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

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

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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 #84 provides WAAS performance data from the January 01 through March 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 FAA's National Satellite Test Bed sites—Grand Forks, North Dakota; Atlantic City, New Jersey; and Arcata, California—are outliers due to receiver quality issues, and not because of the WAAS signal in space quality.

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.496 meters	Memphis 0.576 meters	Barrow 1.043 meters	Bethel 0.783 meters
95% Vertical Accuracy (VPL <= 50 meters)	Atlantic City 1.976 meters	Denver 0.913 meters	Barrow 2.105 meters	Cold Bay 1.356 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Minneapolis 99.75%	Cold Bay 99.93%	Barrow 98.27%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Jacksonville 99.98%	Arcata 99.57%	Cold Bay 99.92%	Barrow 97.99%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Atlanta 99.96%	Arcata 99.29%	Bethel 99.35%	Barrow 96.28%
99% HPL	Miami 18.935 meters	Denver 10.968 meters	Barrow 57.608 meters	Cold Bay 21.365 meters
99% VPL	Arcata 33.734 meters	Dallas 20.764 meters	Barrow 95.091 meters	Bethel 30.994 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 to 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. PA Evaluation `Sites` lists the receivers used in the PA analyses, and NPA Evaluation `Site` lists the receivers used in the NPA analyses.

Table 1-2 PA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	76	6554526
Atlantic City	85	7355362
Oklahoma City	76	6588463
WAAS:		
Albuquerque	90	7774959
Anchorage	90	7774789
Atlanta	90	7773689
Barrow	90	7752831
Bethel	90	7759395
Billings	90	7775338
Boston	90	7774751
Chicago	90	7774992
Cleveland	90	7761115
Cold Bay	90	7775475
Dallas	90	7773773
Denver	90	7766109
Fairbanks	90	7774662
Gander	90	7772613
Goose Bay	90	7771006
Houston	90	7771397
Iqaluit	90	7747757
Jacksonville	90	7775417
Juneau	90	7764357
Kansas City	90	7772082
Kotzebue	90	7739158
Los Angeles	90	7770238
Memphis	90	7775090
Merida	87	7551808
Mexico City	90	7752962
Miami	90	7774101
Minneapolis	90	7775589
New York	90	7775589
Oakland	90	7770569
Puerto Vallarta	87	7521865
Salt Lake City	90	7774761
San Jose Del Cabo	84	7216205
Seattle	90	7771206
Washington, DC	90	7775364
Winnipeg	90	7775016

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	89	7685347
Anchorage	89	7685278
Atlanta	89	7685312
Barrow	89	7663024
Bethel	89	7669020
Billings	89	7685138
Boston	89	7646832
Cleveland	89	7685347
Cold Bay	89	7685259
Fairbanks	89	7685039
Gander	89	7685130
Honolulu	89	7683287
Houston	89	7685346
Iqaluit	89	7662164
Juneau	89	7685348
Kansas City	89	7683898
Kotzebue	88	7577744
Los Angeles	89	7685347
Merida	50	4315251
Miami	89	7685281
Minneapolis	89	7685349
Oakland	89	7685350
Salt Lake City	89	7685345
San Jose Del Cabo	85	7354328
San Juan	89	7685343
Seattle	89	7685345
Tapachula	88	7599161
Washington, DC	89	7684597

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

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
01/13/2023	01/14/2023	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 activity caused multiple IGPs along latitudes 65 to 70 to enter storm state. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 22:45 UTC on 01/13 to 01:55 UTC on 1/14, (2) LPV200 service coverage in Canada from 17:35 UTC on 01/13 to 02:00 UTC on 01/14, (3) LPV service coverage in Alaska from 22:45 UTC on 01/13 to 01:55 UTC on 01/14, and (4) LPV service coverage in Canada from 19:25 UTC on 01/13 to 01:00 UTC on 01/14. Please see plot(s): LPV_1/13/2023 LPV200_1/13/2023 LPV_1/14/2023 LPV200_1/14/2023.
01/14/2023	01/15/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska LPV_Canada LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=3.67) disturbed the ionosphere causing elevated GIVE values. This activity caused multiple IGPs along latitudes 65 to 70 to enter storm state. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 22:40 UTC on 01/14 to 02:05 UTC on 01/15, (2) LPV200 service coverage in Canada from 20:55 UTC on 01/14 to 02:10 UTC on 01/15, (3) LPV service coverage in Alaska from 23:35 UTC on 01/14 to 02:05 UTC on 01/15, and (4) LPV service coverage in Canada from 22:10 UTC on 01/14 to 02:05 UTC on 01/15. Please see plot(s): LPV_1/14/2023 LPV200_1/14/2023 LP_1/15/2023 LPV_1/15/2023
01/16/2023	01/16/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_CONUS LPV_Alaska LPV_Canada LPV200_CONUS 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 CONUS from 22:40 UTC on 01/15 to 00:35 UTC on 01/16, (2) LPV service coverage in CONUS from 22:55 UTC on 01/15 to 00:35 on 01/16, (3) LPV200 service coverage in Alaska from 22:45 UTC on 01/15 to 00:40 UTC on 01/16, (4) LPV service coverage in Alaska from 22:50 UTC on 01/15 to 00:35 UTC on 01/16, (5) LPV200 service coverage in Canada from 16:00 UTC on 01/15 to 00:45 UTC on 01/16, and (6) LPV service coverage in Canada from 19:35 UTC on 01/15 to 00:45 UTC on 01/16. Please see plot(s): LPV_1/16/2023 LPV200_1/16/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
01/20/2023	01/20/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:50 UTC to 16:20 UTC Please see plot(s): LPV200_1/20/2023 Cov_vs_Time_Canada_1/20/2023
01/21/2023	01/21/2023	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: (1) LPV200 service coverage in Canada from 16:00 UTC to 16:15 UTC and from 20:35 UTC to 21:30 UTC and (2) LPV service coverage in Canada from 17:55 UTC to 19:15 UTC. Please see plot(s): LPV_1/21/2023 LPV200_1/21/2023 Cov_vs_Time_Canada_1/21/2023
01/22/2023	01/22/2023	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 17:20 UTC to 19:00 UTC and from 20:30 UTC to 22:05 UTC. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 21:00 UTC to 21:55 UTC. Please see plot(s): LPV_1/22/2023 LPV200_1/22/2023 Cov_vs_Time_Canada_1/22/2023
01/23/2023	01/23/2023	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 14:55 UTC to 23:00 UTC. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 15:35 UTC to 20:30 UTC. Please see plot(s): LPV_1/23/2023 LPV200_1/23/2023 Cov_vs_Time_Canada_1/23/2023
01/25/2023	01/25/2023	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: (1) LPV200 service coverage in Canada from 15:25 UTC to 17:30 UTC and from 22:45 UTC to 23:00 UTC and (2) LPV service coverage in Canada from 22:45 UTC to 23:00 UTC. Please see plot(s):

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_1/25/2023 Cov_vs_Time_Canada_1/25/2023
01/25/2023	03/31/2023		LPV200_CONUS	Beginning 01/25/23 the Tech Center began observing minor degradation of LPV200 service in the Gulf of Mexico and the Florida panhandle. This is due to an increase of dilution of precision in the region.
01/25/2023	01/26/2023	PRN1	LPV_Canada LPV200_Alaska LPV200_Canada	The reduction in LPV200 service in Alaska and Canada was due to a GPS NANU on PRN1 (see NANU2023008), which was unusable from 16:00 UTC on 01/25 to 15:41 UTC on 01/26. The NANU along with Geomagnetic activity (see event 22160) caused moderate degradation of: (1) LPV200 service coverage in Alaska from 00:55 UTC to 01:10 UTC and from 12:35 UTC to 13:05 UTC, (2) LPV200 service coverage in Canada from 00:10 UTC to 00:15 UTC and from 13:30 UTC to 13:50 UTC, and (3) LPV service coverage in Canada from 00:10 UTC to 00:15 UTC. Please see plot(s): LPV_1/26/2023 LPV200_1/26/2023 Cov_vs_Time_Alaska_1/26/2023 Cov_vs_Time_Canada_1/26/2023
01/26/2023	01/26/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. Along with the NANU on PRN1 (see event 22142), this resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 00:55 UTC to 01:10 UTC and from 12:35 UTC to 13:05 UTC, (2) LPV200 service coverage in Canada from 00:10 UTC to 00:15 UTC and from 13:30 UTC to 13:50 UTC, and (3) LPV service coverage in Canada from 00:10 UTC to 00:15 UTC Please see plot(s): LPV_1/26/2023 LPV200_1/26/2023 Cov_vs_Time_Alaska_1/26/2023 Cov_vs_Time_Canada_1/26/2023
01/26/2023	01/26/2023	PRN25	LPV200_Canada	The reduction in LPV200 service in Canada was due to a GPS NANU on PRN25 (see NANU2023009), which was unusable from 15:35 UTC to 21:25 UTC. The NANU caused moderate degradation of LPV200 service coverage in Canada from 21:05 UTC to 21:40 UTC. Please see plot(s): LPV200_1/26/2023 Cov_vs_Time_Canada_1/26/2023
01/28/2023	02/02/2023	PRN1	LPV200_Alaska LPV200_Canada	The reduction in LPV200 service in Alaska and Canada was due to a GPS NANU on PRN1 (see NANU20230011), which was unusable from 15:00 UTC on 01/28 to 22:22 UTC on 02/02. The NANU caused moderate degradation of: (1) LPV200

Start Date	End Date	Location Satellite	Service Affected	Event Description
				service coverage in Alaska from 12:20 UTC to 12:50 UTC and (2) LPV200 service coverage in Canada from 00:10 UTC to 00:15 UTC and from 12:30 UTC to 12:55 UTC on each day of this NANU spanned. Please see plot(s): LPV200_1/29/2023 Cov_vs_Time_Alaska_1/29/2023 Cov_vs_Time_Conus_1/29/2023
01/31/2023	01/31/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_CONUS LPV200_Canada	Geomagnetic activity (KP=3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 16:45 UTC to 20:50 UTC and (2) LPV service coverage in Canada from 17:30 UTC to 19:16 UTC. The elevated GIVE values also results in minor degradation of LPV200 service coverage in CONUS (California) from 12:00 UTC to 12:10 UTC. Please see plot(s): LPV_1/31/2023 LPV200_1/31/2023 Cov_vs_Time_Canada_1/31/2023 Cov_vs_Time_Conus_1/31/2023
02/01/2023	02/02/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 19:45 UTC to 20:55 UTC and from 21:15 UTC until the end of the day. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 22:05 UTC to 23:10 UTC. Please see plot(s): LPV_2/1/2023 LPV200_2/1/2023 Cov_vs_Time_Canada_2/1/2023
02/02/2023	02/02/2023	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 LPV200 service coverage in Canada from 00:00 UTC to 02:10 UTC, also from 02:30 UTC to 03:00 UTC and from 21:30 UTC to 22:40 UTC. The elevated GIVE values also resulted in: (1) moderate degradation of LPV200 service coverage in Alaska from 00:10 UTC to 01:05 UTC and from 22:00 UTC to 22:15 UTC and (2) moderate degradation of LPV service coverage in Canada from 00:30 UTC to 01:30 UTC. Please see plot(s): LPV_2/2/2023 LPV200_2/2/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Alaska_2/2/2023 Cov_vs_Time_Canada_2/2/2023
02/03/2023	02/03/2023	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 significant degradation of: (1) LPV200 service coverage in Canada from 17:00 UTC to 20:30 UTC and (2) LPV service coverage in Canada from 17:40 UTC to 20:25 UTC. Please see plot(s): LPV_2/3/2023 LPV200_2/3/2023 Cov_vs_Time_Canada_2/3/2023
02/05/2023	02/05/2023	Washington D.C. (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 20:00 UTC to 21:15 UTC and from 21:55 UTC to 22:25 UTC. Please see plot(s): LPV200_2/5/2023 Cov_vs_Time_Canada_2/5/2023
02/06/2023	02/07/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=3.67) disturbed the ionosphere causing elevated GIVE values. This activity caused multiple IGPs along latitude 70, longitude -170 through -140 to enter storm state on 2/7. This resulted in significant degradation of LPV200 service coverage in (1) Alaska from 23:30 UTC on 02/06 to 03:10 UTC on 02/07 and (2) Canada from 12:10 UTC on 02/06 to 13:00 UTC on 02/06 and from 17:05 UTC on 02/06 to 03:10 UTC on 2/7. The elevated GIVEs also resulted in significant degradation of LPV service coverage in CANADA from 18:45 UTC on 02/06 to 21:00 UTC on 02/06 and from 23:35 UTC on 2/6 to 01:50 UTC on 02/07 and moderate degradation in Alaska from 00:30 UTC on 02/07 to 02:30 UTC on 02/07. The elevated GIVE values also resulted in minor degradation LPV200 service coverage in CONUS from 17:35 UTC on 02/06 to 18:05 UTC on 02/06. Please see plot(s): LPV_2/6/2023 LPV200_2/6/2023 Cov_vs_Time_Alaska_2/6/2023 Cov_vs_Time_Canada_2/6/2023 Cov_vs_Time_Conus_2/6/2023 LPV_2/7/2023 LPV200_2/7/2023 Cov_vs_Time_Alaska_2/7/2023 Cov_vs_Time_Canada_2/7/2023 Cov_vs_Time_Conus_2/7/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
02/07/2023	02/08/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP=4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:55 UTC on 02/07 to 03:00 UTC on 02/08. Please see plot(s): LPV200_2/7/2023 Cov_vs_Time_Conus_2/7/2023 LPV200_2/8/2023 Cov_vs_Time_Conus_2/8/2023
02/08/2023	02/09/2023	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 LPV200 service coverage in Canada from 17:25 UTC on 02/08 to 02:45 UTC on 02/09 and moderate degradation of LPV200 service coverage in Alaska from 23:05 UTC on 02/08 to 02:10 UTC on 02/09. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 19:20 UTC on 02/08 to 01:30 UTC on 02/09. Please see plot(s): LPV_2/8/2023 LPV200_2/8/2023 Cov_vs_Time_Alaska_2/8/2023 Cov_vs_Time_Canada_2/8/2023 LPV_2/9/2023 LPV200_2/9/2023 Cov_vs_Time_Alaska_2/9/2023 Cov_vs_Time_Canada_2/9/2023
02/09/2023	02/10/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska 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 Canada from 18:45 UTC on 02/09 to 03:50 UTC on 02/10 and (2) LPV service coverage in Canada from 19:25 UTC on 02/09 to 03:50 UTC on 02/10. The elevated GIVE values also resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 21:00 UTC on 02/09 to 22:00 UTC and from 22:25 UTC to 23:35 UTC and (2) LPV service coverage in Alaska from 23:15 UTC on 2/9 to 03:45 UTC on 02/10. The elevated GIVE values also resulted in minor degradation of LPV200 service coverage in CONUS from 00:10 UTC on 02/10 to 00:45 UTC on 02/10. Please see plot(s): LPV_2/9/2023 LPV200_2/9/2023 Cov_vs_Time_Alaska_2/9/2023 Cov_vs_Time_Canada_2/9/2023 LPV_2/10/2023 LPV200_2/10/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Alaska_2/10/2023 Cov_vs_Time_Canada_2/10/2023
02/10/2023	02/10/2023	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 significant degradation of LPV200 service coverage in: (1) Alaska from 21:00 UTC on 02/10 to 02:45 UTC on 2/11 and (2) Canada from 18:45 UTC on 02/10 to 02:45 UTC on 02/11. The elevated GIVE values also resulted in significant degradation of LPV service coverage in: (1) Alaska from 22:00 UTC on 02/10 to 02:45 UTC on 02/11 and (2) Canada from 19:40 UTC on 02/10 to 02:35 UTC on 02/11. Please see plot(s): LPV_2/10/2023 LPV200_2/10/2023 Cov_vs_Time_Alaska_2/10/2023 Cov_vs_Time_Canada_2/10/2023
02/12/2023	02/12/2023	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 17:55 UTC to the end on the day; (2) LPV service coverage in Canada from 19:40 UTC on to 22:45 UTC. Please see plot(s): LPV_2/12/2023 LPV200_2/12/2023 Cov_vs_Time_Canada_2/12/2023
02/13/2023	02/13/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP=2) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 20:50 UTC to 23:50 UTC. Please see plot(s): LPV200_2/13/2023 Cov_vs_Time_Conus_2/13/2023
02/14/2023	02/14/2023	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 17:20 UTC to 22:30 UTC. The elevated gives also resulted in moderate degradation of LPV service coverage in Canada from 21:00 UTC to 22:15 UTC. Please see plot(s): LPV_2/14/2023 LPV200_2/14/2023 Cov_vs_Time_Canada_2/14/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
02/15/2023	02/16/2023	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) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 08:10 UTC on 02/15 to 13:30 UTC on 02/15 and from 19:10 UTC on 02/15 to 00:40 UTC on 2/16, (2) LPV200 service coverage in Alaska from 08:00 UTC on 02/15 to 15:20 UTC on 02/15 and from 20:30 UTC on 02/15 to 00:25 UTC on 02/16, (3) LPV200 service coverage in Canada from 16:05 UTC on 02/15 to 00:50 UTC on 02/16, (4) LPV service coverage in CONUS from 19:30 UTC on 02/15 to 00:15 UTC on 02/16. (5) LPV service coverage in Alaska from 08:45 UTC on 2/15 to 12:20 UTC on 02/15 and from 22:20 UTC on 02/15 to 00:10 UTC on 02/16, and (6) LPV service coverage in Canada from 10:40 UTC on 02/15 to 12:05 UTC on 02/15 and from 16:40 UTC on 02/15 to 00:45 UTC on 02/16. Please see plot(s): LPV_2/15/2023 LPV200_2/15/2023 Cov_vs_Time_Alaska_2/15/2023 Cov_vs_Time_Canada_2/15/2023 Cov_vs_Time_Conus_2/15/2023 LPV_2/16/2023 LPV200_2/16/2023 Cov_vs_Time_Alaska_2/16/2023 Cov_vs_Time_Canada_2/16/2023 Cov_vs_Time_Conus_2/16/2023
02/16/2023	02/16/2023	PRN28	None	SVN79 (PRN28) was launched on 01/18 (see NANU 2023007). PRN28 became operational on 02/16 (see NANU2023013).
02/16/2023	02/17/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 14:00 UTC on 02/16 to 17:30 UTC on 02/16 and (2) LPV service coverage in Canada from 15:20 UTC on 02/16 to 17:05 UTC on 02/16. The elevated GIVE values also resulted in moderate degradation of LPV200 coverage service in CONUS from 02:30 UTC on 02/16 to 02:55 UTC on 02/16, 10:50 UTC on 02/16 to 11:10 UTC on 02/16, and 16:50 UTC on 02/16 to 17:15 UTC on 02/16. The elevated GIVE values also resulted in minor degradation of LPV200 coverage service in Alaska from 01:55 UTC on 02/16 to 02:35 UTC on 02/16, 08:25 UTC on 02/16 to 09:45 UTC on 02/16, 11:05 UTC on 02/16 to 12:15 UTC on 02/16, 20:30 UTC on 02/16 to 21:35 UTC on 02/16, and 23:05 UTC on 02/16 to 00:10 UTC on 02/17. Please see plot(s): LPV_2/16/2023 LPV200_2/16/2023 Cov_vs_Time_Alaska_2/16/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Canada_2/16/2023 LPV200_2/17/2023 Cov_vs_Time_Conus_2/17/2023
02/18/2023	02/18/2023	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 19:05 UTC to 19:45 UTC and from 20:25 UTC to 21:45 UTC. Please see plot(s): LPV200_2/18/2023 Cov_vs_Time_Canada_2/18/2023
02/19/2023	02/19/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. This resulted in resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 19:00 UTC to 21:10 UTC and (2) LPV service coverage in Canada from 20:45 UTC to 21:10 UTC. Please see plot(s): LPV_2/19/2023 LPV200_2/19/2023
02/20/2023	02/20/2023	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 LPV200 service coverage in Canada from 17:30 UTC to 23:10 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 18:05 UTC to 21:10 UTC. Please see plot(s): LPV_2/20/2023 LPV200_2/20/2023 Cov_vs_Time_Canada_2/20/2023
02/21/2023	02/21/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_CONUS LPV200_Alaska	Geomagnetic activity (KP=4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 10:55 UTC to 11:55 UTC. The elevated gives also resulted in minor degradation of LPV200 service coverage in Alaska from 09:20 UTC to 09:30 UTC and 10:55 UTC to 11:20 UTC. Please see plot(s): LPV200_2/21/2023 Cov_vs_Time_Alaska_2/21/2023 Cov_vs_Time_Canada_2/21/2023
02/22/2023	02/22/2023	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 minor degradation of LPV200 service coverage in Canada from 18:40 UTC to 20:10 UTC. Please see plot(s):

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_2/22/2023 Cov_vs_Time_Canada_2/22/2023
02/23/2023	02/23/2023	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 16:05 UTC to 23:30 UTC. The elevated GIVE values also resulted in: (1) moderate degradation of LPV coverage service in Canada from 18:15 UTC to 09:45 UTC and (2) minor degradation of LPV200 coverage service in CONUS from 16:25 UTC to 16:55 UTC. Please see plot(s): LPV_2/23/2023 LPV200_2/23/2023 Cov_vs_Time_Canada_2/23/2023
02/25/2023	02/26/2023	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: (1) LPV200 service coverage in Canada from 16:50 UTC to 01:15 UTC on 02/26 and (2) LPV service coverage in Canada from 17:10 UTC to 21:40 UTC. The elevated GIVE values also resulted in of minor degradation in Alaska from 19:45 UTC to 20:50 UTC and from 22:25 UTC to 23:35 UTC. Please see plot(s): LPV_2/25/2023 LPV200_2/25/2023 Cov_vs_Time_Alaska_2/25/2023 Cov_vs_Time_Canada_2/25/2023 Cov_vs_Time_Conus_2/25/2023 LPV_2/26/2023 LPV200_2/26/2023 Cov_vs_Time_Alaska_2/26/2023 Cov_vs_Time_Canada_2/26/2023 Cov_vs_Time_Conus_2/26/2023
02/26/2023	02/27/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_CONUS LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=5.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in: (1) CONUS from 21:45 UTC on 02/26 to 01:00 UTC on 02/27, (2) Alaska from 21:45 UTC on 02/26 to 03:00 UTC on 02/27, and (3) Canada from 20:10 UTC on 02/26 to 03:00 UTC on 02/27. The elevated GIVE values also resulted in significant degradation of LPV service coverage in: (1) CONUS from 23:15 UTC on 02/26 to 01:00 UTC on 02/27, (2) Alaska from 22:00 UTC on 02/26 to 03:00 UTC on 02/27, and (3) Canada from 21:15 UTC on 02/26 to 03:00 UTC on 02/27. Please see plot(s): LPV_2/26/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_2/26/2023 Cov_vs_Time_Alaska_2/26/2023 Cov_vs_Time_Canada_2/26/2023 Cov_vs_Time_Conus_2/26/2023 LPV_2/27/2023 LPV200_2/27/2023 Cov_vs_Time_Alaska_2/27/2023 Cov_vs_Time_Canada_2/27/2023 Cov_vs_Time_Conus_2/27/2023
02/27/2023	02/27/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_CONUS LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=7) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in: (1) CONUS from 18:00 UTC to 23:30 UTC, (2) Alaska from 06:35 UTC to 11:35 UTC, and (3) Canada from 09:45 UTC to 11:25 UTC, and from 18:20 UTC to 23:30 UTC. The elevated GIVE values also resulted in significant degradation of LPV service coverage in: (1) CONUS from 18:25 UTC to 23:25 UTC, (2) Alaska from 06:55 UTC to 10:35 UTC, and (3) Canada from 18:45 UTC to 23:25 UTC. Please see plot(s): LPV_2/27/2023 LPV200_2/27/2023 Cov_vs_Time_Alaska_2/27/2023 Cov_vs_Time_Canada_2/27/2023 Cov_vs_Time_Conus_2/27/2023
02/28/2023	02/28/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada 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 19:45 UTC to 23:25 UTC. The elevated GIVE values also resulted in moderate degradation of LPV coverage service in Canada from 20:10 UTC to 23:05 UTC. Please see plot(s): LPV_2/28/2023 LPV200_2/28/2023 Cov_vs_Time_Alaska_2/28/2023 Cov_vs_Time_Canada_2/28/2023
03/09/2023	03/10/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska LPV_Canada LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in: (1) LPV200 degradation in Alaska from 01:30 UTC on 03/09 to 11:00 UTC on 03/09 and 21:30 UTC on 03/09 to 04:00 UTC on 03/10; (2) LPV200 degradation in Canada from 01:30 UTC on 03/09 to 11:00 UTC on 03/09 and 18:20 UTC on 03/09 to 03:30 UTC on 03/10; and (3) LPV degradation in Canada from 02:45 UTC on 03/09 to 04:30 UTC on 03/09, 09:55 UTC on 03/09 to 10:50 UTC on 03/09, and 22:00 UTC

Start Date	End Date	Location Satellite	Service Affected	Event Description
				on 03/09 to 2:00 UTC on 03/10. The elevated GIVE values also caused moderate degradation of LPV service coverage in Alaska from 02:50 UTC on 03/09 to 04:45 UTC on 03/09 and 22:50 UTC on 03/09 to 02:20 UTC on 03/10. Please see plot(s): LPV_3/9/2023 LPV200_3/9/2023 Cov_vs_Time_Alaska_3/9/2023 Cov_vs_Time_Canada_3/9/2023 Cov_vs_Time_Conus_3/9/2023 LPV_3/10/2023 LPV200_3/10/2023 Cov_vs_Time_Alaska_3/10/2023 Cov_vs_Time_Canada_3/10/2023 Cov_vs_Time_Conus_3/10/2023
03/11/2023	03/11/2023	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: (1) LPV200 service coverage in Canada from 23:00 UTC on 03/10 to 04:05 UTC on 03/11 and (2) LPV service coverage in Canada from 00:20 UTC to 03:15 UTC. The elevated GIVE values also resulted in moderate degradation of LPV200 coverage service in Alaska from 00:20 UTC to 04:00 UTC, 06:50 UTC to 08:00 UTC, 09:25 UTC to 09:50 UTC, 18:55 UTC to 20:00 UTC, 21:25 UTC to 22:30 UTC, and 23:40 UTC to the end of the day. Please see plot(s): LPV_3/11/2023 LPV200_3/11/2023 Cov_vs_Time_Alaska_3/11/2023 Cov_vs_Time_Canada_3/11/2023
03/12/2023	03/12/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in: (1) Alaska from 00:10 UTC to 14:15 UTC and (2) Canada from the start of the day to 05:20 UTC and from 09:15 UTC to 14:25 UTC. The elevated GIVE values also resulted in moderate degradation of LPV coverage service in: (1) Alaska from 12:15 UTC to 13:25 UTC and (2) Canada from 09:45 UTC to 14:15 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 coverage service in CONUS from 00:55 UTC to 01:10 UTC, from 01:55 UTC to 03:35 UTC, and from 15:10 UTC to 15:35 UTC. Please see plot(s): LPV_3/12/2023 LPV200_3/12/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Alaska_3/12/2023 Cov_vs_Time_Canada_3/12/2023
03/13/2023	03/13/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV) PRN19	LPV200_CONUS	There was a Range Domain Monitor Trip on PRN19 at ZSU at 00:31 UTC. There was an elevation of GIVEs/GIVE monitor Trips in Southeast of North America from 03/12 at 21:00 UTC to 03/13 at 05:00 UTC. During the time of the trip, PA users could have been down 4 ranging satellites for about 12 seconds in some locations. During the trip, there was minor degradation of LPV200 service coverage in the region. In addition, tracking degradation was also observed on PRNs 6 and 17.
03/14/2023	03/14/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=4) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 17:55 UTC on 03/14 to 03:40 UTC on 03/15 and (2) LPV service coverage in Canada from 20:45 UTC on 03/14 to 03:05 UTC on 03/15. The elevated GIVE values also resulted in moderate degradation of LPV200 coverage service in Alaska from 00:10 UTC on 03/14 to 00:40 UTC on 03/14, 02:30 UTC on 03/14 to 03:50 UTC on 03/14, 06:35 UTC on 03/14 to 07:50 UTC on 03/14, 09:10 UTC on 03/14 to 10:30 UTC on 03/14, 12:10 UTC on 03/14 to 13:40 UTC on 03/14, 13:55 UTC on 03/14 to 15:05 UTC on 03/14, 18:40 UTC on 03/14 to 19:50 UTC on 03/14, and 21:15 UTC on 03/14 to 22:20 UTC on 03/14. The elevated GIVE values also resulted in minor degradation of LPV200 coverage service in CONUS from 21:00 UTC on 03/14 to 21:20 UTC on 03/14 and from 22:55 UTC on 03/14 to 03:45 UTC on 03/15. Please see plot(s): LPV_3/14/2023 LPV200_3/14/2023 Cov_vs_Time_Alaska_3/14/2023 Cov_vs_Time_Canada_3/14/2023
03/15/2023	03/16/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=5.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Alaska from 22:15 UTC on 03/15 to 03:50 UTC on 03/16, (2) LPV200 service coverage in Canada from 21:40 UTC on 03/15 to 03:45 UTC on 03/16, (3) LPV service coverage in Alaska from 22:40 UTC on 03/15 to 03:25 UTC on 03/16, and (4) LPV service coverage in Canada from 21:50 UTC on 03/15 to 03:20 UTC on 03/16. The elevated GIVE values also resulted in moderate degradation of LPV200 service coverage in CONUS from 00:45 UTC on 03/15 to 01:05 UTC on 03/16. Please see plot(s): LPV_3/15/2023 LPV200_3/15/2023 Cov_vs_Time_Alaska_3/15/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Canada_3/15/2023 Cov_vs_Time_Conus_3/15/2023 LPV_3/16/2023 LPV200_3/16/2023 Cov_vs_Time_Alaska_3/16/2023 Cov_vs_Time_Canada_3/16/2023
03/15/2023	03/15/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV) PRN12 PRN13	None	There were 6 RDM trips on PRN13 and one RDM trip on PRN12 from ZSU between 01:21 UTC and 01:56 UTC.
03/17/2023	03/17/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP=2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 coverage in CONUS from 00:40 UTC to 00:50 UTC and from 15:00 UTC to 15:20 UTC. Please see plot(s): LPV200_3/17/2023 Cov_vs_Time_Conus_3/17/2023
03/18/2023	03/18/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_CONUS LPV200_Canada	Geomagnetic activity (KP=2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 coverage in CONUS from 00:40 UTC to 00:55 UTC and (2) LPV200 coverage in Canada from 00:40 UTC to 01:05 UTC. Please see plot(s): LPV200_3/18/2023 Cov_vs_Time_Canada_3/18/2023 Cov_vs_Time_Conus_3/18/2023
03/19/2023	03/19/2023	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 moderate degradation of: (1) LPV200 coverage in Canada from 17:40 UTC to 22:10 UTC and (2) LPV coverage in Canada from 19:05 UTC to 19:25 UTC and from 21:00 UTC to 21:10 UTC. Please see plot(s): LPV_3/19/2023 LPV200_3/19/2023 Cov_vs_Time_Canada_3/19/2023
03/20/2023	03/20/2023	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 significant degradation of: (1) LPV200 coverage in Canada from 16:00 UTC to 18:50 UTC and (2) LPV coverage in Canada from 16:30 UTC to 18:30 UTC. Please see plot(s): LPV_3/20/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_3/20/2023 Cov_vs_Time_Canada_3/20/2023
03/23/2023	03/24/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_CONUS LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=7.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 20:00 UTC on 03/23 to 11:50 UTC on 03/24; (2) LPV200 service coverage in Alaska from 10:50 UTC on 03/23 to 14:50 UTC on 03/23, 20:40 UTC on 03/23 to 04:15 UTC on 03/24, and 05:45 UTC on 03/24 to 10:10 UTC on 03/24; (3) LPV200 service coverage in Canada from 10:30 UTC on 03/23 to 16:10 UTC on 3/23, from 19:10 UTC on 3/23 to 03:00 UTC on 3/24, and from 06:00 UTC on 3/24 to 10:10 UTC on 03/24; (4) LPV service coverage in CONUS from 21:00 UTC on 03/23 to 10:00 UTC on 03/24; (5) LPV service coverage in Alaska from 11:00 UTC on 03/23 to 14:15 UTC on 03/23 and from 21:40 UTC on 03/23 to 03:00 UTC on 03/24; and (6) LPV service coverage in Canada from 11:00 UTC on 03/23 to 16:00 UTC on 03/23 and from 19:40 UTC on 03/23 to 02:30 UTC on 03/24. Please see plot(s): LP_3/23/2023 LPV_3/23/2023 LPV200_3/23/2023 Cov_vs_Time_Alaska_3/23/2023 Cov_vs_Time_Canada_3/23/2023 Cov_vs_Time_Conus_3/23/2023 LP_3/24/2023 LPV_3/24/2023 LPV200_3/24/2023 Cov_vs_Time_Alaska_3/24/2023
03/25/2023	03/25/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 08:20 UTC to 14:45 UTC; and (2) LPV200 service coverage in Canada from 08:45 UTC to 12:00 UTC. Please see plot(s): LPV200_3/25/2023 Cov_vs_Time_Alaska_3/25/2023 Cov_vs_Time_Canada_3/25/2023
03/28/2023	03/28/2023	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 significant degradation of LPV200 service coverage in Canada from 16:30 UTC to 20:15 UTC. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 18:30 UTC to 18:50 UTC. Please see plot(s): LPV_3/28/2023

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_3/28/2023 Cov_vs_Time_Canada_3/28/2023
03/29/2023	03/29/2023	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 18:00 UTC to 19:20 UTC and (2) LPV service coverage in Canada from 18:20 UTC to 18:55 UTC. Please see plot(s): LPV_3/29/2023 LPV200_3/29/2023 Cov_vs_Time_Canada_3/29/2023
03/30/2023	03/30/2023	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: (1) LPV200 service coverage in Canada from 15:00 UTC to 18:45 UTC and (2) LPV service coverage in Canada from 15:25 UTC to 18:20 UTC. Please see plot(s): LPV_3/30/2023 LPV200_3/30/2023 Cov_vs_Time_Canada_3/30/2023
03/31/2023	03/31/2023	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Alaska LPV200_Canada	Geomagnetic activity (KP=3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 04:45 UTC to 06:45 UTC and (2) LPV200 service coverage in Canada from 01:45 UTC to 02:00 UTC. IGP GIVE (70, -170) reached storm state. Please see plot(s): LPV200_3/31/2023 Cov_vs_Time_Alaska_3/31/2023 Cov_vs_Time_Canada_3/31/2023

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
01/20/2023	01/20/2023	Faulted	GEO131, Santa Paula (SZ1)	None	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site 07:00:29 UTC. This caused a 13-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 457247-457261.
01/20/2023	01/20/2023	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site 07:00:24 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 457242-457246.
01/21/2023	01/21/2023	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site 07:00:05 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 543623-543627.
02/02/2023	02/02/2023	Faulted	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site 07:01:55 UTC. This caused a 14-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 370927-370942.
02/02/2023	02/02/2023	Manual	GEO131, Santa Paula (SZ1)	None	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site 07:01:50 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 370927-370942.
02/03/2023	02/03/2023	Manual	GEO131, Santa Paula (SZ1)	None	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site 07:00:57 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 457575-457579.
02/06/2023	02/06/2023	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site 08:01:59 UTC. This caused a 4-second outage of the GEO 131 broadcast and also caused the WAAS carrier-smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 115337-115342.
03/30/2023	03/30/2023	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the NAPA uplink site at 07:30:39 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 372657-372661.

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 1.496 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.976 meters observed at Atlantic City-a.
- The minimum 95% CONUS horizontal LPV errors was 0.576 meters observed at Memphis.
- The minimum 95% CONUS vertical LPV error was 0.913 meters observed at Denver.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40m) (m)	Horizontal (HAL=556m) (m)	Vertical (VAL=50m) (m)	Percentage in PA Mode (%)	SPS Accuracy	
					95% Horizontal (m)	95% Vertical (m)
Arcata	1.496	1.502	1.524	100	*	*
Atlantic City-a	1.317	1.321	1.976	100	*	*
Oklahoma City	1.335	1.335	1.436	100	*	*
Albuquerque	0.680	0.681	1.042	100	2.63	6.11
Anchorage	0.803	0.814	1.532	100	2.98	8.27
Atlanta	0.929	0.929	1.294	100	2.49	5.93
Barrow	1.043	1.105	2.105	100	3.45	9.49
Bethel	0.783	0.786	1.559	100	2.80	8.90
Billings	0.785	0.790	1.041	100	2.37	5.75
Boston	0.758	0.764	1.103	100	2.65	5.61
Chicago	0.808	0.814	1.003	100	*	*
Cleveland	0.753	0.756	1.132	100	2.46	5.43
Cold Bay	0.888	0.889	1.356	100	2.61	8.30
Dallas	0.610	0.611	1.353	100	*	*
Denver	0.669	0.670	0.913	100	*	*
Fairbanks	0.895	0.920	1.745	100	3.17	8.51
Gander	0.952	0.976	1.289	99.999	2.73	6.06
Goose Bay	1.078	1.125	1.449	100	*	*
Houston	0.713	0.715	1.558	100	2.97	6.36
Iqaluit	1.478	1.576	2.615	100	*	*
Jacksonville	0.717	0.717	1.404	100	*	*
Juneau	0.940	0.958	1.412	100	2.79	7.10
Kansas City	0.640	0.641	1.016	100	2.47	5.54
Kotzebue	0.884	0.915	1.705	99.999	3.32	9.43
Los Angeles	0.728	0.732	1.283	100	2.91	7.22
Memphis	0.576	0.576	1.186	100	*	*
Merida	0.963	0.968	2.543	99.996	*	*
Mexico City	1.142	1.147	2.730	100	*	*
Miami	0.976	0.976	1.919	100	3.44	6.53
Minneapolis	0.814	0.820	1.018	100	2.42	5.40
New York	0.859	0.863	1.061	100	*	*
Oakland	0.785	0.790	1.198	100	2.83	7.22
Puerto Vallarta	1.163	1.164	2.523	100	*	*
Salt Lake City	0.620	0.621	0.926	100	2.58	6.32
San Jose Del Cabo	1.018	1.019	2.498	100	5.87	8.49
Seattle	0.844	0.850	1.045	100	2.41	6.52
Washington, DC	0.779	0.781	1.096	100	2.49	5.59
Winnipeg	0.919	0.931	1.359	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 10.344 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 24.178 meters observed at San Juan.
- The minimum 95% horizontal error was 1.660 meters observed at Salt Lake City.
- The minimum 99.999% horizontal error was 5.142 meters observed at Seattle.

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	1.838	10.117	100	10.304
Anchorage	2.778	6.036	100	6.204
Atlanta	1.962	6.167	100	6.730
Barrow	3.312	7.275	100	7.425
Bethel	2.584	6.276	100	6.407
Billings	1.688	5.523	100	5.654
Boston	2.245	9.879	100	10.022
Cleveland	2.090	9.937	100	10.224
Cold Bay	2.084	5.212	100	5.319
Fairbanks	3.127	6.814	100	7.520
Gander	2.414	7.491	100	7.694
Honolulu	10.344	18.576	100	19.092
Houston	2.230	6.020	100	6.458
Iqaluit	3.375	7.915	100	8.307
Juneau	2.580	5.484	100	5.639
Kansas City	1.768	10.209	100	10.381
Kotzebue	3.108	7.533	100	7.673
Los Angeles	2.040	9.564	100	9.767
Merida	2.328	5.929	100	6.102
Miami	2.631	6.810	100	7.290
Minneapolis	2.024	7.244	100	7.392
Oakland	2.093	11.241	100	11.435
Salt Lake City	1.660	7.756	100	7.913
San Jose Del Cabo	3.861	12.214	100	12.641
San Juan	4.956	24.178	100	25.112
Seattle	1.686	5.142	100	5.298
Tapachula	5.605	20.180	100	20.386
Washington, DC	2.132	9.256	100	9.410

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 5.301 meters occurred at Chicago and maximum vertical LPV error was 8.103 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
Arcata	5.240	0.150	0.301	5.584	0.175	0.216
Atlantic City-a	3.842	0.112	0.216	5.493	0.164	0.272
Oklahoma City	4.248	0.304	0.304	4.973	0.109	0.202
Prescott	4.992	0.270	0.353	6.853	0.182	0.228
Albuquerque	4.403	0.118	0.228	5.076	0.116	0.185
Anchorage	2.590	0.095	0.190	6.083	0.274	0.274
Atlanta	2.824	0.205	0.221	4.195	0.175	0.175
Barrow	4.080	0.117	0.169	6.193	0.172	0.229
Bethel	2.549	0.148	0.185	5.770	0.165	0.196
Billings	2.871	0.075	0.174	4.162	0.097	0.207
Boston	4.694	0.144	0.180	6.845	0.138	0.210
Chicago	5.301	0.146	0.264	3.872	0.098	0.213
Cleveland	2.931	0.209	0.249	5.037	0.142	0.209
Cold Bay	3.115	0.179	0.179	4.881	0.148	0.164
Dallas	2.938	0.205	0.219	5.635	0.187	0.198
Denver	3.038	0.151	0.228	5.369	0.134	0.174
Fairbanks	3.633	0.109	0.226	7.104	0.209	0.302
Gander	3.492	0.102	0.131	4.985	0.134	0.160
Goose Bay	5.049	0.140	0.195	5.770	0.224	0.224
Houston	2.902	0.162	0.214	5.411	0.162	0.204
Iqaluit	4.847	0.181	0.205	8.103	0.209	0.247
Jacksonville	2.167	0.138	0.175	3.326	0.137	0.177
Juneau	3.045	0.123	0.217	5.336	0.145	0.203
Kansas City	3.390	0.169	0.276	4.749	0.123	0.185
Kotzebue	3.063	0.163	0.188	5.449	0.131	0.212
Los Angeles	2.175	0.124	0.148	4.586	0.112	0.164
Memphis	2.645	0.112	0.175	5.600	0.131	0.194
Merida	4.517	0.144	0.176	5.484	0.110	0.235
Mexico City	3.236	0.239	0.239	7.038	0.151	0.194
Miami	2.205	0.115	0.170	4.095	0.163	0.193
Minneapolis	3.150	0.094	0.205	3.442	0.093	0.189
New York	2.317	0.190	0.195	4.634	0.095	0.207
Oakland	3.591	0.104	0.158	4.956	0.139	0.191
Puerto Vallarta	3.794	0.257	0.259	6.622	0.159	0.193
Salt Lake City	3.187	0.193	0.222	4.796	0.133	0.140
San Jose Del Cabo	3.125	0.191	0.191	6.394	0.165	0.216
Seattle	3.449	0.109	0.181	3.795	0.120	0.190
Washington, DC	2.326	0.072	0.197	3.787	0.076	0.171
Winnipeg	4.034	0.144	0.279	6.588	0.201	0.258

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

- February 15–16, 2023—Position errors in CONUS Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.156 meters and 4.125 meters at Iqaluit. The Kp index was 5.3 and 5.0, respectively.
- February 27, 2023—Position errors in CONUS and Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 3.110 meters and 3.833 meters at Arcata and Atlantic City, respectively. The Kp index was 7.0.
- March 23–24, 2023—Position errors in CONUS, Alaska, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 3.264 meters and 4.556 meters at Arcata and Mexico City, respectively. The Kp index was 7.3 and 7.0, respectively.

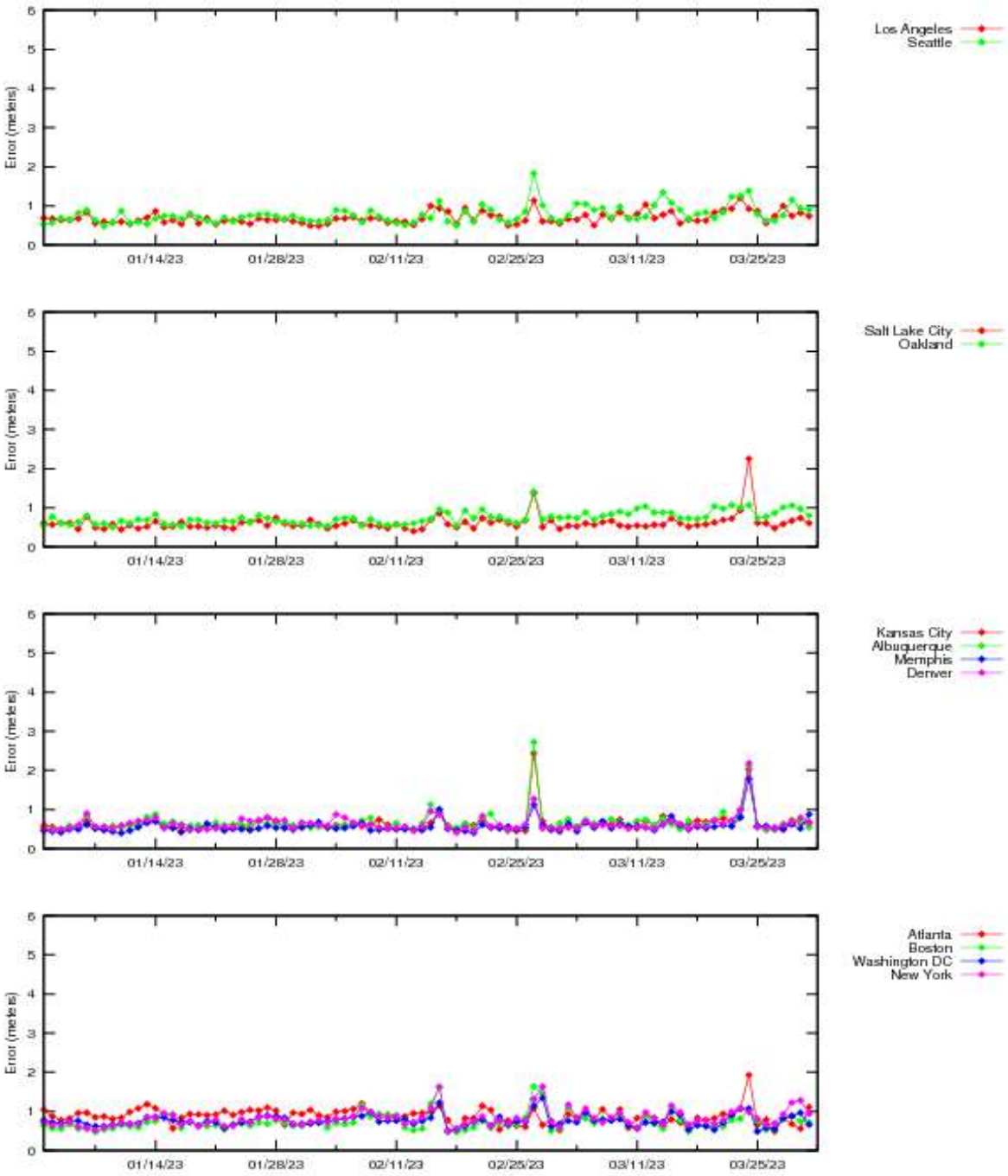

Figure 2-1 LPV 95% Horizontal Accuracy

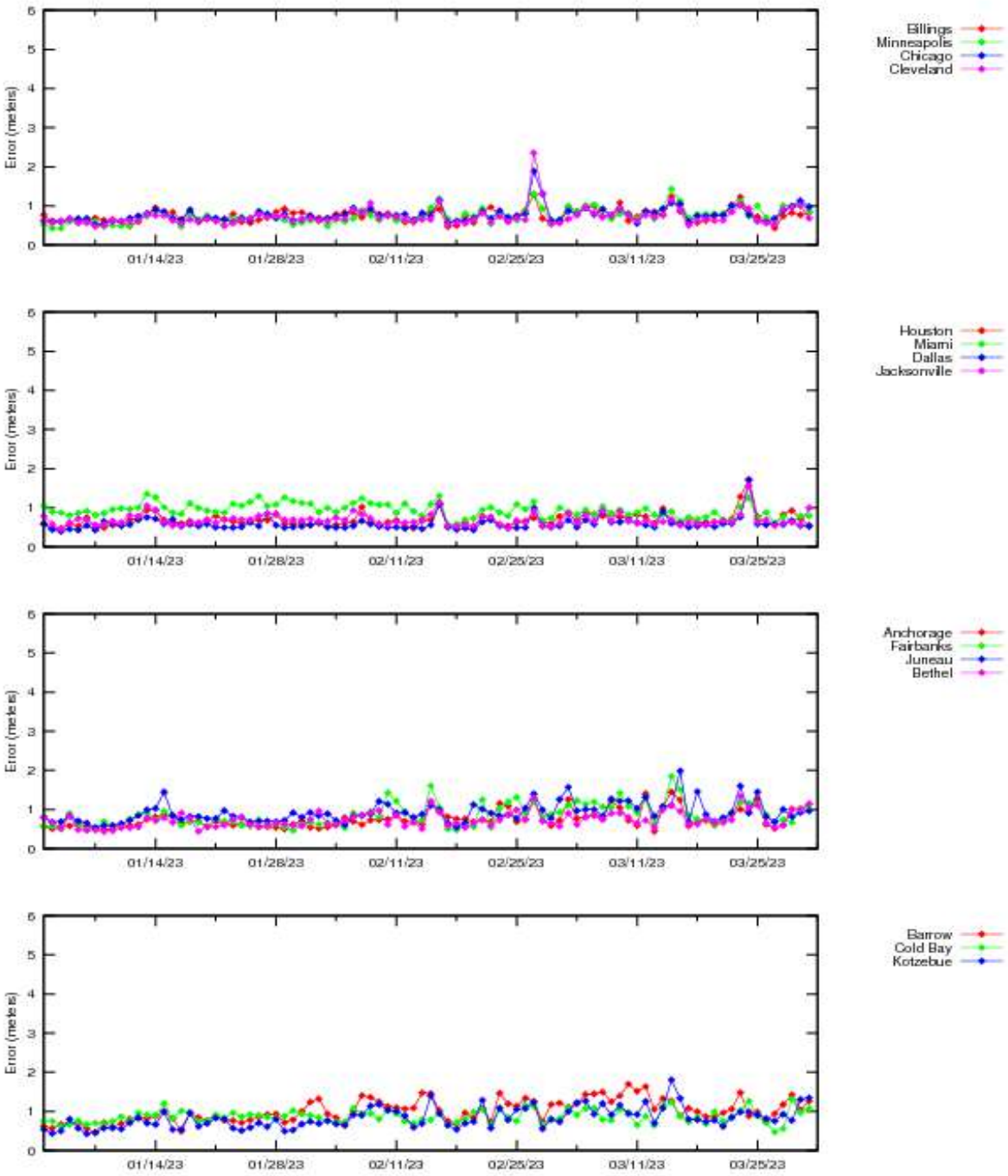

Figure 2-2 LPV 95% Horizontal Accuracy

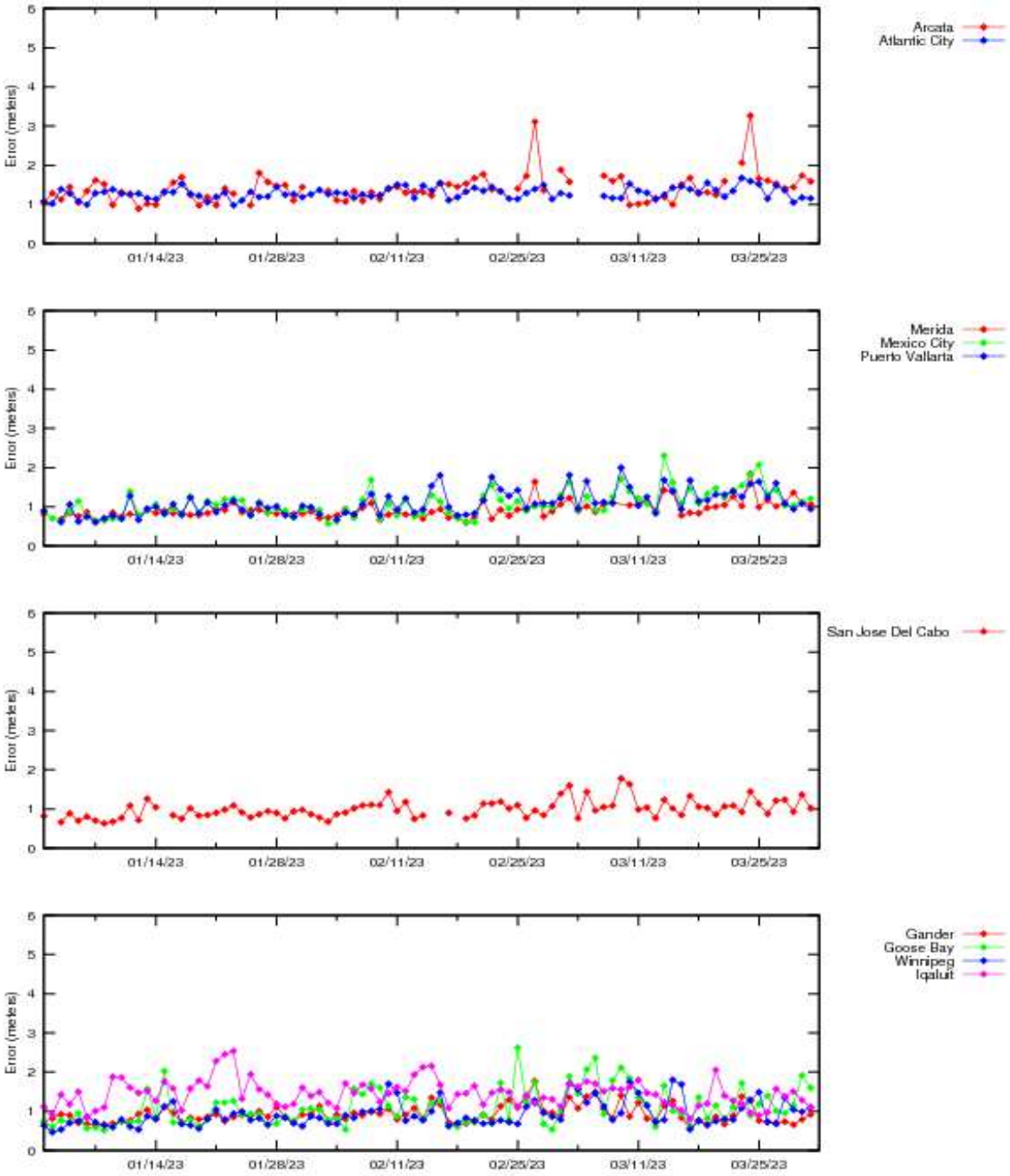

Figure 2-3 LPV 95% Horizontal Accuracy

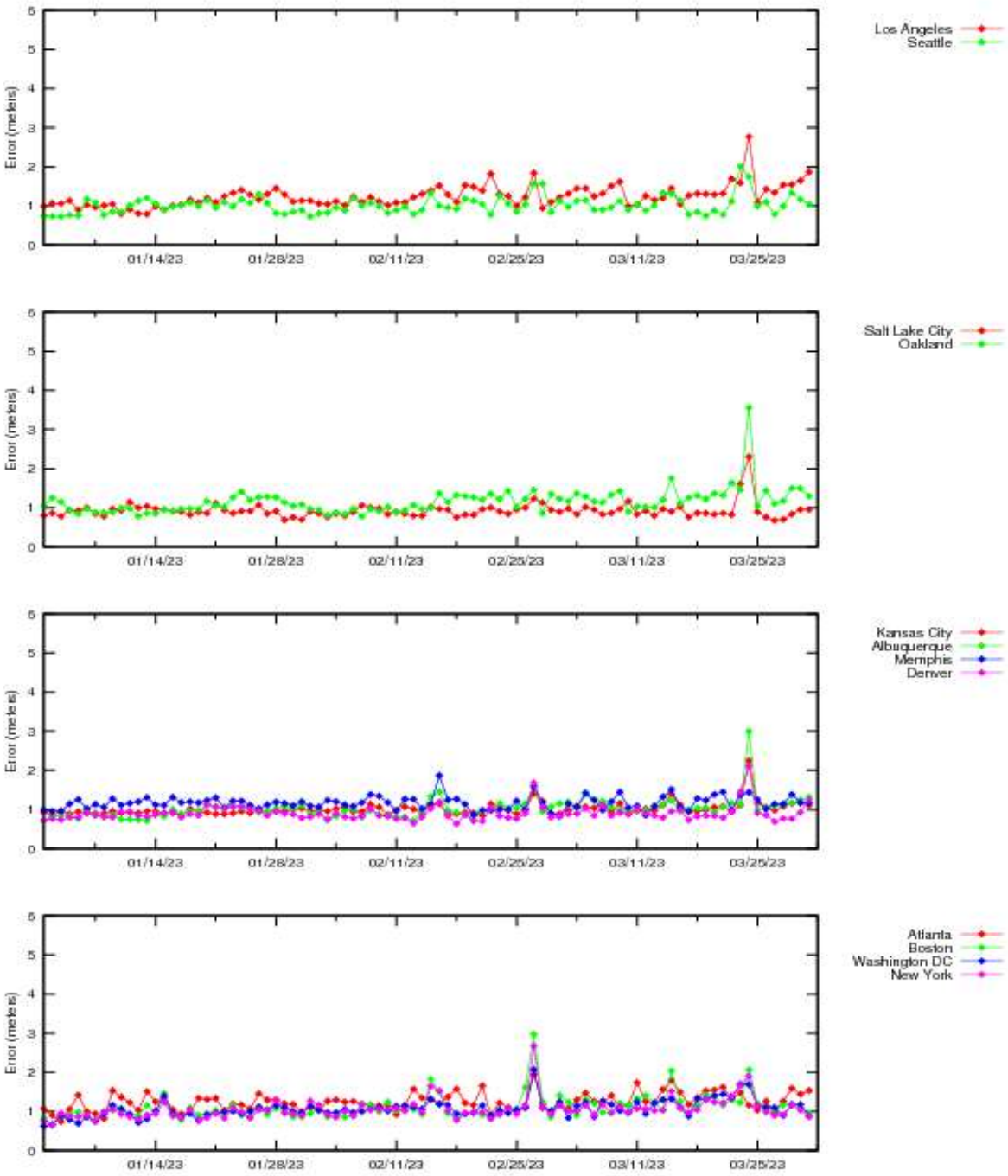

Figure 2-4 LPV 95% Vertical Accuracy

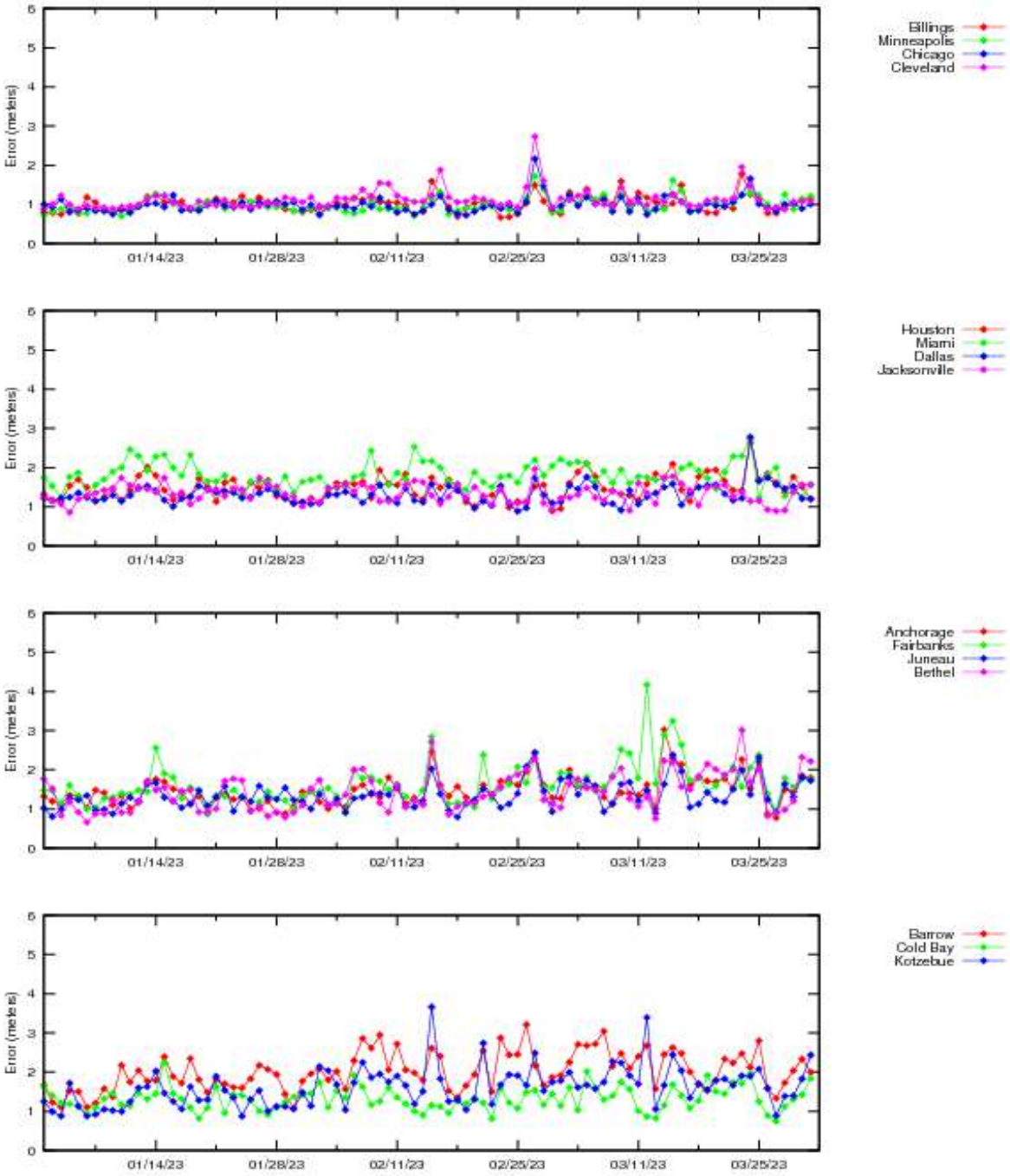

Figure 2-5 LPV 95% Vertical Accuracy

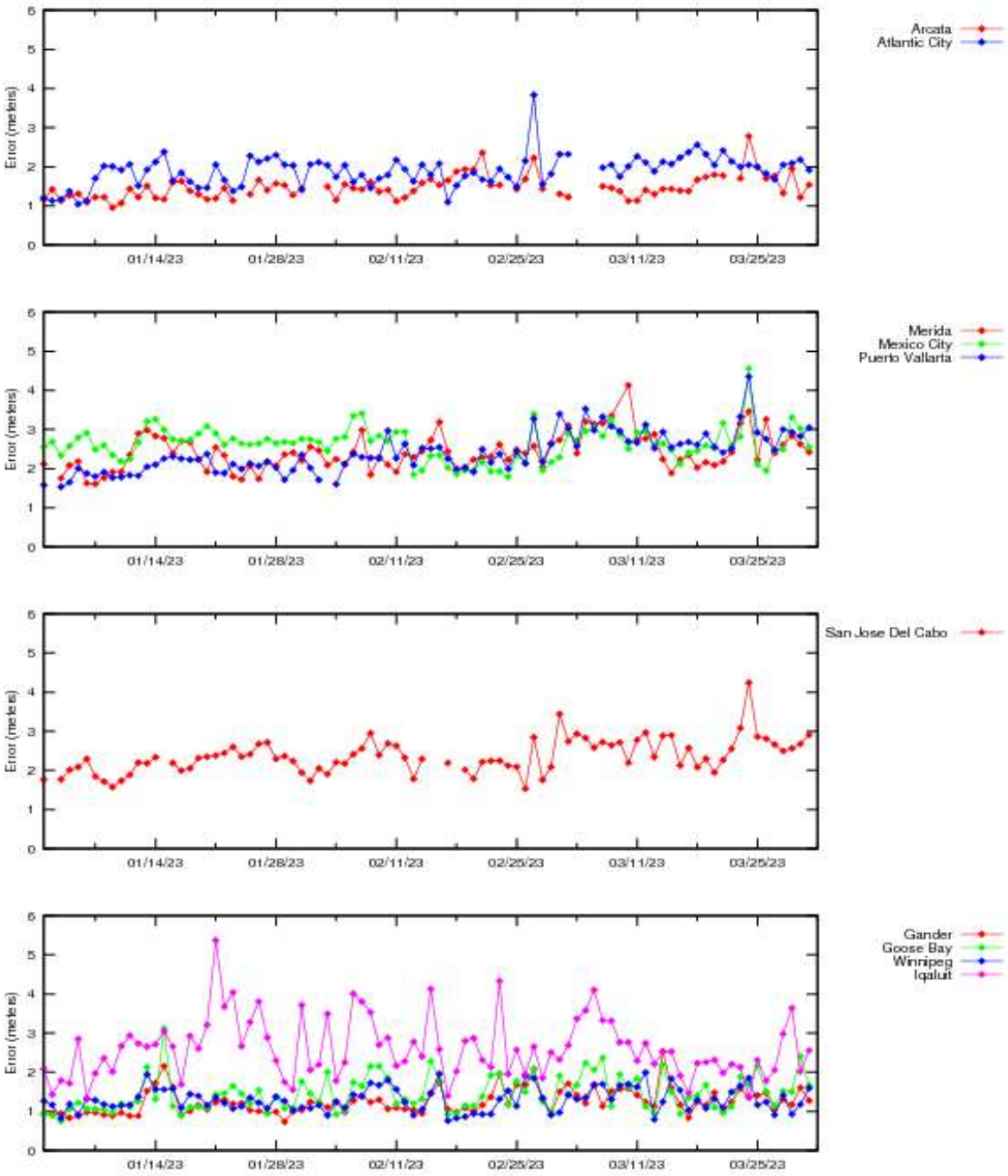

Figure 2-6 LPV 95% Vertical Accuracy

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 February 15, 16, and 27 and March 15, 16, 23, and 24.

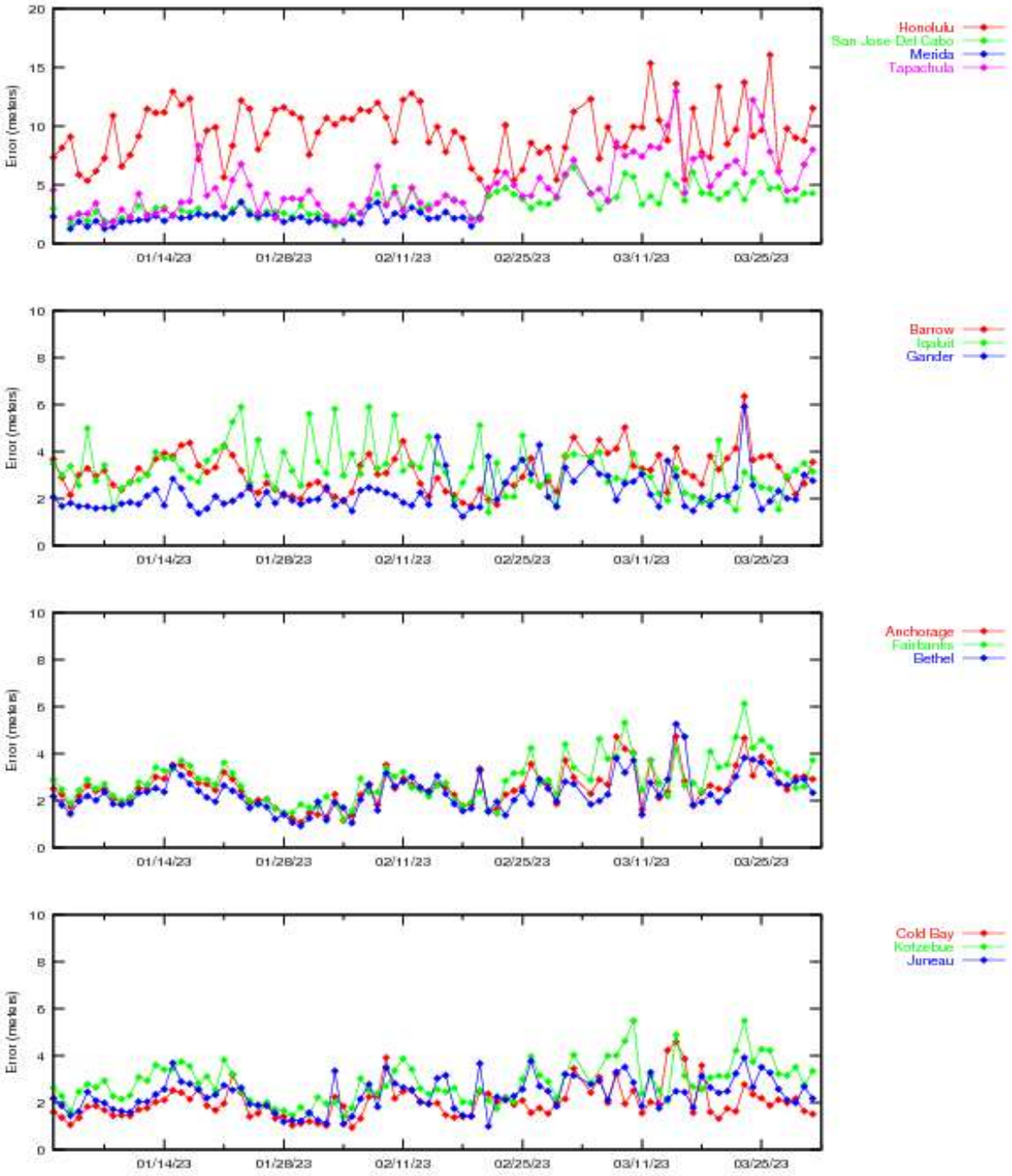

Figure 2-7 NPA 95% Horizontal Accuracy

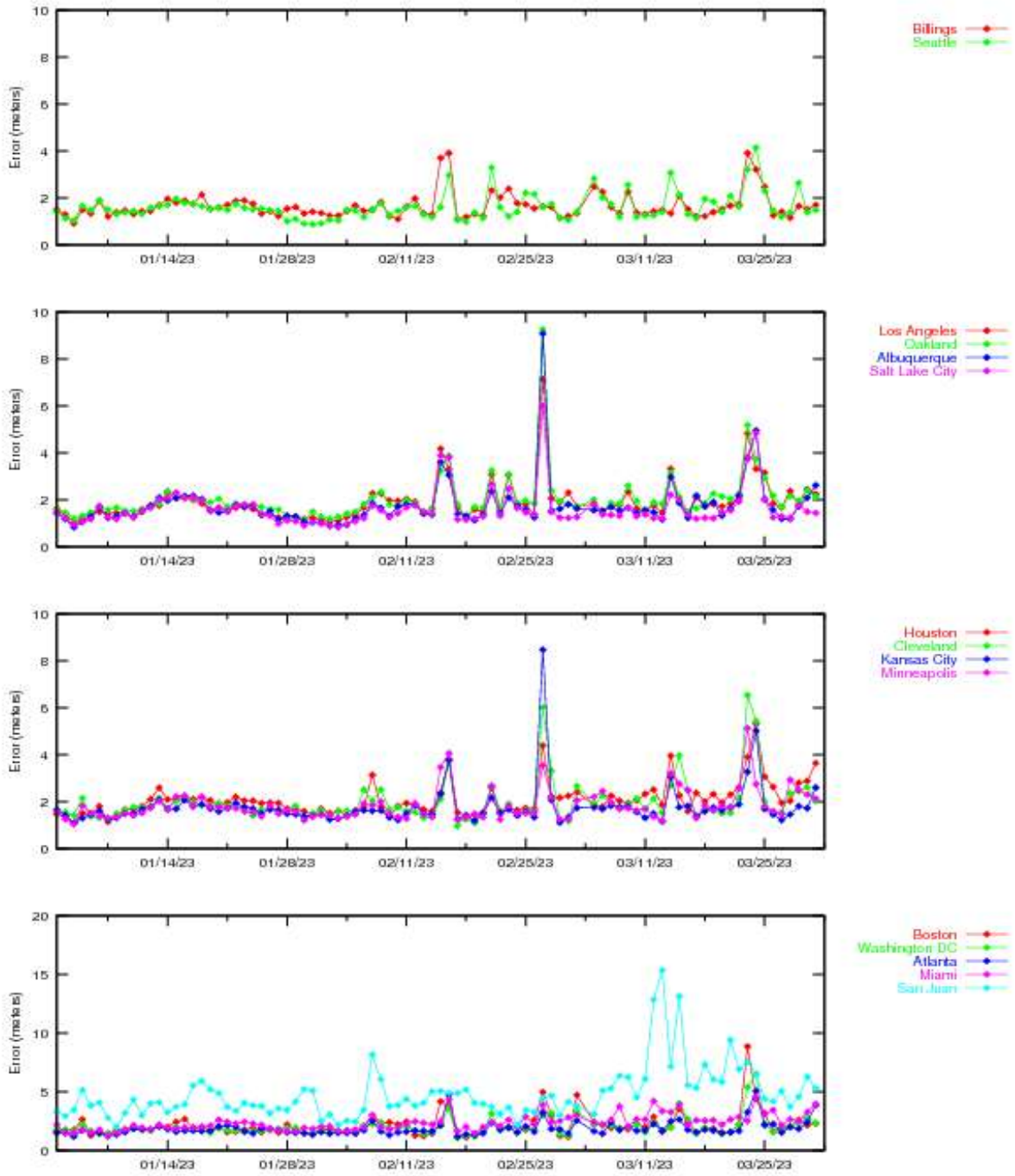

Figure 2-8 NPA 95% Horizontal Accuracy

Figure 2-9 through Figure 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver for the quarter. Figure 2-9 and Figure 2-10 show the triangular distributions of vertical position error (VPE) versus VPL and horizontal position error (HPE) versus HPL: (1) the horizontal axis is the position error, (2) the vertical axis is the WAAS protection level where lower protection levels equate to better availability, (3) the diagonal line shows the point where error equals protection level, (4) above and to the left of the diagonal line show where errors are bounded (WAAS is providing integrity in the position domain), and (5) below and to the right show where errors are not bounded (HMI could be present). Figure 2-11 and Figure 2-12 show the 2-D histograms of HPE, VPE, and normalized position errors: (1) the blue trace shows the distributions of the actual HPE and VPE; (2) the horizontal axis is the position errors and the vertical axis is the total count of data samples (log scale) in each 0.1-meter bin; (3) the magenta trace shows the distributions of the actual horizontal and vertical errors normalized by one-sigma value of the protection level: horizontal protection level (HPL/6.0) and vertical protection level (VPL/5.33); (4) the horizontal axis is the standard units and vertical axis is the observed distribution of normalized errors data samples in each 0.1-sigma bin. The narrowness of the normalized error distributions indicates good safety performance.

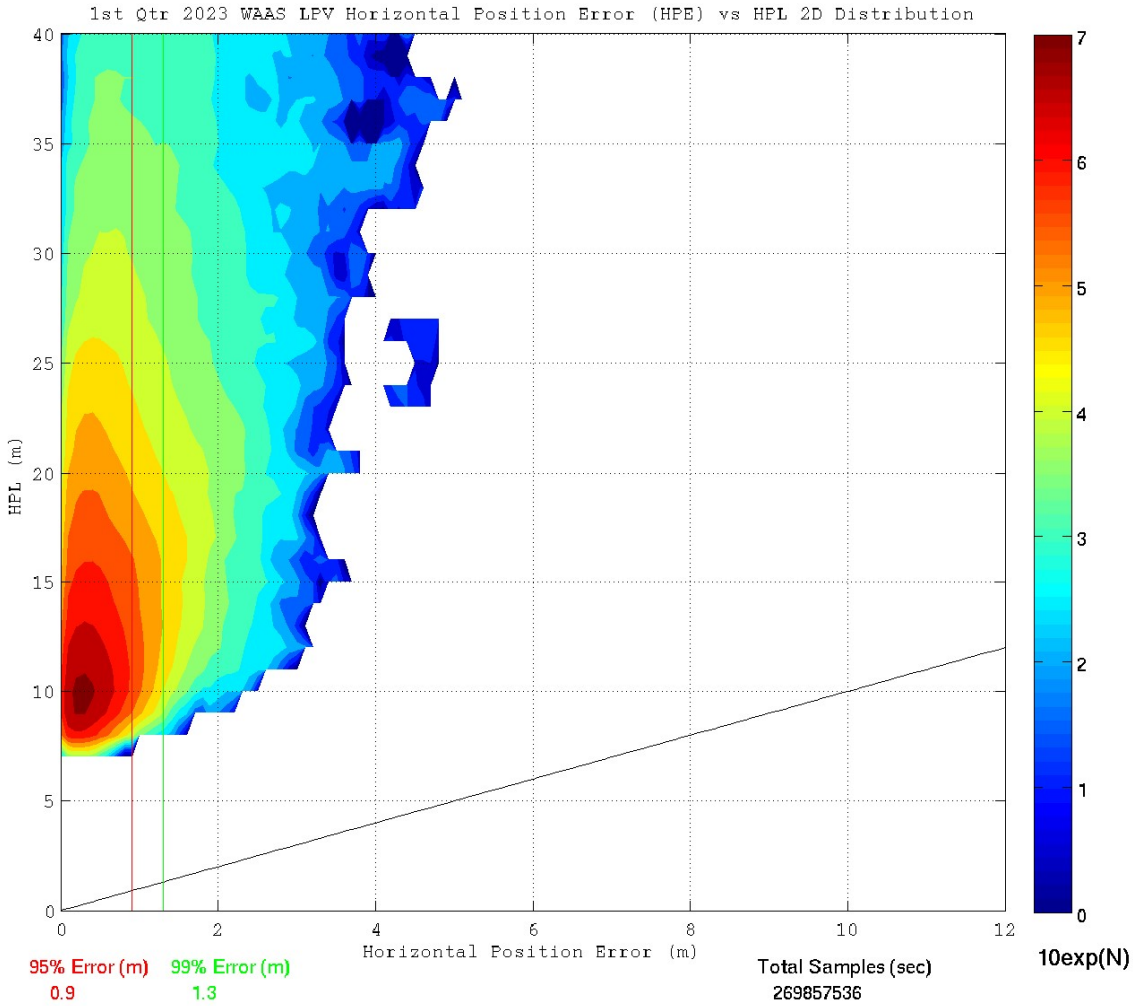

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

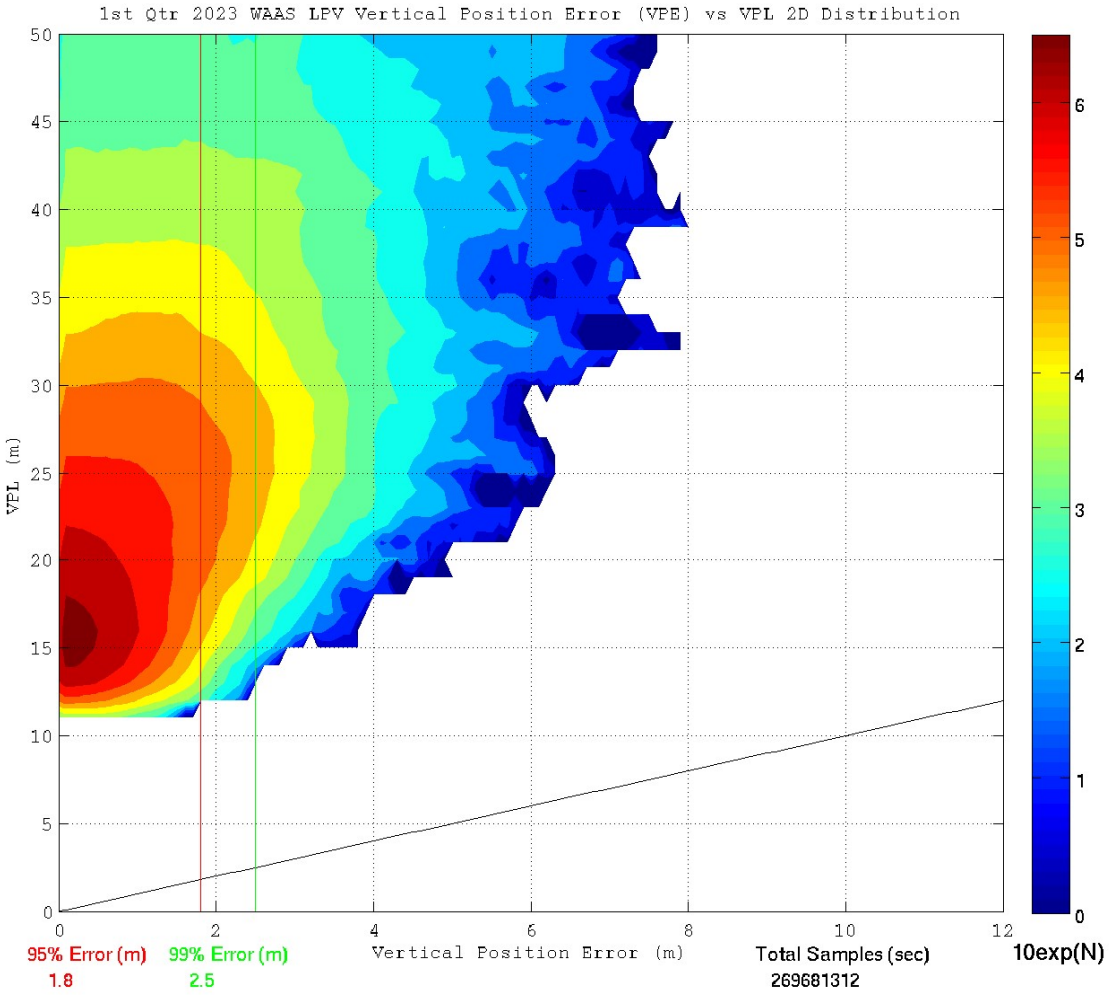

Figure 2-10 LPV Vertical Error Bounding Triangle Chart

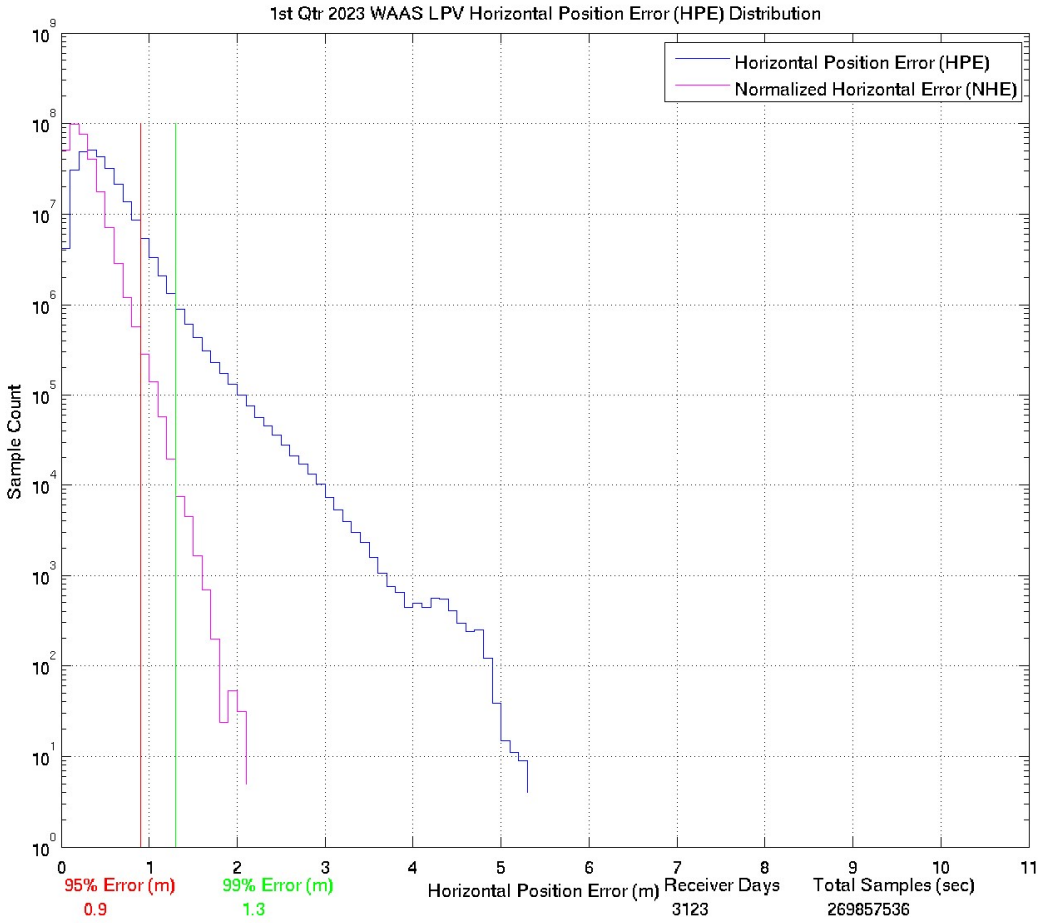

Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

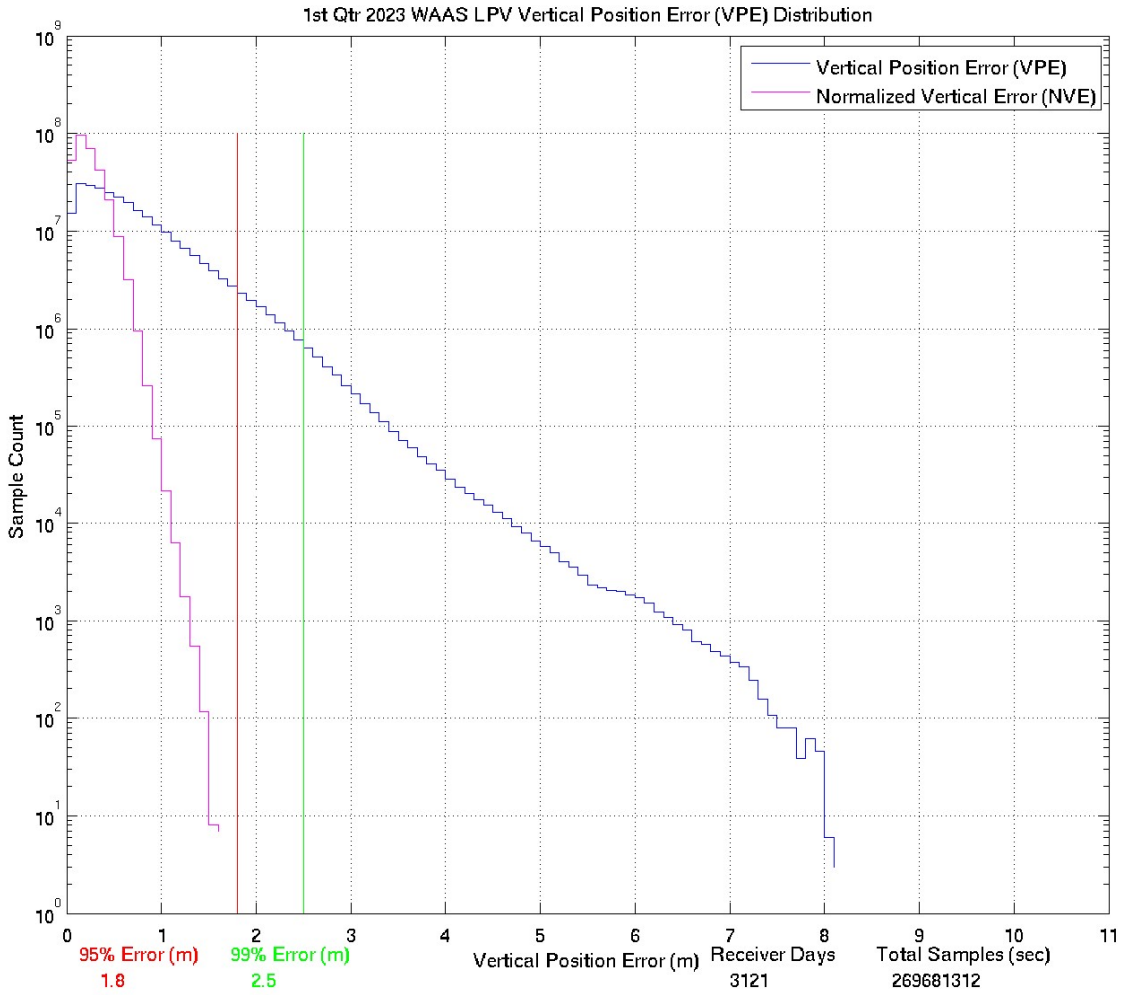

Figure 2-12 LPV 2-D Vertical Error Distribution Histogram

3.0 AVAILABILITY

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

- The maximum 99% CONUS HPL was 18.935 meters observed at Miami
- The maximum 99% CONUS VPL was 33.734 meters observed at Arcata
- The minimum 99% CONUS HPL was 10.968 meters observed at Denver
- The minimum 99% CONUS VPL was 20.764 meters observed at Dallas
- The maximum 99% Alaska HPL was 57.608 meters observed at Barrow
- The maximum 99% Alaska VPL was 95.091 meters observed at Barrow
- The minimum 99% Alaska HPL was 21.365 meters observed at Cold Bay
- The minimum 99% Alaska VPL was 30.994 meters observed at Bethel

Table 3-1 99% Protection Level

Location	99% HPL (m)	99% VPL (m)	Percentage in PA Mode (%)
Arcata	15.624	33.734	100
Atlantic City-a	14.278	23.582	100
Oklahoma City	13.328	24.421	100
Albuquerque	11.771	27.623	100
Anchorage	27.891	35.168	100
Atlanta	12.148	23.848	100
Barrow	57.608	95.091	100
Bethel	21.785	30.994	100
Billings	12.856	21.720	100
Boston	16.348	24.462	100
Chicago	11.952	22.516	100
Cleveland	13.351	22.903	100
Cold Bay	21.365	32.273	100
Dallas	11.576	20.764	100
Denver	10.968	22.461	100
Fairbanks	40.357	56.598	100
Gander	33.877	47.167	99.999
Goose Bay	41.408	49.062	100
Houston	12.064	21.472	100
Iqaluit	76.832	97.786	100
Jacksonville	14.226	25.773	100
Juneau	27.690	45.458	100
Kansas City	11.012	22.680	100
Kotzebue	43.067	50.772	99.999
Los Angeles	14.848	29.431	100
Memphis	11.054	23.350	100
Merida	23.223	41.222	99.996
Mexico City	26.935	43.585	100
Miami	18.935	30.549	100
Minneapolis	12.679	20.957	100
New York	15.077	24.079	100
Oakland	14.750	30.087	100
Puerto Vallarta	25.877	44.573	100
Salt Lake City	11.974	22.530	100
San Jose Del Cabo	23.780	43.931	100
Seattle	14.269	26.183	100
Washington, DC	13.188	22.744	100
Winnipeg	18.888	26.441	100

Availability of LP, LPV, and LPV200 services are evaluated by monitoring the WAAS protection levels at receiver locations. Service is available when the VPL is less than the vertical alert limit (VAL) and the HPL is less than the horizontal alert limit (HAL). When the protection level exceeds the alert limit, the service is unavailable and an outage in service is recorded along with its duration. The operational service is not available again until both protection levels

are within the alert limits for at least 15 minutes. Although this will cause minimal reduction in operational service availability, it will substantially reduce the number of service outages and prevent excessive switching in/out of service availability.

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

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

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
Arcata	99.83	99.57	99.29
Atlantic City-a	99.89	99.84	99.79
Oklahoma City	99.97	99.96	99.86
Prescott	99.53	99.51	99.16
Albuquerque	99.96	99.87	99.75
Anchorage	99.49	99.39	98.82
Atlanta	100	99.97	99.96
Barrow	98.27	97.99	96.28
Bethel	99.74	99.66	99.35
Billings	99.85	99.84	99.76
Boston	99.81	99.79	99.73
Chicago	99.83	99.79	99.73
Cleveland	99.89	99.85	99.77
Cold Bay	99.93	99.92	99.32
Dallas	99.95	99.95	99.91
Denver	99.94	99.89	99.74
Fairbanks	98.96	98.75	98.07
Gander	99.15	98.96	96.76
Goose Bay	98.87	98.81	97.44
Houston	99.9	99.9	99.87
Iqaluit	95.97	95.14	88.71
Jacksonville	100	99.98	99.96
Juneau	99.21	98.93	98.2
Kansas City	99.97	99.94	99.87
Kotzebue	98.87	98.73	97.81
Los Angeles	99.84	99.81	99.66
Memphis	100	99.97	99.94
Merida	99.73	99.58	96.2
Mexico City	99.8	99.49	90.76
Miami	99.93	99.9	99.61
Minneapolis	99.75	99.69	99.65
New York	99.84	99.83	99.74
Oakland	99.84	99.79	99.57
Puerto Vallarta	99.92	99.47	91.31
Salt Lake City	99.92	99.85	99.77

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
San Jose Del Cabo	99.96	99.19	95.25
Seattle	99.79	99.71	99.46
Washington, DC	99.94	99.88	99.79
Winnipeg	99.55	99.43	99.25

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	3	0.000069	8	0.000184	6	0.000138
Atlantic City-a	4	0.000082	3	0.000061	5	0.000102
Oklahoma City	1	0.000023	3	0.000068	6	0.000137
Prescott	9	0.000502	9	0.000502	69	0.003863
Albuquerque	4	0.000077	4	0.000077	8	0.000155
Anchorage	13	0.000252	18	0.000349	34	0.000664
Atlanta	1	0.000019	1	0.000019	2	0.000039
Barrow	29	0.000571	41	0.000810	130	0.002612
Bethel	12	0.000233	13	0.000252	30	0.000584
Billings	3	0.000058	4	0.000077	8	0.000155
Boston	4	0.000077	3	0.000058	4	0.000077
Chicago	3	0.000058	3	0.000058	6	0.000116
Cleveland	2	0.000039	3	0.000058	3	0.000058
Cold Bay	3	0.000058	7	0.000135	43	0.000835
Dallas	1	0.000019	1	0.000019	3	0.000058
Denver	4	0.000077	5	0.000097	6	0.000116
Fairbanks	26	0.000507	32	0.000625	57	0.001121
Gander	21	0.000409	37	0.000722	112	0.002234
Goose Bay	27	0.000527	30	0.000586	61	0.001208
Houston	2	0.000039	2	0.000039	3	0.000058
Iqaluit	94	0.001896	120	0.002442	289	0.006307
Jacksonville	0	0.000000	1	0.000019	4	0.000077
Juneau	17	0.000331	27	0.000527	53	0.001043
Kansas City	3	0.000058	5	0.000097	6	0.000116
Kotzebue	23	0.000451	27	0.000530	75	0.001486
Los Angeles	2	0.000039	3	0.000058	10	0.000194
Memphis	0	0.000000	1	0.000019	3	0.000058
Merida	6	0.000119	9	0.000180	283	0.005843
Mexico City	9	0.000174	33	0.000642	640	0.013643
Miami	2	0.000039	4	0.000077	55	0.001065
Minneapolis	6	0.000116	6	0.000116	8	0.000155
New York	4	0.000077	4	0.000077	4	0.000077
Oakland	2	0.000039	5	0.000097	8	0.000155
Puerto Vallarta	3	0.000060	82	0.001644	733	0.016009
Salt Lake City	4	0.000077	3	0.000058	6	0.000116
San Jose Del Cabo	4	0.000083	97	0.002033	426	0.009296

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Seattle	4	0.000077	5	0.000097	12	0.000233
Washington, DC	2	0.000039	3	0.000058	3	0.000058
Winnipeg	12	0.000233	12	0.000233	18	0.000350

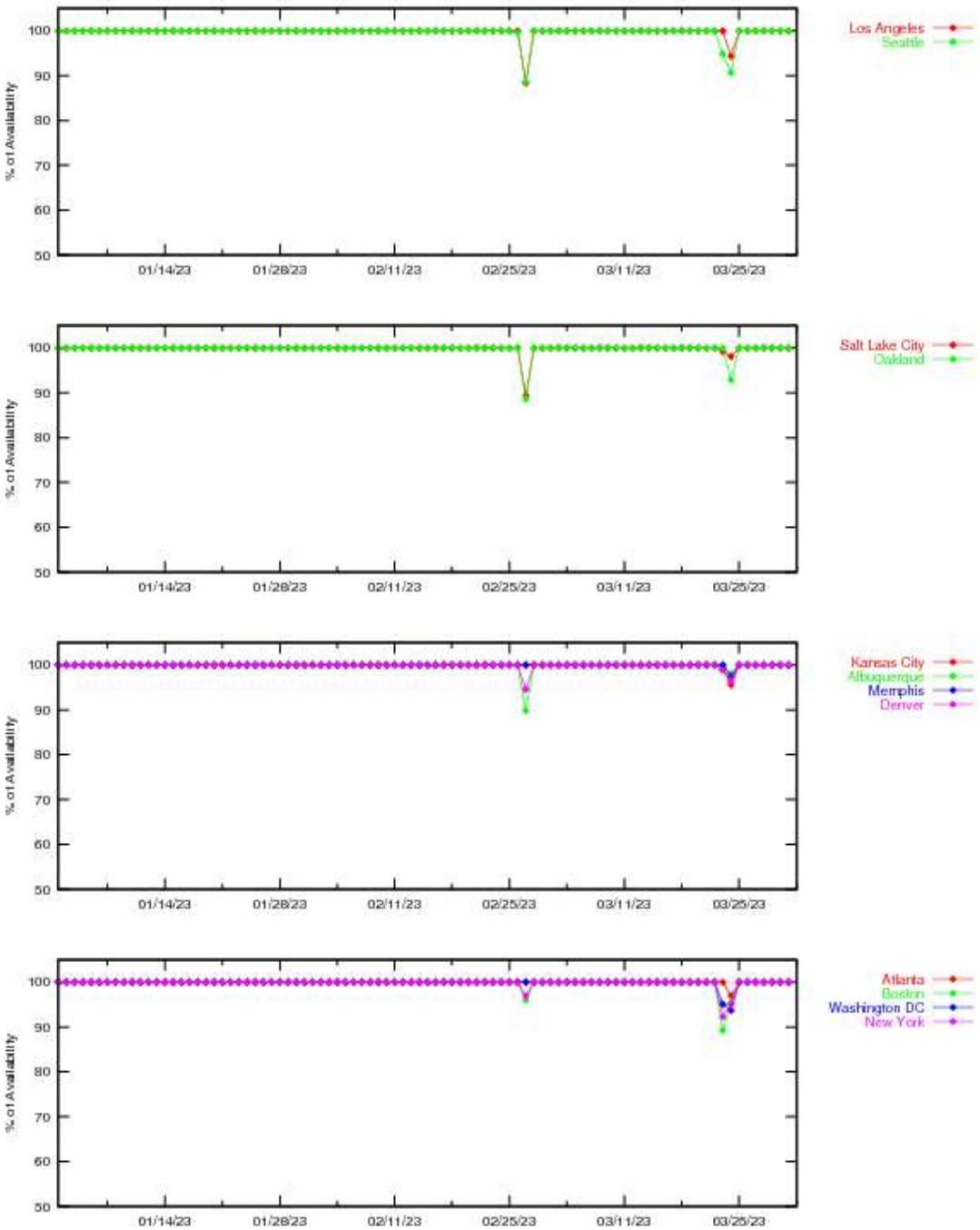

Figure 3-1 LPV Instantaneous Availability

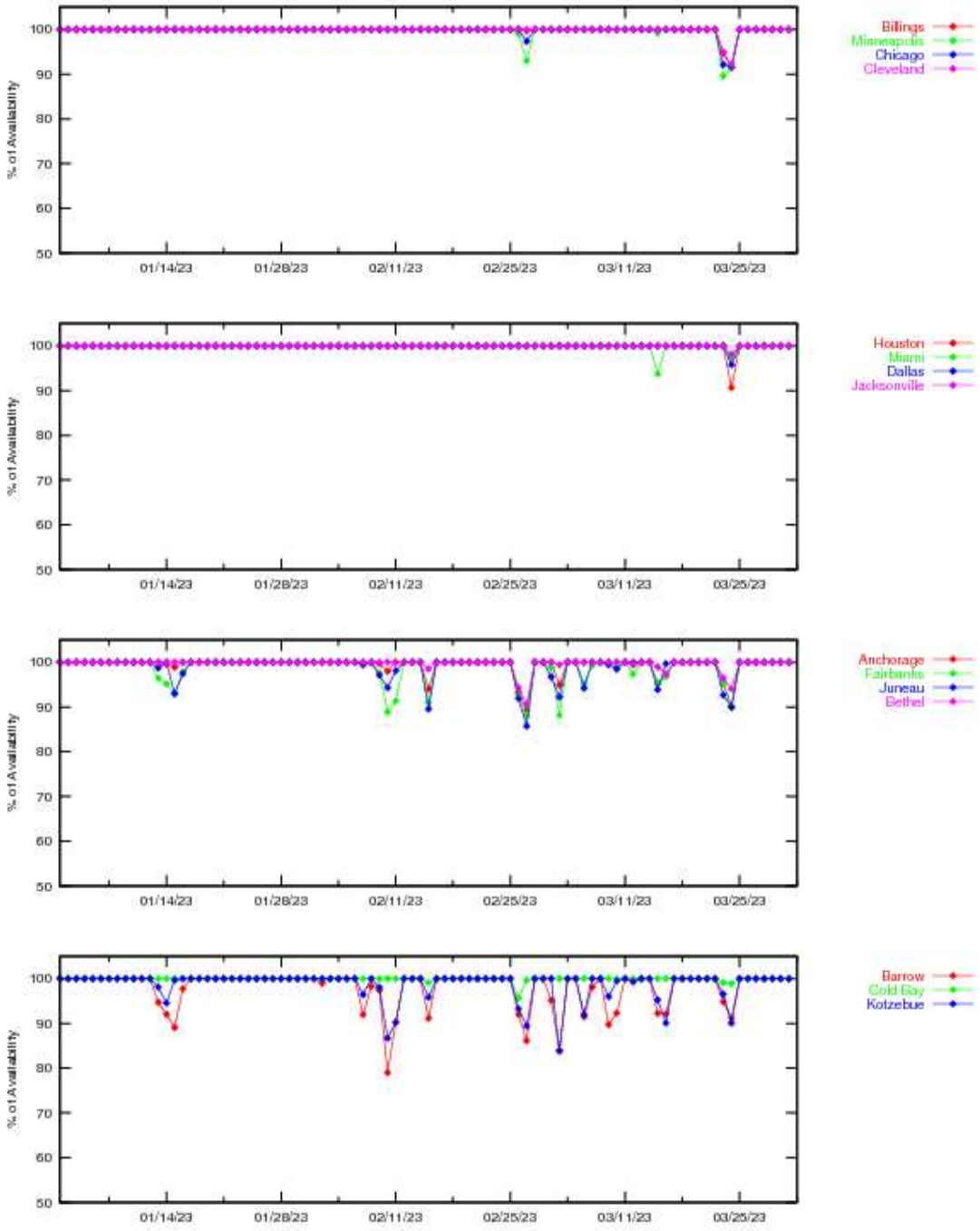

Figure 3-2 LPV Instantaneous Availability

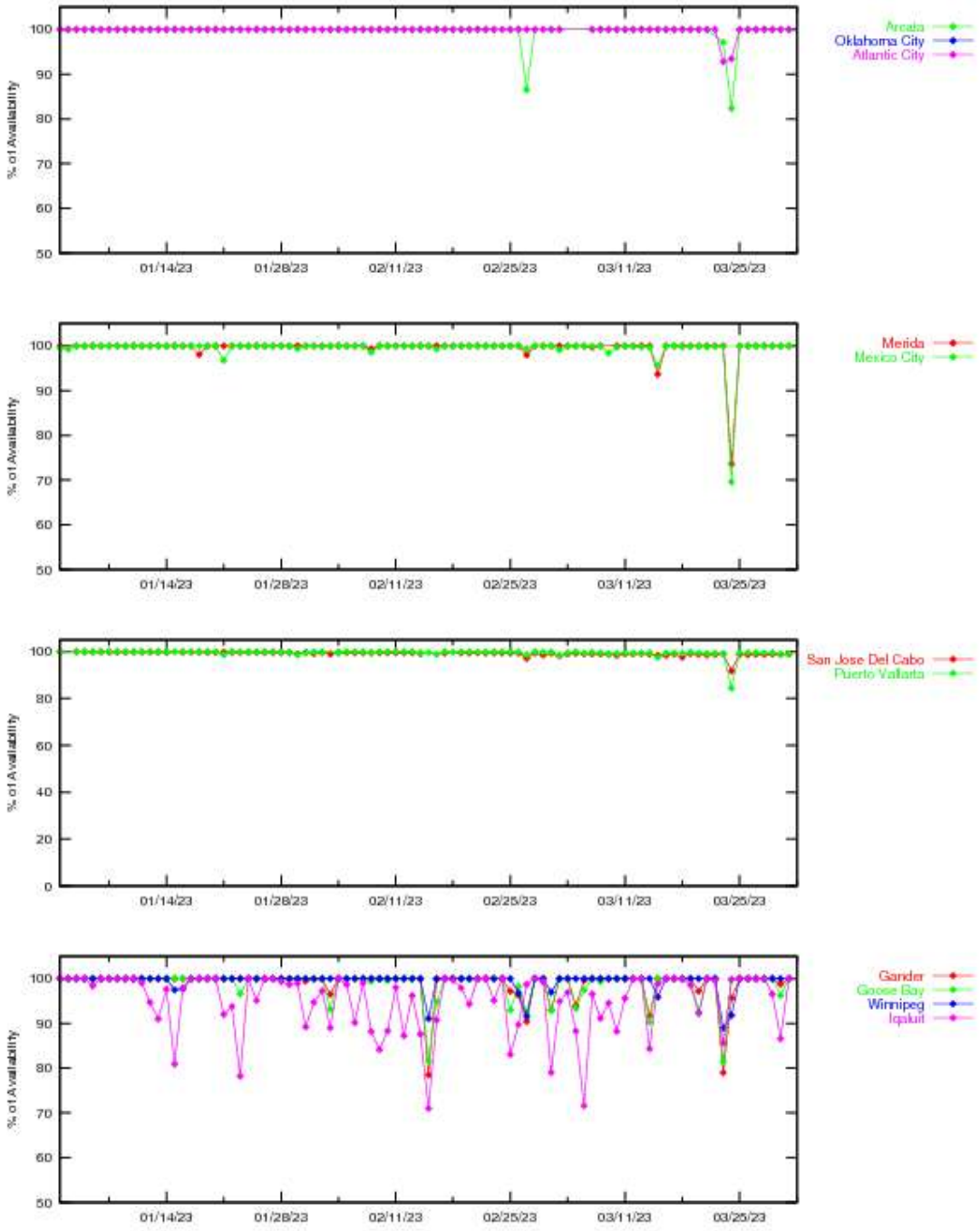

Figure 3-3 LPV Instantaneous Availability

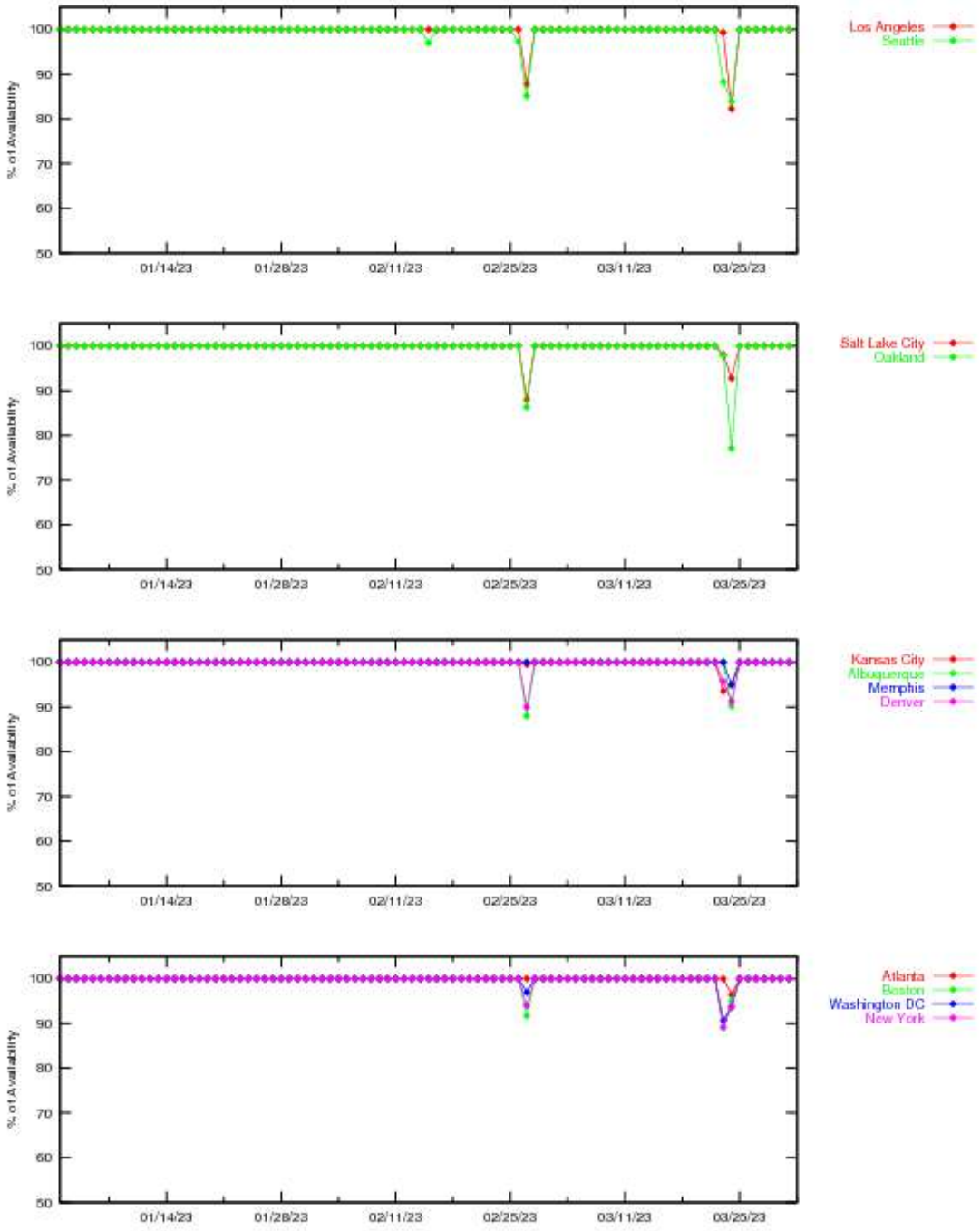

Figure 3-4 LPV200 Instantaneous Availability

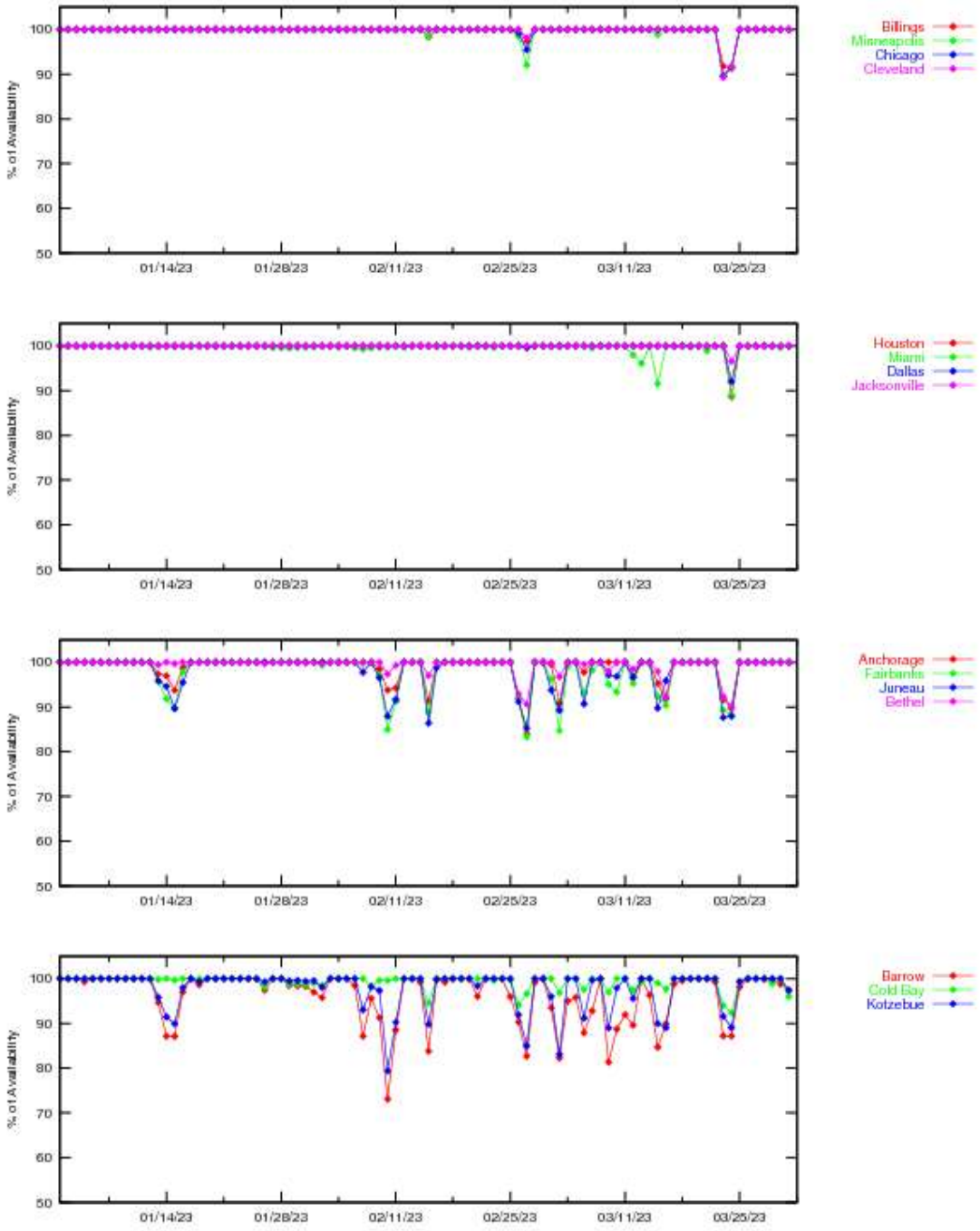

Figure 3-5 LPV200 Instantaneous Availability

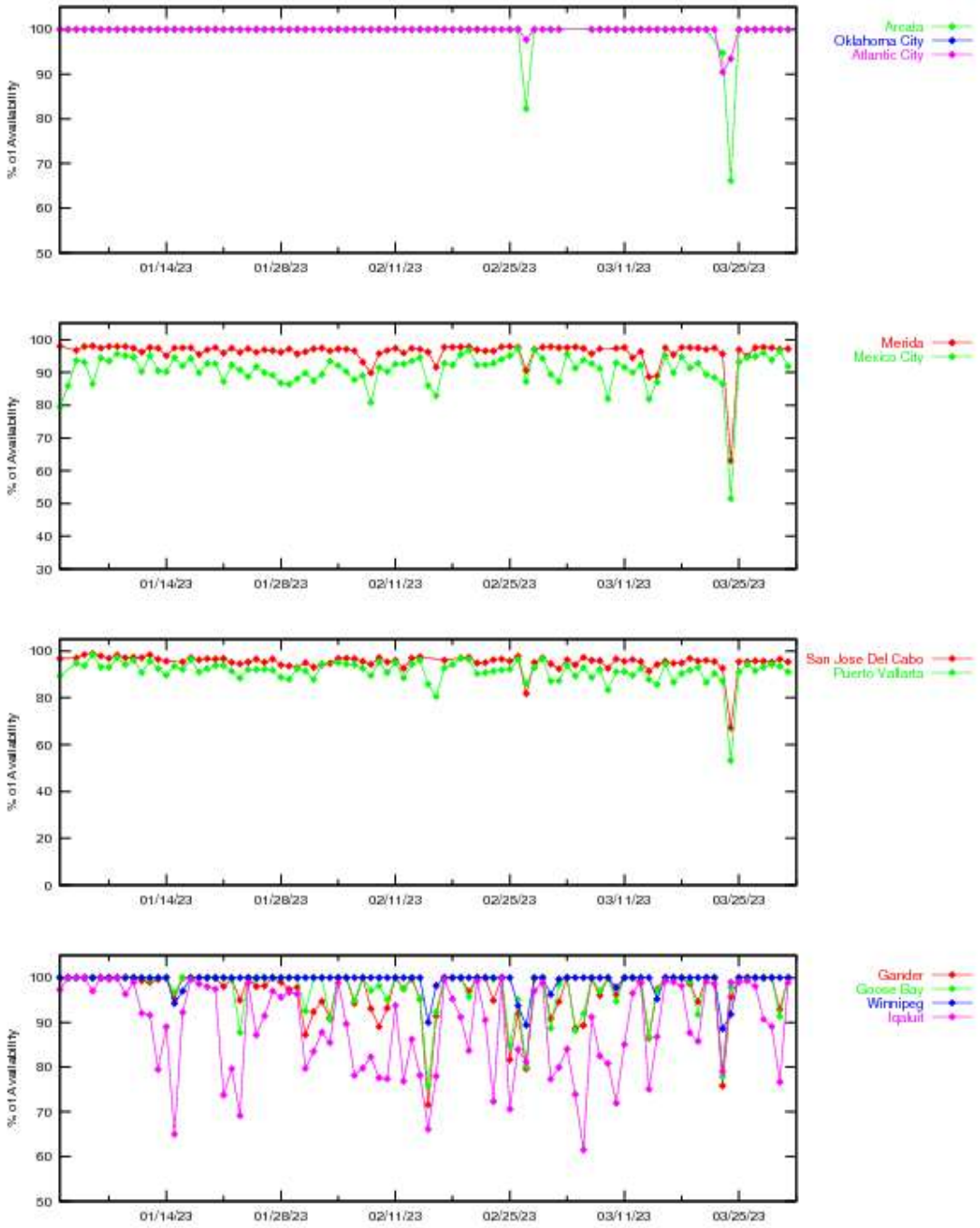

Figure 3-6 LPV200 Instantaneous Availability

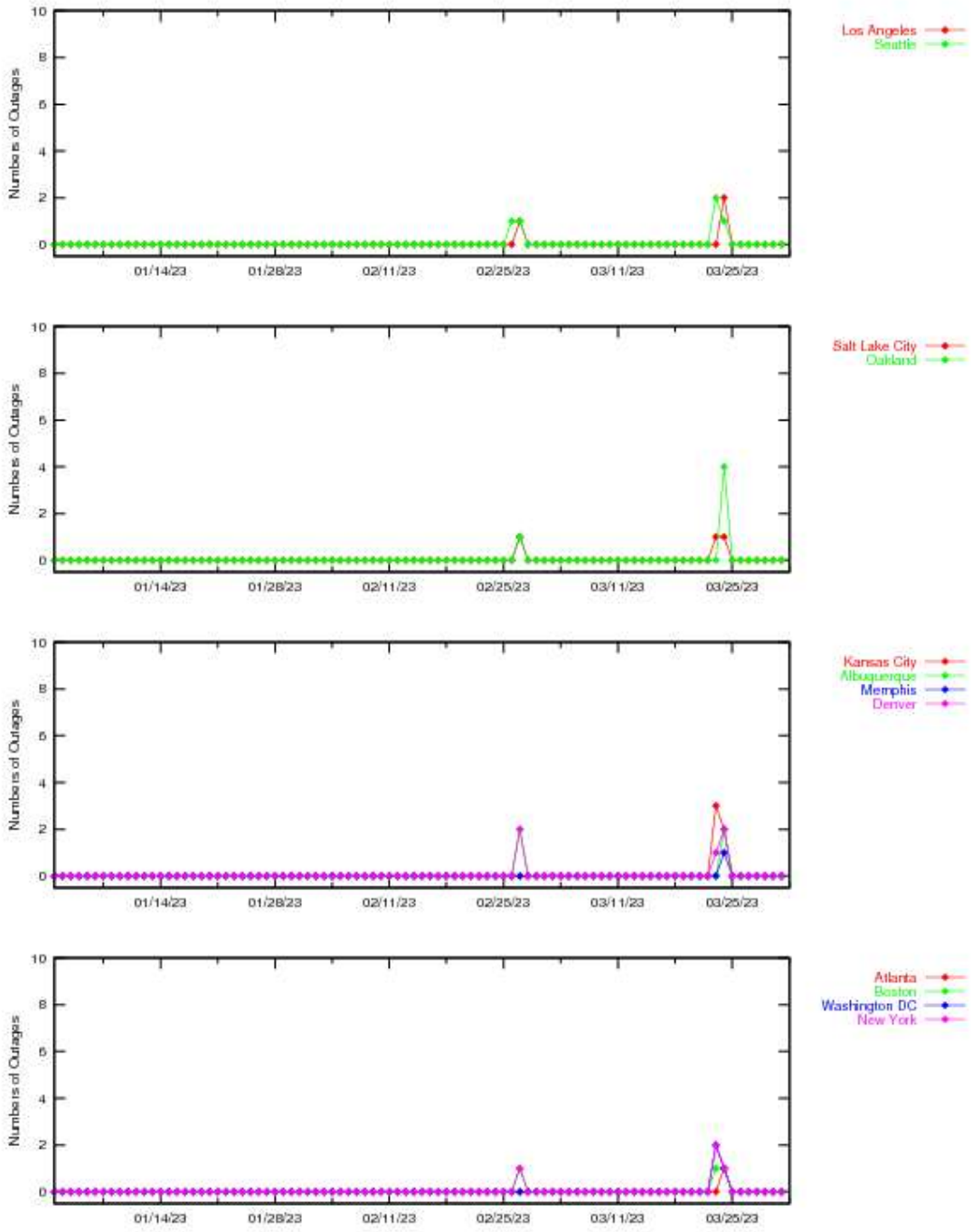

Figure 3-7 LPV Outages

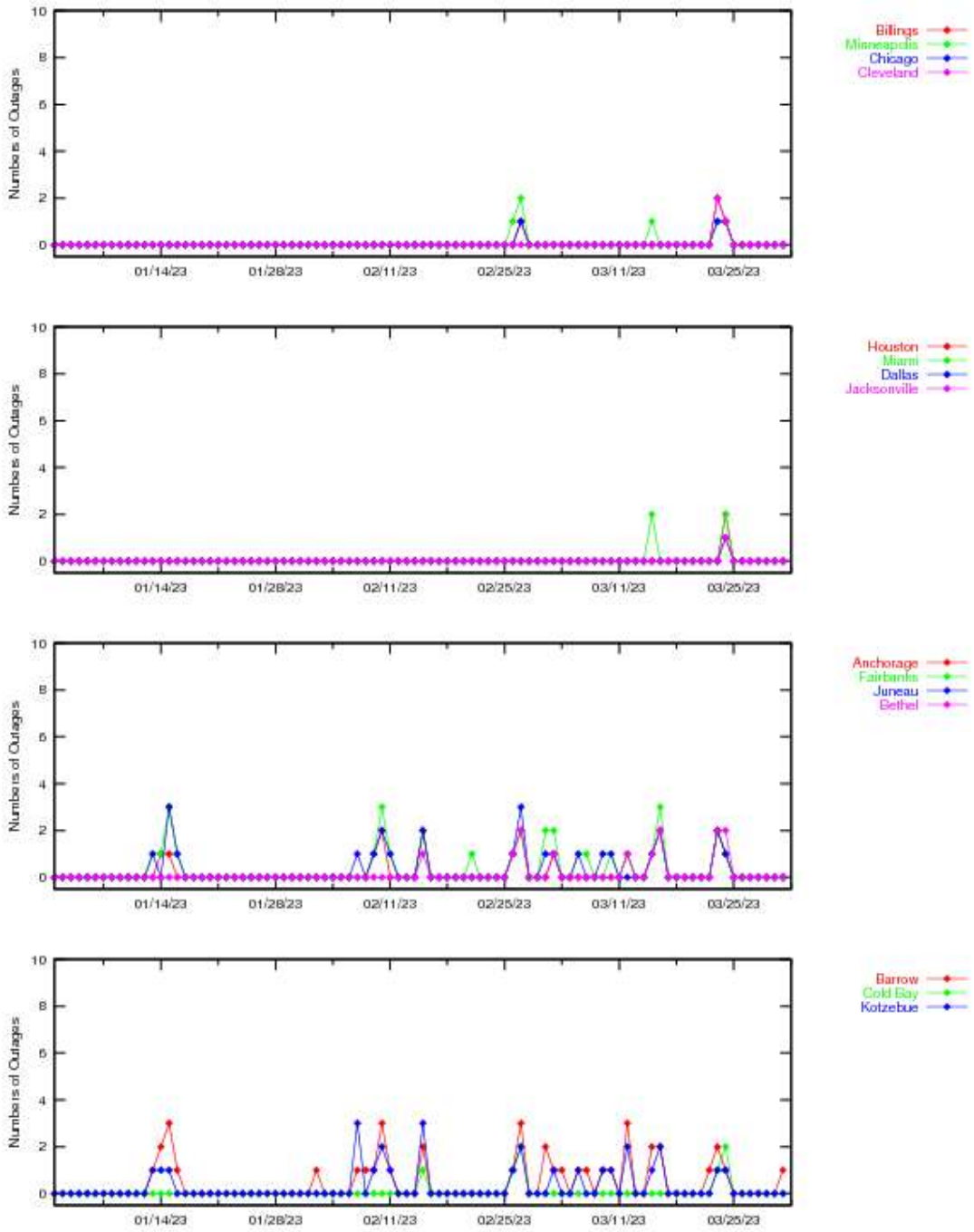

Figure 3-8 LPV Outages

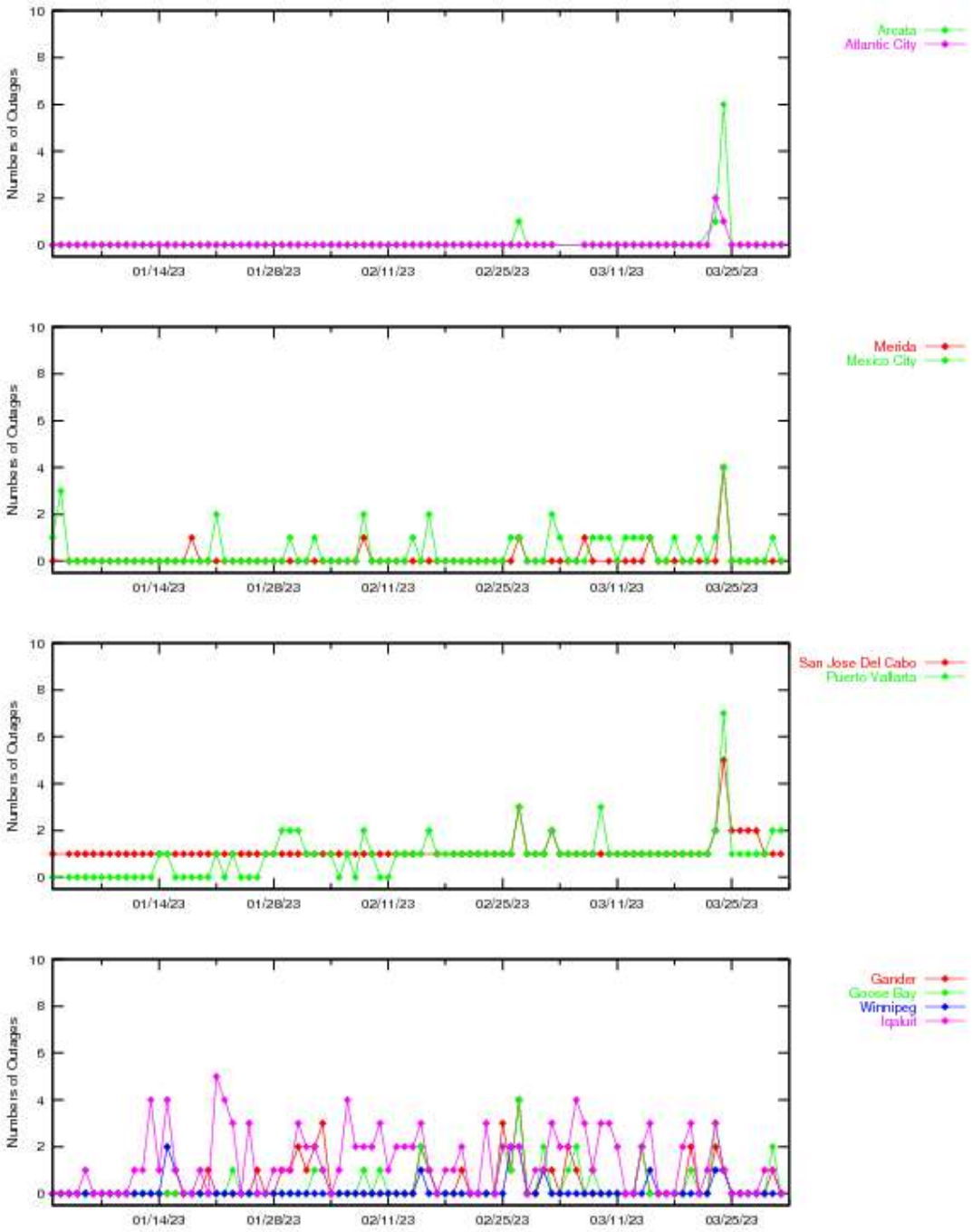

Figure 3-9 LPV Outages

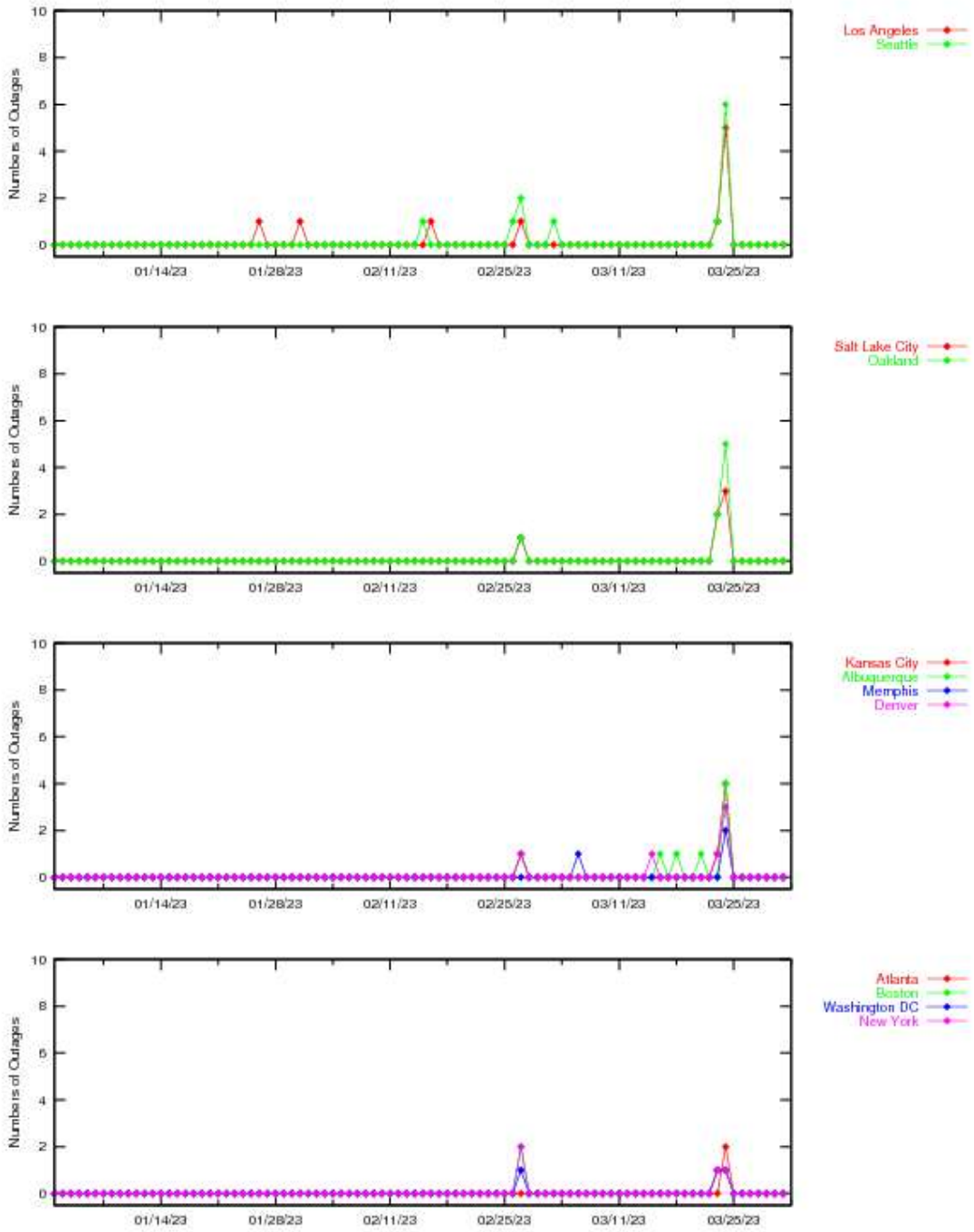

Figure 3-10 LPV200 Outages

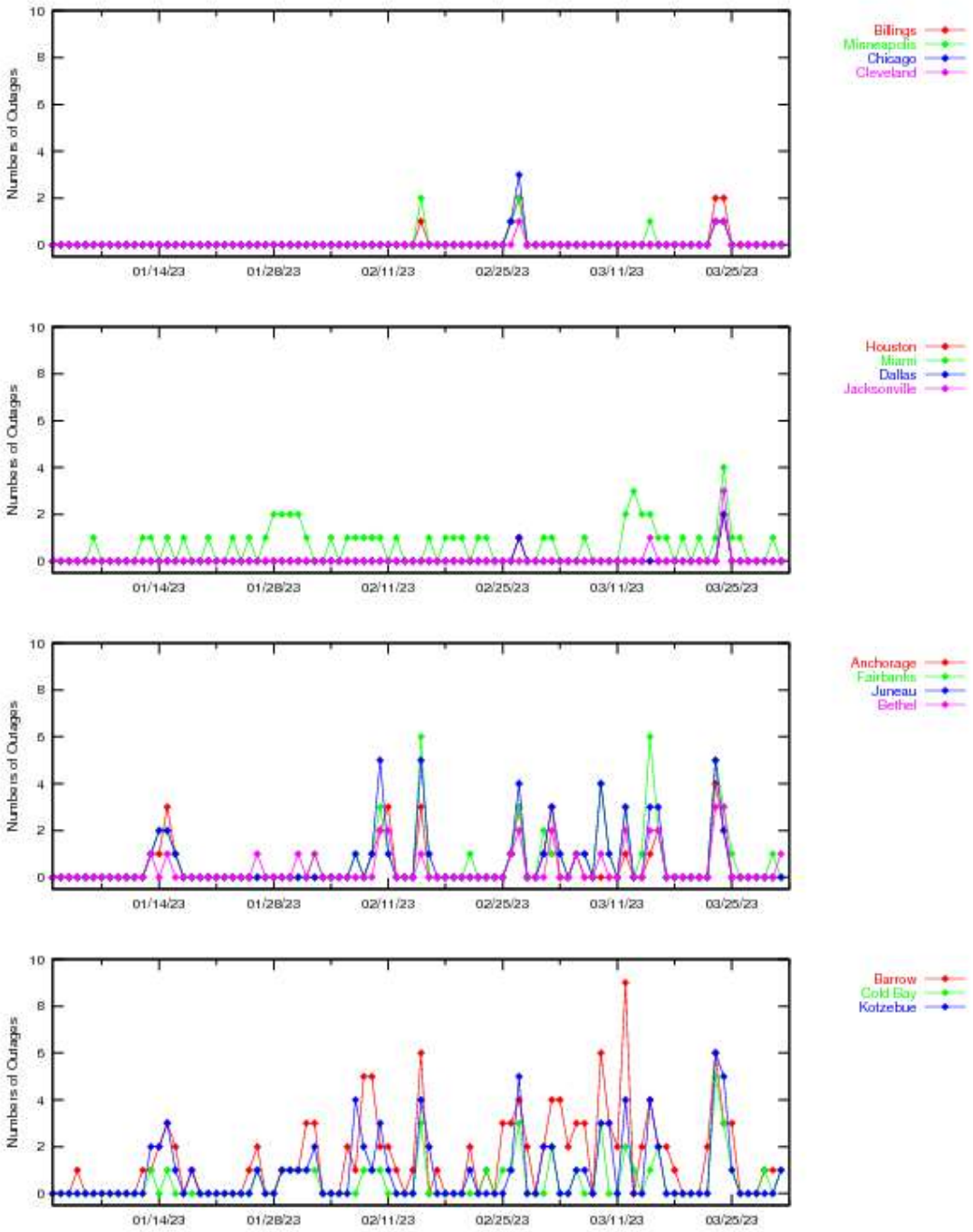

Figure 3-11 LPV200 Outages

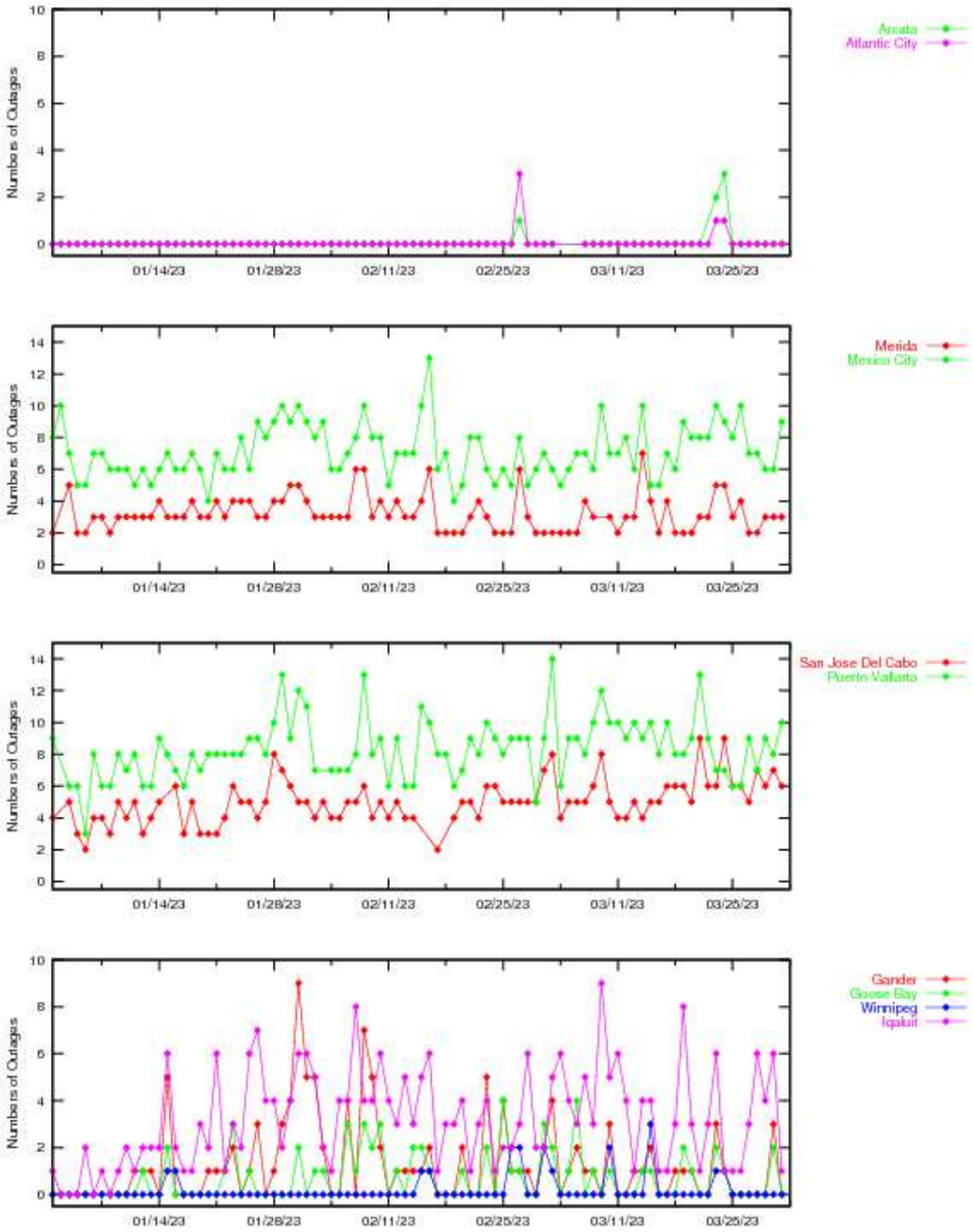

Figure 3-12 LPV200 Outages

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

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

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

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

Location	NPA Outages (Number)	NPA Outage Rates
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	0	0
Bethel	0	0
Billings	0	0
Boston	0	0
Cleveland	0	0
Cold Bay	0	0

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

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

- Jan 01–Mar 31—The Tech Center began observing a reduction of LPV200 availability in the Gulf of Mexico and the Florida panhandle. This is due to an increase of dilution of precision in the region. The region sees a drop in satellites as PRN3 sets. Later, the degradation decreases as PRN21 enters the region.
- Jan 01–Mar 31—The Tech Center began observing a reduction of LPV200 availability over New Mexico and Arizona. This is due to an increase of dilution of precision in the region. The region sees a drop in satellites as PRN6 sets. Later, the degradation decreases as the PRN15 enters the region.
- Jan 13–14—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Alaska and Canada.
- Jan 14–15—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Alaska and Canada.
- Jan 16—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Jan 20—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- Jan 21—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Jan 22—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Jan 23—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Jan 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.

- Jan 25–26—Satellite maintenance elevated UDREs on PRN1 and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Jan 26—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Jan 26—Satellite maintenance elevated UDREs on PRN25 and reduced LPV200 availability in Canada.
- Jan 28–Feb 02—Satellite maintenance elevated UDREs on PRN1 and reduced LPV200 availability in Alaska and Canada.
- Jan 31—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Feb 01–02—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Feb 02—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Feb 03—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Feb 05—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- Feb 06–07—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Feb 07–08—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Feb 08–09—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Feb 09–10—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Alaska and Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Feb 10—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Alaska and Canada.
- Feb 12—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Feb 13—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS.
- Feb 14—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Feb 15–16—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Feb 16–17—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Feb 16—SVN79 (PRN28) was launched on January 18, 2023. PRN28 became operation on February 16, 2023.
- Feb 18—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- Feb 19—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.

- Feb 20—Geomagnetic activity increased IGP GIVE values and reduced and LPV200 availability in Canada.
- Feb 21—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Alaska and Canada.
- Feb 22—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- Feb 23—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in CONUS and Canada.
- Feb 25–26—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Feb 26–27—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Feb 27—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Feb 28—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Mar 09–10—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Alaska and Canada.
- Mar 11—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- Mar 12—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Alaska and Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Mar 13—There was a Range Domain Monitor trip on PRN19 at San Juan (ZSU), which reduced LPV200 availability in CONUS.
- Mar 14—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Mar 15—There were Range Domain Monitor trips on PRN12 and PRN13.
- Mar 15–16—Geomagnetic activity increased IGP GIVE values and reduced LPV availability in Alaska and Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Mar 17—Geomagnetic activity increased IGP GIVE values and LPV200 availability in CONUS.
- Mar 18—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS and Canada.
- Mar 19—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Mar 20—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Mar 23–24—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- Mar 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Alaska and Canada.
- Mar 28—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.

- Mar 29—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability Canada.
- Mar 30—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- Mar 31—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Alaska and Canada.

4.0 COVERAGE

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

Daily PA analysis was conducted for LP, LPV, and LPV200 service levels. The PA coverage plots provide 100%, 99.9%, 99%, 98%, and 95% availability contours. Figure 4-1 shows the rollup LP North America coverage, Figure 4-2 shows the rollup LPV North America coverage, Figure 4-3 shows the rollup LPV200 North America coverage, Figure 4-4 shows the daily LPV and LPV200 CONUS coverage, Figure 4-5 shows the daily LPV Alaska coverage at 99% availability and ionosphere Kp index values, and Figure 4-6 shows the daily LPV and LPV200 Canada coverage at 99% availability and ionosphere Kp index values. See Appendix B: 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.

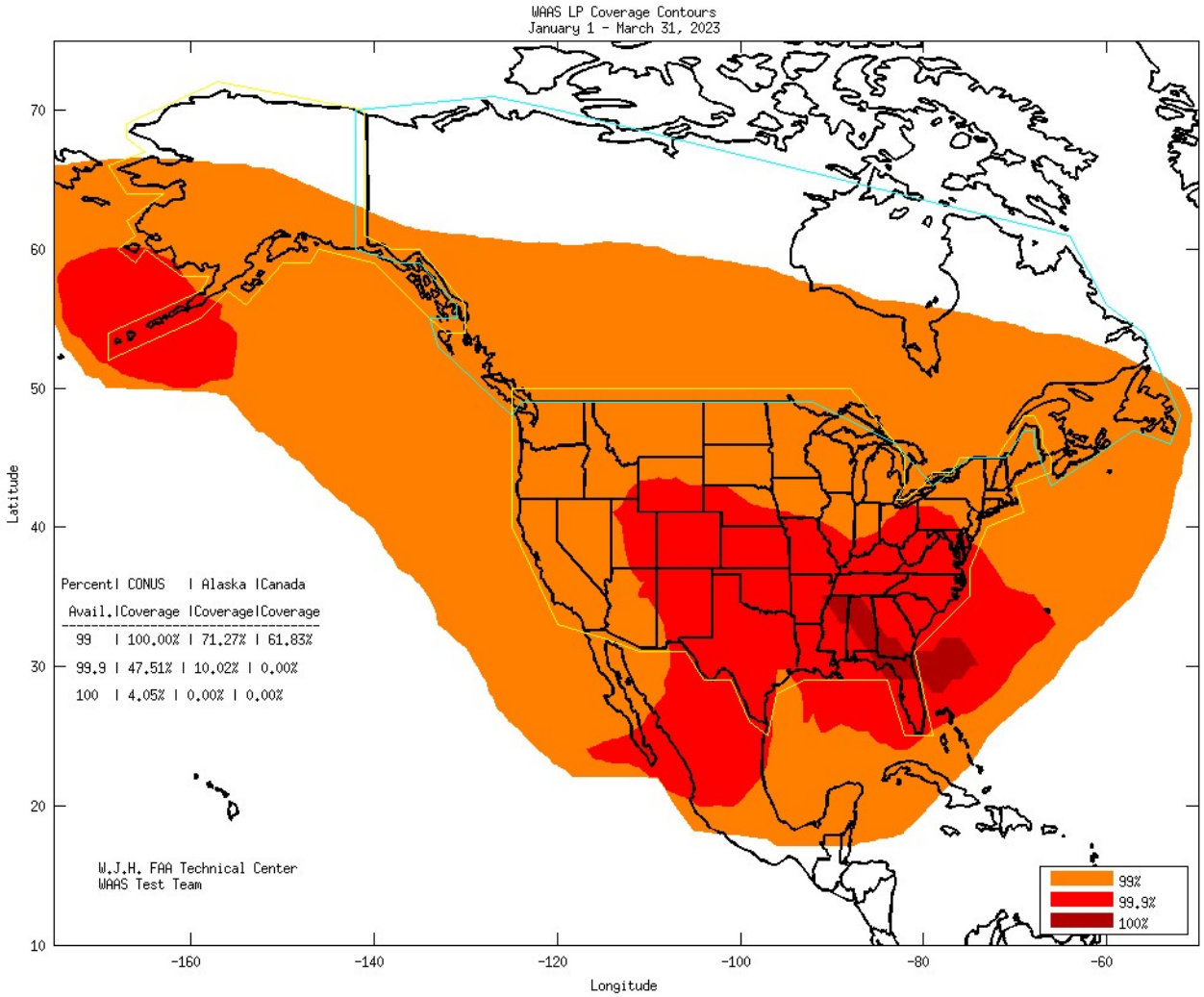

Figure 4-1 LP North America Coverage for the Quarter

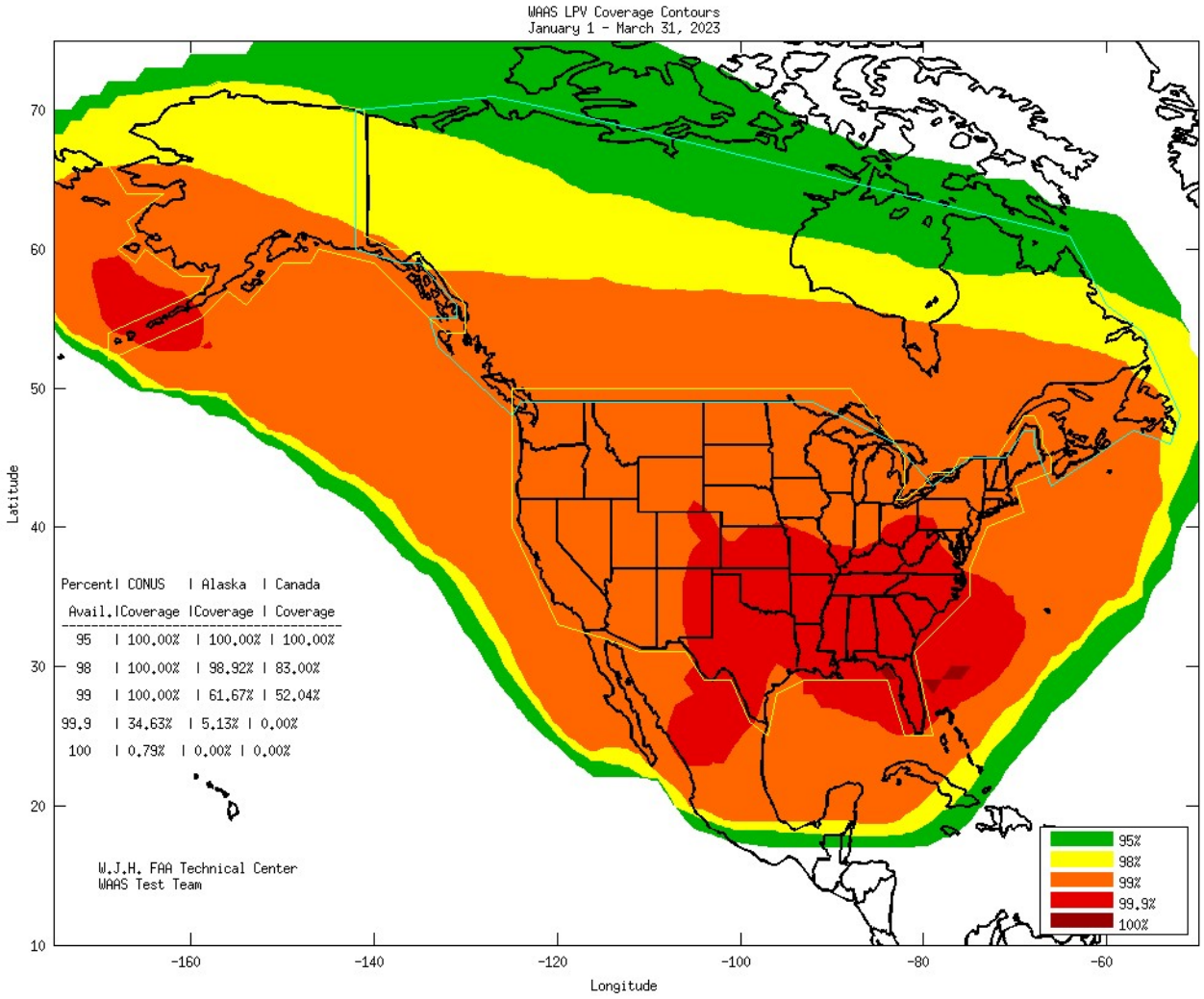

Figure 4-2 LPV North America Coverage for the Quarter

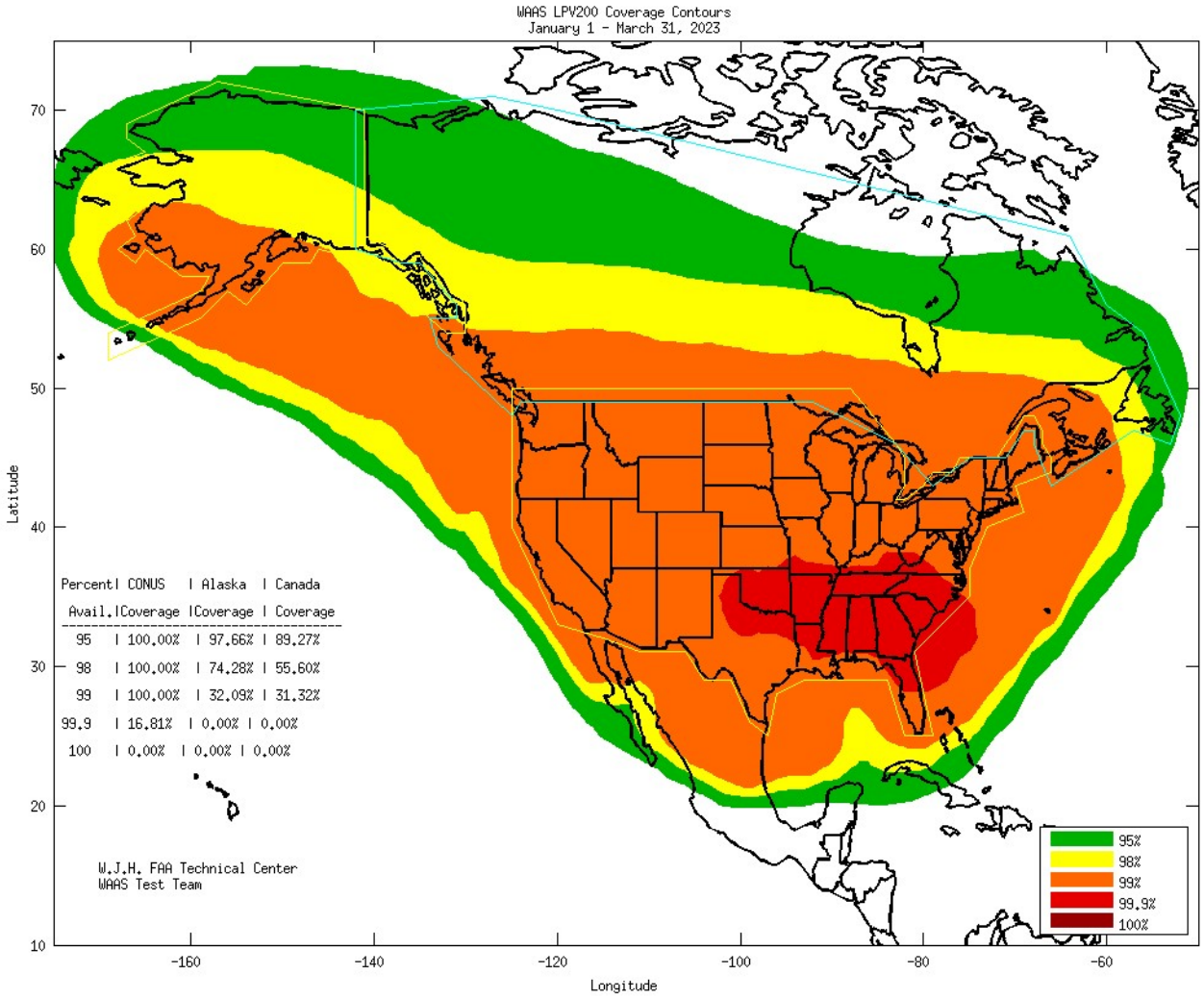

Figure 4-3 LPV200 North America Coverage for the Quarter

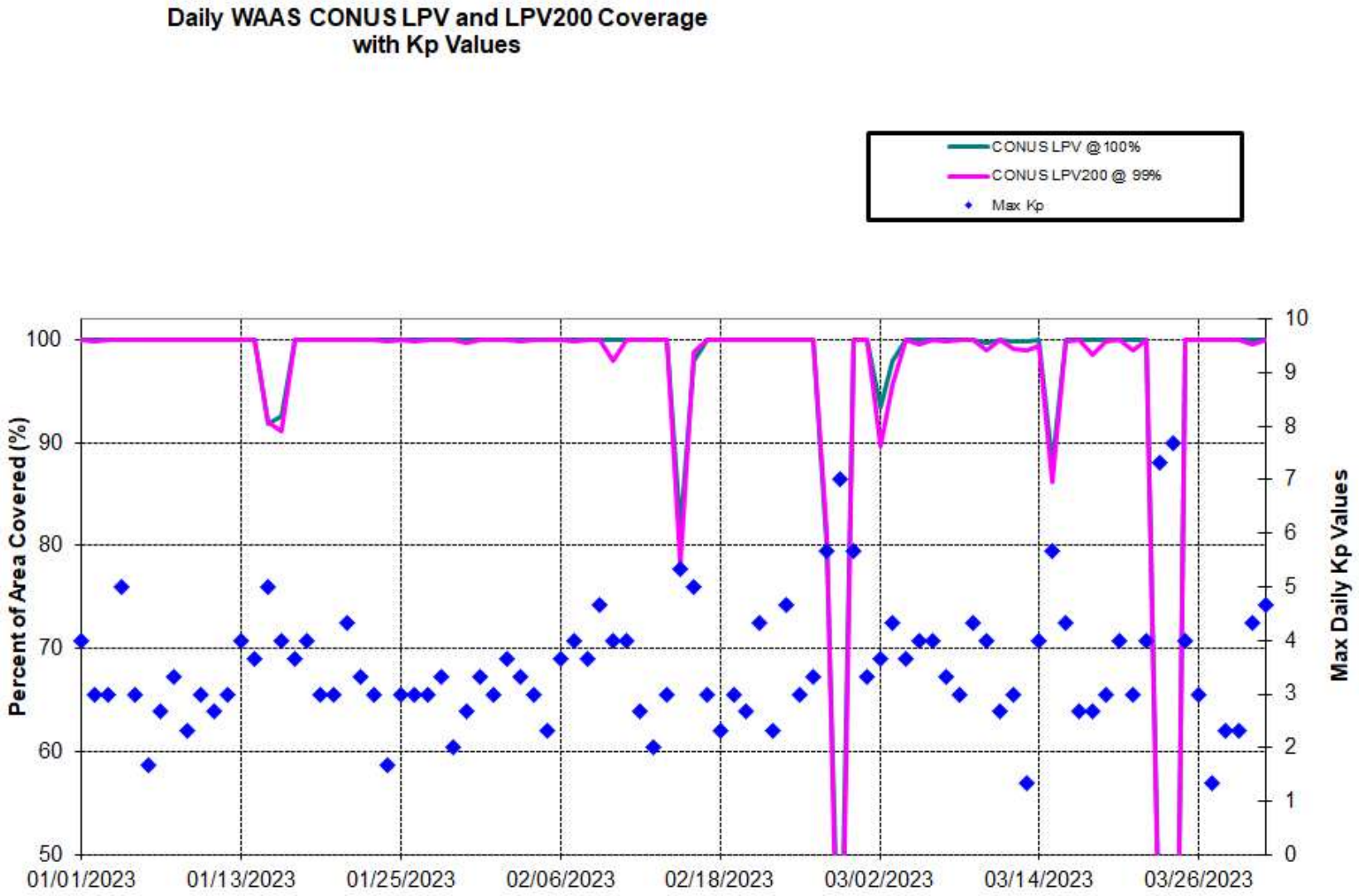

Figure 4-4 Daily LPV and LPV200 CONUS Coverage

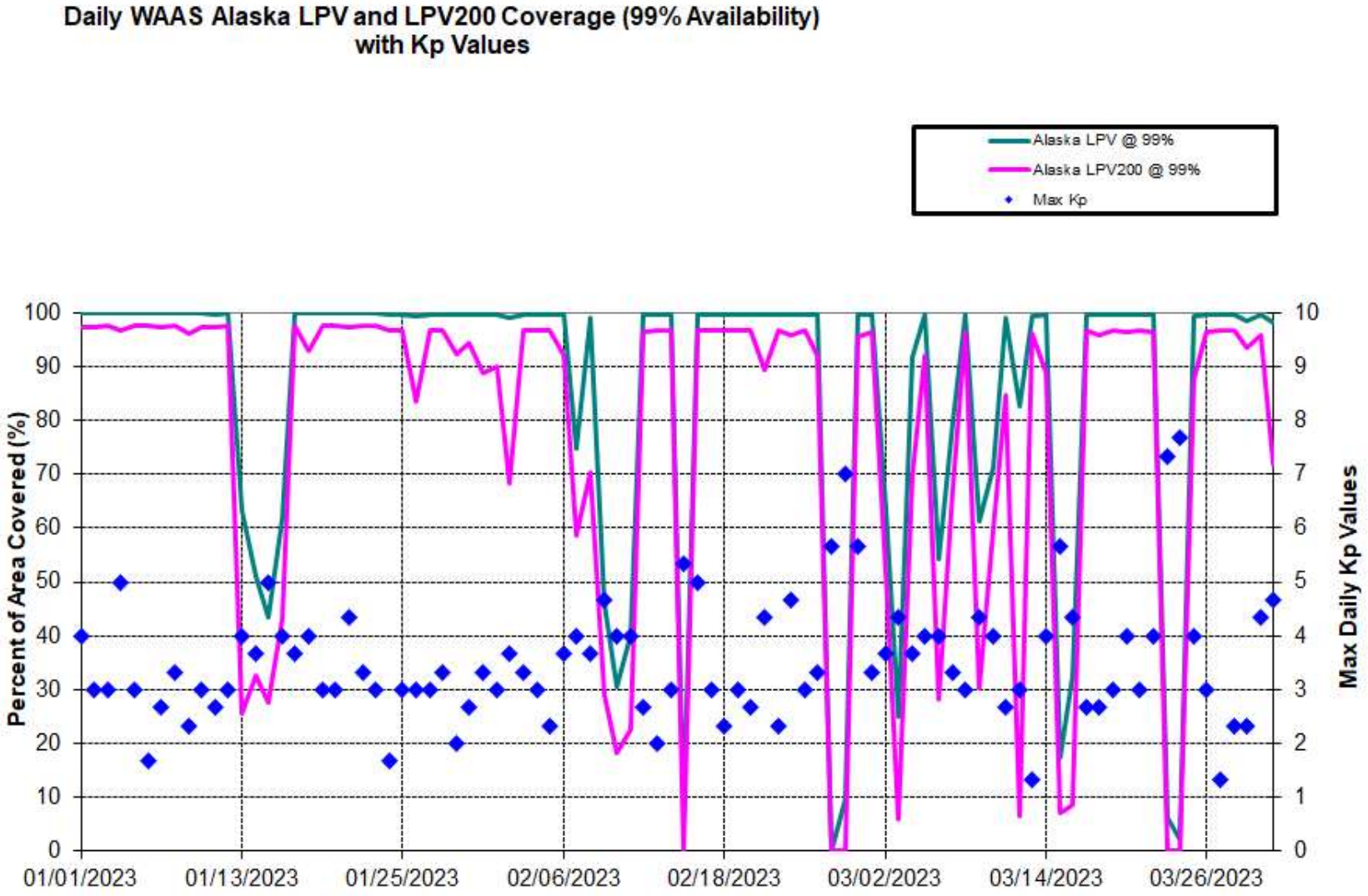

Figure 4-5 Daily LPV and LPV200 Alaska Coverage

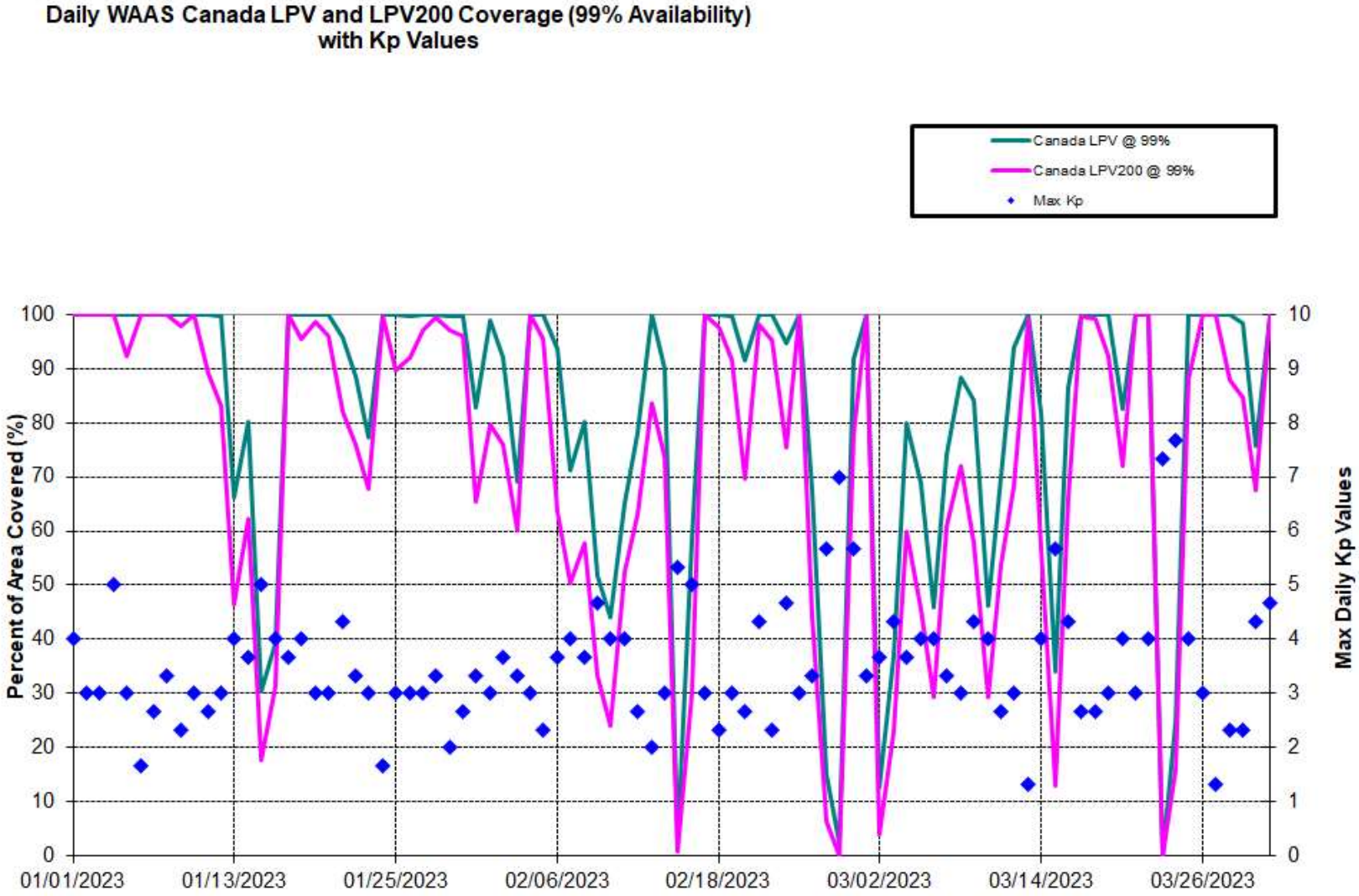

Figure 4-6 Daily LPV and LPV200 Canada Coverage

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.

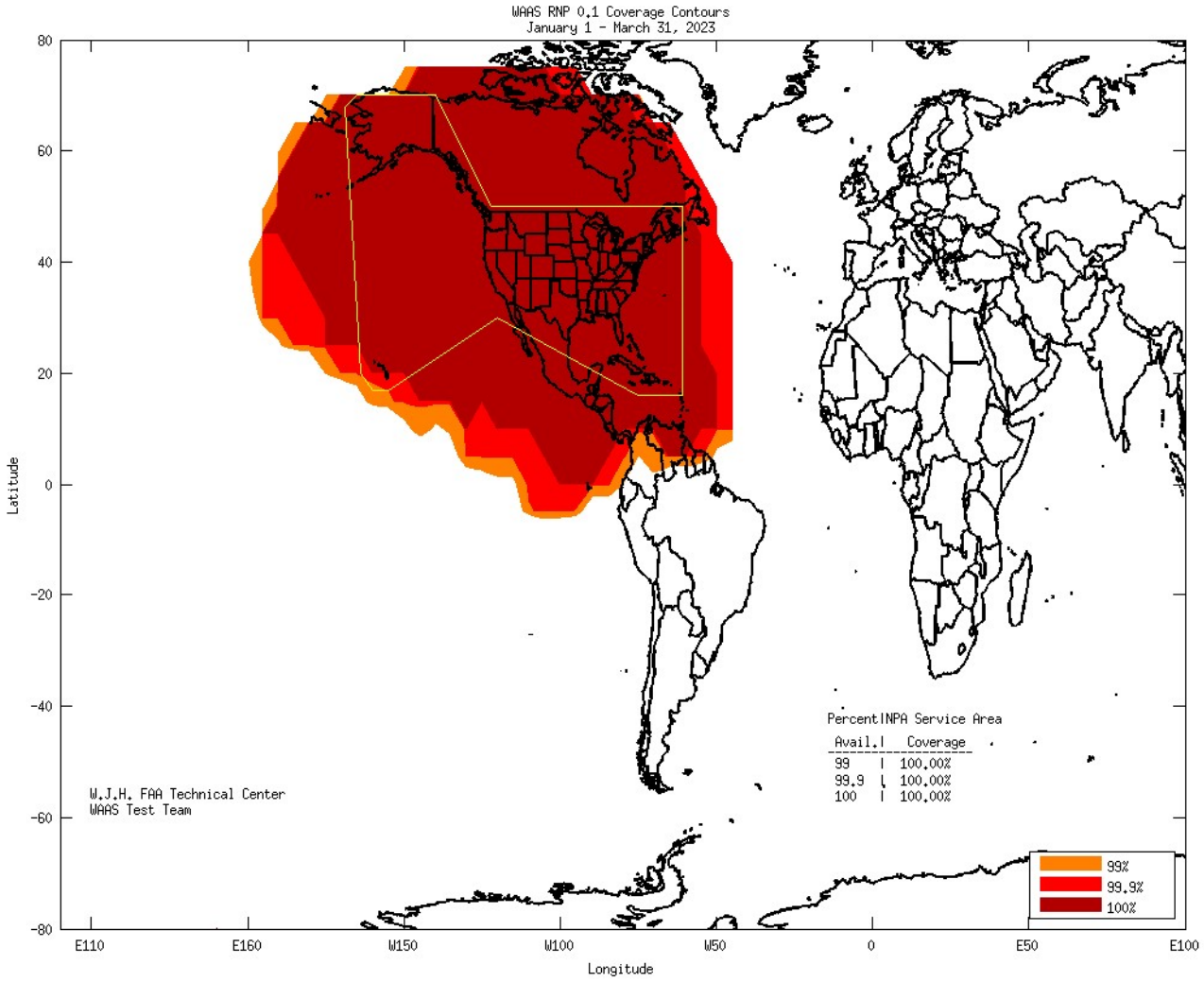

Figure 4-7 RNP 0.1 Coverage for the Quarter

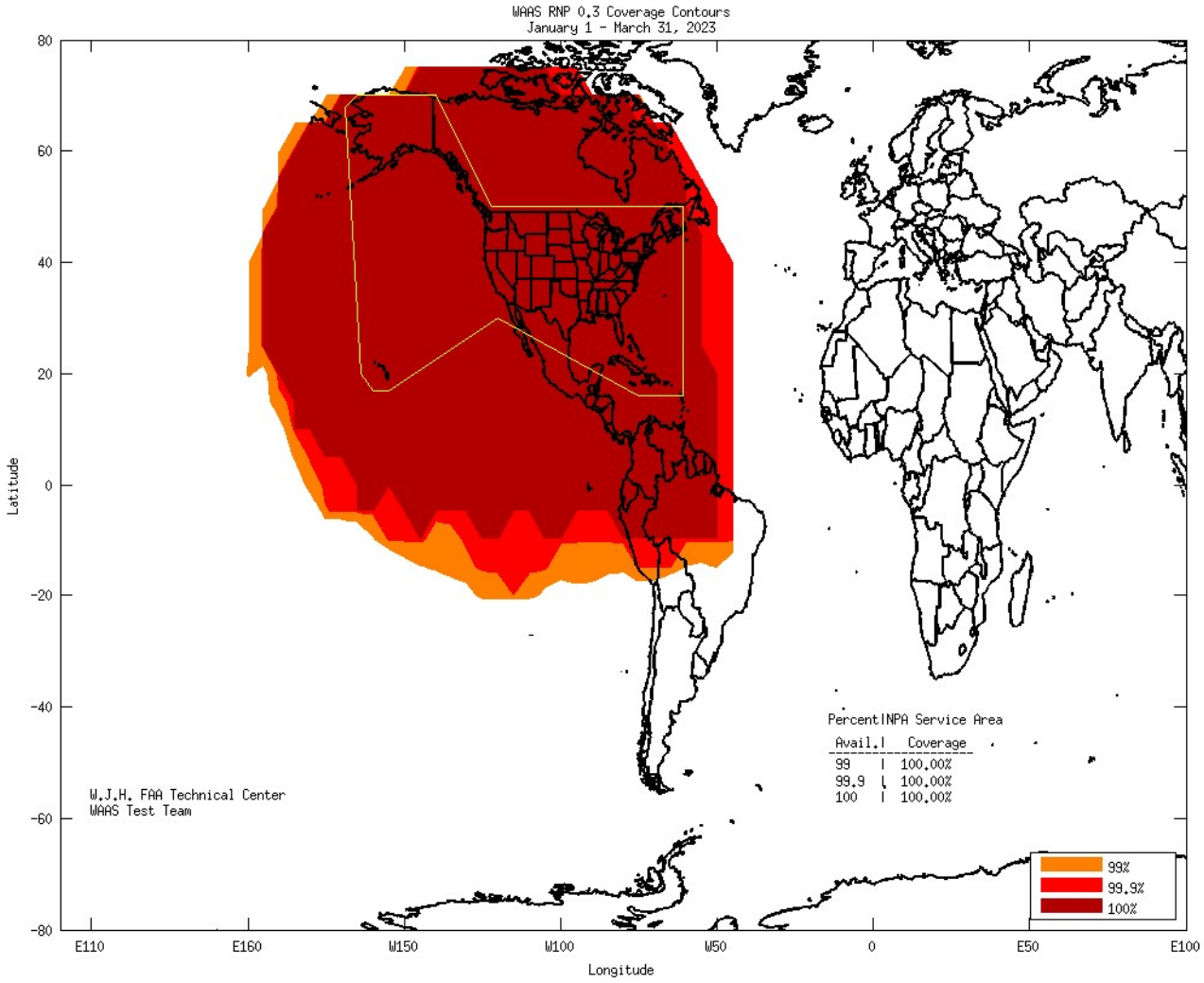

Figure 4-8 RNP 0.3 Coverage for the Quarter

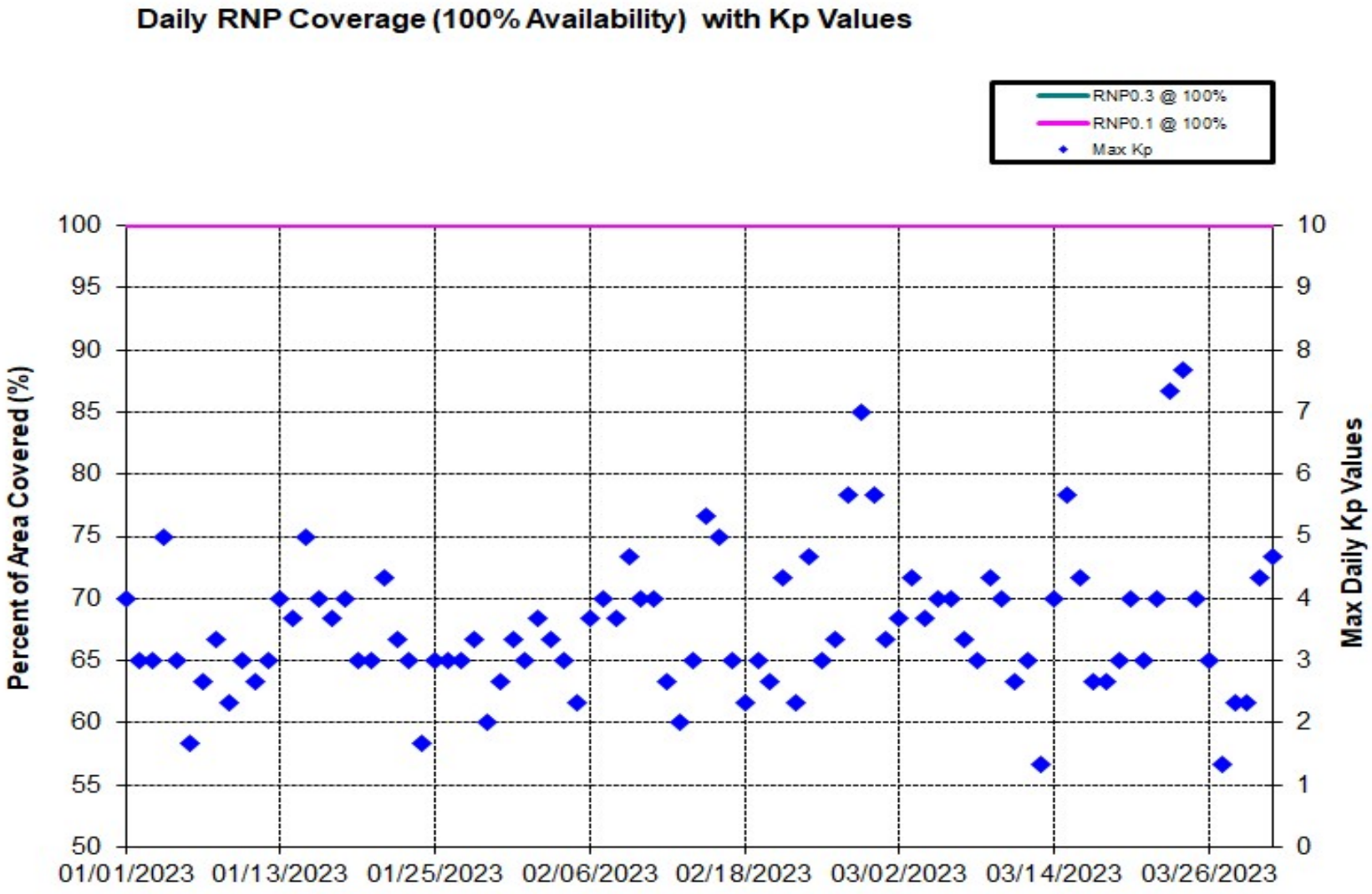

Figure 4-9 Daily RNP Coverage

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 listed below:

- Jan 01–Mar 31—The Tech Center began observing a reduction of LPV200 coverage in the Gulf of Mexico and the Florida panhandle. This is due to an increase of dilution of precision in the region. The region sees a drop in satellites as PRN3 sets. Later, the degradation decreases as PRN21 enters the region.
- Jan 01–Mar 31—The Tech Center began observing a reduction of LPV200 coverage over New Mexico and Arizona. This is due to an increase of dilution of precision in the region. The region sees a drop in satellites as PRN6 sets. Later, the degradation decreases as the PRN15 enters the region.
- Jan 13–14—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Alaska and Canada.
- Jan 14–15—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Alaska and Canada.
- Jan 16—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Jan 20—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Jan 21—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Jan 22—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Jan 23—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Jan 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Jan 25–26—Satellite maintenance elevated UDREs on PRN1 and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Jan 26—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Jan 26—Satellite maintenance elevated UDREs on PRN25 and reduced LPV200 coverage in Canada.
- Jan 28–Feb 02—Satellite maintenance elevated UDREs on PRN1 and reduced LPV200 coverage in Alaska and Canada.
- Jan 31—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Feb 01–02—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Feb 02—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Feb 03—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Feb 05—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Feb 06–07—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in CONUS, Alaska, and Canada.

- Feb 07–08—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Feb 08–09—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Feb 09–10—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Alaska and Canada and LPV200 coverage in CONSU, Alaska, and Canada.
- Feb 10—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Alaska and Canada.
- Feb 12—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Feb 13—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS.
- Feb 14—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Feb 15–16—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Feb 16–17—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in CONUS, Alaska, and Canada.
- Feb 16—SVN79 (PRN28) was launched on January 18, 2023. PRN28 became operation on February 16, 2023.
- Feb 18—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Feb 19—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Feb 20—Geomagnetic activity increased IGP GIVE values and reduced and LPV200 coverage in Canada.
- Feb 21—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Alaska and Canada.
- Feb 22—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Feb 23—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in CONUS and Canada.
- Feb 25–26—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- Feb 26–27—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Feb 27—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Feb 28—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Mar 09–10—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Alaska and Canada.
- Mar 11—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.

- Mar 12—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Alaska and Canada and LPV200 coverage in CONUS, Alaska, and Canada.
- Mar 13—There was a Range Domain Monitor trip on PRN19 at San Juan (ZSU), which reduced LPV200 coverage in CONUS.
- Mar 14—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Canada and LPV200 coverage in CONUS, Alaska, and Canada.
- Mar 15—There were Range Domain Monitor trips on PRN12 and PRN13.
- Mar 15–16—Geomagnetic activity increased IGP GIVE values and reduced LPV coverage in Alaska and Canada and LPV200 coverage in CONUS, Alaska, and Canada.
- Mar 17—Geomagnetic activity increased IGP GIVE values and LPV200 coverage in CONUS.
- Mar 18—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS and Canada.
- Mar 19—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Mar 20—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Mar 23–24—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Mar 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Alaska and Canada.
- Mar 28—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Mar 29—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage Canada.
- Mar 30—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- Mar 31—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Alaska and Canada.

5.0 INTEGRITY

5.1 HMI Analysis

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

A computed safety margin index of greater than 1 indicates safe bounding of the greatest observed error, less than 1 indicates that the maximum error was not bounded, and a result equal to 1 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 3.292 at Oklahoma City and there were no HMI events. There has not been an HMI event since WAAS was made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Horizontal Safety Index (m)	Vertical Safety Index (m)	Number of HMIs
Arcata	6.674	5.720	0
Atlantic City-a	8.920	6.085	0
Oklahoma City	3.292	9.145	0
Albuquerque	8.488	8.585	0
Anchorage	10.505	3.655	0
Atlanta	4.885	5.704	0
Barrow	8.560	5.818	0
Bethel	6.734	6.069	0
Billings	13.419	10.333	0
Boston	6.934	7.227	0
Chicago	6.857	10.197	0
Cleveland	4.781	7.054	0
Cold Bay	5.593	6.753	0
Dallas	4.867	5.340	0
Denver	6.604	7.462	0
Fairbanks	9.190	4.794	0
Gander	9.808	7.486	0
Goose Bay	7.142	4.461	0
Houston	6.160	6.182	0
Iqaluit	5.513	4.778	0
Jacksonville	7.265	7.303	0
Juneau	8.131	6.893	0
Kansas City	5.908	8.149	0
Kotzebue	6.151	7.619	0
Los Angeles	8.037	8.931	0
Memphis	8.919	7.636	0
Merida	6.952	9.063	0
Mexico City	4.187	6.623	0
Miami	8.728	6.143	0
Minneapolis	10.624	10.742	0
New York	5.262	10.507	0
Oakland	9.654	7.189	0
Puerto Vallarta	3.887	6.301	0
Salt Lake City	5.180	7.516	0
San Jose Del Cabo	5.235	6.076	0
Seattle	9.205	8.303	0
Washington, DC	13.948	13.177	0
Winnipeg	6.935	4.966	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	15	17	14	0.1667	0.1889	0.1556
T3	18	21	18	0.2000	0.2333	0.2000
T4	19	23	23	0.2111	0.2556	0.2556
T5	0	0	0	0.0000	0.0000	0.0000
T6	0	0	0	0.0000	0.0000	0.0000
T24	0	0	0	0.0000	0.0000	0.0000
T26	0	0	1	0.0000	0.0000	0.0111
Total SV Alerts	52	61	56	0.5778	0.6778	0.6222
Days in Service	90	90	90			

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

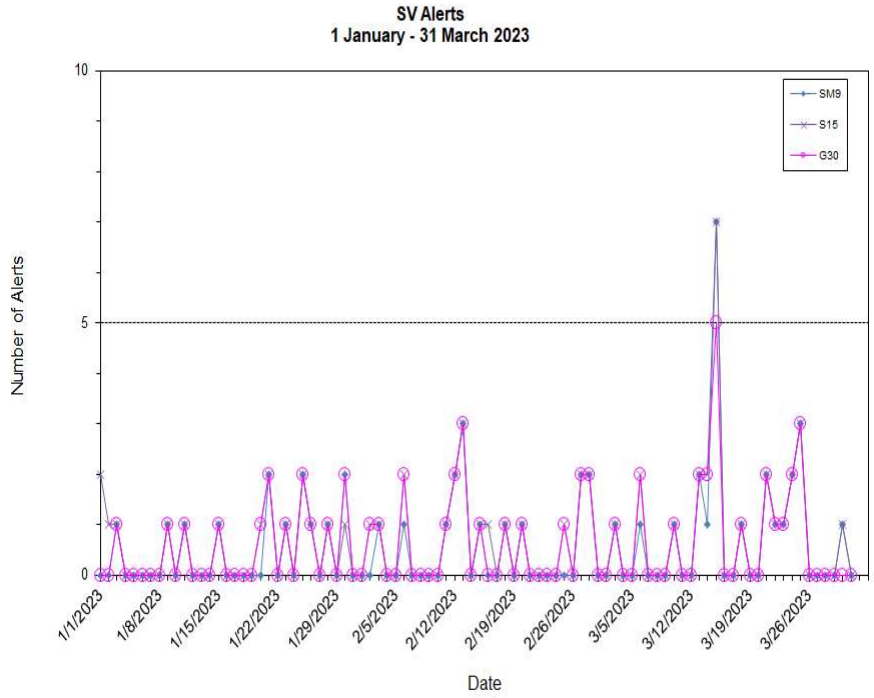

Figure 5-1 SV Daily Alert Trend

5.3 Availability of WAAS Messages (SM9, 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 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. The high Max Late Length reported by S15 GEO for SM9 GEO Type 28 messages occurred after PRN131 switched from Southbury (manual) to Santa Paula on January 21, 2023, causing a 3-second message outage. The high Max Late Length reported by G30 GEO for SM9 GEO Type 28 messages occurred after PRN131 switched from Southbury (fault) to Santa Paula on February 2, 2023, causing a 14-second message outage.

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	107335	1	132
2	1295988	34	21
3	1296000	30	26
4	1296004	34	21
7	98988	13	177
9	91123	1	174
10	98932	5	138

17	31088	1	467

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	44629	0	0
2	47325	1	181
3	47061	0	0
4	46398	0	0
5	46566	1	166
6	47102	0	0
7	46440	1	166
8	47477	1	173
9	46254	0	0
10	46623	1	166
11	46668	0	0
12	46625	0	0
13	47962	2	183
14	45697	0	0
15	46599	2	179
16	46321	1	186
17	47182	0	0
18	46032	1	170
19	45764	0	0
20	47487	1	166
21	49715	0	0
22	11742	0	0
23	45889	1	173
24	47968	2	183
25	47983	0	0
26	47263	0	0
27	47905	0	0
28	22534	1	167
29	46430	2	183
30	46176	1	179
31	46577	0	0
32	45973	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	36635	0	0
2	38886	0	0
3	38683	0	0
4	38113	0	0
5	38232	0	0
6	38704	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
7	38129	1	211
8	38966	0	0
9	37972	0	0
10	38258	0	0
11	38298	0	0
12	38362	0	0
13	39487	1	204
14	37570	0	0
15	38260	1	207
16	38028	0	0
17	38711	0	0
18	37768	1	207
19	37593	0	0
20	38905	0	0
21	40852	1	172
22	9626	0	0
23	37652	1	211
24	39385	1	207
25	39395	0	0
26	38805	0	0
27	39380	1	207
28	18453	0	0
29	38173	0	0
30	37970	1	207
31	38221	0	0
32	37803	1	207
131	74237	0	0
133	74510	1	211
135	74507	1	211

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	26990	5	304
0	1	26998	1	306
0	2	26998	1	305
1	0	27004	3	305
1	1	27004	3	305
1	2	26999	4	304
1	3	26985	6	305
1	4	27000	6	581
2	0	27006	5	304
2	1	26990	5	304
2	2	26996	6	577
2	3	27000	3	306

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
2	4	27001	5	576
3	0	26994	4	304
3	1	26997	5	312
3	2	26991	8	306
9	0	27005	2	305
9	1	27001	2	304
9	2	26994	4	579
9	3	26987	3	578
9	4	26997	5	579
9	5	27015	4	306
9	6	27006	1	304

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35496	0	0
1	35493	0	0
2	35472	0	0
3	35470	0	0
9	35481	0	0

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	99827	2	131
2	1295986	35	10
3	1296002	34	10
4	1296006	33	10
7	92508	9	133
9	91113	0	0
10	92572	4	132
17	30495	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	44627	0	0
2	47317	0	0
3	47052	0	0
4	46382	0	0
5	46550	0	0
6	47085	0	0
7	46423	0	0
8	47477	0	0
9	46238	0	0
10	46633	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
11	46643	0	0
12	46611	0	0
13	47970	0	0
14	45716	0	0
15	46608	0	0
16	46327	0	0
17	47169	0	0
18	46035	0	0
19	45748	0	0
20	47459	0	0
21	49708	0	0
22	11745	0	0
23	45891	0	0
24	47947	0	0
25	47955	0	0
26	47268	0	0
27	47913	0	0
28	22526	0	0
29	46411	0	0
30	46173	0	0
31	46563	0	0
32	45962	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	36636	0	0
2	38855	2	132
3	38680	0	0
4	38100	0	0
5	38220	0	0
6	38695	0	0
7	38125	2	160
8	38947	0	0
9	37968	0	0
10	38267	2	204
11	38287	0	0
12	38348	0	0
13	39472	1	134
14	37563	9	205
15	38254	0	0
16	38024	0	0
17	38707	0	0
18	37768	1	150
19	37578	2	155

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
20	38895	0	0
21	40835	8	199
22	9630	0	0
23	37669	0	0
24	39387	1	211
25	39395	0	0
26	38783	0	0
27	39383	0	0
28	18457	0	0
29	38120	0	0
30	37970	0	0
31	38208	0	0
32	37780	0	0
131	74224	3	5504
133	74463	0	0
135	74488	0	0

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	26984	4	306
0	1	26996	4	306
0	2	26985	7	305
1	0	26995	1	301
1	1	26998	2	301
1	2	26998	2	306
1	3	26987	1	301
1	4	26981	3	304
2	0	27001	3	304
2	1	26998	5	305
2	2	26985	2	302
2	3	26988	3	304
2	4	26998	1	304
3	0	26991	4	301
3	1	26983	4	306
3	2	27007	4	304
9	0	27002	2	304
9	1	26982	2	304
9	2	26987	1	301
9	3	26996	4	304
9	4	26990	2	304
9	5	27000	4	304
9	6	26989	3	303

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	34555	0	0
1	34573	0	0
2	34561	0	0
3	34551	0	0
9	34549	0	0

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	100117	3	178
2	1295974	35	36
3	1295992	33	36
4	1296009	29	50
7	92904	6	170
9	91116	0	0
10	92808	8	127
17	30518	0	0

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)
1	44627	1	176
2	47315	0	0
3	47053	1	166
4	46379	0	0
5	46554	0	0
6	47097	0	0
7	46426	0	0
8	47477	1	176
9	46247	0	0
10	46633	0	0
11	46657	0	0
12	46612	1	159
13	47966	0	0
14	45706	1	179
15	46612	0	0
16	46329	0	0
17	47175	1	149
18	46033	1	166
19	45757	0	0
20	47478	0	0
21	49707	1	166
22	11744	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
23	45897	1	176
24	47948	0	0
25	47970	0	0
26	47269	0	0
27	47910	1	159
28	22518	1	179
29	46417	0	0
30	46178	0	0
31	46567	1	176
32	45973	1	149

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	36635	2	144
2	38866	3	151
3	38680	0	0
4	38105	0	0
5	38219	1	209
6	38684	0	0
7	38124	2	145
8	38960	0	0
9	37962	0	0
10	38258	4	208
11	38278	0	0
12	38350	1	208
13	39479	1	161
14	37553	6	234
15	38250	0	0
16	38027	0	0
17	38702	0	0
18	37767	0	0
19	37579	0	0
20	38896	0	0
21	40837	12	229
22	9626	0	0
23	37647	0	0
24	39377	0	0
25	39406	1	208
26	38800	0	0
27	39372	0	0
28	18432	0	0
29	38126	0	0
30	37969	0	0
31	38214	1	208
32	37776	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
131	74249	3	5480
133	74493	1	209
135	74485	0	0

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	26982	5	311
0	1	26994	5	305
0	2	26994	5	305
1	0	26993	2	302
1	1	26991	4	304
1	2	27003	4	306
1	3	27001	2	306
1	4	26990	1	305
2	0	26989	2	306
2	1	26998	4	306
2	2	26995	3	304
2	3	26990	4	305
2	4	26996	3	304
3	0	27007	2	580
3	1	26995	2	576
3	2	26987	2	580
9	0	26996	5	580
9	1	26999	2	580
9	2	26980	5	580
9	3	26996	2	304
9	4	27016	3	304
9	5	26997	2	302
9	6	26985	6	308

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	34631	1	452
1	34595	0	0
2	34649	0	0
3	34631	0	0
9	34667	0	0

5.4 Satellite Glitches

The GPS satellites will occasionally experience periods of signal carrier stability glitches of varying magnitude. These glitches are short degradations in the signal, which in severe cases may cause WAAS to lose track or cycle slip for some or all 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 visible to WAAS during this quarter.

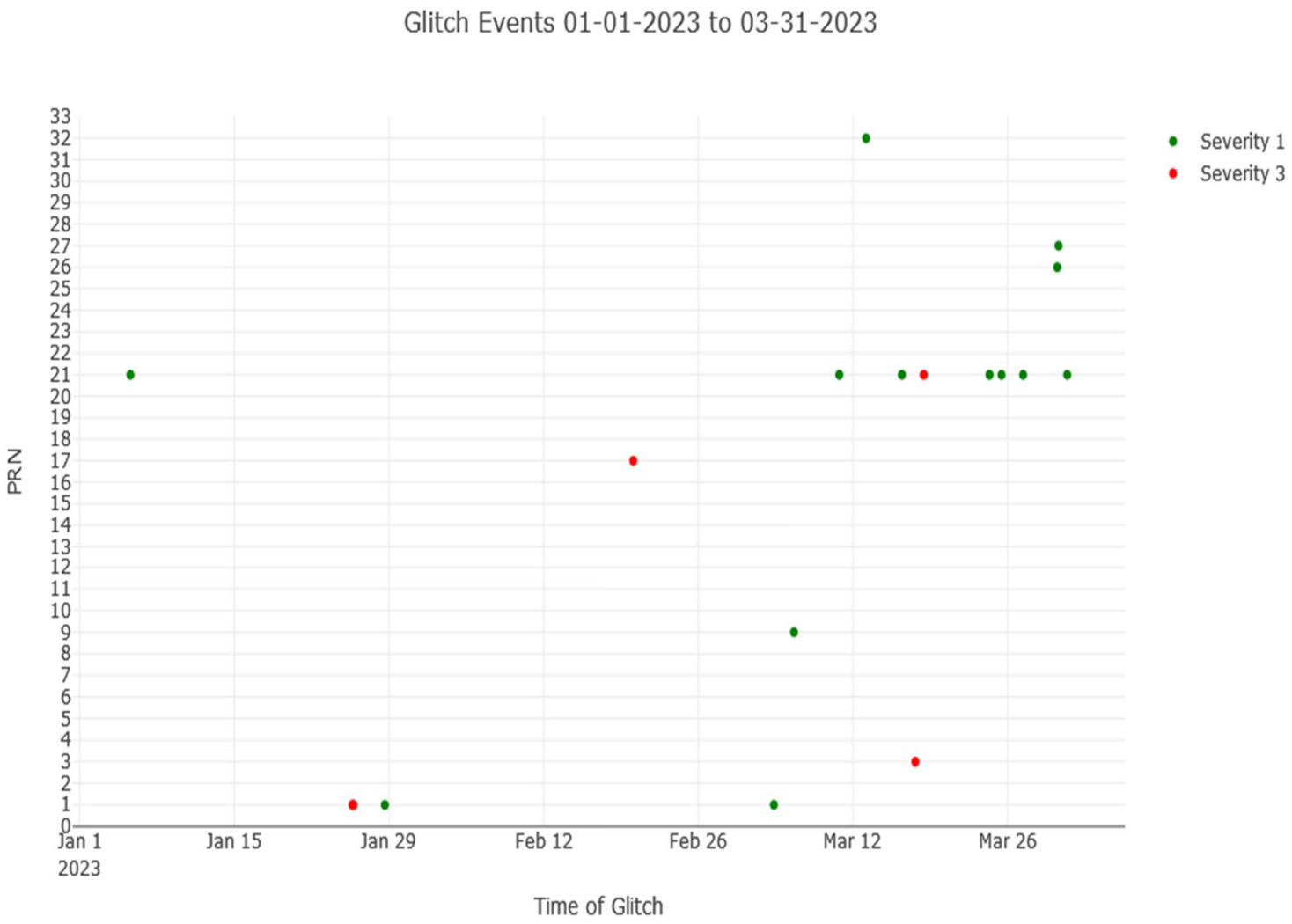

Figure 5-2 SV Glitch Trend

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	1.165	3.704	1.160	1.128	4.280	3.259	1.191	4.855	1.685	1.188	3.526	1.064	1.391	3.052	1.064	1.074	5.344	1.510
2	1.021	2.786	1.686	1.201	3.483	1.111	0.897	3.210	1.443	1.424	3.759	1.311	1.281	4.188	2.937	1.132	2.690	1.550
3	1.063	3.464	1.142	1.248	6.977	2.062	2.030	3.640	1.604	1.191	4.815	1.654	1.446	4.323	1.202	1.368	3.400	1.318
4	1.111	3.198	1.185	1.282	4.510	2.133	1.073	2.463	0.754	1.094	4.172	1.207	1.365	2.411	1.404	1.052	2.325	1.566
5	1.001	3.375	1.718	1.211	4.769	1.847	0.885	2.716	1.608	1.254	3.638	1.608	1.216	3.813	2.457	1.128	3.790	1.416
6	1.192	3.645	3.151	1.302	4.324	2.686	1.073	3.081	2.332	1.288	5.129	2.178	1.312	3.141	1.021	1.102	3.234	0.928
7	1.611	3.428	1.075	1.014	2.134	0.726	1.282	2.648	0.999	1.488	5.080	2.362	1.325	2.780	0.985	1.083	2.553	0.714
8	1.299	3.104	1.326	0.941	2.729	0.891	0.997	2.467	0.741	1.196	3.453	1.426	1.487	4.544	1.226	1.014	2.819	1.140
9	1.021	3.364	1.840	1.069	4.303	2.353	1.134	3.325	0.875	1.074	3.770	1.046	2.387	4.149	1.693	0.857	2.367	0.934
10	0.958	3.112	1.071	1.016	2.561	0.841	0.993	2.197	0.747	1.687	3.125	1.291	1.282	3.099	1.527	1.261	2.881	2.127
11	1.196	3.339	2.931	1.222	3.569	1.887	1.049	2.591	2.139	1.332	4.434	1.984	2.410	8.192	2.205	1.210	3.177	0.812
12	1.163	3.440	2.567	1.347	4.932	1.251	1.080	3.410	1.171	1.262	4.614	3.452	2.137	7.002	2.187	1.423	3.842	1.168
13	1.050	4.493	1.351	1.132	2.670	0.777	1.233	3.611	1.049	1.194	3.739	1.310	1.369	4.336	2.853	1.142	4.367	1.257
14	0.907	2.440	1.059	1.058	4.205	2.494	1.062	2.094	1.556	1.177	3.164	1.305	1.370	2.355	0.751	1.076	3.071	0.819
15	1.436	2.861	1.256	1.099	3.125	1.348	0.834	2.464	1.570	1.186	2.983	1.178	1.364	3.596	2.671	0.820	2.538	1.490
16	1.316	3.115	1.021	0.841	1.896	1.023	1.063	2.289	1.631	1.659	3.838	2.043	1.481	2.868	1.813	0.982	2.427	0.701
17	1.124	3.974	2.505	1.592	4.732	3.363	1.388	3.683	1.992	1.444	5.678	2.613	2.298	7.986	2.526	1.317	2.746	1.273
18	1.230	3.957	1.233	1.004	2.500	0.422	1.054	3.410	1.046	1.541	4.177	2.278	1.375	4.026	2.840	1.182	2.997	0.928
19	1.054	3.569	2.880	1.376	4.425	3.087	1.286	3.211	2.731	1.356	5.098	2.682	1.962	4.800	1.295	1.372	3.517	1.481
20	1.468	3.647	2.238	1.274	5.258	1.723	1.205	4.089	1.093	1.473	3.651	1.774	1.346	2.539	1.315	1.103	2.686	1.653
21	0.941	2.664	1.751	1.128	3.717	0.698	1.113	2.290	1.073	1.669	3.447	1.497	1.528	3.605	1.396	1.328	3.667	0.861
22	0.771	2.358	0.793	1.138	2.898	0.948	0.969	1.771	1.058	1.018	2.380	0.650	1.573	2.950	1.039	1.607	3.852	1.693
23	1.215	2.819	1.204	0.866	2.684	0.862	0.987	2.355	0.892	1.375	3.418	1.475	1.543	4.335	2.911	1.185	3.193	1.611
24	1.550	5.656	1.742	1.065	4.528	2.205	1.276	3.068	1.545	1.298	4.315	2.749	1.560	3.588	0.924	1.290	3.704	1.159
25	1.007	3.315	2.366	1.396	4.255	1.266	1.208	2.486	0.869	1.313	4.031	1.906	1.491	3.532	1.480	1.195	4.807	1.430
26	1.227	4.230	1.810	1.338	3.322	1.150	1.253	2.335	1.448	1.381	4.230	2.545	1.398	3.234	1.002	1.043	2.719	0.861
27	0.882	3.703	1.224	0.967	2.796	0.785	1.261	2.759	0.853	1.303	3.237	1.059	1.385	3.520	2.339	0.929	3.931	1.139
28	2.218	4.045	1.400	2.335	3.969	1.044	1.906	3.138	1.524	2.341	5.015	2.288	2.323	4.041	2.401	2.393	4.013	2.679
29	1.295	3.407	1.112	1.211	2.849	1.288	1.533	3.210	1.547	1.557	3.852	1.447	1.231	3.367	2.981	1.358	3.007	0.998
30	0.909	2.176	1.436	1.454	4.033	1.253	1.356	2.467	1.147	1.149	3.660	1.439	2.017	3.519	1.274	0.843	2.105	0.710
31	0.909	2.358	0.776	1.111	2.296	0.944	1.043	2.411	0.772	1.367	4.250	3.047	1.155	4.518	0.850	1.034	2.609	1.104
32	0.952	2.016	0.637	1.195	2.322	0.788	1.004	2.200	1.665	1.126	4.531	2.658	2.062	5.467	1.588	0.916	5.237	1.339
131	1.742	4.997	0.242	1.430	4.823	0.751	1.672	4.743	0.191	1.698	4.958	0.950	1.475	4.563	0.333	1.631	3.727	1.148
133	1.626	5.024	0.276	2.263	4.368	0.769	1.649	4.139	0.139	1.669	8.366	1.074	1.515	4.078	0.332	1.247	4.284	0.966
135	2.216	5.506	0.710	1.533	5.614	1.079	1.410	5.465	0.646	2.417	6.676	0.809	1.584	6.263	0.916	1.567	4.879	1.393

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	1.047	5.230	0.974	1.703	2.954	1.486	1.334	4.836	1.424	1.012	2.471	1.185	1.366	4.282	2.204	1.067	2.598	0.936
2	1.401	3.634	3.156	1.531	3.450	1.782	0.892	2.823	1.957	0.852	3.845	2.858	1.079	4.138	1.001	0.921	1.912	1.162
3	1.151	2.536	2.193	1.838	3.880	1.296	1.153	3.091	0.789	1.158	3.914	1.347	1.155	2.632	1.516	1.292	3.167	1.031
4	1.269	2.813	2.293	1.484	3.216	1.979	0.817	2.164	0.748	1.082	2.444	0.750	0.988	2.115	1.167	0.949	2.318	1.207
5	1.340	3.512	2.704	2.290	7.176	2.194	1.002	2.698	1.649	2.858	5.557	2.603	1.268	3.111	0.798	0.886	2.647	0.960
6	1.462	3.068	0.997	2.934	8.883	1.615	0.912	2.536	0.427	2.239	4.388	2.057	1.135	4.296	1.527	1.044	2.694	0.815
7	1.657	4.138	1.322	2.369	4.276	2.037	0.925	3.016	2.171	0.979	3.680	1.225	1.269	4.032	2.097	1.040	2.372	1.417
8	1.156	2.660	0.973	1.614	3.338	1.981	1.414	3.470	2.028	0.966	3.641	1.150	1.373	3.614	1.082	0.941	2.513	1.950
9	1.110	4.007	1.694	1.677	3.316	0.590	1.039	2.515	0.869	1.048	4.172	1.312	0.934	2.551	1.416	0.917	2.500	1.621
10	1.601	3.898	1.127	1.103	2.596	0.964	0.894	2.539	1.841	0.894	2.312	1.172	0.974	2.838	1.683	1.019	2.539	1.134
11	1.817	4.686	1.230	1.950	3.517	1.581	1.012	2.471	0.890	1.398	4.265	1.484	1.131	2.279	0.710	0.931	2.460	0.824
12	1.220	3.483	2.737	1.462	4.025	1.254	1.121	3.931	1.186	0.945	4.146	2.590	1.209	3.085	0.896	1.320	3.039	0.865
13	1.096	2.688	1.229	1.804	4.241	0.792	1.069	3.181	1.025	1.001	3.911	2.252	1.443	3.915	1.213	1.049	2.216	0.359
14	1.023	2.757	1.186	1.784	3.282	1.336	1.055	2.536	1.887	1.305	2.730	0.892	1.097	3.740	2.105	1.056	2.384	0.732
15	1.103	3.286	1.598	1.590	3.128	1.367	1.020	4.244	1.429	1.970	5.598	1.681	1.648	3.250	1.228	1.038	2.028	1.157
16	1.233	3.299	1.421	1.304	3.533	1.173	1.155	3.644	1.629	1.472	4.169	1.373	1.539	3.805	1.157	1.107	2.976	2.087
17	1.253	3.286	1.143	2.078	3.927	0.979	1.242	3.654	0.626	1.139	4.850	1.267	1.325	4.004	2.618	1.166	2.174	1.459
18	1.258	3.743	2.117	1.591	3.601	1.190	0.878	2.486	1.757	0.745	4.054	2.014	1.173	3.326	0.922	0.868	1.675	0.939
19	1.952	4.275	1.462	1.962	3.678	1.098	1.202	3.490	0.842	1.113	3.220	1.024	1.152	3.562	2.152	1.060	2.140	0.663
20	1.192	4.052	2.782	2.074	4.022	0.744	1.266	2.904	1.296	1.847	5.771	2.266	1.433	2.497	1.395	0.944	2.061	0.727
21	1.440	3.012	1.643	1.893	5.357	1.611	1.068	3.963	1.203	2.021	9.057	2.391	1.519	4.401	2.294	1.218	3.000	0.543
22	0.809	1.631	1.374	1.662	2.986	1.809	0.800	2.829	1.397	1.198	2.487	0.910	1.006	2.430	0.449	0.960	2.099	1.133
23	1.417	3.721	1.189	1.327	2.778	1.667	0.868	2.831	0.498	1.453	3.838	1.217	1.123	2.720	1.538	0.911	1.944	1.447
24	1.273	2.706	1.253	1.702	3.262	1.068	1.072	2.792	1.815	1.274	4.073	1.256	1.428	3.496	1.845	0.851	2.049	0.579
25	1.213	3.858	2.611	1.793	3.637	1.750	1.045	2.407	0.735	1.110	4.302	1.596	1.359	2.701	0.934	0.849	1.856	0.741
26	1.226	2.989	1.420	1.436	3.135	1.046	0.929	3.897	1.238	1.071	3.803	1.357	1.531	3.428	1.794	1.277	2.650	2.065
27	1.114	2.298	0.921	1.631	4.497	1.797	0.923	3.173	0.950	0.848	2.826	0.821	1.158	4.038	1.271	0.969	3.144	1.130
28	1.859	3.618	0.985	2.573	6.296	1.605	2.474	4.315	2.157	4.521	7.172	3.061	2.813	4.657	1.297	2.496	4.603	1.620
29	1.406	3.691	2.741	1.166	3.775	1.283	1.048	2.596	0.818	1.397	3.980	3.078	1.311	3.480	0.914	1.113	2.788	1.353
30	1.394	3.964	1.207	1.702	2.997	0.989	0.881	2.996	2.280	1.081	3.191	1.007	1.215	3.970	2.467	1.285	2.144	0.761
31	1.465	4.302	1.941	1.488	7.743	1.349	0.874	2.891	1.178	1.368	6.347	2.302	1.492	4.142	1.279	1.151	2.842	2.209
32	1.299	3.111	1.604	1.499	6.011	1.545	0.785	2.466	2.024	0.940	3.338	1.099	1.159	3.128	2.235	1.078	2.568	1.709
131	1.781	5.192	0.745	1.437	4.645	0.520	1.779	5.632	0.426	1.425	3.750	0.974	1.573	5.239	0.380	1.499	3.509	0.862
133	1.897	8.822	1.405	1.410	4.860	0.669	2.013	4.458	0.346	2.217	4.138	1.000	1.644	5.539	0.379	1.433	3.835	0.813
135	1.661	6.548	1.058	1.451	6.225	0.740	1.311	5.532	0.846	1.569	5.394	1.458	1.259	5.210	1.238	1.398	5.690	1.436

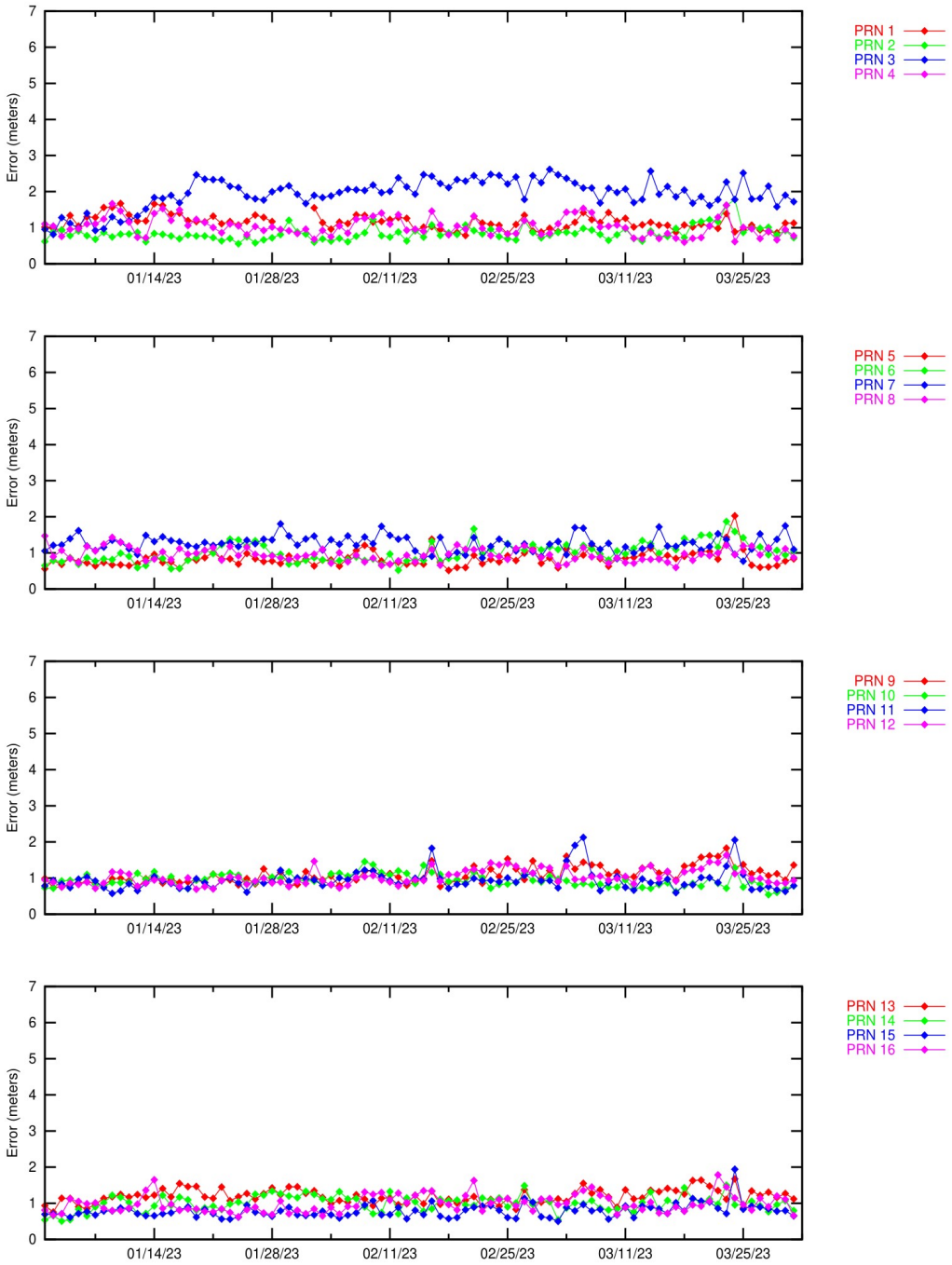

Figure 6-1 Range Error (PRN1–PRN16)—Washington, DC

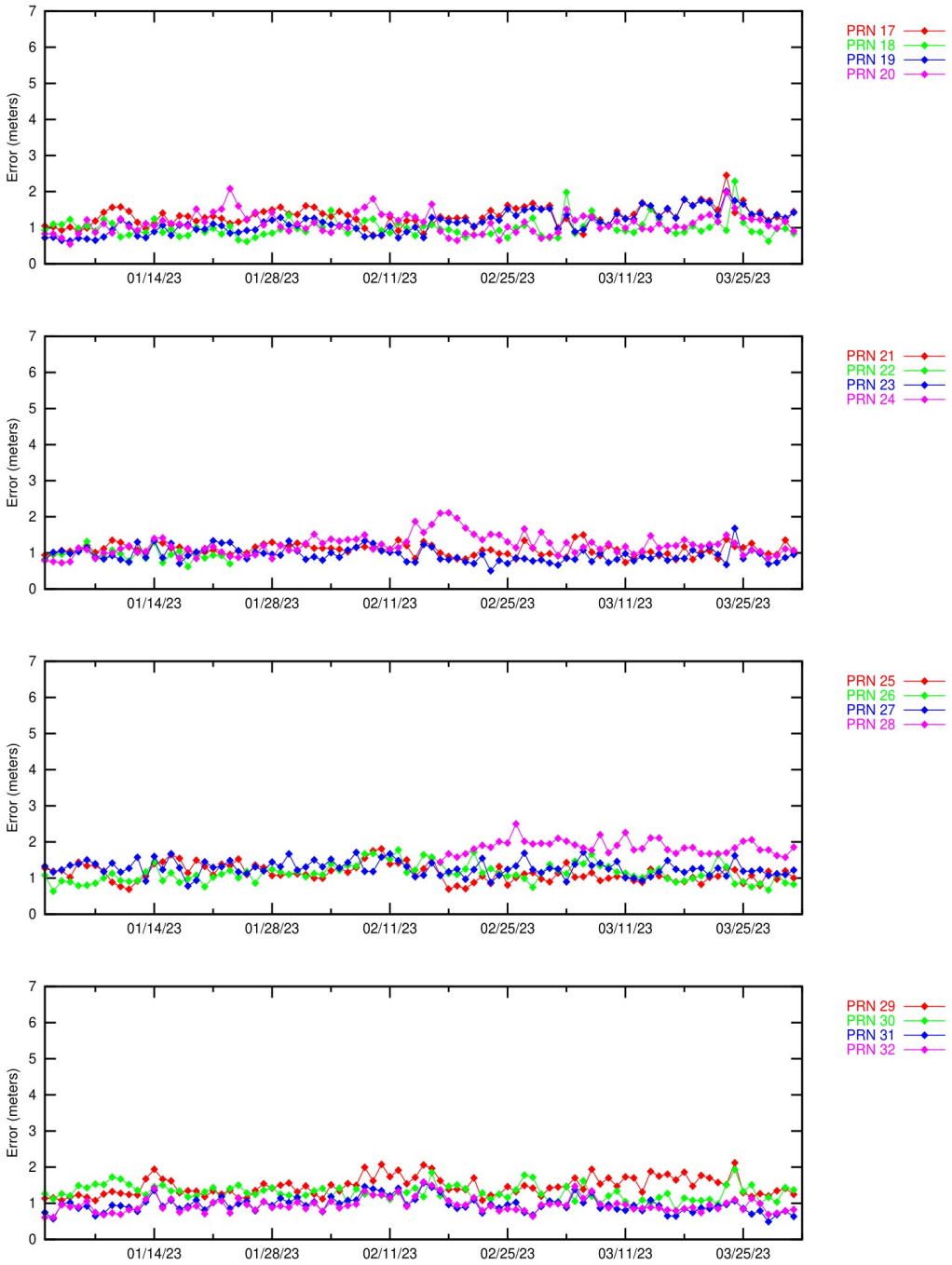

Figure 6-2 Range Error (PRN17–PRN32)—Washington, DC

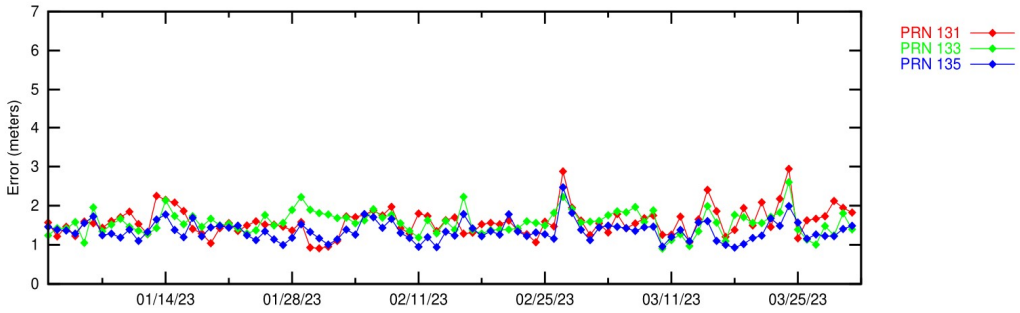

Figure 6-3 Range Error (PRN131, PRN133, and PRN138)—Washington, DC

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	0.627	3.584	0.176	0.676	4.848	0.175	0.506	3.878	1.604	0.967	5.509	0.659	0.510	2.508	0.696	0.472	2.016	0.211
2	0.506	2.765	0.142	0.567	2.613	0.796	0.477	2.853	0.104	0.704	2.630	0.704	0.567	2.379	0.203	0.556	1.792	0.555
3	0.601	4.883	0.157	0.594	3.969	1.029	0.739	2.123	0.803	0.821	7.273	0.215	0.715	2.644	0.785	0.589	4.473	0.119
4	0.653	5.407	0.511	0.766	3.602	0.171	0.659	3.322	0.097	0.673	5.226	0.258	0.687	2.435	0.476	0.469	1.743	0.510
5	0.455	3.054	0.129	0.673	2.367	0.985	0.599	2.027	0.677	0.694	3.531	0.147	1.215	5.168	0.816	0.463	2.657	0.762
6	0.572	2.486	0.681	0.606	2.473	0.158	0.609	2.046	0.505	0.717	3.924	0.827	1.130	3.626	0.701	0.508	2.028	0.590
7	0.834	3.240	0.698	0.694	2.969	0.593	0.582	2.128	0.680	0.758	2.975	0.735	0.724	3.332	0.311	0.466	1.754	0.650
8	0.667	4.335	0.373	0.606	3.080	0.816	0.493	1.672	0.451	0.627	6.227	0.345	0.811	5.061	0.761	0.528	2.148	0.776
9	0.548	6.392	0.682	0.520	2.075	0.163	0.527	2.549	0.730	0.631	4.400	0.844	1.172	2.973	1.033	0.440	3.073	0.120
10	0.657	2.586	1.031	0.615	2.801	0.713	0.646	2.118	0.507	0.960	6.145	0.195	0.821	4.507	0.838	0.681	1.407	0.739
11	0.785	2.628	1.148	0.987	2.732	0.184	0.746	2.123	1.104	0.870	4.088	0.945	1.986	7.242	1.345	0.783	2.422	0.596
12	0.584	3.077	0.080	0.603	7.326	0.221	0.499	2.990	0.614	0.620	5.056	0.137	1.014	3.111	1.021	0.703	2.377	0.780
13	0.430	2.184	0.557	0.640	3.655	0.480	0.572	2.733	1.021	0.547	2.758	0.758	0.600	4.082	0.597	0.428	1.819	0.651
14	0.443	2.080	0.691	0.538	2.274	0.800	0.467	2.063	0.583	0.701	6.578	0.182	0.556	2.817	0.739	0.569	1.977	0.399
15	0.670	3.875	0.316	0.799	3.956	0.906	0.415	1.993	0.563	0.568	3.309	0.760	1.161	3.000	1.354	0.397	1.578	0.416
16	0.624	2.194	0.517	0.508	2.327	0.635	0.565	2.202	0.827	0.724	3.963	0.771	0.769	2.789	0.648	0.493	2.426	0.691
17	0.443	2.463	0.850	0.816	2.418	1.070	0.452	1.841	0.578	0.738	3.795	0.387	1.404	7.087	1.952	0.510	2.627	0.646
18	0.770	3.040	0.597	0.694	2.650	0.670	0.702	3.277	0.863	0.691	4.677	0.547	0.618	2.392	0.501	0.571	1.888	0.572
19	0.530	3.149	0.112	0.572	4.019	0.835	0.476	2.491	0.106	0.735	3.152	0.130	0.745	3.399	0.685	0.658	2.911	0.751
20	0.647	2.907	0.669	0.770	2.439	1.178	0.619	1.686	0.820	0.738	3.310	0.189	1.053	6.107	1.168	0.486	2.624	0.555
21	0.528	3.780	0.206	0.589	2.779	0.321	0.412	2.237	0.538	0.760	4.111	0.326	0.604	2.374	0.808	0.706	2.362	0.105
22	0.499	1.248	0.512	0.556	2.337	0.705	0.495	1.172	0.893	0.484	2.681	0.528	0.885	2.581	0.764	1.014	3.299	1.399
23	0.779	1.875	0.757	0.560	1.838	0.523	0.703	2.282	0.726	0.759	2.751	0.701	0.527	3.102	0.809	0.611	1.884	0.434
24	0.665	5.438	0.209	0.687	4.655	0.170	0.611	4.504	0.407	0.599	5.105	0.435	0.433	3.626	0.183	0.416	1.715	0.592
25	0.509	5.320	0.461	0.649	3.234	0.649	0.477	3.097	0.141	0.612	3.701	0.337	0.600	1.676	0.758	0.655	5.708	0.586
26	0.603	4.256	0.659	0.619	3.104	0.997	0.630	2.264	0.436	0.583	3.055	0.296	0.776	2.084	0.600	0.466	2.349	0.517
27	0.544	3.357	0.538	0.534	2.373	0.221	0.431	2.219	0.530	0.619	3.659	0.989	0.595	3.435	0.123	0.425	1.348	0.438
28	1.556	2.595	0.670	1.437	2.711	0.734	1.349	2.631	0.646	1.713	4.340	0.258	1.463	3.113	0.734	1.816	3.938	0.997
29	0.706	2.642	0.172	0.670	4.530	0.295	0.787	2.989	0.418	0.686	2.332	0.860	0.751	2.802	0.579	0.562	1.919	0.485
30	0.489	3.102	0.715	0.716	3.068	0.767	0.721	1.999	0.419	0.623	3.410	0.214	1.057	3.201	0.291	0.502	1.846	0.123
31	0.543	2.315	0.567	0.721	2.424	0.538	0.528	3.039	0.670	0.614	3.979	0.133	0.794	3.495	0.872	0.511	1.875	0.070
32	0.548	4.091	1.017	0.842	2.423	0.672	0.592	2.721	0.929	1.002	3.716	0.109	0.890	4.487	1.123	0.510	4.154	0.833

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	0.534	3.263	0.116	0.638	2.386	0.415	0.573	2.319	0.915	0.569	1.673	0.935	0.527	2.010	0.582	0.519	1.959	0.118
2	0.699	3.306	0.178	0.624	2.041	0.555	0.438	2.418	0.444	0.484	1.913	0.155	0.414	1.873	0.477	0.424	2.541	0.533
3	0.585	4.733	0.255	0.757	2.375	0.586	0.653	3.105	0.339	0.524	2.858	0.985	0.805	2.173	0.708	0.366	2.298	0.101
4	0.515	1.931	0.602	0.476	1.519	0.586	0.656	2.322	0.500	0.445	1.485	0.355	0.493	1.577	0.513	0.415	3.201	0.108
5	0.750	2.068	0.743	0.993	10.956	0.977	0.641	2.217	0.525	1.101	3.705	1.364	0.542	2.517	0.977	0.567	2.728	0.213
6	0.715	3.621	0.141	1.234	8.892	0.739	0.578	2.451	0.521	1.030	4.805	0.132	0.658	2.592	0.640	0.653	3.471	0.627
7	0.805	3.199	0.977	1.297	2.959	1.096	0.520	1.851	0.378	0.495	1.611	0.743	0.535	1.872	0.526	0.392	1.919	0.515
8	0.599	3.623	0.566	0.645	2.226	0.324	0.604	1.825	0.948	0.548	2.503	0.097	0.449	1.949	0.406	0.693	3.756	0.811
9	0.655	6.397	0.233	0.816	2.474	0.523	0.563	2.327	0.190	0.524	2.894	0.143	0.651	1.901	0.608	0.343	2.468	0.501
10	0.868	3.120	0.881	0.578	2.424	0.122	0.485	1.273	0.587	0.559	2.449	0.431	0.540	2.209	0.591	0.399	1.242	0.334
11	1.170	3.495	1.583	0.689	6.842	1.299	0.760	2.986	0.535	0.895	2.904	0.935	0.760	2.745	0.450	0.792	3.723	0.800
12	0.564	2.108	0.747	0.602	3.048	0.580	0.637	2.717	0.822	0.426	1.492	0.420	0.500	1.980	0.640	0.485	3.769	0.398
13	0.510	1.510	0.127	0.827	2.945	0.100	0.398	1.845	0.147	0.497	1.872	0.703	0.563	2.872	0.625	0.582	2.128	0.677
14	0.510	3.394	1.248	0.992	2.680	0.086	0.454	2.542	0.576	0.628	2.090	0.910	0.440	1.727	0.457	0.394	2.038	0.572
15	0.527	2.604	0.145	0.649	13.573	0.365	0.517	1.900	0.559	0.760	4.373	1.226	0.502	2.493	0.617	0.623	3.135	0.098
16	0.452	3.690	0.864	0.707	2.689	0.520	0.575	2.615	0.655	0.805	2.818	0.356	0.565	2.318	0.590	0.646	2.847	0.595
17	0.853	2.676	0.840	0.739	6.827	1.478	0.578	2.367	0.517	0.751	3.089	0.659	0.440	1.542	0.929	0.581	4.384	0.571
18	0.782	2.439	0.623	0.857	2.791	0.864	0.578	1.694	0.468	0.580	3.779	0.891	0.605	1.410	0.081	0.503	3.061	0.431
19	1.002	2.841	0.919	0.698	3.225	0.368	0.610	2.990	0.113	0.437	2.150	0.726	0.452	2.932	0.105	0.587	3.589	0.659
20	0.516	2.040	0.693	0.602	5.002	0.277	0.542	4.656	0.933	0.987	2.885	0.932	0.611	2.602	0.572	0.546	3.778	0.681
21	0.528	1.898	0.156	0.849	2.043	0.717	0.472	2.554	0.159	0.971	6.316	2.128	0.583	2.569	0.520	0.529	2.437	0.198
22	0.686	2.131	0.770	0.716	2.635	0.576	0.592	2.685	0.587	0.838	3.289	1.003	0.464	1.783	0.564	0.377	1.663	0.290
23	0.645	2.659	0.884	0.603	2.556	0.588	0.467	1.814	0.371	0.890	2.163	0.652	0.451	1.551	0.378	0.734	2.061	0.592
24	0.436	1.341	0.654	0.825	1.918	0.580	0.372	1.953	0.165	0.573	2.616	0.707	0.460	1.799	0.563	0.565	3.877	0.148
25	0.589	3.832	0.217	0.804	5.548	0.223	0.462	4.144	0.766	0.442	2.034	0.223	0.435	2.348	0.088	0.452	2.360	0.331
26	0.519	3.426	0.769	0.611	2.734	0.528	0.509	2.205	0.639	0.670	3.559	0.979	0.541	2.122	0.443	0.562	4.605	0.313
27	0.524	2.365	1.148	0.599	2.750	0.815	0.405	1.449	0.443	0.359	3.032	0.680	0.449	2.871	0.937	0.412	1.874	0.559
28	1.483	5.332	0.240	1.362	3.528	0.835	1.529	3.354	0.754	2.719	5.665	1.818	1.423	3.620	0.849	1.687	4.497	0.362
29	0.733	3.577	0.171	0.645	2.760	0.691	0.569	2.400	0.654	0.739	3.805	0.194	0.653	2.752	0.216	0.593	2.231	0.214
30	0.763	3.520	0.846	0.691	1.674	0.357	0.674	3.024	0.580	0.492	2.372	0.849	0.606	2.285	0.427	0.643	3.816	0.225
31	0.804	6.799	0.166	0.788	4.385	0.966	0.444	2.141	0.542	0.851	5.242	1.600	0.549	3.007	0.711	0.533	2.930	0.753
32	0.962	5.097	1.378	0.685	4.313	0.798	0.659	1.848	0.407	0.586	2.524	0.825	0.543	2.142	0.321	0.527	4.587	0.772

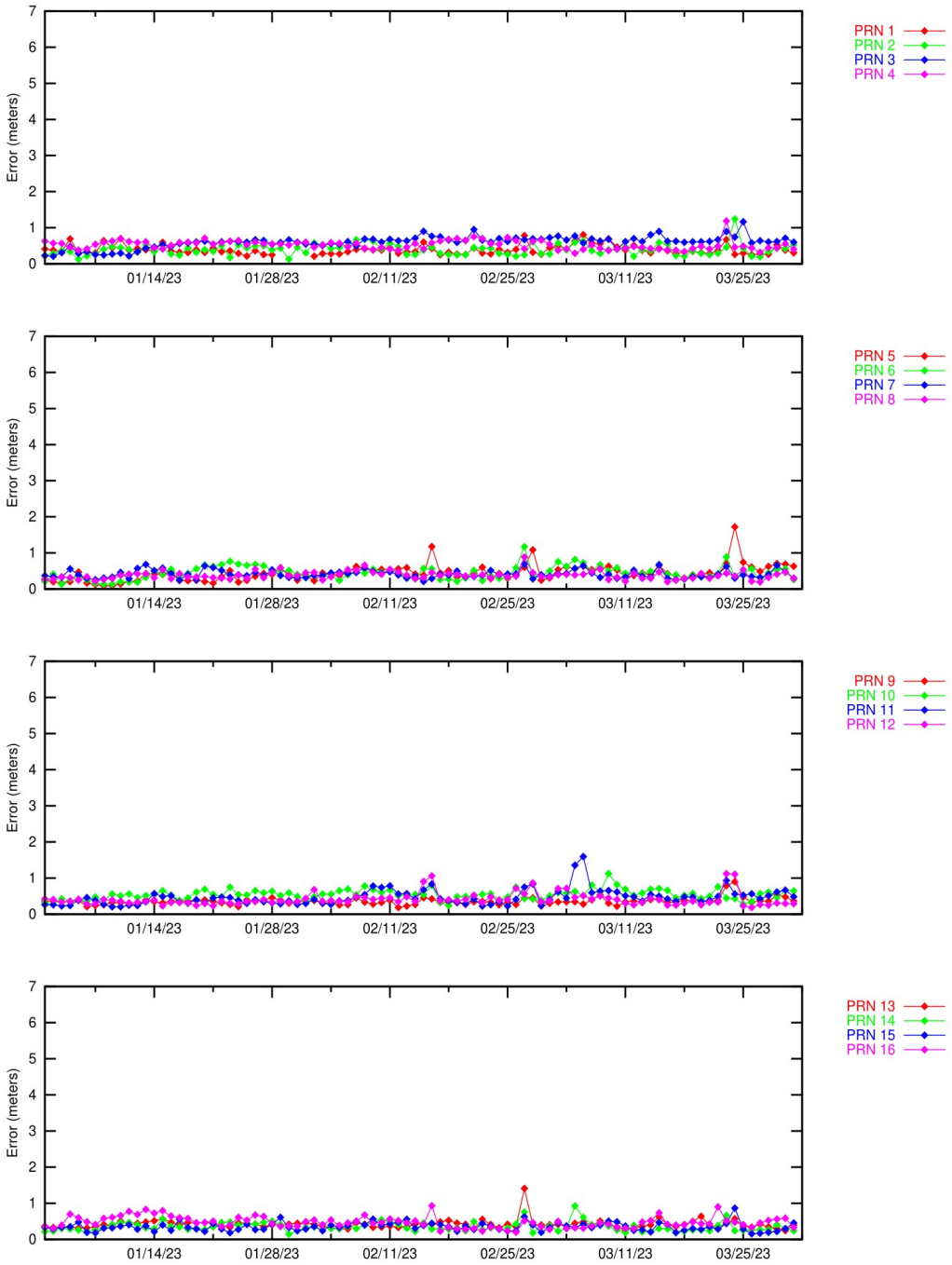

Figure 6-4 Ionospheric Error (PRN1–PRN16)—Washington, DC

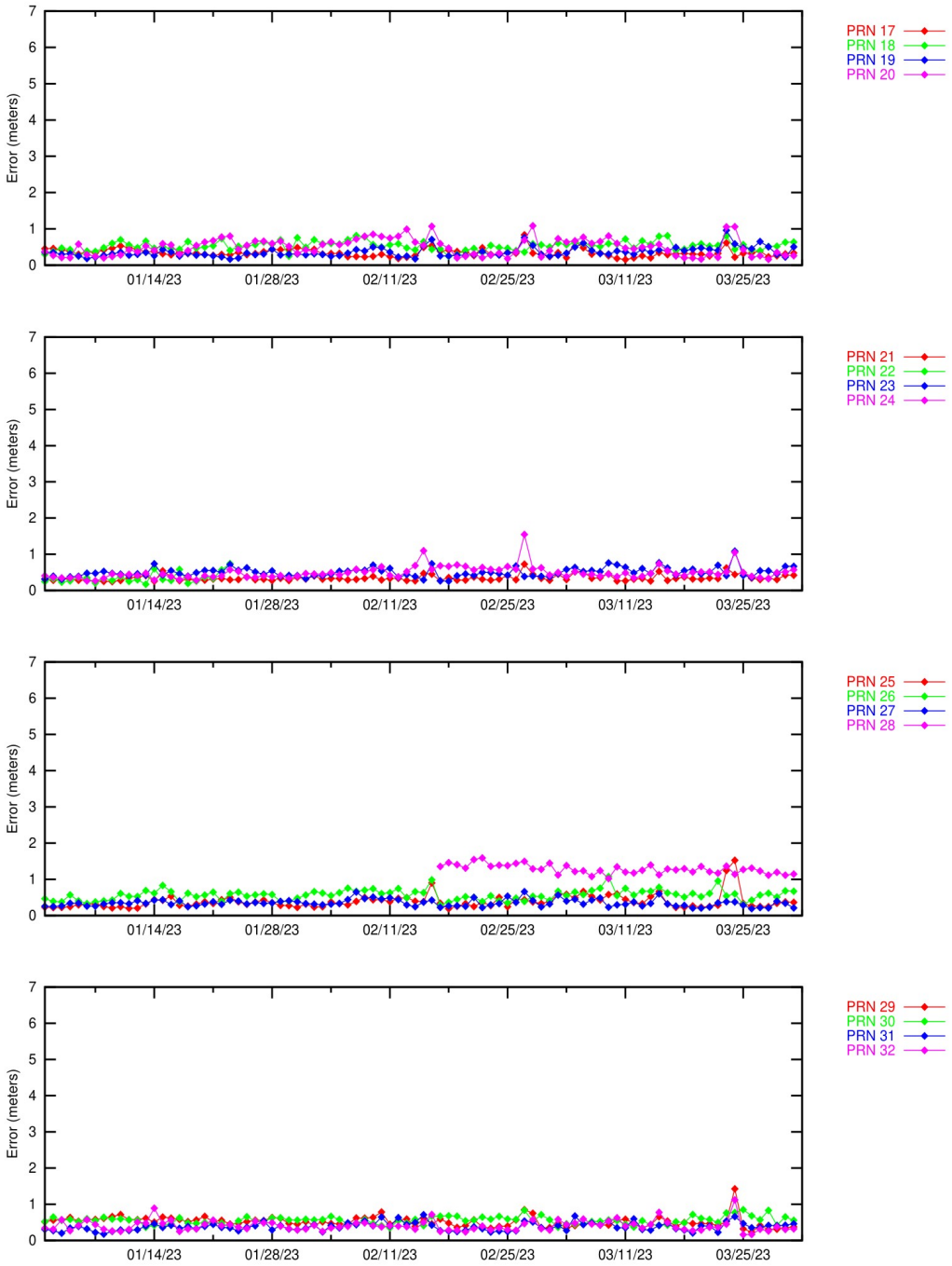

Figure 6-5 Ionospheric Error (PRN17–PRN32)—Washington, DC

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 and noise.

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.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	98.99	0.12	0.87	0.03
SM9 131	S15	99.65	0.00	0.32	0.04
SM9 131	G30	99.57	0.02	0.37	0.04
S15 133	SM9	98.98	0.12	0.87	0.04
S15 133	S15	99.61	0.00	0.33	0.07
S15 133	G30	99.56	0.01	0.36	0.07
G30 135	SM9	98.98	0.12	0.88	0.03
G30 135	S15	99.63	0.00	0.33	0.04
G30 135	G30	99.56	0.01	0.36	0.07

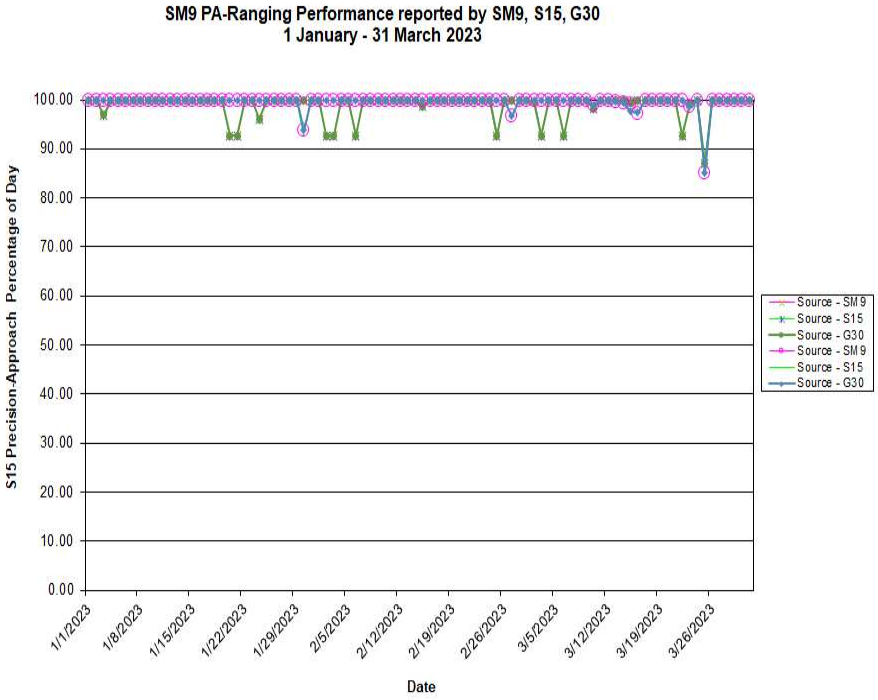

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

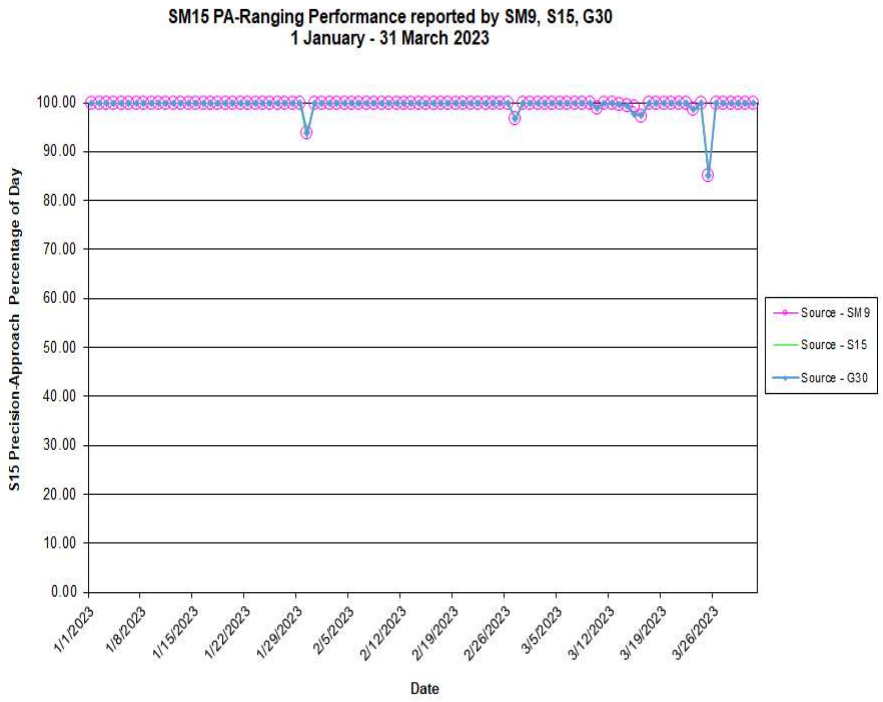

Figure 7-2 Daily PA S15 GEO Ranging Availability Trend

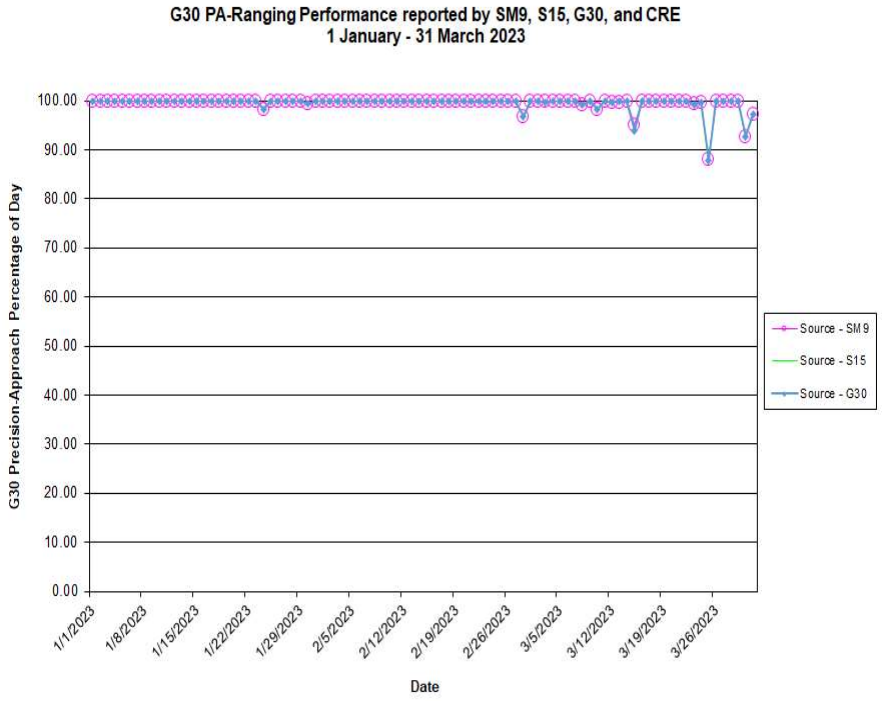

Figure 7-3 Daily PA G30 GEO Ranging Availability Trend

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

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2C7	SHAKTOOLIK	AK	LPV	15	99.228	17	99.157	33	98.716
6A8	ALLAKAKET	AK	LP	20	98.81	22	98.542	38	98.031
7KA	TATITLEK	AK	LP	12	99.436	20	99.328	28	98.772
9A3	CHUATHBALUK	AK	LPV	10	99.648	12	99.571	22	99.187
ADQ	KODIAK	AK	LPV	5	99.725	7	99.662	17	99.427
AFM	AMBLER	AK	LPV	15	98.802	20	98.59	53	97.871
AKN	KING SALMON	AK	LPV	7	99.794	7	99.719	13	99.525
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	11	99.527	15	99.419	29	98.91
ANI	ANIAK	AK	LPV	10	99.649	12	99.571	22	99.193
AQH	QUINHAGAK	AK	LPV	11	99.866	10	99.788	26	99.456
AQT	NUIQSUT	AK	LPV	18	98.285	25	98.119	75	96.916
ATK	ATQASUK EDWARD BURNELL SR MEML	AK	LPV	19	98.358	26	98.166	82	96.926
AWI	WAINWRIGHT	AK	LPV	21	98.391	32	98.191	91	96.742
BET	BETHEL	AK	LPV200	10	99.763	10	99.686	25	99.361
BRW	WILEY POST-WILL ROGERS MEML	AK	LPV	21	98.283	29	98.045	95	96.522
BVK	BUCKLAND	AK	LPV	12	99.013	15	98.951	42	98.346
CDB	COLD BAY	AK	LPV200	4	99.934	7	99.92	41	99.375
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	11	99.427	14	99.319	29	98.798
CEM	CENTRAL	AK	LP	19	98.723	24	98.51	41	97.828
CLP	CLARKS POINT	AK	LPV	8	99.838	8	99.78	18	99.501
CXF	COLDFOOT	AK	LP	19	98.678	21	98.397	47	97.72
D76	ROBERT/BOB/CURTIS MEML	AK	LPV	16	98.9	21	98.8	51	97.961
DEE	DEERING	AK	LPV	12	99.012	16	98.956	41	98.26
DLG	DILLINGHAM	AK	LPV	9	99.826	8	99.778	17	99.484
ELI	ELIM	AK	LPV	14	99.18	15	99.123	33	98.656
ENA	KENAI MUNICIPAL	AK	LPV200	7	99.62	10	99.553	25	99.24
ENM	EMMONAK	AK	LPV	14	99.514	15	99.415	28	98.974
FAI	FAIRBANKS INTL	AK	LPV200	19	98.969	25	98.768	38	98.185
FYU	FORT YUKON	AK	LPV	17	98.608	24	98.397	41	97.643
GAL	EDWARD G PITKA SR	AK	LPV	16	99.151	15	99.039	34	98.564
GAM	GAMBELL	AK	LPV	15	99.461	14	99.344	86	97.996
GKN	GULKANA	AK	LPV	17	99.221	22	99.007	28	98.329
GST	GUSTAVUS	AK	LP	12	99.244	20	99.013	34	98.383

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HLA	HUSLIA	AK	LPV	14	98.983	19	98.846	38	98.378
HOM	HOMER	AK	LPV	5	99.643	7	99.6	19	99.363
HPB	HOOPER BAY	AK	LP	14	99.712	14	99.582	32	99.123
HRR	HEALY RIVER	AK	LP	17	99.114	21	98.888	34	98.409
IAN	BOB BAKER MEML	AK	LPV	14	98.844	19	98.719	53	97.939
IIK	KIPNUK	AK	LPV	10	99.895	12	99.824	25	99.374
ILI	ILIAMNA	AK	LPV	5	99.665	7	99.659	17	99.464
IWK	WALES	AK	LP	17	99.084	19	98.998	55	98.179
IYS	WASILLA	AK	LPV	14	99.467	21	99.359	28	98.735
KAL	KALTAG	AK	LPV	14	99.172	16	99.081	33	98.692
KGX	GRAYLING	AK	LP	13	99.485	17	99.383	26	98.984
KKA	KOYUK ALFRED ADAMS	AK	LP	14	99.159	15	99.089	37	98.624
KSM	ST MARY'S	AK	LPV200	13	99.618	14	99.512	28	99.093
KTN	KETCHIKAN INTL	AK	LPV	8	99.443	16	99.3	26	98.878
KTS	BREVIG MISSION	AK	LPV	14	99.148	16	99.093	50	98.343
KWT	KWETHLUK	AK	LPV	10	99.76	10	99.677	25	99.371
KYU	KOYUKUK	AK	LPV	16	99.123	16	99.038	35	98.584
MCG	MC GRATH	AK	LP	13	99.405	17	99.28	26	98.714
MDM	MARSHALL DON HUNTER SR	AK	LP	14	99.635	14	99.542	24	99.132
MDO	MIDDLETON ISLAND	AK	LP	12	99.486	15	99.404	26	99.068
MLY	MANLEY HOT SPRINGS	AK	LP	16	99.014	20	98.854	34	98.381
MOU	MOUNTAIN VILLAGE	AK	LPV200	13	99.615	14	99.509	29	99.062
MYU	MEKORYUK	AK	LPV	11	99.895	16	99.812	33	99.281
OME	NOME	AK	LPV	12	99.289	14	99.229	40	98.646
OOK	TOKSOOK BAY	AK	LP	9	99.836	12	99.755	29	99.289
ORT	NORTHWAY	AK	LP	19	98.965	26	98.611	36	98.124
OTZ	RALPH WIEN MEML	AK	LPV	16	98.891	20	98.764	54	97.898
PAQ	WARREN BUD WOODS PALMER MUNICIPAL	AK	LP	12	99.439	20	99.313	28	98.72
PBV	ST GEORGE	AK	LPV	4	99.939	9	99.899	97	98.485
PHO	POINT HOPE	AK	LPV	24	98.715	25	98.528	77	97.166
PTU	PLATINUM	AK	LPV	9	99.903	10	99.819	23	99.473
RBY	RUBY	AK	LPV	19	99.149	21	98.981	34	98.516
RSH	RUSSIAN MISSION	AK	LP	13	99.628	13	99.548	25	99.167
SCC	DEADHORSE	AK	LPV200	18	98.266	26	98.058	77	96.831
SCM	SCAMMON BAY	AK	LP	14	99.677	15	99.545	31	99.057
SDP	SAND POINT	AK	LPV	4	99.925	6	99.917	31	99.519

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SHG	SHUNGNAK	AK	LP	15	98.824	21	98.63	50	97.934
SHX	SHAGELUK	AK	LPV	13	99.506	17	99.409	26	99.028
SIT	SITKA ROCKY GUTIERREZ	AK	LP	13	99.33	18	99.195	36	98.652
SLQ	SLEETMUTE	AK	LP	10	99.621	13	99.53	22	99.138
SMK	ST MICHAEL	AK	LPV	12	99.407	17	99.312	31	98.873
SXQ	SOLDOTNA	AK	LP	7	99.613	10	99.549	23	99.28
TER	TELLER	AK	LPV200	13	99.156	15	99.096	49	98.378
TKA	TALKEETNA	AK	LPV	14	99.385	22	99.2	27	98.674
TOG	TOGIAK	AK	LP	8	99.863	8	99.777	22	99.528
WLK	SELAWIK	AK	LPV	12	98.913	16	98.806	48	98.035
WMO	WHITE MOUNTAIN	AK	LPV	15	99.194	17	99.139	37	98.657
WNA	NAPAKIAK	AK	LPV	10	99.778	10	99.705	24	99.38
WSN	SOUTH NAKNEK NR 2	AK	LPV	8	99.796	8	99.733	13	99.51
WTK	NOATAK	AK	LPV	19	98.78	22	98.618	54	97.702
YAK	YAKUTAT	AK	LPV200	13	99.319	21	99.137	32	98.586
02A	CHILTON COUNTY	AL	LP	0	100	1	99.987	2	99.926
06A	MOTON FLD MUNICIPAL	AL	LPV	0	100	1	99.985	2	99.952
09A	BUTLER/CHOCTAW COUNTY	AL	LPV	1	99.999	1	99.961	3	99.916
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	1	99.99	2	99.934
0R1	ATMORE MUNICIPAL	AL	LPV	1	99.981	1	99.961	29	99.913
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	1	99.988	2	99.95
12J	BREWTON MUNICIPAL	AL	LPV	1	99.98	1	99.97	29	99.921
1A9	PRATTVILLE - GROUBY FLD	AL	LPV	0	100	1	99.989	2	99.926
1M4	POSEY FLD	AL	LPV	0	100	2	99.98	1	99.941
1R8	BAY MINETTE MUNICIPAL	AL	LPV	1	99.973	1	99.959	39	99.898
2R5	ST ELMO	AL	LPV	2	99.963	3	99.954	60	99.86
33J	GENEVA MUNICIPAL	AL	LP	0	100	1	99.99	29	99.924
3M8	NORTH PICKENS	AL	LP	0	100	1	99.986	3	99.933
4A9	ISBELL FLD	AL	LPV	1	99.995	2	99.959	2	99.953
5R1	ROY WILCOX	AL	LP	1	99.978	1	99.959	3	99.912
5R4	FOLEY MUNICIPAL	AL	LPV	2	99.969	2	99.958	65	99.844
71J	OZARK/BLACKWELL FLD	AL	LPV	0	100	1	99.99	2	99.933
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	0	100	1	99.99	3	99.934
8A0	ALBERTVILLE RGNL/THOMAS J BRUM	AL	LPV	0	100	1	99.966	1	99.941

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
8A1	GUNTERSVILLE MUNICIPAL/JOE STARNES	AL	LPV	1	99.999	1	99.948	1	99.941
9A4	COURTLAND	AL	LPV200	0	100	1	99.943	1	99.939
A08	VAIDEN FLD	AL	LPV	0	100	2	99.976	2	99.933
ALX	THOMAS C RUSSELL FLD	AL	LPV	0	100	1	99.985	2	99.952
ANB	ANNISTON RGNL	AL	LPV	0	100	1	99.966	2	99.96
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	100	1	99.966	2	99.96
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	100	1	99.985	2	99.952
BFM	MOBILE DOWNTOWN	AL	LPV200	1	99.97	1	99.959	58	99.878
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	0	100	1	99.976	2	99.944
CMD	CULLMAN RGNL-FOLSOM FLD	AL	LPV	0	100	2	99.964	1	99.941
CQF	H L SONNY CALLAHAN	AL	LPV200	1	99.97	1	99.959	63	99.853
DCU	PRYOR FLD RGNL	AL	LPV200	0	100	1	99.941	1	99.938
DHN	DOTHAN RGNL	AL	LPV200	0	100	1	99.99	2	99.933
DYA	DEMOPOLIS RGNL	AL	LPV	0	100	2	99.967	2	99.937
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	100	1	99.99	2	99.935
EET	SHELBY COUNTY	AL	LPV	0	100	1	99.984	3	99.925
EKY	BESSEMER	AL	LPV200	0	100	1	99.983	3	99.922
EUF	WEEDON FLD	AL	LPV	0	100	1	99.986	2	99.946
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	100	1	99.966	2	99.96
GZH	EVERGREEN RGNL/MIDDLETON FLD	AL	LP	1	99.996	2	99.969	3	99.928
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	100	1	99.985	3	99.93
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	0	100	1	99.941	1	99.938
JFX	WALKER COUNTY-BEVILL FLD	AL	LPV	0	100	1	99.982	2	99.944
JKA	GULF SHORES INTL/JACK EDWARDS	AL	LPV200	2	99.968	2	99.957	70	99.818
M95	RICHARD ARTHUR FLD	AL	LPV	0	100	1	99.985	2	99.915
MDQ	HUNTSVILLE EXEC TOM SHARP JR F	AL	LPV200	1	99.993	1	99.941	1	99.937
MGM	MONTGOMERY RGNL (DANNELLY FLD)	AL	LPV200	0	100	1	99.99	2	99.928
MOB	MOBILE RGNL	AL	LPV200	2	99.967	2	99.956	54	99.877
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	1	99.955	1	99.939
PLR	ST CLAIR COUNTY	AL	LPV	0	100	1	99.966	1	99.948

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	1	99.997	1	99.966	2	99.96
SCD	MERKEL FLD SYLACAUGA MUNICIPAL	AL	LPV	0	100	1	99.979	4	99.944
SEM	CRAIG FLD	AL	LPV200	0	100	1	99.989	2	99.933
TCL	TUSCALOOSA NTL	AL	LPV	0	100	1	99.987	2	99.933
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	0	100	1	99.99	2	99.933
0M0	BILLY FREE MUNICIPAL	AR	LPV	1	99.967	1	99.967	3	99.942
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	2	99.979	2	99.938
4A5	SEARCY COUNTY	AR	LPV	1	99.999	3	99.984	2	99.934
4M1	CARROLL COUNTY	AR	LP	1	99.988	3	99.974	2	99.929
4M3	CARLISLE MUNICIPAL	AR	LPV	1	99.996	2	99.985	3	99.955
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	1	99.986	2	99.944
7M1	MC GEHEE MUNICIPAL	AR	LP	1	99.966	1	99.966	3	99.944
9M8	SHERIDAN-GRANT COUNTY RGNL	AR	LPV	1	99.985	2	99.983	4	99.951
ADF	DEXTER B FLORENCE MEML FLD	AR	LPV	1	99.981	1	99.974	2	99.93
ARG	WALNUT RIDGE RGNL	AR	LPV200	1	99.998	2	99.973	2	99.937
ASG	SPRINGDALE MUNICIPAL	AR	LPV	1	99.985	3	99.971	2	99.929
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	0	100	1	99.97	2	99.944
BPK	BAXTER COUNTY	AR	LPV	0	100	2	99.982	2	99.934
BVX	BATESVILLE RGNL	AR	LPV	0	100	2	99.979	2	99.941
BYH	ARKANSAS INTL	AR	LPV200	3	99.994	2	99.959	3	99.949
CDH	HARRELL FLD	AR	LPV	1	99.966	1	99.964	2	99.941
CXW	CONWAY RGNL	AR	LPV	1	99.985	2	99.976	3	99.95
DRP	DELTA RGNL	AR	LPV	0	100	1	99.984	2	99.944
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	1	99.956	1	99.956	1	99.94
FLP	MARION COUNTY RGNL	AR	LPV	0	100	2	99.983	2	99.936
FSM	FORT SMITH RGNL	AR	LPV200	1	99.985	2	99.975	2	99.952
FYV	DRAKE FLD	AR	LPV	1	99.985	3	99.973	2	99.93
H34	HUNTSVILLE MUNICIPAL	AR	LPV	1	99.985	3	99.969	2	99.929
HEE	THOMPSON-ROBBINS	AR	LPV	0	100	1	99.988	2	99.944
HRO	BOONE COUNTY	AR	LPV	1	99.993	3	99.972	2	99.929

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JBR	JONESBORO MUNICIPAL	AR	LPV200	1	99.999	1	99.961	2	99.939
LIT	BILL AND HILLARY CLINTON NTL/A	AR	LPV200	1	99.985	2	99.976	3	99.957
LLQ	MONTICELLO MUNICIPAL/ELLIS FLD	AR	LPV	1	99.966	1	99.966	2	99.941
M18	HOPE MUNICIPAL	AR	LP	1	99.962	1	99.959	2	99.941
M19	NEWPORT RGNL	AR	LPV	0	100	2	99.978	2	99.941
M32	LAKE VILLAGE MUNICIPAL	AR	LP	1	99.966	1	99.966	1	99.947
M70	POCAHONTAS MUNICIPAL	AR	LPV	2	99.989	2	99.973	2	99.936
M77	HOWARD COUNTY	AR	LP	1	99.981	1	99.974	2	99.939
MXA	MANILA MUNICIPAL	AR	LPV	1	99.996	1	99.959	2	99.947
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	1	99.986	2	99.977	3	99.955
PBF	PINEBLUFF RGNL/GRIDER FLD	AR	LPV	1	99.985	1	99.985	4	99.949
ROG	ROGERS EXEC - CARTER FLD	AR	LPV	1	99.985	3	99.971	2	99.929
RUE	RUSSELLVILLE RGNL	AR	LPV	1	99.985	2	99.977	3	99.947
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	1	99.988	2	99.979	3	99.96
SLG	SMITH FLD	AR	LPV	1	99.985	3	99.973	2	99.929
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	1	99.987	2	99.941
SUZ	SALINE COUNTY RGNL	AR	LPV	1	99.985	2	99.978	3	99.959
TXK	TEXARKANA RGNL-WEBB FLD	AR	LPV	1	99.957	1	99.957	1	99.939
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	1	99.985	3	99.971	2	99.929
XNA	NORTHWEST ARKANSAS NTL	AR	LPV200	1	99.985	3	99.973	2	99.929
AVQ	MARANA RGNL	AZ	LP	1	99.867	2	99.851	14	99.65
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	1	99.881	2	99.875	6	99.753
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	1	99.867	2	99.853	8	99.666
CHD	CHANDLER MUNICIPAL	AZ	LPV	1	99.868	2	99.854	9	99.683
DVT	PHOENIX DEER VALLEY	AZ	LPV	1	99.874	3	99.865	8	99.707
FFZ	FALCON FLD	AZ	LP	1	99.874	3	99.864	8	99.689
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	1	99.867	3	99.863	31	99.614
FLG	FLAGSTAFF PULLIAM	AZ	LPV	1	99.88	3	99.84	5	99.718
GCN	GRAND CANYON NTL PARK	AZ	LPV	1	99.878	2	99.852	6	99.738
GEU	GLENDALE MUNICIPAL	AZ	LPV	1	99.873	3	99.855	6	99.692
GYR	PHOENIX GOODYEAR	AZ	LP	1	99.87	3	99.855	6	99.691
HII	LAKE HAVASU CITY	AZ	LPV	1	99.88	4	99.865	4	99.703

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	1	99.879	3	99.867	6	99.717
IGM	KINGMAN	AZ	LPV	1	99.878	3	99.87	6	99.74
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	1	99.87	3	99.863	8	99.687
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	1	99.881	4	99.817	7	99.709
P08	COOLIDGE MUNICIPAL	AZ	LPV	1	99.867	2	99.853	8	99.685
P20	AVI SUQUILLA	AZ	LPV	1	99.881	4	99.861	4	99.702
P33	COCHISE COUNTY	AZ	LPV	1	99.868	2	99.865	20	99.665
PGA	PAGE MUNICIPAL	AZ	LPV	1	99.885	2	99.865	5	99.726
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	1	99.873	2	99.858	8	99.669
PRC	PRESCOTT RGNL - ERNEST A LOVE	AZ	LPV200	1	99.878	4	99.858	5	99.733
RQE	WINDOW ROCK	AZ	LP	1	99.885	4	99.839	7	99.725
RYN	RYAN FLD	AZ	LPV	1	99.867	2	99.851	14	99.675
SAD	SAFFORD RGNL	AZ	LPV	1	99.881	1	99.867	13	99.667
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LPV	1	99.885	3	99.809	7	99.709
SOW	SHOW LOW RGNL	AZ	LPV200	1	99.885	3	99.809	6	99.715
TUS	TUCSON INTL	AZ	LPV	1	99.867	2	99.851	15	99.663
TYL	TAYLOR	AZ	LPV	1	99.885	3	99.809	6	99.715
AAT	ALTURAS MUNICIPAL	CA	LPV	1	99.876	5	99.774	8	99.599
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	1	99.87	5	99.738	8	99.45
APC	NAPA COUNTY	CA	LPV200	2	99.874	6	99.808	8	99.576
APV	APPLE VALLEY	CA	LPV	2	99.841	3	99.803	6	99.685
AUN	AUBURN MUNICIPAL	CA	LPV	1	99.875	4	99.818	8	99.592
BFL	MEADOWS FLD	CA	LPV	2	99.841	4	99.805	9	99.634
BLH	BLYTHE	CA	LP	1	99.874	3	99.841	3	99.698
BUR	BOB HOPE	CA	LP	2	99.837	3	99.8	12	99.649
C83	BYRON	CA	LPV	3	99.87	5	99.801	7	99.584
CCB	CABLE	CA	LP	2	99.837	3	99.799	12	99.655
CCR	BUCHANAN FLD	CA	LPV	2	99.875	5	99.798	8	99.577
CEC	JACK MC NAMARA FLD	CA	LPV	3	99.794	5	99.726	8	99.402
CIC	CHICO MUNICIPAL	CA	LPV	1	99.874	5	99.807	8	99.588
CMA	CAMARILLO	CA	LPV	2	99.837	3	99.798	15	99.592
CNO	CHINO	CA	LPV	2	99.837	3	99.8	12	99.66
CPU	CALAVERAS COUNTY-MAURY RASMUSS	CA	LP	2	99.881	5	99.816	6	99.603
CRQ	MC CLELLAN-PALOMAR	CA	LPV	2	99.834	3	99.794	20	99.602

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CVH	HOLLISTER MUNICIPAL	CA	LPV	2	99.846	4	99.784	4	99.576
DAG	BARSTOW-DAGGETT	CA	LPV	2	99.87	3	99.846	6	99.687
DWA	YOLO COUNTY	CA	LPV	1	99.878	5	99.818	8	99.582
F70	FRENCH VALLEY	CA	LPV	2	99.834	4	99.794	14	99.671
FAT	FRESNO YOSEMITE INTL	CA	LPV200	2	99.854	4	99.811	6	99.641
FCH	FRESNO CHANDLER EXEC	CA	LPV	2	99.852	4	99.811	5	99.618
GOO	NEVADA COUNTY	CA	LPV	1	99.875	5	99.836	7	99.593
HAF	HALF MOON BAY	CA	LPV	2	99.844	5	99.794	8	99.545
HHR	JACK NORTHROP FLD/HAWTHORNE MU	CA	LPV	2	99.837	3	99.797	13	99.619
HJO	HANFORD MUNICIPAL	CA	LPV	2	99.848	4	99.801	6	99.622
HWD	HAYWARD EXEC	CA	LPV	2	99.849	5	99.797	8	99.569
L35	BIG BEAR CITY	CA	LP	2	99.839	3	99.809	6	99.687
LAX	LOS ANGELES INTL	CA	LPV200	2	99.837	3	99.797	13	99.601
LGB	LONG BEACH (DAUGHERTY FLD)	CA	LPV	2	99.834	3	99.793	12	99.614
LHM	LINCOLN RGNL/KARL HARDER FLD	CA	LPV200	1	99.874	4	99.823	8	99.583
LLR	LITTLE RIVER	CA	LP	2	99.865	5	99.784	11	99.539
LSN	LOS BANOS MUNICIPAL	CA	LPV	2	99.843	4	99.79	5	99.601
LVK	LIVERMORE MUNICIPAL	CA	LPV200	2	99.846	5	99.8	7	99.578
MAE	MADERA MUNICIPAL	CA	LPV	2	99.852	4	99.806	6	99.628
MCE	MERCED RGNL/MACREADY FLD	CA	LPV200	2	99.852	5	99.811	5	99.601
MER	CASTLE	CA	LPV200	2	99.852	5	99.811	5	99.601
MHR	SACRAMENTO MATHER	CA	LPV200	1	99.878	3	99.822	8	99.605
MHV	MOJAVE AIR AND SPACE PORT	CA	LP	2	99.837	4	99.811	9	99.655
MIT	SHAFTER-MINTER FLD	CA	LPV	2	99.841	4	99.805	8	99.635
MOD	MODESTO CITY-COUNTY-HARRY SHAM	CA	LPV200	3	99.866	5	99.81	5	99.604
MRY	MONTEREY RGNL	CA	LPV	2	99.841	4	99.778	7	99.551
MYF	MONTGOMERY-GIBBS EXEC	CA	LPV200	2	99.834	3	99.797	26	99.592
MYV	YUBA COUNTY	CA	LPV200	1	99.874	5	99.822	8	99.583
NUQ	MOFFETT FEDERAL AIRFIELD	CA	LPV200	2	99.844	5	99.797	6	99.547
O02	NERVINO	CA	LPV	1	99.878	5	99.832	8	99.607
O08	COLUSA COUNTY	CA	LPV	1	99.874	5	99.815	8	99.58
O27	OAKDALE	CA	LPV	2	99.869	5	99.814	6	99.598
O32	REEDLEY MUNICIPAL	CA	LPV	2	99.856	4	99.813	8	99.659
O69	PETALUMA MUNICIPAL	CA	LPV	2	99.862	6	99.809	8	99.569

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
O88	RIO VISTA MUNICIPAL	CA	LP	2	99.878	5	99.805	8	99.584
OAK	METRO OAKLAND INTL	CA	LPV200	2	99.85	5	99.795	8	99.569
ONT	ONTARIO INTL	CA	LPV200	2	99.837	3	99.8	12	99.66
OVE	OROVILLE MUNICIPAL	CA	LPV	1	99.874	5	99.816	8	99.583
OXR	OXNARD	CA	LPV	2	99.837	3	99.788	15	99.575
PMD	PALMDALE USAF PLANT 42	CA	LPV200	2	99.837	3	99.799	11	99.658
POC	BRACKETT FLD	CA	LPV	2	99.837	3	99.799	12	99.655
PRB	PASO ROBLES MUNICIPAL	CA	LPV	2	99.841	4	99.794	8	99.565
PVF	PLACERVILLE	CA	LPV	1	99.878	4	99.826	6	99.592
RAL	RIVERSIDE MUNICIPAL	CA	LPV	2	99.837	3	99.8	12	99.672
RBL	RED BLUFF MUNICIPAL	CA	LPV	1	99.874	5	99.795	8	99.579
RDD	REDDING MUNICIPAL	CA	LPV	1	99.872	5	99.795	8	99.567
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	2	99.846	5	99.799	8	99.578
RIV	MARCH ARB	CA	LPV200	2	99.834	3	99.797	12	99.675
SAC	SACRAMENTO EXEC	CA	LPV	1	99.878	5	99.821	8	99.601
SAN	SAN DIEGO INTL	CA	LPV	2	99.834	4	99.796	27	99.584
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	2	99.83	4	99.772	16	99.562
SBD	SAN BERNARDINO INTL	CA	LPV	2	99.837	3	99.801	11	99.678
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	2	99.832	4	99.778	9	99.549
SCK	STOCKTON METRO	CA	LPV200	3	99.875	5	99.811	7	99.587
SDM	BROWN FLD MUNICIPAL	CA	LPV200	2	99.834	4	99.796	28	99.592
SEE	GILLESPIE FLD	CA	LP	2	99.834	3	99.797	25	99.61
SFO	SAN FRANCISCO INTL	CA	LPV200	2	99.85	5	99.794	7	99.547
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	2	99.846	5	99.799	7	99.563
SMF	SACRAMENTO INTL	CA	LPV200	1	99.878	5	99.822	8	99.586
SMO	SANTA MONICA MUNICIPAL	CA	LPV	2	99.837	3	99.798	13	99.601
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	2	99.83	4	99.771	14	99.537
SNA	JOHN WAYNE/ORANGE COUNTY	CA	LPV200	2	99.834	3	99.796	13	99.613
SNS	SALINAS MUNICIPAL	CA	LPV200	2	99.842	4	99.78	4	99.564
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	2	99.86	6	99.812	9	99.544
TCY	TRACY MUNICIPAL	CA	LPV	3	99.866	5	99.801	6	99.585
TNP	TWENTYNINE PALMS	CA	LP	2	99.865	3	99.835	5	99.701
TOA	ZAMPERINI FLD	CA	LPV	2	99.834	3	99.794	14	99.601

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TRK	TRUCKEE-TAHOE	CA	LP	1	99.878	4	99.832	6	99.603
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	2	99.834	3	99.805	5	99.692
TVL	LAKE TAHOE	CA	LP	1	99.878	4	99.834	7	99.605
VCB	NUT TREE	CA	LPV	2	99.877	5	99.804	8	99.594
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	2	99.837	3	99.803	10	99.683
VIS	VISALIA MUNICIPAL	CA	LPV	2	99.848	4	99.802	7	99.643
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	2	99.837	3	99.808	11	99.659
WLW	WILLOWS/GLENN COUNTY	CA	LPV	1	99.874	5	99.805	8	99.573
WVI	WATSONVILLE MUNICIPAL	CA	LPV	2	99.843	4	99.779	3	99.552
1V6	FREMONT COUNTY	CO	LPV	4	99.949	3	99.846	3	99.805
20V	MC ELROY AIRFIELD	CO	LPV	3	99.926	3	99.861	5	99.782
2V5	WRAY MUNICIPAL	CO	LPV200	4	99.958	5	99.86	5	99.765
2V6	YUMA MUNICIPAL	CO	LPV200	4	99.957	6	99.87	5	99.769
33V	WALDEN-JACKSON COUNTY	CO	LPV	4	99.932	5	99.889	4	99.746
4V0	RANGELY	CO	LPV	3	99.924	2	99.856	4	99.8
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	4	99.98	5	99.893	3	99.822
AEJ	CENTRAL COLORADO RGNL	CO	LP	4	99.925	4	99.861	3	99.796
AJZ	BLAKE FLD	CO	LPV	4	99.919	3	99.846	4	99.796
AKO	COLORADO PLAINS RGNL	CO	LPV	4	99.956	6	99.897	5	99.769
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	6	99.962	5	99.873	4	99.805
APA	CENTENNIAL	CO	LPV200	3	99.947	4	99.876	4	99.782
BJC	ROCKY MOUNTAIN METRO	CO	LPV200	3	99.933	4	99.88	4	99.748
CAG	CRAIG-MOFFAT	CO	LP	3	99.927	3	99.859	5	99.769
CEZ	CORTEZ MUNICIPAL	CO	LPV	3	99.893	3	99.86	5	99.76
CFO	COLORADO AIR AND SPACE PORT	CO	LPV200	3	99.961	4	99.881	5	99.773
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	4	99.954	5	99.869	3	99.809
DEN	DENVER INTL	CO	LPV200	3	99.961	4	99.881	5	99.769
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	3	99.902	3	99.857	4	99.775
FMM	FORT MORGAN MUNICIPAL	CO	LPV	4	99.957	6	99.898	5	99.769
FNL	NORTHERN COLORADO RGNL	CO	LPV200	5	99.948	4	99.885	6	99.762
FTG	FRONT RANGE	CO	LPV200	3	99.961	4	99.881	5	99.773
GJT	GRAND JUNCTION RGNL	CO	LPV200	3	99.924	3	99.858	3	99.803
GXY	GREELEY-WELD COUNTY	CO	LPV200	5	99.956	4	99.882	5	99.771

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HDN	YAMPA VALLEY	CO	LPV200	3	99.927	3	99.867	5	99.768
ITR	KIT CARSON COUNTY	CO	LPV	4	99.958	3	99.875	5	99.769
LAA	SOUTHEAST COLORADO RGNL	CO	LPV	3	99.982	4	99.88	4	99.791
LHX	LA JUNTA MUNICIPAL	CO	LPV	3	99.981	5	99.895	5	99.811
LMO	VANCE BRAND	CO	LPV	3	99.937	4	99.887	5	99.745
MTJ	MONTROSE RGNL	CO	LPV200	4	99.91	3	99.855	5	99.792
MVI	MONTE VISTA MUNICIPAL	CO	LPV	6	99.961	5	99.87	4	99.804
PSO	STEVENS FLD	CO	LP	3	99.914	3	99.856	4	99.773
PUB	PUEBLO MEML	CO	LPV200	3	99.978	4	99.861	3	99.805
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	6	99.955	5	99.866	4	99.803
RIL	RIFLE GARFIELD COUNTY	CO	LPV	2	99.921	3	99.86	3	99.794
STK	STERLING MUNICIPAL	CO	LPV	5	99.957	7	99.893	5	99.767
TEX	TELLURIDE RGNL	CO	LP	4	99.896	3	99.856	4	99.765
4B8	ROBERTSON FLD	CT	LP	3	99.827	3	99.815	3	99.735
BDL	BRADLEY INTL	CT	LPV200	3	99.824	3	99.811	3	99.733
BDR	IGOR I SIKORSKY MEML	CT	LPV	3	99.837	4	99.824	3	99.744
DXR	DANBURY MUNICIPAL	CT	LP	3	99.844	3	99.811	2	99.747
GON	GROTON-NEW LONDON	CT	LPV	3	99.829	3	99.815	3	99.738
HVN	TWEED/NEW HAVEN	CT	LPV	3	99.837	4	99.825	3	99.729
IJD	WINDHAM	CT	LP	3	99.821	3	99.807	3	99.737
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	3	99.835	4	99.824	3	99.728
OXC	WATERBURY-OXFORD	CT	LPV	3	99.835	4	99.824	3	99.741
DCA	RONALD REAGAN WASHINGTON NTL	DC	LPV	1	99.941	2	99.875	2	99.784
HEF	MANASSAS RGNL/HARRY P DAVIS FL	DC	LPV	1	99.937	2	99.881	3	99.805
IAD	WASHINGTON DULLES INTL	DC	LPV200	1	99.937	2	99.876	2	99.789
33N	DELAWARE AIRPARK	DE	LP	2	99.897	3	99.849	2	99.778
DOV	DOVER AFB	DE	LPV200	2	99.902	3	99.848	2	99.778
EVY	SUMMIT	DE	LPV	2	99.885	3	99.849	2	99.778
GED	DELAWARE COASTAL	DE	LPV	2	99.904	3	99.849	2	99.779
ILG	NEW CASTLE	DE	LPV	2	99.885	3	99.849	2	99.768
1J0	TRI-COUNTY	FL	LP	0	100	1	99.99	48	99.916
24J	SUWANNEE COUNTY	FL	LPV	0	100	1	99.996	3	99.973
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	6	99.957
40J	PERRY-FOLEY	FL	LPV	0	100	1	99.999	6	99.964

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
54J	DEFUNIAK SPRINGS	FL	LP	1	99.998	1	99.998	58	99.903
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	0	100	78	99.845
APF	NAPLES MUNICIPAL	FL	LPV	1	99.974	2	99.964	82	99.564
AVO	AVON PARK EXEC	FL	LPV	2	99.994	1	99.974	26	99.879
BCR	TRI-COUNTY	FL	LPV	0	100	1	99.99	47	99.916
BCT	BOCA RATON	FL	LPV	3	99.975	3	99.932	46	99.696
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	1	99.997	1	99.997	12	99.898
BOW	BARTOW EXEC	FL	LPV	2	99.994	1	99.974	19	99.885
CEW	BOB SIKES	FL	LPV	1	99.994	2	99.991	58	99.907
CGC	CRYSTAL RIVER-CAPT TOM DAVIS F	FL	LP	0	100	0	100	9	99.921
CHN	WAUCHULA MUNICIPAL	FL	LP	2	99.994	1	99.974	25	99.853
COI	MERRITT ISLAND	FL	LPV	1	99.997	1	99.997	14	99.914
CRG	JACKSONVILLE EXEC AT CRAIG	FL	LPV200	0	100	1	99.993	2	99.952
CTY	CROSS CITY	FL	LPV	0	100	0	100	6	99.967
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	4	99.976
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FL	FL	LPV	0	100	0	100	9	99.972
DTS	DESTIN EXEC	FL	LPV	1	99.99	2	99.987	70	99.855
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	0	100	70	99.854
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	6	99.973
EYW	KEY WEST INTL	FL	LPV	2	99.895	5	99.848	114	99.123
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	2	99.994	3	99.965	32	99.74
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	1	99.979	2	99.947
FIN	FLAGLER EXEC	FL	LPV	0	100	0	100	4	99.976
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	2	99.953	3	99.929	51	99.655
FMY	PAGE FLD	FL	LPV	1	99.974	1	99.974	69	99.626
FPR	TREASURE COAST INTL	FL	LPV	2	99.994	1	99.974	25	99.82
FPY	PERRY-FOLEY	FL	LPV	0	100	1	99.999	6	99.964
FXE	FORT LAUDERDALE EXEC	FL	LPV200	2	99.955	3	99.93	49	99.672

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GIF	WINTER HAVEN RGNL	FL	LPV	2	99.995	1	99.974	18	99.902
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	5	99.961
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	1	99.994	5	99.952
IMM	IMMOKALEE RGNL	FL	LPV	1	99.974	3	99.967	50	99.674
ISM	KISSIMMEE GATEWAY	FL	LPV200	1	99.997	1	99.997	17	99.91
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	1	99.981	3	99.949
LAL	LAKELAND LINDER INTL	FL	LPV200	2	99.995	1	99.974	17	99.879
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	1	99.998	6	99.974
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	11	99.929
LNA	PALM BEACH COUNTY PARK	FL	LP	3	99.992	3	99.938	41	99.707
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	1	99.99	37	99.923
MCO	ORLANDO INTL	FL	LPV200	1	99.997	1	99.997	17	99.914
MIA	MIAMI INTL	FL	LPV200	2	99.932	3	99.91	55	99.614
MKY	MARCO ISLAND EXEC	FL	LPV	2	99.973	4	99.948	85	99.549
MLB	MELBOURNE ORLANDO INTL	FL	LPV200	1	99.997	1	99.997	18	99.903
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	3	99.903	6	99.844	106	99.239
OBE	OKEECHOBEE COUNTY	FL	LPV	2	99.994	1	99.974	29	99.817
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	0	100	0	100	7	99.97
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	5	99.97
OPF	MIAMI-OPA LOCKA EXEC	FL	LPV200	2	99.943	3	99.923	53	99.631
ORL	EXEC	FL	LPV200	0	100	0	100	17	99.922
PBI	PALM BEACH INTL	FL	LPV200	2	99.993	3	99.938	37	99.713
PCM	PLANT CITY	FL	LPV	2	99.995	1	99.974	18	99.882
PGD	PUNTA GORDA	FL	LPV200	2	99.993	1	99.974	64	99.691
PHK	PALM BEACH COUNTY GLADES	FL	LPV	2	99.994	2	99.973	39	99.724
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	2	99.994	1	99.974	52	99.842
PMP	POMPANO BEACH AIRPARK	FL	LPV	2	99.955	3	99.93	48	99.679
PNS	PENSACOLA INTL	FL	LPV200	1	99.979	1	99.966	71	99.862
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	1	99.974	1	99.974	66	99.624
SEF	SEBRING RGNL	FL	LPV	2	99.994	1	99.974	27	99.848
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	14	99.945
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	1	99.999	3	99.958
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	2	99.994	1	99.974	67	99.763
SUA	WITHAM FLD	FL	LPV	2	99.994	1	99.974	25	99.795
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	14	99.925
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	1	99.998	19	99.934

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TMB	MIAMI EXEC	FL	LPV200	2	99.931	4	99.901	58	99.582
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	2	99.953	4	99.932	52	99.619
TPA	TAMPA INTL	FL	LPV200	2	99.994	1	99.974	43	99.861
TPF	PETER O KNIGHT	FL	LP	2	99.994	1	99.974	43	99.86
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	9	99.932
VDF	TAMPA EXEC	FL	LPV	2	99.995	1	99.974	27	99.881
VNC	VENICE MUNICIPAL	FL	LP	2	99.993	1	99.974	73	99.714
VQQ	CECIL	FL	LPV200	0	100	1	99.995	5	99.954
VRB	VERO BEACH RGNL	FL	LPV200	2	99.995	1	99.974	23	99.848
X07	LAKE WALES MUNICIPAL	FL	LP	2	99.994	1	99.974	18	99.898
X14	LA BELLE MUNICIPAL	FL	LPV	2	99.992	1	99.974	39	99.717
X35	MARION COUNTY	FL	LP	0	100	0	100	8	99.939
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	2	99.92	4	99.871	59	99.545
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	2	99.996	2	99.994	13	99.89
09J	JEKYLL ISLAND	GA	LPV200	0	100	1	99.974	3	99.961
15J	COOK COUNTY	GA	LPV	0	100	1	99.981	1	99.969
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	1	99.989	15	99.932
18A	FRANKLIN-HART	GA	LPV	1	99.974	1	99.963	2	99.956
19A	JACKSON COUNTY	GA	LPV	1	99.974	1	99.963	2	99.955
2J3	LOUISVILLE MUNICIPAL	GA	LPV	1	99.988	1	99.963	1	99.963
2J5	MILLEN	GA	LPV	1	99.981	1	99.963	1	99.963
3J7	GREENE COUNTY RGNL	GA	LPV	1	99.988	1	99.963	2	99.963
48A	COCHRAN	GA	LPV	1	99.999	1	99.974	1	99.963
49A	GILMER COUNTY	GA	LPV	1	99.974	2	99.964	1	99.941
4A4	POLK COUNTY/CORNELIUS MOORE FL	GA	LPV	1	99.996	1	99.966	2	99.962
4J1	BRANTLEY COUNTY	GA	LPV	0	100	1	99.974	2	99.962
4J2	BERRIEN COUNTY	GA	LPV	0	100	1	99.979	1	99.968
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	1	99.984	2	99.969
52A	MADISON MUNICIPAL	GA	LP	1	99.993	1	99.966	2	99.963
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	1	99.979	1	99.966
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	1	99.999	1	99.966	2	99.961
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	1	99.986	2	99.956
75J	TURNER COUNTY	GA	LP	0	100	1	99.978	1	99.968

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
9A5	BARWICK LAFAYETTE	GA	LP	1	99.995	2	99.957	1	99.941
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	1	99.982	2	99.972
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	1	99.98	1	99.963
AGS	AUGUSTA RGNL AT BUSH FLD	GA	LPV200	1	99.975	1	99.963	1	99.963
AHN	ATHENS/BEN EPPS	GA	LPV200	1	99.974	1	99.964	2	99.96
AJR	HABERSHAM COUNTY	GA	LPV	1	99.974	1	99.963	1	99.941
AMG	BACON COUNTY	GA	LPV	0	100	1	99.974	1	99.963
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	1	99.995	1	99.966	2	99.964
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	1	99.975	1	99.963
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	1	99.988	12	99.947
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	1	99.974	1	99.963
BIJ	EARLY COUNTY	GA	LPV	0	100	1	99.987	2	99.952
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	1	99.97	2	99.962
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	1	99.966	2	99.963
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	1	99.978	1	99.963
CNI	CHEROKEE COUNTY RGNL	GA	LPV	1	99.974	1	99.966	2	99.953
CSG	COLUMBUS	GA	LPV	0	100	1	99.984	1	99.966
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	1	99.966	2	99.962
CVC	COVINGTON MUNICIPAL	GA	LPV	1	99.993	1	99.966	2	99.962
CWV	CLAXTON-EVANS COUNTY	GA	LPV	1	99.993	1	99.963	1	99.963
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	1	99.984	2	99.971
CZL	TOM B DAVID FLD	GA	LPV	2	99.986	2	99.966	2	99.955
D73	CY NUNNALLY MEML	GA	LP	1	99.993	1	99.966	2	99.962
DBN	W H 'BUD' BARRON	GA	LPV200	1	99.998	1	99.971	1	99.963
DNL	DANIEL FLD	GA	LPV	1	99.974	1	99.963	1	99.963
DNN	DALTON MUNICIPAL	GA	LPV	1	99.974	2	99.959	1	99.941
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	1	99.976	1	99.965
EBA	ELBERT COUNTY-PATZ FLD	GA	LP	1	99.974	1	99.963	2	99.961
EZM	HEART OF GEORGIA RGNL	GA	LPV200	1	99.999	1	99.974	1	99.963
FFC	ATLANTA RGNL FALCON FLD	GA	LPV	0	100	1	99.966	2	99.964
FTY	FULTON COUNTY EXEC/CHARLIE BRO	GA	LPV	1	99.995	1	99.966	2	99.964
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	1	99.977	1	99.968
GVL	LEE GILMER MEML	GA	LPV	1	99.974	1	99.966	2	99.954

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HMP	ATLANTA SPEEDWAY	GA	LPV200	1	99.998	1	99.966	2	99.961
HOE	HOMERVILLE	GA	LPV	0	100	1	99.979	1	99.966
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	1	99.981	1	99.963	1	99.963
IIY	WASHINGTON/WILKES COUNTY	GA	LPV	1	99.974	1	99.963	2	99.961
JCA	JACKSON COUNTY	GA	LPV	1	99.974	1	99.963	2	99.955
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	1	99.97	1	99.963
JYL	PLANTATION AIRPARK	GA	LPV	1	99.981	1	99.963	1	99.963
JZP	PICKENS COUNTY	GA	LPV	1	99.974	1	99.966	2	99.955
LGC	LAGRANGE/CALLAWAY	GA	LPV200	0	100	1	99.974	2	99.963
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	1	99.994	1	99.969	1	99.963
LZU	GWINNETT COUNTY/BRISCOE FLD	GA	LPV200	2	99.99	1	99.966	2	99.961
MAC	MACON DOWNTOWN	GA	LPV	1	99.998	1	99.973	2	99.963
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	1	99.999	1	99.974	2	99.963
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	1	99.983	2	99.97
MHP	JOHN EDWIN JONES SR FLD/METTER	GA	LPV	1	99.993	1	99.963	1	99.963
MLJ	BALDWIN COUNTY RGNL	GA	LPV	1	99.992	1	99.966	1	99.963
MQW	TELFAIR-WHEELER	GA	LPV	1	99.999	1	99.974	1	99.963
OKZ	KAOLIN FLD	GA	LPV	1	99.992	1	99.965	1	99.963
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	1	99.966	2	99.961
PIM	HARRIS COUNTY	GA	LPV	0	100	1	99.977	1	99.966
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	1	99.997	1	99.966	2	99.963
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	1	99.975	2	99.963
RMG	RICHARD B RUSSELL RGNL - J H T	GA	LPV	1	99.995	2	99.966	2	99.955
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	1	99.996	1	99.965	1	99.963
RYY	COBB COUNTY INTL/MCCOLLUM FLD	GA	LPV200	1	99.994	1	99.966	2	99.963
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	1	99.993	1	99.963	1	99.963
SBO	EAST GEORGIA RGNL	GA	LPV	1	99.992	1	99.963	1	99.963
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	1	99.993	1	99.963	1	99.963
TMA	HENRY TIFT MYERS	GA	LPV	0	100	1	99.979	1	99.969
TOC	TOCCOA RG LETOURNEAU FLD	GA	LPV	1	99.974	1	99.963	1	99.941

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TVI	THOMASVILLE RGNL	GA	LPV	0	100	1	99.985	2	99.969
VDI	VIDALIA RGNL	GA	LPV200	1	99.996	1	99.969	1	99.963
VLD	VALDOSTA RGNL	GA	LPV	0	100	1	99.983	1	99.97
VPC	CARTERSVILLE	GA	LPV	1	99.995	1	99.966	2	99.956
WDR	BARROW COUNTY	GA	LPV	1	99.974	1	99.966	2	99.961
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	2	99.788	3	99.745	5	99.696
4C8	ALBIA MUNICIPAL	IA	LPV	5	99.858	2	99.817	3	99.783
AIO	ATLANTIC MUNICIPAL	IA	LPV	4	99.849	3	99.815	4	99.745
ALO	WATERLOO RGNL	IA	LPV200	2	99.811	3	99.767	5	99.711
AMW	AMES MUNICIPAL	IA	LPV	3	99.826	3	99.778	3	99.755
AWG	WASHINGTON MUNICIPAL	IA	LPV200	3	99.827	2	99.803	3	99.764
BNW	BOONE MUNICIPAL	IA	LPV	3	99.825	3	99.777	3	99.756
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	3	99.843	2	99.821	2	99.81
C25	WAVERLY MUNICIPAL	IA	LPV	2	99.79	3	99.765	5	99.71
CAV	CLARION MUNICIPAL	IA	LPV	3	99.805	3	99.768	4	99.718
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	4	99.865	3	99.836	4	99.741
CCY	NORTHEAST IOWA RGNL	IA	LPV	2	99.79	3	99.759	5	99.7
CID	THE EASTERN IOWA	IA	LPV200	2	99.811	3	99.78	4	99.72
CIN	ARTHUR N NEU	IA	LPV	2	99.811	3	99.772	3	99.765
CKP	CHEROKEE COUNTY RGNL	IA	LPV	2	99.793	3	99.769	6	99.726
CSQ	CRESTON MUNICIPAL	IA	LPV	5	99.871	3	99.827	3	99.782
CWI	CLINTON MUNICIPAL	IA	LPV200	2	99.815	2	99.783	4	99.719
DBQ	DUBUQUE RGNL	IA	LPV200	2	99.815	3	99.771	5	99.704
DEH	DECORAH MUNICIPAL	IA	LPV	2	99.787	3	99.742	5	99.691
DNS	DENISON MUNICIPAL	IA	LPV	3	99.824	3	99.776	4	99.732
DSM	DES MOINES INTL	IA	LPV200	4	99.841	2	99.794	3	99.757
DVN	DAVENPORT MUNICIPAL	IA	LPV200	2	99.815	2	99.784	4	99.739
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	3	99.805	3	99.768	4	99.719
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	3	99.824	3	99.771	3	99.728
EFW	JEFFERSON MUNICIPAL	IA	LPV	3	99.824	3	99.774	3	99.766
EOK	KEOKUK MUNICIPAL	IA	LPV	2	99.861	1	99.837	2	99.821
EST	ESTHERVILLE MUNICIPAL	IA	LPV	2	99.789	4	99.762	5	99.708
FFL	FAIRFIELD MUNICIPAL	IA	LPV	3	99.83	2	99.817	3	99.769
FOD	FORT DODGE RGNL	IA	LPV200	3	99.823	3	99.767	3	99.728
FSW	FORT MADISON MUNICIPAL	IA	LPV	3	99.844	2	99.822	2	99.818
FXY	FOREST CITY MUNICIPAL	IA	LPV	2	99.789	3	99.756	6	99.702
GCT	GUTHRIE COUNTY RGNL	IA	LPV	3	99.828	3	99.784	3	99.767

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GFZ	GREENFIELD MUNICIPAL	IA	LPV	3	99.831	2	99.801	3	99.77
GGI	GRINNELL RGNL	IA	LPV	2	99.811	3	99.788	4	99.755
HPT	HAMPTON MUNICIPAL	IA	LPV	2	99.79	3	99.762	4	99.713
I75	OSCEOLA MUNICIPAL	IA	LPV	5	99.865	2	99.815	3	99.779
ICL	SCHENCK FLD	IA	LPV	6	99.927	5	99.876	4	99.79
IFA	IOWA FALLS MUNICIPAL	IA	LPV	2	99.811	3	99.77	4	99.718
IIB	JAMES H CONNELL FLD AT INDEPEN	IA	LPV	2	99.811	3	99.768	5	99.709
IKV	ANKENY RGNL	IA	LPV200	3	99.827	3	99.784	3	99.756
IOW	IOWA CITY MUNICIPAL	IA	LPV	2	99.811	2	99.784	4	99.738
LRJ	LE MARS MUNICIPAL	IA	LPV	2	99.793	3	99.769	5	99.711
LWD	LAMONI MUNICIPAL	IA	LPV	6	99.91	4	99.861	2	99.804
MCW	MASON CITY MUNICIPAL	IA	LPV200	2	99.789	3	99.758	5	99.708
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	2	99.811	3	99.781	4	99.728
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	3	99.834	2	99.82	3	99.787
MUT	MUSCATINE MUNICIPAL	IA	LPV200	3	99.825	2	99.799	3	99.763
MXO	MONTICELLO RGNL	IA	LP	2	99.811	3	99.772	5	99.709
OOA	OSKALOOSA MUNICIPAL	IA	LPV	4	99.838	2	99.805	3	99.765
OQW	MAQUOKETA MUNICIPAL	IA	LPV	2	99.815	3	99.775	4	99.715
ORC	ORANGE CITY MUNICIPAL	IA	LPV	2	99.793	4	99.766	5	99.694
OTM	OTTUMWA RGNL	IA	LPV	4	99.841	2	99.815	3	99.766
OXV	KNOXVILLE MUNICIPAL	IA	LPV	5	99.858	2	99.8	3	99.761
PEA	PELLA MUNICIPAL	IA	LPV	3	99.824	2	99.797	3	99.759
POH	POCAHONTAS MUNICIPAL	IA	LPV	2	99.793	3	99.766	3	99.737
PRO	PERRY MUNICIPAL	IA	LPV200	3	99.826	3	99.778	3	99.76
RDK	RED OAK MUNICIPAL	IA	LPV	5	99.892	3	99.849	4	99.753
RRQ	ROCK RAPIDS MUNICIPAL	IA	LP	3	99.788	4	99.756	5	99.687
SDA	SHENANDOAH MUNICIPAL	IA	LPV	5	99.928	5	99.876	4	99.765
SHL	SHELDON RGNL	IA	LPV	2	99.792	4	99.763	5	99.691
SKI	SAC CITY MUNICIPAL	IA	LPV	2	99.804	3	99.77	4	99.759
SLB	STORM LAKE MUNICIPAL	IA	LPV	2	99.804	3	99.769	4	99.733
SPW	SPENCER MUNICIPAL	IA	LPV200	2	99.789	4	99.764	4	99.721
SUX	SIOUX GATEWAY/BRIG GENERAL BUD	IA	LPV200	4	99.827	4	99.787	4	99.725
SXK	SIOUX COUNTY RGNL	IA	LPV200	2	99.793	4	99.766	5	99.694
TNU	NEWTON MUNICIPAL-EARL JOHNSON FLD	IA	LPV200	2	99.811	3	99.789	3	99.756

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TVK	CENTERVILLE MUNICIPAL	IA	LPV	5	99.866	3	99.836	2	99.806
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	3	99.823	3	99.778	5	99.741
VTI	VINTON VETERANS MEML AIRPARK	IA	LPV	2	99.811	3	99.771	4	99.714
1U7	BEAR LAKE COUNTY	ID	LPV	3	99.888	3	99.814	3	99.733
BOI	BOISE AIR TRML/GOWEN FLD	ID	LPV200	2	99.815	3	99.782	7	99.684
COE	COEUR D'ALENE/PAPPY BOYINGTON	ID	LPV200	2	99.852	5	99.811	15	99.636
DIJ	DRIGGS-REED MEML	ID	LP	4	99.874	3	99.797	3	99.73
EUL	TREASURE VALLEY EXEC AT CALDWE	ID	LPV	2	99.815	3	99.782	8	99.679
GNG	GOODING MUNICIPAL	ID	LPV	2	99.834	2	99.802	5	99.696
IDA	IDAHO FALLS RGNL	ID	LPV200	3	99.88	3	99.802	3	99.732
JER	JEROME COUNTY	ID	LPV	2	99.835	2	99.796	5	99.699
LWS	LEWISTON/NEZ PERCE COUNTY	ID	LPV200	3	99.859	6	99.832	12	99.588
MAN	NAMPA MUNICIPAL	ID	LPV	2	99.815	3	99.782	8	99.68
MYL	MC CALL MUNICIPAL	ID	LPV	3	99.84	5	99.826	9	99.684
PIH	POCATELLO RGNL	ID	LPV200	4	99.878	2	99.8	3	99.724
SUN	FRIEDMAN MEML	ID	LP	2	99.826	2	99.809	5	99.705
SZT	SANDPOINT	ID	LP	2	99.827	4	99.802	16	99.616
TWF	JOSLIN FLD/MAGIC VALLEY RGNL	ID	LPV200	2	99.832	2	99.799	3	99.704
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	2	99.808	2	99.797	5	99.695
1H2	EFFINGHAM COUNTY MEML	IL	LPV	2	99.887	2	99.877	1	99.844
3LF	LITCHFIELD MUNICIPAL	IL	LPV	3	99.915	2	99.864	1	99.844
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	2	99.844	2	99.827	3	99.81
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	2	99.895	2	99.886	1	99.848
ALN	ST LOUIS RGNL	IL	LPV200	3	99.948	2	99.884	1	99.844
ARR	AURORA MUNICIPAL	IL	LPV200	2	99.826	2	99.791	4	99.732
BLV	SCOTT AFB/MIDAMERICA ST LOUIS	IL	LPV200	2	99.952	2	99.89	1	99.846
BMI	CENTRAL IL RGNL/BLOOMINGTON-NO	IL	LPV	1	99.857	1	99.844	2	99.821
C15	PEKIN MUNICIPAL	IL	LPV	1	99.859	1	99.844	2	99.821
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	2	99.82	2	99.785	4	99.72
C75	MARSHALL COUNTY	IL	LP	2	99.828	2	99.824	5	99.779

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CIR	CAIRO RGNL	IL	LP	2	99.96	2	99.946	2	99.895
CMI	UNIVERSITY OF ILLINOIS/WILLARD	IL	LPV200	1	99.864	2	99.856	2	99.83
CPS	ST LOUIS DOWNTOWN	IL	LPV200	2	99.953	2	99.892	1	99.845
CTK	INGERSOLL	IL	LPV	2	99.858	2	99.843	2	99.821
CUL	CARMI MUNICIPAL	IL	LPV	2	99.926	2	99.897	1	99.859
DEC	DECATUR	IL	LPV200	1	99.866	1	99.844	2	99.831
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	2	99.823	2	99.788	5	99.727
DNV	VERMILION RGNL	IL	LPV	1	99.862	1	99.855	2	99.84
DPA	DUPAGE	IL	LPV200	2	99.826	2	99.791	4	99.733
ENL	CENTRALIA MUNICIPAL	IL	LPV	3	99.93	2	99.888	1	99.846
EZI	KEWANEE MUNICIPAL	IL	LPV	2	99.827	2	99.82	5	99.768
FEP	ALBERTUS	IL	LPV	2	99.819	3	99.76	5	99.709
FOA	FLORA MUNICIPAL	IL	LPV	2	99.898	2	99.885	1	99.845
GBG	GALESBURG MUNICIPAL	IL	LPV200	3	99.843	2	99.82	3	99.796
GRE	GREENVILLE	IL	LPV	3	99.927	2	99.883	1	99.844
HSB	HARRISBURG-RALEIGH	IL	LPV	2	99.949	2	99.907	2	99.88
I63	MOUNT STERLING MUNICIPAL	IL	LPV	1	99.865	1	99.844	2	99.822
IGQ	LANSING MUNICIPAL	IL	LPV	2	99.848	2	99.804	4	99.745
IKK	GREATER KANKAKEE	IL	LPV200	1	99.859	1	99.843	4	99.779
LOT	LEWIS UNIVERSITY	IL	LPV200	2	99.827	2	99.792	4	99.737
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	2	99.895	2	99.885	1	99.846
MDW	CHICAGO MIDWAY INTL	IL	LPV	2	99.831	2	99.792	4	99.74
MLI	QUAD CITIES INTL	IL	LPV200	2	99.822	2	99.79	4	99.741
MQB	MACOMB MUNICIPAL	IL	LPV200	3	99.859	2	99.839	2	99.821
MTO	COLES COUNTY MEML	IL	LPV200	2	99.878	1	99.859	2	99.843
MVN	MOUNT VERNON	IL	LPV	3	99.935	2	99.889	1	99.849
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	2	99.953	2	99.905	2	99.876
OLY	OLNEY-NOBLE	IL	LPV	2	99.897	2	99.885	1	99.845
ORD	CHICAGO O'HARE INTL	IL	LPV200	2	99.826	2	99.791	4	99.735
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	2	99.851	2	99.837	2	99.818
PJY	PINCKNEYVILLE/DU QUOIN	IL	LPV	2	99.954	2	99.902	1	99.862
PNT	PONTIAC MUNICIPAL	IL	LPV	2	99.854	2	99.842	4	99.791

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PPQ	PITTSFIELD PENSTONE MUNICIPAL	IL	LPV	4	99.923	1	99.844	2	99.826
PRG	EDGAR COUNTY	IL	LPV	1	99.863	1	99.857	1	99.844
PWK	CHICAGO EXEC	IL	LPV	2	99.825	2	99.772	5	99.732
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	2	99.819	3	99.777	5	99.711
RPJ	ROCHELLE MUNICIPAL/KORITZ FLD	IL	LPV	2	99.821	2	99.786	4	99.716
RSV	CRAWFORD COUNTY	IL	LPV	2	99.884	2	99.88	1	99.844
SAR	SPARTA COMMUNICIPALTY-HUNTER FLD	IL	LPV	2	99.952	2	99.892	1	99.852
SFY	TRI-TOWNSHIP	IL	LP	2	99.815	3	99.778	5	99.717
SLO	SALEM-LECKRONE	IL	LPV200	3	99.922	2	99.885	1	99.844
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	1	99.867	1	99.844	2	99.826
SQI	WHITESIDE COUNTY/JOS H BITTORF	IL	LPV200	2	99.82	2	99.784	3	99.721
TIP	RANTOUL NTL AVN CNTR-FRANK ELL	IL	LPV	1	99.863	1	99.856	2	99.827
UGN	WAUKEGAN NTL	IL	LPV	2	99.821	2	99.757	4	99.716
UIN	QUINCY RGNL-BALDWIN FLD	IL	LPV200	3	99.912	1	99.844	2	99.822
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	2	99.827	2	99.795	5	99.759
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	1	99.862	1	99.859	1	99.844
50I	KENTLAND MUNICIPAL	IN	LPV	1	99.861	1	99.842	2	99.825
AID	ANDERSON MUNICIPAL-DARLINGTON FLD	IN	LPV	1	99.86	1	99.858	1	99.841
ASW	WARSAW MUNICIPAL	IN	LPV200	1	99.857	2	99.845	4	99.778
BAK	COLUMBUS MUNICIPAL	IN	LPV	2	99.892	2	99.878	1	99.844
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	2	99.902	2	99.894	1	99.848
BMG	MONROE COUNTY	IN	LPV200	3	99.891	2	99.878	1	99.844
C62	KENDALLVILLE MUNICIPAL	IN	LPV	1	99.862	2	99.818	3	99.761
C65	PLYMOUTH MUNICIPAL	IN	LPV	1	99.858	2	99.847	3	99.764
CEV	METTEL FLD	IN	LPV	2	99.896	2	99.875	2	99.858
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	1	99.861	1	99.855	1	99.844
DCY	DAVIESS COUNTY	IN	LPV	2	99.894	2	99.885	1	99.848
EKM	ELKHART MUNICIPAL	IN	LPV	1	99.857	3	99.824	3	99.755
EVV	EVANSVILLE RGNL	IN	LPV200	2	99.929	2	99.904	2	99.871

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EYE	EAGLE CREEK AIRPARK	IN	LPV	1	99.861	1	99.859	1	99.844
FKR	FRANKFORT CLINTON COUNTY RGNL	IN	LPV	1	99.86	1	99.853	1	99.841
FRH	FRENCH LICK MUNICIPAL	IN	LPV	1	99.911	2	99.891	1	99.856
FWA	FORT WAYNE INTL	IN	LPV200	1	99.86	1	99.848	3	99.805
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	2	99.872	1	99.86	1	99.844
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	1	99.859	1	99.852	1	99.836
GPC	PUTNAM COUNTY RGNL	IN	LPV	1	99.861	1	99.859	1	99.844
GSH	GOSHEN MUNICIPAL	IN	LPV	1	99.857	2	99.814	3	99.76
GWB	DE KALB COUNTY	IN	LPV	1	99.861	2	99.824	3	99.765
GYY	GARY/CHICAGO INTL	IN	LPV200	1	99.852	2	99.806	4	99.746
HFY	INDY SOUTH GREENWOOD	IN	LPV	1	99.86	1	99.86	1	99.844
HNB	HUNTINGBURG	IN	LPV	1	99.911	2	99.903	1	99.856
HUF	TERRE HAUTE RGNL	IN	LPV200	2	99.875	1	99.859	1	99.844
I22	RANDOLPH COUNTY	IN	LPV	1	99.857	1	99.857	1	99.841
I76	PERU MUNICIPAL	IN	LPV	1	99.859	1	99.852	2	99.826
IMS	MADISON MUNICIPAL	IN	LPV	2	99.904	2	99.9	2	99.876
IND	INDIANAPOLIS INTL	IN	LPV200	1	99.861	1	99.86	1	99.844
JVY	CLARK RGNL	IN	LPV200	1	99.915	2	99.901	2	99.877
LAF	PURDUE UNIVERSITY	IN	LPV	1	99.861	1	99.853	1	99.841
MCX	WHITE COUNTY	IN	LP	1	99.86	1	99.853	1	99.841
MIE	DELAWARE COUNTY RGNL	IN	LPV	1	99.858	1	99.858	1	99.841
MQJ	INDIANAPOLIS RGNL	IN	LPV200	1	99.86	1	99.859	1	99.844
MZZ	MARION MUNICIPAL - MCKINNEY FLD	IN	LPV200	1	99.86	1	99.858	1	99.835
OKK	KOKOMO MUNICIPAL	IN	LPV200	1	99.859	1	99.853	1	99.836
OVO	NORTH VERNON	IN	LPV	2	99.903	2	99.893	2	99.87
OXI	STARKE COUNTY	IN	LPV	1	99.859	2	99.843	4	99.777
PLD	PORTLAND MUNICIPAL	IN	LPV	1	99.857	1	99.857	1	99.836
PPO	LA PORTE MUNICIPAL	IN	LPV	1	99.859	2	99.81	3	99.759
RCR	FULTON COUNTY	IN	LPV	1	99.858	1	99.851	4	99.798
RID	RICHMOND MUNICIPAL	IN	LPV200	2	99.901	2	99.878	2	99.862
RWN	ARENS FLD	IN	LPV	1	99.859	1	99.851	4	99.795
RZL	JASPER COUNTY	IN	LPV	1	99.861	1	99.842	3	99.795
SBN	SOUTH BEND INTL	IN	LPV200	1	99.858	3	99.826	3	99.756
SER	FREEMAN MUNICIPAL	IN	LPV	2	99.902	2	99.894	1	99.852
SIV	SULLIVAN COUNTY	IN	LPV	2	99.881	2	99.878	1	99.844

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SMD	SMITH FLD	IN	LPV	1	99.86	1	99.848	4	99.792
TEL	PERRY COUNTY MUNICIPAL	IN	LP	2	99.927	2	99.903	2	99.881
TYQ	INDIANAPOLIS EXEC	IN	LPV	1	99.861	1	99.856	1	99.841
UWL	NEW CASTLE HENRY COUNTY MARLAT	IN	LPV	1	99.861	1	99.858	1	99.844
VPZ	PORTER COUNTY RGNL	IN	LPV	1	99.86	2	99.811	3	99.761
1QK	GOVE COUNTY	KS	LPV	2	99.966	5	99.882	7	99.83
3AU	AUGUSTA MUNICIPAL	KS	LP	1	99.978	3	99.949	6	99.874
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	2	99.996	5	99.948	5	99.818
3K7	MARK HOARD MEML	KS	LPV	3	99.993	4	99.914	5	99.8
3K8	COMANCHE COUNTY	KS	LPV	1	99.987	2	99.956	5	99.897
5K2	TRIBUNE MUNICIPAL	KS	LPV	4	99.981	4	99.903	5	99.801
9K8	KINGMAN/CLYDE CESSNA FLD	KS	LP	1	99.983	2	99.951	6	99.861
AAO	COLONEL JAMES JABARA	KS	LPV	1	99.979	2	99.948	6	99.861
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	5	99.952	5	99.874	4	99.797
ANY	ANTHONY MUNICIPAL	KS	LPV	1	99.982	2	99.951	6	99.89
BEC	BEECH FACTORY	KS	LPV	1	99.979	2	99.949	6	99.862
CBK	SHALZ FLD	KS	LPV	3	99.963	4	99.869	4	99.797
CFV	COFFEYVILLE MUNICIPAL	KS	LPV	1	99.978	1	99.978	5	99.905
CNK	BLOSSER MUNICIPAL	KS	LP	2	99.978	5	99.909	6	99.839
DDC	DODGE CITY RGNL	KS	LPV200	1	99.99	4	99.952	6	99.881
EGT	WELLINGTON MUNICIPAL	KS	LPV200	1	99.979	2	99.954	7	99.885
EHA	ELKHART-MORTON COUNTY	KS	LPV	2	99.996	4	99.96	6	99.857
EMP	EMPORIA MUNICIPAL	KS	LPV	1	99.987	4	99.956	5	99.835
EQA	EL DORADO/CAPT JACK THOMAS MEM	KS	LPV200	1	99.978	4	99.976	6	99.874
EWK	NEWTON-CITY-COUNTY	KS	LPV	1	99.981	4	99.933	6	99.855
FOE	TOPEKA RGNL	KS	LPV	3	99.987	4	99.957	5	99.837
FSK	FORT SCOTT MUNICIPAL	KS	LPV	2	99.989	3	99.979	4	99.886
GBD	GREAT BEND MUNICIPAL	KS	LPV200	1	99.993	4	99.944	6	99.859
GCK	GARDEN CITY RGNL	KS	LPV	1	99.993	4	99.943	6	99.839
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	3	99.959	4	99.863	4	99.787
HLC	HILL CITY MUNICIPAL	KS	LPV	3	99.956	5	99.885	7	99.827
HQG	HUGOTON MUNICIPAL	KS	LPV	1	99.995	3	99.958	5	99.838

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HRU	HERINGTON RGNL	KS	LPV	3	99.989	5	99.929	6	99.865
HUT	HUTCHINSON RGNL	KS	LPV200	1	99.989	3	99.944	6	99.854
HYS	HAYS RGNL	KS	LPV200	1	99.989	6	99.91	7	99.85
ICT	WICHITA DWIGHT D EISENHOWER NT	KS	LPV200	1	99.98	2	99.947	6	99.862
IDP	INDEPENDENCE MUNICIPAL	KS	LPV200	1	99.978	1	99.978	5	99.903
IXD	NEW CENTURY AIRCENTER	KS	LPV	3	99.981	5	99.95	5	99.859
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	2	99.972	5	99.904	4	99.83
K78	ABILENE MUNICIPAL	KS	LPV	3	99.984	5	99.916	6	99.847
K79	JETMORE MUNICIPAL	KS	LPV	1	99.99	4	99.95	6	99.867
K81	MIAMI COUNTY	KS	LPV	2	99.99	2	99.97	5	99.854
K82	SMITH CENTER MUNICIPAL	KS	LPV200	4	99.971	5	99.891	6	99.826
K88	ALLEN COUNTY	KS	LPV	1	99.988	3	99.978	6	99.864
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	1	99.993	3	99.957	5	99.851
LQR	LARNED-PAWNEE COUNTY	KS	LPV	1	99.99	4	99.943	6	99.866
LWC	LAWRENCE RGNL	KS	LPV200	4	99.971	5	99.939	4	99.839
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	1	99.991	3	99.944	6	99.855
MHK	MANHATTAN RGNL	KS	LPV200	2	99.983	5	99.929	4	99.844
MPR	MC PHERSON	KS	LPV	1	99.989	4	99.941	6	99.854
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	4	99.963	7	99.903	5	99.829
NRN	NORTON MUNICIPAL	KS	LPV	4	99.951	6	99.89	6	99.824
OEL	OAKLEY MUNICIPAL	KS	LPV	2	99.968	4	99.869	5	99.804
OIN	OBERLIN MUNICIPAL	KS	LPV	4	99.951	6	99.883	5	99.809
OJC	JOHNSON COUNTY EXEC	KS	LPV	3	99.973	4	99.942	4	99.87
OWI	OTTAWA MUNICIPAL	KS	LPV	2	99.991	2	99.969	5	99.838
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	4	99.95	6	99.888	7	99.826
PPF	TRI-CITY	KS	LPV	1	99.985	2	99.977	5	99.904
PTS	ATKINSON MUNICIPAL	KS	LPV	2	99.986	3	99.98	4	99.924
PTT	PRATT RGNL	KS	LPV	1	99.989	2	99.956	6	99.871
RCP	ROOKS COUNTY RGNL	KS	LPV	2	99.978	6	99.903	6	99.828
RPB	BELLEVILLE MUNICIPAL	KS	LPV	2	99.975	5	99.905	6	99.836
RSL	RUSSELL MUNICIPAL	KS	LPV	1	99.994	5	99.917	6	99.85
SLN	SALINA RGNL	KS	LPV	1	99.99	5	99.917	6	99.85
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	3	99.965	4	99.861	4	99.786
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	3	99.983	4	99.956	4	99.839

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TQK	SCOTT CITY MUNICIPAL	KS	LPV	1	99.994	5	99.91	5	99.794
UKL	COFFEY COUNTY	KS	LPV	1	99.992	4	99.963	5	99.832
ULS	ULYSSES	KS	LPV	1	99.995	4	99.954	4	99.812
WLD	STROTHER FLD	KS	LPV	1	99.978	2	99.977	6	99.9
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	1	99.933	1	99.911	2	99.881
18I	MC CREARY COUNTY	KY	LP	1	99.948	1	99.922	1	99.912
1M7	FULTON	KY	LPV	2	99.963	2	99.952	3	99.923
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	1	99.933	1	99.911	2	99.883
2I0	MADISONVILLE RGNL	KY	LPV	1	99.937	2	99.925	2	99.893
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	2	99.954	2	99.936	2	99.895
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	1	99.937	1	99.93	2	99.898
5M9	MARION-CRITTENDEN COUNTY JAMES	KY	LPV	2	99.952	2	99.927	2	99.892
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	1	99.932	1	99.911	2	99.898
AAS	TAYLOR COUNTY	KY	LPV	1	99.932	1	99.922	2	99.899
BRY	SAMUELS FLD	KY	LPV	1	99.93	2	99.908	2	99.889
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	1	99.935	1	99.927	2	99.897
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	1	99.948	1	99.922	1	99.912
CEY	KYLE-OAKLEY FLD	KY	LPV	2	99.961	2	99.94	3	99.914
CPF	WENDELL H FORD	KY	LPV200	1	99.937	1	99.913	2	99.903
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	1	99.919	2	99.899	2	99.88
DVK	STUART POWELL FLD	KY	LPV	1	99.933	1	99.911	2	99.899
DWU	ASHLAND RGNL	KY	LP	1	99.933	1	99.911	2	99.874
EHR	HENDERSON CITY-COUNTY	KY	LPV	2	99.931	2	99.905	2	99.884
EKQ	WAYNE COUNTY	KY	LPV	2	99.947	1	99.922	2	99.905
EKX	ADDINGTON FLD	KY	LPV	1	99.929	2	99.909	2	99.887
FFT	CAPITAL CITY	KY	LPV	1	99.92	2	99.905	2	99.885
FGX	FLEMING-MASON	KY	LPV	1	99.933	1	99.911	2	99.878
GLW	GLASGOW MUNICIPAL	KY	LPV	1	99.932	1	99.924	2	99.895
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	2	99.961	1	99.941	2	99.896
I93	BRECKINRIDGE COUNTY	KY	LPV	1	99.93	2	99.903	2	99.881

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IOB	MOUNT STERLING/MONTGOMERY COUN	KY	LPV	1	99.933	1	99.911	2	99.903
JQD	OHIO COUNTY	KY	LPV	1	99.934	2	99.92	2	99.89
K24	RUSSELL COUNTY	KY	LPV	2	99.947	1	99.922	2	99.9
K62	GENE SNYDER	KY	LP	1	99.933	1	99.911	2	99.881
KY8	HANCOCK COUNTY/RON LEWIS FLD	KY	LPV	1	99.93	2	99.903	2	99.882
LEX	BLUE GRASS	KY	LPV	1	99.933	1	99.911	2	99.891
LOU	BOWMAN FLD	KY	LPV	1	99.916	2	99.901	2	99.877
LOZ	LONDON/CORBIN/MAGEE	KY	LPV	1	99.947	1	99.922	2	99.906
M20	LEITCHFIELD-GRAYSON COUNTY	KY	LPV	1	99.932	1	99.922	2	99.893
M21	MUHLENBERG COUNTY	KY	LP	1	99.936	1	99.929	2	99.894
M25	MAYFIELD GRAVES COUNTY	KY	LPV	2	99.961	2	99.942	3	99.909
OWB	OWENSBORO/DAVIESS COUNTY RGNL	KY	LPV200	1	99.933	2	99.904	2	99.884
PAH	BARKLEY RGNL	KY	LPV200	2	99.959	2	99.942	2	99.894
PBX	PIKE COUNTY/HATCHER FLD	KY	LPV200	1	99.934	1	99.912	2	99.903
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	1	99.944	1	99.911	2	99.903
SDF	LOUISVILLE MUHAMMAD ALI INTL	KY	LPV200	1	99.915	2	99.901	2	99.878
SJS	BIG SANDY RGNL	KY	LPV	1	99.933	1	99.911	2	99.903
SME	LAKE CUMBERLAND RGNL	KY	LPV	1	99.947	1	99.922	2	99.903
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	1	99.933	1	99.911	3	99.893
TWT	STURGIS MUNICIPAL	KY	LPV	2	99.937	2	99.906	2	99.887
TZV	TOMPKINSVILLE/MONROE COUNTY	KY	LPV	2	99.947	1	99.924	2	99.903
0R4	CONCORDIA PARISH	LA	LPV	1	99.941	2	99.919	2	99.911
0R7	THE RED RIVER	LA	LPV	1	99.937	2	99.93	2	99.904
3R4	HART	LA	LPV	1	99.937	2	99.925	1	99.883
3R7	JENNINGS	LA	LPV	1	99.926	2	99.911	1	99.877
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	1	99.926	2	99.911	2	99.875
ACP	ALLEN PARISH	LA	LPV	1	99.937	2	99.911	2	99.882
AEX	ALEXANDRIA INTL	LA	LPV200	1	99.937	2	99.93	1	99.887
APS	PORT OF SOUTH LOUISIANA EXEC R	LA	LPV	1	99.926	2	99.919	30	99.88

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ARA	ACADIANA RGNL	LA	LPV200	1	99.926	2	99.913	5	99.883
BQP	MOREHOUSE MEML	LA	LPV	1	99.953	1	99.952	2	99.923
BTR	BATON ROUGE METRO` RYAN FLD	LA	LPV200	1	99.926	2	99.917	10	99.908
BXA	GEORGE R CARR MEML AIR FLD	LA	LPV	1	99.926	2	99.923	9	99.909
CWF	CHENNAULT INTL	LA	LPV200	1	99.926	2	99.911	1	99.876
DTN	SHREVEPORT DOWNTOWN	LA	LPV	1	99.937	2	99.936	2	99.92
ESF	ESLER RGNL	LA	LPV200	1	99.937	2	99.93	2	99.908
F88	JONESBORO	LA	LP	1	99.937	2	99.935	2	99.911
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	1	99.922	2	99.915	48	99.802
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	1	99.926	2	99.919	24	99.903
HUM	HOUMA-TERREBONNE	LA	LPV200	1	99.922	2	99.915	35	99.838
HZR	FALSE RIVER RGNL	LA	LPV	1	99.926	2	99.916	2	99.911
IER	NATCHITOCHES RGNL	LA	LPV	1	99.937	2	99.93	1	99.888
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	1	99.926	2	99.911	3	99.883
L39	LEESVILLE	LA	LPV	1	99.937	2	99.922	1	99.88
LCH	LAKE CHARLES RGNL	LA	LPV200	1	99.926	2	99.911	1	99.876
LFT	LAFAYETTE RGNL/PAUL FOURNET FL	LA	LPV200	1	99.926	2	99.913	2	99.885
M79	JOHN H HOOKS JR MEML	LA	LPV	1	99.948	2	99.937	2	99.911
MLU	MONROE RGNL	LA	LPV200	1	99.948	2	99.938	2	99.911
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	1	99.926	2	99.919	39	99.863
NEW	LAKEFRONT	LA	LPV	1	99.926	2	99.919	41	99.859
OPL	ST LANDRY PARISH-AHART FLD	LA	LPV	1	99.926	2	99.916	1	99.886
PTN	HARRY P WILLIAMS MEML	LA	LPV200	1	99.922	2	99.909	27	99.869
REG	LOUISIANA RGNL	LA	LPV	1	99.926	2	99.918	25	99.897
RSN	RUSTON RGNL	LA	LPV	1	99.937	2	99.936	2	99.911
SHV	SHREVEPORT RGNL	LA	LPV200	1	99.937	2	99.93	2	99.915
SPH	SPRINGHILL	LA	LPV	1	99.944	1	99.944	2	99.931
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	1	99.949	1	99.941	2	99.92
UXL	SOUTHLAND FLD	LA	LPV	1	99.926	2	99.911	1	99.876
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	3	99.815	3	99.801	3	99.733
ACK	NANTUCKET MEML	MA	LPV200	3	99.822	2	99.789	3	99.727
BAF	WESTFIELD-BARNES RGNL	MA	LPV	3	99.815	3	99.804	3	99.73

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BED	LAURENCE G HANSCOM FLD	MA	LPV200	3	99.811	2	99.789	3	99.731
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	3	99.811	2	99.789	3	99.735
BVY	BEVERLY RGNL	MA	LPV	3	99.806	2	99.786	4	99.73
EWB	NEW BEDFORD RGNL	MA	LPV200	3	99.823	2	99.789	4	99.745
GBR	WALTER J KOLADZA	MA	LP	3	99.823	3	99.809	3	99.742
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	3	99.811	2	99.789	4	99.734
HYA	CAPE COD GATEWAY	MA	LPV200	3	99.811	2	99.789	4	99.734
LWM	LAWRENCE MUNICIPAL	MA	LPV200	3	99.807	2	99.786	5	99.73
MVY	MARTHA'S VINEYARD	MA	LPV200	3	99.823	2	99.789	3	99.734
ORE	ORANGE MUNICIPAL	MA	LPV	3	99.816	2	99.79	3	99.733
ORH	WORCESTER RGNL	MA	LPV200	3	99.812	2	99.789	4	99.745
OWD	NORWOOD MEML	MA	LPV	3	99.811	2	99.789	4	99.744
PSF	PITTSFIELD MUNICIPAL	MA	LPV	3	99.812	3	99.8	3	99.745
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	3	99.808	2	99.786	4	99.726
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	3	99.811	2	99.789	3	99.735
TAN	TAUNTON MUNICIPAL - KING FLD	MA	LPV	3	99.811	2	99.789	3	99.732
2G4	GARRETT COUNTY	MD	LPV	1	99.922	2	99.917	2	99.807
2W5	MARYLAND	MD	LP	1	99.941	2	99.881	3	99.801
2W6	ST MARY'S COUNTY RGNL	MD	LPV	1	99.941	2	99.875	3	99.797
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	2	99.93	3	99.871	2	99.781
CBE	GREATER CUMBERLAND RGNL	MD	LPV	1	99.922	2	99.903	2	99.805
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	3	99.922	3	99.865	2	99.782
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	2	99.915	2	99.872	2	99.781
ESN	EASTON/NEWNAM FLD	MD	LPV200	3	99.917	3	99.865	2	99.779
FDK	FREDERICK MUNICIPAL	MD	LPV	1	99.925	2	99.875	2	99.782
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	1	99.937	2	99.875	2	99.782
HGR	HAGERSTOWN RGNL/RICHARD A HENS	MD	LPV200	1	99.925	2	99.875	2	99.783
MTN	MARTIN STATE	MD	LPV	3	99.902	3	99.866	2	99.78
OXB	OCEAN CITY MUNICIPAL	MD	LPV	3	99.919	3	99.851	2	99.779

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	2	99.92	3	99.853	2	99.78
W29	BAY BRIDGE	MD	LPV	3	99.925	3	99.866	2	99.782
1B0	DEXTER RGNL	ME	LP	4	99.772	3	99.75	6	99.645
2B7	PITTSFIELD MUNICIPAL	ME	LPV	3	99.779	4	99.765	6	99.659
3B1	GREENVILLE MUNICIPAL	ME	LPV	3	99.753	4	99.747	6	99.631
59B	NEWTON FLD	ME	LP	3	99.753	3	99.75	6	99.625
81B	OXFORD COUNTY RGNL	ME	LP	2	99.787	3	99.782	7	99.697
AUG	AUGUSTA STATE	ME	LPV200	2	99.783	3	99.778	6	99.664
BGR	BANGOR INTL	ME	LPV200	4	99.772	3	99.75	6	99.648
BHB	HANCOCK COUNTY/BAR HARBOR	ME	LPV200	3	99.777	3	99.752	6	99.65
BST	BELFAST MUNICIPAL	ME	LPV	3	99.782	4	99.771	6	99.663
BXM	BRUNSWICK EXEC	ME	LPV200	2	99.785	3	99.782	6	99.699
CAR	CARIBOU MUNICIPAL	ME	LPV	4	99.662	4	99.651	10	99.488
EPM	EASTPORT MUNICIPAL	ME	LPV	3	99.732	4	99.728	7	99.571
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV200	5	99.65	5	99.637	11	99.472
HUL	HOULTON INTL	ME	LP	6	99.73	6	99.716	9	99.556
IZG	EASTERN SLOPES RGNL	ME	LPV	2	99.785	3	99.782	6	99.727
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	2	99.785	3	99.782	6	99.697
LRG	LINCOLN RGNL	ME	LP	3	99.75	4	99.742	7	99.607
MLT	MILLINOCKET MUNICIPAL	ME	LPV	4	99.744	4	99.74	6	99.581
OWK	CENTRAL MAINE /NORRIDGEWOCK	ME	LPV	3	99.78	4	99.77	6	99.661
PQI	PRESQUE ISLE INTL	ME	LPV200	5	99.688	5	99.675	9	99.51
PWM	PORTLAND INTL JETPORT	ME	LPV200	2	99.785	3	99.782	6	99.727
RKD	KNOX COUNTY RGNL	ME	LPV200	2	99.782	3	99.775	6	99.667
SFM	SANFORD SEACOAST RGNL	ME	LPV200	3	99.803	3	99.782	6	99.738
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	2	99.782	3	99.775	6	99.663
48D	CLARE MUNICIPAL	MI	LP	3	99.783	2	99.734	5	99.698
4D0	ABRAMS MUNICIPAL	MI	LP	3	99.821	3	99.748	3	99.728
6Y1	BOIS BLANC ISLAND	MI	LP	4	99.706	6	99.69	6	99.602
77G	MARLETTE TOWNSHIP	MI	LPV	4	99.83	3	99.758	3	99.726
9D9	HASTINGS	MI	LPV	3	99.829	3	99.75	3	99.728
ACB	ANTRIM COUNTY	MI	LPV	4	99.756	4	99.719	5	99.657
ADG	LENAWEE COUNTY	MI	LPV	2	99.871	4	99.814	3	99.746
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	3	99.801	2	99.734	3	99.722

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	7	99.715	8	99.676	6	99.528
APN	ALPENA COUNTY RGNL	MI	LPV	3	99.755	3	99.723	5	99.663
ARB	ANN ARBOR MUNICIPAL	MI	LPV	4	99.87	3	99.782	2	99.73
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV200	2	99.853	3	99.778	2	99.73
BAX	HURON COUNTY MEML	MI	LPV	5	99.817	3	99.746	5	99.714
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	2	99.847	2	99.764	3	99.747
BIV	WEST MICHIGAN RGNL	MI	LPV200	3	99.82	2	99.748	4	99.724
BTL	BATTLE CREEK EXEC AT KELLOGG F	MI	LPV200	2	99.853	2	99.759	2	99.73
C04	OCEANA COUNTY	MI	LPV	3	99.768	2	99.734	6	99.688
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	2	99.85	4	99.794	3	99.748
CAD	WEXFORD COUNTY	MI	LPV200	3	99.773	2	99.734	5	99.678
CFS	TUSCOLA AREA	MI	LP	4	99.816	3	99.748	4	99.72
CIU	CHIPPEWA COUNTY INTL	MI	LPV	7	99.716	8	99.682	7	99.562
CMX	HOUGHTON COUNTY MEML	MI	LPV	7	99.591	7	99.535	8	99.463
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	5	99.734	6	99.709	6	99.608
D95	DUPONT-LAPEER	MI	LP	4	99.834	3	99.764	3	99.726
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	4	99.865	3	99.783	2	99.73
DTW	DETROIT METRO WAYNE COUNTY	MI	LPV200	3	99.869	3	99.785	2	99.73
ERY	LUCE COUNTY	MI	LPV	7	99.688	9	99.663	6	99.537
ESC	DELTA COUNTY	MI	LPV200	5	99.664	7	99.641	7	99.569
FFX	FREMONT MUNICIPAL	MI	LPV	3	99.777	2	99.734	6	99.697
FNT	BISHOP INTL	MI	LPV200	4	99.831	3	99.751	3	99.726
GDW	GLADWIN ZETTEL MEML	MI	LP	3	99.78	2	99.734	5	99.696
GLR	GAYLORD RGNL	MI	LPV	3	99.745	4	99.719	5	99.66
GRR	GERALD R FORD INTL	MI	LPV200	3	99.815	2	99.734	3	99.727
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	3	99.775	2	99.734	5	99.678
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	4	99.8	2	99.734	4	99.721
IKW	JACK BARSTOW	MI	LPV	3	99.785	2	99.734	5	99.706
IMT	FORD	MI	LPV	6	99.657	7	99.635	6	99.545
IRS	KIRSCH MUNICIPAL	MI	LPV	1	99.86	2	99.803	3	99.753
ISQ	SCHOOLCRAFT COUNTY	MI	LP	5	99.666	8	99.643	7	99.563
IWD	GOGEBIC/IRON COUNTY	MI	LPV200	6	99.623	7	99.574	8	99.487

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JXN	JACKSON COUNTY-REYNOLDS FLD	MI	LPV200	2	99.856	2	99.761	2	99.73
JYM	HILLSDALE MUNICIPAL	MI	LPV	2	99.86	4	99.798	3	99.743
LAN	CAPITAL REGION INTL	MI	LPV200	3	99.822	3	99.749	3	99.729
LDM	MASON COUNTY	MI	LPV	3	99.764	2	99.734	6	99.683
MBL	MANISTEE COUNTY/BLACKER	MI	LPV200	3	99.763	3	99.733	6	99.676
MBS	MBS INTL	MI	LPV200	3	99.786	2	99.734	5	99.714
MCD	MACKINAC ISLAND	MI	LPV	4	99.706	6	99.689	7	99.583
MKG	MUSKEGON COUNTY	MI	LPV200	3	99.796	2	99.734	5	99.699
MNM	MENOMINEE RGNL	MI	LPV200	4	99.705	6	99.689	7	99.593
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	3	99.785	2	99.734	5	99.71
N98	BOYNE CITY MUNICIPAL	MI	LP	4	99.74	4	99.718	6	99.649
OEB	BRANCH COUNTY MEML	MI	LPV	2	99.863	4	99.796	3	99.743
OGM	ONTONAGON COUNTY - SCHUSTER FL	MI	LPV	6	99.603	7	99.55	8	99.469
OSC	OSCODA-WURTSMITH	MI	LPV200	2	99.769	3	99.726	5	99.681
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	4	99.841	3	99.767	2	99.73
PHN	ST CLAIR COUNTY INTL	MI	LPV200	4	99.852	3	99.784	3	99.727
PLN	PELLSTON RGNL/EMMET COUNTY	MI	LPV200	5	99.721	6	99.704	6	99.597
PTK	OAKLAND COUNTY INTL	MI	LPV200	4	99.849	3	99.777	2	99.73
RMY	BROOKS FLD	MI	LP	2	99.858	2	99.76	2	99.73
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	3	99.812	2	99.734	3	99.726
RQB	ROBEN-HOOD	MI	LPV200	3	99.778	2	99.734	6	99.695
SAW	SAWYER INTL	MI	LPV200	7	99.65	8	99.613	7	99.518
SLH	CHEBOYGAN COUNTY	MI	LPV	4	99.706	5	99.691	6	99.608
TEW	MASON JEWETT FLD	MI	LP	3	99.832	2	99.755	2	99.73
TTF	CUSTER	MI	LPV	1	99.877	4	99.828	3	99.744
TVC	CHERRY CAPITAL	MI	LPV200	4	99.765	4	99.728	6	99.662
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	3	99.776	2	99.73	5	99.687
Y70	IONIA COUNTY	MI	LPV	3	99.811	2	99.734	3	99.727
YIP	WILLOW RUN	MI	LPV200	3	99.868	3	99.785	2	99.73
16D	PERHAM MUNICIPAL	MN	LPV	5	99.644	6	99.605	7	99.485
3N8	MAHNOMEN COUNTY	MN	LPV	6	99.632	7	99.568	9	99.434
ACQ	WASECA MUNICIPAL	MN	LPV	4	99.776	5	99.725	6	99.668

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ADC	WADENA MUNICIPAL	MN	LPV	5	99.651	6	99.614	7	99.505
AEL	ALBERT LEA MUNICIPAL	MN	LPV	3	99.784	5	99.747	5	99.673
AIT	AITKIN MUNICIPAL/STEVE KURTZ FLD	MN	LPV	5	99.624	6	99.593	8	99.486
ANE	ANOKA COUNTY-BLAINE (JANES FLD	MN	LPV	4	99.715	5	99.685	5	99.606
AUM	AUSTIN MUNICIPAL	MN	LPV200	2	99.785	3	99.736	6	99.671
AXN	CHANDLER FLD	MN	LPV	6	99.685	6	99.66	6	99.578
BBB	BENSON MUNICIPAL	MN	LPV	4	99.717	5	99.7	6	99.608
BDE	BAUDETTE INTL	MN	LPV	8	99.569	9	99.485	13	99.325
BDH	WILLMAR MUNICIPAL/JOHN L RICE FLD	MN	LPV200	4	99.718	5	99.706	5	99.611
BJI	BEMIDJI RGNL	MN	LPV200	7	99.615	8	99.553	10	99.426
BRD	BRAINERD LAKES RGNL	MN	LPV200	5	99.64	6	99.601	8	99.494
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	6	99.701	7	99.667	5	99.59
CFE	BUFFALO MUNICIPAL	MN	LPV	4	99.716	5	99.686	5	99.606
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	7	99.549	7	99.515	11	99.418
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	7	99.631	8	99.549	11	99.415
CNB	MYERS FLD	MN	LPV	3	99.76	4	99.717	6	99.639
COQ	CLOQUET/CARLTON COUNTY	MN	LPV	6	99.615	7	99.567	8	99.464
CQM	COOK MUNICIPAL	MN	LP	8	99.576	8	99.519	11	99.405
D39	SAUK CENTRE MUNICIPAL	MN	LPV	6	99.704	7	99.68	5	99.585
D42	SPRINGFIELD MUNICIPAL	MN	LP	3	99.774	4	99.738	6	99.67
DLH	DULUTH INTL	MN	LPV200	6	99.616	7	99.553	8	99.459
DTL	DETROIT LAKES/WETHING FLD	MN	LPV	6	99.643	6	99.601	7	99.465
DVP	SLAYTON MUNICIPAL	MN	LP	3	99.775	4	99.748	6	99.684
DXX	LAC QUI PARLE COUNTY	MN	LPV200	4	99.74	4	99.713	6	99.635
ELO	ELY MUNICIPAL	MN	LPV200	7	99.553	8	99.515	11	99.417
ETH	WHEATON MUNICIPAL	MN	LP	5	99.687	6	99.662	6	99.589
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	8	99.591	8	99.541	10	99.427
FBL	FARIBAULT MUNICIPAL-LIZ WALL STROHF	MN	LPV	4	99.759	4	99.701	6	99.661
FCM	FLYING CLOUD	MN	LPV200	4	99.716	5	99.687	5	99.61
FFM	FERGUS FALLS MUNICIPAL/EINAR MICKEL	MN	LPV200	5	99.658	5	99.637	8	99.533
FKA	FILLMORE COUNTY	MN	LPV	3	99.781	3	99.729	7	99.669

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FOZ	BIGFORK MUNICIPAL	MN	LP	8	99.591	8	99.535	11	99.412
FRM	FAIRMONT MUNICIPAL	MN	LPV	2	99.789	4	99.752	5	99.684
FSE	FOSSTON MUNICIPAL-ANDERSON FLD	MN	LP	7	99.625	8	99.554	10	99.42
GHW	GLENWOOD MUNICIPAL	MN	LPV	5	99.706	6	99.686	6	99.584
GPZ	GRAND RAPIDS/ITASCA COUNTY-GOR	MN	LPV200	7	99.604	8	99.562	9	99.433
GYL	GLENCOE MUNICIPAL	MN	LPV	4	99.738	5	99.696	5	99.627
HCD	HUTCHINSON MUNICIPAL/BUTLER FLD	MN	LPV	4	99.717	5	99.701	5	99.626
HCO	HALLOCK MUNICIPAL	MN	LPV	6	99.603	9	99.494	11	99.328
HIB	RANGE RGNL	MN	LPV200	8	99.59	8	99.537	10	99.422
INL	FALLS INTL/EINARSON FLD	MN	LPV	8	99.547	8	99.492	12	99.355
JKJ	MOORHEAD MUNICIPAL	MN	LPV	6	99.648	6	99.611	7	99.467
JMR	MORA MUNICIPAL	MN	LPV	6	99.665	6	99.642	6	99.561
JYG	ST JAMES MUNICIPAL	MN	LPV	3	99.778	4	99.742	6	99.677
LJF	LITCHFIELD MUNICIPAL	MN	LPV	4	99.717	5	99.701	5	99.606
LVN	AIRLAKE	MN	LPV200	5	99.751	5	99.692	6	99.645
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	6	99.675	6	99.641	6	99.555
LYV	QUENTIN AANENSON FLD	MN	LPV200	3	99.781	4	99.753	5	99.676
MJQ	JACKSON MUNICIPAL	MN	LPV	3	99.788	4	99.755	5	99.694
MKT	MANKATO RGNL	MN	LPV200	4	99.756	5	99.722	6	99.667
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	3	99.766	4	99.724	6	99.663
MOX	MORRIS MUNICIPAL/CHARLIE SCHMIDT FL	MN	LPV	4	99.717	5	99.699	6	99.601
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	5	99.728	5	99.686	5	99.607
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	4	99.721	4	99.704	6	99.638
MWM	WINDOM MUNICIPAL	MN	LPV	3	99.779	4	99.749	6	99.683
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	5	99.623	7	99.593	8	99.489
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	2	99.764	4	99.718	7	99.66
ORB	ORR RGNL	MN	LP	7	99.564	8	99.515	11	99.394
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	3	99.783	4	99.753	5	99.699

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OWA	OWATONNA DEGNER RGNL	MN	LPV200	3	99.762	5	99.726	6	99.667
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	4	99.718	5	99.701	5	99.602
PKD	PARK RAPIDS MUNICIPAL/KONSHOK FLD	MN	LPV200	6	99.638	6	99.587	7	99.467
PQN	PIPESTONE MUNICIPAL	MN	LPV200	3	99.774	4	99.747	6	99.689
RGK	RED WING RGNL	MN	LPV200	4	99.757	4	99.7	7	99.631
ROS	RUSH CITY RGNL	MN	LPV	5	99.67	6	99.648	6	99.577
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FLD	MN	LPV	7	99.576	10	99.497	12	99.317
RRT	WARROAD INTL MEML	MN	LPV200	8	99.576	9	99.477	12	99.309
RST	ROCHESTER INTL	MN	LPV200	4	99.777	4	99.726	7	99.663
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	3	99.76	4	99.722	6	99.66
SAZ	STAPLES MUNICIPAL	MN	LPV	5	99.652	6	99.612	8	99.503
SBU	BLUE EARTH MUNICIPAL	MN	LPV	3	99.789	5	99.754	6	99.693
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	5	99.73	5	99.687	6	99.598
STC	ST CLOUD RGNL	MN	LPV200	5	99.711	6	99.679	5	99.592
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	5	99.729	5	99.687	6	99.598
TOB	DODGE CENTER	MN	LPV	3	99.764	5	99.724	7	99.661
TVF	THIEF RIVER FALLS RGNL	MN	LPV	7	99.621	8	99.532	12	99.398
TWM	RICHARD B HELGESON	MN	LPV	7	99.601	7	99.544	8	99.451
ULM	NEW ULM MUNICIPAL	MN	LPV200	3	99.765	4	99.723	6	99.661
VVV	ORTONVILLE MUNICIPAL-MARTINSON FLD	MN	LP	4	99.726	4	99.711	6	99.612
Y49	WALKER MUNICIPAL	MN	LP	6	99.62	7	99.563	9	99.436
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	5	99.657	5	99.638	6	99.561
03D	MEMPHIS MEML	MO	LPV	4	99.903	1	99.837	2	99.821
1H0	CREVE COEUR	MO	LPV	2	99.954	2	99.892	1	99.844
1MO	MOUNTAIN GROVE MEML	MO	LP	2	99.987	2	99.98	3	99.897
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	2	99.988	3	99.974	2	99.929
6M6	LEWIS COUNTY RGNL	MO	LPV	3	99.91	1	99.837	2	99.822
8WC	WASHINGTON COUNTY	MO	LPV	3	99.972	4	99.939	1	99.864
94K	CASSVILLE MUNICIPAL	MO	LPV	1	99.986	3	99.976	2	99.929
AIZ	LEE C FINE MEML	MO	LPV	2	99.982	3	99.968	2	99.842

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BBG	BRANSON	MO	LPV200	1	99.995	3	99.973	2	99.929
BUM	BUTLER MEML	MO	LPV	2	99.991	2	99.971	3	99.847
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	2	99.959	2	99.951	2	99.893
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	3	99.947	3	99.869	2	99.822
COU	COLUMBIA RGNL	MO	LPV200	1	99.958	3	99.933	1	99.837
DMO	SEDALIA RGNL	MO	LPV	2	99.972	3	99.949	2	99.837
DXE	DEXTER MUNICIPAL	MO	LPV	3	99.976	2	99.956	3	99.912
EIW	COUNTY MEML	MO	LPV	3	99.976	2	99.954	3	99.925
EOS	NEOSHO HUGH ROBINSON	MO	LPV	1	99.985	3	99.979	3	99.929
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	3	99.938	4	99.881	4	99.807
EZZ	CAMERON MEML	MO	LPV	3	99.948	5	99.896	2	99.834
FAM	FARMINGTON RGNL	MO	LPV	3	99.971	4	99.951	1	99.865
FTT	ELTON HENSLEY MEML	MO	LPV	1	99.959	3	99.925	1	99.838
FWB	BRANSON WEST MUNICIPAL - EMERSON FL	MO	LPV200	2	99.989	3	99.972	2	99.929
FYG	WASHINGTON RGNL	MO	LPV	2	99.956	2	99.903	1	99.844
GLY	CLINTON RGNL	MO	LPV	2	99.974	1	99.955	2	99.822
GPH	MIDWEST NTL AIR CENTER	MO	LPV	2	99.964	4	99.926	2	99.835
H19	BOWLING GREEN MUNICIPAL	MO	LPV	3	99.952	2	99.862	2	99.827
H79	ELDON MODEL AIRPARK	MO	LP	1	99.959	2	99.948	2	99.836
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	3	99.971	2	99.953	1	99.865
HAE	HANNIBAL RGNL	MO	LPV	4	99.945	1	99.844	2	99.822
HFJ	MONETT RGNL	MO	LPV	2	99.985	3	99.976	2	99.929
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	2	99.969	4	99.937	1	99.837
IRK	KIRKSVILLE RGNL	MO	LPV200	4	99.937	1	99.837	2	99.822
JEF	JEFFERSON CITY MEML	MO	LPV	1	99.959	2	99.938	1	99.843
JLN	JOPLIN RGNL	MO	LPV	1	99.985	3	99.979	3	99.927
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	2	99.982	3	99.968	2	99.84
K57	GOULD PETERSON MUNICIPAL	MO	LPV	4	99.936	5	99.897	4	99.802
K89	MACON-FOWER MEML	MO	LPV	3	99.945	1	99.84	2	99.822
LLU	LAMAR MUNICIPAL	MO	LPV	2	99.988	3	99.975	5	99.914
LRY	LAWRENCE SMITH MEML	MO	LPV	2	99.973	1	99.951	2	99.825
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	2	99.971	3	99.942	1	99.837
M05	CARUTHERSVILLE MEML	MO	LPV	3	99.98	2	99.957	2	99.945
M12	STEELE MUNICIPAL	MO	LPV	3	99.99	2	99.958	2	99.947

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
M17	BOLIVAR MUNICIPAL	MO	LPV	2	99.996	2	99.985	4	99.898
M48	HOUSTON MEML	MO	LPV	2	99.985	2	99.978	2	99.865
MAW	MALDEN RGNL	MO	LPV	3	99.978	2	99.957	3	99.916
MBY	OMAR N BRADLEY	MO	LPV	3	99.954	2	99.858	2	99.824
MCI	KANSAS CITY INTL	MO	LPV200	4	99.963	5	99.93	5	99.866
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	2	99.968	3	99.922	2	99.836
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	3	99.966	5	99.939	3	99.869
MNF	MOUNTAIN VIEW	MO	LP	2	99.982	2	99.977	3	99.914
MO3	STOCKTON MUNICIPAL	MO	LP	1	99.998	2	99.986	5	99.895
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	3	99.94	3	99.87	2	99.822
MYJ	MEXICO MEML	MO	LPV	3	99.956	4	99.892	2	99.834
NVD	NEVADA MUNICIPAL	MO	LPV200	1	99.999	2	99.988	4	99.888
OZS	CAMDENTON MEML-LAKE RGNL	MO	LPV	2	99.983	3	99.973	2	99.85
PCD	PERRYVILLE RGNL	MO	LPV	2	99.957	2	99.906	1	99.863
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	2	99.991	3	99.975	2	99.928
POF	POPLAR BLUFF RGNL BUSINESS	MO	LPV	2	99.978	1	99.958	2	99.913
RAW	WARSAW MUNICIPAL	MO	LPV200	2	99.973	1	99.955	2	99.827
RCM	SKYHAVEN	MO	LPV	2	99.971	3	99.947	2	99.834
SGF	SPRINGFIELD-BRANSON NTL	MO	LPV	1	99.996	3	99.982	3	99.917
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	2	99.961	2	99.953	2	99.896
STJ	ROSECRANS MEML	MO	LPV200	3	99.945	5	99.908	4	99.836
STL	ST LOUIS LAMBERT INTL	MO	LPV200	2	99.954	2	99.888	1	99.844
SUS	SPIRIT OF ST LOUIS	MO	LPV200	2	99.955	2	99.893	1	99.844
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	2	99.983	3	99.974	2	99.859
TKX	KENNETT MEML	MO	LPV	3	99.981	2	99.958	2	99.948
TRX	TRENTON MUNICIPAL	MO	LPV	4	99.937	3	99.866	2	99.822
UBX	CUBA MUNICIPAL	MO	LPV	2	99.976	2	99.943	1	99.854
UNO	WEST PLAINS RGNL	MO	LPV	2	99.985	2	99.978	3	99.924
UUV	SULLIVAN RGNL	MO	LPV	3	99.971	3	99.938	1	99.844
VER	JESSE VIERTEL MEML	MO	LPV	1	99.959	3	99.919	1	99.837
VIH	ROLLA NTL	MO	LPV	1	99.959	2	99.943	1	99.853
0R0	COLUMBIA/MARION COUNTY	MS	LPV	1	99.926	1	99.926	2	99.914
17M	MAGEE MUNICIPAL	MS	LP	1	99.951	1	99.93	2	99.918

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
5A4	OKOLONA MUNICIPAL/RICHARD STOVALL F	MS	LPV	0	100	1	99.985	3	99.934
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	1	99.997	1	99.959
87I	YAZOO COUNTY	MS	LPV	1	99.966	1	99.966	2	99.936
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	1	99.959	2	99.93
CKM	FLETCHER FLD	MS	LPV	1	99.999	2	99.993	3	99.943
CRX	ROSCOE TURNER	MS	LPV200	0	100	1	99.957	2	99.938
GLH	GREENVILLE MID-DELTA	MS	LPV200	1	99.966	1	99.966	1	99.948
GNF	GRENADA MUNICIPAL	MS	LPV	0	100	0	100	3	99.947
GPT	GULFPORT-BILOXI INTL	MS	LPV200	1	99.926	2	99.924	50	99.869
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	1	99.995	2	99.937
GWO	GREENWOOD-LEFLORE	MS	LPV	1	99.988	1	99.988	1	99.959
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	1	99.948	1	99.926	2	99.912
HEZ	HARDY-ANDERS FLD/NATCHEZ-ADAMS	MS	LPV200	1	99.941	2	99.919	2	99.911
HKS	HAWKINS FLD	MS	LPV	1	99.966	1	99.959	2	99.934
HSA	STENNIS INTL	MS	LPV200	1	99.926	2	99.922	45	99.874
IDL	INDIANOLA MUNICIPAL	MS	LPV	1	99.966	1	99.966	1	99.956
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	1	99.966	1	99.959	2	99.934
JVW	JOHN BELL WILLIAMS	MS	LPV200	1	99.966	1	99.959	2	99.926
LMS	LOUISVILLE/WINSTON COUNTY	MS	LPV	0	100	2	99.99	2	99.945
LUL	HESLER-NOBLE FLD	MS	LPV	1	99.966	1	99.944	3	99.925
M11	COPIAH COUNTY	MS	LPV	1	99.948	1	99.928	2	99.917
M40	MONROE COUNTY	MS	LPV	0	100	1	99.985	2	99.922
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	0	100	1	99.969	2	99.944
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	1	99.948	1	99.926	2	99.915
MBO	BRUCE CAMPBELL FLD	MS	LPV	1	99.966	1	99.959	2	99.934
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	1	99.926	2	99.92	2	99.915
MEI	KEY FLD	MS	LPV200	1	99.999	1	99.959	3	99.92
MJD	PICAYUNE MUNICIPAL	MS	LPV	1	99.926	2	99.922	39	99.89
MMS	SELFS	MS	LPV	0	100	1	99.995	3	99.941

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	1	99.966	3	99.942
OLV	OLIVE BRANCH/TAYLOR FLD	MS	LPV200	0	100	1	99.981	2	99.944
PIB	HATTIESBURG/LAUREL RGNL	MS	LPV200	1	99.948	1	99.926	2	99.913
PMU	PANOLA COUNTY	MS	LPV	0	100	1	99.99	2	99.944
PQL	TRENT LOTT INTL	MS	LPV200	1	99.948	1	99.926	57	99.861
RNV	CLEVELAND MUNICIPAL	MS	LPV	1	99.985	1	99.985	3	99.946
STF	GEORGE M BRYAN	MS	LPV200	0	100	0	100	2	99.941
TUP	TUPELO RGNL	MS	LPV200	0	100	2	99.984	2	99.934
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	0	100	1	99.986	3	99.934
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	1	99.988	2	99.944
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	1	99.986	2	99.944
VKS	VICKSBURG MUNICIPAL	MS	LP	1	99.948	1	99.941	2	99.919
00U	BIG HORN COUNTY	MT	LPV200	2	99.848	3	99.844	5	99.753
1S3	TILLITT FLD	MT	LPV	3	99.791	4	99.79	7	99.698
4U6	CIRCLE TOWN COUNTY	MT	LPV	5	99.709	5	99.694	10	99.53
6S0	BIG TIMBER	MT	LPV	1	99.863	2	99.858	7	99.758
6S8	LAUREL MUNICIPAL	MT	LPV	2	99.859	3	99.854	6	99.763
7S0	RONAN	MT	LPV	2	99.837	4	99.818	9	99.684
7S1	TWIN BRIDGES	MT	LPV	1	99.863	2	99.862	9	99.758
BHK	BAKER MUNICIPAL	MT	LPV	5	99.747	5	99.747	8	99.611
BIL	BILLINGS LOGAN INTL	MT	LPV200	2	99.85	3	99.845	7	99.758
BTM	BERT MOONEY	MT	LPV	1	99.863	2	99.853	9	99.738
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	1	99.863	2	99.858	7	99.746
CII	CHOTEAU	MT	LPV200	2	99.833	4	99.765	7	99.674
CTB	CUT BANK INTL	MT	LPV200	3	99.806	3	99.743	10	99.627
DLN	DILLON	MT	LPV	2	99.864	2	99.86	10	99.778
EKS	ENNIS BIG SKY	MT	LPV	2	99.861	3	99.861	8	99.768
GDV	DAWSON COMMUNICIPALTY	MT	LPV	5	99.719	5	99.705	8	99.559
GGW	WOKAL FLD/GLASGOW-VALLEY COUNT	MT	LPV200	4	99.716	6	99.689	12	99.47
GPI	GLACIER PARK INTL	MT	LPV	3	99.826	5	99.805	10	99.672
GTF	GREAT FALLS INTL	MT	LPV200	2	99.832	5	99.785	7	99.678
HLN	HELENA RGNL	MT	LPV	2	99.839	3	99.83	6	99.702
HRF	RAVALLI COUNTY	MT	LPV	1	99.863	2	99.852	8	99.695
HVR	HAVRE CITY-COUNTY	MT	LPV	3	99.748	5	99.723	12	99.602
HWQ	WHEATLAND COUNTY AT HARLOWTON	MT	LPV	3	99.833	5	99.821	6	99.713

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LVM	MISSION FLD	MT	LP	1	99.863	2	99.862	7	99.751
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	3	99.813	5	99.786	5	99.68
M75	MALTA	MT	LP	4	99.722	5	99.696	13	99.537
MLS	FRANK WILEY FLD	MT	LPV	4	99.775	5	99.775	11	99.648
MSO	MISSOULA MONTANA	MT	LPV200	2	99.842	3	99.83	8	99.687
OLF	L M CLAYTON	MT	LPV200	5	99.697	6	99.679	13	99.454
PO1	POPLAR MUNICIPAL	MT	LPV200	5	99.682	7	99.664	13	99.45
PWD	SHER-WOOD	MT	LPV200	7	99.671	10	99.63	14	99.431
RPX	ROUNDUP	MT	LPV	3	99.817	4	99.794	5	99.68
RVF	RUBY VALLEY FLD	MT	LPV	1	99.863	2	99.862	9	99.758
S01	CONRAD	MT	LPV	3	99.824	4	99.76	10	99.66
SBX	SHELBY	MT	LPV	4	99.8	4	99.739	10	99.63
SDY	SIDNEY-RICHLAND RGNL	MT	LPV	6	99.688	6	99.674	12	99.488
WYS	YELLOWSTONE	MT	LPV200	2	99.863	2	99.859	7	99.782
43A	MONTGOMERY COUNTY	NC	LP	1	99.948	1	99.944	1	99.932
7W6	HYDE COUNTY	NC	LP	1	99.952	1	99.941	4	99.887
ACZ	HENDERSON FLD	NC	LPV	2	99.973	2	99.962	1	99.932
AFP	ANSON COUNTY/JEFF CLOUD FLD	NC	LPV	1	99.966	1	99.963	1	99.933
AKH	GASTONIA MUNICIPAL	NC	LPV	1	99.966	1	99.963	1	99.922
ASJ	TRI-COUNTY AT HENRY JOYNER FIE	NC	LPV	1	99.937	1	99.929	4	99.859
AVL	ASHEVILLE RGNL	NC	LPV200	1	99.966	2	99.961	1	99.922
BUY	BURLINGTON/ALAMANCE RGNL	NC	LPV	1	99.948	1	99.941	2	99.919
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	1	99.966	1	99.963	1	99.922
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	1	99.974	1	99.963	1	99.944
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	2	99.965	2	99.961	1	99.932
DPL	DUPLIN COUNTY	NC	LPV200	2	99.965	2	99.961	1	99.932
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	1	99.944	1	99.93	3	99.834
EDE	NORTHEASTERN RGNL	NC	LPV200	1	99.937	1	99.932	4	99.87
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	1	99.966	1	99.963	1	99.922
EQY	CHARLOTTE/MONROE EXEC	NC	LPV200	1	99.966	1	99.963	1	99.922
EWN	COASTAL CAROLINA RGNL	NC	LPV	1	99.954	1	99.943	2	99.92
EXX	DAVIDSON COUNTY	NC	LPV	1	99.948	1	99.944	1	99.911
EYF	CURTIS L BROWN JR FLD	NC	LPV	1	99.974	1	99.963	1	99.932

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FAY	FAYETTEVILLE RGNL/GRANNIS FLD	NC	LPV200	2	99.965	2	99.961	1	99.932
FFA	FIRST FLIGHT	NC	LP	1	99.944	1	99.932	4	99.849
FQD	RUTHERFORD COUNTY/MARCHMAN FLD	NC	LPV	2	99.965	3	99.961	1	99.922
GEV	ASHE COUNTY	NC	LP	1	99.939	2	99.929	1	99.911
GSO	PIEDMONT TRIAD INTL	NC	LPV200	1	99.948	1	99.941	2	99.909
GWW	WAYNE EXEC JETPORT	NC	LPV200	1	99.948	1	99.944	2	99.922
HBI	ASHEBORO RGNL	NC	LPV	1	99.948	1	99.944	1	99.923
HKY	HICKORY RGNL	NC	LPV200	1	99.948	1	99.944	1	99.914
HNZ	HENDERSON/OXFORD	NC	LPV	1	99.937	1	99.928	2	99.919
HRJ	HARNETT RGNL JETPORT	NC	LPV	1	99.948	1	99.944	1	99.932
ILM	WILMINGTON INTL	NC	LPV200	1	99.974	1	99.963	1	99.943
INT	SMITH REYNOLDS	NC	LPV200	1	99.948	1	99.941	2	99.91
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	1	99.948	1	99.944	1	99.922
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	1	99.948	1	99.944	2	99.928
IXA	HALIFAX/NORTHAMPTON RGNL	NC	LPV200	1	99.937	1	99.929	4	99.868
JNX	JOHNSTON RGNL	NC	LPV	1	99.948	1	99.944	2	99.922
JQF	CONCORD-PADGETT RGNL	NC	LPV	2	99.964	2	99.96	1	99.922
LBT	LUMBERTON RGNL	NC	LPV	1	99.974	1	99.963	1	99.933
LHZ	TRIANGLE NORTH EXEC	NC	LPV200	1	99.938	1	99.932	2	99.919
MCZ	MARTIN COUNTY	NC	LPV	1	99.94	1	99.936	4	99.903
MEB	LAURINBURG/MAXTON	NC	LPV200	1	99.966	1	99.963	1	99.933
MQI	DARE COUNTY RGNL	NC	LPV	1	99.944	1	99.933	4	99.855
MRH	MICHAEL J SMITH FLD	NC	LPV	1	99.954	1	99.944	2	99.919
MRN	FOOTHILLS RGNL	NC	LPV	1	99.948	2	99.943	1	99.914
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	1	99.937	1	99.927	2	99.91
OAJ	ALBERT J ELLIS	NC	LPV200	2	99.973	2	99.962	1	99.932
OCW	WASHINGTON-WARREN	NC	LPV	1	99.954	1	99.943	3	99.91
ONX	CURRITUCK COUNTY RGNL	NC	LPV	1	99.944	1	99.929	3	99.829
PGV	PITT-GREENVILLE	NC	LPV	1	99.947	1	99.943	3	99.912
PMZ	PLYMOUTH MUNICIPAL	NC	LP	1	99.954	1	99.942	4	99.897
RCZ	RICHMOND COUNTY	NC	LPV	1	99.966	1	99.963	1	99.933
RDU	RALEIGH-DURHAM INTL	NC	LPV200	1	99.948	1	99.943	2	99.919
RHP	WESTERN CAROLINA RGNL	NC	LP	1	99.966	2	99.957	1	99.923

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RUQ	MID-CAROLINA RGNL	NC	LPV200	1	99.948	1	99.944	1	99.914
RWI	ROCKY MOUNT/WILSON RGNL	NC	LPV	1	99.948	1	99.944	2	99.914
SCR	SILER CITY MUNICIPAL	NC	LPV	1	99.948	1	99.944	1	99.922
SOP	MOORE COUNTY	NC	LPV200	1	99.948	1	99.944	1	99.932
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	1	99.974	1	99.963	2	99.96
SVH	STATESVILLE RGNL	NC	LPV200	1	99.948	1	99.944	1	99.912
TDF	RALEIGH RGNL AT PERSON COUNTY	NC	LPV200	1	99.937	1	99.928	2	99.919
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	1	99.948	1	99.944	1	99.923
UKF	WILKES COUNTY	NC	LPV200	1	99.948	1	99.939	1	99.911
VUJ	STANLY COUNTY	NC	LPV200	1	99.948	1	99.944	1	99.922
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	1	99.948	1	99.944	2	99.92
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	1	99.948	1	99.944	2	99.931
ZEF	ELKIN MUNICIPAL	NC	LP	1	99.94	1	99.931	2	99.91
06D	ROLLA MUNICIPAL	ND	LPV	8	99.603	10	99.522	10	99.355
20U	BEACH	ND	LPV	5	99.733	5	99.722	7	99.582
2C8	CAVALIER MUNICIPAL	ND	LPV	6	99.613	9	99.51	10	99.33
3H4	HILLSBORO MUNICIPAL	ND	LPV	6	99.638	7	99.575	9	99.446
46D	CARRINGTON MUNICIPAL	ND	LPV	6	99.659	7	99.592	9	99.44
4E7	ELLENDALE MUNICIPAL	ND	LPV	5	99.678	6	99.653	7	99.6
51D	EDGELEY MUNICIPAL	ND	LPV	6	99.672	6	99.651	7	99.566
5L0	LAKOTA MUNICIPAL	ND	LPV	6	99.637	8	99.552	10	99.41
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	6	99.647	6	99.619	7	99.471
6L3	LISBON MUNICIPAL	ND	LPV	6	99.668	6	99.632	8	99.531
7L2	LINTON MUNICIPAL	ND	LPV	5	99.698	5	99.673	6	99.599
9D7	CANDO MUNICIPAL	ND	LPV	8	99.615	9	99.53	9	99.38
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	6	99.656	6	99.632	7	99.457
BIS	BISMARCK MUNICIPAL	ND	LPV200	5	99.682	5	99.669	8	99.527
BWP	HARRY STERN	ND	LPV	5	99.659	5	99.636	8	99.543
BWW	BOWMAN RGNL	ND	LPV	4	99.751	4	99.745	6	99.63
D05	GARRISON MUNICIPAL	ND	LPV	6	99.67	7	99.639	9	99.476
D09	BOTTINEAU MUNICIPAL	ND	LPV	9	99.606	10	99.537	11	99.378
D55	ROBERTSON FLD	ND	LPV	6	99.616	9	99.511	9	99.346

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
D57	GLEN ULLIN RGNL	ND	LPV	5	99.708	5	99.689	9	99.547
D60	TIOGA MUNICIPAL	ND	LPV	7	99.635	10	99.608	14	99.408
DIK	DICKINSON/THEODORE ROOSEVELT R	ND	LPV200	5	99.727	5	99.72	7	99.573
DVL	DEVILS LAKE RGNL	ND	LPV200	7	99.631	8	99.546	11	99.409
FAR	HECTOR INTL	ND	LPV200	6	99.647	6	99.611	7	99.465
GAF	HUTSON FLD	ND	LPV	7	99.628	8	99.518	11	99.361
GFK	GRAND FORKS INTL	ND	LPV	6	99.634	8	99.544	11	99.415
GWR	GWINNER-ROGER MELROE FLD	ND	LPV	5	99.668	6	99.64	7	99.576
HEI	HETTINGER/JB LINDQUIST RGNL	ND	LPV	4	99.749	5	99.745	6	99.627
HZE	MERCER COUNTY RGNL	ND	LPV	5	99.679	5	99.67	7	99.488
ISN	SLOULIN FLD INTL	ND	LPV200	6	99.679	8	99.649	14	99.441
JMS	JAMESTOWN RGNL	ND	LPV200	6	99.663	6	99.638	7	99.467
K74	ROBERT ODEGAARD FLD	ND	LP	5	99.657	6	99.621	7	99.49
MOT	MINOT INTL	ND	LPV	6	99.638	9	99.575	11	99.409
RUG	RUGBY MUNICIPAL	ND	LP	9	99.616	9	99.547	9	99.383
S25	WATFORD CITY MUNICIPAL	ND	LPV	6	99.691	6	99.671	11	99.462
XWA	WILLISTON BASIN INTL	ND	LPV200	6	99.678	8	99.646	14	99.424
Y19	MANDAN RGNL/LAWLER FLD	ND	LPV	5	99.682	5	99.669	8	99.527
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	4	99.911	4	99.858	5	99.767
08K	HARVARD STATE	NE	LPV	5	99.944	5	99.889	4	99.79
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	3	99.819	4	99.778	5	99.711
0C4	PENDER MUNICIPAL	NE	LPV	4	99.841	5	99.793	4	99.726
0F4	LOUP CITY MUNICIPAL	NE	LPV	3	99.903	5	99.862	5	99.743
0G3	TECUMSEH MUNICIPAL	NE	LPV	3	99.934	6	99.883	3	99.799
0V3	PIONEER VILLAGE FLD	NE	LPV	3	99.947	4	99.896	5	99.826
12K	SUPERIOR MUNICIPAL	NE	LPV	2	99.973	5	99.904	5	99.818
47V	CURTIS MUNICIPAL	NE	LPV	3	99.945	6	99.886	6	99.82
4D9	ALMA MUNICIPAL	NE	LPV	4	99.947	6	99.892	6	99.83
4V9	ANTELOPE COUNTY	NE	LPV	3	99.862	6	99.794	5	99.724
6K3	CREIGHTON MUNICIPAL	NE	LPV	3	99.846	6	99.785	5	99.713
7V7	RED CLOUD MUNICIPAL	NE	LPV	3	99.969	4	99.892	5	99.824
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	2	99.863	6	99.795	6	99.682
93Y	DAVID CITY MUNICIPAL	NE	LPV	4	99.873	5	99.829	5	99.761
9V5	MODISETT	NE	LPV	4	99.914	5	99.86	7	99.669

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	4	99.933	5	99.9	3	99.79
AHQ	WAHOO MUNICIPAL	NE	LPV	4	99.872	5	99.853	5	99.758
AIA	ALLIANCE MUNICIPAL	NE	LPV200	3	99.913	6	99.873	6	99.663
ANW	AINSWORTH RGNL	NE	LPV200	2	99.867	7	99.81	6	99.684
AUH	AURORA MUNICIPAL - AL POTTER FLD	NE	LPV	4	99.919	4	99.869	5	99.778
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	3	99.903	5	99.859	6	99.76
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	4	99.919	5	99.86	5	99.693
BIE	BEATRICE MUNICIPAL	NE	LPV200	4	99.949	6	99.879	3	99.803
BTA	BLAIR MUNICIPAL	NE	LPV	3	99.85	5	99.829	4	99.736
BUB	CRAM FLD	NE	LPV	3	99.885	7	99.828	5	99.72
BVN	ALBION MUNICIPAL	NE	LPV	2	99.862	5	99.797	6	99.727
CDR	CHADRON MUNICIPAL	NE	LPV200	3	99.904	4	99.866	7	99.687
CEK	CRETE MUNICIPAL	NE	LPV	3	99.934	5	99.863	3	99.8
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	4	99.944	6	99.883	6	99.827
CZD	COZAD MUNICIPAL	NE	LPV	4	99.938	6	99.875	7	99.811
EAR	KEARNEY RGNL	NE	LPV200	4	99.934	5	99.892	5	99.814
FBY	FAIRBURY MUNICIPAL	NE	LPV	3	99.961	6	99.893	2	99.804
FET	FREMONT MUNICIPAL	NE	LPV	4	99.866	7	99.839	5	99.747
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	4	99.944	5	99.877	4	99.806
FNB	BRENNER FLD	NE	LPV	3	99.937	5	99.905	5	99.828
GGF	GRANT MUNICIPAL	NE	LPV	4	99.947	5	99.857	5	99.78
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	4	99.918	4	99.869	5	99.774
GRN	GORDON MUNICIPAL	NE	LPV	2	99.886	5	99.856	7	99.664
HDE	BREWSTER FLD	NE	LPV	3	99.946	4	99.896	6	99.826
HSI	HASTINGS MUNICIPAL	NE	LPV	5	99.95	5	99.893	5	99.817
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FL	NE	LPV	4	99.953	6	99.87	6	99.772
IML	IMPERIAL MUNICIPAL	NE	LPV	5	99.947	6	99.874	5	99.79
JYR	YORK MUNICIPAL	NE	LPV	4	99.897	4	99.847	5	99.792
K01	FARINGTON FLD	NE	LPV	3	99.935	5	99.902	4	99.811
LBF	NORTH PLATTE RGNL/LEE BIRD FLD	NE	LPV200	3	99.937	6	99.873	6	99.769
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	4	99.841	6	99.802	4	99.728

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LNK	LINCOLN	NE	LPV200	4	99.93	4	99.851	4	99.777
LXN	JIM KELLY FLD	NE	LPV	3	99.939	4	99.893	6	99.816
MCK	MC COOK BEN NELSON RGNL	NE	LPV	4	99.949	6	99.883	4	99.807
MLE	MILLARD	NE	LPV	4	99.868	4	99.859	5	99.756
ODX	EVELYN SHARP FLD	NE	LPV	3	99.897	7	99.845	5	99.721
OFK	NORFOLK RGNL/KARL STEFAN MEML	NE	LPV200	3	99.849	6	99.786	4	99.73
OGA	SEARLE FLD	NE	LPV	4	99.943	6	99.858	7	99.756
OKS	GARDEN COUNTY/KING RHILEY FLD	NE	LPV	4	99.942	6	99.875	5	99.711
OLU	COLUMBUS MUNICIPAL	NE	LPV	3	99.859	5	99.804	5	99.751
OMA	EPPLEY AIRFIELD	NE	LPV200	4	99.865	4	99.847	4	99.74
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	2	99.86	6	99.792	7	99.706
PMV	PLATTSMOUTH MUNICIPAL/DOUGLAS V DUE	NE	LPV	6	99.925	4	99.87	5	99.77
RBE	ROCK COUNTY	NE	LPV	2	99.863	7	99.803	6	99.68
SCB	SCRIBNER STATE	NE	LPV	4	99.863	7	99.827	4	99.733
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FLD	NE	LPV	4	99.941	5	99.835	5	99.745
SWT	SEWARD MUNICIPAL	NE	LPV	5	99.914	4	99.847	5	99.798
TIF	THOMAS COUNTY	NE	LPV	2	99.895	5	99.836	6	99.706
TQE	TEKAMAH MUNICIPAL	NE	LPV	4	99.843	4	99.798	4	99.729
VTN	MILLER FLD	NE	LPV	3	99.88	6	99.799	6	99.682
ASH	BOIRE FLD	NH	LPV200	3	99.807	2	99.786	3	99.731
CON	CONCORD MUNICIPAL	NH	LPV	3	99.806	2	99.786	4	99.723
DAW	SKYHAVEN	NH	LPV	3	99.805	3	99.785	5	99.739
EEN	DILLANT/HOPKINS	NH	LPV	3	99.812	2	99.789	4	99.745
HIE	MOUNT WASHINGTON RGNL	NH	LPV	2	99.789	3	99.781	7	99.727
LCI	LACONIA MUNICIPAL	NH	LPV	3	99.805	3	99.783	5	99.738
LEB	LEBANON MUNICIPAL	NH	LPV	3	99.811	2	99.789	4	99.74
MHT	MANCHESTER BOSTON RGNL	NH	LPV200	3	99.807	2	99.786	3	99.727
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	3	99.805	2	99.786	6	99.736
47N	CENTRAL JERSEY RGNL	NJ	LP	4	99.871	3	99.82	3	99.761
4N1	GREENWOOD LAKE	NJ	LP	4	99.862	3	99.821	3	99.76
ACY	ATLANTIC CITY INTL	NJ	LPV200	4	99.876	3	99.82	2	99.76
CDW	ESSEX COUNTY	NJ	LPV	4	99.866	3	99.816	2	99.744

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EWR	NEWARK LIBERTY INTL	NJ	LPV200	4	99.868	3	99.816	2	99.744
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	4	99.891	3	99.846	2	99.778
MJX	OCEAN COUNTY	NJ	LPV	4	99.874	3	99.82	2	99.745
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	4	99.868	3	99.816	3	99.76
N12	LAKEWOOD	NJ	LP	4	99.873	3	99.82	2	99.745
N14	FLYING W	NJ	LPV	4	99.874	3	99.82	3	99.761
N40	SKY MANOR	NJ	LP	4	99.871	3	99.82	3	99.761
TEB	TETERBORO	NJ	LPV	4	99.865	3	99.816	2	99.744
TTN	TRENTON MERCER	NJ	LPV	4	99.872	3	99.82	3	99.761
VAY	SOUTH JERSEY RGNL	NJ	LP	4	99.874	3	99.82	3	99.761
WWD	CAPE MAY COUNTY	NJ	LPV	3	99.897	3	99.846	2	99.778
LFVM	MIQUELON	NL	LPV	12	99.283	12	99.27	45	98.444
LFVP	ST PIERRE	NL	LPV	12	99.287	12	99.268	51	98.417
0E0	MORIARTY MUNICIPAL	NM	LPV	2	99.972	5	99.88	5	99.772
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	4	99.958	4	99.869	5	99.762
AEG	DOUBLE EAGLE II	NM	LPV200	4	99.956	4	99.868	5	99.758
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	1	99.926	4	99.876	10	99.78
ATS	ARTESIA MUNICIPAL	NM	LPV200	2	99.968	5	99.932	7	99.811
CAO	CLAYTON MUNICIPAL AIRPARK	NM	LPV	2	99.996	6	99.963	3	99.843
CNM	CAVERN CITY AIR TRML	NM	LPV200	2	99.955	4	99.934	7	99.801
CVN	CLOVIS RGNL	NM	LPV200	1	99.999	4	99.972	6	99.857
DMN	DEMING MUNICIPAL	NM	LPV	2	99.893	2	99.862	13	99.746
E06	LEA COUNTY/ZIP FRANKLIN MEML	NM	LPV	2	99.98	4	99.96	7	99.814
FMN	FOUR CORNERS RGNL	NM	LPV200	3	99.894	3	99.866	6	99.757
HOB	LEA COUNTY RGNL	NM	LPV	3	99.976	4	99.946	7	99.809
LAM	LOS ALAMOS	NM	LP	2	99.975	4	99.871	5	99.772
LRU	LAS CRUCES INTL	NM	LPV200	3	99.915	2	99.861	9	99.758
ONM	SOCORRO MUNICIPAL	NM	LP	4	99.934	5	99.867	6	99.745
ROW	ROSWELL AIR CENTER	NM	LPV	2	99.976	4	99.941	6	99.788
SAF	SANTA FE MUNICIPAL	NM	LPV200	2	99.975	4	99.872	5	99.776
SRR	SIERRA BLANCA RGNL	NM	LPV200	2	99.968	7	99.91	6	99.779
SVC	GRANT COUNTY	NM	LPV	1	99.881	2	99.867	13	99.706
05U	EUREKA	NV	LP	1	99.885	2	99.875	4	99.754
10U	OWYHEE	NV	LPV200	2	99.826	2	99.809	3	99.7
67L	MESQUITE	NV	LP	1	99.885	2	99.875	7	99.742

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BAM	BATTLE MOUNTAIN	NV	LPV	1	99.878	2	99.858	7	99.711
BVU	BOULDER CITY MUNICIPAL	NV	LP	1	99.878	3	99.87	5	99.74
CXP	CARSON CITY	NV	LP	1	99.878	5	99.846	5	99.625
ELY	ELY/YELLAND FLD	NV	LPV	1	99.889	2	99.875	4	99.772
HTH	HAWTHORNE INDUSTRIAL	NV	LP	1	99.881	3	99.861	5	99.668
LAS	HARRY REID INTL	NV	LPV200	1	99.878	2	99.871	4	99.718
LOL	DERBY FLD	NV	LPV	1	99.878	3	99.856	6	99.676
RNO	RENO/TAHOE INTL	NV	LPV	1	99.878	4	99.847	5	99.627
RTS	RENO/STEAD	NV	LPV	1	99.878	3	99.839	6	99.625
SPZ	SILVER SPRINGS	NV	LPV	1	99.881	3	99.85	5	99.631
TPH	TONOPAH	NV	LP	1	99.881	2	99.873	4	99.709
VGT	NORTH LAS VEGAS	NV	LP	1	99.878	2	99.87	4	99.715
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	1	99.878	3	99.845	5	99.665
06N	RANDALL	NY	LP	4	99.86	3	99.814	3	99.76
0G7	FINGER LAKES RGNL	NY	LPV	3	99.862	2	99.829	2	99.734
1B1	COLUMBIA COUNTY	NY	LPV	3	99.83	3	99.809	3	99.737
20N	KINGSTON-ULSTER	NY	LPV	3	99.839	3	99.804	4	99.756
44N	SKY ACRES	NY	LPV	3	99.843	3	99.809	3	99.763
4B6	TICONDEROGA MUNICIPAL	NY	LPV	3	99.814	2	99.782	3	99.73
5B2	SARATOGA COUNTY	NY	LPV	3	99.816	3	99.803	3	99.74
5G0	LE ROY	NY	LP	3	99.861	2	99.817	2	99.738
9G0	BUFFALO AIRFIELD	NY	LP	2	99.859	2	99.819	2	99.735
9G3	AKRON/JESSON FLD	NY	LP	3	99.86	2	99.817	2	99.736
ALB	ALBANY INTL	NY	LPV200	3	99.829	3	99.804	3	99.738
ART	WATERTOWN INTL	NY	LPV200	2	99.851	2	99.818	2	99.751
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	3	99.863	3	99.824	2	99.763
BUF	BUFFALO NIAGARA INTL	NY	LPV200	2	99.859	3	99.817	2	99.735
ELM	ELMIRA/CORNING RGNL	NY	LPV200	4	99.879	2	99.834	2	99.764
ELZ	WELLSVILLE MUNICIPAL/TARANTINE FLD	NY	LPV200	3	99.872	3	99.85	2	99.751
FOK	FRANCIS S GABRESKI	NY	LPV200	3	99.844	3	99.831	3	99.732
FRG	REPUBLIC	NY	LPV200	3	99.845	3	99.813	2	99.744
FZY	OSWEGO COUNTY	NY	LPV	3	99.851	3	99.823	2	99.738
GFL	FLOYD BENNETT MEML	NY	LPV200	3	99.807	2	99.782	3	99.743
GVQ	GENESEE COUNTY	NY	LPV200	3	99.861	2	99.817	3	99.75
HPN	WESTCHESTER COUNTY	NY	LPV	3	99.845	3	99.812	2	99.744

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HTF	HORNELL MUNICIPAL	NY	LPV	3	99.864	2	99.834	2	99.749
HTO	EAST HAMPTON	NY	LPV	3	99.834	3	99.821	3	99.743
HWV	BROOKHAVEN	NY	LPV	3	99.838	3	99.827	3	99.744
IAG	NIAGARA FALLS INTL	NY	LPV	3	99.87	3	99.811	2	99.735
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	3	99.838	3	99.826	2	99.744
ITH	ITHACA TOMPKINS INTL	NY	LPV	3	99.858	3	99.826	2	99.756
IUA	CANANDAIGUA	NY	LPV	3	99.861	2	99.829	2	99.739
JFK	JOHN F KENNEDY INTL	NY	LPV200	4	99.868	3	99.816	2	99.744
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	2	99.871	3	99.849	2	99.748
K09	PISECO	NY	LP	3	99.825	2	99.79	3	99.74
LGA	LAGUARDIA	NY	LPV	4	99.865	3	99.814	2	99.744
MAL	MALONE-DUFORT	NY	LPV	3	99.807	2	99.78	3	99.723
MGJ	ORANGE COUNTY	NY	LPV	4	99.857	3	99.814	3	99.76
MSS	MASSENA INTL-RICHARDS FLD	NY	LPV	3	99.805	2	99.78	4	99.723
MSV	SULLIVAN COUNTY INTL	NY	LPV	4	99.857	3	99.811	3	99.764
N23	SIDNEY MUNICIPAL	NY	LP	3	99.836	3	99.8	2	99.745
N66	ALBERT S NADER RGNL	NY	LPV	3	99.83	3	99.799	2	99.745
NY0	FULTON COUNTY	NY	LPV	3	99.824	3	99.803	3	99.738
OGS	OGDENSBURG INTL	NY	LPV	3	99.809	2	99.781	3	99.723
OIC	LT WARREN EATON	NY	LP	4	99.848	4	99.811	2	99.737
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	3	99.87	2	99.824	2	99.75
PBG	PLATTSBURGH INTL	NY	LPV	3	99.807	3	99.779	4	99.738
PEO	PENN YAN	NY	LPV	3	99.861	2	99.83	2	99.742
POU	HUDSON VALLEY RGNL	NY	LPV	3	99.844	3	99.811	3	99.763
RME	GRIFFISS INTL	NY	LPV200	3	99.833	3	99.802	3	99.747
ROC	FREDERICK DOUGLASS/GREATER ROC	NY	LPV200	3	99.861	2	99.828	2	99.738
SCH	SCHENECTADY COUNTY	NY	LPV200	3	99.826	3	99.803	3	99.738
SDC	WILLIAMSON-SODUS	NY	LPV	3	99.862	3	99.824	2	99.733
SLK	ADIRONDACK RGNL	NY	LPV200	3	99.811	2	99.782	3	99.727
SWF	NEW YORK STEWART INTL	NY	LPV200	3	99.844	3	99.812	3	99.76
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	3	99.86	3	99.811	2	99.737
VGC	HAMILTON MUNICIPAL	NY	LPV	4	99.85	4	99.807	2	99.737
0G6	WILLIAMS COUNTY	OH	LPV	1	99.858	2	99.816	3	99.76
10G	HOLMES COUNTY	OH	LP	2	99.919	2	99.907	4	99.831
16G	SENECA COUNTY	OH	LPV	1	99.874	2	99.861	3	99.79

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	2	99.907	3	99.893	4	99.831
1G0	WOOD COUNTY	OH	LPV	1	99.875	3	99.856	3	99.765
1G3	KENT STATE UNIVERSITY	OH	LPV	2	99.898	3	99.868	3	99.771
2G2	GEARY A BATES/JEFFERSON COUNTY	OH	LPV	1	99.922	2	99.909	3	99.802
4G5	MONROE COUNTY	OH	LP	1	99.922	1	99.911	3	99.827
4I3	KNOX COUNTY	OH	LPV200	2	99.915	2	99.904	2	99.843
5A1	NORWALK-HURON COUNTY	OH	LP	2	99.899	3	99.868	2	99.777
6G5	BARNESVILLE-BRADFIELD	OH	LP	1	99.922	2	99.91	2	99.808
7G8	GEAUGA COUNTY	OH	LP	1	99.885	3	99.852	2	99.744
AKR	AKRON FULTON INTL	OH	LP	2	99.913	3	99.88	3	99.777
AOH	LIMA ALLEN COUNTY	OH	LPV200	1	99.885	2	99.877	3	99.816
AXV	NEIL ARMSTRONG	OH	LPV	2	99.873	2	99.869	1	99.834
BJJ	WAYNE COUNTY	OH	LPV	2	99.914	3	99.895	3	99.786
BKL	BURKE LAKEFRONT	OH	LPV	1	99.885	4	99.848	2	99.755
CAK	AKRON-CANTON RGNL	OH	LPV200	2	99.914	3	99.894	3	99.78
CDI	CAMBRIDGE MUNICIPAL	OH	LP	1	99.922	1	99.911	3	99.825
CGF	CUYAHOGA COUNTY	OH	LPV200	1	99.885	4	99.847	2	99.742
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	1	99.885	3	99.853	2	99.758
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	2	99.919	2	99.907	2	99.861
CQA	LAKEFIELD	OH	LPV	2	99.868	1	99.855	1	99.834
CYO	PICKAWAY COUNTY MEML	OH	LPV	1	99.922	1	99.911	2	99.874
DAY	JAMES M COX DAYTON INTL	OH	LPV200	2	99.914	2	99.895	2	99.869
DLZ	DELAWARE MUNICIPAL/JIM MOORE FLD	OH	LPV	2	99.917	2	99.906	2	99.844
EDJ	BELLEFONTAINE RGNL	OH	LPV	1	99.885	1	99.885	1	99.837
EOP	PIKE COUNTY	OH	LP	1	99.922	1	99.911	2	99.875
FDY	FINDLAY	OH	LPV	1	99.885	2	99.872	3	99.799
FZI	FOSTORIA METRO	OH	LPV	1	99.874	2	99.861	2	99.775
GQQ	GALION MUNICIPAL	OH	LP	2	99.907	2	99.895	4	99.83
HAO	BUTLER COUNTY RGNL/HOGAN FLD	OH	LPV	2	99.914	2	99.898	2	99.878
HOC	HIGHLAND COUNTY	OH	LP	1	99.922	1	99.911	2	99.876
HZY	NORTHEAST OHIO RGNL	OH	LPV	2	99.88	4	99.836	2	99.743
I10	NOBLE COUNTY	OH	LP	1	99.922	1	99.911	4	99.846

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
I19	GREENE COUNTY/LEWIS A JACKSON	OH	LPV	1	99.921	1	99.911	2	99.868
I40	RICHARD DOWNING	OH	LPV	1	99.922	1	99.911	4	99.834
I66	CLINTON FLD	OH	LPV	1	99.922	1	99.911	2	99.871
I68	WARREN COUNTY/JOHN LANE FLD	OH	LPV	1	99.921	1	99.911	2	99.87
I69	CLERMONT COUNTY	OH	LP	1	99.933	1	99.911	2	99.878
I74	GRIMES FLD	OH	LPV	2	99.912	2	99.905	2	99.863
ILN	WILMINGTON AIR PARK	OH	LPV200	1	99.922	1	99.911	2	99.876
LCK	RICKENBACKER INTL	OH	LPV200	1	99.922	1	99.911	2	99.867
LHQ	FAIRFIELD COUNTY	OH	LPV200	1	99.922	1	99.911	2	99.867
LNN	LAKE COUNTY EXEC	OH	LPV	2	99.884	4	99.839	2	99.743
LPR	LORAIN COUNTY RGNL	OH	LPV200	2	99.898	4	99.866	2	99.772
LUK	CINCINNATI MUNICIPAL/LUNKEN FLD	OH	LPV	1	99.921	2	99.903	2	99.879
MFD	MANSFIELD LAHM RGNL	OH	LPV200	2	99.906	3	99.893	4	99.827
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	1	99.921	1	99.911	2	99.87
MNN	MARION MUNICIPAL	OH	LPV	2	99.91	2	99.898	3	99.837
MRT	UNION COUNTY	OH	LP	2	99.915	2	99.904	2	99.846
MWO	MIDDLETOWN RGNL/HOOK FLD	OH	LPV	2	99.919	2	99.9	2	99.87
OSU	OHIO STATE UNIVERSITY	OH	LPV200	2	99.917	2	99.906	3	99.86
OWX	PUTNAM COUNTY	OH	LPV	1	99.874	2	99.866	3	99.799
OXD	MIAMI UNIVERSITY	OH	LPV	2	99.905	2	99.898	2	99.87
PCW	ERIE-OTTAWA INTL	OH	LPV	1	99.885	4	99.857	3	99.76
PHD	HARRY CLEVER FLD	OH	LP	2	99.922	3	99.91	3	99.8
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	1	99.933	1	99.911	2	99.875
POV	PORTAGE COUNTY	OH	LPV	1	99.885	2	99.856	3	99.77
RZT	ROSS COUNTY	OH	LPV	1	99.922	1	99.911	2	99.874
S24	SANDUSKY COUNTY RGNL	OH	LPV	1	99.885	3	99.857	2	99.772
SCA	SIDNEY MUNICIPAL	OH	LPV	2	99.897	2	99.897	2	99.849
SGH	SPRINGFIELD/BECKLEY MUNICIPAL	OH	LPV200	2	99.918	2	99.909	2	99.868
TDZ	TOLEDO EXEC	OH	LPV	1	99.875	3	99.854	3	99.754
TOL	EUGENE F KRANZ TOLEDO EXPRESS	OH	LPV200	1	99.876	3	99.848	3	99.753
TSO	CARROLL COUNTY-TOLSON	OH	LP	2	99.917	3	99.903	3	99.799
TZR	BOLTON FLD	OH	LPV	2	99.92	2	99.909	2	99.866

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UNI	OHIO UNIVERSITY	OH	LPV200	1	99.922	1	99.911	2	99.871
USE	FULTON COUNTY	OH	LPV	2	99.87	3	99.824	3	99.756
UYF	MADISON COUNTY	OH	LPV	2	99.919	2	99.907	2	99.864
VES	DARKE COUNTY	OH	LPV	3	99.885	2	99.868	1	99.841
VTA	NEWARK-HEATH	OH	LP	1	99.922	1	99.911	2	99.859
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	1	99.885	3	99.855	3	99.772
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	1	99.922	1	99.911	3	99.847
1F0	ARDMORE DOWNTOWN EXEC	OK	LP	1	99.974	1	99.974	2	99.972
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	1	99.978	2	99.976	3	99.939
1O4	THOMAS MUNICIPAL	OK	LPV	1	99.978	1	99.978	4	99.918
2K4	SCOTT FLD	OK	LPV	1	99.985	1	99.985	2	99.963
3F7	JONES MEML	OK	LPV	1	99.978	1	99.978	3	99.937
4O4	MC CURTAIN COUNTY RGNL	OK	LP	1	99.974	1	99.974	1	99.944
6K4	FAIRVIEW MUNICIPAL	OK	LPV	1	99.982	2	99.979	4	99.91
80F	ANTLERS MUNICIPAL	OK	LPV	1	99.974	1	99.974	3	99.963
ADH	ADA RGNL	OK	LPV	1	99.974	1	99.974	3	99.956
ADM	ARDMORE MUNICIPAL	OK	LPV	1	99.974	1	99.974	2	99.972
AVK	ALVA RGNL	OK	LPV	1	99.984	2	99.96	4	99.905
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	1	99.983	1	99.983	2	99.967
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	1	99.978	2	99.975	5	99.898
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	1	99.978	1	99.978	5	99.905
CHK	CHICKASHA MUNICIPAL	OK	LPV200	1	99.978	1	99.978	3	99.967
CLK	CLINTON RGNL	OK	LPV	1	99.978	1	99.978	4	99.933
CSM	CLINTON/SHERMAN	OK	LPV200	1	99.978	1	99.978	4	99.936
CUH	CUSHING MUNICIPAL	OK	LPV	1	99.978	1	99.978	3	99.922
DUA	DURANT RGNL/EAKER FLD	OK	LPV	1	99.974	1	99.974	3	99.971
DUC	HALLIBURTON FLD	OK	LPV200	1	99.974	1	99.974	2	99.971
ELK	ELK CITY RGNL BUSINESS	OK	LPV	1	99.978	1	99.978	4	99.934
F22	PERRY MUNICIPAL	OK	LPV	1	99.978	1	99.978	4	99.907
FDR	FREDERICK RGNL	OK	LPV200	1	99.974	1	99.974	2	99.971
GCM	CLAREMORE RGNL	OK	LPV	1	99.978	1	99.978	3	99.944
GMJ	GROVE MUNICIPAL	OK	LPV	1	99.985	3	99.974	3	99.929
GOK	GUTHRIE/EDMOND RGNL	OK	LPV	1	99.978	1	99.978	3	99.913
GUY	GUYMON MUNICIPAL	OK	LPV	1	99.995	3	99.964	5	99.861
GZL	STIGLER RGNL	OK	LPV	1	99.978	1	99.978	2	99.952

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
H71	MID-AMERICA INDUSTRIAL	OK	LPV	1	99.978	1	99.978	3	99.943
HBR	HOBART RGNL	OK	LPV	1	99.978	1	99.978	3	99.963
HHW	STAN STAMPER MUNICIPAL	OK	LPV	1	99.974	1	99.974	2	99.959
HSD	SUNDANCE	OK	LPV	1	99.978	1	99.978	3	99.92
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	1	99.974	1	99.974	2	99.971
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	1	99.978	1	99.978	2	99.95
MLC	MC ALESTER RGNL	OK	LPV	1	99.978	1	99.978	2	99.954
OJA	WEATHERFORD STAFFORD	OK	LPV	1	99.978	1	99.978	3	99.932
OKC	WILL ROGERS WORLD	OK	LPV200	1	99.978	1	99.978	4	99.955
OKM	OKMULGEE RGNL	OK	LPV200	1	99.978	1	99.978	3	99.951
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	1	99.978	1	99.978	4	99.957
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	1	99.978	1	99.978	4	99.933
PNC	PONCA CITY RGNL	OK	LPV	1	99.978	1	99.978	5	99.909
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	1	99.974	1	99.974	3	99.972
PWA	WILEY POST	OK	LPV200	1	99.978	1	99.978	3	99.93
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	1	99.978	1	99.978	3	99.92
RKR	ROBERT S KERR	OK	LPV	1	99.978	2	99.977	2	99.952
RQO	EL RENO RGNL	OK	LPV	1	99.978	1	99.978	3	99.932
RVS	TULSA RIVERSIDE	OK	LPV200	1	99.978	1	99.978	3	99.936
SNL	SHAWNEE RGNL	OK	LPV200	1	99.978	1	99.978	4	99.946
SWO	STILLWATER RGNL	OK	LPV200	1	99.978	1	99.978	3	99.921
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	1	99.978	2	99.977	2	99.946
TUL	TULSA INTL	OK	LPV200	1	99.978	1	99.978	4	99.932
WDG	ENID WOODRING RGNL	OK	LPV200	1	99.979	2	99.979	3	99.909
WWR	WEST WOODWARD	OK	LPV	1	99.987	2	99.961	4	99.907
3S8	GRANTS PASS	OR	LP	3	99.765	6	99.714	8	99.457
77S	HOBBY FLD	OR	LPV	2	99.738	5	99.692	9	99.491
AST	ASTORIA RGNL	OR	LPV	2	99.737	7	99.69	12	99.471
BDN	BEND MUNICIPAL	OR	LPV	2	99.778	5	99.725	7	99.562
BKE	BAKER CITY MUNICIPAL	OR	LPV	4	99.804	5	99.772	8	99.616
CVO	CORVALLIS MUNICIPAL	OR	LPV200	2	99.74	5	99.696	9	99.488
EUG	MAHLON SWEET FLD	OR	LPV200	2	99.745	5	99.693	9	99.49
GCD	GRANT COUNTY RGNL/OGILVIE FLD	OR	LPV	2	99.785	4	99.742	8	99.604
HIO	PORTLAND-HILLSBORO	OR	LPV200	2	99.744	5	99.716	9	99.498
LGD	LA GRANDE/UNION COUNTY	OR	LPV	4	99.815	5	99.752	8	99.591

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LKV	LAKE COUNTY	OR	LPV	2	99.815	4	99.77	7	99.598
LMT	CRATER LAKE/KLAMATH RGNL	OR	LPV	3	99.794	5	99.748	8	99.544
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	2	99.744	5	99.716	9	99.492
ONO	ONTARIO MUNICIPAL	OR	LPV	2	99.809	3	99.78	9	99.673
ONP	NEWPORT MUNICIPAL	OR	LPV	2	99.738	5	99.692	9	99.469
OTH	SOUTHWEST OREGON RGNL	OR	LPV	2	99.739	4	99.694	10	99.447
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	3	99.797	5	99.752	9	99.557
PDX	PORTLAND INTL	OR	LPV200	2	99.745	4	99.718	9	99.503
RDM	ROBERTS FLD	OR	LPV200	2	99.775	5	99.726	7	99.562
S33	MADRAS MUNICIPAL	OR	LPV	3	99.764	5	99.711	7	99.562
S39	PRINEVILLE	OR	LP	2	99.782	5	99.723	8	99.567
SLE	MCNARY FLD	OR	LPV200	2	99.743	5	99.71	9	99.491
SPB	SCAPPOOSE	OR	LPV	2	99.74	4	99.713	9	99.501
UAO	AURORA STATE	OR	LPV	2	99.745	5	99.718	9	99.499
22N	JAKE ARNER MEML	PA	LP	3	99.882	3	99.842	2	99.764
29D	GROVE CITY	PA	LP	1	99.885	3	99.865	2	99.763
2G9	SOMERSET COUNTY	PA	LPV	1	99.922	2	99.912	3	99.801
6G1	TITUSVILLE	PA	LPV	2	99.88	3	99.866	2	99.75
6P7	MCVILLE	PA	LP	2	99.904	3	99.895	2	99.768
8G2	CORRY-LAWRENCE	PA	LPV	2	99.878	3	99.854	2	99.748
8N8	DANVILLE	PA	LP	3	99.88	4	99.857	2	99.77
9D4	DECK	PA	LPV	2	99.883	4	99.862	2	99.767
ABE	LEHIGH VALLEY INTL	PA	LPV200	3	99.873	3	99.842	3	99.76
AFJ	WASHINGTON COUNTY	PA	LPV200	1	99.922	2	99.91	3	99.813
AGC	ALLEGHENY COUNTY	PA	LPV200	1	99.922	2	99.917	3	99.801
AOO	ALTOONA/BLAIR COUNTY	PA	LPV	2	99.916	2	99.876	2	99.783
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	4	99.886	3	99.842	2	99.767
AXQ	CLARION COUNTY	PA	LPV	2	99.885	3	99.872	2	99.763
BFD	BRADFORD RGNL	PA	LPV	2	99.878	3	99.857	2	99.75
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	2	99.904	3	99.896	2	99.77
BVI	BEAVER COUNTY	PA	LPV	2	99.905	3	99.888	3	99.785
CXY	CAPITAL CITY	PA	LPV	2	99.886	3	99.87	2	99.767
DUJ	DUBOIS RGNL	PA	LPV200	2	99.885	3	99.874	2	99.762
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	2	99.873	4	99.831	2	99.747
FIG	CLEARFIELD-LAWRENCE	PA	LPV	2	99.885	3	99.874	2	99.763
FKL	VENANGO RGNL	PA	LPV	2	99.884	3	99.868	2	99.751

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FWQ	ROSTRAVER	PA	LPV	1	99.922	2	99.917	3	99.804
GKJ	PORT MEADVILLE	PA	LP	2	99.881	3	99.846	2	99.749
HMZ	BEDFORD COUNTY	PA	LPV	1	99.922	2	99.883	2	99.787
HZL	HAZLETON RGNL	PA	LPV	3	99.882	3	99.842	2	99.767
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	2	99.921	3	99.909	2	99.769
IPT	WILLIAMSPORT RGNL	PA	LPV	3	99.878	4	99.863	2	99.77
JST	JOHN MURTHA JOHNSTOWN/CAMBRIA	PA	LPV200	1	99.922	2	99.899	2	99.787
LBE	ARNOLD PALMER RGNL	PA	LPV200	1	99.922	2	99.916	3	99.794
LNS	LANCASTER	PA	LPV200	2	99.883	4	99.863	2	99.767
LOM	WINGS FLD	PA	LPV	3	99.873	3	99.834	3	99.761
MDT	HARRISBURG INTL	PA	LPV	2	99.885	3	99.869	2	99.767
MPO	POCONO MOUNTAINS RGNL	PA	LPV	5	99.881	4	99.841	3	99.761
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	2	99.884	3	99.849	2	99.764
N38	GRAND CANYON RGNL	PA	LP	3	99.876	3	99.86	2	99.754
N57	NEW GARDEN	PA	LP	2	99.884	3	99.849	2	99.768
N79	NORTHUMBERLAND COUNTY	PA	LPV	3	99.881	4	99.856	2	99.767
N96	BELLEFONTE	PA	LPV	2	99.885	3	99.873	2	99.772
OQN	BRANDYWINE RGNL	PA	LP	2	99.884	3	99.849	2	99.764
OYM	ST MARYS MUNICIPAL	PA	LPV	2	99.881	3	99.868	2	99.751
PHL	PHILADELPHIA INTL	PA	LPV200	3	99.874	3	99.834	3	99.761
PIT	PITTSBURGH INTL	PA	LPV200	1	99.922	2	99.909	3	99.805
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	4	99.871	4	99.834	3	99.761
PSB	MID-STATE	PA	LPV	2	99.885	3	99.874	2	99.771
PTW	HERITAGE FLD	PA	LPV	3	99.88	3	99.838	2	99.764
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	2	99.883	3	99.849	2	99.764
RVL	MIFFLIN COUNTY	PA	LPV	1	99.885	2	99.873	2	99.774
SEG	PENN VALLEY	PA	LP	3	99.882	4	99.867	2	99.774
THV	YORK	PA	LP	3	99.901	3	99.871	2	99.77
UCP	NEW CASTLE MUNICIPAL	PA	LPV	2	99.897	3	99.881	3	99.78
UKT	QUAKERTOWN	PA	LP	3	99.873	3	99.846	3	99.761
UNV	UNIVERSITY PARK	PA	LPV200	2	99.885	3	99.873	2	99.772
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	1	99.922	2	99.917	2	99.806
WAY	GREENE COUNTY	PA	LPV	1	99.922	2	99.919	2	99.811

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	4	99.878	3	99.842	2	99.767
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	3	99.875	3	99.848	3	99.761
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	2	99.884	4	99.854	2	99.767
BID	BLOCK ISLAND STATE	RI	LPV	3	99.827	2	99.8	3	99.738
OQU	QUONSET STATE	RI	LPV200	3	99.827	2	99.789	3	99.736
PVD	RHODE ISLAND TF GREEN INTL	RI	LPV200	3	99.827	2	99.789	4	99.748
SFZ	NORTH CENTRAL STATE	RI	LPV	3	99.825	2	99.789	4	99.745
35A	UNION COUNTY` TROY SHELTON FLD	SC	LP	1	99.974	1	99.963	2	99.939
6J0	LEXINGTON COUNTY	SC	LPV	1	99.974	1	99.963	1	99.963
AIK	AIKEN RGNL	SC	LPV200	1	99.974	1	99.963	1	99.963
AND	ANDERSON RGNL	SC	LPV200	1	99.974	1	99.963	1	99.941
AQX	ALLENDALE COUNTY	SC	LPV	1	99.981	1	99.963	1	99.963
ARW	BEAUFORT EXEC	SC	LPV200	1	99.981	1	99.963	1	99.963
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	1	99.974	1	99.963	1	99.933
BNL	BARNWELL RGNL	SC	LPV	1	99.974	1	99.963	1	99.963
CAE	COLUMBIA METRO	SC	LPV200	1	99.974	1	99.963	1	99.963
CDN	WOODWARD FLD	SC	LPV	1	99.974	1	99.963	2	99.962
CEU	OCONEE COUNTY RGNL	SC	LPV200	1	99.974	1	99.963	1	99.941
CHS	CHARLESTON AFB/INTL	SC	LPV200	1	99.974	1	99.963	1	99.963
CKI	WILLIAMSBURG RGNL	SC	LPV	1	99.974	1	99.963	1	99.963
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FL	SC	LPV	1	99.967	1	99.963	1	99.933
CRE	GRAND STRAND	SC	LPV200	1	99.974	1	99.963	1	99.963
CUB	JIM HAMILTON L B OWENS	SC	LPV	1	99.974	1	99.963	1	99.963
DCM	CHESTER CATAWBA RGNL	SC	LPV	1	99.966	1	99.963	1	99.922
DYB	SUMMERVILLE	SC	LPV200	1	99.974	1	99.963	1	99.963
FDW	FAIRFIELD COUNTY	SC	LPV	1	99.974	1	99.963	2	99.961
FLO	FLORENCE RGNL	SC	LPV	1	99.974	1	99.963	2	99.962
GGE	GEORGETOWN COUNTY	SC	LPV	1	99.974	1	99.963	1	99.963
GMU	GREENVILLE DOWNTOWN	SC	LPV200	1	99.966	1	99.963	1	99.924
GRD	GREENWOOD COUNTY	SC	LPV	1	99.974	1	99.963	2	99.959

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	1	99.966	1	99.963	1	99.922
GYH	DONALDSON FLD	SC	LPV	1	99.966	1	99.963	1	99.941
HVS	HARTSVILLE RGNL	SC	LPV	1	99.974	1	99.963	2	99.962
HXD	HILTON HEAD	SC	LPV	1	99.994	1	99.963	1	99.963
HYW	CONWAY-HORRY COUNTY	SC	LPV	1	99.974	1	99.963	1	99.963
JZI	CHARLESTON EXEC	SC	LPV200	1	99.981	1	99.963	1	99.963
LKR	LANCASTER COUNTY-MC WHIRTER FL	SC	LPV200	1	99.966	1	99.963	1	99.922
LQK	PICKENS COUNTY	SC	LPV	1	99.966	1	99.963	1	99.941
LRO	MT PLEASANT RGNL-FAISON FLD	SC	LPV	1	99.974	1	99.963	1	99.963
LUX	LAURENS COUNTY	SC	LPV	1	99.974	1	99.963	1	99.941
MAO	MARION COUNTY	SC	LPV	1	99.974	1	99.963	2	99.962
MKS	BERKELEY COUNTY	SC	LPV	1	99.974	1	99.963	1	99.963
MYR	MYRTLE BEACH INTL	SC	LPV200	1	99.974	1	99.963	1	99.963
OGB	ORANGEBURG MUNICIPAL	SC	LPV	1	99.974	1	99.963	1	99.963
PYG	PAGELAND	SC	LPV	1	99.966	1	99.963	1	99.922
RBW	LOWCOUNTRY RGNL	SC	LPV200	1	99.974	1	99.963	1	99.963
SMS	SUMTER	SC	LPV200	1	99.974	1	99.963	1	99.963
SPA	SPARTANBURG DOWNTOWN MEML/SIMP	SC	LPV200	1	99.966	1	99.963	1	99.922
UDG	DARLINGTON COUNTY	SC	LPV	1	99.974	1	99.963	1	99.933
UZA	ROCK HILL/YORK COUNTY/BRYANT F	SC	LPV200	1	99.966	1	99.963	1	99.922
0D8	GETTYSBURG MUNICIPAL	SD	LP	3	99.77	4	99.748	5	99.659
49B	STURGIS MUNICIPAL	SD	LPV	2	99.809	2	99.79	7	99.729
4X4	WESSINGTON SPRINGS	SD	LP	4	99.787	4	99.751	6	99.689
8D3	SISSETON MUNICIPAL	SD	LPV	5	99.717	6	99.691	6	99.593
8D7	CLARK COUNTY	SD	LP	3	99.765	4	99.732	6	99.657
8V3	PARKSTON MUNICIPAL	SD	LPV	3	99.806	5	99.775	5	99.699
98D	ONIDA MUNICIPAL	SD	LP	3	99.778	4	99.752	5	99.665
9D0	HIGHMORE MUNICIPAL	SD	LPV	3	99.769	4	99.751	5	99.673
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	3	99.829	6	99.785	6	99.702
9V6	MARTIN MUNICIPAL	SD	LPV	3	99.888	5	99.802	6	99.697
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	3	99.807	5	99.778	5	99.694
ABR	ABERDEEN RGNL	SD	LPV200	4	99.751	5	99.713	6	99.637

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AGZ	WAGNER MUNICIPAL	SD	LPV	3	99.819	6	99.774	5	99.7
ATY	WATERTOWN RGNL	SD	LPV200	3	99.764	4	99.717	6	99.639
BKX	BROOKINGS RGNL	SD	LPV200	3	99.77	4	99.742	5	99.678
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	2	99.806	2	99.8	8	99.745
FSD	JOE FOSS FLD	SD	LPV200	3	99.783	4	99.752	5	99.671
HON	HURON RGNL	SD	LPV200	3	99.767	4	99.742	5	99.686
HSR	HOT SPRINGS MUNICIPAL	SD	LP	4	99.885	5	99.844	7	99.713
ICR	WINNER RGNL	SD	LPV	3	99.828	6	99.79	5	99.703
IEN	PINE RIDGE	SD	LPV	3	99.884	6	99.851	7	99.669
LEM	LEMMON MUNICIPAL	SD	LPV	5	99.757	5	99.749	6	99.618
MBG	MOBRIDGE MUNICIPAL	SD	LPV	4	99.767	4	99.749	5	99.645
MDS	MADISON MUNICIPAL	SD	LPV	3	99.771	4	99.747	6	99.684
MHE	MITCHELL MUNICIPAL	SD	LPV	4	99.793	5	99.765	5	99.673
MKA	MILLER MUNICIPAL	SD	LPV	3	99.766	4	99.746	5	99.674
PHP	PHILIP	SD	LPV	2	99.796	4	99.768	4	99.732
PIR	PIERRE RGNL	SD	LPV	2	99.789	4	99.754	5	99.698
RAP	RAPID CITY RGNL	SD	LPV200	2	99.812	3	99.788	6	99.745
SPF	BLACK HILLS-CLYDE ICE FLD	SD	LPV	2	99.81	2	99.8	7	99.741
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	4	99.859	6	99.791	6	99.699
VMR	HAROLD DAVIDSON FLD	SD	LPV	3	99.806	3	99.773	5	99.709
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	3	99.805	4	99.768	5	99.7
0A3	SMITHVILLE MUNICIPAL	TN	LPV	2	99.964	1	99.941	1	99.919
0M3	PAUL BRIDGES FLD	TN	LP	1	99.999	1	99.942	2	99.936
0M4	BENTON COUNTY	TN	LPV	1	99.973	1	99.945	2	99.934
0M5	HUMPHREYS COUNTY	TN	LP	1	99.97	1	99.941	2	99.933
1A3	MARTIN CAMPBELL FLD	TN	LP	1	99.973	2	99.96	1	99.941
1M5	PORTLAND MUNICIPAL	TN	LPV	1	99.938	1	99.929	2	99.904
2A0	MARK ANTON	TN	LPV	2	99.968	1	99.941	1	99.922
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	0	100	1	99.941	1	99.937
2M8	CHARLES W BAKER	TN	LPV	0	100	1	99.967	2	99.943
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	1	99.948	1	99.922	2	99.913
3M7	LAFAYETTE MUNICIPAL	TN	LPV	2	99.951	1	99.927	2	99.904
8A3	LIVINGSTON MUNICIPAL	TN	LP	2	99.949	1	99.924	1	99.91
BGF	WINCHESTER MUNICIPAL	TN	LPV	1	99.992	2	99.952	1	99.937
BNA	NASHVILLE INTL	TN	LPV200	1	99.952	1	99.941	1	99.924
CHA	LOVELL FLD	TN	LPV200	1	99.973	2	99.955	1	99.941

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CKV	OUTLAW FLD	TN	LPV	1	99.964	1	99.941	3	99.919
CSV	CROSSVILLE MEML-WHITSON FLD	TN	LPV200	2	99.953	1	99.927	1	99.922
DYR	DYERSBURG RGNL	TN	LPV	3	99.99	2	99.957	2	99.946
FYE	FAYETTE COUNTY	TN	LPV	0	100	1	99.964	3	99.943
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	1	99.993	1	99.941	1	99.937
GCY	GREENEVILLE MUNICIPAL	TN	LPV	1	99.948	1	99.922	2	99.908
GHM	CENTERVILLE MUNICIPAL	TN	LP	1	99.974	1	99.941	2	99.936
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	1	99.949	1	99.924	1	99.922
GZS	ABERNATHY FLD	TN	LPV	0	100	1	99.941	1	99.937
HZD	CARROLL COUNTY	TN	LPV	1	99.968	1	99.953	2	99.934
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	1	99.948	1	99.922	1	99.912
JWN	JOHN C TUNE	TN	LPV	1	99.951	1	99.941	1	99.934
LUG	ELLINGTON	TN	LPV	2	99.99	1	99.941	1	99.936
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	1	99.968	2	99.944
M08	WILLIAM L WHITEHURST FLD	TN	LP	0	100	1	99.959	3	99.947
M53	HUMBOLDT MUNICIPAL	TN	LPV	2	99.991	1	99.956	2	99.937
M54	LEBANON MUNICIPAL	TN	LPV	1	99.952	1	99.941	2	99.923
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	1	99.949	1	99.941	3	99.92
MBT	MURFREESBORO MUNICIPAL	TN	LPV	1	99.952	1	99.941	1	99.924
MEM	MEMPHIS INTL	TN	LPV200	0	100	1	99.972	2	99.944
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	100	1	99.957	2	99.939
MMI	MCMINN COUNTY	TN	LPV	1	99.969	2	99.954	1	99.922
MNV	MONROE COUNTY	TN	LPV	1	99.967	2	99.954	1	99.922
MOR	MOORE-MURRELL	TN	LPV	1	99.948	1	99.922	1	99.914
MQY	SMYRNA	TN	LPV200	1	99.952	1	99.941	1	99.924
MRC	MAURY COUNTY RGNL	TN	LPV	2	99.997	1	99.941	1	99.937
NQA	MILLINGTON/MEMPHIS	TN	LPV200	0	100	1	99.966	2	99.942
PHT	HENRY COUNTY	TN	LPV200	2	99.966	2	99.944	3	99.93
PVE	BEECH RIVER RGNL	TN	LPV	2	99.998	1	99.956	2	99.935
RKW	ROCKWOOD MUNICIPAL	TN	LPV	1	99.952	1	99.927	1	99.922
RNC	WARREN COUNTY MEML	TN	LPV	2	99.964	1	99.941	1	99.929
RVN	HAWKINS COUNTY	TN	LP	1	99.948	1	99.922	2	99.906
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	1	99.971	2	99.957	1	99.934
SCX	SCOTT MUNICIPAL	TN	LPV	1	99.948	1	99.922	1	99.912

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	1	99.957	2	99.937
SRB	UPPER CUMBERLAND RGNL	TN	LPV	2	99.952	1	99.928	1	99.919
SYI	BOMAR FLD/SHELBYVILLE MUNICIPAL	TN	LPV	3	99.979	1	99.941	1	99.936
SZY	ROBERT SIBLEY	TN	LPV	0	100	1	99.957	2	99.937
TGC	GIBSON COUNTY	TN	LP	1	99.977	1	99.956	2	99.936
THA	TULLAHOMA RGNL/WM NORTHERN FLD	TN	LPV	2	99.987	1	99.941	1	99.936
TRI	TRI-CITIES	TN	LPV200	1	99.948	1	99.923	2	99.908
TYS	MC GHEE TYSON	TN	LPV200	1	99.951	1	99.925	1	99.922
UCY	EVERETT-STEWART RGNL	TN	LPV200	2	99.964	2	99.952	3	99.932
XNX	MUSIC CITY EXEC	TN	LPV	1	99.941	1	99.93	2	99.92
0F2	BOWIE MUNICIPAL	TX	LPV	1	99.974	1	99.974	3	99.969
11R	BRENHAM MUNICIPAL	TX	LPV	2	99.91	2	99.893	3	99.871
2R9	KENEDY RGNL	TX	LP	1	99.929	2	99.884	3	99.825
3R9	LAKEWAY AIRPARK	TX	LP	1	99.971	3	99.928	4	99.842
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	1	99.929	2	99.9	3	99.849
41F	FLOYDADA MUNICIPAL	TX	LP	1	99.998	2	99.991	7	99.931
45R	HAWTHORNE FLD	TX	LP	2	99.922	2	99.911	2	99.874
4T2	KENNETH COPELAND	TX	LPV	1	99.971	1	99.971	3	99.919
50R	LOCKHART MUNICIPAL	TX	LPV	1	99.929	1	99.889	3	99.831
5C1	BOERNE STAGE FLD	TX	LP	1	99.971	3	99.915	4	99.818
5T9	MAVERICK COUNTY MEML INTL	TX	LPV	2	99.973	4	99.916	4	99.783
60R	NAVASOTA MUNICIPAL	TX	LPV	2	99.897	2	99.893	3	99.873
6R3	CLEVELAND MUNICIPAL	TX	LPV	2	99.9	2	99.897	2	99.871
77F	WINTERS MUNICIPAL	TX	LP	1	99.974	2	99.956	5	99.87
8F3	CROSBYTON MUNICIPAL	TX	LP	1	99.994	2	99.981	8	99.931
ABI	ABILENE RGNL	TX	LPV200	1	99.974	2	99.956	5	99.906
ACT	WACO RGNL	TX	LPV200	1	99.944	3	99.927	3	99.868
ADS	ADDISON	TX	LPV	1	99.954	1	99.954	3	99.91
AFW	FORT WORTH ALLIANCE	TX	LPV200	1	99.971	1	99.971	3	99.919
ALI	ALICE INTL	TX	LPV	3	99.94	2	99.883	4	99.817
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	1	99.994	2	99.981	4	99.885
ARM	WHARTON RGNL	TX	LPV	2	99.893	1	99.878	4	99.854
ASL	HARRISON COUNTY	TX	LPV	1	99.937	2	99.93	2	99.908
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	2	99.946	2	99.904	4	99.85
AXH	HOUSTON/SOUTHWEST	TX	LPV	2	99.893	2	99.893	3	99.866

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BAZ	NEW BRAUNFELS NTL	TX	LPV	2	99.952	1	99.907	3	99.826
BBD	CURTIS FLD	TX	LPV	1	99.971	3	99.945	5	99.856
BEA	BEEVILLE MUNICIPAL	TX	LPV	2	99.929	2	99.884	3	99.826
BFE	TERRY COUNTY	TX	LPV	1	99.994	2	99.963	7	99.831
BGD	HUTCHINSON COUNTY	TX	LPV	1	99.993	2	99.989	6	99.892
BKD	STEPHENS COUNTY	TX	LP	1	99.975	2	99.972	4	99.917
BKS	BROOKS COUNTY	TX	LPV	3	99.939	2	99.878	5	99.817
BMT	BEAUMONT MUNICIPAL	TX	LPV	2	99.91	2	99.9	2	99.873
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	2	99.969	4	99.932	7	99.84
BPT	JACK BROOKS RGNL	TX	LPV200	2	99.911	2	99.902	1	99.874
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	2	99.919	2	99.874	4	99.798
BWD	BROWNWOOD RGNL	TX	LPV	1	99.971	2	99.952	4	99.873
BYY	BAY CITY RGNL	TX	LPV	2	99.893	1	99.878	4	99.85
CDS	CHILDRESS MUNICIPAL	TX	LPV200	1	99.997	1	99.997	5	99.967
CFD	COULTER FLD	TX	LPV	1	99.926	2	99.893	3	99.872
CLL	EASTERWOOD FLD	TX	LPV200	2	99.924	2	99.893	3	99.872
CNW	TSTC WACO	TX	LPV200	1	99.944	3	99.927	3	99.869
COM	COLEMAN MUNICIPAL	TX	LPV	1	99.973	2	99.954	5	99.879
COT	COTULLA-LA SALLE COUNTY	TX	LPV	2	99.972	3	99.908	3	99.804
CPT	CLEBURNE RGNL	TX	LPV	1	99.971	2	99.951	3	99.896
CRP	CORPUS CHRISTI INTL	TX	LPV200	2	99.929	1	99.882	4	99.826
CVB	CASTROVILLE MUNICIPAL	TX	LPV	2	99.97	4	99.912	4	99.817
CWC	KICKAPOO DOWNTOWN	TX	LPV	1	99.974	1	99.974	3	99.97
CXO	CONROE/NORTH HOUSTON RGNL	TX	LPV200	2	99.897	2	99.897	2	99.871
CZT	DIMMIT COUNTY	TX	LPV	3	99.969	4	99.912	4	99.793
DAL	DALLAS LOVE FLD	TX	LPV200	1	99.951	1	99.951	3	99.904
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	1	99.959	1	99.959	3	99.915
DHT	DALHART MUNICIPAL	TX	LPV	3	99.997	6	99.974	3	99.838
DKR	HOUSTON COUNTY	TX	LP	2	99.926	2	99.908	3	99.873
DRT	DEL RIO INTL	TX	LPV	3	99.976	6	99.92	3	99.767
DTO	DENTON ENTERPRISE	TX	LPV200	1	99.971	1	99.971	4	99.955
DUX	MOORE COUNTY	TX	LPV200	1	99.996	3	99.976	4	99.874
DWH	DAVID WAYNE HOOKS MEML	TX	LPV	2	99.897	2	99.897	2	99.871
E01	ROY HURD MEML	TX	LP	4	99.959	4	99.913	6	99.795
E11	ANDREWS COUNTY	TX	LPV	2	99.972	4	99.931	7	99.8

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
E19	GRUVER MUNICIPAL	TX	LP	1	99.994	2	99.967	6	99.887
E30	BRUCE FLD	TX	LPV	1	99.974	2	99.956	5	99.87
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	3	99.951	4	99.913	3	99.75
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	2	99.937	2	99.885	6	99.811
EDC	AUSTIN EXEC	TX	LPV200	1	99.933	2	99.904	3	99.854
EFD	ELLINGTON	TX	LPV200	2	99.893	2	99.893	3	99.867
ELA	EAGLE LAKE	TX	LP	2	99.893	1	99.878	4	99.865
ELP	EL PASO INTL	TX	LP	1	99.926	2	99.86	10	99.762
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	2	99.97	4	99.924	3	99.799
ETN	EASTLAND MUNICIPAL	TX	LP	1	99.971	2	99.952	4	99.912
F00	JONES FLD	TX	LPV	1	99.974	1	99.974	1	99.949
F05	WILBARGER COUNTY	TX	LPV	1	99.989	1	99.984	3	99.97
F49	CITY OF SLATON/LARRY T NEAL ME	TX	LPV	1	99.992	2	99.974	9	99.899
F98	YOAKUM COUNTY	TX	LPV	2	99.987	3	99.969	7	99.823
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	3	99.942	4	99.903	3	99.751
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	1	99.971	1	99.971	3	99.913
FWS	FORT WORTH SPINKS	TX	LPV200	1	99.971	2	99.952	3	99.906
GDJ	GRANBURY RGNL	TX	LPV	1	99.971	2	99.968	3	99.895
GGG	EAST TEXAS RGNL	TX	LPV	1	99.937	2	99.925	2	99.9
GKY	ARLINGTON MUNICIPAL	TX	LPV200	1	99.952	1	99.952	3	99.9
GLE	GAINESVILLE MUNICIPAL	TX	LPV	1	99.974	1	99.974	2	99.972
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	2	99.893	2	99.893	1	99.871
GNC	GAINES COUNTY	TX	LPV	2	99.978	4	99.943	7	99.805
GRK	ROBERT GRAY AAF	TX	LPV200	1	99.971	2	99.949	3	99.851
GTU	GEORGETOWN MUNICIPAL	TX	LPV	2	99.96	2	99.908	3	99.853
GVT	MAJORS	TX	LPV200	1	99.949	1	99.949	2	99.93
GYI	NORTH TEXAS RGNL/PERRIN FLD	TX	LPV200	1	99.974	1	99.974	3	99.973
GZN	GREGORY M SIMMONS MEML	TX	LPV	1	99.971	2	99.953	5	99.911
HBV	JIM HOGG COUNTY	TX	LPV	2	99.952	3	99.899	6	99.811
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	2	99.97	4	99.915	4	99.801
HHF	HEMPHILL COUNTY	TX	LPV	1	99.99	2	99.987	4	99.924
HOU	WILLIAM P HOBBY	TX	LPV200	2	99.893	2	99.893	3	99.856
HQZ	MESQUITE METRO	TX	LPV	1	99.947	1	99.947	3	99.9

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HRL	VALLEY INTL	TX	LPV200	2	99.926	2	99.875	5	99.8
HRX	HEREFORD MUNICIPAL	TX	LPV200	1	99.996	3	99.983	7	99.887
HYI	SAN MARCOS RGNL	TX	LPV200	2	99.944	1	99.889	3	99.828
IAH	GEORGE BUSH INTCNTL/HOUSTON	TX	LPV200	2	99.897	2	99.897	2	99.871
IKG	KLEBERG COUNTY	TX	LPV	2	99.928	1	99.883	4	99.823
ILE	SKYLARK FLD	TX	LPV200	2	99.968	2	99.93	3	99.853
INJ	HILLSBORO MUNICIPAL	TX	LPV	1	99.946	3	99.937	3	99.873
INK	WINKLER COUNTY	TX	LPV200	3	99.963	5	99.929	7	99.796
IWS	WEST HOUSTON	TX	LP	2	99.893	2	99.893	3	99.87
JAS	JASPER COUNTY/BELL FLD	TX	LPV	2	99.93	2	99.917	1	99.875
JSO	CHEROKEE COUNTY	TX	LPV	1	99.937	2	99.914	2	99.875
JWY	MID-WAY RGNL	TX	LPV200	1	99.949	1	99.949	3	99.889
JXI	FOX STEPHENS FLD - GILMER MUNICIPAL	TX	LP	1	99.939	2	99.936	2	99.907
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	1	99.996	2	99.974	8	99.863
LBX	TEXAS GULF COAST RGNL	TX	LPV	2	99.893	2	99.893	4	99.851
LFK	ANGELINA COUNTY	TX	LPV	2	99.922	2	99.91	1	99.878
LHB	HEARNE MUNICIPAL	TX	LPV200	1	99.931	2	99.898	3	99.871
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	1	99.996	2	99.985	7	99.858
LLN	LEVELLAND MUNICIPAL	TX	LPV	2	99.995	3	99.985	7	99.852
LNC	LANCASTER RGNL	TX	LPV200	1	99.947	1	99.947	3	99.896
LRD	LAREDO INTL	TX	LPV200	2	99.97	3	99.894	3	99.794
LUD	DECATUR MUNICIPAL	TX	LPV	1	99.974	1	99.974	4	99.959
LUV	LAMESA MUNICIPAL	TX	LPV200	2	99.977	3	99.959	8	99.829
LVJ	PEARLAND RGNL	TX	LPV	2	99.893	2	99.893	3	99.856
LXY	MEXIA-LIMESTONE COUNTY	TX	LP	1	99.942	3	99.914	3	99.871
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	2	99.957	4	99.927	6	99.799
MDD	MIDLAND AIRPARK	TX	LPV	2	99.959	4	99.93	7	99.812
MFE	MC ALLEN MILLER INTL	TX	LPV200	2	99.937	2	99.886	6	99.806
MKN	COMANCHE COUNTY-CITY	TX	LPV	1	99.971	2	99.952	3	99.874
MNZ	HAMILTON MUNICIPAL	TX	LPV	1	99.971	3	99.947	3	99.858
MWL	MINERAL WELLS RGNL	TX	LPV200	1	99.971	2	99.968	3	99.907
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	1	99.937	2	99.913	1	99.878

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ODO	ODESSA-SCHLEMEYER FLD	TX	LPV200	2	99.953	4	99.926	6	99.796
ONY	OLNEY MUNICIPAL	TX	LPV	1	99.974	1	99.974	3	99.954
ORG	ORANGE COUNTY	TX	LPV	2	99.911	2	99.907	1	99.875
PEQ	PECOS MUNICIPAL	TX	LPV200	3	99.954	4	99.919	6	99.778
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	2	99.917	2	99.876	4	99.799
PKV	CALHOUN COUNTY	TX	LPV	2	99.901	1	99.878	3	99.838
PPA	PERRY LEFORS FLD	TX	LPV	1	99.992	1	99.992	6	99.909
PRX	COX FLD	TX	LPV	1	99.961	1	99.961	1	99.946
PSX	PALACIOS MUNICIPAL	TX	LPV	2	99.893	1	99.878	3	99.838
PVW	HALE COUNTY	TX	LPV	1	99.993	2	99.973	5	99.869
PWG	MC GREGOR EXEC	TX	LPV	1	99.944	2	99.915	3	99.867
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	1	99.991	2	99.963	5	99.898
RAS	MUSTANG BEACH	TX	LPV	2	99.915	1	99.881	4	99.828
RBD	DALLAS EXEC	TX	LPV200	1	99.948	1	99.948	3	99.9
RBO	NUECES COUNTY	TX	LPV	2	99.929	1	99.883	4	99.828
RKP	ARANSAS COUNTY	TX	LPV	2	99.916	1	99.883	3	99.831
RYW	LAGO VISTA TX/RUSTY ALLEN	TX	LPV	1	99.971	4	99.942	3	99.848
SAT	SAN ANTONIO INTL	TX	LPV200	2	99.969	3	99.915	4	99.821
SGR	SUGAR LAND RGNL	TX	LPV200	2	99.893	2	99.893	3	99.865
SJT	SAN ANGELO RGNL/MATHIS FLD	TX	LPV	2	99.971	3	99.946	5	99.839
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV	1	99.95	1	99.95	2	99.933
SNK	WINSTON FLD	TX	LPV200	1	99.986	3	99.964	9	99.894
SWI	SHERMAN MUNICIPAL	TX	LP	1	99.974	1	99.974	2	99.971
SWW	AVENGER FLD	TX	LPV	1	99.993	3	99.971	8	99.907
T23	ALBANY MUNICIPAL	TX	LPV	1	99.975	2	99.956	5	99.914
T41	LA PORTE MUNICIPAL	TX	LPV	2	99.894	2	99.894	3	99.871
T74	TAYLOR MUNICIPAL	TX	LPV	1	99.944	2	99.904	3	99.858
T78	LIBERTY MUNICIPAL	TX	LP	2	99.902	2	99.897	2	99.874
T82	GILLESPIE COUNTY	TX	LPV	2	99.97	4	99.944	3	99.801
TDW	TRADEWIND	TX	LPV	1	99.995	2	99.977	4	99.884
TFP	MCCAMPBELL-PORTER	TX	LPV	2	99.921	1	99.881	4	99.829
TKI	MCKINNEY NTL	TX	LPV200	1	99.957	1	99.957	4	99.937
TME	HOUSTON EXEC	TX	LPV	2	99.893	2	99.893	3	99.868
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	1	99.944	2	99.908	3	99.862
TRL	TERRELL MUNICIPAL	TX	LPV	1	99.944	1	99.944	4	99.904

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TX2	CHASE FLD INDUSTRIAL	TX	LPV	1	99.929	2	99.884	3	99.834
TXW	MID VALLEY	TX	LPV	2	99.937	2	99.884	5	99.796
TYR	TYLER POUNDS RGNL	TX	LPV200	1	99.937	2	99.922	3	99.898
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	2	99.898	2	99.897	3	99.874
VCT	VICTORIA RGNL	TX	LPV200	2	99.919	1	99.885	3	99.834
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	1	99.971	1	99.971	4	99.955
41U	MANTI-EPHRAIM	UT	LPV	3	99.921	2	99.868	3	99.797
74V	ROOSEVELT MUNICIPAL	UT	LPV	3	99.923	2	99.865	4	99.802
BCE	BRYCE CANYON	UT	LPV	1	99.881	2	99.878	4	99.755
BDG	BLANDING MUNICIPAL	UT	LPV	1	99.885	3	99.863	5	99.758
BMC	BRIGHAM CITY RGNL	UT	LP	4	99.924	2	99.839	3	99.734
CDC	CEDAR CITY RGNL	UT	LPV	1	99.878	1	99.876	5	99.752
CNY	CANYONLANDS RGNL	UT	LP	2	99.892	2	99.869	5	99.793
DTA	DELTA MUNICIPAL	UT	LP	1	99.889	2	99.874	3	99.796
ENV	WENDOVER	UT	LPV	1	99.889	2	99.856	5	99.778
FOM	FILLMORE MUNICIPAL	UT	LPV	1	99.885	2	99.872	3	99.799
LGU	LOGAN-CACHE	UT	LPV	4	99.922	3	99.821	3	99.731
OGD	OGDEN-HINCKLEY	UT	LPV	3	99.925	2	99.841	4	99.753
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	3	99.923	2	99.869	3	99.812
PVU	PROVO MUNICIPAL	UT	LPV200	1	99.907	2	99.868	3	99.807
RIF	RICHFIELD MUNICIPAL	UT	LP	1	99.885	2	99.871	5	99.786
SGU	ST GEORGE RGNL	UT	LPV	1	99.881	2	99.876	7	99.75
SLC	SALT LAKE CITY INTL	UT	LPV200	3	99.924	2	99.857	5	99.773
SPK	SPANISH FORK MUNICIPAL/WOODHOUSE FL	UT	LP	1	99.907	2	99.868	3	99.807
TVY	BOLINDER FLD-TOOELE VALLEY	UT	LPV200	1	99.912	2	99.863	4	99.785
U14	NEPHI MUNICIPAL	UT	LPV	2	99.905	2	99.87	3	99.799
U42	SOUTH VALLEY RGNL	UT	LPV	2	99.927	2	99.862	4	99.788
U55	PANGUITCH MUNICIPAL	UT	LPV200	1	99.881	1	99.878	4	99.748
VEL	VERNAL RGNL	UT	LPV	4	99.936	2	99.861	5	99.796
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	1	99.935	1	99.925	4	99.9
0VG	LEE COUNTY	VA	LPV	1	99.948	1	99.922	2	99.907
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	1	99.937	1	99.927	3	99.866

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BCB	VIRGINIA TECH/MONTGOMERY EXEC	VA	LPV	1	99.936	1	99.924	3	99.903
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	1	99.936	1	99.925	3	99.83
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	1	99.933	2	99.92	3	99.82
CJR	CULPEPER RGNL	VA	LPV	1	99.937	2	99.882	3	99.819
CPK	CHESAPEAKE RGNL	VA	LPV200	1	99.944	1	99.927	3	99.831
DAN	DANVILLE RGNL	VA	LPV200	1	99.937	1	99.927	2	99.919
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	1	99.941	1	99.927	3	99.833
FCI	RICHMOND EXEC/CHESTERFIELD COU	VA	LPV	1	99.933	1	99.924	3	99.822
FKN	FRANKLIN RGNL	VA	LPV	1	99.944	1	99.927	3	99.831
FVX	FARMVILLE RGNL	VA	LPV	1	99.933	1	99.924	3	99.829
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	1	99.942	3	99.902	3	99.816
HLX	TWIN COUNTY	VA	LPV	1	99.937	1	99.925	2	99.91
HSP	INGALLS FLD	VA	LPV	1	99.933	1	99.922	5	99.887
HWY	WARRENTON/FAUQUIER	VA	LPV200	1	99.937	2	99.881	3	99.808
JFZ	TAZEWELL COUNTY	VA	LPV	1	99.937	1	99.912	1	99.911
JYO	LEESBURG EXEC	VA	LPV	1	99.937	2	99.876	2	99.789
LKU	LOUISA COUNTY/FREEMAN FLD	VA	LPV	1	99.933	2	99.92	3	99.82
LNP	LONESOME PINE	VA	LPV	1	99.939	1	99.913	2	99.905
LUA	LURAY CAVERNS	VA	LP	1	99.933	2	99.918	3	99.809
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	1	99.933	1	99.924	5	99.898
MFV	ACCOMACK COUNTY	VA	LPV	1	99.943	3	99.873	3	99.808
MKJ	MOUNTAIN EMPIRE	VA	LPV	1	99.937	1	99.914	1	99.911
MTV	BLUE RIDGE	VA	LPV	1	99.937	1	99.927	2	99.908
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	1	99.933	3	99.907	3	99.82
OKV	WINCHESTER RGNL	VA	LPV200	1	99.937	2	99.881	2	99.795
ORF	NORFOLK INTL	VA	LPV200	1	99.933	3	99.915	3	99.825
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	1	99.943	3	99.913	3	99.822
PSK	NEW RIVER VALLEY	VA	LPV200	1	99.937	1	99.924	3	99.909
PTB	DINWIDDIE COUNTY	VA	LPV	1	99.935	1	99.925	3	99.828
PVG	HAMPTON ROADS EXEC	VA	LPV200	1	99.944	1	99.927	3	99.826
RIC	RICHMOND INTL	VA	LPV200	1	99.933	2	99.912	3	99.82
RMN	STAFFORD RGNL	VA	LPV	1	99.937	2	99.882	3	99.809

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ROA	ROANOKE/BLACKSBURG RGNL (WOODR	VA	LPV	1	99.934	1	99.923	4	99.9
SFQ	SUFFOLK EXEC	VA	LPV	1	99.944	1	99.927	3	99.831
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	1	99.933	2	99.921	4	99.831
VJI	VIRGINIA HIGHLANDS	VA	LPV	1	99.939	1	99.914	1	99.911
W78	WILLIAM M TUCK	VA	LPV	1	99.937	1	99.927	4	99.915
W96	NEW KENT COUNTY	VA	LP	1	99.942	3	99.909	3	99.82
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	2	99.932	3	99.868	3	99.796
XSA	TAPPAHANNOCK/ESSEX COUNTY	VA	LPV	1	99.933	2	99.885	3	99.816
BTV	BURLINGTON INTL	VT	LPV200	3	99.81	3	99.779	4	99.738
EFK	NORTHEAST KINGDOM INTL	VT	LP	2	99.786	3	99.778	7	99.709
FSO	FRANKLIN COUNTY STATE	VT	LPV	2	99.789	3	99.776	6	99.726
MPV	EDWARD F KNAPP STATE	VT	LPV	3	99.811	3	99.787	4	99.738
MVL	MORRISVILLE-STOWE STATE	VT	LPV	3	99.805	3	99.785	6	99.731
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	3	99.811	2	99.785	3	99.73
ALW	WALLA WALLA RGNL	WA	LPV200	3	99.817	5	99.787	10	99.574
AWO	ARLINGTON MUNICIPAL	WA	LPV200	3	99.795	8	99.718	11	99.443
BLI	BELLINGHAM INTL	WA	LPV200	3	99.789	5	99.713	16	99.369
BVS	SKAGIT RGNL	WA	LPV	3	99.792	8	99.717	15	99.386
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	3	99.797	9	99.682	12	99.416
CLS	CHEHALIS-CENTRALIA	WA	LPV	2	99.738	4	99.695	13	99.49
DEW	DEER PARK	WA	LPV	3	99.852	5	99.807	14	99.598
EPH	EPHRATA MUNICIPAL	WA	LPV	2	99.816	8	99.771	16	99.563
FHR	FRIDAY HARBOR	WA	LPV	3	99.792	9	99.709	16	99.384
GEG	SPOKANE INTL	WA	LPV200	2	99.86	6	99.803	12	99.595
HQM	BOWERMAN	WA	LPV200	2	99.737	6	99.689	11	99.405
KLS	SOUTHWEST WASHINGTON RGNL	WA	LPV	2	99.737	4	99.701	10	99.498
MWH	GRANT COUNTY INTL	WA	LPV200	2	99.816	7	99.775	16	99.569
OLM	OLYMPIA RGNL	WA	LPV200	3	99.772	5	99.71	10	99.468
ORS	ORCAS ISLAND	WA	LP	3	99.79	7	99.708	16	99.375
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	3	99.8	6	99.725	10	99.457
PLU	PIERCE COUNTY - THUN FLD	WA	LPV	3	99.781	5	99.71	10	99.479
PSC	TRI-CITIES	WA	LPV200	3	99.809	6	99.756	10	99.559
PWT	BREMERTON NTL	WA	LPV200	3	99.795	5	99.701	11	99.456

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RLD	RICHLAND	WA	LPV	3	99.809	6	99.752	10	99.559
RNT	RENTON MUNICIPAL	WA	LPV	3	99.799	4	99.709	10	99.464
SEA	SEATTLE-TACOMA INTL	WA	LPV200	3	99.798	4	99.709	10	99.464
SFF	FELTS FLD	WA	LPV	2	99.858	6	99.808	13	99.594
SHN	SANDERSON FLD	WA	LPV	3	99.782	6	99.706	10	99.451
TDO	ED CARLSON MEML FLD - SOUTH LE	WA	LPV	2	99.737	5	99.695	12	99.498
TIW	TACOMA NARROWS	WA	LPV	3	99.783	5	99.709	11	99.46
YKM	YAKIMA AIR TRML/MCALLISTER FLD	WA	LPV200	4	99.798	7	99.744	11	99.547
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	4	99.721	6	99.685	6	99.589
57C	EAST TROY MUNICIPAL	WI	LPV	3	99.817	3	99.751	5	99.697
61C	FORT ATKINSON MUNICIPAL	WI	LP	3	99.799	3	99.745	5	99.692
82C	MAUSTON/NEW LISBON UNION	WI	LP	3	99.766	4	99.709	6	99.666
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	2	99.763	4	99.725	6	99.65
AHH	AMERY MUNICIPAL	WI	LP	5	99.713	6	99.68	6	99.578
AIG	LANGLADE COUNTY	WI	LPV	4	99.719	6	99.677	6	99.569
ARV	LAKELAND/NOBLE F LEE MEML FLD	WI	LPV	5	99.663	7	99.627	7	99.537
ASX	JOHN F KENNEDY MEML	WI	LPV	6	99.611	7	99.56	8	99.481
ATW	APPLETON INTL	WI	LPV200	3	99.753	5	99.713	6	99.619
AUW	WAUSAU DOWNTOWN	WI	LPV200	4	99.721	6	99.688	7	99.6
BCK	BLACK RIVER FALLS AREA	WI	LPV	2	99.756	4	99.715	7	99.639
BUU	BURLINGTON MUNICIPAL	WI	LP	3	99.818	2	99.752	5	99.698
C29	MIDDLETON MUNICIPAL/MOREY FLD	WI	LPV	2	99.775	4	99.739	5	99.688
C35	REEDSBURG MUNICIPAL	WI	LP	2	99.77	4	99.724	5	99.67
C47	PORTAGE MUNICIPAL	WI	LP	2	99.77	4	99.728	5	99.659
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	3	99.744	5	99.694	6	99.613
CMY	SPARTA/FORT MC COY	WI	LPV	2	99.765	4	99.718	6	99.664
CWA	CENTRAL WISCONSIN	WI	LPV200	3	99.73	5	99.695	6	99.616
DLL	BARABOO/WISCONSIN DELLS RGNL	WI	LPV	2	99.77	4	99.725	5	99.66
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	4	99.724	6	99.683	6	99.59
EGV	EAGLE RIVER UNION	WI	LPV	5	99.663	7	99.626	7	99.538
ENW	KENOSHA RGNL	WI	LPV200	2	99.819	2	99.752	5	99.704
ETB	WEST BEND MUNICIPAL	WI	LPV	3	99.788	3	99.733	5	99.679

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EZS	SHAWANO MUNICIPAL	WI	LPV	4	99.741	5	99.692	6	99.61
FLD	FOND DU LAC COUNTY	WI	LPV	2	99.763	4	99.727	6	99.665
GRB	GREEN BAY/AUSTIN STRAUBEL INTL	WI	LPV200	3	99.748	5	99.71	6	99.609
GTG	GRANTSBURG MUNICIPAL	WI	LP	5	99.667	6	99.648	7	99.561
HXF	HARTFORD MUNICIPAL	WI	LPV	3	99.789	3	99.735	5	99.679
HYR	SAWYER COUNTY	WI	LPV	6	99.658	7	99.624	7	99.534
ISW	ALEXANDER FLD SOUTH WOOD COUNT	WI	LPV	3	99.747	4	99.704	6	99.632
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	2	99.819	3	99.751	5	99.696
LNR	TRI-COUNTY RGNL	WI	LPV	2	99.788	4	99.731	5	99.687
LSE	LA CROSSE RGNL	WI	LPV	2	99.766	4	99.721	7	99.668
LUM	MENOMONIE MUNICIPAL/SCORE FLD	WI	LPV	4	99.735	6	99.686	6	99.59
MDZ	TAYLOR COUNTY	WI	LPV	4	99.711	6	99.684	6	99.577
MFI	MARSHFIELD MUNICIPAL	WI	LPV	3	99.742	5	99.697	7	99.625
MKE	GENERAL MITCHELL INTL	WI	LPV200	3	99.802	2	99.746	5	99.695
MRJ	IOWA COUNTY	WI	LPV200	2	99.789	3	99.74	5	99.689
MSN	DANE COUNTY RGNL/TRUAX FLD	WI	LPV200	3	99.79	4	99.736	5	99.687
MTW	MANITOWOC COUNTY	WI	LPV200	3	99.76	5	99.723	7	99.646
MWC	LAWRENCE J TIMMERMAN	WI	LPV	3	99.794	3	99.74	5	99.683
OCQ	OCONTO/J DOUGLAS BAKE MUNICIPAL	WI	LP	4	99.74	5	99.69	6	99.601
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	5	99.707	6	99.68	6	99.58
OSH	WITTMAN RGNL	WI	LPV200	3	99.755	5	99.72	6	99.635
OVS	BOSCOBEL	WI	LPV	2	99.787	4	99.736	5	99.686
PBH	PRICE COUNTY	WI	LPV	5	99.672	7	99.637	6	99.552
PCZ	WAUPACA MUNICIPAL	WI	LPV	3	99.753	4	99.699	6	99.618
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	3	99.811	3	99.75	5	99.695
RAC	BATTEN INTL	WI	LPV	3	99.808	2	99.75	5	99.704
RCX	RUSK COUNTY	WI	LPV	6	99.695	8	99.662	6	99.569
RHI	RHINELANDER/ONEIDA COUNTY	WI	LPV200	5	99.676	7	99.642	6	99.552
RNH	NEW RICHMOND RGNL	WI	LPV	4	99.729	5	99.684	6	99.586
RPD	RICE LAKE RGNL/CARL'S FLD	WI	LPV200	5	99.708	7	99.677	6	99.577
RRL	MERRILL MUNICIPAL	WI	LPV	4	99.713	6	99.684	6	99.569
SBM	SHEBOYGAN COUNTY MEML	WI	LPV200	3	99.778	4	99.732	6	99.672

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
STE	STEVENS POINT MUNICIPAL	WI	LPV	3	99.742	5	99.699	6	99.621
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	4	99.736	6	99.706	6	99.601
SUW	RICHARD I BONG	WI	LP	6	99.617	7	99.555	8	99.466
TKV	TOMAHAWK RGNL	WI	LP	5	99.675	7	99.645	6	99.558
UBE	CUMBERLAND MUNICIPAL	WI	LPV	6	99.696	8	99.666	6	99.574
UES	WAUKESHA COUNTY	WI	LPV200	3	99.799	3	99.745	5	99.687
UNU	DODGE COUNTY	WI	LPV	3	99.786	4	99.731	5	99.678
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	3	99.744	5	99.7	7	99.625
Y50	WAUTOMA MUNICIPAL	WI	LP	3	99.755	4	99.707	6	99.633
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	5	99.688	7	99.656	6	99.556
Y72	BLOYER FLD	WI	LP	2	99.761	4	99.718	6	99.663
3I2	MASON COUNTY	WV	LPV	1	99.933	1	99.911	2	99.871
6L4	LOGAN COUNTY	WV	LPV	1	99.933	1	99.912	2	99.903
BKW	RALEIGH COUNTY MEML	WV	LPV200	1	99.933	1	99.913	3	99.903
BLF	MERCER COUNTY	WV	LPV	1	99.936	1	99.914	3	99.905
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	1	99.922	2	99.92	2	99.816
CRW	WEST VIRGINIA INTL YEAGER	WV	LPV200	1	99.933	1	99.911	3	99.894
HLG	WHEELING OHIO COUNTY	WV	LPV200	1	99.922	2	99.909	3	99.812
HTS	TRI-STATE/MILTON J FERGUSON FL	WV	LPV200	1	99.933	1	99.911	3	99.887
I18	JACKSON COUNTY	WV	LPV200	1	99.933	1	99.911	2	99.869
LWB	GREENBRIER VALLEY	WV	LPV	1	99.933	1	99.922	4	99.898
MGW	MORGANTOWN MUNICIPAL (WALTER L BILL	WV	LPV200	1	99.922	2	99.919	2	99.808
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	1	99.925	2	99.878	2	99.79
PKB	MID-OHIO VALLEY RGNL	WV	LPV	1	99.922	1	99.911	3	99.853
USW	BOGGS FLD	WV	LPV	1	99.933	1	99.911	2	99.866
W22	UPSHUR COUNTY RGNL	WV	LPV	1	99.933	2	99.921	3	99.831
W35	POTOMAC AIRPARK	WV	LP	1	99.924	2	99.878	2	99.79
W99	GRANT COUNTY	WV	LP	1	99.933	2	99.919	2	99.808
BYG	JOHNSON COUNTY	WY	LPV	3	99.878	2	99.856	4	99.777
COD	YELLOWSTONE RGNL	WY	LPV	3	99.876	2	99.86	6	99.784
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	4	99.892	5	99.872	5	99.706

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYS	CHEYENNE RGNL/JERRY OLSON FLD	WY	LPV200	4	99.962	5	99.861	5	99.758
DGW	CONVERSE COUNTY	WY	LPV200	3	99.891	3	99.838	6	99.715
DWX	DIXON	WY	LP	2	99.917	4	99.866	5	99.748
EAN	PHIFER AIRFIELD	WY	LPV200	4	99.915	6	99.884	5	99.729
ECS	MONDELL FLD	WY	LPV	2	99.855	4	99.843	7	99.766
EMM	KEMMERER MUNICIPAL	WY	LPV	3	99.912	3	99.818	3	99.74
EVW	EVANSTON-UINTA COUNTY BURNS FL	WY	LPV	4	99.935	2	99.845	4	99.757
FBR	FORT BRIDGER	WY	LP	4	99.932	3	99.838	4	99.756
GCC	NORTHEAST WYOMING RGNL	WY	LPV	4	99.867	4	99.839	4	99.776
GEY	SOUTH BIG HORN COUNTY	WY	LPV	3	99.88	2	99.857	5	99.768
GUR	CAMP GUERNSEY	WY	LP	3	99.899	3	99.846	6	99.718
HSG	HOT SPRINGS COUNTY	WY	LPV	4	99.869	4	99.828	6	99.723
JAC	JACKSON HOLE	WY	LPV200	4	99.874	3	99.793	4	99.731
LAR	LARAMIE RGNL	WY	LPV	5	99.952	4	99.86	3	99.738
LND	HUNT FLD	WY	LPV	4	99.915	2	99.79	4	99.733
PNA	RALPH WENZ FLD	WY	LPV	4	99.92	2	99.8	3	99.724
POY	POWELL MUNICIPAL	WY	LPV	1	99.863	1	99.859	6	99.754
RIW	CENTRAL WYOMING RGNL	WY	LPV200	4	99.911	2	99.79	4	99.733
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	3	99.928	3	99.836	3	99.741
RWL	RAWLINS MUNICIPAL/HARVEY FLD	WY	LPV	4	99.914	2	99.823	4	99.731
SAA	SHIVELY FLD	WY	LPV	4	99.924	2	99.827	4	99.729
SHR	SHERIDAN COUNTY	WY	LPV	2	99.877	1	99.858	4	99.77
U68	NORTH BIG HORN COUNTY	WY	LPV	1	99.861	1	99.858	6	99.77
W43	HULETT MUNICIPAL	WY	LPV	2	99.812	2	99.8	7	99.756
WRL	WORLAND MUNICIPAL	WY	LPV	4	99.865	3	99.838	4	99.693
CAL4	ALBIAN	AB	LPV	10	99.235	17	98.949	39	98.412
CEA3	OLDS-DIDSBURY	AB	LPV	8	99.667	10	99.566	16	99.229
CEB5	FAIRVIEW	AB	LPV	9	99.368	13	99.151	27	98.664
CEC4	JASPER-HINTON	AB	LP	6	99.49	9	99.402	18	99.076
CEH3	PONOKA (LABRIE FIELD)	AB	LPV	10	99.546	8	99.432	16	99.141
CEH5	RED EARTH CREEK	AB	LP	11	99.329	14	99.101	31	98.61
CEH6	PROVOST	AB	LPV	9	99.543	9	99.433	18	99.13
CEN3	THREE HILLS	AB	LPV	10	99.654	12	99.579	17	99.231
CEN5	COLD LAKE REGIONAL	AB	LPV	9	99.412	12	99.279	20	98.857

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CEQ3	CAMROSE	AB	LPV	7	99.497	8	99.4	15	99.073
CET2	CONKLIN (LEISMER)	AB	LPV	11	99.385	17	99.201	24	98.723
CEV3	VEGREVILLE	AB	LPV	6	99.461	8	99.356	16	99.03
CEW3	ST. PAUL	AB	LPV	6	99.425	12	99.332	16	98.932
CEX3	WETASKIWIN REGIONAL	AB	LPV	7	99.503	7	99.407	14	99.055
CEZ3	COOKING LAKE	AB	LPV	6	99.483	9	99.385	14	99.033
CFB6	JOSEPHBURG	AB	LPV	6	99.468	11	99.361	16	98.994
CFM4	DONNELLY	AB	LPV	7	99.393	13	99.206	22	98.761
CYBF	BONNYVILLE	AB	LPV	7	99.407	12	99.308	20	98.876
CYBW	SPRINGBANK	AB	LPV	7	99.734	11	99.672	17	99.376
CYEG	EDMONTON INTL	AB	LPV200	7	99.502	8	99.387	15	99.045
CYFI	FIREBAG	AB	LPV	10	99.231	18	98.929	37	98.367
CYLB	LAC LA BICHE	AB	LPV	7	99.414	14	99.289	20	98.789
CYLL	LLOYDMINSTER	AB	LPV	9	99.478	9	99.335	19	99.037
CYMM	FORT MCMURRAY	AB	LPV200	11	99.311	19	99.057	33	98.544
CYNR	HORIZON	AB	LPV	10	99.221	17	98.932	38	98.354
CYOD	GROUP CAPTAIN R.W. MCNAIR	AB	LP	9	99.413	11	99.279	20	98.876
CYOJ	HIGH LEVEL	AB	LPV	10	99.152	16	98.879	44	97.991
CYOP	RAINBOW LAKE	AB	LPV	11	99.191	14	98.901	41	98.02
CYPE	PEACE RIVER	AB	LPV	11	99.365	14	99.144	27	98.687
CYPY	FORT CHIPEWYAN	AB	LPV	13	99.128	17	98.792	43	97.721
CYQF	RED DEER REGIONAL	AB	LPV	11	99.617	10	99.491	16	99.186
CYQL	LETHBRIDGE	AB	LPV200	4	99.775	5	99.728	14	99.577
CYQU	GRANDE PRAIRIE	AB	LPV200	6	99.426	14	99.267	22	98.782
CYWM	ATHABASCA	AB	LPV	7	99.439	15	99.268	22	98.807
CYXH	MEDICINE HAT	AB	LPV	4	99.716	7	99.687	13	99.469
CYYC	YYC CALGARY INTL	AB	LPV200	6	99.721	11	99.674	18	99.375
CYZU	WHITECOURT	AB	LPV	7	99.467	8	99.336	18	98.944
CZPC	PINCHER CREEK	AB	LPV	3	99.799	5	99.747	14	99.578
CZVL	VILLENEUVE	AB	LPV	7	99.483	8	99.354	17	98.989
CAJ4	ANAHIM LAKE	BC	LPV	6	99.563	13	99.494	21	99.047
CAJ9	FORT WARE	BC	LP	12	99.276	19	99.024	37	98.367
CAU4	VANDERHOOF	BC	LPV	9	99.495	11	99.335	25	98.935
CBN9	TSAY KEH	BC	LP	13	99.293	19	99.068	30	98.487
CBW4	BOB QUINN LAKE	BC	LP	11	99.354	20	99.098	29	98.54
CYBL	CAMPBELL RIVER	BC	LPV	3	99.804	8	99.696	16	99.253
CYCD	NANAIMO	BC	LPV	3	99.789	7	99.702	16	99.33

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYCZ	FAIRMONT HOT SPRINGS	BC	LPV	4	99.79	7	99.748	15	99.451
CYDL	DEASE LAKE	BC	LP	11	99.255	19	98.951	36	98.24
CYDQ	DAWSON CREEK	BC	LPV	7	99.388	13	99.184	24	98.715
CYKA	KAMLOOPS	BC	LPV	5	99.784	7	99.707	18	99.341
CYLW	KELOWNA	BC	LPV	2	99.82	6	99.763	22	99.415
CYPK	PITT MEADOWS	BC	LPV	3	99.798	5	99.73	18	99.338
CYPR	PRINCE RUPERT	BC	LPV	9	99.513	13	99.341	29	98.98
CYQQ	COMOX	BC	LPV200	3	99.804	8	99.702	16	99.272
CYQZ	QUESNEL	BC	LPV	5	99.531	11	99.443	23	99.108
CYVR	VANCOUVER INTL	BC	LPV200	3	99.796	7	99.711	17	99.327
CYWL	WILLIAMS LAKE	BC	LPV	8	99.64	11	99.5	20	99.143
CYXJ	FORT ST. JOHN	BC	LPV200	9	99.345	15	99.134	26	98.607
CYXS	PRINCE GEORGE	BC	LPV200	6	99.5	10	99.34	24	98.961
CYXT	TERRACE	BC	LPV	9	99.508	16	99.356	28	98.905
CYXX	ABBOTSFORD	BC	LPV	3	99.791	5	99.725	17	99.36
CYYD	SMITHERS	BC	LPV	11	99.485	15	99.332	28	98.865
CYYE	FORT NELSON	BC	LPV200	9	99.162	16	98.871	48	97.888
CYYF	PENTICTON	BC	LPV	2	99.823	8	99.772	19	99.432
CYYJ	VICTORIA INTL	BC	LPV200	3	99.791	8	99.683	15	99.356
CYZP	SANDSPIT	BC	LPV	10	99.588	11	99.41	24	99.007
CYZT	PORT HARDY	BC	LPV	5	99.782	14	99.666	17	99.169
CZBB	BOUNDARY BAY	BC	LPV	3	99.791	6	99.711	17	99.356
CJA3	MORDEN REGIONAL	MB	LPV	7	99.613	9	99.478	10	99.324
CJJ4	DELORAINE	MB	LPV	9	99.599	10	99.527	13	99.352
CJW5	RUSSELL	MB	LPV	11	99.531	10	99.411	15	99.216
CKK7	STEINBACH (SOUTH)	MB	LPV	9	99.574	10	99.463	14	99.307
CKZ7	WINKLER	MB	LPV	7	99.61	9	99.479	10	99.323
CYAV	ST. ANDREWS	MB	LPV	11	99.547	10	99.437	15	99.217
CYBR	BRANDON MUNICIPALCIPALITY	MB	LPV	11	99.571	10	99.437	15	99.267
CYFO	FLIN FLON	MB	LPV	9	99.29	12	99.213	33	98.689
CYGX	GILLAM	MB	LPV	19	99.162	18	98.951	42	98.207
CYIV	ISLAND LAKE	MB	LPV	11	99.353	16	99.258	25	98.701
CYQD	THE PAS	MB	LPV	9	99.33	13	99.244	29	98.776
CYTH	THOMPSON	MB	LPV200	16	99.228	17	99.077	34	98.361
CYVD	R.J. (BOB) ANDREW FIELD REGIONAL	MB	LPV	8	99.558	11	99.463	13	99.297

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYWG	JAMES ARMSTRONG RICHARDSON INTL	MB	LPV200	10	99.542	9	99.422	14	99.24
CYYQ	CHURCHILL	MB	LPV	28	98.741	29	98.506	91	96.59
CZJG	JENPEG	MB	LPV	11	99.328	15	99.216	32	98.644
CCE3	JUNIPER	NB	LP	4	99.665	4	99.653	9	99.481
CCN2	GRAND MANAN	NB	LPV	3	99.731	4	99.728	8	99.569
CCR3	FLORENCEVILLE	NB	LPV	6	99.706	5	99.677	9	99.523
CDJ4	CLEARWATER	NB	LPV	4	99.661	4	99.65	12	99.476
CYCH	MIRAMICHI	NB	LPV	5	99.642	4	99.619	14	99.427
CYCL	CHARLO	NB	LPV	4	99.618	4	99.618	14	99.391
CYFC	FREDERICTON INTL	NB	LPV	7	99.707	7	99.691	10	99.526
CYQM	GREATER MONCTON ROMEO LEBLANC INTL	NB	LPV200	5	99.655	5	99.638	14	99.473
CYSJ	SAINT JOHN	NB	LPV	6	99.718	7	99.707	11	99.521
CYSL	ST. LEONARD	NB	LPV	5	99.651	5	99.64	11	99.475
CZBF	BATHURST	NB	LPV	4	99.617	4	99.616	14	99.388
CVB2	VOISEY'S BAY	NL	LPV	32	98.276	35	98.167	68	96.436
CYDF	DEER LAKE	NL	LPV200	13	99.303	14	99.282	37	98.449
CYJT	STEPHENVILLE	NL	LPV	13	99.404	14	99.37	31	98.67
CYQX	GANDER INTL	NL	LPV200	16	99.16	31	98.974	107	96.753
CYWK	WABUSH	NL	LPV	23	99.112	22	99.014	39	98.11
CYYR	GOOSE BAY	NL	LPV	26	98.9	29	98.835	58	97.476
CYYT	ST. JOHN'S INTL	NL	LPV	17	99.116	36	98.727	187	95.216
CZUM	CHURCHILL FALLS	NL	LPV	22	98.976	22	98.907	43	97.723
CCQ3	DEBERT	NS	LPV	5	99.667	5	99.65	13	99.412
CYHZ	STANFIELD INTL	NS	LPV200	4	99.69	5	99.661	12	99.431
CYQI	YARMOUTH	NS	LPV	4	99.755	4	99.733	10	99.594
CYQY	J.A. DOUGLAS MCCURDY	NS	LPV200	8	99.553	9	99.548	17	99.138
CYTN	TRENTON	NS	LPV	5	99.641	5	99.626	14	99.358
CYZX	GREENWOOD	NS	LP	4	99.702	5	99.671	11	99.498
CDK2	DIAVIK	NT	LPV	24	98.231	29	97.767	96	95.204
CEU9	SAMBAA K'E	NT	LPV	16	98.968	25	98.725	53	97.512
CGK2	GAHCHO KUE	NT	LPV	22	98.361	29	97.914	86	95.839
CSK6	SNAP LAKE	NT	LPV	23	98.346	28	97.949	89	95.89
CYEV	INUVIK (MIKE ZUBKO)	NT	LPV	22	98.308	32	97.908	91	96.169
CYFR	FORT RESOLUTION	NT	LPV	14	98.844	22	98.512	53	97.16
CYFS	FORT SIMPSON	NT	LPV	19	98.695	29	98.422	59	97.13

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYGH	FORT GOOD HOPE	NT	LPV	19	98.535	34	98.103	89	96.241
CYHY	MERLYN CARTER AIRPORT	NT	LPV	16	98.899	22	98.586	53	97.252
CYJP	FORT PROVIDENCE	NT	LPV	19	98.78	22	98.498	58	97.206
CYKD	FREDDIE CARMICHAEL	NT	LPV	21	98.331	29	97.92	88	96.412
CYOA	EKATI	NT	LPV	24	98.222	30	97.762	100	95.163
CYPC	PAULATUK (NORA ALIQATCHIALUK RUBEN)	NT	LPV	25	98.179	44	97.417	125	94.4
CYSM	FORT SMITH	NT	LPV	17	99.022	19	98.699	58	97.45
CYSY	SACHS HARBOUR (DAVID NASOGALUAK JR. SAARYUAQ)	NT	LPV	27	97.9	57	96.937	156	92.797
CYUB	JAMES GRUBEN	NT	LPV	22	98.247	35	97.787	99	95.701
CYVQ	NORMAN WELLS	NT	LPV	16	98.567	29	98.152	84	96.427
CYWJ	DELINE	NT	LPV	17	98.505	32	98.068	94	96.206
CYZF	YELLOWKNIFE	NT	LPV200	19	98.609	27	98.222	69	96.718
CZFM	FORT MCPHERSON	NT	LPV	21	98.427	31	98.066	79	96.637
CZFN	TULITA	NT	LPV	15	98.573	29	98.157	84	96.559
CMB2	MEADOWBANK	NU	LPV	44	97.524	65	96.746	164	91.056
CMR2	MARY RIVER	NU	LPV	491	88.382	646	79.802	795	54.628
CYBK	BAKER LAKE	NU	LPV	42	97.659	56	96.927	156	91.633
CYCS	CHESTERFIELD INLET	NU	LPV	49	97.557	51	96.983	172	92.201
CYEK	ARVIAT	NU	LPV	39	98.148	44	97.834	117	94.746
CYFB	IQALUIT	NU	LPV200	90	96.008	106	95.264	260	89.128
CYRB	RESOLUTE BAY	NU	LPV	437	90.412	565	82.359	1008	50.084
CYRT	RANKIN INLET	NU	LPV	44	97.787	54	97.146	151	92.811
CYSK	SANIKILUAQ	NU	LPV	25	98.701	29	98.446	68	96.653
CYTE	KINNGAIT AIRPORT	NU	LPV	68	96.387	85	95.79	183	89.986
CYYH	TALOYOAK	NU	LPV	91	96.101	113	94.447	323	83.941
CNV8	EDENVALE	ON	LPV	3	99.824	2	99.77	4	99.702
CNY3	COLLINGWOOD	ON	LPV	3	99.824	2	99.769	4	99.692
CYAC	CAT LAKE	ON	LPV	10	99.415	13	99.366	20	99.052
CYAM	SAULT STE. MARIE	ON	LPV200	8	99.709	8	99.672	6	99.517
CYCC	CORNWALL REGIONAL	ON	LPV	2	99.791	2	99.78	4	99.738
CYCK	CHATHAM-KENT	ON	LPV	2	99.87	3	99.822	2	99.73
CYEE	HURONIA	ON	LPV	2	99.787	2	99.767	5	99.715
CYFA	FORT ALBANY	ON	LPV	11	99.334	12	99.199	25	98.809
CYGK	KINGSTON	ON	LPV	2	99.845	3	99.83	3	99.747
CYHD	DRYDEN REGIONAL	ON	LPV	9	99.515	9	99.442	14	99.253

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYHF	HEARST (RENE FONTAINE) MUNICIPALCIPALITY	ON	LPV	10	99.596	9	99.554	18	99.27
CYHM	HAMILTON	ON	LPV	2	99.857	3	99.811	2	99.735
CYHS	SAUGEEN MUNICIPALCIPALITY	ON	LPV	3	99.827	3	99.795	4	99.712
CYKF	WATERLOO	ON	LPV200	2	99.856	3	99.805	3	99.727
CYKM	KINCARDINE	ON	LPV	4	99.808	2	99.752	4	99.712
CYKZ	BUTTONVILLE MUNICIPALCIPAL	ON	LPV	2	99.842	3	99.799	3	99.738
CYLS	LAKE SIMCOE	ON	LPV	3	99.824	2	99.771	5	99.714
CYMG	MANITOUWADGE	ON	LPV	9	99.538	9	99.523	12	99.329
CYMO	MOOSONEE	ON	LPV	10	99.457	13	99.363	20	98.966
CYOO	OSHAWA EXECUTIVE AIRPORT	ON	LPV	3	99.854	4	99.805	2	99.736
CYOS	BILLY BISHOP REGIONAL	ON	LPV	3	99.77	2	99.752	4	99.684
CYOW	MACDONALD-CARTIER INTL	ON	LPV200	2	99.787	2	99.78	4	99.708
CYPL	PICKLE LAKE	ON	LPV	9	99.424	10	99.391	20	99.108
CYPQ	PETERBOROUGH	ON	LPV	3	99.845	3	99.809	2	99.729
CYPT	PELEE ISLAND	ON	LPV	1	99.885	4	99.849	3	99.749
CYQG	WINDSOR	ON	LPV	4	99.868	3	99.789	2	99.73
CYQK	KENORA	ON	LPV	9	99.521	10	99.41	14	99.268
CYQS	ST. THOMAS MUNICIPALCIPALITY	ON	LPV	2	99.86	3	99.82	2	99.741
CYQT	THUNDER BAY	ON	LPV200	8	99.531	8	99.51	13	99.373
CYRL	RED LAKE	ON	LPV	10	99.43	9	99.36	18	99.129
CYSA	STRATFORD MUNICIPALCIPALITY	ON	LPV	2	99.856	3	99.809	3	99.737
CYSB	SUDBURY	ON	LPV	4	99.741	4	99.72	9	99.625
CYSN	NIAGARA DISTRICT	ON	LPV	3	99.869	4	99.807	2	99.731
CYTL	BIG TROUT LAKE	ON	LPV	13	99.341	12	99.22	31	98.662
CYTS	TIMMINS (VICTOR M. POWER)	ON	LPV200	7	99.646	7	99.627	10	99.348
CYTZ	BILLY BISHOP TORONTO CITY AIRPORT	ON	LPV	2	99.855	3	99.803	2	99.736
CYVV	WIARTON	ON	LPV	2	99.757	2	99.753	4	99.68
CYWP	WEBEQUIE	ON	LPV	11	99.344	12	99.238	29	98.792
CYXL	SIOUX LOOKOUT	ON	LPV	10	99.509	9	99.446	16	99.213
CYXR	EARLTON (TIMISKAMING REGIONAL)	ON	LPV	5	99.731	5	99.695	14	99.489
CYXU	LONDON	ON	LPV200	2	99.858	3	99.818	3	99.738
CYYB	NORTH BAY	ON	LPV200	3	99.761	3	99.739	6	99.664

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYYU	KAPUSKASING	ON	LPV	8	99.582	8	99.559	14	99.262
CYYW	ARMSTRONG	ON	LPV	12	99.497	12	99.491	17	99.182
CYYZ	LESTER B. PEARSON INTL	ON	LPV200	2	99.855	3	99.802	3	99.737
CYZD	DOWNSVIEW	ON	LPV	2	99.844	3	99.801	3	99.737
CYZR	SARNIA (CHRIS HADFIELD)	ON	LPV	4	99.854	3	99.787	3	99.726
CZPB	SACHIGO LAKE	ON	LP	12	99.353	16	99.247	26	98.705
CYYG	CHARLOTTETOWN	PE	LPV	4	99.625	4	99.62	13	99.37
CEL8	ELEONORE	QC	LPV	13	99.25	11	99.095	38	98.45
CFX5	RENARD	QC	LPV	14	99.219	17	99.125	35	98.296
CSC3	DRUMMONDVILLE	QC	LPV	2	99.756	2	99.753	7	99.625
CSD4	MONT-LAURIER	QC	LPV	2	99.76	2	99.753	10	99.63
CSF3	POSTE MONTAGNAIS (MILE 134)	QC	LPV	15	99.268	19	99.223	34	98.451
CSH4	LEBEL-SUR-QUEVILLON	QC	LPV	5	99.699	5	99.677	15	99.336
CSR3	VICTORIAVILLE (ANDRE-FORTIN)	QC	LPV	2	99.756	2	99.753	7	99.59
CSU2	CHISASIBI	QC	LPV	12	99.149	12	99.013	48	98.111
CTP9	DONALDSON	QC	LPV	65	97.224	68	96.83	139	93.172
CTT5	LA ROMAINE	QC	LPV	13	99.33	14	99.31	34	98.564
CTU2	FONTANGES	QC	LPV	21	98.937	26	98.821	50	97.522
CYAD	LA GRANDE-3	QC	LPV	14	99.163	14	99.052	48	98.076
CYAH	LA GRANDE-4	QC	LPV	15	99.099	17	99.015	53	97.957
CYAS	KANGIRSUK	QC	LPV	51	97.743	57	97.498	104	94.367
CYBC	BAIE-COMEAU	QC	LPV200	4	99.617	4	99.604	19	99.3
CYBG	BAGOTVILLE	QC	LPV200	5	99.65	5	99.625	13	99.403
CYBX	LOURDES-DE-BLANC-SABLON	QC	LPV	24	99.036	27	98.847	84	97.02
CYEY	MAGNY	QC	LPV	5	99.706	5	99.677	12	99.395
CYFJ	MONT-TREMBLANT	QC	LPV	2	99.763	2	99.753	11	99.626
CYGL	LA GRANDE RIVIERE	QC	LPV	13	99.155	13	99.045	47	98.106
CYGP	GASPE (MICHEL-POULIOT)	QC	LPV	5	99.594	5	99.576	17	99.21
CYGR	ILES-DE-LA-MADELEINE	QC	LPV	7	99.572	7	99.567	17	99.14
CYGV	HAVRE ST-PIERRE	QC	LPV	10	99.458	11	99.435	23	98.87
CYGW	KUUJJUARAPIK	QC	LPV	20	99.034	25	98.809	71	97.33
CYHA	QUAQTAQ	QC	LPV	63	97.251	69	97	124	93.673
CYHH	NEMISCAU	QC	LPV	13	99.465	12	99.347	27	98.755
CYHR	CHEVERY	QC	LPV	14	99.312	18	99.284	40	98.426
CYHU	ST-HUBERT	QC	LPV	2	99.768	2	99.75	7	99.703
CYIF	ST-AUGUSTIN	QC	LPV	18	99.194	23	99.121	48	97.996

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYIK	IVUJIVIK	QC	LPV	57	97.23	58	96.65	139	92.42
CYKG	KANGIQSUJUAQ (WAKEHAM BAY)	QC	LPV	63	97.135	70	96.79	144	93.31
CYKL	SCHEFFERVILLE	QC	LPV	20	98.768	25	98.675	49	97.41
CYKO	AKULIVIK	QC	LPV	56	97.691	56	97.245	114	93.54
CYKQ	WASKAGANISH	QC	LPV	10	99.483	14	99.37	23	98.912
CYLA	AUPALUK	QC	LPV	41	97.805	47	97.633	100	94.846
CYLQ	LA TUQUE	QC	LPV	4	99.73	6	99.715	11	99.491
CYLU	KANGIQSUALUJJUAQ (GEORGES RIVER)	QC	LPV	46	97.9	49	97.633	97	94.777
CYME	RUSSELL-BURNETT	QC	LPV	4	99.611	4	99.61	18	99.343
CYMT	CHAPAIS	QC	LPV	5	99.65	5	99.586	13	99.174
CYMU	UMIUJAQ	QC	LPV	28	98.69	34	98.348	66	96.573
CYMW	MANIWAKI	QC	LPV	2	99.763	2	99.756	7	99.654
CYMX	MONTREAL INTL (MIRABEL)	QC	LPV200	2	99.771	2	99.753	7	99.701
CYNA	NATASHQUAN	QC	LPV	12	99.406	13	99.379	26	98.82
CYNC	WEMINDJI	QC	LPV	11	99.231	12	99.086	38	98.419
CYND	GATINEAU	QC	LPV	2	99.787	2	99.776	5	99.708
CYNM	MATAGAMI	QC	LPV	9	99.646	10	99.587	18	99.191
CYPH	INUKJUAK	QC	LPV	39	98.297	41	97.933	93	95.176
CYPN	PORT-MENIER	QC	LPV	7	99.537	8	99.536	27	99.002
CYPX	PUVIRNITUQ	QC	LPV	49	97.909	47	97.494	114	94.113
CYQB	JEAN LESAGE INTL	QC	LPV200	4	99.736	4	99.71	9	99.558
CYRI	RIVIERE-DU-LOUP	QC	LPV	5	99.654	5	99.643	11	99.429
CYRJ	ROBERVAL	QC	LPV	5	99.65	5	99.625	12	99.395
CYRQ	TROIS-RIVIERES	QC	LPV200	2	99.756	2	99.753	8	99.566
CYSC	SHERBROOKE	QC	LPV	2	99.767	2	99.756	6	99.656
CYSG	ST-GEORGES	QC	LPV	3	99.748	4	99.741	6	99.6
CYTF	ALMA	QC	LPV	5	99.652	5	99.624	13	99.403
CYTQ	TASIUJAQ	QC	LPV	40	98.021	47	97.809	90	95.298
CYUL	PIERRE-ELLIOTT-TRUDEAU INTL	QC	LPV200	2	99.783	3	99.769	7	99.705
CYUY	ROUYN-NORANDA	QC	LPV200	5	99.716	5	99.691	9	99.411
CYVB	BONAVENTURE	QC	LPV	4	99.615	4	99.615	15	99.368
CYVO	VAL-DOR	QC	LPV200	5	99.728	5	99.699	9	99.42
CYVP	KUUJJUAQ	QC	LPV200	41	98.123	44	97.971	91	95.721
CYYY	MONT-JOLI	QC	LPV	4	99.622	4	99.615	15	99.379
CYZG	SALLUIT	QC	LPV	62	97.153	64	96.573	138	92.7

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYZV	SEPT-ILES	QC	LPV200	7	99.527	8	99.526	25	98.973
CCB2	SEABEE MINE	SK	LPV	9	99.273	14	99.106	34	98.454
CJC5	SHAUNAVON	SK	LPV	5	99.686	8	99.653	15	99.429
CJE3	WEYBURN	SK	LPV	7	99.567	12	99.52	12	99.323
CJH3	MAIDSTONE	SK	LPV	8	99.463	9	99.348	20	99.026
CJP9	CHARLOT RIVER	SK	LP	15	99.049	21	98.705	56	97.451
CJQ4	MAPLE CREEK	SK	LPV	5	99.695	7	99.669	15	99.488
CJU4	HUMBOLDT	SK	LPV	9	99.449	11	99.367	15	99.07
CJW7	CIGAR LAKE	SK	LPV	14	99.11	21	98.788	48	97.755
CJY3	TISDALE	SK	LPV	11	99.418	10	99.299	16	98.989
CJZ3	MELFORT (MILLER FIELD)	SK	LPV	10	99.424	11	99.297	17	98.981
CKQ8	MCARTHUR RIVER	SK	LPV	13	99.143	22	98.83	50	97.865
CYBE	URANIUM CITY	SK	LPV	14	99.059	20	98.701	57	97.424
CYBU	NIPAWIN	SK	LPV	11	99.396	10	99.237	19	98.935
CYEN	ESTEVAN REGIONAL	SK	LPV	8	99.593	10	99.535	14	99.376
CYES	EDMUNDSTON	SK	LPV	5	99.647	4	99.622	11	99.455
CYKC	COLLINS BAY	SK	LPV	15	99.091	23	98.769	51	97.647
CYKJ	KEY LAKE	SK	LPV	12	99.184	19	98.884	42	98.039
CYLJ	MEADOW LAKE	SK	LPV	9	99.406	10	99.251	19	98.866
CYMJ	AIR VICE MARSHAL C.M. MCEWEN	SK	LPV200	10	99.594	13	99.545	14	99.329
CYNL	POINTS NORTH LANDING	SK	LPV	17	99.085	22	98.749	50	97.615
CYPA	PRINCE ALBERT (GLASS FIELD)	SK	LPV	10	99.417	12	99.262	21	98.939
CYQR	REGINA INTL	SK	LPV200	9	99.538	12	99.466	14	99.285
CYQV	YORKTON MUNICIPALCIPALITY	SK	LPV	12	99.478	10	99.37	14	99.177
CYQW	NORTH BATTLEFORD	SK	LPV	10	99.5	10	99.353	17	99.017
CYVC	LA RONGE (BARBER FIELD)	SK	LPV	9	99.326	12	99.161	31	98.602
CYXE	JOHN G. DIEFENBAKER INTL	SK	LPV200	11	99.506	12	99.41	15	99.076
CYYN	SWIFT CURRENT	SK	LPV	8	99.65	11	99.589	14	99.348
CYMA	MAYO	YT	LPV	19	98.613	23	98.444	42	97.736
CYOC	OLD CROW	YT	LPV	21	98.432	30	98.182	64	97.139
CYQH	WATSON LAKE	YT	LPV	15	99.13	23	98.809	43	97.798
CYXY	ERIK NIELSEN INTL	YT	LPV200	18	99.064	21	98.821	42	98.072
CYZW	TESLIN	YT	LPV	18	99.128	21	98.839	41	97.906

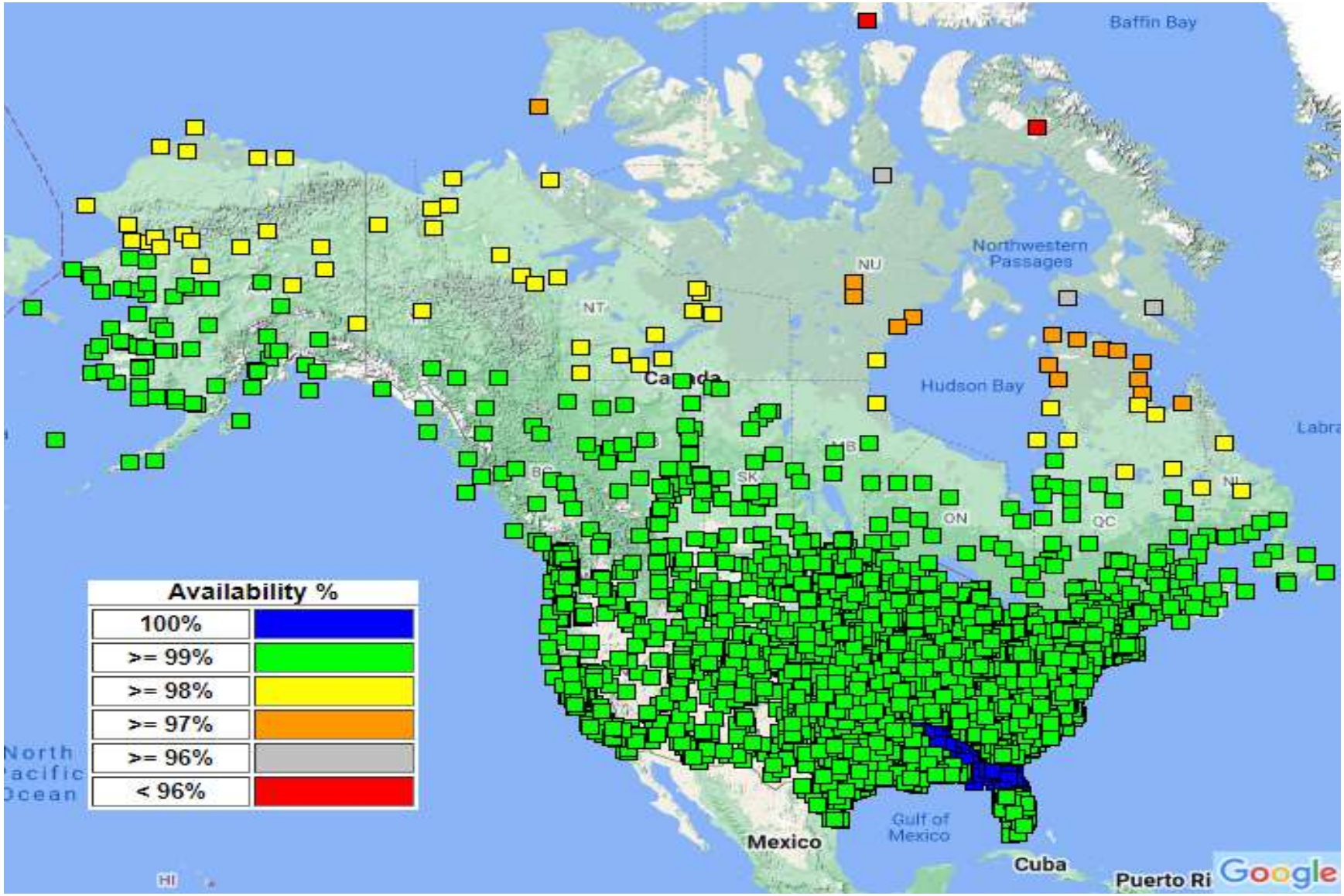

Figure 8-1 WAAS LP Availability at Airports in the U.S. and Canada With GPS RNAV IAPs

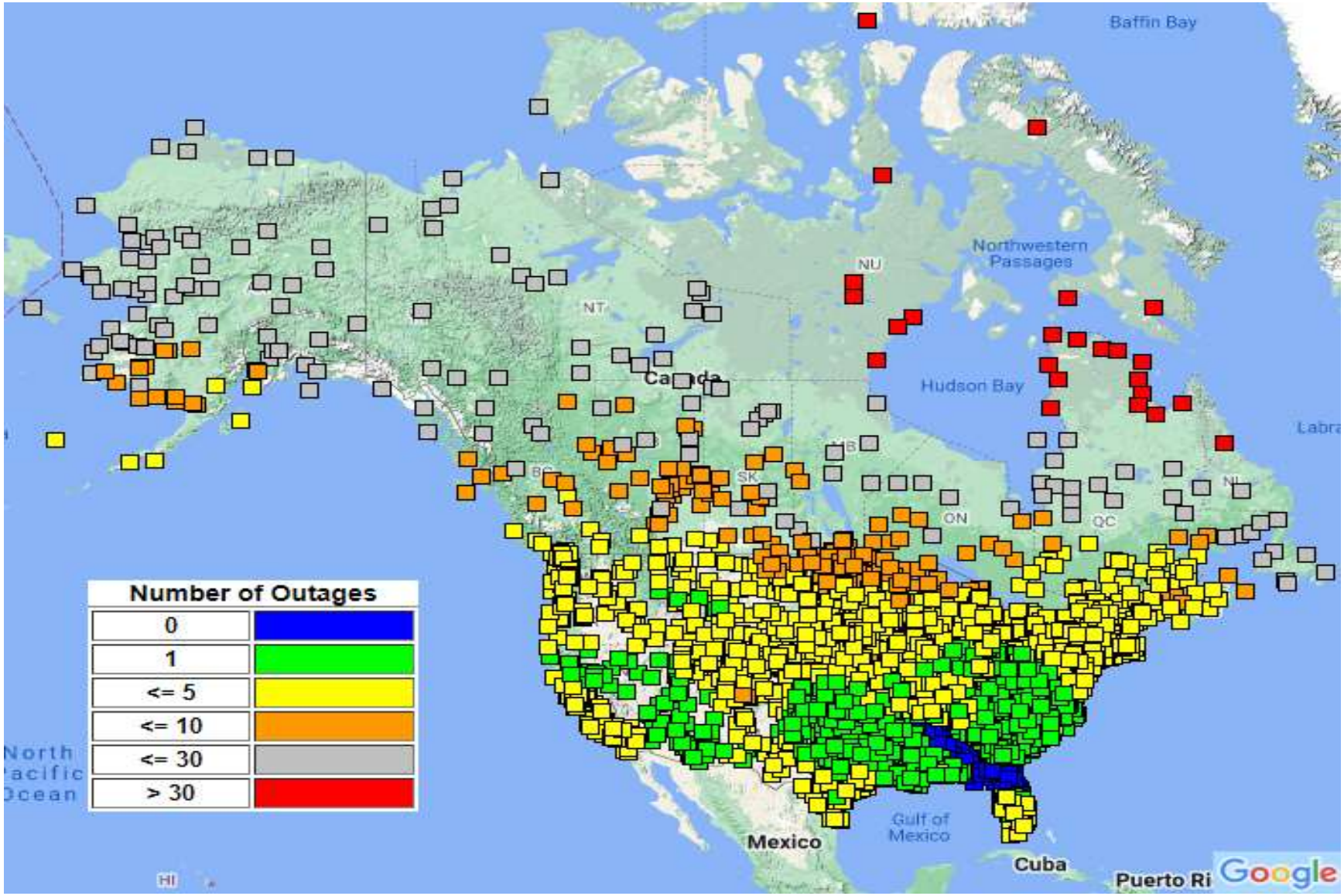

Figure 8-2 WAAS LP Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

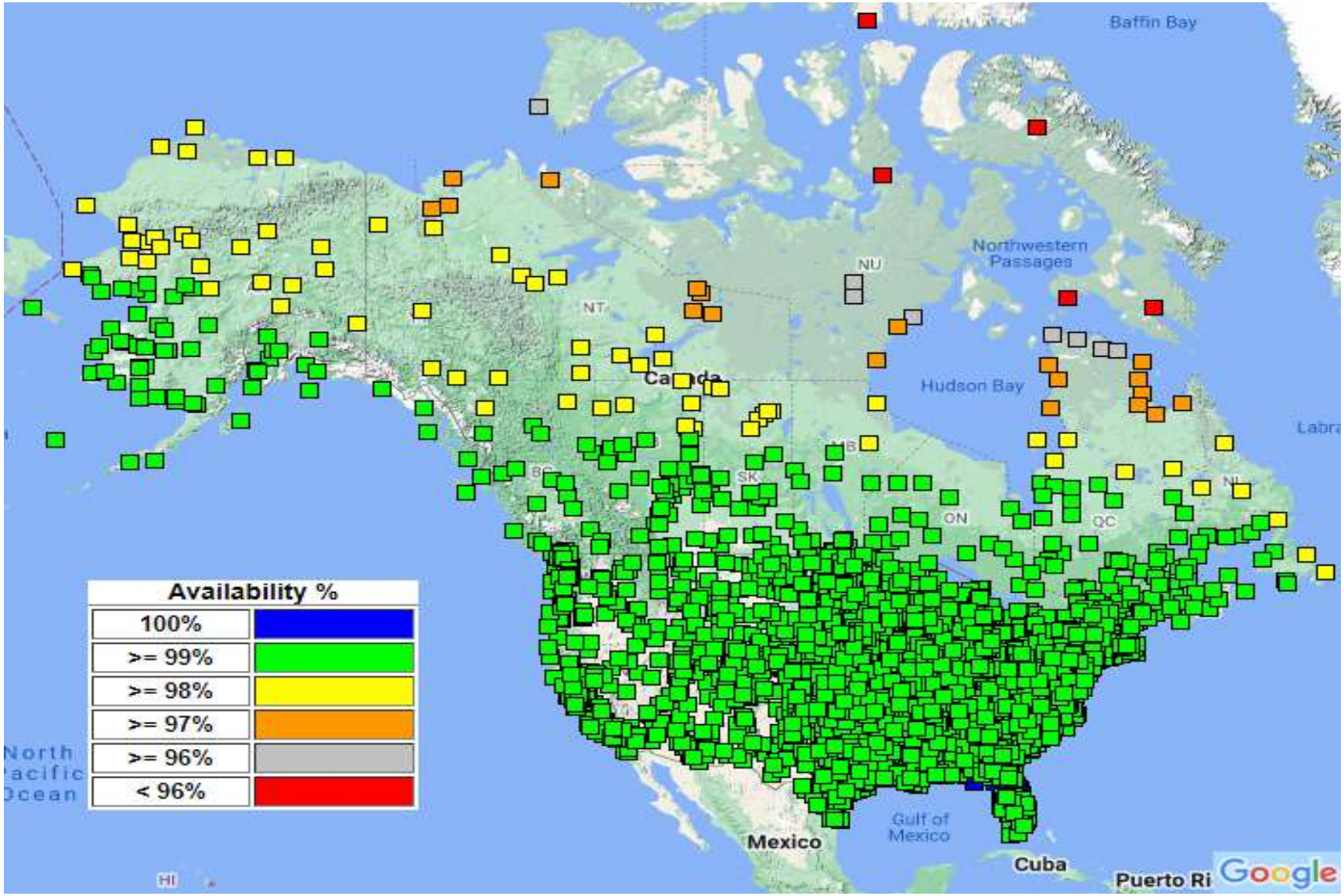

Figure 8-3 WAAS LPV Availability Airports in the U.S. and Canada With GPS RNAV IAPs

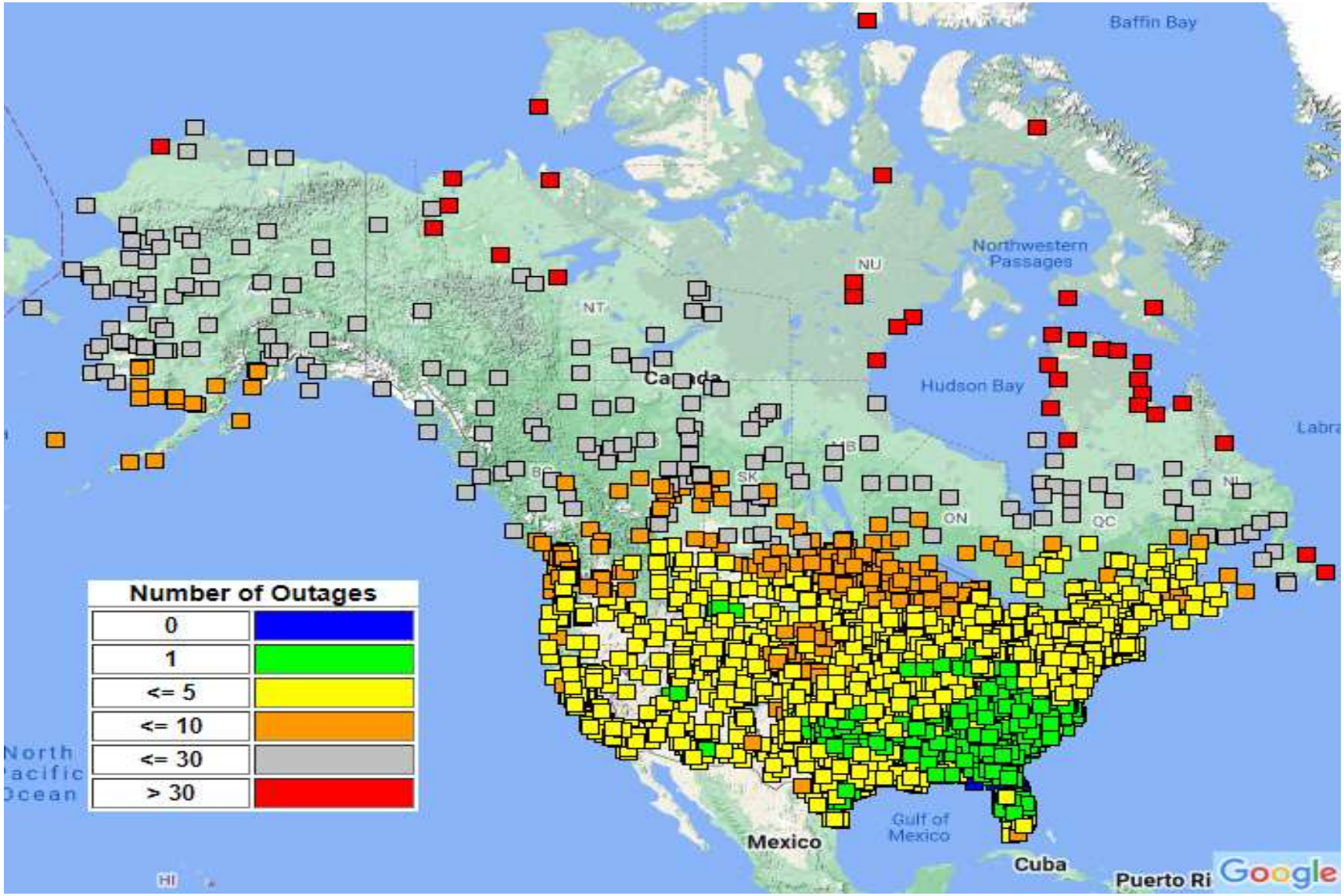

Figure 8-4 WAAS LPV Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

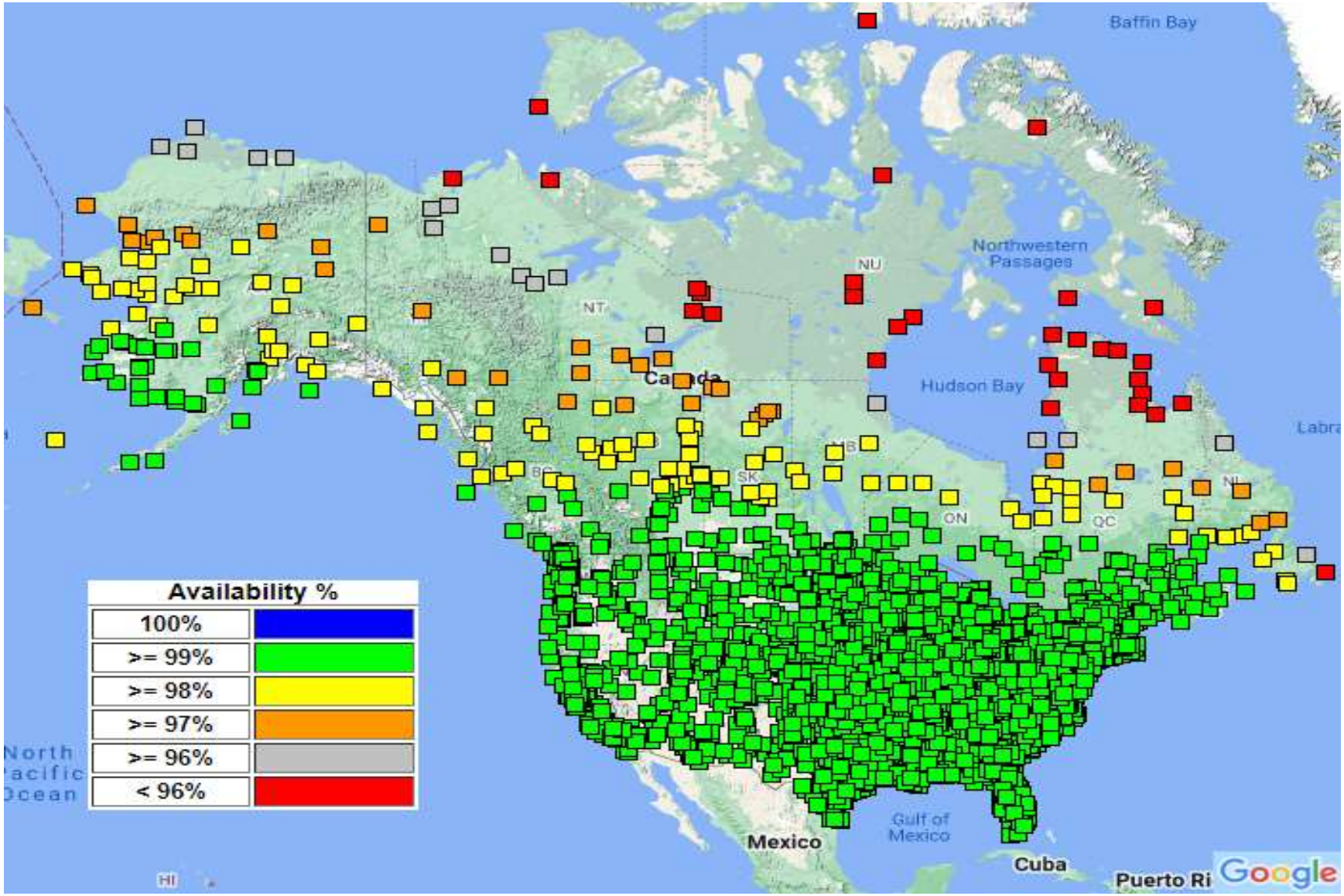

Figure 8-5 WAAS LPV200 Availability at Airports in the U.S. and Canada With GPS RNAV IAPs

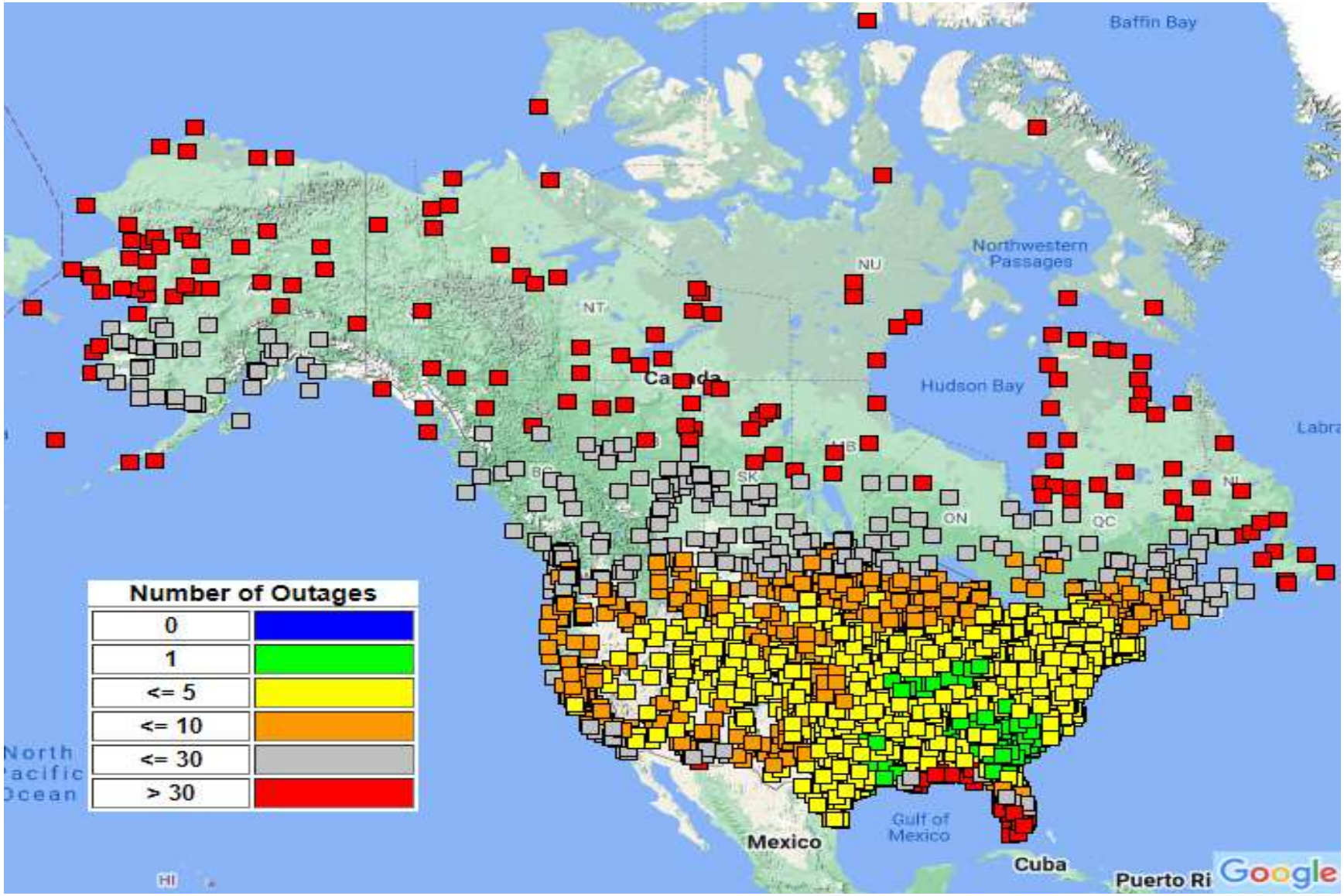

Figure 8-6 WAAS LPV200 Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

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	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 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

WAAS Site	WRE	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 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	•	•	•	•	•	•	•	•	•	•	•	•

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 04/01/2023. Bethel Thread C (BET3), Merida Thread A (MMD1), Mexico City Thread B (MMX2), Tapachula Thread B (MTP2), and Washington, DC. Thread B (ZDC2) are excluded from this since 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 NGS OPUS and the CSRS PPP services. The International GPS Service (IGS) 08 reference frame is used for the OPUS solutions. A value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing of the data.

The OPUS-reported RMS quality metrics were 2.4 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 12.0 mm or less. The OPUS and CSRS surveys agreed to an average of 1.9 cm with a standard deviation of 6.96 mm. The maximum of difference was 3.83 cm Los Angeles Thread B (ZLA2).

The OPUS positions were compared to the positions computed by the WAAS C&Vs. The survey was completed on April 01, 2023. The OPUS surveys agree with the calculated positions to better or equal to 1.69 cm for most sites. The maximum difference was 5.22 cm at Cold Bay Thread C (CBD3).

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	-2965385.248	-972576.663	5543892.781	60.7879134	-161.8417254	52.181
BET2	-2965386.011	-972580.386	5543891.714	60.7878939	-161.8416648	52.17
BET3	N/A	N/A	N/A	N/A	N/A	N/A
BIL1	-1416446.023	-4223577.011	4550862.063	45.803706	-108.5397248	1112.207
BIL2	-1416450.097	-4223574.856	4550862.797	45.8037155	-108.5397833	1112.212
BIL3	-1416441.727	-4223574.268	4550865.93	45.8037559	-108.5396836	1112.215
BRW1	-1886759.134	-809058.705	6018494.389	71.2827629	-156.789926	15.556
BRW2	-1886756.546	-809055.965	6018495.567	71.2827956	-156.7899678	15.562
BRW3	-1886755.457	-809059.743	6018495.389	71.282791	-156.7898589	15.55
CDB1	-3484099.264	-1084748.804	5213678.482	55.1923718	-162.7064054	49.695
CDB2	-3484105.9	-1084741.61	5213675.539	55.1923258	-162.7065442	49.675
CDB3	-3484112.174	-1084734.843	5213672.804	55.1922824	-162.7066749	49.7
FAI1	-2304742.021	-1448715.348	5748843.666	64.8096282	-147.847342	150.009
FAI2	-2304741.566	-1448706.54	5748846.06	64.8096785	-147.8474938	150.017
FAI3	-2304733.045	-1448707.479	5748849.219	64.8097451	-147.8473816	150.017
JNU1	-2354255.161	-2388549.721	5407043.181	58.3625731	-134.5857094	16.283
JNU2	-2354253.082	-2388565.84	5407037.018	58.3624675	-134.5854908	16.292
JNU3	-2354239.864	-2388568.689	5407041.467	58.3625438	-134.5852958	16.277
MMD1	N/A	N/A	N/A	N/A	N/A	N/A
MMD2	35065.402	-5959687.028	2264364.983	20.9319016	-89.662889	29.149
MMD3	35065.064	-5959685.227	2264369.635	20.9319466	-89.6628921	29.127
MMX1	-948700.728	-5943932.776	2109211.747	19.4316539	-99.0683904	2232.586
MMX2	N/A	N/A	N/A	N/A	N/A	N/A
MMX3	-948705.157	-5943932.97	2109209.334	19.4316307	-99.0684318	2232.622
MPR1	-1570142.294	-5759530.584	2238184.736	20.6790032	-105.2492039	10.971
MPR2	-1570139.471	-5759530.093	2238188.778	20.6790412	-105.249179	11.26
MPR3	-1570143.575	-5759527.965	2238190.546	20.6790592	-105.2492224	10.974
MSD1	-1979520.206	-5523222.775	2493107.017	23.1604491	-109.7176535	104.284
MSD2	-1979521.781	-5523225.116	2493100.608	23.1603862	-109.7176602	104.278
MSD3	-1979526.223	-5523221.853	2493104.288	23.1604224	-109.7177118	104.279

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
MTP1	-254854.4	-6162909.129	1617805.086	14.7913663	-92.3679996	54.913
MTP2	N/A	N/A	N/A	N/A	N/A	N/A
MTP3	-254855.546	-6162910.271	1617800.131	14.7913202	-92.3680098	54.797
OTZ1	-2396056.231	-750356.222	5843502.396	66.8873299	-162.611373	10.862
OTZ2	-2396053.061	-750354.395	5843503.915	66.8873647	-162.6113912	10.857
OTZ3	-2396053.039	-750358.33	5843503.431	66.8873535	-162.6113054	10.865
YFB1	1035381.254	-2634289.67	5696539.606	63.7314911	-68.5431873	10.067
YFB2	1035372.041	-2634296.091	5696538.237	63.7314647	-68.5434084	9.993
YFB3	1035365.968	-2634306.85	5696534.462	63.7313871	-68.5436025	10.056
YQX1	2430424.47	-3419640.427	4788223.917	48.966491	-54.5976343	146.899
YQX2	2430432.415	-3419639.076	4788220.86	48.9664492	-54.5975351	146.891
YQX3	2430440.316	-3419637.718	4788217.858	48.9664079	-54.5974364	146.905
YWG1	-520164.584	-4083475.982	4855842.985	49.9005736	-97.2594004	222.102
YWG2	-520150.715	-4083468.923	4855850.378	49.9006766	-97.2592213	222.118
YWG3	-520152.586	-4083478.037	4855842.552	49.9005675	-97.2592312	222.108
YYR1	1885341.241	-3321428.389	5091171.739	53.308648	-60.4194709	37.874
YYR2	1885344.209	-3321419.913	5091176.163	53.3087143	-60.4193694	37.893
YYR3	1885339.928	-3321413.098	5091182.17	53.3088045	-60.4193748	37.906
ZAB1	-1488636.979	-5003946.538	3654557.667	35.1735749	-106.5673512	1620.132
ZAB2	-1488631.645	-5003948.222	3654557.643	35.1735742	-106.5672899	1620.195
ZAB3	-1488632.423	-5003950.807	3654553.79	35.1735318	-106.56729	1620.182
ZAN1	-2659536.791	-1549114.685	5567750.713	61.229201	-149.7802537	80.695
ZAN2	-2659548.546	-1549110.73	5567746.222	61.2291173	-149.7804274	80.69
ZAN3	-2659541.497	-1549106.606	5567750.698	61.2292009	-149.7804277	80.682
ZAU1	138703.959	-4761244.129	4227763.918	41.7826581	-88.3313386	195.866
ZAU2	138704.221	-4761248.747	4227758.758	41.7825957	-88.331337	195.876
ZAU3	138710.925	-4761248.48	4227758.836	41.7825966	-88.3312563	195.874
ZBW1	1490299.059	-4448983.179	4306010.528	42.735721	-71.4804278	39.104
ZBW2	1490304.173	-4448981.172	4306010.876	42.735725	-71.4803608	39.136
ZBW3	1490305.881	-4448984.793	4306006.559	42.7356722	-71.480355	39.126
ZDC1	1069125.605	-4839598.983	4001126.515	39.1015962	-77.5427483	80.039
ZDC2	N/A	N/A	N/A	N/A	N/A	N/A

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZDC3	1069123.905	-4839602.698	4001122.511	39.1015497	-77.5427768	80.044
ZDV1	-1273628.761	-4711375.57	4094890.069	40.1873028	-105.1272261	1541.355
ZDV2	-1273623.058	-4711377.082	4094890.078	40.187303	-105.1271568	1541.339
ZDV3	-1273625.071	-4711380.283	4094885.792	40.1872525	-105.1271698	1541.335
ZFW1	-659983.325	-5324060.775	3438276.446	32.8306495	-97.0664731	155.616
ZFW2	-659988.6	-5324063.329	3438271.453	32.8305961	-97.0665257	155.584
ZFW3	-659983.624	-5324063.859	3438271.66	32.8305981	-97.0664722	155.624
ZHN1	-5508637.207	-2234492.647	2303722.538	21.3129937	-157.9208339	24.655
ZHN2	-5508656.381	-2234482.967	2303687.299	21.3126508	-157.9209898	25.01
ZHN3	-5508647.789	-2234496.9	2303694.374	21.3127193	-157.9208342	25.043
ZHU1	-513864.583	-5506451.622	3166720.421	29.9618963	-95.3314275	10.761
ZHU2	-513867.233	-5506455.02	3166714.257	29.9618318	-95.3314516	10.827
ZHU3	-513873.511	-5506457.66	3166708.659	29.9617735	-95.3315138	10.813
ZJX1	772646.321	-5434462.185	3237231.759	30.6988599	-81.9081864	2.126
ZJX2	772649.653	-5434463.742	3237228.365	30.6988243	-81.9081542	2.122
ZJX3	772645.588	-5434466.171	3237225.255	30.6987917	-81.9081998	2.11
ZKC1	-415247.659	-4954556.385	3982161.094	38.8801592	-94.7908355	305.89
ZKC2	-415231.266	-4954557.707	3982161.149	38.8801599	-94.790646	305.884
ZKC3	-415237.386	-4954561.048	3982155.95	38.8801017	-94.790713	305.611
ZLA1	-2474410.168	-4637294.493	3602183.613	34.603519	-118.0838984	763.533
ZLA2	-2474404.901	-4637297.29	3602183.611	34.6035191	-118.0838334	763.522
ZLA3	-2474411.497	-4637296.981	3602179.637	34.6034751	-118.0838984	763.597
ZLC1	-1808273.37	-4486410.809	4145302.966	40.7860427	-111.9521793	1287.432
ZLC2	-1808274.76	-4486414.434	4145298.47	40.7859892	-111.9521786	1287.434
ZLC3	-1808270.557	-4486416.142	4145298.474	40.7859891	-111.9521248	1287.447
ZMA1	966042.19	-5662999.809	2761581.526	25.8246125	-80.3191909	-7.605
ZMA2	966029.219	-5662999.114	2761586.015	25.8246603	-80.3193172	-8.23
ZMA3	966037.297	-5662997.953	2761586.368	25.8246623	-80.3192358	-7.883
ZME1	4070.752	-5226189.305	3644028.426	35.0673941	-89.9553715	68.611
ZME2	4070.781	-5226186.753	3644032.537	35.0674376	-89.9553712	68.884
ZME3	4064.586	-5226186.629	3644032.695	35.0674395	-89.9554391	68.87
ZMP1	-249978.538	-4539297.489	4458955.001	44.637463	-93.1520875	262.617

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZMP2	-249972.737	-4539297.827	4458955.001	44.6374628	-93.1520142	262.63
ZMP3	-249973.833	-4539302.106	4458950.526	44.6374068	-93.1520251	262.569
ZNY1	1406144.473	-4627343.968	4144322.106	40.7843293	-73.0971675	6.434
ZNY2	1406146.276	-4627347.018	4144317.306	40.7842763	-73.0971575	5.905
ZNY3	1406140.716	-4627348.673	4144317.338	40.7842767	-73.0972263	5.901
ZOA1	-2684437.098	-4293337.187	3865351.95	37.5430549	-122.0159513	-3.5
ZOA2	-2684434.092	-4293341.272	3865349.523	37.5430272	-122.0158979	-3.496
ZOA3	-2684438.468	-4293342.152	3865345.672	37.5429829	-122.0159346	-3.412
ZOB1	650770.028	-4754715.655	4187420.747	41.2971547	-82.2064466	223.651
ZOB2	650777.709	-4754714.831	4187422.765	41.297167	-82.2063544	225.152
ZOB3	650776.036	-4754719.654	4187414.975	41.2970872	-82.2063819	223.43
ZSE1	-2308930.376	-3668169.673	4663526.417	47.2869925	-122.188374	82.091
ZSE2	-2308934.769	-3668175.214	4663520.008	47.286907	-122.1883841	82.151
ZSE3	-2308935.83	-3668179.488	4663516.065	47.2868553	-122.1883659	82.09
ZSU1	2462589.489	-5529372.055	2003724.598	18.4313369	-65.9934761	-28.096
ZSU2	2462587.557	-5529377.426	2003712.308	18.4312198	-65.9935135	-28.073
ZSU3	2462594.184	-5529375.161	2003710.226	18.4312002	-65.9934474	-28.136
ZTL1	529840.276	-5305248.819	3489342.864	33.3796887	-84.2967274	261.14
ZTL2	529846.654	-5305247.976	3489343.149	33.3796919	-84.2966583	261.125
ZTL3	529847.336	-5305251.413	3489337.913	33.3796352	-84.2966546	261.157

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 show the OPUS survey's overall RMS quality indications.

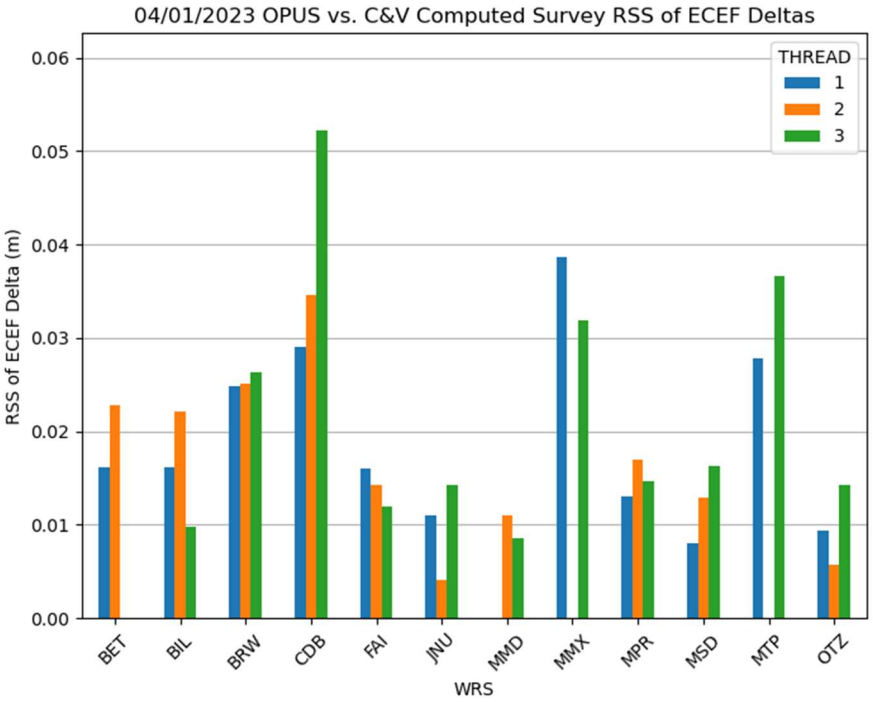

Figure 10-1 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

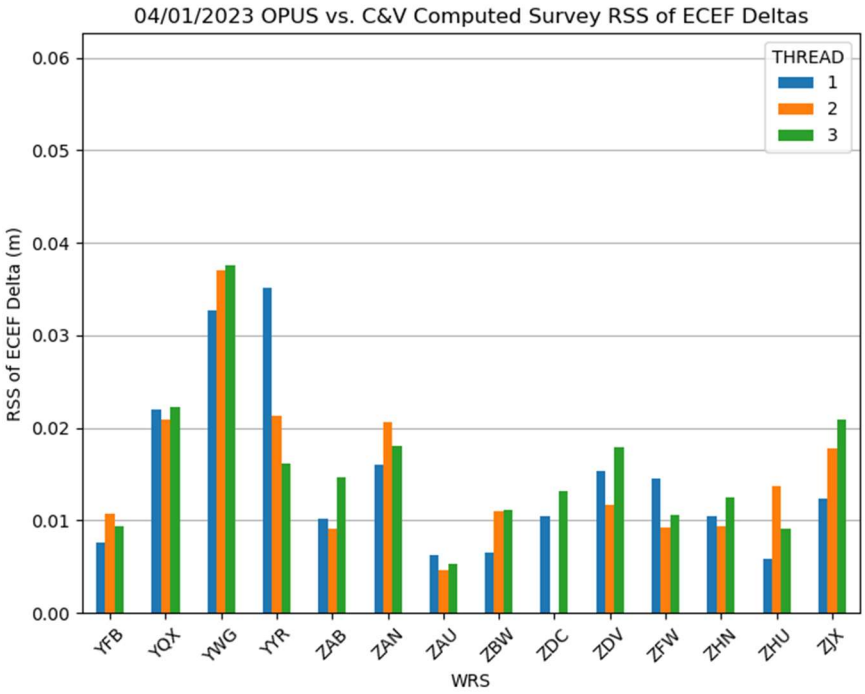

Figure 10-2 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

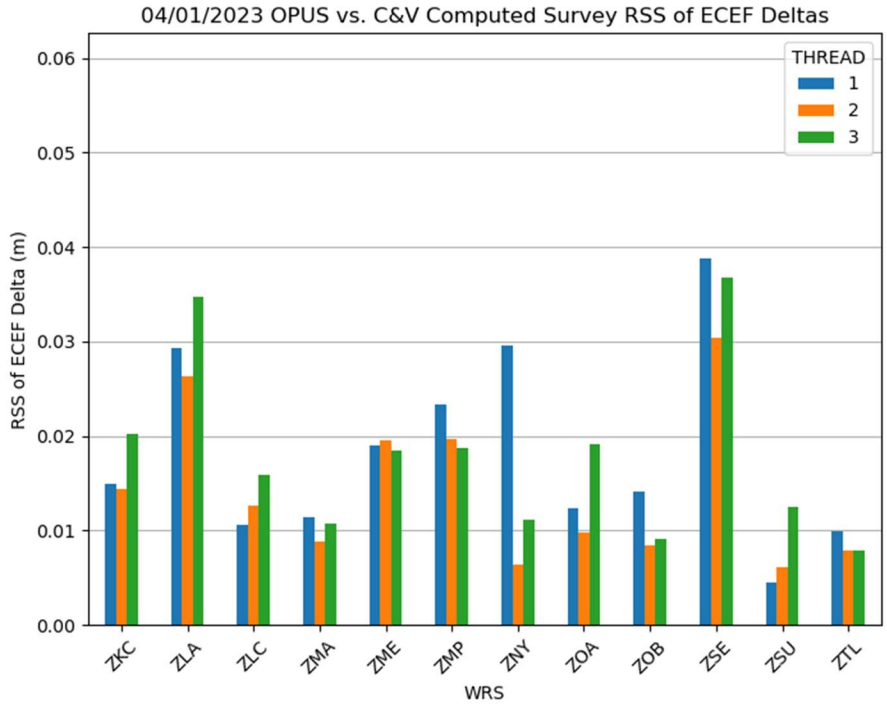

Figure 10-3 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

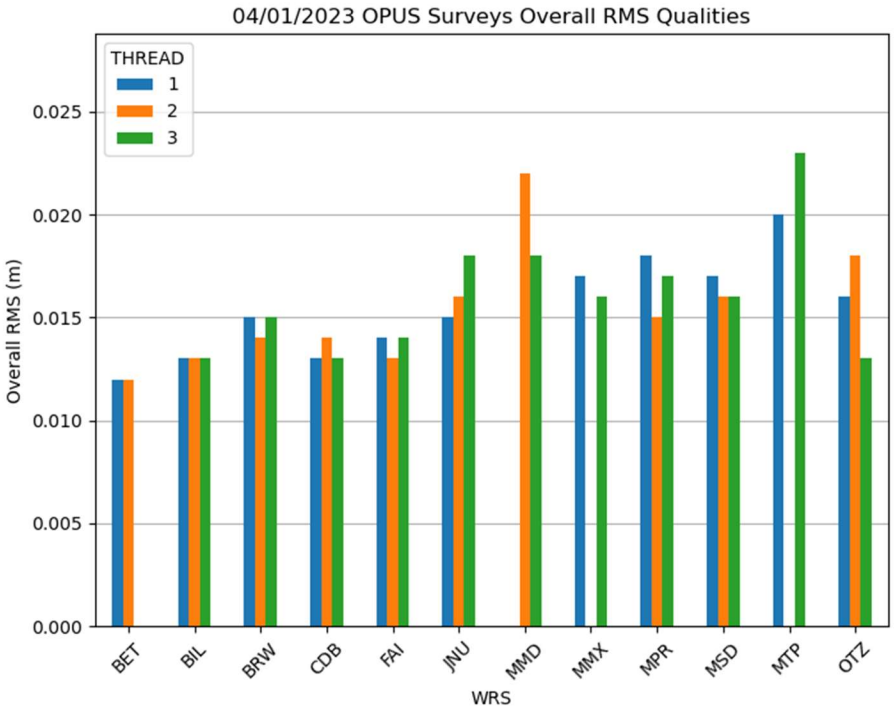

Figure 10-4 OPUS Survey Overall RMS Qualities

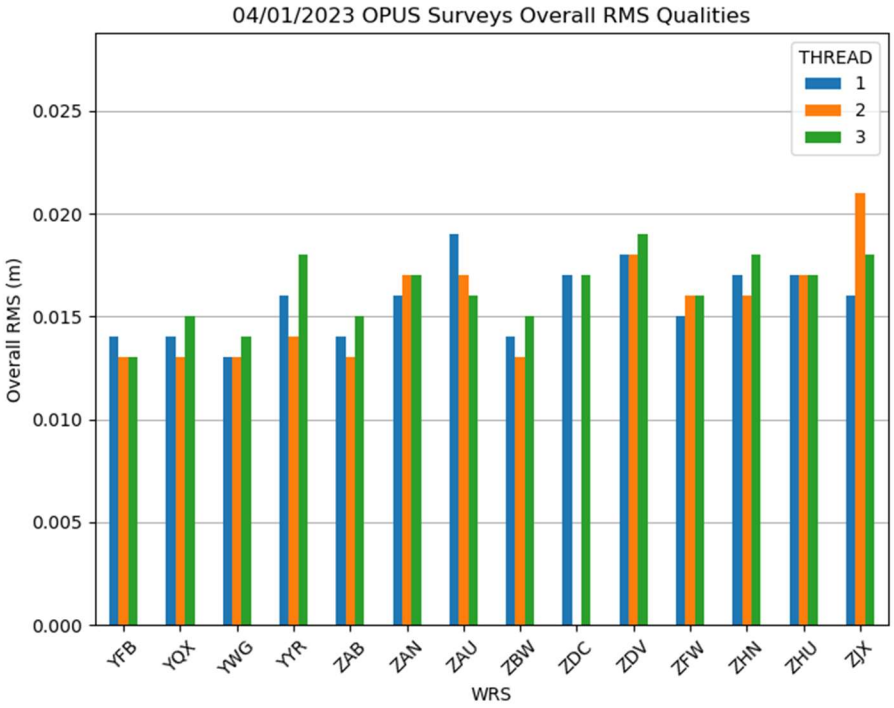

Figure 10-5 OPUS Survey Overall RMS Qualities

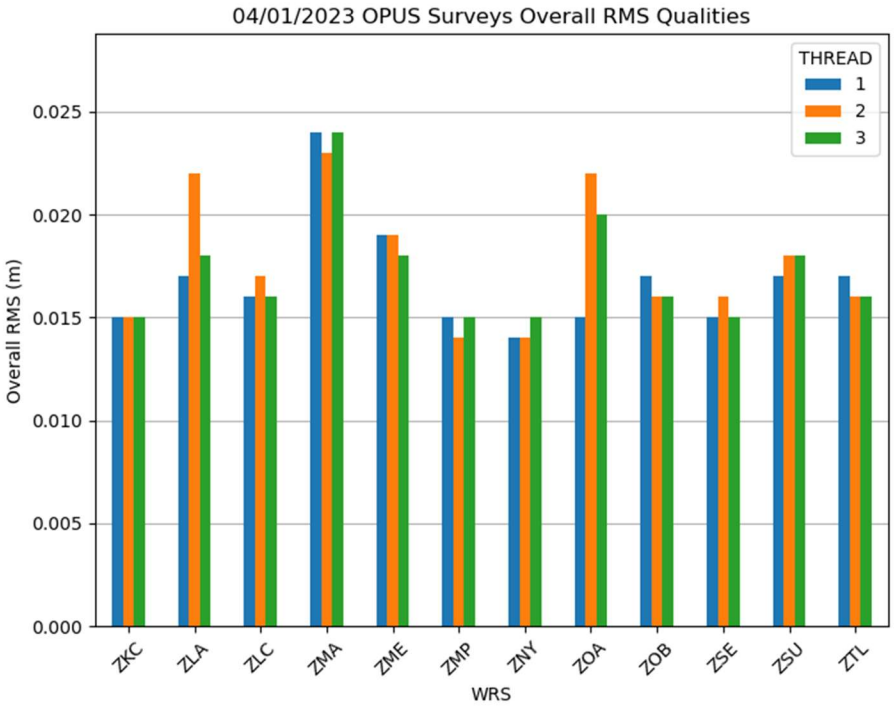

Figure 10-6 OPUS Survey Overall RMS Qualities

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.

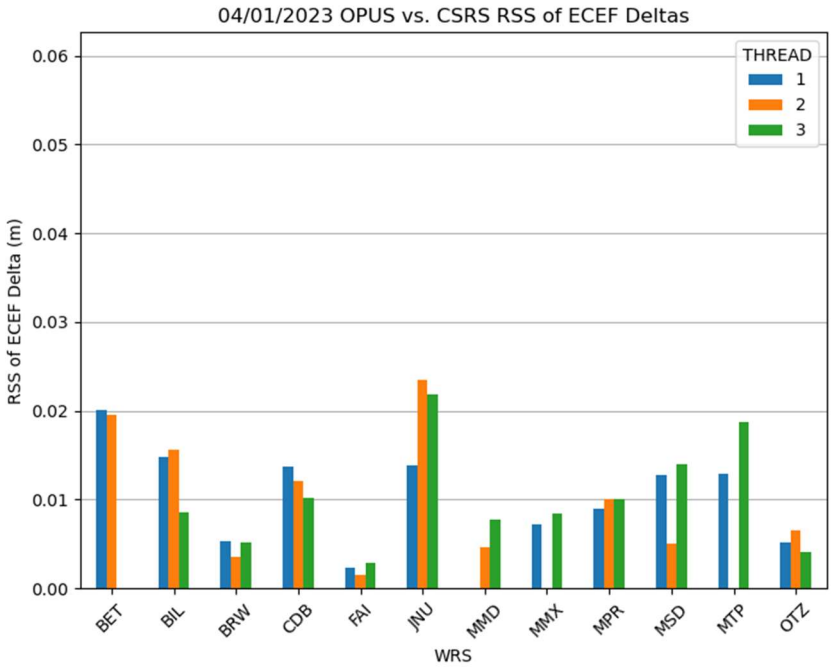

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

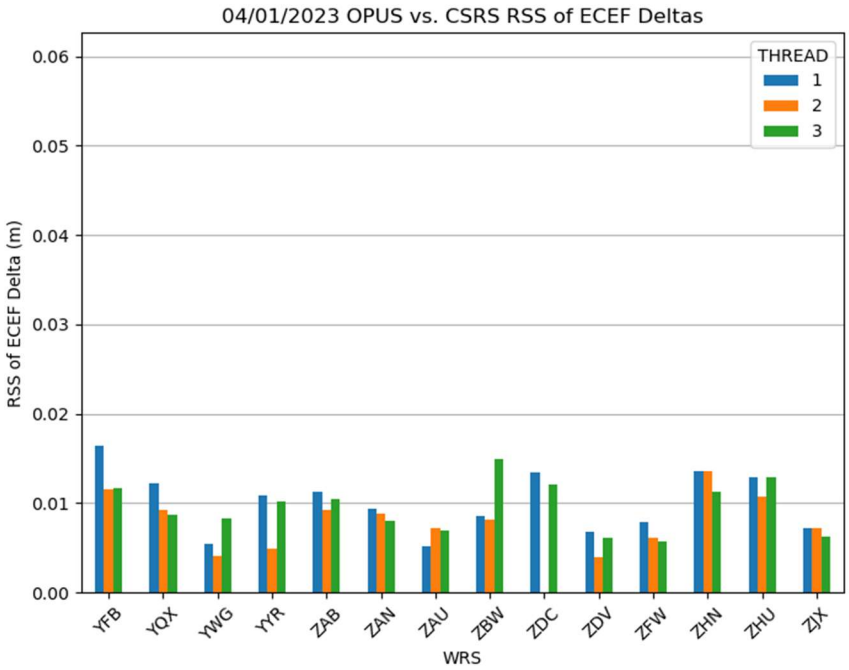

Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

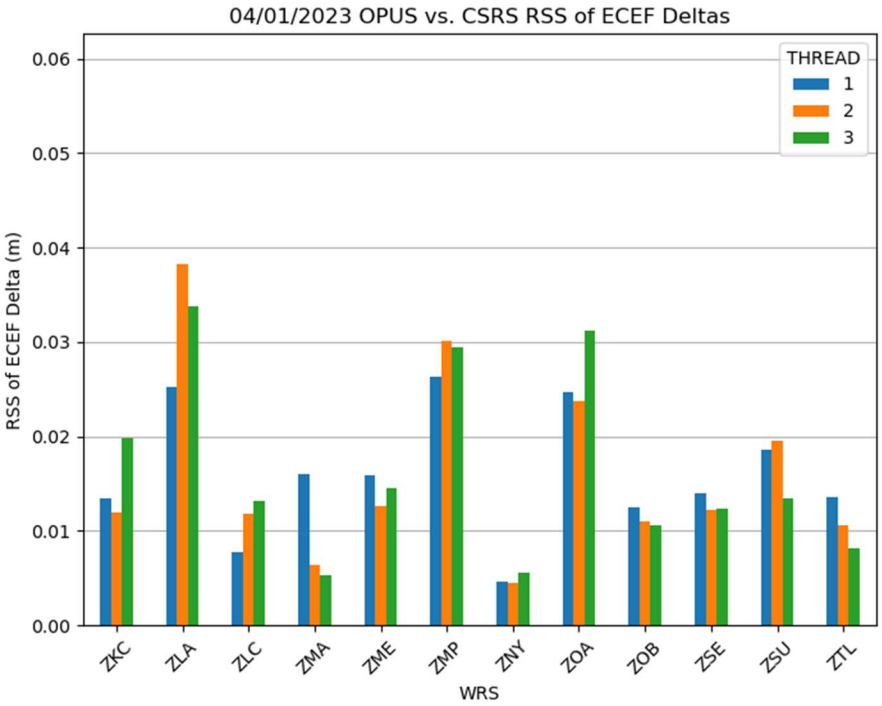

Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

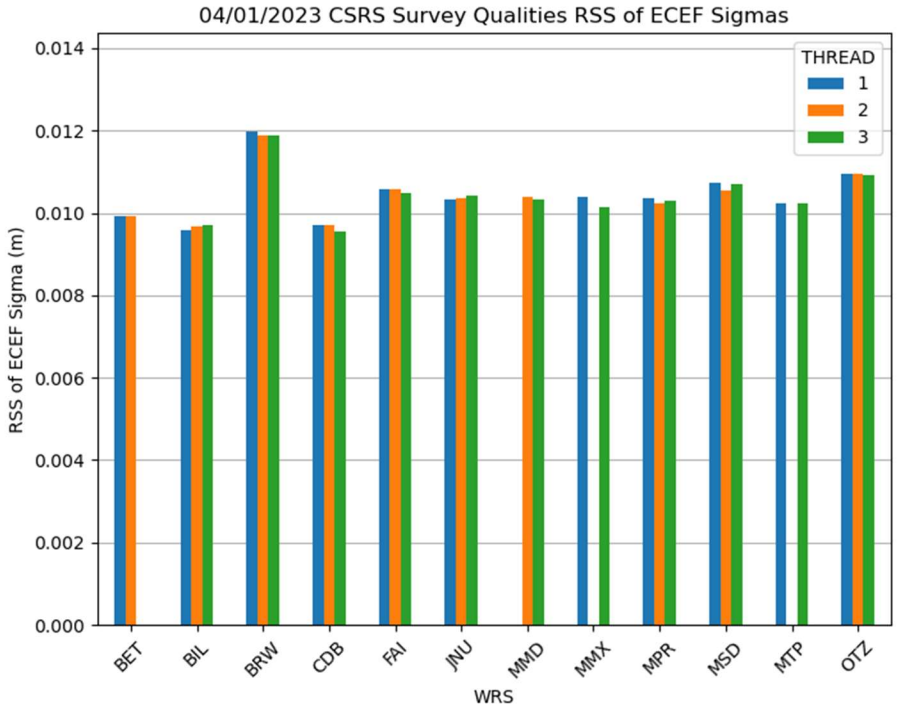

Figure 10-10 CSRS Survey Qualities

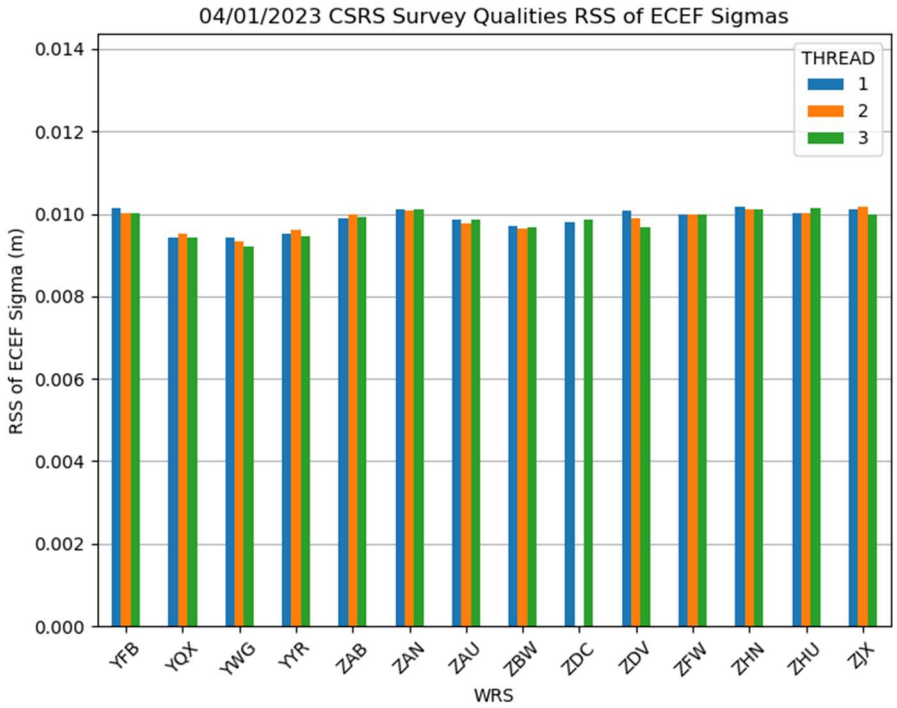

Figure 10-11 CSRS Survey Qualities

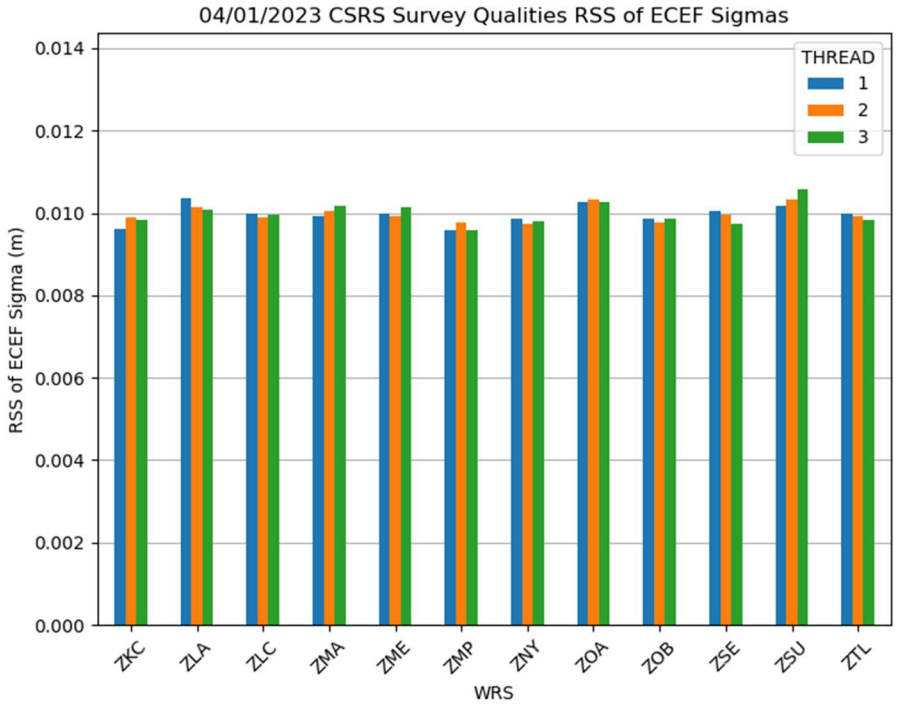

Figure 10-12 CSRS Survey Qualities

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, a noticeable change in type 0 bias was observed on 01/24/2023. This was due to the decommissioning of PRN22/SVN41. 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	1.30233	1.30458	1.30654
DM 2	0.240522	0.243606	0.246697
DM 3	0.961809	0.962201	0.962846
DM 4	-0.186172	-0.187743	-0.189716

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31886	1.32105	1.3228
DM 2	0.241954	0.245149	0.248284
DM 3	0.972793	0.973289	0.973865
DM 4	-0.187235	-0.188901	-0.190913

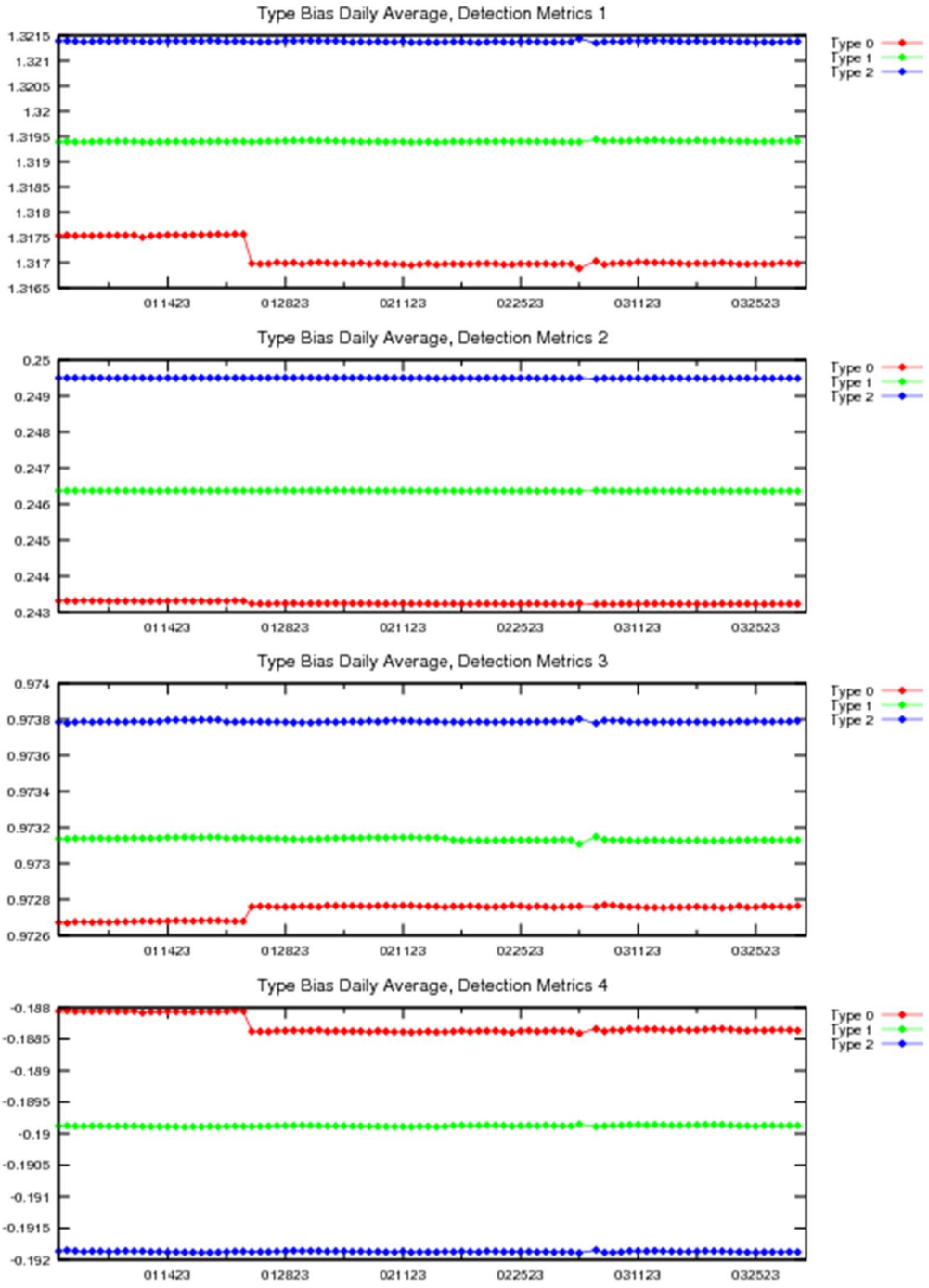

Figure 11-1 Type Bias Average Trend

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 0.0008976 observed on PRN22, (2) the maximum average for DM2 is 0.0002224 observed on PRN19, (3) the maximum average for DM3 is 0.0004483 observed on PRN18, (4) the maximum average for DM4 is 0.0004778 observed on PRN22.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000203774	9.53619e-05	4.3856e-05	0.000144296
2	0.000265165	7.4942e-05	0.000107178	0.00011127
3	0.000217939	6.3342e-05	9.78159e-05	0.000130391
4	0.000677908	0.000243916	0.000392794	0.00026866
5	0.00016411	7.27068e-05	0.000101052	0.000108495
6	0.000583555	0.000100414	5.31159e-05	0.000226211
7	0.000172933	0.000123394	4.69989e-05	0.00012433
8	0.000332752	9.10068e-05	0.000117375	0.000172457
9	0.000250715	4.5408e-05	0.000172695	0.000185078
10	0.00020228	6.02989e-05	7.73852e-05	0.000182724
11	0.00029942	0.000132539	0.000384758	0.000321783
12	0.000337772	0.000102949	8.28705e-05	9.23011e-05
13	0.000642611	5.91284e-05	5.42273e-05	0.000262803
14	0.000473757	0.00018681	0.000399292	0.00026683
15	0.000370906	0.000119615	5.18932e-05	0.000103549
16	0.000229674	4.68659e-05	0.000127334	0.000217127
17	0.000376895	0.000112374	5.61034e-05	8.98227e-05
18	0.000629608	0.000176939	0.000448333	0.000261275
19	0.000765669	0.000222442	8.29591e-05	0.000129127
20	0.000173584	7.79705e-05	4.78193e-05	0.000152572
21	0.00019972	0.000100272	0.00010684	0.000464038
22	0.000897613	8.24391e-05	5.98304e-05	0.000477804
23	0.000391653	0.000165122	0.000372239	0.00025786
24	0.000219811	8.62545e-05	0.000195151	0.000250466
25	0.000435699	7.66557e-05	4.55557e-05	0.000208008
26	0.000234502	0.000109341	0.000120137	0.000182702
27	0.000379851	0.000176589	0.00017787	0.000335439
28	0.000179476	8.92786e-05	0.000341233	0.000387443
29	0.000311934	0.000125752	0.000150119	0.000259909
30	0.000313756	7.71091e-05	0.000107628	9.63727e-05
31	0.000255374	7.7042e-05	9.74091e-05	0.000197348
32	0.000238406	5.8733e-05	6.02955e-05	0.000205711

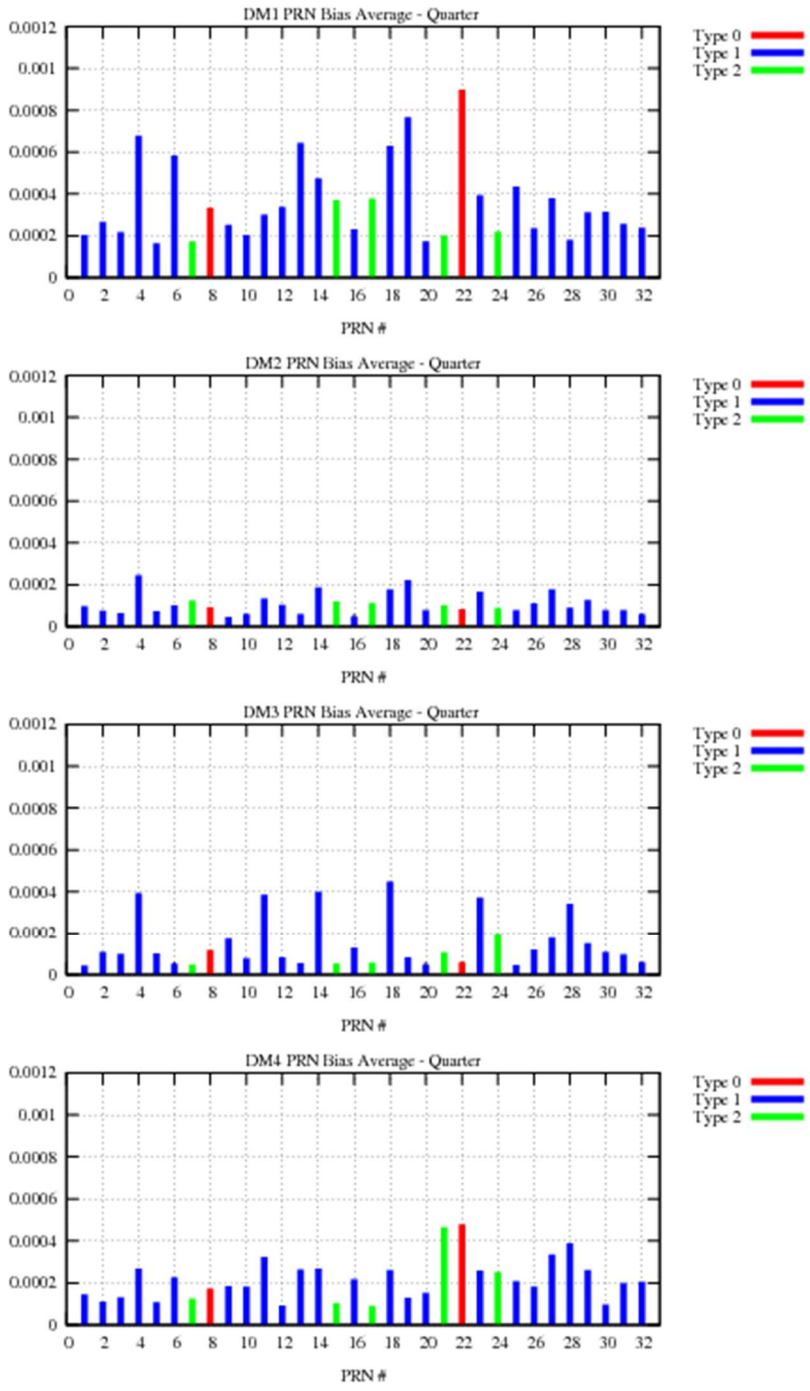

Figure 11-2 PRN Bias Average for the Quarter

Figure 11-3 through Figure 11-10 show the daily PRN bias for each PRN for four detection metrics. PRN bias for PRN1 was unavailable from 01/28/2023 to 02/02/2023 due to an unusable NANU 2023011. Please note data was incomplete on 03/04/2023 and 03/06/2023 and missing on 03/05/2023 due to a local lab outage.

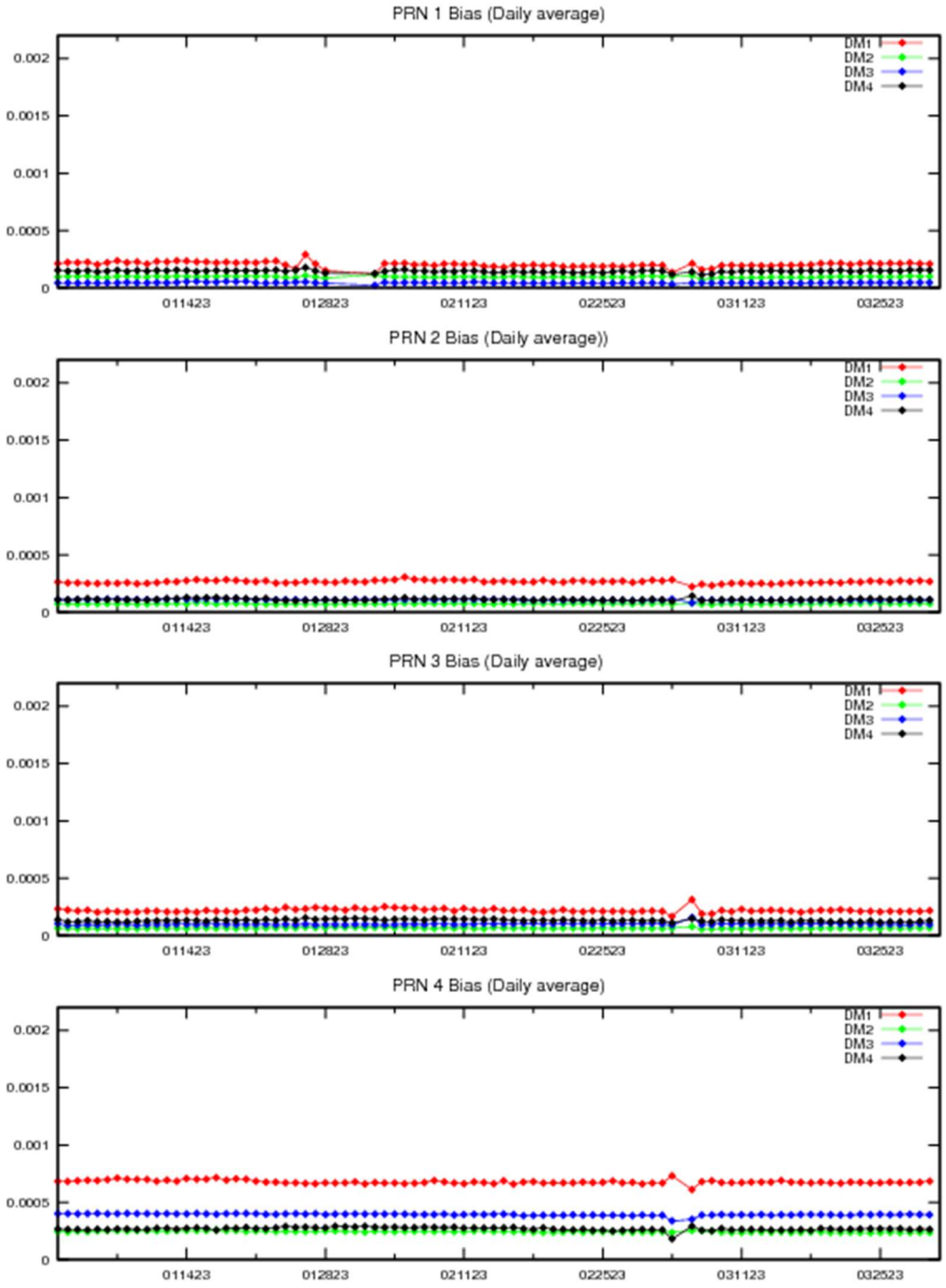

Figure 11-3 PRN Bias Average Trend (PRN1–PRN4)

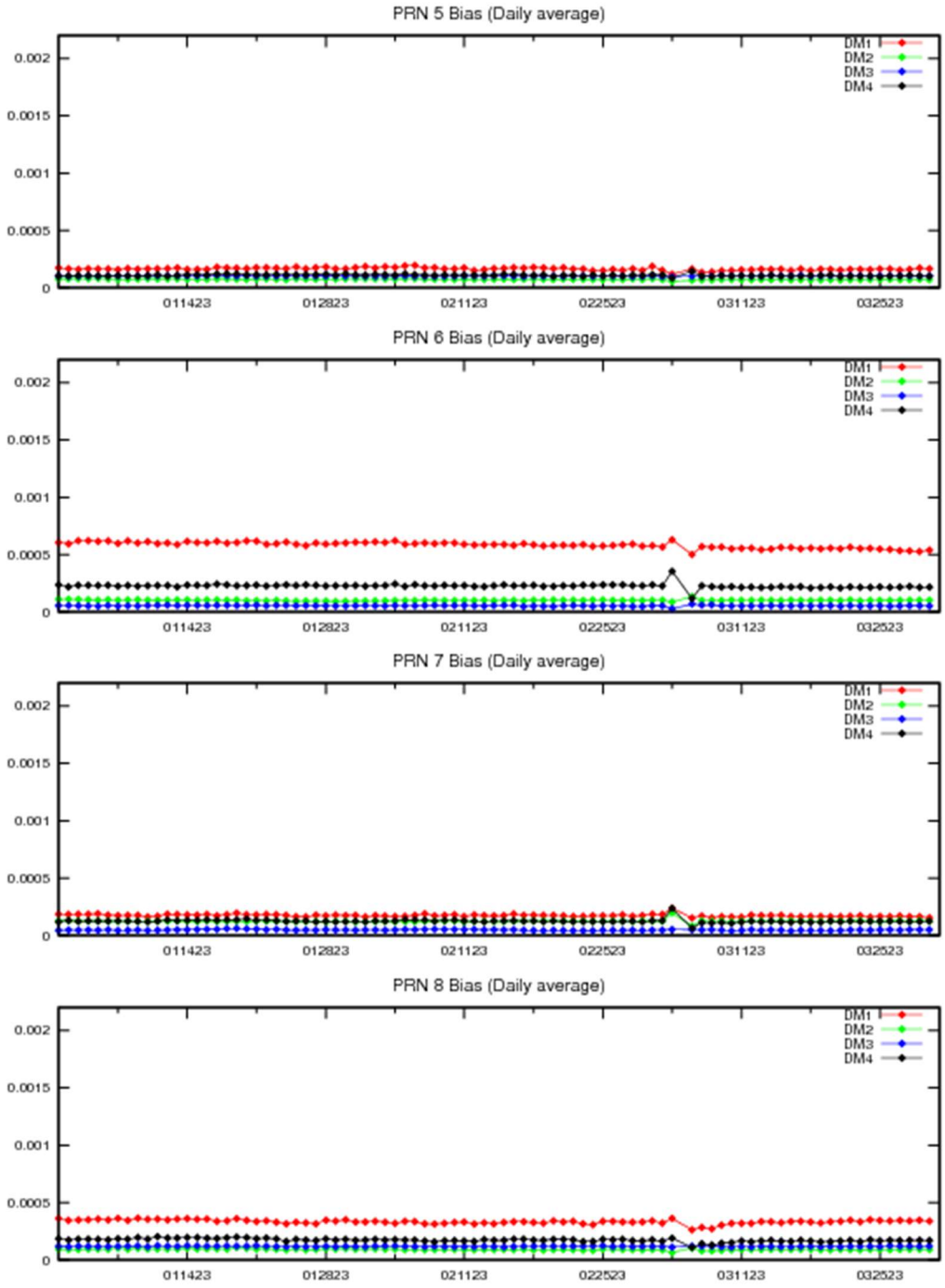

Figure 11-4 PRN Bias Average Trend (PRN5–PRN8)

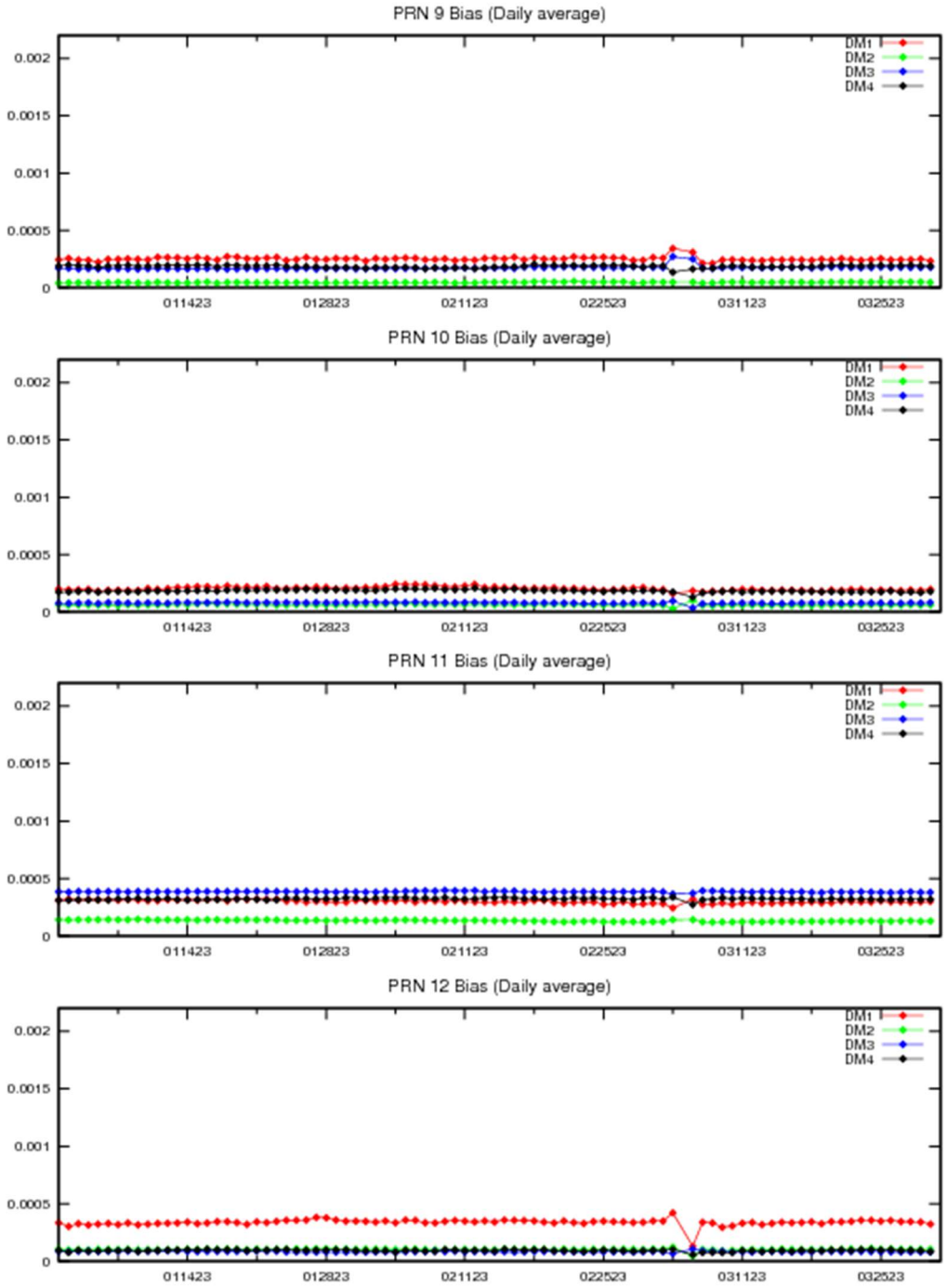

Figure 11-5 PRN Bias Average Trend (PRN9–PRN12)

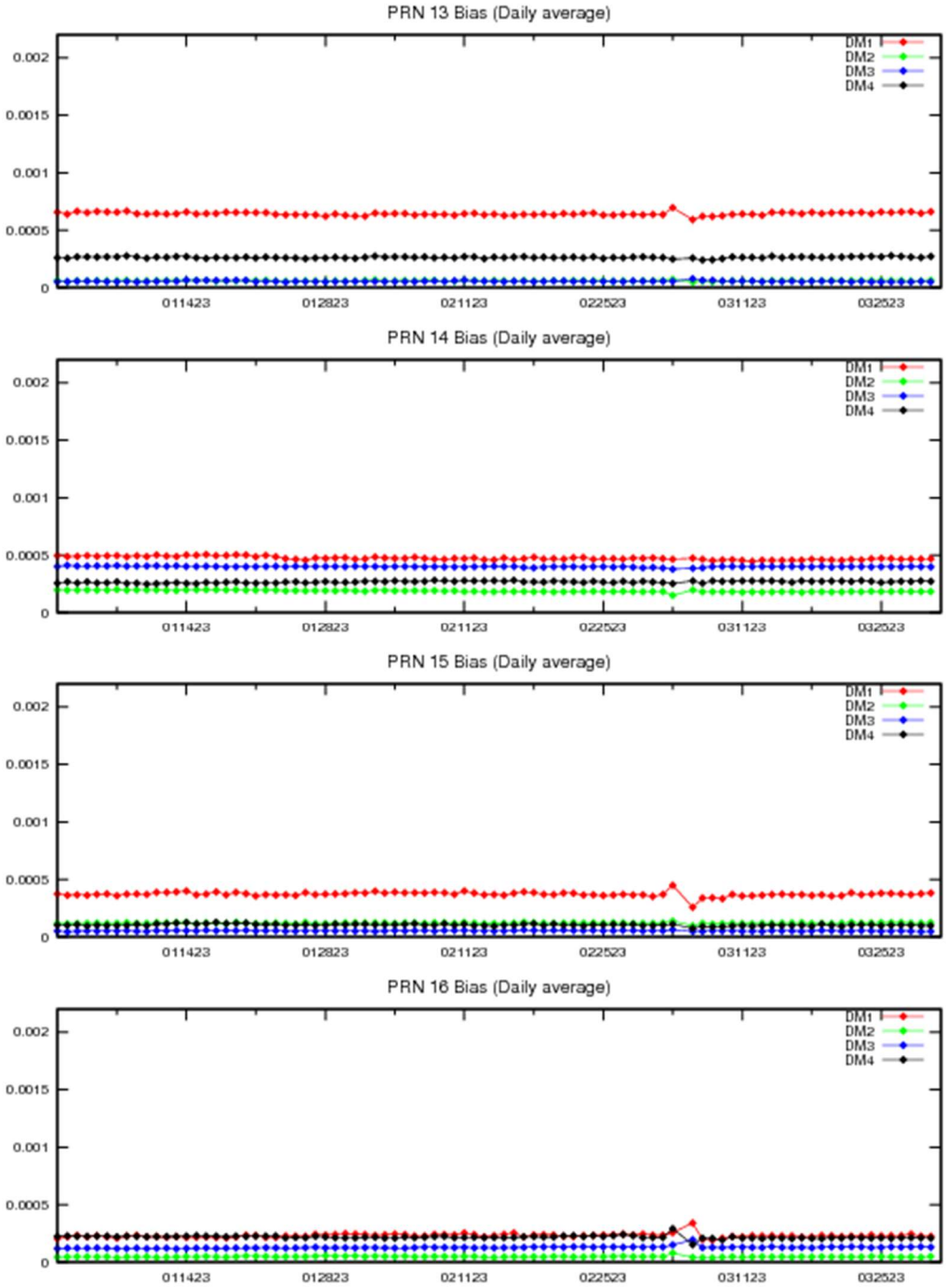

Figure 11-6 PRN Bias Average Trend (PRN13–PRN16)

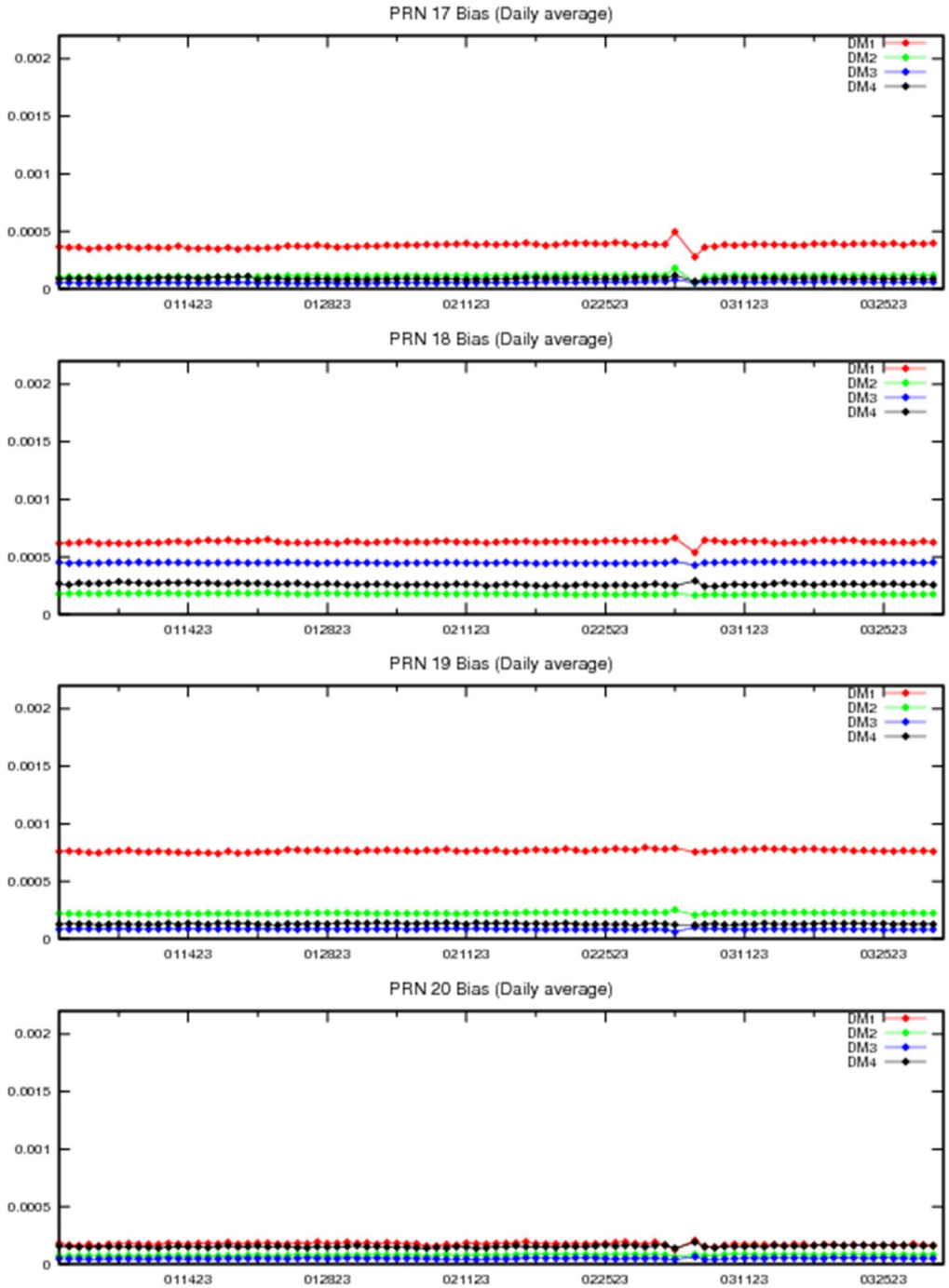

Figure 11-7 PRN Bias Average Trend (PRN17–PRN20)

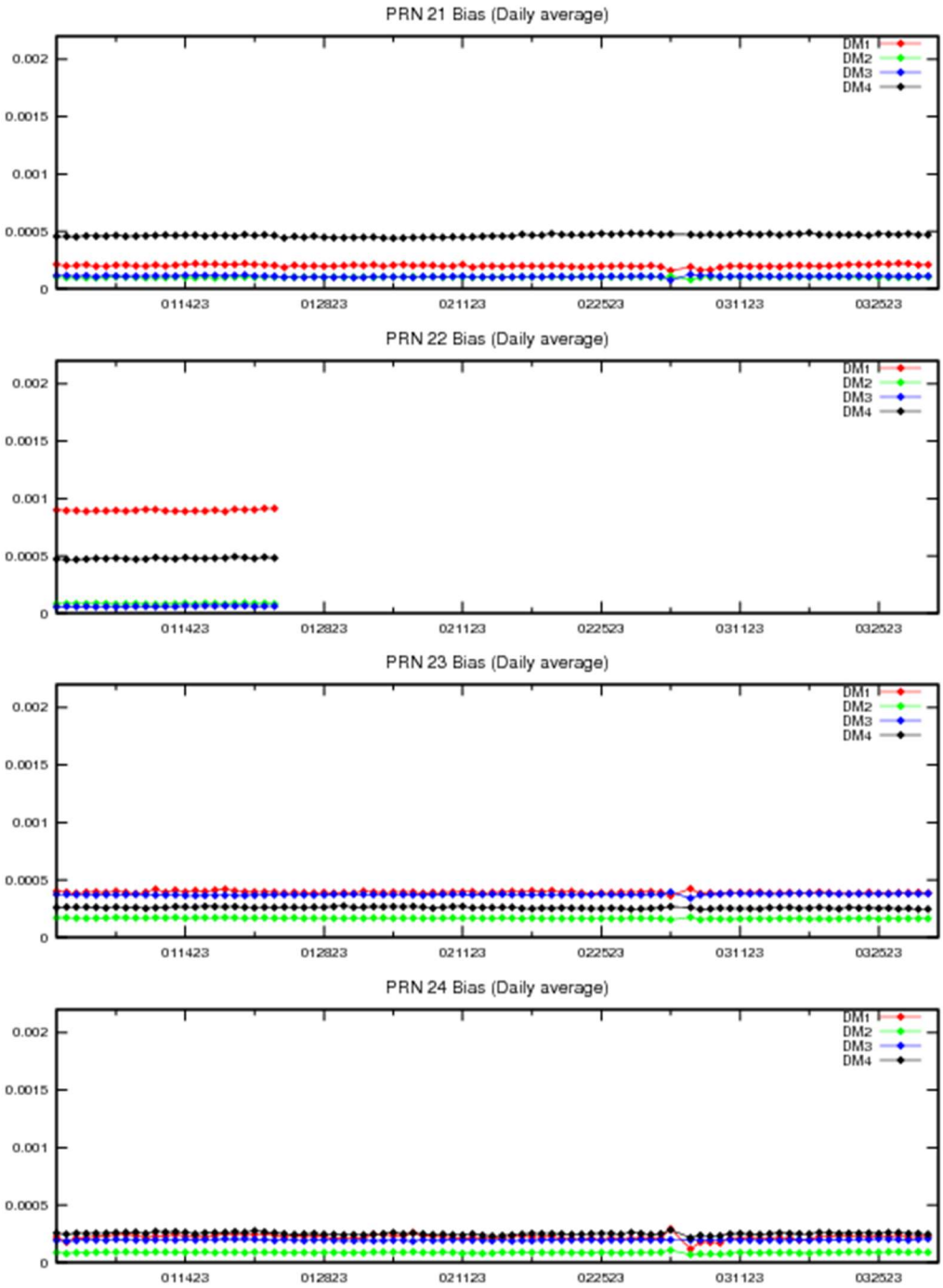

Figure 11-8 PRN Bias Average Trend (PRN21–PRN24)

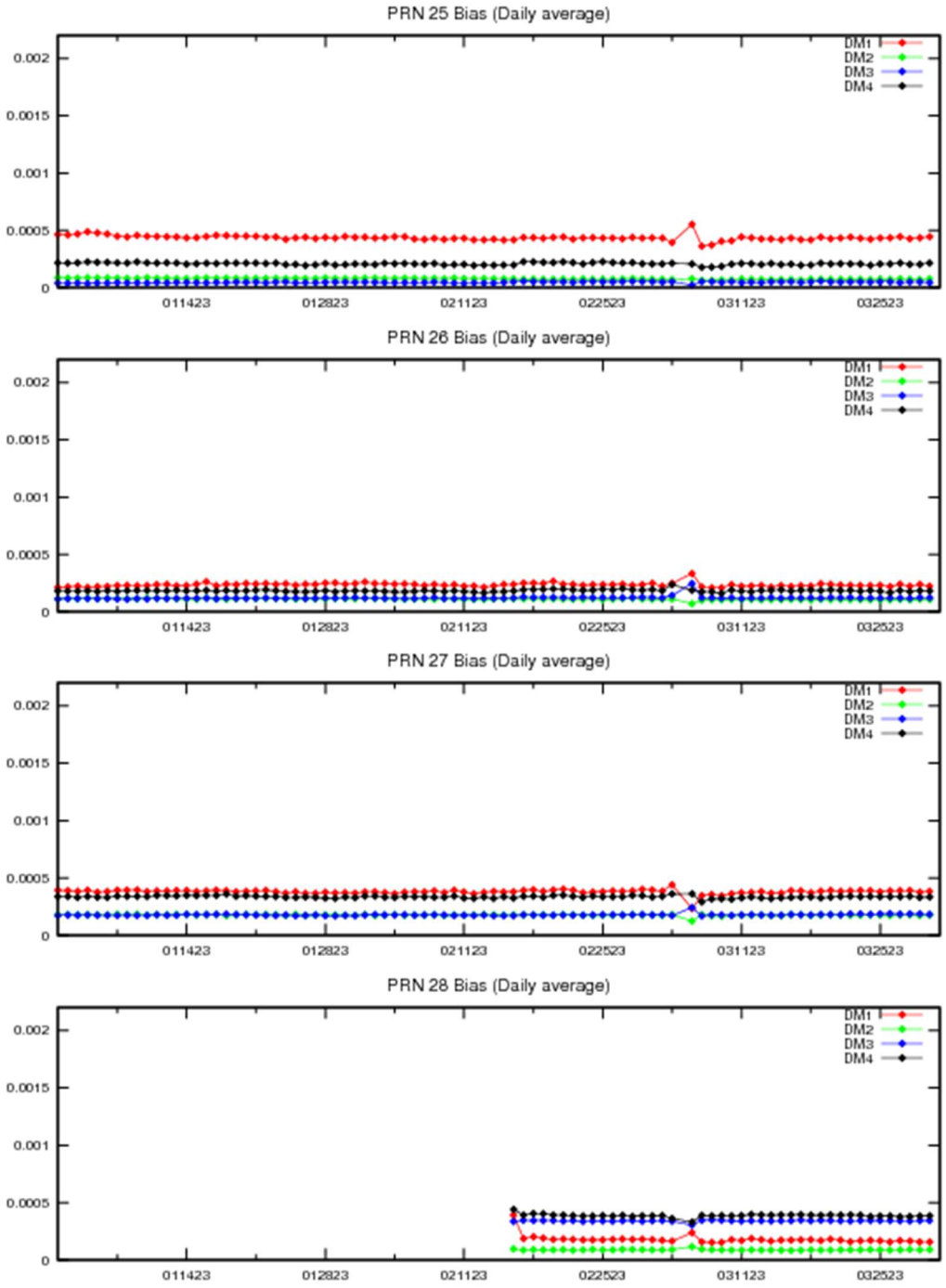

Figure 11-9 PRN Bias Average Trend (PRN25–PRN28)

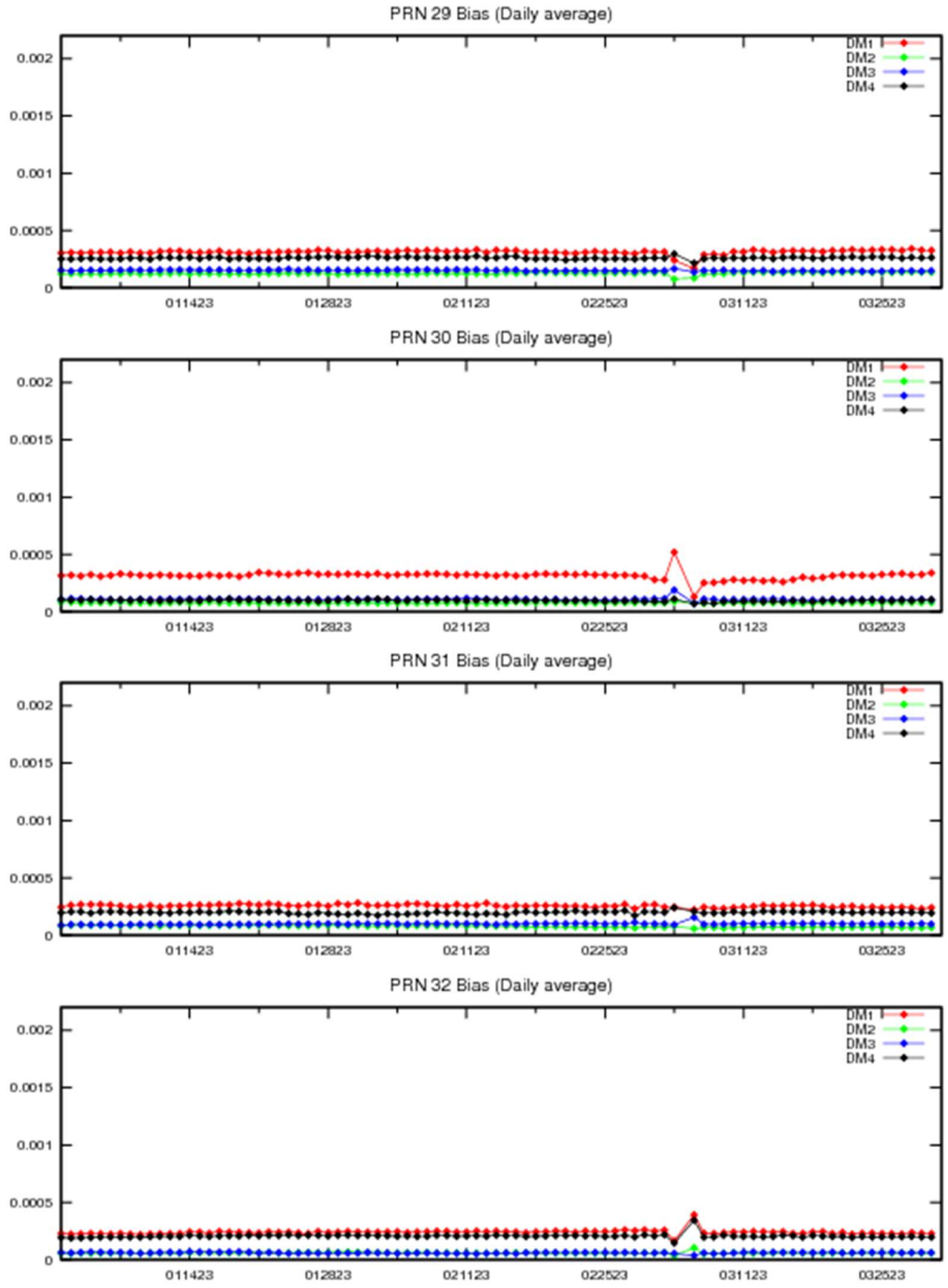

Figure 11-10 PRN Bias Average Trend (PRN29–PRN32)

11.4 SQM Trips

A SQM trip occurs when the estimated deformation exceeds threshold. There were 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 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. Ionospheric 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: Additional Coverage Plots 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.

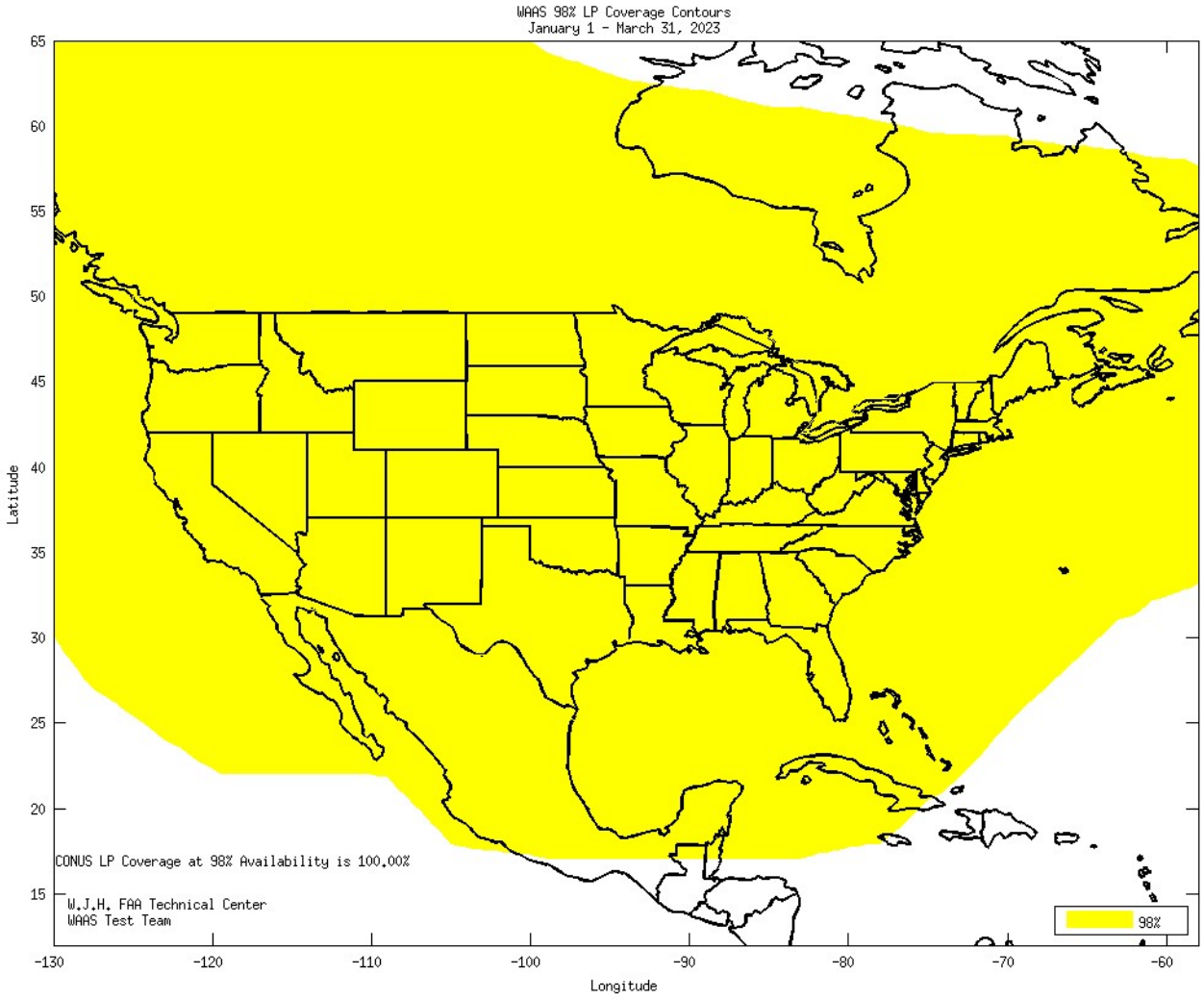

Figure B-1 98% CONUS LP Availability Contour

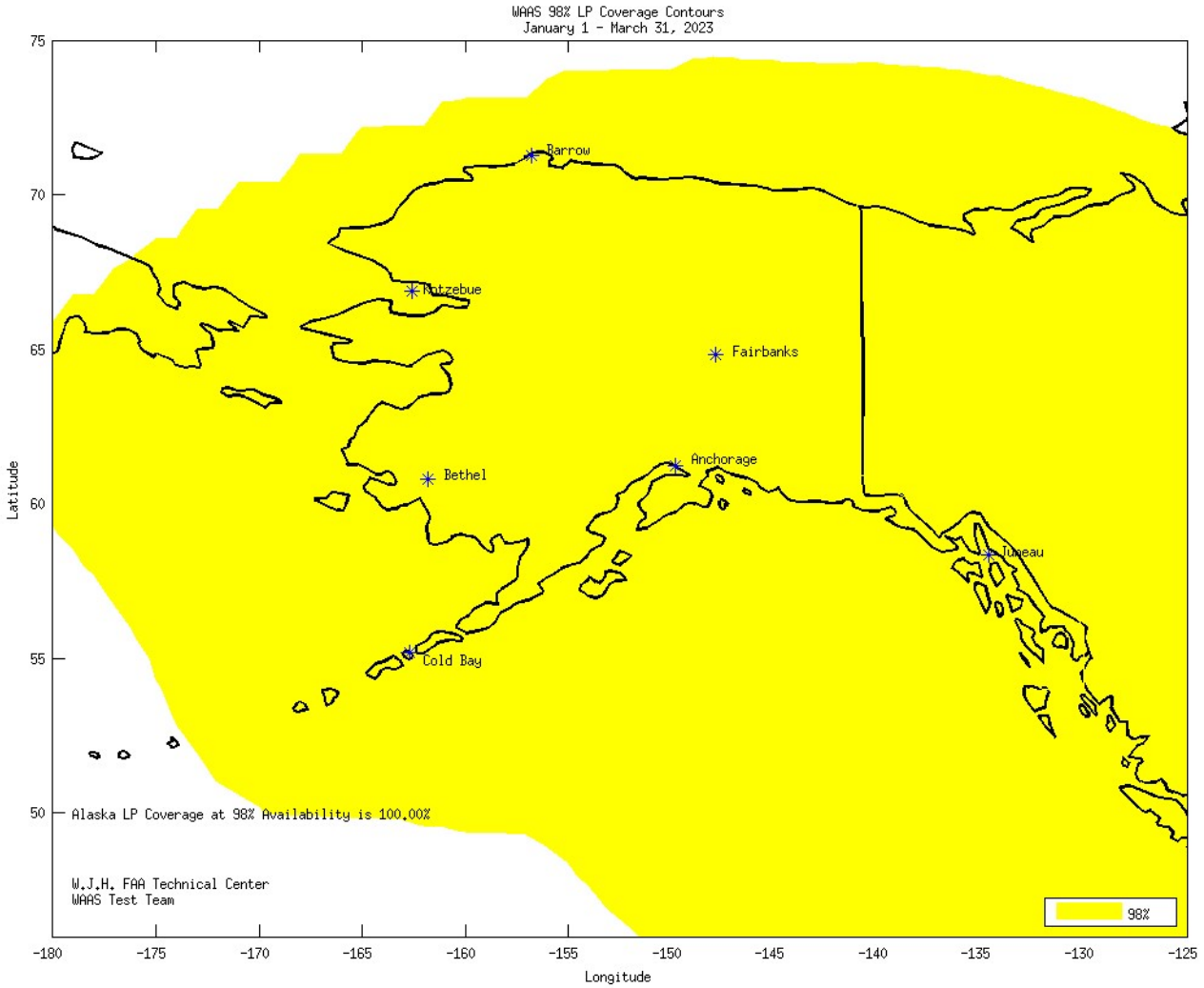

Figure B-2 98% Alaska LP Availability Contour

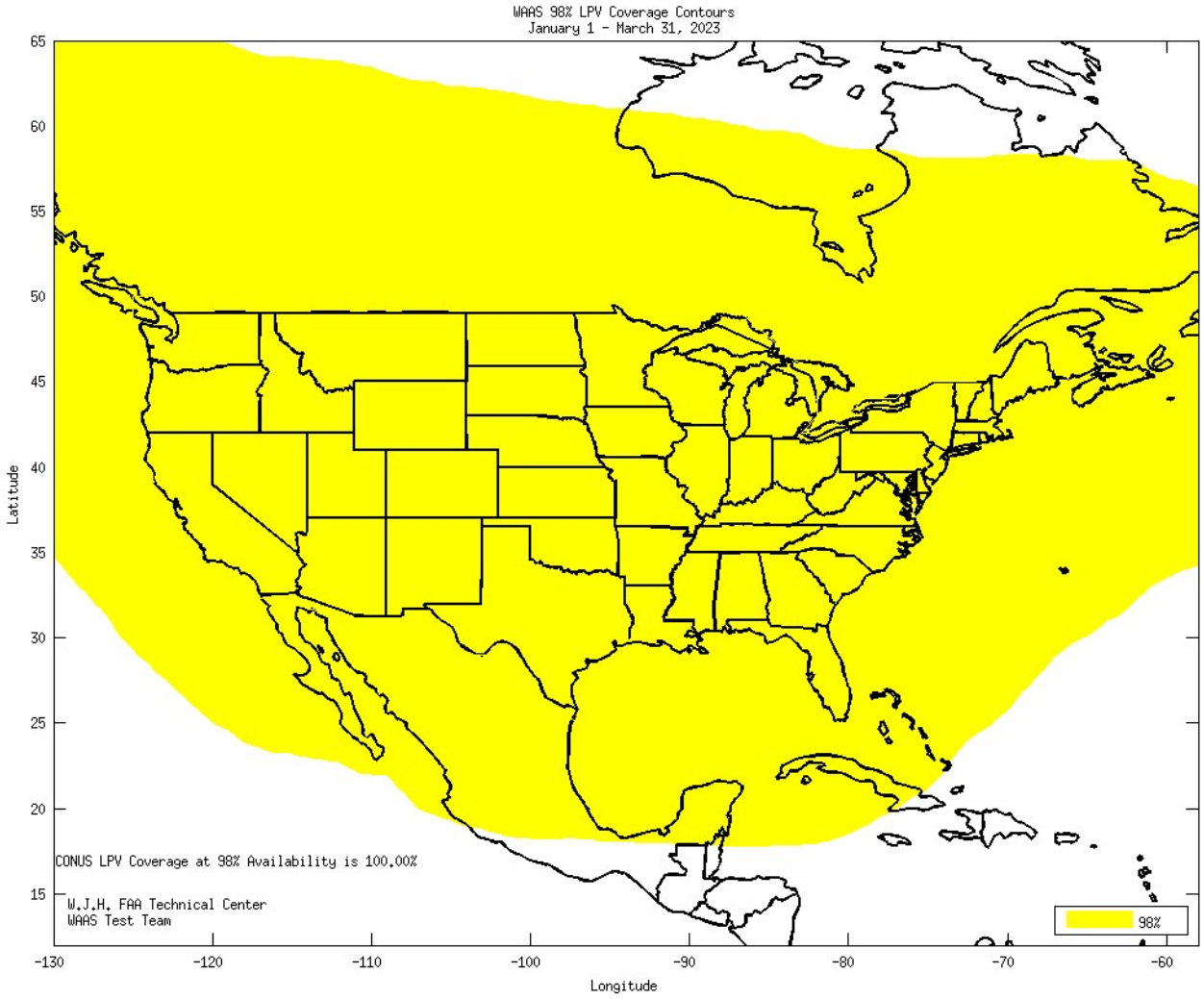

Figure B-3 98% CONUS LPV Availability Contour

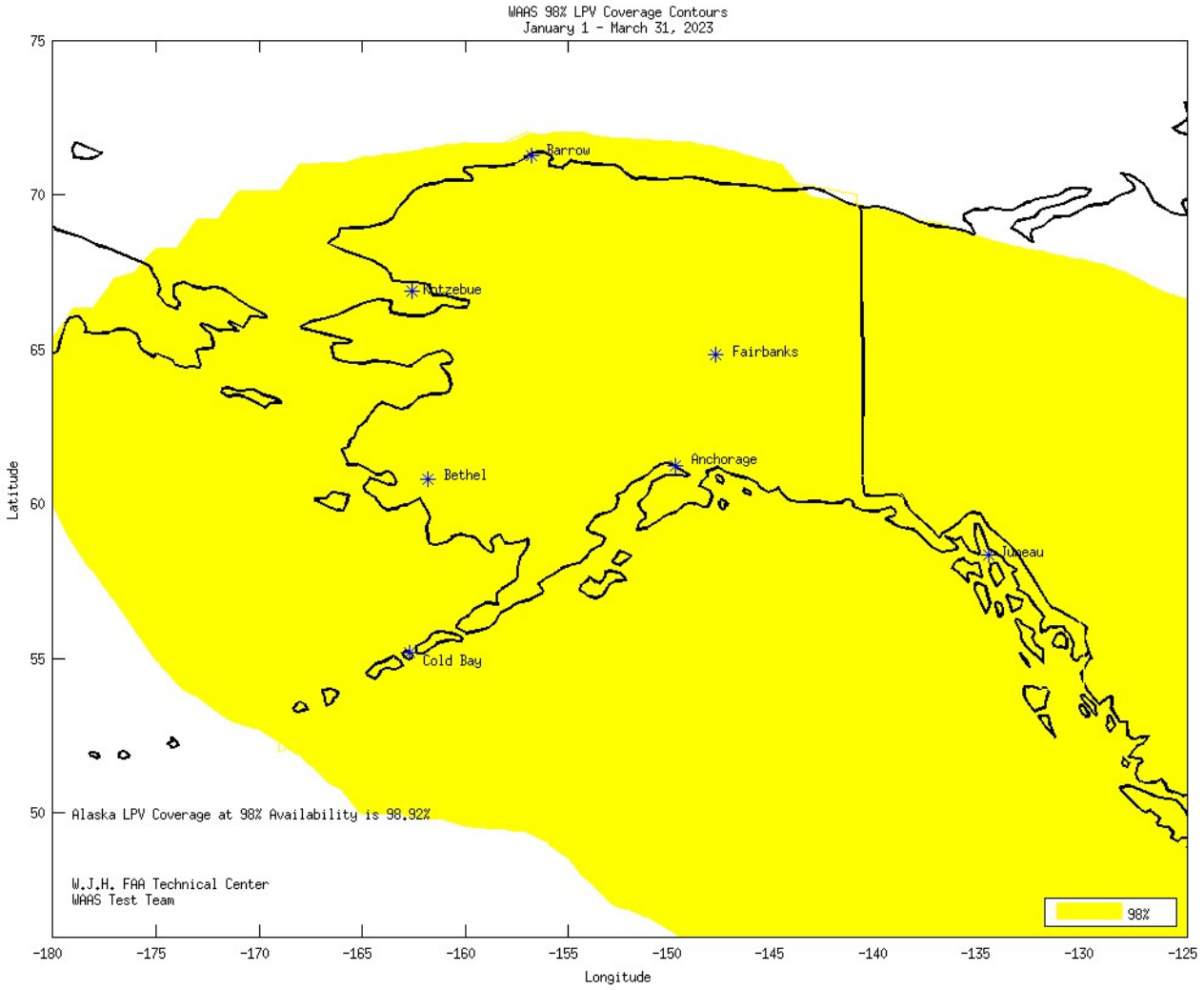

Figure B-4 98% Alaska LPV Availability Contour

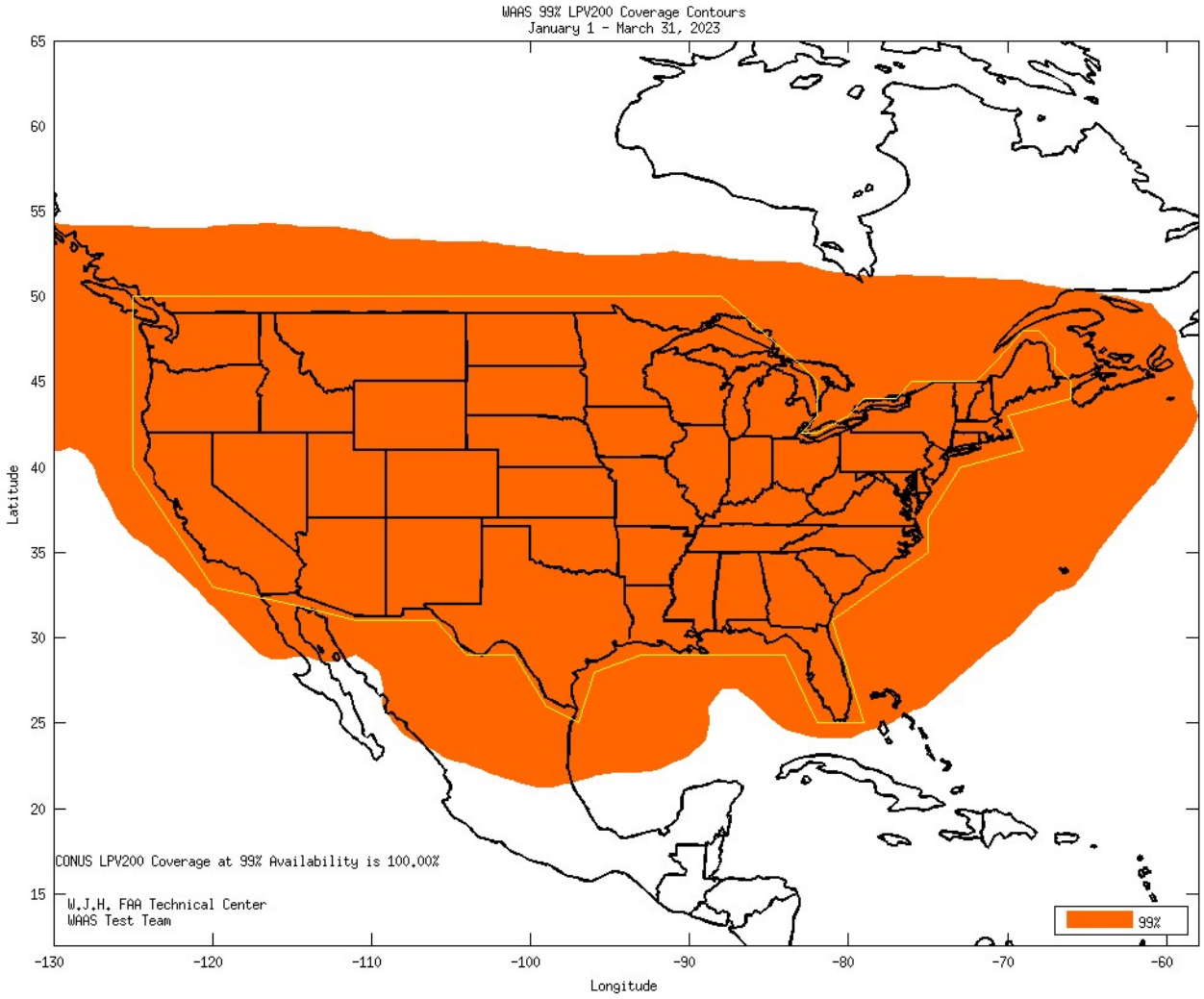

Figure B-5 99% CONUS LPV200 Availability Contour

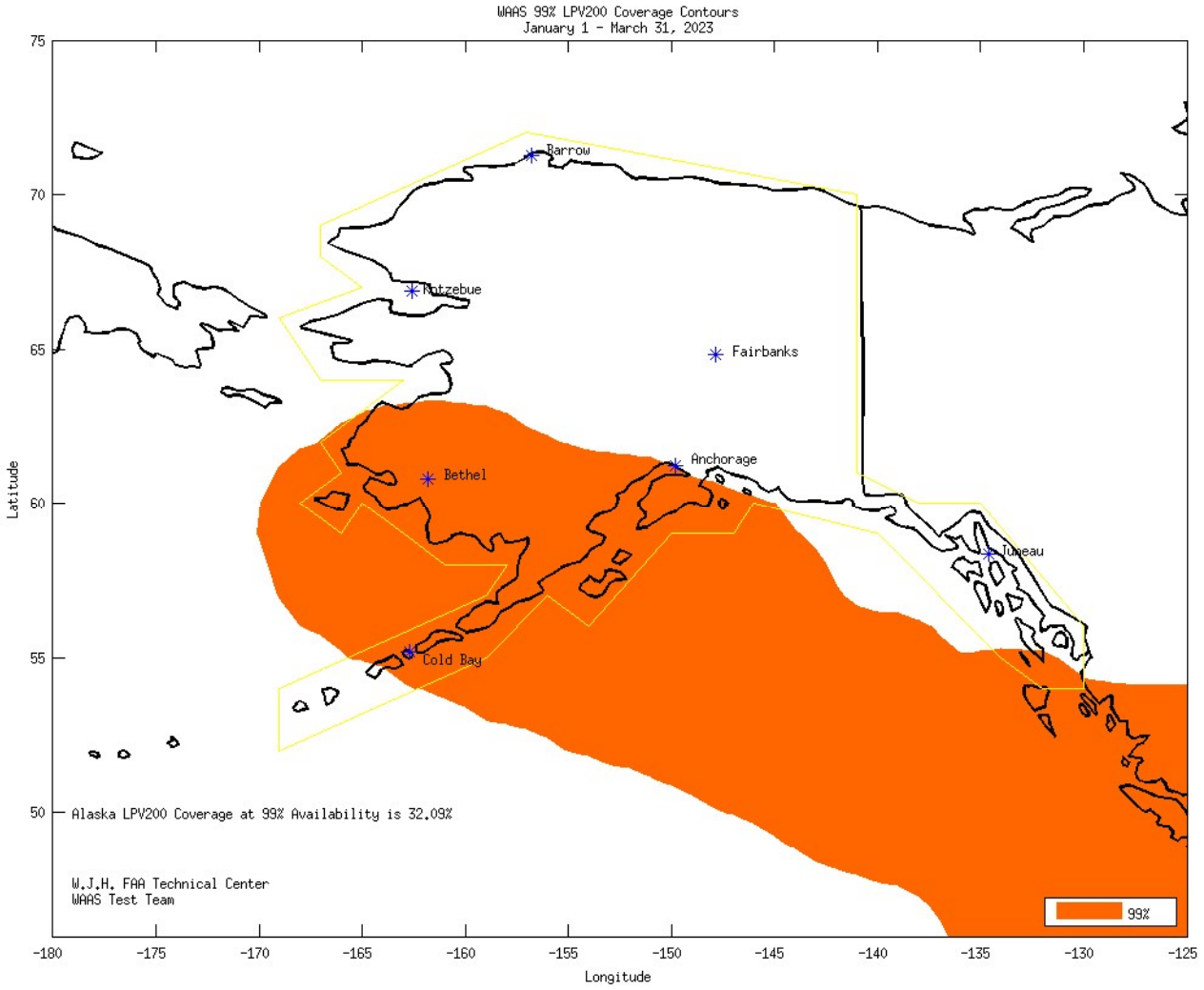

Figure B-6 99% Alaska LPV200 Availability Contour