM	CLAREMORE RGNL	OK	LPV	1	99.833	1	99.831	1	99.823
GMJ	GROVE MUNICIPAL	OK	LPV	1	99.830	1	99.829	1	99.826
GOK	GUTHRIE/EDMOND RGNL	OK	LPV	1	99.833	1	99.829	1	99.822
GUY	GUYMON MUNICIPAL	OK	LPV	1	99.833	1	99.830	1	99.826
GZL	STIGLER RGNL	OK	LPV	1	99.833	1	99.833	1	99.826
H71	MID-AMERICA INDUSTRIAL	OK	LPV	1	99.832	1	99.832	1	99.823
HBR	HOBART RGNL	OK	LPV	1	99.829	1	99.826	1	99.826
HHW	STAN STAMPER MUNICIPAL	OK	LPV	1	99.836	1	99.833	1	99.823
HSD	SUNDANCE	OK	LPV	1	99.833	1	99.829	1	99.822
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	1	99.833	1	99.828	1	99.826
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	1	99.833	1	99.833	1	99.823
MLC	MC ALESTER RGNL	OK	LPV	1	99.833	1	99.830	1	99.823
OJA	WEATHERFORD STAFFORD	OK	LPV	1	99.833	1	99.826	1	99.826
OKC	WILL ROGERS WORLD	OK	LPV200	1	99.833	1	99.829	1	99.822
OKM	OKMULGEE RGNL	OK	LPV200	1	99.833	1	99.830	1	99.823
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	1	99.833	1	99.829	1	99.822
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	1	99.833	1	99.829	1	99.822
PNC	PONCA CITY RGNL	OK	LPV	1	99.833	1	99.829	1	99.822
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	1	99.833	1	99.829	1	99.823
PWA	WILEY POST	OK	LPV200	1	99.833	1	99.829	1	99.822

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	1	99.833	1	99.829	1	99.822
RKR	ROBERT S KERR	OK	LPV	1	99.833	1	99.833	1	99.827
RQO	EL RENO RGNL	OK	LPV	1	99.833	1	99.829	1	99.822
RVS	TULSA RIVERSIDE	OK	LPV200	1	99.833	1	99.830	1	99.823
SNL	SHAWNEE RGNL	OK	LPV200	1	99.833	1	99.829	1	99.823
SWO	STILLWATER RGNL	OK	LPV200	1	99.833	1	99.829	1	99.822
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	1	99.831	1	99.831	1	99.826
TUL	TULSA INTL	OK	LPV200	1	99.833	1	99.830	1	99.823
WDG	ENID WOODRING RGNL	OK	LPV200	1	99.833	1	99.829	1	99.822
WWR	WEST WOODWARD	OK	LPV	1	99.829	1	99.826	1	99.826
CNV8	EDENVALE	ON	LPV	2	99.772	3	99.766	5	99.656
CNY3	COLLINGWOOD	ON	LPV	2	99.768	3	99.763	5	99.655
CYAC	CAT LAKE	ON	LPV	5	99.515	5	99.438	10	99.240
CYAM	SAULT STE. MARIE	ON	LPV200	4	99.667	5	99.652	6	99.511
CYCC	CORNWALL REGIONAL	ON	LPV	4	99.752	4	99.737	4	99.624
CYCK	CHATHAM-KENT	ON	LPV	2	99.791	2	99.772	2	99.744
CYEE	HURONIA	ON	LPV	2	99.768	4	99.750	5	99.653
CYFA	FORT ALBANY	ON	LPV	10	99.446	11	99.381	17	99.064
CYGK	KINGSTON	ON	LPV	2	99.775	3	99.770	5	99.669
CYHD	DRYDEN REGIONAL	ON	LPV	5	99.563	4	99.465	7	99.373
CYHF	HEARST (RENE FONTAINE) MUNICIPALCIPALITY	ON	LPV	4	99.565	4	99.485	11	99.393
CYHM	HAMILTON	ON	LPV	2	99.772	2	99.772	4	99.709
CYHS	SAUGEEN MUNICIPALCIPALITY	ON	LPV	2	99.771	2	99.771	5	99.663
CYKF	WATERLOO	ON	LPV200	2	99.772	2	99.772	4	99.697
CYKM	KINCARDINE	ON	LPV	2	99.772	2	99.761	5	99.662
CYKZ	BUTTONVILLE MUNICIPALCIPAL	ON	LPV	2	99.772	2	99.772	5	99.674
CYLS	LAKE SIMCOE	ON	LPV	2	99.772	3	99.766	5	99.659

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYMG	MANITOUWADGE	ON	LPV	5	99.611	4	99.484	8	99.384
CYMO	MOOSONEE	ON	LPV	5	99.491	7	99.434	16	99.218
CYOO	OSHAWA EXECUTIVE AIRPORT	ON	LPV	2	99.772	2	99.771	5	99.672
CYOS	BILLY BISHOP REGIONAL	ON	LPV	2	99.768	3	99.758	5	99.648
CYOW	MACDONALD-CARTIER INTL	ON	LPV200	3	99.758	4	99.718	4	99.635
CYPL	PICKLE LAKE	ON	LPV	5	99.520	4	99.424	11	99.252
CYPQ	PETERBOROUGH	ON	LPV	2	99.772	2	99.771	5	99.664
CYPT	PELEE ISLAND	ON	LPV	2	99.796	2	99.792	2	99.744
CYQG	WINDSOR	ON	LPV	2	99.793	2	99.793	3	99.741
CYQK	KENORA	ON	LPV	5	99.588	4	99.475	7	99.398
CYQS	ST. THOMAS MUNICIPALCIPALITY	ON	LPV	2	99.791	2	99.771	4	99.738
CYQT	THUNDER BAY	ON	LPV200	3	99.623	4	99.498	6	99.419
CYRL	RED LAKE	ON	LPV	4	99.522	4	99.448	8	99.293
CYSA	STRATFORD MUNICIPALCIPALITY	ON	LPV	2	99.772	2	99.771	4	99.698
CYSB	SUDBURY	ON	LPV	4	99.669	3	99.635	6	99.559
CYSN	NIAGARA DISTRICT	ON	LPV	2	99.772	2	99.772	4	99.698
CYTL	BIG TROUT LAKE	ON	LPV	5	99.420	8	99.334	12	98.939
CYTS	TIMMINS (VICTOR M. POWER)	ON	LPV200	3	99.609	5	99.559	7	99.424
CYTZ	BILLY BISHOP TORONTO CITY AIRPORT	ON	LPV	2	99.772	2	99.772	5	99.688
CYVV	WIARTON	ON	LPV	2	99.768	3	99.750	5	99.645
CYWP	WEBEQUIE	ON	LPV	7	99.460	8	99.353	10	99.017
CYXL	SIOUX LOOKOUT	ON	LPV	5	99.558	4	99.455	8	99.345
CYXR	EARLTON (TIMISKAMING REGIONAL)	ON	LPV	3	99.630	4	99.607	6	99.473
CYXU	LONDON	ON	LPV200	3	99.790	2	99.769	4	99.703
CYYB	NORTH BAY	ON	LPV200	4	99.671	3	99.643	4	99.569
CYYU	KAPUSKASING	ON	LPV	3	99.572	4	99.506	8	99.395
CYYW	ARMSTRONG	ON	LPV	5	99.544	4	99.454	11	99.344

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYYZ	LESTER B. PEARSON INTL	ON	LPV200	2	99.772	2	99.772	5	99.687
CYZD	DOWNSVIEW	ON	LPV	2	99.772	2	99.772	4	99.675
CYZR	SARNIA (CHRIS HADFIELD)	ON	LPV	2	99.792	2	99.765	4	99.720
CZPB	SACHIGO LAKE	ON	LP	5	99.439	7	99.354	15	98.964
3S8	GRANTS PASS	OR	LP	2	99.885	2	99.817	3	99.791
77S	HOBBY FLD	OR	LPV	1	99.895	1	99.874	3	99.828
AST	ASTORIA RGNL	OR	LPV	1	99.918	3	99.882	3	99.762
BDN	BEND MUNICIPAL	OR	LPV	1	99.895	1	99.873	2	99.870
BKE	BAKER CITY MUNICIPAL	OR	LPV	1	99.888	1	99.873	1	99.871
CVO	CORVALLIS MUNICIPAL	OR	LPV200	1	99.895	1	99.874	4	99.851
EUG	MAHLON SWEET FLD	OR	LPV200	1	99.895	1	99.874	4	99.845
GCD	GRANT COUNTY RGNL/OGILVIE FLD	OR	LPV	1	99.887	1	99.873	2	99.871
HIO	PORTLAND-HILLSBORO	OR	LPV200	1	99.918	2	99.905	5	99.803
LGD	LA GRANDE/UNION COUNTY	OR	LPV	1	99.891	1	99.880	2	99.866
LKV	LAKE COUNTY	OR	LPV	1	99.887	1	99.864	1	99.851
LMT	CRATER LAKE/KLAMATH RGNL	OR	LPV	1	99.887	2	99.817	3	99.809
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	1	99.917	2	99.901	5	99.835
ONO	ONTARIO MUNICIPAL	OR	LPV	1	99.887	1	99.873	1	99.873
ONP	NEWPORT MUNICIPAL	OR	LPV	1	99.895	3	99.886	5	99.840
OTH	SOUTHWEST OREGON RGNL	OR	LPV	2	99.885	2	99.817	3	99.790
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	2	99.918	2	99.897	3	99.821
PDX	PORTLAND INTL	OR	LPV200	1	99.918	2	99.906	4	99.797
RDM	ROBERTS FLD	OR	LPV200	1	99.895	1	99.873	2	99.872
S33	MADRAS MUNICIPAL	OR	LPV	1	99.897	1	99.875	3	99.860
S39	PRINEVILLE	OR	LP	1	99.895	1	99.873	2	99.872
SLE	MCNARY FLD	OR	LPV200	2	99.916	1	99.885	4	99.849
SPB	SCAPPOOSE	OR	LPV	1	99.918	2	99.903	3	99.773

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UAO	AURORA STATE	OR	LPV	1	99.918	2	99.902	4	99.840
22N	JAKE ARNER MEML	PA	LP	2	99.794	2	99.786	3	99.765
29D	GROVE CITY	PA	LP	2	99.801	2	99.798	2	99.764
2G9	SOMERSET COUNTY	PA	LPV	2	99.823	2	99.820	3	99.795
6G1	TITUSVILLE	PA	LPV	2	99.794	2	99.790	2	99.764
6P7	MCVILLE	PA	LP	2	99.806	2	99.803	2	99.780
8G2	CORRY-LAWRENCE	PA	LPV	2	99.794	2	99.786	3	99.763
8N8	DANVILLE	PA	LP	2	99.795	2	99.791	2	99.765
9D4	DECK	PA	LPV	2	99.810	2	99.804	3	99.778
ABE	LEHIGH VALLEY INTL	PA	LPV200	2	99.795	2	99.791	4	99.751
AFJ	WASHINGTON COUNTY	PA	LPV200	2	99.833	2	99.821	2	99.793
AGC	ALLEGHENY COUNTY	PA	LPV200	2	99.815	2	99.815	2	99.791
AOO	ALTOONA/BLAIR COUNTY	PA	LPV	2	99.812	2	99.812	2	99.791
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	2	99.790	2	99.786	3	99.759
AXQ	CLARION COUNTY	PA	LPV	2	99.796	2	99.793	2	99.765
BFD	BRADFORD RGNL	PA	LPV	2	99.792	2	99.786	3	99.761
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	2	99.804	2	99.800	2	99.772
BVI	BEAVER COUNTY	PA	LPV	2	99.807	2	99.803	2	99.771
CXY	CAPITAL CITY	PA	LPV	2	99.809	2	99.805	2	99.785
DUJ	DUBOIS RGNL	PA	LPV200	2	99.795	2	99.792	2	99.768
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	2	99.794	2	99.786	3	99.764
FIG	CLEARFIELD-LAWRENCE	PA	LPV	2	99.795	2	99.795	2	99.769
FKL	VENANGO RGNL	PA	LPV	2	99.797	2	99.791	2	99.764
FWQ	ROSTRAVER	PA	LPV	2	99.820	2	99.818	2	99.792
GKJ	PORT MEADVILLE	PA	LP	2	99.795	2	99.790	2	99.764
HMZ	BEDFORD COUNTY	PA	LPV	2	99.814	2	99.814	2	99.793
HZL	HAZLETON RGNL	PA	LPV	2	99.793	2	99.790	3	99.761

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	2	99.808	2	99.808	2	99.783
IPT	WILLIAMSPORT RGNL	PA	LPV	2	99.792	2	99.792	2	99.762
JST	JOHN MURTHA JOHNSTOWN/CAMBRIA	PA	LPV200	2	99.813	2	99.813	2	99.789
LBE	ARNOLD PALMER RGNL	PA	LPV200	2	99.813	2	99.813	2	99.791
LNS	LANCASTER	PA	LPV200	2	99.808	2	99.807	3	99.781
LOM	WINGS FLD	PA	LPV	2	99.804	2	99.801	4	99.767
MDT	HARRISBURG INTL	PA	LPV	2	99.809	2	99.805	2	99.785
MPO	POCONO MOUNTAINS RGNL	PA	LPV	2	99.790	2	99.785	3	99.747
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	2	99.808	2	99.804	3	99.783
N38	GRAND CANYON RGNL	PA	LP	2	99.793	2	99.786	3	99.760
N57	NEW GARDEN	PA	LP	2	99.808	2	99.804	4	99.783
N79	NORTHUMBERLAND COUNTY	PA	LPV	2	99.794	2	99.790	2	99.767
N96	BELLEFONTE	PA	LPV	2	99.797	2	99.793	2	99.768
OQN	BRANDYWINE RGNL	PA	LP	2	99.808	2	99.804	4	99.770
OYM	ST MARYS MUNICIPAL	PA	LPV	2	99.795	2	99.789	3	99.764
PHL	PHILADELPHIA INTL	PA	LPV200	2	99.808	2	99.804	4	99.774
PIT	PITTSBURGH INTL	PA	LPV200	2	99.815	2	99.815	2	99.789
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	2	99.804	2	99.801	4	99.766
PSB	MID-STATE	PA	LPV	2	99.797	2	99.797	2	99.779
PTW	HERITAGE FLD	PA	LPV	2	99.808	2	99.801	4	99.766
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	2	99.807	2	99.806	3	99.775
RVL	MIFFLIN COUNTY	PA	LPV	2	99.803	2	99.803	2	99.776
SEG	PENN VALLEY	PA	LP	2	99.795	2	99.791	2	99.768
THV	YORK	PA	LP	2	99.812	2	99.808	3	99.789
UCP	NEW CASTLE MUNICIPAL	PA	LPV	2	99.802	2	99.798	2	99.766
UKT	QUAKERTOWN	PA	LP	2	99.799	2	99.795	4	99.761
UNV	UNIVERSITY PARK	PA	LPV200	2	99.797	2	99.793	2	99.769

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	2	99.832	2	99.826	2	99.801
WAY	GREENE COUNTY	PA	LPV	1	99.833	1	99.833	2	99.804
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	2	99.790	2	99.787	3	99.759
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	2	99.797	2	99.793	4	99.755
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	2	99.797	2	99.793	2	99.772
CYYG	CHARLOTTETOWN	PE	LPV	3	99.538	3	99.533	13	99.318
CEL8	ELEONORE	QC	LPV	9	99.302	9	99.279	26	98.926
CFX5	RENARD	QC	LPV	11	99.236	11	99.198	23	98.836
CSC3	DRUMMONDVILLE	QC	LPV	3	99.706	4	99.681	5	99.577
CSD4	MONT-LAURIER	QC	LPV	5	99.697	4	99.669	7	99.566
CSF3	POSTE MONTAGNAIS (MILE 134)	QC	LPV	13	99.136	14	99.111	20	98.791
CSH4	LEBEL-SUR-QUEVILLON	QC	LPV	3	99.585	4	99.538	6	99.384
CSR3	VICTORIAVILLE (ANDRE-FORTIN)	QC	LPV	4	99.698	4	99.670	5	99.553
CSU2	CHISASIBI	QC	LPV	8	99.265	12	99.191	29	98.775
CTP9	DONALDSON	QC	LPV	22	98.410	29	98.256	109	95.751
CTT5	LA ROMAINE	QC	LPV	10	99.208	10	99.168	19	98.837
CTU2	FONTANGES	QC	LPV	14	98.964	14	98.936	38	98.454
CYAD	LA GRANDE-3	QC	LPV	11	99.231	13	99.167	26	98.766
CYAH	LA GRANDE-4	QC	LPV	12	99.140	13	99.110	29	98.640
CYAS	KANGIRSUK	QC	LPV	23	98.512	23	98.472	82	96.544
CYBC	BAIE-COMEAU	QC	LPV200	4	99.506	5	99.470	11	99.280
CYBG	BAGOTVILLE	QC	LPV200	3	99.588	3	99.577	6	99.418
CYBX	LOURDES-DE-BLANC-SABLON	QC	LPV	15	98.987	15	98.916	41	98.193
CYEY	MAGNY	QC	LPV	3	99.601	4	99.568	7	99.400
CYFJ	MONT-TREMBLANT	QC	LPV	4	99.713	4	99.675	6	99.576
CYGL	LA GRANDE RIVIERE	QC	LPV	8	99.278	12	99.207	28	98.800
CYGP	GASPE (MICHEL-POULIOT)	QC	LPV	4	99.436	4	99.421	14	99.198

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYGR	ILES-DE-LA-MADELEINE	QC	LPV	6	99.435	6	99.428	13	99.119
CYGV	HAVRE ST-PIERRE	QC	LPV	10	99.346	12	99.341	15	98.997
CYGW	KUUJJUARAPIK	QC	LPV	13	99.078	12	99.017	34	98.389
CYHA	QUAQTAQ	QC	LPV	23	98.422	26	98.346	109	96.079
CYHH	NEMISCAU	QC	LPV	8	99.397	10	99.365	18	99.120
CYHR	CHEVERY	QC	LPV	12	99.122	11	99.102	20	98.751
CYHU	ST-HUBERT	QC	LPV	2	99.718	4	99.691	5	99.603
CYIF	ST-AUGUSTIN	QC	LPV	11	99.012	12	99.001	26	98.563
CYIK	IVUJIVIK	QC	LPV	26	98.327	32	98.117	113	95.150
CYKG	KANGIQSUJUAQ (WAKEHAM BAY)	QC	LPV	23	98.446	29	98.314	116	95.833
CYKL	SCHEFFERVILLE	QC	LPV	16	98.856	16	98.843	35	98.355
CYKO	AKULIVIK	QC	LPV	22	98.523	24	98.321	82	96.035
CYKQ	WASKAGANISH	QC	LPV	7	99.470	8	99.422	20	99.161
CYLA	AUPALUK	QC	LPV	20	98.582	20	98.523	67	96.870
CYLQ	LA TUQUE	QC	LPV	3	99.627	3	99.591	5	99.454
CYLU	KANGIQSUALUJJUAQ (GEORGES RIVER)	QC	LPV	22	98.625	26	98.543	63	96.822
CYME	RUSSELL-BURNETT	QC	LPV	4	99.506	5	99.477	11	99.278
CYMT	CHAPAIS	QC	LPV	4	99.552	5	99.496	7	99.369
CYMU	UMIUJAQ	QC	LPV	17	98.862	18	98.787	50	98.005
CYMW	MANIWAKI	QC	LPV	5	99.727	5	99.687	7	99.599
CYMX	MONTREAL INTL (MIRABEL)	QC	LPV200	3	99.719	4	99.692	5	99.605
CYNA	NATASHQUAN	QC	LPV	10	99.294	11	99.290	14	98.976
CYNC	WEMINDJI	QC	LPV	9	99.330	11	99.266	23	98.851
CYND	GATINEAU	QC	LPV	3	99.752	4	99.711	4	99.618
CYNM	MATAGAMI	QC	LPV	3	99.567	4	99.507	6	99.355
CYPH	INUKJUAK	QC	LPV	15	98.701	19	98.539	66	97.251
CYPN	PORT-MENIER	QC	LPV	6	99.383	6	99.383	16	99.070

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYPX	PUVIRNITUQ	QC	LPV	20	98.563	21	98.389	79	96.326
CYQB	JEAN LESAGE INTL	QC	LPV200	5	99.664	5	99.630	6	99.480
CYRI	RIVIERE-DU-LOUP	QC	LPV	4	99.609	3	99.586	6	99.426
CYRJ	ROBERVAL	QC	LPV	4	99.605	4	99.583	6	99.413
CYRQ	TROIS-RIVIERES	QC	LPV200	4	99.687	4	99.661	5	99.556
CYSC	SHERBROOKE	QC	LPV	2	99.715	3	99.692	5	99.595
CYSG	ST-GEORGES	QC	LPV	3	99.678	4	99.653	5	99.544
CYTF	ALMA	QC	LPV	4	99.596	4	99.575	6	99.412
CYTQ	TASIUJAQ	QC	LPV	16	98.618	17	98.554	56	97.113
CYUL	PIERRE-ELLIOTT-TRUDEAU INTL	QC	LPV200	2	99.718	4	99.693	5	99.607
CYUY	ROUYN-NORANDA	QC	LPV200	4	99.635	4	99.596	6	99.418
CYVB	BONAVENTURE	QC	LPV	4	99.509	6	99.508	11	99.273
CYVO	VAL-DOR	QC	LPV200	4	99.627	4	99.590	6	99.412
CYVP	KUUJJUAQ	QC	LPV200	16	98.662	16	98.624	54	97.352
CYYY	MONT-JOLI	QC	LPV	4	99.535	6	99.516	11	99.309
CYZG	SALLUIT	QC	LPV	22	98.356	29	98.165	115	95.412
CYZV	SEPT-ILES	QC	LPV200	6	99.404	6	99.404	18	99.172
BID	BLOCK ISLAND STATE	RI	LPV	2	99.779	2	99.776	4	99.695
OQU	QUONSET STATE	RI	LPV200	2	99.776	2	99.752	3	99.691
PVD	RHODE ISLAND TF GREEN INTL	RI	LPV200	2	99.776	2	99.749	3	99.691
SFZ	NORTH CENTRAL STATE	RI	LPV	2	99.768	2	99.743	3	99.692
35A	UNION COUNTY` TROY SHELTON FLD	SC	LP	1	99.909	1	99.898	1	99.836
6J0	LEXINGTON COUNTY	SC	LPV	2	99.937	1	99.899	2	99.859
AIK	AIKEN RGNL	SC	LPV200	3	99.962	1	99.899	3	99.871
AND	ANDERSON RGNL	SC	LPV200	1	99.885	1	99.885	1	99.837
AQX	ALLENDALE COUNTY	SC	LPV	2	99.963	1	99.907	1	99.899
ARW	BEAUFORT EXEC	SC	LPV200	2	99.970	2	99.931	1	99.899

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	2	99.920	1	99.899	2	99.847
BNL	BARNWELL RGNL	SC	LPV	2	99.963	1	99.903	1	99.899
CAE	COLUMBIA METRO	SC	LPV200	2	99.937	1	99.899	2	99.859
CDN	WOODWARD FLD	SC	LPV	2	99.930	1	99.899	2	99.854
CEU	OCONEE COUNTY RGNL	SC	LPV200	1	99.880	1	99.880	1	99.837
CHS	CHARLESTON AFB/INTL	SC	LPV200	2	99.944	2	99.919	1	99.899
CKI	WILLIAMSBURG RGNL	SC	LPV	2	99.940	2	99.914	2	99.886
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FL	SC	LPV	2	99.919	1	99.898	2	99.847
CRE	GRAND STRAND	SC	LPV200	2	99.913	2	99.913	2	99.863
CUB	JIM HAMILTON L B OWENS	SC	LPV	2	99.931	1	99.899	2	99.858
DCM	CHESTER CATAWBA RGNL	SC	LPV	1	99.908	1	99.898	2	99.848
DYB	SUMMERVILLE	SC	LPV200	2	99.943	2	99.919	1	99.899
FDW	FAIRFIELD COUNTY	SC	LPV	2	99.931	1	99.899	2	99.852
FLO	FLORENCE RGNL	SC	LPV	2	99.923	1	99.899	3	99.867
GGE	GEORGETOWN COUNTY	SC	LPV	2	99.933	2	99.914	2	99.892
GMU	GREENVILLE DOWNTOWN	SC	LPV200	1	99.885	2	99.884	1	99.837
GRD	GREENWOOD COUNTY	SC	LPV	1	99.917	1	99.899	1	99.837
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	1	99.884	3	99.881	1	99.837
GYH	DONALDSON FLD	SC	LPV	1	99.884	2	99.884	1	99.837
HVS	HARTSVILLE RGNL	SC	LPV	2	99.923	1	99.899	2	99.854
HXD	HILTON HEAD	SC	LPV	1	99.986	2	99.940	1	99.899
HYW	CONWAY-HORRY COUNTY	SC	LPV	2	99.923	2	99.914	3	99.881
JZI	CHARLESTON EXEC	SC	LPV200	2	99.945	2	99.921	1	99.899
LKR	LANCASTER COUNTY-MC WHIRTER FL	SC	LPV200	2	99.922	1	99.898	2	99.847
LQK	PICKENS COUNTY	SC	LPV	1	99.880	2	99.880	1	99.837
LRO	MT PLEASANT RGNL-FAISON FLD	SC	LPV	2	99.944	2	99.918	1	99.895
LUX	LAURENS COUNTY	SC	LPV	1	99.911	1	99.898	1	99.837

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MAO	MARION COUNTY	SC	LPV	2	99.923	2	99.913	3	99.864
MKS	BERKELEY COUNTY	SC	LPV	2	99.941	2	99.916	2	99.896
MYR	MYRTLE BEACH INTL	SC	LPV200	2	99.923	2	99.914	3	99.878
OGB	ORANGEBURG MUNICIPAL	SC	LPV	2	99.949	1	99.901	2	99.896
PYG	PAGELAND	SC	LPV	2	99.920	1	99.898	2	99.847
RBW	LOWCOUNTRY RGNL	SC	LPV200	2	99.951	2	99.921	1	99.899
SMS	SUMTER	SC	LPV200	2	99.931	1	99.899	2	99.857
SPA	SPARTANBURG DOWNTOWN MEML/SIMP	SC	LPV200	2	99.901	3	99.881	1	99.836
UDG	DARLINGTON COUNTY	SC	LPV	2	99.923	1	99.899	2	99.848
UZA	ROCK HILL/YORK COUNTY/BRYANT F	SC	LPV200	1	99.903	2	99.883	2	99.847
0D8	GETTYSBURG MUNICIPAL	SD	LP	1	99.804	1	99.801	5	99.744
49B	STURGIS MUNICIPAL	SD	LPV	1	99.833	1	99.830	2	99.799
4X4	WESSINGTON SPRINGS	SD	LP	1	99.804	1	99.801	5	99.769
8D3	SISSETON MUNICIPAL	SD	LPV	2	99.786	5	99.753	6	99.697
8D7	CLARK COUNTY	SD	LP	1	99.801	2	99.799	6	99.735
8V3	PARKSTON MUNICIPAL	SD	LPV	2	99.816	1	99.801	3	99.789
98D	ONIDA MUNICIPAL	SD	LP	1	99.804	1	99.801	5	99.750
9D0	HIGHMORE MUNICIPAL	SD	LPV	1	99.804	1	99.801	5	99.758
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	2	99.820	2	99.817	2	99.798
9V6	MARTIN MUNICIPAL	SD	LPV	1	99.833	1	99.833	2	99.817
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	1	99.804	1	99.801	3	99.786
ABR	ABERDEEN RGNL	SD	LPV200	1	99.801	3	99.791	6	99.726
AGZ	WAGNER MUNICIPAL	SD	LPV	2	99.820	1	99.802	2	99.799
ATY	WATERTOWN RGNL	SD	LPV200	1	99.801	4	99.794	6	99.736
BKX	BROOKINGS RGNL	SD	LPV200	1	99.801	2	99.797	6	99.744
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	1	99.833	1	99.830	2	99.794
FSD	JOE FOSS FLD	SD	LPV200	1	99.803	1	99.801	4	99.774

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HON	HURON RGNL	SD	LPV200	1	99.804	1	99.801	5	99.750
HSR	HOT SPRINGS MUNICIPAL	SD	LP	1	99.833	1	99.833	1	99.823
ICR	WINNER RGNL	SD	LPV	2	99.817	2	99.817	2	99.798
IEN	PINE RIDGE	SD	LPV	1	99.833	1	99.833	1	99.823
LEM	LEMMON MUNICIPAL	SD	LPV	2	99.795	2	99.781	6	99.723
MBG	MOBRIDGE MUNICIPAL	SD	LPV	1	99.801	2	99.800	5	99.729
MDS	MADISON MUNICIPAL	SD	LPV	1	99.801	1	99.801	6	99.756
MHE	MITCHELL MUNICIPAL	SD	LPV	1	99.804	1	99.801	5	99.775
MKA	MILLER MUNICIPAL	SD	LPV	1	99.804	1	99.801	5	99.750
PHP	PHILIP	SD	LPV	1	99.833	1	99.823	3	99.795
PIR	PIERRE RGNL	SD	LPV	1	99.804	1	99.801	5	99.769
RAP	RAPID CITY RGNL	SD	LPV200	1	99.833	1	99.830	1	99.809
SPF	BLACK HILLS-CLYDE ICE FLD	SD	LPV	1	99.833	1	99.830	2	99.799
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	2	99.826	2	99.822	1	99.801
VMR	HAROLD DAVIDSON FLD	SD	LPV	2	99.818	1	99.802	2	99.800
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	2	99.820	1	99.804	2	99.800
CCB2	SEABEE MINE	SK	LPV	4	99.477	7	99.353	13	99.028
CJC5	SHAUNAVON	SK	LPV	4	99.753	4	99.740	5	99.616
CJE3	WEYBURN	SK	LPV	4	99.705	5	99.666	5	99.533
CJH3	MAIDSTONE	SK	LPV	4	99.612	4	99.548	12	99.421
CJP9	CHARLOT RIVER	SK	LP	6	99.288	10	99.170	28	98.537
CJQ4	MAPLE CREEK	SK	LPV	3	99.741	3	99.725	4	99.636
CJU4	HUMBOLDT	SK	LPV	5	99.589	7	99.559	10	99.382
CJW7	CIGAR LAKE	SK	LPV	6	99.396	10	99.225	23	98.625
CJY3	TISDALE	SK	LPV	4	99.563	6	99.524	8	99.273
CJZ3	MELFORT (MILLER FIELD)	SK	LPV	4	99.566	6	99.524	8	99.306
CKQ8	MCARTHUR RIVER	SK	LPV	6	99.414	9	99.227	23	98.715

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYBE	URANIUM CITY	SK	LPV	7	99.293	9	99.141	27	98.503
CYBU	NIPAWIN	SK	LPV	4	99.553	7	99.500	9	99.210
CYEN	ESTEVAN REGIONAL	SK	LPV	3	99.733	5	99.671	5	99.544
CYES	EDMUNDSTON	SK	LPV	3	99.587	3	99.578	7	99.423
CYKC	COLLINS BAY	SK	LPV	6	99.384	10	99.190	27	98.585
CYKJ	KEY LAKE	SK	LPV	6	99.441	10	99.282	23	98.867
CYLJ	MEADOW LAKE	SK	LPV	5	99.575	6	99.531	12	99.305
CYMJ	AIR VICE MARSHAL C.M. MCEWEN	SK	LPV200	4	99.678	4	99.603	6	99.518
CYNL	POINTS NORTH LANDING	SK	LPV	6	99.391	11	99.198	25	98.595
CYPA	PRINCE ALBERT (GLASS FIELD)	SK	LPV	4	99.559	6	99.527	9	99.301
CYQR	REGINA INTL	SK	LPV200	4	99.676	4	99.593	7	99.508
CYQV	YORKTON MUNICIPALCIPALITY	SK	LPV	5	99.592	6	99.562	7	99.400
CYQW	NORTH BATTLEFORD	SK	LPV	5	99.596	4	99.553	12	99.440
CYVC	LA RONGE (BARBER FIELD)	SK	LPV	5	99.522	8	99.412	14	99.122
CYXE	JOHN G. DIEFENBAKER INTL	SK	LPV200	5	99.610	5	99.563	10	99.426
CYYN	SWIFT CURRENT	SK	LPV	4	99.710	4	99.651	7	99.552
0A3	SMITHVILLE MUNICIPAL	TN	LPV	1	99.855	1	99.837	1	99.837
0M3	PAUL BRIDGES FLD	TN	LP	1	99.855	1	99.841	1	99.837
0M4	BENTON COUNTY	TN	LPV	1	99.844	1	99.837	1	99.830
0M5	HUMPHREYS COUNTY	TN	LP	1	99.845	1	99.837	1	99.830
1A3	MARTIN CAMPBELL FLD	TN	LP	1	99.855	2	99.849	1	99.837
1M5	PORTLAND MUNICIPAL	TN	LPV	1	99.840	1	99.837	1	99.837
2A0	MARK ANTON	TN	LPV	1	99.855	1	99.837	1	99.837
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	1	99.855	1	99.841	1	99.837
2M8	CHARLES W BAKER	TN	LPV	1	99.848	1	99.841	1	99.826
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	2	99.850	1	99.837	1	99.836
3M7	LAFAYETTE MUNICIPAL	TN	LPV	1	99.839	1	99.837	1	99.837

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
8A3	LIVINGSTON MUNICIPAL	TN	LP	1	99.837	1	99.837	1	99.837
BGF	WINCHESTER MUNICIPAL	TN	LPV	1	99.855	2	99.851	1	99.837
BNA	NASHVILLE INTL	TN	LPV200	1	99.855	1	99.837	1	99.837
CHA	LOVELL FLD	TN	LPV200	1	99.855	2	99.855	1	99.837
CKV	OUTLAW FLD	TN	LPV	1	99.845	1	99.837	1	99.829
CSV	CROSSVILLE MEML-WHITSON FLD	TN	LPV200	2	99.853	1	99.837	1	99.837
DYR	DYERSBURG RGNL	TN	LPV	1	99.841	1	99.837	1	99.826
FYE	FAYETTE COUNTY	TN	LPV	1	99.848	1	99.841	1	99.827
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	1	99.855	2	99.855	1	99.837
GCY	GREENEVILLE MUNICIPAL	TN	LPV	1	99.839	1	99.837	1	99.836
GHM	CENTERVILLE MUNICIPAL	TN	LP	1	99.849	1	99.837	1	99.837
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	2	99.855	1	99.837	1	99.836
GZS	ABERNATHY FLD	TN	LPV	1	99.855	2	99.854	1	99.837
HZD	CARROLL COUNTY	TN	LPV	1	99.842	1	99.837	1	99.830
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	1	99.837	1	99.837	1	99.836
JWN	JOHN C TUNE	TN	LPV	1	99.855	1	99.837	1	99.837
LUG	ELLINGTON	TN	LPV	1	99.855	1	99.840	1	99.837
M01	GENERAL DEWITT SPAIN	TN	LPV	1	99.848	1	99.841	1	99.827
M08	WILLIAM L WHITEHURST FLD	TN	LP	1	99.848	1	99.841	1	99.835
M53	HUMBOLDT MUNICIPAL	TN	LPV	1	99.845	1	99.837	1	99.828
M54	LEBANON MUNICIPAL	TN	LPV	1	99.855	1	99.837	1	99.837
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	1	99.849	1	99.837	1	99.836
MBT	MURFREESBORO MUNICIPAL	TN	LPV	1	99.855	1	99.837	1	99.837
MEM	MEMPHIS INTL	TN	LPV200	1	99.848	1	99.841	1	99.833
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	1	99.846	1	99.837	1	99.828
MMI	MCMINN COUNTY	TN	LPV	1	99.855	1	99.837	1	99.837
MNV	MONROE COUNTY	TN	LPV	1	99.855	1	99.837	1	99.837

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MOR	MOORE-MURRELL	TN	LPV	2	99.850	1	99.837	1	99.836
MQY	SMYRNA	TN	LPV200	1	99.855	1	99.837	1	99.837
MRC	MAURY COUNTY RGNL	TN	LPV	1	99.855	1	99.841	1	99.837
NQA	MILLINGTON/MEMPHIS	TN	LPV200	1	99.847	1	99.841	1	99.826
PHT	HENRY COUNTY	TN	LPV200	1	99.841	1	99.837	1	99.829
PVE	BEECH RIVER RGNL	TN	LPV	1	99.846	1	99.837	1	99.830
RKW	ROCKWOOD MUNICIPAL	TN	LPV	2	99.853	1	99.837	1	99.837
RNC	WARREN COUNTY MEML	TN	LPV	1	99.855	1	99.838	1	99.837
RVN	HAWKINS COUNTY	TN	LP	1	99.837	1	99.837	1	99.836
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	1	99.855	1	99.837	1	99.837
SCX	SCOTT MUNICIPAL	TN	LPV	1	99.837	1	99.837	1	99.836
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	1	99.850	1	99.841	1	99.837
SRB	UPPER CUMBERLAND RGNL	TN	LPV	2	99.850	1	99.837	1	99.837
SYI	BOMAR FLD/SHELBYVILLE MUNICIPAL	TN	LPV	1	99.855	1	99.840	1	99.837
SZY	ROBERT SIBLEY	TN	LPV	1	99.850	1	99.841	1	99.837
TGC	GIBSON COUNTY	TN	LP	1	99.843	1	99.837	1	99.828
THA	TULLAHOMA RGNL/WM NORTHERN FLD	TN	LPV	1	99.855	1	99.839	1	99.837
TRI	TRI-CITIES	TN	LPV200	1	99.837	1	99.837	1	99.833
TYS	MC GHEE TYSON	TN	LPV200	1	99.855	1	99.837	1	99.836
UCY	EVERETT-STEWART RGNL	TN	LPV200	1	99.841	1	99.837	1	99.826
XNX	MUSIC CITY EXEC	TN	LPV	1	99.855	1	99.837	1	99.837
0F2	BOWIE MUNICIPAL	TX	LPV	1	99.833	1	99.826	1	99.811
11R	BRENHAM MUNICIPAL	TX	LPV	1	99.877	3	99.856	1	99.808
2R9	KENEDY RGNL	TX	LP	1	99.879	2	99.864	6	99.791
3R9	LAKEWAY AIRPARK	TX	LP	2	99.869	3	99.845	1	99.804
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	1	99.877	3	99.858	2	99.798
41F	FLOYDADA MUNICIPAL	TX	LP	1	99.829	1	99.826	1	99.822

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
45R	HAWTHORNE FLD	TX	LP	2	99.900	2	99.869	1	99.813
4T2	KENNETH COPELAND	TX	LPV	1	99.844	1	99.811	1	99.804
50R	LOCKHART MUNICIPAL	TX	LPV	1	99.877	3	99.853	2	99.792
5C1	BOERNE STAGE FLD	TX	LP	2	99.870	3	99.847	2	99.789
5T9	MAVERICK COUNTY MEML INTL	TX	LPV	1	99.862	3	99.838	5	99.764
60R	NAVASOTA MUNICIPAL	TX	LPV	2	99.873	3	99.856	1	99.808
6R3	CLEVELAND MUNICIPAL	TX	LPV	1	99.883	3	99.863	1	99.812
77F	WINTERS MUNICIPAL	TX	LP	1	99.804	1	99.800	1	99.787
8F3	CROSBYTON MUNICIPAL	TX	LP	1	99.829	1	99.823	1	99.812
ABI	ABILENE RGNL	TX	LPV200	2	99.830	1	99.800	1	99.797
ACT	WACO RGNL	TX	LPV200	2	99.837	2	99.833	1	99.798
ADS	ADDISON	TX	LPV	1	99.841	1	99.811	1	99.808
AFW	FORT WORTH ALLIANCE	TX	LPV200	1	99.841	1	99.811	1	99.805
ALI	ALICE INTL	TX	LPV	2	99.869	4	99.852	7	99.778
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	1	99.833	1	99.830	1	99.826
ARM	WHARTON RGNL	TX	LPV	1	99.884	2	99.877	3	99.803
ASL	HARRISON COUNTY	TX	LPV	1	99.848	1	99.815	1	99.812
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	2	99.873	3	99.852	1	99.804
AXH	HOUSTON/SOUTHWEST	TX	LPV	1	99.887	2	99.878	3	99.802
BAZ	NEW BRAUNFELS NTL	TX	LPV	1	99.876	3	99.856	2	99.788
BBD	CURTIS FLD	TX	LPV	2	99.823	1	99.804	1	99.786
BEA	BEEVILLE MUNICIPAL	TX	LPV	1	99.881	3	99.863	6	99.788
BFE	TERRY COUNTY	TX	LPV	2	99.825	1	99.811	1	99.793
BGD	HUTCHINSON COUNTY	TX	LPV	1	99.833	1	99.830	1	99.826
BKD	STEPHENS COUNTY	TX	LP	2	99.832	1	99.811	1	99.797
BKS	BROOKS COUNTY	TX	LPV	3	99.854	6	99.823	7	99.736
BMT	BEAUMONT MUNICIPAL	TX	LPV	1	99.887	2	99.877	2	99.806

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	1	99.804	1	99.800	1	99.791
BPT	JACK BROOKS RGNL	TX	LPV200	1	99.887	2	99.881	2	99.803
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	3	99.817	3	99.789	7	99.727
BWD	BROWNWOOD RGNL	TX	LPV	1	99.815	1	99.800	1	99.797
BYY	BAY CITY RGNL	TX	LPV	1	99.887	2	99.881	3	99.807
CDS	CHILDRESS MUNICIPAL	TX	LPV200	1	99.833	1	99.830	1	99.826
CFD	COULTER FLD	TX	LPV	2	99.870	2	99.841	1	99.808
CLL	EASTERWOOD FLD	TX	LPV200	2	99.870	2	99.841	1	99.808
CNW	TSTC WACO	TX	LPV200	2	99.837	2	99.832	1	99.801
COM	COLEMAN MUNICIPAL	TX	LPV	1	99.804	1	99.800	1	99.797
COT	COTULLA-LA SALLE COUNTY	TX	LPV	1	99.872	3	99.854	6	99.778
CPT	CLEBURNE RGNL	TX	LPV	2	99.834	1	99.812	1	99.797
CRP	CORPUS CHRISTI INTL	TX	LPV200	2	99.875	4	99.865	7	99.786
CVB	CASTROVILLE MUNICIPAL	TX	LPV	1	99.873	3	99.852	3	99.784
CWC	KICKAPOO DOWNTOWN	TX	LPV	1	99.833	1	99.826	1	99.818
CXO	CONROE/NORTH HOUSTON RGNL	TX	LPV200	2	99.879	3	99.863	1	99.810
CZT	DIMMIT COUNTY	TX	LPV	1	99.867	3	99.855	5	99.758
DAL	DALLAS LOVE FLD	TX	LPV200	1	99.841	1	99.811	1	99.808
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	1	99.841	1	99.811	1	99.807
DHT	DALHART MUNICIPAL	TX	LPV	1	99.833	1	99.832	1	99.826
DKR	HOUSTON COUNTY	TX	LP	3	99.889	2	99.841	1	99.808
DRT	DEL RIO INTL	TX	LPV	2	99.855	2	99.813	3	99.778
DTO	DENTON ENTERPRISE	TX	LPV200	1	99.837	1	99.813	1	99.808
DUX	MOORE COUNTY	TX	LPV200	1	99.833	1	99.830	1	99.826
DWH	DAVID WAYNE HOOKS MEML	TX	LPV	1	99.884	3	99.870	2	99.801
E01	ROY HURD MEML	TX	LP	1	99.802	1	99.798	2	99.786
E11	ANDREWS COUNTY	TX	LPV	1	99.804	1	99.800	1	99.786

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
E19	GRUVER MUNICIPAL	TX	LP	1	99.833	1	99.830	1	99.826
E30	BRUCE FLD	TX	LPV	1	99.804	1	99.800	1	99.787
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	1	99.803	1	99.793	3	99.778
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	5	99.853	4	99.809	7	99.721
EDC	AUSTIN EXEC	TX	LPV200	2	99.870	3	99.849	1	99.804
EFD	ELLINGTON	TX	LPV200	1	99.887	2	99.878	3	99.805
ELA	EAGLE LAKE	TX	LP	1	99.879	3	99.868	3	99.800
ELP	EL PASO INTL	TX	LP	1	99.790	1	99.790	4	99.723
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	2	99.863	3	99.838	2	99.787
ETN	EASTLAND MUNICIPAL	TX	LP	2	99.830	1	99.808	1	99.797
F00	JONES FLD	TX	LPV	1	99.837	1	99.826	1	99.812
F05	WILBARGER COUNTY	TX	LPV	1	99.831	1	99.827	1	99.822
F49	CITY OF SLATON/LARRY T NEAL ME	TX	LPV	1	99.833	1	99.822	1	99.809
F98	YOAKUM COUNTY	TX	LPV	2	99.824	1	99.811	1	99.795
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	1	99.801	1	99.801	2	99.786
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	1	99.844	1	99.811	1	99.802
FWS	FORT WORTH SPINKS	TX	LPV200	2	99.843	1	99.811	1	99.800
GDJ	GRANBURY RGNL	TX	LPV	2	99.834	1	99.811	1	99.797
GGG	EAST TEXAS RGNL	TX	LPV	1	99.848	1	99.815	1	99.812
GKY	ARLINGTON MUNICIPAL	TX	LPV200	1	99.842	1	99.811	1	99.804
GLE	GAINESVILLE MUNICIPAL	TX	LPV	1	99.833	1	99.826	1	99.813
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	1	99.887	2	99.881	3	99.807
GNC	GAINES COUNTY	TX	LPV	1	99.800	1	99.800	1	99.786
GRK	ROBERT GRAY AAF	TX	LPV200	2	99.870	2	99.830	1	99.800
GTU	GEORGETOWN MUNICIPAL	TX	LPV	2	99.870	2	99.835	1	99.804
GVT	MAJORS	TX	LPV200	1	99.841	1	99.813	1	99.808
GYI	NORTH TEXAS RGNL/PERRIN FLD	TX	LPV200	1	99.830	1	99.826	1	99.815

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GZN	GREGORY M SIMMONS MEML	TX	LPV	2	99.830	1	99.807	1	99.797
HBV	JIM HOGG COUNTY	TX	LPV	3	99.855	6	99.821	7	99.724
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	1	99.866	3	99.846	3	99.773
HHF	HEMPHILL COUNTY	TX	LPV	1	99.829	1	99.826	1	99.826
HOU	WILLIAM P HOBBY	TX	LPV200	1	99.887	2	99.878	3	99.804
HQZ	MESQUITE METRO	TX	LPV	1	99.841	1	99.812	1	99.808
HRL	VALLEY INTL	TX	LPV200	3	99.822	4	99.810	7	99.724
HRX	HEREFORD MUNICIPAL	TX	LPV200	1	99.833	1	99.832	1	99.826
HYI	SAN MARCOS RGNL	TX	LPV200	2	99.873	3	99.851	2	99.794
IAH	GEORGE BUSH INTCNTL/HOUSTON	TX	LPV200	1	99.884	3	99.870	2	99.800
IKG	KLEBERG COUNTY	TX	LPV	2	99.869	5	99.848	7	99.767
ILE	SKYLARK FLD	TX	LPV200	2	99.870	2	99.831	1	99.799
INJ	HILLSBORO MUNICIPAL	TX	LPV	2	99.832	1	99.815	1	99.801
INK	WINKLER COUNTY	TX	LPV200	1	99.803	1	99.799	1	99.786
IWS	WEST HOUSTON	TX	LP	1	99.884	3	99.870	2	99.793
JAS	JASPER COUNTY/BELL FLD	TX	LPV	3	99.893	3	99.858	1	99.815
JSO	CHEROKEE COUNTY	TX	LPV	2	99.844	1	99.815	1	99.810
JWY	MID-WAY RGNL	TX	LPV200	2	99.837	1	99.812	1	99.804
JXI	FOX STEPHENS FLD - GILMER MUNICIPAL	TX	LP	1	99.841	1	99.815	1	99.811
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	1	99.833	1	99.824	1	99.813
LBX	TEXAS GULF COAST RGNL	TX	LPV	1	99.887	2	99.881	3	99.806
LFK	ANGELINA COUNTY	TX	LPV	3	99.892	2	99.841	1	99.815
LHB	HEARNE MUNICIPAL	TX	LPV200	2	99.870	2	99.841	1	99.804
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	1	99.833	1	99.829	1	99.820
LLN	LEVELLAND MUNICIPAL	TX	LPV	1	99.833	1	99.826	1	99.811
LNC	LANCASTER RGNL	TX	LPV200	1	99.841	1	99.812	1	99.808
LRD	LAREDO INTL	TX	LPV200	3	99.854	6	99.822	6	99.705

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LUD	DECATUR MUNICIPAL	TX	LPV	1	99.838	1	99.814	1	99.808
LUV	LAMESA MUNICIPAL	TX	LPV200	1	99.807	1	99.801	1	99.792
LVJ	PEARLAND RGNL	TX	LPV	1	99.887	2	99.879	3	99.805
LXY	MEXIA-LIMESTONE COUNTY	TX	LP	3	99.851	2	99.835	1	99.803
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	1	99.804	1	99.800	1	99.786
MDD	MIDLAND AIRPARK	TX	LPV	1	99.804	1	99.800	1	99.786
MFE	MC ALLEN MILLER INTL	TX	LPV200	5	99.825	4	99.803	7	99.718
MKN	COMANCHE COUNTY-CITY	TX	LPV	1	99.815	1	99.804	1	99.797
MNZ	HAMILTON MUNICIPAL	TX	LPV	1	99.819	1	99.807	1	99.797
MWL	MINERAL WELLS RGNL	TX	LPV200	1	99.841	1	99.811	1	99.797
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	3	99.867	2	99.841	1	99.815
ODO	ODESSA-SCHLEMEYER FLD	TX	LPV200	1	99.804	1	99.800	1	99.786
ONY	OLNEY MUNICIPAL	TX	LPV	1	99.833	1	99.816	1	99.807
ORG	ORANGE COUNTY	TX	LPV	1	99.889	2	99.882	2	99.809
PEQ	PECOS MUNICIPAL	TX	LPV200	1	99.803	1	99.800	2	99.783
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	3	99.827	4	99.810	7	99.732
PKV	CALHOUN COUNTY	TX	LPV	1	99.884	2	99.877	5	99.803
PPA	PERRY LEFORS FLD	TX	LPV	1	99.833	1	99.830	1	99.826
PRX	COX FLD	TX	LPV	1	99.837	1	99.830	1	99.817
PSX	PALACIOS MUNICIPAL	TX	LPV	1	99.887	2	99.881	5	99.804
PVW	HALE COUNTY	TX	LPV	1	99.833	1	99.830	1	99.822
PWG	MC GREGOR EXEC	TX	LPV	2	99.842	2	99.835	1	99.798
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	1	99.829	1	99.826	1	99.826
RAS	MUSTANG BEACH	TX	LPV	2	99.878	4	99.867	7	99.793
RBD	DALLAS EXEC	TX	LPV200	1	99.841	1	99.811	1	99.807
RBO	NUECES COUNTY	TX	LPV	2	99.870	4	99.855	7	99.783
RKP	ARANSAS COUNTY	TX	LPV	2	99.885	4	99.875	7	99.805

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RYW	LAGO VISTA TX/RUSTY ALLEN	TX	LPV	2	99.870	2	99.832	1	99.804
SAT	SAN ANTONIO INTL	TX	LPV200	1	99.873	3	99.856	2	99.786
SGR	SUGAR LAND RGNL	TX	LPV200	1	99.886	2	99.876	3	99.801
SJT	SAN ANGELO RGNL/MATHIS FLD	TX	LPV	1	99.804	1	99.801	1	99.788
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV	1	99.841	1	99.818	1	99.810
SNK	WINSTON FLD	TX	LPV200	2	99.830	1	99.801	1	99.790
SWI	SHERMAN MUNICIPAL	TX	LP	1	99.834	1	99.826	1	99.812
SWW	AVENGER FLD	TX	LPV	2	99.830	1	99.800	1	99.797
T23	ALBANY MUNICIPAL	TX	LPV	2	99.832	1	99.810	1	99.797
T41	LA PORTE MUNICIPAL	TX	LPV	1	99.887	2	99.878	3	99.805
T74	TAYLOR MUNICIPAL	TX	LPV	2	99.870	2	99.836	1	99.804
T78	LIBERTY MUNICIPAL	TX	LP	1	99.884	3	99.872	2	99.805
T82	GILLESPIE COUNTY	TX	LPV	2	99.863	3	99.836	1	99.804
TDW	TRADEWIND	TX	LPV	1	99.833	1	99.830	1	99.826
TFP	MCCAMPBELL-PORTER	TX	LPV	2	99.878	4	99.868	7	99.793
TKI	MCKINNEY NTL	TX	LPV200	1	99.841	1	99.812	1	99.808
TME	HOUSTON EXEC	TX	LPV	1	99.882	3	99.868	2	99.793
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	3	99.869	2	99.835	1	99.799
TRL	TERRELL MUNICIPAL	TX	LPV	1	99.841	1	99.814	1	99.809
TX2	CHASE FLD INDUSTRIAL	TX	LPV	1	99.883	3	99.864	6	99.789
TXW	MID VALLEY	TX	LPV	5	99.828	4	99.806	7	99.719
TYR	TYLER POUNDS RGNL	TX	LPV200	1	99.846	1	99.815	1	99.810
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	2	99.870	2	99.841	1	99.809
VCT	VICTORIA RGNL	TX	LPV200	1	99.884	2	99.869	5	99.799
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	1	99.837	1	99.811	1	99.806
41U	MANTI-EPHRAIM	UT	LPV	1	99.851	1	99.847	1	99.844
74V	ROOSEVELT MUNICIPAL	UT	LPV	1	99.847	1	99.847	1	99.844

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BCE	BRYCE CANYON	UT	LPV	1	99.866	1	99.847	1	99.841
BDG	BLANDING MUNICIPAL	UT	LPV	1	99.847	1	99.841	1	99.837
BMC	BRIGHAM CITY RGNL	UT	LP	1	99.870	1	99.866	1	99.844
CDC	CEDAR CITY RGNL	UT	LPV	1	99.866	1	99.847	1	99.841
CNY	CANYONLANDS RGNL	UT	LP	1	99.847	1	99.847	1	99.844
DTA	DELTA MUNICIPAL	UT	LP	1	99.866	1	99.847	1	99.841
ENV	WENDOVER	UT	LPV	1	99.873	1	99.873	1	99.843
FOM	FILLMORE MUNICIPAL	UT	LPV	1	99.866	1	99.847	1	99.841
LGU	LOGAN-CACHE	UT	LPV	1	99.866	1	99.851	1	99.841
OGD	OGDEN-HINCKLEY	UT	LPV	1	99.866	2	99.860	1	99.844
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	1	99.847	1	99.847	1	99.844
PVU	PROVO MUNICIPAL	UT	LPV200	1	99.851	1	99.847	1	99.844
RIF	RICHFIELD MUNICIPAL	UT	LP	1	99.866	1	99.847	1	99.841
SGU	ST GEORGE RGNL	UT	LPV	1	99.866	1	99.847	1	99.837
SLC	SALT LAKE CITY INTL	UT	LPV200	1	99.866	1	99.847	1	99.844
SPK	SPANISH FORK MUNICIPAL/WOODHOUSE FL	UT	LP	1	99.851	1	99.847	1	99.844
TVY	BOLINDER FLD-TOOELE VALLEY	UT	LPV200	1	99.869	1	99.847	1	99.844
U14	NEPHI MUNICIPAL	UT	LPV	1	99.854	1	99.847	1	99.844
U42	SOUTH VALLEY RGNL	UT	LPV	1	99.866	1	99.847	1	99.844
U55	PANGUITCH MUNICIPAL	UT	LPV200	1	99.866	1	99.847	1	99.841
VEL	VERNAL RGNL	UT	LPV	1	99.847	1	99.847	1	99.844
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	1	99.833	1	99.833	2	99.818
0VG	LEE COUNTY	VA	LPV	1	99.837	1	99.837	1	99.836
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	2	99.848	1	99.833	2	99.819
BCB	VIRGINIA TECH/MONTGOMERY EXEC	VA	LPV	1	99.840	1	99.833	2	99.828
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	2	99.848	1	99.833	3	99.815
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	1	99.833	1	99.833	2	99.809

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CJR	CULPEPER RGNL	VA	LPV	1	99.833	1	99.833	3	99.813
CPK	CHESAPEAKE RGNL	VA	LPV200	1	99.833	1	99.833	3	99.807
DAN	DANVILLE RGNL	VA	LPV200	2	99.855	2	99.848	2	99.826
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	2	99.848	1	99.833	3	99.816
FCI	RICHMOND EXEC/CHESTERFIELD COU	VA	LPV	2	99.846	1	99.833	3	99.809
FKN	FRANKLIN RGNL	VA	LPV	2	99.848	1	99.833	3	99.813
FVX	FARMVILLE RGNL	VA	LPV	1	99.833	1	99.833	2	99.817
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	1	99.833	1	99.833	3	99.800
HLX	TWIN COUNTY	VA	LPV	2	99.855	1	99.837	1	99.833
HSP	INGALLS FLD	VA	LPV	1	99.836	1	99.833	2	99.819
HWY	WARRENTON/FAUQUIER	VA	LPV200	1	99.833	1	99.833	4	99.809
JFZ	TAZEWELL COUNTY	VA	LPV	1	99.837	1	99.837	1	99.833
JYO	LEESBURG EXEC	VA	LPV	1	99.833	1	99.833	2	99.795
LKU	LOUISA COUNTY/FREEMAN FLD	VA	LPV	1	99.833	1	99.833	3	99.810
LNP	LONESOME PINE	VA	LPV	1	99.837	1	99.837	1	99.833
LUA	LURAY CAVERNS	VA	LP	1	99.833	1	99.833	3	99.810
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	1	99.833	1	99.833	2	99.818
MFV	ACCOMACK COUNTY	VA	LPV	1	99.833	2	99.832	3	99.797
MKJ	MOUNTAIN EMPIRE	VA	LPV	1	99.840	1	99.837	1	99.833
MTV	BLUE RIDGE	VA	LPV	2	99.860	2	99.850	2	99.831
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	1	99.833	1	99.833	3	99.812
OKV	WINCHESTER RGNL	VA	LPV200	1	99.833	1	99.833	2	99.800
ORF	NORFOLK INTL	VA	LPV200	1	99.833	1	99.833	3	99.806
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	1	99.833	1	99.833	3	99.803
PSK	NEW RIVER VALLEY	VA	LPV200	1	99.840	1	99.836	2	99.830
PTB	DINWIDDIE COUNTY	VA	LPV	2	99.848	1	99.833	3	99.809
PVG	HAMPTON ROADS EXEC	VA	LPV200	1	99.833	1	99.833	3	99.806

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RIC	RICHMOND INTL	VA	LPV200	2	99.847	1	99.833	3	99.812
RMN	STAFFORD RGNL	VA	LPV	1	99.833	1	99.833	3	99.812
ROA	ROANOKE/BLACKSBURG RGNL (WOODR	VA	LPV	1	99.837	1	99.833	2	99.823
SFQ	SUFFOLK EXEC	VA	LPV	1	99.833	1	99.833	3	99.812
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	1	99.833	1	99.833	2	99.809
VJI	VIRGINIA HIGHLANDS	VA	LPV	1	99.837	1	99.837	1	99.833
W78	WILLIAM M TUCK	VA	LPV	2	99.850	2	99.848	2	99.821
W96	NEW KENT COUNTY	VA	LP	2	99.848	1	99.833	3	99.815
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	2	99.825	2	99.819	3	99.795
XSA	TAPPAHANNOCK/ESSEX COUNTY	VA	LPV	1	99.833	1	99.833	3	99.794
BTV	BURLINGTON INTL	VT	LPV200	2	99.738	2	99.723	4	99.629
EFK	NORTHEAST KINGDOM INTL	VT	LP	2	99.721	3	99.707	3	99.612
FSO	FRANKLIN COUNTY STATE	VT	LPV	2	99.721	3	99.720	4	99.610
MPV	EDWARD F KNAPP STATE	VT	LPV	2	99.731	2	99.723	3	99.642
MVL	MORRISVILLE-STOWE STATE	VT	LPV	2	99.721	2	99.721	3	99.626
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	2	99.743	2	99.724	4	99.681
ALW	WALLA WALLA RGNL	WA	LPV200	2	99.921	2	99.892	4	99.808
AWO	ARLINGTON MUNICIPAL	WA	LPV200	3	99.871	2	99.832	4	99.770
BLI	BELLINGHAM INTL	WA	LPV200	2	99.848	2	99.823	6	99.730
BVS	SKAGIT RGNL	WA	LPV	3	99.870	2	99.825	4	99.766
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	3	99.866	2	99.812	4	99.752
CLS	CHEHALIS-CENTRALIA	WA	LPV	2	99.890	3	99.864	3	99.763
DEW	DEER PARK	WA	LPV	3	99.876	3	99.868	3	99.763
EPH	EPHRATA MUNICIPAL	WA	LPV	2	99.892	3	99.853	2	99.773
FHR	FRIDAY HARBOR	WA	LPV	3	99.868	2	99.823	5	99.748
GEG	SPOKANE INTL	WA	LPV200	3	99.877	3	99.867	2	99.767
HQM	BOWERMAN	WA	LPV200	3	99.884	3	99.840	3	99.765

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
KLS	SOUTHWEST WASHINGTON RGNL	WA	LPV	1	99.924	3	99.889	3	99.772
MWH	GRANT COUNTY INTL	WA	LPV200	2	99.892	3	99.854	2	99.773
OLM	OLYMPIA RGNL	WA	LPV200	2	99.890	3	99.842	3	99.765
ORS	ORCAS ISLAND	WA	LP	3	99.861	2	99.823	6	99.733
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	3	99.867	2	99.819	3	99.770
PLU	PIERCE COUNTY - THUN FLD	WA	LPV	3	99.880	3	99.843	3	99.771
PSC	TRI-CITIES	WA	LPV200	2	99.903	2	99.877	2	99.781
PWT	BREMERTON NTL	WA	LPV200	3	99.859	2	99.819	3	99.767
RLD	RICHLAND	WA	LPV	2	99.900	3	99.892	2	99.781
RNT	RENTON MUNICIPAL	WA	LPV	3	99.863	3	99.832	3	99.767
SEA	SEATTLE-TACOMA INTL	WA	LPV200	3	99.860	3	99.833	3	99.767
SFF	FELTS FLD	WA	LPV	3	99.872	3	99.862	2	99.765
SHN	SANDERSON FLD	WA	LPV	4	99.871	3	99.838	3	99.766
TDO	ED CARLSON MEML FLD - SOUTH LE	WA	LPV	2	99.893	3	99.873	3	99.769
TIW	TACOMA NARROWS	WA	LPV	4	99.872	3	99.838	3	99.768
YKM	YAKIMA AIR TRML/MCALLISTER FLD	WA	LPV200	2	99.890	3	99.879	2	99.772
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	2	99.786	4	99.754	8	99.645
57C	EAST TROY MUNICIPAL	WI	LPV	2	99.828	2	99.768	4	99.691
61C	FORT ATKINSON MUNICIPAL	WI	LP	2	99.824	2	99.782	4	99.691
82C	MAUSTON/NEW LISBON UNION	WI	LP	2	99.800	3	99.769	5	99.686
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	3	99.784	4	99.749	5	99.657
AHH	AMERY MUNICIPAL	WI	LP	4	99.783	5	99.750	7	99.621
AIG	LANGLADE COUNTY	WI	LPV	4	99.760	3	99.721	6	99.609
ARV	LAKELAND/NOBLE F LEE MEML FLD	WI	LPV	4	99.701	4	99.680	6	99.507
ASX	JOHN F KENNEDY MEML	WI	LPV	4	99.673	4	99.627	5	99.458
ATW	APPLETON INTL	WI	LPV200	4	99.778	4	99.746	5	99.644
AUW	WAUSAU DOWNTOWN	WI	LPV200	4	99.764	4	99.735	6	99.641

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BCK	BLACK RIVER FALLS AREA	WI	LPV	2	99.797	2	99.776	6	99.689
BUU	BURLINGTON MUNICIPAL	WI	LP	1	99.829	2	99.769	4	99.692
C29	MIDDLETON MUNICIPAL/MOREY FLD	WI	LPV	2	99.819	3	99.767	5	99.704
C35	REEDSBURG MUNICIPAL	WI	LP	2	99.820	3	99.767	5	99.698
C47	PORTAGE MUNICIPAL	WI	LP	3	99.815	3	99.760	5	99.684
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	4	99.768	3	99.726	5	99.638
CMY	SPARTA/FORT MC COY	WI	LPV	1	99.803	2	99.776	5	99.698
CWA	CENTRAL WISCONSIN	WI	LPV200	4	99.766	4	99.737	5	99.651
DLL	BARABOO/WISCONSIN DELLS RGNL	WI	LPV	2	99.820	3	99.764	5	99.687
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	2	99.787	4	99.758	6	99.647
EGV	EAGLE RIVER UNION	WI	LPV	4	99.693	4	99.673	6	99.515
ENW	KENOSHA RGNL	WI	LPV200	1	99.829	2	99.768	4	99.703
ETB	WEST BEND MUNICIPAL	WI	LPV	3	99.806	3	99.756	5	99.665
EZS	SHAWANO MUNICIPAL	WI	LPV	4	99.765	4	99.721	5	99.637
FLD	FOND DU LAC COUNTY	WI	LPV	3	99.808	3	99.752	5	99.657
GRB	GREEN BAY/AUSTIN STRAUBEL INTL	WI	LPV200	4	99.769	4	99.732	5	99.642
GTG	GRANTSBURG MUNICIPAL	WI	LP	4	99.761	4	99.728	9	99.576
HXF	HARTFORD MUNICIPAL	WI	LPV	3	99.810	3	99.756	5	99.676
HYR	SAWYER COUNTY	WI	LPV	6	99.729	5	99.692	6	99.496
ISW	ALEXANDER FLD SOUTH WOOD COUNT	WI	LPV	3	99.790	4	99.759	5	99.671
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	2	99.829	2	99.789	4	99.715
LNR	TRI-COUNTY RGNL	WI	LPV	2	99.824	3	99.773	4	99.705
LSE	LA CROSSE RGNL	WI	LPV	1	99.801	2	99.776	4	99.703
LUM	MENOMONIE MUNICIPAL/SCORE FLD	WI	LPV	2	99.787	4	99.757	6	99.647
MDZ	TAYLOR COUNTY	WI	LPV	4	99.761	4	99.731	6	99.626
MFI	MARSHFIELD MUNICIPAL	WI	LPV	3	99.780	4	99.752	5	99.664
MKE	GENERAL MITCHELL INTL	WI	LPV200	3	99.821	2	99.762	4	99.692

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MRJ	IOWA COUNTY	WI	LPV200	2	99.822	3	99.791	3	99.714
MSN	DANE COUNTY RGNL/TRUAX FLD	WI	LPV200	2	99.819	3	99.773	5	99.703
MTW	MANITOWOC COUNTY	WI	LPV200	3	99.774	4	99.732	5	99.653
MWC	LAWRENCE J TIMMERMAN	WI	LPV	3	99.812	2	99.762	5	99.687
OCQ	OCONTO/J DOUGLAS BAKE MUNICIPAL	WI	LP	5	99.760	3	99.715	6	99.639
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	2	99.784	4	99.750	6	99.610
OSH	WITTMAN RGNL	WI	LPV200	3	99.799	3	99.751	5	99.657
OVS	BOSCOBEL	WI	LPV	2	99.823	2	99.776	5	99.735
PBH	PRICE COUNTY	WI	LPV	5	99.730	4	99.691	7	99.547
PCZ	WAUPACA MUNICIPAL	WI	LPV	4	99.777	4	99.750	5	99.643
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	2	99.821	2	99.799	4	99.736
RAC	BATTEN INTL	WI	LPV	2	99.829	2	99.762	4	99.698
RCX	RUSK COUNTY	WI	LPV	4	99.757	4	99.727	8	99.583
RHI	RHINELANDER/ONEIDA COUNTY	WI	LPV200	5	99.741	4	99.705	8	99.571
RNH	NEW RICHMOND RGNL	WI	LPV	2	99.785	4	99.752	7	99.628
RPD	RICE LAKE RGNL/CARL'S FLD	WI	LPV200	3	99.762	4	99.730	7	99.601
RRL	MERRILL MUNICIPAL	WI	LPV	4	99.756	4	99.728	7	99.621
SBM	SHEBOYGAN COUNTY MEML	WI	LPV200	3	99.798	4	99.750	5	99.658
STE	STEVENS POINT MUNICIPAL	WI	LPV	3	99.773	4	99.742	5	99.658
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	4	99.748	3	99.715	7	99.641
SUW	RICHARD I BONG	WI	LP	5	99.689	4	99.625	5	99.447
TKV	TOMAHAWK RGNL	WI	LP	4	99.754	3	99.714	9	99.601
UBE	CUMBERLAND MUNICIPAL	WI	LPV	3	99.762	4	99.730	8	99.590
UES	WAUKESHA COUNTY	WI	LPV200	3	99.824	2	99.762	5	99.684
UNU	DODGE COUNTY	WI	LPV	3	99.813	4	99.771	5	99.664
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	3	99.790	4	99.761	5	99.666
Y50	WAUTOMA MUNICIPAL	WI	LP	3	99.792	4	99.754	6	99.681

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	5	99.747	5	99.713	7	99.592
Y72	BLOYER FLD	WI	LP	1	99.801	3	99.775	5	99.691
3I2	MASON COUNTY	WV	LPV	1	99.833	1	99.833	2	99.826
6L4	LOGAN COUNTY	WV	LPV	1	99.837	1	99.837	2	99.832
BKW	RALEIGH COUNTY MEML	WV	LPV200	1	99.835	1	99.835	2	99.829
BLF	MERCER COUNTY	WV	LPV	1	99.838	1	99.837	2	99.830
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	1	99.833	1	99.833	2	99.813
CRW	WEST VIRGINIA INTL YEAGER	WV	LPV200	1	99.833	1	99.833	2	99.828
HLG	WHEELING OHIO COUNTY	WV	LPV200	2	99.830	2	99.821	2	99.793
HTS	TRI-STATE/MILTON J FERGUSON FL	WV	LPV200	1	99.836	1	99.836	1	99.833
I18	JACKSON COUNTY	WV	LPV200	1	99.833	1	99.833	2	99.826
LWB	GREENBRIER VALLEY	WV	LPV	1	99.835	1	99.833	2	99.824
MGW	MORGANTOWN MUNICIPAL (WALTER L BILL	WV	LPV200	1	99.833	1	99.833	3	99.802
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	1	99.833	2	99.824	2	99.799
PKB	MID-OHIO VALLEY RGNL	WV	LPV	1	99.833	1	99.833	2	99.821
USW	BOGGS FLD	WV	LPV	1	99.833	1	99.833	2	99.824
W22	UPSHUR COUNTY RGNL	WV	LPV	1	99.833	1	99.833	2	99.813
W35	POTOMAC AIRPARK	WV	LP	2	99.824	2	99.824	2	99.800
W99	GRANT COUNTY	WV	LP	1	99.833	1	99.833	3	99.806
BYG	JOHNSON COUNTY	WY	LPV	1	99.833	1	99.833	1	99.811
COD	YELLOWSTONE RGNL	WY	LPV	1	99.855	1	99.851	1	99.826
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	1	99.833	1	99.833	1	99.832
CYS	CHEYENNE RGNL/JERRY OLSON FLD	WY	LPV200	1	99.833	1	99.833	1	99.833
DGW	CONVERSE COUNTY	WY	LPV200	1	99.833	1	99.833	1	99.830
DWX	DIXON	WY	LP	1	99.848	1	99.848	1	99.833
EAN	PHIFER AIRFIELD	WY	LPV200	1	99.833	1	99.833	1	99.832
ECS	MONDELL FLD	WY	LPV	1	99.833	1	99.830	2	99.824

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EMM	KEMMERER MUNICIPAL	WY	LPV	1	99.852	1	99.851	1	99.844
EVW	EVANSTON-UINTA COUNTY BURNS FL	WY	LPV	1	99.852	1	99.847	1	99.844
FBR	FORT BRIDGER	WY	LP	1	99.852	1	99.851	1	99.844
GCC	NORTHEAST WYOMING RGNL	WY	LPV	1	99.833	1	99.830	1	99.809
GEY	SOUTH BIG HORN COUNTY	WY	LPV	1	99.852	2	99.850	1	99.826
GUR	CAMP GUERNSEY	WY	LP	1	99.833	1	99.833	1	99.832
HSG	HOT SPRINGS COUNTY	WY	LPV	1	99.853	1	99.851	1	99.826
JAC	JACKSON HOLE	WY	LPV200	1	99.855	1	99.851	1	99.845
LAR	LARAMIE RGNL	WY	LPV	1	99.833	1	99.833	1	99.833
LND	HUNT FLD	WY	LPV	1	99.852	1	99.851	2	99.842
PNA	RALPH WENZ FLD	WY	LPV	1	99.852	1	99.851	1	99.843
POY	POWELL MUNICIPAL	WY	LPV	1	99.850	1	99.844	2	99.825
RIW	CENTRAL WYOMING RGNL	WY	LPV200	1	99.852	1	99.851	1	99.826
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	1	99.847	1	99.847	1	99.844
RWL	RAWLINS MUNICIPAL/HARVEY FLD	WY	LPV	1	99.848	1	99.848	1	99.833
SAA	SHIVELY FLD	WY	LPV	1	99.848	2	99.846	1	99.833
SHR	SHERIDAN COUNTY	WY	LPV	1	99.848	1	99.830	2	99.809
U68	NORTH BIG HORN COUNTY	WY	LPV	1	99.851	1	99.844	2	99.824
W43	HULETT MUNICIPAL	WY	LPV	1	99.833	1	99.830	2	99.798
WRL	WORLAND MUNICIPAL	WY	LPV	1	99.852	1	99.851	1	99.826
CYMA	MAYO	YT	LPV	12	99.469	11	99.205	23	98.868
CYQH	WATSON LAKE	YT	LPV	10	99.573	13	99.429	26	98.937
CYXY	ERIK NIELSEN INTL	YT	LPV200	11	99.630	12	99.492	18	99.054
CYZW	TESLIN	YT	LPV	10	99.634	13	99.471	20	98.990

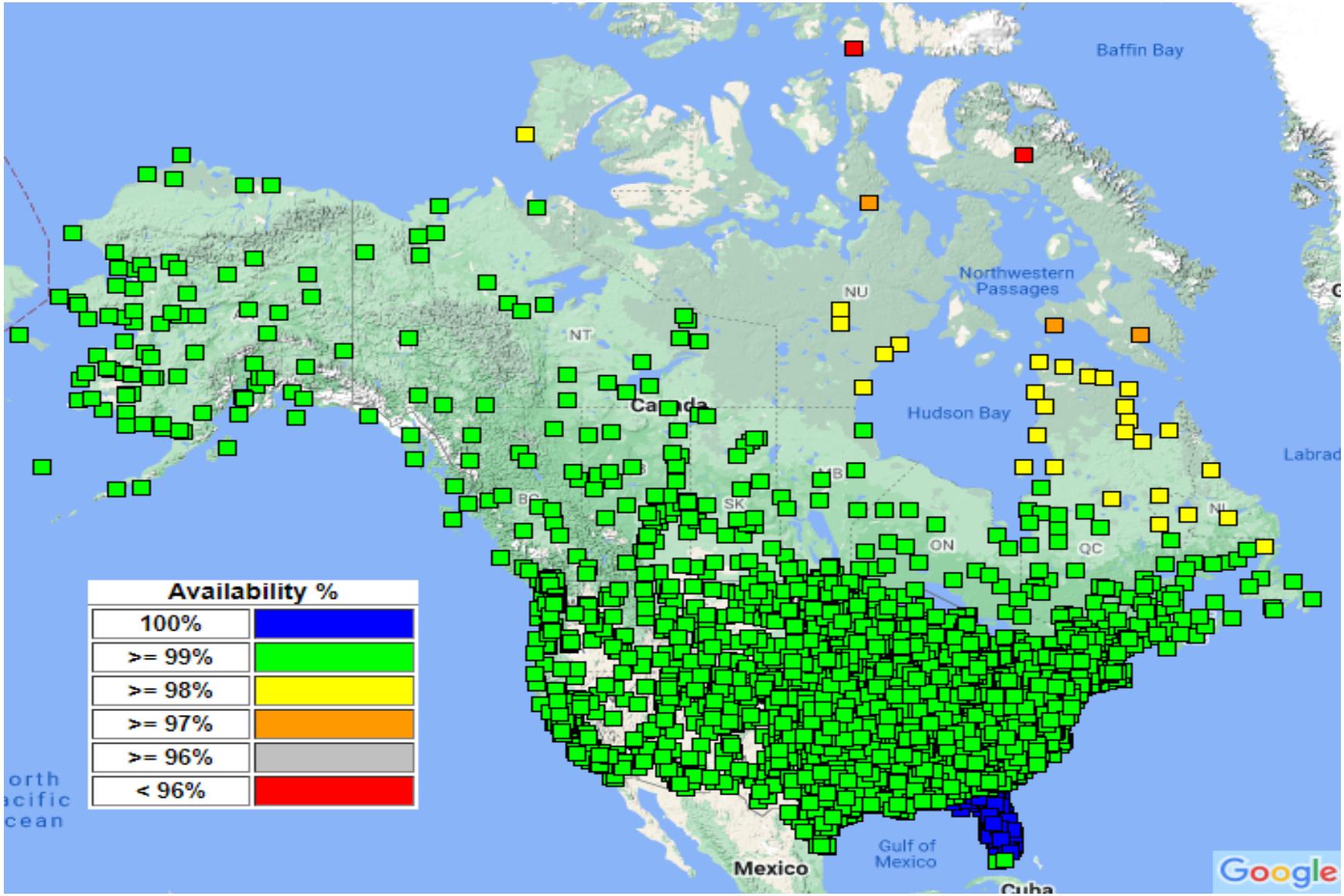

Figure 8-1 WAAS LP Availability at Airports in the U.S. and Canada with GPS RNAV IAPs

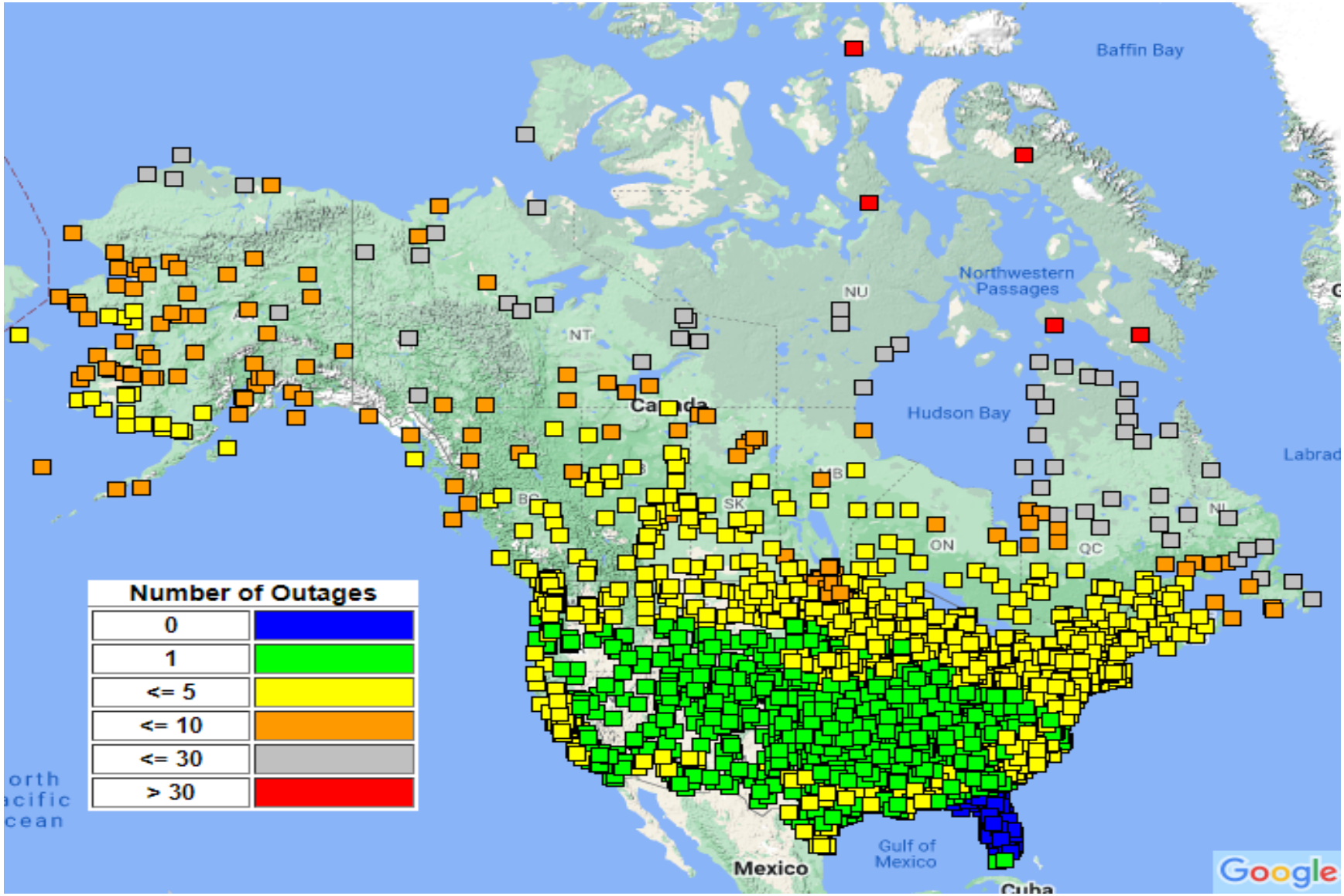

Figure 8-2 WAAS LP Outages at Airports in the U.S. and Canada with GPS RNAV IAPs

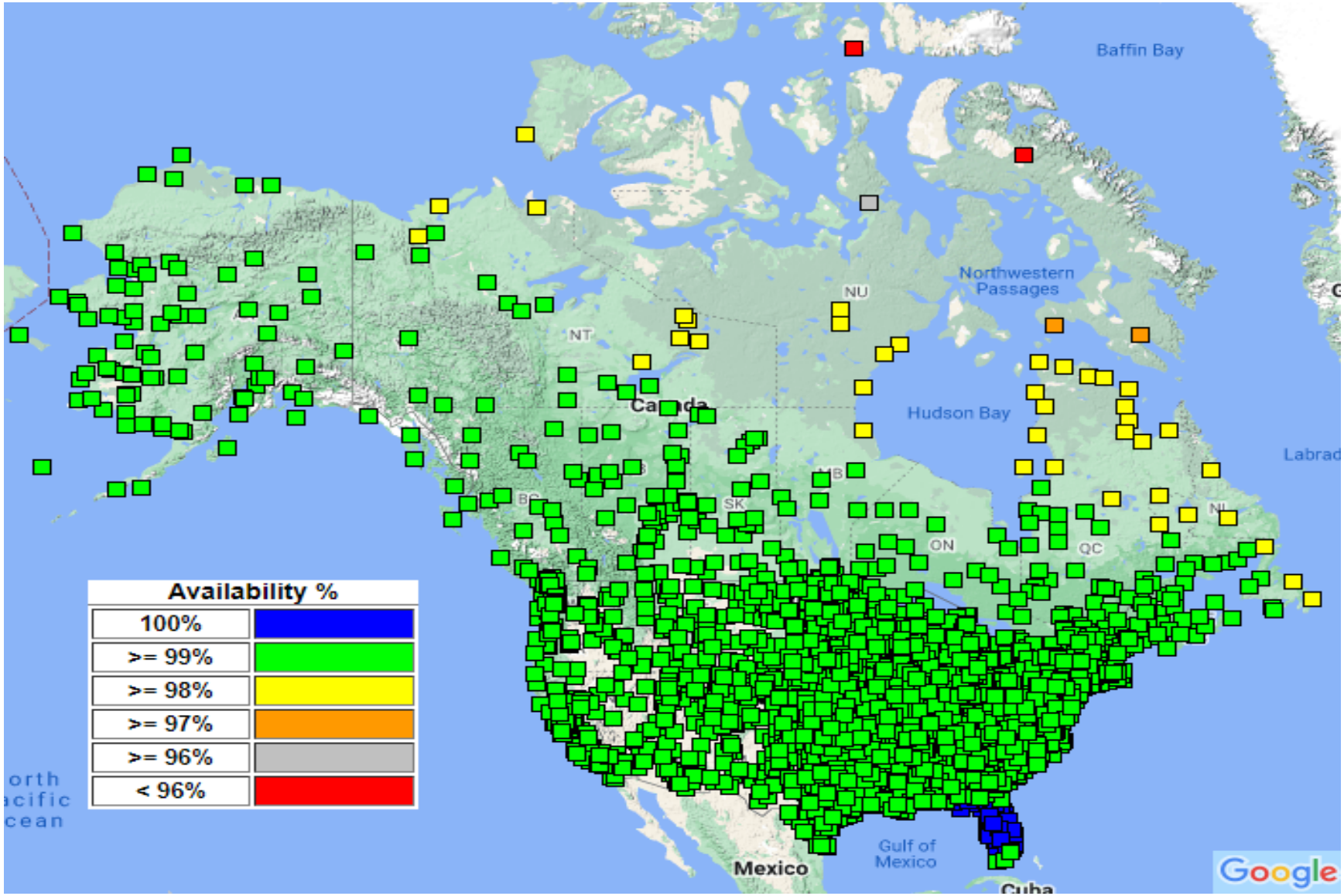

Figure 8-3 WAAS LPV Availability Airports in the U.S. and Canada with GPS RNAV IAPs

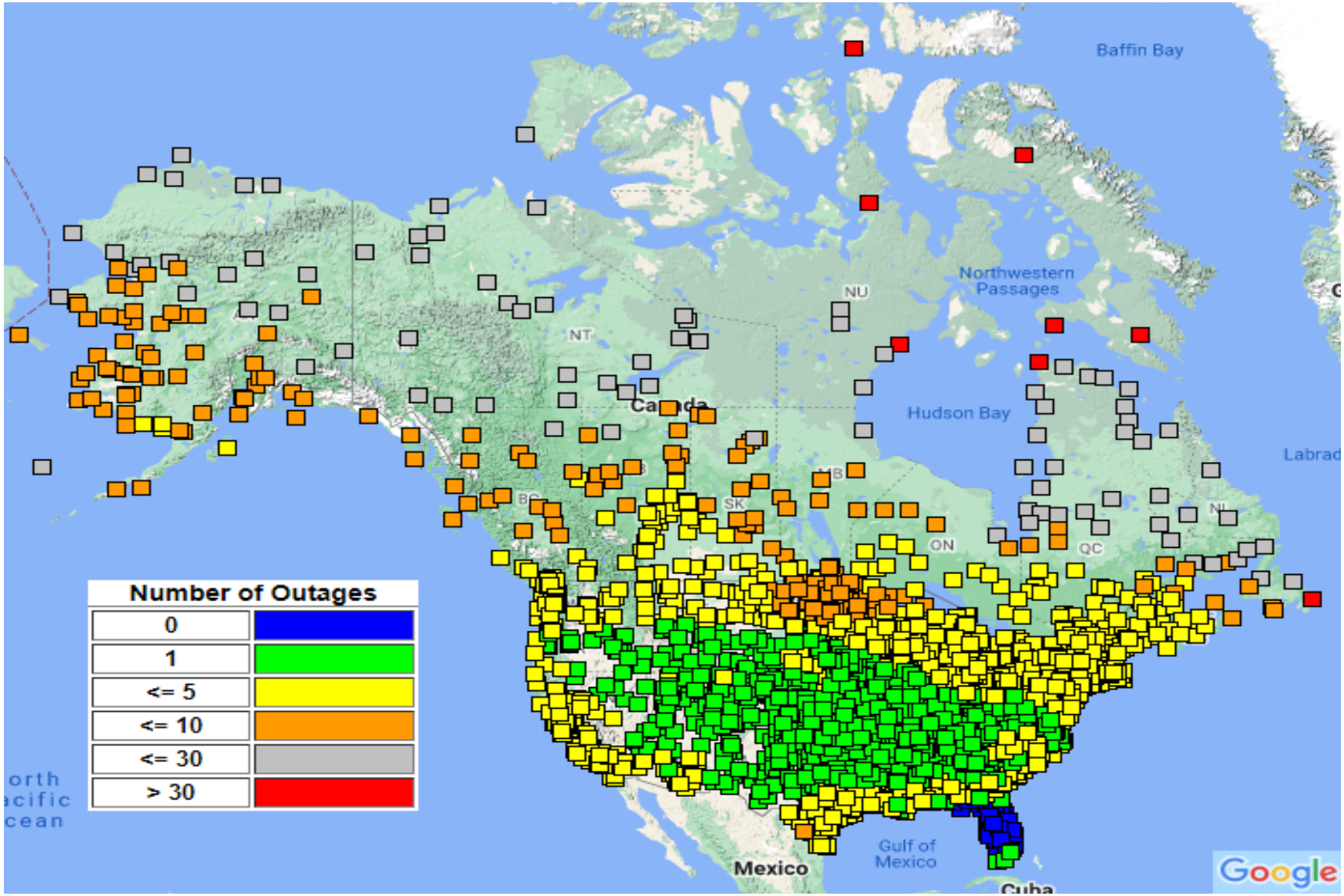

Figure 8-4 WAAS LPV Outages at Airports in the U.S. and Canada with GPS RNAV IAPs

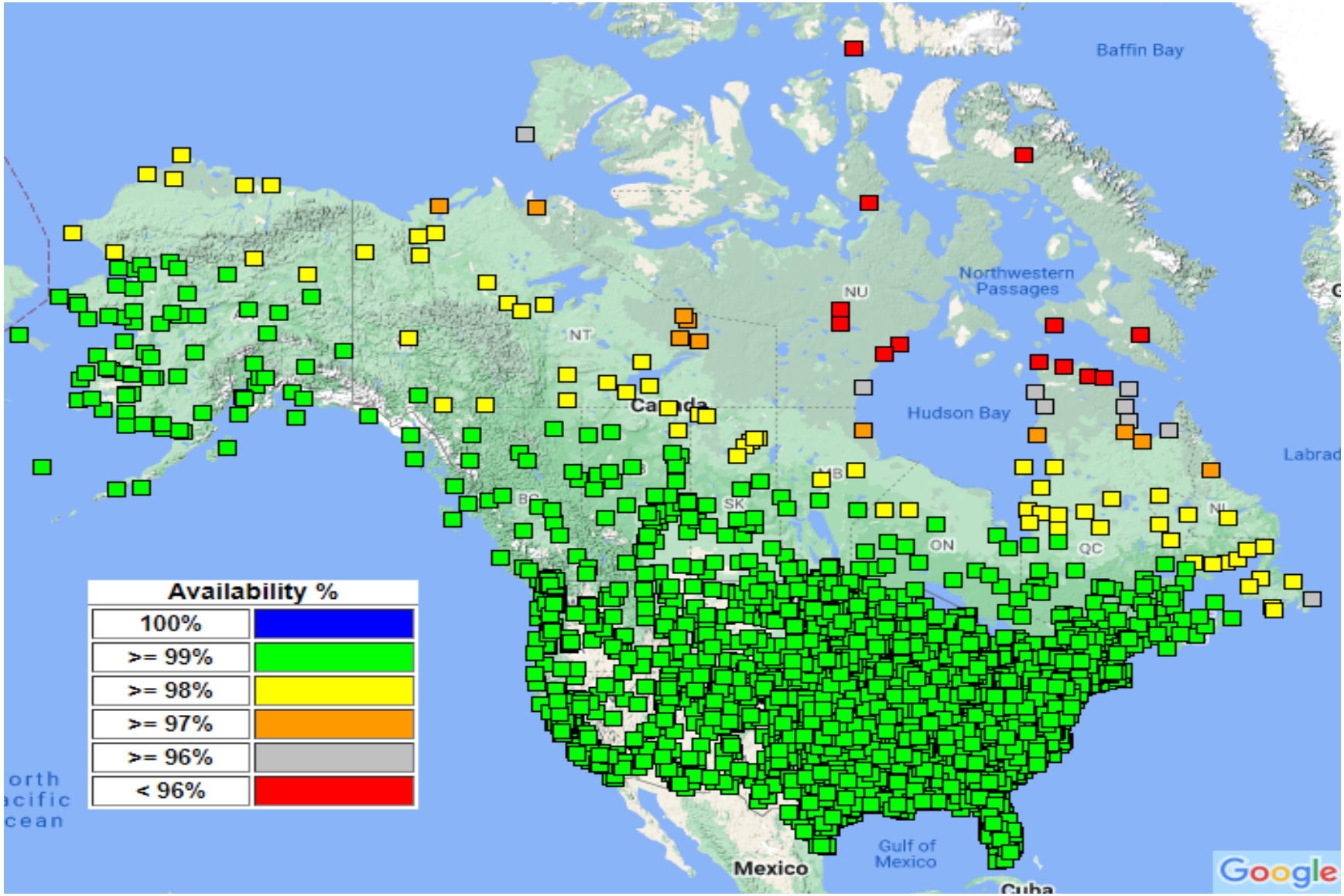

Figure 8-5 WAAS LPV200 Availability at Airports in the U.S. and Canada with GPS RNAV IAPs

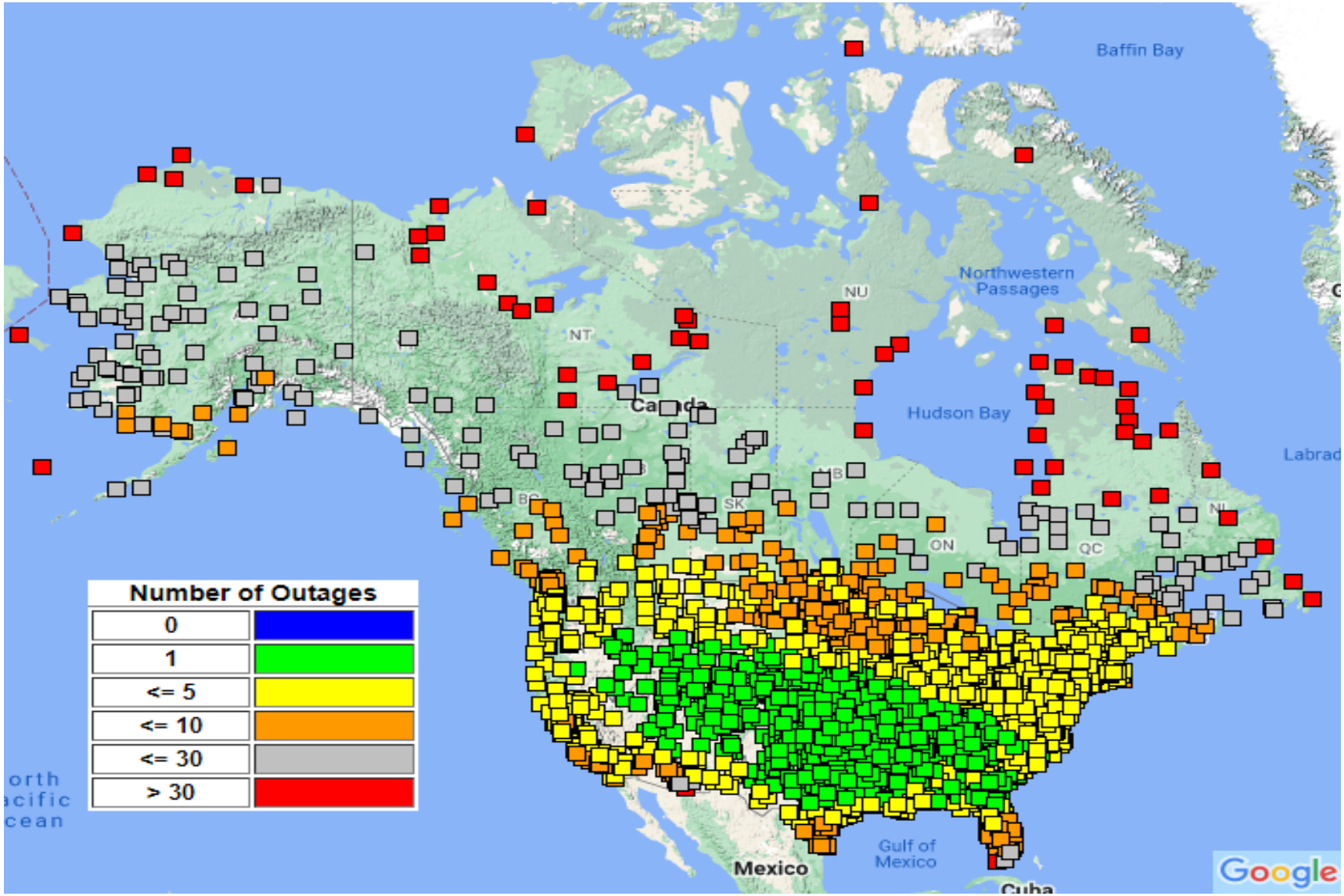

Figure 8-6 WAAS LPV200 Outages at Airports in the U.S. and Canada with GPS RNAV IAPs

9.0 WAAS CNMP BOUNDING ANALYSIS

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

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

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

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

Table 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23
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	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23
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 12/26/2023. Mexico City Thread A (MMX1), Mexico City Thread B (MMX2), and Tapachula Thread B (MTP2) are excluded from this because they were out of service. Each WAAS WRS has three independent threads of WRE: (1) Thread A is also referred to as Thread 1, (2) Thread B is also referred to as Thread 2, and (3) Thread C is referred to as Thread 3.

Duplicate surveys were performed using both the National Geodetic Survey (NGS) Online Positioning User Service (OPUS) and the Canadian Spatial Reference System (CSRS) Precise Point Positioning (PPP) service. The IGS08 reference frame is used for the OPUS solutions. A value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing of the data.

The OPUS-reported RMS quality metrics were 2.1 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 11.88 mm or less. The OPUS and CSRS surveys agreed to an average of 1.30 cm with a standard deviation of 7.70 mm. The maximum of difference was 5.03 cm at Cold Bay Thread B (CDB2).

The OPUS positions were compared to the positions computed by the WAAS C&Vs. The survey was completed on December 26, 2023. The OPUS surveys agree with the calculated positions to better or equal to 1.71 cm for most sites. The maximum difference was 5.99 cm at Cold Bay Thread A (CDB1).

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	-2965385.269	-972576.671	5543892.782	60.7879132	-161.8417254	52.193
BET2	-2965386.031	-972580.393	5543891.715	60.7878938	-161.8416648	52.181
BET3	-2965388.605	-972577.522	5543890.86	60.7878779	-161.8417296	52.192
BIL1	-1416446.038	-4223577.005	4550862.058	45.803706	-108.539725	1112.203
BIL2	-1416450.11	-4223574.851	4550862.793	45.8037154	-108.5397835	1112.209
BIL3	-1416441.741	-4223574.26	4550865.918	45.8037558	-108.5396838	1112.204
BRW1	-1886759.141	-809058.709	6018494.391	71.2827628	-156.789926	15.561
BRW2	-1886756.562	-809055.96	6018495.573	71.2827955	-156.7899681	15.572
BRW3	-1886755.466	-809059.749	6018495.393	71.2827909	-156.7898589	15.558
CDB1	-3484099.275	-1084748.829	5213678.483	55.1923717	-162.706405	49.706
CDB2	-3484105.895	-1084741.61	5213675.535	55.1923258	-162.7065442	49.669
CDB3	-3484112.198	-1084734.85	5213672.774	55.1922821	-162.7066749	49.69
FAI1	-2304742.039	-1448715.345	5748843.654	64.809628	-147.8473422	150.004
FAI2	-2304741.583	-1448706.541	5748846.053	64.8096784	-147.847494	150.017
FAI3	-2304733.06	-1448707.474	5748849.208	64.8097449	-147.8473819	150.012
JNU1	-2354255.184	-2388549.727	5407043.182	58.362573	-134.5857096	16.294
JNU2	-2354253.099	-2388565.841	5407037.02	58.3624674	-134.585491	16.3
JNU3	-2354239.884	-2388568.695	5407041.481	58.3625438	-134.585296	16.298
MMD1	35070.315	-5959686.635	2264365.76	20.9319093	-89.6628417	29.086
MMD2	35065.392	-5959687.012	2264364.981	20.9319016	-89.662889	29.133
MMD3	35065.058	-5959685.217	2264369.634	20.9319467	-89.6628922	29.117
MMX1						
MMX2						
MMX3	-948705.124	-5943932.76	2109209.257	19.4316307	-99.0684318	2232.396
MPR1	-1570142.294	-5759530.583	2238184.736	20.6790032	-105.2492039	10.97
MPR2	-1570139.465	-5759530.096	2238188.781	20.6790412	-105.2491789	11.263
MPR3	-1570143.571	-5759527.967	2238190.546	20.6790592	-105.2492223	10.975

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
MSD1	-1979520.241	-5523222.764	2493107.028	23.1604492	-109.7176538	104.29
MSD2	-1979521.816	-5523225.092	2493100.626	23.1603864	-109.7176606	104.275
MSD3	-1979526.256	-5523221.825	2493104.298	23.1604225	-109.7177122	104.269
MTP1	-254854.397	-6162909.12	1617805.098	14.7913664	-92.3679996	54.907
MTP2						
MTP3	-254855.554	-6162910.27	1617800.141	14.7913203	-92.3680099	54.799
OTZ1	-2396056.244	-750356.22	5843502.387	66.8873298	-162.6113732	10.858
OTZ2	-2396053.072	-750354.391	5843503.906	66.8873646	-162.6113914	10.852
OTZ3	-2396053.052	-750358.328	5843503.42	66.8873534	-162.6113055	10.86
YFB1	1035381.233	-2634289.673	5696539.608	63.7314912	-68.5431877	10.067
YFB2	1035372.022	-2634296.09	5696538.244	63.7314648	-68.5434088	9.996
YFB3	1035365.95	-2634306.851	5696534.469	63.7313871	-68.5436028	10.06
YQX1	2430424.457	-3419640.425	4788223.922	48.966491	-54.5976344	146.896
YQX2	2430432.402	-3419639.073	4788220.862	48.9664492	-54.5975352	146.886
YQX3	2430440.308	-3419637.721	4788217.878	48.966408	-54.5974366	146.919
YWG1	-520164.598	-4083475.987	4855842.985	49.9005735	-97.2594006	222.107
YWG2	-520150.731	-4083468.925	4855850.373	49.9006765	-97.2592216	222.117
YWG3	-520152.602	-4083478.04	4855842.55	49.9005674	-97.2592314	222.109
YYR1	1885341.235	-3321428.393	5091171.758	53.3086481	-60.419471	37.89
YYR2	1885344.196	-3321419.917	5091176.173	53.3087144	-60.4193696	37.899
YYR3	1885339.916	-3321413.1	5091182.177	53.3088046	-60.419375	37.909
ZAB1	-1488636.989	-5003946.531	3654557.651	35.1735748	-106.5673514	1620.12
ZAB2	-1488631.655	-5003948.221	3654557.633	35.1735742	-106.56729	1620.19
ZAB3	-1488632.434	-5003950.803	3654553.776	35.1735317	-106.5672901	1620.173
ZAN1	-2659536.812	-1549114.67	5567750.721	61.2292009	-149.7802541	80.708
ZAN2	-2659548.564	-1549110.714	5567746.231	61.2291173	-149.7804278	80.701
ZAN3	-2659541.51	-1549106.588	5567750.698	61.2292009	-149.7804281	80.683
ZAU1	138703.946	-4761244.123	4227763.912	41.7826581	-88.3313387	195.857
ZAU2	138704.21	-4761248.748	4227758.756	41.7825957	-88.3313372	195.875

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZAU3	138710.914	-4761248.48	4227758.834	41.7825966	-88.3312565	195.873
ZBW1	1490299.051	-4448983.187	4306010.532	42.735721	-71.4804279	39.111
ZBW2	1490304.166	-4448981.182	4306010.88	42.735725	-71.4803609	39.144
ZBW3	1490305.874	-4448984.804	4306006.568	42.7356722	-71.4803552	39.139
ZDC1	1069125.597	-4839598.985	4001126.523	39.1015962	-77.5427484	80.044
ZDC2	1069127.994	-4839603.612	4001120.322	39.1015243	-77.5427329	80.041
ZDC3	1069123.896	-4839602.699	4001122.52	39.1015497	-77.5427769	80.049
ZDV1	-1273628.775	-4711375.567	4094890.06	40.1873027	-105.1272263	1541.35
ZDV2	-1273623.073	-4711377.077	4094890.067	40.1873029	-105.127157	1541.331
ZDV3	-1273625.085	-4711380.283	4094885.786	40.1872525	-105.12717	1541.334
ZFW1	-659983.335	-5324060.783	3438276.45	32.8306494	-97.0664732	155.626
ZFW2	-659988.609	-5324063.332	3438271.452	32.830596	-97.0665258	155.587
ZFW3	-659983.633	-5324063.858	3438271.661	32.8305981	-97.0664723	155.625
ZHN1	-5508637.217	-2234492.598	2303722.557	21.3129939	-157.9208343	24.653
ZHN2	-5508656.386	-2234482.92	2303687.313	21.3126509	-157.9209902	25.003
ZHN3	-5508647.797	-2234496.848	2303694.41	21.3127196	-157.9208347	25.045
ZHU1	-513864.591	-5506451.623	3166720.412	29.9618962	-95.3314276	10.758
ZHU2	-513867.238	-5506455.023	3166714.253	29.9618317	-95.3314516	10.828
ZHU3	-513873.518	-5506457.665	3166708.656	29.9617735	-95.3315139	10.817
ZJX1	772646.314	-5434462.2	3237231.767	30.6988599	-81.9081865	2.142
ZJX2	772649.643	-5434463.75	3237228.372	30.6988243	-81.9081543	2.131
ZJX3	772645.578	-5434466.174	3237225.259	30.6987918	-81.9081999	2.114
ZKC1	-415247.67	-4954556.38	3982161.091	38.8801592	-94.7908356	305.885
ZKC2	-415231.278	-4954557.703	3982161.146	38.8801599	-94.7906461	305.88
ZKC3	-415237.396	-4954561.051	3982155.953	38.8801017	-94.7907131	305.616
ZLA1	-2474410.173	-4637294.471	3602183.611	34.6035191	-118.0838985	763.518
ZLA2	-2474404.893	-4637297.267	3602183.612	34.6035192	-118.0838334	763.503
ZLA3	-2474411.499	-4637296.951	3602179.633	34.6034752	-118.0838986	763.574
ZLC1	-1808273.388	-4486410.807	4145302.958	40.7860426	-111.9521795	1287.431

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZLC2	-1808274.774	-4486414.434	4145298.463	40.7859891	-111.9521787	1287.434
ZLC3	-1808270.571	-4486416.136	4145298.465	40.7859891	-111.952125	1287.441
ZMA1	966042.184	-5662999.813	2761581.533	25.8246126	-80.3191909	-7.599
ZMA2	966029.21	-5662999.114	2761586.019	25.8246603	-80.3193173	-8.229
ZMA3	966037.288	-5662997.953	2761586.372	25.8246624	-80.3192359	-7.883
ZME1	4070.741	-5226189.29	3644028.418	35.0673941	-89.9553716	68.594
ZME2	4070.769	-5226186.744	3644032.534	35.0674377	-89.9553713	68.875
ZME3	4064.578	-5226186.614	3644032.686	35.0674395	-89.9554392	68.852
ZMP1	-249978.552	-4539297.486	4458955.009	44.637463	-93.1520876	262.621
ZMP2	-249972.747	-4539297.826	4458955.01	44.6374629	-93.1520144	262.636
ZMP3	-249973.846	-4539302.101	4458950.529	44.6374068	-93.1520252	262.568
ZNY1	1406144.462	-4627343.967	4144322.11	40.7843293	-73.0971676	6.434
ZNY2	1406146.264	-4627347.016	4144317.308	40.7842764	-73.0971577	5.903
ZNY3	1406140.706	-4627348.674	4144317.346	40.7842768	-73.0972264	5.905
ZOA1	-2684437.118	-4293337.178	3865351.957	37.5430549	-122.0159515	-3.493
ZOA2	-2684434.109	-4293341.254	3865349.528	37.5430273	-122.0158982	-3.498
ZOA3	-2684438.483	-4293342.132	3865345.673	37.542983	-122.0159349	-3.418
ZOB1	650770.017	-4754715.663	4187420.752	41.2971547	-82.2064467	223.659
ZOB2	650777.697	-4754714.835	4187422.769	41.297167	-82.2063545	225.156
ZOB3	650776.025	-4754719.661	4187414.98	41.2970872	-82.2063821	223.437
ZSE1	-2308930.38	-3668169.663	4663526.407	47.2869925	-122.1883741	82.08
ZSE2	-2308934.775	-3668175.215	4663520.007	47.286907	-122.1883842	82.153
ZSE3	-2308935.833	-3668179.486	4663516.062	47.2868553	-122.1883659	82.088
ZSU1	2462589.496	-5529372.058	2003724.61	18.431337	-65.993476	-28.087
ZSU2	2462587.564	-5529377.426	2003712.319	18.4312199	-65.9935134	-28.067
ZSU3	2462594.19	-5529375.163	2003710.238	18.4312003	-65.9934474	-28.129
ZTL1	529840.263	-5305248.823	3489342.865	33.3796887	-84.2967275	261.142
ZTL2	529846.645	-5305247.976	3489343.147	33.3796919	-84.2966584	261.123
ZTL3	529847.325	-5305251.421	3489337.916	33.3796352	-84.2966548	261.164

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 C&V computed positions. Figure 10-4 through Figure 10-6 shows the OPUS surveys overall RMS quality indications.

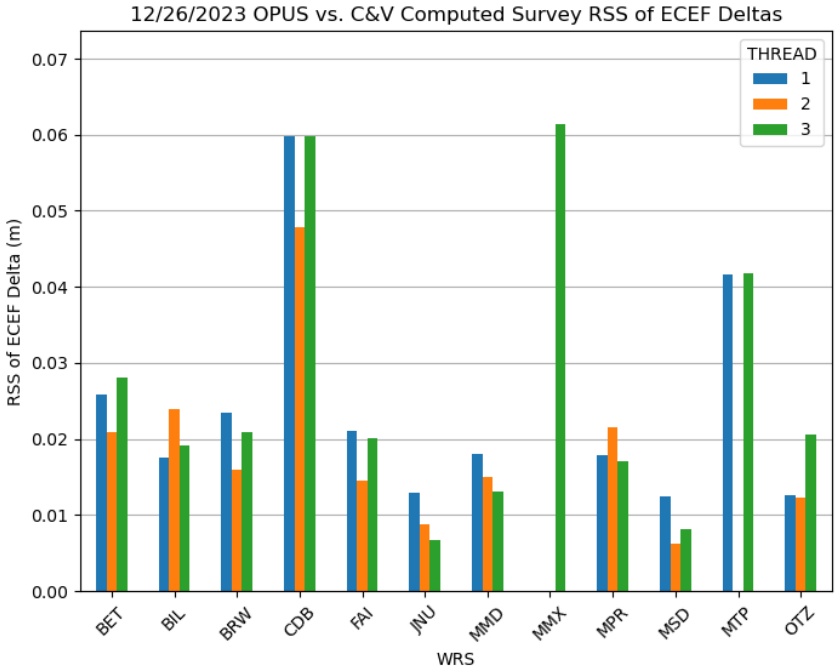

Figure 10-1 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

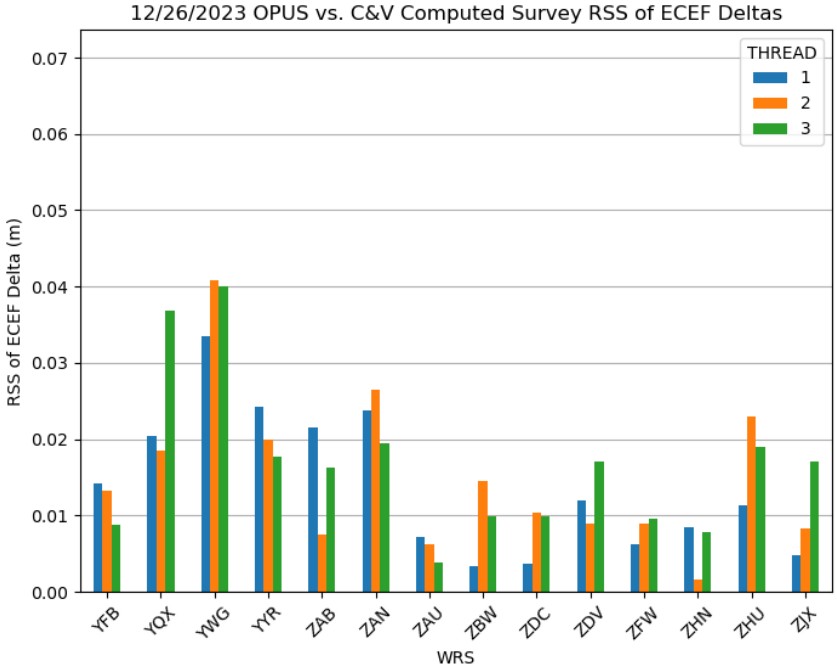

Figure 10-2 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

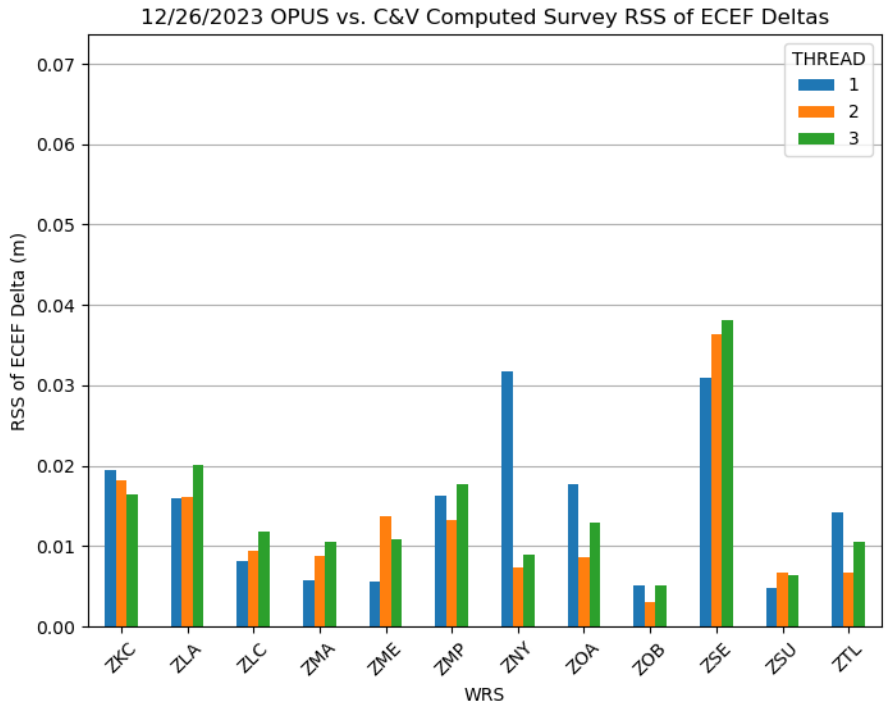

Figure 10-3 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

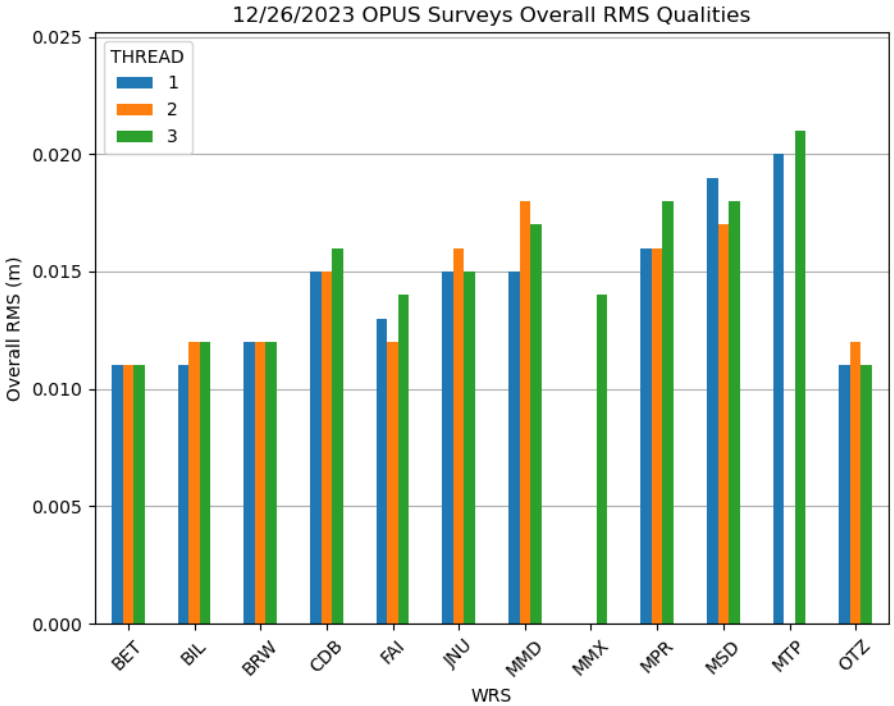

Figure 10-4 OPUS Survey Overall RMS Qualities

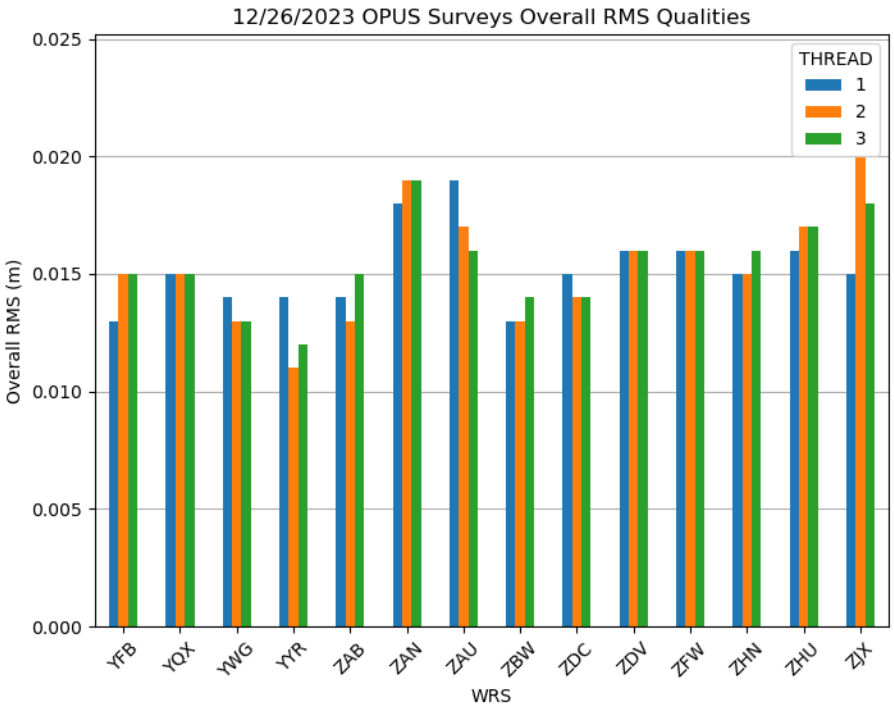

Figure 10-5 OPUS Survey Overall RMS Qualities

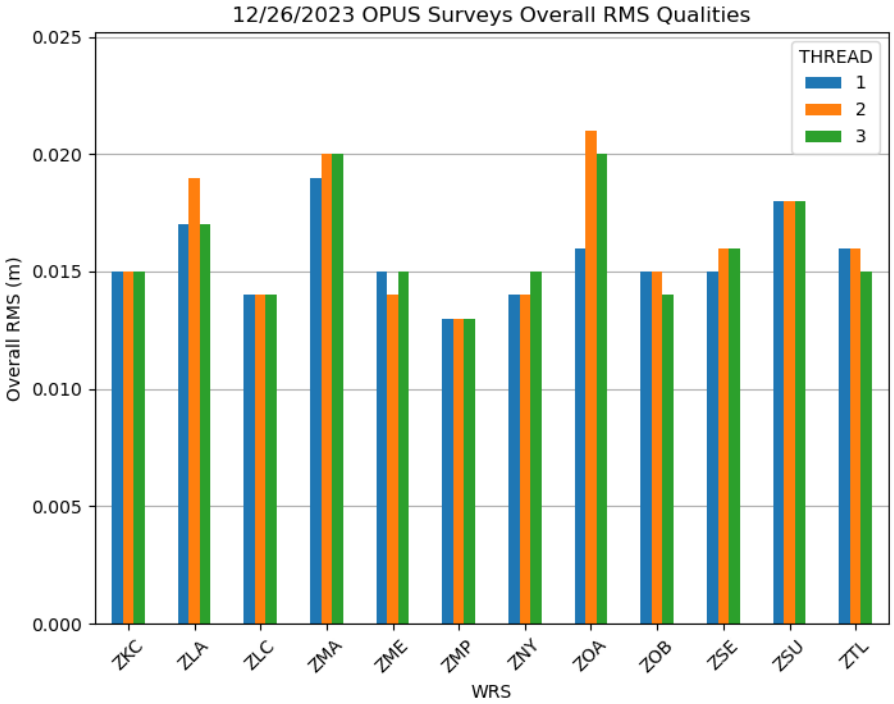

Figure 10-6 OPUS Survey Overall RMS Qualities

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.

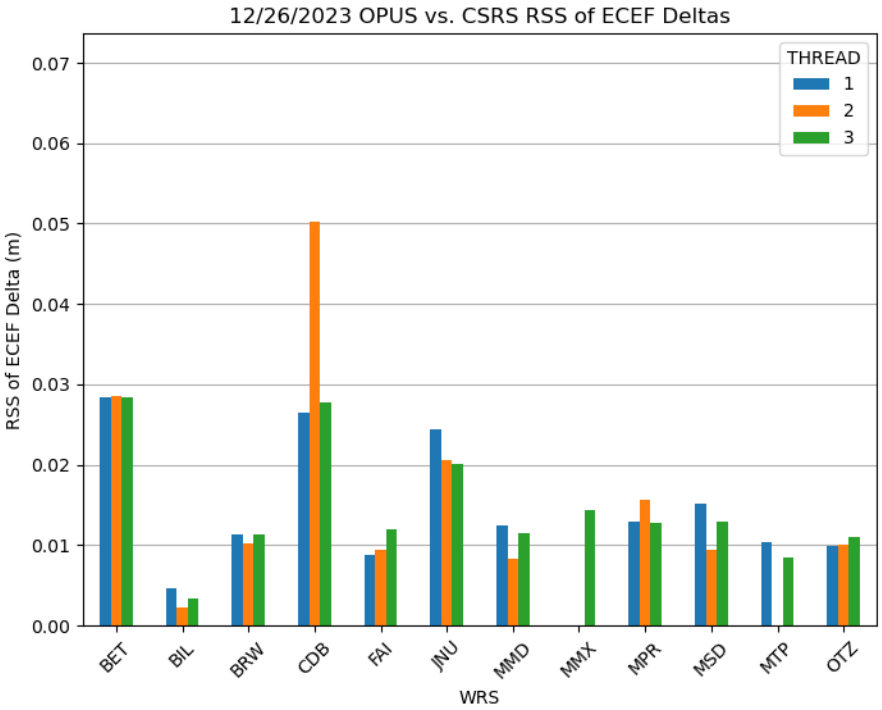

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

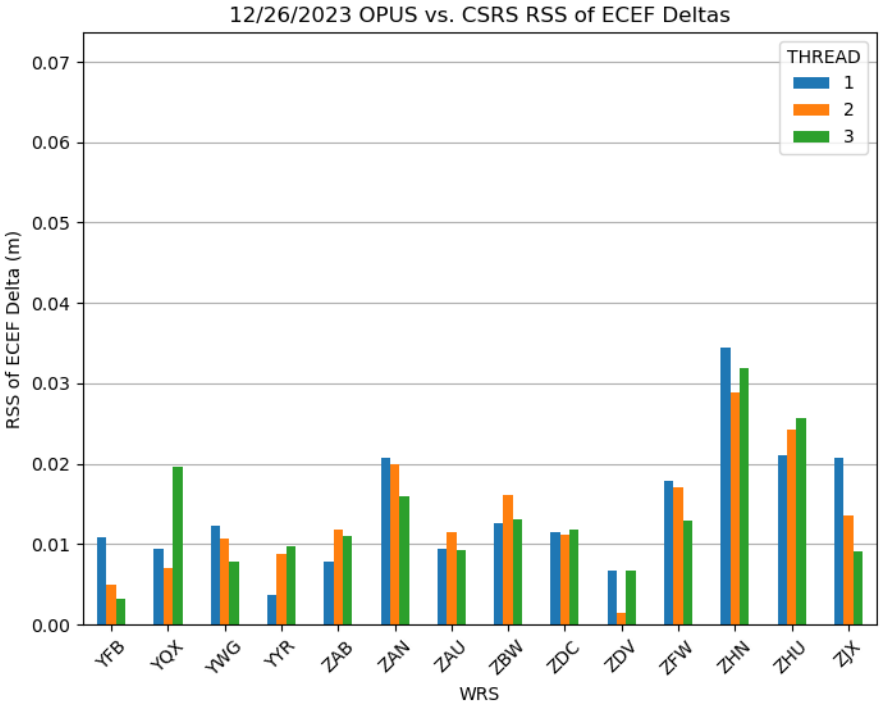

Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

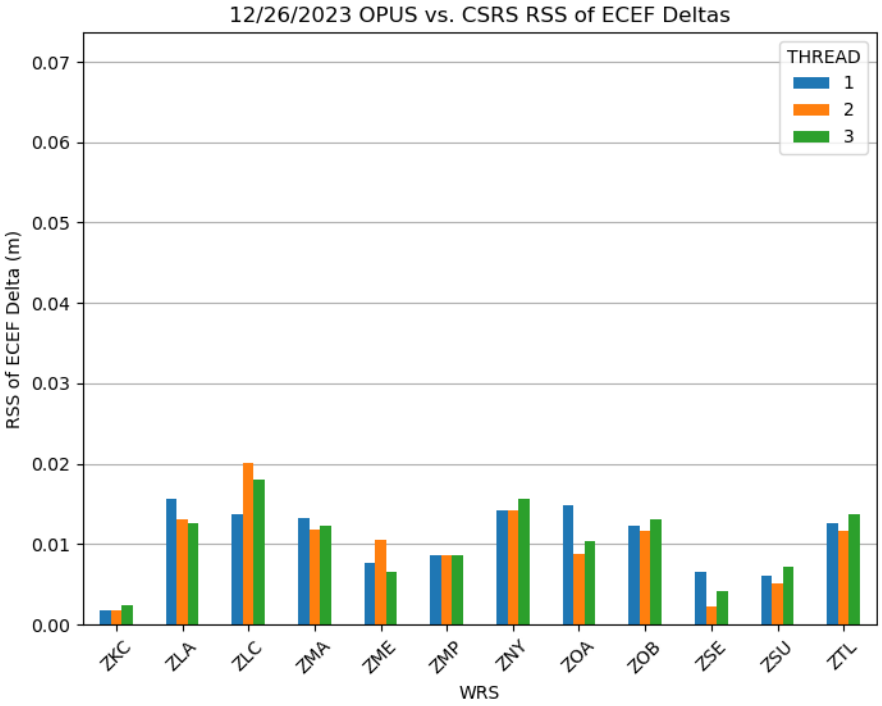

Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

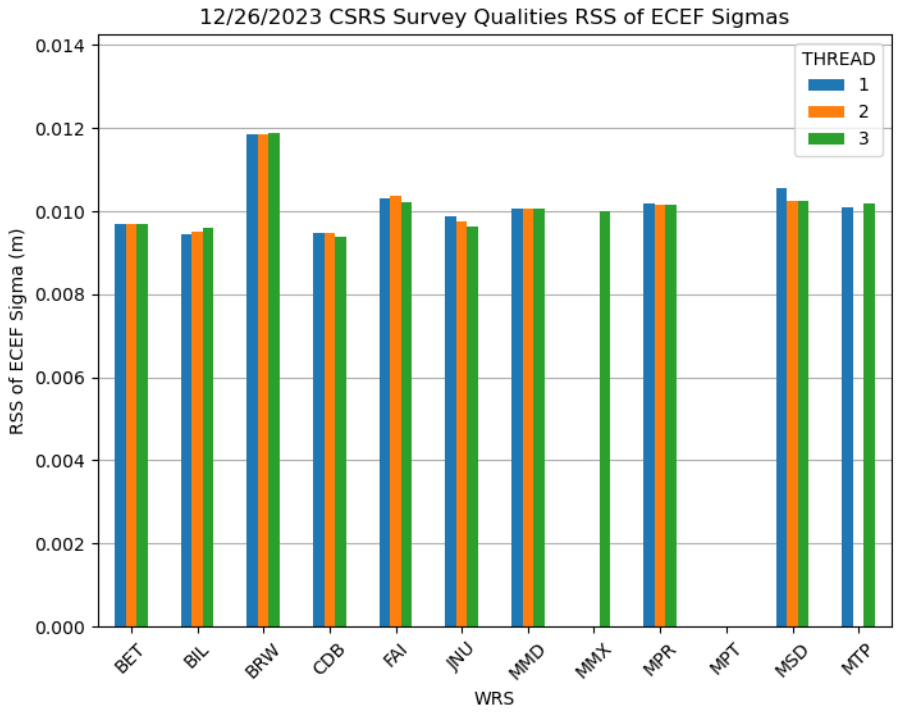

Figure 10-10 CSRS Survey Qualities

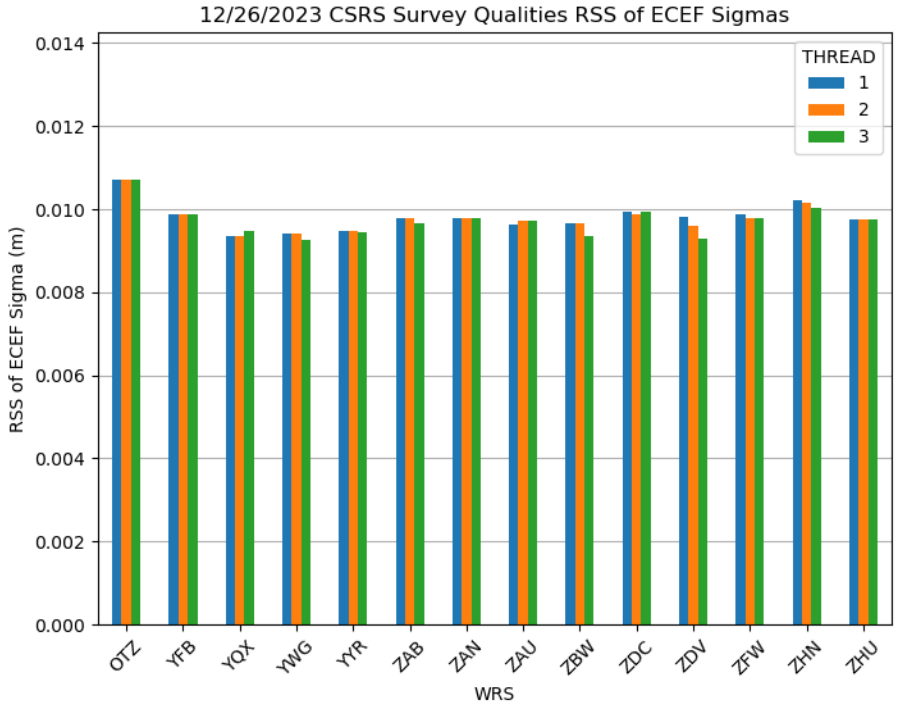

Figure 10-11 CSRS Survey Qualities

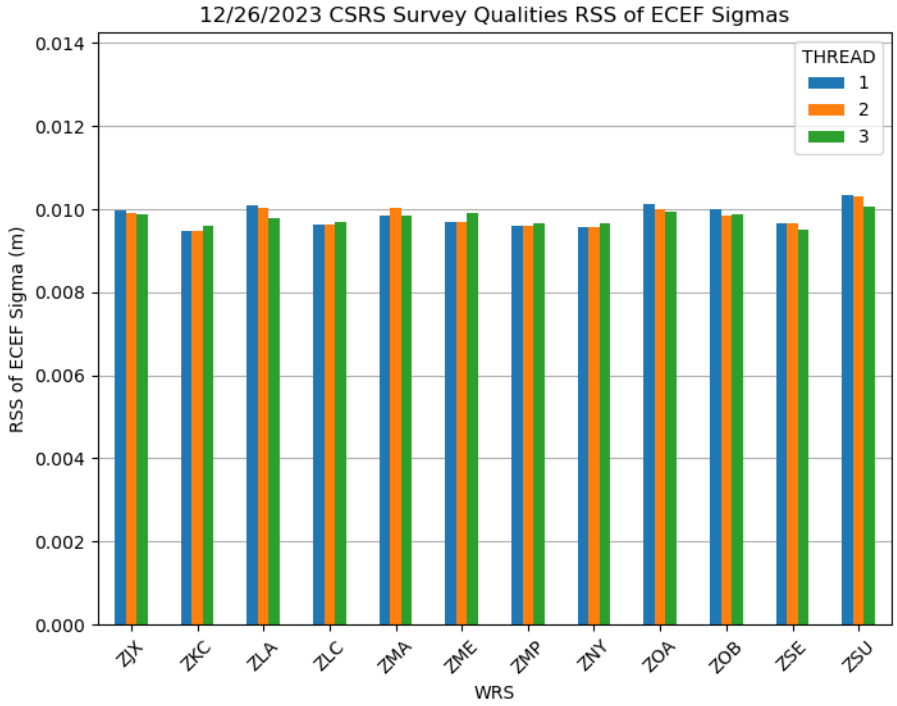

Figure 10-12 CSRS Survey Qualities

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	1.31771	1.31939	1.32138
DM 2	0.243352	0.246386	0.249516
DM 3	0.972679	0.973126	0.9738
DM 4	-0.18806	-0.189899	-0.19191

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31584	1.31803	1.31978
DM 2	0.241472	0.244655	0.247783
DM 3	0.970613	0.971106	0.971684
DM 4	-0.18686	-0.188523	-0.190531

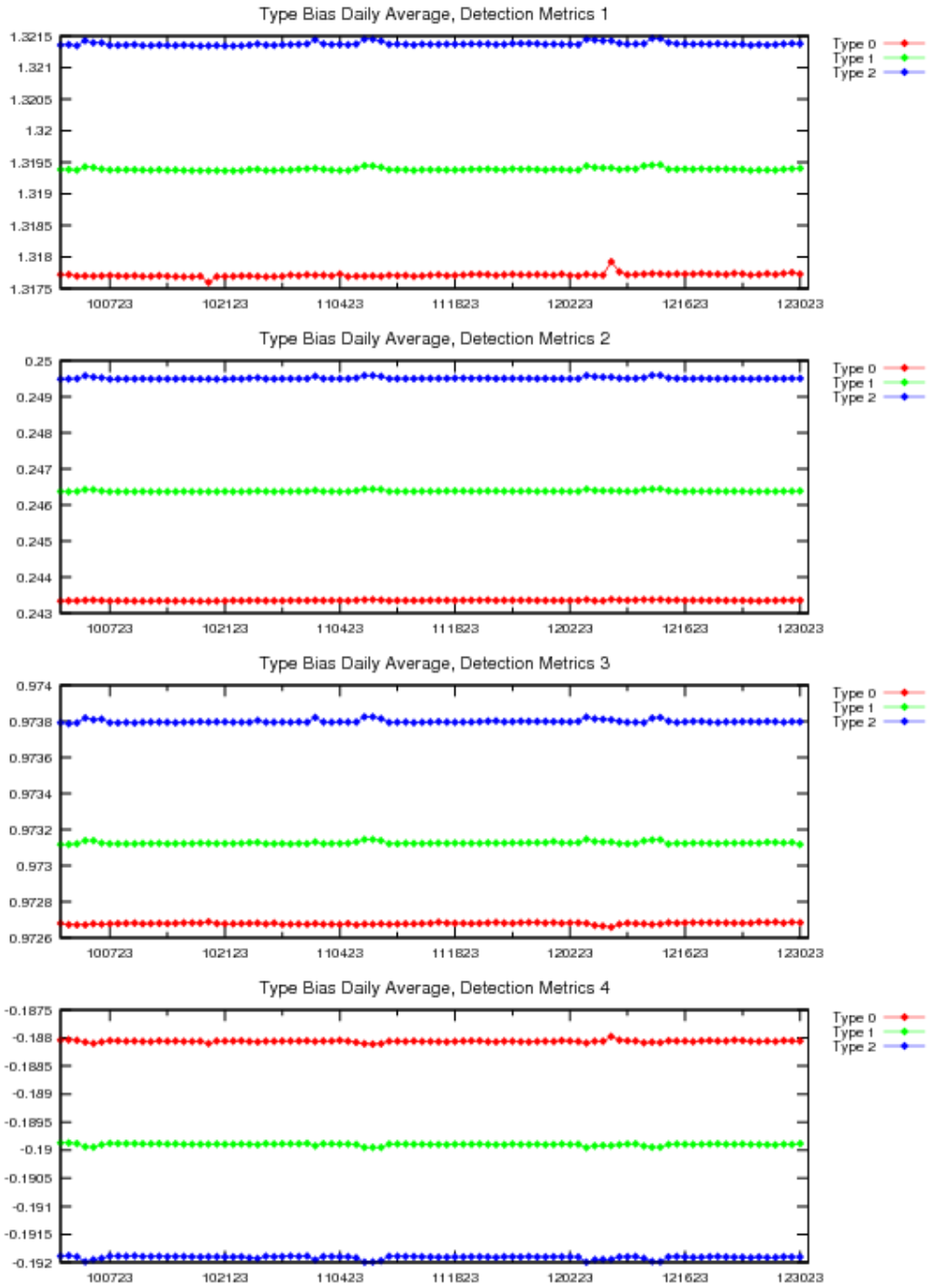

Figure 11-1 Type Bias Average Trend

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 0.0014343 observed on PRN22, (2) the maximum average for DM2 is 0.0002063 observed on PRN19, (3) the maximum average for DM3 is 0.0004421 observed on PRN18, (4) the maximum average for DM4 is 0.0006185 observed on PRN22.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1				
2	0.000256715	6.67297e-05	0.000105132	0.000108789
3	0.000192295	5.54846e-05	0.000104471	0.000132362
4	0.000689758	0.000249956	0.000392092	0.000257277
5	0.000150576	6.91396e-05	0.000101621	0.000106951
6	0.000624619	9.25253e-05	5.34495e-05	0.000246511
7	0.000158958	0.000120756	4.75308e-05	0.000121819
8	0.000360775	9.67703e-05	0.000114991	0.000180708
9	0.000240095	4.91264e-05	0.00016883	0.000162488
10	0.000178162	5.26209e-05	7.64615e-05	0.000157797
11	0.000298637	0.000134197	0.000382657	0.000342016
12	0.000323018	9.4844e-05	7.92967e-05	7.97451e-05
13	0.000636177	5.90495e-05	6.65901e-05	0.000273562
14	0.000512325	0.000203478	0.000394276	0.00024874
15	0.000354146	0.00011431	6.12571e-05	0.00010002
16	0.000204515	4.71011e-05	0.000118536	0.000203633
17	0.000355232	0.00010792	5.22451e-05	8.82846e-05
18	0.000636315	0.00018201	0.000442097	0.000263351
19	0.000724067	0.000206298	7.74088e-05	0.000124745
20	0.000176256	7.66791e-05	4.87934e-05	0.000138675
21	0.000208814	8.17989e-05	0.000123051	0.000459601
22	0.00143433	0.000146019	6.01516e-05	0.000618489
23	0.000401932	0.000178458	0.000360912	0.00026091
24	0.000199507	8.30582e-05	0.000212788	0.000272729
25	0.000451236	8.04582e-05	3.78176e-05	0.00021014
26	0.000202895	9.6311e-05	0.000114958	0.000169179
27	0.000353788	0.000154882	0.000197743	0.000358513
28	0.000274877	0.000112434	0.000380855	0.000344715
29	0.000315541	0.000136586	0.00015452	0.000260415
30	0.000311516	8.13802e-05	0.000118002	8.72648e-05
31	0.000227311	7.10978e-05	9.06538e-05	0.000187889
32	0.000257052	5.42363e-05	6.53758e-05	0.000205064

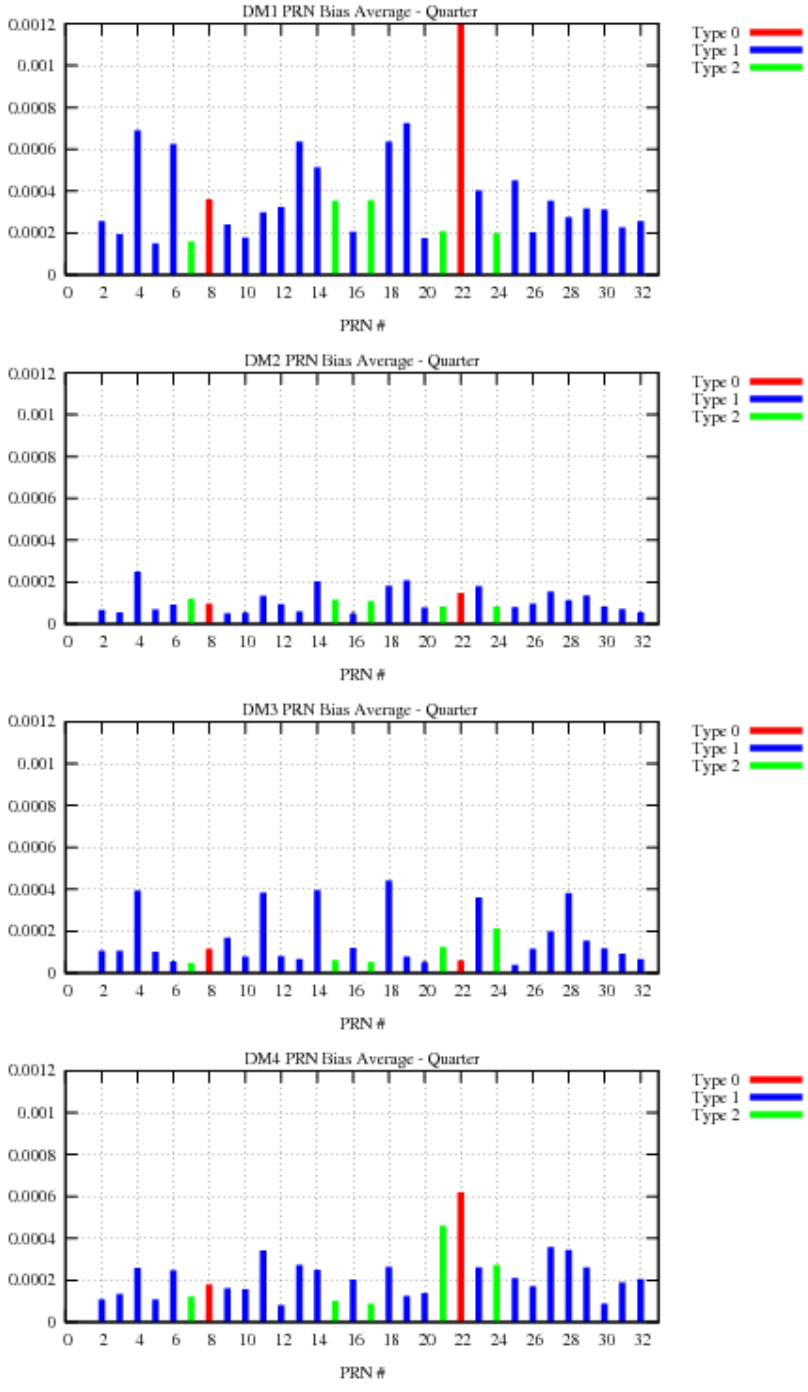

Figure 11-2 PRN Bias Average for the Quarter

Figure 11-3 through Figure 11-10 show the daily PRN bias for each PRN, for four detection metrics. PRN Bias for most PRNs show deviation from 10-04-2023 to 10-06-2023, 11-06-2023 to 11-09-2023, and 11-04-2023 to 11-14-2023 likely due to L2 signal power testing. Figure 11-3 shows no SQM data for PRN1 as a result of its decommissioning.

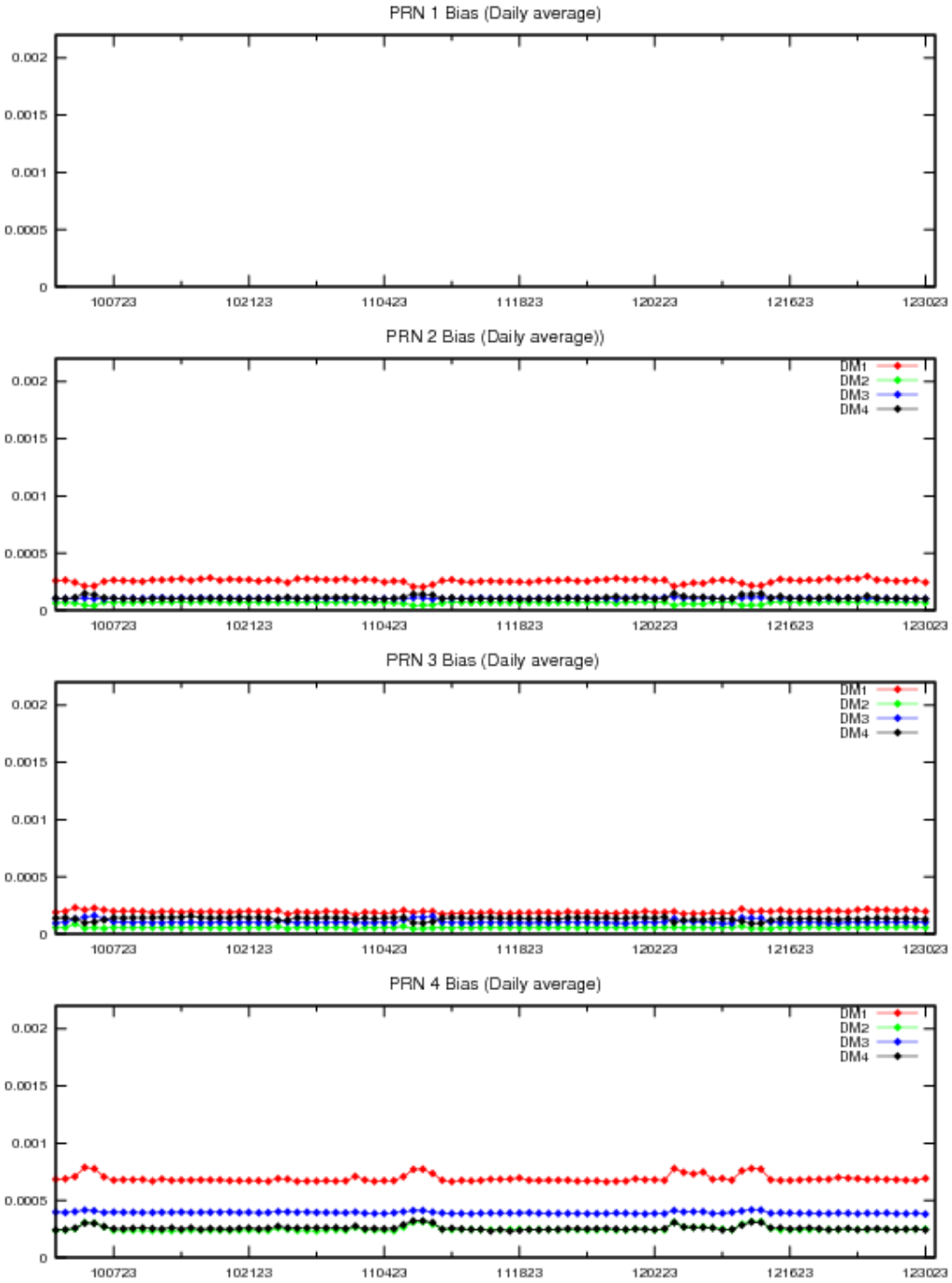

Figure 11-3 PRN Bias Average Trend (PRN1 – PRN4)

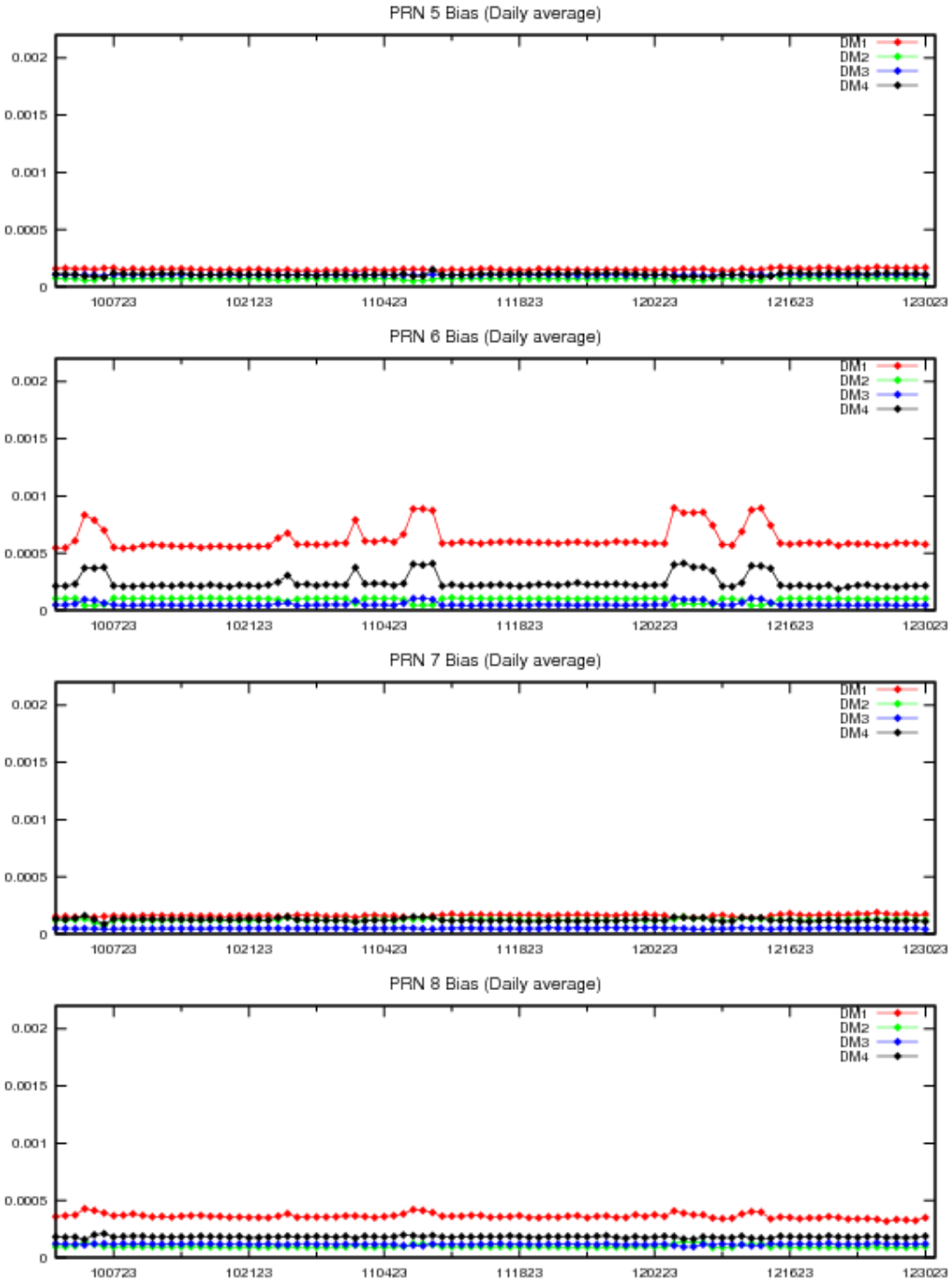

Figure 11-4 PRN Bias Average Trend (PRN5 – PRN8)

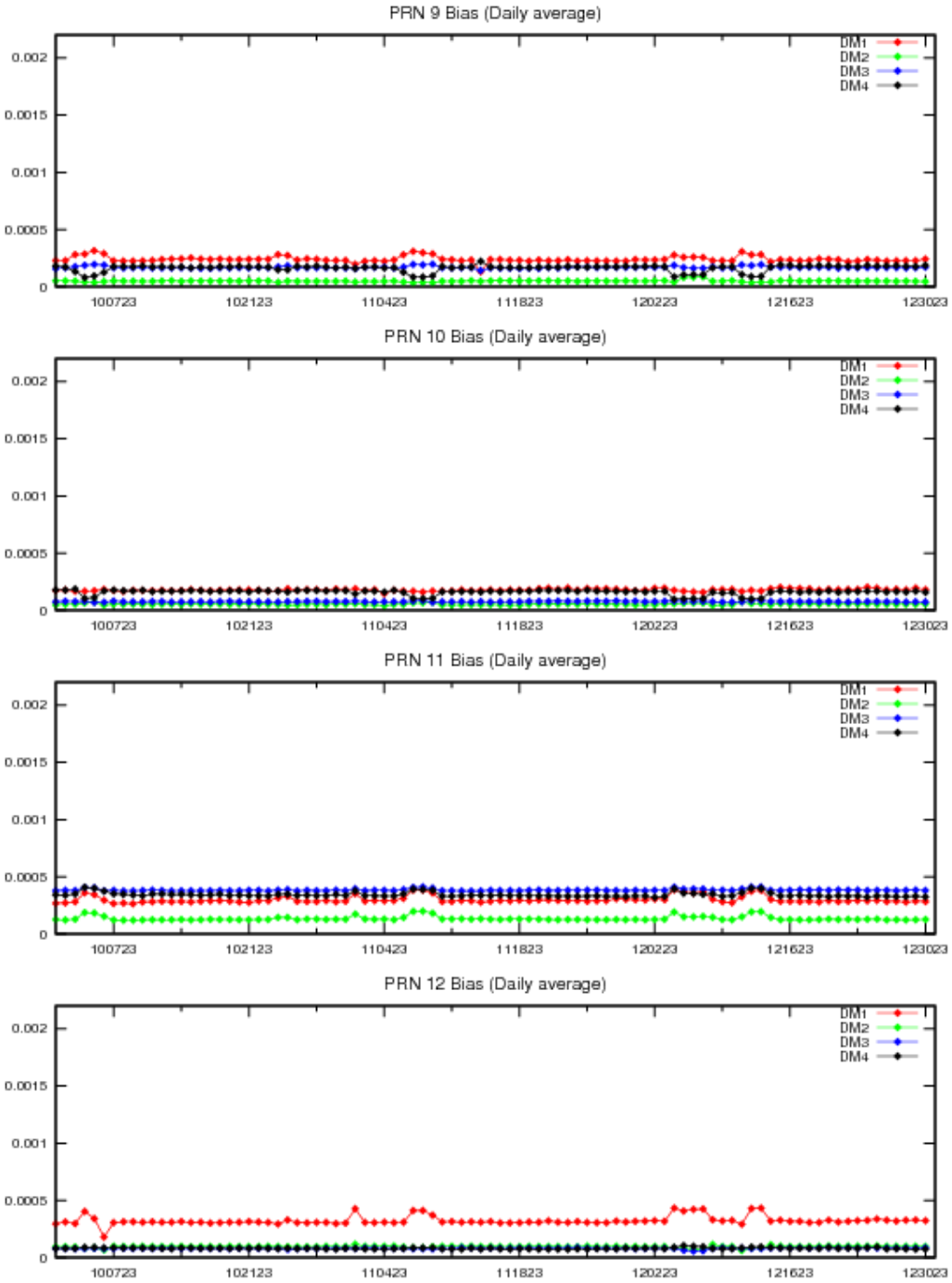

Figure 11-5 PRN Bias Average Trend (PRN9 – PRN12)

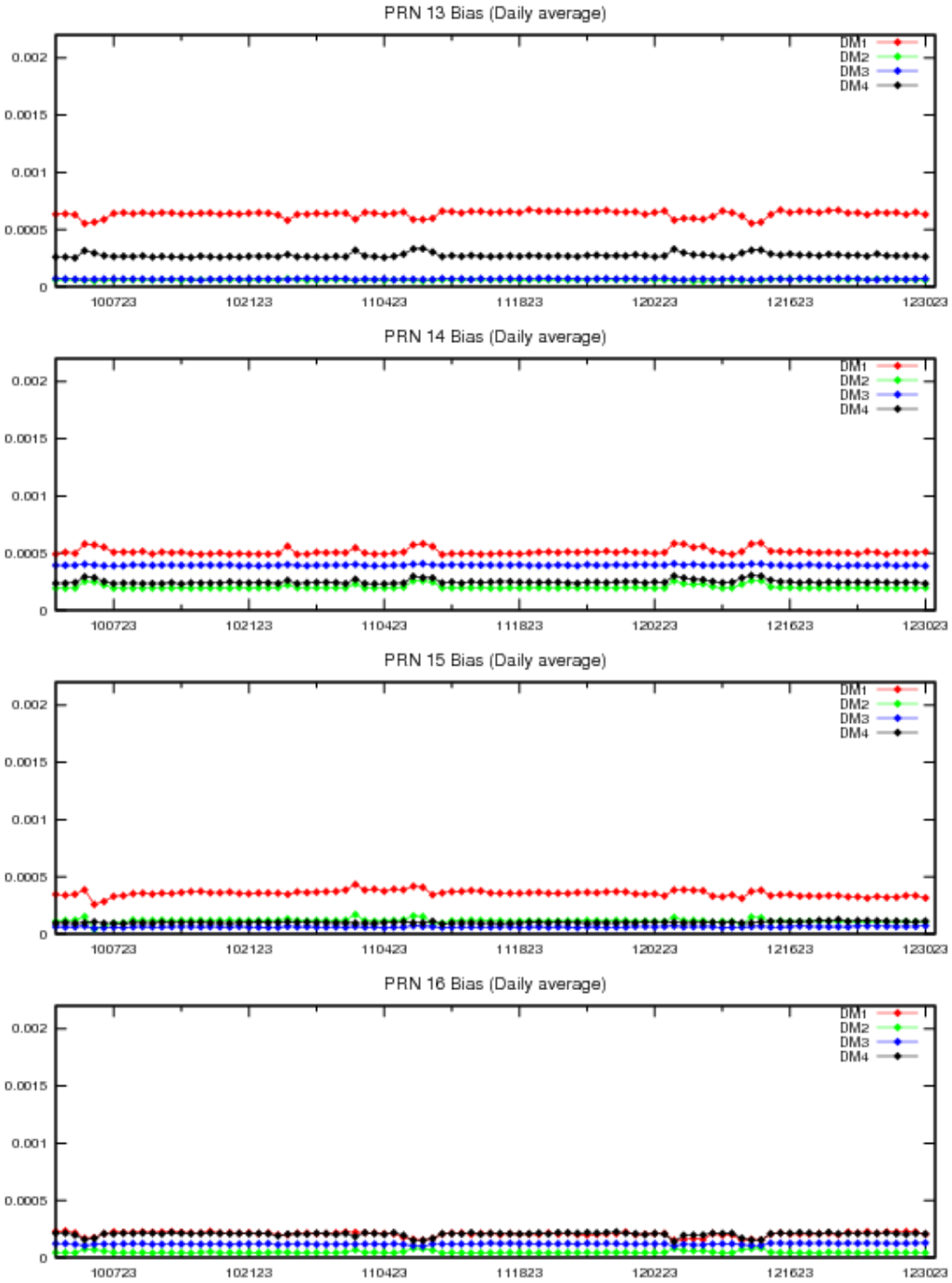

Figure 11-6 PRN Bias Average Trend (PRN13 – PRN16)

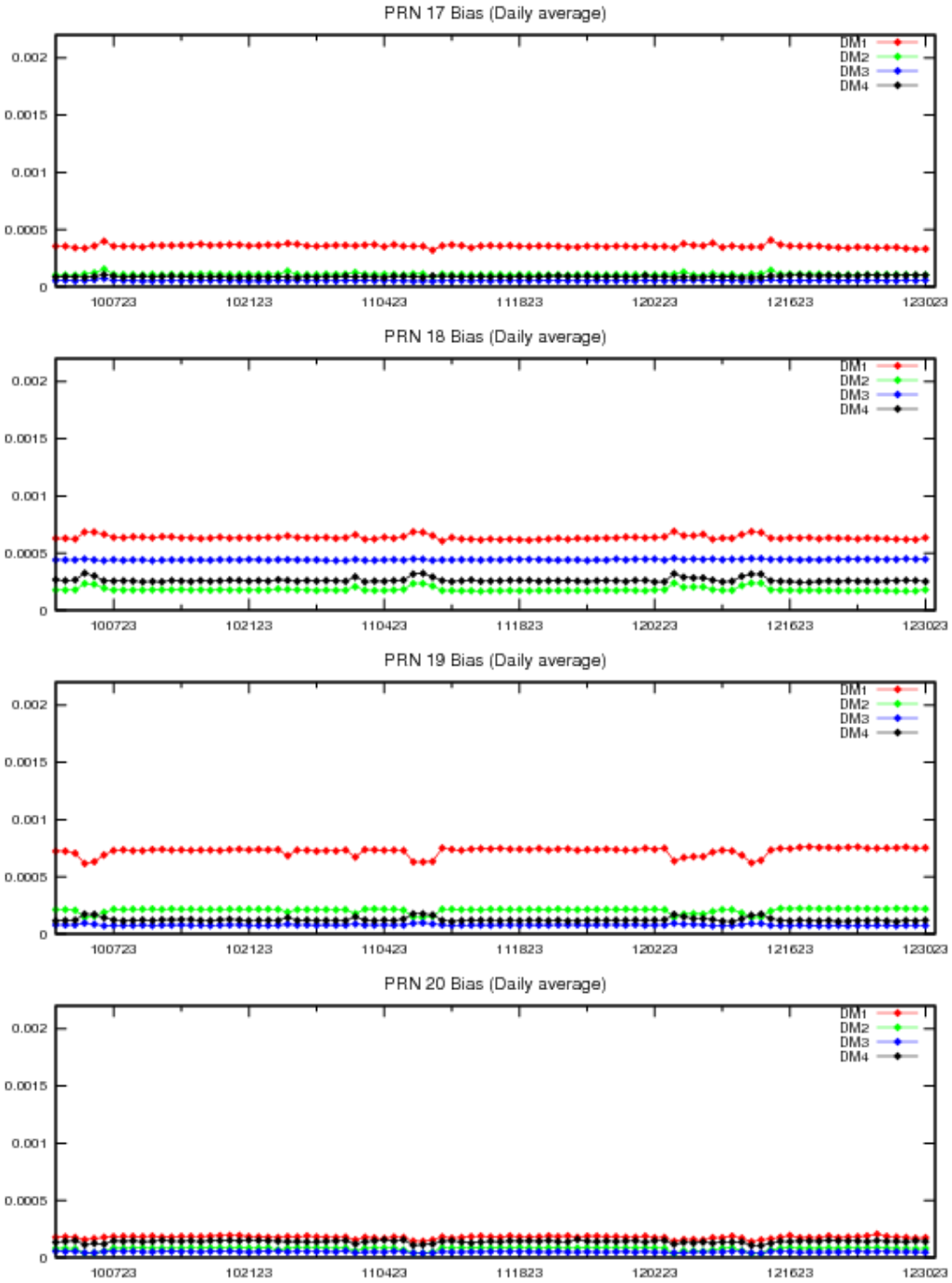

Figure 11-7 PRN Bias Average Trend (PRN17 – PRN20)

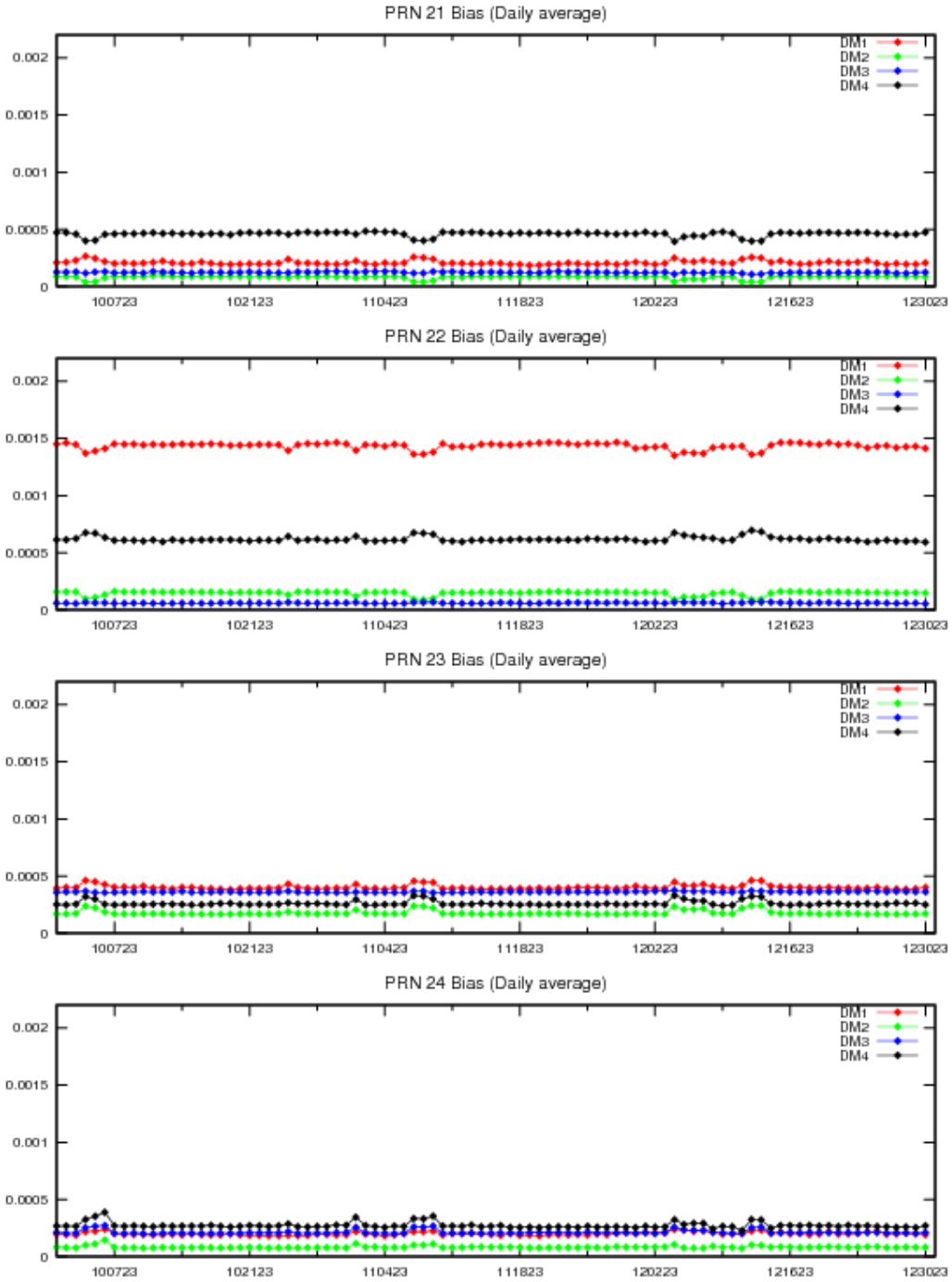

Figure 11-8 PRN Bias Average Trend (PRN21 – PRN24)

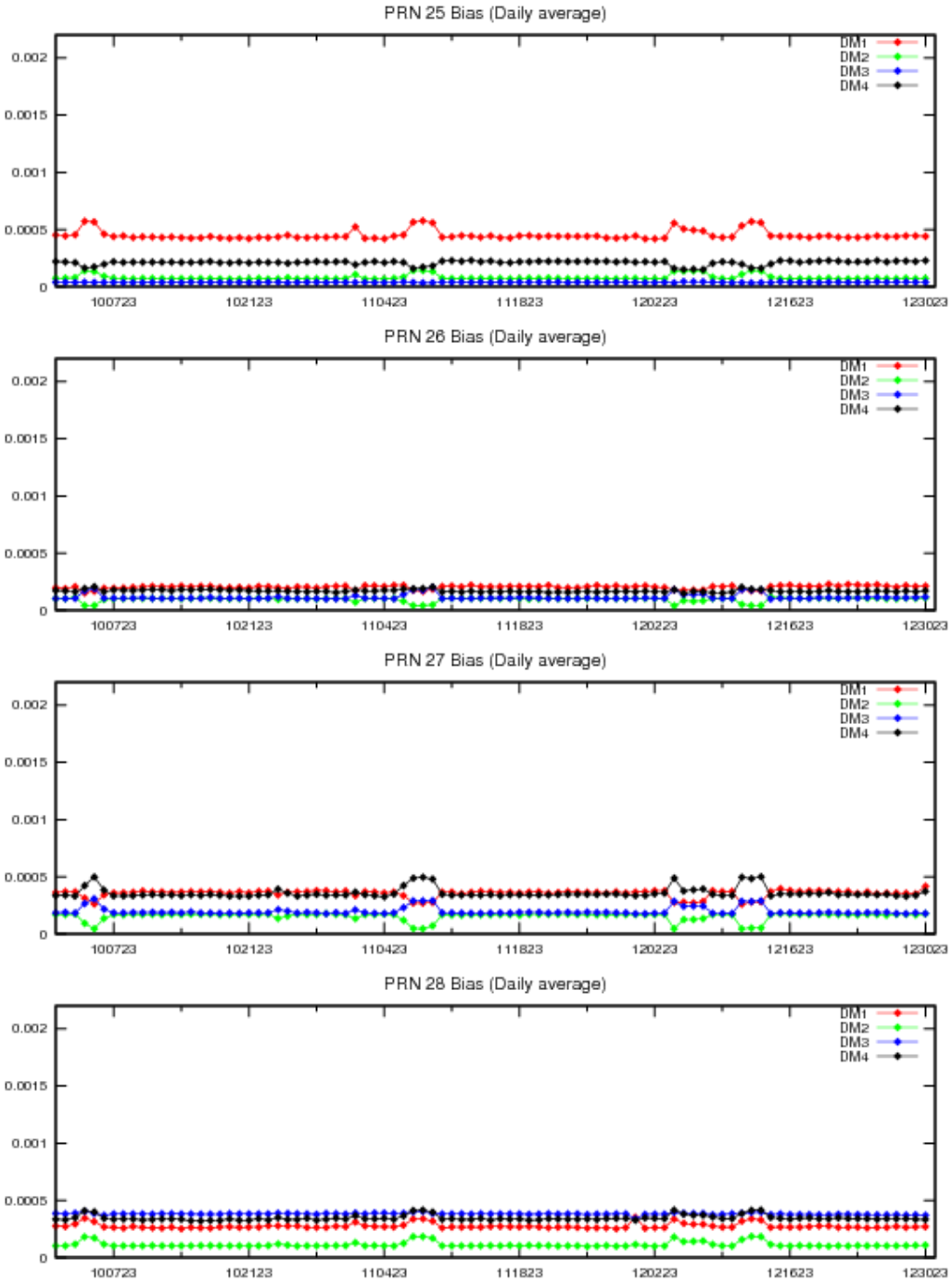

Figure 11-9 PRN Bias Average Trend (PRN25 – PRN28)

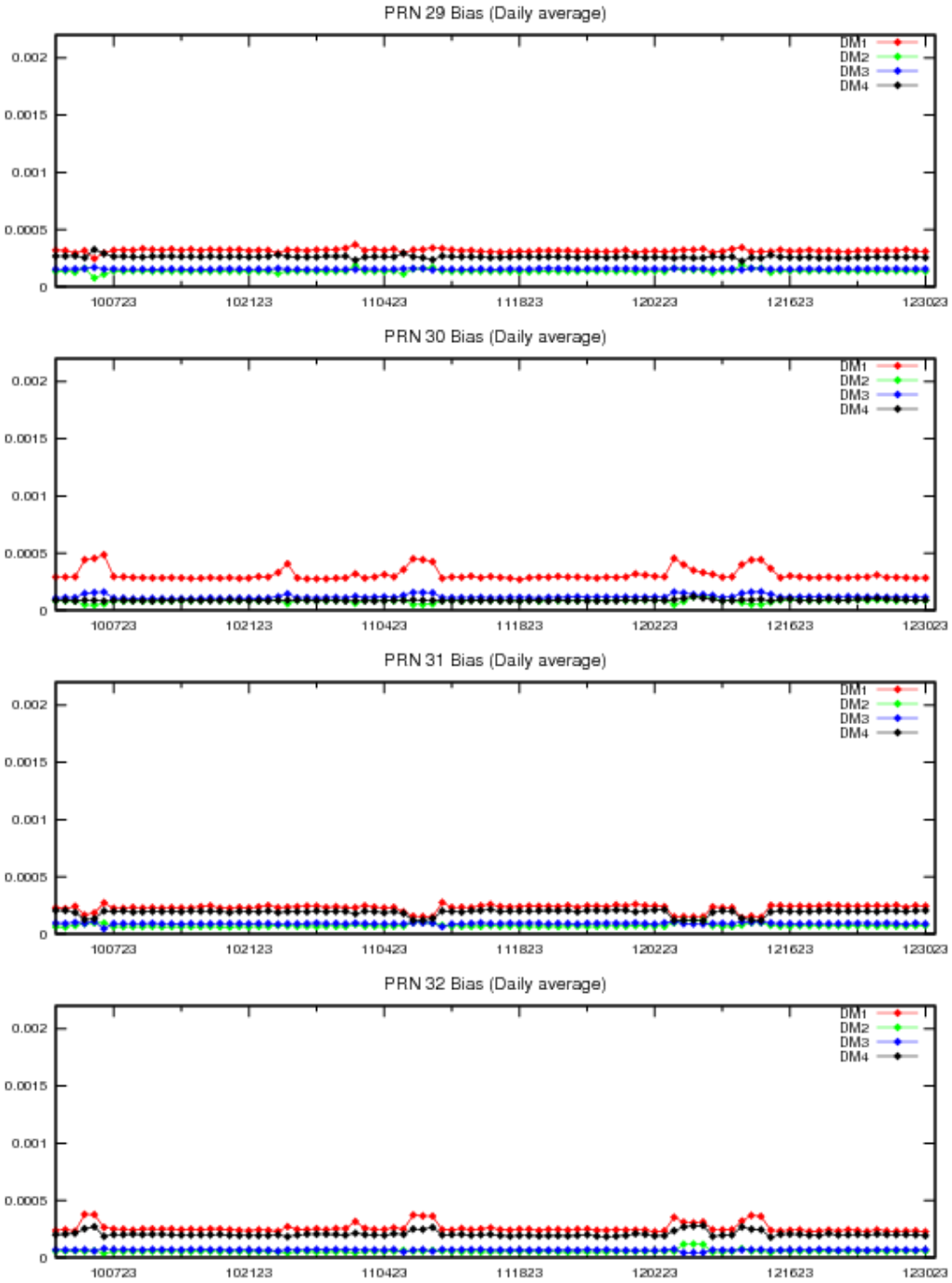

Figure 11-10 PRN Bias Average Trend (PRN29 – PRN32)

11.4 SQM Trips

SQM trips occur when the estimated deformation exceeds threshold. There we no SQM trips observed in this quarter.

APPENDIX A: GLOSSARY AND ACRONYMS

General Terms and Definitions

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

AMR. GEO PRN133

APC. Antenna phase center

ARP. Antenna reference point

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

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

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

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

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.

G30. GEO PRN135

GEO. Geostationary satellite

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

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.

GUS. Ground uplink station

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.

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).

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

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

IGS. International GPS Service.

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

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.

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.

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.

S15. GEO PRN133

SBAS. Space Based Augmentation System

SIS. Signal in space

SM9. GEO PRN131

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.

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

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.

VNAV. Vertical navigation

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.

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.

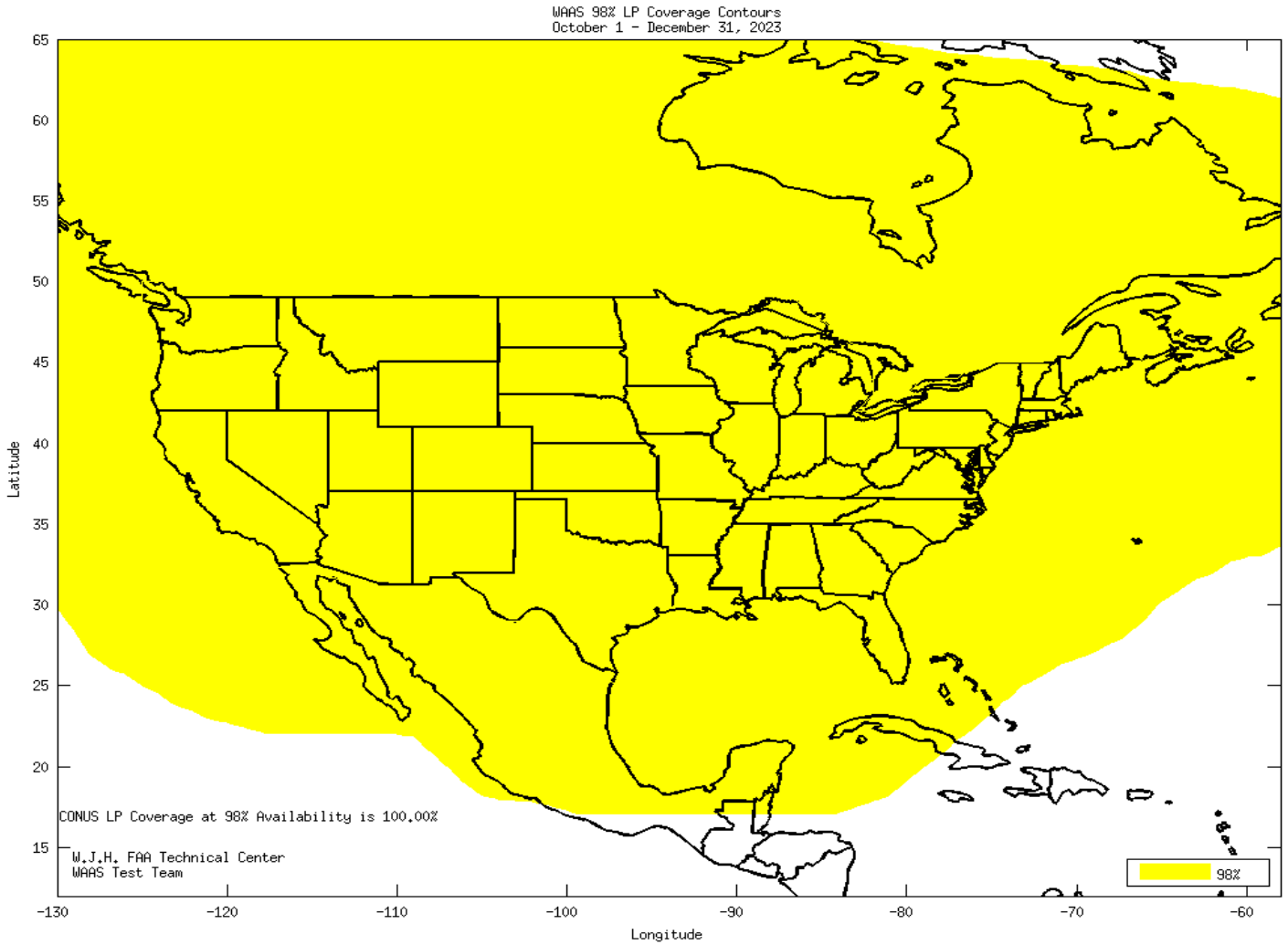

Figure B-1 98% CONUS LP Availability Contour

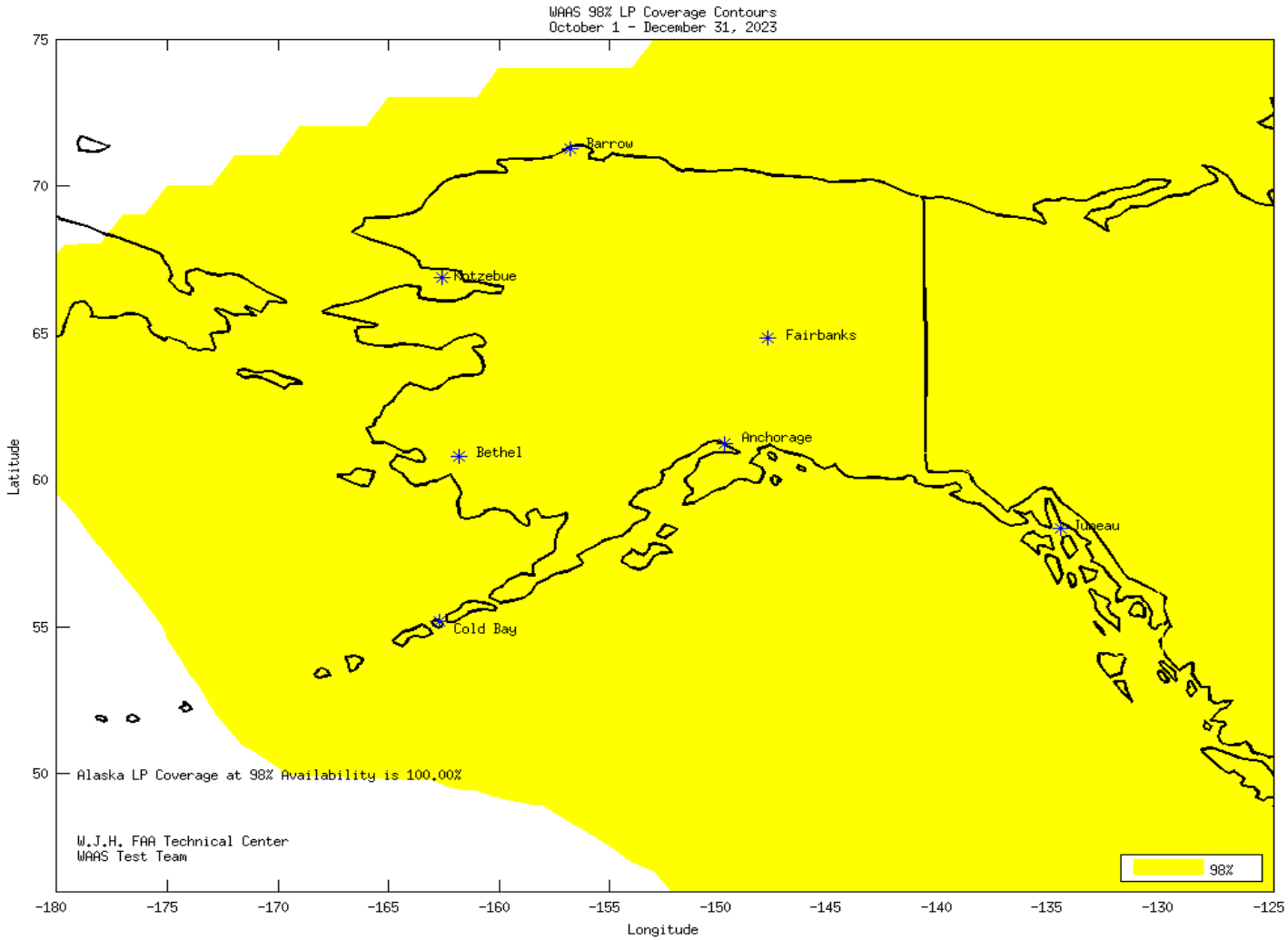

Figure B-2 98% Alaska LP Availability Contour

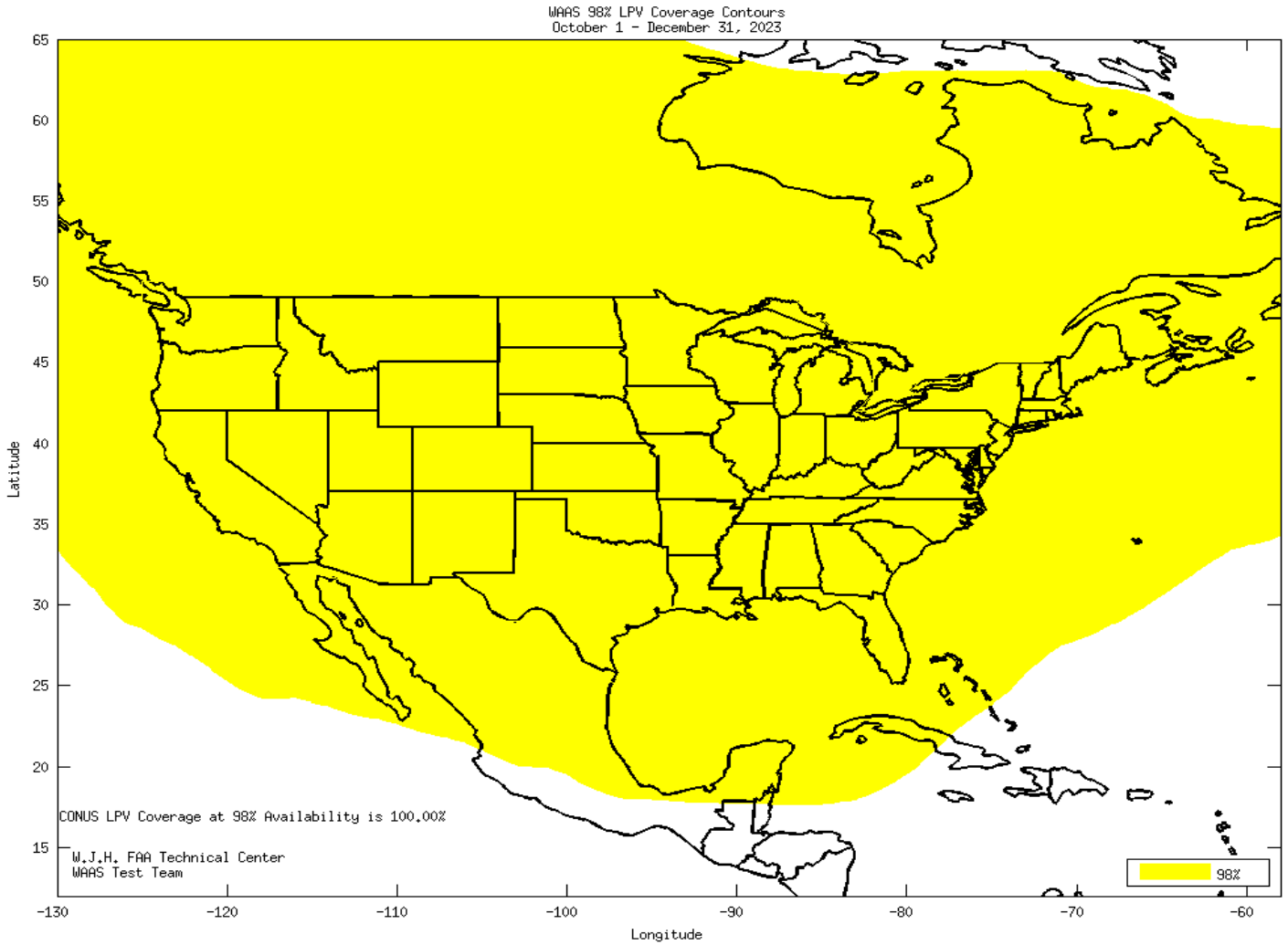

Figure B-3 98% CONUS LPV Availability Contour

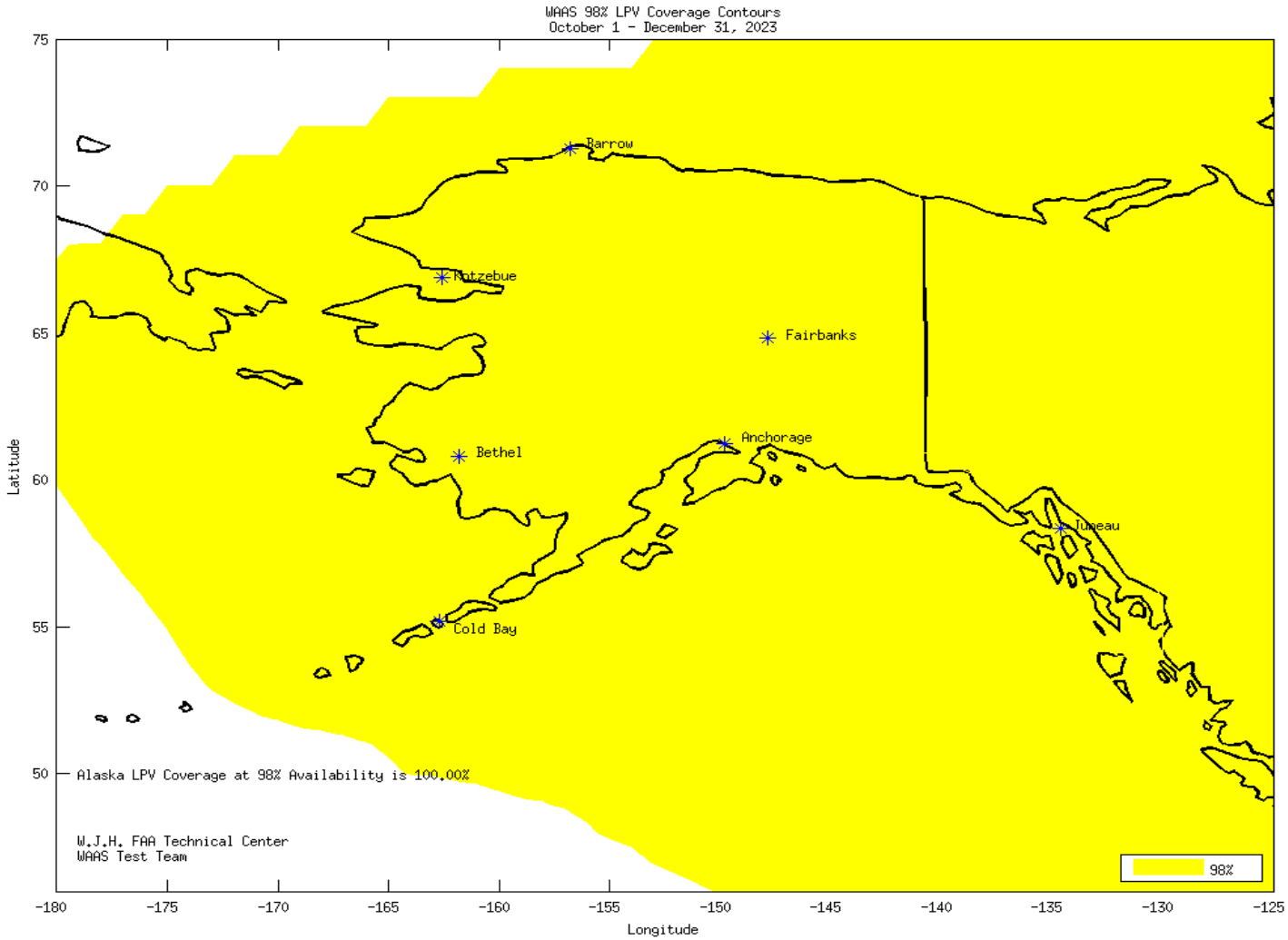

Figure B-4 98% Alaska LPV Availability Contour

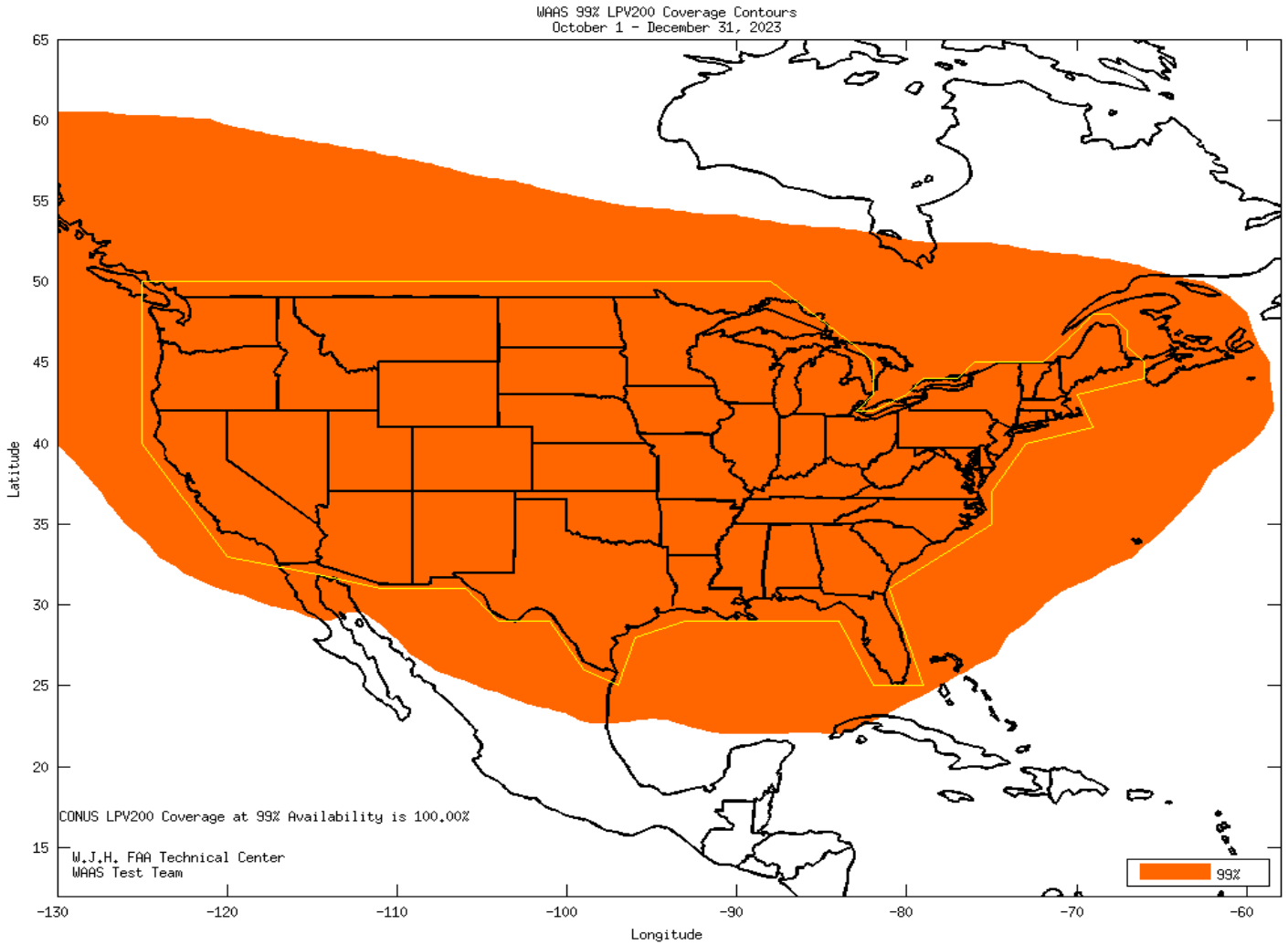

Figure B-5 99% CONUS LPV200 Availability Contour

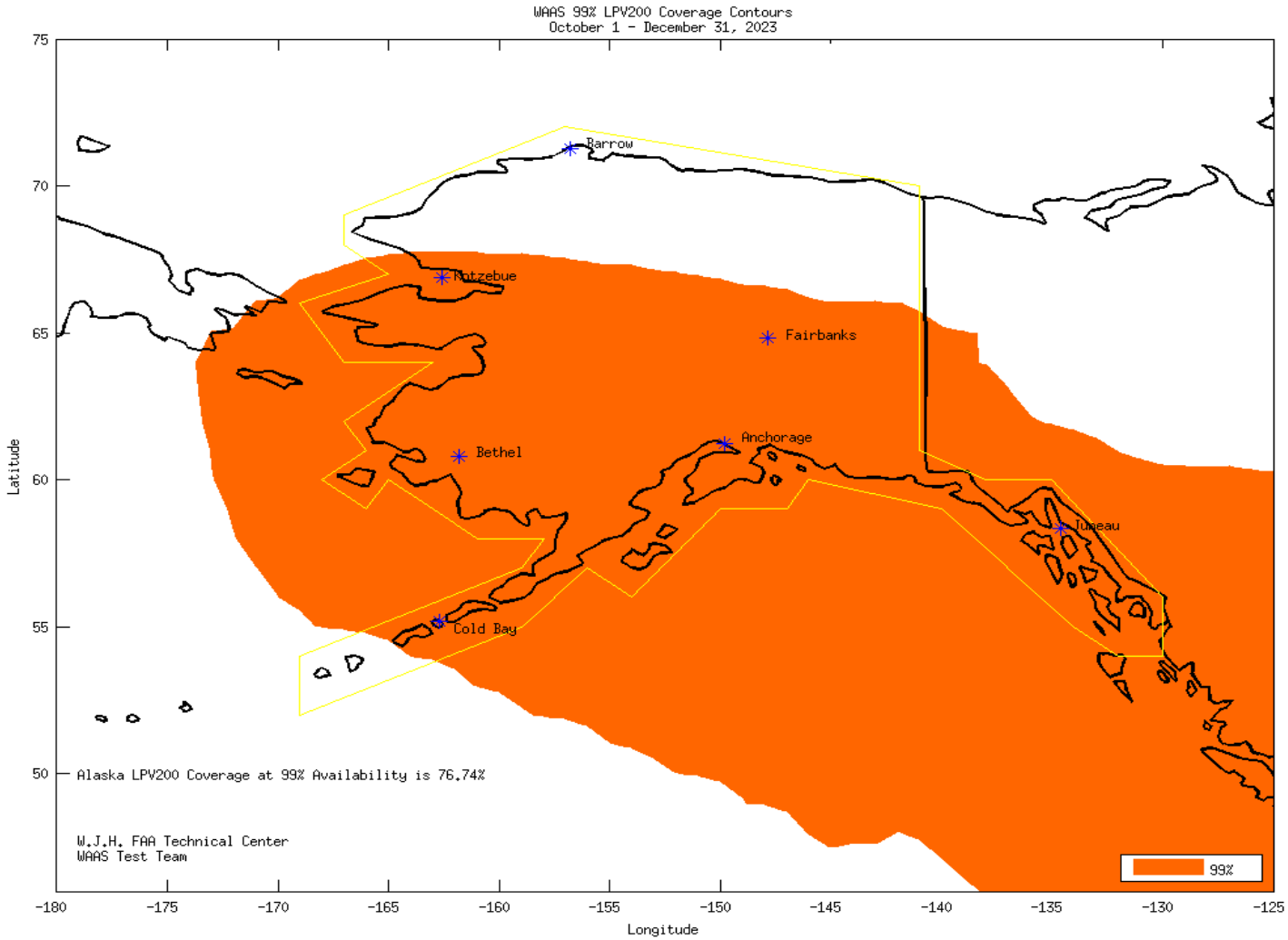

Figure B-6 99% Alaska LPV200 Availability Contour