Added November 3, 2022 event information to Table 1-5, Section 3, and Section 4.

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

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

January 2023

Report #83
Reporting Period: October 01 to December 31, 2022
http://www.nstb.tc.faa.gov

FAA William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405

DOCUMENT VERSION CONTROL

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0.1	Initial Version of Document	01/18/2023
0.2	Technical Edit	01/19/2023
0.3	Peer Review	01/27/2023
1.0	Final Edit	01/30/2023
2.0	Added November 3, 2022 event information to Table 1-5, Section 3, and Section 4	02/16/2023

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 #83 provides WAAS performance data from the October 01 through December 31, 2022 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 1.439 meters	Dallas 0.526 meters	Barrow 0.744 meters	Bethel 0.606 meters
95% Vertical Accuracy (VPL <= 50 meters)	Miami 1.670 meters	Salt Lake City 0.819 meters	Barrow 1.713 meters	Bethel 1.223 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Los Angeles 99.99%	Multiple Sites 100%	Juneau 99.98%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites 100%	Arcata 99.98%	Multiple Sites 100%	Juneau 99.97%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Oakland 99.86%	Anchorage 99.98%	Barrow 99.80%
99% HPL	Miami 18.558 meters	Denver 10.523 meters	Cold Bay 18.549 meters	Juneau 13.299 meters
99% VPL	Arcata 32.673 meters	Kansas City 19.439 meters	Barrow 30.843 meters	Juneau 23.078 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. Table 1-2 lists the receivers used in the PA analyses, and Table 1-3 lists the receivers used in the NPA analyses.

Table 1-2 PA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	82	7066421
Atlantic City	86	7448395
Oklahoma City	88	7601957
WAAS:		
Albuquerque	92	7948234
Anchorage	92	7946480
Atlanta	92	7946262
Barrow	92	7943171
Bethel	92	7941388
Billings	90	7744842
Boston	92	7948644
Chicago	92	7947904
Cleveland	92	7939775
Cold Bay	59	5096227
Dallas	92	7946500
Denver	92	7943539
Fairbanks	92	7947452
Gander	92	7944531
Goose Bay	92	7947111
Houston	92	7947040
Iqaluit	92	7910732
Jacksonville	92	7948566
Juneau	92	7945530
Kansas City	92	7944804
Kotzebue	91	7856180
Los Angeles	92	7937062
Memphis	92	7947140
Merida	90	7811175
Mexico City	92	7924683
Miami	92	7947364
Minneapolis	92	7948585
New York	92	7948800
Oakland	92	7946903
Puerto Vallarta	89	7662994
Salt Lake City	92	7947187
San Jose Del Cabo	87	7522419
Seattle	92	7946004
Washington, DC	92	7948693
Winnipeg	92	7948774

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7948294
Anchorage	92	7946453
Atlanta	92	7948107
Barrow	92	7944615
Bethel	92	7940800
Billings	90	7740373
Boston	92	7948294
Cleveland	92	7948295
Cold Bay	59	5120049
Fairbanks	92	7948014
Gander	92	7948233
Honolulu	92	7948279
Houston	92	7948294
Iqaluit	92	7917736
Juneau	92	7948194
Kansas City	92	7948275
Kotzebue	91	7905388
Los Angeles	92	7948294
Merida	91	7873120
Miami	92	7948295
Minneapolis	92	7948293
Oakland	92	7948294
Salt Lake City	92	7948210
San Jose Del Cabo	89	7730069
San Juan	92	7948296
Seattle	92	7939567
Tapachula	86	7430227
Washington, DC	92	7948296

The report is divided by the performance category:

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

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

Table 1-4 WAAS Performance Parameters

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

1.1 Event Summary

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

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

Table 1-5 Events

Start Date	End Date	Location Satellite	Service Affected	Event Description
10/02/2022	10/02/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_Alaska LPV200_Canada	Geomagnetic activity (Kp=5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 22:30 UTC on 10/2 to 01:55 UTC on 10/3. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 23:15 UTC on 10/2 to 23:45 UTC on 10/2. The elevated GIVE values also caused minor degradation of LPV200 service coverage in Alaska from 00:55 UTC to 01:05 UTC on 10/3. Please see plot(s): LPV_10/2/2022 LPV200_10/2/2022

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Cov_vs_Time_Alaska_10/2/2022 Cov_vs_Time_Canada_10/2/2022
10/06/2022	10/06/2022	PRN3	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN3 (see NANU2022061), which was unusable from 14:28 UTC to 20:19 UTC. The NANU caused moderate degradation of LPV200 service coverage in CONUS (California) from 20:05 UTC to 20:15 UTC. Please see plot(s): LPV200_10/6/2022 Cov_vs_Time_Conus_10/6/2022
10/06/2022	10/06/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_Canada	Geomagnetic activity (Kp=4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Canada from 19:00 UTC to 23:00 UTC; and (2) LPV service coverage in Canada from 21:00 UTC to 21:40 UTC. Please see plot(s): LPV_10/6/2022 LPV200_10/6/2022 Cov_vs_Time_Canada_10/6/2022
10/07/2022	10/07/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp=4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 00:05 UTC to 00:40 UTC. Please see plot(s): LPV200_10/7/2022 Cov_vs_Time_Canada_10/7/2022
10/08/2022	10/08/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp=3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 17:00 UTC to 19:00 UTC. Please see plot(s): LPV200_10/8/2022 Cov_vs_Time_Canada_10/8/2022
10/09/2022	10/09/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp=4) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 17:20 UTC to 23:20 UTC. Please see plot(s): LPV200_10/9/2022 Cov_vs_Time_Canada_10/9/2022

Start Date	End Date	Location Satellite	Service Affected	Event Description
10/10/2022	10/10/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (Kp = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in CONUS (California) from 23:45 UTC to 23:59 UTC. Please see plot(s): LPV200_10/10/2022 Cov_vs_Time_Conus_10/10/2022
10/11/2022	10/11/2022	PRN25	LPV200_CONUS LPV200_Alaska	The reduction in LPV200 service in CONUS and Alaska was due to a GPS NANU on PRN25 (see NANU2022066), which was unusable from 08:09 UTC to 13:09 UTC. The NANU caused moderate degradation of LPV200 service coverage in Alaska from 10:10 UTC to 10:20 UTC. The NANU also caused minor degradation of LPV200 service coverage in CONUS from 08:25 UTC to 08:40 UTC. Please see plot(s): LPV200_10/11/2022 Cov_vs_Time_Alaska_10/11/2022 Cov_vs_Time_Conus_10/11/2022
10/12/2022	10/12/2022	PRN25	LPV200_CONUS LPV200_Alaska	The reduction in LPV200 service in CONUS and Alaska was due to a GPS NANU on PRN25 (see NANU2022067), which was unusable from 08:02 UTC to 12:38 UTC. The NANU caused moderate degradation of LPV200 service coverage in Alaska from 10:00 UTC to 10:15 UTC. The NANU also caused minor degradation of LPV200 service coverage in CONUS from 08:20 UTC to 08:35 UTC. Please see plot(s): LPV200_10/12/2022 Cov_vs_Time_Alaska_10/12/2022 Cov_vs_Time_Conus_10/12/2022
10/14/2022	10/14/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Alaska 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 Alaska from 12:45 UTC to 14:20 UTC. The elevated GIVE values also caused moderate degradation of: (1) LPV service coverage in Alaska from 12:55 UTC to 13:45 UTC; and (2) LPV200 service coverage in Canada from 17:45 UTC to 17:50 UTC.

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Please see plot(s): LPV_10/14/2022 LPV200_10/14/2022 Cov_vs_Time_Alaska_10/14/2022 Cov_vs_Time_Canada_10/14/2022
10/18/2022	10/19/2022	PRN9	LPV200_Alaska LPV200_Canada	The reduction in LPV200 service in Alaska and Canada was due to a GPS NANU on PRN9 (see NANU2022080), which was unusable from 22:20 UTC on 10/18 and 00:06 UTC on 10/19. The NANU caused moderate degradation of (1) LPV200 service coverage in Alaska from 23:30 UTC on 10/18 to 00:20 UTC on 10/19; and (2) LPV200 service coverage in Canada from 23:30 UTC on 10/18 to 00:05 UTC on 10/19. Please see plot(s): LPV200_10/18/2022 Cov_vs_Time_Alaska_10/18/2022 Cov_vs_Time_Canada_10/18/2022 LPV200_10/19/2022 Cov_vs_Time_Alaska_10/19/2022 Cov_vs_Time_Canada_10/19/2022
10/19/2022	10/19/2022	PRN3	LPV200_CONUS LPV200_Alaska LPV200_Canada	The reduction in LPV200 service in CONUS, Alaska, and Canada was due to a GPS NANU on PRN3 (see NANU2022081), which was unusable from 19:23 UTC to 20:55 UTC. The NANU caused moderate degradation of (1) LPV200 service coverage in Alaska from 20:30 UTC to 21:00 UTC; and (2) LPV200 service coverage in Canada from 20:45 UTC to 21:05 UTC. The NANU also caused very minor degradation of LPV200 service coverage in CONUS (California) from 19:25 UTC to 19:30 UTC. Please see plot(s): LPV200_10/19/2022 Cov_vs_Time_Alaska_10/19/2022 Cov_vs_Time_Canada_10/19/2022 Cov_vs_Time_Conus_10/19/2022
10/20/2022	10/20/2022	PRN26	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN26 (see NANU2022083), which was unusable from 21:44 UTC to 23:37 UTC. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 22:45 UTC to 23:25 UTC. Please see plot(s):

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_10/20/2022 Cov_vs_Time_Conus_10/20/2022
10/22/2022	10/22/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_Alaska LPV200_Canada	Geomagnetic activity (Kp=5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 14:20 UTC to 21:15 UTC. The elevated GIVE values also caused moderate degradation of: (1) LPV service coverage in Canada from 17:00 UTC to 20:00 UTC; and (2) LPV200 service coverage in Alaska from 09:30 UTC to 09:50 UTC and from 14:00 UTC to 14:40 UTC. Please see plot(s): LPV_10/22/2022 LPV200_10/22/2022 Cov_vs_Time_Alaska_10/22/2022 Cov_vs_Time_Canada_10/22/2022
10/28/2022	10/28/2022	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 LPV200 service coverage in Canada from 16:25 UTC to 23:40 UTC. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 16:40 UTC to 20:10 UTC. Please see plot(s): LPV_10/28/2022 LPV200_10/28/2022 Cov_vs_Time_Canada_10/28/2022
10/29/2022	10/29/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (Kp=5) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada from 02:10 UTC to 02:20 UTC. Please see plot(s): LPV200_10/29/2022 Cov_vs_Time_Canada_10/29/2022
10/31/2022	10/31/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_Canada	Geomagnetic activity (Kp=5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 15:45 UTC to 21:30 UTC. The elevated GIVE values also caused moderate degradation of LPV service coverage in Canada from 16:35 UTC to 18:00 UTC. Please see plot(s): LPV_10/31/2022 LPV200_10/31/2022 Cov_vs_Time_Canada_10/31/2022

Start Date	End Date	Location Satellite	Service Affected	Event Description
11/03/2022	11/03/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_Canada LPV200_CONUS LPV200_Canada	A G1 geomagnetic storm (KP=5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in Canada from 15:20 UTC to 22:45 UTC; and (2) LPV service coverage in Canada from 16:10 UTC to 21:20 UTC. The elevated GIVEs also caused minor degradation of LPV200 service coverage in CONUS (Maine) from 18:15 UTC to 18:35 UTC. Please see plot(s): LPV_11/3/2022 LPV200_11/3/2022 Cov_vs_Time_Canada_11/3/2022
11/03/2022	11/03/2022	PRN12	LPV200_Alaska	The reduction in LPV200 service in Alaska was due to a GPS NANU on PRN12 (see NANU2022097) which was unusable from 05:55 UTC to 08:32 UTC. The NANU caused moderate degradation of LPV200 service coverage in Alaska from 06:50 UTC to 07:25 UTC. Please see plot(s): LPV200_11/3/2022 Cov_vs_Time_Alaska_11/3/2022
11/03/2022	11/03/2022	PRN30	LPV200_Canada	The reduction in LPV200 service in Canada was due to a GPS NANU on PRN30 (see NANU2022096), which was unusable from 00:19 UTC to 01:55 UTC. The NANU caused minor degradation of LPV200 service coverage in Canada from 01:45 UTC to 02:05 UTC. Please see plot(s): LPV200_11/3/2022 Cov_vs_Time_Canada_11/3/2022
11/04/2022	11/04/2022	PRN29	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN 29 (see NANU2022103), which was unusable from 08:43 UTC to 10:32 UTC. The NANU along with EVENT #22003 caused minor degradation of LPV200 service coverage in CONUS from 09:55 UTC to 10:05 UTC. Please see plot(s): LPV200_11/4/2022 Cov_vs_Time_Conus_11/4/2022
11/04/2022	11/04/2022	PRN17	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN 17 (see NANU2022098), which was unusable from 04:17 UTC to 06:49 UTC. The NANU caused minor degradation of LPV200

Start Date	End Date	Location Satellite	Service Affected	Event Description
				service coverage in CONUS from 06:45 UTC to 07:00 UTC. Please see plot(s): LPV200_11/4/2022 Cov_vs_Time_Conus_11/4/2022
11/07/2022	11/07/2022	PRN5	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN5 (see NANU2022108), which was unusable from 10:08 UTC to 12:22 UTC. The NANU caused significant degradation of LPV200 service coverage in CONUS from 10:20 UTC to 11:00 UTC. Please see plot(s): LPV200_11/7/2022 Cov_vs_Time_Conus_11/7/2022
11/07/2022	11/07/2022	Washington, DC (CnV) Los Angeles (CnV) Atlanta (CnV)	LPV_CONUS LPV_Alaska LPV_Canada LPV200_CONUS LPV200_Alaska LPV200_Canada	A G1 geomagnetic storm (KP=5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 17:45 UTC to 21:00 UTC; (2) LPV service coverage in CONUS from 18:30 UTC to 20:45 UTC; (3) LPV200 service coverage in Canada from 14:10 UTC to 21:40 UTC; and (2) LPV service coverage in Canada from 14:35 UTC to 20:50 UTC. The elevated GIVE values also caused moderate degradation of LPV200 service coverage in Alaska from 20:20 UTC to 21:20 UTC. The elevated GIV values also caused minor degradation of LPV service coverage in Alaska from 20:50 UTC to 21:05 UTC. Please see plot(s): LPV_11/7/2022 LPV200_11/7/2022 Cov_vs_Time_Alaska_11/7/2022 Cov_vs_Time_Canada_11/7/2022 Cov_vs_Time_Conus_11/7/2022
11/14/2022	11/15/2022	PRN7	LPV_CONUS LPV200_CONUS LPV200_Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN7 (see NANU2022115), which was unusable from 22:00 UTC on 11/14 to 03:15 UTC on 11/15. The NANU caused moderate degradation of: (1) LPV200 service coverage in CONUS from 01:10 UTC to 02:00 UTC on 11/15; and (2) LPV200 service coverage in Canada from 00:00 UTC to 00:20 UTC on 11/15. The NANU also caused minor degradation of: (1) LPV service coverage in CONUS

Start Date	End Date	Location Satellite	Service Affected	Event Description
				from 01:35 UTC to 01:50 UTC on 1/15; and LPV200 service coverage from 23:40 UTC to 00:00 UTC on 11/14. Please see plot(s): LPV200_11/14/2022 Cov_vs_Time_Canada_11/14/2022 Cov_vs_Time_Conus_11/14/2022 LPV200_11/15/2022 Cov_vs_Time_Canada_11/15/2022 Cov_vs_Time_Conus_11/15/2022
11/16/2022	11/16/2022	PRN15	LPV_Canada LPV200_CONUS LPV200_Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN15 (see NANU2022117), which was unusable from 11:18 UTC to 20:20 UTC. The NANU caused moderate degradation of: (1) LPV200 service coverage in CONUS from 14:50 UTC to 15:10 UTC; (2) LPV200 service coverage in Canada from 14:50 UTC to 15:40 UTC; and (3) LPV service coverage in Canada from 14:45 UTC to 15:35 UTC. Please see plot(s): LPV_11/16/2022 LPV200_11/16/2022 Cov_vs_Time_Canada_11/16/2022 Cov_vs_Time_Conus_11/16/2022
12/08/2022	12/09/2022	PRN26	LPV200_CONUS LPV200_Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN26 (see NANU2022123), which was unusable from 13:30 UTC on 12/8 to 03:43 UTC on 12/9. The NANU caused significant degradation of LPV200 service coverage in CONUS from 19:25 UTC to 19:50 UTC and from 21:25 UTC to 22:05 UTC. The NANU also caused moderate degradation of LPV200 service coverage in Canada from 19:05 UTC to 19:30 UTC. Please see plot(s): LPV200_12/8/2022 Cov_vs_Time_Canada_12/8/2022 Cov_vs_Time_Conus_12/8/2022
12/13/2022	12/13/2022	PRN23	LPV200_Canada	The reduction in LPV200 service in Canada was due to a GPS NANU on PRN23 (see NANU2022126), which was unusable from 11:00 UTC to 23:50 UTC. The NANU caused moderate degradation of LPV200 service coverage in Canada from 13:25 UTC to 13:50 UTC

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Please see plot(s): LPV200_12/13/2022 Cov_vs_Time_Canada_12/13/2022
12/15/2022	12/16/2022	PRN31	LPV200_Canada	The reduction in LPV200 service in Canada was due to a GPS NANU on PRN31 (see NANU2022127), which was unusable from 10:00 UTC on 12/15 UTC to 03:06 UTC on 12/16. The NANU caused moderate degradation of LPV200 service coverage in Canada from 19:30 UTC to 19:50 UTC on 12/15 and from 20:05 UTC 20:35 UTC on 12/15. Please see plot(s): LPV200_12/15/2022 Cov_vs_Time_Canada_12/15/2022
12/20/2022	12/20/2022	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 LPV200 service coverage in Canada from 20:05 UTC to 20:25 UTC. The elevated GIVE values also caused very minor degradation of LPV200 service coverage in CONUS (Gulf of Mexico) from 20:55 UTC to 23:00 UTC. Please see plot(s): LPV200_12/20/2022 Cov_vs_Time_Canada_12/20/2022 Cov_vs_Time_Conus_12/20/2022

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
11/18/2022	11/18/2022	Manual	GEO133, South Mountain (CM1)	None	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 07:01:24 UTC. This caused a 3-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 457302-457306.
12/13/2022	12/13/2022	Manual	GEO131, Southbury (DX1)		GEO 131, manual switchover from Southbury to Santa_Paula. TOW 198063-198067.

12/16/2022	12/16/2022	Manual	GEO131, Santa_Paula (SZ1)		GEO 131, manual switchover from Santa_Paula to Southbury. TOW 457321-457326.
12/11/2022	12/11/2022	Manual	GEO131, Southbury (DX1)		GEO 131, manual switchover from Southbury to Santa_Paula. TOW 25300-25304.
12/11/2022	12/11/2022	Faulted	GEO131, Santa_Paula (SZ1)		GEO 131 switched to Southbury, Santa_Paula faulted. TOW 25305-25319.
12/11/2022	12/11/2022	Manual	GEO131, Southbury (DX1)		GEO 131, manual switchover from Southbury to Santa_Paula. TOW 35489-35493.
12/11/2022	12/11/2022	Faulted	GEO131, Santa_Paula (SZ1)		GEO 131 switched to Southbury, Santa_Paula faulted. TOW 35494-35509.
12/12/2022	12/12/2022	Manual	GEO135, Napa (AP1)		GEO 135, manual switchover from Napa to Brewster. TOW 111661-111665.
12/20/2022	12/20/2022	Missed Navigation Message	GEO133, Brewster (BR1), Atlanta (CnV)		Brewster had CnV Source Select from Atlanta to Los Angeles. TOW 223752-223754.
10/19/2022	10/19/2022	Manual	GEO133, South Mountain (CM1)		GEO 133, manual switchover from South Mountain to Brewster. TOW 285272-285276.

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 1.439 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.670 meters observed at Miami.
- The minimum 95% CONUS horizontal LPV errors was 0.526 meters observed at Dallas.
- The minimum 95% CONUS vertical LPV error was 0.819 meters observed at Salt Lake City.

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	1.439	1.439	1.476	100	*	*
Atlantic City	1.080	1.080	1.542	100	*	*
Oklahoma City	1.292	1.292	1.358	100	*	*
Albuquerque	0.606	0.606	0.914	100	1.77	6.08
Anchorage	0.637	0.637	1.364	100	2.21	7.90
Atlanta	0.874	0.874	1.324	100	2.00	6.04
Barrow	0.744	0.744	1.713	100	2.66	8.00
Bethel	0.606	0.606	1.223	100	2.05	8.30
Billings	0.640	0.640	0.969	100	1.89	5.91
Boston	0.682	0.682	1.047	100	2.31	5.42
Chicago	0.685	0.685	0.882	100	*	*
Cleveland	0.722	0.722	0.956	100	2.18	5.55
Cold Bay	0.710	0.710	1.281	100	*	*
Dallas	0.526	0.526	1.360	100	*	*
Denver	0.584	0.584	0.838	100	*	*
Fairbanks	0.666	0.666	1.248	100	2.40	7.76
Gander	0.897	0.902	1.176	99.999	2.41	5.10
Goose Bay	0.949	0.966	1.335	100	*	*
Houston	0.606	0.606	1.592	100	2.01	6.30

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)
Iqaluit	1.223	1.254	2.095	100	*	*
Jacksonville	0.653	0.653	1.522	100	*	*
Juneau	0.714	0.715	1.294	100	2.11	6.75
Kansas City	0.599	0.599	1.023	100	1.87	5.67
Kotzebue	0.682	0.682	1.335	100	2.46	8.20
Los Angeles	0.715	0.715	1.177	100	2.09	7.11
Memphis	0.584	0.584	1.270	100	*	*
Merida	0.747	0.747	1.971	100	3.21	6.38
Mexico City	0.749	0.749	2.401	100	*	*
Miami	0.818	0.818	1.670	100	2.31	6.39
Minneapolis	0.620	0.620	0.870	100	1.96	5.64
New York	0.740	0.740	1.062	100	*	*
Oakland	0.743	0.743	1.207	100	2.09	7.25
Puerto Vallarta	0.756	0.756	1.784	100	*	*
Salt Lake City	0.550	0.550	0.819	100	1.8	6.19
San Jose Del Cabo	0.833	0.833	1.970	100	3.53	6.83
Seattle	0.630	0.630	0.904	100	1.71	6.39
Washington, DC	0.772	0.772	1.001	100	2.28	5.64
Winnipeg	0.600	0.600	1.031	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 7.624 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 17.030 meters observed at San Juan.
- The minimum 95% horizontal error was 1.347 meters observed at Seattle.
- The minimum 99.999% horizontal error was 2.635 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	1.472	3.936	100	4.092
Anchorage	2.222	5.216	100	5.366
Atlanta	1.557	3.110	100	3.263
Barrow	2.638	5.627	100	5.781
Bethel	1.960	4.334	100	4.551
Billings	1.535	3.151	100	3.355
Boston	1.830	3.293	100	3.408
Cleveland	1.712	3.420	100	3.539
Cold Bay	1.547	3.488	100	3.614
Fairbanks	2.396	5.906	100	6.136

Location	95% Horizontal (m)	99.999% Horizontal (m)	Percentage in NPA Mode (%)	Maximum Horizontal Error (m)
Gander	2.042	6.870	100	7.026
Honolulu	7.624	13.653	100	13.905
Houston	1.528	3.515	100	3.839
Iqaluit	2.653	6.690	100	6.925
Juneau	1.949	4.583	100	4.746
Kansas City	1.533	4.015	100	4.199
Kotzebue	2.403	5.828	100	5.930
Los Angeles	1.685	5.885	100	5.994
Merida	1.944	8.689	100	9.037
Miami	1.726	4.372	100	4.516
Minneapolis	1.606	6.713	100	6.928
Oakland	1.829	6.566	100	6.772
Salt Lake City	1.386	4.856	100	5.044
San Jose Del Cabo	2.398	9.153	100	9.327
San Juan	4.080	17.030	100	18.136
Seattle	1.347	2.635	100	2.984
Tapachula	3.346	12.791	100	13.005
Washington, DC	1.822	3.417	100	3.547

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 4.266 meters occurred at Iqaluit and maximum vertical LPV error was 8.545 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	2.523	0.213	0.226	3.447	0.167	0.180
Atlantic City-a	2.217	0.165	0.206	3.906	0.215	0.215
Oklahoma City	2.469	0.220	0.227	3.415	0.130	0.196
Prescott	2.692	0.236	0.250	4.107	0.180	0.199
Albuquerque	1.678	0.153	0.171	2.819	0.157	0.157
Anchorage	1.767	0.134	0.155	5.111	0.249	0.249
Atlanta	1.953	0.127	0.175	2.800	0.163	0.176
Barrow	2.453	0.111	0.184	6.868	0.201	0.273
Bethel	2.508	0.168	0.168	4.589	0.149	0.159
Billings	1.818	0.161	0.161	2.430	0.123	0.160
Boston	1.984	0.134	0.160	2.827	0.152	0.161
Chicago	1.560	0.135	0.163	2.622	0.167	0.170
Cleveland	1.735	0.169	0.169	3.121	0.149	0.153

Location	Horizontal Error (m)	Horizontal Error HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error VPL	Vertical Maximum Ratio
Cold Bay	1.727	0.096	0.151	2.975	0.106	0.150
Dallas	1.349	0.124	0.140	3.229	0.187	0.191
Denver	2.511	0.216	0.222	2.526	0.122	0.141
Fairbanks	2.610	0.170	0.201	4.654	0.239	0.239
Gander	3.855	0.158	0.203	3.903	0.170	0.186
Goose Bay	3.890	0.194	0.195	4.304	0.088	0.173
Houston	1.404	0.131	0.168	3.189	0.173	0.203
Iqaluit	4.266	0.115	0.205	8.545	0.230	0.273
Jacksonville	1.539	0.132	0.138	3.113	0.140	0.184
Juneau	2.257	0.152	0.152	3.406	0.125	0.177
Kansas City	1.372	0.152	0.152	2.502	0.134	0.161
Kotzebue	2.271	0.121	0.155	4.815	0.183	0.200
Los Angeles	3.526	0.184	0.184	2.782	0.066	0.157
Memphis	1.325	0.138	0.147	3.160	0.189	0.189
Merida	2.391	0.115	0.189	4.897	0.126	0.187
Mexico City	2.889	0.119	0.206	4.703	0.104	0.169
Miami	2.087	0.138	0.177	3.550	0.089	0.174
Minneapolis	2.354	0.181	0.230	2.599	0.136	0.161
New York	1.863	0.125	0.144	2.898	0.129	0.163
Oakland	3.140	0.136	0.178	3.893	0.087	0.147
Puerto Vallarta	2.812	0.176	0.186	4.124	0.085	0.148
Salt Lake City	1.572	0.116	0.136	2.465	0.135	0.135
San Jose Del Cabo	2.482	0.166	0.166	3.957	0.133	0.194
Seattle	1.764	0.156	0.156	2.904	0.160	0.160
Washington, DC	1.639	0.154	0.154	2.849	0.178	0.178
Winnipeg	2.696	0.187	0.190	4.861	0.180	0.202

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.

- October 3, 2022—Position errors in CONUS and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.929 meters and 2.971 meters at Mexico City. The Kp index was 5.
- October 14, 2022—Position errors in Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 1.419 meters and 2.904 meters at Bethel and Anchorage respectively. The Kp index was 4.
- November 7, 2022—Position errors in CONUS and Alaska were elevated. The maximum 95% horizontal and vertical LPV errors were 2.380 meters and 2.418 meters at Los Angeles and Kotzebue respectively. The Kp index was 5.
- December 7, 2022—Position errors in CONUS, Alaska, and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 1.625 meters and 2.887 meters at Goose Bay and Iqaluit respectively. The Kp index 5.

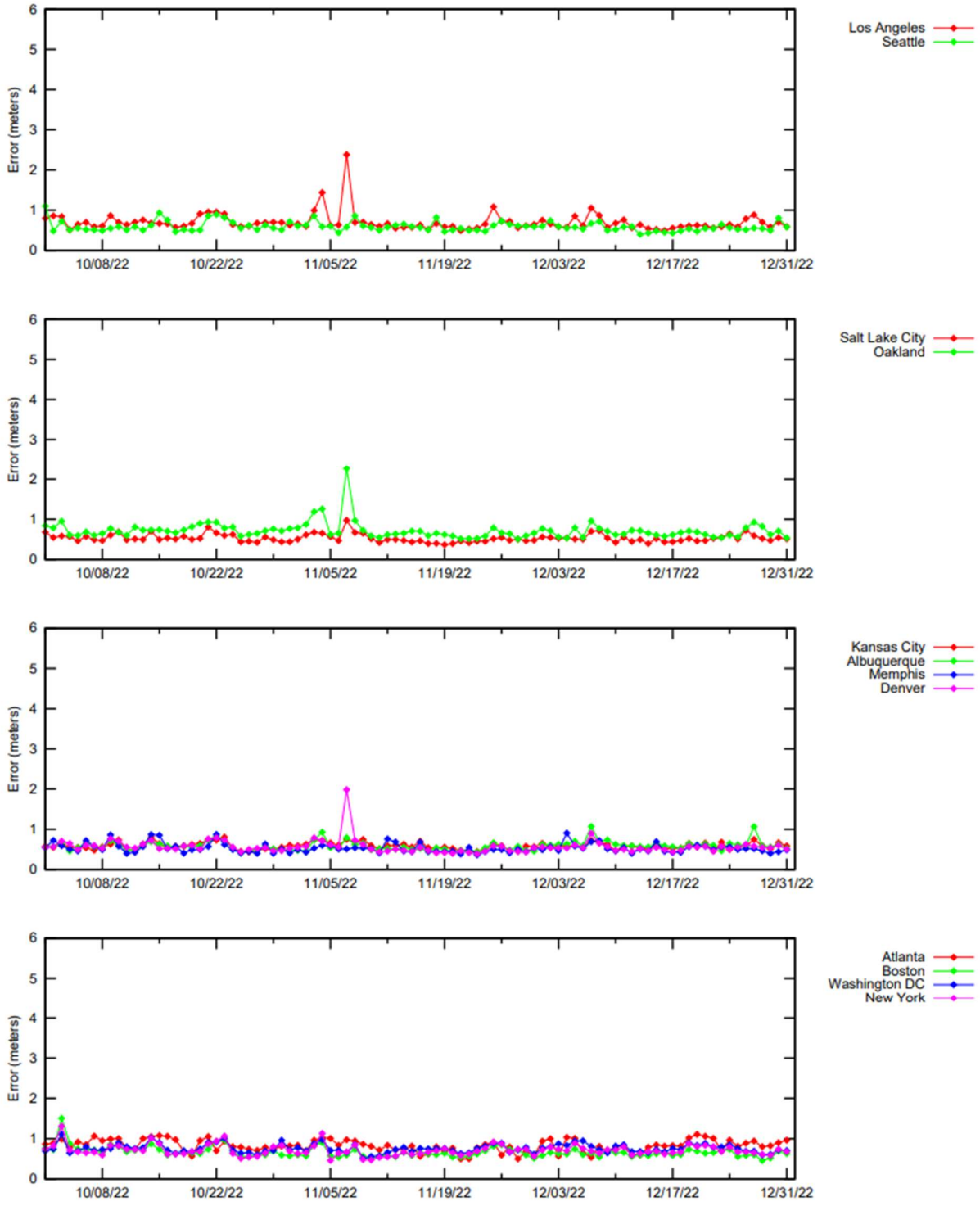

Figure 2-1 LPV 95% Horizontal Accuracy

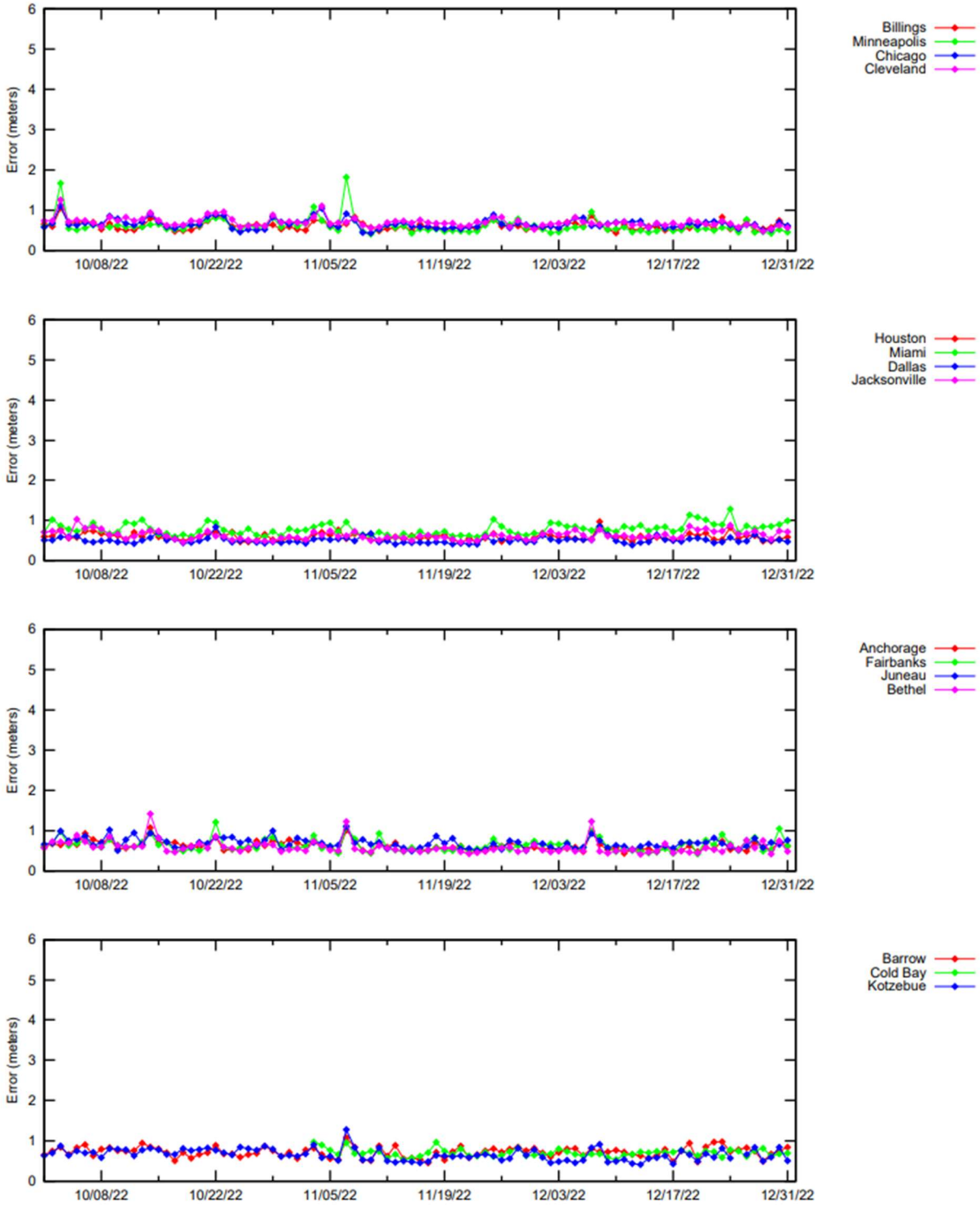

Figure 2-2 LPV 95% Horizontal Accuracy

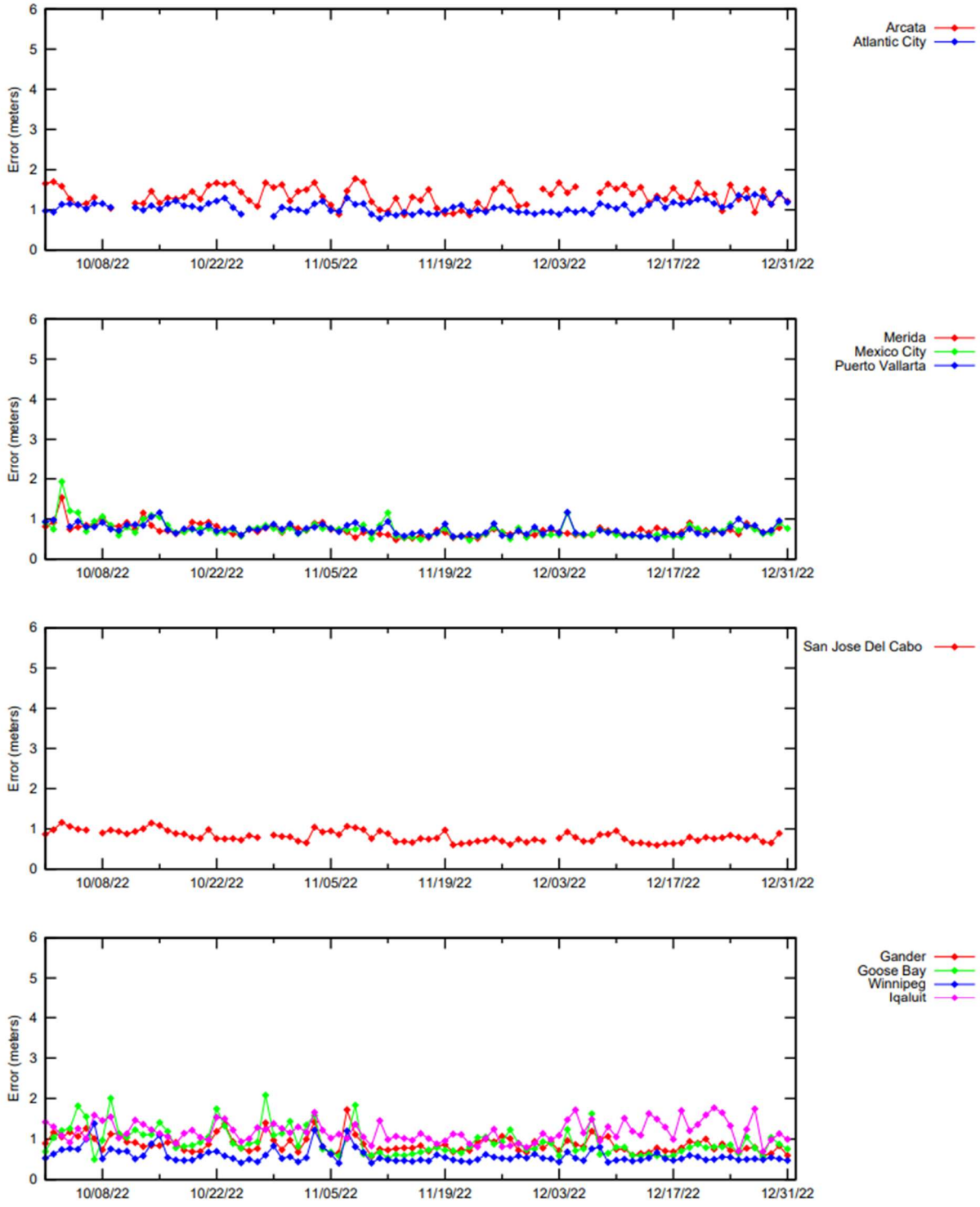

Figure 2-3 LPV 95% Horizontal Accuracy

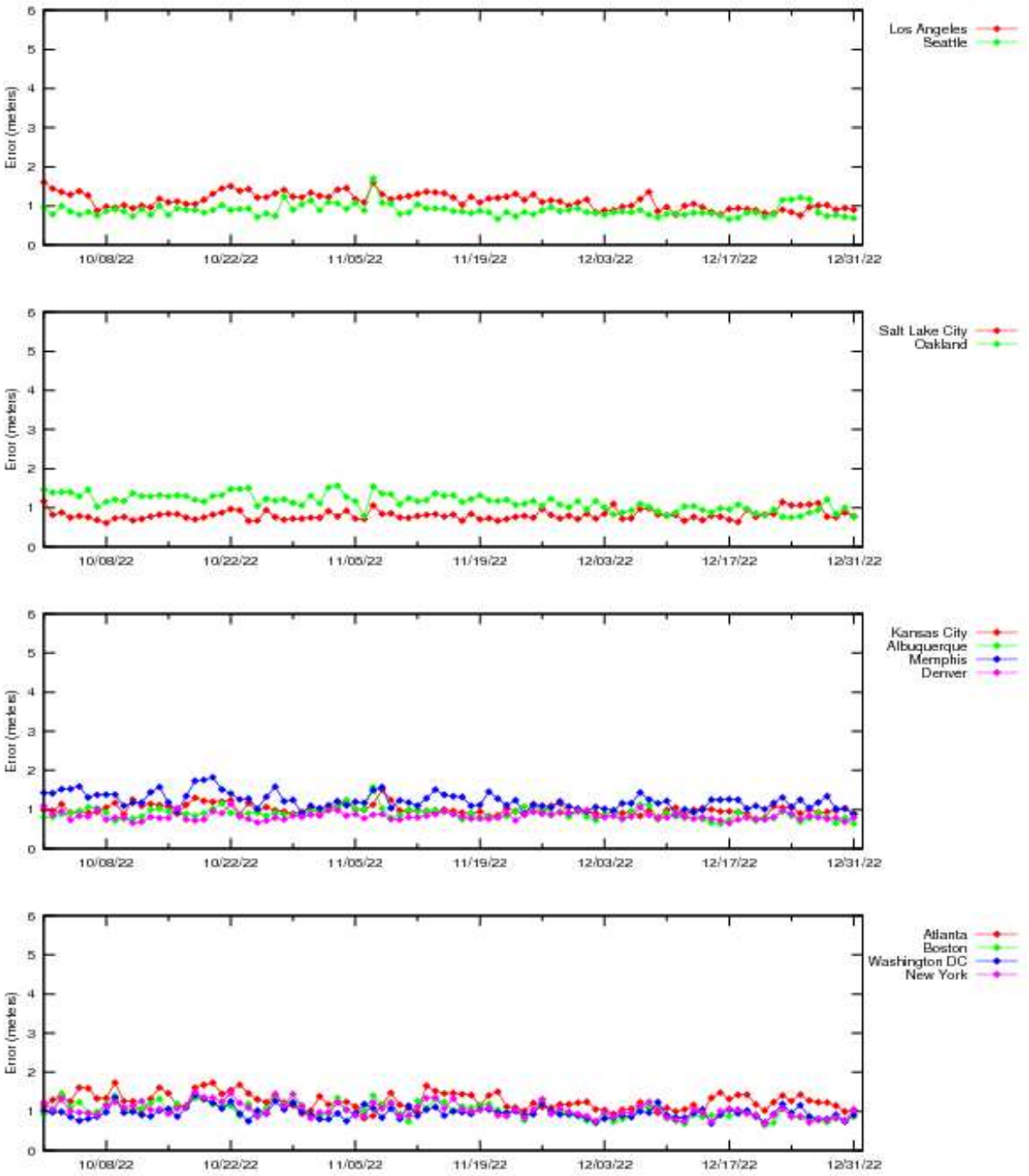

Figure 2-4 LPV 95% Vertical Accuracy

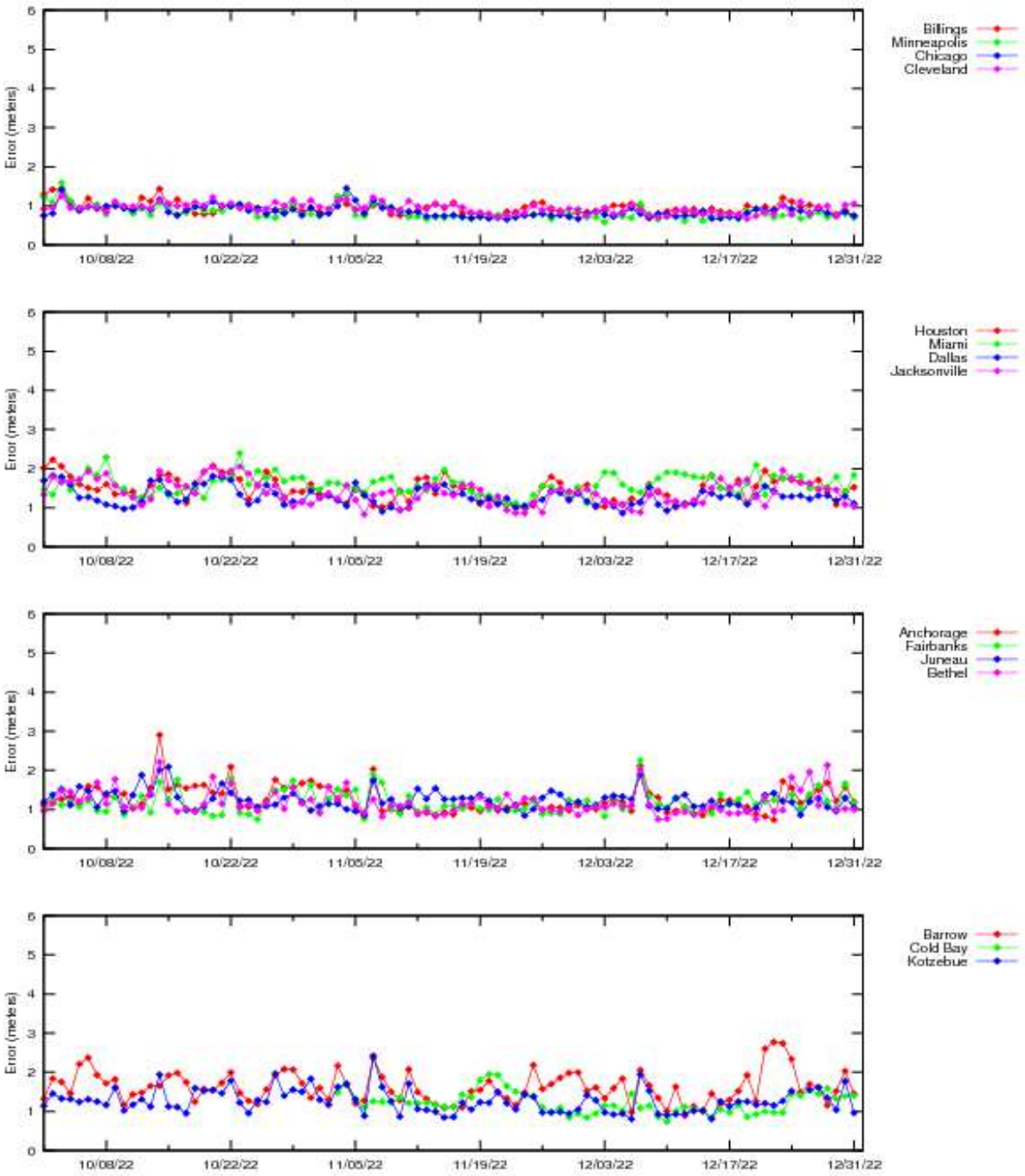

Figure 2-5 LPV 95% Vertical Accuracy

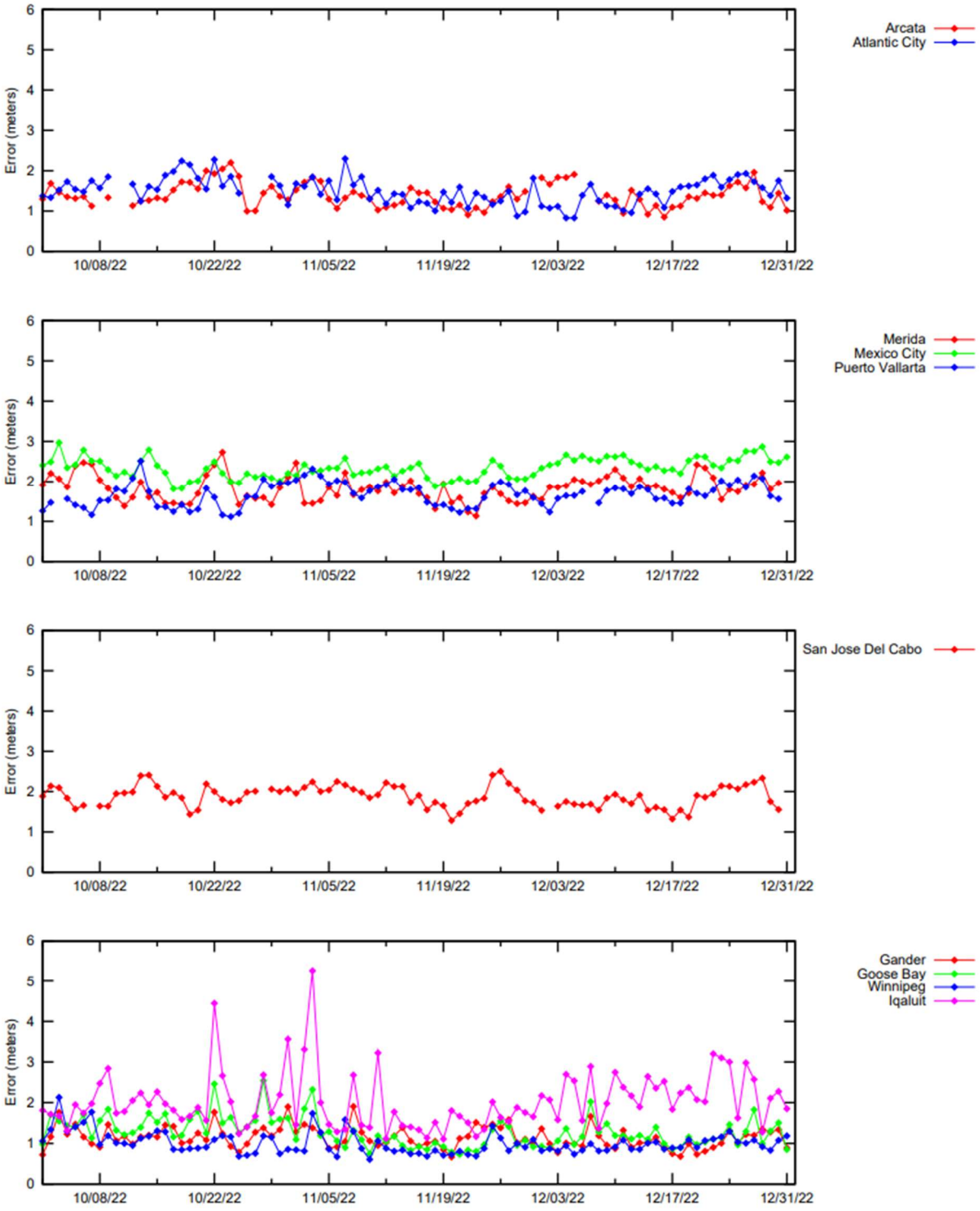

Figure 2-6 LPV 95% Vertical Accuracy

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 October 4-6, October 22, November 7, and December 7, 2022.

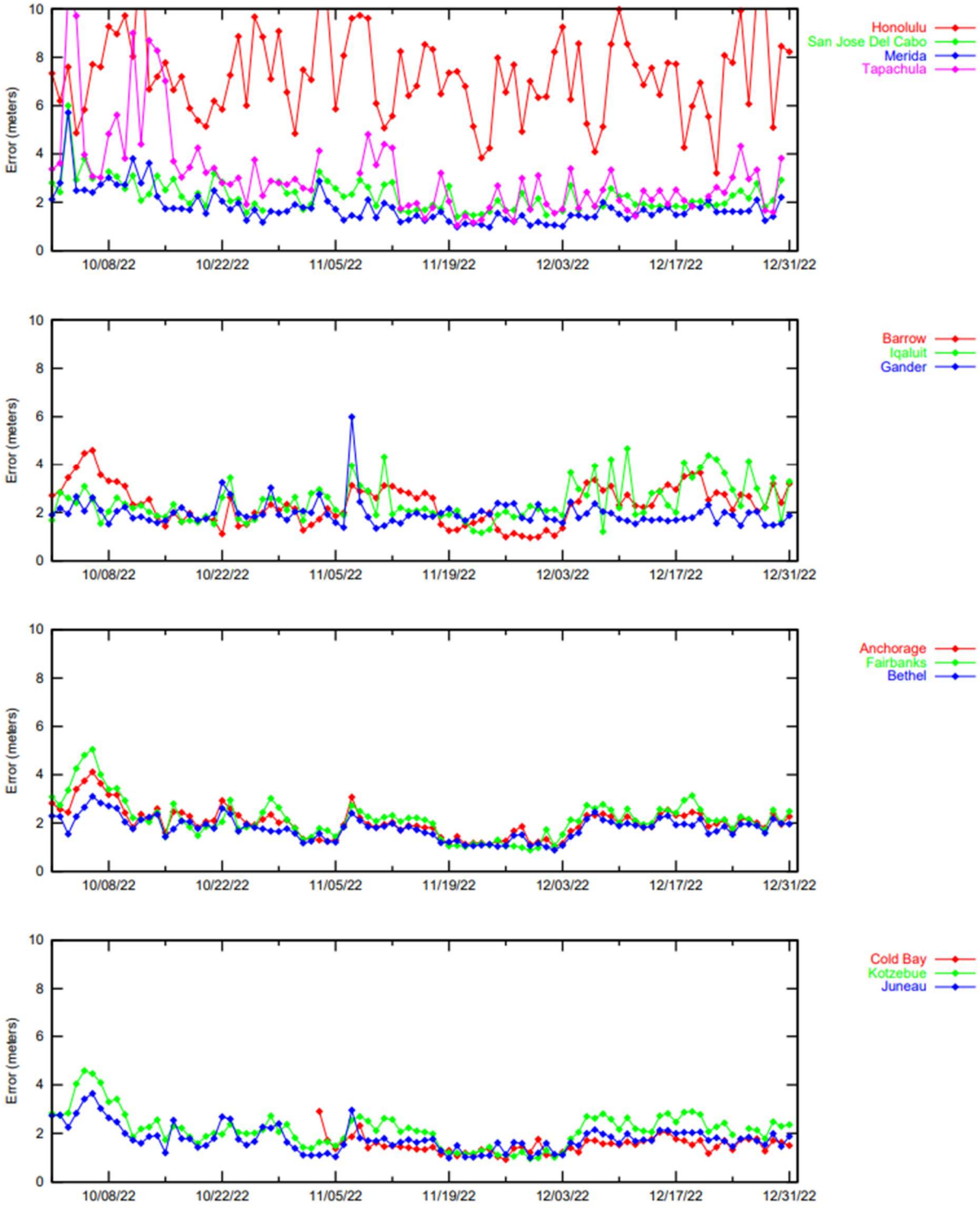

Figure 2-7 NPA 95% Horizontal Accuracy

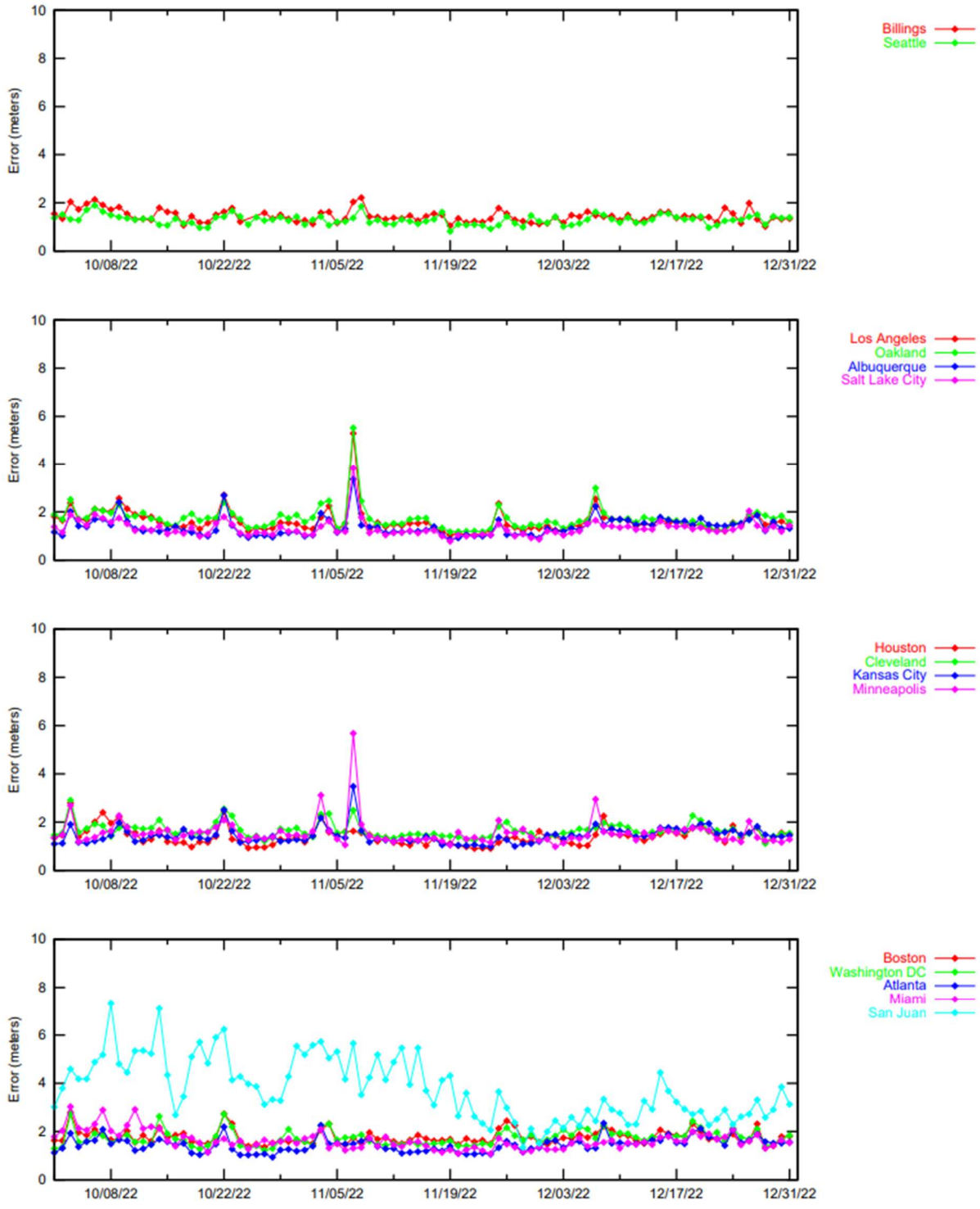

Figure 2-8 NPA 95% Horizontal Accuracy

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.

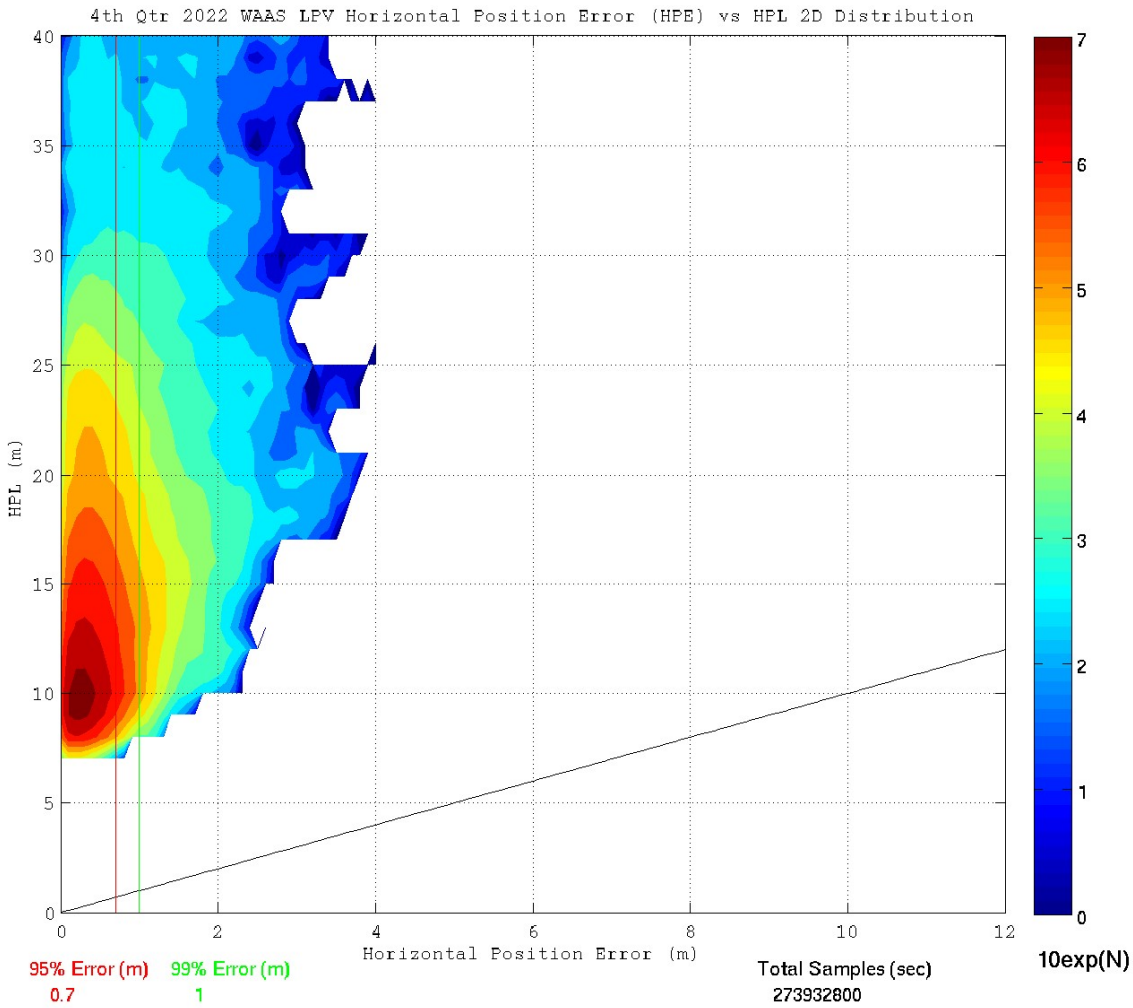

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

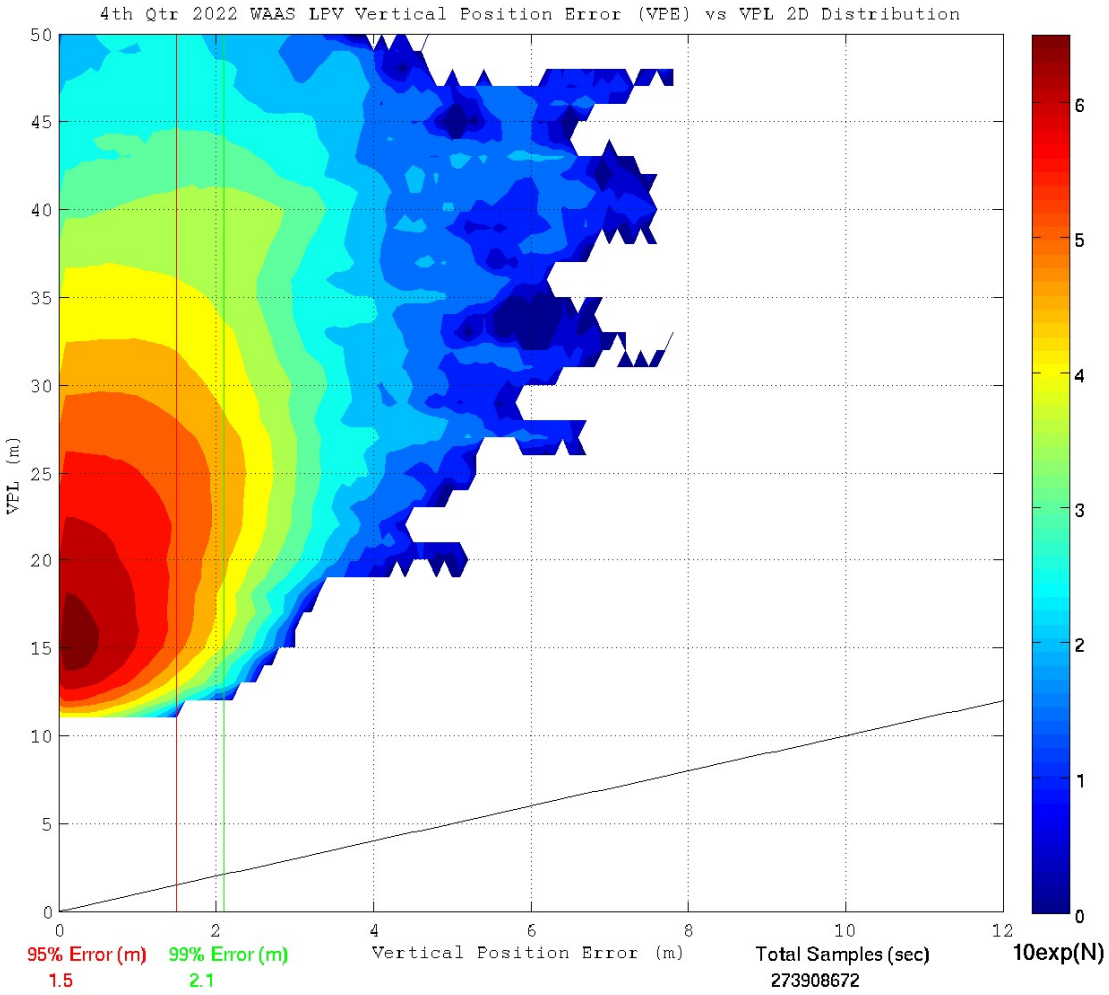

Figure 2-10 LPV Vertical Error Bounding Triangle Chart

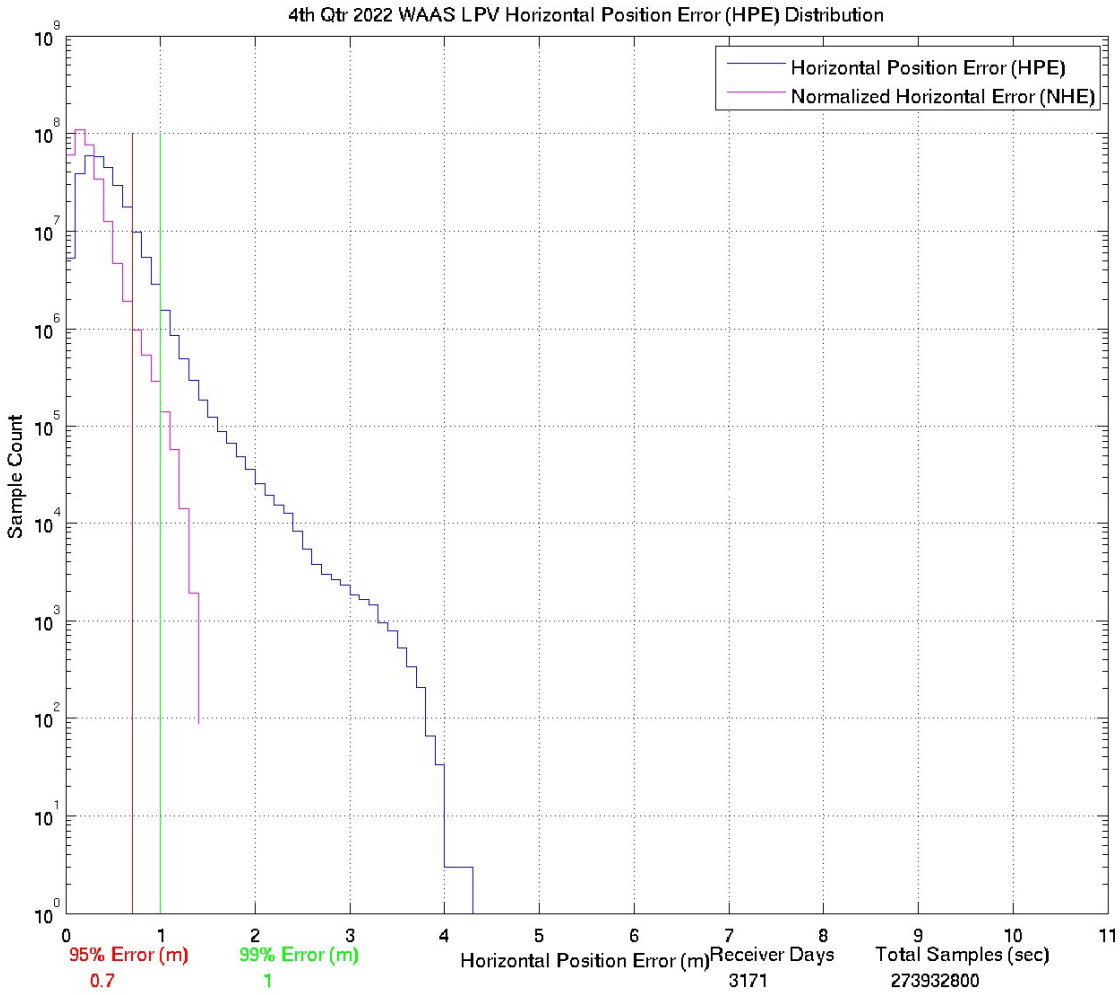

Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

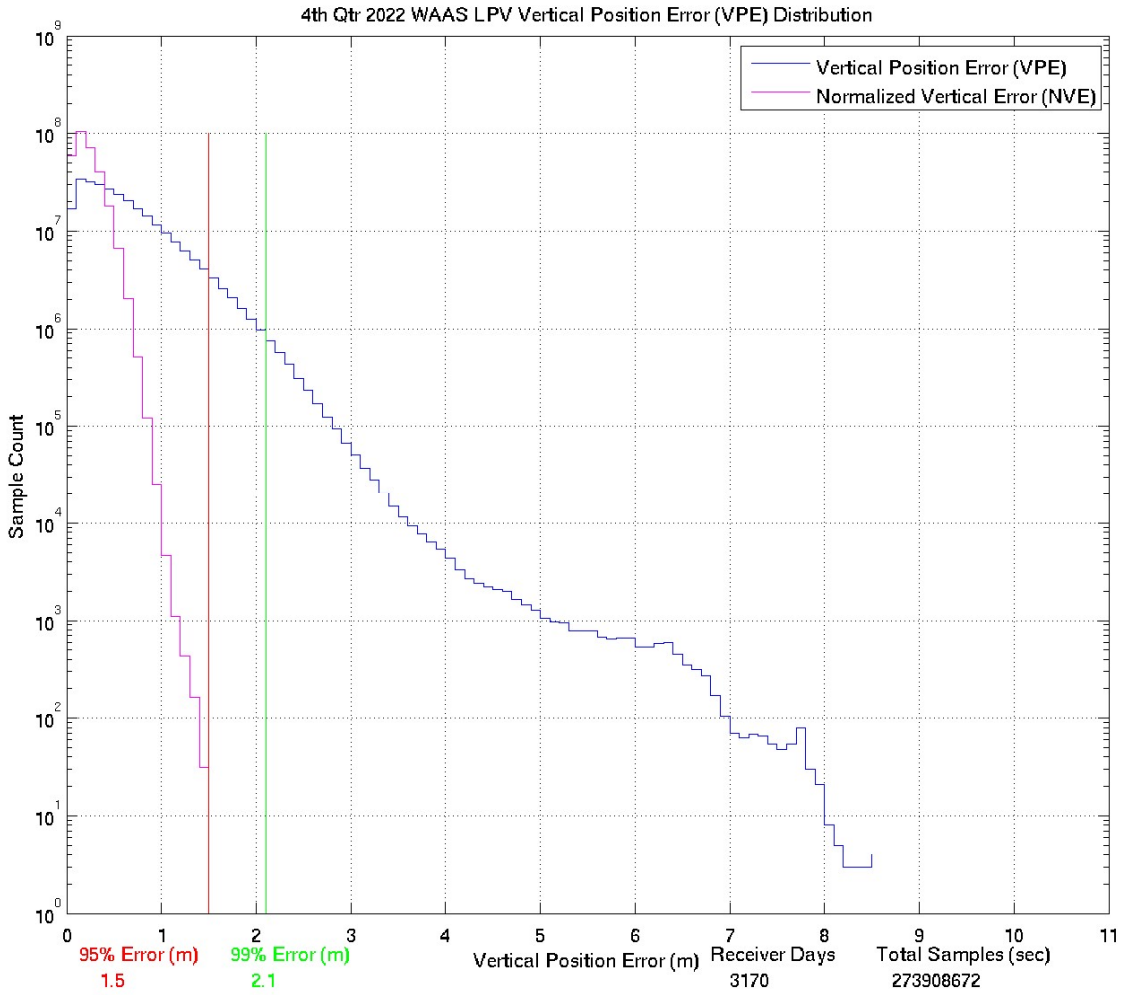

Figure 2-12 LPV 2-D Vertical Error Distribution Histogram

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 18.558 meters observed at Miami
- The maximum 99% CONUS VPL was 32.673 meters observed at Arcata
- The minimum 99% CONUS HPL was 10.523 meters observed at Denver
- The minimum 99% CONUS VPL was 19.439 meters observed at Kansas City
- The maximum 99% Alaska HPL was 18.549 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 30.843 meters observed at Barrow
- The minimum 99% Alaska HPL was 13.299 meters observed at Juneau
- The minimum 99% Alaska VPL was 23.078 meters observed at Juneau

Table 3-1 99% Protection Level

Location	99% HPL (m)	99% VPL (m)	Percentage in PA Mode (%)
Arcata	15.048	32.673	100
Atlantic City	14.263	24.149	100
Oklahoma City	13.146	23.155	100
Albuquerque	11.026	21.890	100
Anchorage	13.944	23.989	100
Atlanta	12.183	23.641	100
Barrow	15.984	30.843	100
Bethel	16.515	27.790	100
Billings	12.225	19.458	100
Boston	15.740	24.266	100
Chicago	11.528	21.816	100
Cleveland	13.111	23.195	100
Cold Bay	18.549	28.772	100
Dallas	11.206	20.736	100
Denver	10.523	19.765	100
Fairbanks	13.581	24.645	100
Gander	24.520	33.284	99.999
Goose Bay	23.757	29.352	100
Houston	11.920	21.722	100
Iqaluit	39.602	48.168	100
Jacksonville	14.309	25.506	100
Juneau	13.299	23.078	100
Kansas City	10.787	19.439	100
Kotzebue	15.621	28.796	100
Los Angeles	12.976	28.423	100
Memphis	11.051	22.319	100
Merida	21.847	39.412	100
Mexico City	24.655	40.742	100
Miami	18.558	28.209	100
Minneapolis	11.562	20.035	100
New York	14.889	24.153	100
Oakland	13.367	28.180	100
Puerto Vallarta	24.150	38.948	100
Salt Lake City	11.064	20.564	100
San Jose Del Cabo	21.389	36.573	100
Seattle	12.217	21.516	100
Washington, DC	13.095	23.115	100
Winnipeg	13.760	21.140	100

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

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

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

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

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
Arcata	100	99.98	99.93
Atlantic City-a	100	100	100
Oklahoma City	100	100	100
Prescott	100	100	99.82
Albuquerque	100	100	100
Anchorage	100	100	99.98
Atlanta	100	100	99.99
Barrow	100	100	99.8
Bethel	100	100	99.95
Billings	100	100	100
Boston	100	100	99.99
Chicago	100	100	100
Cleveland	100	100	99.98
Cold Bay	100	100	99.89
Dallas	100	100	100
Denver	100	100	100
Fairbanks	100	100	99.97
Gander	99.62	99.59	99.08
Goose Bay	99.59	99.55	99.24
Houston	100	100	100
Iqaluit	98.93	98.73	96.81
Jacksonville	100	100	99.97
Juneau	99.98	99.97	99.97
Kansas City	100	100	100
Kotzebue	100	100	99.95
Los Angeles	99.99	99.99	99.91
Memphis	100	100	100
Merida	100	99.96	97.27
Mexico City	100	99.88	92.66
Miami	100	100	99.91
Minneapolis	100	100	100
New York	100	100	100
Oakland	100	100	99.86
Puerto Vallarta	100	99.85	94.56
Salt Lake City	100	100	100

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
San Jose Del Cabo	100	99.88	96.96
Seattle	100	100	100
Washington, DC	100	100	99.99
Winnipeg	100	100	99.97

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	0	0.000000	2	0.000042	2	0.000042
Atlantic City-a	0	0.000000	0	0.000000	0	0.000000
Oklahoma City	0	0.000000	0	0.000000	0	0.000000
Prescott	2	0.000068	2	0.000068	64	0.002191
Albuquerque	0	0.000000	0	0.000000	0	0.000000
Anchorage	0	0.000000	0	0.000000	2	0.000038
Atlanta	0	0.000000	0	0.000000	2	0.000038
Barrow	0	0.000000	2	0.000038	26	0.000492
Bethel	0	0.000000	1	0.000019	8	0.000151
Billings	0	0.000000	0	0.000000	0	0.000000
Boston	0	0.000000	0	0.000000	2	0.000038
Chicago	0	0.000000	0	0.000000	0	0.000000
Cleveland	0	0.000000	0	0.000000	1	0.000019
Cold Bay	0	0.000000	0	0.000000	6	0.000177
Dallas	0	0.000000	0	0.000000	0	0.000000
Denver	0	0.000000	0	0.000000	0	0.000000
Fairbanks	0	0.000000	1	0.000019	7	0.000132
Gander	7	0.000133	10	0.000190	33	0.000629
Goose Bay	5	0.000095	4	0.000076	14	0.000266
Houston	0	0.000000	0	0.000000	0	0.000000
Iqaluit	27	0.000518	45	0.000864	112	0.002194
Jacksonville	0	0.000000	0	0.000000	2	0.000038
Juneau	1	0.000019	1	0.000019	1	0.000019
Kansas City	0	0.000000	0	0.000000	0	0.000000
Kotzebue	1	0.000019	2	0.000038	14	0.000267
Los Angeles	1	0.000019	1	0.000019	7	0.000132
Memphis	0	0.000000	0	0.000000	0	0.000000
Merida	0	0.000000	3	0.000058	228	0.004501
Mexico City	0	0.000000	17	0.000322	637	0.013013
Miami	0	0.000000	1	0.000019	8	0.000151
Minneapolis	0	0.000000	0	0.000000	0	0.000000
New York	0	0.000000	0	0.000000	0	0.000000
Oakland	0	0.000000	0	0.000000	11	0.000208
Puerto Vallarta	1	0.000020	38	0.000745	576	0.011923
Salt Lake City	0	0.000000	0	0.000000	0	0.000000
San Jose Del Cabo	0	0.000000	68	0.001358	333	0.006848

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Seattle	0	0.000000	0	0.000000	0	0.000000
Washington, DC	0	0.000000	0	0.000000	1	0.000019
Winnipeg	0	0.000000	0	0.000000	3	0.000057

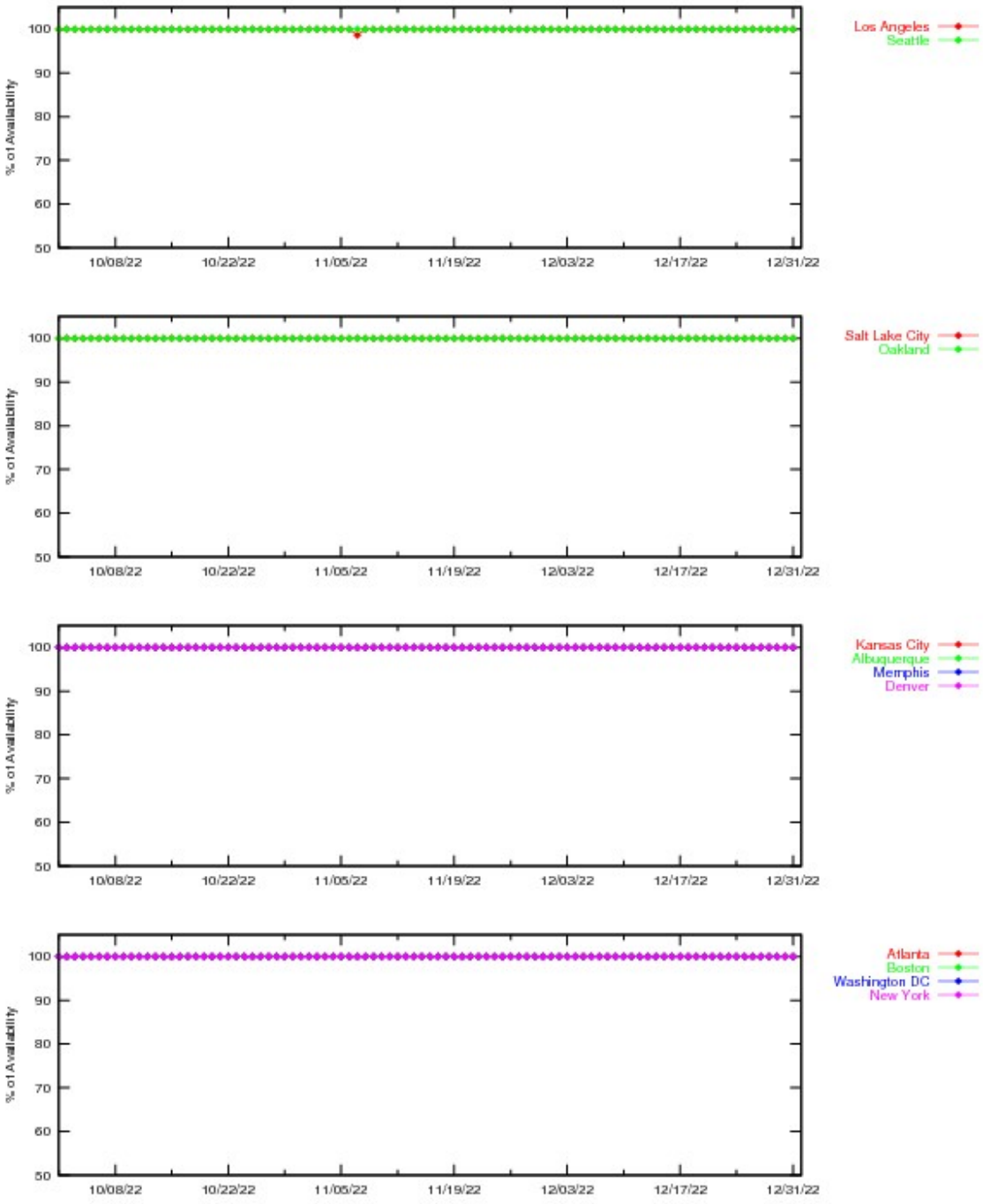

Figure 3-1 LPV Instantaneous Availability

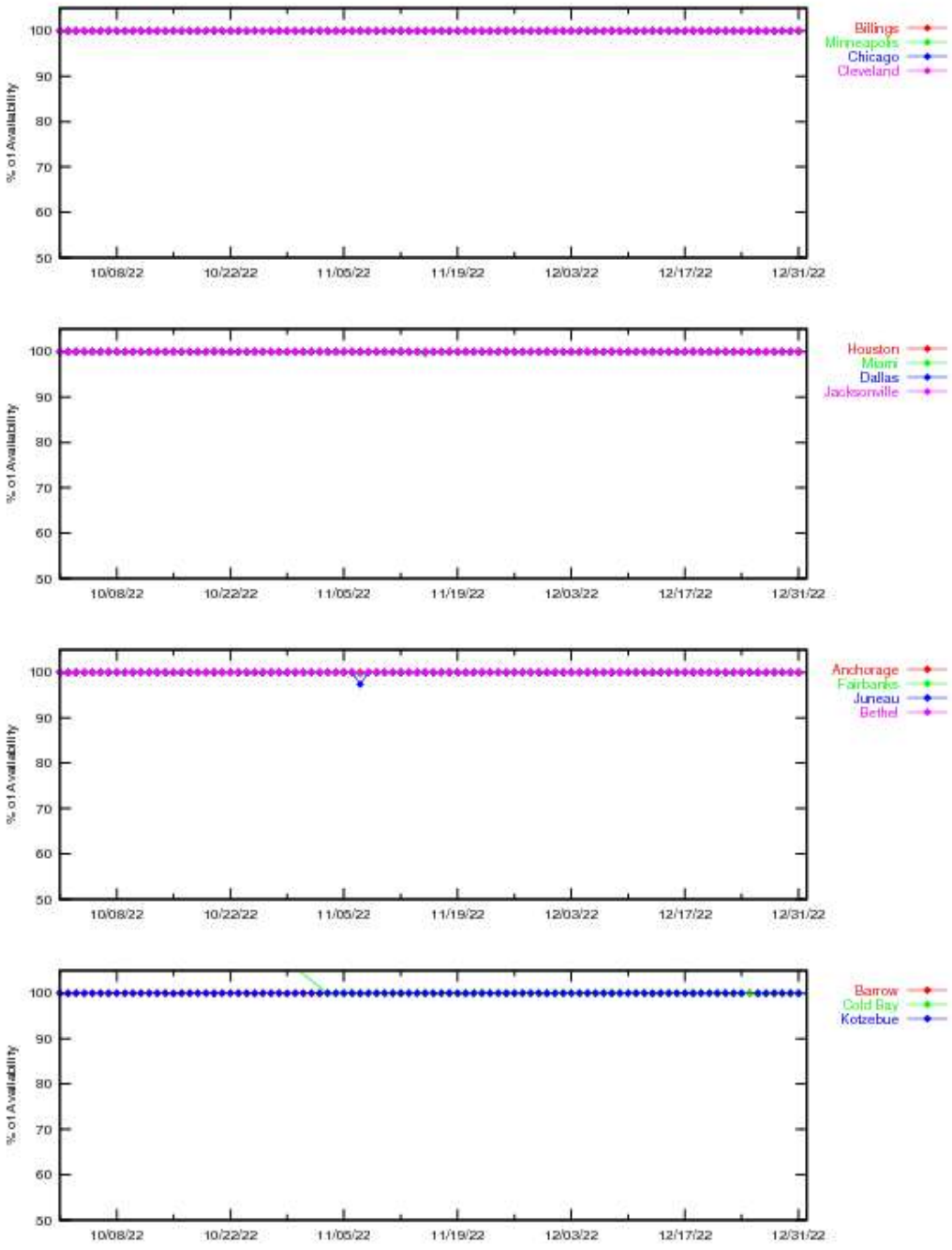

Figure 3-2 LPV Instantaneous Availability

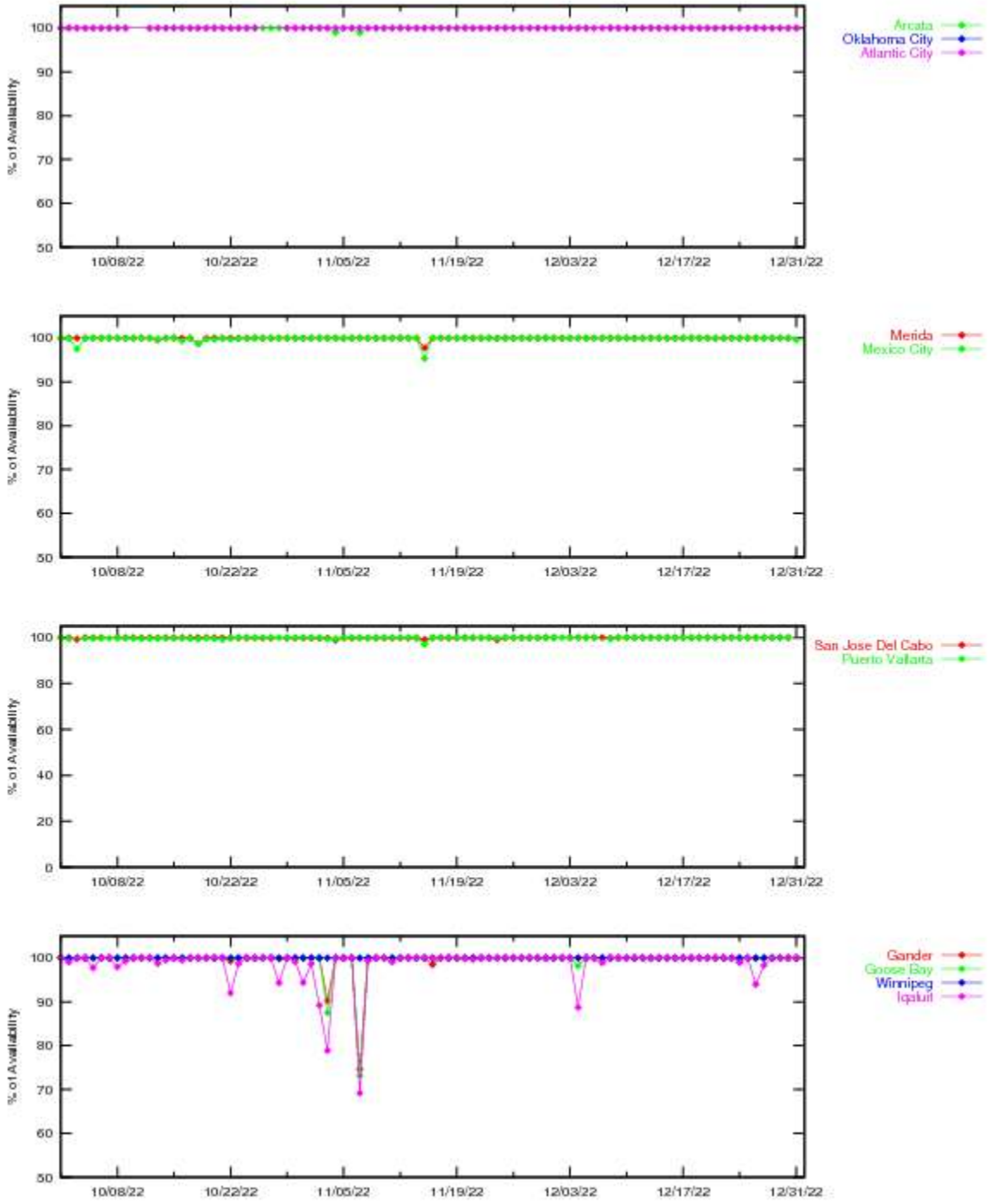

Figure 3-3 LPV Instantaneous Availability

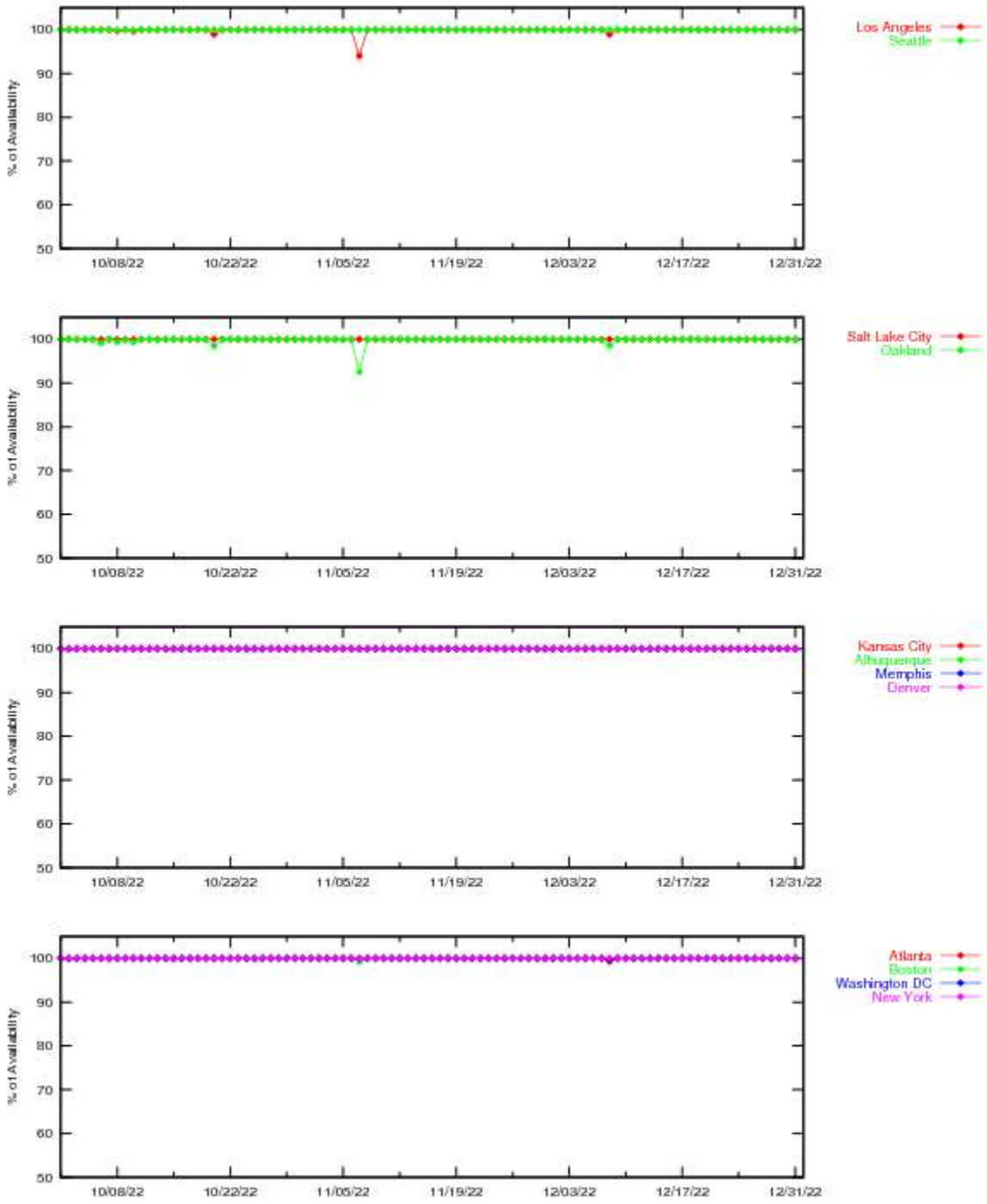

Figure 3-4 LPV200 Instantaneous Availability

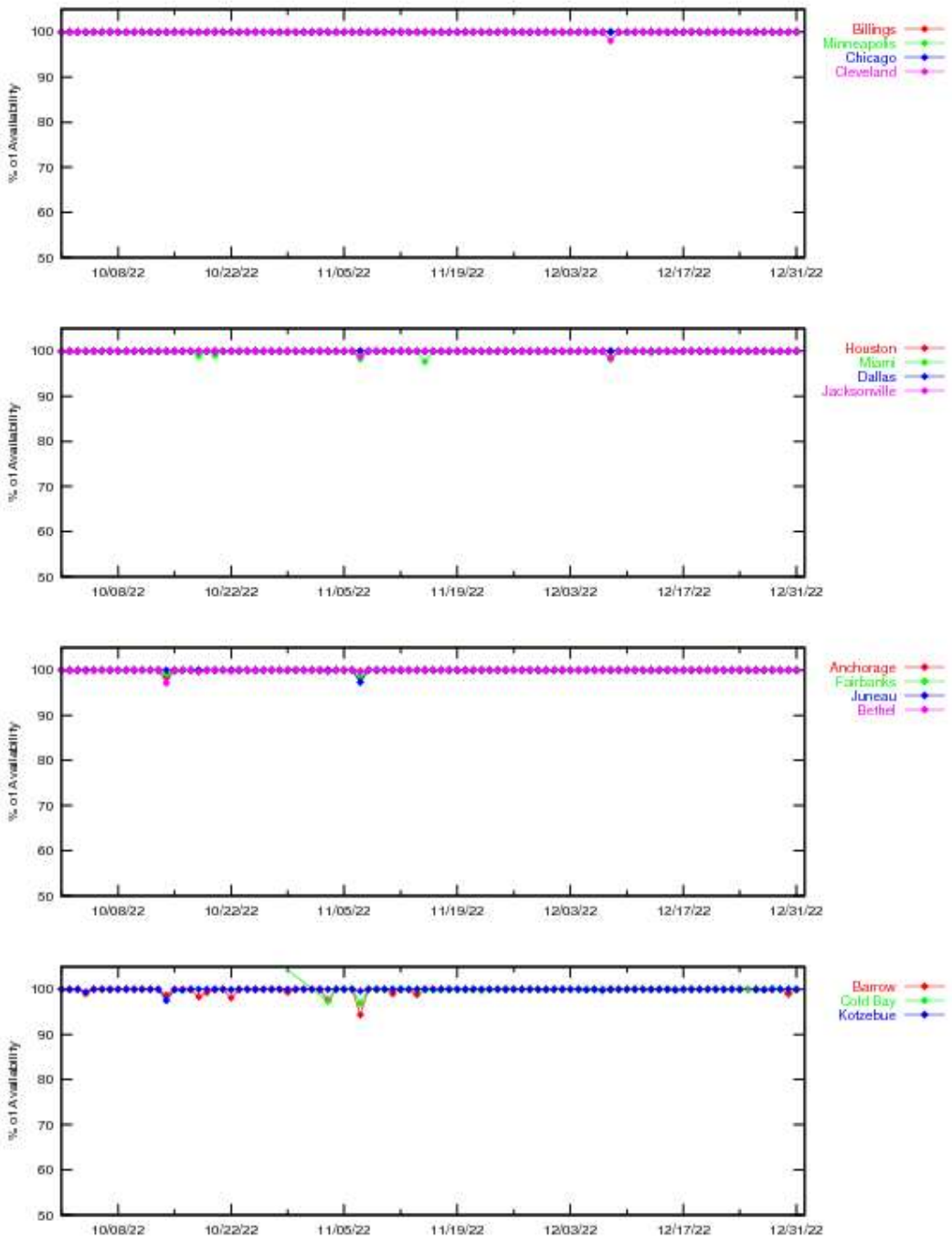

Figure 3-5 LPV200 Instantaneous Availability

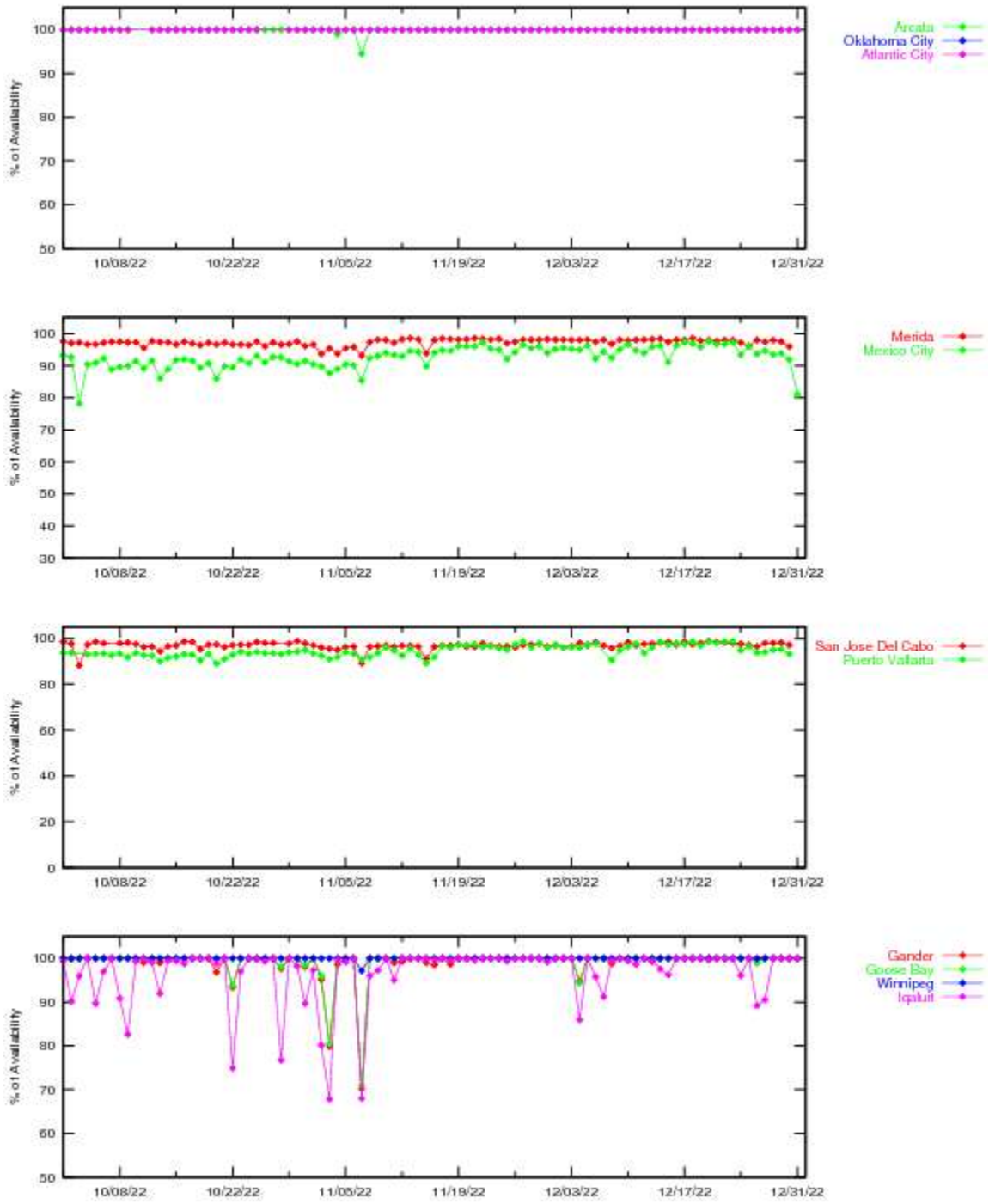

Figure 3-6 LPV200 Instantaneous Availability

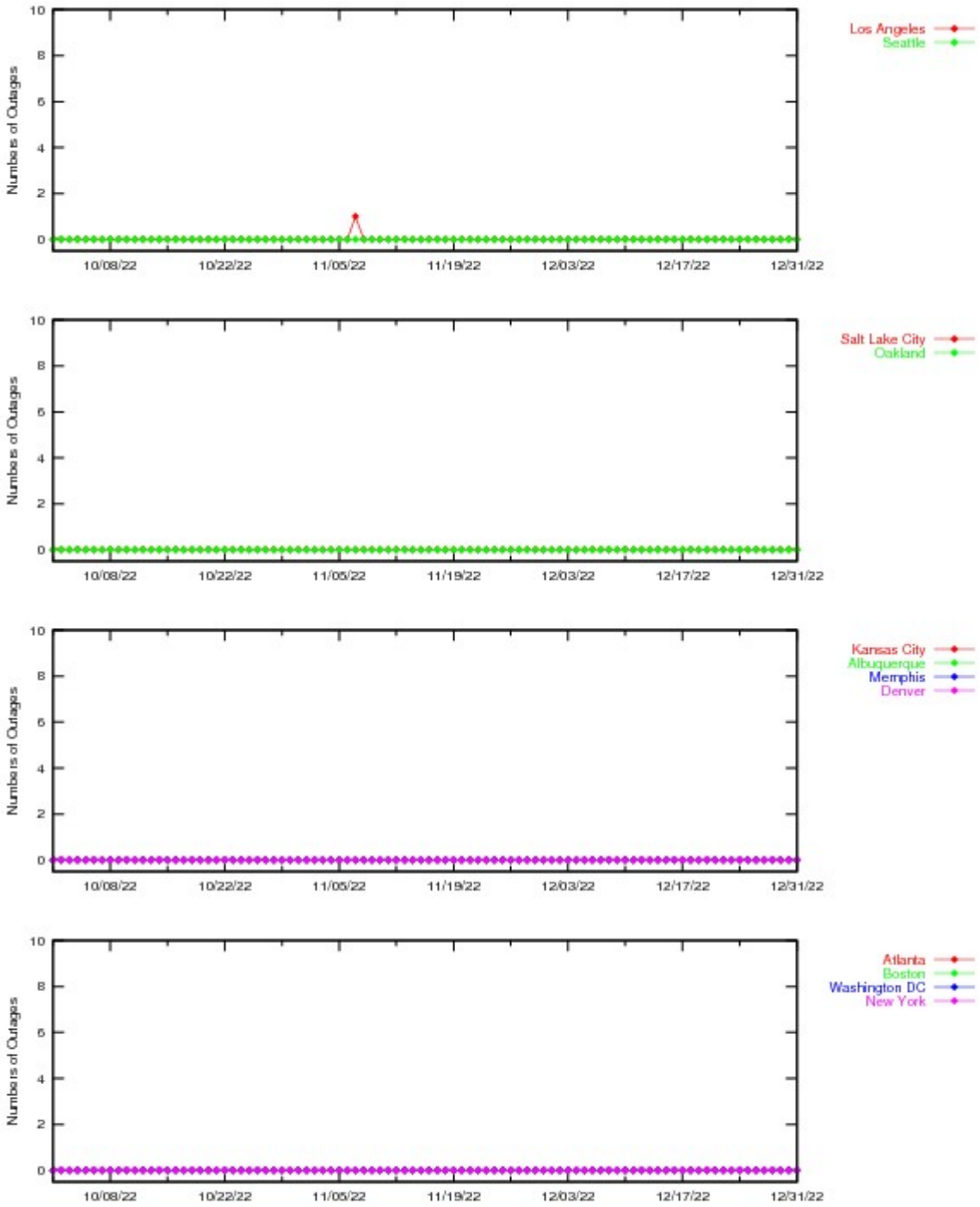

Figure 3-7 LPV Outages

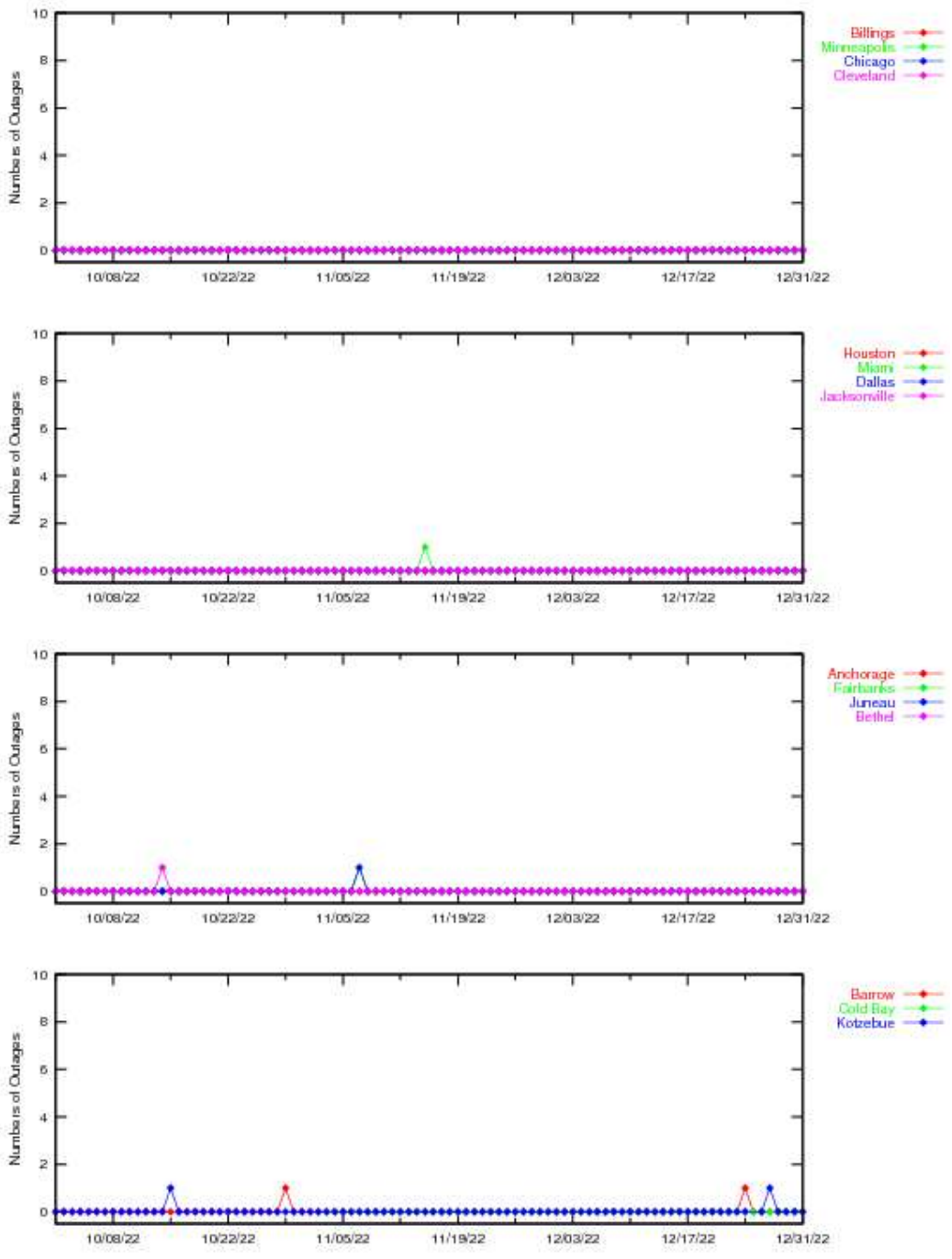

Figure 3-8 LPV Outages

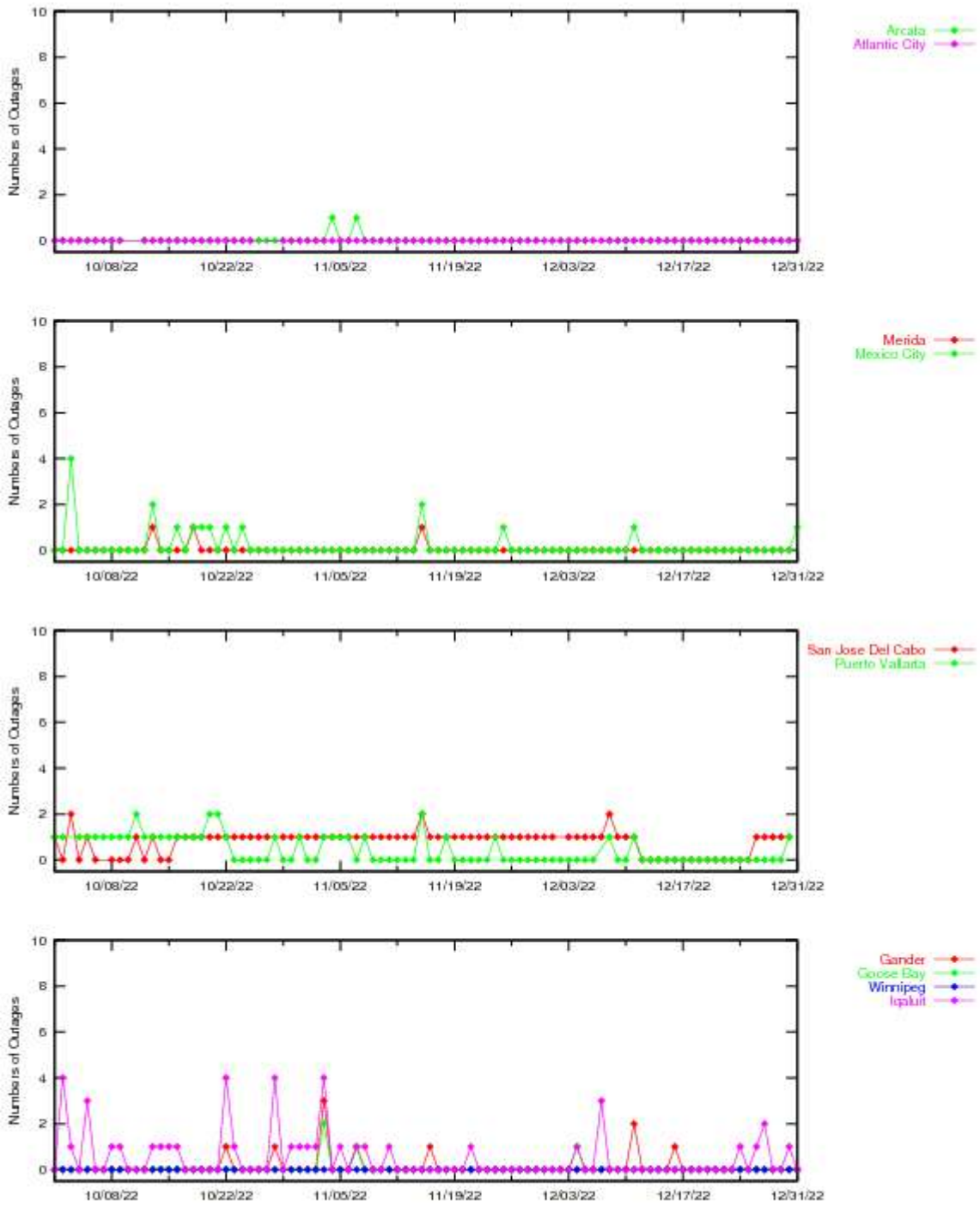

Figure 3-9 LPV Outages

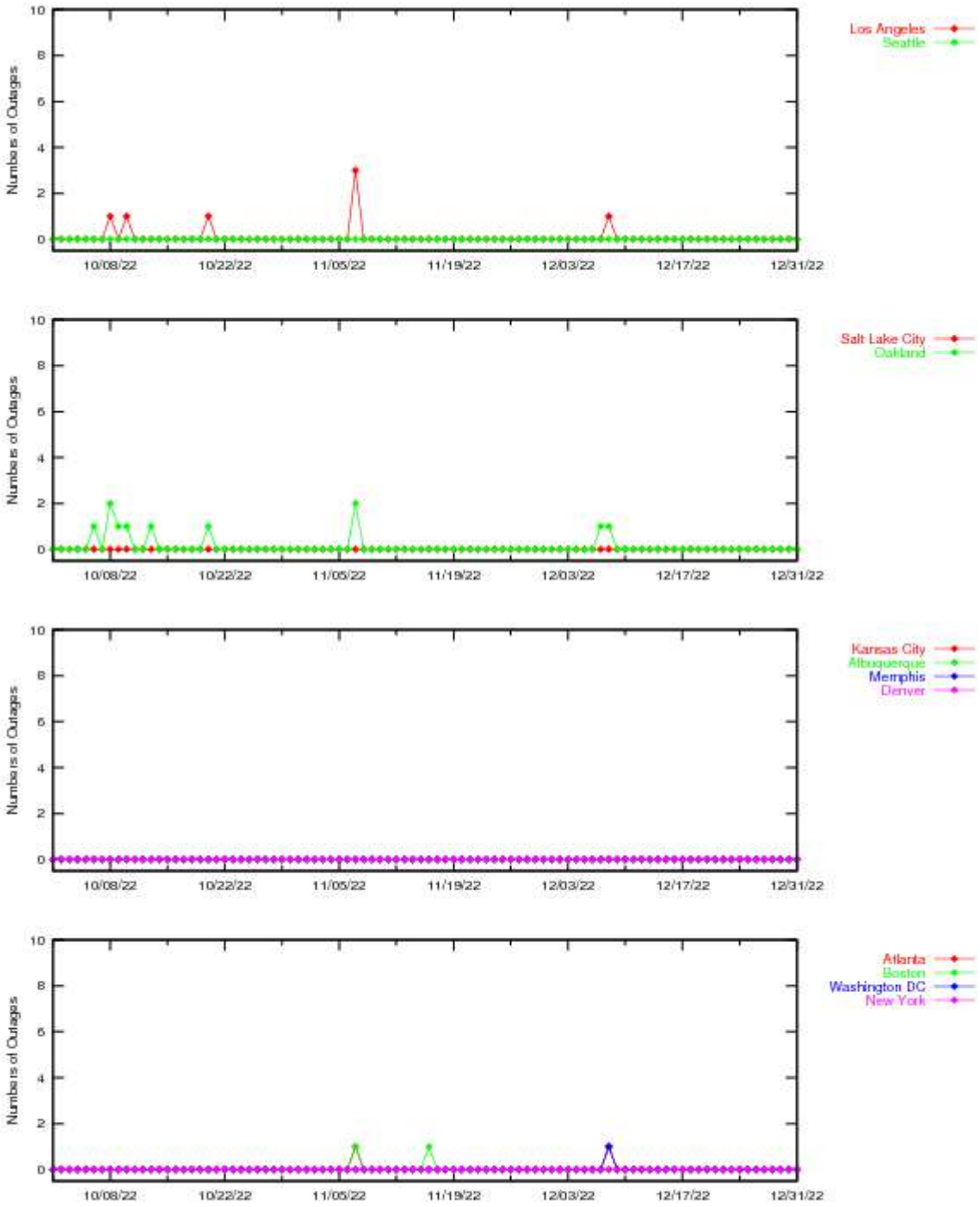

Figure 3-10 LPV200 Outages

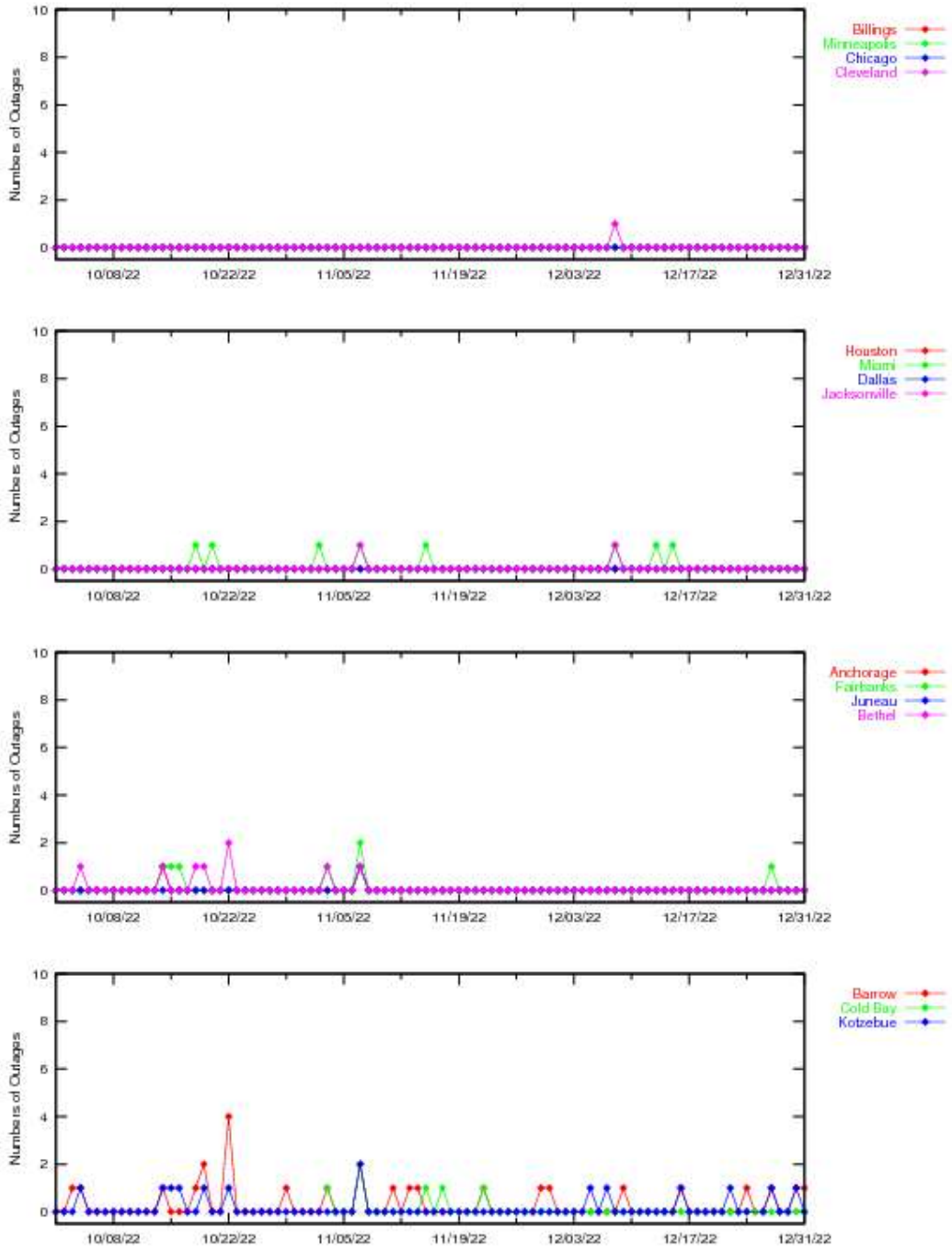

Figure 3-11 LPV200 Outages

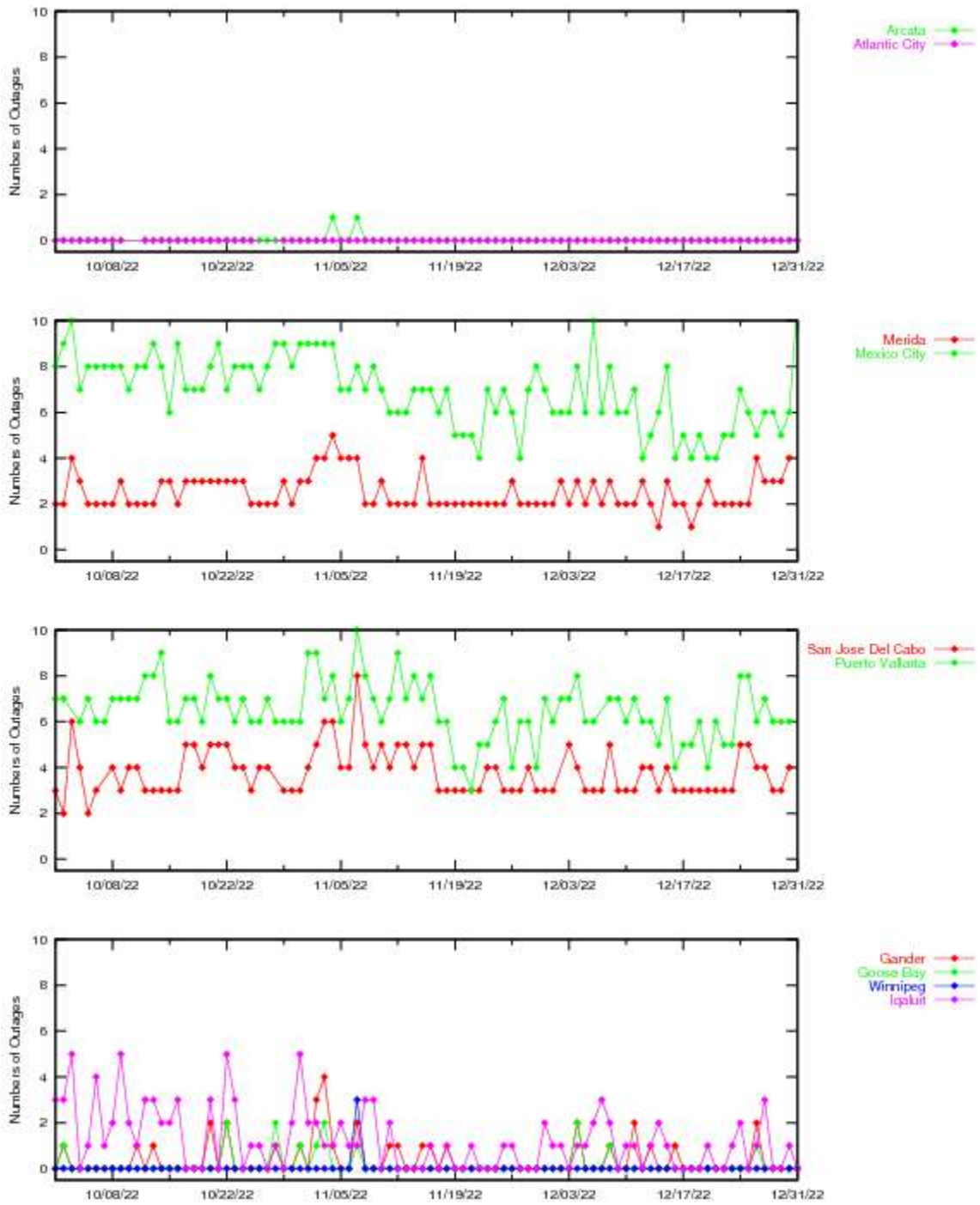

Figure 3-12 LPV200 Outages

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 outages, geomagnetic activity, communication outages, radio frequency interference (RFI), and elevated UDRE and GIVE values. Noteworthy events that affected availability are:

- October 2—Geomagnetic activity increased IGP GIVEs and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.
- October 6—Satellite maintenance elevated UDREs on PRN3 and reduced LPV200 availability in CONUS.
- October 6—Geomagnetic activity increased IGP GIVEs and reduced LPV and LPV200 availability in Canada.
- October 7—Geomagnetic activity increased IGP GIVEs and reduced LPV200 availability in Canada.
- October 8—Geomagnetic activity increased IGP GIVEs and reduced LPV200 availability in Canada.
- October 9—Geomagnetic activity increased IGP GIVEs and reduced LPV200 availability in Canada.
- October 10—Elevated GIVEs reduced LPV200 availability in CONUS.
- October 11—Satellite maintenance elevated UDREs on PRN25 and reduced LPV200 availability in CONUS and Alaska.
- October 12—Satellite maintenance elevated UDREs on PRN25 and reduced LPV200 availability in CONUS and Alaska.
- October 14—Geomagnetic Activity increased IGP GIVEs and reduced LPV availability in Alaska and LPV200 availability in Alaska and Canada.
- October 18—Satellite Maintenance elevated UDREs on PRN9 and reduced LPV200 availability in Alaska and Canada.
- October 19—Satellite maintenance elevated UDREs on PRN3 and reduced LPV200 availability in CONUS, Alaska, and Canada.
- October 20—Satellite maintenance elevated UDREs on PRN26 and reduced LPV200 availability in CONUS.
- October 22—Geomagnetic Activity increased IGP GIVEs and reduced LPV availability in Canada and LPV200 availability in Alaska and Canada.

- October 28—Geomagnetic Activity increased IGP GIVEs and reduced LPV and LPV200 availability in Canada.
- October 29—Geomagnetic Activity increased IGP GIVEs and reduced LPV200 availability in Canada.
- October 31—Geomagnetic Activity increased IGP GIVEs and reduced LPV and LPV200 availability in Canada.
- November 3—A G1 geomagnetic storm increased IGP GIVEs and reduced LPV and LPV200 availability in CONUS and Canada.
- November 3—Satellite maintenance elevated UDREs on PRN12 and reduced LPV200 availability in Alaska.
- November 3—Satellite maintenance elevated UDREs on PRN30 and reduced LPV200 availability in Canada.
- November 4—Satellite maintenance elevated UDREs on PRN17 and reduced LPV200 availability in CONUS.
- November 4—Satellite maintenance elevated UDREs on PRN29 and reduced LPV200 availability in CONUS.
- November 7—Satellite maintenance elevated UDREs on PRN5 and reduced LPV200 availability in CONUS.
- November 7—A G1 geomagnetic storm increased IGP GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- November 14–15—Satellite maintenance elevated UDREs on PRN7 and reduced LPV Availability in CONUS and LPV200 availability in CONUS and Canada.
- November 16—Satellite maintenance elevated UDREs on PRN15 and reduced LPV availability in Canada and LPV200 availability in CONUS and Canada.
- December 8–9—Satellite maintenance elevated UDREs on PRN26 and reduced LPV200 availability in CONUS and Canada.
- December 13—Satellite maintenance elevated UDREs on PRN23 and reduced LPV200 availability in Canada.
- December 15–16—Satellite maintenance elevated UDREs on PRN31 and reduced LPV200 availability in Canada.
- December 20—Geomagnetic Activity increased IGP GIVEs and reduced LPV200 availability in CONUS 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.

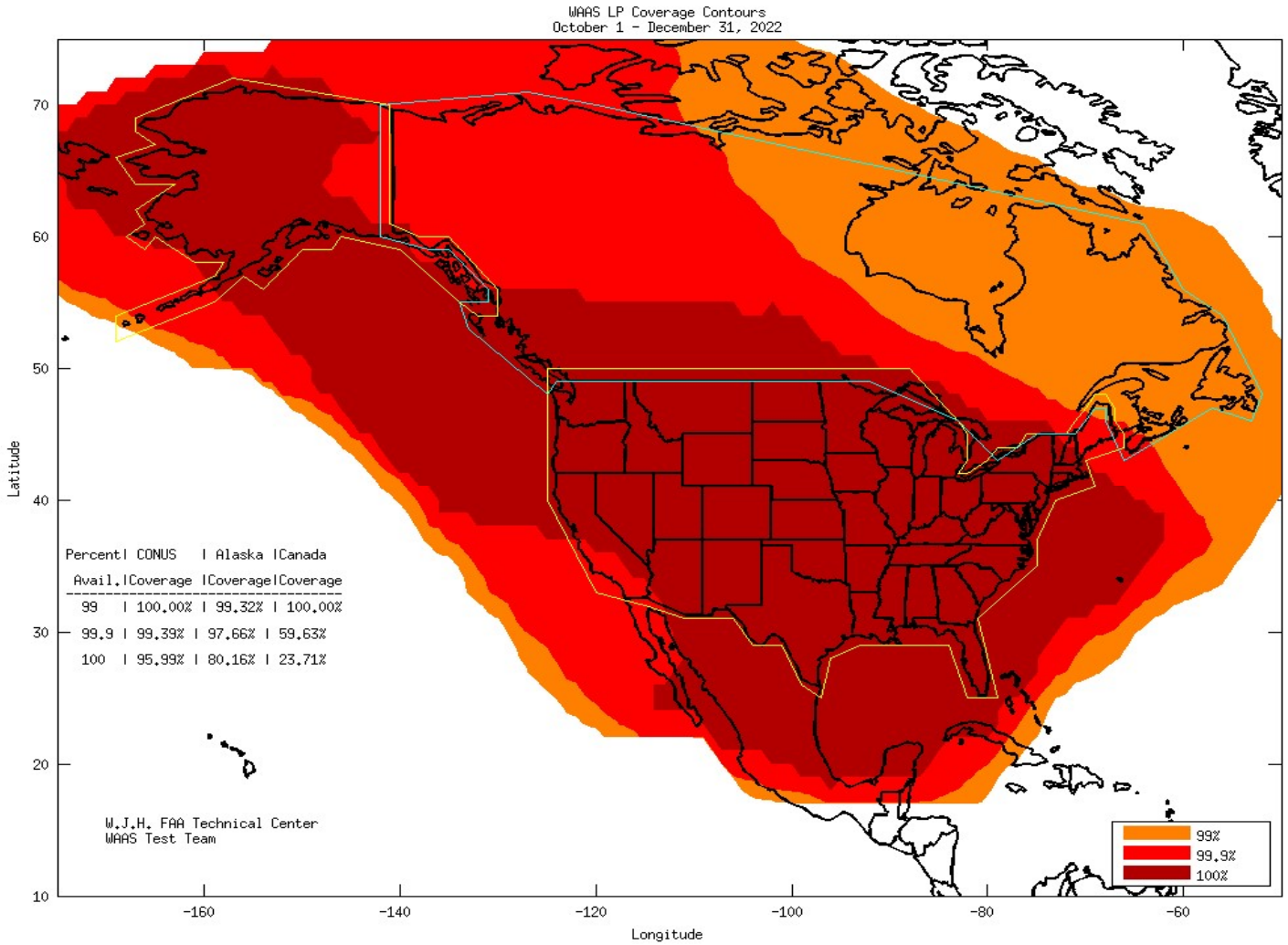

Figure 4-1 LP North America Coverage for the Quarter

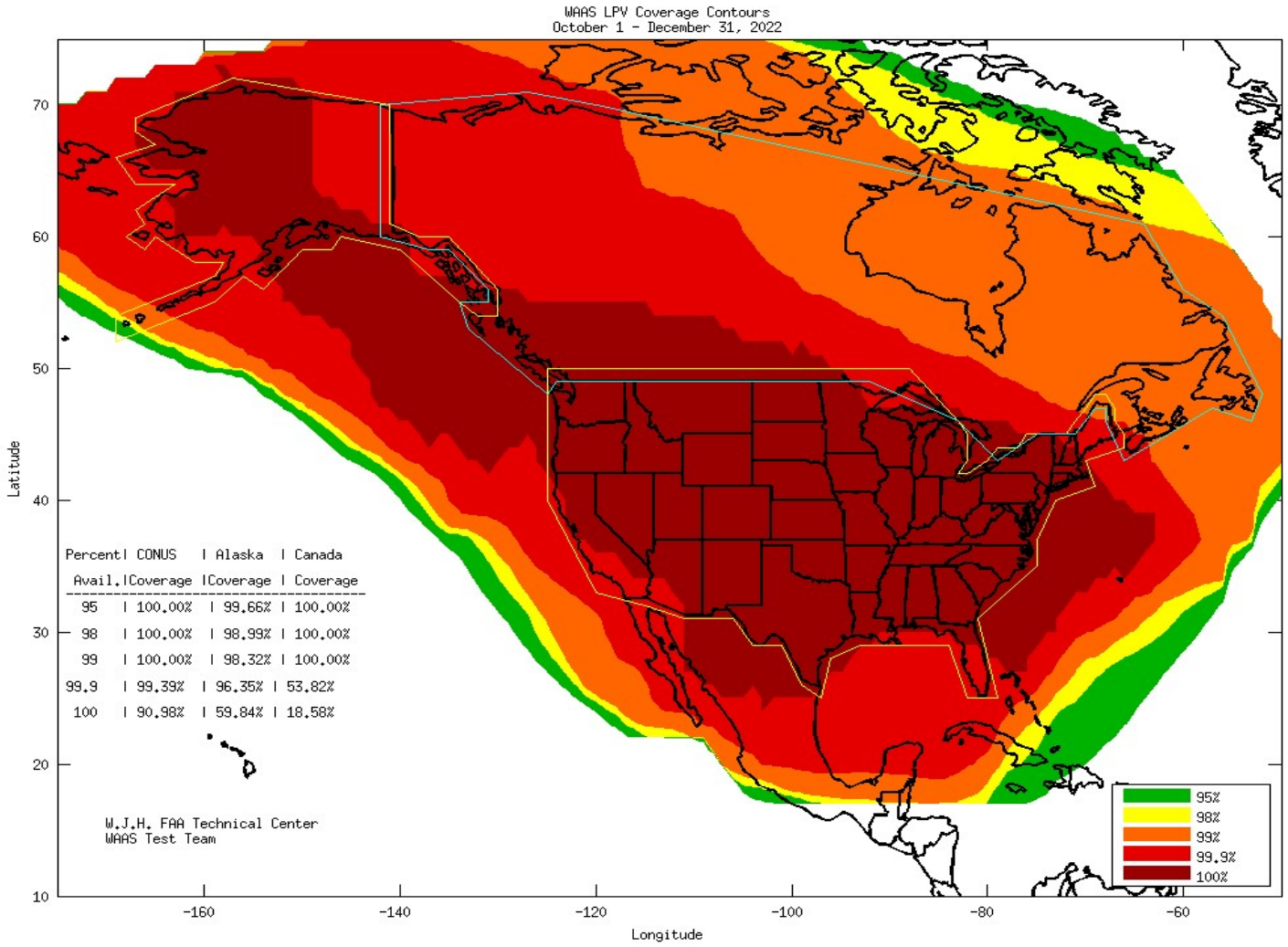

Figure 4-2 LPV North America Coverage for the Quarter

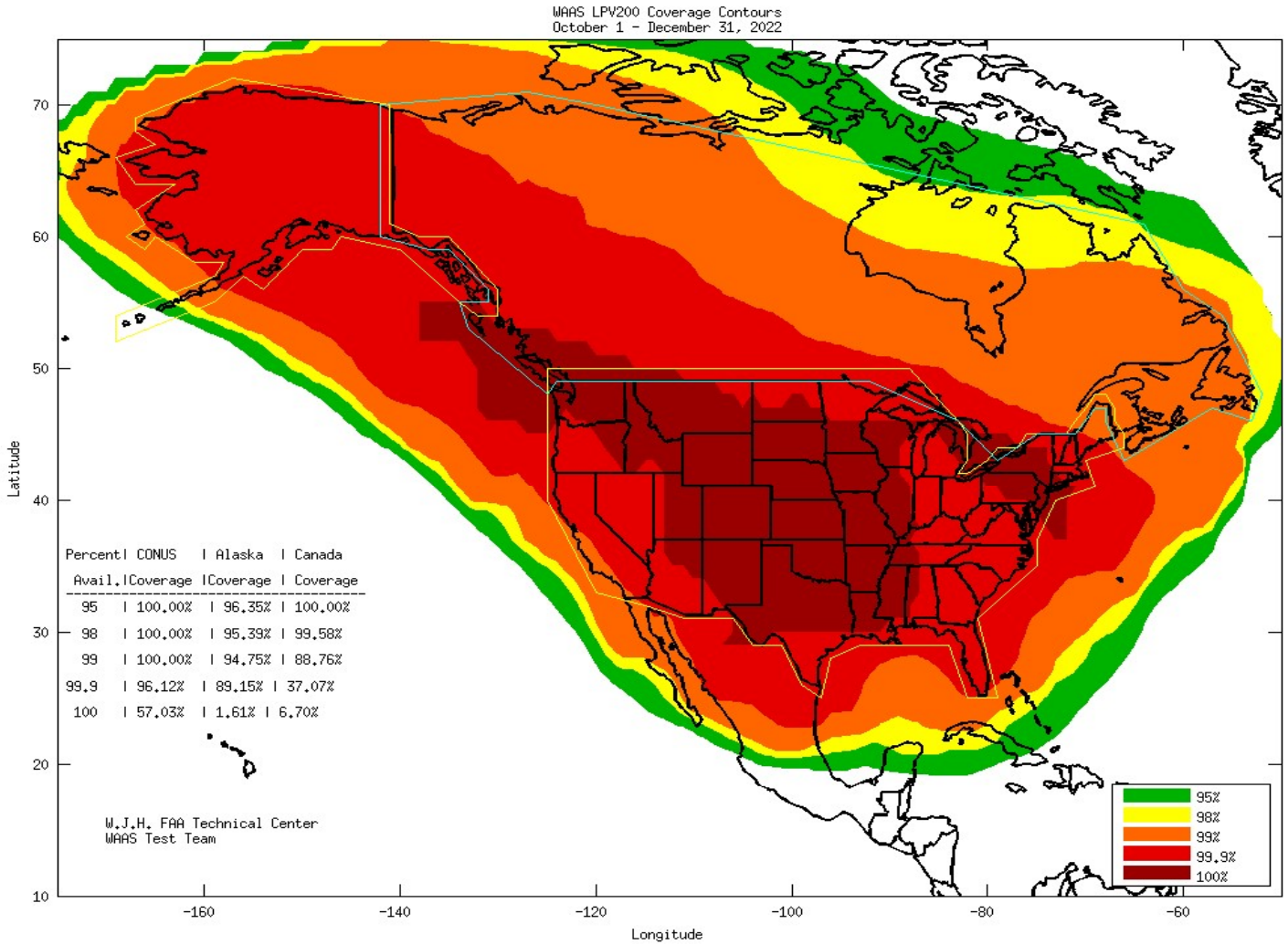

Figure 4-3 LPV200 North America Coverage for the Quarter

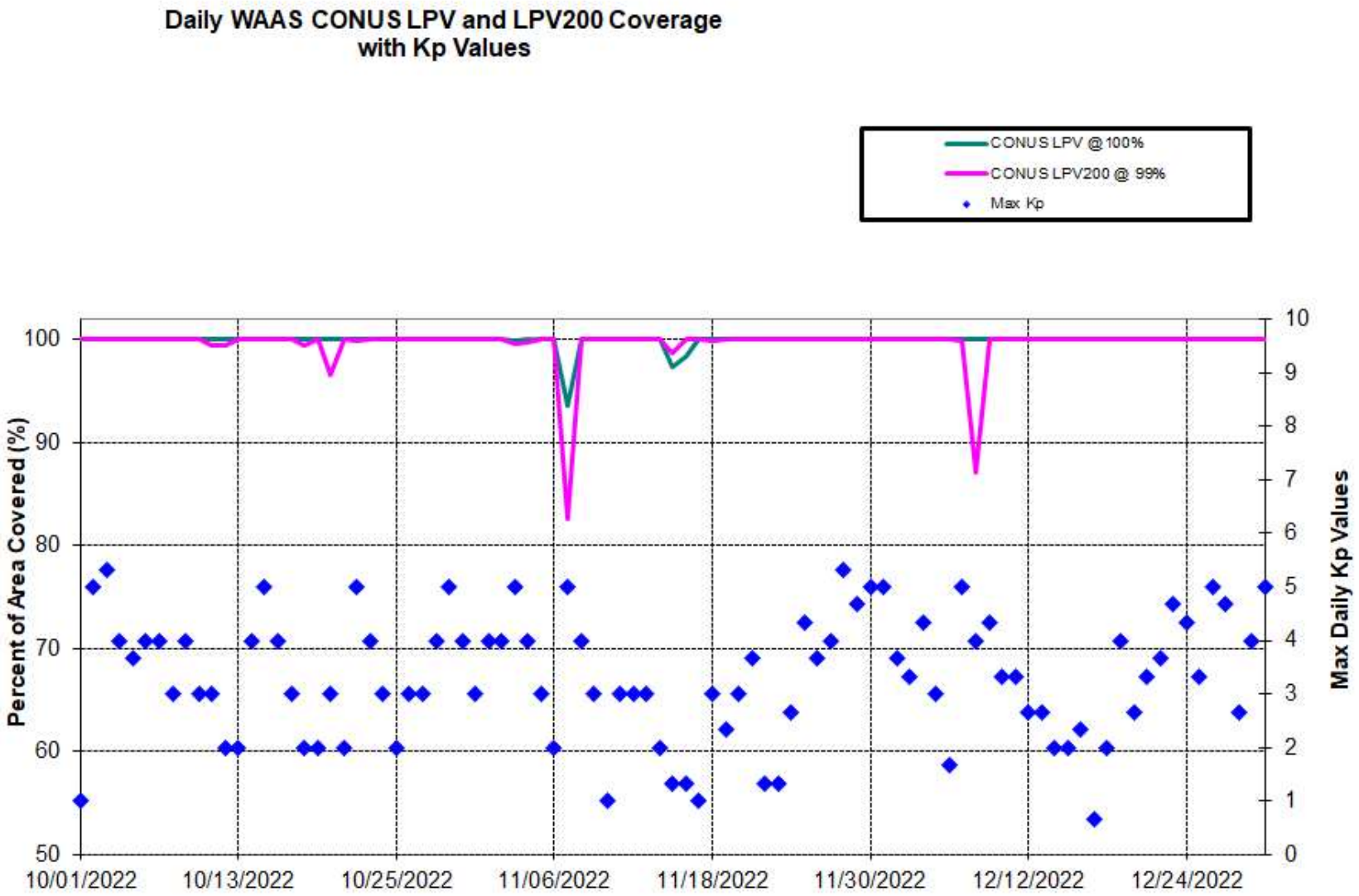

Figure 4-4 Daily LPV and LPV200 CONUS Coverage

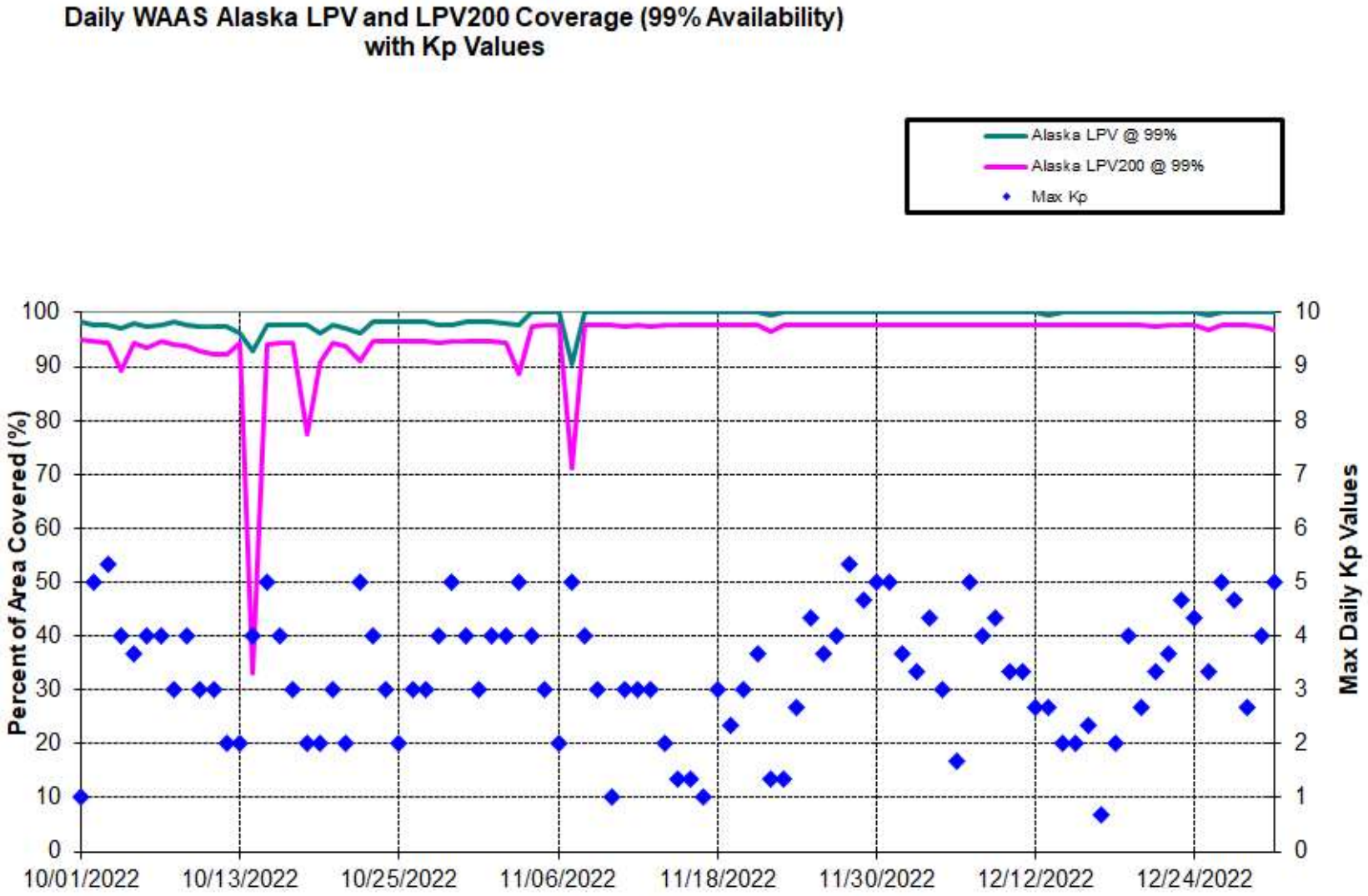

Figure 4-5 Daily LPV and LPV200 Alaska Coverage

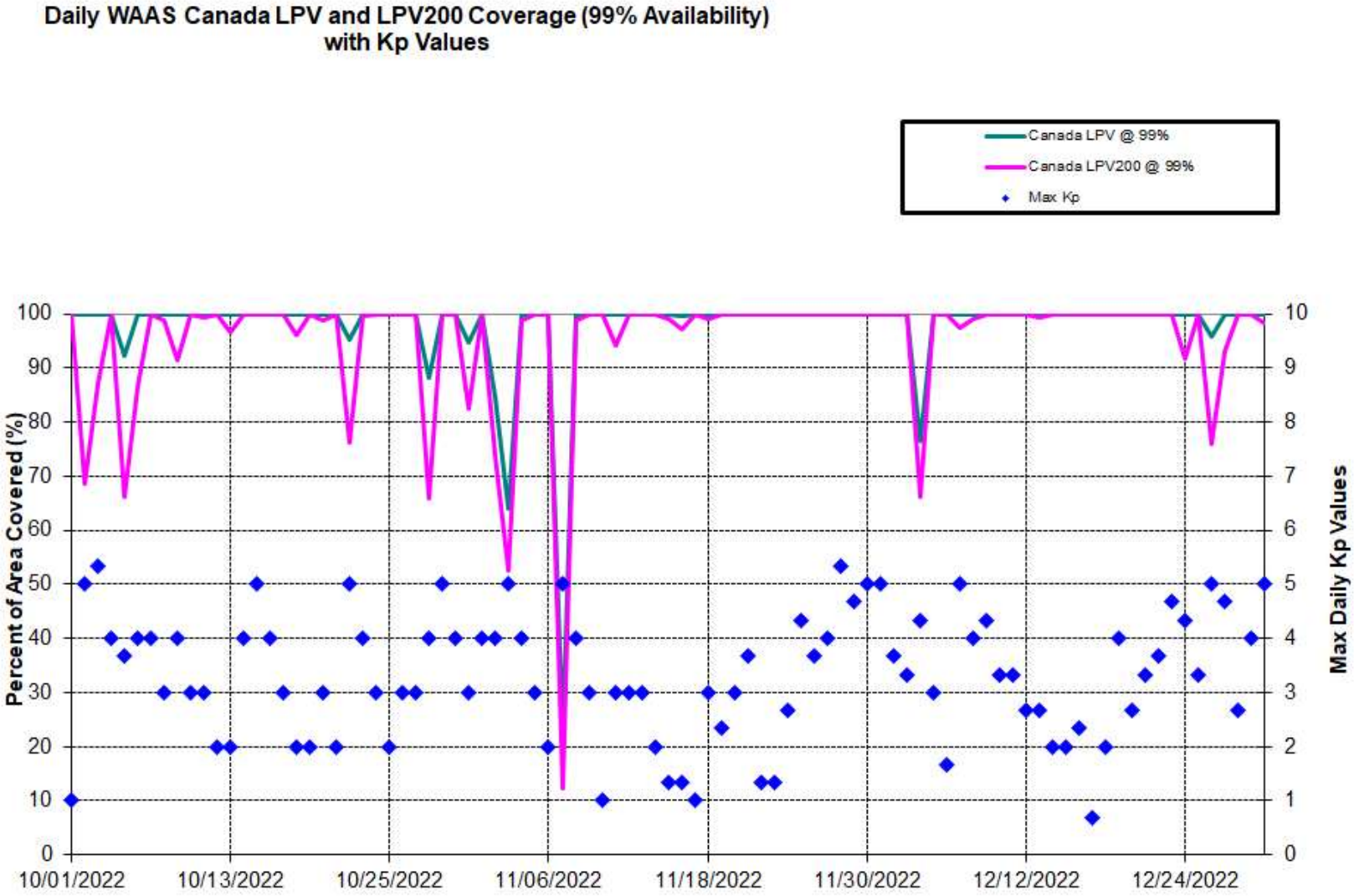

Figure 4-6 Daily LPV and LPV200 Canada Coverage

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.

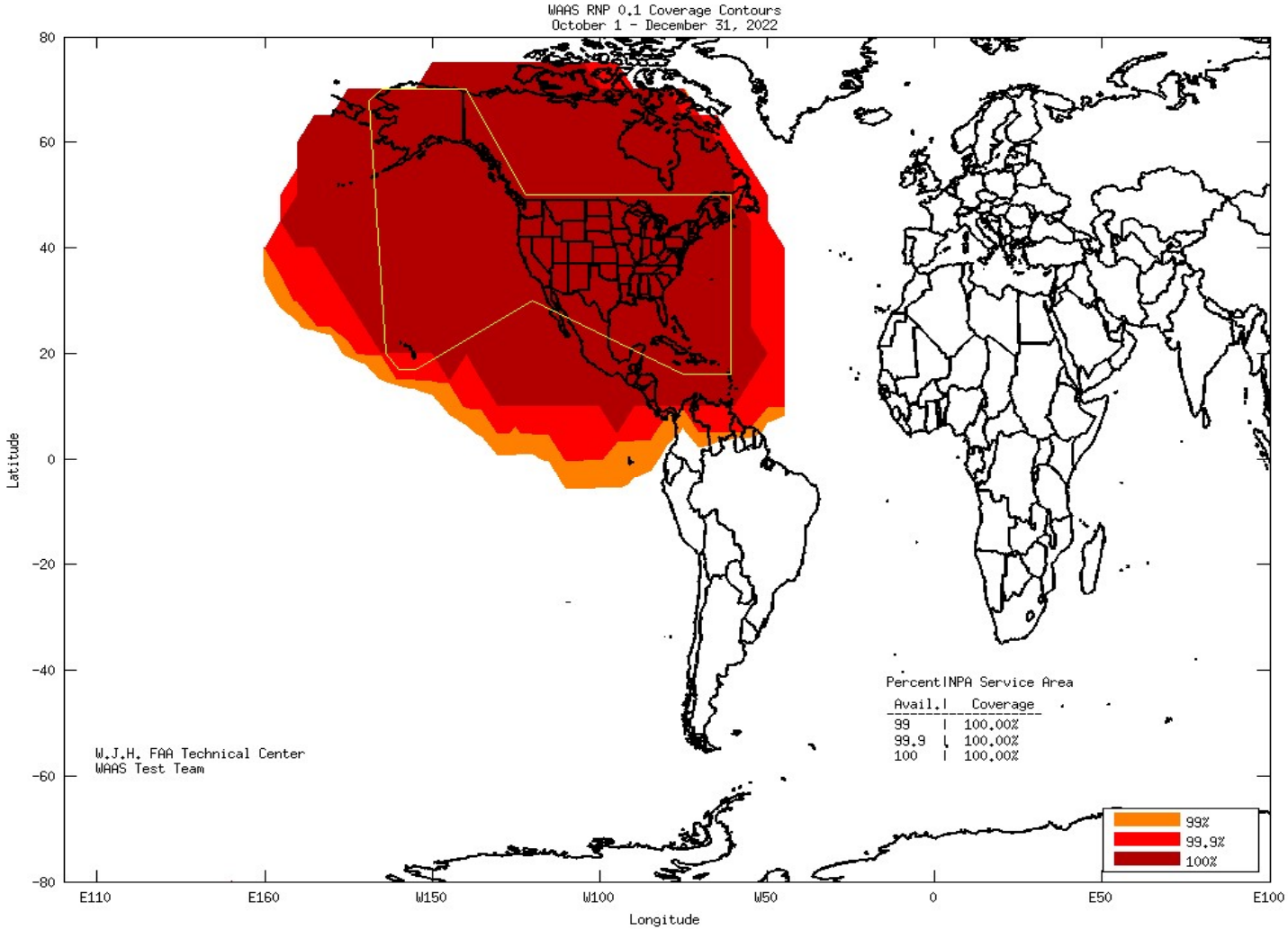

Figure 4-7 RNP 0.1 Coverage for the Quarter

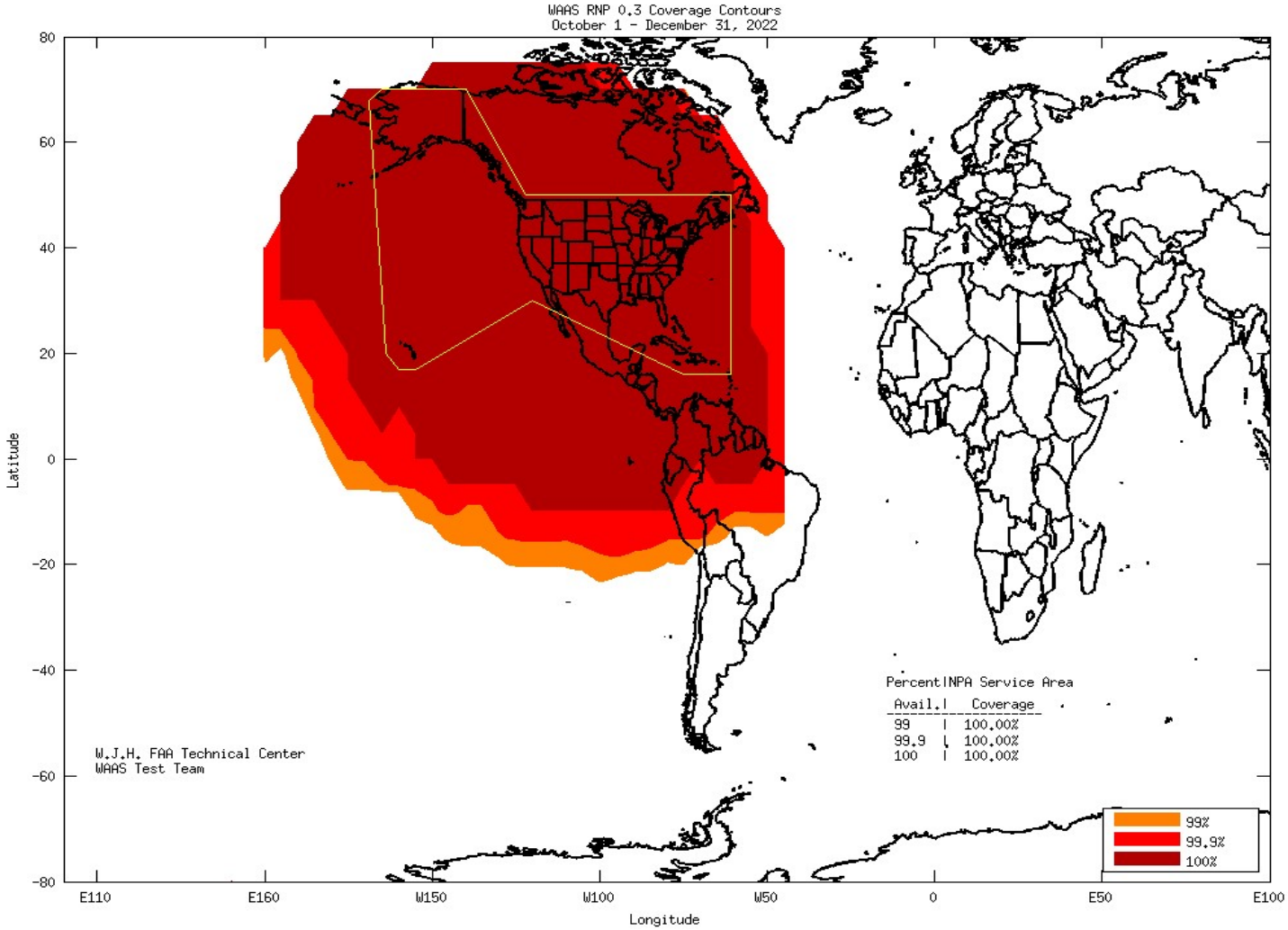

Figure 4-8 RNP 0.3 Coverage for the Quarter

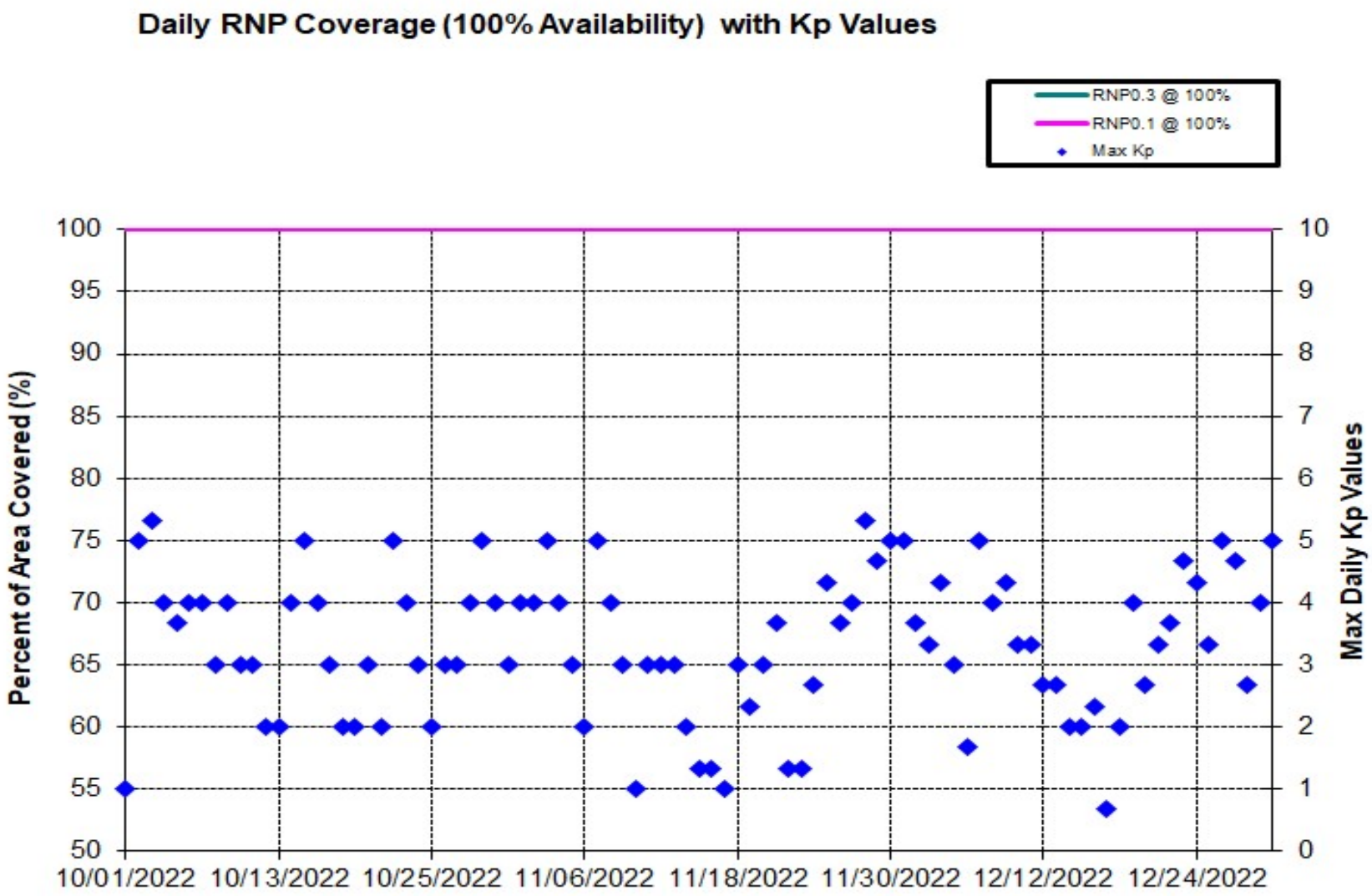

Figure 4-9 Daily RNP Coverage

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.

- October 2—Geomagnetic activity increased IGP GIVEs and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- October 6—Satellite maintenance elevated UDREs on PRN3 and reduced LPV200 coverage in CONUS.
- October 6—Geomagnetic activity increased IGP GIVEs and reduced LPV and LPV200 coverage in Canada.
- October 7—Geomagnetic activity increased IGP GIVEs and reduced LPV200 coverage in Canada.
- October 8—Geomagnetic activity increased IGP GIVEs and reduced LPV200 coverage in Canada.
- October 9—Geomagnetic activity increased IGP GIVEs and reduced LPV200 coverage in Canada.
- October 10—Elevated GIVEs reduced LPV200 coverage in CONUS.
- October 11—Satellite maintenance elevated UDREs on PRN25 and reduced LPV200 coverage in CONUS and Alaska.
- October 12—Satellite maintenance elevated UDREs on PRN25 and reduced LPV200 coverage in CONUS and Alaska.
- October 14—Geomagnetic Activity increased IGP GIVEs and reduced LPV coverage in Alaska and LPV200 coverage in Alaska and Canada.
- October 18—Satellite Maintenance elevated UDREs on PRN9 and reduced LPV200 coverage in Alaska and Canada.
- October 19—Satellite maintenance elevated UDREs on PRN3 and reduced LPV200 coverage in CONUS, Alaska, and Canada.
- October 20—Satellite maintenance elevated UDREs on PRN26 and reduced LPV200 coverage in CONUS.
- October 22—Geomagnetic Activity increased IGP GIVEs and reduced LPV coverage in Canada and LPV200 coverage in Alaska and Canada.
- October 28—Geomagnetic Activity increased IGP GIVEs and reduced LPV and LPV200 coverage in Canada.
- October 29—Geomagnetic Activity increased IGP GIVEs and reduced LPV200 coverage in Canada.
- October 31—Geomagnetic Activity increased IGP GIVEs and reduced LPV and LPV200 coverage in Canada.
- November 3—A G1 geomagnetic storm increased IGP GIVEs and reduced LPV and LPV200 coverage in CONUS and Canada.
- November 3—Satellite maintenance elevated UDREs on PRN12 and reduced LPV200 coverage in Alaska.
- November 3—Satellite maintenance elevated UDREs on PRN30 and reduced LPV200 coverage in Canada.
- November 4—Satellite maintenance elevated UDREs on PRN17 and reduced LPV200 coverage in CONUS.
- November 4—Satellite maintenance elevated UDREs on PRN29 and reduced LPV200 coverage in CONUS.
- November 7—Satellite maintenance elevated UDREs on PRN5 and reduced LPV200 coverage in CONUS.
- November 7—A G1 geomagnetic storm increased IGP GIVEs and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- November 14–15—Satellite maintenance elevated UDREs on PRN7 and reduced LPV Coverage in CONUS and LPV200 coverage in CONUS and Canada.
- November 16—Satellite maintenance elevated UDREs on PRN15 and reduced LPV coverage in Canada and LPV200 coverage in CONUS and Canada.
- December 8–9—Satellite maintenance elevated UDREs on PRN26 and reduced LPV200 coverage in CONUS and Canada.
- December 13—Satellite maintenance elevated UDREs on PRN23 and reduced LPV200 coverage in Canada.
- December 15–16—Satellite maintenance elevated UDREs on PRN31 and reduced LPV200 coverage in Canada.
- December 20—Geomagnetic Activity increased IGP GIVEs and reduced LPV200 coverage in CONUS 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 4.013 at Anchorage and there were no HMI events. There has not been an HMI event since WAAS was made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Horizontal Safety Index (m)	Vertical Safety Index (m)	Number of HMIs
Arcata	4.695	5.984	0
Atlantic City	6.059	4.641	0
Oklahoma City	4.543	7.673	0
Albuquerque	6.551	6.383	0
Anchorage	7.452	4.013	0
Atlanta	7.873	6.137	0
Barrow	8.975	4.965	0
Bethel	5.945	6.731	0
Billings	6.196	8.154	0
Boston	7.471	6.573	0
Chicago	7.383	5.985	0
Cleveland	5.933	6.699	0
Cold Bay	10.416	9.439	0
Dallas	8.038	5.355	0
Denver	4.632	8.220	0
Fairbanks	5.899	4.184	0
Gander	6.327	5.865	0
Goose Bay	5.146	11.318	0
Houston	7.650	5.768	0
Iqaluit	8.662	4.343	0
Jacksonville	7.591	7.122	0
Juneau	6.589	7.995	0
Kansas City	6.569	7.468	0

Location	Horizontal Safety Index (m)	Vertical Safety Index (m)	Number of HMIs
Kotzebue	8.250	5.469	0
Los Angeles	5.447	15.165	0
Memphis	7.221	5.288	0
Merida	8.728	7.939	0
Mexico City	8.385	9.589	0
Miami	7.229	11.244	0
Minneapolis	5.528	7.377	0
New York	7.968	7.758	0
Oakland	7.378	11.541	0
Puerto Vallarta	5.696	11.791	0
Salt Lake City	8.594	7.414	0
San Jose Del Cabo	6.038	7.505	0
Seattle	6.396	6.250	0
Washington, DC	6.479	5.620	0
Winnipeg	5.349	5.562	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	14	19	14	0.1522	0.2065	0.1522
T3	23	27	23	0.2500	0.2935	0.2500
T4	15	17	17	0.1630	0.1848	0.1848
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	0.0109
Total SV Alerts:	52	63	55	0.5652	0.6848	0.5978
Days in Service	92	92	92			

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

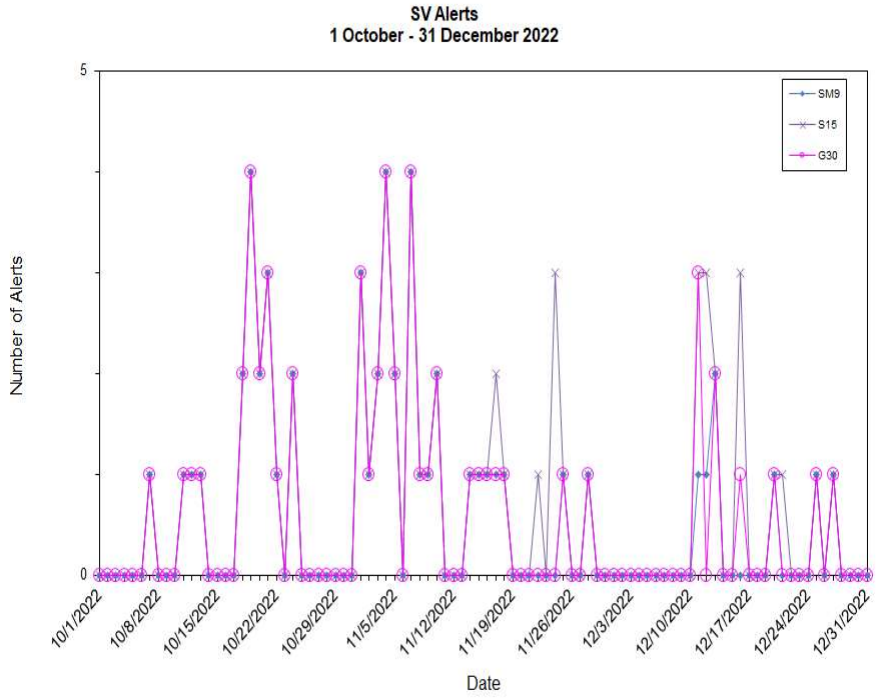

Figure 5-1 SV Daily Alert Trend

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

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

Table 5-3 Update Rates for WAAS Messages

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

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

For this quarter, statistics reported for late messages were mainly caused by GEO SIS outages, GUS switchovers, and SV alerts; excluding message type 7 and 10. Furthermore, the delay of message types 7 and 10 had little or no impact on user performance and safety, and 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 for S15 GEO messages occurred after PRN133 switched from Brewster (faulted) to South Mountain on November 7, 2022 causing a 19 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	109518	1	157
2	1324798	29	25
3	1324831	23	25
4	1324813	25	20
7	101335	16	169
9	93148	1	167
10	101324	5	133
17	31838	0	0

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	48856	0	0
2	48266	1	165
3	47687	0	0
4	47308	0	0
5	47541	0	0
6	47810	0	0
7	47480	0	0
8	48736	0	0
9	47314	0	0
10	47560	0	0
11	47554	1	169
12	47176	0	0
13	49071	0	0
14	46648	0	0
15	47515	0	0
16	47892	0	0
17	47932	0	0
18	47207	1	165
19	46477	0	0
20	48564	0	0
21	50930	0	0
22	47174	0	0
23	46746	0	0
24	49179	0	0
25	48458	1	168
26	47965	1	169
27	49121	0	0
29	47315	0	0
30	47063	0	0
31	47046	0	0
32	46578	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	40134	3	250
2	39618	3	152
3	39191	0	0
4	38877	0	0
5	39028	1	211
6	39240	1	211
7	39024	1	144
8	39979	1	157
9	38822	1	127

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
10	39016	3	205
11	39019	1	126
12	38773	0	0
13	40321	6	187
14	38333	2	216
15	38948	0	0
16	39316	1	211
17	39341	0	0
18	38688	2	162
19	38155	3	209
20	39782	0	0
21	41835	4	222
22	38740	0	0
23	38365	2	151
24	40439	0	0
25	39819	0	0
26	39380	0	0
27	40357	1	144
29	38840	1	211
30	38692	0	0
31	38574	0	0
32	38276	0	0
131	76249	1	209
133	76310	1	5520
135	76425	1	209

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	27604	3	301
0	1	27595	0	0
0	2	27587	4	305
1	0	27594	5	306
1	1	27608	3	310
1	2	27608	3	304
1	3	27597	2	304
1	4	27590	5	304
2	0	27601	2	306
2	1	27599	4	305
2	2	27597	6	306
2	3	27605	2	304
2	4	27596	3	304
3	0	27591	8	304
3	1	27601	6	305
3	2	27606	3	576

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
9	0	27585	4	577
9	1	27598	4	577
9	2	27600	3	304
9	3	27609	2	306
9	4	27581	6	306
9	5	27599	4	311
9	6	27623	4	301

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35301	1	429
1	35274	1	434
2	35293	1	409
3	35308	0	0
9	35249	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	101218	4	157
2	1324800	36	26
3	1324839	27	26
4	1324798	35	23
7	94283	9	144
9	93146	1	182
10	94310	7	128
17	31147	1	304

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	48855	0	0
2	48290	0	0
3	47683	0	0
4	47308	0	0
5	47543	0	0
6	47794	0	0
7	47487	0	0
8	48714	0	0
9	47297	0	0
10	47541	0	0
11	47561	0	0
12	47166	1	183
13	49055	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
14	46649	0	0
15	47513	0	0
16	47890	0	0
17	47933	0	0
18	47198	0	0
19	46480	0	0
20	48553	0	0
21	50929	0	0
22	47165	0	0
23	46744	0	0
24	49185	0	0
25	48471	0	0
26	47978	0	0
27	49116	1	183
29	47306	0	0
30	47056	0	0
31	47037	0	0
32	46577	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	40134	3	250
2	39618	3	152
3	39191	0	0
4	38877	0	0
5	39028	1	211
6	39240	1	211
7	39024	1	144
8	39979	1	157
9	38822	1	127
10	39016	3	205
11	39019	1	126
12	38773	0	0
13	40321	6	187
14	38333	2	216
15	38948	0	0
16	39316	1	211
17	39341	0	0
18	38688	2	162
19	38155	3	209
20	39782	0	0
21	41835	4	222
22	38740	0	0
23	38365	2	151
24	40439	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
25	39819	0	0
26	39380	0	0
27	40357	1	144
29	38840	1	211
30	38692	0	0
31	38574	0	0
32	38276	0	0
131	76249	1	209
133	76310	1	5520
135	76425	1	209

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	27592	3	479
0	1	27590	4	576
0	2	27602	4	576
1	0	27600	3	471
1	1	27602	5	460
1	2	27591	4	461
1	3	27602	2	397
1	4	27611	2	395
2	0	27601	4	385
2	1	27596	6	306
2	2	27593	1	301
2	3	27601	5	305
2	4	27603	3	305
3	0	27602	4	304
3	1	27605	1	301
3	2	27601	5	306
9	0	27603	2	301
9	1	27594	6	396
9	2	27610	2	391
9	3	27600	4	395
9	4	27598	6	402
9	5	27602	5	478
9	6	27610	4	577

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35301	1	429
1	35274	1	434
2	35293	1	409
3	35308	0	0

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
9	35249	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	102315	3	154
2	1324795	29	64
3	1324828	24	42
4	1324813	22	64
7	95059	12	132
9	93150	0	0
10	95056	9	149
17	31233	1	467

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	48843	0	0
2	48274	1	179
3	47685	0	0
4	47314	0	0
5	47540	0	0
6	47808	1	167
7	47492	0	0
8	48723	0	0
9	47302	0	0
10	47553	0	0
11	47555	0	0
12	47167	1	180
13	49086	0	0
14	46640	0	0
15	47516	0	0
16	47894	0	0
17	47936	0	0
18	47205	1	167
19	46480	0	0
20	48555	0	0
21	50936	0	0
22	47165	0	0
23	46733	0	0
24	49190	0	0
25	48465	0	0
26	47980	0	0
27	49131	0	0
29	47312	1	165

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
30	47066	0	0
31	47045	1	180
32	46575	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	40163	1	130
2	39626	2	168
3	39182	0	0
4	38889	0	0
5	39034	0	0
6	39250	1	208
7	38984	1	198
8	39969	1	168
9	38815	0	0
10	39016	2	209
11	39016	1	209
12	38760	1	209
13	40340	5	203
14	38318	5	224
15	38970	0	0
16	39327	0	0
17	39334	0	0
18	38700	3	209
19	38147	2	199
20	39796	0	0
21	41829	8	208
22	38753	0	0
23	38356	0	0
24	40444	2	154
25	39821	2	133
26	39372	0	0
27	40371	1	206
29	38833	1	209
30	38723	0	0
31	38582	1	209
32	38287	0	0
131	76247	0	0
133	76355	3	5512
135	76427	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	27611	2	579
0	1	27596	2	304
0	2	27605	1	305
1	0	27604	2	301
1	1	27612	2	304
1	2	27608	2	301
1	3	27600	2	303
1	4	27612	2	304
2	0	27600	2	305
2	1	27590	4	302
2	2	27612	2	302
2	3	27611	3	306
2	4	27606	4	304
3	0	27588	2	305
3	1	27625	1	301
3	2	27609	1	301
9	0	27595	3	306
9	1	27605	5	306
9	2	27587	3	305
9	3	27622	3	579
9	4	27595	1	581
9	5	27586	2	576
9	6	27594	3	581

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35477	0	0
1	35435	0	0
2	35458	0	0
3	35489	0	0
9	35458	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 the WAAS receivers. The more severe glitches will cause the WAAS-reported UDRE to increase to "Not Monitor" and result in an alert. No satellite glitches were visible to WAAS during the quarter.

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	1.035	3.278	1.091	0.996	3.196	0.782	1.276	4.094	1.404	1.392	3.042	0.962	1.835	4.268	1.297	1.058	4.074	1.141
2	1.016	2.418	0.775	0.980	3.549	1.151	0.863	2.148	0.695	1.281	2.579	0.728	1.514	3.605	0.988	0.896	3.099	1.078
3	1.182	2.812	1.178	1.491	4.873	1.840	1.282	3.220	0.954	1.387	3.032	1.477	1.830	3.698	1.253	1.066	3.701	1.125
4	1.091	2.328	0.760	1.380	3.443	1.086	1.639	2.904	1.500	1.194	2.941	0.741	1.702	2.727	2.282	0.948	2.555	0.799
5	0.828	1.901	0.850	0.933	2.726	0.742	0.909	1.991	0.833	1.174	3.483	1.123	1.324	4.046	0.772	1.031	2.584	1.128
6	0.966	2.207	0.716	1.103	2.240	0.756	0.936	2.742	0.730	1.030	3.176	0.999	1.408	3.213	0.981	1.078	2.805	0.937
7	0.970	2.226	1.084	1.050	2.233	0.868	1.041	2.367	0.839	1.167	2.782	1.006	2.051	3.144	2.064	1.265	3.605	1.457
8	1.199	3.319	0.982	1.213	3.151	1.162	1.535	2.592	1.577	1.220	2.776	0.904	1.506	4.960	1.357	1.313	3.237	0.900
9	0.970	3.259	1.081	1.017	3.380	1.518	1.171	2.640	0.500	0.943	2.693	0.852	2.147	3.627	1.219	0.959	2.308	0.713
10	0.826	2.256	0.749	0.847	2.201	0.787	0.936	2.201	0.742	1.264	3.062	0.914	1.174	2.880	0.881	0.801	2.232	1.107
11	0.755	1.991	0.644	0.987	2.180	1.128	0.792	2.173	0.697	1.164	3.809	1.389	1.734	10.159	2.672	1.034	3.092	0.982
12	0.964	2.483	0.796	1.270	4.419	1.306	1.033	2.693	0.912	1.052	2.963	0.971	1.785	5.173	1.613	1.380	3.796	1.150
13	0.947	3.835	1.110	1.020	3.845	1.110	1.066	2.493	0.764	1.237	3.532	1.359	1.279	2.660	0.983	0.967	4.241	1.226
14	0.966	2.338	0.761	0.957	2.453	0.783	0.971	1.939	0.652	1.044	2.559	0.744	1.742	2.765	0.975	0.955	2.993	0.777
15	0.953	2.502	0.755	0.890	2.471	0.964	0.835	1.996	0.713	1.180	2.766	0.874	1.394	2.826	1.145	0.819	2.244	0.723
16	1.420	3.227	0.973	1.285	2.305	0.739	1.391	2.667	1.758	1.277	4.021	1.884	1.513	2.625	1.760	0.935	2.575	0.747
17	1.167	3.164	0.856	1.241	2.522	1.116	1.329	2.357	1.108	1.081	3.309	0.952	1.711	2.566	0.954	1.195	2.184	0.714
18	1.094	2.542	1.244	0.974	2.566	0.442	1.074	3.885	1.158	1.410	2.947	1.842	1.467	2.798	0.829	0.998	3.494	1.034
19	1.189	2.911	0.934	1.147	2.042	1.397	1.091	2.065	0.742	1.041	2.802	0.856	2.265	4.743	1.159	1.363	5.197	1.556
20	1.271	2.844	1.070	0.959	2.032	0.918	0.835	1.735	0.864	1.320	3.108	0.985	1.160	2.095	1.534	1.027	2.196	0.600
21	1.216	2.999	0.886	1.339	2.351	1.077	1.195	2.164	0.909	1.375	3.404	0.999	2.015	3.923	1.396	1.443	3.378	0.973
22	1.005	2.335	0.808	1.510	2.661	0.895	1.321	2.632	2.154	1.374	3.005	0.813	1.709	4.586	1.236	1.163	4.618	1.751
23	0.989	2.328	0.814	0.830	1.802	0.603	0.942	2.230	0.747	1.227	3.634	0.980	1.367	2.302	0.627	1.568	5.440	1.899
24	1.290	5.960	1.766	1.012	2.680	0.785	1.019	2.716	0.766	1.596	2.953	0.985	1.709	3.788	0.986	1.150	3.384	0.950
25	1.039	2.516	0.701	1.228	3.119	1.316	1.233	2.819	1.270	1.277	2.671	1.041	1.289	2.744	0.991	1.391	5.206	1.550
26	1.287	3.010	0.923	1.459	2.417	1.601	1.398	3.476	1.163	1.281	2.993	1.079	1.671	2.894	1.249	1.037	2.493	0.953
27	1.207	3.898	1.186	1.238	2.119	0.520	1.276	2.621	0.787	1.108	2.421	0.819	1.450	2.826	0.734	1.051	3.112	0.849
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	0.973	3.082	1.000	1.025	2.065	1.305	1.195	2.539	1.284	1.445	2.809	1.501	1.838	3.457	1.222	1.164	3.154	0.982
30	1.026	2.486	1.049	1.565	4.543	1.513	1.666	3.352	1.015	1.234	3.003	0.856	2.818	4.013	1.838	1.119	2.098	0.820
31	1.076	1.998	0.922	1.372	2.934	1.023	1.200	2.345	1.809	1.403	3.124	0.788	1.496	3.703	1.507	0.950	2.467	0.924
32	1.007	2.260	1.152	1.040	2.706	0.924	0.973	2.035	0.657	1.204	3.763	2.023	1.535	5.543	1.667	0.922	4.105	1.043
131	1.894	3.786	0.875	1.266	3.457	0.581	1.837	3.430	0.665	1.447	3.246	0.713	1.358	3.696	1.167	1.574	3.714	1.220
133	1.701	3.717	0.785	1.477	3.483	0.335	1.451	3.509	0.385	1.549	3.736	0.811	1.441	3.362	0.872	1.255	3.431	0.826
135	2.275	4.255	1.003	1.400	3.890	0.761	1.442	3.243	0.708	1.878	3.875	0.822	1.737	3.808	1.013	1.317	3.332	0.952

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

Site	Billings			Miami			Albuquerque			Kansas City			Los Angeles			Atlanta		
PRN ↓	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma
1	2.338	4.460	1.441	1.848	3.094	1.073	1.411	5.011	1.546	1.073	2.697	0.975	1.618	3.861	1.318	1.267	2.470	1.643
2	2.147	7.854	4.426	1.426	3.694	1.571	1.014	2.242	1.005	0.986	3.250	1.070	1.045	5.473	1.568	1.006	1.835	1.132
3	2.179	4.114	1.211	1.995	5.669	1.888	1.083	2.815	0.973	1.443	4.361	1.143	1.139	2.809	1.128	2.234	4.532	1.523
4	2.265	5.197	3.142	1.868	3.155	1.452	1.003	2.451	0.789	1.225	2.456	0.938	1.138	2.905	1.042	1.524	2.720	2.196
5	2.066	4.816	2.188	2.340	8.210	1.456	1.001	1.848	1.339	1.308	4.190	1.386	1.145	2.885	0.869	1.075	2.976	0.939
6	2.093	4.294	1.409	2.398	8.590	1.558	0.950	1.843	0.919	1.825	5.539	1.890	1.282	2.755	0.984	1.204	2.250	0.828
7	2.302	5.277	4.591	2.770	4.596	2.211	1.055	1.985	0.803	1.217	2.301	1.094	1.603	2.410	1.340	1.367	2.523	1.457
8	2.225	7.842	5.009	1.901	3.332	1.105	1.499	2.960	1.489	1.454	3.145	0.943	1.610	3.338	0.826	1.471	2.907	2.254
9	2.085	5.510	4.442	1.966	4.047	1.413	0.976	2.611	0.833	1.372	4.921	1.693	1.210	2.335	0.662	1.272	2.582	0.896
10	1.728	7.992	6.716	1.062	2.378	0.832	0.913	2.163	0.847	0.938	2.220	0.955	0.992	2.453	1.340	1.015	2.637	0.830
11	1.908	5.631	1.513	1.641	3.026	1.639	0.975	2.490	0.630	0.912	2.246	0.865	1.119	2.151	1.157	1.151	2.266	0.895
12	2.195	3.921	1.646	1.208	2.582	1.270	1.287	3.632	1.144	0.969	3.184	0.969	1.095	2.507	0.729	1.193	2.878	1.153
13	2.123	7.056	3.920	1.364	2.990	1.252	0.967	2.786	0.831	0.981	2.144	0.746	1.341	3.628	1.108	1.106	2.243	0.623
14	2.175	5.531	3.068	1.796	3.187	1.244	1.052	1.896	1.266	1.465	3.025	1.014	1.272	2.828	0.892	1.362	2.417	1.900
15	1.696	7.221	5.176	1.055	2.368	1.134	0.970	4.035	1.334	2.345	5.705	1.864	1.593	3.085	0.884	0.890	2.305	0.900
16	2.723	7.844	3.852	2.061	3.517	2.061	1.359	3.144	1.381	2.040	5.789	1.751	1.337	3.483	0.997	1.538	2.752	0.867
17	2.476	7.905	2.524	1.754	3.536	1.056	1.000	2.055	0.945	1.057	4.057	1.241	1.182	2.257	1.061	1.394	2.842	1.163
18	1.918	7.804	4.388	1.560	3.509	1.332	0.784	1.809	1.198	0.829	1.922	0.586	1.102	2.832	0.563	1.036	2.108	0.699
19	2.060	3.605	1.897	1.801	3.927	1.212	1.190	3.867	1.264	1.166	3.688	1.332	1.190	2.221	1.148	1.299	2.224	0.839
20	2.244	5.355	3.109	1.335	2.948	0.977	1.217	2.365	0.793	3.356	6.589	2.575	1.222	2.599	0.927	0.910	2.151	0.863
21	3.068	7.465	3.439	2.192	4.985	1.497	1.264	5.105	1.624	2.093	8.973	2.673	1.690	3.043	1.566	1.587	2.621	1.498
22	2.286	7.747	4.224	1.903	5.195	1.413	1.116	3.871	1.198	1.223	3.108	0.989	1.097	2.375	0.452	1.264	2.362	1.378
23	1.930	7.706	6.531	1.156	2.573	0.754	0.825	2.418	0.711	1.243	3.726	1.247	1.005	3.535	0.640	1.058	2.101	1.499
24	2.260	7.205	4.524	1.548	2.859	1.659	1.223	2.868	0.887	1.315	3.275	1.244	1.221	2.953	0.890	1.019	1.934	1.538
25	2.507	4.602	2.077	1.381	2.650	0.729	1.004	2.397	0.713	1.050	6.283	2.161	1.200	3.956	1.157	1.003	2.368	0.688
26	2.582	4.331	2.756	2.240	3.960	1.643	1.267	4.888	1.541	1.443	5.604	1.745	1.052	2.336	0.673	1.438	2.272	0.829
27	2.071	8.022	5.553	2.098	3.566	1.875	1.121	3.200	0.969	1.020	2.634	1.153	1.288	4.085	1.542	1.266	2.707	2.089
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	2.049	8.194	4.189	1.403	2.983	1.184	1.023	2.667	0.834	1.287	3.148	1.222	1.293	2.984	0.778	1.101	2.739	0.946
30	2.208	4.958	3.493	1.839	3.904	1.425	1.121	2.292	0.687	1.286	2.766	0.885	1.544	2.551	0.446	1.741	2.572	1.274
31	2.429	6.197	2.497	1.801	7.576	2.079	0.935	1.848	0.679	1.632	5.988	1.600	1.556	3.986	1.158	1.275	2.749	0.951
32	1.910	8.656	4.096	1.618	3.111	1.821	0.753	1.779	1.375	0.960	2.559	0.937	1.054	2.483	0.821	1.211	2.131	1.510
131	1.910	7.822	2.238	1.340	2.953	0.630	1.697	3.644	1.220	1.404	3.335	0.926	1.601	3.901	0.288	1.798	3.509	0.859
133	1.772	6.723	1.562	1.396	4.045	0.556	1.960	3.757	0.910	2.228	4.230	1.016	1.547	4.633	0.325	1.312	3.438	0.470
135	1.605	7.535	2.055	1.290	3.581	0.775	1.474	3.030	0.863	1.924	3.538	0.961	1.489	4.899	0.353	1.234	2.782	0.701

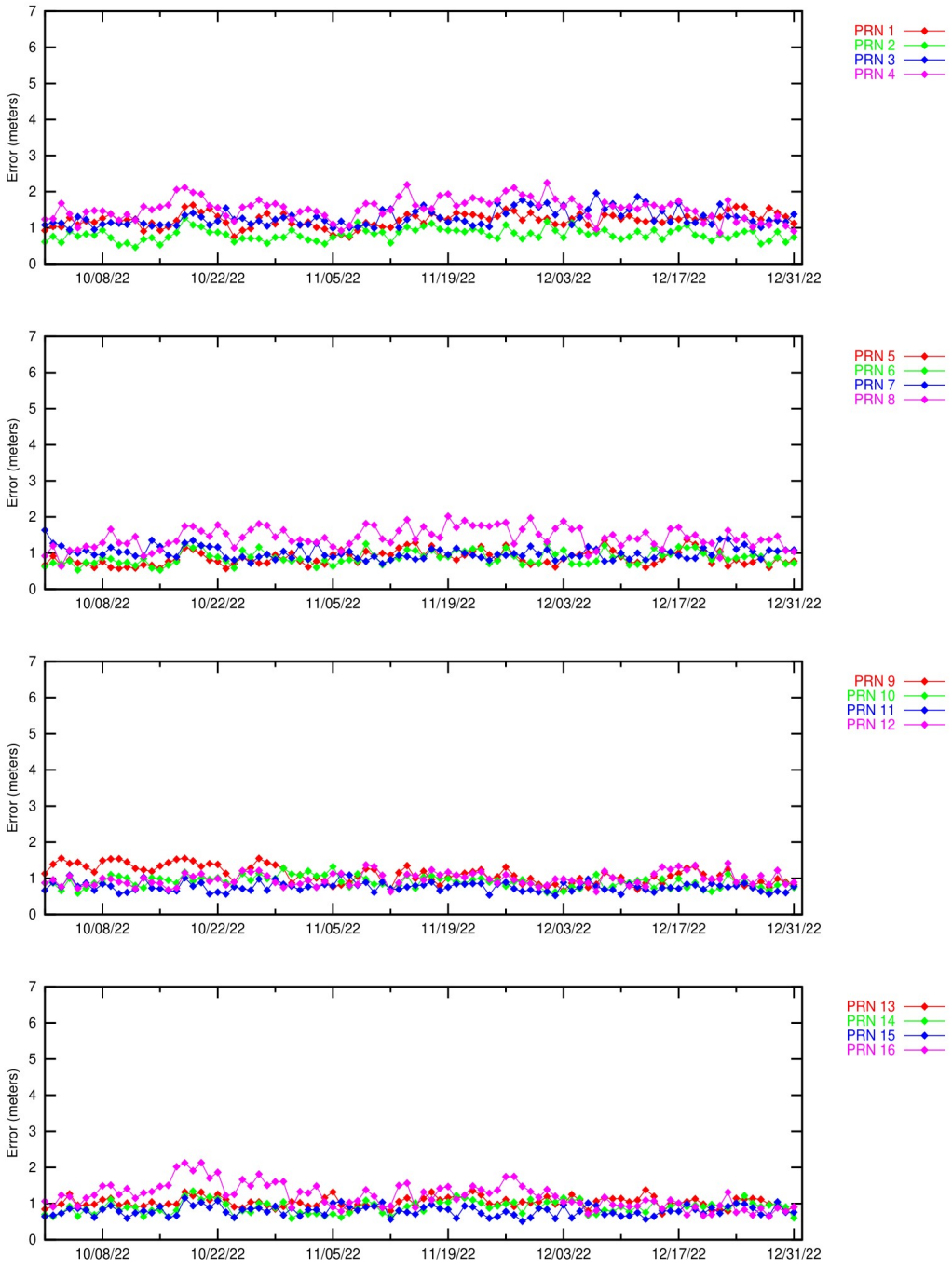

Figure 6-1 Range Error (PRN1–PRN16)—Washington, DC

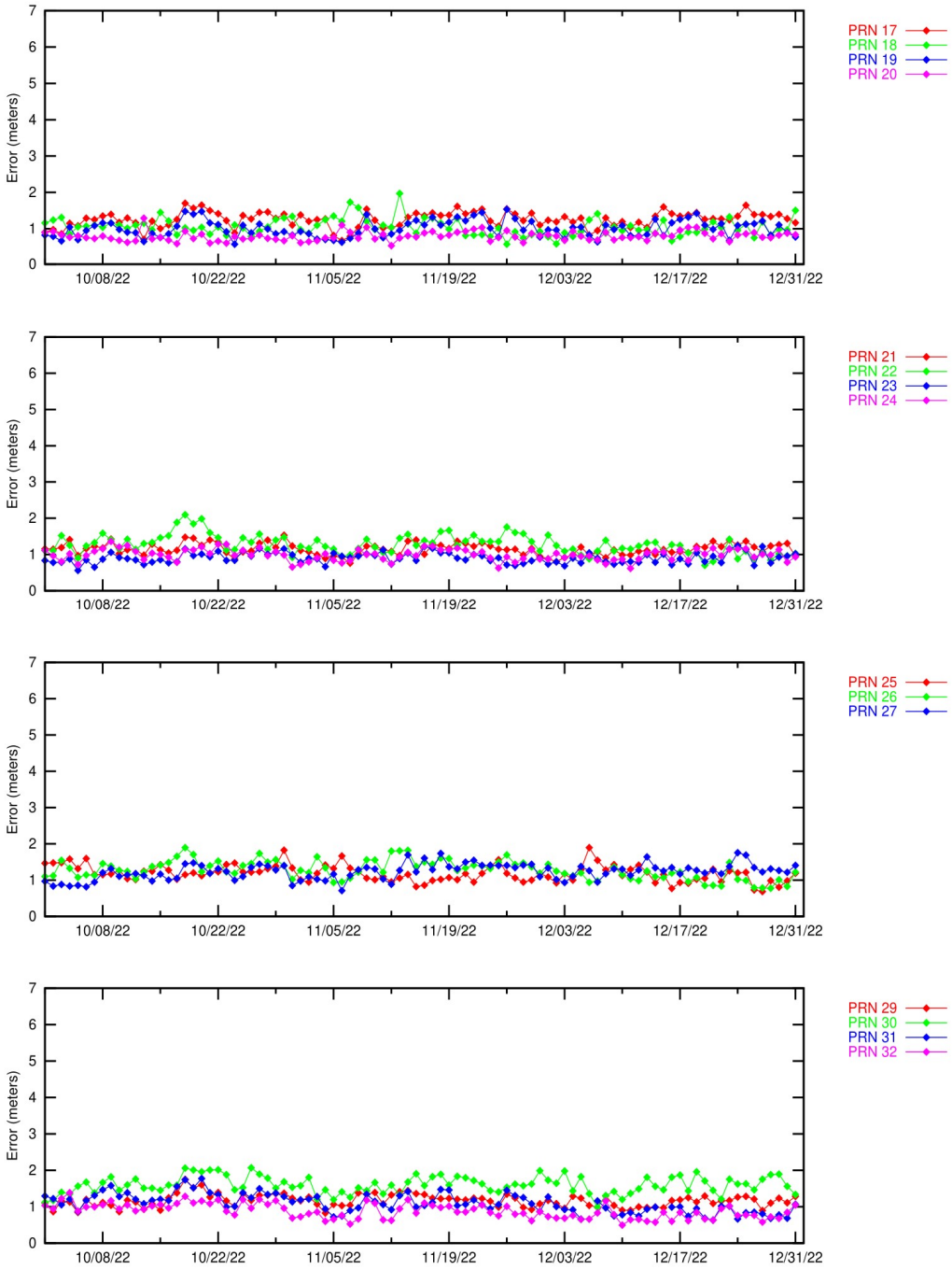

Figure 6-2 Range Error (PRN17–PRN32)—Washington, DC

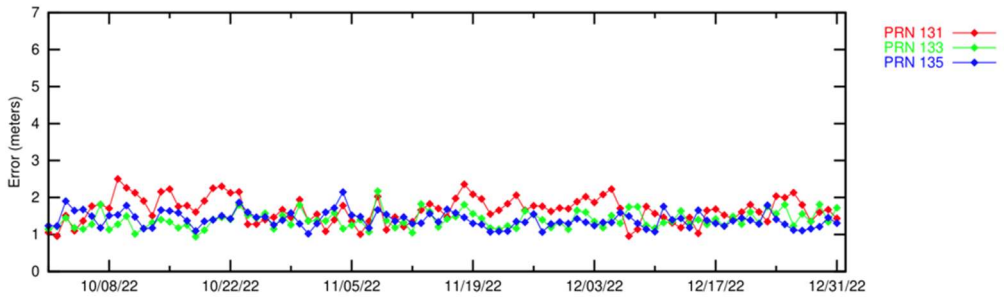

Figure 6-3 Range Error (PRN131, PRN133, and PRN135)—Washington, DC

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

The GPS satellite ionospheric errors were calculated for 12 WAAS receivers during the quarter. Table 6-3 and Table 6-4 show the ionospheric error 95% index and 99.9% bounding statistics for each SV at the selected locations. Figure 6-4 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	0.457	1.933	0.635	0.536	4.227	0.897	0.511	2.886	0.906	0.799	2.495	1.144	0.638	1.996	0.662	0.459	1.527	0.580
2	0.581	1.446	0.424	0.568	2.526	0.780	0.452	1.356	0.365	0.614	2.344	0.671	0.590	4.389	1.273	0.444	2.688	0.659
3	0.686	1.971	0.816	0.765	3.211	1.039	0.548	2.089	0.693	0.671	1.930	0.790	0.813	2.008	0.602	0.509	1.411	0.505
4	0.550	1.991	0.598	0.681	3.145	0.779	0.918	2.071	0.604	0.634	2.111	0.529	0.684	2.052	0.528	0.470	2.139	0.170
5	0.409	1.158	0.424	0.644	1.917	0.498	0.402	1.682	0.405	0.540	1.743	0.618	0.695	2.128	0.588	0.654	1.441	0.456
6	0.430	1.617	0.395	0.576	2.500	0.823	0.358	1.131	0.378	0.636	2.420	0.773	0.753	2.733	0.636	0.497	2.492	0.771
7	0.451	1.766	0.556	0.548	2.415	0.632	0.430	1.292	0.525	0.570	2.425	0.574	1.049	2.893	0.677	0.647	5.264	1.744
8	0.488	2.587	0.576	0.528	1.909	0.556	0.543	1.624	0.489	0.522	2.637	0.612	0.702	4.685	0.895	0.557	2.260	0.942
9	0.417	1.681	0.335	0.470	5.119	0.966	0.511	1.860	0.564	0.443	1.825	0.460	0.947	2.790	0.928	0.483	1.795	0.263
10	0.472	2.403	0.840	0.448	1.655	0.455	0.506	1.877	0.570	0.507	1.664	0.463	0.592	1.901	0.395	0.492	1.904	0.559
11	0.377	1.231	0.610	0.696	1.826	0.610	0.385	1.405	0.384	0.685	2.109	0.607	0.946	9.490	2.548	0.551	2.741	0.730
12	0.454	3.767	0.810	0.732	4.217	0.908	0.500	1.833	0.433	0.590	2.680	0.595	0.906	2.855	0.996	0.795	2.497	0.691
13	0.369	1.834	0.459	0.541	2.433	0.827	0.531	2.392	0.663	0.400	2.602	0.994	0.574	3.116	0.908	0.333	1.654	0.579
14	0.459	1.577	0.482	0.430	1.686	0.509	0.425	1.481	0.450	0.529	2.335	0.582	0.609	2.446	0.636	0.372	2.364	0.603
15	0.448	1.540	0.389	0.417	1.619	0.717	0.392	2.133	0.623	0.429	2.566	0.757	1.071	2.830	0.706	0.369	1.566	0.443
16	0.499	1.993	0.604	0.394	1.725	0.604	0.401	1.706	0.470	0.581	2.249	0.590	0.795	2.961	0.531	0.523	1.358	0.508
17	0.496	2.194	0.652	0.492	2.125	0.812	0.647	1.977	0.539	0.809	2.427	0.372	0.706	2.582	0.564	0.540	2.540	0.574
18	0.575	1.981	0.725	0.669	1.759	0.477	0.581	2.698	0.739	0.582	2.050	0.414	0.498	2.029	0.508	0.440	1.654	0.489
19	0.673	1.858	0.581	0.514	1.870	0.563	0.459	1.678	0.549	0.776	3.109	0.790	0.888	4.177	0.934	0.792	3.291	0.859
20	0.543	1.968	0.587	0.373	1.457	0.368	0.436	2.169	0.593	0.503	2.522	0.836	0.920	2.173	0.559	0.532	2.665	0.564
21	0.580	2.121	0.511	0.594	2.707	0.693	0.482	1.861	0.208	0.545	1.945	0.590	0.767	2.216	0.682	0.783	2.594	0.764
22	0.426	2.017	0.582	0.863	2.396	0.735	0.381	1.944	0.501	0.530	4.200	0.152	0.839	4.113	1.043	0.809	3.379	1.391
23	0.557	1.818	0.884	0.420	1.632	0.397	0.469	1.865	0.555	0.538	3.359	0.647	0.484	2.226	0.634	0.975	3.302	1.127
24	0.472	2.626	0.152	0.508	2.466	0.942	0.435	1.355	0.510	0.532	3.611	0.870	0.528	1.571	0.431	0.354	1.213	0.592
25	0.414	2.042	0.748	0.486	1.635	0.445	0.384	1.119	0.472	0.430	3.225	0.766	0.492	1.301	0.406	0.830	4.168	1.097
26	0.484	1.701	0.753	0.460	1.588	0.652	0.426	1.878	0.575	0.639	3.260	0.646	0.700	5.140	1.002	0.441	1.448	0.472
27	0.437	2.039	0.556	0.487	1.622	0.470	0.420	1.547	0.519	0.511	2.852	0.843	0.526	2.576	0.888	0.407	1.186	0.678
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	0.524	3.705	0.884	0.434	2.093	0.408	0.731	1.824	0.519	0.515	3.037	0.687	0.900	2.251	0.730	0.487	1.757	0.381
30	0.514	2.025	0.652	0.749	3.263	0.928	0.959	1.817	0.760	0.590	1.879	0.348	1.373	2.966	0.791	0.444	1.248	0.346
31	0.435	1.499	0.562	0.405	1.999	0.733	0.406	1.664	0.802	0.461	2.562	0.816	0.882	4.328	1.036	0.512	1.960	0.877
32	0.442	1.466	0.434	0.707	2.492	0.653	0.389	1.656	0.450	0.627	3.846	0.792	0.869	3.772	1.049	0.509	3.097	0.796

Table 6-4 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	1.235	2.641	0.830	0.891	1.981	0.474	0.616	2.474	0.728	0.485	1.942	0.710	0.530	1.903	0.501	0.518	2.029	0.659
2	1.731	5.080	1.347	0.741	2.373	0.914	0.492	1.882	0.367	0.533	3.457	0.998	0.516	1.439	0.402	0.402	2.655	0.873
3	1.683	2.847	1.067	0.926	3.898	1.157	0.688	3.607	0.674	0.739	2.697	0.767	1.238	2.637	1.255	0.508	2.185	0.567
4	1.740	3.165	0.286	0.729	1.698	0.479	0.635	2.258	0.584	0.514	2.795	0.786	0.700	1.829	0.488	0.579	1.858	0.435
5	1.481	3.321	1.019	0.883	5.353	1.339	0.536	2.785	0.638	0.751	2.832	0.846	0.558	2.539	0.664	0.453	2.238	0.539
6	1.569	4.203	1.171	1.002	5.945	1.144	0.508	2.238	0.689	0.889	3.565	1.293	0.529	2.479	0.644	0.529	1.996	0.444
7	1.582	2.804	0.729	1.582	3.487	1.133	0.542	2.659	0.670	0.562	2.791	0.805	0.643	1.479	0.533	0.395	2.522	0.438
8	1.236	2.186	0.962	0.558	2.397	0.539	0.665	1.621	0.870	0.600	2.698	0.752	0.468	2.130	0.744	0.736	2.592	0.732
9	1.573	2.693	0.635	0.869	2.807	1.082	0.499	2.022	0.521	0.607	2.294	0.765	0.689	1.629	0.519	0.433	2.210	0.416
10	1.234	2.364	0.944	0.499	3.212	0.310	0.448	1.874	0.778	0.526	2.220	0.618	0.427	2.015	0.389	0.360	1.761	0.693
11	1.295	4.760	1.218	0.398	1.344	0.337	0.483	2.203	0.574	0.515	2.738	0.859	0.418	2.054	0.641	0.404	1.488	0.363
12	1.652	5.396	0.477	0.673	1.876	0.475	0.710	2.360	0.671	0.433	1.267	0.336	0.606	1.870	0.508	0.380	1.971	0.350
13	1.092	2.186	0.804	0.744	1.777	0.669	0.327	1.186	0.471	0.436	1.871	0.713	0.617	1.508	0.426	0.520	2.104	0.638
14	1.612	3.029	0.968	1.032	2.158	0.583	0.542	1.791	0.459	0.738	2.278	0.643	0.620	1.879	0.607	0.353	1.583	0.617
15	1.089	1.867	0.652	0.498	1.269	0.460	0.548	1.774	0.484	0.889	4.005	1.196	0.458	2.084	0.560	0.667	2.277	0.579
16	1.611	2.474	0.907	0.615	6.383	1.261	0.459	1.825	0.800	0.850	3.709	1.054	0.584	1.991	0.568	0.586	2.172	0.631
17	1.972	5.655	1.312	0.546	3.596	1.114	0.521	2.207	0.542	0.430	1.733	0.545	0.458	2.066	0.604	0.445	2.485	0.531
18	1.493	3.439	0.993	0.934	2.254	0.797	0.498	1.673	0.355	0.494	1.755	0.522	0.525	1.425	0.483	0.349	1.470	0.190
19	1.654	2.773	0.692	0.818	3.246	0.760	0.638	2.947	0.707	0.569	2.440	0.823	0.592	1.487	0.624	0.445	1.714	0.580
20	1.443	2.774	0.544	0.581	1.742	0.411	0.732	2.045	0.494	1.274	3.172	1.124	0.530	2.348	0.562	0.529	2.113	0.423
21	1.435	2.762	1.070	1.055	3.409	0.627	0.535	2.378	0.948	0.989	6.005	2.049	0.780	2.561	0.598	0.654	1.773	0.599
22	1.723	4.256	1.167	0.764	3.856	0.811	0.504	2.570	0.620	0.579	3.830	1.293	0.527	2.106	0.066	0.354	2.349	0.416
23	1.520	2.637	0.917	0.549	2.195	0.475	0.485	1.875	0.498	0.683	1.986	0.751	0.513	1.853	0.379	0.547	2.849	0.556
24	1.096	1.727	0.734	0.793	1.840	0.560	0.592	1.783	0.668	0.628	1.669	0.521	0.478	1.368	0.508	0.520	2.383	0.602
25	1.320	3.034	1.160	0.694	2.096	0.727	0.465	1.552	0.518	0.450	3.411	1.386	0.430	2.385	0.675	0.379	1.590	0.365
26	1.359	3.060	1.513	0.834	4.623	1.170	0.461	3.012	1.034	0.728	4.446	1.317	0.566	2.214	0.501	0.451	1.810	0.420
27	0.999	1.658	0.888	0.572	2.164	0.487	0.382	1.597	0.565	0.336	1.541	0.553	0.421	1.674	0.425	0.515	2.557	0.857
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	1.630	4.111	0.823	0.652	2.361	0.612	0.435	2.094	0.535	0.556	1.917	0.776	0.571	1.553	0.489	0.463	1.933	0.183
30	1.596	2.865	0.657	0.783	1.805	0.547	0.675	2.121	0.539	0.548	1.874	0.544	0.824	1.627	0.749	0.665	2.212	0.203
31	1.515	4.365	1.291	1.103	7.115	1.542	0.405	1.398	0.386	0.750	3.241	0.895	0.520	2.634	0.553	0.628	3.103	0.729
32	1.478	4.115	1.133	0.695	3.227	0.766	0.508	1.761	0.413	0.384	1.463	0.487	0.477	1.809	0.278	0.442	2.173	0.428

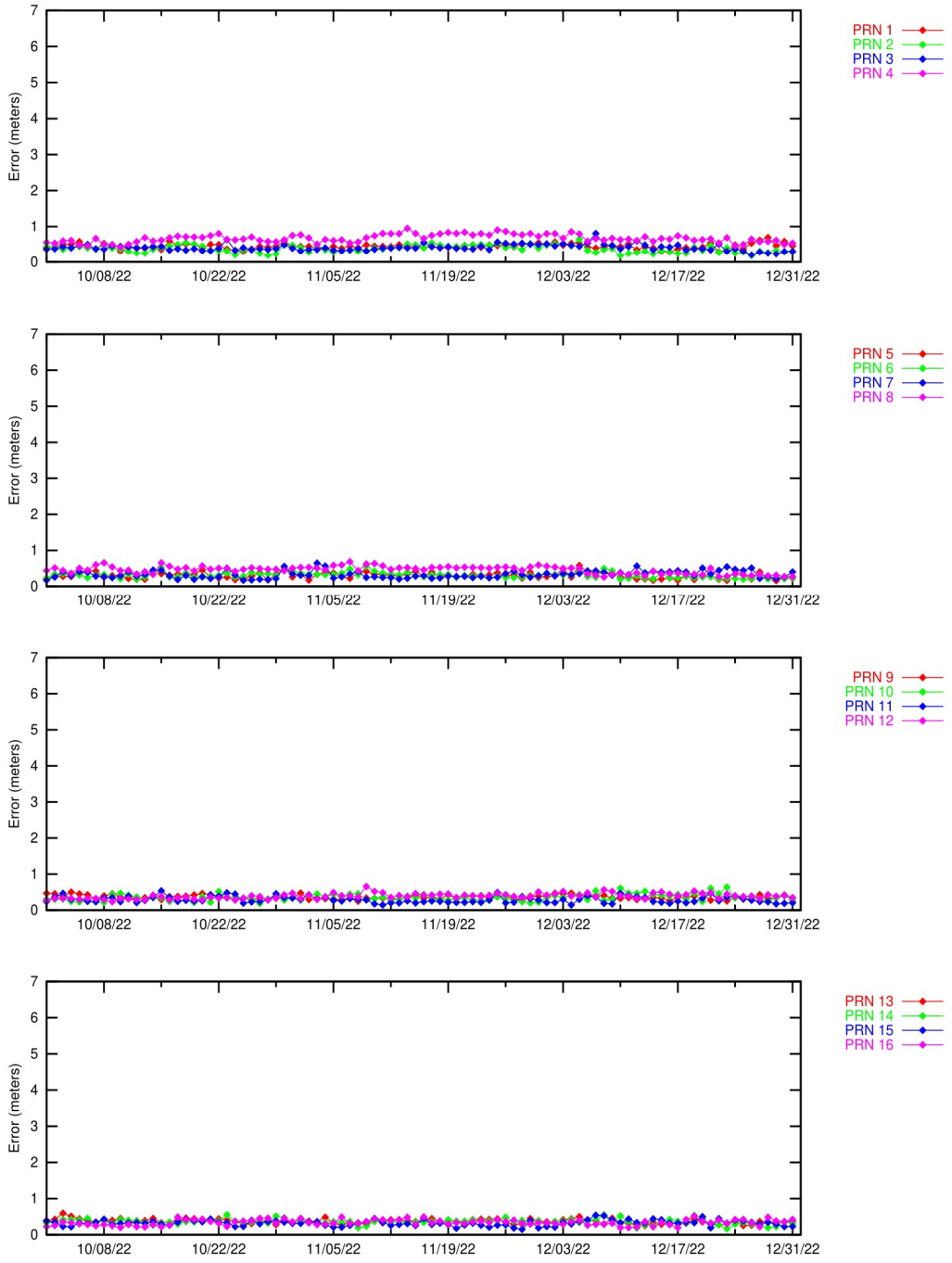

Figure 6-4 Ionospheric Error (PRN1–PRN16)—Washington, DC

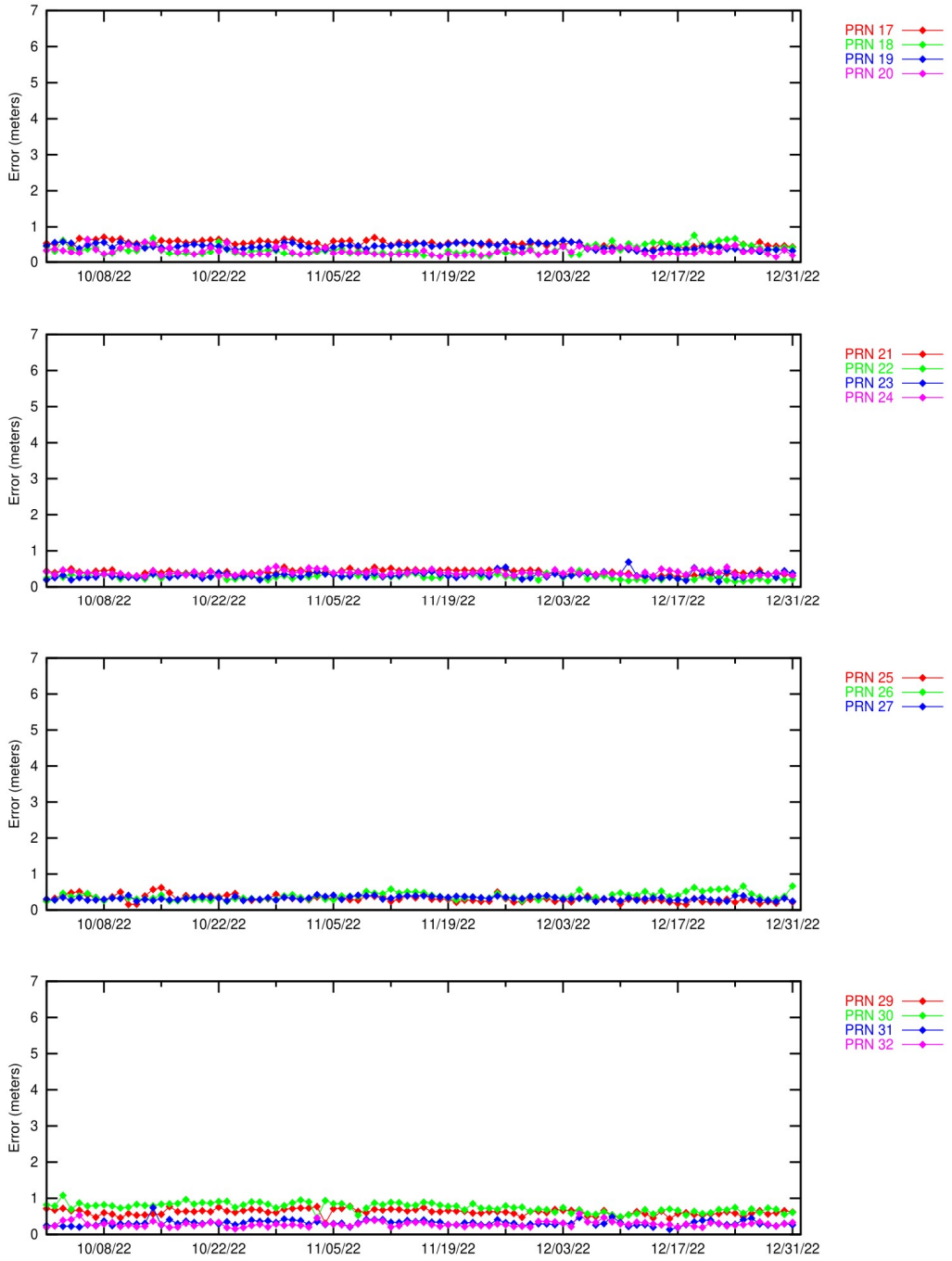

Figure 6-5 Ionospheric Error (PRN17–PRN32)—Washington, DC

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

7.0 GEO RANGING PERFORMANCE

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

Table 7-1 shows the GEO PA and NPA ranging availability as well as the percentage of time the GEO UDRE was set to "Not Monitored" and "Do Not Use." Figure 7-1 to Figure 7-3 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	GEO Source	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9	SM9 131	99.67	0.05	0.50	0.08
S15	SM9 131	99.68	0.05	0.34	0.00
G30	SM9 131	99.92	0.01	0.14	0.04
SM9	S15 133	99.67	0.05	0.51	0.08
S15	S15 133	99.68	0.05	0.35	0.00
G30	S15 133	99.92	0.01	0.14	0.04
SM9	G30 135	99.65	0.05	0.50	0.08
S15	G30 135	99.68	0.05	0.35	0.00
G30	G30 135	99.92	0.01	0.14	0.04

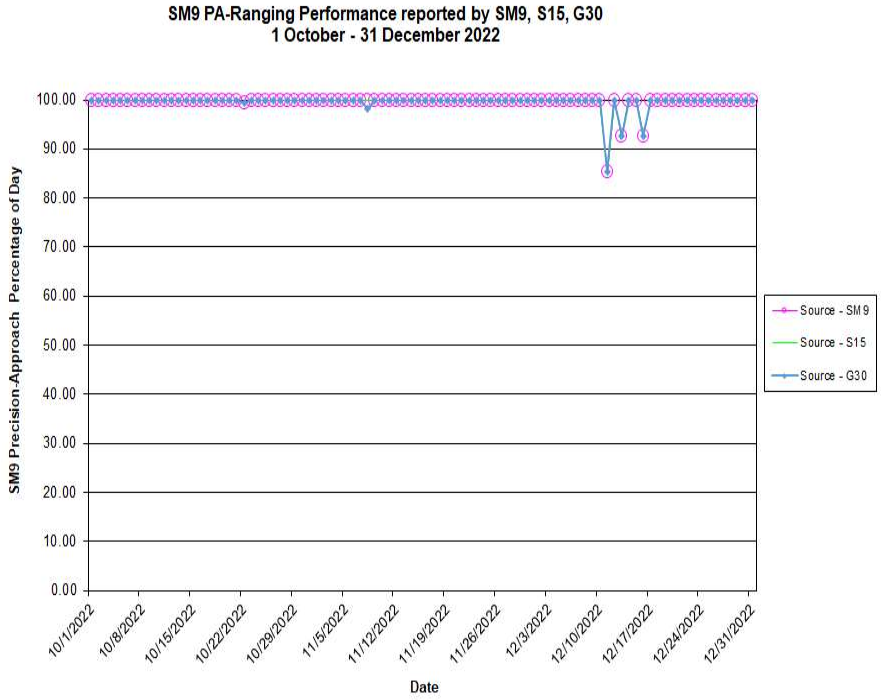

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

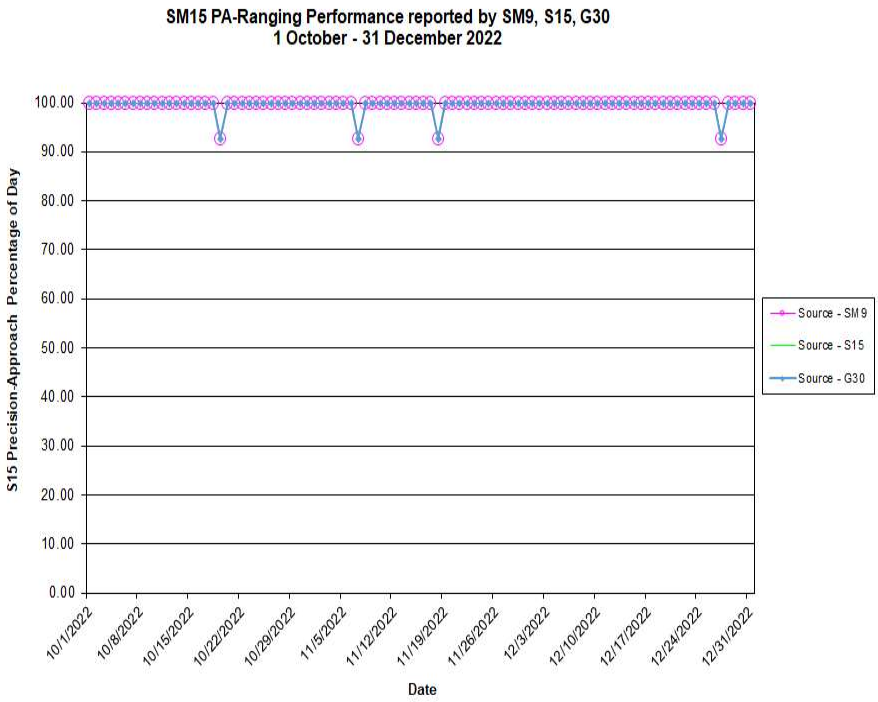

Figure 7-2 Daily PA S15 GEO Ranging Availability Trend

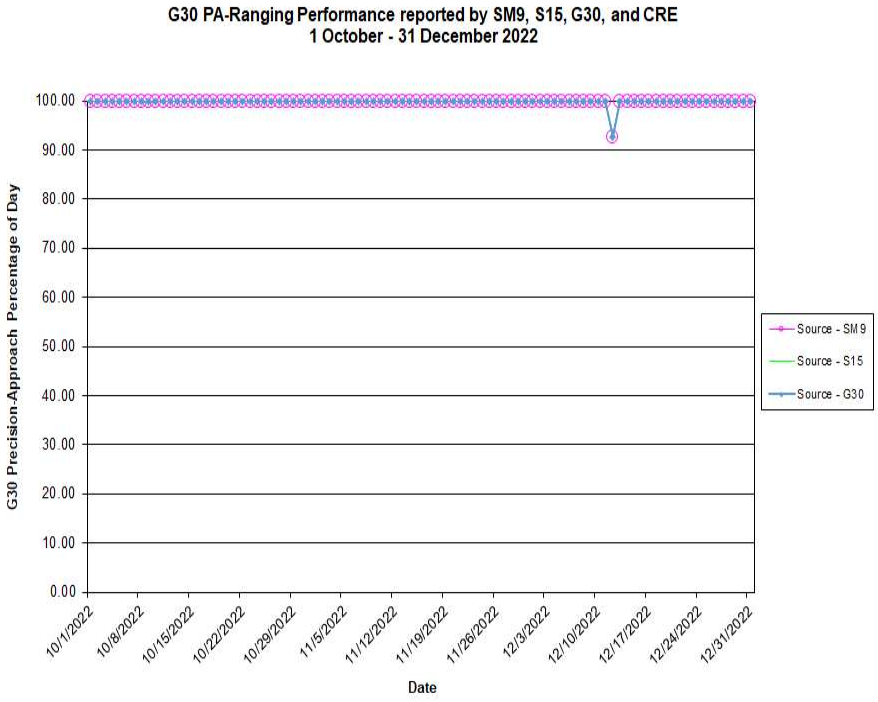

Figure 7-3 Daily PA G30 GEO Ranging Availability Trend

8.0 WAAS AIRPORT AVAILABILITY

The WAAS airport availability evaluation determines the number and length of LPV service outages at selected airports using the transmitted WAAS navigation message. The navigation messages transmitted from all GEO satellites are processed simultaneously, and WAAS protection levels (VPL and HPL) are computed at each airport once every 30 seconds in accordance with the RTCA DO-229D. The WAAS LPV service is available for a user when the VPL is less than or equal to the VAL of 50 meters and the HPL is less than or equal to the HAL of 40 meters. If both conditions are met, WAAS LPV service is available at that airport. Consequently, if either one of the conditions are not met, the WAAS LPV service outage and its duration is recorded.

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

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

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2C7	SHAKTOOLIK	AK	LPV	0	100	0	100	4	99.969
6A8	ALLAKAKET	AK	LP	0	100	0	100	2	99.987
7KA	TATITLEK	AK	LP	0	100	0	100	1	99.981
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	2	99.974
ADQ	KODIAK	AK	LPV	0	100	0	100	2	99.959
AFM	AMBLER	AK	LPV	0	100	0	100	2	99.974
AKN	KING SALMON	AK	LPV	0	100	1	99.994	4	99.963
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	2	99.981
ANI	ANIAK	AK	LPV	0	100	0	100	2	99.974
AQH	QUINHAGAK	AK	LPV	0	100	0	100	8	99.925
AQT	NUIQSUT	AK	LPV	0	100	0	100	7	99.955
ATK	ATQASUK EDWARD BURNELL SR MEML	AK	LPV	0	100	0	100	9	99.939
AWI	WAINWRIGHT	AK	LPV	0	100	0	100	12	99.922
BET	BETHEL	AK	LPV200	0	100	0	100	8	99.943
BRW	WILEY POST-WILL ROGERS MEML	AK	LPV	0	100	0	100	10	99.893
BVK	BUCKLAND	AK	LPV	0	100	0	100	4	99.968
CDB	COLD BAY	AK	LPV200	2	99.995	4	99.947	152	98.404
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	1	99.984
CEM	CENTRAL	AK	LP	1	99.994	1	99.994	2	99.955
CLP	CLARKS POINT	AK	LPV	0	100	1	99.999	4	99.958
CXF	COLDFOOT	AK	LP	0	100	0	100	4	99.983
D76	ROBERT/BOB/CURTIS MEML	AK	LPV	0	100	0	100	4	99.969
DEE	DEERING	AK	LPV	0	100	0	100	6	99.965
DLG	DILLINGHAM	AK	LPV	0	100	1	99.999	4	99.961
ELI	ELIM	AK	LPV	0	100	0	100	5	99.964
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	2	99.977
ENM	EMMONAK	AK	LPV	0	100	1	99.999	7	99.938
FAI	FAIRBANKS INTL	AK	LPV200	0	100	1	99.997	3	99.974
FYU	FORT YUKON	AK	LPV	0	100	1	99.994	2	99.954
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	2	99.972

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GAM	GAMBELL	AK	LPV	0	100	2	99.987	38	99.629
GKN	GULKANA	AK	LPV	0	100	0	100	2	99.981
GST	GUSTAVUS	AK	LP	1	99.984	1	99.981	1	99.971
HLA	HUSLIA	AK	LPV	0	100	0	100	2	99.978
HOM	HOMER	AK	LPV	0	100	0	100	1	99.978
HPB	HOOPER BAY	AK	LP	0	100	1	99.999	12	99.908
HRR	HEALY RIVER	AK	LP	0	100	0	100	3	99.983
IAN	BOB BAKER MEML	AK	LPV	0	100	0	100	4	99.969
IIK	KIPNUK	AK	LPV	0	100	1	99.999	9	99.902
ILI	ILIAMNA	AK	LPV	0	100	0	100	2	99.977
IWK	WALES	AK	LP	0	100	1	99.999	13	99.906
IYS	WASILLA	AK	LPV	0	100	0	100	2	99.981
KAL	KALTAG	AK	LPV	0	100	0	100	2	99.971
KGX	GRAYLING	AK	LP	0	100	0	100	2	99.972
KKA	KOYUK ALFRED ADAMS	AK	LP	0	100	0	100	4	99.967
KSM	ST MARY'S	AK	LPV200	0	100	0	100	7	99.943
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	2	99.992
KTS	BREVIG MISSION	AK	LPV	0	100	1	99.999	10	99.926
KWT	KWETHLUK	AK	LPV	0	100	0	100	7	99.955
KYU	KOYUKUK	AK	LPV	0	100	0	100	2	99.971
MCG	MC GRATH	AK	LP	0	100	0	100	2	99.976
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	6	99.964
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	1	99.974
MLY	MANLEY HOT SPRINGS	AK	LP	0	100	0	100	2	99.989
MOU	MOUNTAIN VILLAGE	AK	LPV200	0	100	0	100	7	99.940
MYU	MEKORYUK	AK	LPV	0	100	1	99.988	18	99.851
OME	NOME	AK	LPV	0	100	1	99.999	8	99.938
OOK	TOKSOOK BAY	AK	LP	0	100	1	99.988	11	99.900
ORT	NORTHWAY	AK	LP	1	99.991	2	99.991	2	99.967
OTZ	RALPH WIEN MEML	AK	LPV	0	100	0	100	7	99.964
PAQ	WARREN BUD WOODS PALMER MUNICIPAL	AK	LP	0	100	0	100	2	99.982
PBV	ST GEORGE	AK	LPV	2	99.975	13	99.900	301	94.615

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PHO	POINT HOPE	AK	LPV	0	100	0	100	14	99.895
PTU	PLATINUM	AK	LPV	0	100	1	99.999	12	99.910
RBY	RUBY	AK	LPV	0	100	0	100	2	99.973
RSH	RUSSIAN MISSION	AK	LP	0	100	0	100	5	99.972
SCC	DEADHORSE	AK	LPV200	0	100	1	99.995	5	99.943
SCM	SCAMMON BAY	AK	LP	0	100	1	99.999	11	99.918
SDP	SAND POINT	AK	LPV	2	99.997	3	99.952	77	99.562
SHG	SHUNGNAK	AK	LP	0	100	0	100	2	99.976
SHX	SHAGELUK	AK	LPV	0	100	0	100	2	99.972
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	1	99.971
SLQ	SLEETMUTE	AK	LP	0	100	0	100	2	99.975
SMK	ST MICHAEL	AK	LPV	0	100	0	100	5	99.969
SXQ	SOLDOTNA	AK	LP	0	100	0	100	2	99.977
TER	TELLER	AK	LPV200	0	100	1	99.999	9	99.927
TKA	TALKEETNA	AK	LPV	0	100	0	100	2	99.981
TOG	TOGIAK	AK	LP	0	100	1	99.999	9	99.935
WLK	SELAWIK	AK	LPV	0	100	0	100	4	99.974
WMO	WHITE MOUNTAIN	AK	LPV	0	100	0	100	8	99.961
WNA	NAPAKIAK	AK	LPV	0	100	0	100	8	99.937
WSN	SOUTH NAKNEK NR 2	AK	LPV	0	100	1	99.994	4	99.961
WTK	NOATAK	AK	LPV	0	100	0	100	8	99.954
YAK	YAKUTAT	AK	LPV200	0	100	0	100	1	99.995
02A	CHILTON COUNTY	AL	LP	0	100	0	100	1	99.997
06A	MOTON FLD MUNICIPAL	AL	LPV	0	100	0	100	2	99.996
09A	BUTLER/CHOCTAW COUNTY	AL	LPV	0	100	0	100	0	100
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	0	100	2	99.990
0R1	ATMORE MUNICIPAL	AL	LPV	0	100	0	100	1	99.997
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	0	100	2	99.992
12J	BREWTON MUNICIPAL	AL	LPV	0	100	0	100	2	99.997
1A9	PRATTVILLE - GROUBY FLD	AL	LPV	0	100	0	100	1	99.997
1M4	POSEY FLD	AL	LPV	0	100	0	100	0	100
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	100	0	100	1	99.997

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JKA	GULF SHORES INTL/JACK EDWARDS	AL	LPV200	0	100	0	100	3	99.996
M95	RICHARD ARTHUR FLD	AL	LPV	0	100	0	100	0	100
MDQ	HUNTSVILLE EXEC TOM SHARP JR F	AL	LPV200	0	100	0	100	0	100
MGM	MONTGOMERY RGNL (DANNELLY FLD)	AL	LPV200	0	100	0	100	1	99.997
MOB	MOBILE RGNL	AL	LPV200	0	100	0	100	1	99.997
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	0	100	0	100
PLR	ST CLAIR COUNTY	AL	LPV	0	100	0	100	1	99.997
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	0	100	0	100	1	99.997
SCD	MERKEL FLD SYLACAUGA MUNICIPAL	AL	LPV	0	100	0	100	1	99.997
SEM	CRAIG FLD	AL	LPV200	0	100	0	100	0	100
TCL	TUSCALOOSA NTL	AL	LPV	0	100	0	100	0	100
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	0	100	0	100	2	99.996
0M0	BILLY FREE MUNICIPAL	AR	LPV	0	100	0	100	0	100
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	0	100	0	100
4A5	SEARCY COUNTY	AR	LPV	0	100	0	100	0	100
4M1	CARROLL COUNTY	AR	LP	0	100	0	100	0	100
4M3	CARLISLE MUNICIPAL	AR	LPV	0	100	0	100	0	100
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	0	100	0	100
7M1	MC GEHEE MUNICIPAL	AR	LP	0	100	0	100	0	100
9M8	SHERIDAN-GRANT COUNTY RGNL	AR	LPV	0	100	0	100	0	100
ADF	DEXTER B FLORENCE MEML FLD	AR	LPV	0	100	0	100	0	100
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	100	0	100	0	100
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	100	0	100	0	100
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	0	100	0	100	0	100
BPK	BAXTER COUNTY	AR	LPV	0	100	0	100	0	100
BVX	BATESVILLE RGNL	AR	LPV	0	100	0	100	0	100
BYH	ARKANSAS INTL	AR	LPV200	0	100	0	100	0	100
CDH	HARRELL FLD	AR	LPV	0	100	0	100	0	100
CXW	CONWAY RGNL	AR	LPV	0	100	0	100	0	100
DRP	DELTA RGNL	AR	LPV	0	100	0	100	0	100
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	0	100	0	100	0	100
FLP	MARION COUNTY RGNL	AR	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FSM	FORT SMITH RGNL	AR	LPV200	0	100	0	100	0	100
FYV	DRAKE FLD	AR	LPV	0	100	0	100	0	100
H34	HUNTSVILLE MUNICIPAL	AR	LPV	0	100	0	100	0	100
HEE	THOMPSON-ROBBINS	AR	LPV	0	100	0	100	0	100
HRO	BOONE COUNTY	AR	LPV	0	100	0	100	0	100
JBR	JONESBORO MUNICIPAL	AR	LPV200	0	100	0	100	0	100
LIT	BILL AND HILLARY CLINTON NTL/A	AR	LPV200	0	100	0	100	0	100
LLQ	MONTICELLO MUNICIPAL/ELLIS FLD	AR	LPV	0	100	0	100	0	100
M18	HOPE MUNICIPAL	AR	LP	0	100	0	100	0	100
M19	NEWPORT RGNL	AR	LPV	0	100	0	100	0	100
M32	LAKE VILLAGE MUNICIPAL	AR	LP	0	100	0	100	0	100
M70	POCAHONTAS MUNICIPAL	AR	LPV	0	100	0	100	0	100
M77	HOWARD COUNTY	AR	LP	0	100	0	100	0	100
MXA	MANILA MUNICIPAL	AR	LPV	0	100	0	100	0	100
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	100	0	100	0	100
PBF	PINEBLUFF RGNL/GRIDER FLD	AR	LPV	0	100	0	100	0	100
ROG	ROGERS EXEC - CARTER FLD	AR	LPV	0	100	0	100	0	100
RUE	RUSSELLVILLE RGNL	AR	LPV	0	100	0	100	0	100
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	0	100	0	100	0	100
SLG	SMITH FLD	AR	LPV	0	100	0	100	0	100
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	0	100	0	100
SUZ	SALINE COUNTY RGNL	AR	LPV	0	100	0	100	0	100
TXK	TEXARKANA RGNL-WEBB FLD	AR	LPV	0	100	0	100	0	100
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	0	100	0	100	0	100
XNA	NORTHWEST ARKANSAS NTL	AR	LPV200	0	100	0	100	0	100
AVQ	MARANA RGNL	AZ	LP	0	100	0	100	2	99.962
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	0	100	0	100	0	100
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	0	100	0	100	3	99.960
CHD	CHANDLER MUNICIPAL	AZ	LPV	0	100	0	100	2	99.970
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	0	100	2	99.984
FFZ	FALCON FLD	AZ	LP	0	100	0	100	1	99.988
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	0	100	3	99.963

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	0	100
GCN	GRAND CANYON NTL PARK	AZ	LPV	0	100	0	100	0	100
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	0	100	2	99.978
GYR	PHOENIX GOODYEAR	AZ	LP	0	100	0	100	2	99.973
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	2	99.968
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	3	99.974
IGM	KINGMAN	AZ	LPV	0	100	0	100	1	99.986
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	0	100	2	99.982
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	0	100	0	100
P08	COOLIDGE MUNICIPAL	AZ	LPV	0	100	0	100	2	99.972
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	2	99.954
P33	COCHISE COUNTY	AZ	LPV	0	100	0	100	2	99.969
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	0	100
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	0	100	2	99.974
PRC	PRESCOTT RGNL - ERNEST A LOVE	AZ	LPV200	0	100	0	100	1	99.998
RQE	WINDOW ROCK	AZ	LP	0	100	0	100	0	100
RYN	RYAN FLD	AZ	LPV	0	100	0	100	2	99.960
SAD	SAFFORD RGNL	AZ	LPV	0	100	0	100	1	99.981
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LPV	0	100	0	100	0	100
SOW	SHOW LOW RGNL	AZ	LPV200	0	100	0	100	0	100
TUS	TUCSON INTL	AZ	LPV	0	100	0	100	2	99.961
TYL	TAYLOR	AZ	LPV	0	100	0	100	0	100
AAT	ALTURAS MUNICIPAL	CA	LPV	0	100	0	100	3	99.987
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	0	100	0	100	5	99.934
APC	NAPA COUNTY	CA	LPV200	0	100	0	100	10	99.897
APV	APPLE VALLEY	CA	LPV	1	99.994	1	99.994	6	99.927
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	3	99.957
BFL	MEADOWS FLD	CA	LPV	1	99.999	1	99.999	8	99.901
BLH	BLYTHE	CA	LP	0	100	2	99.988	2	99.922
BUR	BOB HOPE	CA	LP	1	99.982	1	99.982	7	99.882
C83	BYRON	CA	LPV	0	100	0	100	9	99.896
CCB	CABLE	CA	LP	1	99.983	1	99.982	7	99.894

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CCR	BUCHANAN FLD	CA	LPV	0	100	0	100	9	99.876
CEC	JACK MC NAMARA FLD	CA	LPV	0	100	0	100	5	99.929
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	6	99.963
CMA	CAMARILLO	CA	LPV	1	99.982	1	99.977	7	99.844
CNO	CHINO	CA	LPV	1	99.983	1	99.977	7	99.895
CPU	CALAVERAS COUNTY-MAURY RASMUSS	CA	LP	0	100	0	100	4	99.918
CRQ	MC CLELLAN-PALOMAR	CA	LPV	1	99.979	2	99.960	3	99.880
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	0	100	10	99.832
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	4	99.934
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	9	99.933
F70	FRENCH VALLEY	CA	LPV	1	99.983	2	99.964	3	99.887
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	4	99.913
FCH	FRESNO CHANDLER EXEC	CA	LPV	0	100	0	100	4	99.912
GOO	NEVADA COUNTY	CA	LPV	0	100	0	100	3	99.961
HAF	HALF MOON BAY	CA	LPV	0	100	1	99.999	11	99.848
HHR	JACK NORTHROP FLD/HAWTHORNE MU	CA	LPV	1	99.982	1	99.977	6	99.854
HJO	HANFORD MUNICIPAL	CA	LPV	0	100	0	100	4	99.920
HWD	HAYWARD EXEC	CA	LPV	0	100	0	100	10	99.864
L35	BIG BEAR CITY	CA	LP	1	99.991	1	99.987	5	99.928
LAX	LOS ANGELES INTL	CA	LPV200	1	99.982	1	99.977	6	99.852
LGB	LONG BEACH (DAUGHERTY FLD)	CA	LPV	1	99.982	2	99.976	6	99.857
LHM	LINCOLN RGNL/KARL HARDER FLD	CA	LPV200	0	100	0	100	4	99.951
LLR	LITTLE RIVER	CA	LP	0	100	0	100	9	99.898
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	0	100	9	99.877
LVK	LIVERMORE MUNICIPAL	CA	LPV200	0	100	0	100	11	99.883
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	5	99.910
MCE	MERCED RGNL/MACREADY FLD	CA	LPV200	0	100	0	100	5	99.907
MER	CASTLE	CA	LPV200	0	100	0	100	6	99.906
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	6	99.943
MHV	MOJAVE AIR AND SPACE PORT	CA	LP	1	99.999	1	99.999	7	99.913
MIT	SHAFTER-MINTER FLD	CA	LPV	1	99.999	1	99.999	8	99.892
MOD	MODESTO CITY-COUNTY-HARRY SHAM	CA	LPV200	0	100	0	100	7	99.903

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MRY	MONTEREY RGNL	CA	LPV	0	100	1	99.999	10	99.791
MYF	MONTGOMERY-GIBBS EXEC	CA	LPV200	1	99.975	2	99.950	3	99.882
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	4	99.954
NUQ	MOFFETT FEDERAL AIRFIELD	CA	LPV200	0	100	0	100	10	99.847
O02	NERVINO	CA	LPV	0	100	0	100	3	99.969
O08	COLUSA COUNTY	CA	LPV	0	100	0	100	8	99.949
O27	OAKDALE	CA	LPV	0	100	0	100	6	99.909
O32	REEDLEY MUNICIPAL	CA	LPV	0	100	0	100	4	99.926
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	11	99.895
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	8	99.906
OAK	METRO OAKLAND INTL	CA	LPV200	0	100	0	100	11	99.860
ONT	ONTARIO INTL	CA	LPV200	1	99.983	1	99.982	7	99.896
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	5	99.961
OXR	OXNARD	CA	LPV	1	99.982	1	99.977	8	99.841
PMD	PALMDALE USAF PLANT 42	CA	LPV200	1	99.987	1	99.986	7	99.912
POC	BRACKETT FLD	CA	LPV	1	99.983	1	99.982	7	99.893
PRB	PASO ROBLES MUNICIPAL	CA	LPV	1	99.997	1	99.997	10	99.837
PVF	PLACERVILLE	CA	LPV	0	100	0	100	4	99.952
RAL	RIVERSIDE MUNICIPAL	CA	LPV	1	99.985	1	99.979	6	99.897
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	7	99.963
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	5	99.963
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	0	100	9	99.830
RIV	MARCH ARB	CA	LPV200	1	99.985	1	99.979	5	99.896
SAC	SACRAMENTO EXEC	CA	LPV	0	100	0	100	7	99.941
SAN	SAN DIEGO INTL	CA	LPV	1	99.975	2	99.950	3	99.881
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	1	99.982	1	99.982	9	99.828
SBD	SAN BERNARDINO INTL	CA	LPV	1	99.987	1	99.985	6	99.912
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	1	99.990	1	99.990	11	99.838
SCK	STOCKTON METRO	CA	LPV200	0	100	0	100	8	99.915
SDM	BROWN FLD MUNICIPAL	CA	LPV200	1	99.975	2	99.939	4	99.883
SEE	GILLESPIE FLD	CA	LP	1	99.975	2	99.950	3	99.883
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	0	100	11	99.856

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	0	100	9	99.833
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	6	99.946
SMO	SANTA MONICA MUNICIPAL	CA	LPV	1	99.982	1	99.977	6	99.852
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	1	99.982	1	99.982	11	99.829
SNA	JOHN WAYNE/ORANGE COUNTY	CA	LPV200	1	99.983	2	99.969	6	99.863
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	0	100	10	99.810
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	11	99.886
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	9	99.882
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	4	99.937
TOA	ZAMPERINI FLD	CA	LPV	1	99.982	2	99.975	6	99.854
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	5	99.972
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	1	99.990	1	99.967	3	99.906
TVL	LAKE TAHOE	CA	LP	0	100	0	100	5	99.957
VCB	NUT TREE	CA	LPV	0	100	0	100	9	99.917
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	1	99.990	1	99.987	6	99.924
VIS	VISALIA MUNICIPAL	CA	LPV	0	100	0	100	4	99.922
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	1	99.988	1	99.986	7	99.909
WLW	WILLOWS/GLENN COUNTY	CA	LPV	0	100	0	100	9	99.952
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	0	100	9	99.800
1V6	FREMONT COUNTY	CO	LPV	0	100	0	100	0	100
20V	MC ELROY AIRFIELD	CO	LPV	0	100	0	100	0	100
2V5	WRAY MUNICIPAL	CO	LPV200	0	100	0	100	0	100
2V6	YUMA MUNICIPAL	CO	LPV200	0	100	0	100	0	100
33V	WALDEN-JACKSON COUNTY	CO	LPV	0	100	0	100	0	100
4V0	RANGELY	CO	LPV	0	100	0	100	0	100
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	0	100	0	100	0	100
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	0	100	0	100
AJZ	BLAKE FLD	CO	LPV	0	100	0	100	0	100
AKO	COLORADO PLAINS RGNL	CO	LPV	0	100	0	100	0	100
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	0	100	0	100
APA	CENTENNIAL	CO	LPV200	0	100	0	100	0	100
BJC	ROCKY MOUNTAIN METRO	CO	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CAG	CRAIG-MOFFAT	CO	LP	0	100	0	100	0	100
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	0	100	0	100
CFO	COLORADO AIR AND SPACE PORT	CO	LPV200	0	100	0	100	0	100
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	100	0	100	0	100
DEN	DENVER INTL	CO	LPV200	0	100	0	100	0	100
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	100	0	100	0	100
FMM	FORT MORGAN MUNICIPAL	CO	LPV	0	100	0	100	0	100
FNL	NORTHERN COLORADO RGNL	CO	LPV200	0	100	0	100	0	100
FTG	FRONT RANGE	CO	LPV200	0	100	0	100	0	100
GJT	GRAND JUNCTION RGNL	CO	LPV200	0	100	0	100	0	100
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	0	100
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	0	100
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	0	100
LAA	SOUTHEAST COLORADO RGNL	CO	LPV	0	100	0	100	0	100
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	0	100
LMO	VANCE BRAND	CO	LPV	0	100	0	100	0	100
MTJ	MONTROSE RGNL	CO	LPV200	0	100	0	100	0	100
MVI	MONTE VISTA MUNICIPAL	CO	LPV	0	100	0	100	0	100
PSO	STEVENS FLD	CO	LP	0	100	0	100	0	100
PUB	PUEBLO MEML	CO	LPV200	0	100	0	100	0	100
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	0	100	0	100	0	100
RIL	RIFLE GARFIELD COUNTY	CO	LPV	0	100	0	100	0	100
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	0	100
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	0	100
4B8	ROBERTSON FLD	CT	LP	0	100	0	100	0	100
BDL	BRADLEY INTL	CT	LPV200	0	100	0	100	0	100
BDR	IGOR I SIKORSKY MEML	CT	LPV	0	100	0	100	0	100
DXR	DANBURY MUNICIPAL	CT	LP	0	100	0	100	0	100
GON	GROTON-NEW LONDON	CT	LPV	0	100	0	100	0	100
HVN	TWEED/NEW HAVEN	CT	LPV	0	100	0	100	0	100
IJD	WINDHAM	CT	LP	0	100	0	100	0	100
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OXC	WATERBURY-OXFORD	CT	LPV	0	100	0	100	0	100
DCA	RONALD REAGAN WASHINGTON NTL	DC	LPV	0	100	0	100	1	99.995
HEF	MANASSAS RGNL/HARRY P DAVIS FL	DC	LPV	0	100	0	100	1	99.991
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	100	0	100	1	99.994
33N	DELAWARE AIRPARK	DE	LP	0	100	0	100	0	100
DOV	DOVER AFB	DE	LPV200	0	100	0	100	0	100
EVY	SUMMIT	DE	LPV	0	100	0	100	0	100
GED	DELAWARE COASTAL	DE	LPV	0	100	0	100	1	99.998
ILG	NEW CASTLE	DE	LPV	0	100	0	100	0	100
1J0	TRI-COUNTY	FL	LP	0	100	0	100	2	99.985
24J	SUWANNEE COUNTY	FL	LPV	0	100	0	100	2	99.974
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	2	99.967
40J	PERRY-FOLEY	FL	LPV	0	100	0	100	2	99.976
54J	DEFUNIAK SPRINGS	FL	LP	0	100	0	100	2	99.991
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	0	100	3	99.979
APF	NAPLES MUNICIPAL	FL	LPV	0	100	1	99.995	7	99.932
AVO	AVON PARK EXEC	FL	LPV	0	100	1	99.998	5	99.952
BCR	TRI-COUNTY	FL	LPV	0	100	0	100	2	99.985
BCT	BOCA RATON	FL	LPV	0	100	1	99.997	5	99.917
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	1	99.999	3	99.964
BOW	BARTOW EXEC	FL	LPV	0	100	1	99.999	5	99.956
CEW	BOB SIKES	FL	LPV	0	100	0	100	2	99.993
CGC	CRYSTAL RIVER-CAPT TOM DAVIS F	FL	LP	0	100	0	100	3	99.966
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	1	99.998	5	99.952
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	4	99.954
CRG	JACKSONVILLE EXEC AT CRAIG	FL	LPV200	0	100	0	100	2	99.966
CTY	CROSS CITY	FL	LPV	0	100	0	100	2	99.972
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	3	99.965
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FL	FL	LPV	0	100	0	100	3	99.965
DTS	DESTIN EXEC	FL	LPV	0	100	0	100	2	99.989
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	0	100	2	99.984
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	4	99.964

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EYW	KEY WEST INTL	FL	LPV	0	100	1	99.991	18	99.885
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	1	99.998	5	99.929
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	0	100	2	99.966
FIN	FLAGLER EXEC	FL	LPV	0	100	0	100	3	99.966
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	0	100	1	99.996	6	99.913
FMY	PAGE FLD	FL	LPV	0	100	1	99.996	5	99.936
FPR	TREASURE COAST INTL	FL	LPV	0	100	1	99.999	4	99.936
FPY	PERRY-FOLEY	FL	LPV	0	100	0	100	2	99.976
FXE	FORT LAUDERDALE EXEC	FL	LPV200	0	100	1	99.997	6	99.915
GIF	WINTER HAVEN RGNL	FL	LPV	0	100	1	99.999	4	99.960
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	2	99.970
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	2	99.967
IMM	IMMOKALEE RGNL	FL	LPV	0	100	1	99.996	6	99.931
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	4	99.957
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	2	99.967
LAL	LAKELAND LINDER INTL	FL	LPV200	0	100	1	99.999	4	99.959
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	0	100	2	99.971
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	3	99.964
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	1	99.998	5	99.921
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	0	100	2	99.984
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	4	99.958
MIA	MIAMI INTL	FL	LPV200	0	100	1	99.995	7	99.909
MKY	MARCO ISLAND EXEC	FL	LPV	0	100	1	99.995	8	99.927
MLB	MELBOURNE ORLANDO INTL	FL	LPV200	0	100	0	100	4	99.952
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	0	100	1	99.992	14	99.886
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	1	99.998	4	99.937
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	0	100	0	100	3	99.967
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	3	99.965
OPF	MIAMI-OPA LOCKA EXEC	FL	LPV200	0	100	1	99.996	7	99.912
ORL	EXEC	FL	LPV200	0	100	0	100	4	99.961
PBI	PALM BEACH INTL	FL	LPV200	0	100	1	99.998	5	99.925
PCM	PLANT CITY	FL	LPV	0	100	1	99.999	4	99.960

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PGD	PUNTA GORDA	FL	LPV200	0	100	1	99.997	5	99.940
PHK	PALM BEACH COUNTY GLADES	FL	LPV	0	100	1	99.997	5	99.931
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	1	99.998	4	99.960
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	1	99.997	6	99.915
PNS	PENSACOLA INTL	FL	LPV200	0	100	0	100	3	99.995
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	1	99.996	5	99.936
SEF	SEBRING RGNL	FL	LPV	0	100	1	99.998	4	99.951
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	3	99.963
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	2	99.965
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	1	99.997	4	99.955
SUA	WITHAM FLD	FL	LPV	0	100	1	99.999	4	99.932
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	4	99.955
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	0	100	2	99.980
TMB	MIAMI EXEC	FL	LPV200	0	100	1	99.995	8	99.907
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	1	99.995	9	99.915
TPA	TAMPA INTL	FL	LPV200	0	100	1	99.999	4	99.960
TPF	PETER O KNIGHT	FL	LP	0	100	1	99.999	4	99.960
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	4	99.956
VDF	TAMPA EXEC	FL	LPV	0	100	1	99.999	4	99.960
VNC	VENICE MUNICIPAL	FL	LP	0	100	1	99.997	5	99.950
VQQ	CECIL	FL	LPV200	0	100	0	100	2	99.967
VRB	VERO BEACH RGNL	FL	LPV200	0	100	1	99.999	5	99.949
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	1	99.999	5	99.954
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	1	99.997	5	99.937
X35	MARION COUNTY	FL	LP	0	100	0	100	3	99.967
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	0	100	1	99.994	11	99.905
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	1	99.999	3	99.961
09J	JEKYLL ISLAND	GA	LPV200	0	100	0	100	2	99.968
15J	COOK COUNTY	GA	LPV	0	100	0	100	2	99.978
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	0	100	2	99.983
18A	FRANKLIN-HART	GA	LPV	0	100	0	100	2	99.986
19A	JACKSON COUNTY	GA	LPV	0	100	0	100	2	99.986

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2J3	LOUISVILLE MUNICIPAL	GA	LPV	0	100	0	100	2	99.977
2J5	MILLEN	GA	LPV	0	100	0	100	2	99.975
3J7	GREENE COUNTY RGNL	GA	LPV	0	100	0	100	2	99.983
48A	COCHRAN	GA	LPV	0	100	0	100	2	99.982
49A	GILMER COUNTY	GA	LPV	0	100	0	100	2	99.993
4A4	POLK COUNTY/CORNELIUS MOORE FL	GA	LPV	0	100	0	100	2	99.996
4J1	BRANTLEY COUNTY	GA	LPV	0	100	0	100	2	99.970
4J2	BERRIEN COUNTY	GA	LPV	0	100	0	100	2	99.976
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	0	100	2	99.976
52A	MADISON MUNICIPAL	GA	LP	0	100	0	100	2	99.984
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	0	100	2	99.987
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	100	0	100	2	99.988
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	0	100	2	99.981
75J	TURNER COUNTY	GA	LP	0	100	0	100	2	99.981
9A5	BARWICK LAFAYETTE	GA	LP	0	100	0	100	1	99.996
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	0	100	2	99.983
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	0	100	2	99.984
AGS	AUGUSTA RGNL AT BUSH FLD	GA	LPV200	0	100	0	100	2	99.976
AHN	ATHENS/BEN EPPS	GA	LPV200	0	100	0	100	2	99.986
AJR	HABERSHAM COUNTY	GA	LPV	0	100	0	100	2	99.986
AMG	BACON COUNTY	GA	LPV	0	100	0	100	2	99.975
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	0	100	0	100	2	99.991
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	0	100	2	99.973
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	0	100	2	99.982
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	0	100	2	99.975
BIJ	EARLY COUNTY	GA	LPV	0	100	0	100	2	99.986
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	0	100	2	99.969
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	0	100	2	99.992
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	0	100	2	99.983
CNI	CHEROKEE COUNTY RGNL	GA	LPV	0	100	0	100	2	99.990
CSG	COLUMBUS	GA	LPV	0	100	0	100	2	99.992
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	0	100	2	99.995

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CVC	COVINGTON MUNICIPAL	GA	LPV	0	100	0	100	2	99.984
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	100	0	100	2	99.975
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	0	100	2	99.981
CZL	TOM B DAVID FLD	GA	LPV	0	100	0	100	2	99.994
D73	CY NUNNALLY MEML	GA	LP	0	100	0	100	2	99.985
DBN	W H 'BUD' BARRON	GA	LPV200	0	100	0	100	2	99.981
DNL	DANIEL FLD	GA	LPV	0	100	0	100	2	99.976
DNN	DALTON MUNICIPAL	GA	LPV	0	100	0	100	2	99.994
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	0	100	2	99.975
EBA	ELBERT COUNTY-PATZ FLD	GA	LP	0	100	0	100	2	99.984
EZM	HEART OF GEORGIA RGNL	GA	LPV200	0	100	0	100	2	99.981
FFC	ATLANTA RGNL FALCON FLD	GA	LPV	0	100	0	100	2	99.991
FTY	FULTON COUNTY EXEC/CHARLIE BRO	GA	LPV	0	100	0	100	2	99.992
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	0	100	2	99.980
GVL	LEE GILMER MEML	GA	LPV	0	100	0	100	2	99.986
HMP	ATLANTA SPEEDWAY	GA	LPV200	0	100	0	100	2	99.988
HOE	HOMERVILLE	GA	LPV	0	100	0	100	2	99.974
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	100	0	100	2	99.978
IIY	WASHINGTON/WILKES COUNTY	GA	LPV	0	100	0	100	2	99.980
JCA	JACKSON COUNTY	GA	LPV	0	100	0	100	2	99.986
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	0	100	2	99.972
JYL	PLANTATION AIRPARK	GA	LPV	0	100	0	100	2	99.973
JZP	PICKENS COUNTY	GA	LPV	0	100	0	100	2	99.990
LGC	LAGRANGE/CALLAWAY	GA	LPV200	0	100	0	100	2	99.993
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	0	100	0	100	2	99.972
LZU	GWINNETT COUNTY/BRISCOE FLD	GA	LPV200	0	100	0	100	2	99.986
MAC	MACON DOWNTOWN	GA	LPV	0	100	0	100	2	99.983
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	100	0	100	2	99.983
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	0	100	2	99.980
MHP	JOHN EDWIN JONES SR FLD/METTER	GA	LPV	0	100	0	100	2	99.975
MLJ	BALDWIN COUNTY RGNL	GA	LPV	0	100	0	100	2	99.983
MQW	TELFAIR-WHEELER	GA	LPV	0	100	0	100	2	99.979

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OKZ	KAOLIN FLD	GA	LPV	0	100	0	100	2	99.981
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	0	100	2	99.987
PIM	HARRIS COUNTY	GA	LPV	0	100	0	100	2	99.992
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	100	0	100	2	99.994
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	0	100	2	99.983
RMG	RICHARD B RUSSELL RGNL - J H T	GA	LPV	0	100	0	100	1	99.996
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	0	100	0	100	2	99.975
RYY	COBB COUNTY INTL/MCCOLLUM FLD	GA	LPV200	0	100	0	100	2	99.992
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	100	0	100	2	99.970
SBO	EAST GEORGIA RGNL	GA	LPV	0	100	0	100	2	99.977
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	100	0	100	2	99.974
TMA	HENRY TIFT MYERS	GA	LPV	0	100	0	100	2	99.980
TOC	TOCCOA RG LETOURNEAU FLD	GA	LPV	0	100	0	100	2	99.986
TVI	THOMASVILLE RGNL	GA	LPV	0	100	0	100	2	99.980
VDI	VIDALIA RGNL	GA	LPV200	0	100	0	100	2	99.976
VLD	VALDOSTA RGNL	GA	LPV	0	100	0	100	2	99.975
VPC	CARTERSVILLE	GA	LPV	0	100	0	100	2	99.994
WDR	BARROW COUNTY	GA	LPV	0	100	0	100	2	99.986
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	0	100	0	100	0	100
4C8	ALBIA MUNICIPAL	IA	LPV	0	100	0	100	0	100
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	100	0	100	0	100
ALO	WATERLOO RGNL	IA	LPV200	0	100	0	100	0	100
AMW	AMES MUNICIPAL	IA	LPV	0	100	0	100	0	100
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
BNW	BOONE MUNICIPAL	IA	LPV	0	100	0	100	0	100
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	100	0	100	0	100
C25	WAVERLY MUNICIPAL	IA	LPV	0	100	0	100	0	100
CAV	CLARION MUNICIPAL	IA	LPV	0	100	0	100	0	100
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	100	0	100	0	100
CCY	NORTHEAST IOWA RGNL	IA	LPV	0	100	0	100	0	100
CID	THE EASTERN IOWA	IA	LPV200	0	100	0	100	0	100
CIN	ARTHUR N NEU	IA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
CSQ	CRESTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
CWI	CLINTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
DBQ	DUBUQUE RGNL	IA	LPV200	0	100	0	100	0	100
DEH	DECORAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
DNS	DENISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
DSM	DES MOINES INTL	IA	LPV200	0	100	0	100	0	100
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	100	0	100	0	100
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	0	100	0	100	0	100
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	100	0	100	0	100
EOK	KEOKUK MUNICIPAL	IA	LPV	0	100	0	100	0	100
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
FOD	FORT DODGE RGNL	IA	LPV200	0	100	0	100	0	100
FSW	FORT MADISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
GCT	GUTHRIE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
GFZ	GREENFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
GGI	GRINNELL RGNL	IA	LPV	0	100	0	100	0	100
HPT	HAMPTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
I75	OSCEOLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ICL	SCHENCK FLD	IA	LPV	0	100	0	100	0	100
IFA	IOWA FALLS MUNICIPAL	IA	LPV	0	100	0	100	0	100
IIB	JAMES H CONNELL FLD AT INDEPEN	IA	LPV	0	100	0	100	0	100
IKV	ANKENY RGNL	IA	LPV200	0	100	0	100	0	100
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
LRJ	LE MARS MUNICIPAL	IA	LPV	0	100	0	100	0	100
LWD	LAMONI MUNICIPAL	IA	LPV	0	100	0	100	0	100
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	0	100	0	100	0	100
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MUT	MUSCATINE MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MXO	MONTICELLO RGNL	IA	LP	0	100	0	100	0	100
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	100	0	100	0	100
OQW	MAQUOKETA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ORC	ORANGE CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
OTM	OTTUMWA RGNL	IA	LPV	0	100	0	100	0	100
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
PEA	PELLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	100	0	100	0	100
PRO	PERRY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
RDK	RED OAK MUNICIPAL	IA	LPV	0	100	0	100	0	100
RRQ	ROCK RAPIDS MUNICIPAL	IA	LP	0	100	0	100	0	100
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
SHL	SHELDON RGNL	IA	LPV	0	100	0	100	0	100
SKI	SAC CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	100	0	100	0	100
SPW	SPENCER MUNICIPAL	IA	LPV200	0	100	0	100	0	100
SUX	SIOUX GATEWAY/BRIG GENERAL BUD	IA	LPV200	0	100	0	100	0	100
SXK	SIOUX COUNTY RGNL	IA	LPV200	0	100	0	100	0	100
TNU	NEWTON MUNICIPAL-EARL JOHNSON FLD	IA	LPV200	0	100	0	100	0	100
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	100	0	100	0	100
VTI	VINTON VETERANS MEML AIRPARK	IA	LPV	0	100	0	100	0	100
1U7	BEAR LAKE COUNTY	ID	LPV	0	100	0	100	0	100
BOI	BOISE AIR TRML/GOWEN FLD	ID	LPV200	0	100	0	100	0	100
COE	COEUR D'ALENE/PAPPY BOYINGTON	ID	LPV200	0	100	0	100	0	100
DIJ	DRIGGS-REED MEML	ID	LP	0	100	0	100	0	100
EUL	TREASURE VALLEY EXEC AT CALDWE	ID	LPV	0	100	0	100	0	100
GNG	GOODING MUNICIPAL	ID	LPV	0	100	0	100	0	100
IDA	IDAHO FALLS RGNL	ID	LPV200	0	100	0	100	0	100
JER	JEROME COUNTY	ID	LPV	0	100	0	100	0	100
LWS	LEWISTON/NEZ PERCE COUNTY	ID	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MAN	NAMPA MUNICIPAL	ID	LPV	0	100	0	100	0	100
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	0	100
PIH	POCATELLO RGNL	ID	LPV200	0	100	0	100	0	100
SUN	FRIEDMAN MEML	ID	LP	0	100	0	100	0	100
SZT	SANDPOINT	ID	LP	0	100	0	100	0	100
TWF	JOSLIN FLD/MAGIC VALLEY RGNL	ID	LPV200	0	100	0	100	1	99.999
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	100	0	100	0	100
1H2	EFFINGHAM COUNTY MEML	IL	LPV	0	100	0	100	0	100
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	100	0	100	0	100
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	0	100	0	100	0	100
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	100	0	100	0	100
ALN	ST LOUIS RGNL	IL	LPV200	0	100	0	100	0	100
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	0	100
BLV	SCOTT AFB/MIDAMERICA ST LOUIS	IL	LPV200	0	100	0	100	0	100
BMI	CENTRAL IL RGNL/BLOOMINGTON-NO	IL	LPV	0	100	0	100	0	100
C15	PEKIN MUNICIPAL	IL	LPV	0	100	0	100	0	100
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	0	100	0	100	0	100
C75	MARSHALL COUNTY	IL	LP	0	100	0	100	0	100
CIR	CAIRO RGNL	IL	LP	0	100	0	100	0	100
CMI	UNIVERSITY OF ILLINOIS/WILLARD	IL	LPV200	0	100	0	100	0	100
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	100	0	100	0	100
CTK	INGERSOLL	IL	LPV	0	100	0	100	0	100
CUL	CARMI MUNICIPAL	IL	LPV	0	100	0	100	0	100
DEC	DECATUR	IL	LPV200	0	100	0	100	0	100
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	100	0	100	0	100
DNV	VERMILION RGNL	IL	LPV	0	100	0	100	0	100
DPA	DUPAGE	IL	LPV200	0	100	0	100	0	100
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	100	0	100	0	100
EZI	KEWANEE MUNICIPAL	IL	LPV	0	100	0	100	0	100
FEP	ALBERTUS	IL	LPV	0	100	0	100	0	100
FOA	FLORA MUNICIPAL	IL	LPV	0	100	0	100	0	100
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GRE	GREENVILLE	IL	LPV	0	100	0	100	0	100
HSB	HARRISBURG-RALEIGH	IL	LPV	0	100	0	100	0	100
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IGQ	LANSING MUNICIPAL	IL	LPV	0	100	0	100	1	99.998
IKK	GREATER KANKAKEE	IL	LPV200	0	100	0	100	0	100
LOT	LEWIS UNIVERSITY	IL	LPV200	0	100	0	100	0	100
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	100	0	100	0	100
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	100	0	100	1	99.999
MLI	QUAD CITIES INTL	IL	LPV200	0	100	0	100	0	100
MQB	MACOMB MUNICIPAL	IL	LPV200	0	100	0	100	0	100
MTO	COLES COUNTY MEML	IL	LPV200	0	100	0	100	0	100
MVN	MOUNT VERNON	IL	LPV	0	100	0	100	0	100
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	0	100	0	100	0	100
OLY	OLNEY-NOBLE	IL	LPV	0	100	0	100	0	100
ORD	CHICAGO O'HARE INTL	IL	LPV200	0	100	0	100	1	99.999
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	0	100	0	100	0	100
PJY	PINCKNEYVILLE/DU QUOIN	IL	LPV	0	100	0	100	0	100
PNT	PONTIAC MUNICIPAL	IL	LPV	0	100	0	100	0	100
PPQ	PITTSFIELD PENSTONE MUNICIPAL	IL	LPV	0	100	0	100	0	100
PRG	EDGAR COUNTY	IL	LPV	0	100	0	100	0	100
PWK	CHICAGO EXEC	IL	LPV	0	100	0	100	1	99.999
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	100	0	100	0	100
RPJ	ROCHELLE MUNICIPAL/KORITZ FLD	IL	LPV	0	100	0	100	0	100
RSV	CRAWFORD COUNTY	IL	LPV	0	100	0	100	0	100
SAR	SPARTA COMMUNICIPALTY-HUNTER FLD	IL	LPV	0	100	0	100	0	100
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	0	100
SLO	SALEM-LECKRONE	IL	LPV200	0	100	0	100	0	100
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	100	0	100	0	100
SQI	WHITESIDE COUNTY/JOS H BITTORF	IL	LPV200	0	100	0	100	0	100
TIP	RANTOUL NTL AVN CNTR-FRANK ELL	IL	LPV	0	100	0	100	0	100
UGN	WAUKEGAN NTL	IL	LPV	0	100	0	100	1	99.999
UIN	QUINCY RGNL-BALDWIN FLD	IL	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	0	100	0	100	0	100
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	0	100	0	100	1	99.997
50I	KENTLAND MUNICIPAL	IN	LPV	0	100	0	100	1	99.999
AID	ANDERSON MUNICIPAL-DARLINGTON FLD	IN	LPV	0	100	0	100	1	99.994
ASW	WARSAW MUNICIPAL	IN	LPV200	0	100	0	100	1	99.994
BAK	COLUMBUS MUNICIPAL	IN	LPV	0	100	0	100	1	99.995
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	0	100	0	100	1	99.998
BMG	MONROE COUNTY	IN	LPV200	0	100	0	100	1	99.999
C62	KENDALLVILLE MUNICIPAL	IN	LPV	0	100	0	100	1	99.993
C65	PLYMOUTH MUNICIPAL	IN	LPV	0	100	0	100	1	99.995
CEV	METTEL FLD	IN	LPV	0	100	0	100	1	99.992
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	0	100	0	100	1	99.998
DCY	DAVIESS COUNTY	IN	LPV	0	100	0	100	0	100
EKM	ELKHART MUNICIPAL	IN	LPV	0	100	0	100	1	99.994
EVV	EVANSVILLE RGNL	IN	LPV200	0	100	0	100	0	100
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	100	0	100	1	99.997
FKR	FRANKFORT CLINTON COUNTY RGNL	IN	LPV	0	100	0	100	1	99.997
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	100	0	100	1	99.998
FWA	FORT WAYNE INTL	IN	LPV200	0	100	0	100	1	99.993
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	100	0	100	1	99.995
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	100	0	100	1	99.995
GPC	PUTNAM COUNTY RGNL	IN	LPV	0	100	0	100	1	99.999
GSH	GOSHEN MUNICIPAL	IN	LPV	0	100	0	100	1	99.994
GWB	DE KALB COUNTY	IN	LPV	0	100	0	100	1	99.992
GYY	GARY/CHICAGO INTL	IN	LPV200	0	100	0	100	1	99.998
HFY	INDY SOUTH GREENWOOD	IN	LPV	0	100	0	100	1	99.996
HNB	HUNTINGBURG	IN	LPV	0	100	0	100	0	100
HUF	TERRE HAUTE RGNL	IN	LPV200	0	100	0	100	0	100
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	1	99.992
I76	PERU MUNICIPAL	IN	LPV	0	100	0	100	1	99.995
IMS	MADISON MUNICIPAL	IN	LPV	0	100	0	100	1	99.994
IND	INDIANAPOLIS INTL	IN	LPV200	0	100	0	100	1	99.996

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JVY	CLARK RGNL	IN	LPV200	0	100	0	100	1	99.996
LAF	PURDUE UNIVERSITY	IN	LPV	0	100	0	100	1	99.998
MCX	WHITE COUNTY	IN	LP	0	100	0	100	1	99.998
MIE	DELAWARE COUNTY RGNL	IN	LPV	0	100	0	100	1	99.993
MQJ	INDIANAPOLIS RGNL	IN	LPV200	0	100	0	100	1	99.996
MZZ	MARION MUNICIPAL - MCKINNEY FLD	IN	LPV200	0	100	0	100	1	99.994
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	100	0	100	1	99.995
OVO	NORTH VERNON	IN	LPV	0	100	0	100	1	99.994
OXI	STARKE COUNTY	IN	LPV	0	100	0	100	1	99.996
PLD	PORTLAND MUNICIPAL	IN	LPV	0	100	0	100	1	99.992
PPO	LA PORTE MUNICIPAL	IN	LPV	0	100	0	100	1	99.996
RCR	FULTON COUNTY	IN	LPV	0	100	0	100	1	99.995
RID	RICHMOND MUNICIPAL	IN	LPV200	0	100	0	100	1	99.992
RWN	ARENS FLD	IN	LPV	0	100	0	100	1	99.996
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	1	99.999
SBN	SOUTH BEND INTL	IN	LPV200	0	100	0	100	1	99.995
SER	FREEMAN MUNICIPAL	IN	LPV	0	100	0	100	1	99.995
SIV	SULLIVAN COUNTY	IN	LPV	0	100	0	100	0	100
SMD	SMITH FLD	IN	LPV	0	100	0	100	1	99.992
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	100	0	100	1	99.999
TYQ	INDIANAPOLIS EXEC	IN	LPV	0	100	0	100	1	99.997
UWL	NEW CASTLE HENRY COUNTY MARLAT	IN	LPV	0	100	0	100	1	99.993
VPZ	PORTER COUNTY RGNL	IN	LPV	0	100	0	100	1	99.997
1QK	GOVE COUNTY	KS	LPV	0	100	0	100	0	100
3AU	AUGUSTA MUNICIPAL	KS	LP	0	100	0	100	0	100
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
3K7	MARK HOARD MEML	KS	LPV	0	100	0	100	0	100
3K8	COMANCHE COUNTY	KS	LPV	0	100	0	100	0	100
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	0	100
9K8	KINGMAN/CLYDE CESSNA FLD	KS	LP	0	100	0	100	0	100
AAO	COLONEL JAMES JABARA	KS	LPV	0	100	0	100	0	100
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	0	100
BEC	BEECH FACTORY	KS	LPV	0	100	0	100	0	100
CBK	SHALZ FLD	KS	LPV	0	100	0	100	0	100
CFV	COFFEYVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
CNK	BLOSSER MUNICIPAL	KS	LP	0	100	0	100	0	100
DDC	DODGE CITY RGNL	KS	LPV200	0	100	0	100	0	100
EGT	WELLINGTON MUNICIPAL	KS	LPV200	0	100	0	100	0	100
EHA	ELKHART-MORTON COUNTY	KS	LPV	0	100	0	100	0	100
EMP	EMPORIA MUNICIPAL	KS	LPV	0	100	0	100	0	100
EQA	EL DORADO/CAPT JACK THOMAS MEM	KS	LPV200	0	100	0	100	0	100
EWK	NEWTON-CITY-COUNTY	KS	LPV	0	100	0	100	0	100
FOE	TOPEKA RGNL	KS	LPV	0	100	0	100	0	100
FSK	FORT SCOTT MUNICIPAL	KS	LPV	0	100	0	100	0	100
GBD	GREAT BEND MUNICIPAL	KS	LPV200	0	100	0	100	0	100
GCK	GARDEN CITY RGNL	KS	LPV	0	100	0	100	0	100
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	0	100	0	100	0	100
HLC	HILL CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
HQG	HUGOTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
HRU	HERINGTON RGNL	KS	LPV	0	100	0	100	0	100
HUT	HUTCHINSON RGNL	KS	LPV200	0	100	0	100	0	100
HYS	HAYS RGNL	KS	LPV200	0	100	0	100	0	100
ICT	WICHITA DWIGHT D EISENHOWER NT	KS	LPV200	0	100	0	100	0	100
IDP	INDEPENDENCE MUNICIPAL	KS	LPV200	0	100	0	100	0	100
IXD	NEW CENTURY AIRCENTER	KS	LPV	0	100	0	100	0	100
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	0	100	0	100	0	100
K78	ABILENE MUNICIPAL	KS	LPV	0	100	0	100	0	100
K79	JETMORE MUNICIPAL	KS	LPV	0	100	0	100	0	100
K81	MIAMI COUNTY	KS	LPV	0	100	0	100	0	100
K82	SMITH CENTER MUNICIPAL	KS	LPV200	0	100	0	100	0	100
K88	ALLEN COUNTY	KS	LPV	0	100	0	100	0	100
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	0	100	0	100	0	100
LQR	LARNED-PAWNEE COUNTY	KS	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LWC	LAWRENCE RGNL	KS	LPV200	0	100	0	100	0	100
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
MHK	MANHATTAN RGNL	KS	LPV200	0	100	0	100	0	100
MPR	MC PHERSON	KS	LPV	0	100	0	100	0	100
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
NRN	NORTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	0	100
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	0	100
OJC	JOHNSON COUNTY EXEC	KS	LPV	0	100	0	100	0	100
OWI	OTTAWA MUNICIPAL	KS	LPV	0	100	0	100	0	100
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	0	100	0	100	0	100
PPF	TRI-CITY	KS	LPV	0	100	0	100	0	100
PTS	ATKINSON MUNICIPAL	KS	LPV	0	100	0	100	0	100
PTT	PRATT RGNL	KS	LPV	0	100	0	100	0	100
RCP	ROOKS COUNTY RGNL	KS	LPV	0	100	0	100	0	100
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
RSL	RUSSELL MUNICIPAL	KS	LPV	0	100	0	100	0	100
SLN	SALINA RGNL	KS	LPV	0	100	0	100	0	100
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	0	100	0	100	0	100
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
UKL	COFFEY COUNTY	KS	LPV	0	100	0	100	0	100
ULS	ULYSSES	KS	LPV	0	100	0	100	0	100
WLD	STROTHER FLD	KS	LPV	0	100	0	100	0	100
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	0	100	0	100	1	99.990
18I	MC CREARY COUNTY	KY	LP	0	100	0	100	1	99.990
1M7	FULTON	KY	LPV	0	100	0	100	0	100
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	0	100	0	100	1	99.992
2I0	MADISONVILLE RGNL	KY	LPV	0	100	0	100	0	100
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	0	100	0	100	0	100
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	0	100	0	100	1	99.999
5M9	MARION-CRITTENDEN COUNTY JAMES	KY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	0	100	0	100	1	99.994
AAS	TAYLOR COUNTY	KY	LPV	0	100	0	100	1	99.995
BRY	SAMUELS FLD	KY	LPV	0	100	0	100	1	99.996
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	0	100	0	100	1	99.999
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	0	100	0	100	1	99.990
CEY	KYLE-OAKLEY FLD	KY	LPV	0	100	0	100	0	100
CPF	WENDELL H FORD	KY	LPV200	0	100	0	100	2	99.986
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	0	100	0	100	1	99.991
DVK	STUART POWELL FLD	KY	LPV	0	100	0	100	1	99.991
DWU	ASHLAND RGNL	KY	LP	0	100	0	100	1	99.986
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	100	0	100	0	100
EKQ	WAYNE COUNTY	KY	LPV	0	100	0	100	1	99.993
EKX	ADDINGTON FLD	KY	LPV	0	100	0	100	1	99.996
FFT	CAPITAL CITY	KY	LPV	0	100	0	100	1	99.992
FGX	FLEMING-MASON	KY	LPV	0	100	0	100	1	99.988
GLW	GLASGOW MUNICIPAL	KY	LPV	0	100	0	100	1	99.997
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	100	0	100	0	100
I93	BRECKINRIDGE COUNTY	KY	LPV	0	100	0	100	1	99.999
IOB	MOUNT STERLING/MONTGOMERY COUN	KY	LPV	0	100	0	100	1	99.989
JQD	OHIO COUNTY	KY	LPV	0	100	0	100	1	99.999
K24	RUSSELL COUNTY	KY	LPV	0	100	0	100	1	99.994
K62	GENE SNYDER	KY	LP	0	100	0	100	1	99.990
KY8	HANCOCK COUNTY/RON LEWIS FLD	KY	LPV	0	100	0	100	1	99.999
LEX	BLUE GRASS	KY	LPV	0	100	0	100	1	99.992
LOU	BOWMAN FLD	KY	LPV	0	100	0	100	1	99.996
LOZ	LONDON/CORBIN/MAGEE	KY	LPV	0	100	0	100	1	99.990
M20	LEITCHFIELD-GRAYSON COUNTY	KY	LPV	0	100	0	100	1	99.998
M21	MUHLENBERG COUNTY	KY	LP	0	100	0	100	1	99.999
M25	MAYFIELD GRAVES COUNTY	KY	LPV	0	100	0	100	0	100
OWB	OWENSBORO/DAVIESS COUNTY RGNL	KY	LPV200	0	100	0	100	0	100
PAH	BARKLEY RGNL	KY	LPV200	0	100	0	100	0	100
PBX	PIKE COUNTY/HATCHER FLD	KY	LPV200	0	100	0	100	2	99.984

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	0	100	0	100	1	99.991
SDF	LOUISVILLE MUHAMMAD ALI INTL	KY	LPV200	0	100	0	100	1	99.997
SJS	BIG SANDY RGNL	KY	LPV	0	100	0	100	2	99.985
SME	LAKE CUMBERLAND RGNL	KY	LPV	0	100	0	100	1	99.990
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	0	100	0	100	1	99.987
TWT	STURGIS MUNICIPAL	KY	LPV	0	100	0	100	0	100
TZV	TOMPKINSVILLE/MONROE COUNTY	KY	LPV	0	100	0	100	1	99.995
0R4	CONCORDIA PARISH	LA	LPV	0	100	0	100	0	100
0R7	THE RED RIVER	LA	LPV	0	100	0	100	0	100
3R4	HART	LA	LPV	0	100	0	100	0	100
3R7	JENNINGS	LA	LPV	0	100	0	100	0	100
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	0	100	0	100	0	100
ACP	ALLEN PARISH	LA	LPV	0	100	0	100	0	100
AEX	ALEXANDRIA INTL	LA	LPV200	0	100	0	100	0	100
APS	PORT OF SOUTH LOUISIANA EXEC R	LA	LPV	0	100	0	100	0	100
ARA	ACADIANA RGNL	LA	LPV200	0	100	0	100	0	100
BQP	MOREHOUSE MEML	LA	LPV	0	100	0	100	0	100
BTR	BATON ROUGE METRO` RYAN FLD	LA	LPV200	0	100	0	100	0	100
BXA	GEORGE R CARR MEML AIR FLD	LA	LPV	0	100	0	100	0	100
CWF	CHENNAULT INTL	LA	LPV200	0	100	0	100	0	100
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	100	0	100	0	100
ESF	ESLER RGNL	LA	LPV200	0	100	0	100	0	100
F88	JONESBORO	LA	LP	0	100	0	100	0	100
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	0	100	0	100	6	99.997
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	100	0	100	0	100
HUM	HOUMA-TERREBONNE	LA	LPV200	0	100	0	100	3	99.998
HZR	FALSE RIVER RGNL	LA	LPV	0	100	0	100	0	100
IER	NATCHITOCHES RGNL	LA	LPV	0	100	0	100	0	100
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	0	100	0	100	0	100
L39	LEESVILLE	LA	LPV	0	100	0	100	0	100
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	0	100
LFT	LAFAYETTE RGNL/PAUL FOURNET FL	LA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
M79	JOHN H HOOKS JR MEML	LA	LPV	0	100	0	100	0	100
MLU	MONROE RGNL	LA	LPV200	0	100	0	100	0	100
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	0	100	0	100	0	100
NEW	LAKEFRONT	LA	LPV	0	100	0	100	1	99.999
OPL	ST LANDRY PARISH-AHART FLD	LA	LPV	0	100	0	100	0	100
PTN	HARRY P WILLIAMS MEML	LA	LPV200	0	100	0	100	1	99.999
REG	LOUISIANA RGNL	LA	LPV	0	100	0	100	0	100
RSN	RUSTON RGNL	LA	LPV	0	100	0	100	0	100
SHV	SHREVEPORT RGNL	LA	LPV200	0	100	0	100	0	100
SPH	SPRINGHILL	LA	LPV	0	100	0	100	0	100
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	0	100	0	100	0	100
UXL	SOUTHLAND FLD	LA	LPV	0	100	0	100	0	100
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	100	0	100	1	99.995
ACK	NANTUCKET MEML	MA	LPV200	0	100	0	100	1	99.996
BAF	WESTFIELD-BARNES RGNL	MA	LPV	0	100	0	100	0	100
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	100	0	100	1	99.993
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	0	100	0	100	1	99.993
BVY	BEVERLY RGNL	MA	LPV	0	100	0	100	2	99.981
EWB	NEW BEDFORD RGNL	MA	LPV200	0	100	0	100	2	99.998
GBR	WALTER J KOLADZA	MA	LP	0	100	0	100	0	100
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	0	100	0	100	2	99.992
HYA	CAPE COD GATEWAY	MA	LPV200	0	100	0	100	2	99.990
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	100	0	100	2	99.984
MVY	MARTHA'S VINEYARD	MA	LPV200	0	100	0	100	1	99.998
ORE	ORANGE MUNICIPAL	MA	LPV	0	100	0	100	1	99.994
ORH	WORCESTER RGNL	MA	LPV200	0	100	0	100	1	99.994
OWD	NORWOOD MEML	MA	LPV	0	100	0	100	1	99.993
PSF	PITTSFIELD MUNICIPAL	MA	LPV	0	100	0	100	0	100
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	0	100	0	100	2	99.977
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	2	99.992
TAN	TAUNTON MUNICIPAL - KING FLD	MA	LPV	0	100	0	100	2	99.993
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	1	99.977

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2W5	MARYLAND	MD	LP	0	100	0	100	1	99.993
2W6	ST MARY'S COUNTY RGNL	MD	LPV	0	100	0	100	1	99.993
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	0	100	0	100	1	99.998
CBE	GREATER CUMBERLAND RGNL	MD	LPV	0	100	0	100	1	99.994
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	0	100	0	100	1	99.996
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	0	100	0	100	0	100
ESN	EASTON/NEWNAM FLD	MD	LPV200	0	100	0	100	1	99.997
FDK	FREDERICK MUNICIPAL	MD	LPV	0	100	0	100	1	99.997
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	100	0	100	1	99.997
HGR	HAGERSTOWN RGNL/RICHARD A HENS	MD	LPV200	0	100	0	100	1	99.999
MTN	MARTIN STATE	MD	LPV	0	100	0	100	1	99.999
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	100	0	100	1	99.998
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	0	100	0	100	1	99.997
W29	BAY BRIDGE	MD	LPV	0	100	0	100	1	99.998
1B0	DEXTER RGNL	ME	LP	1	99.941	2	99.939	3	99.880
2B7	PITTSFIELD MUNICIPAL	ME	LPV	1	99.946	2	99.945	3	99.894
3B1	GREENVILLE MUNICIPAL	ME	LPV	1	99.939	2	99.937	2	99.852
59B	NEWTON FLD	ME	LP	1	99.942	2	99.940	2	99.855
81B	OXFORD COUNTY RGNL	ME	LP	0	100	1	99.999	2	99.929
AUG	AUGUSTA STATE	ME	LPV200	1	99.989	2	99.988	2	99.924
BGR	BANGOR INTL	ME	LPV200	1	99.939	2	99.939	3	99.883
BHB	HANCOCK COUNTY/BAR HARBOR	ME	LPV200	1	99.941	1	99.927	3	99.904
BST	BELFAST MUNICIPAL	ME	LPV	1	99.948	1	99.948	3	99.918
BXM	BRUNSWICK EXEC	ME	LPV200	1	99.993	1	99.993	2	99.928
CAR	CARIBOU MUNICIPAL	ME	LPV	2	99.863	2	99.846	4	99.780
EPM	EASTPORT MUNICIPAL	ME	LPV	2	99.927	2	99.927	2	99.844
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV200	3	99.858	3	99.839	4	99.784
HUL	HOULTON INTL	ME	LP	2	99.898	2	99.898	4	99.825
IZG	EASTERN SLOPES RGNL	ME	LPV	0	100	0	100	2	99.953
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	1	99.995	1	99.995	2	99.928
LRG	LINCOLN RGNL	ME	LP	1	99.929	2	99.926	2	99.849
MLT	MILLINOCKET MUNICIPAL	ME	LPV	2	99.918	2	99.917	2	99.848

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OWK	CENTRAL MAINE /NORRIDGEWOCK	ME	LPV	1	99.980	2	99.978	3	99.916
PQI	PRESQUE ISLE INTL	ME	LPV200	2	99.884	2	99.884	4	99.784
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	100	0	100	2	99.933
RKD	KNOX COUNTY RGNL	ME	LPV200	2	99.981	2	99.973	2	99.920
SFM	SANFORD SEACOAST RGNL	ME	LPV200	0	100	0	100	2	99.961
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	1	99.980	2	99.974	3	99.920
48D	CLARE MUNICIPAL	MI	LP	0	100	0	100	1	99.997
4D0	ABRAMS MUNICIPAL	MI	LP	0	100	0	100	1	99.990
6Y1	BOIS BLANC ISLAND	MI	LP	0	100	0	100	0	100
77G	MARLETTE TOWNSHIP	MI	LPV	0	100	0	100	0	100
9D9	HASTINGS	MI	LPV	0	100	0	100	1	99.993
ACB	ANTRIM COUNTY	MI	LPV	0	100	0	100	0	100
ADG	LENAWEE COUNTY	MI	LPV	0	100	0	100	1	99.990
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	0	100	0	100	1	99.992
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	0	100	0	100	2	99.996
APN	ALPENA COUNTY RGNL	MI	LPV	0	100	0	100	0	100
ARB	ANN ARBOR MUNICIPAL	MI	LPV	0	100	0	100	1	99.989
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV200	0	100	0	100	1	99.994
BAX	HURON COUNTY MEML	MI	LPV	0	100	0	100	0	100
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	1	99.995
BIV	WEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	1	99.995
BTL	BATTLE CREEK EXEC AT KELLOGG F	MI	LPV200	0	100	0	100	1	99.992
C04	OCEANA COUNTY	MI	LPV	0	100	0	100	1	99.995
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	0	100	0	100	1	99.995
CAD	WEXFORD COUNTY	MI	LPV200	0	100	0	100	1	99.997
CFS	TUSCOLA AREA	MI	LP	0	100	0	100	0	100
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	100	0	100	0	100
CMX	HOUGHTON COUNTY MEML	MI	LPV	0	100	0	100	2	99.978
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	100	0	100	0	100
D95	DUPONT-LAPEER	MI	LP	0	100	0	100	0	100
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	100	0	100	1	99.997
DTW	DETROIT METRO WAYNE COUNTY	MI	LPV200	0	100	0	100	1	99.988

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ERY	LUCE COUNTY	MI	LPV	0	100	0	100	0	100
ESC	DELTA COUNTY	MI	LPV200	0	100	0	100	0	100
FFX	FREMONT MUNICIPAL	MI	LPV	0	100	0	100	1	99.994
FNT	BISHOP INTL	MI	LPV200	0	100	0	100	1	99.997
GDW	GLADWIN ZETTEL MEML	MI	LP	0	100	0	100	1	99.999
GLR	GAYLORD RGNL	MI	LPV	0	100	0	100	0	100
GRR	GERALD R FORD INTL	MI	LPV200	0	100	0	100	1	99.994
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	0	100	0	100	0	100
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	0	100	0	100	1	99.999
IKW	JACK BARSTOW	MI	LPV	0	100	0	100	1	99.999
IMT	FORD	MI	LPV	0	100	0	100	0	100
IRS	KIRSCH MUNICIPAL	MI	LPV	0	100	0	100	1	99.994
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	100	0	100	0	100
IWD	GOGEBIC/IRON COUNTY	MI	LPV200	0	100	0	100	1	99.994
JXN	JACKSON COUNTY-REYNOLDS FLD	MI	LPV200	0	100	0	100	1	99.991
JYM	HILLSDALE MUNICIPAL	MI	LPV	0	100	0	100	1	99.991
LAN	CAPITAL REGION INTL	MI	LPV200	0	100	0	100	1	99.990
LDM	MASON COUNTY	MI	LPV	0	100	0	100	1	99.994
MBL	MANISTEE COUNTY/BLACKER	MI	LPV200	0	100	0	100	1	99.994
MBS	MBS INTL	MI	LPV200	0	100	0	100	1	99.999
MCD	MACKINAC ISLAND	MI	LPV	0	100	0	100	0	100
MKG	MUSKEGON COUNTY	MI	LPV200	0	100	0	100	1	99.995
MNM	MENOMINEE RGNL	MI	LPV200	0	100	0	100	0	100
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	0	100	0	100	1	99.995
N98	BOYNE CITY MUNICIPAL	MI	LP	0	100	0	100	0	100
OEB	BRANCH COUNTY MEML	MI	LPV	0	100	0	100	1	99.993
OGM	ONTONAGON COUNTY - SCHUSTER FL	MI	LPV	0	100	0	100	1	99.987
OSC	OSCODA-WURTSMITH	MI	LPV200	0	100	0	100	0	100
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	0	100	0	100	1	99.989
PHN	ST CLAIR COUNTY INTL	MI	LPV200	0	100	0	100	0	100
PLN	PELLSTON RGNL/EMMET COUNTY	MI	LPV200	0	100	0	100	0	100
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	100	0	100	1	99.996

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RMY	BROOKS FLD	MI	LP	0	100	0	100	1	99.992
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	0	100	0	100	1	99.993
RQB	ROBEN-HOOD	MI	LPV200	0	100	0	100	1	99.993
SAW	SAWYER INTL	MI	LPV200	0	100	0	100	0	100
SLH	CHEBOYGAN COUNTY	MI	LPV	0	100	0	100	0	100
TEW	MASON JEWETT FLD	MI	LP	0	100	0	100	1	99.990
TTF	CUSTER	MI	LPV	0	100	0	100	1	99.988
TVC	CHERRY CAPITAL	MI	LPV200	0	100	0	100	1	99.999
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	0	100	0	100	0	100
Y70	IONIA COUNTY	MI	LPV	0	100	0	100	1	99.991
YIP	WILLOW RUN	MI	LPV200	0	100	0	100	1	99.988
16D	PERHAM MUNICIPAL	MN	LPV	0	100	0	100	0	100
3N8	MAHNOMEN COUNTY	MN	LPV	0	100	0	100	1	99.990
ACQ	WASECA MUNICIPAL	MN	LPV	0	100	0	100	0	100
ADC	WADENA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AIT	AITKIN MUNICIPAL/STEVE KURTZ FLD	MN	LPV	0	100	0	100	0	100
ANE	ANOKA COUNTY-BLAINE (JANES FLD	MN	LPV	0	100	0	100	0	100
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	100	0	100	0	100
AXN	CHANDLER FLD	MN	LPV	0	100	0	100	0	100
BBB	BENSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
BDE	BAUDETTE INTL	MN	LPV	0	100	0	100	3	99.973
BDH	WILLMAR MUNICIPAL/JOHN L RICE FLD	MN	LPV200	0	100	0	100	0	100
BJI	BEMIDJI RGNL	MN	LPV200	0	100	0	100	1	99.987
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	100	0	100	0	100
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	100	0	100	0	100
CFE	BUFFALO MUNICIPAL	MN	LPV	0	100	0	100	0	100
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	100	1	99.989	3	99.956
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	0	100	0	100	1	99.988
CNB	MYERS FLD	MN	LPV	0	100	0	100	0	100
COQ	CLOQUET/CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
CQM	COOK MUNICIPAL	MN	LP	0	100	0	100	2	99.973

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
D39	SAUK CENTRE MUNICIPAL	MN	LPV	0	100	0	100	0	100
D42	SPRINGFIELD MUNICIPAL	MN	LP	0	100	0	100	0	100
DLH	DULUTH INTL	MN	LPV200	0	100	0	100	1	99.988
DTL	DETROIT LAKES/WETHING FLD	MN	LPV	0	100	0	100	0	100
DVP	SLAYTON MUNICIPAL	MN	LP	0	100	0	100	0	100
DXX	LAC QUI PARLE COUNTY	MN	LPV200	0	100	0	100	0	100
ELO	ELY MUNICIPAL	MN	LPV200	0	100	1	99.994	2	99.972
ETH	WHEATON MUNICIPAL	MN	LP	0	100	0	100	0	100
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	0	100	0	100	2	99.974
FBL	FARIBAULT MUNICIPAL-LIZ WALL STROHF	MN	LPV	0	100	0	100	0	100
FCM	FLYING CLOUD	MN	LPV200	0	100	0	100	0	100
FFM	FERGUS FALLS MUNICIPAL/EINAR MICKEL	MN	LPV200	0	100	0	100	0	100
FKA	FILLMORE COUNTY	MN	LPV	0	100	0	100	0	100
FOZ	BIGFORK MUNICIPAL	MN	LP	0	100	0	100	1	99.986
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	100	0	100	0	100
FSE	FOSSTON MUNICIPAL-ANDERSON FLD	MN	LP	0	100	0	100	1	99.987
GHW	GLENWOOD MUNICIPAL	MN	LPV	0	100	0	100	0	100
GPZ	GRAND RAPIDS/ITASCA COUNTY-GOR	MN	LPV200	0	100	0	100	1	99.989
GYL	GLENCOE MUNICIPAL	MN	LPV	0	100	0	100	0	100
HCD	HUTCHINSON MUNICIPAL/BUTLER FLD	MN	LPV	0	100	0	100	0	100
HCO	HALLOCK MUNICIPAL	MN	LPV	0	100	0	100	1	99.986
HIB	RANGE RGNL	MN	LPV200	0	100	0	100	2	99.983
INL	FALLS INTL/EINARSON FLD	MN	LPV	0	100	0	100	3	99.969
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	100	0	100	0	100
JMR	MORA MUNICIPAL	MN	LPV	0	100	0	100	0	100
JYG	ST JAMES MUNICIPAL	MN	LPV	0	100	0	100	0	100
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	100	0	100	0	100
LVN	AIRLAKE	MN	LPV200	0	100	0	100	0	100
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	0	100	0	100	0	100
LYV	QUENTIN AANENSON FLD	MN	LPV200	0	100	0	100	0	100
MJQ	JACKSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
MKT	MANKATO RGNL	MN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	0	100	0	100	0	100
MOX	MORRIS MUNICIPAL/CHARLIE SCHMIDT FL	MN	LPV	0	100	0	100	0	100
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	0	100	0	100	0	100
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	0	100	0	100	0	100
MWM	WINDOM MUNICIPAL	MN	LPV	0	100	0	100	0	100
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	0	100	0	100	0	100
ORB	ORR RGNL	MN	LP	0	100	0	100	2	99.973
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	100	0	100	0	100
OWA	OWATONNA DEGNER RGNL	MN	LPV200	0	100	0	100	0	100
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
PKD	PARK RAPIDS MUNICIPAL/KONSHOK FLD	MN	LPV200	0	100	0	100	1	99.994
PQN	PIPESTONE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
RGK	RED WING RGNL	MN	LPV200	0	100	0	100	0	100
ROS	RUSH CITY RGNL	MN	LPV	0	100	0	100	0	100
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FLD	MN	LPV	0	100	0	100	3	99.982
RRT	WARROAD INTL MEML	MN	LPV200	0	100	0	100	3	99.979
RST	ROCHESTER INTL	MN	LPV200	0	100	0	100	0	100
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	100	0	100	0	100
SAZ	STAPLES MUNICIPAL	MN	LPV	0	100	0	100	0	100
SBU	BLUE EARTH MUNICIPAL	MN	LPV	0	100	0	100	0	100
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	0	100	0	100	0	100
STC	ST CLOUD RGNL	MN	LPV200	0	100	0	100	0	100
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	100	0	100	0	100
TOB	DODGE CENTER	MN	LPV	0	100	0	100	0	100
TVF	THIEF RIVER FALLS RGNL	MN	LPV	0	100	0	100	1	99.986
TWM	RICHARD B HELGESON	MN	LPV	0	100	0	100	2	99.978
ULM	NEW ULM MUNICIPAL	MN	LPV200	0	100	0	100	0	100
VVV	ORTONVILLE MUNICIPAL-MARTINSON FLD	MN	LP	0	100	0	100	0	100
Y49	WALKER MUNICIPAL	MN	LP	0	100	0	100	1	99.990
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	0	100	0	100	0	100
03D	MEMPHIS MEML	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
1H0	CREVE COEUR	MO	LPV	0	100	0	100	0	100
1MO	MOUNTAIN GROVE MEML	MO	LP	0	100	0	100	0	100
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	100	0	100	0	100
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	0	100
8WC	WASHINGTON COUNTY	MO	LPV	0	100	0	100	0	100
94K	CASSVILLE MUNICIPAL	MO	LPV	0	100	0	100	0	100
AIZ	LEE C FINE MEML	MO	LPV	0	100	0	100	0	100
BBG	BRANSON	MO	LPV200	0	100	0	100	0	100
BUM	BUTLER MEML	MO	LPV	0	100	0	100	0	100
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	0	100	0	100	0	100
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	100	0	100	0	100
COU	COLUMBIA RGNL	MO	LPV200	0	100	0	100	0	100
DMO	SEDALIA RGNL	MO	LPV	0	100	0	100	0	100
DXE	DEXTER MUNICIPAL	MO	LPV	0	100	0	100	0	100
EIW	COUNTY MEML	MO	LPV	0	100	0	100	0	100
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	100	0	100	0	100
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
EZZ	CAMERON MEML	MO	LPV	0	100	0	100	0	100
FAM	FARMINGTON RGNL	MO	LPV	0	100	0	100	0	100
FTT	ELTON HENSLEY MEML	MO	LPV	0	100	0	100	0	100
FWB	BRANSON WEST MUNICIPAL - EMERSON FL	MO	LPV200	0	100	0	100	0	100
FYG	WASHINGTON RGNL	MO	LPV	0	100	0	100	0	100
GLY	CLINTON RGNL	MO	LPV	0	100	0	100	0	100
GPH	MIDWEST NTL AIR CENTER	MO	LPV	0	100	0	100	0	100
H19	BOWLING GREEN MUNICIPAL	MO	LPV	0	100	0	100	0	100
H79	ELDON MODEL AIRPARK	MO	LP	0	100	0	100	0	100
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	0	100	0	100	0	100
HAE	HANNIBAL RGNL	MO	LPV	0	100	0	100	0	100
HFJ	MONETT RGNL	MO	LPV	0	100	0	100	0	100
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
IRK	KIRKSVILLE RGNL	MO	LPV200	0	100	0	100	0	100
JEF	JEFFERSON CITY MEML	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JLN	JOPLIN RGNL	MO	LPV	0	100	0	100	0	100
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	0	100	0	100	0	100
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	100	0	100	0	100
K89	MACON-FOWER MEML	MO	LPV	0	100	0	100	0	100
LLU	LAMAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
LRY	LAWRENCE SMITH MEML	MO	LPV	0	100	0	100	0	100
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	100	0	100	0	100
M05	CARUTHERSVILLE MEML	MO	LPV	0	100	0	100	0	100
M12	STEELE MUNICIPAL	MO	LPV	0	100	0	100	0	100
M17	BOLIVAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
M48	HOUSTON MEML	MO	LPV	0	100	0	100	0	100
MAW	MALDEN RGNL	MO	LPV	0	100	0	100	0	100
MBY	OMAR N BRADLEY	MO	LPV	0	100	0	100	0	100
MCI	KANSAS CITY INTL	MO	LPV200	0	100	0	100	0	100
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	0	100	0	100	0	100
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	0	100	0	100	0	100
MNF	MOUNTAIN VIEW	MO	LP	0	100	0	100	0	100
MO3	STOCKTON MUNICIPAL	MO	LP	0	100	0	100	0	100
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
MYJ	MEXICO MEML	MO	LPV	0	100	0	100	0	100
NVD	NEVADA MUNICIPAL	MO	LPV200	0	100	0	100	0	100
OZS	CAMDENTON MEML-LAKE RGNL	MO	LPV	0	100	0	100	0	100
PCD	PERRYVILLE RGNL	MO	LPV	0	100	0	100	0	100
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	0	100	0	100	0	100
POF	POPLAR BLUFF RGNL BUSINESS	MO	LPV	0	100	0	100	0	100
RAW	WARSAW MUNICIPAL	MO	LPV200	0	100	0	100	0	100
RCM	SKYHAVEN	MO	LPV	0	100	0	100	0	100
SGF	SPRINGFIELD-BRANSON NTL	MO	LPV	0	100	0	100	0	100
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	0	100	0	100	0	100
STJ	ROSECRANS MEML	MO	LPV200	0	100	0	100	0	100
STL	ST LOUIS LAMBERT INTL	MO	LPV200	0	100	0	100	0	100
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	0	100	0	100	0	100
TKX	KENNETT MEML	MO	LPV	0	100	0	100	0	100
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	0	100
UBX	CUBA MUNICIPAL	MO	LPV	0	100	0	100	0	100
UNO	WEST PLAINS RGNL	MO	LPV	0	100	0	100	0	100
UUV	SULLIVAN RGNL	MO	LPV	0	100	0	100	0	100
VER	JESSE VIERTEL MEML	MO	LPV	0	100	0	100	0	100
VIH	ROLLA NTL	MO	LPV	0	100	0	100	0	100
0R0	COLUMBIA/MARION COUNTY	MS	LPV	0	100	0	100	0	100
17M	MAGEE MUNICIPAL	MS	LP	0	100	0	100	0	100
5A4	OKOLONA MUNICIPAL/RICHARD STOVALL F	MS	LPV	0	100	0	100	0	100
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	0	100	0	100
87I	YAZOO COUNTY	MS	LPV	0	100	0	100	0	100
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	0	100	0	100
CKM	FLETCHER FLD	MS	LPV	0	100	0	100	0	100
CRX	ROSCOE TURNER	MS	LPV200	0	100	0	100	0	100
GLH	GREENVILLE MID-DELTA	MS	LPV200	0	100	0	100	0	100
GNF	GRENADA MUNICIPAL	MS	LPV	0	100	0	100	0	100
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	100	0	100	0	100
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	0	100	0	100
GWO	GREENWOOD-LEFLORE	MS	LPV	0	100	0	100	0	100
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	0	100	0	100	0	100
HEZ	HARDY-ANDERS FLD/NATCHEZ-ADAMS	MS	LPV200	0	100	0	100	0	100
HKS	HAWKINS FLD	MS	LPV	0	100	0	100	0	100
HSA	STENNIS INTL	MS	LPV200	0	100	0	100	0	100
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	100	0	100	0	100
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	0	100	0	100	0	100
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	100	0	100	0	100
LMS	LOUISVILLE/WINSTON COUNTY	MS	LPV	0	100	0	100	0	100
LUL	HESLER-NOBLE FLD	MS	LPV	0	100	0	100	0	100
M11	COPIAH COUNTY	MS	LPV	0	100	0	100	0	100
M40	MONROE COUNTY	MS	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	0	100	0	100	0	100
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	0	100	0	100	0	100
MBO	BRUCE CAMPBELL FLD	MS	LPV	0	100	0	100	0	100
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	0	100	0	100	0	100
MEI	KEY FLD	MS	LPV200	0	100	0	100	0	100
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	100	0	100	0	100
MMS	SELFS	MS	LPV	0	100	0	100	0	100
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	0	100	0	100
OLV	OLIVE BRANCH/TAYLOR FLD	MS	LPV200	0	100	0	100	0	100
PIB	HATTIESBURG/LAUREL RGNL	MS	LPV200	0	100	0	100	0	100
PMU	PANOLA COUNTY	MS	LPV	0	100	0	100	0	100
PQL	TRENT LOTT INTL	MS	LPV200	0	100	0	100	0	100
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	100	0	100	0	100
STF	GEORGE M BRYAN	MS	LPV200	0	100	0	100	0	100
TUP	TUPELO RGNL	MS	LPV200	0	100	0	100	0	100
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	0	100	0	100	0	100
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	0	100	0	100
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	0	100	0	100
VKS	VICKSBURG MUNICIPAL	MS	LP	0	100	0	100	0	100
00U	BIG HORN COUNTY	MT	LPV200	0	100	0	100	0	100
1S3	TILLITT FLD	MT	LPV	0	100	0	100	0	100
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	0	100	0	100
6S0	BIG TIMBER	MT	LPV	0	100	0	100	0	100
6S8	LAUREL MUNICIPAL	MT	LPV	0	100	0	100	0	100
7S0	RONAN	MT	LPV	0	100	0	100	0	100
7S1	TWIN BRIDGES	MT	LPV	0	100	0	100	0	100
BHK	BAKER MUNICIPAL	MT	LPV	0	100	0	100	0	100
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	100	0	100	0	100
BTM	BERT MOONEY	MT	LPV	0	100	0	100	0	100
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	0	100	0	100	0	100
CII	CHOTEAU	MT	LPV200	0	100	0	100	0	100
CTB	CUT BANK INTL	MT	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
DLN	DILLON	MT	LPV	0	100	0	100	0	100
EKS	ENNIS BIG SKY	MT	LPV	0	100	0	100	0	100
GDV	DAWSON COMMUNICIPALTY	MT	LPV	0	100	0	100	0	100
GGW	WOKAL FLD/GLASGOW-VALLEY COUNT	MT	LPV200	0	100	0	100	0	100
GPI	GLACIER PARK INTL	MT	LPV	0	100	0	100	0	100
GTF	GREAT FALLS INTL	MT	LPV200	0	100	0	100	0	100
HLN	HELENA RGNL	MT	LPV	0	100	0	100	0	100
HRF	RAVALLI COUNTY	MT	LPV	0	100	0	100	0	100
HVR	HAVRE CITY-COUNTY	MT	LPV	0	100	0	100	0	100
HWQ	WHEATLAND COUNTY AT HARLOWTON	MT	LPV	0	100	0	100	0	100
LVM	MISSION FLD	MT	LP	0	100	0	100	0	100
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	0	100	0	100	0	100
M75	MALTA	MT	LP	0	100	0	100	0	100
MLS	FRANK WILEY FLD	MT	LPV	0	100	0	100	0	100
MSO	MISSOULA MONTANA	MT	LPV200	0	100	0	100	0	100
OLF	L M CLAYTON	MT	LPV200	0	100	0	100	0	100
PO1	POPLAR MUNICIPAL	MT	LPV200	0	100	0	100	1	99.998
PWD	SHER-WOOD	MT	LPV200	0	100	0	100	2	99.999
RPX	ROUNDUP	MT	LPV	0	100	0	100	0	100
RVF	RUBY VALLEY FLD	MT	LPV	0	100	0	100	0	100
S01	CONRAD	MT	LPV	0	100	0	100	0	100
SBX	SHELBY	MT	LPV	0	100	0	100	0	100
SDY	SIDNEY-RICHLAND RGNL	MT	LPV	0	100	0	100	0	100
WYS	YELLOWSTONE	MT	LPV200	0	100	0	100	0	100
43A	MONTGOMERY COUNTY	NC	LP	0	100	0	100	2	99.970
7W6	HYDE COUNTY	NC	LP	0	100	0	100	3	99.969
ACZ	HENDERSON FLD	NC	LPV	0	100	0	100	2	99.966
AFP	ANSON COUNTY/JEFF CLOUD FLD	NC	LPV	0	100	0	100	2	99.970
AKH	GASTONIA MUNICIPAL	NC	LPV	0	100	0	100	2	99.974
ASJ	TRI-COUNTY AT HENRY JOYNER FIE	NC	LPV	0	100	0	100	2	99.975
AVL	ASHEVILLE RGNL	NC	LPV200	0	100	0	100	2	99.983
BUY	BURLINGTON/ALAMANCE RGNL	NC	LPV	0	100	0	100	2	99.977

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	100	0	100	2	99.972
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	0	100	0	100	2	99.967
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	100	0	100	2	99.967
DPL	DUPLIN COUNTY	NC	LPV200	0	100	0	100	2	99.967
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	0	100	0	100	2	99.970
EDE	NORTHEASTERN RGNL	NC	LPV200	0	100	0	100	2	99.970
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	100	0	100	2	99.981
EQY	CHARLOTTE/MONROE EXEC	NC	LPV200	0	100	0	100	2	99.971
EWN	COASTAL CAROLINA RGNL	NC	LPV	0	100	0	100	2	99.967
EXX	DAVIDSON COUNTY	NC	LPV	0	100	0	100	2	99.974
EYF	CURTIS L BROWN JR FLD	NC	LPV	0	100	0	100	2	99.967
FAY	FAYETTEVILLE RGNL/GRANNIS FLD	NC	LPV200	0	100	0	100	2	99.969
FFA	FIRST FLIGHT	NC	LP	0	100	0	100	2	99.972
FQD	RUTHERFORD COUNTY/MARCHMAN FLD	NC	LPV	0	100	0	100	2	99.981
GEV	ASHE COUNTY	NC	LP	0	100	0	100	2	99.981
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	100	0	100	2	99.978
GWW	WAYNE EXEC JETPORT	NC	LPV200	0	100	0	100	2	99.967
HBI	ASHEBORO RGNL	NC	LPV	0	100	0	100	2	99.972
HKY	HICKORY RGNL	NC	LPV200	0	100	0	100	2	99.980
HNZ	HENDERSON/OXFORD	NC	LPV	0	100	0	100	2	99.975
HRJ	HARNETT RGNL JETPORT	NC	LPV	0	100	0	100	2	99.969
ILM	WILMINGTON INTL	NC	LPV200	0	100	0	100	2	99.966
INT	SMITH REYNOLDS	NC	LPV200	0	100	0	100	2	99.979
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	0	100	0	100	2	99.975
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	0	100	0	100	2	99.967
IXA	HALIFAX/NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	2	99.975
JNX	JOHNSTON RGNL	NC	LPV	0	100	0	100	2	99.969
JQF	CONCORD-PADGETT RGNL	NC	LPV	0	100	0	100	2	99.972
LBT	LUMBERTON RGNL	NC	LPV	0	100	0	100	2	99.967
LHZ	TRIANGLE NORTH EXEC	NC	LPV200	0	100	0	100	2	99.975
MCZ	MARTIN COUNTY	NC	LPV	0	100	0	100	2	99.969
MEB	LAURINBURG/MAXTON	NC	LPV200	0	100	0	100	2	99.968

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	2	99.970
MRH	MICHAEL J SMITH FLD	NC	LPV	0	100	0	100	3	99.967
MRN	FOOTHILLS RGNL	NC	LPV	0	100	0	100	2	99.981
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	100	0	100	2	99.980
OAJ	ALBERT J ELLIS	NC	LPV200	0	100	0	100	2	99.966
OCW	WASHINGTON-WARREN	NC	LPV	0	100	0	100	2	99.969
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	1	99.976
PGV	PITT-GREENVILLE	NC	LPV	0	100	0	100	2	99.969
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	100	0	100	2	99.969
RCZ	RICHMOND COUNTY	NC	LPV	0	100	0	100	2	99.970
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	100	0	100	2	99.970
RHP	WESTERN CAROLINA RGNL	NC	LP	0	100	0	100	2	99.987
RUQ	MID-CAROLINA RGNL	NC	LPV200	0	100	0	100	2	99.974
RWI	ROCKY MOUNT/WILSON RGNL	NC	LPV	0	100	0	100	2	99.969
SCR	SILER CITY MUNICIPAL	NC	LPV	0	100	0	100	2	99.970
SOP	MOORE COUNTY	NC	LPV200	0	100	0	100	2	99.969
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	0	100	0	100	2	99.965
SVH	STATESVILLE RGNL	NC	LPV200	0	100	0	100	2	99.974
TDF	RALEIGH RGNL AT PERSON COUNTY	NC	LPV200	0	100	0	100	2	99.976
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	0	100	0	100	2	99.968
UKF	WILKES COUNTY	NC	LPV200	0	100	0	100	2	99.980
VUJ	STANLY COUNTY	NC	LPV200	0	100	0	100	2	99.971
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	0	100	0	100	2	99.969
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	0	100	0	100	2	99.967
ZEF	ELKIN MUNICIPAL	NC	LP	0	100	0	100	2	99.980
06D	ROLLA MUNICIPAL	ND	LPV	0	100	0	100	2	99.992
20U	BEACH	ND	LPV	0	100	0	100	0	100
2C8	CAVALIER MUNICIPAL	ND	LPV	0	100	0	100	1	99.986
3H4	HILLSBORO MUNICIPAL	ND	LPV	0	100	0	100	0	100
46D	CARRINGTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
4E7	ELLENDALE MUNICIPAL	ND	LPV	0	100	0	100	0	100
51D	EDGELEY MUNICIPAL	ND	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
5L0	LAKOTA MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	100	0	100	0	100
6L3	LISBON MUNICIPAL	ND	LPV	0	100	0	100	0	100
7L2	LINTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
9D7	CANDO MUNICIPAL	ND	LPV	0	100	0	100	1	99.992
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	100	0	100	0	100
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	100	0	100	0	100
BWP	HARRY STERN	ND	LPV	0	100	0	100	0	100
BWW	BOWMAN RGNL	ND	LPV	0	100	0	100	0	100
D05	GARRISON MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	100	0	100	2	99.999
D55	ROBERTSON FLD	ND	LPV	0	100	0	100	1	99.987
D57	GLEN ULLIN RGNL	ND	LPV	0	100	0	100	0	100
D60	TIOGA MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
DIK	DICKINSON/THEODORE ROOSEVELT R	ND	LPV200	0	100	0	100	0	100
DVL	DEVILS LAKE RGNL	ND	LPV200	0	100	0	100	1	99.999
FAR	HECTOR INTL	ND	LPV200	0	100	0	100	0	100
GAF	HUTSON FLD	ND	LPV	0	100	0	100	1	99.986
GFK	GRAND FORKS INTL	ND	LPV	0	100	0	100	1	99.989
GWR	GWINNER-ROGER MELROE FLD	ND	LPV	0	100	0	100	0	100
HEI	HETTINGER/JB LINDQUIST RGNL	ND	LPV	0	100	0	100	0	100
HZE	MERCER COUNTY RGNL	ND	LPV	0	100	0	100	0	100
ISN	SLOULIN FLD INTL	ND	LPV200	0	100	0	100	1	99.999
JMS	JAMESTOWN RGNL	ND	LPV200	0	100	0	100	0	100
K74	ROBERT ODEGAARD FLD	ND	LP	0	100	0	100	0	100
MOT	MINOT INTL	ND	LPV	0	100	0	100	1	99.999
RUG	RUGBY MUNICIPAL	ND	LP	0	100	0	100	2	99.999
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	100	0	100	1	99.999
XWA	WILLISTON BASIN INTL	ND	LPV200	0	100	0	100	1	99.999
Y19	MANDAN RGNL/LAWLER FLD	ND	LPV	0	100	0	100	0	100
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	0	100	0	100	0	100
08K	HARVARD STATE	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	0	100	0	100	0	100
0C4	PENDER MUNICIPAL	NE	LPV	0	100	0	100	0	100
0F4	LOUP CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
0G3	TECUMSEH MUNICIPAL	NE	LPV	0	100	0	100	0	100
0V3	PIONEER VILLAGE FLD	NE	LPV	0	100	0	100	0	100
12K	SUPERIOR MUNICIPAL	NE	LPV	0	100	0	100	0	100
47V	CURTIS MUNICIPAL	NE	LPV	0	100	0	100	0	100
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	0	100
4V9	ANTELOPE COUNTY	NE	LPV	0	100	0	100	0	100
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	100	0	100	0	100
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	100	0	100	0	100
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	100	0	100	0	100
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
9V5	MODISETT	NE	LPV	0	100	0	100	0	100
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
AHQ	WAHOO MUNICIPAL	NE	LPV	0	100	0	100	0	100
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
ANW	AINSWORTH RGNL	NE	LPV200	0	100	0	100	0	100
AUH	AURORA MUNICIPAL - AL POTTER FLD	NE	LPV	0	100	0	100	0	100
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	0	100	0	100	0	100
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	0	100	0	100	0	100
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
BTA	BLAIR MUNICIPAL	NE	LPV	0	100	0	100	0	100
BUB	CRAM FLD	NE	LPV	0	100	0	100	0	100
BVN	ALBION MUNICIPAL	NE	LPV	0	100	0	100	0	100
CDR	CHADRON MUNICIPAL	NE	LPV200	0	100	0	100	0	100
CEK	CRETE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	0	100
EAR	KEARNEY RGNL	NE	LPV200	0	100	0	100	0	100
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	100	0	100	0	100
FET	FREMONT MUNICIPAL	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	100	0	100	0	100
FNB	BRENNER FLD	NE	LPV	0	100	0	100	0	100
GGF	GRANT MUNICIPAL	NE	LPV	0	100	0	100	0	100
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	100	0	100	0	100
GRN	GORDON MUNICIPAL	NE	LPV	0	100	0	100	0	100
HDE	BREWSTER FLD	NE	LPV	0	100	0	100	0	100
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	0	100
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FL	NE	LPV	0	100	0	100	0	100
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	0	100
JYR	YORK MUNICIPAL	NE	LPV	0	100	0	100	0	100
K01	FARINGTON FLD	NE	LPV	0	100	0	100	0	100
LBF	NORTH PLATTE RGNL/LEE BIRD FLD	NE	LPV200	0	100	0	100	0	100
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	0	100	0	100	0	100
LNK	LINCOLN	NE	LPV200	0	100	0	100	0	100
LXN	JIM KELLY FLD	NE	LPV	0	100	0	100	0	100
MCK	MC COOK BEN NELSON RGNL	NE	LPV	0	100	0	100	0	100
MLE	MILLARD	NE	LPV	0	100	0	100	0	100
ODX	EVELYN SHARP FLD	NE	LPV	0	100	0	100	0	100
OFK	NORFOLK RGNL/KARL STEFAN MEML	NE	LPV200	0	100	0	100	0	100
OGA	SEARLE FLD	NE	LPV	0	100	0	100	0	100
OKS	GARDEN COUNTY/KING RHILEY FLD	NE	LPV	0	100	0	100	0	100
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	100	0	100	0	100
OMA	EPPLEY AIRFIELD	NE	LPV200	0	100	0	100	0	100
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	0	100	0	100	0	100
PMV	PLATTSMOUTH MUNICIPAL/DOUGLAS V DUE	NE	LPV	0	100	0	100	0	100
RBE	ROCK COUNTY	NE	LPV	0	100	0	100	0	100
SCB	SCRIBNER STATE	NE	LPV	0	100	0	100	0	100
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FLD	NE	LPV	0	100	0	100	0	100
SWT	SEWARD MUNICIPAL	NE	LPV	0	100	0	100	0	100
TIF	THOMAS COUNTY	NE	LPV	0	100	0	100	0	100
TQE	TEKAMAH MUNICIPAL	NE	LPV	0	100	0	100	0	100
VTN	MILLER FLD	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ASH	BOIRE FLD	NH	LPV200	0	100	0	100	2	99.990
CON	CONCORD MUNICIPAL	NH	LPV	0	100	0	100	2	99.973
DAW	SKYHAVEN	NH	LPV	0	100	0	100	2	99.966
EEN	DILLANT/HOPKINS	NH	LPV	0	100	0	100	1	99.994
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	100	0	100	3	99.950
LCI	LACONIA MUNICIPAL	NH	LPV	0	100	0	100	2	99.964
LEB	LEBANON MUNICIPAL	NH	LPV	0	100	0	100	2	99.972
MHT	MANCHESTER BOSTON RGNL	NH	LPV200	0	100	0	100	2	99.977
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	100	0	100	2	99.968
47N	CENTRAL JERSEY RGNL	NJ	LP	0	100	0	100	0	100
4N1	GREENWOOD LAKE	NJ	LP	0	100	0	100	0	100
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	100	0	100	0	100
CDW	ESSEX COUNTY	NJ	LPV	0	100	0	100	0	100
EWR	NEWARK LIBERTY INTL	NJ	LPV200	0	100	0	100	0	100
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
MJX	OCEAN COUNTY	NJ	LPV	0	100	0	100	0	100
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
N12	LAKEWOOD	NJ	LP	0	100	0	100	0	100
N14	FLYING W	NJ	LPV	0	100	0	100	0	100
N40	SKY MANOR	NJ	LP	0	100	0	100	0	100
TEB	TETERBORO	NJ	LPV	0	100	0	100	0	100
TTN	TRENTON MERCER	NJ	LPV	0	100	0	100	0	100
VAY	SOUTH JERSEY RGNL	NJ	LP	0	100	0	100	0	100
WWD	CAPE MAY COUNTY	NJ	LPV	0	100	0	100	0	100
LFVM	MIQUELON	NL	LPV	3	99.709	3	99.693	12	99.476
LFVP	ST PIERRE	NL	LPV	3	99.709	4	99.706	12	99.482
0E0	MORIARTY MUNICIPAL	NM	LPV	0	100	0	100	0	100
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	0	100	0	100	0	100
AEG	DOUBLE EAGLE II	NM	LPV200	0	100	0	100	0	100
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	0	100	0	100	0	100
ATS	ARTESIA MUNICIPAL	NM	LPV200	0	100	0	100	0	100
CAO	CLAYTON MUNICIPAL AIRPARK	NM	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CNM	CAVERN CITY AIR TRML	NM	LPV200	0	100	0	100	0	100
CVN	CLOVIS RGNL	NM	LPV200	0	100	0	100	0	100
DMN	DEMING MUNICIPAL	NM	LPV	0	100	0	100	1	99.993
E06	LEA COUNTY/ZIP FRANKLIN MEML	NM	LPV	0	100	0	100	0	100
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	0	100
HOB	LEA COUNTY RGNL	NM	LPV	0	100	0	100	0	100
LAM	LOS ALAMOS	NM	LP	0	100	0	100	0	100
LRU	LAS CRUCES INTL	NM	LPV200	0	100	0	100	0	100
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	0	100	0	100
ROW	ROSWELL AIR CENTER	NM	LPV	0	100	0	100	0	100
SAF	SANTA FE MUNICIPAL	NM	LPV200	0	100	0	100	0	100
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	100	0	100	0	100
SVC	GRANT COUNTY	NM	LPV	0	100	0	100	1	99.993
05U	EUREKA	NV	LP	0	100	0	100	2	99.987
10U	OWYHEE	NV	LPV200	0	100	0	100	0	100
67L	MESQUITE	NV	LP	0	100	0	100	1	99.999
BAM	BATTLE MOUNTAIN	NV	LPV	0	100	0	100	2	99.984
BVU	BOULDER CITY MUNICIPAL	NV	LP	0	100	0	100	4	99.981
CXP	CARSON CITY	NV	LP	0	100	0	100	5	99.963
ELY	ELY/YELLAND FLD	NV	LPV	0	100	0	100	2	99.995
HTH	HAWTHORNE INDUSTRIAL	NV	LP	0	100	0	100	5	99.953
LAS	HARRY REID INTL	NV	LPV200	0	100	0	100	3	99.967
LOL	DERBY FLD	NV	LPV	0	100	0	100	3	99.984
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	5	99.973
RTS	RENO/STEAD	NV	LPV	0	100	0	100	4	99.978
SPZ	SILVER SPRINGS	NV	LPV	0	100	0	100	5	99.964
TPH	TONOPAH	NV	LP	0	100	0	100	4	99.978
VGT	NORTH LAS VEGAS	NV	LP	0	100	0	100	3	99.968
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	2	99.997
06N	RANDALL	NY	LP	0	100	0	100	0	100
0G7	FINGER LAKES RGNL	NY	LPV	0	100	0	100	0	100
1B1	COLUMBIA COUNTY	NY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
20N	KINGSTON-ULSTER	NY	LPV	0	100	0	100	0	100
44N	SKY ACRES	NY	LPV	0	100	0	100	0	100
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	100	0	100	1	99.999
5B2	SARATOGA COUNTY	NY	LPV	0	100	0	100	0	100
5G0	LE ROY	NY	LP	0	100	0	100	0	100
9G0	BUFFALO AIRFIELD	NY	LP	0	100	0	100	0	100
9G3	AKRON/JESSON FLD	NY	LP	0	100	0	100	0	100
ALB	ALBANY INTL	NY	LPV200	0	100	0	100	0	100
ART	WATERTOWN INTL	NY	LPV200	0	100	0	100	0	100
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	0	100	0	100	0	100
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	100	0	100	0	100
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	100	0	100	0	100
ELZ	WELLSVILLE MUNICIPAL/TARANTINE FLD	NY	LPV200	0	100	0	100	0	100
FOK	FRANCIS S GABRESKI	NY	LPV200	0	100	0	100	0	100
FRG	REPUBLIC	NY	LPV200	0	100	0	100	0	100
FZY	OSWEGO COUNTY	NY	LPV	0	100	0	100	0	100
GFL	FLOYD BENNETT MEML	NY	LPV200	0	100	0	100	0	100
GVQ	GENESEE COUNTY	NY	LPV200	0	100	0	100	0	100
HPN	WESTCHESTER COUNTY	NY	LPV	0	100	0	100	0	100
HTF	HORNELL MUNICIPAL	NY	LPV	0	100	0	100	0	100
HTO	EAST HAMPTON	NY	LPV	0	100	0	100	0	100
HWV	BROOKHAVEN	NY	LPV	0	100	0	100	0	100
IAG	NIAGARA FALLS INTL	NY	LPV	0	100	0	100	0	100
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	100	0	100	0	100
ITH	ITHACA TOMPKINS INTL	NY	LPV	0	100	0	100	0	100
IUA	CANANDAIGUA	NY	LPV	0	100	0	100	0	100
JFK	JOHN F KENNEDY INTL	NY	LPV200	0	100	0	100	0	100
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	100	0	100	0	100
K09	PISECO	NY	LP	0	100	0	100	0	100
LGA	LAGUARDIA	NY	LPV	0	100	0	100	0	100
MAL	MALONE-DUFORT	NY	LPV	0	100	0	100	1	99.996
MGJ	ORANGE COUNTY	NY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MSS	MASSENA INTL-RICHARDS FLD	NY	LPV	0	100	0	100	0	100
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	100	0	100	0	100
N23	SIDNEY MUNICIPAL	NY	LP	0	100	0	100	0	100
N66	ALBERT S NADER RGNL	NY	LPV	0	100	0	100	0	100
NY0	FULTON COUNTY	NY	LPV	0	100	0	100	0	100
OGS	OGDENSBURG INTL	NY	LPV	0	100	0	100	0	100
OIC	LT WARREN EATON	NY	LP	0	100	0	100	0	100
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	100	0	100	0	100
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	1	99.960
PEO	PENN YAN	NY	LPV	0	100	0	100	0	100
POU	HUDSON VALLEY RGNL	NY	LPV	0	100	0	100	0	100
RME	GRIFFISS INTL	NY	LPV200	0	100	0	100	0	100
ROC	FREDERICK DOUGLASS/GREATER ROC	NY	LPV200	0	100	0	100	0	100
SCH	SCHENECTADY COUNTY	NY	LPV200	0	100	0	100	0	100
SDC	WILLIAMSON-SODUS	NY	LPV	0	100	0	100	0	100
SLK	ADIRONDACK RGNL	NY	LPV200	0	100	0	100	0	100
SWF	NEW YORK STEWART INTL	NY	LPV200	0	100	0	100	0	100
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	100	0	100	0	100
VGC	HAMILTON MUNICIPAL	NY	LPV	0	100	0	100	0	100
0G6	WILLIAMS COUNTY	OH	LPV	0	100	0	100	1	99.991
10G	HOLMES COUNTY	OH	LP	0	100	0	100	1	99.984
16G	SENECA COUNTY	OH	LPV	0	100	0	100	1	99.988
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	0	100	0	100	1	99.987
1G0	WOOD COUNTY	OH	LPV	0	100	0	100	1	99.989
1G3	KENT STATE UNIVERSITY	OH	LPV	0	100	0	100	1	99.983
2G2	GEARY A BATES/JEFFERSON COUNTY	OH	LPV	0	100	0	100	1	99.981
4G5	MONROE COUNTY	OH	LP	0	100	0	100	1	99.982
4I3	KNOX COUNTY	OH	LPV200	0	100	0	100	1	99.986
5A1	NORWALK-HURON COUNTY	OH	LP	0	100	0	100	1	99.986
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	100	0	100	1	99.982
7G8	GEAUGA COUNTY	OH	LP	0	100	0	100	0	100
AKR	AKRON FULTON INTL	OH	LP	0	100	0	100	1	99.983

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AOH	LIMA ALLEN COUNTY	OH	LPV200	0	100	0	100	1	99.990
AXV	NEIL ARMSTRONG	OH	LPV	0	100	0	100	1	99.990
BJJ	WAYNE COUNTY	OH	LPV	0	100	0	100	1	99.984
BKL	BURKE LAKEFRONT	OH	LPV	0	100	0	100	1	99.998
CAK	AKRON-CANTON RGNL	OH	LPV200	0	100	0	100	1	99.983
CDI	CAMBRIDGE MUNICIPAL	OH	LP	0	100	0	100	1	99.983
CGF	CUYAHOGA COUNTY	OH	LPV200	0	100	0	100	0	100
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	1	99.984
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	0	100	0	100	1	99.987
CQA	LAKEFIELD	OH	LPV	0	100	0	100	1	99.991
CYO	PICKAWAY COUNTY MEML	OH	LPV	0	100	0	100	1	99.987
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	100	0	100	1	99.990
DLZ	DELAWARE MUNICIPAL/JIM MOORE FLD	OH	LPV	0	100	0	100	1	99.988
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	1	99.989
EOP	PIKE COUNTY	OH	LP	0	100	0	100	1	99.987
FDY	FINDLAY	OH	LPV	0	100	0	100	1	99.989
FZI	FOSTORIA METRO	OH	LPV	0	100	0	100	1	99.989
GQQ	GALION MUNICIPAL	OH	LP	0	100	0	100	1	99.987
HAO	BUTLER COUNTY RGNL/HOGAN FLD	OH	LPV	0	100	0	100	1	99.990
HOC	HIGHLAND COUNTY	OH	LP	0	100	0	100	1	99.989
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	0	100
I10	NOBLE COUNTY	OH	LP	0	100	0	100	1	99.984
I19	GREENE COUNTY/LEWIS A JACKSON	OH	LPV	0	100	0	100	1	99.990
I40	RICHARD DOWNING	OH	LPV	0	100	0	100	1	99.984
I66	CLINTON FLD	OH	LPV	0	100	0	100	1	99.989
I68	WARREN COUNTY/JOHN LANE FLD	OH	LPV	0	100	0	100	1	99.990
I69	CLERMONT COUNTY	OH	LP	0	100	0	100	1	99.989
I74	GRIMES FLD	OH	LPV	0	100	0	100	1	99.989
ILN	WILMINGTON AIR PARK	OH	LPV200	0	100	0	100	1	99.989
LCK	RICKENBACKER INTL	OH	LPV200	0	100	0	100	1	99.987
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	100	0	100	1	99.986
LNN	LAKE COUNTY EXEC	OH	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	100	0	100	1	99.985
LUK	CINCINNATI MUNICIPAL/LUNKEN FLD	OH	LPV	0	100	0	100	1	99.990
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	100	0	100	1	99.986
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	100	0	100	1	99.990
MNN	MARION MUNICIPAL	OH	LPV	0	100	0	100	1	99.987
MRT	UNION COUNTY	OH	LP	0	100	0	100	1	99.988
MWO	MIDDLETOWN RGNL/HOOK FLD	OH	LPV	0	100	0	100	1	99.990
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	1	99.987
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	1	99.990
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	1	99.992
PCW	ERIE-OTTAWA INTL	OH	LPV	0	100	0	100	1	99.986
PHD	HARRY CLEVER FLD	OH	LP	0	100	0	100	1	99.983
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	0	100	0	100	1	99.986
POV	PORTAGE COUNTY	OH	LPV	0	100	0	100	1	99.998
RZT	ROSS COUNTY	OH	LPV	0	100	0	100	1	99.987
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	100	0	100	1	99.987
SCA	SIDNEY MUNICIPAL	OH	LPV	0	100	0	100	1	99.990
SGH	SPRINGFIELD/BECKLEY MUNICIPAL	OH	LPV200	0	100	0	100	1	99.990
TDZ	TOLEDO EXEC	OH	LPV	0	100	0	100	1	99.989
TOL	EUGENE F KRANZ TOLEDO EXPRESS	OH	LPV200	0	100	0	100	1	99.989
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	100	0	100	1	99.982
TZR	BOLTON FLD	OH	LPV	0	100	0	100	1	99.988
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	1	99.985
USE	FULTON COUNTY	OH	LPV	0	100	0	100	1	99.990
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	1	99.988
VES	DARKE COUNTY	OH	LPV	0	100	0	100	1	99.991
VTA	NEWARK-HEATH	OH	LP	0	100	0	100	1	99.986
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	0	100	0	100	0	100
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	0	100	0	100	1	99.985
1F0	ARDMORE DOWNTOWN EXEC	OK	LP	0	100	0	100	0	100
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	0	100	0	100	0	100
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2K4	SCOTT FLD	OK	LPV	0	100	0	100	0	100
3F7	JONES MEML	OK	LPV	0	100	0	100	0	100
4O4	MC CURTAIN COUNTY RGNL	OK	LP	0	100	0	100	0	100
6K4	FAIRVIEW MUNICIPAL	OK	LPV	0	100	0	100	0	100
80F	ANTLERS MUNICIPAL	OK	LPV	0	100	0	100	0	100
ADH	ADA RGNL	OK	LPV	0	100	0	100	0	100
ADM	ARDMORE MUNICIPAL	OK	LPV	0	100	0	100	0	100
AVK	ALVA RGNL	OK	LPV	0	100	0	100	0	100
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	100	0	100	0	100
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	100	0	100	0	100
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	100	0	100	0	100
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	100	0	100	0	100
CLK	CLINTON RGNL	OK	LPV	0	100	0	100	0	100
CSM	CLINTON/SHERMAN	OK	LPV200	0	100	0	100	0	100
CUH	CUSHING MUNICIPAL	OK	LPV	0	100	0	100	0	100
DUA	DURANT RGNL/EAKER FLD	OK	LPV	0	100	0	100	0	100
DUC	HALLIBURTON FLD	OK	LPV200	0	100	0	100	0	100
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	100	0	100	0	100
F22	PERRY MUNICIPAL	OK	LPV	0	100	0	100	0	100
FDR	FREDERICK RGNL	OK	LPV200	0	100	0	100	0	100
GCM	CLAREMORE RGNL	OK	LPV	0	100	0	100	0	100
GMJ	GROVE MUNICIPAL	OK	LPV	0	100	0	100	0	100
GOK	GUTHRIE/EDMOND RGNL	OK	LPV	0	100	0	100	0	100
GUY	GUYMON MUNICIPAL	OK	LPV	0	100	0	100	0	100
GZL	STIGLER RGNL	OK	LPV	0	100	0	100	0	100
H71	MID-AMERICA INDUSTRIAL	OK	LPV	0	100	0	100	0	100
HBR	HOBART RGNL	OK	LPV	0	100	0	100	0	100
HHW	STAN STAMPER MUNICIPAL	OK	LPV	0	100	0	100	0	100
HSD	SUNDANCE	OK	LPV	0	100	0	100	0	100
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	0	100	0	100	0	100
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	0	100	0	100	0	100
MLC	MC ALESTER RGNL	OK	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OJA	WEATHERFORD STAFFORD	OK	LPV	0	100	0	100	0	100
OKC	WILL ROGERS WORLD	OK	LPV200	0	100	0	100	0	100
OKM	OKMULGEE RGNL	OK	LPV200	0	100	0	100	0	100
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	0	100	0	100	0	100
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	0	100	0	100	0	100
PNC	PONCA CITY RGNL	OK	LPV	0	100	0	100	0	100
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	100	0	100	0	100
PWA	WILEY POST	OK	LPV200	0	100	0	100	0	100
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	0	100
RKR	ROBERT S KERR	OK	LPV	0	100	0	100	0	100
RQO	EL RENO RGNL	OK	LPV	0	100	0	100	0	100
RVS	TULSA RIVERSIDE	OK	LPV200	0	100	0	100	0	100
SNL	SHAWNEE RGNL	OK	LPV200	0	100	0	100	0	100
SWO	STILLWATER RGNL	OK	LPV200	0	100	0	100	0	100
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	100	0	100	0	100
TUL	TULSA INTL	OK	LPV200	0	100	0	100	0	100
WDG	ENID WOODRING RGNL	OK	LPV200	0	100	0	100	0	100
WWR	WEST WOODWARD	OK	LPV	0	100	0	100	0	100
3S8	GRANTS PASS	OR	LP	0	100	0	100	4	99.937
77S	HOBBY FLD	OR	LPV	0	100	0	100	1	99.981
AST	ASTORIA RGNL	OR	LPV	0	100	0	100	0	100
BDN	BEND MUNICIPAL	OR	LPV	0	100	0	100	3	99.986
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	0	100
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	1	99.993
EUG	MAHLON SWEET FLD	OR	LPV200	0	100	0	100	1	99.982
GCD	GRANT COUNTY RGNL/OGILVIE FLD	OR	LPV	0	100	0	100	0	100
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	100	0	100	1	99.997
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	100	0	100	0	100
LKV	LAKE COUNTY	OR	LPV	0	100	0	100	3	99.988
LMT	CRATER LAKE/KLAMATH RGNL	OR	LPV	0	100	0	100	3	99.963
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	1	99.997
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ONP	NEWPORT MUNICIPAL	OR	LPV	0	100	0	100	1	99.994
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	1	99.980
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	0	100	0	100	0	100
PDX	PORTLAND INTL	OR	LPV200	0	100	0	100	1	99.997
RDM	ROBERTS FLD	OR	LPV200	0	100	0	100	3	99.989
S33	MADRAS MUNICIPAL	OR	LPV	0	100	0	100	2	99.996
S39	PRINEVILLE	OR	LP	0	100	0	100	2	99.995
SLE	MCNARY FLD	OR	LPV200	0	100	0	100	1	99.997
SPB	SCAPPOOSE	OR	LPV	0	100	0	100	1	99.998
UAO	AURORA STATE	OR	LPV	0	100	0	100	1	99.997
22N	JAKE ARNER MEML	PA	LP	0	100	0	100	0	100
29D	GROVE CITY	PA	LP	0	100	0	100	0	100
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	1	99.997
6G1	TITUSVILLE	PA	LPV	0	100	0	100	0	100
6P7	MCVILLE	PA	LP	0	100	0	100	0	100
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	0	100
8N8	DANVILLE	PA	LP	0	100	0	100	0	100
9D4	DECK	PA	LPV	0	100	0	100	0	100
ABE	LEHIGH VALLEY INTL	PA	LPV200	0	100	0	100	0	100
AFJ	WASHINGTON COUNTY	PA	LPV200	0	100	0	100	1	99.981
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	1	99.997
AOO	ALTOONA/BLAIR COUNTY	PA	LPV	0	100	0	100	0	100
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	0	100	0	100	0	100
AXQ	CLARION COUNTY	PA	LPV	0	100	0	100	0	100
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	0	100
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	0	100	0	100	0	100
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	1	99.999
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	0	100
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	0	100
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	0	100	0	100	0	100
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	100	0	100	0	100
FKL	VENANGO RGNL	PA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FWQ	ROSTRAVER	PA	LPV	0	100	0	100	1	99.995
GKJ	PORT MEADVILLE	PA	LP	0	100	0	100	0	100
HMZ	BEDFORD COUNTY	PA	LPV	0	100	0	100	1	99.999
HZL	HAZLETON RGNL	PA	LPV	0	100	0	100	0	100
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	0	100	0	100	0	100
IPT	WILLIAMSPORT RGNL	PA	LPV	0	100	0	100	0	100
JST	JOHN MURTHA JOHNSTOWN/CAMBRIA	PA	LPV200	0	100	0	100	0	100
LBE	ARNOLD PALMER RGNL	PA	LPV200	0	100	0	100	1	99.998
LNS	LANCASTER	PA	LPV200	0	100	0	100	0	100
LOM	WINGS FLD	PA	LPV	0	100	0	100	0	100
MDT	HARRISBURG INTL	PA	LPV	0	100	0	100	0	100
MPO	POCONO MOUNTAINS RGNL	PA	LPV	0	100	0	100	0	100
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	100	0	100	0	100
N38	GRAND CANYON RGNL	PA	LP	0	100	0	100	0	100
N57	NEW GARDEN	PA	LP	0	100	0	100	0	100
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	100	0	100	0	100
N96	BELLEFONTE	PA	LPV	0	100	0	100	0	100
OQN	BRANDYWINE RGNL	PA	LP	0	100	0	100	0	100
OYM	ST MARYS MUNICIPAL	PA	LPV	0	100	0	100	0	100
PHL	PHILADELPHIA INTL	PA	LPV200	0	100	0	100	0	100
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	1	99.996
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	0	100	0	100	0	100
PSB	MID-STATE	PA	LPV	0	100	0	100	0	100
PTW	HERITAGE FLD	PA	LPV	0	100	0	100	0	100
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	0	100	0	100	0	100
RVL	MIFFLIN COUNTY	PA	LPV	0	100	0	100	0	100
SEG	PENN VALLEY	PA	LP	0	100	0	100	0	100
THV	YORK	PA	LP	0	100	0	100	0	100
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	100	0	100	0	100
UKT	QUAKERTOWN	PA	LP	0	100	0	100	0	100
UNV	UNIVERSITY PARK	PA	LPV200	0	100	0	100	0	100
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	0	100	0	100	2	99.992

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	1	99.980
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	100	0	100	0	100
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	100	0	100	0	100
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	0	100	0	100	0	100
BID	BLOCK ISLAND STATE	RI	LPV	0	100	0	100	0	100
OQU	QUONSET STATE	RI	LPV200	0	100	0	100	0	100
PVD	RHODE ISLAND TF GREEN INTL	RI	LPV200	0	100	0	100	1	99.999
SFZ	NORTH CENTRAL STATE	RI	LPV	0	100	0	100	1	99.994
35A	UNION COUNTY` TROY SHELTON FLD	SC	LP	0	100	0	100	2	99.975
6J0	LEXINGTON COUNTY	SC	LPV	0	100	0	100	2	99.973
AIK	AIKEN RGNL	SC	LPV200	0	100	0	100	2	99.974
AND	ANDERSON RGNL	SC	LPV200	0	100	0	100	2	99.983
AQX	ALLENDALE COUNTY	SC	LPV	0	100	0	100	2	99.972
ARW	BEAUFORT EXEC	SC	LPV200	0	100	0	100	2	99.969
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	0	100	0	100	2	99.969
BNL	BARNWELL RGNL	SC	LPV	0	100	0	100	2	99.973
CAE	COLUMBIA METRO	SC	LPV200	0	100	0	100	2	99.972
CDN	WOODWARD FLD	SC	LPV	0	100	0	100	2	99.970
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	100	0	100	2	99.984
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	100	0	100	2	99.968
CKI	WILLIAMSBURG RGNL	SC	LPV	0	100	0	100	2	99.969
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FL	SC	LPV	0	100	0	100	2	99.970
CRE	GRAND STRAND	SC	LPV200	0	100	0	100	2	99.966
CUB	JIM HAMILTON L B OWENS	SC	LPV	0	100	0	100	2	99.972
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	100	0	100	2	99.973
DYB	SUMMERVILLE	SC	LPV200	0	100	0	100	2	99.969
FDW	FAIRFIELD COUNTY	SC	LPV	0	100	0	100	2	99.973
FLO	FLORENCE RGNL	SC	LPV	0	100	0	100	2	99.969
GGE	GEORGETOWN COUNTY	SC	LPV	0	100	0	100	2	99.966
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	100	0	100	2	99.982
GRD	GREENWOOD COUNTY	SC	LPV	0	100	0	100	2	99.977
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	0	100	0	100	2	99.982

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GYH	DONALDSON FLD	SC	LPV	0	100	0	100	2	99.982
HVS	HARTSVILLE RGNL	SC	LPV	0	100	0	100	2	99.970
HXD	HILTON HEAD	SC	LPV	0	100	0	100	2	99.969
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	100	0	100	2	99.967
JZI	CHARLESTON EXEC	SC	LPV200	0	100	0	100	2	99.968
LKR	LANCASTER COUNTY-MC WHIRTER FL	SC	LPV200	0	100	0	100	2	99.972
LQK	PICKENS COUNTY	SC	LPV	0	100	0	100	2	99.984
LRO	MT PLEASANT RGNL-FAISON FLD	SC	LPV	0	100	0	100	2	99.966
LUX	LAURENS COUNTY	SC	LPV	0	100	0	100	2	99.976
MAO	MARION COUNTY	SC	LPV	0	100	0	100	2	99.967
MKS	BERKELEY COUNTY	SC	LPV	0	100	0	100	2	99.969
MYR	MYRTLE BEACH INTL	SC	LPV200	0	100	0	100	2	99.966
OGB	ORANGEBURG MUNICIPAL	SC	LPV	0	100	0	100	2	99.971
PYG	PAGELAND	SC	LPV	0	100	0	100	2	99.970
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	100	0	100	2	99.969
SMS	SUMTER	SC	LPV200	0	100	0	100	2	99.969
SPA	SPARTANBURG DOWNTOWN MEML/SIMP	SC	LPV200	0	100	0	100	2	99.981
UDG	DARLINGTON COUNTY	SC	LPV	0	100	0	100	2	99.970
UZA	ROCK HILL/YORK COUNTY/BRYANT F	SC	LPV200	0	100	0	100	2	99.973
0D8	GETTYSBURG MUNICIPAL	SD	LP	0	100	0	100	0	100
49B	STURGIS MUNICIPAL	SD	LPV	0	100	0	100	0	100
4X4	WESSINGTON SPRINGS	SD	LP	0	100	0	100	0	100
8D3	SISSETON MUNICIPAL	SD	LPV	0	100	0	100	0	100
8D7	CLARK COUNTY	SD	LP	0	100	0	100	0	100
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	0	100	0	100
98D	ONIDA MUNICIPAL	SD	LP	0	100	0	100	0	100
9D0	HIGHMORE MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	0	100	0	100	0	100
9V6	MARTIN MUNICIPAL	SD	LPV	0	100	0	100	0	100
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	0	100	0	100	0	100
ABR	ABERDEEN RGNL	SD	LPV200	0	100	0	100	0	100
AGZ	WAGNER MUNICIPAL	SD	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ATY	WATERTOWN RGNL	SD	LPV200	0	100	0	100	0	100
BKX	BROOKINGS RGNL	SD	LPV200	0	100	0	100	0	100
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	0	100	0	100	0	100
FSD	JOE FOSS FLD	SD	LPV200	0	100	0	100	0	100
HON	HURON RGNL	SD	LPV200	0	100	0	100	0	100
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	100	0	100	0	100
ICR	WINNER RGNL	SD	LPV	0	100	0	100	0	100
IEN	PINE RIDGE	SD	LPV	0	100	0	100	0	100
LEM	LEMMON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	100	0	100	0	100
MDS	MADISON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MHE	MITCHELL MUNICIPAL	SD	LPV	0	100	0	100	0	100
MKA	MILLER MUNICIPAL	SD	LPV	0	100	0	100	0	100
PHP	PHILIP	SD	LPV	0	100	0	100	0	100
PIR	PIERRE RGNL	SD	LPV	0	100	0	100	0	100
RAP	RAPID CITY RGNL	SD	LPV200	0	100	0	100	0	100
SPF	BLACK HILLS-CLYDE ICE FLD	SD	LPV	0	100	0	100	0	100
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	0	100	0	100	0	100
VMR	HAROLD DAVIDSON FLD	SD	LPV	0	100	0	100	0	100
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	0	100	0	100	0	100
0A3	SMITHVILLE MUNICIPAL	TN	LPV	0	100	0	100	1	99.996
0M3	PAUL BRIDGES FLD	TN	LP	0	100	0	100	0	100
0M4	BENTON COUNTY	TN	LPV	0	100	0	100	0	100
0M5	HUMPHREYS COUNTY	TN	LP	0	100	0	100	0	100
1A3	MARTIN CAMPBELL FLD	TN	LP	0	100	0	100	2	99.990
1M5	PORTLAND MUNICIPAL	TN	LPV	0	100	0	100	1	99.999
2A0	MARK ANTON	TN	LPV	0	100	0	100	1	99.994
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	0	100	0	100	0	100
2M8	CHARLES W BAKER	TN	LPV	0	100	0	100	0	100
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	0	100	0	100	2	99.987
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	100	0	100	1	99.997
8A3	LIVINGSTON MUNICIPAL	TN	LP	0	100	0	100	1	99.994

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	100	0	100	1	99.997
BNA	NASHVILLE INTL	TN	LPV200	0	100	0	100	1	99.997
CHA	LOVELL FLD	TN	LPV200	0	100	0	100	1	99.995
CKV	OUTLAW FLD	TN	LPV	0	100	0	100	0	100
CSV	CROSSVILLE MEML-WHITSON FLD	TN	LPV200	0	100	0	100	1	99.994
DYR	DYERSBURG RGNL	TN	LPV	0	100	0	100	0	100
FYE	FAYETTE COUNTY	TN	LPV	0	100	0	100	0	100
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
GCY	GREENEVILLE MUNICIPAL	TN	LPV	0	100	0	100	2	99.984
GHM	CENTERVILLE MUNICIPAL	TN	LP	0	100	0	100	0	100
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	100	0	100	2	99.987
GZS	ABERNATHY FLD	TN	LPV	0	100	0	100	0	100
HZD	CARROLL COUNTY	TN	LPV	0	100	0	100	0	100
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	0	100	0	100	2	99.989
JWN	JOHN C TUNE	TN	LPV	0	100	0	100	0	100
LUG	ELLINGTON	TN	LPV	0	100	0	100	0	100
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	0	100	0	100
M08	WILLIAM L WHITEHURST FLD	TN	LP	0	100	0	100	0	100
M53	HUMBOLDT MUNICIPAL	TN	LPV	0	100	0	100	0	100
M54	LEBANON MUNICIPAL	TN	LPV	0	100	0	100	1	99.997
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	100	0	100	1	99.999
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	100	0	100	1	99.997
MEM	MEMPHIS INTL	TN	LPV200	0	100	0	100	0	100
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	100	0	100	0	100
MMI	MCMINN COUNTY	TN	LPV	0	100	0	100	2	99.991
MNV	MONROE COUNTY	TN	LPV	0	100	0	100	2	99.991
MOR	MOORE-MURRELL	TN	LPV	0	100	0	100	2	99.987
MQY	SMYRNA	TN	LPV200	0	100	0	100	1	99.997
MRC	MAURY COUNTY RGNL	TN	LPV	0	100	0	100	0	100
NQA	MILLINGTON/MEMPHIS	TN	LPV200	0	100	0	100	0	100
PHT	HENRY COUNTY	TN	LPV200	0	100	0	100	0	100
PVE	BEECH RIVER RGNL	TN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	100	0	100	1	99.993
RNC	WARREN COUNTY MEML	TN	LPV	0	100	0	100	1	99.997
RVN	HAWKINS COUNTY	TN	LP	0	100	0	100	2	99.984
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	0	100	0	100	1	99.994
SCX	SCOTT MUNICIPAL	TN	LPV	0	100	0	100	1	99.990
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	0	100	0	100
SRB	UPPER CUMBERLAND RGNL	TN	LPV	0	100	0	100	1	99.995
SYI	BOMAR FLD/SHELBYVILLE MUNICIPAL	TN	LPV	0	100	0	100	1	99.997
SZY	ROBERT SIBLEY	TN	LPV	0	100	0	100	0	100
TGC	GIBSON COUNTY	TN	LP	0	100	0	100	0	100
THA	TULLAHOMA RGNL/WM NORTHERN FLD	TN	LPV	0	100	0	100	1	99.997
TRI	TRI-CITIES	TN	LPV200	0	100	0	100	2	99.983
TYS	MC GHEE TYSON	TN	LPV200	0	100	0	100	2	99.988
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	100	0	100	0	100
XNX	MUSIC CITY EXEC	TN	LPV	0	100	0	100	1	99.997
0F2	BOWIE MUNICIPAL	TX	LPV	0	100	0	100	0	100
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	0	100	0	100
2R9	KENEDY RGNL	TX	LP	0	100	0	100	1	99.999
3R9	LAKEWAY AIRPARK	TX	LP	0	100	0	100	0	100
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	100	0	100	0	100
41F	FLOYDADA MUNICIPAL	TX	LP	0	100	0	100	0	100
45R	HAWTHORNE FLD	TX	LP	0	100	0	100	0	100
4T2	KENNETH COPELAND	TX	LPV	0	100	0	100	0	100
50R	LOCKHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
5C1	BOERNE STAGE FLD	TX	LP	0	100	0	100	0	100
5T9	MAVERICK COUNTY MEML INTL	TX	LPV	0	100	0	100	1	99.999
60R	NAVASOTA MUNICIPAL	TX	LPV	0	100	0	100	0	100
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	100	0	100	0	100
77F	WINTERS MUNICIPAL	TX	LP	0	100	0	100	0	100
8F3	CROSBYTON MUNICIPAL	TX	LP	0	100	0	100	0	100
ABI	ABILENE RGNL	TX	LPV200	0	100	0	100	0	100
ACT	WACO RGNL	TX	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ADS	ADDISON	TX	LPV	0	100	0	100	0	100
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	100	0	100	0	100
ALI	ALICE INTL	TX	LPV	0	100	0	100	1	99.995
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	100	0	100	0	100
ARM	WHARTON RGNL	TX	LPV	0	100	0	100	0	100
ASL	HARRISON COUNTY	TX	LPV	0	100	0	100	0	100
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	100	0	100	0	100
AXH	HOUSTON/SOUTHWEST	TX	LPV	0	100	0	100	0	100
BAZ	NEW BRAUNFELS NTL	TX	LPV	0	100	0	100	0	100
BBD	CURTIS FLD	TX	LPV	0	100	0	100	0	100
BEA	BEEVILLE MUNICIPAL	TX	LPV	0	100	0	100	1	99.997
BFE	TERRY COUNTY	TX	LPV	0	100	0	100	0	100
BGD	HUTCHINSON COUNTY	TX	LPV	0	100	0	100	0	100
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	0	100
BKS	BROOKS COUNTY	TX	LPV	0	100	0	100	1	99.994
BMT	BEAUMONT MUNICIPAL	TX	LPV	0	100	0	100	0	100
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	0	100	0	100
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	0	100
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	0	100	0	100	1	99.989
BWD	BROWNWOOD RGNL	TX	LPV	0	100	0	100	0	100
BYY	BAY CITY RGNL	TX	LPV	0	100	0	100	1	99.999
CDS	CHILDRESS MUNICIPAL	TX	LPV200	0	100	0	100	0	100
CFD	COULTER FLD	TX	LPV	0	100	0	100	0	100
CLL	EASTERWOOD FLD	TX	LPV200	0	100	0	100	0	100
CNW	TSTC WACO	TX	LPV200	0	100	0	100	0	100
COM	COLEMAN MUNICIPAL	TX	LPV	0	100	0	100	0	100
COT	COTULLA-LA SALLE COUNTY	TX	LPV	0	100	0	100	1	99.998
CPT	CLEBURNE RGNL	TX	LPV	0	100	0	100	0	100
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	100	0	100	1	99.995
CVB	CASTROVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
CWC	KICKAPOO DOWNTOWN	TX	LPV	0	100	0	100	0	100
CXO	CONROE/NORTH HOUSTON RGNL	TX	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CZT	DIMMIT COUNTY	TX	LPV	0	100	0	100	1	99.998
DAL	DALLAS LOVE FLD	TX	LPV200	0	100	0	100	0	100
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	0	100	0	100	0	100
DHT	DALHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
DKR	HOUSTON COUNTY	TX	LP	0	100	0	100	0	100
DRT	DEL RIO INTL	TX	LPV	0	100	0	100	0	100
DTO	DENTON ENTERPRISE	TX	LPV200	0	100	0	100	0	100
DUX	MOORE COUNTY	TX	LPV200	0	100	0	100	0	100
DWH	DAVID WAYNE HOOKS MEML	TX	LPV	0	100	0	100	0	100
E01	ROY HURD MEML	TX	LP	0	100	0	100	0	100
E11	ANDREWS COUNTY	TX	LPV	0	100	0	100	0	100
E19	GRUVER MUNICIPAL	TX	LP	0	100	0	100	0	100
E30	BRUCE FLD	TX	LPV	0	100	0	100	0	100
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	0	100	0	100	0	100
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	0	100	1	99.991
EDC	AUSTIN EXEC	TX	LPV200	0	100	0	100	0	100
EFD	ELLINGTON	TX	LPV200	0	100	0	100	0	100
ELA	EAGLE LAKE	TX	LP	0	100	0	100	0	100
ELP	EL PASO INTL	TX	LP	0	100	0	100	0	100
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	0	100	0	100	0	100
ETN	EASTLAND MUNICIPAL	TX	LP	0	100	0	100	0	100
F00	JONES FLD	TX	LPV	0	100	0	100	0	100
F05	WILBARGER COUNTY	TX	LPV	0	100	0	100	0	100
F49	CITY OF SLATON/LARRY T NEAL ME	TX	LPV	0	100	0	100	0	100
F98	YOAKUM COUNTY	TX	LPV	0	100	0	100	0	100
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	0	100	0	100	0	100
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	100	0	100	0	100
FWS	FORT WORTH SPINKS	TX	LPV200	0	100	0	100	0	100
GDJ	GRANBURY RGNL	TX	LPV	0	100	0	100	0	100
GGG	EAST TEXAS RGNL	TX	LPV	0	100	0	100	0	100
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	100	0	100	0	100
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	100	0	100	0	100
GNC	GAINES COUNTY	TX	LPV	0	100	0	100	0	100
GRK	ROBERT GRAY AAF	TX	LPV200	0	100	0	100	0	100
GTU	GEORGETOWN MUNICIPAL	TX	LPV	0	100	0	100	0	100
GVT	MAJORS	TX	LPV200	0	100	0	100	0	100
GYI	NORTH TEXAS RGNL/PERRIN FLD	TX	LPV200	0	100	0	100	0	100
GZN	GREGORY M SIMMONS MEML	TX	LPV	0	100	0	100	0	100
HBV	JIM HOGG COUNTY	TX	LPV	0	100	0	100	1	99.994
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	0	100	0	100	0	100
HHF	HEMPHILL COUNTY	TX	LPV	0	100	0	100	0	100
HOU	WILLIAM P HOBBY	TX	LPV200	0	100	0	100	0	100
HQZ	MESQUITE METRO	TX	LPV	0	100	0	100	0	100
HRL	VALLEY INTL	TX	LPV200	0	100	0	100	1	99.990
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	100	0	100	0	100
HYI	SAN MARCOS RGNL	TX	LPV200	0	100	0	100	0	100
IAH	GEORGE BUSH INTCNTL/HOUSTON	TX	LPV200	0	100	0	100	0	100
IKG	KLEBERG COUNTY	TX	LPV	0	100	0	100	1	99.995
ILE	SKYLARK FLD	TX	LPV200	0	100	0	100	0	100
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	100	0	100	0	100
INK	WINKLER COUNTY	TX	LPV200	0	100	0	100	0	100
IWS	WEST HOUSTON	TX	LP	0	100	0	100	0	100
JAS	JASPER COUNTY/BELL FLD	TX	LPV	0	100	0	100	0	100
JSO	CHEROKEE COUNTY	TX	LPV	0	100	0	100	0	100
JWY	MID-WAY RGNL	TX	LPV200	0	100	0	100	0	100
JXI	FOX STEPHENS FLD - GILMER MUNICIPAL	TX	LP	0	100	0	100	0	100
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	100	0	100	0	100
LBX	TEXAS GULF COAST RGNL	TX	LPV	0	100	0	100	0	100
LFK	ANGELINA COUNTY	TX	LPV	0	100	0	100	0	100
LHB	HEARNE MUNICIPAL	TX	LPV200	0	100	0	100	0	100
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	0	100	0	100	0	100
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	100	0	100	0	100
LNC	LANCASTER RGNL	TX	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LRD	LAREDO INTL	TX	LPV200	0	100	0	100	1	99.995
LUD	DECATUR MUNICIPAL	TX	LPV	0	100	0	100	0	100
LUV	LAMESA MUNICIPAL	TX	LPV200	0	100	0	100	0	100
LVJ	PEARLAND RGNL	TX	LPV	0	100	0	100	0	100
LXY	MEXIA-LIMESTONE COUNTY	TX	LP	0	100	0	100	0	100
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	0	100	0	100	0	100
MDD	MIDLAND AIRPARK	TX	LPV	0	100	0	100	0	100
MFE	MC ALLEN MILLER INTL	TX	LPV200	0	100	0	100	1	99.990
MKN	COMANCHE COUNTY-CITY	TX	LPV	0	100	0	100	0	100
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	100	0	100	0	100
MWL	MINERAL WELLS RGNL	TX	LPV200	0	100	0	100	0	100
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	0	100	0	100	0	100
ODO	ODESSA-SCHLEMEYER FLD	TX	LPV200	0	100	0	100	0	100
ONY	OLNEY MUNICIPAL	TX	LPV	0	100	0	100	0	100
ORG	ORANGE COUNTY	TX	LPV	0	100	0	100	0	100
PEQ	PECOS MUNICIPAL	TX	LPV200	0	100	0	100	0	100
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	100	0	100	1	99.990
PKV	CALHOUN COUNTY	TX	LPV	0	100	0	100	1	99.998
PPA	PERRY LEFORS FLD	TX	LPV	0	100	0	100	0	100
PRX	COX FLD	TX	LPV	0	100	0	100	0	100
PSX	PALACIOS MUNICIPAL	TX	LPV	0	100	0	100	1	99.998
PVW	HALE COUNTY	TX	LPV	0	100	0	100	0	100
PWG	MC GREGOR EXEC	TX	LPV	0	100	0	100	0	100
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	0	100	0	100	0	100
RAS	MUSTANG BEACH	TX	LPV	0	100	0	100	1	99.996
RBD	DALLAS EXEC	TX	LPV200	0	100	0	100	0	100
RBO	NUECES COUNTY	TX	LPV	0	100	0	100	1	99.995
RKP	ARANSAS COUNTY	TX	LPV	0	100	0	100	1	99.997
RYW	LAGO VISTA TX/RUSTY ALLEN	TX	LPV	0	100	0	100	0	100
SAT	SAN ANTONIO INTL	TX	LPV200	0	100	0	100	0	100
SGR	SUGAR LAND RGNL	TX	LPV200	0	100	0	100	0	100
SJT	SAN ANGELO RGNL/MATHIS FLD	TX	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV	0	100	0	100	0	100
SNK	WINSTON FLD	TX	LPV200	0	100	0	100	0	100
SWI	SHERMAN MUNICIPAL	TX	LP	0	100	0	100	0	100
SWW	AVENGER FLD	TX	LPV	0	100	0	100	0	100
T23	ALBANY MUNICIPAL	TX	LPV	0	100	0	100	0	100
T41	LA PORTE MUNICIPAL	TX	LPV	0	100	0	100	0	100
T74	TAYLOR MUNICIPAL	TX	LPV	0	100	0	100	0	100
T78	LIBERTY MUNICIPAL	TX	LP	0	100	0	100	0	100
T82	GILLESPIE COUNTY	TX	LPV	0	100	0	100	0	100
TDW	TRADEWIND	TX	LPV	0	100	0	100	0	100
TFP	MCCAMPBELL-PORTER	TX	LPV	0	100	0	100	1	99.996
TKI	MCKINNEY NTL	TX	LPV200	0	100	0	100	0	100
TME	HOUSTON EXEC	TX	LPV	0	100	0	100	0	100
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	0	100	0	100	0	100
TRL	TERRELL MUNICIPAL	TX	LPV	0	100	0	100	0	100
TX2	CHASE FLD INDUSTRIAL	TX	LPV	0	100	0	100	1	99.998
TXW	MID VALLEY	TX	LPV	0	100	0	100	1	99.990
TYR	TYLER POUNDS RGNL	TX	LPV200	0	100	0	100	0	100
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
VCT	VICTORIA RGNL	TX	LPV200	0	100	0	100	1	99.999
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	0	100	0	100	0	100
41U	MANTI-EPHRAIM	UT	LPV	0	100	0	100	0	100
74V	ROOSEVELT MUNICIPAL	UT	LPV	0	100	0	100	0	100
BCE	BRYCE CANYON	UT	LPV	0	100	0	100	0	100
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	0	100	0	100
BMC	BRIGHAM CITY RGNL	UT	LP	0	100	0	100	0	100
CDC	CEDAR CITY RGNL	UT	LPV	0	100	0	100	0	100
CNY	CANYONLANDS RGNL	UT	LP	0	100	0	100	0	100
DTA	DELTA MUNICIPAL	UT	LP	0	100	0	100	0	100
ENV	WENDOVER	UT	LPV	0	100	0	100	1	99.998
FOM	FILLMORE MUNICIPAL	UT	LPV	0	100	0	100	0	100
LGU	LOGAN-CACHE	UT	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OGD	OGDEN-HINCKLEY	UT	LPV	0	100	0	100	0	100
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	0	100	0	100	0	100
PVU	PROVO MUNICIPAL	UT	LPV200	0	100	0	100	0	100
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	0	100	0	100
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	0	100
SLC	SALT LAKE CITY INTL	UT	LPV200	0	100	0	100	0	100
SPK	SPANISH FORK MUNICIPAL/WOODHOUSE FL	UT	LP	0	100	0	100	0	100
TVY	BOLINDER FLD-TOOELE VALLEY	UT	LPV200	0	100	0	100	0	100
U14	NEPHI MUNICIPAL	UT	LPV	0	100	0	100	0	100
U42	SOUTH VALLEY RGNL	UT	LPV	0	100	0	100	0	100
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	0	100	0	100
VEL	VERNAL RGNL	UT	LPV	0	100	0	100	0	100
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	2	99.977
0VG	LEE COUNTY	VA	LPV	0	100	0	100	2	99.985
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	2	99.974
BCB	VIRGINIA TECH/MONTGOMERY EXEC	VA	LPV	0	100	0	100	2	99.980
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	0	100	0	100	1	99.975
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	0	100	0	100	1	99.975
CJR	CULPEPER RGNL	VA	LPV	0	100	0	100	1	99.986
CPK	CHESAPEAKE RGNL	VA	LPV200	0	100	0	100	1	99.974
DAN	DANVILLE RGNL	VA	LPV200	0	100	0	100	2	99.977
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	0	100	0	100	2	99.974
FCI	RICHMOND EXEC/CHESTERFIELD COU	VA	LPV	0	100	0	100	1	99.974
FKN	FRANKLIN RGNL	VA	LPV	0	100	0	100	1	99.974
FVX	FARMVILLE RGNL	VA	LPV	0	100	0	100	1	99.975
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	100	0	100	1	99.983
HLX	TWIN COUNTY	VA	LPV	0	100	0	100	2	99.980
HSP	INGALLS FLD	VA	LPV	0	100	0	100	1	99.978
HWY	WARRENTON/FAUQUIER	VA	LPV200	0	100	0	100	1	99.989
JFZ	TAZEWELL COUNTY	VA	LPV	0	100	0	100	2	99.982
JYO	LEESBURG EXEC	VA	LPV	0	100	0	100	1	99.994
LKU	LOUISA COUNTY/FREEMAN FLD	VA	LPV	0	100	0	100	1	99.974

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LNP	LONESOME PINE	VA	LPV	0	100	0	100	2	99.984
LUA	LURAY CAVERNS	VA	LP	0	100	0	100	1	99.975
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	0	100	0	100	2	99.977
MFV	ACCOMACK COUNTY	VA	LPV	0	100	0	100	1	99.992
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	100	0	100	2	99.981
MTV	BLUE RIDGE	VA	LPV	0	100	0	100	2	99.979
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	100	0	100	1	99.974
OKV	WINCHESTER RGNL	VA	LPV200	0	100	0	100	1	99.992
ORF	NORFOLK INTL	VA	LPV200	0	100	0	100	1	99.980
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	0	100	0	100	1	99.972
PSK	NEW RIVER VALLEY	VA	LPV200	0	100	0	100	2	99.980
PTB	DINWIDDIE COUNTY	VA	LPV	0	100	0	100	1	99.974
PVG	HAMPTON ROADS EXEC	VA	LPV200	0	100	0	100	1	99.974
RIC	RICHMOND INTL	VA	LPV200	0	100	0	100	1	99.974
RMN	STAFFORD RGNL	VA	LPV	0	100	0	100	1	99.988
ROA	ROANOKE/BLACKSBURG RGNL (WOODR	VA	LPV	0	100	0	100	2	99.980
SFQ	SUFFOLK EXEC	VA	LPV	0	100	0	100	1	99.974
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	1	99.976
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	100	0	100	2	99.982
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	2	99.976
W96	NEW KENT COUNTY	VA	LP	0	100	0	100	1	99.973
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	0	100	0	100	1	99.995
XSA	TAPPAHANNOCK/ESSEX COUNTY	VA	LPV	0	100	0	100	1	99.987
BTV	BURLINGTON INTL	VT	LPV200	0	100	0	100	1	99.961
EFK	NORTHEAST KINGDOM INTL	VT	LP	0	100	0	100	4	99.948
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	100	0	100	2	99.953
MPV	EDWARD F KNAPP STATE	VT	LPV	0	100	0	100	2	99.959
MVL	MORRISVILLE-STOWE STATE	VT	LPV	0	100	0	100	2	99.955
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	0	100	0	100	2	99.994
ALW	WALLA WALLA RGNL	WA	LPV200	0	100	0	100	0	100
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	100	0	100	0	100
BLI	BELLINGHAM INTL	WA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BVS	SKAGIT RGNL	WA	LPV	0	100	0	100	0	100
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	100	0	100	0	100
CLS	CHEHALIS-CENTRALIA	WA	LPV	0	100	0	100	0	100
DEW	DEER PARK	WA	LPV	0	100	0	100	0	100
EPH	EPHRATA MUNICIPAL	WA	LPV	0	100	0	100	0	100
FHR	FRIDAY HARBOR	WA	LPV	0	100	0	100	0	100
GEG	SPOKANE INTL	WA	LPV200	0	100	0	100	0	100
HQM	BOWERMAN	WA	LPV200	0	100	0	100	0	100
KLS	SOUTHWEST WASHINGTON RGNL	WA	LPV	0	100	0	100	0	100
MWH	GRANT COUNTY INTL	WA	LPV200	0	100	0	100	0	100
OLM	OLYMPIA RGNL	WA	LPV200	0	100	0	100	0	100
ORS	ORCAS ISLAND	WA	LP	0	100	0	100	0	100
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	0	100	0	100	0	100
PLU	PIERCE COUNTY - THUN FLD	WA	LPV	0	100	0	100	0	100
PSC	TRI-CITIES	WA	LPV200	0	100	0	100	0	100
PWT	BREMERTON NTL	WA	LPV200	0	100	0	100	0	100
RLD	RICHLAND	WA	LPV	0	100	0	100	0	100
RNT	RENTON MUNICIPAL	WA	LPV	0	100	0	100	0	100
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	100	0	100	0	100
SFF	FELTS FLD	WA	LPV	0	100	0	100	0	100
SHN	SANDERSON FLD	WA	LPV	0	100	0	100	0	100
TDO	ED CARLSON MEML FLD - SOUTH LE	WA	LPV	0	100	0	100	0	100
TIW	TACOMA NARROWS	WA	LPV	0	100	0	100	0	100
YKM	YAKIMA AIR TRML/MCALLISTER FLD	WA	LPV200	0	100	0	100	0	100
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
57C	EAST TROY MUNICIPAL	WI	LPV	0	100	0	100	0	100
61C	FORT ATKINSON MUNICIPAL	WI	LP	0	100	0	100	0	100
82C	MAUSTON/NEW LISBON UNION	WI	LP	0	100	0	100	0	100
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	100	0	100	1	99.999
AHH	AMERY MUNICIPAL	WI	LP	0	100	0	100	0	100
AIG	LANGLADE COUNTY	WI	LPV	0	100	0	100	0	100
ARV	LAKELAND/NOBLE F LEE MEML FLD	WI	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ASX	JOHN F KENNEDY MEML	WI	LPV	0	100	0	100	1	99.994
ATW	APPLETON INTL	WI	LPV200	0	100	0	100	0	100
AUW	WAUSAU DOWNTOWN	WI	LPV200	0	100	0	100	0	100
BCK	BLACK RIVER FALLS AREA	WI	LPV	0	100	0	100	0	100
BUU	BURLINGTON MUNICIPAL	WI	LP	0	100	0	100	0	100
C29	MIDDLETON MUNICIPAL/MOREY FLD	WI	LPV	0	100	0	100	0	100
C35	REEDSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
C47	PORTAGE MUNICIPAL	WI	LP	0	100	0	100	0	100
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
CMY	SPARTA/FORT MC COY	WI	LPV	0	100	0	100	0	100
CWA	CENTRAL WISCONSIN	WI	LPV200	0	100	0	100	0	100
DLL	BARABOO/WISCONSIN DELLS RGNL	WI	LPV	0	100	0	100	0	100
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	100	0	100	0	100
EGV	EAGLE RIVER UNION	WI	LPV	0	100	0	100	0	100
ENW	KENOSHA RGNL	WI	LPV200	0	100	0	100	1	99.999
ETB	WEST BEND MUNICIPAL	WI	LPV	0	100	0	100	1	99.999
EZS	SHAWANO MUNICIPAL	WI	LPV	0	100	0	100	0	100
FLD	FOND DU LAC COUNTY	WI	LPV	0	100	0	100	0	100
GRB	GREEN BAY/AUSTIN STRAUBEL INTL	WI	LPV200	0	100	0	100	0	100
GTG	GRANTSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
HXF	HARTFORD MUNICIPAL	WI	LPV	0	100	0	100	0	100
HYR	SAWYER COUNTY	WI	LPV	0	100	0	100	0	100
ISW	ALEXANDER FLD SOUTH WOOD COUNT	WI	LPV	0	100	0	100	0	100
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	0	100	0	100	0	100
LNR	TRI-COUNTY RGNL	WI	LPV	0	100	0	100	0	100
LSE	LA CROSSE RGNL	WI	LPV	0	100	0	100	0	100
LUM	MENOMONIE MUNICIPAL/SCORE FLD	WI	LPV	0	100	0	100	0	100
MDZ	TAYLOR COUNTY	WI	LPV	0	100	0	100	0	100
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	100	0	100	0	100
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	100	0	100	1	99.999
MRJ	IOWA COUNTY	WI	LPV200	0	100	0	100	0	100
MSN	DANE COUNTY RGNL/TRUAX FLD	WI	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MTW	MANITOWOC COUNTY	WI	LPV200	0	100	0	100	1	99.998
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	100	0	100	1	99.999
OCQ	OCONTO/J DOUGLAS BAKE MUNICIPAL	WI	LP	0	100	0	100	0	100
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	0	100	0	100	0	100
OSH	WITTMAN RGNL	WI	LPV200	0	100	0	100	0	100
OVS	BOSCOBEL	WI	LPV	0	100	0	100	0	100
PBH	PRICE COUNTY	WI	LPV	0	100	0	100	0	100
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	100	0	100	0	100
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
RAC	BATTEN INTL	WI	LPV	0	100	0	100	1	99.999
RCX	RUSK COUNTY	WI	LPV	0	100	0	100	0	100
RHI	RHINELANDER/ONEIDA COUNTY	WI	LPV200	0	100	0	100	0	100
RNH	NEW RICHMOND RGNL	WI	LPV	0	100	0	100	0	100
RPD	RICE LAKE RGNL/CARL'S FLD	WI	LPV200	0	100	0	100	0	100
RRL	MERRILL MUNICIPAL	WI	LPV	0	100	0	100	0	100
SBM	SHEBOYGAN COUNTY MEML	WI	LPV200	0	100	0	100	1	99.999
STE	STEVENS POINT MUNICIPAL	WI	LPV	0	100	0	100	0	100
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	100	0	100	0	100
SUW	RICHARD I BONG	WI	LP	0	100	0	100	1	99.991
TKV	TOMAHAWK RGNL	WI	LP	0	100	0	100	0	100
UBE	CUMBERLAND MUNICIPAL	WI	LPV	0	100	0	100	0	100
UES	WAUKESHA COUNTY	WI	LPV200	0	100	0	100	0	100
UNU	DODGE COUNTY	WI	LPV	0	100	0	100	0	100
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y50	WAUTOMA MUNICIPAL	WI	LP	0	100	0	100	0	100
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y72	BLOYER FLD	WI	LP	0	100	0	100	0	100
3I2	MASON COUNTY	WV	LPV	0	100	0	100	1	99.985
6L4	LOGAN COUNTY	WV	LPV	0	100	0	100	2	99.983
BKW	RALEIGH COUNTY MEML	WV	LPV200	0	100	0	100	2	99.981
BLF	MERCER COUNTY	WV	LPV	0	100	0	100	2	99.981
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	1	99.980

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CRW	WEST VIRGINIA INTL YEAGER	WV	LPV200	0	100	0	100	1	99.983
HLG	WHEELING OHIO COUNTY	WV	LPV200	0	100	0	100	1	99.981
HTS	TRI-STATE/MILTON J FERGUSON FL	WV	LPV200	0	100	0	100	1	99.985
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	1	99.984
LWB	GREENBRIER VALLEY	WV	LPV	0	100	0	100	2	99.980
MGW	MORGANTOWN MUNICIPAL (WALTER L BILL	WV	LPV200	0	100	0	100	1	99.980
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	0	100	0	100	1	99.995
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	100	0	100	1	99.983
USW	BOGGS FLD	WV	LPV	0	100	0	100	1	99.983
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	1	99.980
W35	POTOMAC AIRPARK	WV	LP	0	100	0	100	1	99.997
W99	GRANT COUNTY	WV	LP	0	100	0	100	1	99.977
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	0	100
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	0	100
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	0	100
CYS	CHEYENNE RGNL/JERRY OLSON FLD	WY	LPV200	0	100	0	100	0	100
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	0	100
DWX	DIXON	WY	LP	0	100	0	100	0	100
EAN	PHIFER AIRFIELD	WY	LPV200	0	100	0	100	0	100
ECS	MONDELL FLD	WY	LPV	0	100	0	100	0	100
EMM	KEMMERER MUNICIPAL	WY	LPV	0	100	0	100	0	100
EVW	EVANSTON-UINTA COUNTY BURNS FL	WY	LPV	0	100	0	100	0	100
FBR	FORT BRIDGER	WY	LP	0	100	0	100	0	100
GCC	NORTHEAST WYOMING RGNL	WY	LPV	0	100	0	100	0	100
GEY	SOUTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	0	100
HSG	HOT SPRINGS COUNTY	WY	LPV	0	100	0	100	0	100
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	0	100
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	0	100
LND	HUNT FLD	WY	LPV	0	100	0	100	0	100
PNA	RALPH WENZ FLD	WY	LPV	0	100	0	100	0	100
POY	POWELL MUNICIPAL	WY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RIW	CENTRAL WYOMING RGNL	WY	LPV200	0	100	0	100	0	100
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	0	100	0	100	0	100
RWL	RAWLINS MUNICIPAL/HARVEY FLD	WY	LPV	0	100	0	100	0	100
SAA	SHIVELY FLD	WY	LPV	0	100	0	100	0	100
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	0	100
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
W43	HULETT MUNICIPAL	WY	LPV	0	100	0	100	0	100
WRL	WORLAND MUNICIPAL	WY	LPV	0	100	0	100	0	100
CAJ4	ANAHIM LAKE		LPV	0	100	0	100	0	100
CAJ9	FORT WARE		LP	1	99.975	1	99.969	1	99.951
CAL4	ALBIAN		LPV	1	99.962	1	99.962	5	99.911
CAU4	VANDERHOOF		LPV	0	100	0	100	1	99.974
CBN9	TSAY KEH		LP	1	99.975	1	99.971	1	99.952
CBW4	BOB QUINN LAKE		LP	1	99.985	1	99.972	1	99.971
CCB2	SEABEE MINE		LPV	1	99.972	3	99.963	8	99.808
CCE3	JUNIPER		LP	2	99.887	2	99.876	4	99.783
CCN2	GRAND MANAN		LPV	1	99.932	1	99.927	2	99.846
CCQ3	DEBERT		LPV	2	99.883	2	99.883	4	99.775
CCR3	FLORENCEVILLE		LPV	2	99.889	2	99.889	4	99.798
CDJ4	CLEARWATER		LPV	3	99.886	3	99.875	4	99.757
CDK2	DIAVIK		LPV	1	99.934	4	99.890	21	99.466
CEA3	OLDS-DIDSBURY		LPV	0	100	0	100	2	99.990
CEB5	FAIRVIEW		LPV	1	99.989	2	99.985	2	99.948
CEC4	JASPER-HINTON		LP	0	100	0	100	1	99.993
CEH3	PONOKA (LABRIE FIELD)		LPV	0	100	0	100	1	99.993
CEH5	RED EARTH CREEK		LP	1	99.971	1	99.969	2	99.936
CEH6	PROVOST		LPV	0	100	0	100	2	99.980
CEL8	ELEONORE		LPV	4	99.629	4	99.601	6	99.529
CEN3	THREE HILLS		LPV	0	100	0	100	2	99.987
CEN5	COLD LAKE REGIONAL		LPV	0	100	0	100	6	99.934
CEQ3	CAMROSE		LPV	0	100	0	100	1	99.993
CET2	CONKLIN (LEISMER)		LPV	1	99.987	1	99.966	5	99.925

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CEU9	SAMBAA K'E		LPV	1	99.964	1	99.964	3	99.914
CEV3	VEGREVILLE		LPV	0	100	0	100	2	99.987
CEW3	ST. PAUL		LPV	0	100	0	100	4	99.953
CEX3	WETASKIWIN REGIONAL		LPV	0	100	0	100	1	99.993
CEZ3	COOKING LAKE		LPV	0	100	0	100	1	99.993
CFB6	JOSEPHBURG		LPV	0	100	0	100	1	99.993
CFM4	DONNELLY		LPV	1	99.997	2	99.994	2	99.947
CFX5	RENARD		LPV	4	99.632	3	99.575	4	99.519
CGK2	GAHCHO KUE		LPV	1	99.930	4	99.886	21	99.462
CJA3	MORDEN REGIONAL		LPV	0	100	0	100	1	99.978
CJC5	SHAUNAVON		LPV	0	100	0	100	1	99.999
CJE3	WEYBURN		LPV	0	100	0	100	2	99.996
CJH3	MAIDSTONE		LPV	0	100	0	100	2	99.957
CJJ4	DELORAINE		LPV	0	100	0	100	2	99.999
CJP9	CHARLOT RIVER		LP	1	99.949	1	99.935	12	99.751
CJQ4	MAPLE CREEK		LPV	0	100	0	100	1	99.999
CJU4	HUMBOLDT		LPV	0	100	0	100	3	99.950
CJW5	RUSSELL		LPV	0	100	0	100	3	99.980
CJW7	CIGAR LAKE		LPV	1	99.949	1	99.898	10	99.725
CJY3	TISDALE		LPV	0	100	1	99.997	3	99.949
CJZ3	MELFORT (MILLER FIELD)		LPV	0	100	1	99.998	3	99.948
CKK7	STEINBACH (SOUTH)		LPV	0	100	0	100	3	99.979
CKQ8	MCARTHUR RIVER		LPV	1	99.949	1	99.906	9	99.763
CKZ7	WINKLER		LPV	0	100	0	100	1	99.978
CMB2	MEADOWBANK		LPV	5	99.505	10	99.357	53	98.326
CMR2	MARY RIVER		LPV	504	95.215	611	92.057	1050	73.340
CNV8	EDENVALE		LPV	0	100	0	100	0	100
CNY3	COLLINGWOOD		LPV	0	100	0	100	0	100
CSC3	DRUMMONDVILLE		LPV	1	99.996	2	99.994	3	99.882
CSD4	MONT-LAURIER		LPV	1	99.995	2	99.975	2	99.896
CSF3	POSTE MONTAGNAIS (MILE 134)		LPV	5	99.641	5	99.590	8	99.534
CSH4	LEBEL-SUR-QUEVILLON		LPV	1	99.891	1	99.879	2	99.835

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CSK6	SNAP LAKE		LPV	1	99.932	2	99.895	20	99.547
CSR3	VICTORIAVILLE (ANDRE-FORTIN)		LPV	2	99.960	2	99.959	2	99.867
CSU2	CHISASIBI		LPV	4	99.623	4	99.589	11	99.467
CTP9	DONALDSON		LPV	9	99.260	14	99.196	36	98.187
CTT5	LA ROMAINE		LPV	2	99.670	2	99.665	8	99.532
CTU2	FONTANGES		LPV	3	99.558	4	99.541	12	99.299
CVB2	VOISEY'S BAY		LPV	7	99.406	7	99.402	14	99.066
CYAC	CAT LAKE		LPV	2	99.980	2	99.919	6	99.813
CYAD	LA GRANDE-3		LPV	4	99.613	4	99.583	9	99.440
CYAH	LA GRANDE-4		LPV	3	99.593	3	99.549	12	99.394
CYAM	SAULT STE. MARIE		LPV200	0	100	0	100	2	99.996
CYAS	KANGIRSUK		LPV	8	99.270	10	99.220	34	98.465
CYAV	ST. ANDREWS		LPV	0	100	0	100	3	99.968
CYBC	BAIE-COMEAU		LPV200	3	99.765	3	99.765	5	99.709
CYBE	URANIUM CITY		LPV	1	99.949	1	99.935	14	99.720
CYBF	BONNYVILLE		LPV	0	100	0	100	5	99.940
CYBG	BAGOTVILLE		LPV200	1	99.833	1	99.833	2	99.790
CYBK	BAKER LAKE		LPV	4	99.528	9	99.389	45	98.457
CYBL	CAMPBELL RIVER		LPV	0	100	0	100	0	100
CYBR	BRANDON MUNICIPALCIPALITY		LPV	0	100	0	100	3	99.986
CYBU	NIPAWIN		LPV	0	100	2	99.997	5	99.930
CYBW	SPRINGBANK		LPV	0	100	0	100	1	99.994
CYBX	LOURDES-DE-BLANC-SABLON		LPV	5	99.599	7	99.550	19	99.266
CYCC	CORNWALL REGIONAL		LPV	0	100	0	100	2	99.989
CYCD	NANAIMO		LPV	0	100	0	100	0	100
CYCH	MIRAMICHI		LPV	2	99.827	2	99.818	4	99.725
CYCK	CHATHAM-KENT		LPV	0	100	0	100	0	100
CYCL	CHARLO		LPV	3	99.764	3	99.761	5	99.706
CYCS	CHESTERFIELD INLET		LPV	6	99.410	7	99.238	46	98.242
CYCZ	FAIRMONT HOT SPRINGS		LPV	0	100	0	100	0	100
CYDF	DEER LAKE		LPV200	4	99.697	4	99.697	10	99.509
CYDL	DEASE LAKE		LP	1	99.972	1	99.971	1	99.953

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYDQ	DAWSON CREEK		LPV	0	100	1	99.998	1	99.948
CYEE	HURONIA		LPV	0	100	0	100	0	100
CYEG	EDMONTON INTL		LPV200	0	100	0	100	1	99.993
CYEK	ARVIAT		LPV	7	99.638	8	99.478	28	98.903
CYEN	ESTEVAN REGIONAL		LPV	0	100	0	100	2	99.999
CYES	EDMUNDSTON		LPV	3	99.840	2	99.812	4	99.782
CYEV	INUVIK (MIKE ZUBKO)		LPV	1	99.981	3	99.940	8	99.862
CYEY	MAGNY		LPV	1	99.910	1	99.900	1	99.859
CYFA	FORT ALBANY		LPV	4	99.820	7	99.778	7	99.632
CYFB	IQALUIT		LPV200	25	98.906	35	98.775	103	96.893
CYFC	FREDERICTON INTL		LPV	2	99.898	2	99.898	4	99.812
CYFI	FIREBAG		LPV	1	99.962	1	99.962	5	99.907
CYFJ	MONT-TREMBLANT		LPV	1	99.996	2	99.977	2	99.882
CYFO	FLIN FLON		LPV	0	100	2	99.959	7	99.820
CYFR	FORT RESOLUTION		LPV	1	99.960	1	99.931	10	99.849
CYFS	FORT SIMPSON		LPV	1	99.960	1	99.953	4	99.901
CYGH	FORT GOOD HOPE		LPV	1	99.961	3	99.950	9	99.850
CYGK	KINGSTON		LPV	0	100	0	100	0	100
CYGL	LA GRANDE RIVIERE		LPV	4	99.623	4	99.586	9	99.468
CYGP	GASPE (MICHEL-POULIOT)		LPV	4	99.733	4	99.731	4	99.636
CYGR	ILES-DE-LA-MADELEINE		LPV	4	99.714	4	99.714	5	99.638
CYGV	HAVRE ST-PIERRE		LPV	2	99.677	2	99.672	8	99.583
CYGW	KUUJJUARAPIK		LPV	5	99.558	4	99.533	17	99.156
CYGX	GILLAM		LPV	6	99.896	5	99.798	13	99.516
CYHA	QUAQTAQ		LPV	10	99.250	13	99.198	33	98.274
CYHD	DRYDEN REGIONAL		LPV	0	100	1	99.997	3	99.929
CYHF	HEARST (RENE FONTAINE) MUNICIPALCIPALITY		LPV	3	99.943	3	99.934	1	99.862
CYHH	NEMISCAU		LPV	5	99.713	5	99.688	6	99.575
CYHM	HAMILTON		LPV	0	100	0	100	0	100
CYHR	CHEVERY		LPV	2	99.664	2	99.664	8	99.521
CYHS	SAUGEEN MUNICIPALCIPALITY		LPV	0	100	0	100	0	100
CYHU	ST-HUBERT		LPV	0	100	1	99.999	3	99.919

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYHY	MERLYN CARTER AIRPORT		LPV	1	99.960	1	99.941	6	99.891
CYHZ	STANFIELD INTL		LPV200	1	99.898	1	99.884	4	99.785
CYIF	ST-AUGUSTIN		LPV	3	99.644	4	99.643	9	99.439
CYIK	IVUJIVIK		LPV	10	99.249	17	99.139	46	98.082
CYIV	ISLAND LAKE		LPV	2	99.970	4	99.922	12	99.720
CYJP	FORT PROVIDENCE		LPV	1	99.960	1	99.935	5	99.892
CYJT	STEPHENVILLE		LPV	2	99.703	2	99.703	10	99.542
CYKA	KAMLOOPS		LPV	0	100	0	100	0	100
CYKC	COLLINS BAY		LPV	1	99.949	2	99.897	15	99.682
CYKD	FREDDIE CARMICHAEL		LPV	1	99.983	2	99.945	8	99.880
CYKF	WATERLOO		LPV200	0	100	0	100	0	100
CYKG	KANGIQSUJUAQ (WAKEHAM BAY)		LPV	9	99.252	12	99.196	36	98.220
CYKJ	KEY LAKE		LPV	1	99.949	1	99.917	8	99.813
CYKL	SCHEFFERVILLE		LPV	5	99.520	5	99.517	12	99.230
CYKM	KINCARDINE		LPV	0	100	0	100	0	100
CYKO	AKULIVIK		LPV	7	99.305	8	99.267	36	98.309
CYKQ	WASKAGANISH		LPV	4	99.809	6	99.781	5	99.650
CYKZ	BUTTONVILLE MUNICIPALCIPAL		LPV	0	100	0	100	0	100
CYLA	AUPALUK		LPV	8	99.291	10	99.234	28	98.693
CYLB	LAC LA BICHE		LPV	0	100	1	99.998	3	99.943
CYLJ	MEADOW LAKE		LPV	0	100	0	100	5	99.917
CYLL	LLOYDMINSTER		LPV	0	100	0	100	3	99.970
CYLQ	LA TUQUE		LPV	1	99.884	2	99.872	1	99.837
CYLS	LAKE SIMCOE		LPV	0	100	0	100	0	100
CYLU	KANGIQSUALUJJUAQ (GEORGES RIVER)		LPV	9	99.318	12	99.265	26	98.650
CYLW	KELOWNA		LPV	0	100	0	100	0	100
CYMA	MAYO		LPV	1	99.981	1	99.971	2	99.959
CYME	RUSSELL-BURNETT		LPV	3	99.764	3	99.764	4	99.686
CYMG	MANITOUWADGE		LPV	1	99.998	3	99.982	3	99.906
CYMJ	AIR VICE MARSHAL C.M. MCEWEN		LPV200	0	100	0	100	2	99.993
CYMM	FORT MCMURRAY		LPV200	1	99.963	1	99.962	4	99.930
CYMO	MOOSONEE		LPV	3	99.849	4	99.808	6	99.683

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYMT	CHAPAIS		LPV	1	99.837	1	99.837	4	99.791
CYMU	UMIUJAQ		LPV	4	99.489	4	99.449	14	98.994
CYMW	MANIWAKI		LPV	1	99.998	2	99.992	3	99.940
CYMX	MONTREAL INTL (MIRABEL)		LPV200	0	100	1	99.997	2	99.897
CYNA	NATASHQUAN		LPV	3	99.694	3	99.688	8	99.559
CYNC	WEMINDJI		LPV	6	99.708	6	99.646	8	99.523
CYND	GATINEAU		LPV	0	100	0	100	1	99.975
CYNL	POINTS NORTH LANDING		LPV	1	99.949	1	99.898	13	99.704
CYNM	MATAGAMI		LPV	1	99.885	1	99.877	4	99.820
CYNR	HORIZON		LPV	1	99.962	1	99.962	4	99.911
CYOA	EKATI		LPV	1	99.935	4	99.890	22	99.461
CYOC	OLD CROW		LPV	1	99.989	1	99.972	4	99.920
CYOD	GROUP CAPTAIN R.W. MCNAIR		LP	0	100	0	100	6	99.933
CYOJ	HIGH LEVEL		LPV	1	99.969	1	99.960	3	99.918
CYOO	OSHAWA EXECUTIVE AIRPORT		LPV	0	100	0	100	0	100
CYOP	RAINBOW LAKE		LPV	1	99.970	1	99.960	3	99.937
CYOS	BILLY BISHOP REGIONAL		LPV	0	100	0	100	0	100
CYOW	MACDONALD-CARTIER INTL		LPV200	0	100	0	100	1	99.983
CYPA	PRINCE ALBERT (GLASS FIELD)		LPV	0	100	0	100	3	99.931
CYPC	PAULATUK (NORA ALIQATCHIALUK RUBEN)		LPV	3	99.966	3	99.916	22	99.592
CYPE	PEACE RIVER		LPV	1	99.993	2	99.988	2	99.947
CYPH	INUKJUAK		LPV	5	99.406	8	99.381	20	98.773
CYPK	PITT MEADOWS		LPV	0	100	0	100	0	100
CYPL	PICKLE LAKE		LPV	2	99.958	3	99.931	6	99.823
CYPN	PORT-MENIER		LPV	2	99.696	2	99.696	7	99.601
CYPQ	PETERBOROUGH		LPV	0	100	0	100	0	100
CYPR	PRINCE RUPERT		LPV	0	100	0	100	1	99.995
CYPT	PELEE ISLAND		LPV	0	100	0	100	1	99.986
CYPX	PUVIRNITUQ		LPV	6	99.321	9	99.278	36	98.413
CYPY	FORT CHIPEWYAN		LPV	1	99.960	2	99.958	8	99.876
CYQB	JEAN LESAGE INTL		LPV200	1	99.891	2	99.887	2	99.837
CYQD	THE PAS		LPV	0	100	2	99.961	7	99.865

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYQF	RED DEER REGIONAL		LPV	0	100	0	100	2	99.992
CYQG	WINDSOR		LPV	0	100	0	100	1	99.995
CYQH	WATSON LAKE		LPV	1	99.973	1	99.971	2	99.944
CYQI	YARMOUTH		LPV	1	99.935	1	99.919	2	99.861
CYQK	KENORA		LPV	0	100	0	100	3	99.958
CYQL	LETHBRIDGE		LPV200	0	100	0	100	0	100
CYQM	GREATER MONCTON ROMEO LEBLANC INTL		LPV200	2	99.893	2	99.877	4	99.748
CYQQ	COMOX		LPV200	0	100	0	100	0	100
CYQR	REGINA INTL		LPV200	0	100	0	100	2	99.989
CYQS	ST. THOMAS MUNICIPALCIPALITY		LPV	0	100	0	100	0	100
CYQT	THUNDER BAY		LPV200	0	100	1	99.984	3	99.927
CYQU	GRANDE PRAIRIE		LPV200	0	100	0	100	1	99.948
CYQV	YORKTON MUNICIPALCIPALITY		LPV	0	100	0	100	2	99.979
CYQW	NORTH BATTLEFORD		LPV	0	100	0	100	2	99.970
CYQX	GANDER INTL		LPV200	5	99.627	8	99.596	29	99.102
CYQY	J.A. DOUGLAS MCCURDY		LPV200	4	99.760	4	99.760	5	99.665
CYQZ	QUESNEL		LPV	0	100	0	100	2	99.994
CYRB	RESOLUTE BAY		LPV	256	97.606	340	96.023	1401	70.048
CYRI	RIVIERE-DU-LOUP		LPV	3	99.849	3	99.847	4	99.792
CYRJ	ROBERVAL		LPV	1	99.837	1	99.837	2	99.801
CYRL	RED LAKE		LPV	0	100	2	99.984	4	99.926
CYRQ	TROIS-RIVIERES		LPV200	2	99.965	2	99.960	1	99.866
CYRT	RANKIN INLET		LPV	7	99.470	9	99.298	38	98.414
CYSA	STRATFORD MUNICIPALCIPALITY		LPV	0	100	0	100	0	100
CYSB	SUDBURY		LPV	0	100	0	100	3	99.937
CYSC	SHERBROOKE		LPV	1	99.991	3	99.990	3	99.893
CYSG	ST-GEORGES		LPV	1	99.920	2	99.918	2	99.856
CYSJ	SAINT JOHN		LPV	2	99.898	2	99.898	4	99.821
CYSK	SANIKILUAQ		LPV	4	99.494	5	99.471	16	99.075
CYSL	ST. LEONARD		LPV	3	99.860	2	99.821	4	99.780
CYSM	FORT SMITH		LPV	1	99.962	1	99.941	9	99.818
CYSN	NIAGARA DISTRICT		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYSY	SACHS HARBOUR (DAVID NASOGALUAK JR. SAARYUAQ)		LPV	2	99.967	6	99.904	34	99.359
CYTE	KINNGAIT AIRPORT		LPV	14	99.092	18	98.979	72	97.369
CYTF	ALMA		LPV	1	99.833	1	99.833	2	99.791
CYTH	THOMPSON		LPV200	3	99.951	3	99.884	14	99.676
CYTL	BIG TROUT LAKE		LPV	4	99.892	5	99.869	10	99.639
CYTN	TRENTON		LPV	2	99.880	3	99.879	4	99.766
CYTQ	TASIUJAQ		LPV	8	99.325	10	99.258	24	98.796
CYTS	TIMMINS (VICTOR M. POWER)		LPV200	2	99.955	2	99.955	1	99.862
CYTZ	BILLY BISHOP TORONTO CITY AIRPORT		LPV	0	100	0	100	0	100
CYUB	JAMES GRUBEN		LPV	2	99.977	3	99.940	12	99.819
CYUL	PIERRE-ELLIOTT-TRUDEAU INTL		LPV200	0	100	0	100	2	99.926
CYUY	ROUYN-NORANDA		LPV200	1	99.931	2	99.922	1	99.862
CYVB	BONAVENTURE		LPV	3	99.763	3	99.760	4	99.668
CYVC	LA RONGE (BARBER FIELD)		LPV	1	99.998	2	99.965	5	99.867
CYVD	R.J. (BOB) ANDREW FIELD REGIONAL		LPV	0	100	0	100	2	99.990
CYVO	VAL-DOR		LPV200	1	99.931	2	99.921	1	99.863
CYVP	KUUJJUAQ		LPV200	7	99.340	10	99.284	19	98.907
CYVQ	NORMAN WELLS		LPV	1	99.964	2	99.946	9	99.868
CYVR	VANCOUVER INTL		LPV200	0	100	0	100	0	100
CYVV	WIARTON		LPV	0	100	0	100	0	100
CYWG	JAMES ARMSTRONG RICHARDSON INTL		LPV200	0	100	0	100	3	99.970
CYWJ	DELINE		LPV	1	99.961	2	99.943	8	99.843
CYWK	WABUSH		LPV	4	99.597	3	99.553	10	99.454
CYWL	WILLIAMS LAKE		LPV	0	100	0	100	0	100
CYWM	ATHABASCA		LPV	0	100	0	100	2	99.945
CYWP	WEBEQUIE		LPV	3	99.881	5	99.859	9	99.669
CYXE	JOHN G. DIEFENBAKER INTL		LPV200	0	100	0	100	2	99.966
CYXH	MEDICINE HAT		LPV	0	100	0	100	1	99.999
CYXJ	FORT ST. JOHN		LPV200	1	99.994	2	99.991	1	99.947
CYXL	SIOUX LOOKOUT		LPV	0	100	2	99.977	3	99.923
CYXR	EARLTON (TIMISKAMING REGIONAL)		LPV	2	99.967	2	99.967	1	99.873

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYXS	PRINCE GEORGE		LPV200	0	100	0	100	1	99.971
CYXT	TERRACE		LPV	0	100	0	100	1	99.995
CYXU	LONDON		LPV200	0	100	0	100	0	100
CYXX	ABBOTSFORD		LPV	0	100	0	100	0	100
CYXY	ERIK NIELSEN INTL		LPV200	1	99.986	1	99.971	1	99.969
CYYB	NORTH BAY		LPV200	0	100	0	100	2	99.935
CYYC	YYC CALGARY INTL		LPV200	0	100	0	100	1	99.992
CYYD	SMITHERS		LPV	0	100	0	100	1	99.993
CYYE	FORT NELSON		LPV200	1	99.971	1	99.964	3	99.938
CYYF	PENTICTON		LPV	0	100	0	100	0	100
CYYG	CHARLOTTETOWN		LPV	3	99.873	4	99.864	4	99.716
CYYH	TALOYOAK		LPV	18	99.340	33	99.008	118	96.643
CYYJ	VICTORIA INTL		LPV200	0	100	0	100	0	100
CYYN	SWIFT CURRENT		LPV	0	100	0	100	2	99.994
CYYQ	CHURCHILL		LPV	5	99.669	5	99.593	20	99.164
CYYR	GOOSE BAY		LPV	5	99.596	4	99.562	13	99.258
CYYT	ST. JOHN'S INTL		LPV	7	99.621	8	99.595	48	98.817
CYYU	KAPUSKASING		LPV	2	99.927	2	99.924	1	99.854
CYYW	ARMSTRONG		LPV	0	100	3	99.955	2	99.897
CYYY	MONT-JOLI		LPV	4	99.810	4	99.795	5	99.736
CYYZ	LESTER B. PEARSON INTL		LPV200	0	100	0	100	0	100
CYZD	DOWNSVIEW		LPV	0	100	0	100	0	100
CYZF	YELLOWKNIFE		LPV200	1	99.946	2	99.907	12	99.800
CYZG	SALLUIT		LPV	9	99.211	14	99.126	42	98.095
CYZP	SANDSPIT		LPV	0	100	0	100	0	100
CYZR	SARNIA (CHRIS HADFIELD)		LPV	0	100	0	100	0	100
CYZT	PORT HARDY		LPV	0	100	0	100	0	100
CYZU	WHITECOURT		LPV	0	100	0	100	1	99.979
CYZV	SEPT-ILES		LPV200	3	99.709	3	99.696	6	99.605
CYZW	TESLIN		LPV	1	99.983	1	99.971	1	99.953
CYZX	GREENWOOD		LP	2	99.898	2	99.898	4	99.801
CZBB	BOUNDARY BAY		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CZBF	BATHURST		LPV	3	99.778	3	99.774	4	99.705
CZFM	FORT MCPHERSON		LPV	1	99.972	1	99.968	6	99.896
CZFN	TULITA		LPV	1	99.965	2	99.947	8	99.879
CZJG	JENPEG		LPV	1	99.987	4	99.934	9	99.791
CZPB	SACHIGO LAKE		LP	3	99.925	4	99.896	10	99.655
CZPC	PINCHER CREEK		LPV	0	100	0	100	0	100
CZUM	CHURCHILL FALLS		LPV	4	99.583	4	99.537	10	99.311
CZVL	VILLENEUVE		LPV	0	100	0	100	1	99.993

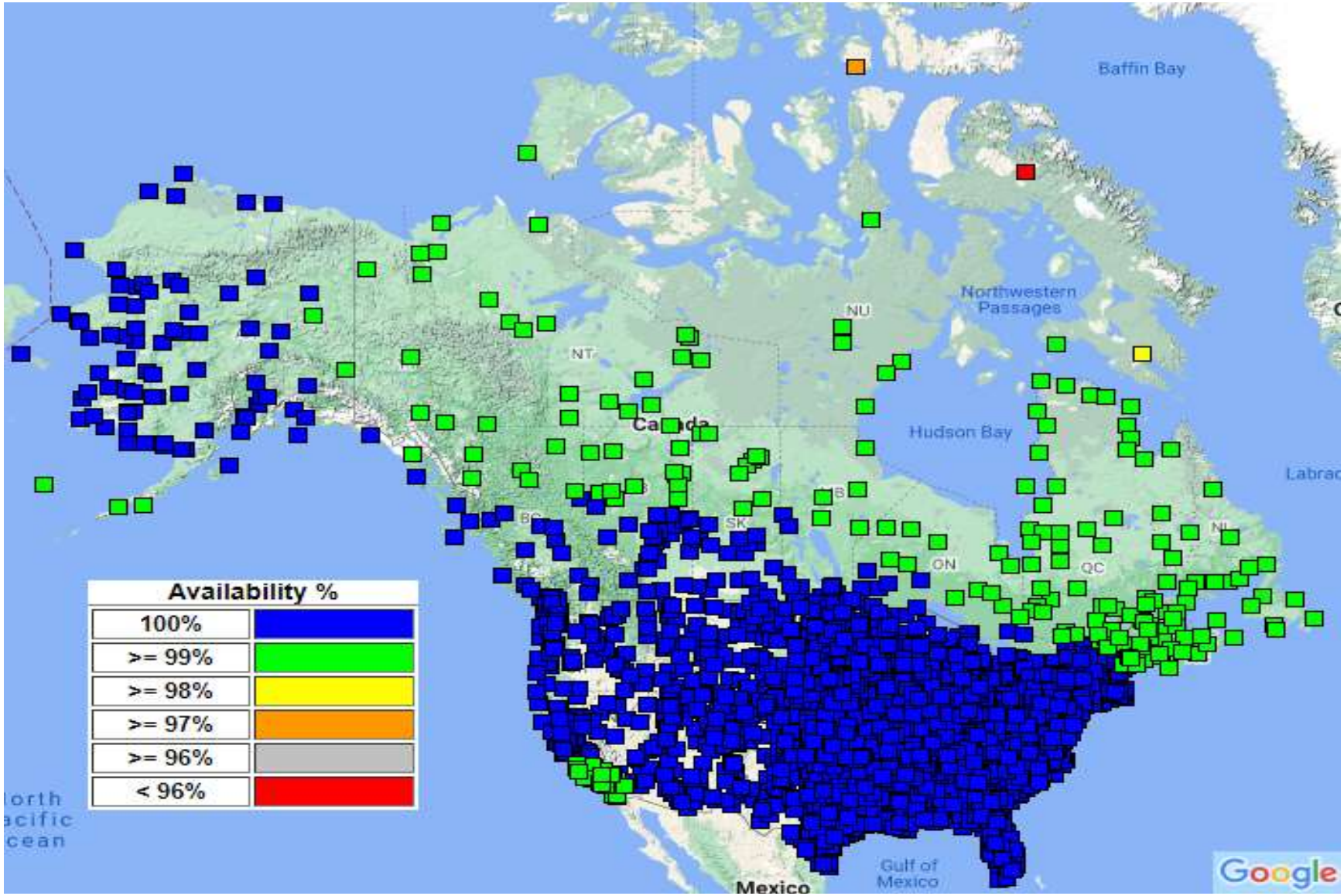

Figure 8-1 WAAS LP Availability at Airports in the U.S. and Canada With GPS RNAV IAPs

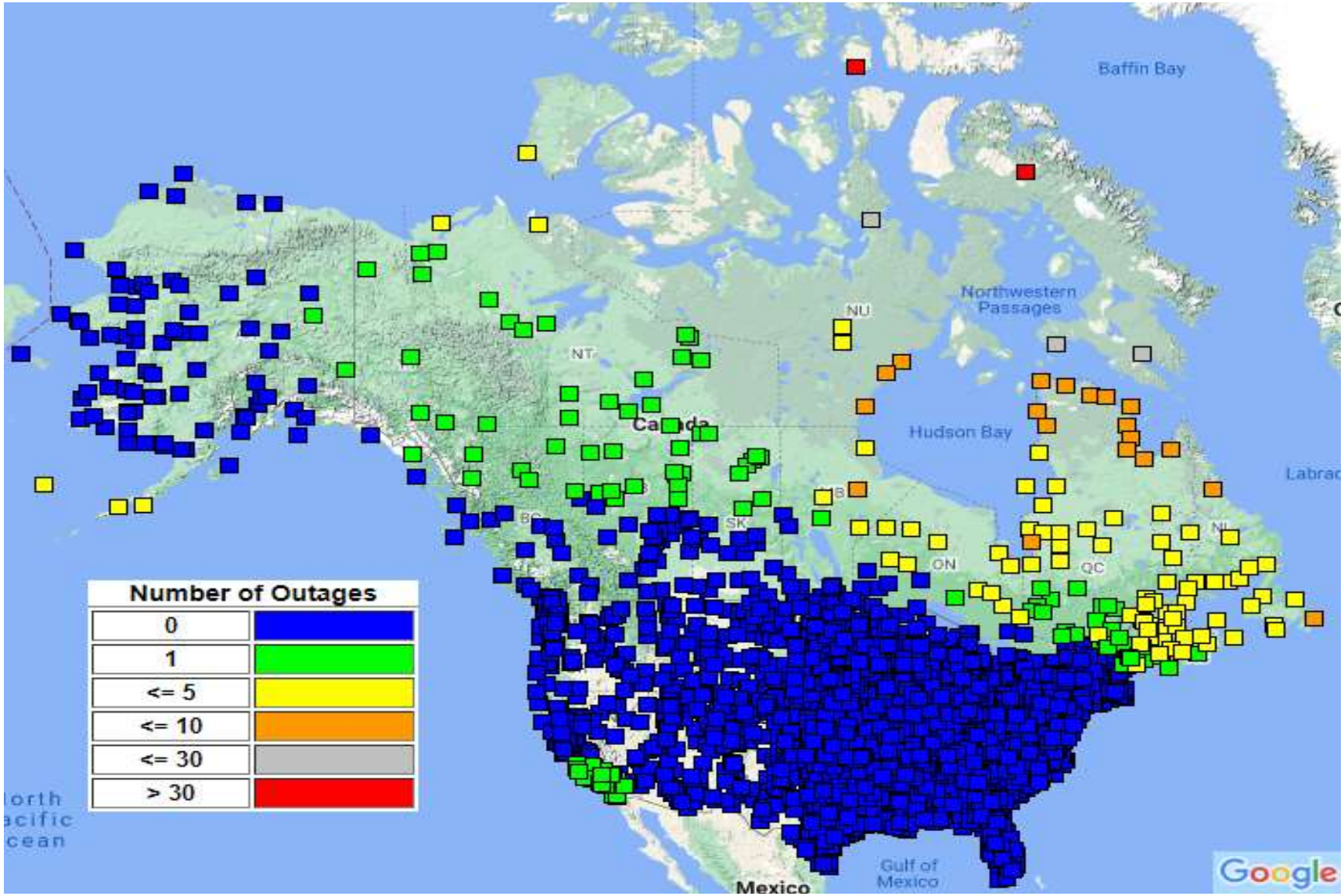

Figure 8-2 WAAS LP Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

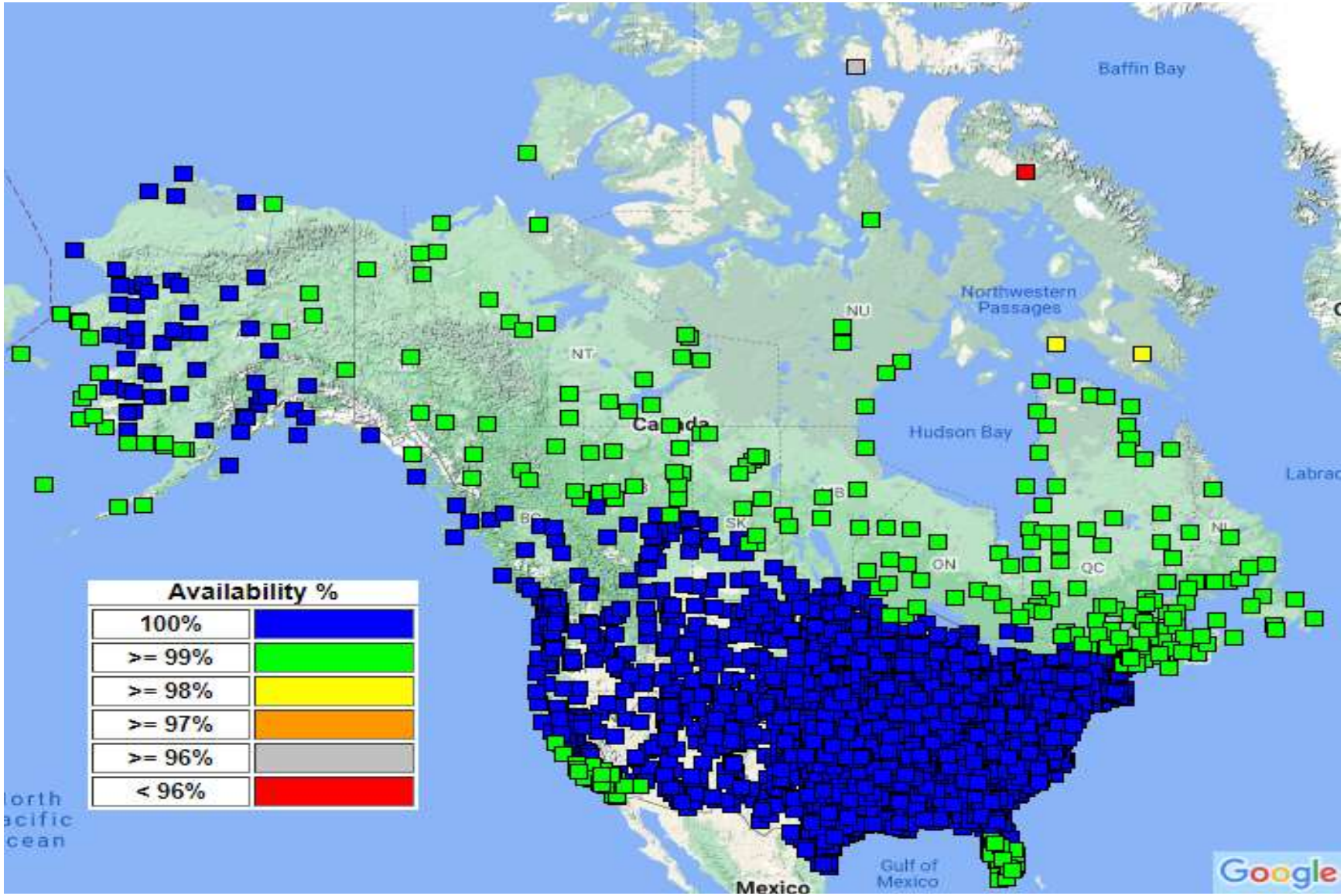

Figure 8-3 WAAS LPV Availability Airports in the U.S. and Canada With GPS RNAV IAPs

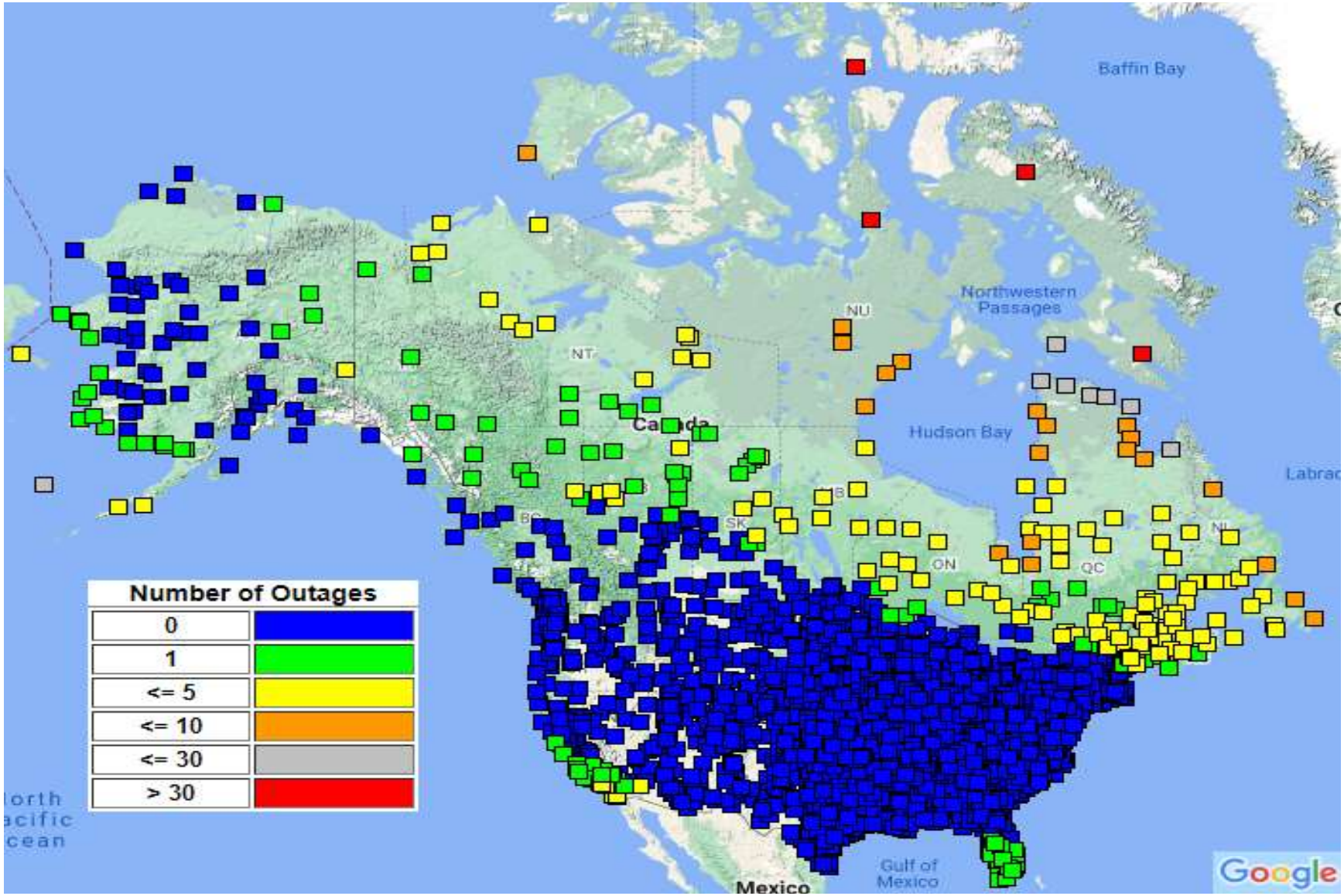

Figure 8-4 WAAS LPV Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

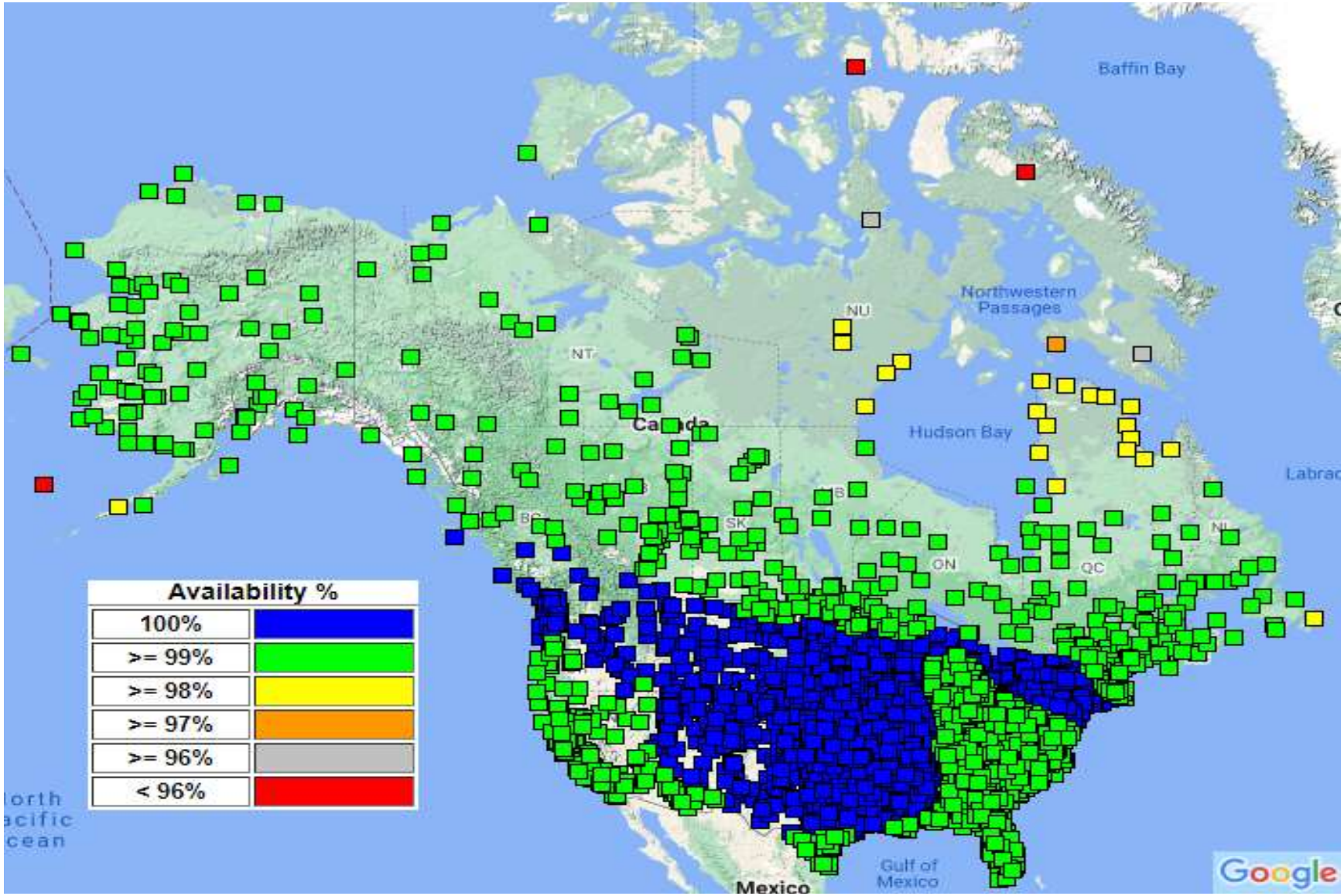

Figure 8-5 WAAS LPV200 Availability at Airports in the U.S. and Canada With GPS RNAV IAPs

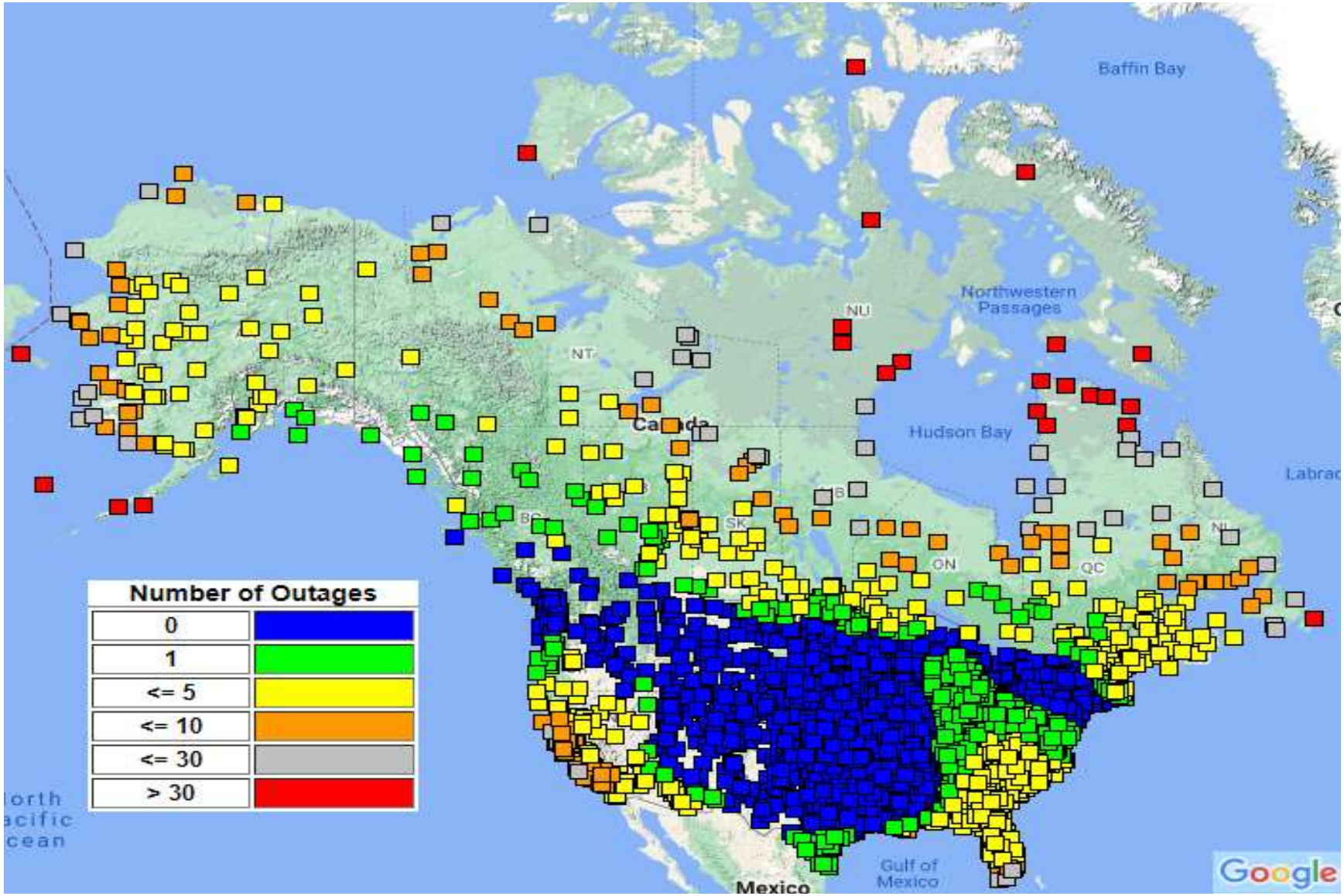

Figure 8-6 WAAS LPV200 Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

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. Figure 9-1 shows the analysis results for the previous 12 months for all three threads of WRE at each WAAS reference station. The color coding represents four levels of performance based on the magnitude and probability distribution of the residual error and the bounding performance of the CNMP algorithm.

Figure 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
Albuquerque	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Anchorage	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Atlanta	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Barrow	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Bethel	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Billings	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Boston	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Chicago	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Cleveland	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Cold Bay	A	•	•	•	•	•	•	•	•	•	–	•	•
	B	•	•	•	•	•	•	•	•	•	–	•	•
	C	•	•	•	•	•	•	•	•	•	–	•	•
Dallas	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Denver	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Fairbanks	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Gander	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Goose Bay	A	•	•	•	•	•	•	–	–	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Honolulu	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Houston	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Iqaluit	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Jacksonville	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•

WAAS Site	WRE	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
Juneau	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kansas City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kotzebue	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Los Angeles	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Memphis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Merida	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Mexico City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	–	–	–	–	–	–	–	–	–	–	–	–
	C	•	•	•	•	•	•	•	•	•	•	•	•
Miami	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Minneapolis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	–
	C	•	•	•	•	•	•	•	•	•	•	•	•
New York	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Oakland	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	–	•	•	•	•	•	•
Puerto Vallarta	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	–	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Salt Lake City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Jose Del Cabo	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Juan	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Seattle	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Tapachula	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	–
	C	•	•	•	•	•	•	•	•	•	•	•	•
Washington, DC	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Winnipeg	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•

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

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 24 hour sets on 01/04/2023. Bethel Thread C (BET3), Mexico City Thread B (MMX2), and Tapachula Thread B (MTP2) are excluded from this since they were out of service at the time of the survey. Each WAAS WRS has three independent threads of WRE: (1) Thread A is also referred to as Thread 1, (2) Thread B is also referred to as Thread 2, and (3) Thread C is referred to as Thread 3.

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

The OPUS-reported RMS quality metrics were 26 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 11.9 mm or less. The OPUS and CSRS surveys agreed to an average of 1.2 cm with a standard deviation of 6.1 mm. The maximum of difference was 3.0 cm at Honolulu Thread A (ZHN1).

The OPUS positions were compared to the positions computed by the WAAS C&Vs. The survey was completed on January 4, 2023. The OPUS surveys agree with the calculated positions to better or equal to 1.6 cm for most sites. The maximum difference was 4.0 cm at Cold Bay Thread C (CDB3).

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	-2965385.25	-972576.665	5543892.788	60.7879134	-161.8417254	52.188
BET2	-2965386.014	-972580.388	5543891.724	60.7878939	-161.8416648	52.18
BET3						
BIL1	-1416446.024	-4223577.014	4550862.069	45.803706	-108.5397248	1112.214
BIL2	-1416450.095	-4223574.853	4550862.793	45.8037155	-108.5397833	1112.207
BIL3	-1416441.725	-4223574.267	4550865.93	45.8037559	-108.5396836	1112.214
BRW1	-1886759.121	-809058.705	6018494.391	71.282763	-156.7899258	15.555
BRW2	-1886756.539	-809055.964	6018495.57	71.2827957	-156.7899677	15.563
BRW3	-1886755.452	-809059.742	6018495.387	71.282791	-156.7898589	15.547
CDB1	-3484099.254	-1084748.806	5213678.497	55.192372	-162.7064053	49.702
CDB2	-3484105.888	-1084741.613	5213675.547	55.1923259	-162.7065441	49.675
CDB3	-3484112.17	-1084734.834	5213672.802	55.1922825	-162.706675	49.695
FAI1	-2304742.02	-1448715.344	5748843.669	64.8096282	-147.847342	150.011
FAI2	-2304741.563	-1448706.539	5748846.064	64.8096786	-147.8474938	150.019
FAI3	-2304733.042	-1448707.472	5748849.219	64.8097451	-147.8473817	150.015
JNU1	-2354255.155	-2388549.718	5407043.178	58.3625731	-134.5857094	16.277
JNU2	-2354253.074	-2388565.839	5407037.023	58.3624676	-134.5854907	16.293
JNU3	-2354239.851	-2388568.681	5407041.473	58.362544	-134.5852957	16.274
MMD1	35070.326	-5959686.644	2264365.764	20.9319093	-89.6628416	29.096
MMD2	35065.406	-5959687.014	2264364.983	20.9319016	-89.6628889	29.136
MMD3	35065.069	-5959685.223	2264369.636	20.9319467	-89.662892	29.123
MMX1	-948700.735	-5943932.848	2109211.766	19.4316539	-99.0683904	2232.66
MMX2						
MMX3	-948705.158	-5943933.032	2109209.361	19.4316308	-99.0684317	2232.689

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
MPR1	-1570142.289	-5759530.587	2238184.734	20.6790031	-105.2492039	10.972
MPR2	-1570139.465	-5759530.11	2238188.788	20.6790412	-105.2491789	11.278
MPR3	-1570143.571	-5759527.973	2238190.546	20.6790592	-105.2492223	10.98
MSD1	-1979520.203	-5523222.781	2493107.004	23.160449	-109.7176534	104.283
MSD2	-1979521.768	-5523225.122	2493100.611	23.1603862	-109.7176601	104.28
MSD3	-1979526.21	-5523221.853	2493104.283	23.1604223	-109.7177117	104.273
MTP1	-254854.404	-6162909.126	1617805.088	14.7913663	-92.3679997	54.911
MTP2						
MTP3	-254855.556	-6162910.28	1617800.136	14.7913202	-92.3680099	54.807
OTZ1	-2396056.223	-750356.229	5843502.395	66.88733	-162.6113728	10.858
OTZ2	-2396053.051	-750354.387	5843503.921	66.8873649	-162.6113913	10.858
OTZ3	-2396053.032	-750358.338	5843503.431	66.8873535	-162.6113051	10.863
YFB1	1035381.259	-2634289.674	5696539.615	63.7314911	-68.5431872	10.078
YFB2	1035372.045	-2634296.093	5696538.246	63.7314647	-68.5434083	10.002
YFB3	1035365.97	-2634306.853	5696534.467	63.7313871	-68.5436025	10.062
YQX1	2430424.477	-3419640.423	4788223.907	48.9664909	-54.5976342	146.892
YQX2	2430432.42	-3419639.078	4788220.855	48.9664491	-54.5975351	146.891
YQX3	2430440.324	-3419637.717	4788217.859	48.9664079	-54.5974363	146.908
YWG1	-520164.576	-4083475.979	4855842.983	49.9005736	-97.2594003	222.098
YWG2	-520150.708	-4083468.93	4855850.381	49.9006766	-97.2592212	222.124
YWG3	-520152.58	-4083478.037	4855842.556	49.9005675	-97.2592311	222.11
YYR1	1885341.258	-3321428.397	5091171.752	53.308648	-60.4194707	37.894
YYR2	1885344.22	-3321419.915	5091176.164	53.3087143	-60.4193693	37.898
YYR3	1885339.935	-3321413.089	5091182.156	53.3088045	-60.4193746	37.892
ZAB1	-1488636.979	-5003946.539	3654557.664	35.1735749	-106.5673512	1620.131
ZAB2	-1488631.644	-5003948.225	3654557.641	35.1735742	-106.5672899	1620.196
ZAB3	-1488632.422	-5003950.808	3654553.785	35.1735318	-106.56729	1620.179
ZAN1	-2659536.791	-1549114.682	5567750.723	61.229201	-149.7802537	80.703
ZAN2	-2659548.55	-1549110.73	5567746.234	61.2291174	-149.7804275	80.702
ZAN3	-2659541.497	-1549106.603	5567750.71	61.229201	-149.7804278	80.692
ZAU1	138703.962	-4761244.126	4227763.915	41.7826581	-88.3313385	195.862
ZAU2	138704.226	-4761248.744	4227758.755	41.7825957	-88.331337	195.872
ZAU3	138710.928	-4761248.479	4227758.834	41.7825966	-88.3312563	195.872
ZBW1	1490299.066	-4448983.185	4306010.53	42.7357209	-71.4804277	39.111
ZBW2	1490304.181	-4448981.179	4306010.876	42.7357249	-71.4803607	39.142
ZBW3	1490305.889	-4448984.802	4306006.565	42.7356721	-71.480355	39.139
ZDC1	1069125.612	-4839598.986	4001126.522	39.1015962	-77.5427482	80.047
ZDC2	1069128.009	-4839603.615	4001120.32	39.1015242	-77.5427327	80.044
ZDC3	1069123.911	-4839602.702	4001122.518	39.1015497	-77.5427767	80.053
ZDV1	-1273628.759	-4711375.574	4094890.07	40.1873028	-105.1272261	1541.358
ZDV2	-1273623.058	-4711377.091	4094890.084	40.187303	-105.1271568	1541.349
ZDV3	-1273625.07	-4711380.288	4094885.796	40.1872525	-105.1271698	1541.341
ZFW1	-659983.322	-5324060.775	3438276.446	32.8306495	-97.0664731	155.616
ZFW2	-659988.595	-5324063.324	3438271.45	32.8305961	-97.0665256	155.578
ZFW3	-659983.62	-5324063.859	3438271.661	32.8305981	-97.0664722	155.624
ZHN1	-5508637.208	-2234492.653	2303722.511	21.3129934	-157.9208338	24.648
ZHN2	-5508656.385	-2234482.98	2303687.274	21.3126506	-157.9209897	25.009

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZHN3	-5508647.787	-2234496.916	2303694.373	21.3127192	-157.9208341	25.047
ZHU1	-513864.583	-5506451.63	3166720.422	29.9618962	-95.3314275	10.768
ZHU2	-513867.231	-5506455.03	3166714.262	29.9618317	-95.3314515	10.838
ZHU3	-513873.51	-5506457.669	3166708.663	29.9617735	-95.3315138	10.823
ZJX1	772646.331	-5434462.203	3237231.768	30.6988599	-81.9081863	2.147
ZJX2	772649.659	-5434463.749	3237228.369	30.6988243	-81.9081542	2.131
ZJX3	772645.592	-5434466.174	3237225.259	30.6987918	-81.9081998	2.115
ZKC1	-415247.653	-4954556.384	3982161.095	38.8801592	-94.7908354	305.89
ZKC2	-415231.261	-4954557.702	3982161.145	38.8801599	-94.7906459	305.878
ZKC3	-415237.38	-4954561.051	3982155.952	38.8801017	-94.7907129	305.614
ZLA1	-2474410.152	-4637294.486	3602183.602	34.603519	-118.0838983	763.516
ZLA2	-2474404.883	-4637297.293	3602183.606	34.6035191	-118.0838332	763.515
ZLA3	-2474411.477	-4637296.967	3602179.624	34.6034751	-118.0838983	763.572
ZLC1	-1808273.373	-4486410.816	4145302.968	40.7860426	-111.9521793	1287.439
ZLC2	-1808274.757	-4486414.437	4145298.47	40.7859892	-111.9521785	1287.436
ZLC3	-1808270.555	-4486416.141	4145298.473	40.7859891	-111.9521248	1287.445
ZMA1	966042.193	-5662999.811	2761581.525	25.8246125	-80.3191908	-7.603
ZMA2	966029.222	-5662999.113	2761586.012	25.8246603	-80.3193172	-8.231
ZMA3	966037.3	-5662997.953	2761586.366	25.8246623	-80.3192358	-7.884
ZME1	4070.752	-5226189.306	3644028.427	35.0673941	-89.9553715	68.613
ZME2	4070.784	-5226186.744	3644032.531	35.0674376	-89.9553712	68.874
ZME3	4064.592	-5226186.621	3644032.688	35.0674395	-89.955439	68.859
ZMP1	-249978.538	-4539297.489	4458955.012	44.637463	-93.1520875	262.625
ZMP2	-249972.735	-4539297.831	4458955.013	44.6374629	-93.1520142	262.641
ZMP3	-249973.833	-4539302.111	4458950.535	44.6374068	-93.1520251	262.579
ZNY1	1406144.479	-4627343.965	4144322.105	40.7843293	-73.0971674	6.433
ZNY2	1406146.281	-4627347.017	4144317.306	40.7842763	-73.0971575	5.906
ZNY3	1406140.722	-4627348.672	4144317.341	40.7842767	-73.0972262	5.904
ZOA1	-2684437.094	-4293337.196	3865351.944	37.5430548	-122.0159512	-3.499
ZOA2	-2684434.085	-4293341.273	3865349.518	37.5430272	-122.0158978	-3.502
ZOA3	-2684438.461	-4293342.158	3865345.669	37.5429829	-122.0159345	-3.413
ZOB1	650770.031	-4754715.666	4187420.755	41.2971546	-82.2064465	223.664
ZOB2	650777.71	-4754714.84	4187422.773	41.297167	-82.2063544	225.164
ZOB3	650776.04	-4754719.666	4187414.984	41.2970872	-82.2063819	223.445
ZSE1	-2308930.373	-3668169.666	4663526.414	47.2869926	-122.188374	82.084
ZSE2	-2308934.761	-3668175.212	4663520.008	47.286907	-122.188384	82.147
ZSE3	-2308935.824	-3668179.483	4663516.062	47.2868553	-122.1883659	82.083
ZSU1	2462589.487	-5529372.054	2003724.598	18.431337	-65.9934761	-28.098
ZSU2	2462587.555	-5529377.421	2003712.305	18.4312198	-65.9935135	-28.079
ZSU3	2462594.182	-5529375.159	2003710.224	18.4312002	-65.9934474	-28.14
ZTL1	529840.281	-5305248.828	3489342.87	33.3796887	-84.2967273	261.151
ZTL2	529846.657	-5305247.982	3489343.151	33.3796919	-84.2966582	261.131
ZTL3	529847.342	-5305251.424	3489337.919	33.3796352	-84.2966546	261.17

Figure 10-1 to Figure 10-3 show the RSS of the ECEF differences between the OPUS survey antenna phase center locations and the locations in the C&V computed positions. Figure 10-4 to Figure 10-6 show the OPUS surveys overall RMS quality indications.

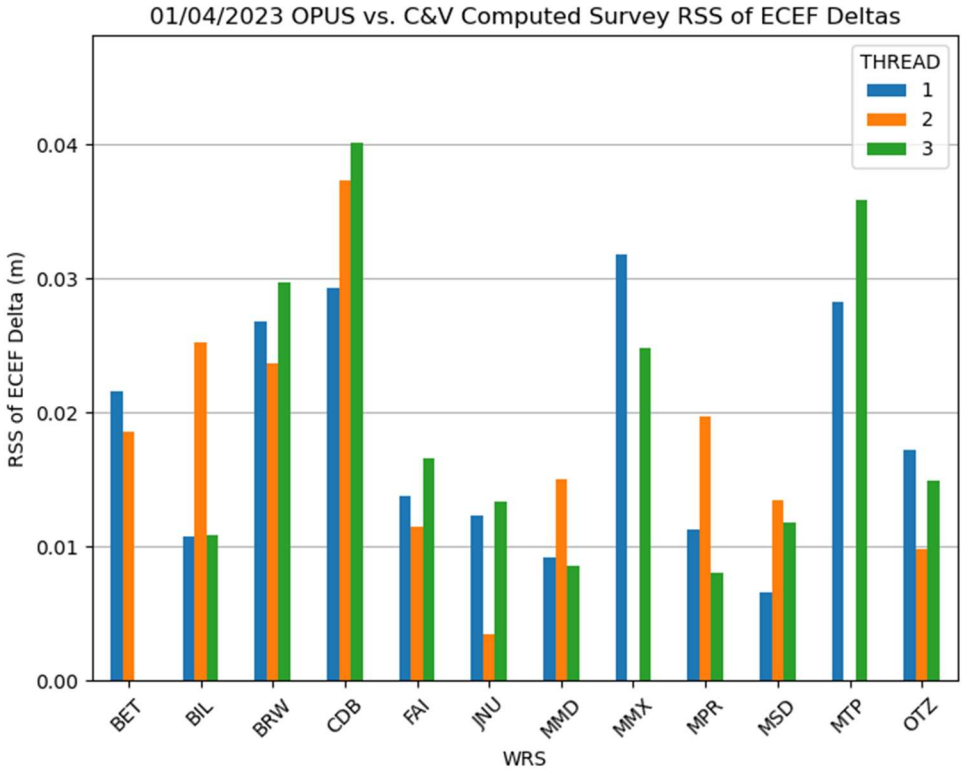

Figure 10-1 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey (1 of 3)

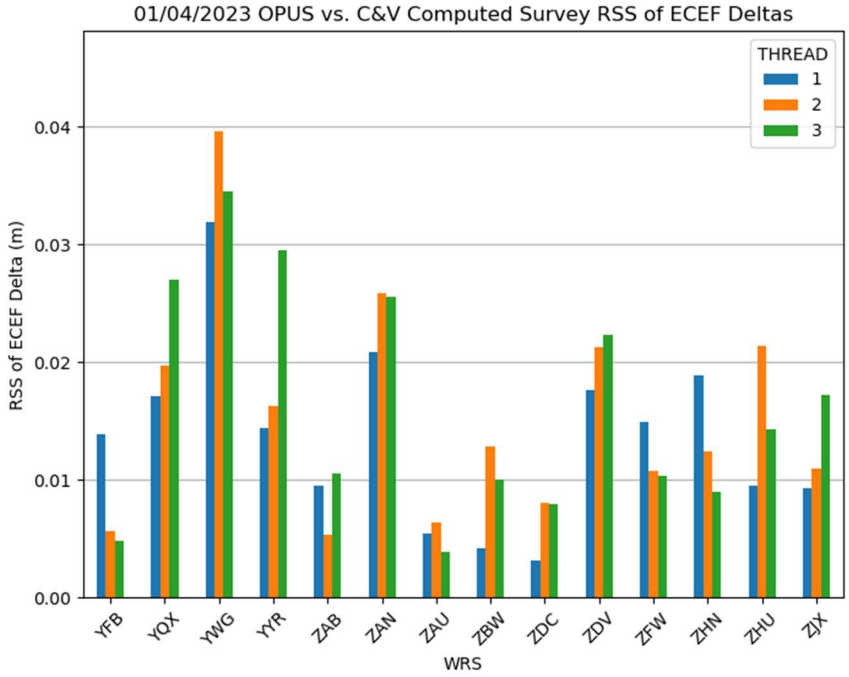

Figure 10-2 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey (2 of 3)

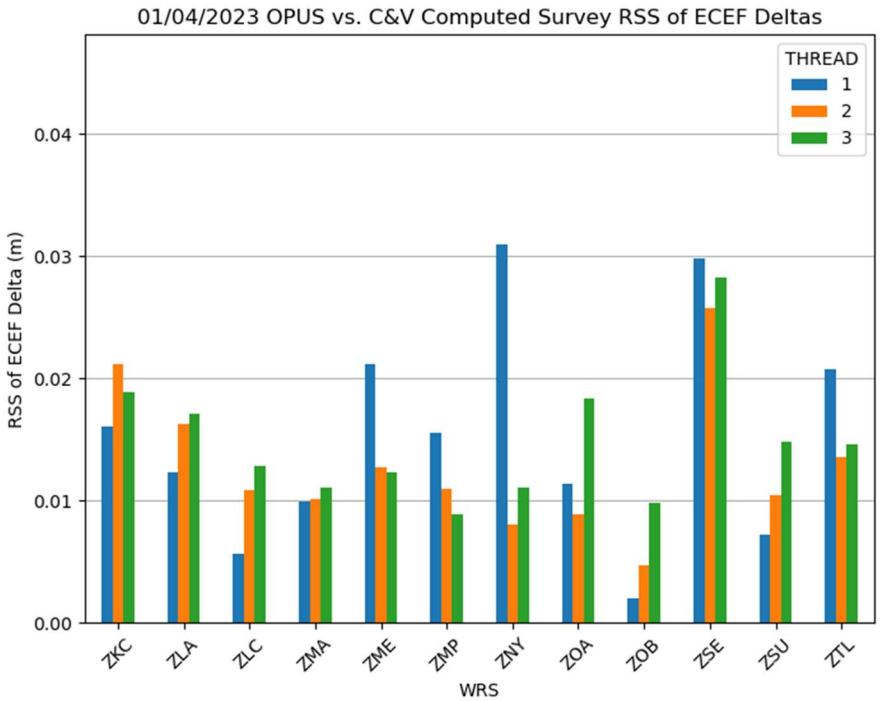

Figure 10-3 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey (3 of 3)

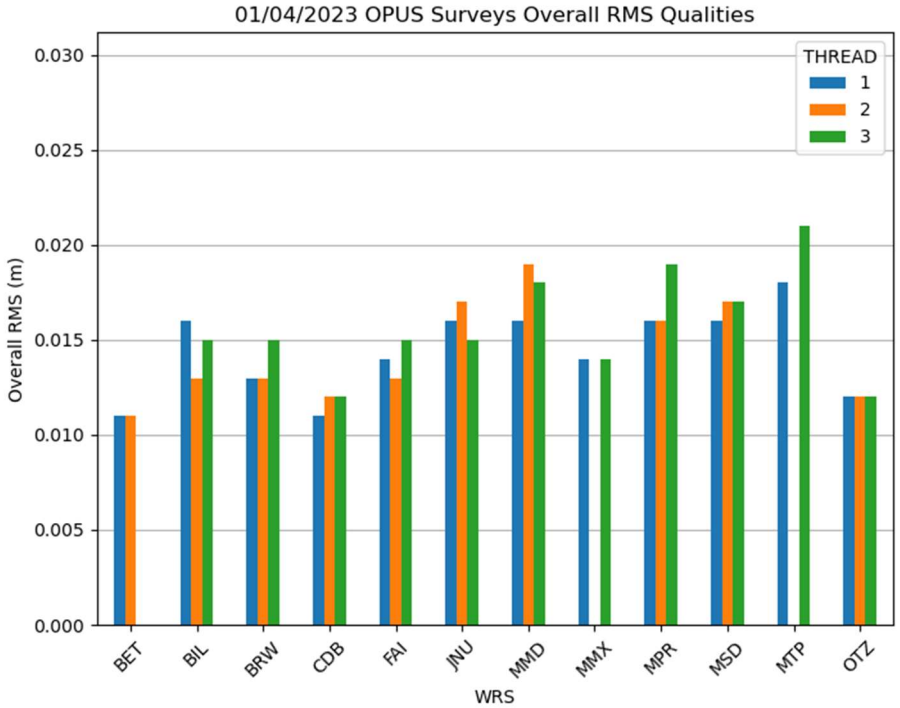

Figure 10-4 OPUS Survey Overall RMS Qualities (1 of 3)

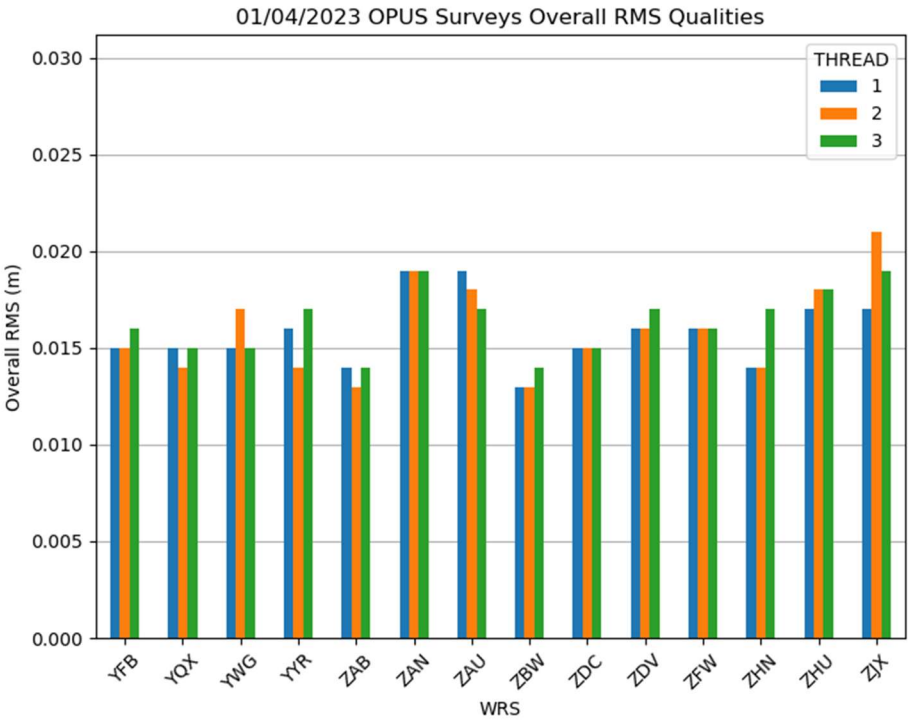

Figure 10-5 OPUS Survey Overall RMS Qualities (2 of 3)

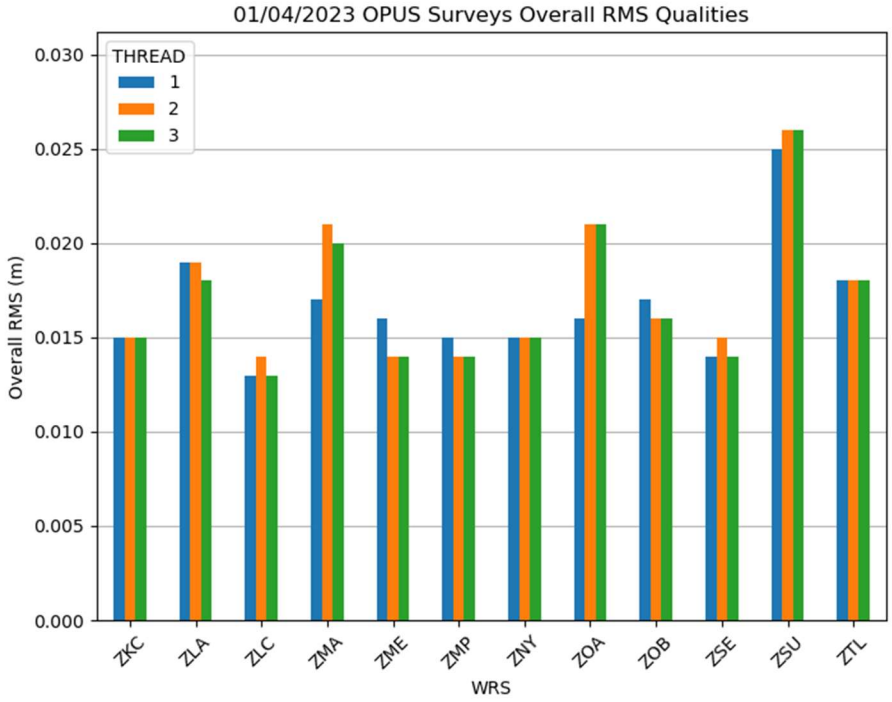

Figure 10-6 OPUS Survey Overall RMS Qualities (3 of 3)

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.

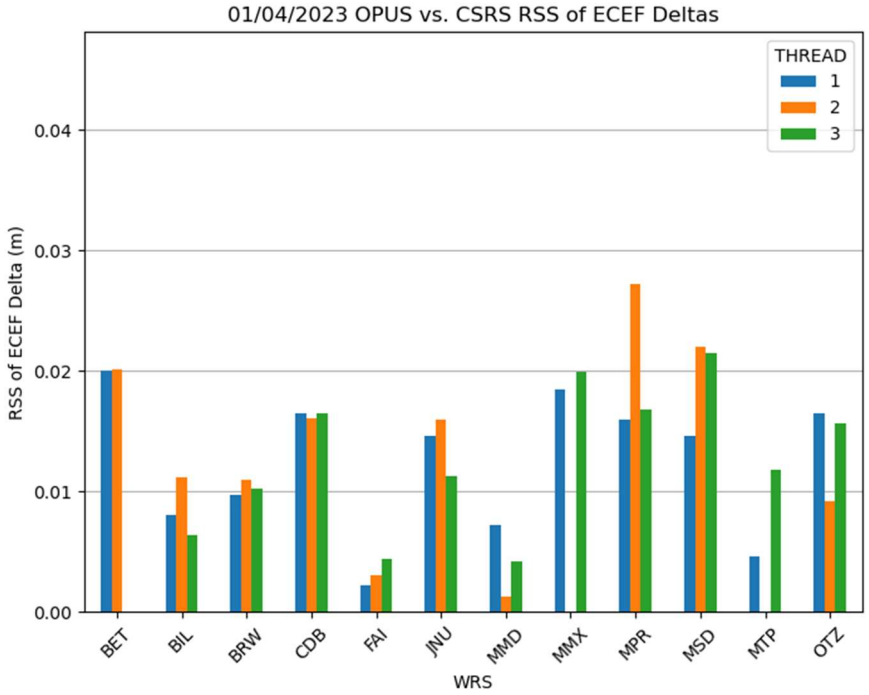

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas (1 of 3)

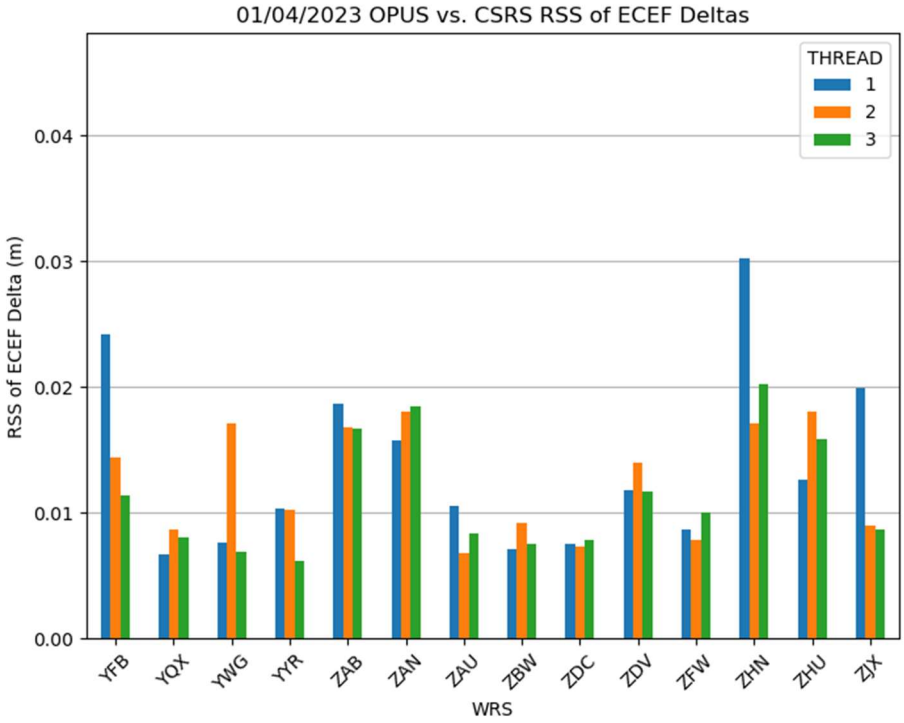

Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas (2 of 3)

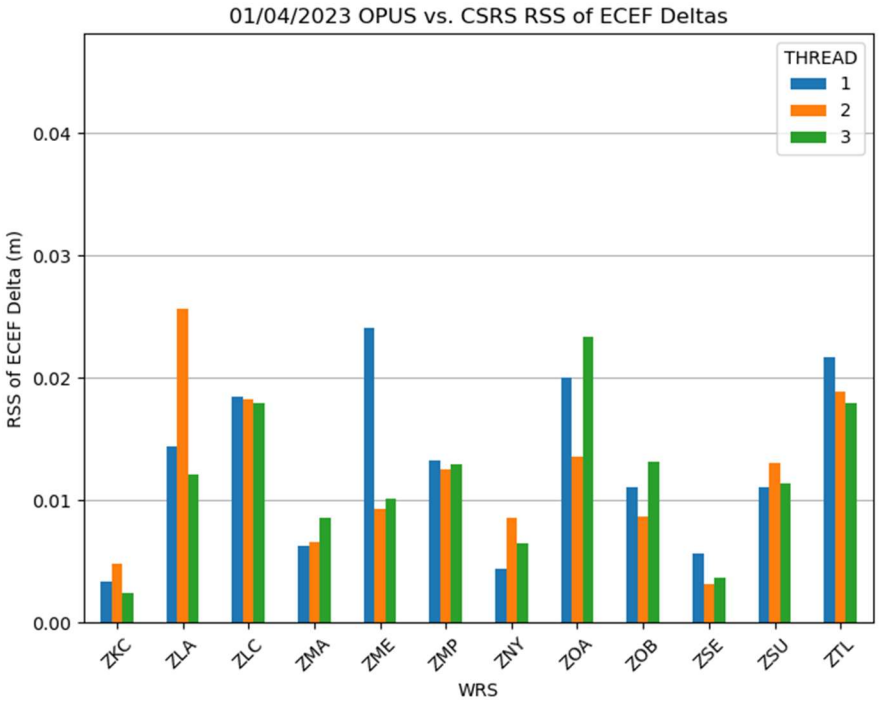

Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas (3 of 3)

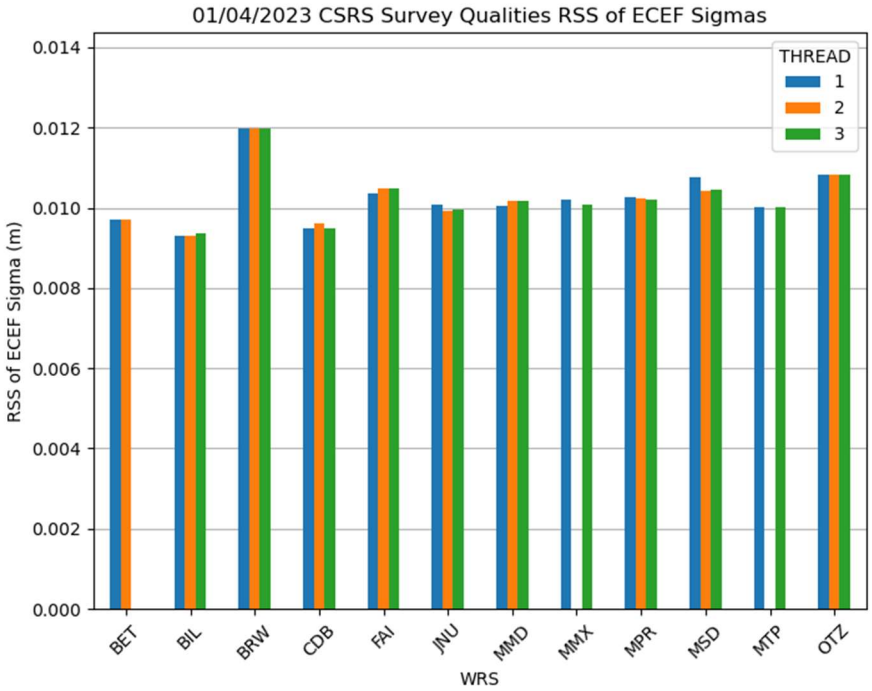

Figure 10-10 CSRS Survey Qualities (1 of 3)

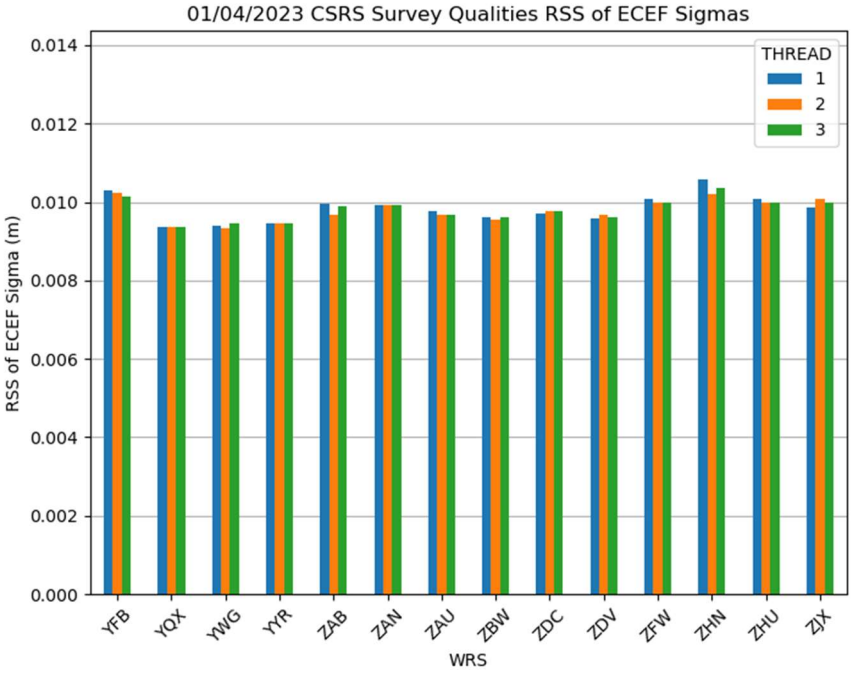

Figure 10-11 CSRS Survey Qualities (2 of 3)

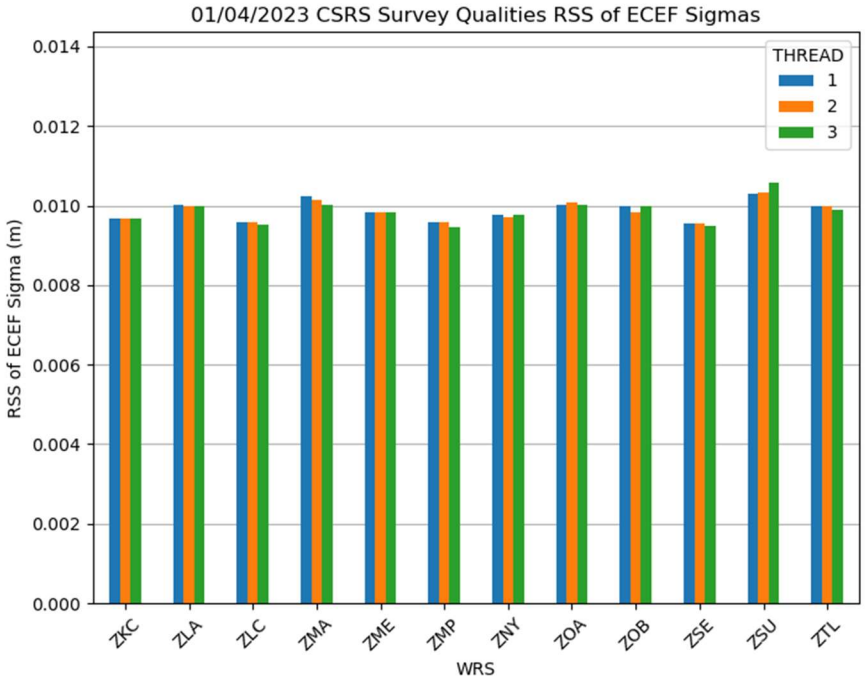

Figure 10-12 CSRS Survey Qualities (3 of 3)

11.0 SQM

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

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

11.1 Alpha Metrics

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

Table 11-1 Alpha Metrics

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

11.2 Type Bias

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

For this reporting period, the GEO-type biases were not evaluated. Table 11-2 shows the rollup averages for the quarter.

Table 11-3 shows the rollup averages since January 1, 2008. Figure 11-1 shows the daily averages of the four detection metrics for the quarter.

Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31752	1.31939	1.32137
DM 2	0.243311	0.246383	0.249509
DM 3	0.972675	0.973143	0.973794
DM 4	-0.188071	-0.189897	-0.191889

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31913	1.32132	1.32307
DM 2	0.241977	0.245174	0.24831
DM 3	0.972972	0.97347	0.974045
DM 4	-0.187252	-0.18892	-0.190933

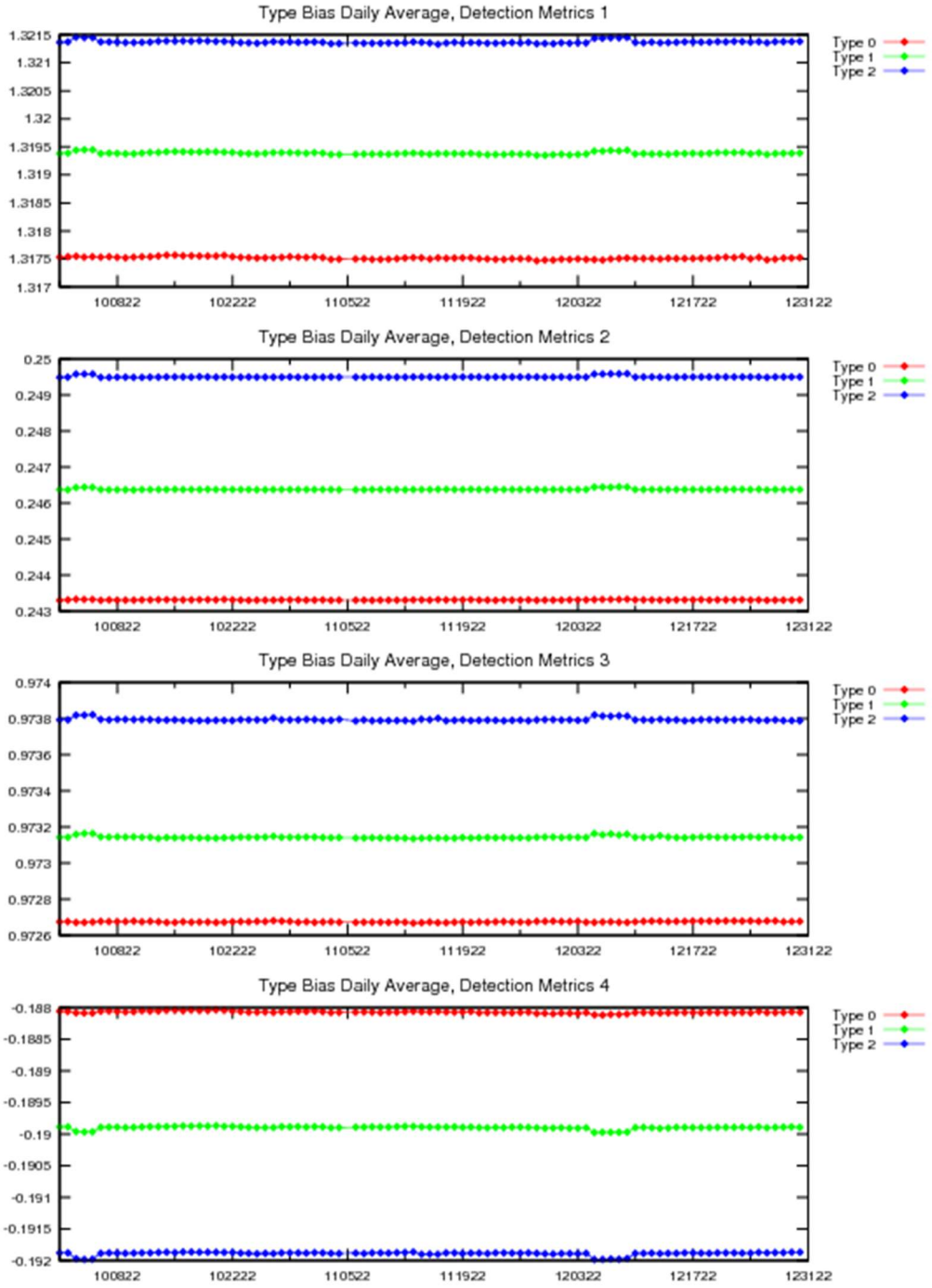

Figure 11-1 Type Bias Average Trend

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 0.000874679 observed on PRN22, (2) the maximum average for DM2 is 0.000209812 observed on PRN19, (3) the maximum average for DM3 is 0.000442028 observed on PRN18, (4) the maximum average for DM4 is 0.000478781 observed on PRN22.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000221939	9.52356e-05	4.699e-05	0.000150753
2	0.000263017	6.97267e-05	0.000107044	0.000122379
3	0.000226138	6.00478e-05	9.913e-05	0.000132877
4	0.000708438	0.000259364	0.000399363	0.00025983
5	0.000176328	7.692e-05	0.000103419	0.000108993
6	0.00061845	9.96811e-05	5.90344e-05	0.000237072
7	0.000173829	0.000124742	4.54844e-05	0.000133547
8	0.000359416	9.62556e-05	0.000115384	0.000178667
9	0.000241434	4.15956e-05	0.00016536	0.000177676
10	0.000199404	5.686e-05	7.92244e-05	0.0001767
11	0.000323717	0.000148466	0.00038606	0.000334454
12	0.000331754	0.000104321	8.35933e-05	9.07278e-05
13	0.000648824	6.12167e-05	5.36256e-05	0.000274718
14	0.000503213	0.000203022	0.000402628	0.000259381
15	0.000380319	0.000118294	5.34989e-05	0.000102821
16	0.000219681	5.08867e-05	0.000116196	0.000221171
17	0.000372956	0.000107056	5.15767e-05	9.201e-05
18	0.00064762	0.00018925	0.000442028	0.00027445
19	0.000745996	0.000209812	8.61522e-05	0.00013826
20	0.000179033	6.97933e-05	4.846e-05	0.000145877
21	0.000217717	9.45711e-05	0.000112587	0.000448479
22	0.000874679	7.80378e-05	6.00956e-05	0.000478781
23	0.000396796	0.000174979	0.000368389	0.000275094
24	0.000224342	8.89411e-05	0.000193819	0.000260827
25	0.000480611	9.17811e-05	4.05244e-05	0.000214969
26	0.000230522	0.000107594	0.000115762	0.00018528
27	0.000389708	0.000168207	0.00018751	0.000351941
28				
29	0.000297516	0.000123781	0.000152311	0.000256749
30	0.000323356	7.69833e-05	0.000107339	0.000101927
31	0.000256703	8.52e-05	9.09967e-05	0.000194706
32	0.000244772	5.65444e-05	6.44256e-05	0.000197729

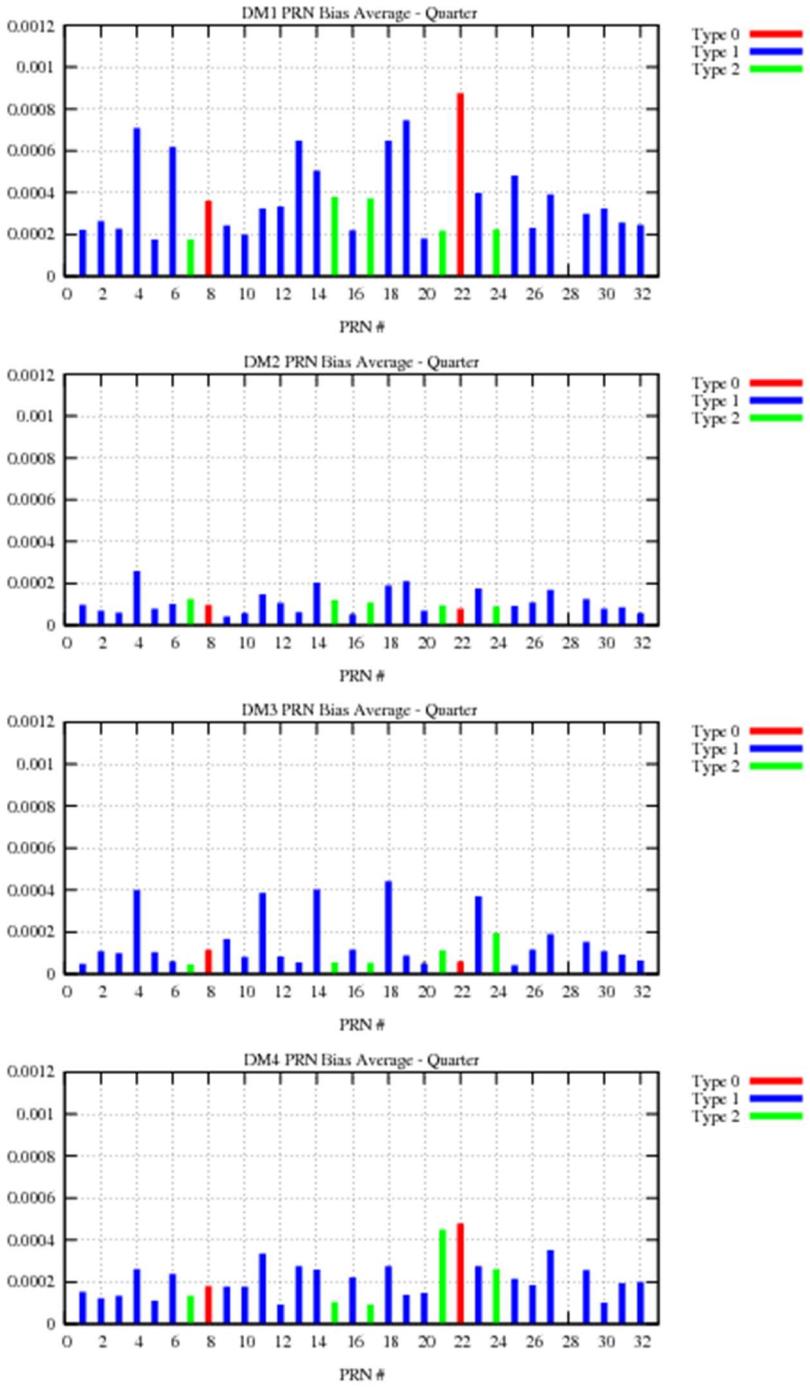

Figure 11-2 PRN Bias Average for the Quarter

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

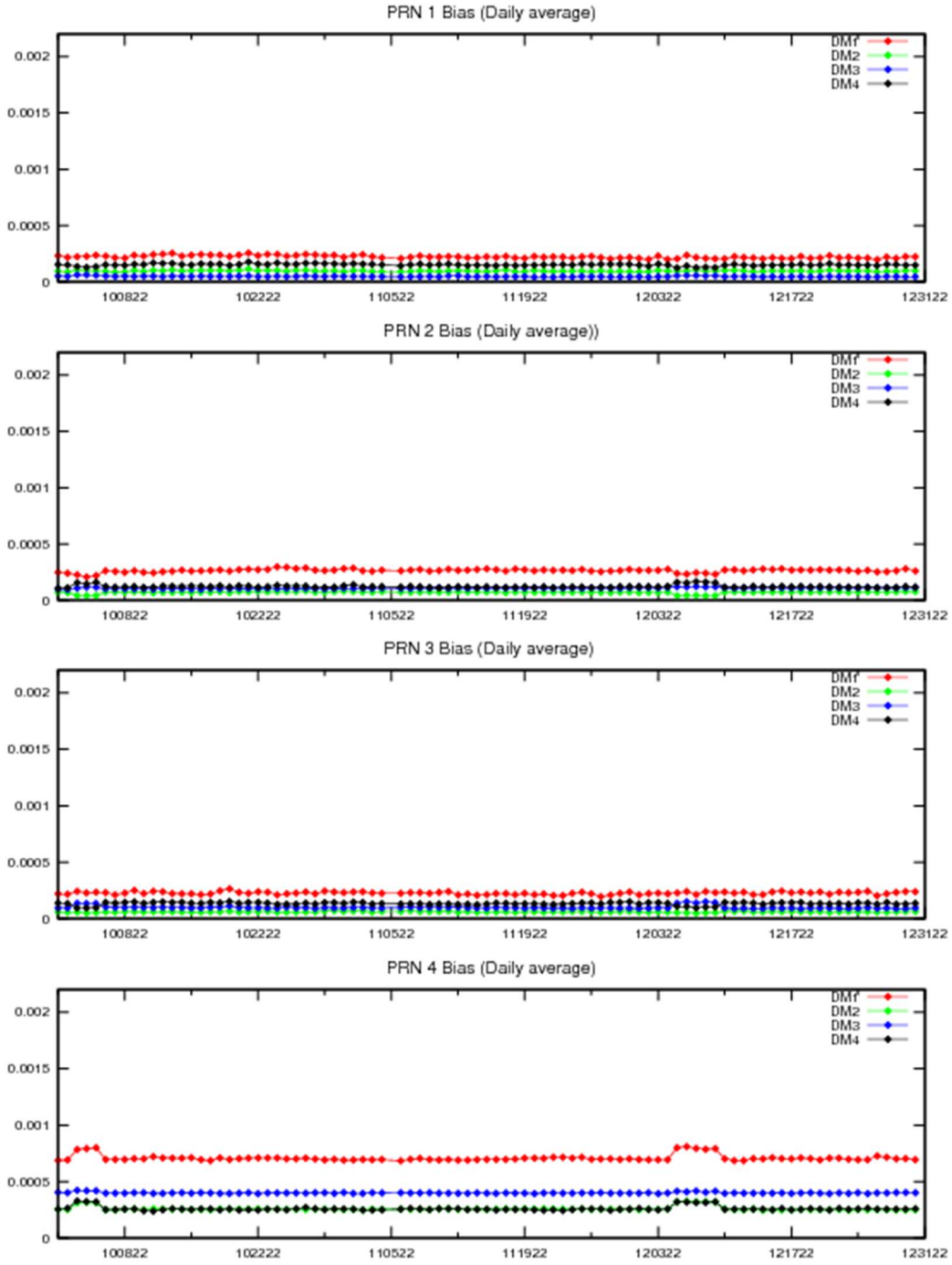

Figure 11-3 PRN Bias Average Trend (PRN1–PRN4)

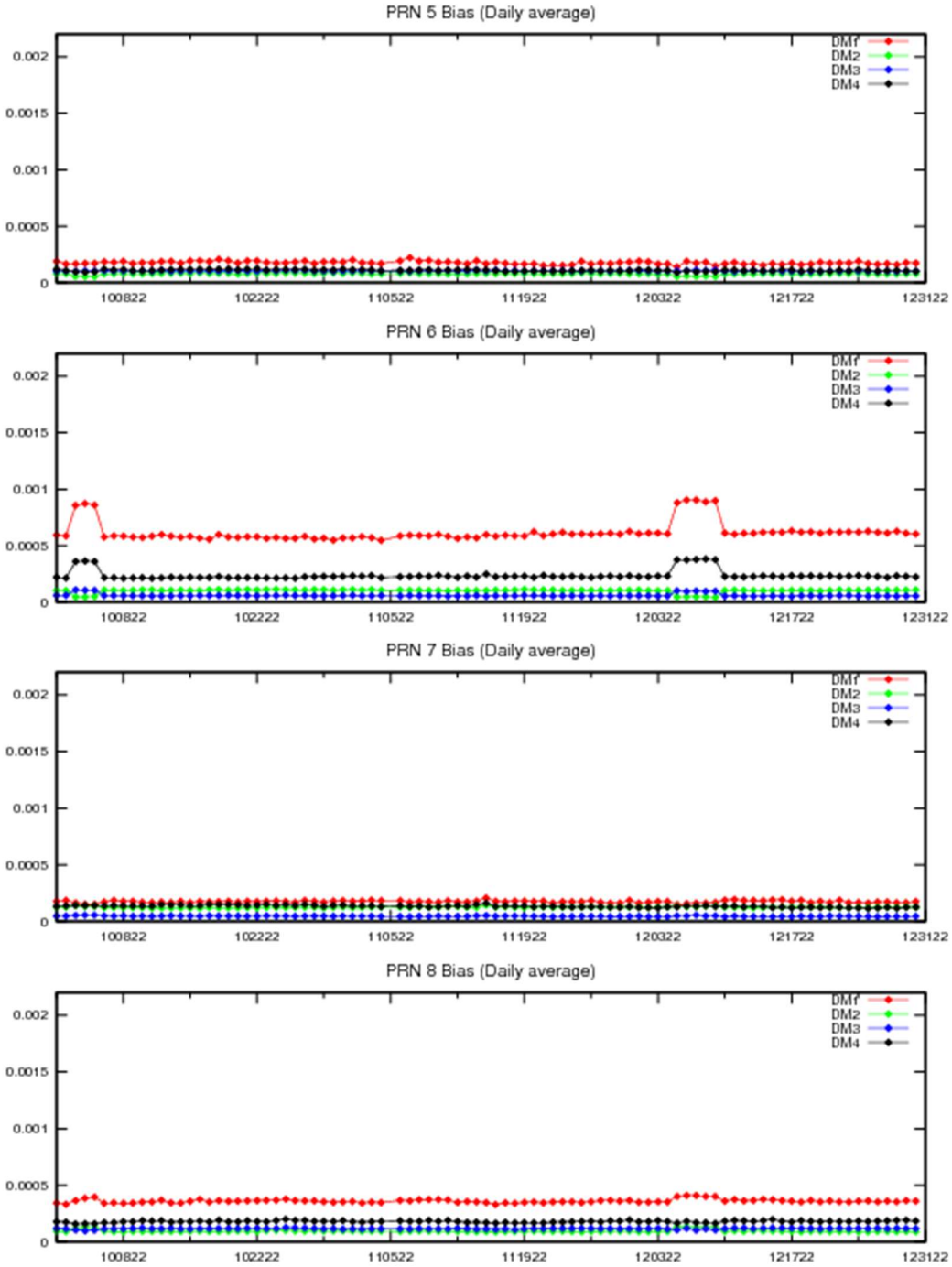

Figure 11-4 PRN Bias Average Trend (PRN5–PRN8)

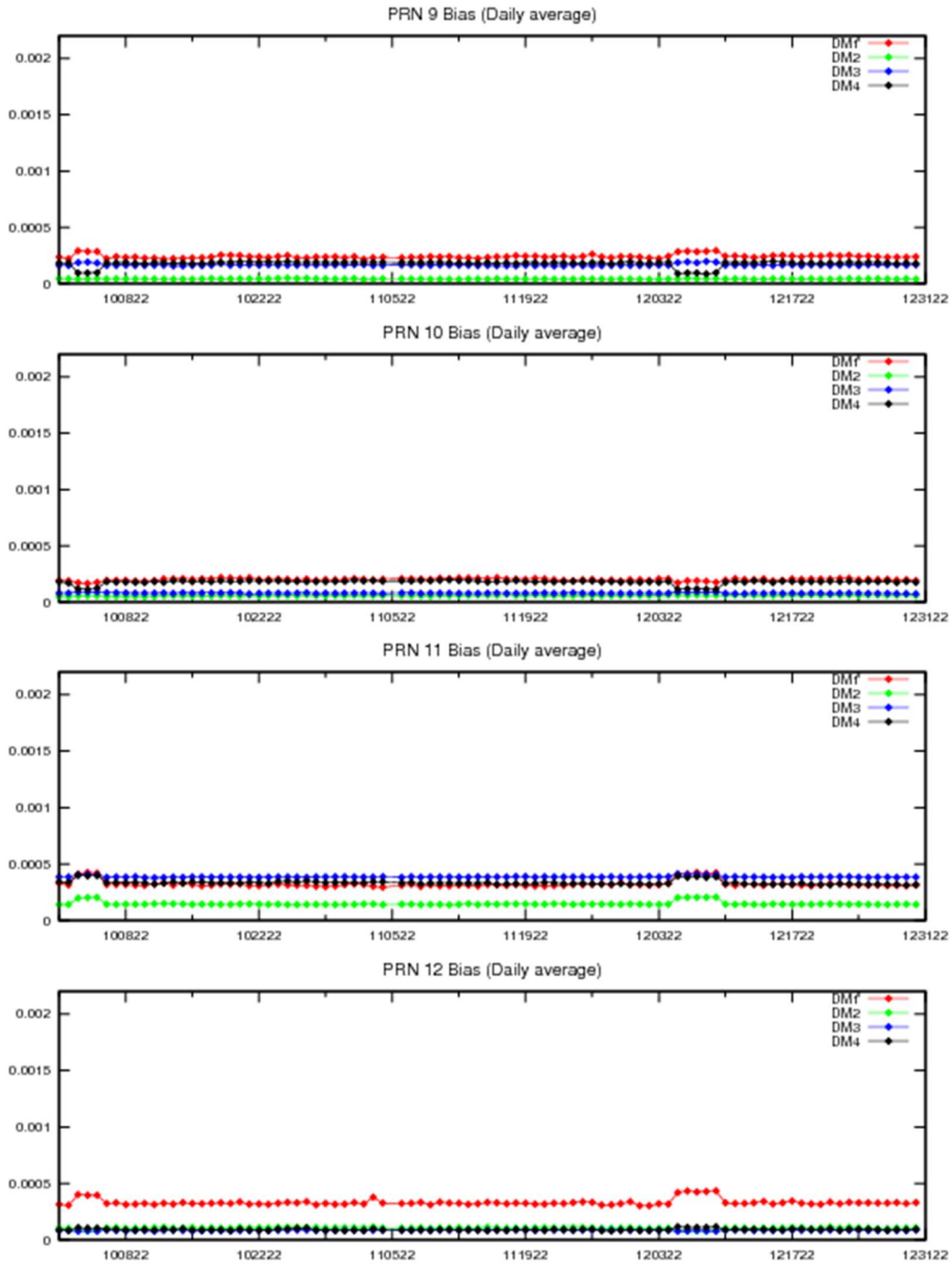

Figure 11-5 PRN Bias Average Trend (PRN9–PRN12)

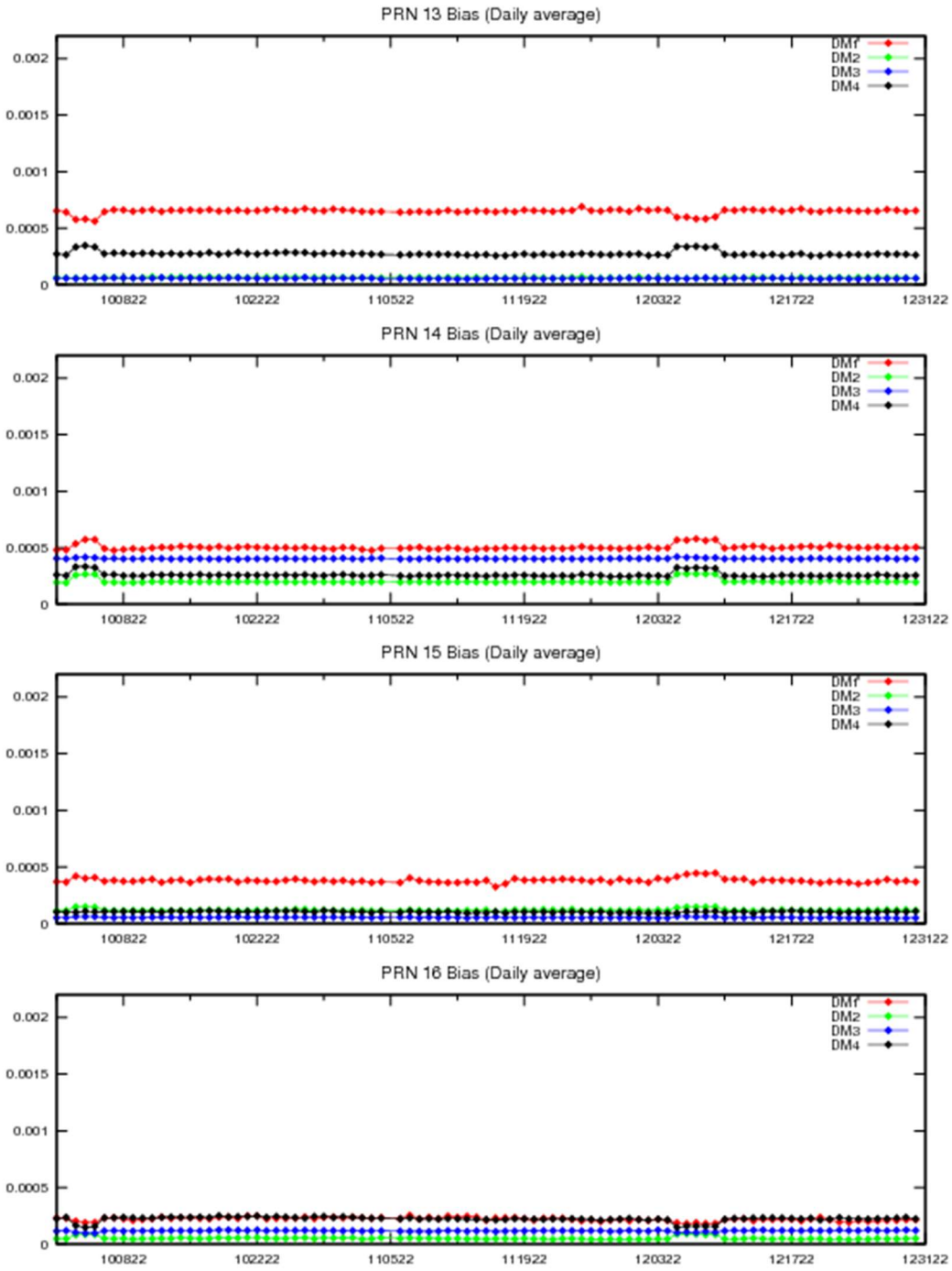

Figure 11-6 PRN Bias Average Trend (PRN13–PRN16)

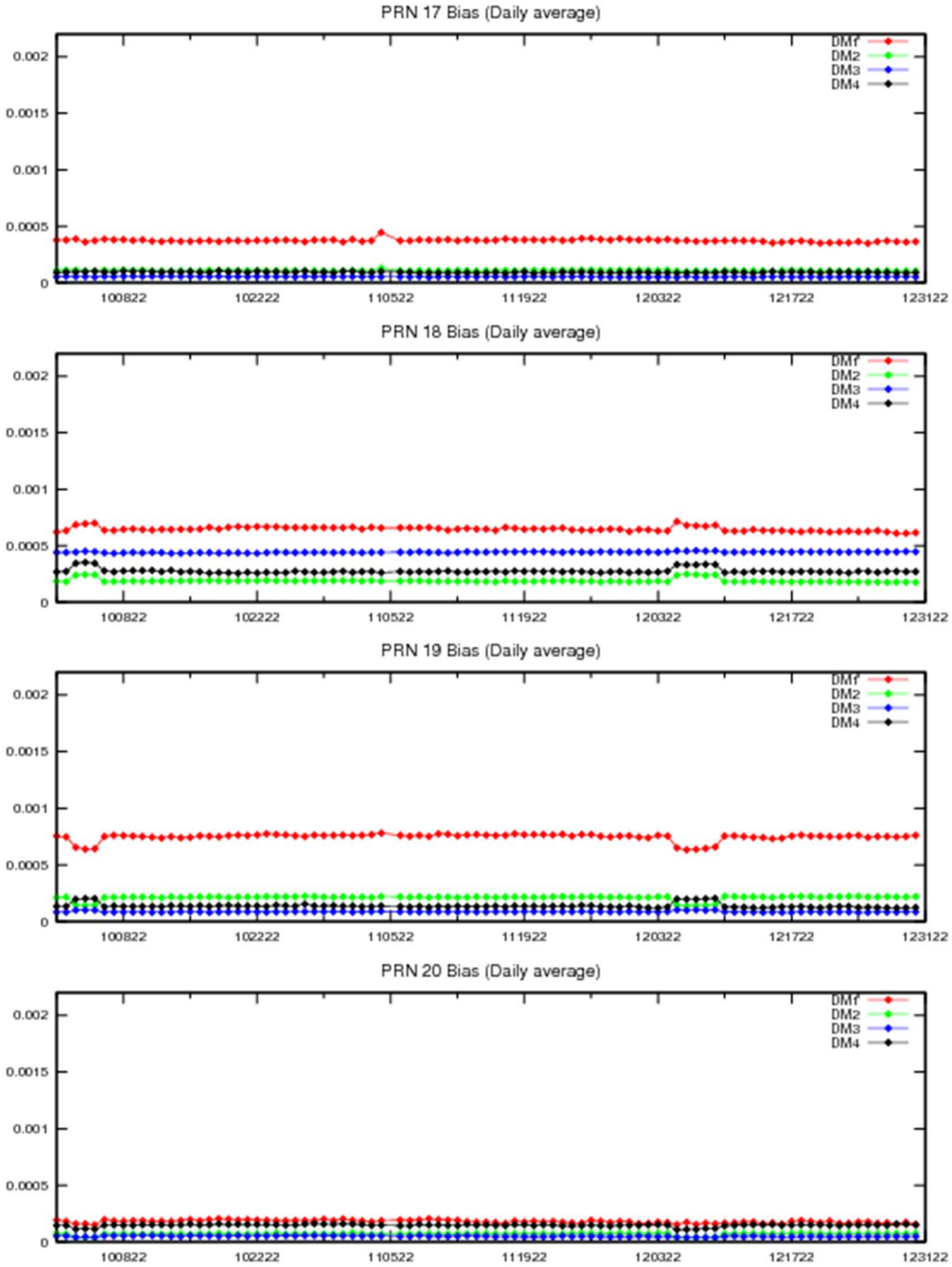

Figure 11-7 PRN Bias Average Trend (PRN17–PRN20)

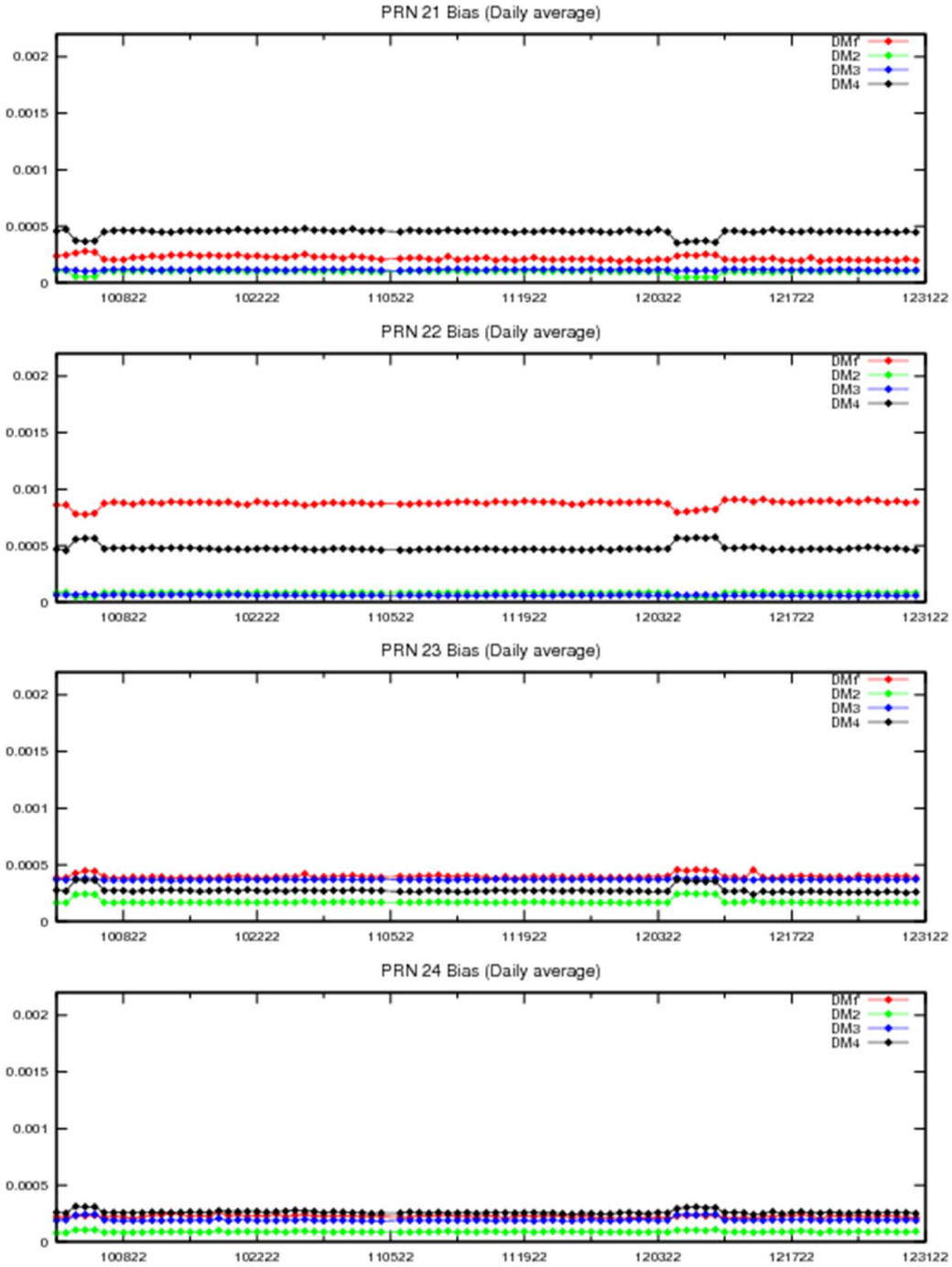

Figure 11-8 PRN Bias Average Trend (PRN21–PRN24)

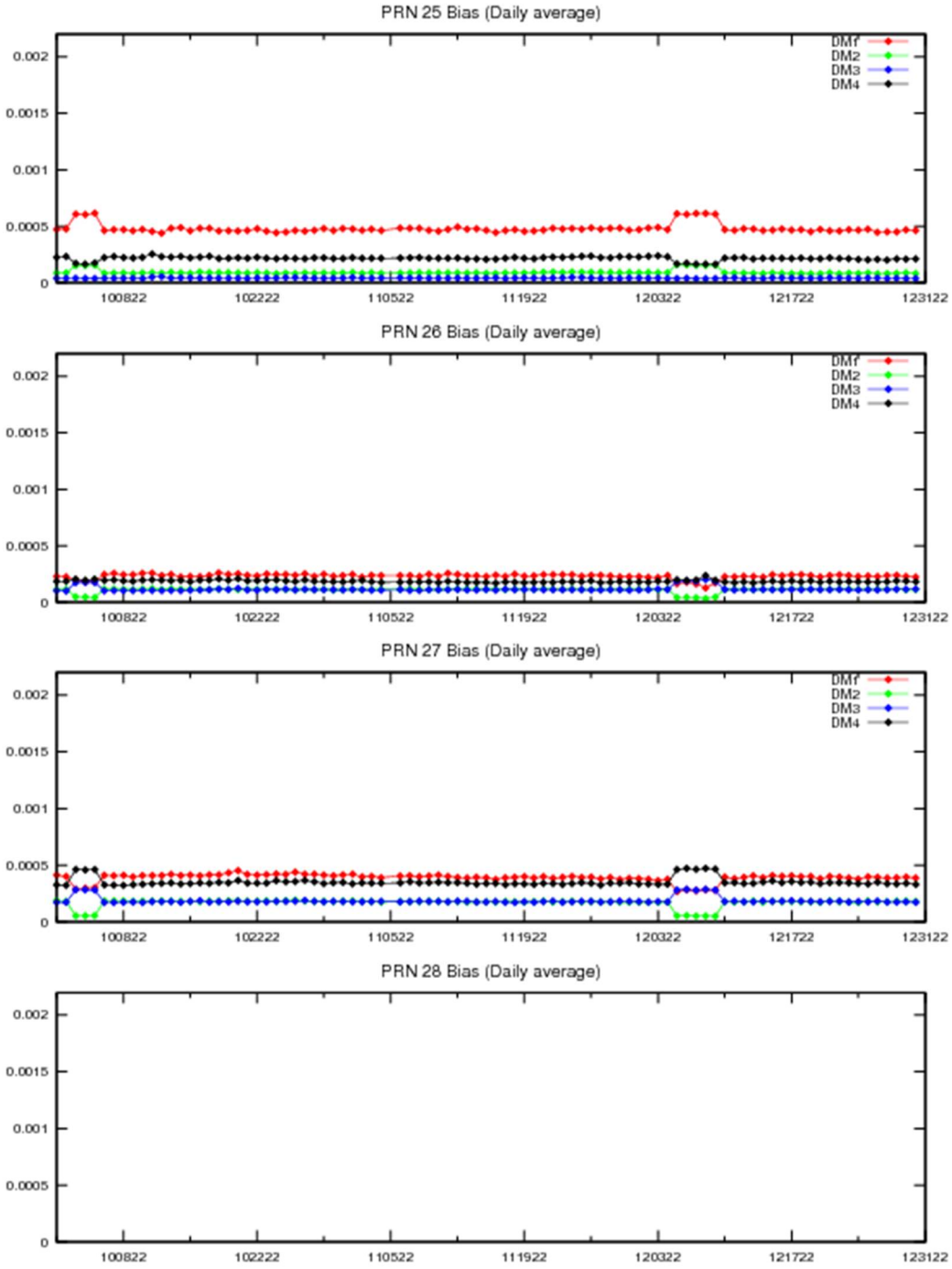

Figure 11-9 PRN Bias Average Trend (PRN25–PRN28)

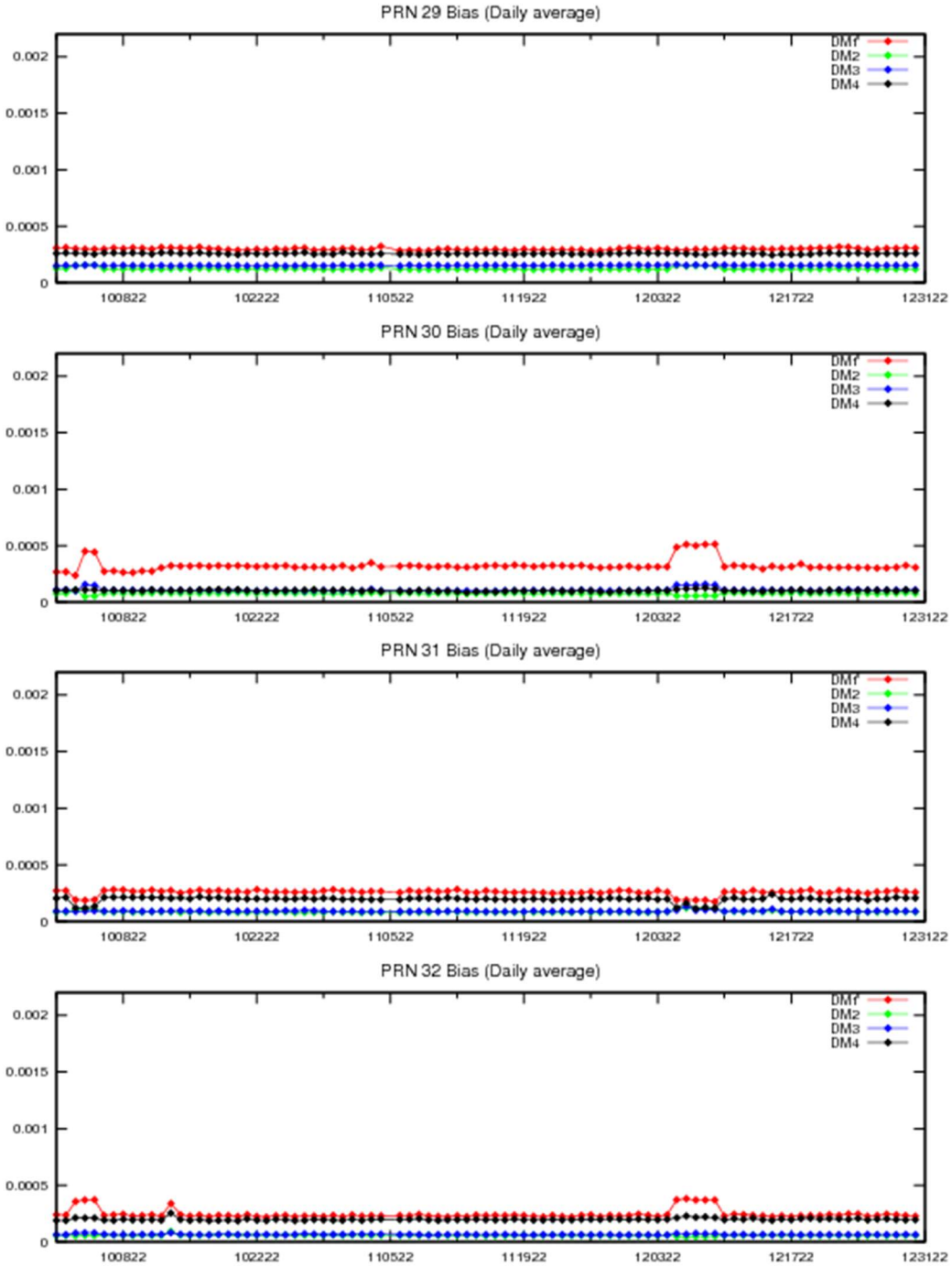

Figure 11-10 PRN Bias Average Trend (PRN29–PRN32)

11.4 SQM Trips

A SQM trip occurs when the estimated deformation exceeds threshold. There were no SQM trips during the reporting period.

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

IGS. International GPS Service.

Kp. Planetary index

LNAV. Lateral navigation

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

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

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

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

NAS. National Airspace System

Navigation Message. Message structure designed to carry navigation data.

NGS. National Geodetic Survey

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

NTSB. National Satellite Test Bed

OCONUS. Outside Contiguous United States

OPUS. Online Positioning Use Server

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

PAN. Performance Analysis Network

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

PPP. Precise Point Positioning.

PRN. Pseudo-random noise

RAIM. Receiver autonomous integrity monitoring

RFI. Radio frequency interference

RNAV. Area navigation

RNP. Required Navigation Performance

RSS. Residual sum of squares.

S15. GEO PRN133

SBAS. Space Based Augmentation System

SIS. Signal in space

SM9. GEO PRN131

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

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

SSM. System support modification

SV. Space vehicle.

SVN. Space Vehicle Number.

TOW. Time of GPS week

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

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

VNAV. Vertical navigation

VPE. Vertical position error

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

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

WIPP. WAAS Integrity Performance Panel

WJHTC. William J. Hughes Technical Center

WRE. Wide-Area Reference Equipment

WRS. WAAS reference station

Appendix B: Additional Coverage Plots

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

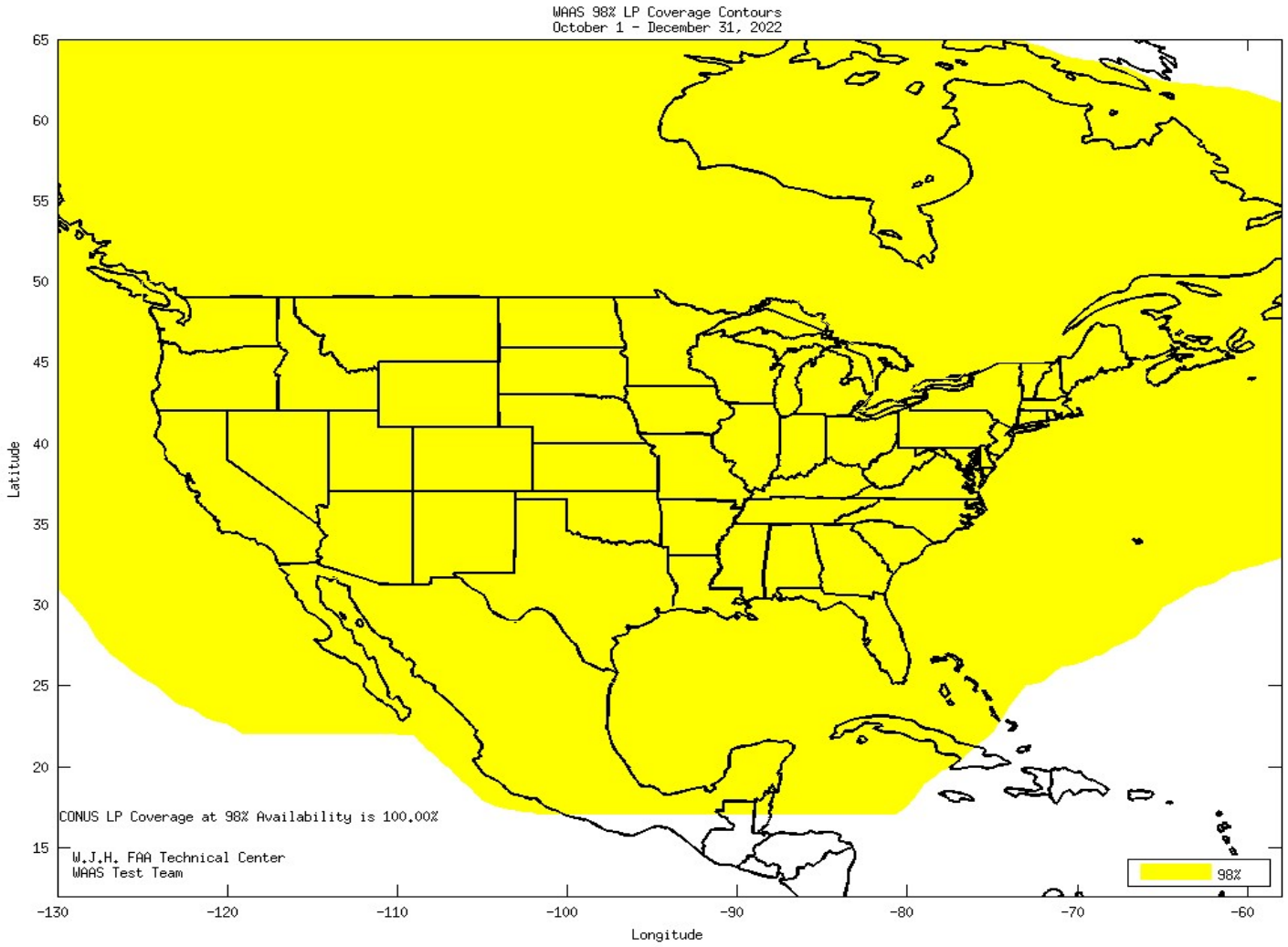

Figure B-1 98% CONUS LP Availability Contour

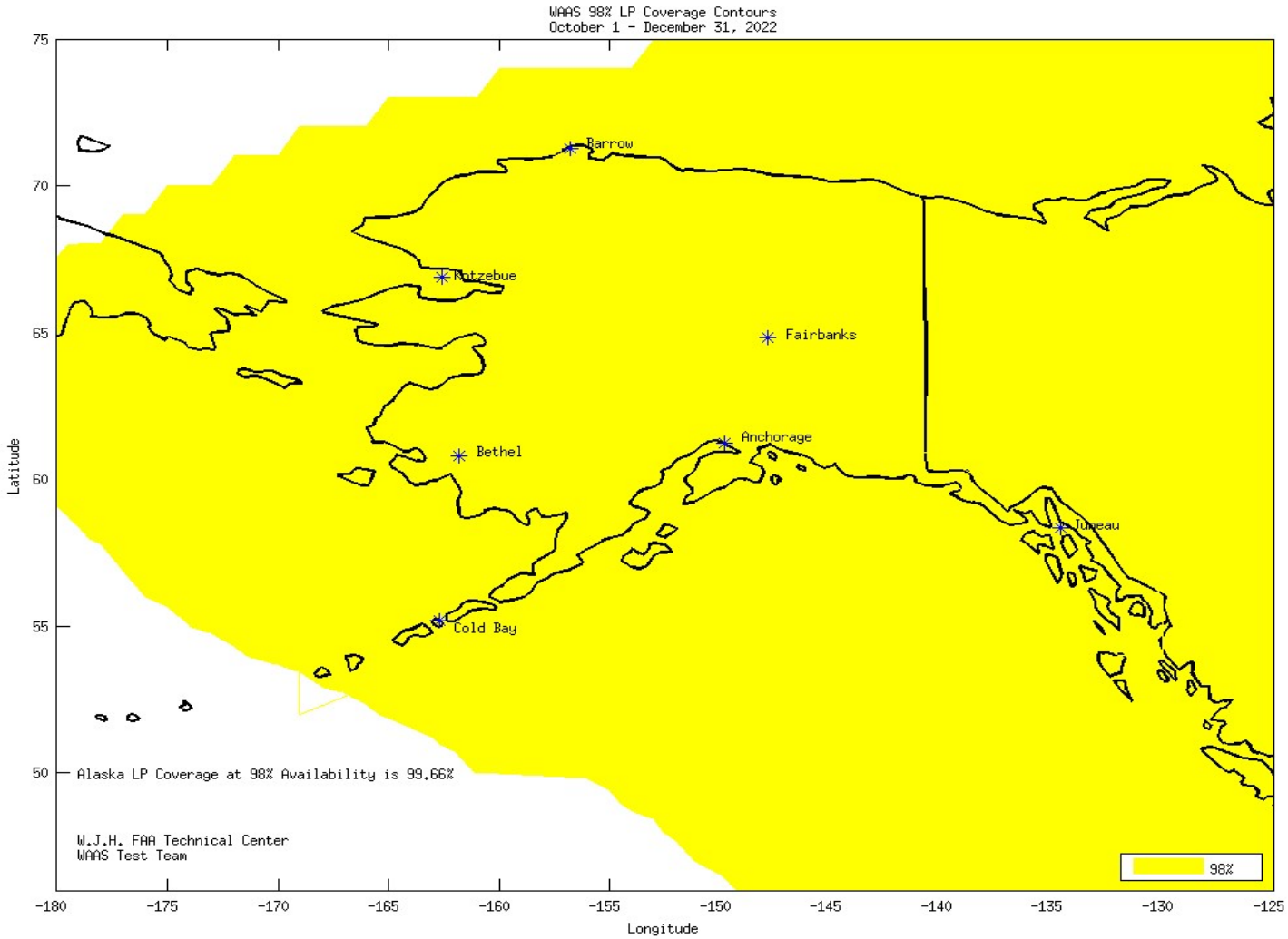

Figure B-2 98% Alaska LP Availability Contour

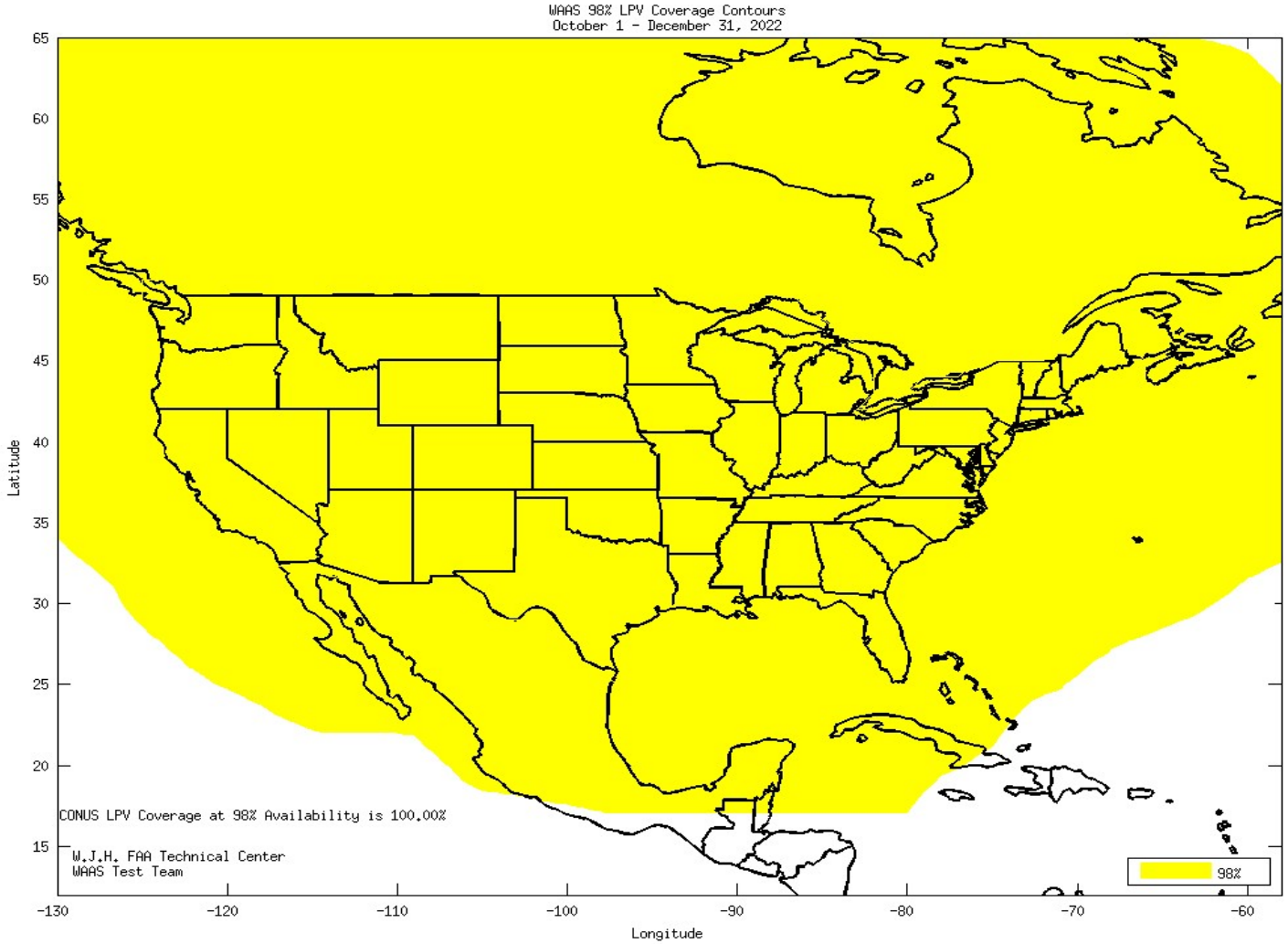

Figure B-3 98% CONUS LPV Availability Contour

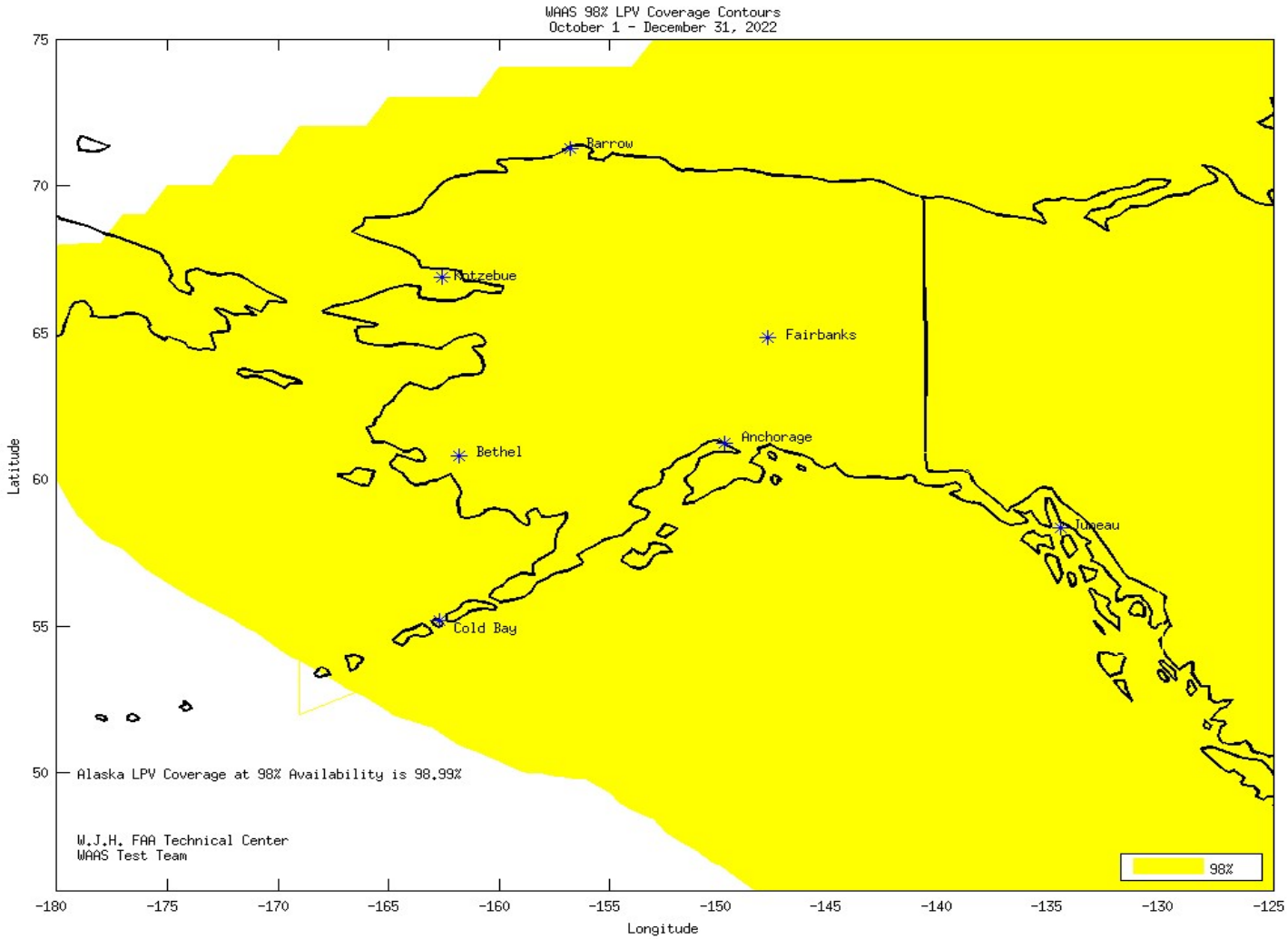

Figure B-4 98% Alaska LPV Availability Contour

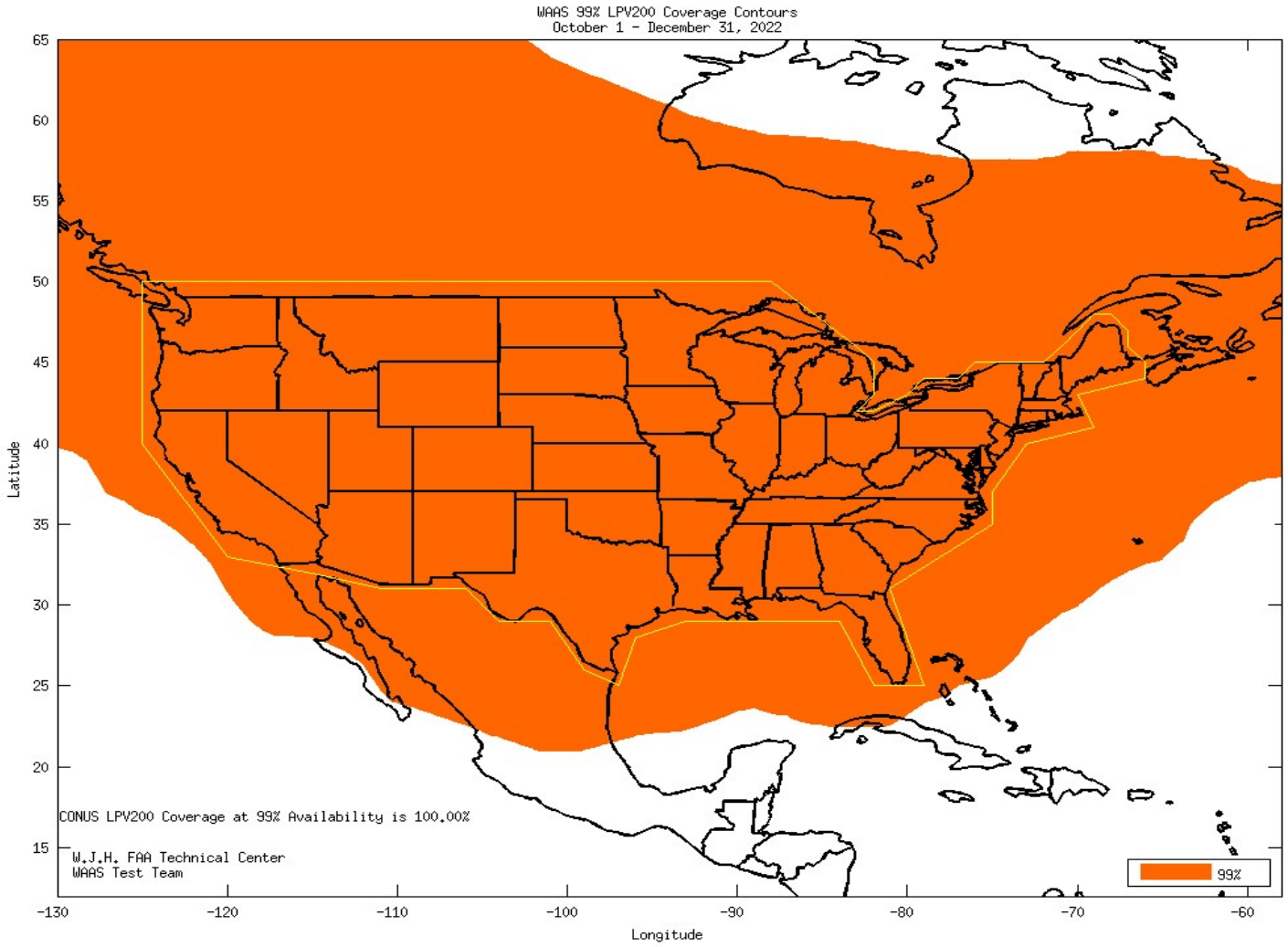

Figure B-5 99% CONUS LPV200 Availability Contour

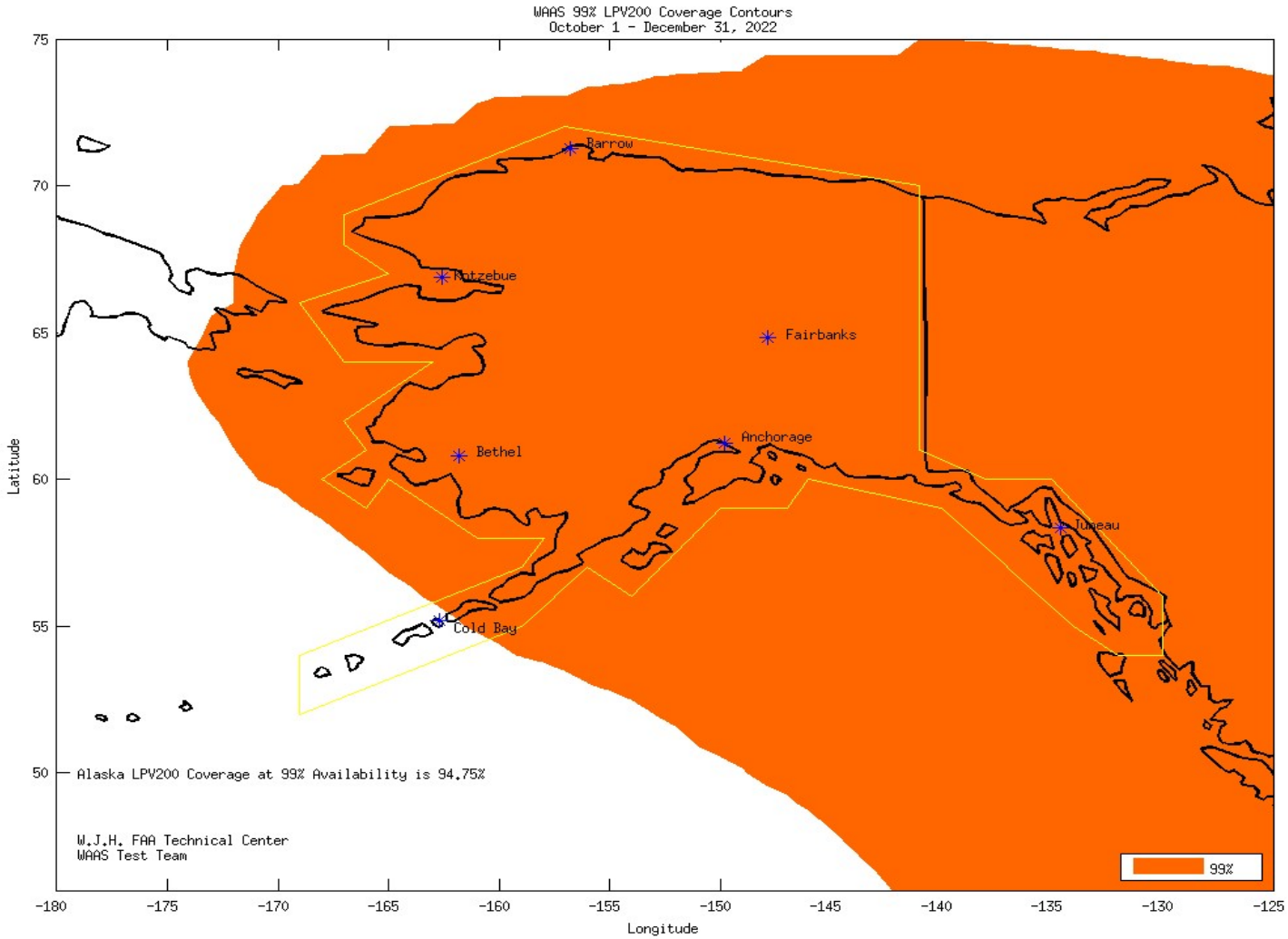

Figure B-6 99% Alaska LPV200 Availability Contour