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

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

July 2023

Report #85
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FAA William J. Hughes Technical Center
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Executive Summary

Since 1999, the Wide Area Augmentation System (WAAS) Test Team at the FAA William J. Hughes Technical Center has reported GPS performance as measured against the GPS Standard Positioning Service (SPS) Signal Specification in quarterly GPS Performance Analysis Network (PAN) Reports. In addition to the GPS PAN reports, the WAAS Test Team has provided quarterly reports on WAAS performance. The current WAAS PAN Report #85 provides WAAS performance data from the April 01 through June 30, 2023 reporting period.

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

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

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.422 meters	Memphis 0.581 meters	Juneau 0.750 meters	Barrow 0.679 meters
95% Vertical Accuracy (VPL <= 50 meters)	Atlantic City 1.974 meters	Salt Lake City 0.892 meters	Bethel 1.523 meters	Juneau 1.299 meters
LP Availability (HPL <= 40 meters)	Los Angeles 100%	Minneapolis 99.73%	Bethel 99.94%	Juneau 99.78%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Albuquerque 99.97%	Minneapolis 99.71%	Cold Bay 99.93%	Juneau 99.74%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Los Angeles 99.95%	Billings 99.70%	Fairbanks 99.81%	Barrow 99.66%
99% HPL	Miami 17.866 meters	Salt Lake City 10.730 meters	Cold Bay 19.681 meters	Fairbanks 13.422 meters
99% VPL	Arcata 30.292 meters	Memphis 20.158 meters	Barrow 31.127 meters	Juneau 23.887 meters

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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	80	6896144
Atlantic City	90	7748428
Oklahoma City	82	7121765
WAAS:		
Albuquerque	91	7849678
Anchorage	91	7855519
Atlanta	91	7860516
Barrow	91	7858238
Bethel	91	7858913
Billings	91	7860021
Boston	91	7859859
Chicago	91	7859617
Cleveland	91	7845468
Cold Bay	91	7859852
Dallas	91	7858596
Denver	91	7849637
Fairbanks	91	7858999
Gander	89	7729538
Goose Bay	91	7855701
Houston	91	7853807
Iqaluit	91	7848785
Jacksonville	91	7859187
Juneau	91	7857282
Kansas City	91	7845903
Kotzebue	91	7858076
Los Angeles	91	7854097
Memphis	91	7855198
Merida	89	7709005
Mexico City	91	7834004
Miami	91	7856986
Minneapolis	91	7860761
New York	91	7859142
Oakland	91	7829554
Puerto Vallarta	90	7798950
Salt Lake City	91	7852157
San Jose Del Cabo	90	7736082
Seattle	91	7848027
Washington, DC	91	7858626
Winnipeg	91	7859967

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	91	7854160
Anchorage	91	7861416
Atlanta	90	7775017
Barrow	55	4793782
Bethel	91	7860138
Billings	91	7861243
Boston	91	7861423
Cleveland	90	7775031
Cold Bay	91	7861326
Fairbanks	91	7860768
Gander	90	7737224
Honolulu	90	7784988
Houston	90	7775030
Iqaluit	91	7857134
Juneau	91	7861340
Kansas City	90	7775028
Kotzebue	91	7860287
Los Angeles	90	7772692
Merida	23	2021843
Miami	90	7774928
Minneapolis	90	7775029
Oakland	90	7767695
Salt Lake City	90	7765239
San Jose Del Cabo	90	7762965
San Juan	90	7765357
Seattle	90	7743375
Tapachula	88	7633865
Washington, DC	91	7861427

The report is divided by the performance category:

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

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

Table 1-4 WAAS Performance Parameters

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

1.1 Event Summary

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

Analyses of events that merit more detailed investigations are documented in the Discrepancy Reports (DRs). The DRs are available at http://www.nstb.tc.faa.gov under "WAAS Technical Reports" and also accessible via hyperlink in Table 1-5. Note that "TOW" is the time of GPS week, which is the cumulative number of seconds beginning 00:00:00 Sunday (GMT without leap seconds).WAAS Upgrades
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
04/01/2023	04/02/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Alaska from 23:30 UTC on 4/1 to 01:45 UTC on 4/2. Please see plot(s): LPV200_4/2/2023 Cov_vs_Time_Alaska_4/2/2023
04/03/2023	04/03/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 23:30 UTC on 4/3 to 00:10 UTC on 4/4. Please see plot(s): LPV200_4/3/2023 Cov_vs_Time_Canada_4/3/2023
04/03/2023	05/10/2023	Barrow (BRW1)	None	There was an extended WRS outage at Barrow Thread A (BRW1) from April 3rd at 04:07 UTC to April 13th at 01:46 UTC and from April 15th at 04:11 UTC to May 10th at 17:55 UTC. There was no impact on availability at Barrow on Threads B or C.
04/04/2023	04/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 23:20 UTC on 4/4 to 00:05 on 4/5. The elevated GIVE values also resulted in minor degradation of LPV200 service in CONUS 00:30 UTC to 00:55 UTC. Please see plot(s): LPV200_4/4/2023 Cov_vs_Time_Canada_4/4/2023
04/05/2023	04/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 05:35 UTC to 05:50 UTC and from 19:50 UTC to 20:05 UTC. Please see plot(s): LPV200_4/5/2023 Cov_vs_Time_Canada_4/5/2023
04/07/2023	04/07/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 00:20 UTC to 02:30 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 service in Alaska from 01:35 UTC to 02:15 UTC and from 05:05 UTC to 06:05 UTC. Please see plot(s): LPV200_4/7/2023 Cov_vs_Time_Alaska_4/7/2023 Cov_vs_Time_Canada_4/7/2023

04/09/2023	04/09/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 18:10 UTC to 18:20 UTC and from 19:30 UTC to 21:25 UTC. Please see plot(s): LPV200_4/9/2023 Cov_vs_Time_Canada_4/9/2023
04/10/2023	04/10/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in Alaska from 04:00 UTC to 08:30 UTC; and (2) LPV200 service coverage in Canada from 03:45 UTC to 04:45 UTC. Please see plot(s): LPV200_4/10/2023 Cov_vs_Time_Alaska_4/10/2023 Cov_vs_Time_Canada_4/10/2023
04/13/2023	04/14/2023	PRN29	LPV200_Alaska, LPV200_Canada	The reduction in LPV200 service in Canada was due to a GPS NANU on PRN29 (see NANU2023022) which was unusable from 19:48 UTC on 4/13 to 02:07 UTC on 4/14. The NANU caused moderate degradation of: (1) LPV200 service coverage in Alaska from 22:10 UTC to 23:50 UTC; and (2) LPV200 service coverage in Canada from 23:10 UTC to 23:35 UTC. Please see plot(s): LPV200_4/13/2023 Cov_vs_Time_Alaska_4/13/2023 Cov_vs_Time_Canada_4/13/2023
04/19/2023	04/19/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in CONUS (CA, AZ, & NM) from 22:00 UTC to 22:45. The elevated GIVE values also resulted in minor degradation of LPV200 service in Canada from 16:00 UTC to 16:10 UTC and from 18:50 UTC to 19:05 UTC. Please see plot(s): LPV200_4/19/2023 Cov_vs_Time_Canada_4/19/2023 Cov_vs_Time_Conus_4/19/2023
04/19/2023	04/19/2023	PRN28	LPV200_CONUS	The reduction in LPV200 service in CONUS was due to a GPS NANU on PRN28 (see NANU2023024) which was unusable from 14:45 UTC to 22:21 UTC. The NANU caused moderate degradation of LPV200 service coverage in CONUS from 20:05 UTC to 20:35 UTC and from 21:40 UTC to 21:55 UTC. Please see plot(s): LPV200_4/19/2023 Cov_vs_Time_Conus_4/19/2023
04/20/2023	04/20/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in CONUS from 04:05 UTC to 04:20 UTC (TX) and

				from 12:45 UTC to 12:55 UTC in (FL panhandle). Please see plot(s): LPV200_4/20/2023 Cov_vs_Time_Conus_4/20/2023
04/21/2023	04/21/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 19:35 to 20:25 UTC, from 20:40 UTC to 21:55 UTC, and from 22:20 to 22:25 UTC. Please see plot(s): LPV200_4/21/2023 Cov_vs_Time_Canada_4/21/2023
04/22/2023	04/22/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 05:20 UTC to 05:30 UTC and from 18:40 UTC to 19:00 UTC. Please see plot(s): LPV200_4/22/2023 Cov_vs_Time_Canada_4/22/2023
04/23/2023	04/23/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 8), caused by a G4 iono storm, disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of (1) LPV200 Service coverage in CONUS from 19:30 UTC to 23:45 UTC; (2) LPV200 service coverage in Alaska from 19:20 UTC to 23:00 UTC; (3) LPV200 service coverage in Canada from 19:30 UTC to 23:30 UTC; (4) LPV service coverage in CONUS from 19:30 UTC to 23:30 UTC; (5) LPV service coverage in Alaska from 19:20 UTC to 23:00 UTC; and (6)LPV service coverage in Canada from 19:30 UTC to 23:30 UTC. Please see plot(s): LP_4/23/2023 LPV_4/23/2023 LPV200_4/23/2023 Cov_vs_Time_Alaska_4/23/2023 Cov_vs_Time_Canada_4/23/2023 Cov_vs_Time_Conus_4/23/2023
04/24/2023	04/24/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 8) caused by an X 1.4 solar flare disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of: (1) LPV200 service coverage in CONUS from 03:30 UTC to 04:30 UTC; (2) LPV200 service coverage in Alaska from 03:30 UTC to 05:00 UTC; (3) LPV200 service coverage in Canada from 04:00 UTC to 04:30 UTC and from 07:20 UTC to 07:30 UTC; and (4) LPV service coverage in Alaska from 04:05 UTC to 04:55 UTC. The elevated GIVE values also caused minor degradation of: (1) LPV service coverage in CONUS from 04:10 UTC to 04:20 UTC; and (2) LPV service coverage in Canada from 04:10 UTC to 04:20 UTC. Please see plot(s): LPV_4/24/2023 LPV200_4/24/2023

				Cov_vs_Time_Alaska_4/24/2023 Cov_vs_Time_Canada_4/24/2023 Cov_vs_Time_Conus_4/24/2023
04/25/2023	04/25/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada (1) from 18:25 UTC to 18:55 UTC; (2) from 19:15 UTC to 19:25 UTC; (3) from 20:40 UTC to 21:05 UTC; (4) from 21:15 UTC to 21:25 UTC; (5) from 21:45 UTC to 22:00 UTC. Please see plot(s): LPV200_4/25/2023 Cov_vs_Time_Canada_4/25/2023
04/29/2023	04/29/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from the start of the day to 00:30 UTC. Please see plot(s): LPV200_4/29/2023 Cov_vs_Time_Canada_4/29/2023
05/01/2023	05/01/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 23:15 UTC on 5/1 to 00:50 on 5/2. The elevated GIVE values also resulted in moderate degradation of LPV service coverage in Canada from 23:20 UTC on 5/1 to 23:55 UTC on 5/1. Please see plot(s): LPV_5/1/2023 LPV200_5/1/2023 Cov_vs_Time_Canada_5/1/2023
05/01/2023	05/02/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in moderate degradation of LPV200 service coverage in Canada from 23:15 UTC on 5/1 to 00:55 UTC on 5/2. Please see plot(s): LPV200_5/1/2023 Cov_vs_Time_Canada_5/1/2023 LPV200_5/2/2023 Cov_vs_Time_Canada_5/2/2023
05/04/2023	05/04/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 06:20 UTC to 06:45 UTC. The elevated GIVE values also resulted in moderate degradation of LPV200 service coverage in CONUS from 21:00 UTC to 21:35 UTC (CA and NM). Please see plot(s): LPV200_5/4/2023 Cov_vs_Time_Canada_5/4/2023 Cov_vs_Time_Conus_5/4/2023

05/05/2023	05/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in CONUS (CA) from 20:55 UTC to 21:25 UTC. Please see plot(s): LPV200_5/5/2023
05/06/2023	05/06/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Alaska from 05:00 UTC to 07:00 UTC, 15:05 UTC to 16:05 UTC, 17:40 UTC to 18:40 UTC, and from 20:25 UTC to 20:55 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 service coverage in Canada from 04:25 UTC to 04:35 UTC, 05:45 UTC to 05:55 UTC, from 17:40 UTC to 17:55 UTC, and from 18:05 UTC to 18:10 UTC. Please see plot(s): LPV200_5/6/2023 Cov_vs_Time_Alaska_5/6/2023 Cov_vs_Time_Canada_5/6/2023
05/09/2023	05/09/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 4.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal) from 20:45 UTC to 21:10 UTC.
05/09/2023	07/10/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Starting around May 9, the Tech Center began observing degradation in Southern CONUS. This is a result of increased DOPs in the region starting in January (see event #22156) along with an increase in IGP GIVE values. Both these increases caused minor degradation in Southern California, New Mexico, Arizona, Western Texas, and the Florida panhandle.
05/10/2023	05/10/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS	Geomagnetic activity (KP = 5.33) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in CONUS (SoCal) from 20:40 UTC to 21:10 UTC.
05/11/2023	05/11/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal) from 20:30 UTC to 21:05 UTC.
05/12/2023	05/12/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 5.33) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in moderate degradation of LPV200 service coverage in CONUS (SoCal) from 20:25 UTC to 21:05 UTC. The elevated GIVE values also resulted in moderate degradation of LPV200 service in Canada from 05:50 UTC to 06:05 UTC.

				Please see plot(s): LPV200_5/12/2023 Cov_vs_Time_Canada_5/12/2023 Cov_vs_Time_Conus_5/12/2023
05/13/2023	05/13/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 00:00 UTC to 00:05 UTC, and from 21:30 UTC to 22:00 UTC. Please see plot(s): LPV200_5/13/2023 Cov_vs_Time_Canada_5/13/2023
05/20/2023	05/20/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 5.67) caused by a G1 IGP storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in (1) CONUS from 00:50 UTC to 06:35 UTC, and from 07:20 UTC to 08:00 UTC; (2) Alaska from 00:55 UTC to 06:15 UTC; (3) Canada from the start of the day to 06:35 UTC. The elevated GIVE values also resulted in significant degradation of LPV service coverage in (1) CONUS from 00:55 UTC to 05:50 UTC; (2) Alaska from 01:35 UTC to 05:40 UTC; (3) Canada from the start of the day to 05:50 UTC. Please see plot(s): LPV_5/20/2023 LPV200_5/20/2023 Cov_vs_Time_Alaska_5/20/2023 Cov_vs_Time_Canada_5/20/2023 Cov_vs_Time_Conus_5/20/2023
05/21/2023	05/21/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 16:40 UTC to 17:10 UTC.
05/22/2023	05/22/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 6) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in moderate degradation of LPV200 service coverage in CONUS (SoCal and FL panhandle) from 19:45 UTC to 20:20 UTC.
05/23/2023	05/23/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in (1) moderate degradation of LPV200 service coverage in CONUS from 19:50 UTC to 20:15 UTC; (2) moderate degradation of LPV200 service coverage in Alaska from 14:00 UTC to 15:00 UTC, from 16:30 UTC to 17:35 UTC, and from 19:20 UTC to 19:45 UTC. The elevated GIVE values also resulted in minor degradation of LPV200 service coverage in Canada from 16:30 UTC to 16:50 UTC. Please see plot(s): LPV200_5/23/2023 Cov_vs_Time_Alaska_5/23/2023 Cov_vs_Time_Canada_5/23/2023 Cov_vs_Time_Conus_5/23/2023

05/27/2023	05/27/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (FL) from 19:40 UTC to 20:00 UTC, and from 21:00 UTC to 21:25 UTC.
05/30/2023	05/30/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal and New Mexico) from 19:10 UTC to 19:50 UTC.
06/01/2023	06/01/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM) from 19:05 UTC to 19:45 UTC. The elevated GIVE values also caused minor degradation of LPV service coverage in CONUS (SoCal, AZ, NM) from 19:20 UTC to 19:35 UTC.
06/04/2023	06/04/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ. NM, West TX) from 18:55 UTC to 19:30 UTC.
06/04/2023	06/04/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 4) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ. NM, West TX) from 18:55 UTC to 19:30 UTC.
06/05/2023	06/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal) from 18:50 UTC to 19:25 UTC.
06/05/2023	06/05/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal) from 18:50 UTC to 19:25 UTC.
06/06/2023	06/06/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, TX, FL) from 00:40 UTC to 01:05 UTC, from 18:45 UTC to 19:20 UTC, and from 20:15 UTC to 20:40 UTC.

06/07/2023	06/07/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (AZ, CA, FL, NM, TX) from 16:10 UTC to 16:15 UTC, from 18:40 UTC to 19:15 UTC, and from 20:25 UTC to 20:35 UTC.
06/09/2023	06/09/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, NM, AZ, TX, FL) from 00:30 UTC to 00:50 UTC, from 18:35 UTC to 19:10 UTC, and from 20:15 UTC to 20:30 UTC.
06/11/2023	06/11/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (NM, AZ, TX) from 18:25 UTC to 18:35 UTC, and from 18:40 UTC to 19:00 UTC.
06/12/2023	06/12/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (AZ, NM, TX, FL) from 18:30 UTC to 19:00 UTC, and from 20:05 UTC to 20:15 UTC.
06/13/2023	06/13/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.33) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX) from 18:15 UTC to 18:55 UTC, and from 20:00 UTC to 20:10 UTC.
06/14/2023	06/14/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX) from 00:25 UTC to 00:30 UTC, and from 18:15 UTC to 18:45 UTC.
06/15/2023	06/15/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 5.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX) from 18:10 UTC to 18:45 UTC, and from 19:50 UTC to 20:00 UTC. The elevated GIVE values also caused minor degradation of LPV200 service coverage in Canada from 20:55 UTC to 21:00 UTC, and from 22:40 UTC to 22:45 UTC.

				Please see plot(s): LPV200_6/15/2023 Cov_vs_Time_Canada_6/15/2023
06/16/2023	06/16/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 6.33) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX, FL) from 18:10 UTC to 18:15 UTC, and from 18:20 UTC to 18:35 UTC.
06/17/2023	06/17/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX) from 18:05 UTC to 18:10 UTC, and from 18:15 UTC to 18:35 UTC.
06/18/2023	06/18/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX) from 18:10 UTC to 18:30 UTC.
06/19/2023	06/19/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, AZ, NM, TX, FL) from 17:50 UTC to 18:25 UTC, and from 23:50 UTC to 23:55 UTC.
06/20/2023	06/20/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, FL) from 00:00 UTC to 00:05 UTC, and from 17:50 UTC to 18:20 UTC.
06/25/2023	06/25/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 01:40 UTC to 04:20 UTC. Please see plot(s): LPV200_6/25/2023 Cov_vs_Time_Canada_6/25/2023
06/26/2023	06/26/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, NM, AZ, TX) from 17:30 UTC to 18:00 UTC.

06/28/2023	06/28/2023	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV_Canada, LPV200_Canada	SSM-WAAS-062: This system support modification (SSM) upgrades the Iqaluit (YFB) WRS to software build W7.391L. All three receivers were taken down during the upgrade. This reduced observations and increased GIVE values in the region at this time. The elevated GIVE values caused moderate degradation of: (1) LPV200 service coverage in Canada from 14:40 UTC to 15:10 UTC; and (2) LPV service coverage in Canada from 14:40 UTC to 15:10 UTC. Please see plot(s): LPV_6/28/2023 LPV200_6/28/2023 Cov_vs_Time_Canada_6/28/2023
06/28/2023	06/28/2023	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 2.333) disturbed the ionosphere causing elevated GIVE values. This, along with increased DOPs (see event #22156), resulted in minor degradation of LPV200 service coverage in CONUS (SoCal, NM, AZ, TX, and FL) from 17:15 UTC to 17:55 UTC.

Table 1-6 WAAS Upgrades

Start Date	End Date	Location Satellite	Event Description
06/28/2023	06/28/2023	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	SSM-WAAS-062: This system support modification (SSM) upgrades the Iqaluit (YFB) WRS to software build W7.391L. All three receivers were taken down during the upgrade. This reduced observations and increased GIVE values in the region at this time. The elevated GIVE values caused moderate degradation of: (1) LPV200 service coverage in Canada from 14:40 UTC to 15:10 UTC; and (2) LPV service coverage in Canada from 14:40 UTC to 15:10 UTC. Please see plot(s): LPV_6/28/2023 LPV200_6/28/2023 Cov_vs_Time_Canada_6/28/2023

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
04/13/2023	04/13/2023	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site at 07:01:07 UTC. This caused a 4-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 370885-370890
04/18/2023	04/18/2023	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 07:07:10 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 198448-198452
04/27/2023	04/27/2023	Faulted	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 06:03:37 UTC. This caused an 18-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 367435-367454
05/14/2023	05/14/2023	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 07:03:50 UTC. This caused a 4-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 25448-25453
05/16/2023	05/16/2023	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 07:22:18 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 199356-199360
05/24/2023	05/24/2023	Manual	GEO131, Santa_Paula (SZ1)	None	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site at 07:00:47 UTC. This caused a 3-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 284465-284469
05/25/2023	05/25/2023	Manual	GEO131, Southbury (DX1)	None	The uplink for the SM9 GEO, PRN131 switched from the Southbury uplink site to the Santa Paula uplink site at 06:00:06 UTC. This caused a 3-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 367224-367228
05/29/2023	05/29/2023	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 05:48:09 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 107307-107311

05/31/2023	05/31/2023	Manual	GEO133, South Mountain (CM1)	None	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 06:05:16 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 281134-281138
06/07/2023	06/07/2023	Manual	GEO131, Santa_Paula (SZ1)	None	The uplink for the SM9 GEO, PRN131 switched from the Santa Paula uplink site to the Southbury uplink site at 07:01:25 UTC. This caused a 3-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 284503-284507
06/29/2023	06/29/2023	Manual	GEO133, Brewster (BR1)		GEO 133, manual switchover from Brewster to South Mountain. TOW 370891-370906
06/29/2023	06/29/2023	Faulted	GEO133, South Mountain (CM1)		GEO 133 switched to Brewster, South Mountain faulted. TOW 370891-370906

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 1.422 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.974 meters observed at Atlantic City-a.
- The minimum 95% CONUS horizontal LPV errors was 0.581 meters observed at Memphis.
- The minimum 95% CONUS vertical LPV error was 0.892 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	1.422	1.423	1.555	100	*	*
Atlantic City-a	1.279	1.284	1.974	100	*	*
Oklahoma City	1.352	1.352	1.439	100	*	*
Albuquerque	0.723	0.723	1.228	100	3.04	4.64
Anchorage	0.714	0.715	1.485	100	3.05	4.51
Atlanta	0.877	0.880	1.224	100	2.92	4.66
Barrow	0.679	0.681	1.522	100	*	*
Bethel	0.694	0.694	1.523	100	2.86	5.2
Billings	0.675	0.680	0.939	100	2.25	4.57
Boston	0.658	0.662	1.050	100	2.42	4.54
Chicago	0.803	0.807	0.972	100	*	*
Cleveland	0.664	0.668	1.041	100	2.41	4.35
Cold Bay	0.740	0.741	1.378	100	2.13	5.5
Dallas	0.599	0.600	1.305	100	*	*
Denver	0.618	0.619	0.902	100	*	*
Fairbanks	0.709	0.712	1.509	100	3.47	4.24
Gander	0.836	0.841	1.407	100	2.68	4.15
Goose Bay	0.877	0.878	1.375	100	*	*
Houston	0.739	0.740	1.512	100	3.58	4.69
Iqaluit	0.890	0.890	1.556	100	2.54	4.29
Jacksonville	0.696	0.699	1.332	100	*	*
Juneau	0.750	0.756	1.299	100	2.89	4.08
Kansas City	0.631	0.634	1.041	100	2.5	4.4
Kotzebue	0.736	0.738	1.493	100	3.49	4.8
Los Angeles	0.882	0.882	1.610	100	3.92	4.83
Memphis	0.581	0.582	1.176	100	*	*
Merida	1.057	1.062	2.380	99.997	*	*
Mexico City	1.025	1.030	2.665	100	*	*
Miami	1.054	1.058	1.632	100	3.92	5.45
Minneapolis	0.776	0.784	0.973	100	2.23	4.37
New York	0.755	0.759	1.090	100	*	*
Oakland	0.870	0.870	1.593	100	3.53	5.21
Puerto Vallarta	0.994	0.997	2.974	99.997	*	*
Salt Lake City	0.599	0.599	0.892	100	2.62	4.83
San Jose Del Cabo	1.019	1.021	2.913	99.997	5.12	5.34
Seattle	0.758	0.761	0.962	100	2.24	4.83
Washington, DC	0.711	0.715	1.087	100	5.25	7.05
Winnipeg	0.740	0.750	1.132	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 7.228 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 16.174 meters observed at Tapachula.
- The minimum 95% horizontal error was 1.524 meters observed at Salt Lake City.
- The minimum 99.999% horizontal error was 3.794 meters observed at Cold Bay.

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	2.146	6.881	100	7.131
Anchorage	3.159	5.391	100	5.522
Atlanta	2.492	8.747	100	9.004
Barrow	2.762	9.672	100	11.001
Bethel	2.908	4.988	100	5.119
Billings	1.706	5.644	100	5.799
Boston	2.272	10.428	100	10.526
Cleveland	1.985	11.842	100	12.078
Cold Bay	1.950	3.794	100	3.942
Fairbanks	3.552	5.820	100	5.952
Gander	2.481	5.052	100	5.201
Honolulu	7.228	15.117	100	15.269
Houston	2.925	9.914	100	10.236
Iqaluit	2.671	5.632	100	5.823
Juneau	2.789	6.268	100	6.438
Kansas City	1.704	5.574	100	5.966
Kotzebue	3.562	5.787	100	5.903
Los Angeles	2.810	7.879	100	8.224
Merida	3.232	6.523	100	14.120
Miami	3.379	9.173	100	9.376
Minneapolis	1.888	8.816	100	9.051
Oakland	2.667	6.632	100	7.008
Salt Lake City	1.524	4.903	100	5.032
San Jose Del Cabo	3.893	16.095	100	16.367
San Juan	3.310	9.735	100	10.095
Seattle	1.539	3.939	100	4.065
Tapachula	3.716	16.174	100	16.614
Washington, DC	2.222	12.629	100	12.782

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 4.037 meters occurred at Chicago and maximum vertical LPV error was 11.641 meters occurred at Puerto Vallarta.

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	3.530	0.120	0.221	3.941	0.155	0.186
Atlantic City-a	3.679	0.253	0.253	4.610	0.171	0.222
Oklahoma City	2.372	0.108	0.241	4.464	0.180	0.220
Albuquerque	3.075	0.091	0.213	3.859	0.101	0.180
Anchorage	3.359	0.241	0.242	7.407	0.276	0.276
Atlanta	3.202	0.089	0.234	4.967	0.196	0.220
Barrow	2.012	0.132	0.157	4.433	0.126	0.218
Bethel	3.070	0.152	0.168	5.273	0.109	0.223
Billings	2.853	0.191	0.236	3.797	0.129	0.192
Boston	2.184	0.112	0.174	4.894	0.221	0.227
Chicago	4.037	0.110	0.212	4.866	0.148	0.214
Cleveland	3.351	0.139	0.239	5.686	0.138	0.165
Cold Bay	2.294	0.117	0.125	3.968	0.140	0.156
Dallas	2.130	0.099	0.235	3.615	0.138	0.215
Denver	2.160	0.077	0.185	4.506	0.104	0.166
Fairbanks	2.406	0.198	0.198	4.015	0.220	0.220
Gander	3.062	0.137	0.187	4.492	0.161	0.161
Goose Bay	3.281	0.170	0.186	4.646	0.219	0.219
Houston	3.147	0.095	0.238	4.161	0.099	0.227
Iqaluit	3.063	0.111	0.154	5.400	0.197	0.201
Jacksonville	2.836	0.072	0.237	5.845	0.203	0.208
Juneau	3.703	0.111	0.228	4.406	0.163	0.175
Kansas City	2.562	0.133	0.258	5.669	0.120	0.281
Kotzebue	3.059	0.132	0.179	5.283	0.178	0.180
Los Angeles	3.071	0.114	0.224	4.294	0.171	0.185
Memphis	3.373	0.107	0.273	5.786	0.118	0.202
Merida	2.647	0.072	0.163	9.014	0.185	0.259
Mexico City	3.159	0.210	0.244	7.362	0.191	0.236
Miami	2.864	0.072	0.190	5.668	0.167	0.186
Minneapolis	3.508	0.093	0.220	7.296	0.191	0.191
New York	3.063	0.144	0.205	4.886	0.166	0.183
Oakland	2.916	0.120	0.156	4.271	0.140	0.197
Puerto Vallarta	3.768	0.334	0.334	11.641	0.272	0.272
Salt Lake City	2.273	0.074	0.193	3.188	0.100	0.154
San Jose Del Cabo	3.128	0.171	0.185	8.912	0.260	0.276
Seattle	3.364	0.256	0.256	4.312	0.087	0.192
Washington, DC	3.995	0.101	0.237	5.035	0.146	0.162
Winnipeg	3.622	0.108	0.281	6.204	0.144	0.233

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.

- April 23-24, 2023—Position errors in CONUS Alaska, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.811 meters and 4.666 meters at Albuquerque and San Jose Del Cabo, respectively. The Kp index was 8.0.
- May 20, 2023—Position errors in CONUS, Alaska, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.261 meters and 3.857 meters at Billings and Mexico City, respectively. The Kp index was 5.7.

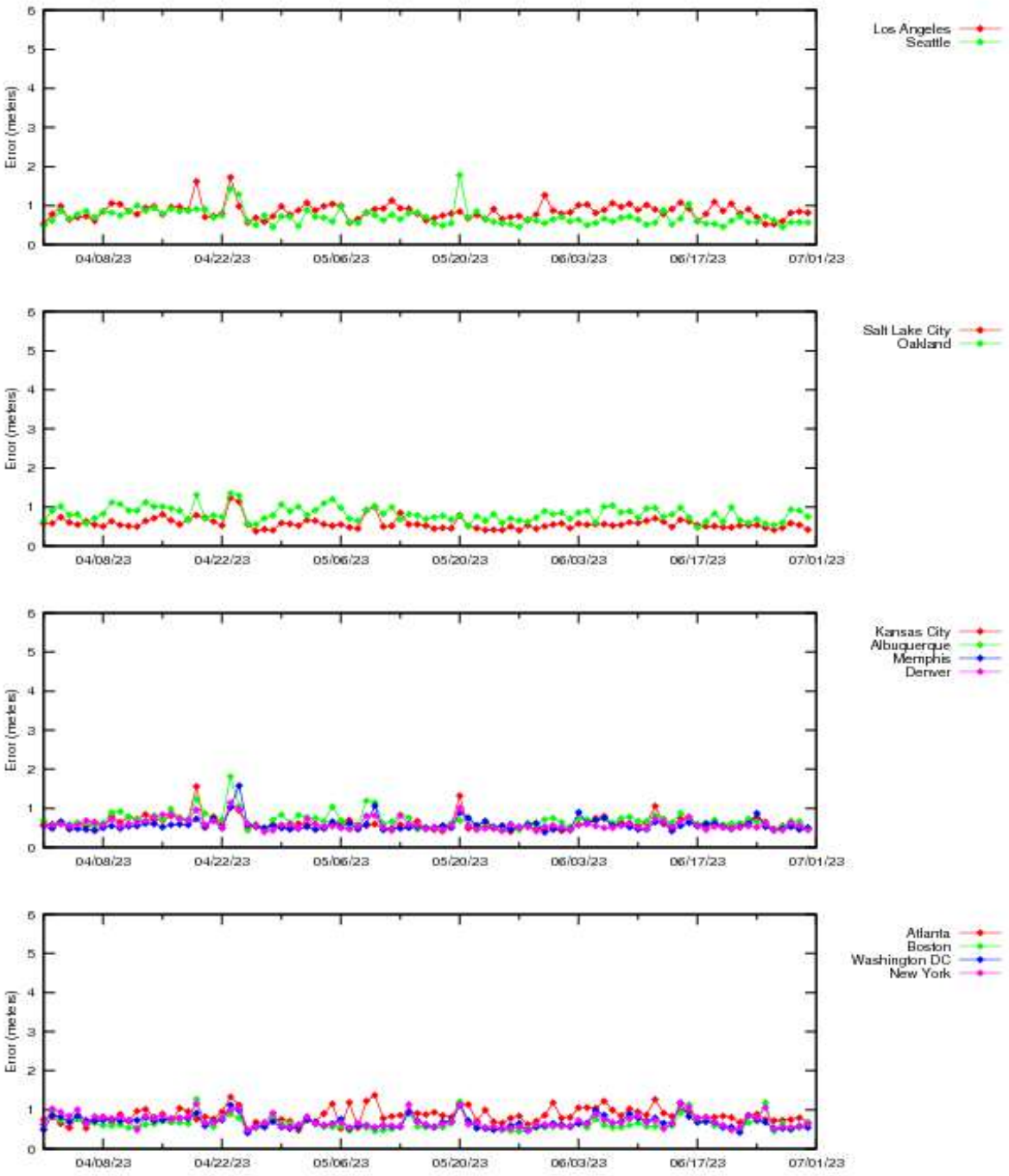

Figure 2-1 LPV 95% Horizontal Accuracy

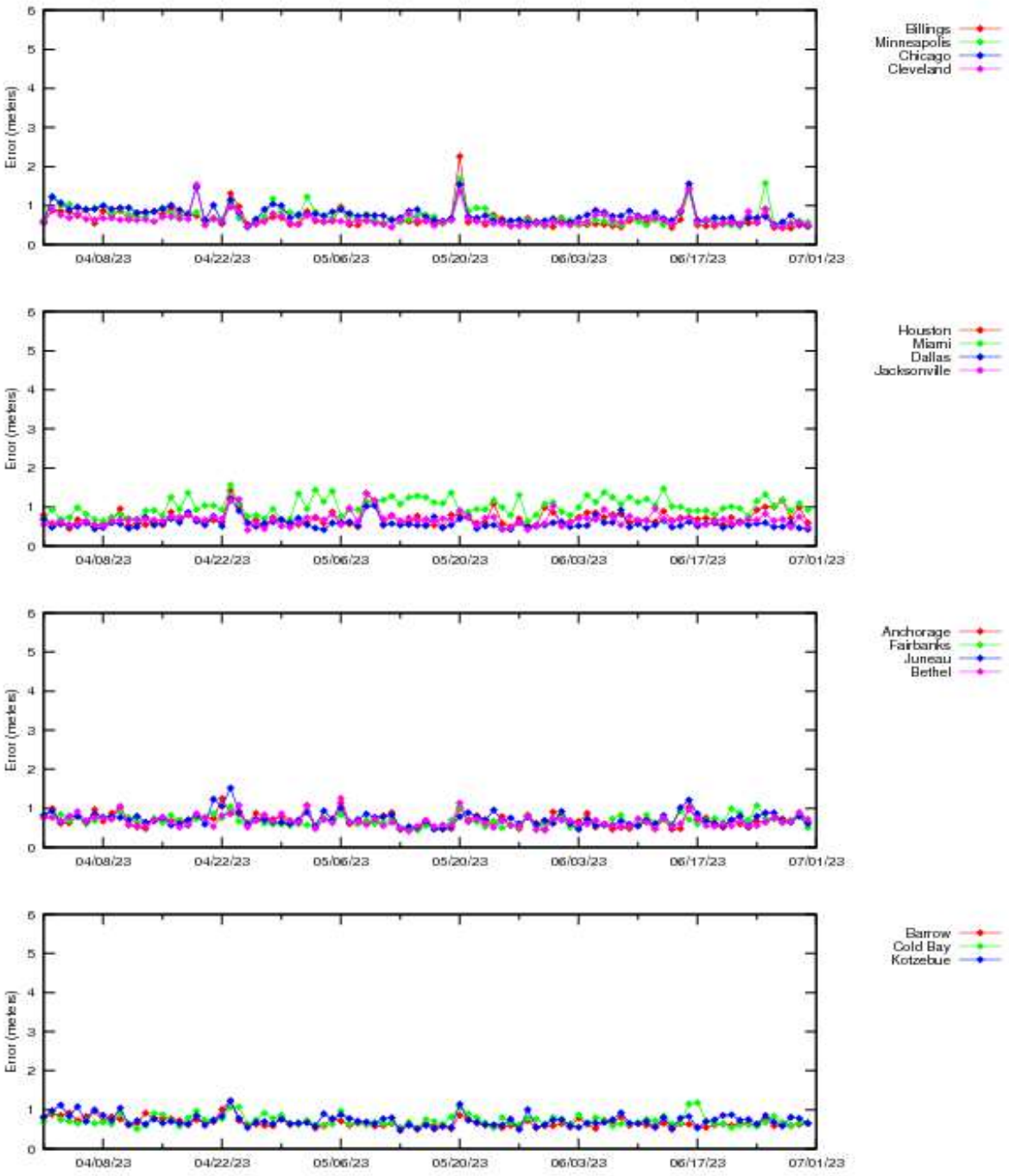

Figure 2-2 LPV 95% Horizontal Accuracy

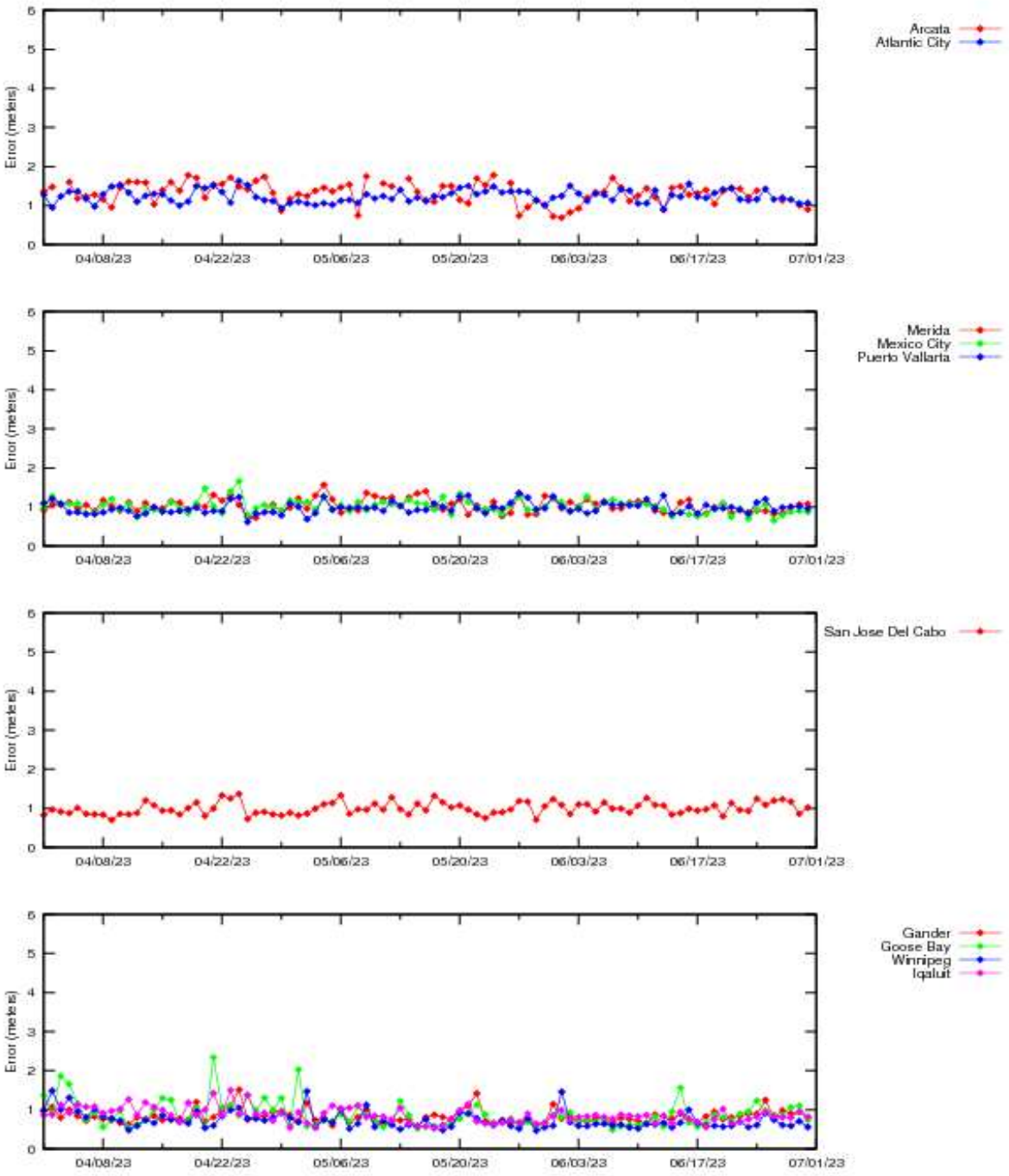

Figure 2-3 LPV 95% Horizontal Accuracy

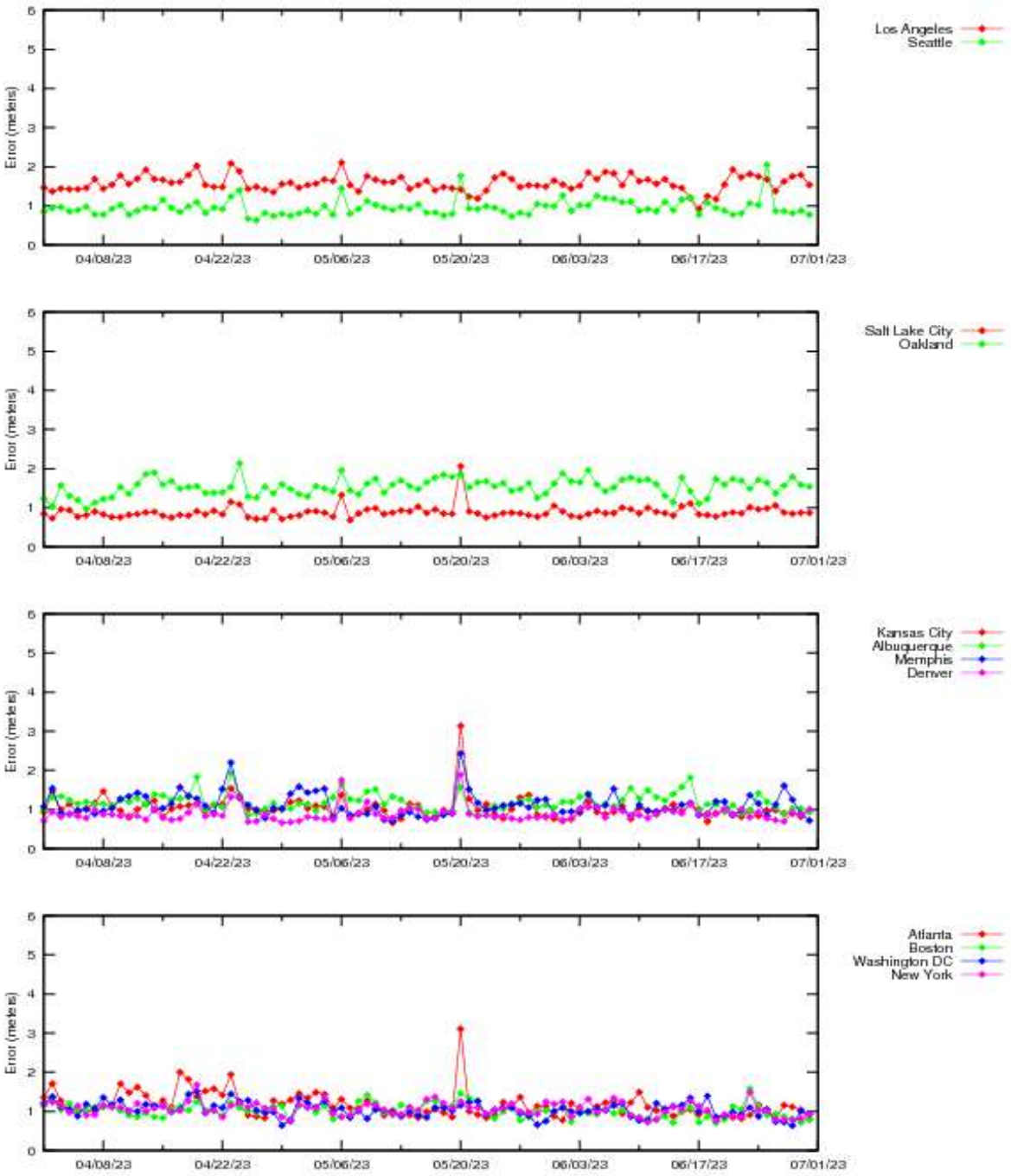

Figure 2-4 LPV 95% Vertical Accuracy

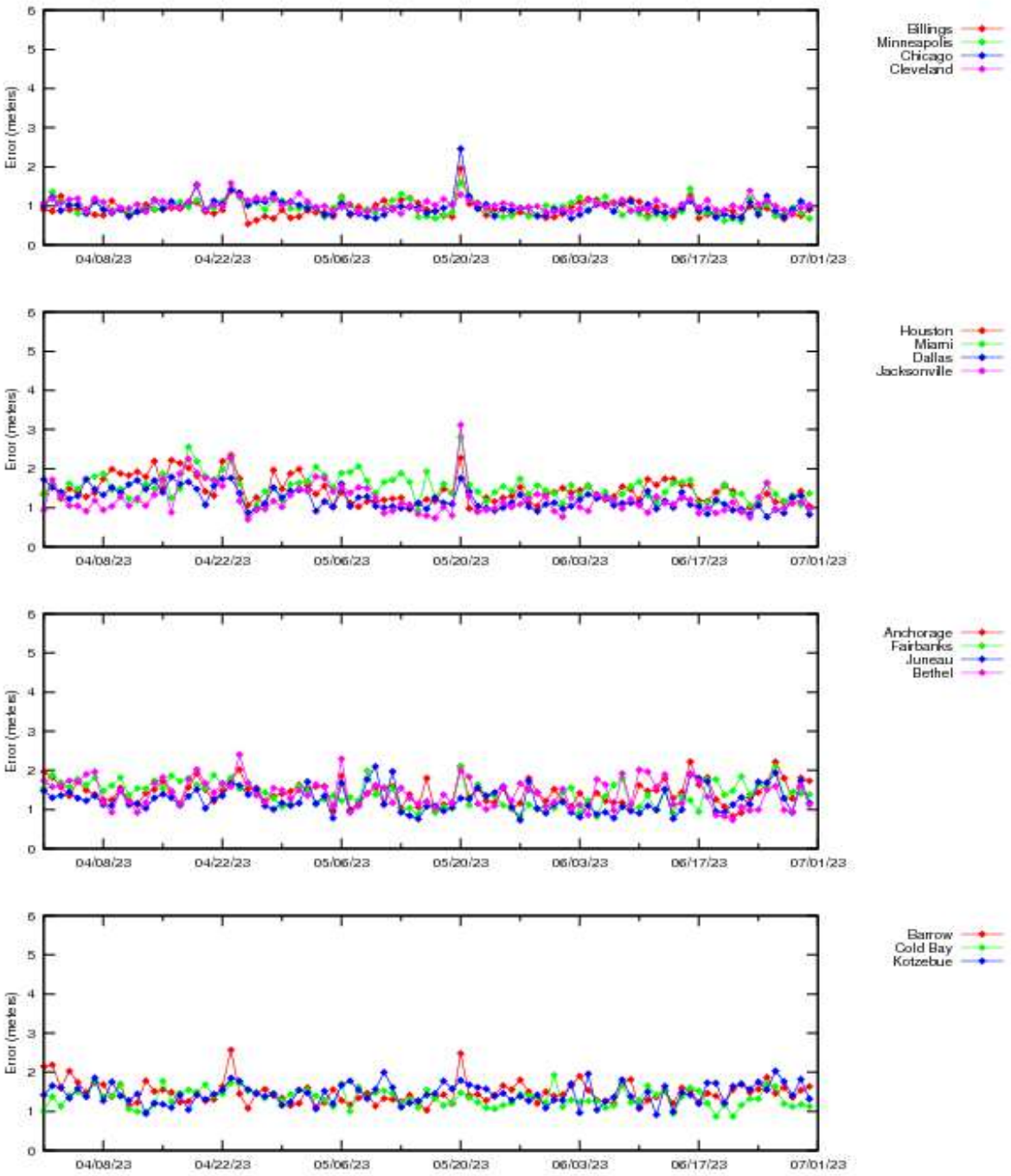

Figure 2-5 LPV 95% Vertical Accuracy

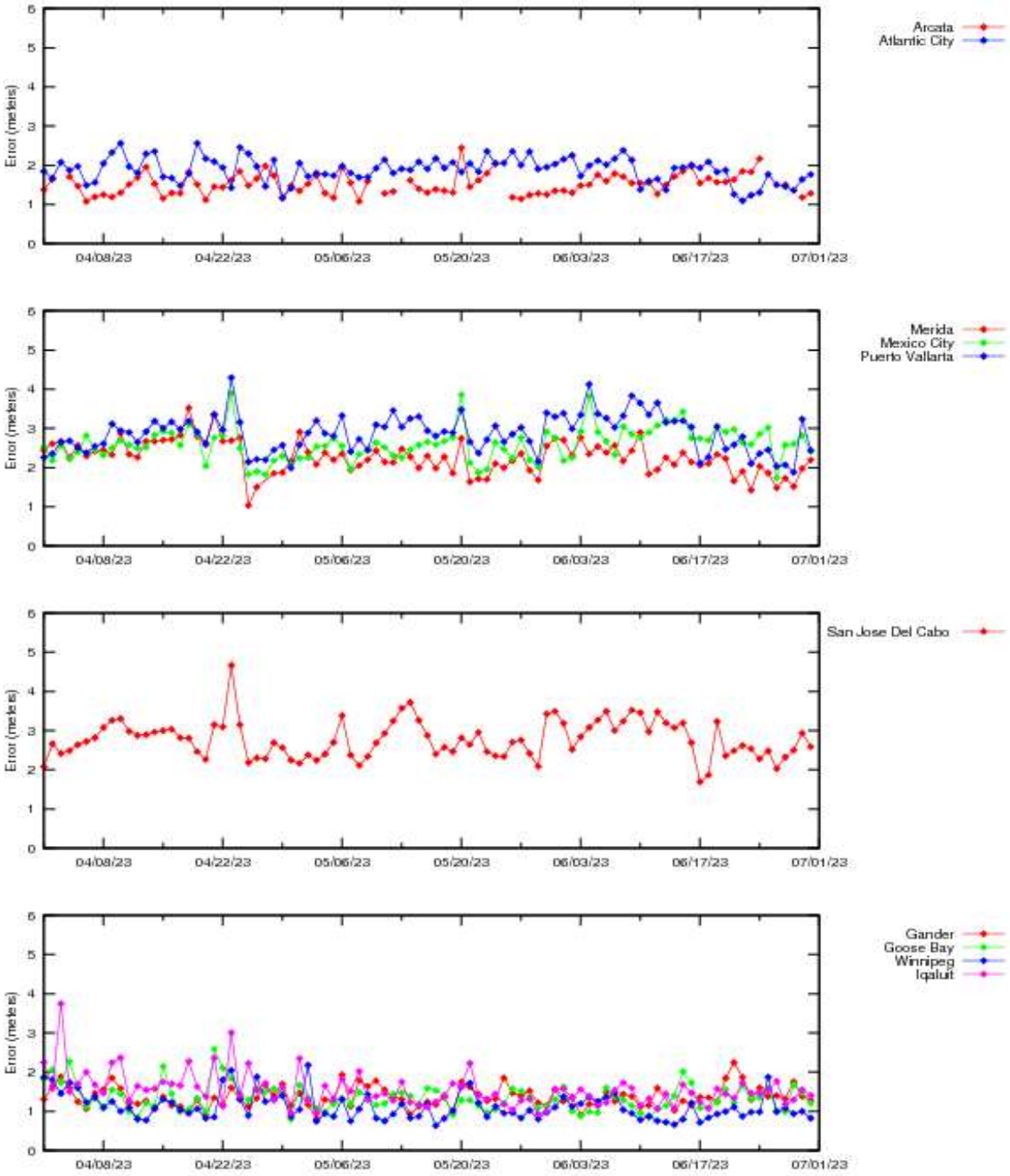

Figure 2-6 LPV 95% Vertical Accuracy

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 were due to geomagnetic activity occurred on April 23 and May 20, 2023.

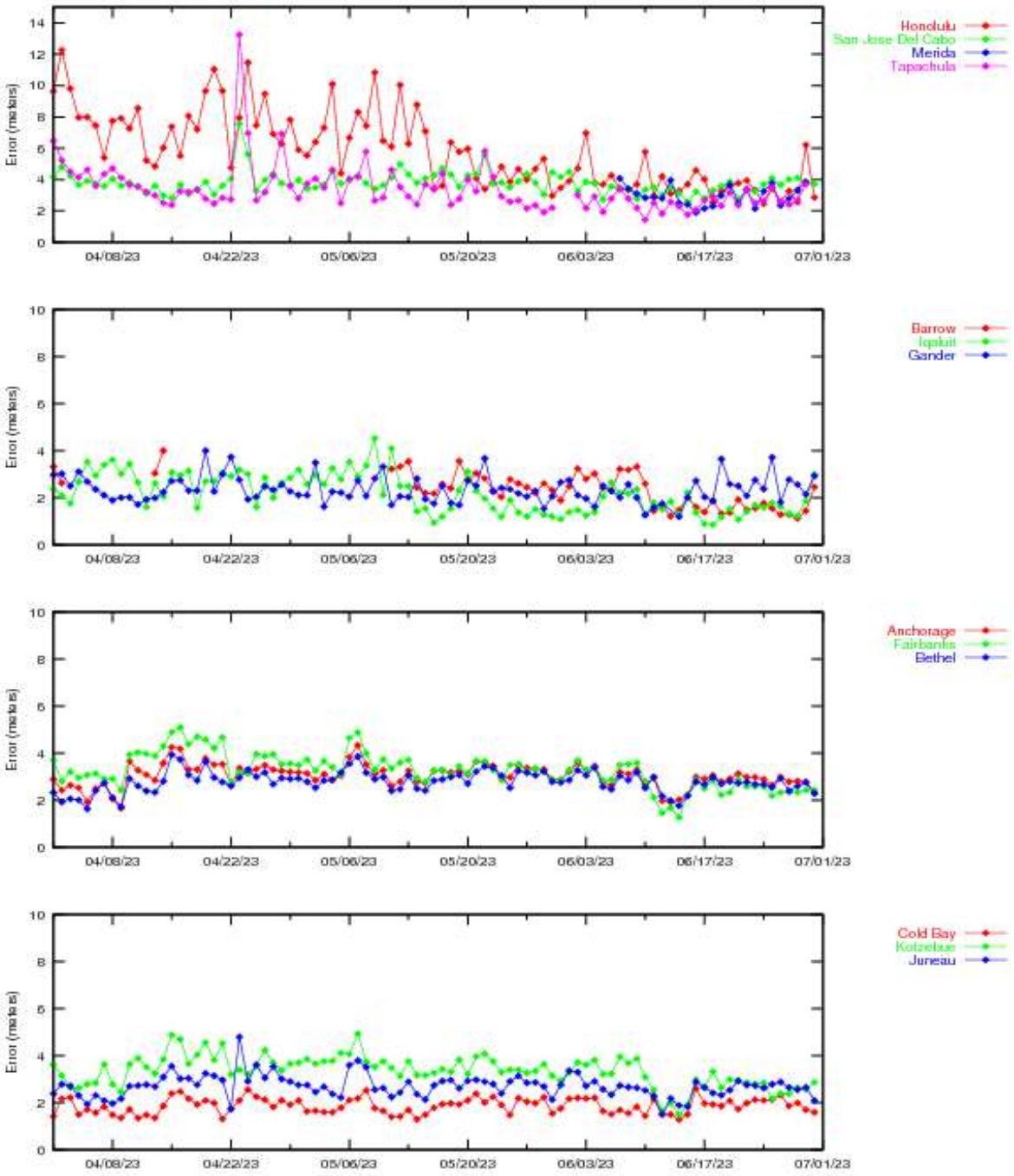

Figure 2-7 NPA 95% Horizontal Accuracy

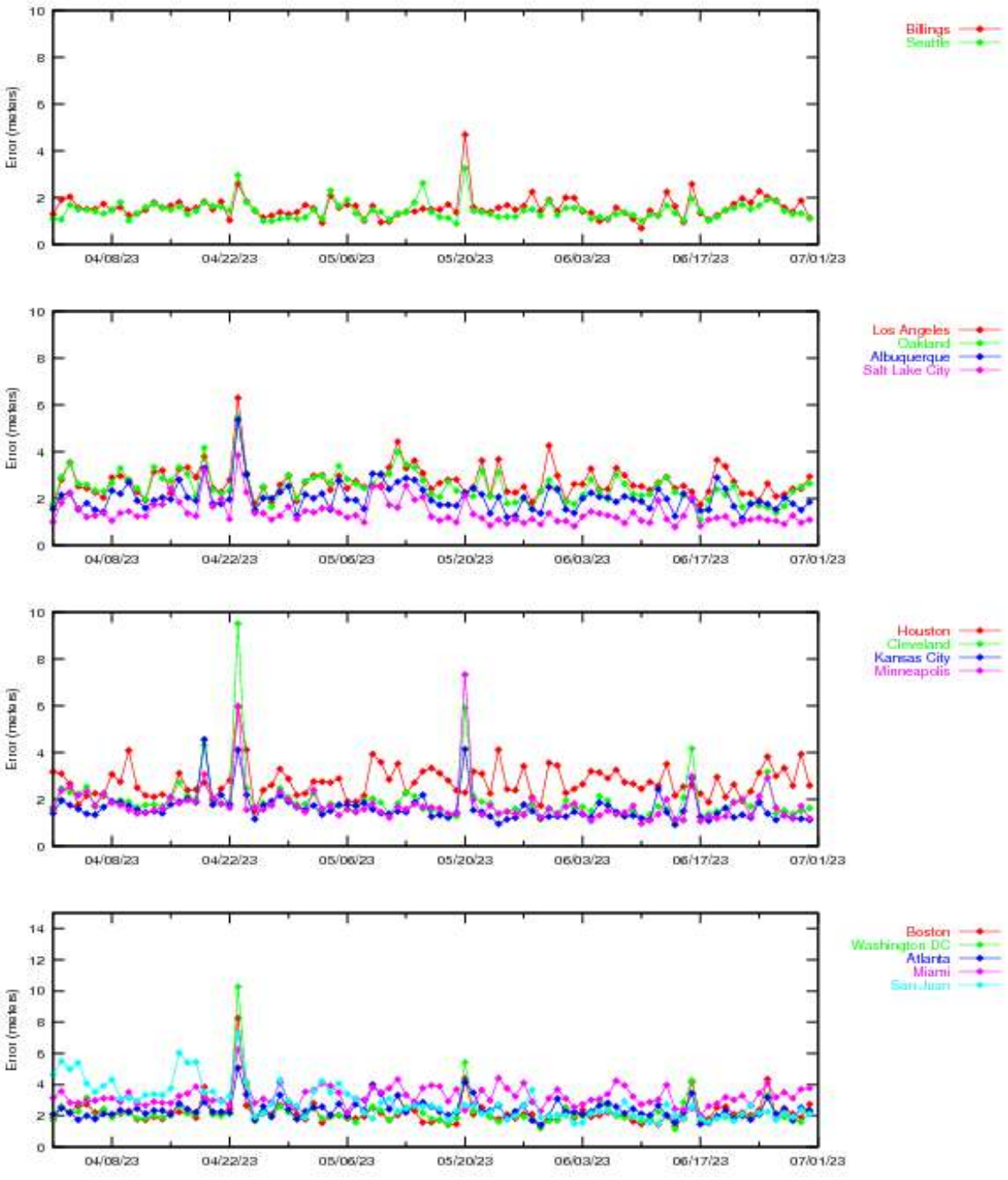

Figure 2-8 NPA 95% Horizontal Accuracy

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

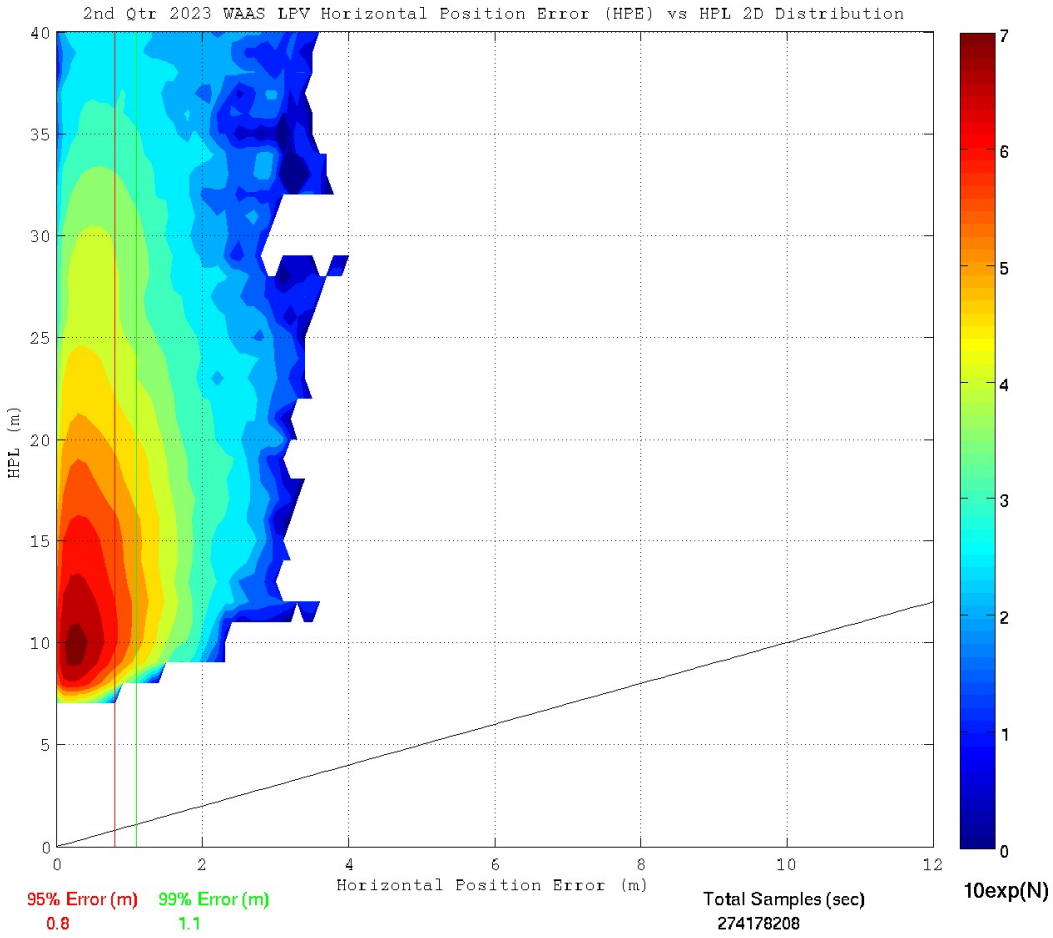

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

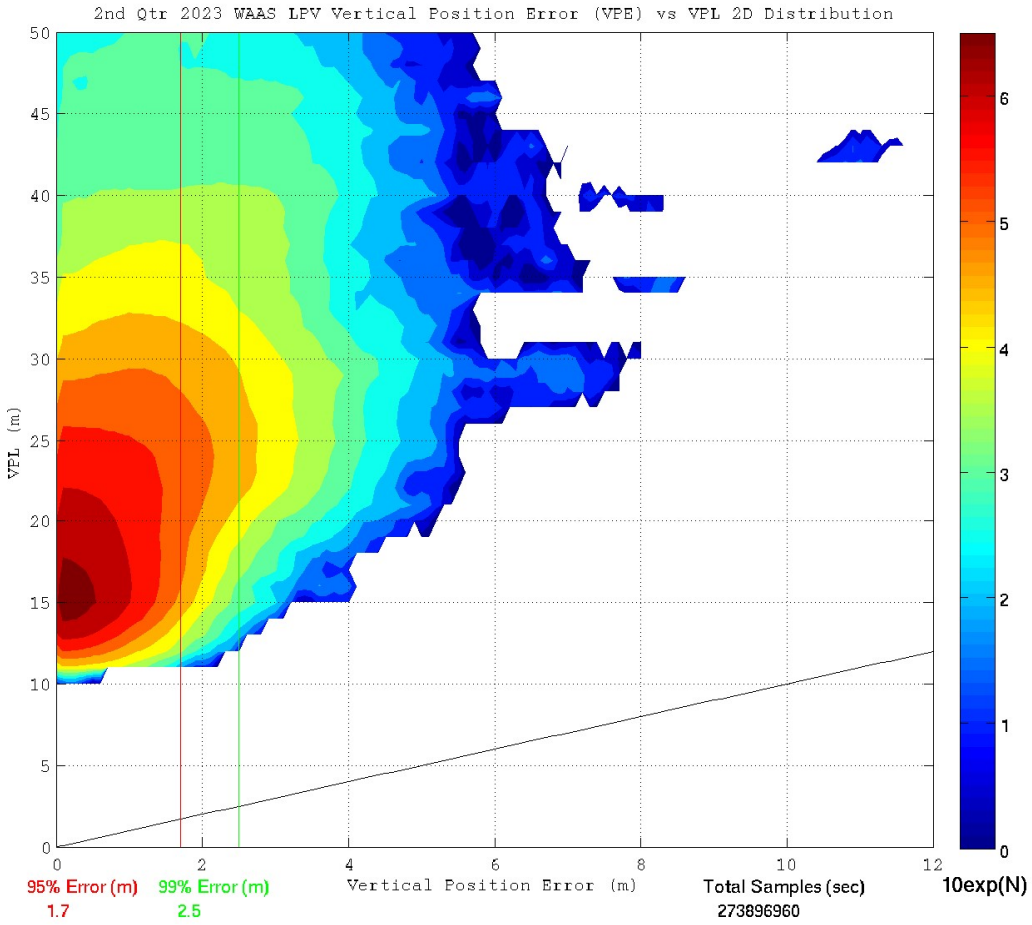

Figure 2-10 LPV Vertical Error Bounding Triangle Chart

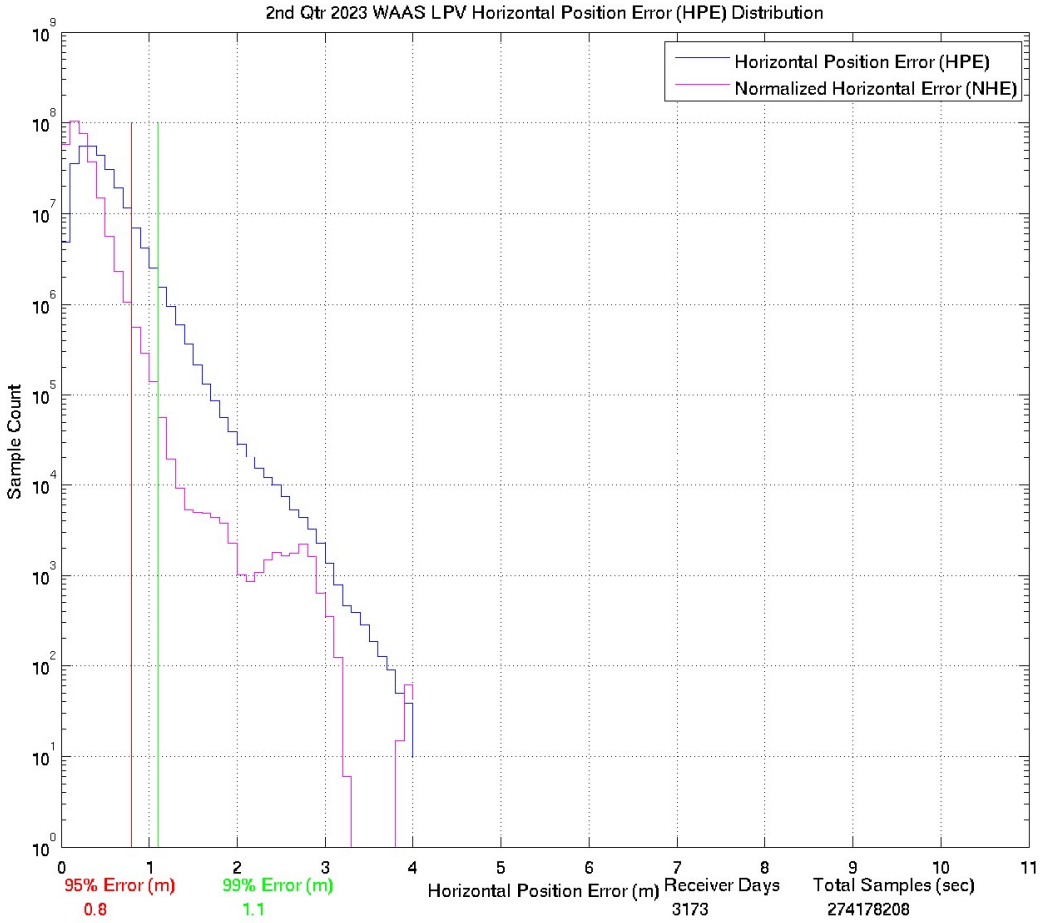

Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

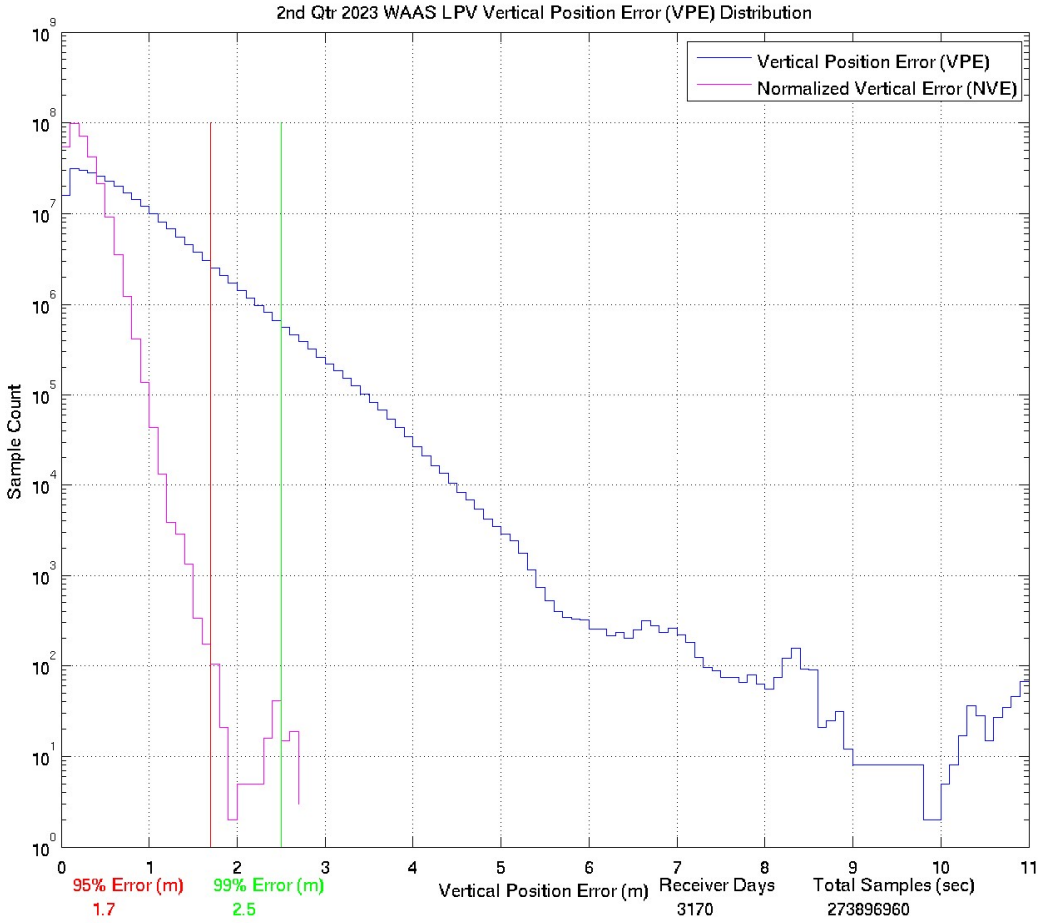

Figure 2-12 LPV 2-D Vertical Error Distribution Histogram

3.0 AVAILABILITY

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

- The maximum 99% CONUS HPL was 17.866 meters observed at Miami
- The maximum 99% CONUS VPL was 30.292 meters observed at Arcata
- The minimum 99% CONUS HPL was 10.730 meters observed at Salt Lake City
- The minimum 99% CONUS VPL was 20.158 meters observed at Memphis
- The maximum 99% Alaska HPL was 19.681 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 31.127 meters observed at Barrow
- The minimum 99% Alaska HPL was 13.422 meters observed at Fairbanks
- The minimum 99% Alaska VPL was 23.887 meters observed at Juneau

Table 3-1 99% Protection Level

Location	99% HPL (m)	99% VPL (m)	Percentage in PA Mode (%)
Arcata	14.121	30.292	100
Atlantic City-a	14.992	23.091	100
Oklahoma City	12.985	22.356	100
Albuquerque	12.885	28.172	100
Anchorage	13.703	24.002	100
Atlanta	12.119	22.251	100
Barrow	15.784	31.127	100
Bethel	15.784	27.895	100
Billings	11.919	20.582	100
Boston	15.437	23.043	100
Chicago	12.010	20.835	100
Cleveland	15.597	23.100	100
Cold Bay	19.681	30.576	100
Dallas	10.984	20.169	100
Denver	11.354	22.977	100
Fairbanks	13.422	25.175	100
Gander	22.915	29.363	100
Goose Bay	19.065	25.010	100
Houston	11.875	21.545	100
Iqaluit	25.203	34.449	100
Jacksonville	13.726	24.120	100
Juneau	13.695	23.887	100
Kansas City	11.235	22.433	100
Kotzebue	15.466	29.264	100
Los Angeles	13.044	29.358	100
Memphis	11.400	20.158	100
Merida	20.998	42.126	99.997
Mexico City	30.589	48.378	100
Miami	17.866	28.375	100
Minneapolis	12.063	20.317	100
New York	15.014	23.063	100
Oakland	13.112	28.732	100
Puerto Vallarta	29.745	49.029	99.997
Salt Lake City	10.730	21.574	100
San Jose Del Cabo	28.206	57.591	99.997
Seattle	13.338	23.207	100
Washington, DC	14.196	22.454	100
Winnipeg	13.956	21.206	100

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

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

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

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

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
Arcata	99.97	99.93	99.86
Atlantic City-a	99.85	99.85	99.85
Oklahoma City	99.95	99.92	99.91
Albuquerque	99.99	99.97	99.94
Anchorage	99.87	99.86	99.76
Atlanta	99.91	99.89	99.87
Barrow	99.93	99.86	99.66
Bethel	99.94	99.88	99.8
Billings	99.79	99.75	99.7
Boston	99.85	99.85	99.85
Chicago	99.87	99.85	99.83
Cleveland	99.86	99.86	99.84
Cold Bay	99.94	99.93	99.71
Dallas	99.96	99.95	99.94
Denver	99.94	99.92	99.88
Fairbanks	99.87	99.85	99.81
Gander	99.84	99.84	99.81
Goose Bay	99.96	99.96	99.93
Houston	99.95	99.94	99.92
Iqaluit	99.96	99.94	98.92
Jacksonville	99.9	99.89	99.85
Juneau	99.78	99.74	99.71
Kansas City	99.89	99.89	99.85
Kotzebue	99.93	99.89	99.75
Los Angeles	100	99.97	99.95
Memphis	99.95	99.92	99.89
Merida	99.86	99.72	97.05
Mexico City	99.84	99.05	92.76
Miami	99.9	99.85	99.78
Minneapolis	99.73	99.71	99.71
New York	99.85	99.85	99.83
Oakland	100	99.96	99.94
Puerto Vallarta	99.91	99	90.31
Salt Lake City	99.98	99.95	99.93
San Jose Del Cabo	99.91	98.48	92.82

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
Seattle	99.8	99.75	99.73
Washington, DC	99.86	99.86	99.84
Winnipeg	99.68	99.66	99.64

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	1	0.000022	1	0.000022	4	0.000087
Atlantic City-a	1	0.000019	1	0.000019	2	0.000039
Oklahoma City	1	0.000021	1	0.000021	2	0.000042
Albuquerque	1	0.000019	1	0.000019	2	0.000038
Anchorage	2	0.000038	3	0.000057	3	0.000057
Atlanta	1	0.000019	1	0.000019	1	0.000019
Barrow	3	0.000057	2	0.000038	20	0.000383
Bethel	3	0.000057	4	0.000076	7	0.000134
Billings	2	0.000038	2	0.000038	3	0.000057
Boston	1	0.000019	1	0.000019	1	0.000019
Chicago	2	0.000038	2	0.000038	3	0.000057
Cleveland	1	0.000019	1	0.000019	2	0.000038
Cold Bay	4	0.000076	4	0.000076	16	0.000306
Dallas	1	0.000019	1	0.000019	1	0.000019
Denver	1	0.000019	2	0.000038	3	0.000057
Fairbanks	2	0.000038	2	0.000038	5	0.000096
Gander	1	0.000019	1	0.000019	7	0.000136
Goose Bay	1	0.000019	2	0.000038	6	0.000115
Houston	1	0.000019	2	0.000038	1	0.000019
Iqaluit	5	0.000096	8	0.000153	121	0.002338
Jacksonville	1	0.000019	1	0.000019	1	0.000019
Juneau	2	0.000038	2	0.000038	3	0.000057
Kansas City	1	0.000019	2	0.000038	3	0.000057
Kotzebue	2	0.000038	2	0.000038	13	0.000249
Los Angeles	0	0.000000	1	0.000019	5	0.000096
Memphis	3	0.000057	2	0.000038	1	0.000019
Merida	2	0.000039	33	0.000644	223	0.004471
Mexico City	6	0.000115	117	0.002262	625	0.012901
Miami	1	0.000019	2	0.000038	13	0.000249
Minneapolis	3	0.000057	2	0.000038	2	0.000038
New York	1	0.000019	1	0.000019	1	0.000019
Oakland	0	0.000000	1	0.000019	3	0.000058
Puerto Vallarta	2	0.000039	111	0.002156	652	0.013886
Salt Lake City	1	0.000019	1	0.000019	4	0.000076
San Jose Del Cabo	4	0.000078	87	0.001713	547	0.011427
Seattle	3	0.000057	3	0.000057	3	0.000057
Washington, DC	1	0.000019	1	0.000019	1	0.000019

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Winnipeg	2	0.000038	3	0.000057	4	0.000077

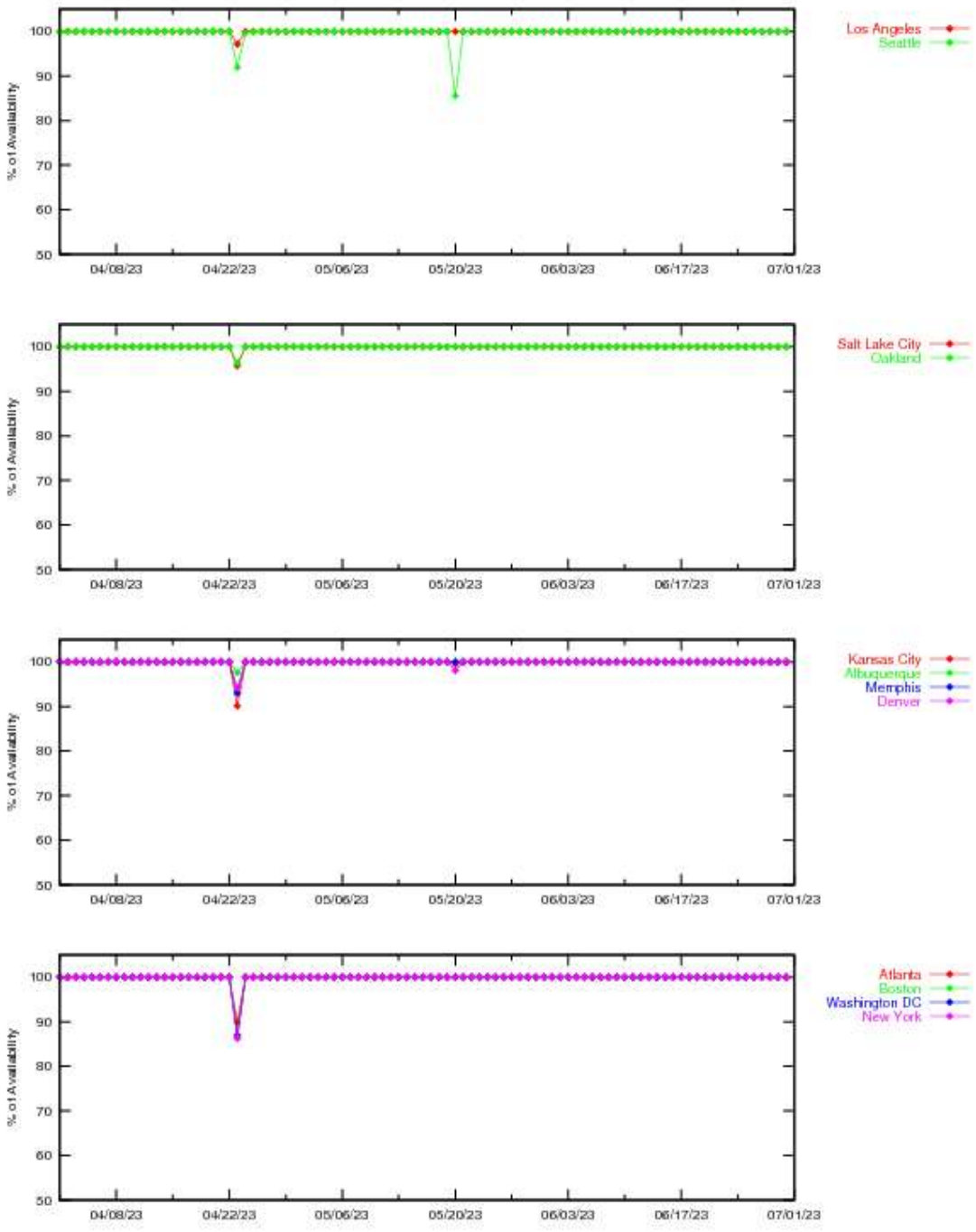

Figure 3-1 LPV Instantaneous Availability

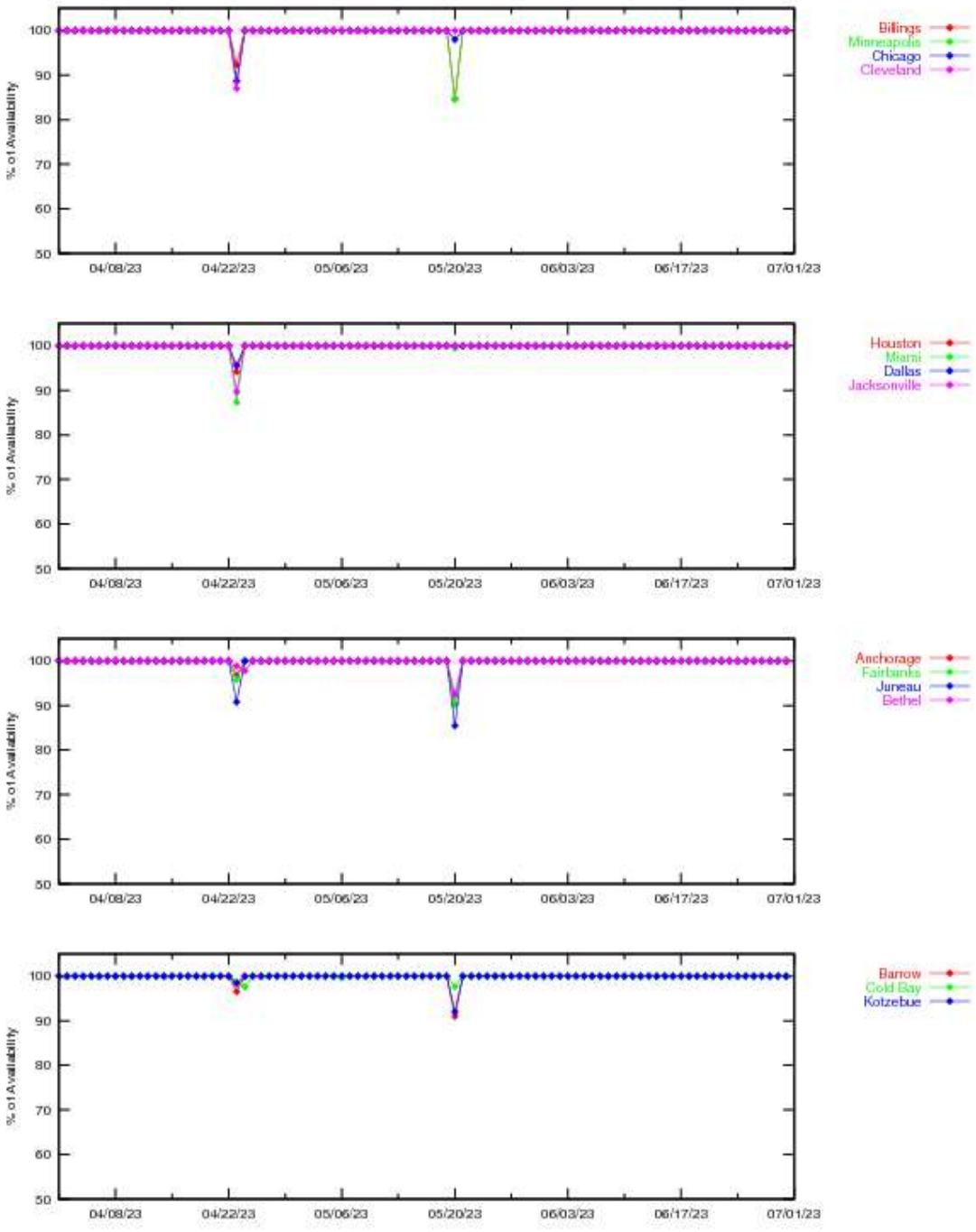

Figure 3-2 LPV Instantaneous Availability

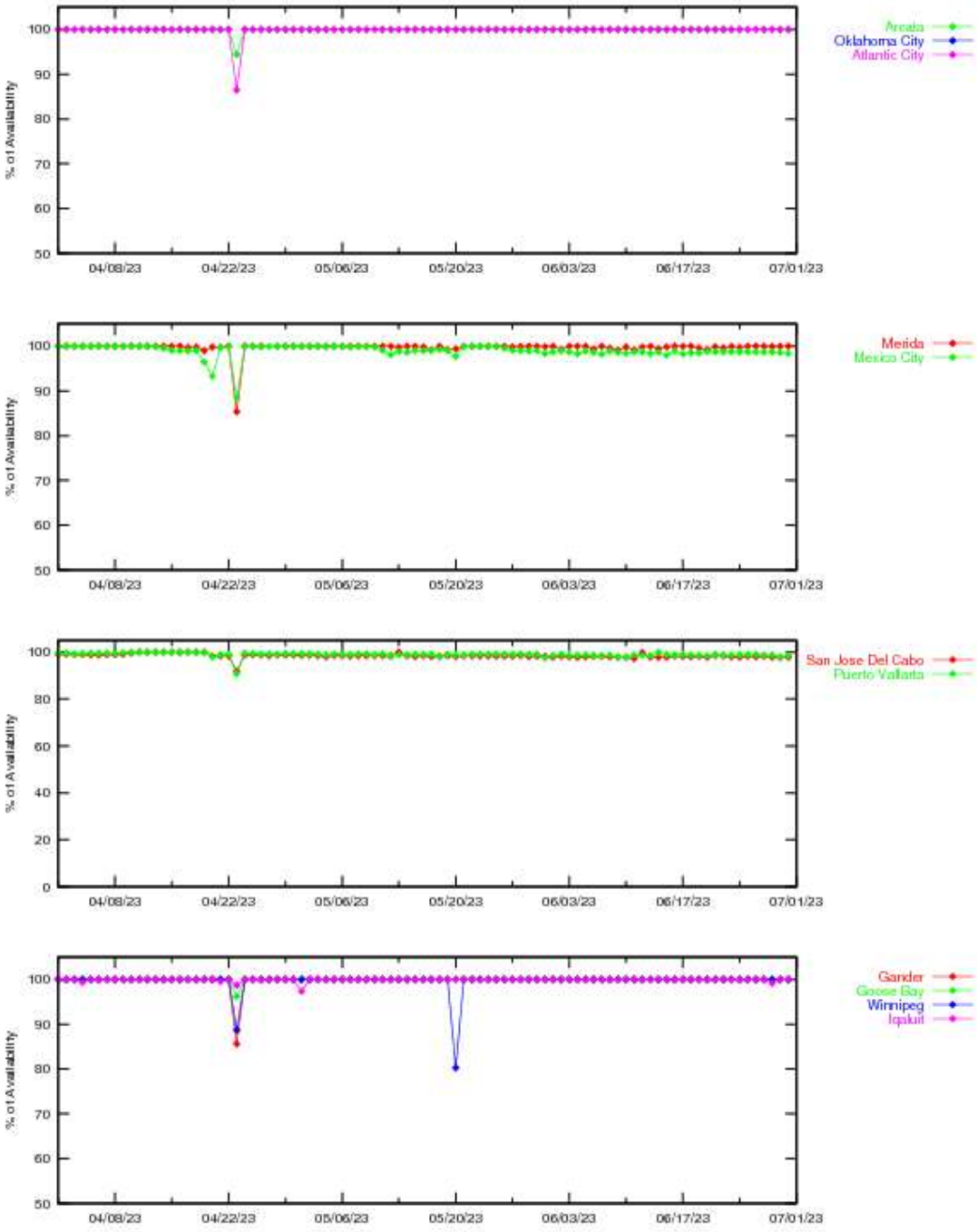

Figure 3-3 LPV Instantaneous Availability

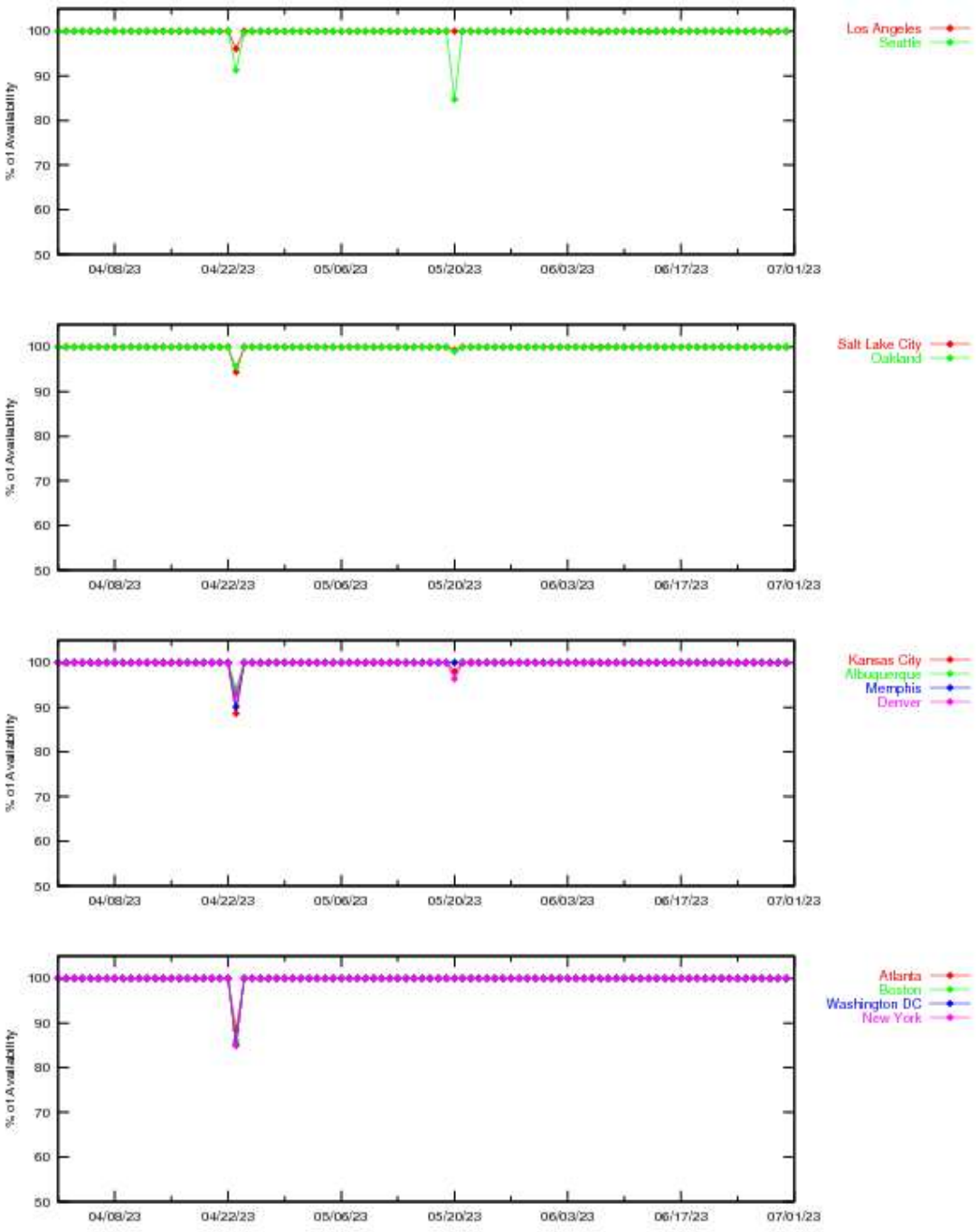

Figure 3-4 LPV200 Instantaneous Availability

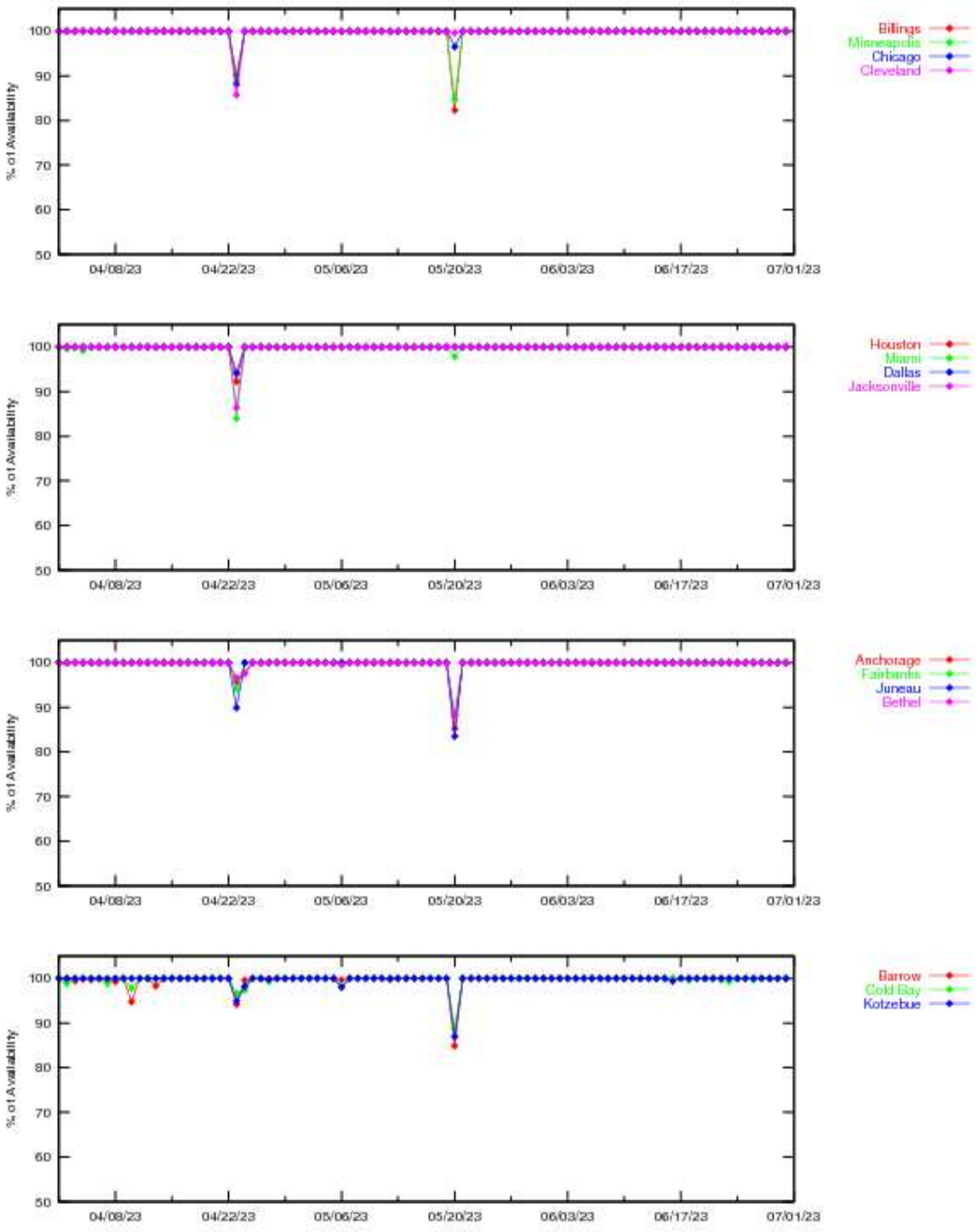

Figure 3-5 LPV200 Instantaneous Availability

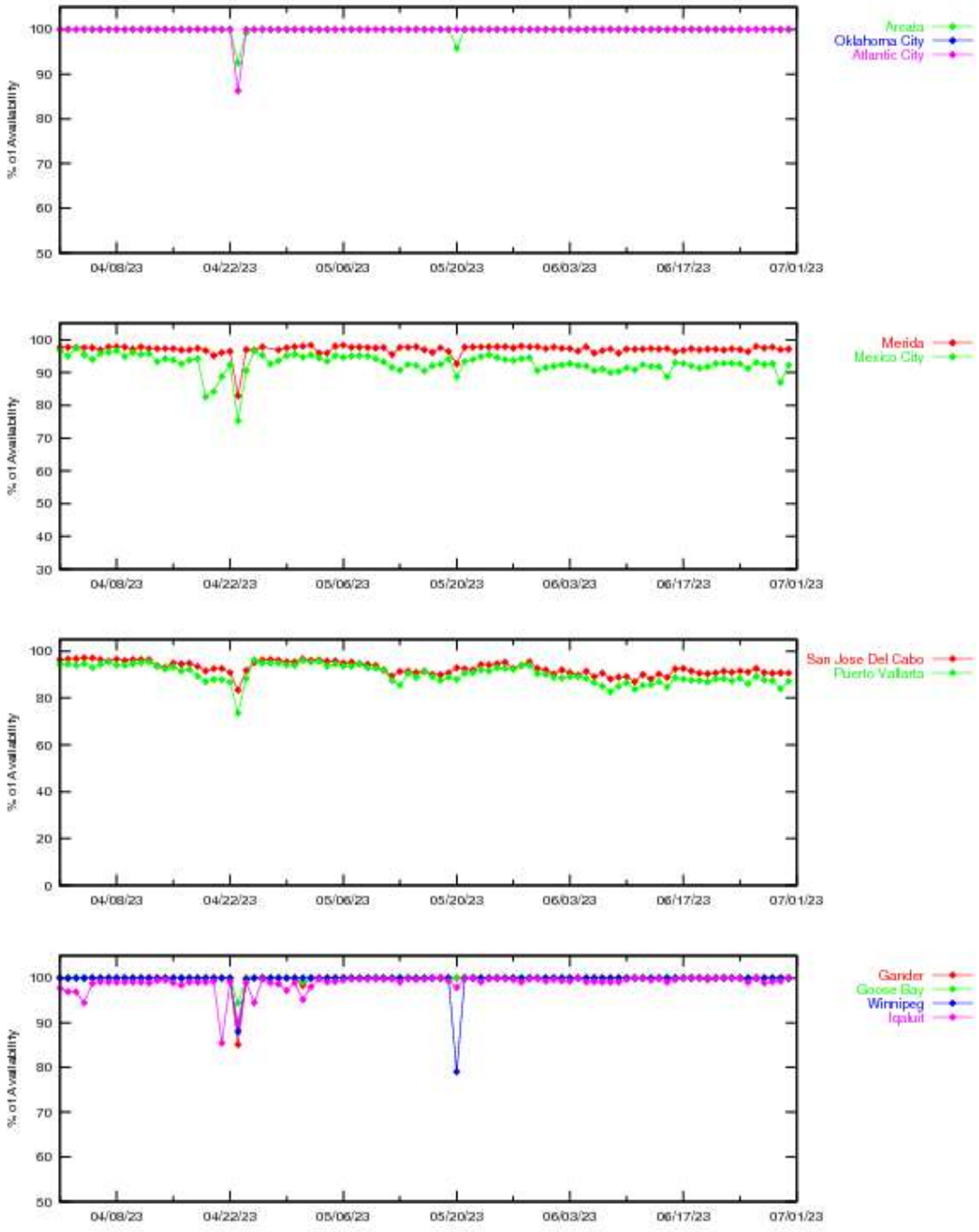

Figure 3-6 LPV200 Instantaneous Availability

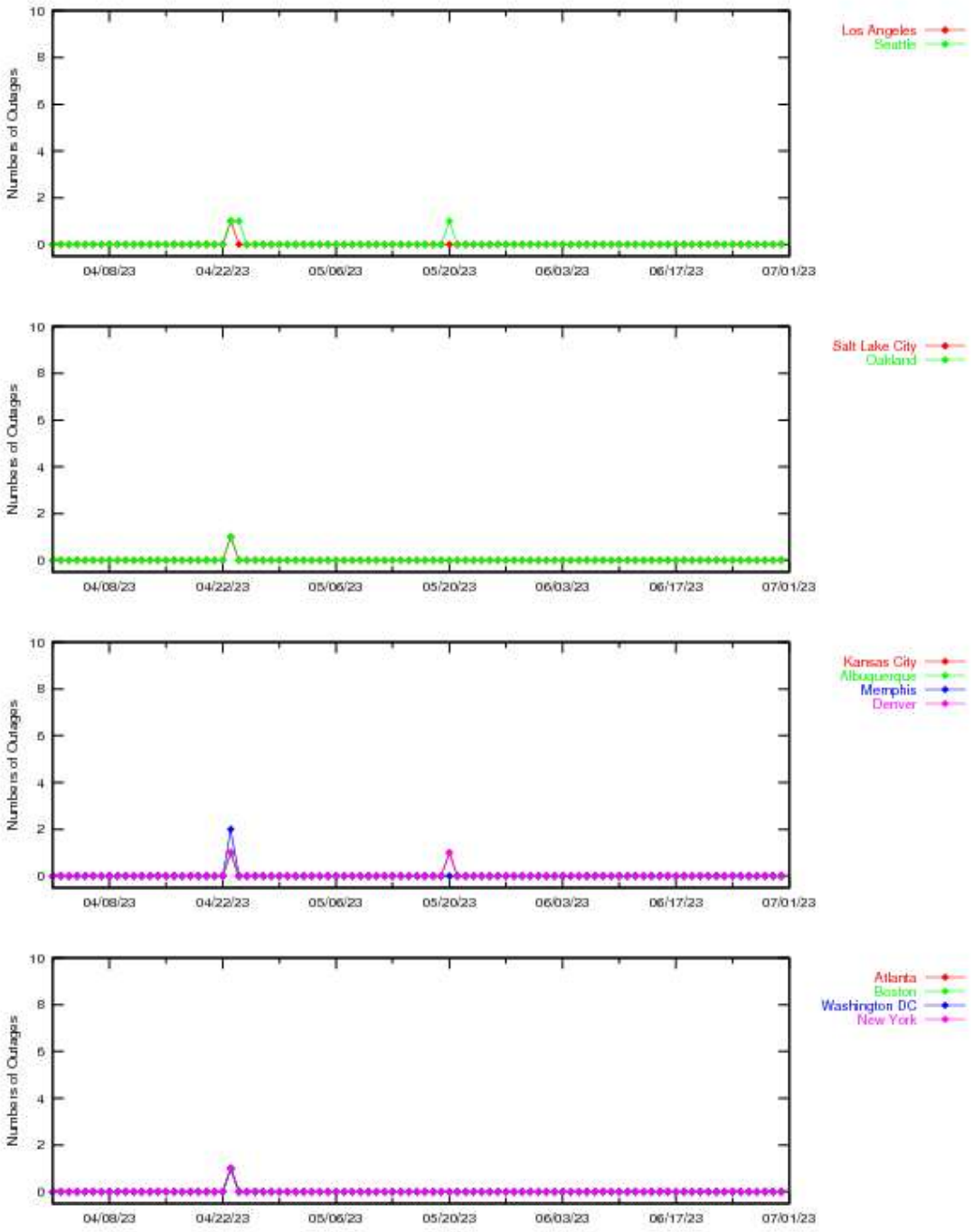

Figure 3-7 LPV Outages

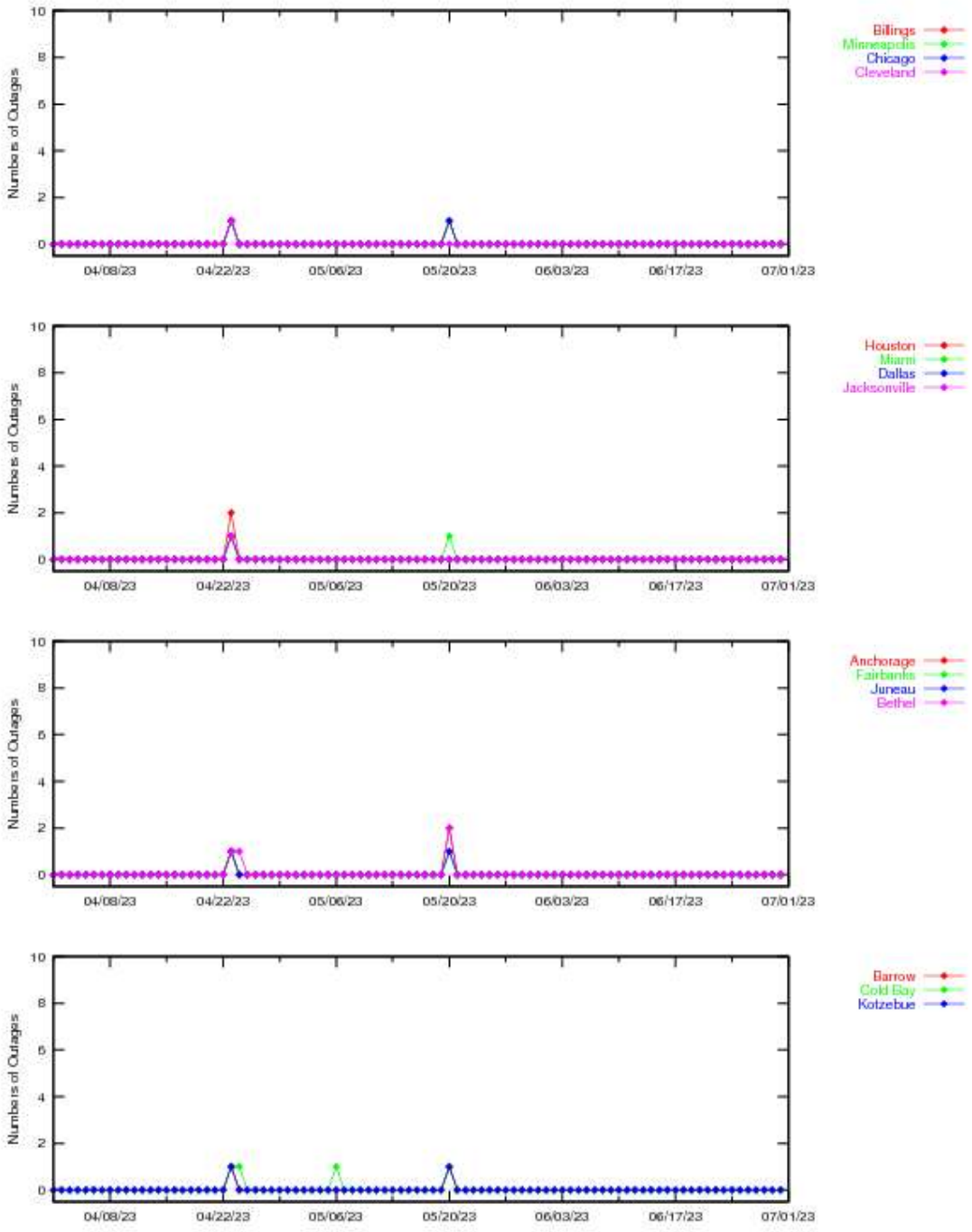

Figure 3-8 LPV Outages

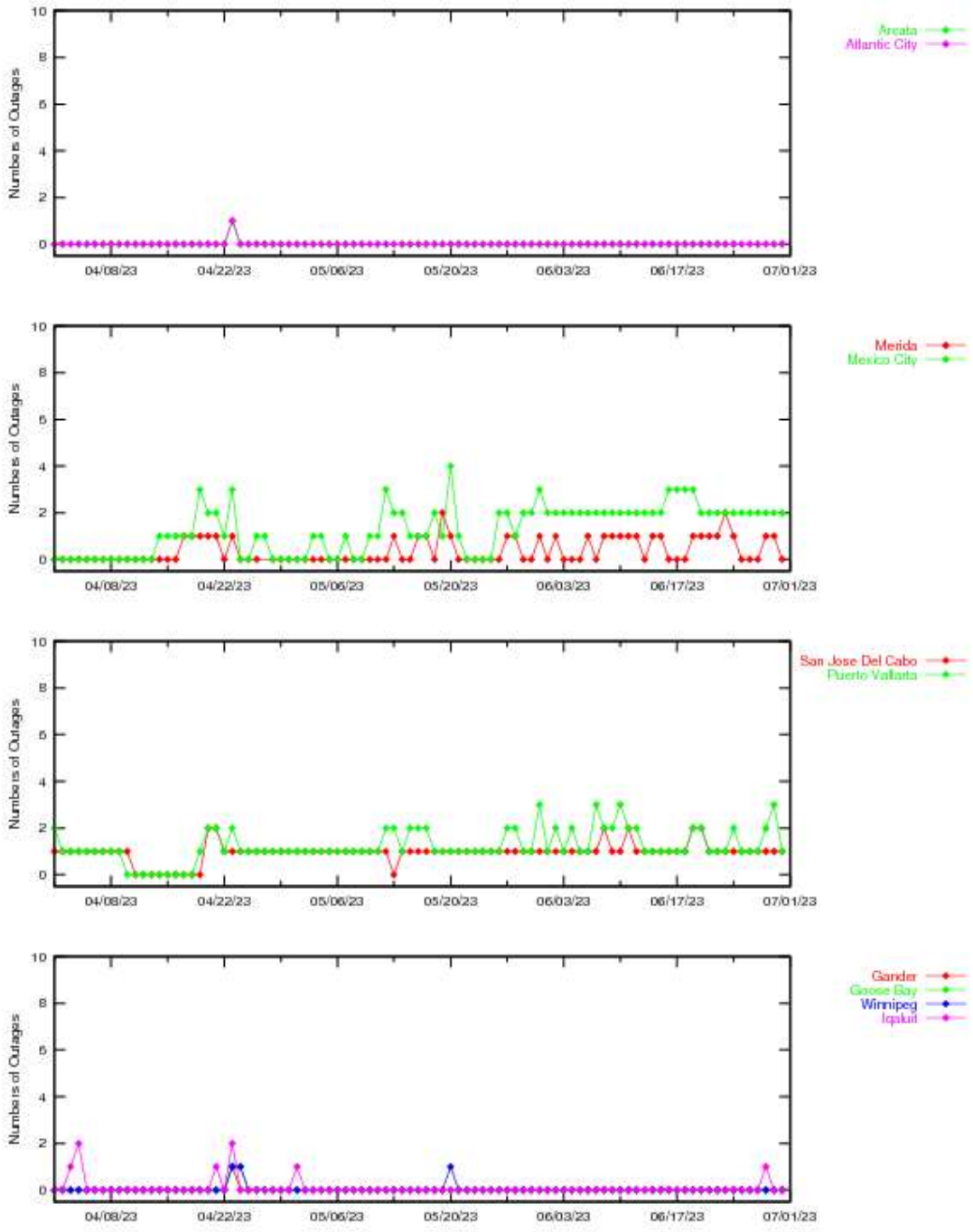

Figure 3-9 LPV Outages

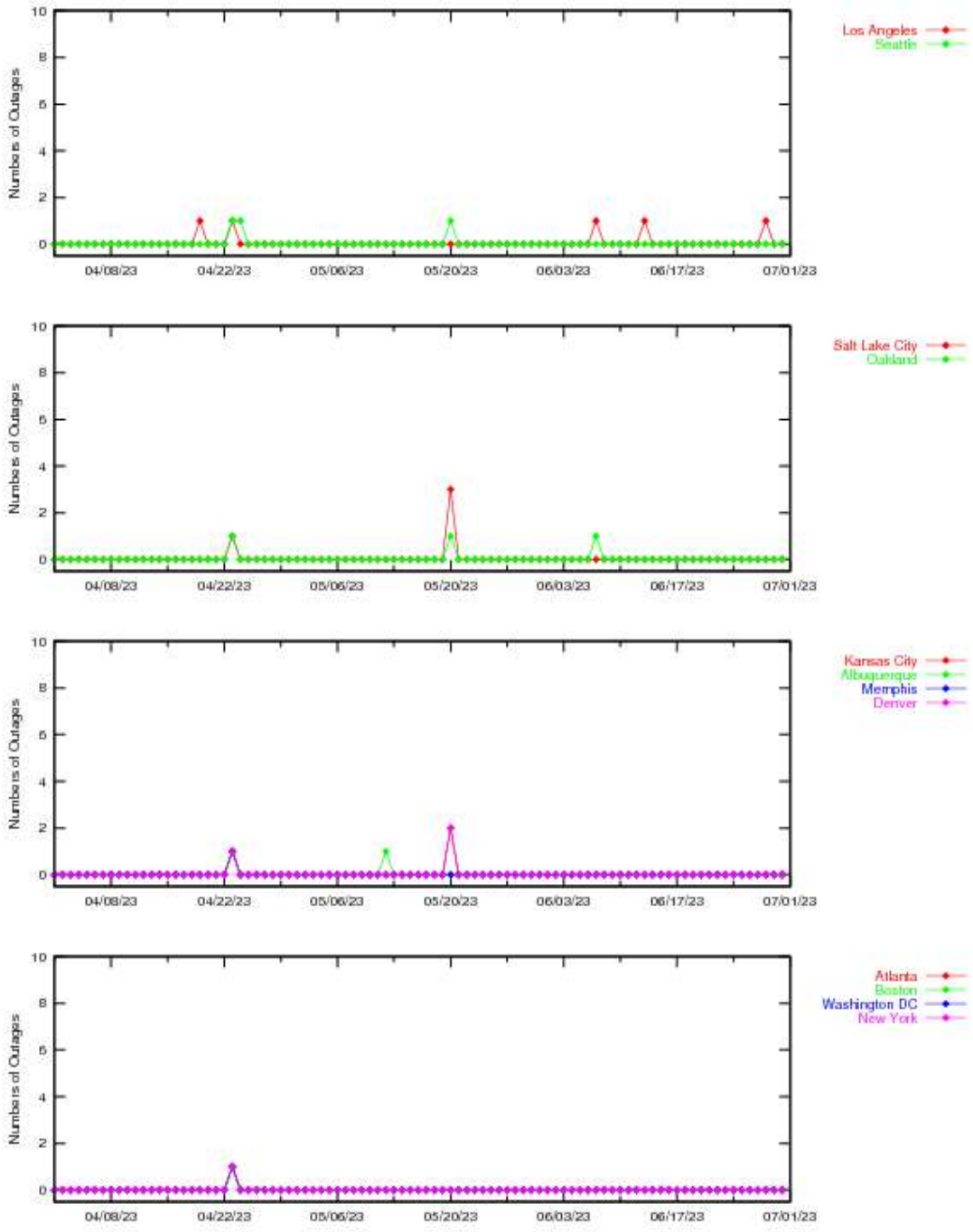

Figure 3-10 LPV200 Outages

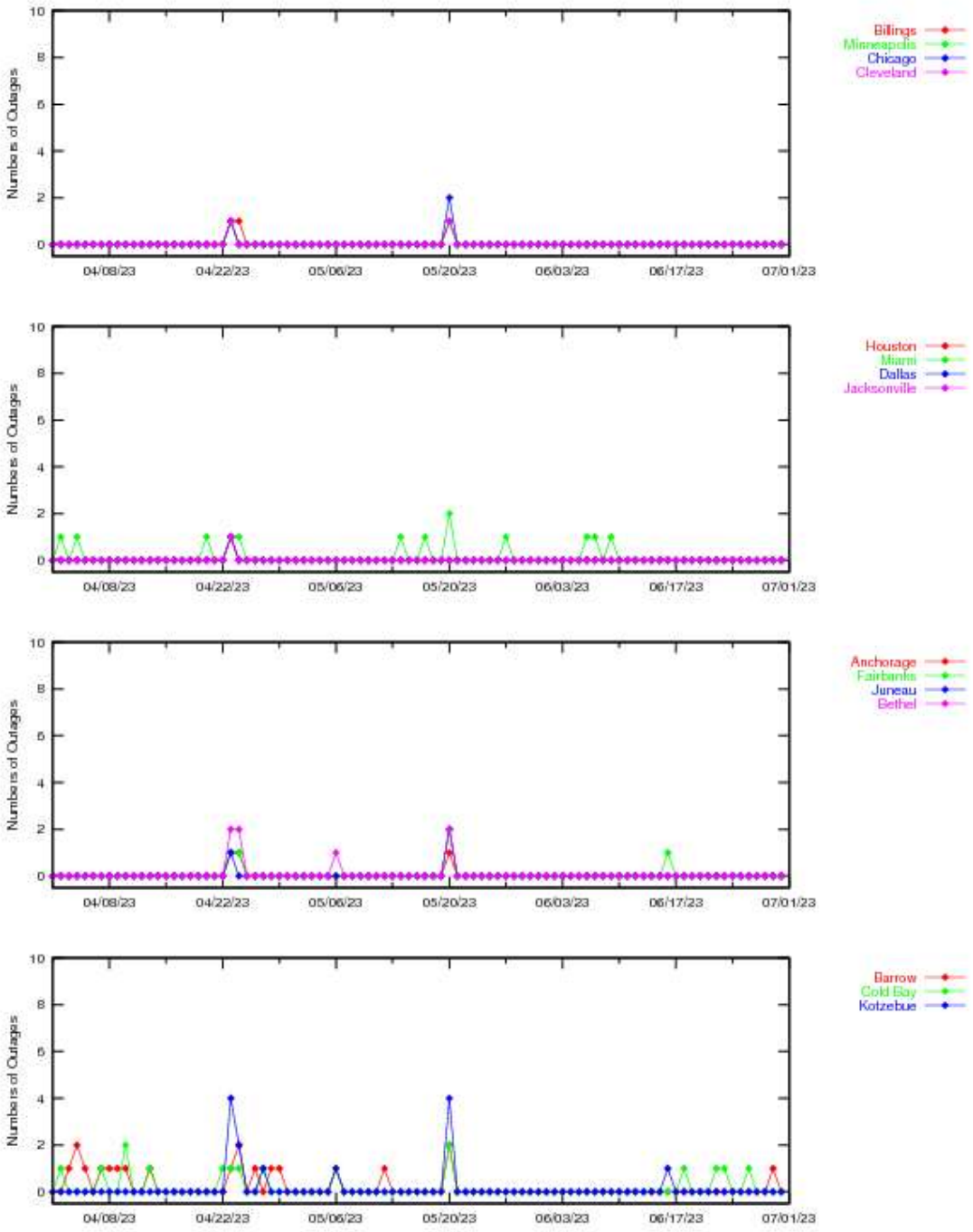

Figure 3-11 LPV200 Outages

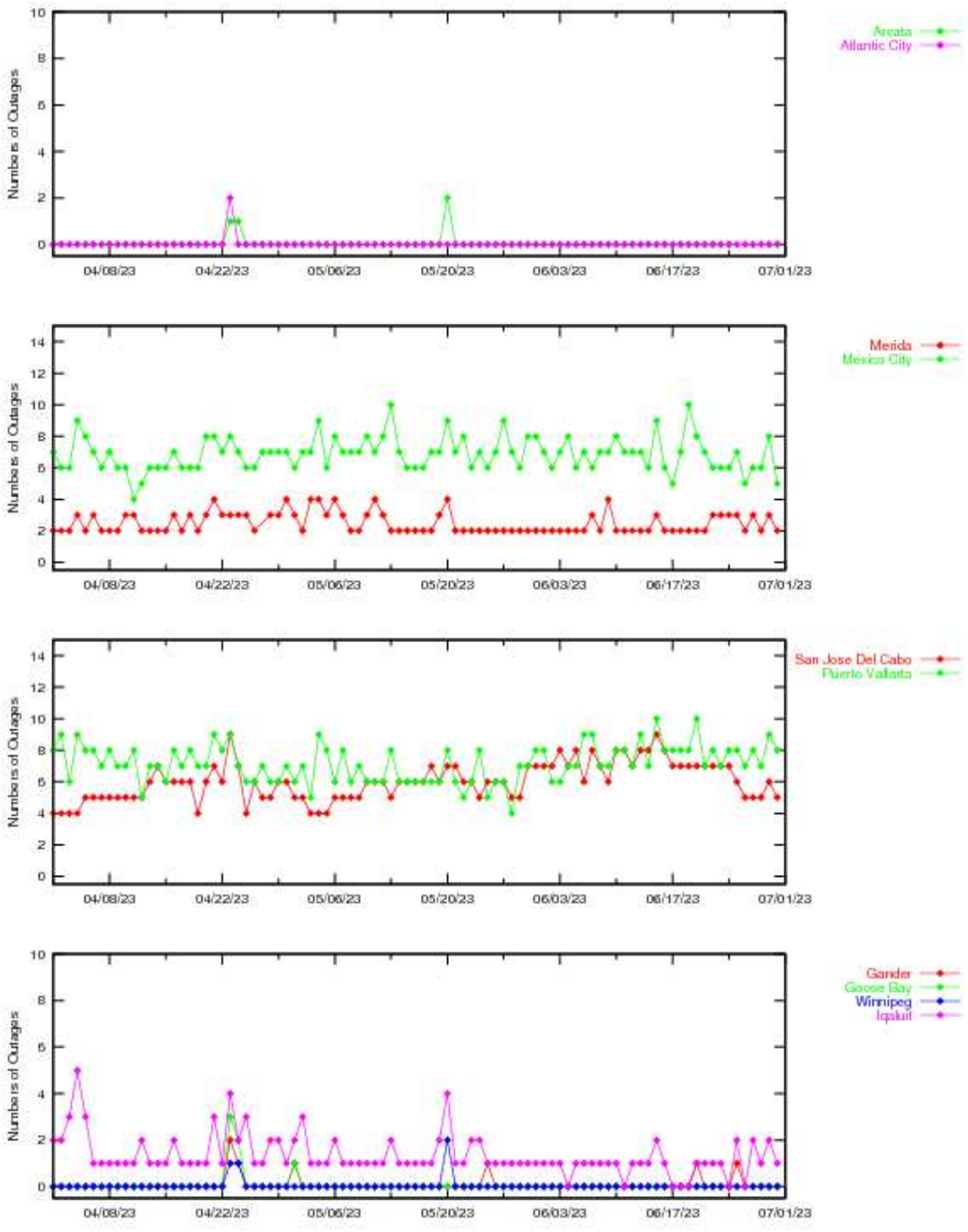

Figure 3-12 LPV200 Outages

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
Fairbanks	0	0
Gander	0	0
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0
Kotzebue	0	0
Los Angeles	0	0
Merida	0	0
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	0	0
San Juan	0	0
Seattle	0	0
Tapachula	0	0
Washington, DC	0	0

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

- Jan 1–Jun 30—The Tech Center began observing a reduction of LPV200 availability in the Gulf of Mexico and the Florida panhandle. This is due to an increase of dilution of precision in the region. The region sees a drop in satellites as PRN3 sets. Later the degradation decreases as PRN21 enters the region.
- April 1—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 3—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 4–5—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS and Canada.
- April 5—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 7—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Alaska and Canada.

- April 9—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 10—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Alaska and Canada.
- April 13–14—Satellite maintenance elevated UDREs on PRN29 and reduced LPV200 availability in Alaska and Canada.
- April 19—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS and Canada.
- April 19—Satellite maintenance elevated UDREs on PRN28 and reduced LPV200 availability in CONUS.
- April 20—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS.
- April 21—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 22—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 23—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- April 24—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- April 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- April 29—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- May 1–2—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in Canada.
- May 4—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS and Canada.
- May 5—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS.
- May 6—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Alaska and Canada.
- May 9–Jun 30—Starting around May 9, the Tech Center began observing degradation in Southern CONUS. This is a result of increased DOPs in the region starting in January (see event #22156) along with an increase in IGP GIVE values. Both these increases caused minor degradation in Southern California, New Mexico, Arizona, Western Texas, and the Florida panhandle.
- May 12—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS and Canada.
- May 13—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- May 20—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- May 21—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.
- May 23—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS, Alaska, and Canada.
- Jun 15—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in CONUS and Canada.
- Jun 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 availability in Canada.

- Jun 28—Receiver upgrades at Iqaluit (YFB) reduced LPV and LPV200 availability in Canada.

4.0 COVERAGE

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

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

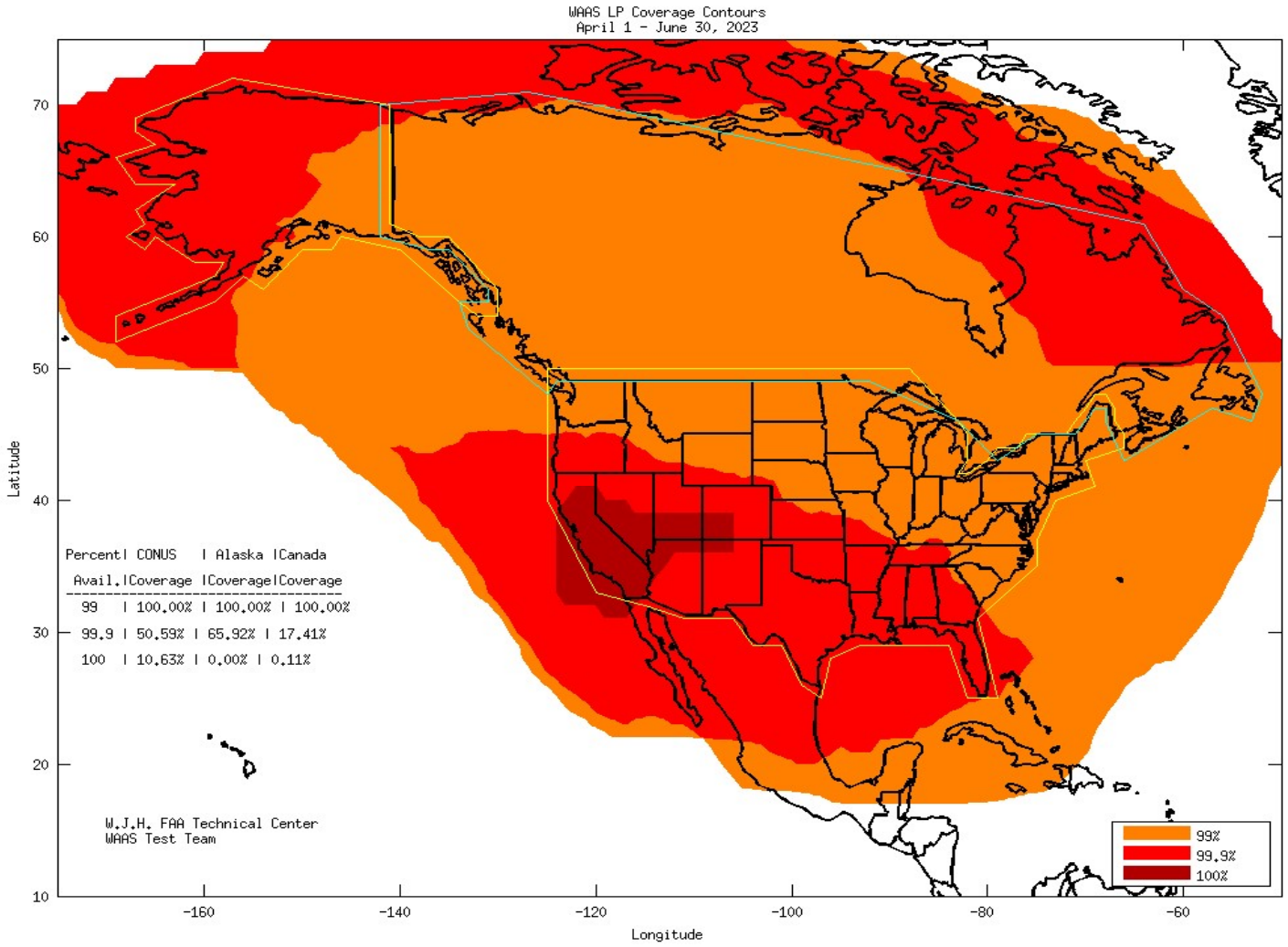

Figure 4-1 LP North America Coverage for the Quarter

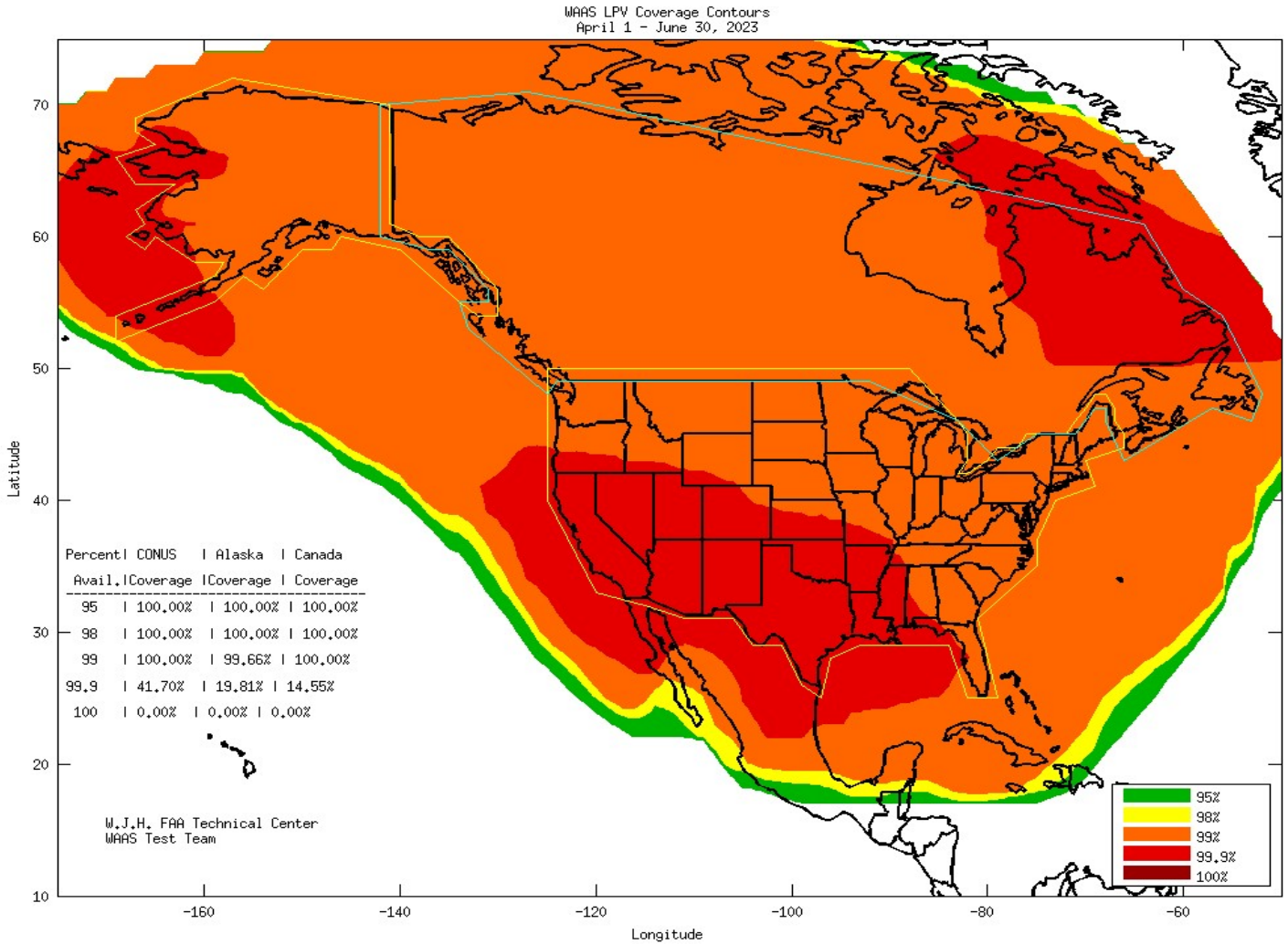

Figure 4-2 LPV North America Coverage for the Quarter

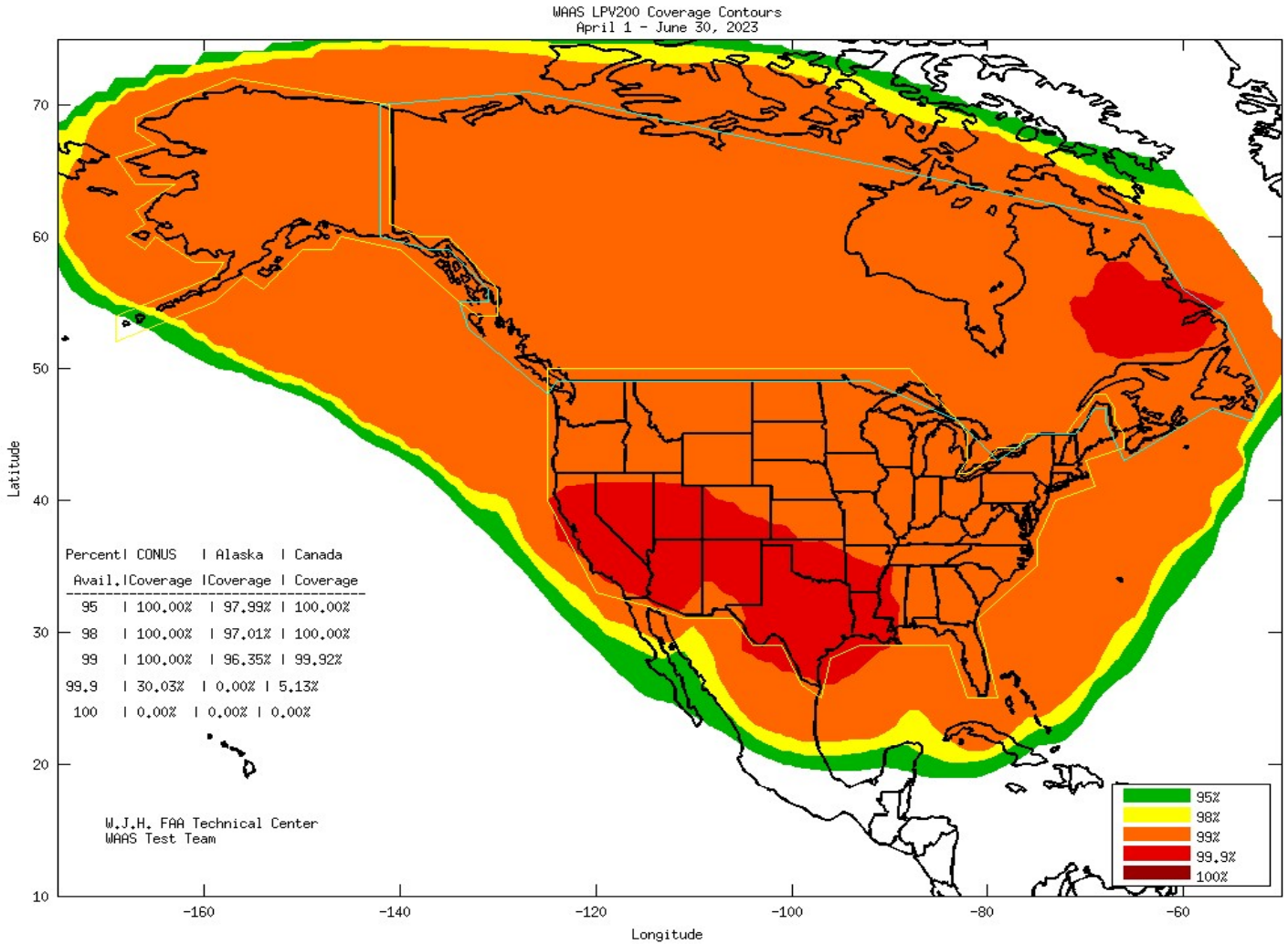

Figure 4-3 LPV200 North America Coverage for the Quarter

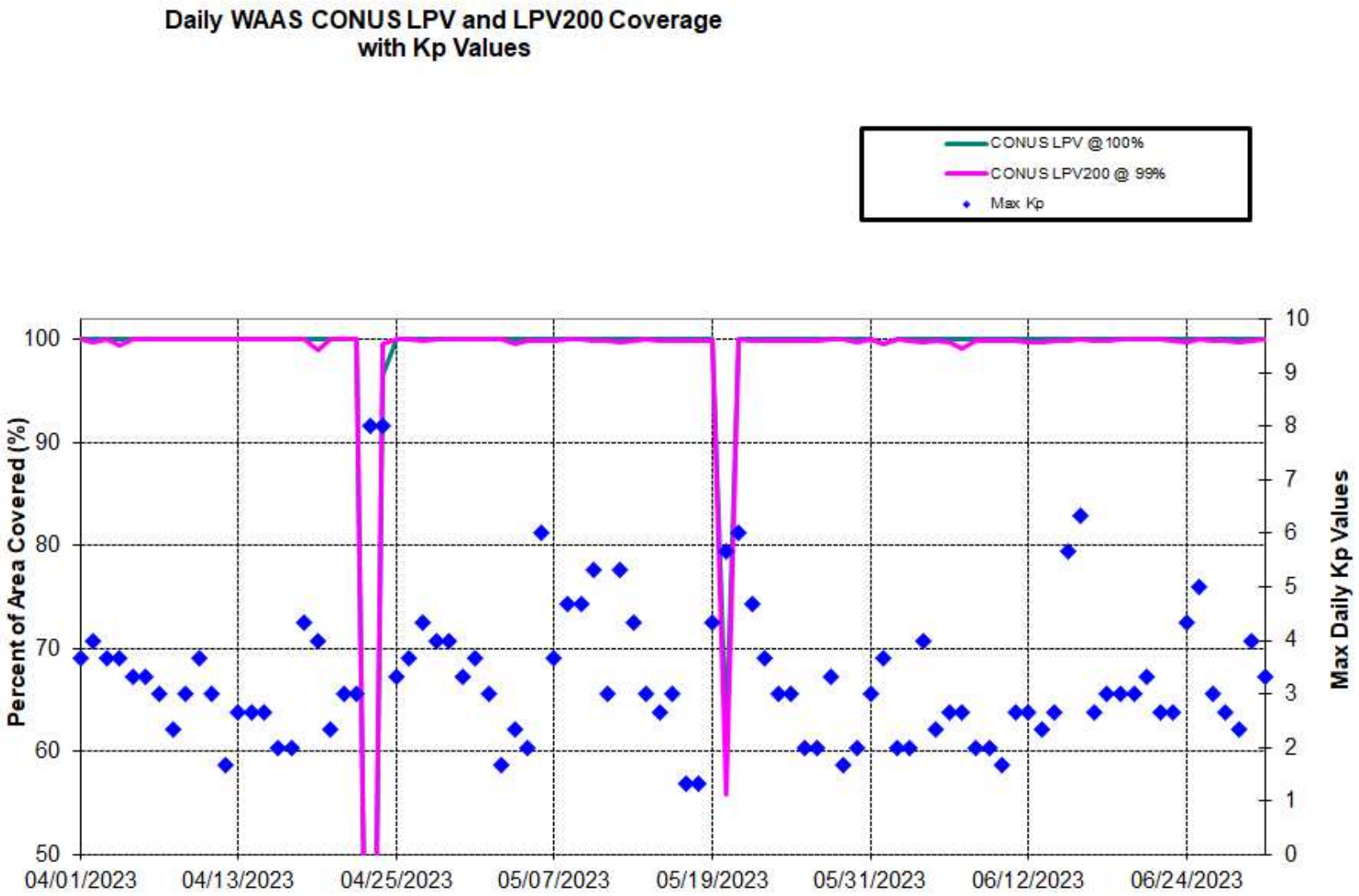

Figure 4-4 Daily LPV and LPV200 CONUS Coverage

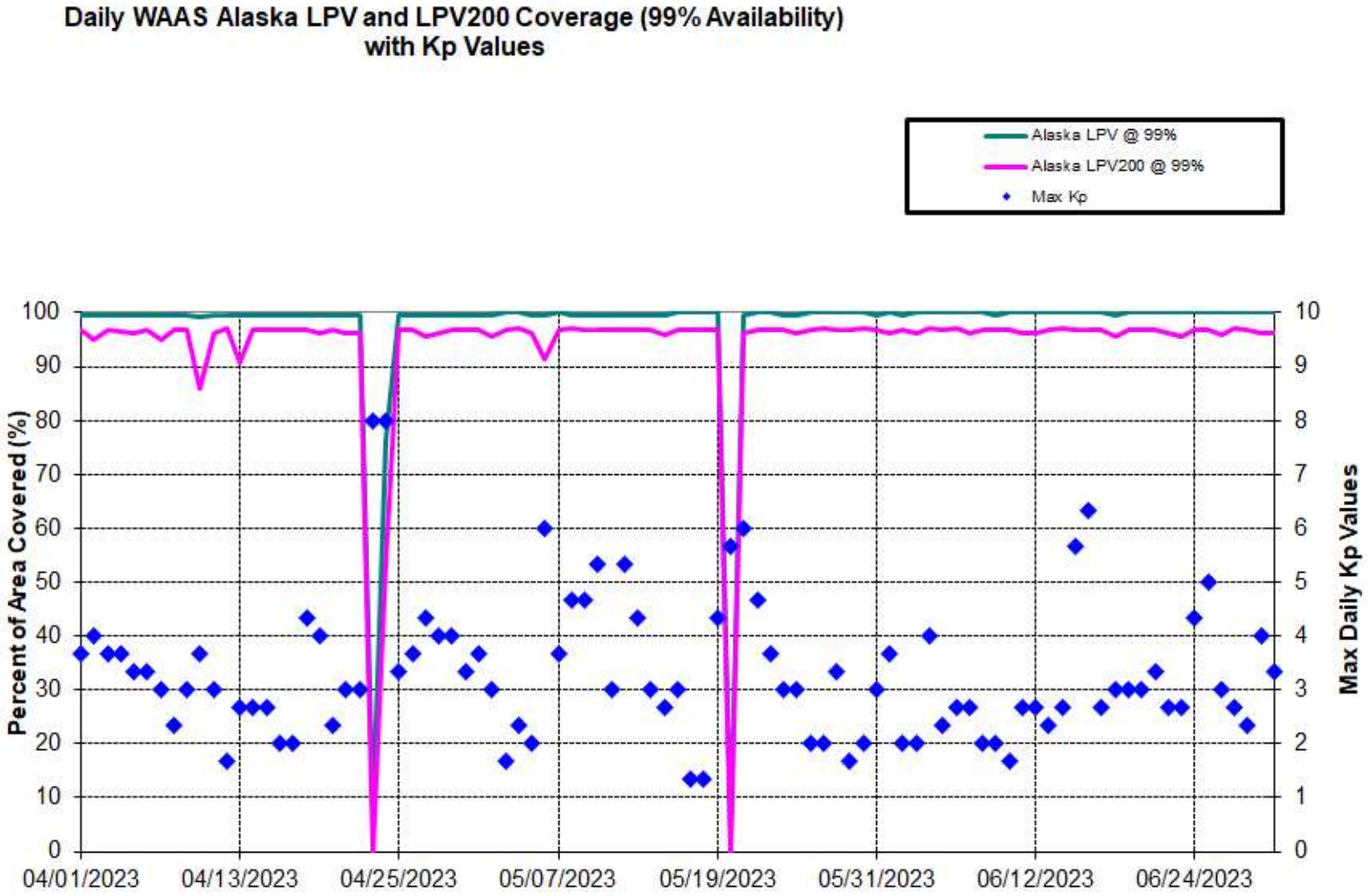

Figure 4-5 Daily LPV and LPV200 Alaska Coverage

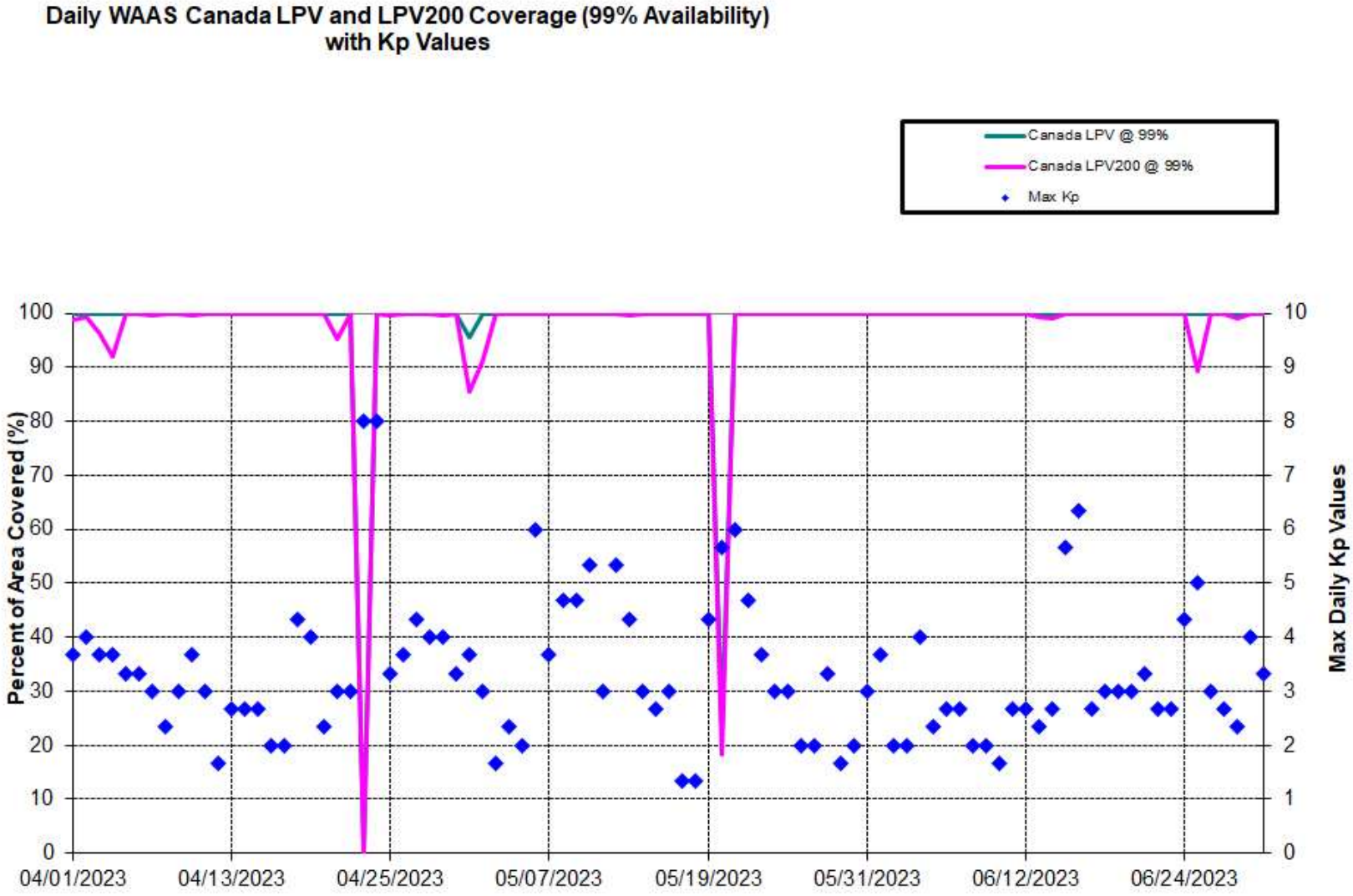

Figure 4-6 Daily LPV and LPV200 Canada Coverage

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.

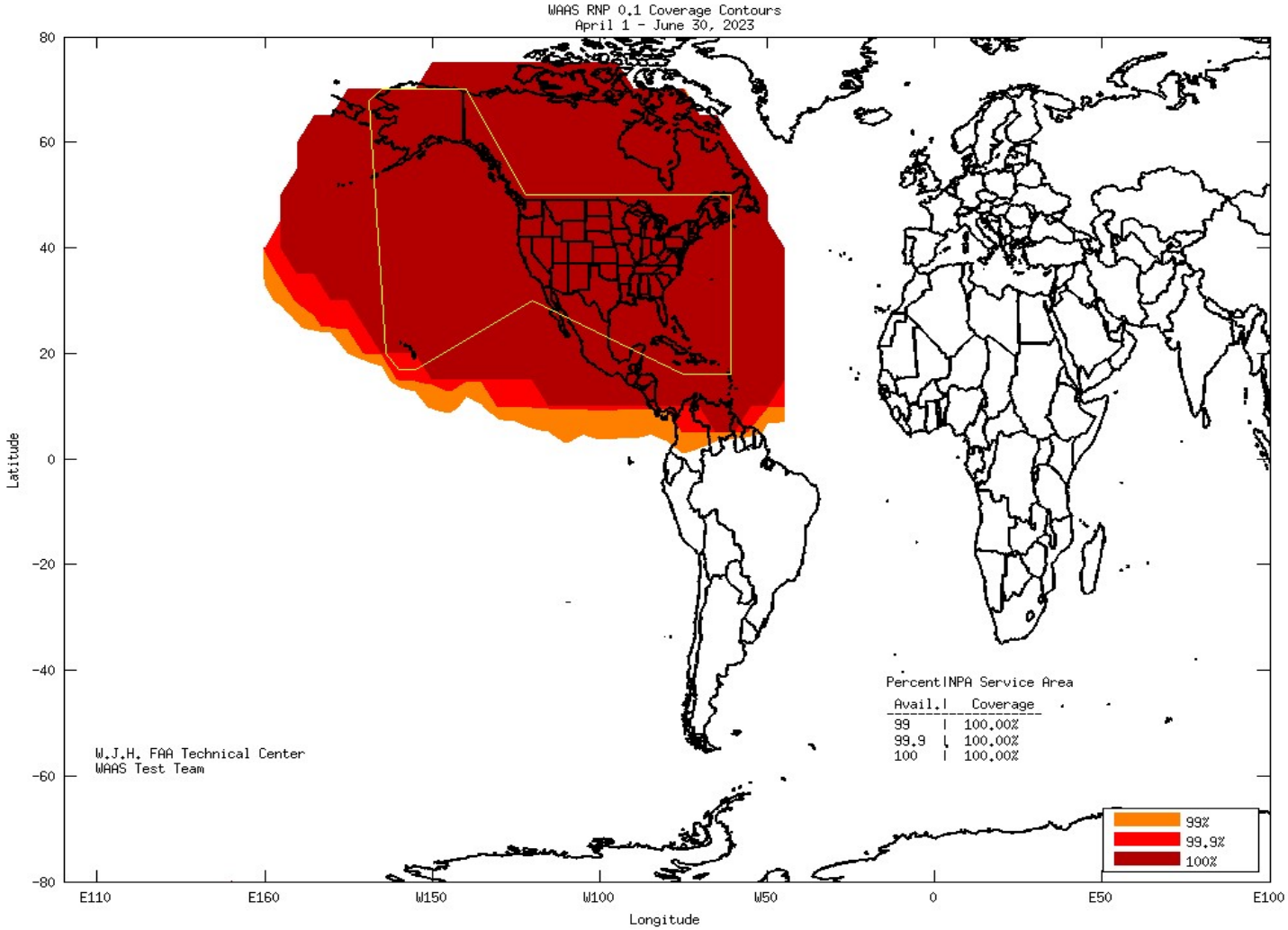

Figure 4-7 RNP 0.1 Coverage for the Quarter

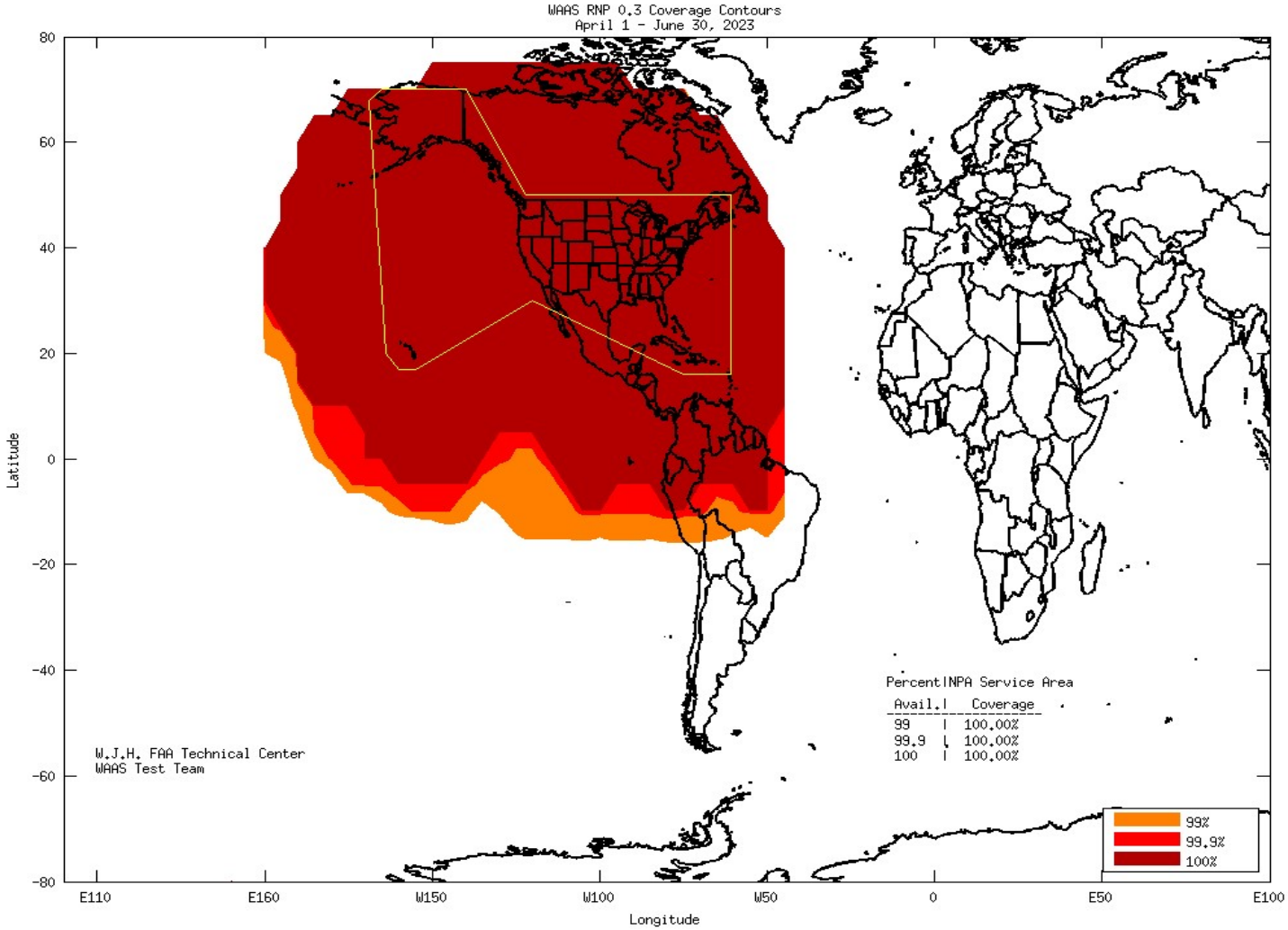

Figure 4-8 RNP 0.3 Coverage for the Quarter

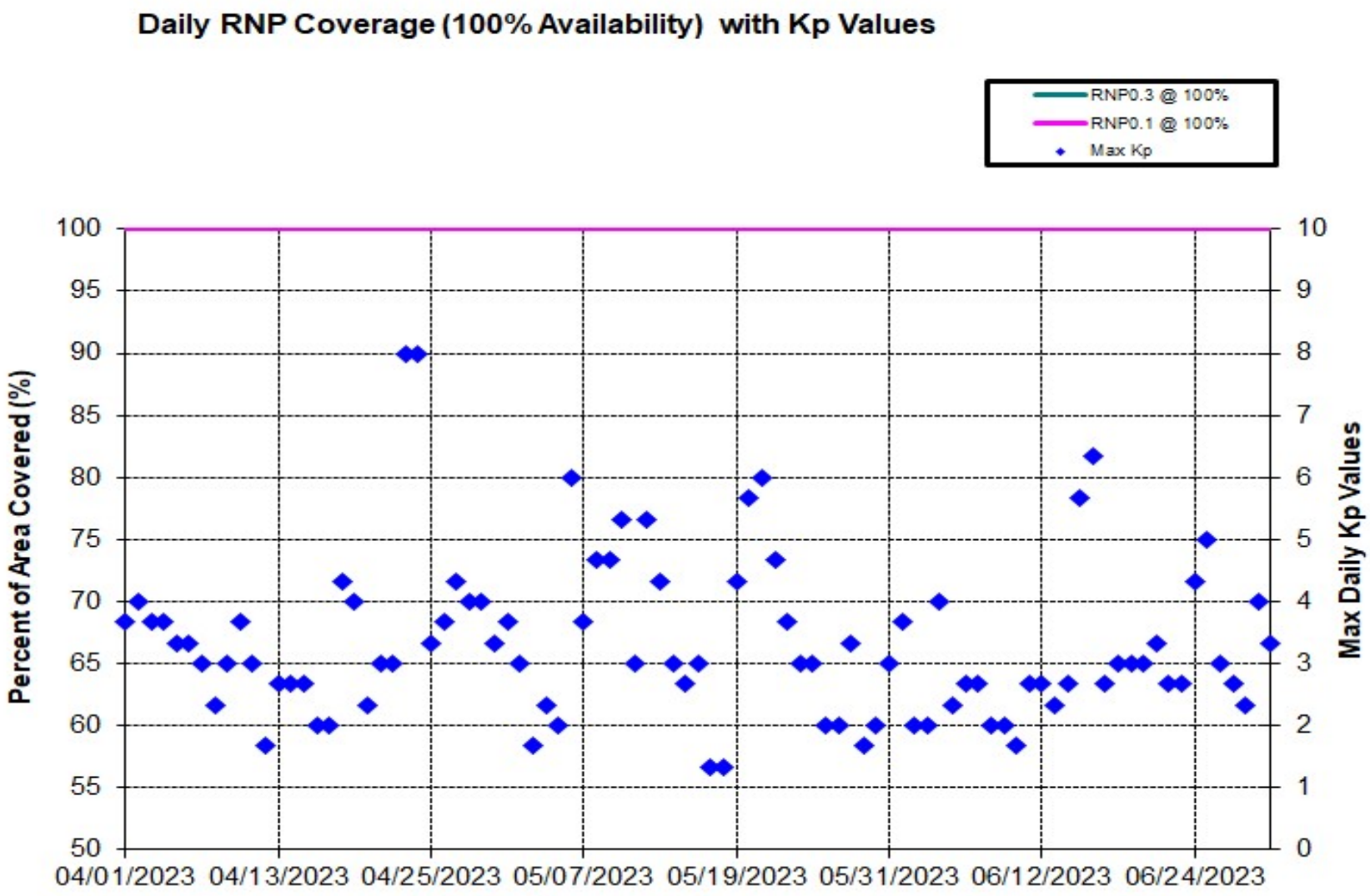

Figure 4-9 Daily RNP Coverage

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:

- Jan 1–Jun 30—The Tech Center began observing a reduction of LPV200 coverage in the Gulf of Mexico and the Florida panhandle. This is due to an increase of dilution of precision in the region. The region sees a drop in satellites as PRN3 sets. Later the degradation decreases as PRN21 enters the region.
- Apr 1—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
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- Apr 4–5—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS and Canada.
- Apr 5—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Apr 7—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Alaska and Canada.
- Apr 9—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Apr 10—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Alaska and Canada.
- Apr 13–14—Satellite maintenance elevated UDREs on PRN29 and reduced LPV200 coverage in Alaska and Canada.
- Apr 19—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS and Canada.
- Apr 19—Satellite maintenance elevated UDREs on PRN28 and reduced LPV200 coverage in CONUS.
- Apr 20—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS.
- Apr 21—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Apr 22—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Apr 23—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Apr 24—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- Apr 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Apr 29—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- May 1–2—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in Canada.
- May 4—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS and Canada.
- May 5—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS.
- May 6—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Alaska and Canada.
- May 9–Jun 30—Starting around May 9, the Tech Center began observing degradation in Southern CONUS. This is a result of increased DOPs in the region starting in January (see event #22156) along with

an increase in IGP GIVE values. Both these increases caused minor degradation in Southern California, New Mexico, Arizona, Western Texas, and the Florida panhandle.

- May 12—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS and Canada.
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- May 20—Geomagnetic activity increased IGP GIVE values and reduced LPV and LPV200 coverage in CONUS, Alaska, and Canada.
- May 21—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- May 23—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS, Alaska, and Canada.
- Jun 15—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in CONUS and Canada.
- Jun 25—Geomagnetic activity increased IGP GIVE values and reduced LPV200 coverage in Canada.
- Jun 28—Receiver upgrades at Iqaluit (YFB) reduced LPV and LPV200 coverage in Canada.

5.0 INTEGRITY

5.1 HMI Analysis

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

A computed safety margin index of greater than 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 2.992 at Puerto Vallarta 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	8.320	6.468	0
Atlantic City	3.946	5.852	0
Oklahoma City	9.294	5.570	0
Albuquerque	10.982	9.864	0
Anchorage	4.144	3.624	0
Atlanta	11.287	5.096	0
Barrow	7.566	7.942	0
Bethel	6.558	9.183	0
Billings	5.223	7.733	0
Boston	8.964	4.525	0
Chicago	9.095	6.744	0
Cleveland	7.198	7.237	0
Cold Bay	8.523	7.142	0
Dallas	10.115	7.233	0
Denver	13.050	9.592	0
Fairbanks	5.045	4.546	0
Gander	7.283	6.204	0
Goose Bay	5.867	4.568	0
Houston	10.496	10.143	0
Iqaluit	9.021	5.084	0
Jacksonville	13.953	4.932	0
Juneau	9.049	6.120	0
Kansas City	7.510	8.306	0
Kotzebue	7.601	5.602	0
Los Angeles	8.757	5.852	0
Memphis	9.385	8.454	0
Merida	13.932	5.408	0
Mexico City	4.753	5.241	0
Miami	13.961	5.988	0
Minneapolis	10.765	5.231	0
New York	6.934	6.024	0
Oakland	8.312	7.119	0
Puerto Vallarta	2.992	3.675	0
Salt Lake City	13.592	10.044	0
San Jose Del Cabo	5.845	3.843	0
Seattle	3.905	11.544	0
Washington, DC	9.877	6.868	0
Winnipeg	9.274	6.922	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	6	7	6	0.0659	0.0769	0.0659
T3	10	11	12	0.1099	0.1209	0.1319
T4	17	16	14	0.1868	0.1758	0.1538
T5	0	0	0	0.0000	0.0000	0.0000
T6	0	0	1	0.0000	0.0000	0.0110
T24	0	0	0	0.0000	0.0000	0.0000
T26	0	0	0	0.0000	0.0000	0.0000
Total SV Alerts	33	34	33	0.3626	0.3736	0.3626
Days in Service	91	91	91			

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

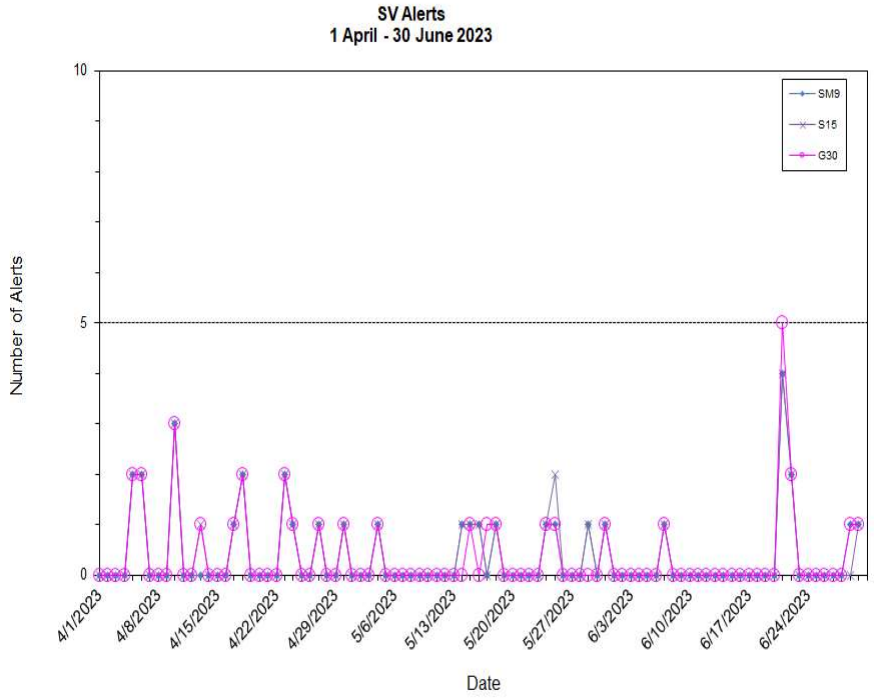

Figure 5-1 SV Daily Alert Trend

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

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

Table 5-3 Update Rates for WAAS Messages

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

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

For this quarter, statistics reported for late messages were mainly caused by GEO SIS outages, GUS switchovers, and SV alerts, excluding message type 7 and 10. Furthermore, the delay of message types 7 and 10 had little or no impact on user performance and safety, and were not caused by GEO SIS outages, GUS switchovers, or SV alerts. Table 5-4 through Table 5-8 show statistics for fast correction, long correction, ephemeris covariance, ionosphere correction, and ionospheric mask message rates broadcasted on SM9 GEO. Table 5-9 through Table 5-13 show statistics for message rates broadcasted on S15 GEO. Table 5-14 through Table 5-18 show statistics for message rates broadcasted on G30 GEO. The high Max Late Length reported by SM9 GEO for SM9 GEO Type 28 messages occurred after PRN131 switched from Southbury (manual) to Santa Paula on May 25, 2023, causing a 3-second message outage. The high Max Late Length reported by SM9 GEO for G30 GEO Type 28 messages occurred after PRN135 switched from Brewster (manual) to Napa on May 29, 2023, causing a 3-second message outage. The high Max Late Length reported by S15 GEO for G30 GEO Type 28 messages occurred after PRN135 switched from Brewster (manual) to Napa on May 29, 2023, causing a 3-second message outage. The high Max Late Length reported by G30 GEO for G30 GEO Type 28 messages occurred after PRN135 switched from Napa (manual) to Brewster on May 16, 2023, causing a 3-second message outage.

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	89842	1	121
2	1137578	28	13
3	1137596	23	13
4	1137622	19	10
7	83159	10	131
9	79984	1	170
10	83195	6	138
17	26980	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	41880	0	0
2	41989	1	169
3	41219	1	168
4	40566	0	0
5	40986	0	0
6	41169	0	0
7	40882	0	0
8	41742	0	0
9	40439	0	0
10	40910	0	0
11	40742	1	182
12	40604	0	0
13	42317	0	0
14	40045	0	0
15	41093	0	0
16	41053	1	171
17	41082	1	186
18	40668	2	169
19	40049	0	0
20	41396	0	0
21	43485	0	0
23	40381	0	0
24	42156	0	0
25	42151	0	0
26	41524	1	182
27	42169	0	0
28	41011	0	0
29	40480	0	0
30	40627	0	0
31	40757	0	0
32	40250	1	186

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	34430	4	177
2	34485	3	216
3	33861	0	0
4	33321	1	181
5	33662	0	0
6	33826	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
7	33553	1	132
8	34258	1	161
9	33196	0	0
10	33614	1	190
11	33444	0	0
12	33375	0	0
13	34773	5	264
14	32901	1	131
15	33740	0	0
16	33704	0	0
17	33738	1	184
18	33405	2	186
19	32885	3	209
20	33933	0	0
21	35751	5	192
23	33153	0	0
24	34609	0	0
25	34629	2	168
26	34060	0	0
27	34642	2	128
28	33632	0	0
29	33268	0	0
30	33406	0	0
31	33395	1	184
32	33045	1	160
131	65427	1	5463
133	65508	0	0
135	65276	2	5505

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	23689	9	521
0	1	23693	5	305
0	2	23708	2	304
1	0	23703	2	306
1	1	23692	4	581
1	2	23705	3	301
1	3	23700	4	305
1	4	23707	1	304
2	0	23694	5	429
2	1	23691	8	433
2	2	23694	7	434
2	3	23707	6	417

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
2	4	23696	5	427
3	0	23696	5	416
3	1	23697	8	447
3	2	23700	5	446
9	0	23689	8	439
9	1	23698	4	417
9	2	23702	1	304
9	3	23691	7	496
9	4	23695	5	520
9	5	23704	8	532
9	6	23701	2	503

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	30683	0	0
1	30642	0	0
2	30640	0	0
3	30685	1	340
9	30626	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	88174	0	0
2	1137578	26	22
3	1137588	26	18
4	1137612	20	20
7	81746	6	130
9	79980	0	0
10	81729	9	131
17	26815	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	41873	0	0
2	41985	0	0
3	41221	1	162
4	40574	0	0
5	40975	0	0
6	41171	0	0
7	40871	0	0
8	41739	0	0
9	40441	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
10	40907	0	0
11	40752	1	161
12	40596	0	0
13	42309	0	0
14	40053	0	0
15	41085	0	0
16	41044	1	144
17	41089	0	0
18	40655	1	162
19	40044	0	0
20	41405	0	0
21	43487	0	0
23	40377	0	0
24	42153	1	125
25	42143	0	0
26	41517	2	161
27	42162	0	0
28	41004	0	0
29	40474	0	0
30	40626	0	0
31	40751	0	0
32	40250	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	34418	5	212
2	34462	4	192
3	33860	0	0
4	33327	0	0
5	33651	1	144
6	33822	1	208
7	33530	2	208
8	34258	3	212
9	33190	0	0
10	33592	2	160
11	33443	0	0
12	33391	1	171
13	34738	8	180
14	32905	4	192
15	33729	0	0
16	33724	0	0
17	33729	0	0
18	33377	0	0
19	32879	5	198
20	33937	0	0
21	35744	11	192
23	33154	0	0
24	34560	2	162
25	34625	2	155
26	34057	0	0
27	34659	1	136
28	33657	0	0
29	33240	0	0
30	33383	0	0
31	33389	0	0
32	33044	1	165
131	65429	0	0
133	65501	0	0
135	65275	2	5486

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	23717	1	305
0	1	23693	4	306
0	2	23697	3	579
1	0	23685	7	581
1	1	23697	5	305
1	2	23710	3	304
1	3	23682	5	562
1	4	23690	2	388
2	0	23694	6	399
2	1	23702	3	405
2	2	23690	3	416
2	3	23700	1	394
2	4	23694	4	409
3	0	23687	5	405
3	1	23703	2	386
3	2	23704	3	382
9	0	23694	4	395
9	1	23693	8	416
9	2	23689	5	411
9	3	23685	5	421
9	4	23697	6	418
9	5	23693	6	304
9	6	23687	7	321

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	30424	1	380
1	30425	0	0
2	30414	0	0
3	30423	0	0
9	30405	1	382

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	90741	2	136
2	1137555	31	38
3	1137582	23	48
4	1137593	22	32
7	83707	7	127
9	79980	2	167
10	83823	12	157
17	27013	3	505

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	41870	4	188
2	41981	0	0
3	41217	2	178
4	40565	2	165
5	40976	0	0
6	41164	1	170
7	40872	0	0
8	41753	0	0
9	40442	1	164
10	40907	1	175
11	40746	1	164
12	40598	0	0
13	42297	0	0
14	40046	1	199
15	41082	0	0
16	41052	2	183
17	41081	1	160
18	40674	0	0
19	40039	3	178
20	41411	0	0
21	43477	1	170
23	40380	0	0
24	42152	1	166
25	42132	3	175
26	41525	1	164
27	42156	0	0
28	41009	0	0
29	40473	0	0
30	40625	0	0
31	40746	1	188
32	40246	1	160

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	34420	3	206
2	34475	2	155
3	33866	0	0
4	33329	1	210
5	33661	0	0
6	33825	0	0
7	33555	0	0
8	34265	0	0
9	33183	1	208
10	33597	0	0
11	33450	1	182
12	33363	1	153
13	34769	6	167
14	32902	1	155
15	33743	0	0
16	33718	0	0
17	33739	1	210
18	33386	1	152
19	32893	7	208
20	33962	0	0
21	35758	3	208
23	33158	0	0
24	34590	1	206
25	34627	4	211
26	34054	1	206
27	34633	5	186
28	33640	1	210
29	33271	0	0
30	33394	0	0
31	33401	0	0
32	33049	1	216
131	65392	2	208
133	65503	2	208
135	65279	1	5534

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	23699	2	578
0	1	23700	3	480
0	2	23700	9	481
1	0	23684	5	503
1	1	23699	6	486
1	2	23703	6	479

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	3	23684	7	474
1	4	23694	8	576
2	0	23684	11	579
2	1	23697	5	340
2	2	23692	2	339
2	3	23693	5	345
2	4	23687	3	349
3	0	23690	4	339
3	1	23696	4	362
3	2	23705	4	578
9	0	23697	5	579
9	1	23701	2	576
9	2	23692	2	578
9	3	23699	4	305
9	4	23697	4	304
9	5	23695	5	375
9	6	23692	2	578

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	30754	1	390
1	30705	2	484
2	30715	1	440
3	30716	0	0
9	30722	2	475

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	1.090	3.707	1.156	0.997	3.227	0.947	1.019	2.869	0.768	1.218	2.680	1.644	1.382	3.683	1.124	0.956	4.314	1.208
2	1.221	4.577	3.227	1.145	3.661	1.093	1.247	4.175	1.268	1.451	3.641	1.170	1.459	6.190	1.972	1.257	4.269	1.251
3	1.018	3.040	1.150	1.179	4.089	1.199	1.543	4.302	2.510	1.173	2.538	0.883	1.642	4.157	1.413	1.282	3.164	1.212
4	1.346	3.825	1.283	1.203	4.211	2.126	1.146	4.039	1.622	1.261	3.210	1.020	1.623	2.917	1.647	0.847	1.884	0.539
5	0.944	4.842	3.085	1.003	3.763	1.733	0.888	2.645	1.781	1.206	2.799	1.114	1.420	2.812	0.913	1.116	3.170	1.163
6	1.299	4.705	3.392	1.170	4.482	2.615	1.109	4.632	2.994	1.395	3.290	1.465	1.210	3.223	2.250	1.015	3.601	1.102
7	1.190	2.759	0.949	1.021	2.163	0.944	1.367	2.737	0.854	1.391	3.075	0.910	1.394	2.954	1.038	1.033	2.637	1.136
8	1.345	4.151	2.397	0.789	2.628	0.797	1.094	2.459	0.766	1.242	3.344	2.522	1.432	4.054	1.330	1.022	2.404	0.663
9	1.266	5.511	2.991	1.167	4.655	3.067	1.038	3.805	1.718	1.223	2.775	1.156	1.820	5.318	2.377	0.973	2.862	0.853
10	0.994	4.846	4.110	0.855	2.421	0.769	0.947	2.930	1.064	1.429	3.453	1.938	1.543	3.174	1.548	1.061	2.451	0.846
11	0.914	5.637	3.739	1.194	5.229	2.997	0.900	4.025	2.292	1.414	2.842	1.667	1.625	7.538	2.142	0.992	2.219	0.752
12	1.037	5.401	3.775	1.112	4.808	2.566	0.979	4.583	2.435	1.207	2.569	0.680	1.711	6.298	1.954	1.151	4.024	1.198
13	1.384	3.930	1.078	1.190	5.343	2.532	1.325	3.586	1.066	1.101	4.073	1.309	1.182	2.588	0.949	1.180	4.038	1.116
14	0.851	1.883	0.829	0.906	2.911	0.987	0.889	3.983	1.787	1.097	3.450	1.496	1.116	2.303	1.145	0.889	3.095	0.537
15	1.708	3.931	2.357	1.010	1.988	0.888	0.930	2.704	1.363	1.190	2.319	0.925	0.916	2.065	0.746	0.870	2.492	0.710
16	1.367	3.164	1.132	0.876	2.160	0.760	1.039	2.500	0.753	1.400	2.934	1.396	1.385	2.815	1.738	0.852	1.904	0.545
17	1.058	4.342	2.575	1.329	3.704	1.851	1.209	4.809	3.864	1.384	3.391	0.991	2.113	9.987	3.693	1.091	3.002	0.933
18	1.578	4.275	2.261	1.211	3.983	1.835	1.138	5.455	1.607	1.431	2.890	0.794	1.309	3.734	1.291	0.972	3.121	1.500
19	1.154	5.230	2.754	1.157	4.329	2.849	1.198	4.718	3.207	1.205	2.756	0.805	1.545	5.264	1.488	1.152	3.835	1.272
20	1.621	5.310	4.273	1.215	4.651	2.419	1.101	4.223	2.027	1.530	4.001	1.269	1.583	5.789	1.851	1.034	2.808	0.842
21	0.985	4.532	1.402	1.050	2.584	0.876	0.989	2.753	0.492	1.559	5.192	2.149	1.346	3.960	1.316	1.383	3.528	1.146
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	1.587	4.767	4.103	0.834	2.953	1.808	0.963	2.736	1.957	1.378	3.825	1.380	1.386	3.007	0.858	1.189	3.017	1.288
24	1.416	4.980	1.491	1.098	2.520	0.892	1.134	4.543	2.279	1.567	3.016	2.223	1.281	2.845	0.938	1.421	4.131	1.192
25	1.022	5.307	3.668	1.179	5.689	2.891	1.201	3.061	1.723	1.525	3.387	1.282	1.141	3.068	1.678	1.391	4.714	1.413
26	1.077	2.328	1.176	1.390	3.756	1.206	1.016	2.322	1.475	1.367	3.240	1.034	1.250	2.832	0.963	0.993	2.546	0.775
27	0.898	4.763	3.007	0.949	2.226	1.030	1.152	3.269	0.917	1.304	3.434	1.946	1.316	3.299	1.017	0.882	3.049	0.864
28	2.352	4.058	3.470	2.093	4.118	1.833	2.184	4.242	3.630	2.596	4.494	1.795	2.460	4.767	2.214	2.351	4.264	1.972
29	1.287	4.290	2.575	1.243	4.492	1.348	1.379	3.249	1.572	1.502	3.002	0.847	1.026	2.582	1.183	1.061	2.927	0.943
30	1.009	2.838	0.884	1.379	3.069	1.142	1.269	2.760	0.859	1.056	3.427	1.023	1.697	2.759	0.927	0.973	2.033	0.708
31	0.938	4.584	1.978	1.037	2.437	0.829	0.998	2.194	1.448	1.686	3.940	1.213	1.392	7.307	2.016	0.973	2.711	1.005
32	1.169	4.925	3.317	1.043	2.009	1.310	1.117	2.469	1.184	1.165	2.986	1.396	1.943	5.629	1.531	0.918	4.282	1.330
131	1.984	8.602	0.785	1.140	5.980	0.209	1.893	4.737	0.496	1.715	5.629	0.542	1.465	5.269	0.329	1.200	3.611	1.144
133	1.489	8.182	0.701	1.860	4.061	0.717	1.567	5.506	1.028	1.769	7.967	0.894	1.364	5.528	0.384	1.149	3.049	0.686
135	1.705	7.295	0.647	1.320	4.910	0.152	1.336	4.833	0.672	2.055	5.668	0.590	1.539	5.985	0.347	1.257	3.563	0.975

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

Site	Billings			Miami			Albuquerque			Kansas City			Los Angeles			Atlanta		
PRN ↓	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma
1	1.044	4.322	1.707	1.229	2.605	1.566	1.076	3.779	1.182	0.991	3.621	1.520	1.433	2.421	1.262	1.185	3.007	0.937
2	1.320	3.584	2.973	1.515	3.671	1.567	1.119	3.940	1.171	1.248	8.303	2.706	1.363	3.391	0.915	1.047	3.137	1.629
3	1.090	3.684	1.640	1.291	2.657	0.975	1.442	3.124	1.079	1.035	2.875	0.945	1.122	3.674	1.187	1.125	2.144	1.036
4	1.379	2.785	1.223	1.145	2.637	1.477	0.941	2.483	0.684	1.061	2.901	0.885	1.256	2.104	1.085	0.821	1.613	0.850
5	1.188	2.858	1.350	1.627	5.086	1.541	0.896	2.181	1.036	2.311	4.827	2.789	1.388	2.573	1.499	1.041	3.594	2.396
6	1.345	2.845	0.906	1.689	6.304	1.843	1.049	2.836	1.719	1.109	3.448	2.688	1.466	3.098	1.612	0.899	3.474	2.658
7	1.305	3.387	1.246	1.801	6.558	2.249	1.020	2.861	0.825	0.992	2.342	1.211	1.505	2.405	1.306	1.016	2.178	0.807
8	1.032	3.407	2.336	1.108	2.897	1.780	1.657	3.052	1.613	0.985	2.391	0.909	1.497	2.977	0.922	0.941	3.121	1.073
9	1.041	2.437	0.907	1.183	3.744	1.311	0.882	2.799	0.888	1.193	5.044	1.803	1.309	2.617	0.713	0.994	3.398	1.959
10	1.579	3.719	2.913	1.332	3.148	1.698	0.962	2.191	0.649	1.002	2.759	2.395	1.341	2.546	1.533	1.007	2.782	1.874
11	1.269	4.673	1.514	1.348	4.035	1.175	0.975	2.404	1.485	1.306	3.720	1.234	1.300	2.292	1.487	0.869	4.031	2.815
12	1.083	4.052	1.776	1.448	3.848	1.330	1.153	3.132	0.937	1.534	4.658	1.467	1.333	2.578	0.797	1.022	3.545	2.311
13	1.048	2.400	0.779	1.429	5.828	1.798	1.158	3.260	1.006	1.041	3.055	1.029	1.418	3.477	1.162	1.121	3.625	1.038
14	0.886	2.232	1.048	1.209	3.378	2.439	0.774	2.410	0.431	1.104	2.684	0.897	1.249	2.345	1.076	0.844	1.950	1.275
15	1.212	3.094	1.934	1.378	3.309	2.050	0.947	3.359	1.088	1.411	4.863	1.507	1.820	3.694	1.158	1.043	2.839	1.916
16	1.140	3.148	1.167	1.276	2.551	1.442	1.230	3.519	1.520	1.492	4.811	1.450	1.866	3.464	1.304	1.014	2.072	0.820
17	1.606	3.540	1.469	1.423	3.326	2.092	1.126	2.569	1.501	1.423	5.355	1.670	1.702	3.163	1.743	0.992	3.555	1.656
18	1.141	4.188	1.944	1.444	3.825	2.036	0.901	3.368	0.904	1.023	3.940	2.423	1.309	2.661	1.147	1.017	4.248	2.950
19	1.174	3.427	1.798	1.396	3.177	1.975	1.285	4.598	1.263	1.253	4.198	1.444	1.489	3.094	1.616	0.936	3.193	2.549
20	1.085	3.226	2.024	1.375	3.381	1.110	1.167	3.365	1.538	1.503	4.993	2.001	1.383	2.749	0.952	1.007	3.793	2.792
21	1.276	3.993	2.566	1.392	3.206	0.985	1.297	6.105	1.817	1.366	7.492	2.315	1.512	3.321	1.313	1.093	3.404	1.345
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	1.386	4.076	1.615	1.476	3.676	0.944	0.956	2.569	1.657	1.302	3.243	2.678	1.272	2.469	1.395	0.958	3.219	2.371
24	1.254	3.865	2.296	1.418	3.335	1.635	1.056	3.092	0.915	1.090	3.220	1.272	1.413	2.688	1.417	1.048	2.894	0.525
25	1.555	4.114	2.075	1.373	2.990	1.284	1.120	3.019	1.035	1.273	5.624	1.884	1.561	3.765	1.078	1.047	3.782	2.100
26	1.261	4.342	1.541	1.404	2.877	1.004	1.077	3.548	1.133	1.139	3.743	1.179	1.727	3.566	1.148	0.888	1.807	1.259
27	1.029	3.573	1.882	1.396	3.371	1.574	0.999	2.038	0.826	0.915	2.848	0.895	1.240	3.283	1.011	0.863	2.967	1.699
28	2.593	4.477	1.636	2.289	5.828	1.857	2.350	4.361	2.618	3.124	5.846	2.478	2.822	5.243	2.660	2.318	4.804	2.049
29	1.267	2.941	1.577	1.317	2.767	1.503	0.973	2.444	0.954	1.256	3.979	1.746	1.569	4.256	1.167	1.089	3.868	1.775
30	1.409	3.200	1.019	1.051	2.211	1.188	1.041	2.418	0.748	0.962	3.089	0.923	1.220	2.374	0.616	1.015	2.023	1.493
31	1.292	4.643	2.134	1.648	7.521	1.883	0.920	2.405	1.369	1.314	6.051	2.721	1.609	3.783	1.172	0.908	2.046	1.532
32	1.368	3.684	1.833	1.477	4.665	1.567	0.847	2.033	0.611	1.139	3.529	1.119	1.593	3.049	2.130	1.060	2.831	1.794
131	2.000	5.210	0.371	1.426	5.478	0.477	2.152	6.006	0.448	1.438	3.836	0.500	2.087	4.399	1.188	1.425	4.451	0.951
133	1.777	5.875	0.398	1.527	6.914	0.278	1.766	3.604	0.870	2.301	4.065	0.982	2.037	4.276	0.632	1.283	4.992	1.035
135	1.759	4.402	0.307	1.563	5.572	0.436	1.326	4.041	0.294	1.534	5.848	0.845	1.645	4.396	0.963	1.382	3.864	0.819

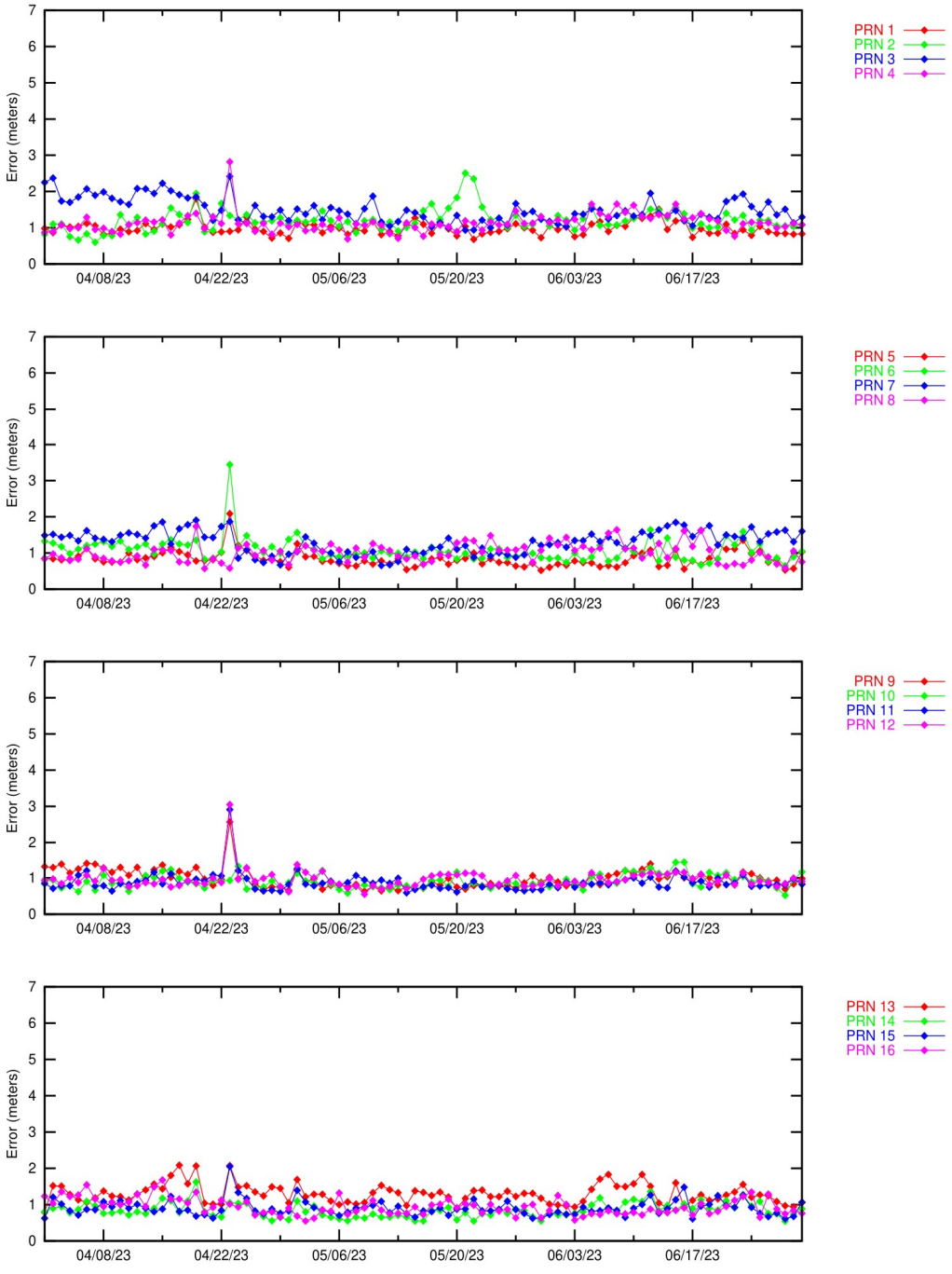

Figure 6-1 Range Error (PRN1–PRN16)—Washington, DC

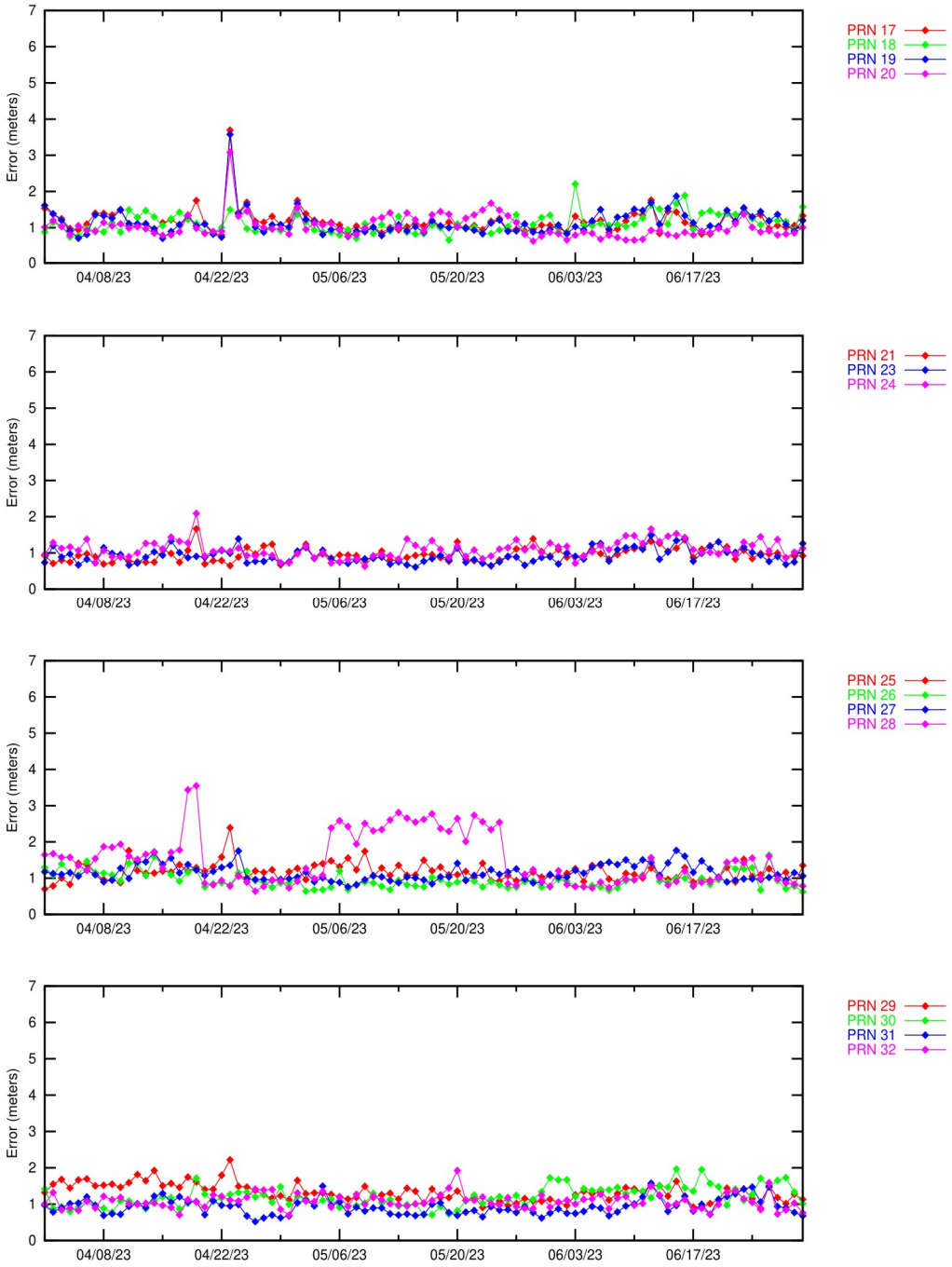

Figure 6-2 Range Error (PRN17–PRN32)—Washington, DC

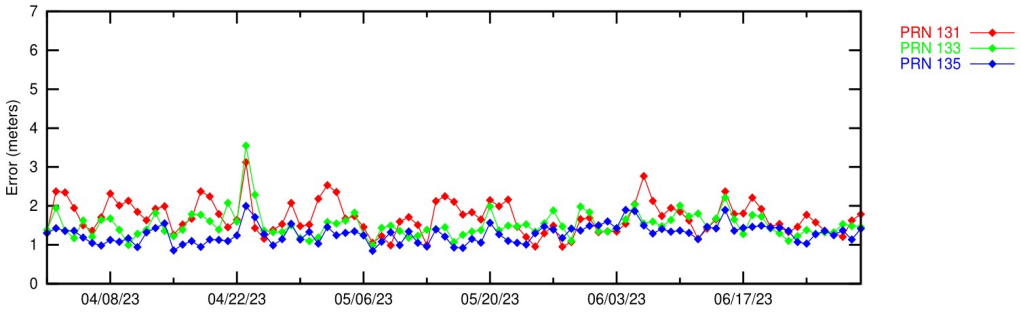

Figure 6-3 Range Error (PRN131, PRN133, and PRN138)—Washington, DC

A GIVE is broadcasted by the WAAS for each monitored IGP and the maximum normalized value (divided by sigma_UISE [User Ionospheric Slant Error]) of the ionospheric error after application of ionospheric corrections is checked. The WAAS broadcasts the ionospheric model using IGPs at predefined geographic locations. Each IGP contains the vertical ionospheric delay and the delay error in the form of the GIVE value. The ionospheric error is determined by taking the difference between the WAAS vertical ionospheric delay interpolated from the IGP and GPS dual frequency measurement at that GPS satellite.

The GPS satellite ionospheric errors were calculated for 12 WAAS receivers during the quarter. Table 6-3 and Table 6-4 show the ionospheric error 95% index, maximum ionospheric error, and maximum normalized value (divided by sigma_UISE) for each SV at the selected locations. Figure 6-4 and Figure 6-5 show the 95% ionospheric error for each SV measured by the WAAS receiver at the Washington, DC reference station.

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

Site	Minneapolis			Chicago			Boston			Juneau			Honolulu			Salt Lake City		
PRN ↓	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma
1	0.537	2.645	0.220	0.529	2.601	0.701	0.392	1.714	0.691	0.631	2.445	1.033	0.545	2.081	0.794	0.404	1.739	0.085
2	0.668	2.540	0.766	0.622	4.621	0.189	0.689	2.634	0.777	0.832	2.848	0.658	0.699	2.857	0.851	0.659	3.225	0.845
3	0.482	2.335	0.587	0.484	3.180	0.780	0.700	2.746	0.668	0.547	3.408	0.411	0.613	2.395	0.839	0.605	1.841	0.527
4	0.624	2.742	0.594	0.728	3.460	0.114	0.632	4.724	0.131	0.605	3.698	0.428	0.796	2.369	0.636	0.427	1.399	0.508
5	0.555	3.417	0.233	0.335	4.403	0.258	0.711	2.675	0.784	0.667	2.944	0.344	1.543	4.836	0.553	0.588	2.458	0.632
6	0.533	1.922	0.523	0.345	2.558	0.189	0.542	3.773	0.221	0.709	2.127	0.541	0.860	2.186	0.915	0.406	3.636	0.109
7	0.644	2.819	0.620	0.591	2.971	0.130	0.605	2.104	0.758	0.766	3.153	1.001	0.578	2.223	0.541	0.486	1.434	0.368
8	0.605	3.787	0.142	0.409	2.753	0.838	0.325	1.736	0.428	0.548	1.936	0.706	0.904	3.790	0.692	0.411	2.288	0.698
9	0.541	3.696	0.465	0.490	2.558	0.150	0.441	2.612	0.690	0.576	2.741	0.467	0.639	2.695	0.816	0.452	1.363	0.412
10	0.666	1.865	0.122	0.619	2.856	0.716	0.648	3.859	0.737	0.929	3.179	0.803	1.026	3.643	0.950	0.734	1.771	0.565
11	0.446	4.099	0.301	0.837	2.957	0.197	0.557	3.196	0.275	0.774	3.275	1.371	0.982	3.963	0.841	0.571	1.523	0.641
12	0.489	2.974	0.273	0.481	3.430	0.790	0.395	4.625	0.327	0.623	2.821	0.554	0.849	3.438	1.054	0.566	2.862	0.653
13	0.709	2.799	0.303	0.539	4.251	1.545	0.544	1.797	1.248	0.598	2.964	1.106	0.619	2.410	0.680	0.371	1.244	0.085
14	0.463	1.465	0.649	0.410	1.813	0.467	0.577	2.807	0.820	0.791	2.397	0.662	0.636	2.342	0.795	0.572	3.017	0.676
15	0.943	3.664	0.169	0.450	2.638	0.806	0.470	2.140	1.804	0.688	2.800	0.629	0.956	2.617	0.774	0.452	3.166	0.095
16	0.637	2.423	0.546	0.557	3.406	0.609	0.528	1.859	0.466	0.626	2.129	0.599	0.930	2.569	0.725	0.597	2.208	0.615
17	0.441	4.530	0.209	0.644	3.084	0.076	0.560	3.754	0.106	0.763	2.267	0.630	1.240	5.910	1.514	0.531	2.053	0.466
18	0.861	2.684	0.715	0.667	2.597	0.672	0.698	4.234	1.124	0.863	3.780	0.966	0.624	3.195	0.887	0.508	1.459	0.392
19	0.486	3.705	0.199	0.405	3.589	1.075	0.544	4.812	0.154	0.725	2.023	0.608	0.773	4.562	1.058	0.548	2.446	0.587
20	0.663	4.664	0.303	0.566	3.215	0.197	0.416	2.009	0.504	0.827	4.294	0.228	1.264	5.660	1.445	0.560	3.013	0.723
21	0.511	2.665	0.922	0.524	2.682	0.699	0.430	1.661	0.196	0.590	2.654	0.624	0.646	2.408	0.765	0.597	2.099	0.733
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	0.850	2.292	0.754	0.596	4.447	0.902	0.711	2.980	0.733	0.901	2.648	0.796	0.682	2.347	0.760	1.004	2.846	1.024
24	0.571	2.422	0.185	0.645	3.675	0.985	0.514	2.147	0.909	0.757	2.851	0.622	0.475	2.842	0.666	0.474	1.946	0.151
25	0.433	4.260	0.285	0.458	2.115	0.582	0.439	2.864	0.141	0.718	3.108	0.667	0.532	2.233	0.680	0.795	4.044	1.120
26	0.526	2.166	0.524	0.748	2.731	0.769	0.667	2.669	0.629	0.568	2.483	0.685	0.785	2.288	0.659	0.484	2.121	0.583
27	0.385	2.640	0.673	0.527	3.930	0.824	0.381	1.872	0.465	0.499	3.506	1.604	0.605	3.196	0.686	0.366	1.051	0.405
28	1.603	3.048	0.962	1.633	3.159	1.092	1.903	4.654	1.483	1.733	3.673	1.088	2.097	4.936	1.092	1.577	3.218	2.243
29	0.506	6.478	0.211	0.488	2.515	0.811	0.682	2.323	0.687	0.724	3.130	0.331	0.692	5.973	1.103	0.482	2.009	0.440
30	0.522	3.597	0.411	0.667	2.922	0.079	0.624	2.474	0.413	0.595	4.029	0.360	0.661	2.402	0.527	0.439	1.524	0.396
31	0.508	3.488	1.019	0.645	2.160	0.800	0.693	2.510	0.632	0.931	3.478	0.198	0.897	5.688	1.171	0.513	2.119	0.574
32	0.825	3.203	1.005	0.510	2.656	0.771	0.571	2.119	0.951	0.695	2.868	0.295	1.325	4.908	1.151	0.643	2.098	0.523

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

Site	Billings			Miami			Albuquerque			Kansas City			Atlanta			Los Angeles		
PRN ↓	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma
1	0.378	2.872	0.193	0.521	1.851	0.508	0.573	1.380	0.703	0.464	3.409	0.198	0.528	1.917	0.630	0.464	1.605	0.597
2	0.628	2.651	0.912	0.684	3.485	1.304	0.678	3.693	0.724	0.745	3.076	1.117	0.610	2.272	0.519	0.594	4.987	0.740
3	0.497	4.478	0.893	0.664	2.329	0.754	0.697	2.234	0.496	0.506	2.884	0.174	0.626	5.216	0.130	0.405	1.973	0.752
4	0.532	1.427	0.447	0.477	1.464	0.527	0.684	2.384	0.518	0.549	1.489	0.630	0.540	1.495	0.381	0.448	2.063	0.438
5	0.700	2.340	0.632	0.900	3.592	0.701	0.585	3.620	0.516	0.747	2.997	0.862	0.801	4.228	0.576	0.763	2.633	0.482
6	0.474	1.813	0.456	1.087	5.830	1.095	0.530	2.061	0.494	0.544	2.232	1.049	0.490	2.925	0.733	0.716	2.340	0.526
7	0.723	2.776	0.687	0.950	3.750	1.208	0.434	1.946	0.459	0.554	1.937	0.817	0.647	1.676	0.609	0.405	1.936	0.472
8	0.404	2.068	0.307	0.529	1.679	0.369	0.802	1.927	0.593	0.481	3.322	0.764	0.459	2.968	1.041	0.700	2.404	0.535
9	0.635	2.353	0.328	0.711	3.495	0.111	0.480	1.920	0.483	0.579	4.150	0.218	0.582	1.713	0.085	0.394	1.839	0.365
10	1.020	3.275	0.852	0.615	1.602	0.766	0.568	2.665	0.804	0.640	2.354	0.843	0.629	1.800	1.200	0.485	2.451	0.246
11	0.601	3.980	0.858	0.954	5.038	0.980	0.572	2.676	0.618	0.849	2.964	1.261	0.661	2.305	0.524	0.616	2.386	1.072
12	0.568	2.023	0.502	0.776	2.386	0.566	0.646	2.152	0.567	0.547	2.638	0.826	0.489	2.985	0.827	0.504	2.337	0.433
13	0.424	3.091	0.363	0.666	3.263	0.741	0.471	1.694	0.762	0.497	2.616	0.793	0.624	2.054	0.512	0.521	1.602	0.650
14	0.465	1.374	0.380	0.750	1.992	0.540	0.502	1.832	0.583	0.546	2.055	0.581	0.575	3.920	0.120	0.407	1.603	0.538
15	0.541	1.758	0.551	1.020	3.142	0.686	0.578	1.959	0.205	0.540	3.038	0.856	0.745	2.658	0.912	0.867	3.555	0.301
16	0.456	1.741	0.777	0.670	2.542	0.682	0.620	2.252	0.610	0.761	4.536	1.316	0.554	2.495	0.518	1.072	4.640	1.230
17	0.710	4.110	0.405	0.748	2.758	0.857	0.623	3.035	0.679	0.908	2.812	0.895	0.531	1.930	0.538	0.669	3.539	0.797
18	0.610	2.243	0.659	0.997	2.433	0.790	0.463	2.992	0.646	0.590	1.828	0.623	0.691	2.326	0.526	0.670	4.517	0.387
19	0.583	1.769	0.829	0.692	3.995	0.806	0.623	1.651	0.464	0.615	2.769	0.095	0.453	1.373	0.358	0.582	3.383	0.477
20	0.463	1.667	0.297	0.878	3.050	0.799	0.608	2.241	0.642	0.868	3.592	0.993	0.726	2.963	0.637	0.579	3.327	0.774
21	0.489	1.903	0.668	0.682	2.097	0.749	0.617	2.875	1.202	0.548	4.861	1.177	0.510	2.319	0.117	0.478	2.485	1.057
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	0.807	2.067	0.757	0.807	2.918	0.617	0.743	2.558	0.794	0.968	2.255	0.696	0.622	2.048	0.563	0.485	2.212	0.524
24	0.408	3.465	0.188	0.721	1.876	0.706	0.419	2.907	0.091	0.580	1.667	0.603	0.631	2.394	0.731	0.511	2.386	0.611
25	0.597	4.241	0.324	0.675	3.505	0.452	0.500	1.611	0.514	0.454	2.920	0.940	0.496	3.656	0.878	0.494	1.901	0.540
26	0.517	2.071	0.768	0.549	3.397	0.672	0.535	2.233	0.665	0.673	3.511	0.840	0.556	1.941	0.602	0.528	3.023	0.763
27	0.430	1.305	0.481	0.729	2.702	0.781	0.387	1.424	0.640	0.352	1.230	0.426	0.412	1.547	0.379	0.453	2.070	0.770
28	1.655	3.278	0.854	1.867	3.592	1.025	1.646	3.402	0.819	1.755	4.668	1.323	1.756	5.163	1.381	1.628	4.004	0.750
29	0.537	1.702	0.221	0.780	3.299	0.930	0.553	4.254	0.771	0.591	1.960	1.091	0.581	1.525	0.414	0.632	2.911	0.232
30	0.797	2.130	0.622	0.619	1.962	0.665	0.518	2.209	0.557	0.477	1.879	0.545	0.552	1.660	0.341	0.386	2.041	0.275
31	0.588	6.897	0.195	0.757	5.233	0.965	0.628	2.483	0.644	0.834	3.732	1.112	0.661	2.434	0.627	0.596	3.030	0.731
32	1.077	2.885	1.687	0.835	5.790	1.032	0.936	2.367	0.706	0.926	2.548	0.920	0.839	1.901	0.915	0.762	2.862	0.621

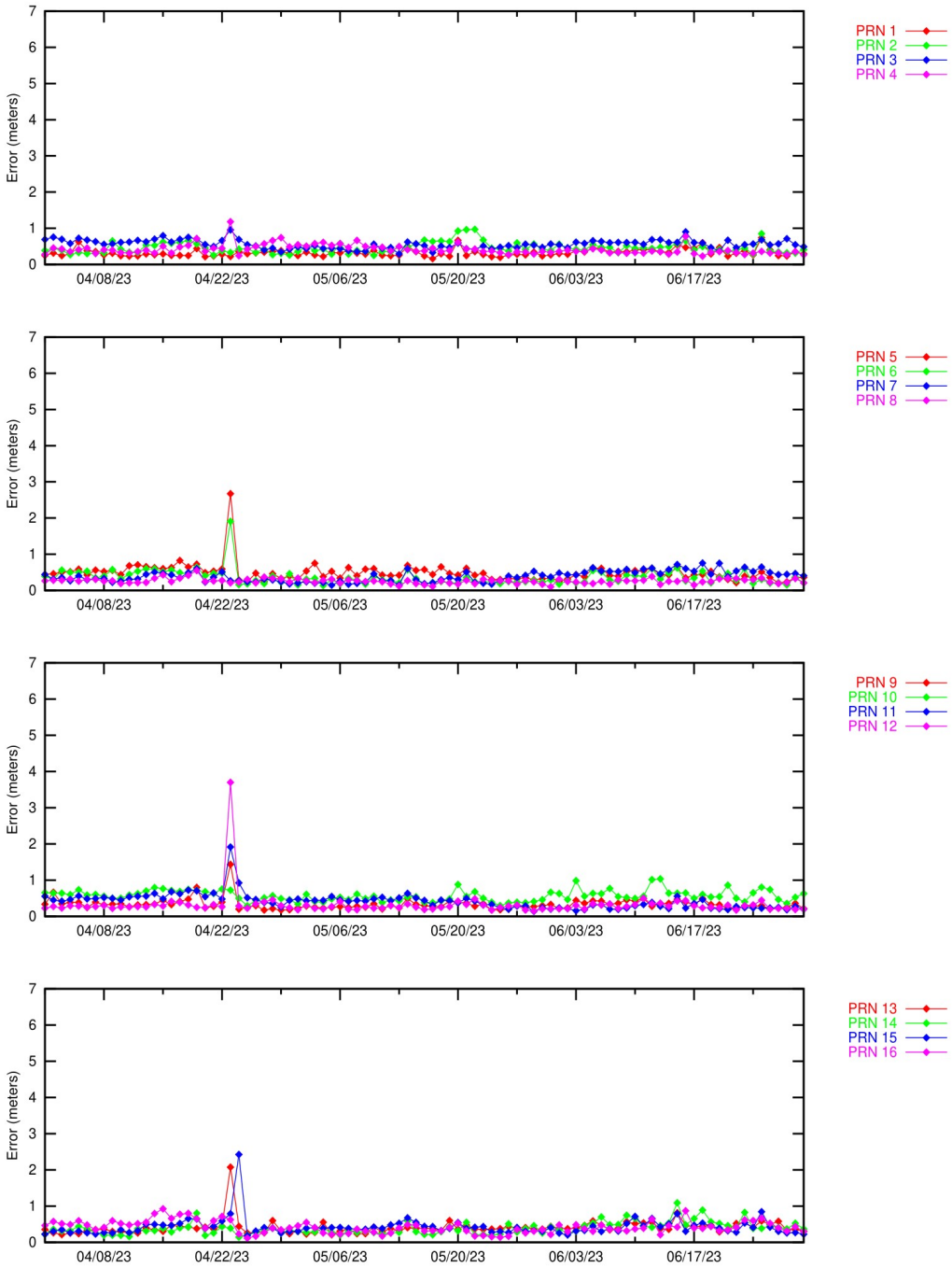

Figure 6-4 Ionospheric Error (PRN1–PRN16)—Washington, DC

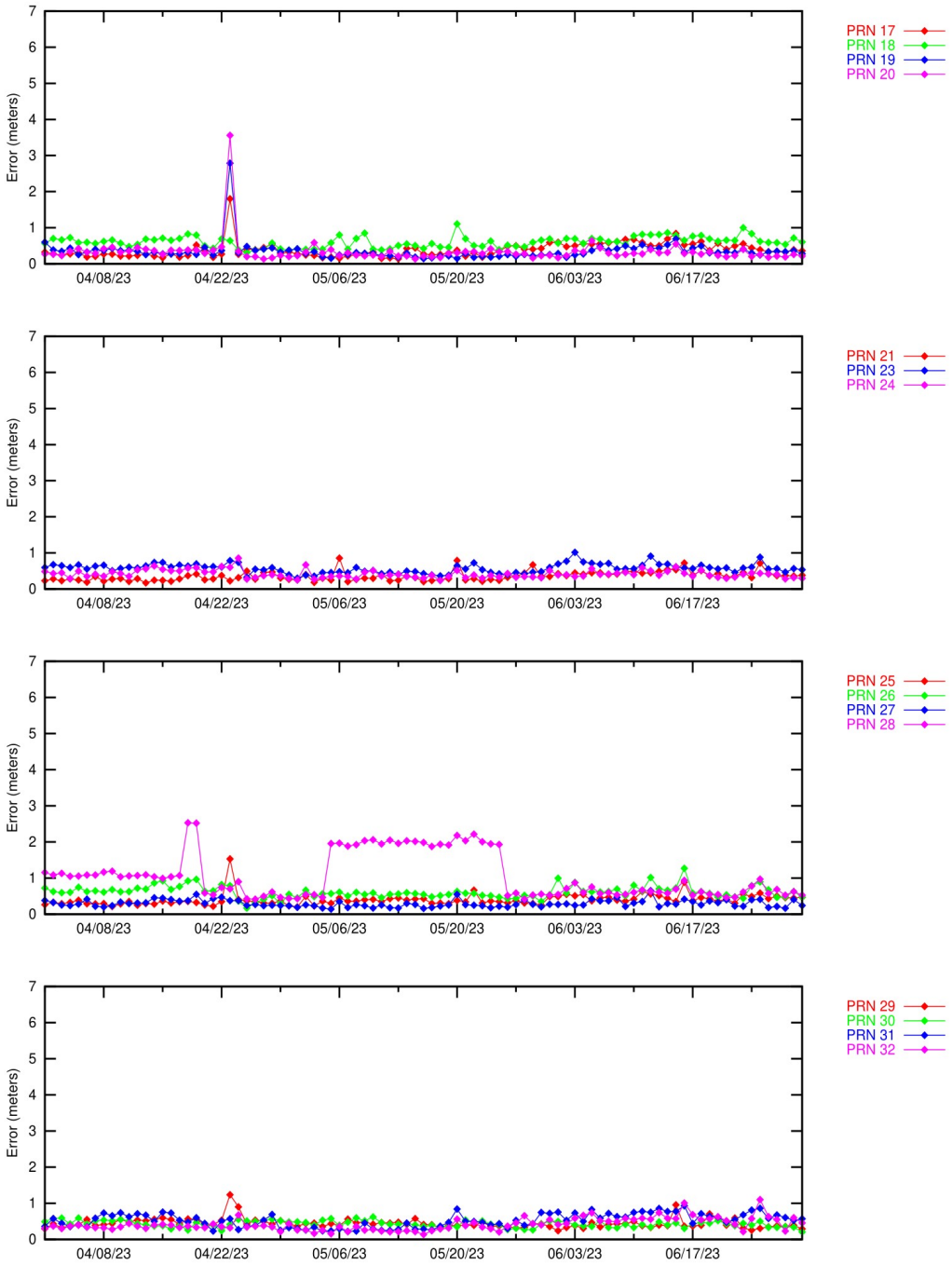

Figure 6-5 Ionospheric Error (PRN17–PRN32)—Washington, DC

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 Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	99.61	0.05	0.35	0.00
SM9 131	S15	99.74	0.02	0.20	0.03
SM9 131	G30	99.32	0.08	0.54	0.06
S15 133	SM9	99.60	0.05	0.35	0.00
S15 133	S15	99.74	0.02	0.20	0.03
S15 133	G30	99.33	0.08	0.54	0.06
G30 135	SM9	99.60	0.05	0.35	0.00
G30 135	S15	99.74	0.02	0.20	0.03
G30 135	G30	99.33	0.08	0.53	0.06

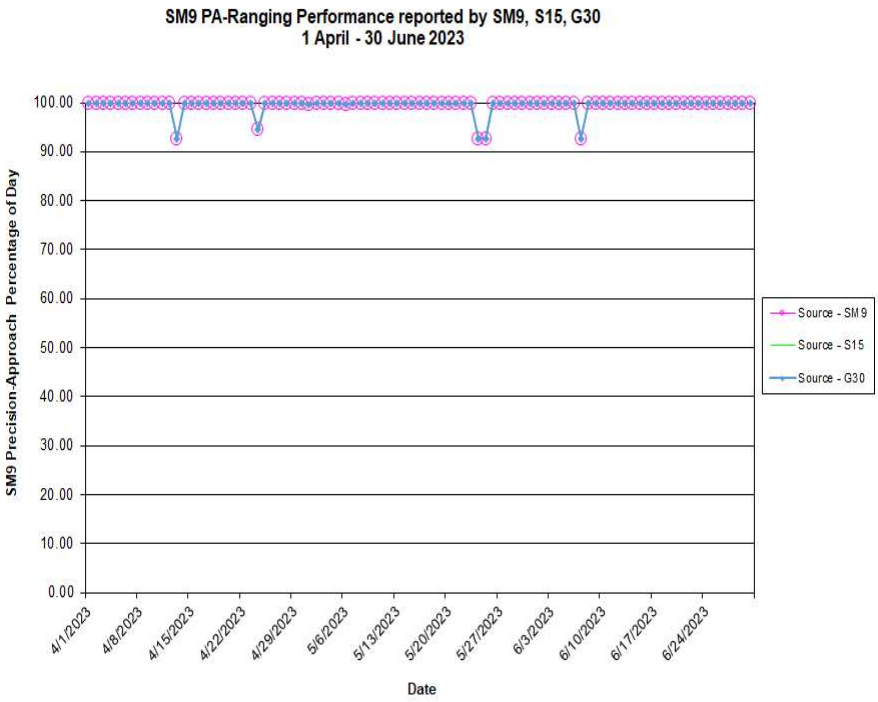

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

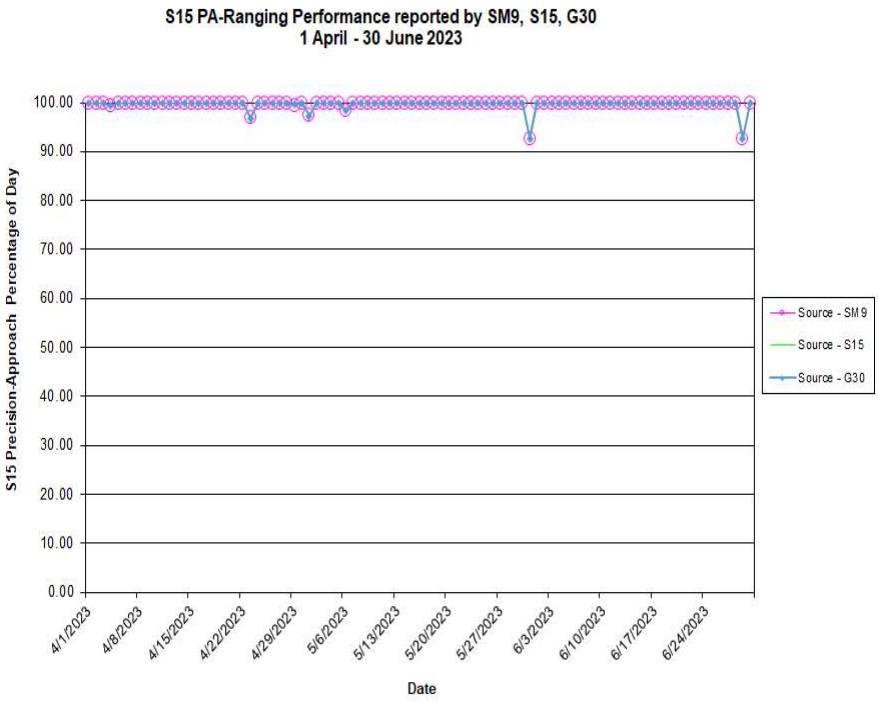

Figure 7-2 Daily PA S15 GEO Ranging Availability Trend

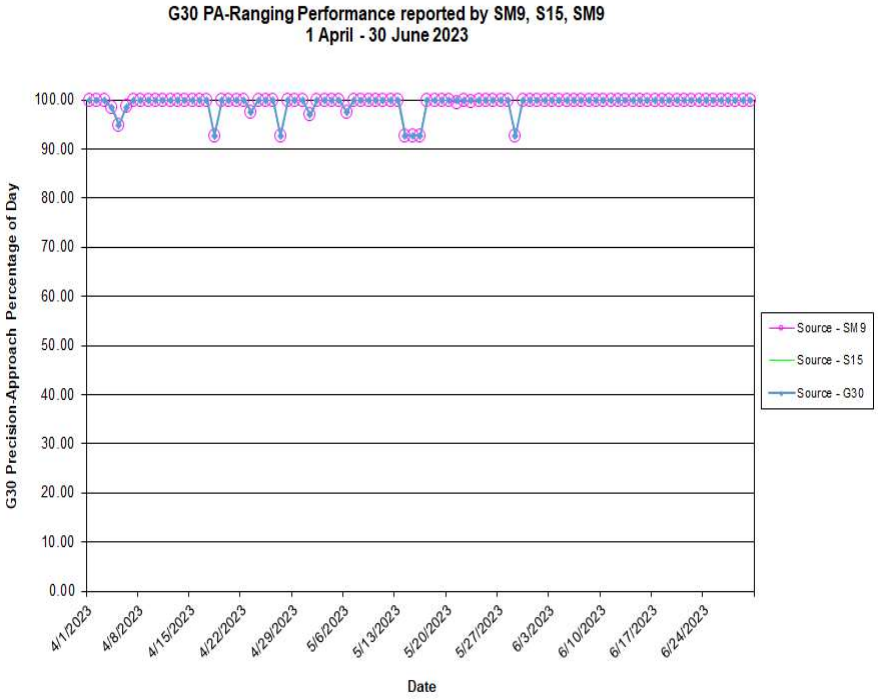

Figure 7-3 Daily PA G30 GEO Ranging Availability Trend

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	2	99.934	2	99.885	6	99.822
6A8	ALLAKAKET	AK	LP	2	99.890	2	99.859	3	99.837
7KA	TATITLEK	AK	LP	2	99.859	3	99.840	4	99.773
9A3	CHUATHBALUK	AK	LPV	1	99.920	3	99.878	5	99.800
ADQ	KODIAK	AK	LPV	4	99.882	5	99.857	5	99.787
AFM	AMBLER	AK	LPV	2	99.931	2	99.879	7	99.824
AKN	KING SALMON	AK	LPV	3	99.910	3	99.871	4	99.797
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	2	99.883	3	99.862	3	99.771
ANI	ANIAK	AK	LPV	1	99.922	3	99.878	5	99.800
AQH	QUINHAGAK	AK	LPV	2	99.923	4	99.883	4	99.811
AQT	NUIQSUT	AK	LPV	3	99.927	2	99.867	5	99.769
ATK	ATQASUK EDWARD BURNELL SR MEML	AK	LPV	2	99.937	3	99.871	7	99.765
AWI	WAINWRIGHT	AK	LPV	2	99.937	2	99.865	9	99.716
BET	BETHEL	AK	LPV200	3	99.936	4	99.884	5	99.814
BRW	WILEY POST-WILL ROGERS MEML	AK	LPV	1	99.938	2	99.871	12	99.698
BVK	BUCKLAND	AK	LPV	2	99.931	2	99.898	6	99.812
CDB	COLD BAY	AK	LPV200	5	99.958	5	99.945	15	99.718
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	2	99.858	3	99.835	2	99.772
CEM	CENTRAL	AK	LP	2	99.869	2	99.843	4	99.802
CLP	CLARKS POINT	AK	LPV	3	99.913	3	99.877	4	99.805
CXF	COLDFOOT	AK	LP	3	99.914	2	99.854	3	99.828
D76	ROBERT/BOB/CURTIS MEML	AK	LPV	2	99.934	2	99.892	6	99.812
DEE	DEERING	AK	LPV	2	99.931	2	99.898	5	99.797
DLG	DILLINGHAM	AK	LPV	3	99.913	3	99.877	4	99.805
ELI	ELIM	AK	LPV	2	99.934	2	99.893	6	99.821
ENA	KENAI MUNICIPAL	AK	LPV200	3	99.886	3	99.862	4	99.770
ENM	EMMONAK	AK	LPV	1	99.938	4	99.898	4	99.798
FAI	FAIRBANKS INTL	AK	LPV200	2	99.879	2	99.850	3	99.807
FYU	FORT YUKON	AK	LPV	3	99.885	2	99.845	5	99.805
GAL	EDWARD G PITKA SR	AK	LPV	2	99.914	2	99.869	4	99.819
GAM	GAMBELL	AK	LPV	1	99.938	4	99.914	21	99.708
GKN	GULKANA	AK	LPV	2	99.855	2	99.850	3	99.789
GST	GUSTAVUS	AK	LP	2	99.787	2	99.742	2	99.728
HLA	HUSLIA	AK	LPV	3	99.908	2	99.868	5	99.831
HOM	HOMER	AK	LPV	3	99.865	4	99.840	4	99.773

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HPB	HOOPER BAY	AK	LP	2	99.931	5	99.916	5	99.790
HRR	HEALY RIVER	AK	LP	2	99.890	2	99.855	4	99.823
IAN	BOB BAKER MEML	AK	LPV	2	99.934	2	99.887	6	99.810
IIK	KIPNUK	AK	LPV	2	99.935	5	99.917	5	99.827
ILI	ILIAMNA	AK	LPV	3	99.898	3	99.869	4	99.796
IWK	WALES	AK	LP	1	99.938	3	99.898	7	99.795
IYS	WASILLA	AK	LPV	2	99.881	2	99.861	3	99.766
KAL	KALTAG	AK	LPV	2	99.931	2	99.880	5	99.810
KGX	GRAYLING	AK	LP	1	99.938	3	99.878	5	99.808
KKA	KOYUK ALFRED ADAMS	AK	LP	2	99.934	2	99.897	5	99.803
KSM	ST MARY'S	AK	LPV200	1	99.934	3	99.881	4	99.793
KTN	KETCHIKAN INTL	AK	LPV	2	99.766	2	99.744	4	99.700
KTS	BREVIG MISSION	AK	LPV	2	99.935	3	99.898	6	99.806
KWT	KWETHLUK	AK	LPV	3	99.937	4	99.884	5	99.813
KYU	KOYUKUK	AK	LPV	2	99.931	2	99.870	4	99.819
MCG	MC GRATH	AK	LP	2	99.907	2	99.869	5	99.810
MDM	MARSHALL DON HUNTER SR	AK	LP	1	99.934	3	99.878	5	99.804
MDO	MIDDLETON ISLAND	AK	LP	2	99.860	3	99.830	3	99.745
MLY	MANLEY HOT SPRINGS	AK	LP	2	99.888	2	99.855	3	99.834
MOU	MOUNTAIN VILLAGE	AK	LPV200	1	99.938	3	99.881	4	99.793
MYU	MEKORYUK	AK	LPV	2	99.935	4	99.928	10	99.816
OME	NOME	AK	LPV	1	99.938	3	99.900	5	99.795
OOK	TOKSOOK BAY	AK	LP	2	99.934	4	99.906	4	99.809
ORT	NORTHWAY	AK	LP	2	99.853	3	99.819	2	99.766
OTZ	RALPH WIEN MEML	AK	LPV	2	99.934	2	99.895	5	99.795
PAQ	WARREN 'BUD' WOODS PALMER MUNICIPAL	AK	LP	2	99.879	2	99.861	3	99.762
PBV	ST GEORGE	AK	LPV	2	99.971	5	99.925	86	99.380
PHO	POINT HOPE	AK	LPV	1	99.938	2	99.889	14	99.708
PTU	PLATINUM	AK	LPV	3	99.926	4	99.887	4	99.811
RBY	RUBY	AK	LPV	2	99.892	2	99.868	4	99.818
RSH	RUSSIAN MISSION	AK	LP	1	99.934	3	99.878	5	99.805
SCC	DEADHORSE	AK	LPV200	3	99.924	2	99.864	6	99.794
SCM	SCAMMON BAY	AK	LP	2	99.931	4	99.900	5	99.791
SDP	SAND POINT	AK	LPV	4	99.934	4	99.915	5	99.792
SHG	SHUNGNAK	AK	LP	3	99.930	3	99.878	7	99.824
SHX	SHAGELUK	AK	LPV	2	99.937	3	99.878	6	99.820
SIT	SITKA ROCKY GUTIERREZ	AK	LP	2	99.778	3	99.757	3	99.727

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SLQ	SLEETMUTE	AK	LP	2	99.911	3	99.871	6	99.805
SMK	ST MICHAEL	AK	LPV	1	99.938	3	99.882	5	99.810
SXQ	SOLDOTNA	AK	LP	3	99.886	3	99.862	4	99.770
TER	TELLER	AK	LPV200	2	99.935	3	99.898	6	99.806
TKA	TALKEETNA	AK	LPV	2	99.887	2	99.860	4	99.784
TOG	TOGIAK	AK	LP	2	99.922	3	99.881	4	99.813
WLK	SELAWIK	AK	LPV	2	99.934	2	99.890	6	99.813
WMO	WHITE MOUNTAIN	AK	LPV	1	99.938	2	99.897	4	99.797
WNA	NAPAKIAK	AK	LPV	2	99.934	3	99.882	4	99.808
WSN	SOUTH NAKNEK NR 2	AK	LPV	3	99.911	3	99.877	4	99.799
WTK	NOATAK	AK	LPV	2	99.934	2	99.895	7	99.784
YAK	YAKUTAT	AK	LPV200	3	99.805	2	99.778	2	99.732
02A	CHILTON COUNTY	AL	LP	2	99.935	1	99.897	1	99.893
06A	MOTON FLD MUNICIPAL	AL	LPV	2	99.931	1	99.897	1	99.886
09A	BUTLER/CHOCTAW COUNTY	AL	LPV	1	99.956	1	99.897	1	99.897
0J6	HEADLAND MUNICIPAL	AL	LPV	2	99.935	1	99.897	1	99.882
0R1	ATMORE MUNICIPAL	AL	LPV	1	99.938	1	99.897	1	99.893
11A	CLAYTON MUNICIPAL	AL	LPV	2	99.933	1	99.897	1	99.883
12J	BREWTON MUNICIPAL	AL	LPV	1	99.938	1	99.897	1	99.893
1A9	PRATTVILLE - GROUBY FLD	AL	LPV	2	99.937	1	99.897	1	99.893
1M4	POSEY FLD	AL	LPV	2	99.932	1	99.894	1	99.891
1R8	BAY MINETTE MUNICIPAL	AL	LPV	1	99.938	1	99.897	1	99.893
2R5	ST ELMO	AL	LPV	1	99.938	2	99.917	1	99.893
33J	GENEVA MUNICIPAL	AL	LP	1	99.938	1	99.897	1	99.886
3M8	NORTH PICKENS	AL	LP	1	99.938	1	99.897	1	99.893
4A9	ISBELL FLD	AL	LPV	1	99.908	1	99.892	1	99.883
5R1	ROY WILCOX	AL	LP	1	99.956	1	99.897	1	99.893
5R4	FOLEY MUNICIPAL	AL	LPV	1	99.938	2	99.913	1	99.893
71J	OZARK/BLACKWELL FLD	AL	LPV	2	99.937	1	99.897	1	99.883
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	1	99.938	1	99.897	1	99.893
8A0	ALBERTVILLE RGNL/THOMAS J BRUM	AL	LPV	1	99.908	1	99.893	1	99.886
8A1	GUNTERSVILLE MUNICIPAL/JOE STARNES	AL	LPV	1	99.908	1	99.893	1	99.886
9A4	COURTLAND	AL	LPV200	2	99.929	1	99.893	1	99.890
A08	VAIDEN FLD	AL	LPV	1	99.938	1	99.897	1	99.897
ALX	THOMAS C RUSSELL FLD	AL	LPV	2	99.920	1	99.897	1	99.890
ANB	ANNISTON RGNL	AL	LPV	1	99.908	1	99.897	1	99.886
ASN	TALLADEGA MUNICIPAL	AL	LPV200	1	99.908	1	99.897	1	99.886

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	2	99.926	1	99.897	1	99.886
BFM	MOBILE DOWNTOWN	AL	LPV200	1	99.938	2	99.912	1	99.893
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	1	99.908	1	99.897	1	99.890
CMD	CULLMAN RGNL-FOLSOM FLD	AL	LPV	1	99.908	1	99.893	1	99.890
CQF	H L SONNY CALLAHAN	AL	LPV200	1	99.938	2	99.913	1	99.893
DCU	PRYOR FLD RGNL	AL	LPV200	1	99.908	1	99.893	1	99.888
DHN	DOTHAN RGNL	AL	LPV200	2	99.937	1	99.897	1	99.882
DYA	DEMOPOLIS RGNL	AL	LPV	1	99.956	1	99.897	1	99.897
EDN	ENTERPRISE MUNICIPAL	AL	LPV	1	99.938	1	99.897	1	99.886
EET	SHELBY COUNTY	AL	LPV	2	99.931	1	99.897	1	99.890
EKY	BESSEMER	AL	LPV200	2	99.932	1	99.897	1	99.891
EUF	WEEDON FLD	AL	LPV	2	99.929	1	99.897	1	99.882
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	1	99.908	1	99.893	1	99.886
GZH	EVERGREEN RGNL/MIDDLETON FLD	AL	LP	1	99.938	1	99.897	1	99.893
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	2	99.934	1	99.897	1	99.891
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	1	99.908	1	99.893	1	99.886
JFX	WALKER COUNTY-BEVILL FLD	AL	LPV	2	99.932	1	99.897	1	99.893
JKA	GULF SHORES INTL/JACK EDWARDS	AL	LPV200	1	99.938	2	99.916	1	99.893
M95	RICHARD ARTHUR FLD	AL	LPV	2	99.937	1	99.897	1	99.893
MDQ	HUNTSVILLE EXEC TOM SHARP JR F	AL	LPV200	1	99.905	1	99.893	1	99.881
MGM	MONTGOMERY RGNL (DANNELLY FLD)	AL	LPV200	2	99.936	1	99.897	1	99.893
MOB	MOBILE RGNL	AL	LPV200	1	99.938	2	99.913	1	99.893
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	2	99.929	1	99.893	1	99.890
PLR	ST CLAIR COUNTY	AL	LPV	1	99.908	1	99.897	1	99.890
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	1	99.908	1	99.892	1	99.883
SCD	MERKEL FLD SYLACAUGA MUNICIPAL	AL	LPV	1	99.908	1	99.897	1	99.890
SEM	CRAIG FLD	AL	LPV200	1	99.938	1	99.897	1	99.894
TCL	TUSCALOOSA NTL	AL	LPV	1	99.938	1	99.897	1	99.893
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	2	99.936	1	99.897	1	99.890
0M0	BILLY FREE MUNICIPAL	AR	LPV	1	99.963	2	99.948	1	99.902
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	1	99.940	1	99.904	1	99.879
4A5	SEARCY COUNTY	AR	LPV	1	99.946	1	99.906	1	99.879
4M1	CARROLL COUNTY	AR	LP	1	99.929	1	99.908	1	99.878
4M3	CARLISLE MUNICIPAL	AR	LPV	1	99.963	1	99.927	1	99.899
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	1	99.963	1	99.927	1	99.897
7M1	MC GEHEE MUNICIPAL	AR	LP	1	99.963	2	99.947	1	99.899
9M8	SHERIDAN-GRANT COUNTY RGNL	AR	LPV	1	99.967	2	99.951	1	99.901

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ADF	DEXTER B FLORENCE MEML FLD	AR	LPV	1	99.967	1	99.956	1	99.906
ARG	WALNUT RIDGE RGNL	AR	LPV200	1	99.916	1	99.901	1	99.879
ASG	SPRINGDALE MUNICIPAL	AR	LPV	1	99.931	1	99.912	1	99.882
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	2	99.955	2	99.924	1	99.892
BPK	BAXTER COUNTY	AR	LPV	1	99.927	1	99.905	1	99.876
BVX	BATESVILLE RGNL	AR	LPV	1	99.952	1	99.903	1	99.882
BYH	ARKANSAS INTL	AR	LPV200	1	99.902	1	99.899	1	99.879
CDH	HARRELL FLD	AR	LPV	1	99.967	1	99.956	1	99.916
CXW	CONWAY RGNL	AR	LPV	1	99.967	1	99.927	1	99.901
DRP	DELTA RGNL	AR	LPV	1	99.956	2	99.926	1	99.893
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	1	99.967	1	99.956	1	99.920
FLP	MARION COUNTY RGNL	AR	LPV	1	99.934	1	99.906	1	99.876
FSM	FORT SMITH RGNL	AR	LPV200	1	99.967	2	99.951	1	99.905
FYV	DRAKE FLD	AR	LPV	1	99.936	1	99.912	1	99.882
H34	HUNTSVILLE MUNICIPAL	AR	LPV	1	99.934	1	99.911	1	99.882
HEE	THOMPSON-ROBBINS	AR	LPV	1	99.963	1	99.927	1	99.897
HRO	BOONE COUNTY	AR	LPV	1	99.929	1	99.907	1	99.877
JBR	JONESBORO MUNICIPAL	AR	LPV200	2	99.929	1	99.901	1	99.879
LIT	BILL AND HILLARY CLINTON NTL/A	AR	LPV200	1	99.963	2	99.939	1	99.900
LLQ	MONTICELLO MUNICIPAL/ELLIS FLD	AR	LPV	1	99.963	2	99.948	1	99.900
M18	HOPE MUNICIPAL	AR	LP	1	99.967	1	99.960	1	99.916
M19	NEWPORT RGNL	AR	LPV	1	99.953	2	99.914	1	99.882
M32	LAKE VILLAGE MUNICIPAL	AR	LP	1	99.963	2	99.947	1	99.899
M70	POCAHONTAS MUNICIPAL	AR	LPV	1	99.911	1	99.902	1	99.879
M77	HOWARD COUNTY	AR	LP	1	99.967	1	99.960	1	99.909
MXA	MANILA MUNICIPAL	AR	LPV	1	99.909	1	99.900	1	99.879
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	1	99.963	1	99.927	1	99.900
PBF	PINEBLUFF RGNL/GRIDER FLD	AR	LPV	1	99.963	2	99.953	1	99.900
ROG	ROGERS EXEC - CARTER FLD	AR	LPV	1	99.930	1	99.912	1	99.882
RUE	RUSSELLVILLE RGNL	AR	LPV	1	99.966	1	99.927	1	99.902
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	1	99.963	1	99.927	1	99.898
SLG	SMITH FLD	AR	LPV	1	99.931	1	99.913	1	99.883
SRC	SEARCY MUNICIPAL	AR	LPV	1	99.956	1	99.927	1	99.899
SUZ	SALINE COUNTY RGNL	AR	LPV	1	99.967	2	99.950	1	99.902
TXK	TEXARKANA RGNL-WEBB FLD	AR	LPV	1	99.967	1	99.960	1	99.919
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	1	99.931	1	99.913	1	99.883
XNA	NORTHWEST ARKANSAS NTL	AR	LPV200	1	99.931	1	99.913	1	99.883

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AVQ	MARANA RGNL	AZ	LP	1	99.971	1	99.956	4	99.935
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	0	100	1	99.963	1	99.950
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	1	99.978	1	99.956	2	99.947
CHD	CHANDLER MUNICIPAL	AZ	LPV	1	99.978	1	99.964	2	99.948
DVT	PHOENIX DEER VALLEY	AZ	LPV	1	99.978	1	99.967	1	99.950
FFZ	FALCON FLD	AZ	LP	1	99.978	1	99.964	2	99.948
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	1	99.960	1	99.952	61	99.711
FLG	FLAGSTAFF PULLIAM	AZ	LPV	1	99.993	1	99.972	1	99.953
GCN	GRAND CANYON NTL PARK	AZ	LPV	0	100	1	99.983	1	99.955
GEU	GLENDALE MUNICIPAL	AZ	LPV	1	99.978	1	99.964	2	99.950
GYR	PHOENIX GOODYEAR	AZ	LP	1	99.978	1	99.964	2	99.948
HII	LAKE HAVASU CITY	AZ	LPV	0	100	1	99.976	1	99.960
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	1	99.977	1	99.957
IGM	KINGMAN	AZ	LPV	0	100	1	99.977	1	99.957
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	1	99.978	1	99.964	2	99.948
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	1	99.974	1	99.960	1	99.943
P08	COOLIDGE MUNICIPAL	AZ	LPV	1	99.973	1	99.956	2	99.948
P20	AVI SUQUILLA	AZ	LPV	0	100	1	99.977	1	99.959
P33	COCHISE COUNTY	AZ	LPV	1	99.960	1	99.955	59	99.779
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	1	99.963	1	99.950
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	1	99.978	1	99.964	2	99.949
PRC	PRESCOTT RGNL - ERNEST A LOVE	AZ	LPV200	1	99.993	1	99.971	1	99.953
RQE	WINDOW ROCK	AZ	LP	1	99.999	1	99.963	1	99.946
RYN	RYAN FLD	AZ	LPV	1	99.967	1	99.956	4	99.928
SAD	SAFFORD RGNL	AZ	LPV	1	99.967	1	99.956	36	99.888
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LPV	1	99.973	1	99.961	1	99.943
SOW	SHOW LOW RGNL	AZ	LPV200	1	99.975	1	99.960	1	99.945
TUS	TUCSON INTL	AZ	LPV	1	99.964	1	99.956	7	99.913
TYL	TAYLOR	AZ	LPV	1	99.975	1	99.963	1	99.949
AAT	ALTURAS MUNICIPAL	CA	LPV	1	99.986	1	99.946	4	99.882
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	1	99.974	1	99.942	4	99.881
APC	NAPA COUNTY	CA	LPV200	0	100	1	99.960	3	99.933
APV	APPLE VALLEY	CA	LPV	0	100	1	99.972	5	99.955
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	1	99.963	2	99.939
BFL	MEADOWS FLD	CA	LPV	0	100	1	99.967	3	99.956
BLH	BLYTHE	CA	LP	0	100	1	99.978	3	99.952
BUR	BOB HOPE	CA	LP	0	100	1	99.968	7	99.937

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
C83	BYRON	CA	LPV	0	100	1	99.964	3	99.939
CCB	CABLE	CA	LP	0	100	1	99.970	7	99.943
CCR	BUCHANAN FLD	CA	LPV	0	100	1	99.960	3	99.935
CEC	JACK MC NAMARA FLD	CA	LPV	1	99.960	1	99.934	4	99.859
CIC	CHICO MUNICIPAL	CA	LPV	0	100	1	99.960	3	99.934
CMA	CAMARILLO	CA	LPV	0	100	1	99.967	17	99.920
CNO	CHINO	CA	LPV	0	100	1	99.970	8	99.941
CPU	CALAVERAS COUNTY-MAURY RASMUSS	CA	LP	0	100	1	99.964	2	99.949
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	1	99.967	23	99.892
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	1	99.964	4	99.943
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	1	99.972	1	99.957
DWA	YOLO COUNTY	CA	LPV	0	100	1	99.961	3	99.937
F70	FRENCH VALLEY	CA	LPV	0	100	1	99.976	13	99.923
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	1	99.966	2	99.955
FCH	FRESNO CHANDLER EXEC	CA	LPV	0	100	1	99.965	2	99.955
GOO	NEVADA COUNTY	CA	LPV	0	100	1	99.963	2	99.938
HAF	HALF MOON BAY	CA	LPV	0	100	1	99.960	4	99.933
HHR	JACK NORTHROP FLD/HAWTHORNE MU	CA	LPV	0	100	1	99.968	18	99.920
HJO	HANFORD MUNICIPAL	CA	LPV	0	100	1	99.966	2	99.955
HWD	HAYWARD EXEC	CA	LPV	0	100	1	99.960	3	99.935
L35	BIG BEAR CITY	CA	LP	0	100	1	99.972	7	99.957
LAX	LOS ANGELES INTL	CA	LPV200	0	100	1	99.968	18	99.920
LGB	LONG BEACH (DAUGHERTY FLD)	CA	LPV	0	100	1	99.968	18	99.919
LHM	LINCOLN RGNL/KARL HARDER FLD	CA	LPV200	0	100	1	99.963	2	99.940
LLR	LITTLE RIVER	CA	LP	1	99.998	1	99.959	6	99.916
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	1	99.963	2	99.949
LVK	LIVERMORE MUNICIPAL	CA	LPV200	0	100	1	99.964	3	99.938
MAE	MADERA MUNICIPAL	CA	LPV	0	100	1	99.964	2	99.951
MCE	MERCED RGNL/MACREADY FLD	CA	LPV200	0	100	1	99.964	2	99.950
MER	CASTLE	CA	LPV200	0	100	1	99.964	2	99.949
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	1	99.963	2	99.943
MHV	MOJAVE AIR AND SPACE PORT	CA	LP	0	100	1	99.969	4	99.955
MIT	SHAFTER-MINTER FLD	CA	LPV	0	100	1	99.966	3	99.956
MOD	MODESTO CITY-COUNTY-HARRY SHAM	CA	LPV200	0	100	1	99.963	3	99.947
MRY	MONTEREY RGNL	CA	LPV	0	100	1	99.964	6	99.941
MYF	MONTGOMERY-GIBBS EXEC	CA	LPV200	0	100	1	99.966	31	99.862
MYV	YUBA COUNTY	CA	LPV200	0	100	1	99.962	2	99.938

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
NUQ	MOFFETT FEDERAL AIRFIELD	CA	LPV200	0	100	1	99.961	4	99.937
O02	NERVINO	CA	LPV	0	100	1	99.962	2	99.937
O08	COLUSA COUNTY	CA	LPV	0	100	1	99.960	2	99.934
O27	OAKDALE	CA	LPV	0	100	1	99.963	2	99.948
O32	REEDLEY MUNICIPAL	CA	LPV	0	100	1	99.966	2	99.955
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	1	99.960	3	99.929
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	1	99.963	3	99.939
OAK	METRO OAKLAND INTL	CA	LPV200	0	100	1	99.960	3	99.934
ONT	ONTARIO INTL	CA	LPV200	0	100	1	99.970	7	99.944
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	1	99.961	2	99.935
OXR	OXNARD	CA	LPV	0	100	1	99.967	17	99.918
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	1	99.969	7	99.951
POC	BRACKETT FLD	CA	LPV	0	100	1	99.969	7	99.942
PRB	PASO ROBLES MUNICIPAL	CA	LPV	0	100	1	99.966	5	99.941
PVF	PLACERVILLE	CA	LPV	0	100	1	99.963	2	99.945
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	1	99.970	8	99.943
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	1	99.960	3	99.923
RDD	REDDING MUNICIPAL	CA	LPV	0	100	1	99.959	4	99.904
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	1	99.964	3	99.940
RIV	MARCH ARB	CA	LPV200	0	100	1	99.971	8	99.942
SAC	SACRAMENTO EXEC	CA	LPV	0	100	1	99.963	3	99.941
SAN	SAN DIEGO INTL	CA	LPV	0	100	1	99.966	37	99.843
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	1	99.967	17	99.907
SBD	SAN BERNARDINO INTL	CA	LPV	0	100	1	99.971	7	99.951
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	1	99.966	15	99.917
SCK	STOCKTON METRO	CA	LPV200	0	100	1	99.964	3	99.943
SDM	BROWN FLD MUNICIPAL	CA	LPV200	0	100	2	99.979	40	99.829
SEE	GILLESPIE FLD	CA	LP	0	100	1	99.966	27	99.869
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	1	99.960	4	99.934
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	1	99.964	3	99.939
SMF	SACRAMENTO INTL	CA	LPV200	0	100	1	99.963	2	99.941
SMO	SANTA MONICA MUNICIPAL	CA	LPV	0	100	1	99.968	16	99.922
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	1	99.966	19	99.907
SNA	JOHN WAYNE/ORANGE COUNTY	CA	LPV200	0	100	1	99.969	18	99.917
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	1	99.964	4	99.943
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	1	99.960	4	99.929
TCY	TRACY MUNICIPAL	CA	LPV	0	100	1	99.964	3	99.941

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TNP	TWENTYNINE PALMS	CA	LP	0	100	1	99.974	2	99.959
TOA	ZAMPERINI FLD	CA	LPV	0	100	1	99.968	20	99.912
TRK	TRUCKEE-TAHOE	CA	LP	0	100	1	99.963	2	99.937
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	0	100	1	99.977	9	99.943
TVL	LAKE TAHOE	CA	LP	0	100	1	99.963	2	99.947
VCB	NUT TREE	CA	LPV	0	100	1	99.960	3	99.936
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	1	99.971	5	99.955
VIS	VISALIA MUNICIPAL	CA	LPV	0	100	1	99.966	2	99.955
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	1	99.969	6	99.951
WLW	WILLOWS/GLENN COUNTY	CA	LPV	0	100	1	99.960	3	99.931
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	1	99.964	4	99.942
1V6	FREMONT COUNTY	CO	LPV	1	99.974	1	99.950	2	99.919
20V	MC ELROY AIRFIELD	CO	LPV	1	99.987	2	99.932	2	99.893
2V5	WRAY MUNICIPAL	CO	LPV200	3	99.910	4	99.885	4	99.856
2V6	YUMA MUNICIPAL	CO	LPV200	3	99.911	4	99.886	4	99.867
33V	WALDEN-JACKSON COUNTY	CO	LPV	2	99.963	2	99.925	4	99.871
4V0	RANGELY	CO	LPV	1	99.981	1	99.951	2	99.929
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	1	99.974	1	99.949	2	99.922
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	1	99.948	1	99.924
AJZ	BLAKE FLD	CO	LPV	0	100	1	99.955	1	99.934
AKO	COLORADO PLAINS RGNL	CO	LPV	3	99.913	4	99.887	4	99.873
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	1	99.952	1	99.930
APA	CENTENNIAL	CO	LPV200	1	99.948	2	99.935	3	99.885
BJC	ROCKY MOUNTAIN METRO	CO	LPV200	1	99.949	2	99.929	3	99.885
CAG	CRAIG-MOFFAT	CO	LP	1	99.981	2	99.942	3	99.895
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	1	99.958	1	99.945
CFO	COLORADO AIR AND SPACE PORT	CO	LPV200	1	99.936	3	99.912	3	99.884
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	1	99.955	1	99.945	2	99.915
DEN	DENVER INTL	CO	LPV200	1	99.938	3	99.913	3	99.884
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	100	1	99.956	1	99.935
FMM	FORT MORGAN MUNICIPAL	CO	LPV	3	99.916	4	99.887	4	99.873
FNL	NORTHERN COLORADO RGNL	CO	LPV200	2	99.936	3	99.906	4	99.874
FTG	FRONT RANGE	CO	LPV200	1	99.936	3	99.912	3	99.884
GJT	GRAND JUNCTION RGNL	CO	LPV200	1	99.999	1	99.955	1	99.935
GXY	GREELEY-WELD COUNTY	CO	LPV200	3	99.916	4	99.886	5	99.866
HDN	YAMPA VALLEY	CO	LPV200	1	99.982	2	99.938	3	99.892
ITR	KIT CARSON COUNTY	CO	LPV	1	99.929	2	99.910	3	99.875

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LAA	SOUTHEAST COLORADO RGNL	CO	LPV	1	99.945	2	99.935	2	99.910
LHX	LA JUNTA MUNICIPAL	CO	LPV	1	99.953	1	99.947	2	99.913
LMO	VANCE BRAND	CO	LPV	1	99.940	2	99.916	3	99.884
MTJ	MONTROSE RGNL	CO	LPV200	0	100	1	99.955	1	99.934
MVI	MONTE VISTA MUNICIPAL	CO	LPV	0	100	1	99.952	1	99.930
PSO	STEVENS FLD	CO	LP	0	100	1	99.955	1	99.933
PUB	PUEBLO MEML	CO	LPV200	1	99.960	1	99.948	2	99.914
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	0	100	1	99.952	1	99.930
RIL	RIFLE GARFIELD COUNTY	CO	LPV	1	99.993	1	99.950	2	99.918
STK	STERLING MUNICIPAL	CO	LPV	3	99.910	4	99.882	5	99.848
TEX	TELLURIDE RGNL	CO	LP	0	100	1	99.955	1	99.934
4B8	ROBERTSON FLD	CT	LP	1	99.850	1	99.850	1	99.839
BDL	BRADLEY INTL	CT	LPV200	1	99.850	1	99.850	1	99.850
BDR	IGOR I SIKORSKY MEML	CT	LPV	1	99.850	1	99.850	1	99.836
DXR	DANBURY MUNICIPAL	CT	LP	1	99.850	1	99.850	1	99.835
GON	GROTON-NEW LONDON	CT	LPV	1	99.850	1	99.850	1	99.850
HVN	TWEED/NEW HAVEN	CT	LPV	1	99.850	1	99.850	1	99.837
IJD	WINDHAM	CT	LP	1	99.850	1	99.850	1	99.850
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	1	99.850	1	99.850	1	99.838
OXC	WATERBURY-OXFORD	CT	LPV	1	99.850	1	99.850	1	99.837
DCA	RONALD REAGAN WASHINGTON NTL	DC	LPV	1	99.860	1	99.857	1	99.831
HEF	MANASSAS RGNL/HARRY P DAVIS FL	DC	LPV	1	99.859	1	99.853	1	99.839
IAD	WASHINGTON DULLES INTL	DC	LPV200	1	99.861	1	99.857	1	99.839
33N	DELAWARE AIRPARK	DE	LP	1	99.857	1	99.857	1	99.831
DOV	DOVER AFB	DE	LPV200	1	99.857	1	99.857	1	99.831
EVY	SUMMIT	DE	LPV	1	99.857	1	99.857	1	99.831
GED	DELAWARE COASTAL	DE	LPV	1	99.857	1	99.857	1	99.831
ILG	NEW CASTLE	DE	LPV	1	99.857	1	99.857	1	99.830
1J0	TRI-COUNTY	FL	LP	1	99.938	1	99.897	1	99.883
24J	SUWANNEE COUNTY	FL	LPV	1	99.924	1	99.890	1	99.853
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	1	99.923	1	99.887	2	99.846
40J	PERRY-FOLEY	FL	LPV	1	99.926	1	99.890	1	99.854
54J	DEFUNIAK SPRINGS	FL	LP	1	99.938	1	99.897	1	99.893
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	1	99.927	1	99.894	3	99.879
APF	NAPLES MUNICIPAL	FL	LPV	1	99.916	1	99.871	50	99.768
AVO	AVON PARK EXEC	FL	LPV	1	99.912	1	99.879	7	99.822
BCR	TRI-COUNTY	FL	LPV	1	99.938	1	99.897	1	99.883

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BCT	BOCA RATON	FL	LPV	1	99.911	2	99.871	9	99.793
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	1	99.925	1	99.886	7	99.834
BOW	BARTOW EXEC	FL	LPV	1	99.925	1	99.879	6	99.830
CEW	BOB SIKES	FL	LPV	1	99.938	1	99.897	1	99.893
CGC	CRYSTAL RIVER-CAPT TOM DAVIS F	FL	LP	1	99.925	1	99.893	4	99.841
CHN	WAUCHULA MUNICIPAL	FL	LP	1	99.912	1	99.882	10	99.827
COI	MERRITT ISLAND	FL	LPV	1	99.912	1	99.880	2	99.834
CRG	JACKSONVILLE EXEC AT CRAIG	FL	LPV200	1	99.904	1	99.885	1	99.849
CTY	CROSS CITY	FL	LPV	1	99.926	1	99.893	1	99.852
DAB	DAYTONA BEACH INTL	FL	LPV200	1	99.919	1	99.886	2	99.842
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FL	FL	LPV	1	99.922	1	99.887	2	99.840
DTS	DESTIN EXEC	FL	LPV	1	99.938	1	99.897	1	99.893
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	1	99.938	1	99.897	2	99.885
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	1	99.917	1	99.885	2	99.839
EYW	KEY WEST INTL	FL	LPV	1	99.890	2	99.861	24	99.737
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	1	99.911	2	99.871	7	99.808
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	1	99.904	1	99.885	1	99.849
FIN	FLAGLER EXEC	FL	LPV	1	99.922	1	99.886	2	99.843
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	1	99.911	2	99.866	10	99.782
FMY	PAGE FLD	FL	LPV	1	99.912	1	99.876	42	99.783
FPR	TREASURE COAST INTL	FL	LPV	1	99.911	1	99.879	3	99.824
FPY	PERRY-FOLEY	FL	LPV	1	99.926	1	99.890	1	99.854
FXE	FORT LAUDERDALE EXEC	FL	LPV200	1	99.911	2	99.866	9	99.787
GIF	WINTER HAVEN RGNL	FL	LPV	1	99.923	1	99.879	5	99.831
GNV	GAINESVILLE RGNL	FL	LPV	1	99.925	1	99.889	1	99.849
HEG	HERLONG RECREATIONAL	FL	LPV	1	99.904	1	99.887	1	99.850
IMM	IMMOKALEE RGNL	FL	LPV	1	99.912	1	99.871	28	99.798
ISM	KISSIMMEE GATEWAY	FL	LPV200	1	99.921	1	99.880	2	99.832
JAX	JACKSONVILLE INTL	FL	LPV200	1	99.904	1	99.886	1	99.850
LAL	LAKELAND LINDER INTL	FL	LPV200	1	99.925	1	99.883	8	99.830
LCQ	LAKE CITY GATEWAY	FL	LPV	1	99.924	1	99.889	1	99.852
LEE	LEESBURG INTL	FL	LPV	1	99.923	1	99.888	2	99.838
LNA	PALM BEACH COUNTY PARK	FL	LP	1	99.911	2	99.871	8	99.798
MAI	MARIANNA MUNICIPAL	FL	LPV	1	99.934	1	99.897	1	99.882
MCO	ORLANDO INTL	FL	LPV200	1	99.919	1	99.886	2	99.832
MIA	MIAMI INTL	FL	LPV200	1	99.905	2	99.866	10	99.779
MKY	MARCO ISLAND EXEC	FL	LPV	1	99.912	1	99.871	48	99.772

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MLB	MELBOURNE ORLANDO INTL	FL	LPV200	1	99.912	1	99.879	2	99.826
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	1	99.890	2	99.859	25	99.757
OBE	OKEECHOBEE COUNTY	FL	LPV	1	99.911	1	99.876	5	99.823
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	1	99.924	1	99.893	2	99.845
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	1	99.921	1	99.886	2	99.842
OPF	MIAMI-OPA LOCKA EXEC	FL	LPV200	1	99.911	2	99.866	9	99.784
ORL	EXEC	FL	LPV200	1	99.919	1	99.886	2	99.834
PBI	PALM BEACH INTL	FL	LPV200	1	99.911	2	99.871	8	99.803
PCM	PLANT CITY	FL	LPV	1	99.926	2	99.896	11	99.829
PGD	PUNTA GORDA	FL	LPV200	1	99.912	1	99.876	37	99.789
PHK	PALM BEACH COUNTY GLADES	FL	LPV	1	99.911	1	99.876	8	99.807
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	1	99.926	1	99.901	32	99.813
PMP	POMPANO BEACH AIRPARK	FL	LPV	1	99.911	2	99.866	9	99.791
PNS	PENSACOLA INTL	FL	LPV200	1	99.938	1	99.897	1	99.893
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	1	99.912	1	99.876	39	99.787
SEF	SEBRING RGNL	FL	LPV	1	99.912	1	99.878	8	99.822
SFB	ORLANDO SANFORD INTL	FL	LPV200	1	99.919	1	99.886	2	99.836
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	1	99.904	1	99.885	1	99.848
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	1	99.912	1	99.884	41	99.797
SUA	WITHAM FLD	FL	LPV	1	99.911	2	99.875	4	99.811
TIX	SPACE COAST RGNL	FL	LPV200	1	99.915	1	99.886	2	99.835
TLH	TALLAHASSEE INTL	FL	LPV200	1	99.930	1	99.897	2	99.870
TMB	MIAMI EXEC	FL	LPV200	1	99.901	2	99.865	11	99.779
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	1	99.911	2	99.867	17	99.789
TPA	TAMPA INTL	FL	LPV200	1	99.926	1	99.901	28	99.820
TPF	PETER O KNIGHT	FL	LP	1	99.926	1	99.901	27	99.821
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	1	99.915	1	99.886	2	99.837
VDF	TAMPA EXEC	FL	LPV	1	99.926	2	99.900	18	99.825
VNC	VENICE MUNICIPAL	FL	LP	1	99.912	1	99.877	48	99.769
VQQ	CECIL	FL	LPV200	2	99.917	1	99.887	1	99.850
VRB	VERO BEACH RGNL	FL	LPV200	1	99.911	1	99.879	2	99.826
X07	LAKE WALES MUNICIPAL	FL	LP	1	99.923	1	99.879	7	99.829
X14	LA BELLE MUNICIPAL	FL	LPV	1	99.912	1	99.876	14	99.808
X35	MARION COUNTY	FL	LP	1	99.925	1	99.893	2	99.845
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	1	99.901	2	99.864	10	99.781
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	1	99.924	1	99.884	7	99.831
09J	JEKYLL ISLAND	GA	LPV200	1	99.901	1	99.884	1	99.850

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
15J	COOK COUNTY	GA	LPV	1	99.908	1	99.890	2	99.868
17J	DONALSONVILLE MUNICIPAL	GA	LPV	2	99.930	1	99.897	1	99.882
18A	FRANKLIN-HART	GA	LPV	1	99.894	1	99.885	1	99.871
19A	JACKSON COUNTY	GA	LPV	1	99.894	1	99.886	1	99.872
2J3	LOUISVILLE MUNICIPAL	GA	LPV	1	99.905	1	99.885	1	99.868
2J5	MILLEN	GA	LPV	1	99.901	1	99.884	1	99.853
3J7	GREENE COUNTY RGNL	GA	LPV	1	99.894	1	99.886	1	99.871
48A	COCHRAN	GA	LPV	1	99.908	1	99.888	1	99.871
49A	GILMER COUNTY	GA	LPV	1	99.894	1	99.888	1	99.882
4A4	POLK COUNTY/CORNELIUS MOORE FL	GA	LPV	1	99.908	1	99.891	1	99.883
4J1	BRANTLEY COUNTY	GA	LPV	1	99.908	1	99.885	1	99.851
4J2	BERRIEN COUNTY	GA	LPV	1	99.908	1	99.890	2	99.867
4J5	QUITMAN BROOKS COUNTY	GA	LP	2	99.921	1	99.891	2	99.867
52A	MADISON MUNICIPAL	GA	LP	1	99.894	1	99.887	1	99.871
6A1	BUTLER MUNICIPAL	GA	LPV	1	99.908	1	99.891	1	99.882
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	1	99.908	1	99.890	1	99.882
70J	CAIRO-GRADY COUNTY	GA	LPV	2	99.925	1	99.896	2	99.870
75J	TURNER COUNTY	GA	LP	1	99.908	1	99.890	1	99.871
9A5	BARWICK LAFAYETTE	GA	LP	1	99.894	1	99.890	1	99.882
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	1	99.908	1	99.895	1	99.872
ACJ	JIMMY CARTER RGNL	GA	LPV	1	99.908	1	99.891	1	99.872
AGS	AUGUSTA RGNL AT BUSH FLD	GA	LPV200	1	99.901	1	99.883	1	99.864
AHN	ATHENS/BEN EPPS	GA	LPV200	1	99.894	1	99.886	1	99.871
AJR	HABERSHAM COUNTY	GA	LPV	1	99.894	1	99.886	1	99.872
AMG	BACON COUNTY	GA	LPV	1	99.908	1	99.887	1	99.867
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	1	99.908	1	99.889	1	99.882
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	1	99.908	1	99.887	2	99.864
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	2	99.929	1	99.897	1	99.882
BHC	BAXLEY MUNICIPAL	GA	LPV	1	99.908	1	99.886	1	99.867
BIJ	EARLY COUNTY	GA	LPV	2	99.926	1	99.897	1	99.882
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	1	99.901	1	99.884	2	99.862
CCO	NEWNAN COWETA COUNTY	GA	LPV	1	99.908	1	99.891	1	99.882
CKF	CRISP COUNTY-CORDELE	GA	LPV	1	99.908	1	99.890	1	99.871
CNI	CHEROKEE COUNTY RGNL	GA	LPV	1	99.894	1	99.889	1	99.882
CSG	COLUMBUS	GA	LPV	1	99.908	1	99.897	1	99.882
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	1	99.908	1	99.891	1	99.883
CVC	COVINGTON MUNICIPAL	GA	LPV	1	99.905	1	99.888	1	99.872

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CWV	CLAXTON-EVANS COUNTY	GA	LPV	1	99.905	1	99.884	2	99.865
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	1	99.908	1	99.896	1	99.872
CZL	TOM B DAVID FLD	GA	LPV	1	99.894	1	99.889	1	99.882
D73	CY NUNNALLY MEML	GA	LP	1	99.894	1	99.887	1	99.872
DBN	W H 'BUD' BARRON	GA	LPV200	1	99.908	1	99.887	1	99.869
DNL	DANIEL FLD	GA	LPV	1	99.901	1	99.883	1	99.865
DNN	DALTON MUNICIPAL	GA	LPV	1	99.894	1	99.889	1	99.882
DQH	DOUGLAS MUNICIPAL	GA	LPV200	1	99.908	1	99.888	1	99.868
EBA	ELBERT COUNTY-PATZ FLD	GA	LP	1	99.894	1	99.884	1	99.871
EZM	HEART OF GEORGIA RGNL	GA	LPV200	1	99.908	1	99.888	1	99.869
FFC	ATLANTA RGNL FALCON FLD	GA	LPV	1	99.908	1	99.891	1	99.882
FTY	FULTON COUNTY EXEC/CHARLIE BRO	GA	LPV	1	99.908	1	99.889	1	99.882
FZG	FITZGERALD MUNICIPAL	GA	LPV	1	99.908	1	99.889	1	99.869
GVL	LEE GILMER MEML	GA	LPV	1	99.894	1	99.887	1	99.872
HMP	ATLANTA SPEEDWAY	GA	LPV200	1	99.908	1	99.889	1	99.882
HOE	HOMERVILLE	GA	LPV	1	99.908	1	99.889	2	99.865
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	1	99.894	1	99.884	1	99.869
IIY	WASHINGTON/WILKES COUNTY	GA	LPV	1	99.894	1	99.885	1	99.871
JCA	JACKSON COUNTY	GA	LPV	1	99.894	1	99.886	1	99.872
JES	JESUP-WAYNE COUNTY	GA	LPV	1	99.905	1	99.885	1	99.866
JYL	PLANTATION AIRPARK	GA	LPV	1	99.901	1	99.883	1	99.852
JZP	PICKENS COUNTY	GA	LPV	1	99.894	1	99.888	1	99.882
LGC	LAGRANGE/CALLAWAY	GA	LPV200	1	99.908	1	99.897	1	99.883
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	1	99.901	1	99.884	2	99.864
LZU	GWINNETT COUNTY/BRISCOE FLD	GA	LPV200	1	99.894	1	99.888	1	99.882
MAC	MACON DOWNTOWN	GA	LPV	1	99.908	1	99.888	1	99.871
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	1	99.908	1	99.889	1	99.871
MGR	MOULTRIE MUNICIPAL	GA	LPV200	1	99.908	1	99.892	2	99.871
MHP	JOHN EDWIN JONES SR FLD/METTER	GA	LPV	1	99.905	1	99.885	2	99.866
MLJ	BALDWIN COUNTY RGNL	GA	LPV	1	99.908	1	99.887	1	99.871
MQW	TELFAIR-WHEELER	GA	LPV	1	99.908	1	99.887	1	99.869
OKZ	KAOLIN FLD	GA	LPV	1	99.908	1	99.886	1	99.869
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	1	99.908	1	99.891	1	99.882
PIM	HARRIS COUNTY	GA	LPV	1	99.908	1	99.897	1	99.883
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	1	99.908	1	99.890	1	99.882
PXE	PERRY-HOUSTON COUNTY	GA	LPV	1	99.908	1	99.889	1	99.871
RMG	RICHARD B RUSSELL RGNL - J H T	GA	LPV	1	99.894	1	99.890	1	99.883

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	1	99.905	1	99.885	2	99.866
RYY	COBB COUNTY INTL/MCCOLLUM FLD	GA	LPV200	1	99.894	1	99.889	1	99.882
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	1	99.901	1	99.882	1	99.851
SBO	EAST GEORGIA RGNL	GA	LPV	1	99.908	1	99.885	2	99.868
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	1	99.901	1	99.883	1	99.852
TMA	HENRY TIFT MYERS	GA	LPV	1	99.908	1	99.890	1	99.869
TOC	TOCCOA RG LETOURNEAU FLD	GA	LPV	1	99.894	1	99.885	1	99.872
TVI	THOMASVILLE RGNL	GA	LPV	2	99.922	1	99.892	2	99.869
VDI	VIDALIA RGNL	GA	LPV200	1	99.908	1	99.885	1	99.867
VLD	VALDOSTA RGNL	GA	LPV	1	99.908	1	99.890	2	99.866
VPC	CARTERSVILLE	GA	LPV	1	99.894	1	99.890	1	99.882
WDR	BARROW COUNTY	GA	LPV	1	99.894	1	99.887	1	99.872
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	3	99.829	3	99.772	2	99.715
4C8	ALBIA MUNICIPAL	IA	LPV	1	99.883	3	99.845	4	99.774
AIO	ATLANTIC MUNICIPAL	IA	LPV	3	99.872	4	99.788	2	99.718
ALO	WATERLOO RGNL	IA	LPV200	3	99.839	3	99.762	2	99.718
AMW	AMES MUNICIPAL	IA	LPV	3	99.855	3	99.766	2	99.707
AWG	WASHINGTON MUNICIPAL	IA	LPV200	2	99.878	2	99.853	3	99.775
BNW	BOONE MUNICIPAL	IA	LPV	3	99.854	3	99.766	2	99.707
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	1	99.892	2	99.854	4	99.821
C25	WAVERLY MUNICIPAL	IA	LPV	4	99.828	3	99.751	2	99.718
CAV	CLARION MUNICIPAL	IA	LPV	4	99.819	3	99.750	2	99.707
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	4	99.874	4	99.800	2	99.718
CCY	NORTHEAST IOWA RGNL	IA	LPV	4	99.816	3	99.751	2	99.711
CID	THE EASTERN IOWA	IA	LPV200	3	99.865	4	99.825	3	99.731
CIN	ARTHUR N NEU	IA	LPV	3	99.845	3	99.762	2	99.707
CKP	CHEROKEE COUNTY RGNL	IA	LPV	4	99.774	3	99.731	2	99.707
CSQ	CRESTON MUNICIPAL	IA	LPV	2	99.883	3	99.826	3	99.734
CWI	CLINTON MUNICIPAL	IA	LPV200	3	99.874	3	99.838	3	99.768
DBQ	DUBUQUE RGNL	IA	LPV200	3	99.860	4	99.809	3	99.754
DEH	DECORAH MUNICIPAL	IA	LPV	3	99.813	4	99.764	2	99.715
DNS	DENISON MUNICIPAL	IA	LPV	4	99.822	3	99.768	2	99.707
DSM	DES MOINES INTL	IA	LPV200	3	99.871	3	99.807	2	99.718
DVN	DAVENPORT MUNICIPAL	IA	LPV200	2	99.878	2	99.845	3	99.782
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	5	99.818	3	99.749	2	99.707
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	4	99.839	3	99.753	2	99.707
EFW	JEFFERSON MUNICIPAL	IA	LPV	3	99.852	3	99.766	2	99.707

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EOK	KEOKUK MUNICIPAL	IA	LPV	1	99.892	2	99.857	3	99.828
EST	ESTHERVILLE MUNICIPAL	IA	LPV	4	99.773	3	99.721	2	99.707
FFL	FAIRFIELD MUNICIPAL	IA	LPV	1	99.882	2	99.853	4	99.787
FOD	FORT DODGE RGNL	IA	LPV200	5	99.821	3	99.750	2	99.707
FSW	FORT MADISON MUNICIPAL	IA	LPV	1	99.892	2	99.855	4	99.825
FXY	FOREST CITY MUNICIPAL	IA	LPV	4	99.786	3	99.726	2	99.707
GCT	GUTHRIE COUNTY RGNL	IA	LPV	3	99.856	3	99.771	2	99.718
GFZ	GREENFIELD MUNICIPAL	IA	LPV	3	99.877	3	99.813	2	99.718
GGI	GRINNELL RGNL	IA	LPV	3	99.868	4	99.819	3	99.731
HPT	HAMPTON MUNICIPAL	IA	LPV	4	99.825	3	99.752	2	99.707
I75	OSCEOLA MUNICIPAL	IA	LPV	2	99.880	3	99.825	4	99.750
ICL	SCHENCK FLD	IA	LPV	2	99.884	3	99.830	4	99.765
IFA	IOWA FALLS MUNICIPAL	IA	LPV	4	99.840	3	99.752	2	99.707
IIB	JAMES H CONNELL FLD AT INDEPEN	IA	LPV	3	99.846	3	99.774	2	99.718
IKV	ANKENY RGNL	IA	LPV200	3	99.860	3	99.798	2	99.718
IOW	IOWA CITY MUNICIPAL	IA	LPV	3	99.874	3	99.838	3	99.747
LRJ	LE MARS MUNICIPAL	IA	LPV	4	99.774	3	99.730	2	99.707
LWD	LAMONI MUNICIPAL	IA	LPV	2	99.885	4	99.843	4	99.800
MCW	MASON CITY MUNICIPAL	IA	LPV200	5	99.807	3	99.736	2	99.707
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	3	99.856	3	99.763	2	99.718
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	1	99.884	2	99.853	4	99.797
MUT	MUSCATINE MUNICIPAL	IA	LPV200	2	99.880	2	99.848	3	99.781
MXO	MONTICELLO RGNL	IA	LP	3	99.861	5	99.823	3	99.730
OOA	OSKALOOSA MUNICIPAL	IA	LPV	1	99.879	3	99.845	4	99.748
OQW	MAQUOKETA MUNICIPAL	IA	LPV	3	99.868	4	99.834	3	99.767
ORC	ORANGE CITY MUNICIPAL	IA	LPV	4	99.774	3	99.729	2	99.707
OTM	OTTUMWA RGNL	IA	LPV	1	99.879	2	99.850	4	99.764
OXV	KNOXVILLE MUNICIPAL	IA	LPV	2	99.879	4	99.837	3	99.732
PEA	PELLA MUNICIPAL	IA	LPV	3	99.878	4	99.832	3	99.731
POH	POCAHONTAS MUNICIPAL	IA	LPV	6	99.806	3	99.740	2	99.707
PRO	PERRY MUNICIPAL	IA	LPV200	3	99.855	3	99.766	2	99.708
RDK	RED OAK MUNICIPAL	IA	LPV	2	99.883	3	99.836	2	99.721
RRQ	ROCK RAPIDS MUNICIPAL	IA	LP	4	99.758	3	99.719	2	99.707
SDA	SHENANDOAH MUNICIPAL	IA	LPV	2	99.882	3	99.842	4	99.759
SHL	SHELDON RGNL	IA	LPV	4	99.773	3	99.727	2	99.707
SKI	SAC CITY MUNICIPAL	IA	LPV	6	99.812	3	99.745	2	99.707
SLB	STORM LAKE MUNICIPAL	IA	LPV	4	99.778	3	99.744	2	99.707

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SPW	SPENCER MUNICIPAL	IA	LPV200	4	99.774	3	99.723	2	99.707
SUX	SIOUX GATEWAY/BRIG GENERAL BUD	IA	LPV200	4	99.785	3	99.737	2	99.707
SXK	SIOUX COUNTY RGNL	IA	LPV200	4	99.774	3	99.729	2	99.707
TNU	NEWTON MUNICIPAL-EARL JOHNSON FLD	IA	LPV200	3	99.869	4	99.819	3	99.731
TVK	CENTERVILLE MUNICIPAL	IA	LPV	1	99.886	2	99.854	4	99.803
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	3	99.866	4	99.818	3	99.730
VTI	VINTON VETERANS MEML AIRPARK	IA	LPV	3	99.860	3	99.777	3	99.730
1U7	BEAR LAKE COUNTY	ID	LPV	2	99.898	3	99.898	3	99.798
BOI	BOISE AIR TRML/GOWEN FLD	ID	LPV200	2	99.908	2	99.877	4	99.787
COE	COEUR D'ALENE/PAPPY BOYINGTON	ID	LPV200	3	99.824	2	99.752	5	99.694
DIJ	DRIGGS-REED MEML	ID	LP	2	99.864	3	99.803	3	99.746
EUL	TREASURE VALLEY EXEC AT CALDWE	ID	LPV	2	99.910	2	99.877	4	99.782
GNG	GOODING MUNICIPAL	ID	LPV	2	99.905	2	99.882	5	99.811
IDA	IDAHO FALLS RGNL	ID	LPV200	3	99.879	5	99.843	3	99.753
JER	JEROME COUNTY	ID	LPV	2	99.909	2	99.895	4	99.815
LWS	LEWISTON/NEZ PERCE COUNTY	ID	LPV200	2	99.842	2	99.764	4	99.723
MAN	NAMPA MUNICIPAL	ID	LPV	2	99.912	2	99.877	4	99.787
MYL	MC CALL MUNICIPAL	ID	LPV	2	99.872	4	99.813	3	99.744
PIH	POCATELLO RGNL	ID	LPV200	2	99.884	2	99.879	4	99.789
SUN	FRIEDMAN MEML	ID	LP	2	99.897	2	99.879	4	99.788
SZT	SANDPOINT	ID	LP	2	99.781	2	99.747	5	99.700
TWF	JOSLIN FLD/MAGIC VALLEY RGNL	ID	LPV200	3	99.930	3	99.916	4	99.817
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	2	99.908	2	99.878	4	99.796
1H2	EFFINGHAM COUNTY MEML	IL	LPV	1	99.886	1	99.879	1	99.879
3LF	LITCHFIELD MUNICIPAL	IL	LPV	1	99.888	1	99.879	1	99.879
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	2	99.888	2	99.853	2	99.851
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	1	99.884	1	99.882	1	99.875
ALN	ST LOUIS RGNL	IL	LPV200	1	99.889	1	99.879	1	99.879
ARR	AURORA MUNICIPAL	IL	LPV200	2	99.874	2	99.853	3	99.832
BLV	SCOTT AFB/MIDAMERICA ST LOUIS	IL	LPV200	1	99.889	1	99.879	1	99.879
BMI	CENTRAL IL RGNL/BLOOMINGTON-NO	IL	LPV	1	99.875	2	99.856	2	99.853
C15	PEKIN MUNICIPAL	IL	LPV	2	99.888	2	99.856	2	99.852
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	2	99.873	2	99.845	4	99.792
C75	MARSHALL COUNTY	IL	LP	1	99.875	2	99.853	2	99.850
CIR	CAIRO RGNL	IL	LP	1	99.898	1	99.898	1	99.879
CMI	UNIVERSITY OF ILLINOIS/WILLARD	IL	LPV200	1	99.886	1	99.875	2	99.853
CPS	ST LOUIS DOWNTOWN	IL	LPV200	1	99.889	1	99.879	1	99.879

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CTK	INGERSOLL	IL	LPV	1	99.889	2	99.855	3	99.851
CUL	CARMI MUNICIPAL	IL	LPV	1	99.885	1	99.885	1	99.879
DEC	DECATUR	IL	LPV200	1	99.887	1	99.879	2	99.853
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	2	99.874	2	99.853	4	99.822
DNV	VERMILION RGNL	IL	LPV	1	99.875	1	99.875	2	99.846
DPA	DUPAGE	IL	LPV200	2	99.874	2	99.853	3	99.830
ENL	CENTRALIA MUNICIPAL	IL	LPV	1	99.887	1	99.879	1	99.879
EZI	KEWANEE MUNICIPAL	IL	LPV	3	99.888	2	99.853	5	99.831
FEP	ALBERTUS	IL	LPV	3	99.868	4	99.835	3	99.766
FOA	FLORA MUNICIPAL	IL	LPV	1	99.885	1	99.879	1	99.879
GBG	GALESBURG MUNICIPAL	IL	LPV200	1	99.890	2	99.853	4	99.843
GRE	GREENVILLE	IL	LPV	1	99.888	1	99.879	1	99.879
HSB	HARRISBURG-RALEIGH	IL	LPV	1	99.889	1	99.889	1	99.879
I63	MOUNT STERLING MUNICIPAL	IL	LPV	1	99.891	2	99.873	2	99.853
IGQ	LANSING MUNICIPAL	IL	LPV	1	99.875	2	99.853	3	99.837
IKK	GREATER KANKAKEE	IL	LPV200	1	99.875	3	99.865	2	99.842
LOT	LEWIS UNIVERSITY	IL	LPV200	1	99.875	2	99.853	3	99.838
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	1	99.884	1	99.879	1	99.875
MDW	CHICAGO MIDWAY INTL	IL	LPV	1	99.875	2	99.853	3	99.837
MLI	QUAD CITIES INTL	IL	LPV200	2	99.880	2	99.847	4	99.800
MQB	MACOMB MUNICIPAL	IL	LPV200	1	99.890	2	99.856	3	99.850
MTO	COLES COUNTY MEML	IL	LPV200	1	99.885	1	99.879	2	99.853
MVN	MOUNT VERNON	IL	LPV	1	99.886	1	99.879	1	99.879
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	1	99.894	1	99.890	1	99.879
OLY	OLNEY-NOBLE	IL	LPV	1	99.885	1	99.879	1	99.879
ORD	CHICAGO O'HARE INTL	IL	LPV200	2	99.875	2	99.853	3	99.830
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	2	99.889	2	99.854	2	99.851
PJY	PINCKNEYVILLE/DU QUOIN	IL	LPV	1	99.891	1	99.891	1	99.879
PNT	PONTIAC MUNICIPAL	IL	LPV	1	99.875	2	99.853	2	99.847
PPQ	PITTSFIELD PENSTONE MUNICIPAL	IL	LPV	1	99.891	1	99.875	2	99.853
PRG	EDGAR COUNTY	IL	LPV	1	99.884	1	99.879	2	99.850
PWK	CHICAGO EXEC	IL	LPV	2	99.874	2	99.853	4	99.811
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	2	99.872	2	99.844	3	99.777
RPJ	ROCHELLE MUNICIPAL/KORITZ FLD	IL	LPV	2	99.873	2	99.845	4	99.794
RSV	CRAWFORD COUNTY	IL	LPV	1	99.884	1	99.879	1	99.875
SAR	SPARTA COMMUNICIPALTY-HUNTER FLD	IL	LPV	1	99.888	1	99.879	1	99.879
SFY	TRI-TOWNSHIP	IL	LP	3	99.870	4	99.836	3	99.765

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SLO	SALEM-LECKRONE	IL	LPV200	1	99.887	1	99.879	1	99.879
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	1	99.889	1	99.879	2	99.853
SQI	WHITESIDE COUNTY/JOS H BITTORF	IL	LPV200	2	99.874	2	99.845	3	99.795
TIP	RANTOUL NTL AVN CNTR-FRANK ELL	IL	LPV	1	99.875	1	99.875	2	99.846
UGN	WAUKEGAN NTL	IL	LPV	2	99.872	2	99.853	5	99.816
UIN	QUINCY RGNL-BALDWIN FLD	IL	LPV200	1	99.892	2	99.872	2	99.853
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	2	99.875	2	99.853	3	99.837
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	1	99.882	1	99.879	2	99.863
50I	KENTLAND MUNICIPAL	IN	LPV	1	99.875	2	99.872	2	99.845
AID	ANDERSON MUNICIPAL-DARLINGTON FLD	IN	LPV	1	99.881	1	99.872	2	99.867
ASW	WARSAW MUNICIPAL	IN	LPV200	1	99.875	1	99.872	2	99.846
BAK	COLUMBUS MUNICIPAL	IN	LPV	1	99.881	1	99.876	1	99.872
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	1	99.881	1	99.881	1	99.875
BMG	MONROE COUNTY	IN	LPV200	1	99.882	1	99.879	1	99.875
C62	KENDALLVILLE MUNICIPAL	IN	LPV	1	99.874	1	99.868	2	99.857
C65	PLYMOUTH MUNICIPAL	IN	LPV	1	99.875	2	99.874	2	99.846
CEV	METTEL FLD	IN	LPV	1	99.879	1	99.875	1	99.872
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	1	99.883	1	99.875	2	99.850
DCY	DAVIESS COUNTY	IN	LPV	1	99.883	1	99.879	1	99.875
EKM	ELKHART MUNICIPAL	IN	LPV	1	99.875	2	99.866	2	99.846
EVV	EVANSVILLE RGNL	IN	LPV200	1	99.883	1	99.883	1	99.875
EYE	EAGLE CREEK AIRPARK	IN	LPV	1	99.882	1	99.879	2	99.863
FKR	FRANKFORT CLINTON COUNTY RGNL	IN	LPV	1	99.875	1	99.875	2	99.846
FRH	FRENCH LICK MUNICIPAL	IN	LPV	1	99.882	1	99.882	1	99.875
FWA	FORT WAYNE INTL	IN	LPV200	1	99.874	1	99.872	2	99.857
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	1	99.881	1	99.875	1	99.872
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	1	99.875	1	99.875	2	99.846
GPC	PUTNAM COUNTY RGNL	IN	LPV	1	99.882	1	99.879	2	99.870
GSH	GOSHEN MUNICIPAL	IN	LPV	1	99.874	1	99.868	2	99.846
GWB	DE KALB COUNTY	IN	LPV	1	99.873	1	99.868	2	99.857
GYY	GARY/CHICAGO INTL	IN	LPV200	1	99.875	2	99.853	3	99.837
HFY	INDY SOUTH GREENWOOD	IN	LPV	1	99.881	1	99.877	1	99.872
HNB	HUNTINGBURG	IN	LPV	1	99.882	1	99.882	1	99.875
HUF	TERRE HAUTE RGNL	IN	LPV200	1	99.884	1	99.879	2	99.871
I22	RANDOLPH COUNTY	IN	LPV	1	99.876	1	99.872	2	99.868
I76	PERU MUNICIPAL	IN	LPV	1	99.875	1	99.872	2	99.846
IMS	MADISON MUNICIPAL	IN	LPV	1	99.882	1	99.876	1	99.875

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IND	INDIANAPOLIS INTL	IN	LPV200	1	99.882	1	99.879	2	99.871
JVY	CLARK RGNL	IN	LPV200	1	99.882	1	99.880	1	99.876
LAF	PURDUE UNIVERSITY	IN	LPV	1	99.875	1	99.875	2	99.846
MCX	WHITE COUNTY	IN	LP	1	99.875	2	99.874	2	99.846
MIE	DELAWARE COUNTY RGNL	IN	LPV	1	99.880	1	99.872	2	99.860
MQJ	INDIANAPOLIS RGNL	IN	LPV200	1	99.881	1	99.875	2	99.871
MZZ	MARION MUNICIPAL - MCKINNEY FLD	IN	LPV200	1	99.881	1	99.872	2	99.857
OKK	KOKOMO MUNICIPAL	IN	LPV200	1	99.882	1	99.872	2	99.846
OVO	NORTH VERNON	IN	LPV	1	99.880	1	99.875	1	99.875
OXI	STARKE COUNTY	IN	LPV	1	99.875	2	99.872	2	99.843
PLD	PORTLAND MUNICIPAL	IN	LPV	1	99.878	1	99.872	2	99.858
PPO	LA PORTE MUNICIPAL	IN	LPV	1	99.875	2	99.872	2	99.840
RCR	FULTON COUNTY	IN	LPV	1	99.875	1	99.872	2	99.846
RID	RICHMOND MUNICIPAL	IN	LPV200	1	99.876	1	99.875	1	99.872
RWN	ARENS FLD	IN	LPV	1	99.875	2	99.872	2	99.846
RZL	JASPER COUNTY	IN	LPV	1	99.875	2	99.872	2	99.843
SBN	SOUTH BEND INTL	IN	LPV200	1	99.875	2	99.872	2	99.846
SER	FREEMAN MUNICIPAL	IN	LPV	1	99.881	1	99.878	1	99.875
SIV	SULLIVAN COUNTY	IN	LPV	1	99.884	1	99.879	1	99.875
SMD	SMITH FLD	IN	LPV	1	99.874	1	99.868	2	99.857
TEL	PERRY COUNTY MUNICIPAL	IN	LP	1	99.882	1	99.882	1	99.875
TYQ	INDIANAPOLIS EXEC	IN	LPV	1	99.882	1	99.875	2	99.858
UWL	NEW CASTLE HENRY COUNTY MARLAT	IN	LPV	1	99.880	1	99.875	1	99.872
VPZ	PORTER COUNTY RGNL	IN	LPV	1	99.875	2	99.872	2	99.838
1QK	GOVE COUNTY	KS	LPV	2	99.921	2	99.903	4	99.845
3AU	AUGUSTA MUNICIPAL	KS	LP	1	99.934	1	99.926	3	99.881
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	1	99.929	2	99.913	2	99.905
3K7	MARK HOARD MEML	KS	LPV	1	99.929	2	99.908	2	99.901
3K8	COMANCHE COUNTY	KS	LPV	1	99.930	1	99.929	2	99.893
5K2	TRIBUNE MUNICIPAL	KS	LPV	1	99.929	2	99.910	2	99.902
9K8	KINGMAN/CLYDE CESSNA FLD	KS	LP	1	99.936	2	99.931	3	99.881
AAO	COLONEL JAMES JABARA	KS	LPV	1	99.934	1	99.926	3	99.881
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	3	99.905	4	99.878	3	99.828
ANY	ANTHONY MUNICIPAL	KS	LPV	1	99.936	1	99.932	3	99.888
BEC	BEECH FACTORY	KS	LPV	1	99.934	1	99.926	3	99.881
CBK	SHALZ FLD	KS	LPV	2	99.922	3	99.887	4	99.844
CFV	COFFEYVILLE MUNICIPAL	KS	LPV	1	99.930	1	99.923	2	99.881

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CNK	BLOSSER MUNICIPAL	KS	LP	2	99.870	3	99.854	3	99.807
DDC	DODGE CITY RGNL	KS	LPV200	1	99.929	2	99.909	2	99.895
EGT	WELLINGTON MUNICIPAL	KS	LPV200	1	99.934	1	99.927	2	99.887
EHA	ELKHART-MORTON COUNTY	KS	LPV	1	99.934	1	99.934	2	99.906
EMP	EMPORIA MUNICIPAL	KS	LPV	2	99.918	2	99.898	3	99.865
EQA	EL DORADO/CAPT JACK THOMAS MEM	KS	LPV200	1	99.933	1	99.922	3	99.880
EWK	NEWTON-CITY-COUNTY	KS	LPV	1	99.927	3	99.919	3	99.878
FOE	TOPEKA RGNL	KS	LPV	2	99.893	2	99.878	3	99.828
FSK	FORT SCOTT MUNICIPAL	KS	LPV	1	99.922	1	99.903	2	99.863
GBD	GREAT BEND MUNICIPAL	KS	LPV200	2	99.924	2	99.904	5	99.876
GCK	GARDEN CITY RGNL	KS	LPV	1	99.928	2	99.910	2	99.898
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	2	99.925	3	99.892	4	99.868
HLC	HILL CITY MUNICIPAL	KS	LPV	2	99.907	3	99.883	3	99.828
HQG	HUGOTON MUNICIPAL	KS	LPV	1	99.930	1	99.930	2	99.904
HRU	HERINGTON RGNL	KS	LPV	2	99.916	2	99.890	3	99.864
HUT	HUTCHINSON RGNL	KS	LPV200	1	99.934	2	99.919	3	99.865
HYS	HAYS RGNL	KS	LPV200	2	99.910	2	99.902	4	99.853
ICT	WICHITA DWIGHT D EISENHOWER NT	KS	LPV200	1	99.934	1	99.927	2	99.879
IDP	INDEPENDENCE MUNICIPAL	KS	LPV200	1	99.931	1	99.923	2	99.881
IXD	NEW CENTURY AIRCENTER	KS	LPV	1	99.893	2	99.889	3	99.854
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	2	99.867	3	99.850	4	99.804
K78	ABILENE MUNICIPAL	KS	LPV	4	99.905	2	99.879	3	99.823
K79	JETMORE MUNICIPAL	KS	LPV	1	99.929	2	99.909	3	99.893
K81	MIAMI COUNTY	KS	LPV	1	99.893	2	99.892	2	99.856
K82	SMITH CENTER MUNICIPAL	KS	LPV200	3	99.875	4	99.852	3	99.805
K88	ALLEN COUNTY	KS	LPV	1	99.923	1	99.904	2	99.860
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	1	99.929	1	99.929	2	99.905
LQR	LARNED-PAWNEE COUNTY	KS	LPV	2	99.924	2	99.904	5	99.878
LWC	LAWRENCE RGNL	KS	LPV200	2	99.893	2	99.876	3	99.827
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	2	99.922	2	99.905	3	99.860
MHK	MANHATTAN RGNL	KS	LPV200	2	99.892	2	99.885	3	99.811
MPR	MC PHERSON	KS	LPV	2	99.926	3	99.914	3	99.858
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	2	99.865	3	99.846	3	99.790
NRN	NORTON MUNICIPAL	KS	LPV	3	99.897	4	99.871	3	99.813
OEL	OAKLEY MUNICIPAL	KS	LPV	2	99.926	2	99.904	4	99.849
OIN	OBERLIN MUNICIPAL	KS	LPV	3	99.897	4	99.872	3	99.823
OJC	JOHNSON COUNTY EXEC	KS	LPV	1	99.892	2	99.887	3	99.854

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OWI	OTTAWA MUNICIPAL	KS	LPV	1	99.896	2	99.894	3	99.856
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	3	99.893	4	99.869	3	99.810
PPF	TRI-CITY	KS	LPV	1	99.930	1	99.919	2	99.877
PTS	ATKINSON MUNICIPAL	KS	LPV	1	99.929	1	99.906	2	99.871
PTT	PRATT RGNL	KS	LPV	1	99.934	2	99.918	3	99.888
RCP	ROOKS COUNTY RGNL	KS	LPV	2	99.905	3	99.882	3	99.817
RPB	BELLEVILLE MUNICIPAL	KS	LPV	2	99.868	4	99.848	3	99.805
RSL	RUSSELL MUNICIPAL	KS	LPV	2	99.901	2	99.897	4	99.834
SLN	SALINA RGNL	KS	LPV	3	99.899	3	99.896	4	99.845
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	2	99.921	3	99.887	4	99.861
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	2	99.892	2	99.877	3	99.821
TQK	SCOTT CITY MUNICIPAL	KS	LPV	1	99.929	2	99.907	3	99.897
UKL	COFFEY COUNTY	KS	LPV	1	99.905	2	99.902	3	99.858
ULS	ULYSSES	KS	LPV	1	99.928	2	99.917	2	99.904
WLD	STROTHER FLD	KS	LPV	1	99.934	1	99.926	2	99.891
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	1	99.882	1	99.879	1	99.875
18I	MC CREARY COUNTY	KY	LP	1	99.888	1	99.879	1	99.879
1M7	FULTON	KY	LPV	1	99.897	1	99.897	1	99.879
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	1	99.882	1	99.879	1	99.875
2I0	MADISONVILLE RGNL	KY	LPV	1	99.891	1	99.891	1	99.875
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	1	99.895	1	99.893	1	99.879
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	1	99.893	1	99.889	1	99.875
5M9	MARION-CRITTENDEN COUNTY JAMES	KY	LPV	1	99.895	1	99.894	1	99.879
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	1	99.886	1	99.876	1	99.875
AAS	TAYLOR COUNTY	KY	LPV	1	99.888	1	99.879	1	99.875
BRY	SAMUELS FLD	KY	LPV	1	99.882	1	99.879	1	99.876
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	1	99.893	1	99.884	1	99.877
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	1	99.888	1	99.879	1	99.879
CEY	KYLE-OAKLEY FLD	KY	LPV	1	99.896	1	99.896	1	99.879
CPF	WENDELL H FORD	KY	LPV200	1	99.882	1	99.879	1	99.876
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	1	99.882	1	99.877	1	99.874
DVK	STUART POWELL FLD	KY	LPV	1	99.885	1	99.879	1	99.875
DWU	ASHLAND RGNL	KY	LP	1	99.879	1	99.879	1	99.875
EHR	HENDERSON CITY-COUNTY	KY	LPV	1	99.887	1	99.887	1	99.875
EKQ	WAYNE COUNTY	KY	LPV	1	99.888	1	99.879	1	99.875
EKX	ADDINGTON FLD	KY	LPV	1	99.886	1	99.880	1	99.876
FFT	CAPITAL CITY	KY	LPV	1	99.882	1	99.875	1	99.875

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FGX	FLEMING-MASON	KY	LPV	1	99.881	1	99.879	1	99.875
GLW	GLASGOW MUNICIPAL	KY	LPV	1	99.888	1	99.880	1	99.876
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	1	99.894	1	99.892	1	99.876
I93	BRECKINRIDGE COUNTY	KY	LPV	1	99.886	1	99.881	1	99.875
IOB	MOUNT STERLING/MONTGOMERY COUN	KY	LPV	1	99.882	1	99.879	1	99.875
JQD	OHIO COUNTY	KY	LPV	1	99.890	1	99.885	1	99.875
K24	RUSSELL COUNTY	KY	LPV	1	99.888	1	99.882	1	99.875
K62	GENE SNYDER	KY	LP	1	99.882	1	99.879	1	99.875
KY8	HANCOCK COUNTY/RON LEWIS FLD	KY	LPV	1	99.882	1	99.882	1	99.875
LEX	BLUE GRASS	KY	LPV	1	99.882	1	99.879	1	99.875
LOU	BOWMAN FLD	KY	LPV	1	99.882	1	99.879	1	99.876
LOZ	LONDON/CORBIN/MAGEE	KY	LPV	1	99.888	1	99.879	1	99.879
M20	LEITCHFIELD-GRAYSON COUNTY	KY	LPV	1	99.888	1	99.880	1	99.877
M21	MUHLENBERG COUNTY	KY	LP	1	99.891	1	99.890	1	99.875
M25	MAYFIELD GRAVES COUNTY	KY	LPV	1	99.896	1	99.896	1	99.879
OWB	OWENSBORO/DAVIESS COUNTY RGNL	KY	LPV200	1	99.888	1	99.883	1	99.875
PAH	BARKLEY RGNL	KY	LPV200	1	99.897	1	99.897	1	99.879
PBX	PIKE COUNTY/HATCHER FLD	KY	LPV200	1	99.882	1	99.879	1	99.874
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	1	99.884	1	99.879	1	99.875
SDF	LOUISVILLE MUHAMMAD ALI INTL	KY	LPV200	1	99.882	1	99.880	1	99.876
SJS	BIG SANDY RGNL	KY	LPV	1	99.882	1	99.879	1	99.878
SME	LAKE CUMBERLAND RGNL	KY	LPV	1	99.888	1	99.879	1	99.877
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	1	99.882	1	99.879	1	99.875
TWT	STURGIS MUNICIPAL	KY	LPV	1	99.894	1	99.887	1	99.879
TZV	TOMPKINSVILLE/MONROE COUNTY	KY	LPV	1	99.888	1	99.879	1	99.875
0R4	CONCORDIA PARISH	LA	LPV	1	99.974	2	99.948	1	99.913
0R7	THE RED RIVER	LA	LPV	1	99.974	1	99.960	1	99.919
3R4	HART	LA	LPV	1	99.979	1	99.967	1	99.916
3R7	JENNINGS	LA	LPV	1	99.971	1	99.941	1	99.909
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	1	99.974	1	99.948	1	99.912
ACP	ALLEN PARISH	LA	LPV	1	99.979	1	99.967	1	99.910
AEX	ALEXANDRIA INTL	LA	LPV200	1	99.979	1	99.967	1	99.912
APS	PORT OF SOUTH LOUISIANA EXEC R	LA	LPV	1	99.967	1	99.928	1	99.905
ARA	ACADIANA RGNL	LA	LPV200	1	99.971	1	99.928	1	99.905
BQP	MOREHOUSE MEML	LA	LPV	1	99.967	2	99.948	1	99.913
BTR	BATON ROUGE METRO` RYAN FLD	LA	LPV200	1	99.974	2	99.966	1	99.908
BXA	GEORGE R CARR MEML AIR FLD	LA	LPV	1	99.957	2	99.948	1	99.910

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CWF	CHENNAULT INTL	LA	LPV200	1	99.970	1	99.945	1	99.912
DTN	SHREVEPORT DOWNTOWN	LA	LPV	1	99.967	1	99.962	1	99.926
ESF	ESLER RGNL	LA	LPV200	1	99.977	1	99.966	1	99.912
F88	JONESBORO	LA	LP	1	99.973	1	99.960	1	99.917
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	1	99.938	1	99.919	1	99.897
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	1	99.974	2	99.963	1	99.908
HUM	HOUMA-TERREBONNE	LA	LPV200	1	99.949	1	99.919	1	99.905
HZR	FALSE RIVER RGNL	LA	LPV	1	99.974	2	99.966	1	99.908
IER	NATCHITOCHES RGNL	LA	LPV	1	99.977	1	99.963	1	99.915
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	1	99.971	1	99.927	1	99.908
L39	LEESVILLE	LA	LPV	1	99.982	1	99.969	1	99.916
LCH	LAKE CHARLES RGNL	LA	LPV200	1	99.969	1	99.945	1	99.911
LFT	LAFAYETTE RGNL/PAUL FOURNET FL	LA	LPV200	1	99.971	1	99.934	1	99.905
M79	JOHN H HOOKS JR MEML	LA	LPV	1	99.972	2	99.946	1	99.916
MLU	MONROE RGNL	LA	LPV200	1	99.969	2	99.955	1	99.916
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	1	99.967	1	99.927	1	99.894
NEW	LAKEFRONT	LA	LPV	1	99.956	1	99.917	1	99.894
OPL	ST LANDRY PARISH-AHART FLD	LA	LPV	1	99.974	1	99.967	1	99.907
PTN	HARRY P WILLIAMS MEML	LA	LPV200	1	99.964	1	99.920	1	99.906
REG	LOUISIANA RGNL	LA	LPV	1	99.967	3	99.959	1	99.906
RSN	RUSTON RGNL	LA	LPV	1	99.967	2	99.956	1	99.924
SHV	SHREVEPORT RGNL	LA	LPV200	1	99.967	1	99.961	1	99.926
SPH	SPRINGHILL	LA	LPV	1	99.967	1	99.963	1	99.926
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	1	99.973	2	99.942	1	99.916
UXL	SOUTHLAND FLD	LA	LPV	1	99.967	1	99.945	1	99.912
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	1	99.850	1	99.850	1	99.850
ACK	NANTUCKET MEML	MA	LPV200	1	99.850	1	99.850	1	99.847
BAF	WESTFIELD-BARNES RGNL	MA	LPV	1	99.850	1	99.850	1	99.850
BED	LAURENCE G HANSCOM FLD	MA	LPV200	1	99.850	1	99.850	1	99.848
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	1	99.850	1	99.850	1	99.847
BVY	BEVERLY RGNL	MA	LPV	1	99.850	1	99.850	1	99.847
EWB	NEW BEDFORD RGNL	MA	LPV200	1	99.850	1	99.850	1	99.847
GBR	WALTER J KOLADZA	MA	LP	1	99.850	1	99.850	2	99.850
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	1	99.850	1	99.850	1	99.847
HYA	CAPE COD GATEWAY	MA	LPV200	1	99.850	1	99.850	1	99.847
LWM	LAWRENCE MUNICIPAL	MA	LPV200	1	99.850	1	99.850	1	99.847
MVY	MARTHA'S VINEYARD	MA	LPV200	1	99.850	1	99.850	1	99.847

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ORE	ORANGE MUNICIPAL	MA	LPV	1	99.850	1	99.850	1	99.850
ORH	WORCESTER RGNL	MA	LPV200	1	99.850	1	99.850	1	99.849
OWD	NORWOOD MEML	MA	LPV	1	99.850	1	99.850	1	99.847
PSF	PITTSFIELD MUNICIPAL	MA	LPV	1	99.850	1	99.850	1	99.850
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	1	99.850	1	99.850	1	99.847
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	1	99.850	1	99.850	1	99.847
TAN	TAUNTON MUNICIPAL - KING FLD	MA	LPV	1	99.850	1	99.850	1	99.847
2G4	GARRETT COUNTY	MD	LPV	1	99.867	1	99.853	1	99.842
2W5	MARYLAND	MD	LP	1	99.861	1	99.857	1	99.831
2W6	ST MARY'S COUNTY RGNL	MD	LPV	1	99.864	1	99.857	1	99.831
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	1	99.857	1	99.857	1	99.831
CBE	GREATER CUMBERLAND RGNL	MD	LPV	1	99.867	1	99.853	1	99.842
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	1	99.857	1	99.857	1	99.831
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	1	99.857	1	99.857	1	99.833
ESN	EASTON/NEWNAM FLD	MD	LPV200	1	99.857	1	99.857	1	99.831
FDK	FREDERICK MUNICIPAL	MD	LPV	1	99.857	1	99.857	1	99.836
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	1	99.857	1	99.857	1	99.837
HGR	HAGERSTOWN RGNL/RICHARD A HENS	MD	LPV200	1	99.857	1	99.857	1	99.835
MTN	MARTIN STATE	MD	LPV	1	99.857	1	99.857	1	99.831
OXB	OCEAN CITY MUNICIPAL	MD	LPV	1	99.857	1	99.857	1	99.831
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	1	99.857	1	99.857	1	99.831
W29	BAY BRIDGE	MD	LPV	1	99.857	1	99.857	1	99.831
1B0	DEXTER RGNL	ME	LP	1	99.861	1	99.861	1	99.850
2B7	PITTSFIELD MUNICIPAL	ME	LPV	1	99.861	1	99.861	1	99.850
3B1	GREENVILLE MUNICIPAL	ME	LPV	1	99.864	1	99.864	1	99.850
59B	NEWTON FLD	ME	LP	1	99.864	1	99.864	1	99.850
81B	OXFORD COUNTY RGNL	ME	LP	1	99.861	1	99.861	1	99.850
AUG	AUGUSTA STATE	ME	LPV200	1	99.857	1	99.857	1	99.850
BGR	BANGOR INTL	ME	LPV200	1	99.861	1	99.861	1	99.850
BHB	HANCOCK COUNTY/BAR HARBOR	ME	LPV200	1	99.861	1	99.861	1	99.850
BST	BELFAST MUNICIPAL	ME	LPV	1	99.857	1	99.857	1	99.850
BXM	BRUNSWICK EXEC	ME	LPV200	1	99.853	1	99.853	1	99.850
CAR	CARIBOU MUNICIPAL	ME	LPV	1	99.871	1	99.871	1	99.861
EPM	EASTPORT MUNICIPAL	ME	LPV	1	99.857	1	99.857	1	99.850
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV200	1	99.871	1	99.871	1	99.861
HUL	HOULTON INTL	ME	LP	1	99.872	1	99.872	1	99.850
IZG	EASTERN SLOPES RGNL	ME	LPV	1	99.861	1	99.861	1	99.850

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	1	99.861	1	99.861	1	99.850
LRG	LINCOLN RGNL	ME	LP	1	99.857	1	99.857	1	99.850
MLT	MILLINOCKET MUNICIPAL	ME	LPV	1	99.861	1	99.861	1	99.850
OWK	CENTRAL MAINE /NORRIDGEWOCK	ME	LPV	1	99.861	1	99.861	1	99.850
PQI	PRESQUE ISLE INTL	ME	LPV200	1	99.871	1	99.871	1	99.861
PWM	PORTLAND INTL JETPORT	ME	LPV200	1	99.853	1	99.853	1	99.850
RKD	KNOX COUNTY RGNL	ME	LPV200	1	99.857	1	99.857	1	99.850
SFM	SANFORD SEACOAST RGNL	ME	LPV200	1	99.850	1	99.850	1	99.847
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	1	99.861	1	99.861	1	99.850
48D	CLARE MUNICIPAL	MI	LP	1	99.872	3	99.865	4	99.834
4D0	ABRAMS MUNICIPAL	MI	LP	1	99.872	1	99.868	3	99.842
6Y1	BOIS BLANC ISLAND	MI	LP	2	99.857	2	99.850	4	99.761
77G	MARLETTE TOWNSHIP	MI	LPV	1	99.868	1	99.864	3	99.831
9D9	HASTINGS	MI	LPV	1	99.872	2	99.867	2	99.842
ACB	ANTRIM COUNTY	MI	LPV	2	99.868	2	99.844	4	99.802
ADG	LENAWEE COUNTY	MI	LPV	1	99.875	1	99.872	2	99.856
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	1	99.872	1	99.868	4	99.837
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	2	99.815	3	99.806	2	99.708
APN	ALPENA COUNTY RGNL	MI	LPV	2	99.876	2	99.857	2	99.781
ARB	ANN ARBOR MUNICIPAL	MI	LPV	1	99.874	1	99.868	3	99.853
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV200	1	99.873	2	99.867	2	99.857
BAX	HURON COUNTY MEML	MI	LPV	1	99.866	1	99.863	3	99.833
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	1	99.875	2	99.868	2	99.846
BIV	WEST MICHIGAN RGNL	MI	LPV200	1	99.875	3	99.865	2	99.837
BTL	BATTLE CREEK EXEC AT KELLOGG F	MI	LPV200	1	99.872	2	99.868	2	99.853
C04	OCEANA COUNTY	MI	LPV	2	99.864	2	99.850	4	99.823
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	1	99.875	2	99.868	2	99.846
CAD	WEXFORD COUNTY	MI	LPV200	1	99.882	2	99.843	4	99.821
CFS	TUSCOLA AREA	MI	LP	1	99.872	1	99.868	3	99.836
CIU	CHIPPEWA COUNTY INTL	MI	LPV	2	99.814	3	99.807	2	99.708
CMX	HOUGHTON COUNTY MEML	MI	LPV	2	99.759	2	99.715	3	99.689
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	2	99.868	2	99.848	4	99.760
D95	DUPONT-LAPEER	MI	LP	1	99.870	1	99.866	3	99.830
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	1	99.869	1	99.868	3	99.843
DTW	DETROIT METRO WAYNE COUNTY	MI	LPV200	1	99.874	1	99.872	3	99.852
ERY	LUCE COUNTY	MI	LPV	2	99.816	3	99.797	2	99.703
ESC	DELTA COUNTY	MI	LPV200	3	99.799	3	99.774	2	99.696

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FFX	FREMONT MUNICIPAL	MI	LPV	1	99.876	2	99.851	3	99.836
FNT	BISHOP INTL	MI	LPV200	1	99.872	1	99.868	3	99.832
GDW	GLADWIN ZETTEL MEML	MI	LP	1	99.872	3	99.864	4	99.835
GLR	GAYLORD RGNL	MI	LPV	2	99.868	2	99.845	3	99.783
GRR	GERALD R FORD INTL	MI	LPV200	1	99.875	2	99.866	3	99.837
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	1	99.873	2	99.844	4	99.819
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	1	99.872	1	99.868	4	99.836
IKW	JACK BARSTOW	MI	LPV	1	99.872	1	99.870	4	99.835
IMT	FORD	MI	LPV	3	99.785	3	99.745	2	99.711
IRS	KIRSCH MUNICIPAL	MI	LPV	1	99.874	1	99.868	2	99.857
ISQ	SCHOOLCRAFT COUNTY	MI	LP	3	99.813	3	99.790	2	99.711
IWD	GOGEBIC/IRON COUNTY	MI	LPV200	3	99.747	2	99.718	2	99.692
JXN	JACKSON COUNTY-REYNOLDS FLD	MI	LPV200	1	99.872	1	99.868	2	99.853
JYM	HILLSDALE MUNICIPAL	MI	LPV	1	99.872	1	99.868	2	99.857
LAN	CAPITAL REGION INTL	MI	LPV200	1	99.872	1	99.868	3	99.842
LDM	MASON COUNTY	MI	LPV	2	99.860	2	99.846	4	99.806
MBL	MANISTEE COUNTY/BLACKER	MI	LPV200	2	99.862	2	99.846	4	99.806
MBS	MBS INTL	MI	LPV200	1	99.872	1	99.869	4	99.835
MCD	MACKINAC ISLAND	MI	LPV	2	99.833	2	99.830	4	99.754
MKG	MUSKEGON COUNTY	MI	LPV200	1	99.875	2	99.852	3	99.823
MNM	MENOMINEE RGNL	MI	LPV200	4	99.824	5	99.789	2	99.718
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	1	99.872	1	99.868	4	99.834
N98	BOYNE CITY MUNICIPAL	MI	LP	2	99.868	2	99.848	4	99.765
OEB	BRANCH COUNTY MEML	MI	LPV	1	99.872	1	99.868	2	99.857
OGM	ONTONAGON COUNTY - SCHUSTER FL	MI	LPV	3	99.760	2	99.717	2	99.691
OSC	OSCODA-WURTSMITH	MI	LPV200	1	99.872	2	99.867	3	99.819
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	1	99.872	1	99.868	3	99.853
PHN	ST CLAIR COUNTY INTL	MI	LPV200	1	99.869	1	99.858	3	99.828
PLN	PELLSTON RGNL/EMMET COUNTY	MI	LPV200	2	99.857	2	99.855	4	99.762
PTK	OAKLAND COUNTY INTL	MI	LPV200	1	99.874	1	99.868	3	99.843
RMY	BROOKS FLD	MI	LP	1	99.872	1	99.868	2	99.853
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	1	99.872	1	99.868	4	99.837
RQB	ROBEN-HOOD	MI	LPV200	1	99.876	3	99.861	3	99.837
SAW	SAWYER INTL	MI	LPV200	3	99.784	3	99.755	2	99.679
SLH	CHEBOYGAN COUNTY	MI	LPV	2	99.857	2	99.856	4	99.761
TEW	MASON JEWETT FLD	MI	LP	1	99.872	1	99.868	3	99.853
TTF	CUSTER	MI	LPV	1	99.874	1	99.872	2	99.853

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TVC	CHERRY CAPITAL	MI	LPV200	2	99.868	2	99.843	5	99.805
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	1	99.872	3	99.868	4	99.824
Y70	IONIA COUNTY	MI	LPV	1	99.872	2	99.868	3	99.838
YIP	WILLOW RUN	MI	LPV200	1	99.874	1	99.872	3	99.852
16D	PERHAM MUNICIPAL	MN	LPV	2	99.709	2	99.689	2	99.673
3N8	MAHNOMEN COUNTY	MN	LPV	2	99.705	2	99.684	2	99.648
ACQ	WASECA MUNICIPAL	MN	LPV	4	99.752	2	99.707	2	99.707
ADC	WADENA MUNICIPAL	MN	LPV	2	99.708	2	99.696	2	99.674
AEL	ALBERT LEA MUNICIPAL	MN	LPV	5	99.786	2	99.710	2	99.707
AIT	AITKIN MUNICIPAL/STEVE KURTZ FLD	MN	LPV	2	99.707	2	99.707	2	99.674
ANE	ANOKA COUNTY-BLAINE (JANES FLD	MN	LPV	2	99.707	2	99.707	2	99.707
AUM	AUSTIN MUNICIPAL	MN	LPV200	5	99.789	2	99.718	2	99.707
AXN	CHANDLER FLD	MN	LPV	2	99.711	2	99.707	2	99.693
BBB	BENSON MUNICIPAL	MN	LPV	2	99.715	2	99.707	2	99.697
BDE	BAUDETTE INTL	MN	LPV	2	99.691	2	99.673	2	99.646
BDH	WILLMAR MUNICIPAL/JOHN L RICE FLD	MN	LPV200	2	99.715	2	99.707	2	99.707
BJI	BEMIDJI RGNL	MN	LPV200	2	99.698	2	99.684	2	99.648
BRD	BRAINERD LAKES RGNL	MN	LPV200	2	99.707	2	99.707	2	99.674
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	2	99.707	2	99.707	2	99.707
CFE	BUFFALO MUNICIPAL	MN	LPV	2	99.710	2	99.707	2	99.707
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	2	99.749	2	99.717	3	99.672
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	2	99.696	2	99.682	2	99.648
CNB	MYERS FLD	MN	LPV	2	99.715	2	99.707	2	99.696
COQ	CLOQUET/CARLTON COUNTY	MN	LPV	3	99.722	2	99.708	2	99.670
CQM	COOK MUNICIPAL	MN	LP	2	99.707	2	99.689	2	99.665
D39	SAUK CENTRE MUNICIPAL	MN	LPV	2	99.710	2	99.707	2	99.700
D42	SPRINGFIELD MUNICIPAL	MN	LP	2	99.715	2	99.707	2	99.707
DLH	DULUTH INTL	MN	LPV200	4	99.740	2	99.713	2	99.670
DTL	DETROIT LAKES/WETHING FLD	MN	LPV	2	99.709	2	99.689	2	99.669
DVP	SLAYTON MUNICIPAL	MN	LP	2	99.715	2	99.707	2	99.707
DXX	LAC QUI PARLE COUNTY	MN	LPV200	2	99.715	2	99.707	2	99.696
ELO	ELY MUNICIPAL	MN	LPV200	4	99.739	2	99.697	2	99.665
ETH	WHEATON MUNICIPAL	MN	LP	2	99.712	2	99.707	2	99.689
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	3	99.721	2	99.696	2	99.667
FBL	FARIBAULT MUNICIPAL-LIZ WALL STROHF	MN	LPV	4	99.745	2	99.707	2	99.707
FCM	FLYING CLOUD	MN	LPV200	2	99.712	2	99.707	2	99.707
FFM	FERGUS FALLS MUNICIPAL/EINAR MICKEL	MN	LPV200	2	99.709	2	99.703	2	99.678

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FKA	FILLMORE COUNTY	MN	LPV	3	99.799	3	99.733	2	99.715
FOZ	BIGFORK MUNICIPAL	MN	LP	2	99.697	2	99.688	2	99.651
FRM	FAIRMONT MUNICIPAL	MN	LPV	4	99.764	2	99.707	2	99.707
FSE	FOSSTON MUNICIPAL-ANDERSON FLD	MN	LP	2	99.698	2	99.683	2	99.648
GHW	GLENWOOD MUNICIPAL	MN	LPV	2	99.710	2	99.707	2	99.697
GPZ	GRAND RAPIDS/ITASCA COUNTY-GOR	MN	LPV200	3	99.719	2	99.689	2	99.668
GYL	GLENCOE MUNICIPAL	MN	LPV	2	99.711	2	99.707	2	99.707
HCD	HUTCHINSON MUNICIPAL/BUTLER FLD	MN	LPV	2	99.711	2	99.707	2	99.707
HCO	HALLOCK MUNICIPAL	MN	LPV	2	99.687	2	99.676	2	99.638
HIB	RANGE RGNL	MN	LPV200	3	99.720	2	99.691	2	99.665
INL	FALLS INTL/EINARSON FLD	MN	LPV	2	99.700	2	99.681	2	99.648
JKJ	MOORHEAD MUNICIPAL	MN	LPV	2	99.710	2	99.687	2	99.669
JMR	MORA MUNICIPAL	MN	LPV	3	99.719	2	99.707	2	99.696
JYG	ST JAMES MUNICIPAL	MN	LPV	4	99.750	2	99.707	2	99.707
LJF	LITCHFIELD MUNICIPAL	MN	LPV	2	99.710	2	99.707	2	99.707
LVN	AIRLAKE	MN	LPV200	3	99.723	2	99.707	2	99.707
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	2	99.710	2	99.707	2	99.700
LYV	QUENTIN AANENSON FLD	MN	LPV200	4	99.744	2	99.707	2	99.707
MJQ	JACKSON MUNICIPAL	MN	LPV	4	99.757	2	99.707	2	99.707
MKT	MANKATO RGNL	MN	LPV200	4	99.739	2	99.707	2	99.707
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	2	99.715	2	99.707	2	99.707
MOX	MORRIS MUNICIPAL/CHARLIE SCHMIDT FL	MN	LPV	2	99.715	2	99.707	2	99.694
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	2	99.708	2	99.707	2	99.707
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	2	99.715	2	99.707	2	99.700
MWM	WINDOM MUNICIPAL	MN	LPV	4	99.742	2	99.707	2	99.707
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	3	99.721	2	99.708	2	99.674
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	3	99.780	2	99.719	2	99.703
ORB	ORR RGNL	MN	LP	2	99.704	2	99.689	2	99.665
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	4	99.755	2	99.707	2	99.707
OWA	OWATONNA DEGNER RGNL	MN	LPV200	4	99.759	2	99.707	2	99.707
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	2	99.710	2	99.707	2	99.707
PKD	PARK RAPIDS MUNICIPAL/KONSHOK FLD	MN	LPV200	2	99.705	2	99.689	2	99.669
PQN	PIPESTONE MUNICIPAL	MN	LPV200	2	99.715	2	99.707	2	99.707
RGK	RED WING RGNL	MN	LPV200	3	99.734	2	99.718	2	99.703
ROS	RUSH CITY RGNL	MN	LPV	3	99.719	2	99.707	2	99.703
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FLD	MN	LPV	2	99.687	2	99.676	2	99.645
RRT	WARROAD INTL MEML	MN	LPV200	2	99.687	3	99.672	2	99.645

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RST	ROCHESTER INTL	MN	LPV200	4	99.779	2	99.718	2	99.707
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	2	99.715	2	99.707	2	99.707
SAZ	STAPLES MUNICIPAL	MN	LPV	2	99.711	2	99.707	2	99.674
SBU	BLUE EARTH MUNICIPAL	MN	LPV	4	99.776	2	99.707	2	99.707
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	2	99.711	2	99.708	2	99.707
STC	ST CLOUD RGNL	MN	LPV200	2	99.710	2	99.707	2	99.707
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	2	99.709	2	99.707	2	99.707
TOB	DODGE CENTER	MN	LPV	5	99.772	2	99.718	2	99.707
TVF	THIEF RIVER FALLS RGNL	MN	LPV	2	99.695	2	99.678	2	99.645
TWM	RICHARD B HELGESON	MN	LPV	3	99.731	2	99.716	2	99.669
ULM	NEW ULM MUNICIPAL	MN	LPV200	2	99.715	2	99.707	2	99.707
VVV	ORTONVILLE MUNICIPAL-MARTINSON FLD	MN	LP	2	99.715	2	99.707	2	99.692
Y49	WALKER MUNICIPAL	MN	LP	2	99.705	2	99.689	2	99.666
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	2	99.711	2	99.707	2	99.682
03D	MEMPHIS MEML	MO	LPV	1	99.886	2	99.858	4	99.809
1H0	CREVE COEUR	MO	LPV	1	99.890	1	99.879	1	99.879
1MO	MOUNTAIN GROVE MEML	MO	LP	1	99.908	1	99.905	1	99.876
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	1	99.926	1	99.910	1	99.879
6M6	LEWIS COUNTY RGNL	MO	LPV	1	99.893	2	99.861	2	99.846
8WC	WASHINGTON COUNTY	MO	LPV	1	99.893	1	99.893	1	99.879
94K	CASSVILLE MUNICIPAL	MO	LPV	1	99.930	1	99.911	1	99.879
AIZ	LEE C FINE MEML	MO	LPV	1	99.898	2	99.897	2	99.868
BBG	BRANSON	MO	LPV200	1	99.928	1	99.907	1	99.877
BUM	BUTLER MEML	MO	LPV	1	99.895	2	99.894	2	99.857
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	1	99.898	1	99.898	1	99.879
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	1	99.886	3	99.857	3	99.825
COU	COLUMBIA RGNL	MO	LPV200	1	99.889	1	99.879	2	99.871
DMO	SEDALIA RGNL	MO	LPV	1	99.889	1	99.882	2	99.860
DXE	DEXTER MUNICIPAL	MO	LPV	1	99.899	1	99.899	1	99.879
EIW	COUNTY MEML	MO	LPV	1	99.898	1	99.898	1	99.879
EOS	NEOSHO HUGH ROBINSON	MO	LPV	1	99.931	1	99.924	1	99.880
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	2	99.885	3	99.834	3	99.803
EZZ	CAMERON MEML	MO	LPV	1	99.886	3	99.857	3	99.810
FAM	FARMINGTON RGNL	MO	LPV	1	99.897	1	99.893	1	99.879
FTT	ELTON HENSLEY MEML	MO	LPV	1	99.889	1	99.879	1	99.875
FWB	BRANSON WEST MUNICIPAL - EMERSON FL	MO	LPV200	1	99.929	1	99.908	1	99.878
FYG	WASHINGTON RGNL	MO	LPV	1	99.891	1	99.879	1	99.879

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GLY	CLINTON RGNL	MO	LPV	1	99.892	1	99.882	2	99.860
GPH	MIDWEST NTL AIR CENTER	MO	LPV	1	99.889	3	99.874	3	99.826
H19	BOWLING GREEN MUNICIPAL	MO	LPV	1	99.892	1	99.875	2	99.853
H79	ELDON MODEL AIRPARK	MO	LP	1	99.889	1	99.882	2	99.865
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	1	99.900	1	99.900	1	99.879
HAE	HANNIBAL RGNL	MO	LPV	1	99.892	2	99.874	2	99.853
HFJ	MONETT RGNL	MO	LPV	1	99.930	1	99.912	1	99.879
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	1	99.889	1	99.882	3	99.834
IRK	KIRKSVILLE RGNL	MO	LPV200	1	99.886	2	99.860	3	99.826
JEF	JEFFERSON CITY MEML	MO	LPV	1	99.889	1	99.879	1	99.875
JLN	JOPLIN RGNL	MO	LPV	1	99.928	1	99.919	2	99.878
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	1	99.898	2	99.897	2	99.867
K57	GOULD PETERSON MUNICIPAL	MO	LPV	2	99.883	3	99.844	4	99.797
K89	MACON-FOWER MEML	MO	LPV	1	99.886	2	99.861	3	99.830
LLU	LAMAR MUNICIPAL	MO	LPV	1	99.924	1	99.905	2	99.871
LRY	LAWRENCE SMITH MEML	MO	LPV	1	99.892	2	99.892	2	99.856
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	1	99.889	2	99.881	3	99.847
M05	CARUTHERSVILLE MEML	MO	LPV	1	99.898	1	99.898	1	99.879
M12	STEELE MUNICIPAL	MO	LPV	1	99.900	1	99.899	1	99.879
M17	BOLIVAR MUNICIPAL	MO	LPV	1	99.908	1	99.899	2	99.869
M48	HOUSTON MEML	MO	LPV	1	99.904	1	99.904	1	99.879
MAW	MALDEN RGNL	MO	LPV	1	99.899	1	99.899	1	99.879
MBY	OMAR N BRADLEY	MO	LPV	1	99.886	1	99.877	3	99.835
MCI	KANSAS CITY INTL	MO	LPV200	1	99.889	3	99.878	3	99.815
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	1	99.889	1	99.879	3	99.835
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	1	99.889	2	99.879	3	99.829
MNF	MOUNTAIN VIEW	MO	LP	1	99.906	1	99.904	1	99.879
MO3	STOCKTON MUNICIPAL	MO	LP	1	99.922	1	99.900	2	99.866
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	1	99.886	2	99.861	3	99.827
MYJ	MEXICO MEML	MO	LPV	1	99.886	1	99.879	2	99.855
NVD	NEVADA MUNICIPAL	MO	LPV200	1	99.921	1	99.901	2	99.863
OZS	CAMDENTON MEML-LAKE RGNL	MO	LPV	1	99.898	1	99.898	2	99.868
PCD	PERRYVILLE RGNL	MO	LPV	1	99.892	1	99.892	1	99.879
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	1	99.929	1	99.907	1	99.877
POF	POPLAR BLUFF RGNL BUSINESS	MO	LPV	1	99.900	1	99.900	1	99.879
RAW	WARSAW MUNICIPAL	MO	LPV200	1	99.890	1	99.882	2	99.861
RCM	SKYHAVEN	MO	LPV	1	99.889	1	99.883	2	99.857

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SGF	SPRINGFIELD-BRANSON NTL	MO	LPV	1	99.922	1	99.908	2	99.876
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	1	99.898	1	99.898	1	99.879
STJ	ROSECRANS MEML	MO	LPV200	1	99.889	3	99.861	3	99.808
STL	ST LOUIS LAMBERT INTL	MO	LPV200	1	99.890	1	99.879	1	99.879
SUS	SPIRIT OF ST LOUIS	MO	LPV200	1	99.890	1	99.879	1	99.879
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	1	99.904	1	99.901	1	99.876
TKX	KENNETT MEML	MO	LPV	1	99.901	1	99.900	1	99.879
TRX	TRENTON MUNICIPAL	MO	LPV	1	99.886	3	99.854	3	99.821
UBX	CUBA MUNICIPAL	MO	LPV	1	99.895	2	99.894	1	99.879
UNO	WEST PLAINS RGNL	MO	LPV	1	99.909	1	99.904	1	99.879
UUV	SULLIVAN RGNL	MO	LPV	1	99.895	1	99.882	1	99.879
VER	JESSE VIERTEL MEML	MO	LPV	1	99.889	1	99.879	2	99.861
VIH	ROLLA NTL	MO	LPV	1	99.890	1	99.882	1	99.877
0R0	COLUMBIA/MARION COUNTY	MS	LPV	1	99.963	2	99.944	1	99.912
17M	MAGEE MUNICIPAL	MS	LP	1	99.963	2	99.941	1	99.916
5A4	OKOLONA MUNICIPAL/RICHARD STOVALL F	MS	LPV	2	99.955	1	99.897	1	99.892
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	1	99.963	1	99.927	1	99.895
87I	YAZOO COUNTY	MS	LPV	1	99.963	1	99.927	1	99.898
8M1	BOONEVILLE/BALDWYN	MS	LPV	2	99.933	1	99.897	1	99.892
CKM	FLETCHER FLD	MS	LPV	1	99.963	1	99.930	1	99.897
CRX	ROSCOE TURNER	MS	LPV200	2	99.932	1	99.895	1	99.888
GLH	GREENVILLE MID-DELTA	MS	LPV200	1	99.963	2	99.943	1	99.898
GNF	GRENADA MUNICIPAL	MS	LPV	1	99.963	1	99.927	1	99.898
GPT	GULFPORT-BILOXI INTL	MS	LPV200	1	99.956	1	99.919	1	99.893
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	1	99.956	1	99.897	1	99.897
GWO	GREENWOOD-LEFLORE	MS	LPV	1	99.963	1	99.927	1	99.896
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	1	99.956	1	99.926	1	99.894
HEZ	HARDY-ANDERS FLD/NATCHEZ-ADAMS	MS	LPV200	1	99.974	2	99.943	1	99.913
HKS	HAWKINS FLD	MS	LPV	1	99.963	2	99.940	1	99.916
HSA	STENNIS INTL	MS	LPV200	1	99.956	1	99.919	1	99.893
IDL	INDIANOLA MUNICIPAL	MS	LPV	1	99.963	1	99.927	1	99.897
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	1	99.963	2	99.939	1	99.916
JVW	JOHN BELL WILLIAMS	MS	LPV200	1	99.963	2	99.940	1	99.916
LMS	LOUISVILLE/WINSTON COUNTY	MS	LPV	1	99.956	2	99.910	1	99.895
LUL	HESLER-NOBLE FLD	MS	LPV	1	99.956	3	99.939	1	99.894
M11	COPIAH COUNTY	MS	LPV	1	99.967	2	99.941	1	99.915
M40	MONROE COUNTY	MS	LPV	3	99.949	1	99.897	1	99.895

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	3	99.954	2	99.920	1	99.893
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	1	99.963	2	99.942	1	99.914
MBO	BRUCE CAMPBELL FLD	MS	LPV	1	99.963	2	99.940	1	99.913
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	1	99.974	2	99.950	1	99.912
MEI	KEY FLD	MS	LPV200	1	99.956	2	99.912	1	99.897
MJD	PICAYUNE MUNICIPAL	MS	LPV	1	99.956	1	99.920	2	99.906
MMS	SELFS	MS	LPV	1	99.963	1	99.927	1	99.897
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	1	99.963	2	99.915	1	99.897
OLV	OLIVE BRANCH/TAYLOR FLD	MS	LPV200	3	99.953	2	99.925	1	99.890
PIB	HATTIESBURG/LAUREL RGNL	MS	LPV200	1	99.956	2	99.941	1	99.894
PMU	PANOLA COUNTY	MS	LPV	1	99.963	1	99.927	1	99.895
PQL	TRENT LOTT INTL	MS	LPV200	1	99.938	2	99.918	1	99.893
RNV	CLEVELAND MUNICIPAL	MS	LPV	1	99.963	1	99.929	1	99.897
STF	GEORGE M BRYAN	MS	LPV200	1	99.956	1	99.897	1	99.897
TUP	TUPELO RGNL	MS	LPV200	2	99.954	1	99.897	1	99.893
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	1	99.938	1	99.897	1	99.894
UOX	UNIVERSITY-OXFORD	MS	LPV	1	99.956	2	99.921	1	99.895
UTA	TUNICA MUNICIPAL	MS	LPV200	1	99.956	1	99.927	1	99.896
VKS	VICKSBURG MUNICIPAL	MS	LP	1	99.971	2	99.942	1	99.916
00U	BIG HORN COUNTY	MT	LPV200	2	99.774	2	99.743	2	99.696
1S3	TILLITT FLD	MT	LPV	2	99.748	2	99.717	2	99.690
4U6	CIRCLE TOWN COUNTY	MT	LPV	3	99.716	2	99.698	3	99.652
6S0	BIG TIMBER	MT	LPV	2	99.797	2	99.756	3	99.703
6S8	LAUREL MUNICIPAL	MT	LPV	2	99.792	2	99.751	3	99.701
7S0	RONAN	MT	LPV	3	99.812	2	99.751	4	99.661
7S1	TWIN BRIDGES	MT	LPV	2	99.846	2	99.766	3	99.734
BHK	BAKER MUNICIPAL	MT	LPV	3	99.723	2	99.709	2	99.681
BIL	BILLINGS LOGAN INTL	MT	LPV200	2	99.792	2	99.751	3	99.695
BTM	BERT MOONEY	MT	LPV	3	99.840	2	99.763	3	99.729
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	3	99.830	2	99.759	3	99.713
CII	CHOTEAU	MT	LPV200	2	99.785	2	99.744	4	99.647
CTB	CUT BANK INTL	MT	LPV200	3	99.779	2	99.736	5	99.656
DLN	DILLON	MT	LPV	2	99.853	2	99.768	3	99.737
EKS	ENNIS BIG SKY	MT	LPV	3	99.845	2	99.767	3	99.737
GDV	DAWSON COMMUNICIPALTY	MT	LPV	3	99.709	2	99.695	3	99.650
GGW	WOKAL FLD/GLASGOW-VALLEY COUNT	MT	LPV200	3	99.707	2	99.688	3	99.647
GPI	GLACIER PARK INTL	MT	LPV	2	99.781	2	99.744	5	99.668

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GTF	GREAT FALLS INTL	MT	LPV200	2	99.784	2	99.745	5	99.665
HLN	HELENA RGNL	MT	LPV	2	99.802	2	99.755	5	99.705
HRF	RAVALLI COUNTY	MT	LPV	2	99.839	2	99.763	3	99.727
HVR	HAVRE CITY-COUNTY	MT	LPV	2	99.728	2	99.714	5	99.653
HWQ	WHEATLAND COUNTY AT HARLOWTON	MT	LPV	2	99.787	2	99.747	4	99.699
LVM	MISSION FLD	MT	LP	3	99.824	2	99.759	3	99.707
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	2	99.782	2	99.738	5	99.681
M75	MALTA	MT	LP	3	99.714	2	99.695	3	99.647
MLS	FRANK WILEY FLD	MT	LPV	2	99.730	2	99.711	2	99.684
MSO	MISSOULA MONTANA	MT	LPV200	2	99.836	2	99.762	5	99.700
OLF	L M CLAYTON	MT	LPV200	2	99.692	2	99.689	3	99.648
PO1	POPLAR MUNICIPAL	MT	LPV200	2	99.698	2	99.693	3	99.649
PWD	SHER-WOOD	MT	LPV200	2	99.697	2	99.684	3	99.642
RPX	ROUNDUP	MT	LPV	2	99.769	2	99.734	4	99.693
RVF	RUBY VALLEY FLD	MT	LPV	2	99.846	2	99.766	3	99.734
S01	CONRAD	MT	LPV	3	99.784	2	99.742	4	99.644
SBX	SHELBY	MT	LPV	3	99.779	2	99.727	5	99.658
SDY	SIDNEY-RICHLAND RGNL	MT	LPV	2	99.692	2	99.689	3	99.649
WYS	YELLOWSTONE	MT	LPV200	2	99.850	2	99.777	3	99.737
43A	MONTGOMERY COUNTY	NC	LP	1	99.882	1	99.879	1	99.836
7W6	HYDE COUNTY	NC	LP	1	99.863	1	99.861	1	99.831
ACZ	HENDERSON FLD	NC	LPV	1	99.879	1	99.879	1	99.832
AFP	ANSON COUNTY/JEFF CLOUD FLD	NC	LPV	1	99.894	1	99.879	1	99.837
AKH	GASTONIA MUNICIPAL	NC	LPV	1	99.894	1	99.879	1	99.852
ASJ	TRI-COUNTY AT HENRY JOYNER FIE	NC	LPV	1	99.866	1	99.854	1	99.832
AVL	ASHEVILLE RGNL	NC	LPV200	1	99.894	1	99.879	1	99.868
BUY	BURLINGTON/ALAMANCE RGNL	NC	LPV	1	99.879	1	99.873	1	99.842
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	1	99.894	1	99.879	1	99.845
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	1	99.894	1	99.879	1	99.833
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	1	99.879	1	99.879	1	99.833
DPL	DUPLIN COUNTY	NC	LPV200	1	99.879	1	99.879	1	99.832
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	1	99.863	1	99.853	1	99.830
EDE	NORTHEASTERN RGNL	NC	LPV200	1	99.864	1	99.856	1	99.830
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	1	99.894	1	99.879	2	99.866
EQY	CHARLOTTE/MONROE EXEC	NC	LPV200	1	99.894	1	99.879	1	99.845
EWN	COASTAL CAROLINA RGNL	NC	LPV	1	99.869	1	99.866	1	99.830
EXX	DAVIDSON COUNTY	NC	LPV	1	99.881	1	99.876	1	99.842

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EYF	CURTIS L BROWN JR FLD	NC	LPV	1	99.883	1	99.879	1	99.833
FAY	FAYETTEVILLE RGNL/GRANNIS FLD	NC	LPV200	1	99.882	1	99.879	1	99.834
FFA	FIRST FLIGHT	NC	LP	1	99.861	1	99.853	1	99.829
FQD	RUTHERFORD COUNTY/MARCHMAN FLD	NC	LPV	1	99.894	1	99.879	2	99.865
GEV	ASHE COUNTY	NC	LP	1	99.888	1	99.879	1	99.842
GSO	PIEDMONT TRIAD INTL	NC	LPV200	1	99.879	1	99.874	1	99.842
GWW	WAYNE EXEC JETPORT	NC	LPV200	1	99.879	1	99.866	1	99.833
HBI	ASHEBORO RGNL	NC	LPV	1	99.879	1	99.874	1	99.838
HKY	HICKORY RGNL	NC	LPV200	1	99.888	1	99.879	1	99.849
HNZ	HENDERSON/OXFORD	NC	LPV	1	99.879	1	99.862	1	99.834
HRJ	HARNETT RGNL JETPORT	NC	LPV	1	99.879	1	99.867	1	99.834
ILM	WILMINGTON INTL	NC	LPV200	1	99.882	1	99.869	1	99.831
INT	SMITH REYNOLDS	NC	LPV200	1	99.879	1	99.875	1	99.842
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	1	99.894	1	99.879	1	99.849
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	1	99.869	1	99.866	1	99.832
IXA	HALIFAX/NORTHAMPTON RGNL	NC	LPV200	1	99.879	1	99.860	1	99.833
JNX	JOHNSTON RGNL	NC	LPV	1	99.879	1	99.866	1	99.834
JQF	CONCORD-PADGETT RGNL	NC	LPV	1	99.888	1	99.879	1	99.849
LBT	LUMBERTON RGNL	NC	LPV	1	99.888	1	99.879	1	99.834
LHZ	TRIANGLE NORTH EXEC	NC	LPV200	1	99.879	1	99.864	1	99.834
MCZ	MARTIN COUNTY	NC	LPV	1	99.866	1	99.860	1	99.831
MEB	LAURINBURG/MAXTON	NC	LPV200	1	99.888	1	99.879	1	99.835
MQI	DARE COUNTY RGNL	NC	LPV	1	99.861	1	99.855	1	99.831
MRH	MICHAEL J SMITH FLD	NC	LPV	1	99.879	1	99.865	1	99.829
MRN	FOOTHILLS RGNL	NC	LPV	1	99.888	1	99.879	1	99.849
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	1	99.879	1	99.876	1	99.842
OAJ	ALBERT J ELLIS	NC	LPV200	1	99.879	1	99.868	1	99.831
OCW	WASHINGTON-WARREN	NC	LPV	1	99.868	1	99.863	1	99.831
ONX	CURRITUCK COUNTY RGNL	NC	LPV	1	99.862	1	99.853	1	99.827
PGV	PITT-GREENVILLE	NC	LPV	1	99.868	1	99.863	1	99.831
PMZ	PLYMOUTH MUNICIPAL	NC	LP	1	99.865	1	99.860	1	99.831
RCZ	RICHMOND COUNTY	NC	LPV	1	99.888	1	99.879	1	99.836
RDU	RALEIGH-DURHAM INTL	NC	LPV200	1	99.879	1	99.866	1	99.834
RHP	WESTERN CAROLINA RGNL	NC	LP	1	99.894	1	99.885	1	99.879
RUQ	MID-CAROLINA RGNL	NC	LPV200	1	99.888	1	99.879	1	99.845
RWI	ROCKY MOUNT/WILSON RGNL	NC	LPV	1	99.879	1	99.863	1	99.833
SCR	SILER CITY MUNICIPAL	NC	LPV	1	99.879	1	99.873	1	99.836

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SOP	MOORE COUNTY	NC	LPV200	1	99.882	1	99.879	1	99.835
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	1	99.893	1	99.870	1	99.831
SVH	STATESVILLE RGNL	NC	LPV200	1	99.888	1	99.879	1	99.845
TDF	RALEIGH RGNL AT PERSON COUNTY	NC	LPV200	1	99.879	1	99.866	1	99.838
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	1	99.879	1	99.872	1	99.835
UKF	WILKES COUNTY	NC	LPV200	1	99.888	1	99.879	1	99.842
VUJ	STANLY COUNTY	NC	LPV200	1	99.888	1	99.879	1	99.839
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	1	99.879	1	99.864	1	99.833
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	1	99.879	1	99.868	1	99.833
ZEF	ELKIN MUNICIPAL	NC	LP	1	99.882	1	99.876	1	99.842
06D	ROLLA MUNICIPAL	ND	LPV	2	99.685	3	99.674	3	99.631
20U	BEACH	ND	LPV	2	99.700	2	99.700	3	99.667
2C8	CAVALIER MUNICIPAL	ND	LPV	2	99.686	2	99.676	3	99.637
3H4	HILLSBORO MUNICIPAL	ND	LPV	2	99.704	2	99.684	2	99.652
46D	CARRINGTON MUNICIPAL	ND	LPV	2	99.706	2	99.684	2	99.649
4E7	ELLENDALE MUNICIPAL	ND	LPV	2	99.726	2	99.695	2	99.681
51D	EDGELEY MUNICIPAL	ND	LPV	2	99.723	2	99.689	2	99.680
5L0	LAKOTA MUNICIPAL	ND	LPV	2	99.693	2	99.677	3	99.641
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	2	99.711	2	99.687	2	99.673
6L3	LISBON MUNICIPAL	ND	LPV	2	99.711	2	99.689	2	99.677
7L2	LINTON MUNICIPAL	ND	LPV	2	99.727	2	99.692	2	99.680
9D7	CANDO MUNICIPAL	ND	LPV	2	99.688	2	99.676	3	99.637
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	2	99.711	2	99.686	2	99.673
BIS	BISMARCK MUNICIPAL	ND	LPV200	2	99.700	2	99.685	2	99.674
BWP	HARRY STERN	ND	LPV	2	99.709	2	99.703	2	99.678
BWW	BOWMAN RGNL	ND	LPV	3	99.723	2	99.707	2	99.673
D05	GARRISON MUNICIPAL	ND	LPV	2	99.690	2	99.684	3	99.631
D09	BOTTINEAU MUNICIPAL	ND	LPV	2	99.685	3	99.670	3	99.629
D55	ROBERTSON FLD	ND	LPV	2	99.686	2	99.676	3	99.638
D57	GLEN ULLIN RGNL	ND	LPV	2	99.698	2	99.696	2	99.670
D60	TIOGA MUNICIPAL	ND	LPV	2	99.692	2	99.685	3	99.637
DIK	DICKINSON/THEODORE ROOSEVELT R	ND	LPV200	2	99.698	2	99.698	3	99.669
DVL	DEVILS LAKE RGNL	ND	LPV200	2	99.691	2	99.677	3	99.637
FAR	HECTOR INTL	ND	LPV200	2	99.710	2	99.687	2	99.669
GAF	HUTSON FLD	ND	LPV	2	99.689	2	99.677	2	99.639
GFK	GRAND FORKS INTL	ND	LPV	2	99.696	2	99.680	2	99.642
GWR	GWINNER-ROGER MELROE FLD	ND	LPV	2	99.710	2	99.689	2	99.681

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HEI	HETTINGER/JB LINDQUIST RGNL	ND	LPV	3	99.720	2	99.707	2	99.678
HZE	MERCER COUNTY RGNL	ND	LPV	2	99.692	2	99.687	3	99.639
ISN	SLOULIN FLD INTL	ND	LPV200	2	99.697	2	99.686	3	99.636
JMS	JAMESTOWN RGNL	ND	LPV200	2	99.713	2	99.686	2	99.672
K74	ROBERT ODEGAARD FLD	ND	LP	2	99.710	2	99.689	2	99.673
MOT	MINOT INTL	ND	LPV	2	99.686	3	99.673	3	99.631
RUG	RUGBY MUNICIPAL	ND	LP	2	99.699	3	99.673	3	99.631
S25	WATFORD CITY MUNICIPAL	ND	LPV	2	99.696	2	99.686	3	99.635
XWA	WILLISTON BASIN INTL	ND	LPV200	2	99.697	2	99.686	3	99.643
Y19	MANDAN RGNL/LAWLER FLD	ND	LPV	2	99.701	2	99.685	2	99.674
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	3	99.866	3	99.806	3	99.731
08K	HARVARD STATE	NE	LPV	3	99.866	4	99.836	5	99.774
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	3	99.775	3	99.738	2	99.707
0C4	PENDER MUNICIPAL	NE	LPV	4	99.796	3	99.760	2	99.707
0F4	LOUP CITY MUNICIPAL	NE	LPV	3	99.865	4	99.817	3	99.732
0G3	TECUMSEH MUNICIPAL	NE	LPV	3	99.879	3	99.837	3	99.767
0V3	PIONEER VILLAGE FLD	NE	LPV	3	99.868	4	99.839	3	99.779
12K	SUPERIOR MUNICIPAL	NE	LPV	3	99.866	4	99.844	3	99.803
47V	CURTIS MUNICIPAL	NE	LPV	3	99.890	4	99.854	3	99.779
4D9	ALMA MUNICIPAL	NE	LPV	4	99.885	5	99.858	3	99.808
4V9	ANTELOPE COUNTY	NE	LPV	5	99.828	3	99.759	2	99.707
6K3	CREIGHTON MUNICIPAL	NE	LPV	4	99.797	3	99.740	2	99.707
7V7	RED CLOUD MUNICIPAL	NE	LPV	3	99.868	4	99.845	3	99.803
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	4	99.805	3	99.757	2	99.707
93Y	DAVID CITY MUNICIPAL	NE	LPV	3	99.860	3	99.797	2	99.718
9V5	MODISETT	NE	LPV	4	99.847	3	99.794	2	99.715
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	2	99.879	3	99.843	5	99.774
AHQ	WAHOO MUNICIPAL	NE	LPV	3	99.856	3	99.787	2	99.718
AIA	ALLIANCE MUNICIPAL	NE	LPV200	4	99.896	4	99.857	2	99.721
ANW	AINSWORTH RGNL	NE	LPV200	4	99.788	3	99.741	3	99.709
AUH	AURORA MUNICIPAL - AL POTTER FLD	NE	LPV	3	99.866	4	99.823	3	99.732
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	3	99.867	4	99.816	2	99.733
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	3	99.897	4	99.861	3	99.763
BIE	BEATRICE MUNICIPAL	NE	LPV200	2	99.864	3	99.841	3	99.769
BTA	BLAIR MUNICIPAL	NE	LPV	4	99.866	3	99.781	2	99.718
BUB	CRAM FLD	NE	LPV	4	99.853	3	99.781	3	99.721
BVN	ALBION MUNICIPAL	NE	LPV	4	99.847	3	99.776	2	99.707

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CDR	CHADRON MUNICIPAL	NE	LPV200	4	99.846	3	99.794	2	99.718
CEK	CRETE MUNICIPAL	NE	LPV	2	99.864	4	99.834	4	99.761
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	3	99.892	4	99.859	3	99.790
CZD	COZAD MUNICIPAL	NE	LPV	3	99.888	4	99.851	4	99.761
EAR	KEARNEY RGNL	NE	LPV200	3	99.867	4	99.834	4	99.770
FBY	FAIRBURY MUNICIPAL	NE	LPV	2	99.866	3	99.843	5	99.794
FET	FREMONT MUNICIPAL	NE	LPV	3	99.852	3	99.781	2	99.718
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	3	99.866	4	99.836	4	99.775
FNB	BRENNER FLD	NE	LPV	2	99.887	3	99.855	3	99.805
GGF	GRANT MUNICIPAL	NE	LPV	3	99.897	4	99.859	3	99.777
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	3	99.866	4	99.824	3	99.732
GRN	GORDON MUNICIPAL	NE	LPV	4	99.837	3	99.788	2	99.712
HDE	BREWSTER FLD	NE	LPV	3	99.872	4	99.840	3	99.781
HSI	HASTINGS MUNICIPAL	NE	LPV	3	99.866	4	99.835	3	99.777
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FL	NE	LPV	3	99.908	4	99.879	4	99.813
IML	IMPERIAL MUNICIPAL	NE	LPV	3	99.897	4	99.865	3	99.794
JYR	YORK MUNICIPAL	NE	LPV	3	99.865	3	99.811	3	99.730
K01	FARINGTON FLD	NE	LPV	2	99.883	3	99.849	5	99.795
LBF	NORTH PLATTE RGNL/LEE BIRD FLD	NE	LPV200	3	99.889	4	99.845	2	99.733
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	4	99.796	4	99.753	2	99.707
LNK	LINCOLN	NE	LPV200	2	99.864	4	99.826	3	99.731
LXN	JIM KELLY FLD	NE	LPV	3	99.871	4	99.835	4	99.767
MCK	MC COOK BEN NELSON RGNL	NE	LPV	3	99.894	4	99.865	3	99.812
MLE	MILLARD	NE	LPV	4	99.869	3	99.806	2	99.718
ODX	EVELYN SHARP FLD	NE	LPV	4	99.862	3	99.784	3	99.721
OFK	NORFOLK RGNL/KARL STEFAN MEML	NE	LPV200	4	99.823	3	99.770	2	99.707
OGA	SEARLE FLD	NE	LPV	3	99.897	4	99.854	2	99.755
OKS	GARDEN COUNTY/KING RHILEY FLD	NE	LPV	3	99.898	4	99.858	3	99.774
OLU	COLUMBUS MUNICIPAL	NE	LPV	3	99.858	3	99.786	2	99.718
OMA	EPPLEY AIRFIELD	NE	LPV200	4	99.870	3	99.781	2	99.718
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	4	99.810	3	99.755	2	99.707
PMV	PLATTSMOUTH MUNICIPAL/DOUGLAS V DUE	NE	LPV	3	99.877	4	99.840	2	99.718
RBE	ROCK COUNTY	NE	LPV	4	99.798	3	99.749	3	99.708
SCB	SCRIBNER STATE	NE	LPV	3	99.851	3	99.771	2	99.710
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FLD	NE	LPV	3	99.898	4	99.868	4	99.802
SWT	SEWARD MUNICIPAL	NE	LPV	2	99.865	3	99.812	3	99.730
TIF	THOMAS COUNTY	NE	LPV	4	99.879	4	99.824	2	99.722

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TQE	TEKAMAH MUNICIPAL	NE	LPV	4	99.844	3	99.769	2	99.707
VTN	MILLER FLD	NE	LPV	3	99.772	2	99.731	3	99.706
ASH	BOIRE FLD	NH	LPV200	1	99.850	1	99.850	1	99.848
CON	CONCORD MUNICIPAL	NH	LPV	1	99.850	1	99.850	1	99.848
DAW	SKYHAVEN	NH	LPV	1	99.850	1	99.850	1	99.847
EEN	DILLANT/HOPKINS	NH	LPV	1	99.850	1	99.850	1	99.850
HIE	MOUNT WASHINGTON RGNL	NH	LPV	1	99.861	1	99.861	1	99.850
LCI	LACONIA MUNICIPAL	NH	LPV	1	99.850	1	99.850	1	99.847
LEB	LEBANON MUNICIPAL	NH	LPV	1	99.852	1	99.852	1	99.847
MHT	MANCHESTER BOSTON RGNL	NH	LPV200	1	99.850	1	99.850	1	99.848
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	1	99.850	1	99.850	1	99.847
47N	CENTRAL JERSEY RGNL	NJ	LP	1	99.857	1	99.853	1	99.831
4N1	GREENWOOD LAKE	NJ	LP	1	99.853	1	99.850	1	99.831
ACY	ATLANTIC CITY INTL	NJ	LPV200	1	99.857	1	99.853	1	99.831
CDW	ESSEX COUNTY	NJ	LPV	1	99.853	1	99.850	1	99.831
EWR	NEWARK LIBERTY INTL	NJ	LPV200	1	99.857	1	99.853	1	99.831
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	1	99.857	1	99.853	1	99.831
MJX	OCEAN COUNTY	NJ	LPV	1	99.857	1	99.853	1	99.831
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	1	99.857	1	99.853	1	99.831
N12	LAKEWOOD	NJ	LP	1	99.857	1	99.853	1	99.831
N14	FLYING W	NJ	LPV	1	99.857	1	99.853	1	99.831
N40	SKY MANOR	NJ	LP	1	99.857	1	99.853	1	99.831
TEB	TETERBORO	NJ	LPV	1	99.853	1	99.850	1	99.831
TTN	TRENTON MERCER	NJ	LPV	1	99.857	1	99.853	1	99.831
VAY	SOUTH JERSEY RGNL	NJ	LP	1	99.857	1	99.853	1	99.831
WWD	CAPE MAY COUNTY	NJ	LPV	1	99.857	1	99.853	1	99.831
LFVM	MIQUELON	NL	LPV	1	99.846	1	99.846	5	99.834
LFVP	ST PIERRE	NL	LPV	1	99.846	1	99.846	6	99.829
0E0	MORIARTY MUNICIPAL	NM	LPV	1	99.981	1	99.971	1	99.937
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	1	99.991	1	99.974	1	99.940
AEG	DOUBLE EAGLE II	NM	LPV200	1	99.990	1	99.974	1	99.937
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	1	99.956	1	99.952	11	99.926
ATS	ARTESIA MUNICIPAL	NM	LPV200	1	99.953	1	99.952	2	99.932
CAO	CLAYTON MUNICIPAL AIRPARK	NM	LPV	1	99.960	1	99.947	1	99.926
CNM	CAVERN CITY AIR TRML	NM	LPV200	1	99.953	1	99.948	1	99.935
CVN	CLOVIS RGNL	NM	LPV200	1	99.956	1	99.952	1	99.928
DMN	DEMING MUNICIPAL	NM	LPV	1	99.956	1	99.956	68	99.716

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
E06	LEA COUNTY/ZIP FRANKLIN MEML	NM	LPV	1	99.952	1	99.948	1	99.930
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	1	99.957	1	99.939
HOB	LEA COUNTY RGNL	NM	LPV	1	99.952	1	99.948	1	99.929
LAM	LOS ALAMOS	NM	LP	1	99.998	1	99.957	1	99.935
LRU	LAS CRUCES INTL	NM	LPV200	1	99.956	1	99.952	53	99.809
ONM	SOCORRO MUNICIPAL	NM	LP	1	99.968	1	99.956	1	99.938
ROW	ROSWELL AIR CENTER	NM	LPV	1	99.953	1	99.949	2	99.931
SAF	SANTA FE MUNICIPAL	NM	LPV200	1	99.996	2	99.972	1	99.934
SRR	SIERRA BLANCA RGNL	NM	LPV200	1	99.955	1	99.953	2	99.934
SVC	GRANT COUNTY	NM	LPV	1	99.963	1	99.956	68	99.754
05U	EUREKA	NV	LP	0	100	1	99.963	1	99.943
10U	OWYHEE	NV	LPV200	1	99.971	1	99.946	3	99.829
67L	MESQUITE	NV	LP	0	100	1	99.963	1	99.952
BAM	BATTLE MOUNTAIN	NV	LPV	1	99.996	1	99.956	3	99.918
BVU	BOULDER CITY MUNICIPAL	NV	LP	0	100	1	99.964	1	99.957
CXP	CARSON CITY	NV	LP	0	100	1	99.962	2	99.937
ELY	ELY/YELLAND FLD	NV	LPV	0	100	1	99.963	1	99.948
HTH	HAWTHORNE INDUSTRIAL	NV	LP	0	100	1	99.963	1	99.956
LAS	HARRY REID INTL	NV	LPV200	0	100	1	99.963	1	99.957
LOL	DERBY FLD	NV	LPV	0	100	1	99.963	2	99.936
RNO	RENO/TAHOE INTL	NV	LPV	0	100	1	99.962	2	99.937
RTS	RENO/STEAD	NV	LPV	0	100	1	99.962	2	99.937
SPZ	SILVER SPRINGS	NV	LPV	0	100	1	99.962	2	99.937
TPH	TONOPAH	NV	LP	0	100	1	99.963	1	99.955
VGT	NORTH LAS VEGAS	NV	LP	0	100	1	99.963	1	99.957
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	1	99.997	1	99.956	3	99.913
06N	RANDALL	NY	LP	1	99.850	1	99.850	1	99.831
0G7	FINGER LAKES RGNL	NY	LPV	1	99.854	2	99.850	1	99.834
1B1	COLUMBIA COUNTY	NY	LPV	1	99.850	1	99.850	2	99.849
20N	KINGSTON-ULSTER	NY	LPV	1	99.850	1	99.850	1	99.835
44N	SKY ACRES	NY	LPV	1	99.850	1	99.850	1	99.835
4B6	TICONDEROGA MUNICIPAL	NY	LPV	1	99.852	1	99.851	1	99.850
5B2	SARATOGA COUNTY	NY	LPV	1	99.850	1	99.850	1	99.850
5G0	LE ROY	NY	LP	1	99.853	1	99.836	2	99.832
9G0	BUFFALO AIRFIELD	NY	LP	1	99.853	1	99.837	2	99.832
9G3	AKRON/JESSON FLD	NY	LP	1	99.850	1	99.837	2	99.832
ALB	ALBANY INTL	NY	LPV200	1	99.850	1	99.850	1	99.850

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ART	WATERTOWN INTL	NY	LPV200	1	99.857	2	99.855	2	99.847
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	1	99.857	2	99.853	1	99.832
BUF	BUFFALO NIAGARA INTL	NY	LPV200	1	99.853	1	99.837	2	99.832
ELM	ELMIRA/CORNING RGNL	NY	LPV200	1	99.857	2	99.853	1	99.834
ELZ	WELLSVILLE MUNICIPAL/TARANTINE FLD	NY	LPV200	1	99.853	1	99.839	1	99.835
FOK	FRANCIS S GABRESKI	NY	LPV200	1	99.850	1	99.850	1	99.837
FRG	REPUBLIC	NY	LPV200	1	99.850	1	99.850	1	99.833
FZY	OSWEGO COUNTY	NY	LPV	1	99.857	2	99.853	1	99.834
GFL	FLOYD BENNETT MEML	NY	LPV200	1	99.850	1	99.850	1	99.850
GVQ	GENESEE COUNTY	NY	LPV200	1	99.850	1	99.836	2	99.832
HPN	WESTCHESTER COUNTY	NY	LPV	1	99.850	1	99.850	1	99.832
HTF	HORNELL MUNICIPAL	NY	LPV	1	99.853	1	99.837	1	99.835
HTO	EAST HAMPTON	NY	LPV	1	99.850	1	99.850	1	99.839
HWV	BROOKHAVEN	NY	LPV	1	99.850	1	99.850	1	99.836
IAG	NIAGARA FALLS INTL	NY	LPV	1	99.853	1	99.838	2	99.832
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	1	99.850	1	99.850	1	99.835
ITH	ITHACA TOMPKINS INTL	NY	LPV	1	99.857	2	99.852	1	99.833
IUA	CANANDAIGUA	NY	LPV	1	99.853	1	99.835	1	99.835
JFK	JOHN F KENNEDY INTL	NY	LPV200	1	99.856	1	99.853	1	99.831
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	1	99.853	1	99.842	2	99.832
K09	PISECO	NY	LP	1	99.850	1	99.850	1	99.850
LGA	LAGUARDIA	NY	LPV	1	99.852	1	99.850	1	99.831
MAL	MALONE-DUFORT	NY	LPV	1	99.861	1	99.861	1	99.848
MGJ	ORANGE COUNTY	NY	LPV	1	99.850	1	99.850	1	99.832
MSS	MASSENA INTL-RICHARDS FLD	NY	LPV	1	99.861	1	99.861	1	99.850
MSV	SULLIVAN COUNTY INTL	NY	LPV	1	99.850	1	99.850	1	99.831
N23	SIDNEY MUNICIPAL	NY	LP	1	99.850	1	99.839	1	99.831
N66	ALBERT S NADER RGNL	NY	LPV	1	99.850	1	99.837	1	99.832
NY0	FULTON COUNTY	NY	LPV	1	99.850	2	99.849	2	99.849
OGS	OGDENSBURG INTL	NY	LPV	1	99.859	1	99.858	1	99.850
OIC	LT WARREN EATON	NY	LP	1	99.850	1	99.837	1	99.832
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	1	99.853	1	99.839	2	99.832
PBG	PLATTSBURGH INTL	NY	LPV	1	99.861	1	99.861	1	99.847
PEO	PENN YAN	NY	LPV	1	99.857	2	99.851	1	99.834
POU	HUDSON VALLEY RGNL	NY	LPV	1	99.850	1	99.850	1	99.834
RME	GRIFFISS INTL	NY	LPV200	1	99.850	2	99.847	2	99.845
ROC	FREDERICK DOUGLASS/GREATER ROC	NY	LPV200	1	99.853	1	99.835	2	99.835

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SCH	SCHENECTADY COUNTY	NY	LPV200	1	99.850	1	99.850	1	99.850
SDC	WILLIAMSON-SODUS	NY	LPV	1	99.854	2	99.850	1	99.835
SLK	ADIRONDACK RGNL	NY	LPV200	1	99.859	1	99.858	1	99.850
SWF	NEW YORK STEWART INTL	NY	LPV200	1	99.850	1	99.850	1	99.832
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	1	99.854	2	99.850	1	99.833
VGC	HAMILTON MUNICIPAL	NY	LPV	1	99.850	1	99.836	1	99.832
0G6	WILLIAMS COUNTY	OH	LPV	1	99.872	1	99.872	2	99.857
10G	HOLMES COUNTY	OH	LP	1	99.868	1	99.863	1	99.852
16G	SENECA COUNTY	OH	LPV	1	99.875	1	99.872	2	99.863
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	1	99.875	1	99.872	2	99.863
1G0	WOOD COUNTY	OH	LPV	1	99.875	1	99.872	2	99.856
1G3	KENT STATE UNIVERSITY	OH	LPV	1	99.861	1	99.856	2	99.839
2G2	GEARY A BATES/JEFFERSON COUNTY	OH	LPV	1	99.866	1	99.850	1	99.842
4G5	MONROE COUNTY	OH	LP	1	99.871	1	99.870	1	99.842
4I3	KNOX COUNTY	OH	LPV200	1	99.874	1	99.869	1	99.861
5A1	NORWALK-HURON COUNTY	OH	LP	1	99.870	1	99.866	2	99.859
6G5	BARNESVILLE-BRADFIELD	OH	LP	1	99.870	1	99.870	1	99.843
7G8	GEAUGA COUNTY	OH	LP	1	99.858	1	99.843	2	99.835
AKR	AKRON FULTON INTL	OH	LP	1	99.862	1	99.856	2	99.839
AOH	LIMA ALLEN COUNTY	OH	LPV200	1	99.875	1	99.872	2	99.858
AXV	NEIL ARMSTRONG	OH	LPV	1	99.875	1	99.872	2	99.866
BJJ	WAYNE COUNTY	OH	LPV	1	99.865	1	99.860	2	99.848
BKL	BURKE LAKEFRONT	OH	LPV	1	99.860	1	99.855	2	99.835
CAK	AKRON-CANTON RGNL	OH	LPV200	1	99.862	1	99.856	2	99.839
CDI	CAMBRIDGE MUNICIPAL	OH	LP	1	99.874	1	99.874	1	99.843
CGF	CUYAHOGA COUNTY	OH	LPV200	1	99.859	1	99.854	2	99.835
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	1	99.862	1	99.858	2	99.838
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	1	99.879	1	99.879	1	99.870
CQA	LAKEFIELD	OH	LPV	1	99.875	1	99.872	2	99.859
CYO	PICKAWAY COUNTY MEML	OH	LPV	1	99.879	1	99.879	1	99.874
DAY	JAMES M COX DAYTON INTL	OH	LPV200	1	99.876	1	99.876	1	99.872
DLZ	DELAWARE MUNICIPAL/JIM MOORE FLD	OH	LPV	1	99.876	1	99.872	1	99.866
EDJ	BELLEFONTAINE RGNL	OH	LPV	1	99.875	1	99.872	2	99.868
EOP	PIKE COUNTY	OH	LP	1	99.879	1	99.879	1	99.875
FDY	FINDLAY	OH	LPV	1	99.875	1	99.872	2	99.856
FZI	FOSTORIA METRO	OH	LPV	1	99.875	1	99.872	2	99.856
GQQ	GALION MUNICIPAL	OH	LP	1	99.872	1	99.869	2	99.862

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HAO	BUTLER COUNTY RGNL/HOGAN FLD	OH	LPV	1	99.879	1	99.879	1	99.872
HOC	HIGHLAND COUNTY	OH	LP	1	99.879	1	99.879	1	99.872
HZY	NORTHEAST OHIO RGNL	OH	LPV	1	99.862	1	99.843	2	99.835
I10	NOBLE COUNTY	OH	LP	1	99.874	1	99.874	1	99.843
I19	GREENE COUNTY/LEWIS A JACKSON	OH	LPV	1	99.879	1	99.879	1	99.872
I40	RICHARD DOWNING	OH	LPV	1	99.872	1	99.868	1	99.844
I66	CLINTON FLD	OH	LPV	1	99.879	1	99.879	1	99.872
I68	WARREN COUNTY/JOHN LANE FLD	OH	LPV	1	99.879	1	99.879	1	99.872
I69	CLERMONT COUNTY	OH	LP	1	99.879	1	99.879	1	99.874
I74	GRIMES FLD	OH	LPV	1	99.876	1	99.873	1	99.868
ILN	WILMINGTON AIR PARK	OH	LPV200	1	99.879	1	99.879	1	99.872
LCK	RICKENBACKER INTL	OH	LPV200	1	99.879	1	99.879	1	99.874
LHQ	FAIRFIELD COUNTY	OH	LPV200	1	99.879	1	99.879	1	99.867
LNN	LAKE COUNTY EXEC	OH	LPV	1	99.858	1	99.853	2	99.835
LPR	LORAIN COUNTY RGNL	OH	LPV200	1	99.865	1	99.861	2	99.850
LUK	CINCINNATI MUNICIPAL/LUNKEN FLD	OH	LPV	1	99.879	1	99.879	1	99.872
MFD	MANSFIELD LAHM RGNL	OH	LPV200	1	99.872	1	99.868	2	99.858
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	1	99.879	1	99.879	1	99.872
MNN	MARION MUNICIPAL	OH	LPV	1	99.875	1	99.872	2	99.866
MRT	UNION COUNTY	OH	LP	1	99.876	1	99.872	1	99.867
MWO	MIDDLETOWN RGNL/HOOK FLD	OH	LPV	1	99.879	1	99.879	1	99.872
OSU	OHIO STATE UNIVERSITY	OH	LPV200	1	99.879	1	99.879	1	99.871
OWX	PUTNAM COUNTY	OH	LPV	1	99.874	1	99.872	2	99.857
OXD	MIAMI UNIVERSITY	OH	LPV	1	99.877	1	99.875	1	99.872
PCW	ERIE-OTTAWA INTL	OH	LPV	1	99.871	1	99.868	2	99.860
PHD	HARRY CLEVER FLD	OH	LP	1	99.869	1	99.865	1	99.842
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	1	99.879	1	99.879	1	99.875
POV	PORTAGE COUNTY	OH	LPV	1	99.860	1	99.844	2	99.838
RZT	ROSS COUNTY	OH	LPV	1	99.879	1	99.879	1	99.874
S24	SANDUSKY COUNTY RGNL	OH	LPV	1	99.875	1	99.872	2	99.862
SCA	SIDNEY MUNICIPAL	OH	LPV	1	99.875	1	99.872	2	99.868
SGH	SPRINGFIELD/BECKLEY MUNICIPAL	OH	LPV200	1	99.879	1	99.879	1	99.872
TDZ	TOLEDO EXEC	OH	LPV	1	99.875	1	99.872	2	99.855
TOL	EUGENE F KRANZ TOLEDO EXPRESS	OH	LPV200	1	99.874	1	99.872	2	99.856
TSO	CARROLL COUNTY-TOLSON	OH	LP	1	99.866	2	99.856	1	99.842
TZR	BOLTON FLD	OH	LPV	1	99.879	1	99.879	1	99.871
UNI	OHIO UNIVERSITY	OH	LPV200	1	99.879	1	99.876	1	99.856

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
USE	FULTON COUNTY	OH	LPV	1	99.875	1	99.872	2	99.856
UYF	MADISON COUNTY	OH	LPV	1	99.879	1	99.879	1	99.871
VES	DARKE COUNTY	OH	LPV	1	99.875	1	99.872	2	99.867
VTA	NEWARK-HEATH	OH	LP	1	99.879	1	99.876	1	99.864
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	1	99.859	1	99.843	2	99.835
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	1	99.875	1	99.875	1	99.847
1F0	ARDMORE DOWNTOWN EXEC	OK	LP	1	99.959	1	99.943	1	99.927
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	1	99.932	1	99.925	1	99.885
1O4	THOMAS MUNICIPAL	OK	LPV	1	99.947	1	99.938	1	99.920
2K4	SCOTT FLD	OK	LPV	1	99.952	1	99.943	1	99.927
3F7	JONES MEML	OK	LPV	1	99.943	1	99.937	1	99.913
4O4	MC CURTAIN COUNTY RGNL	OK	LP	1	99.967	1	99.959	2	99.935
6K4	FAIRVIEW MUNICIPAL	OK	LPV	1	99.940	1	99.937	1	99.920
80F	ANTLERS MUNICIPAL	OK	LPV	1	99.960	1	99.950	1	99.930
ADH	ADA RGNL	OK	LPV	1	99.952	1	99.941	1	99.927
ADM	ARDMORE MUNICIPAL	OK	LPV	1	99.954	1	99.943	1	99.927
AVK	ALVA RGNL	OK	LPV	1	99.939	1	99.931	3	99.902
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	1	99.952	1	99.943	1	99.926
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	1	99.938	1	99.930	1	99.893
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	1	99.935	1	99.924	1	99.887
CHK	CHICKASHA MUNICIPAL	OK	LPV200	1	99.952	1	99.940	1	99.926
CLK	CLINTON RGNL	OK	LPV	1	99.950	1	99.942	1	99.926
CSM	CLINTON/SHERMAN	OK	LPV200	1	99.951	1	99.942	1	99.927
CUH	CUSHING MUNICIPAL	OK	LPV	1	99.939	1	99.937	1	99.914
DUA	DURANT RGNL/EAKER FLD	OK	LPV	1	99.963	1	99.947	1	99.933
DUC	HALLIBURTON FLD	OK	LPV200	1	99.952	1	99.940	1	99.926
ELK	ELK CITY RGNL BUSINESS	OK	LPV	1	99.951	1	99.943	1	99.926
F22	PERRY MUNICIPAL	OK	LPV	1	99.938	1	99.930	1	99.901
FDR	FREDERICK RGNL	OK	LPV200	1	99.952	1	99.942	1	99.926
GCM	CLAREMORE RGNL	OK	LPV	1	99.934	1	99.926	2	99.898
GMJ	GROVE MUNICIPAL	OK	LPV	1	99.932	1	99.925	1	99.881
GOK	GUTHRIE/EDMOND RGNL	OK	LPV	1	99.944	1	99.938	1	99.916
GUY	GUYMON MUNICIPAL	OK	LPV	1	99.934	1	99.934	2	99.914
GZL	STIGLER RGNL	OK	LPV	1	99.959	1	99.950	1	99.911
H71	MID-AMERICA INDUSTRIAL	OK	LPV	1	99.933	1	99.926	2	99.901
HBR	HOBART RGNL	OK	LPV	1	99.952	1	99.942	1	99.926
HHW	STAN STAMPER MUNICIPAL	OK	LPV	1	99.963	1	99.950	1	99.934

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HSD	SUNDANCE	OK	LPV	1	99.948	1	99.939	1	99.918
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	1	99.952	1	99.941	1	99.926
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	1	99.946	1	99.941	1	99.912
MLC	MC ALESTER RGNL	OK	LPV	1	99.956	1	99.946	1	99.930
OJA	WEATHERFORD STAFFORD	OK	LPV	1	99.950	1	99.941	1	99.926
OKC	WILL ROGERS WORLD	OK	LPV200	1	99.952	1	99.939	1	99.919
OKM	OKMULGEE RGNL	OK	LPV200	1	99.947	1	99.941	1	99.916
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	1	99.952	1	99.938	1	99.920
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	1	99.935	1	99.928	1	99.906
PNC	PONCA CITY RGNL	OK	LPV	1	99.937	1	99.930	1	99.893
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	1	99.952	1	99.938	1	99.927
PWA	WILEY POST	OK	LPV200	1	99.949	1	99.939	1	99.918
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	1	99.950	1	99.939	1	99.919
RKR	ROBERT S KERR	OK	LPV	1	99.967	2	99.951	1	99.910
RQO	EL RENO RGNL	OK	LPV	1	99.950	1	99.940	1	99.920
RVS	TULSA RIVERSIDE	OK	LPV200	1	99.936	1	99.931	1	99.905
SNL	SHAWNEE RGNL	OK	LPV200	1	99.952	1	99.941	1	99.916
SWO	STILLWATER RGNL	OK	LPV200	1	99.937	1	99.934	2	99.914
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	1	99.938	1	99.925	2	99.901
TUL	TULSA INTL	OK	LPV200	1	99.935	1	99.927	2	99.905
WDG	ENID WOODRING RGNL	OK	LPV200	1	99.939	1	99.935	2	99.914
WWR	WEST WOODWARD	OK	LPV	1	99.936	1	99.931	1	99.920
3S8	GRANTS PASS	OR	LP	1	99.945	1	99.934	4	99.830
77S	HOBBY FLD	OR	LPV	2	99.905	2	99.871	4	99.766
AST	ASTORIA RGNL	OR	LPV	2	99.842	3	99.759	3	99.733
BDN	BEND MUNICIPAL	OR	LPV	3	99.908	3	99.871	4	99.766
BKE	BAKER CITY MUNICIPAL	OR	LPV	2	99.894	3	99.796	3	99.740
CVO	CORVALLIS MUNICIPAL	OR	LPV200	2	99.905	4	99.854	3	99.744
EUG	MAHLON SWEET FLD	OR	LPV200	2	99.905	3	99.869	4	99.761
GCD	GRANT COUNTY RGNL/OGILVIE FLD	OR	LPV	2	99.916	4	99.829	3	99.744
HIO	PORTLAND-HILLSBORO	OR	LPV200	2	99.869	4	99.786	3	99.738
LGD	LA GRANDE/UNION COUNTY	OR	LPV	2	99.894	2	99.773	3	99.739
LKV	LAKE COUNTY	OR	LPV	1	99.983	2	99.934	3	99.843
LMT	CRATER LAKE/KLAMATH RGNL	OR	LPV	1	99.988	1	99.938	3	99.842
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	2	99.878	5	99.816	3	99.739
ONO	ONTARIO MUNICIPAL	OR	LPV	2	99.908	4	99.865	3	99.760
ONP	NEWPORT MUNICIPAL	OR	LPV	2	99.897	4	99.841	3	99.741

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OTH	SOUTHWEST OREGON RGNL	OR	LPV	2	99.937	4	99.912	5	99.801
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	2	99.870	3	99.771	3	99.736
PDX	PORTLAND INTL	OR	LPV200	2	99.869	4	99.785	3	99.741
RDM	ROBERTS FLD	OR	LPV200	2	99.896	4	99.864	3	99.753
S33	MADRAS MUNICIPAL	OR	LPV	2	99.889	4	99.833	3	99.748
S39	PRINEVILLE	OR	LP	3	99.907	3	99.847	3	99.743
SLE	MCNARY FLD	OR	LPV200	2	99.902	5	99.824	3	99.743
SPB	SCAPPOOSE	OR	LPV	2	99.866	4	99.773	3	99.736
UAO	AURORA STATE	OR	LPV	2	99.879	5	99.811	3	99.742
22N	JAKE ARNER MEML	PA	LP	1	99.857	1	99.857	1	99.831
29D	GROVE CITY	PA	LP	1	99.863	1	99.844	2	99.835
2G9	SOMERSET COUNTY	PA	LPV	1	99.866	1	99.853	1	99.836
6G1	TITUSVILLE	PA	LPV	1	99.863	1	99.844	2	99.834
6P7	MCVILLE	PA	LP	1	99.864	1	99.853	1	99.837
8G2	CORRY-LAWRENCE	PA	LPV	1	99.854	1	99.853	2	99.832
8N8	DANVILLE	PA	LP	1	99.857	1	99.857	1	99.832
9D4	DECK	PA	LPV	1	99.857	1	99.857	1	99.831
ABE	LEHIGH VALLEY INTL	PA	LPV200	1	99.857	1	99.854	1	99.830
AFJ	WASHINGTON COUNTY	PA	LPV200	1	99.867	1	99.853	1	99.841
AGC	ALLEGHENY COUNTY	PA	LPV200	1	99.865	1	99.853	1	99.837
AOO	ALTOONA/BLAIR COUNTY	PA	LPV	1	99.854	1	99.853	1	99.835
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	1	99.857	1	99.854	1	99.831
AXQ	CLARION COUNTY	PA	LPV	1	99.854	1	99.853	1	99.837
BFD	BRADFORD RGNL	PA	LPV	1	99.853	1	99.853	2	99.835
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	1	99.864	1	99.850	1	99.838
BVI	BEAVER COUNTY	PA	LPV	1	99.864	1	99.844	1	99.839
CXY	CAPITAL CITY	PA	LPV	1	99.857	1	99.857	1	99.832
DUJ	DUBOIS RGNL	PA	LPV200	1	99.854	1	99.853	1	99.836
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	1	99.862	1	99.842	2	99.832
FIG	CLEARFIELD-LAWRENCE	PA	LPV	1	99.854	1	99.853	1	99.835
FKL	VENANGO RGNL	PA	LPV	1	99.863	1	99.844	2	99.835
FWQ	ROSTRAVER	PA	LPV	1	99.866	1	99.853	1	99.837
GKJ	PORT MEADVILLE	PA	LP	1	99.863	1	99.842	2	99.835
HMZ	BEDFORD COUNTY	PA	LPV	1	99.854	1	99.853	1	99.835
HZL	HAZLETON RGNL	PA	LPV	1	99.857	1	99.857	1	99.831
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	1	99.854	1	99.853	1	99.836
IPT	WILLIAMSPORT RGNL	PA	LPV	1	99.857	1	99.857	1	99.833

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JST	JOHN MURTHA JOHNSTOWN/CAMBRIA	PA	LPV200	1	99.854	1	99.853	1	99.835
LBE	ARNOLD PALMER RGNL	PA	LPV200	1	99.865	1	99.853	1	99.836
LNS	LANCASTER	PA	LPV200	1	99.857	1	99.857	1	99.831
LOM	WINGS FLD	PA	LPV	1	99.857	1	99.853	1	99.830
MDT	HARRISBURG INTL	PA	LPV	1	99.857	1	99.857	1	99.832
MPO	POCONO MOUNTAINS RGNL	PA	LPV	1	99.857	1	99.854	1	99.830
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	1	99.857	1	99.857	1	99.830
N38	GRAND CANYON RGNL	PA	LP	1	99.853	1	99.853	1	99.834
N57	NEW GARDEN	PA	LP	1	99.857	1	99.857	1	99.830
N79	NORTHUMBERLAND COUNTY	PA	LPV	1	99.857	1	99.857	1	99.832
N96	BELLEFONTE	PA	LPV	1	99.853	1	99.853	1	99.834
OQN	BRANDYWINE RGNL	PA	LP	1	99.857	1	99.857	1	99.830
OYM	ST MARYS MUNICIPAL	PA	LPV	1	99.854	1	99.853	1	99.835
PHL	PHILADELPHIA INTL	PA	LPV200	1	99.857	1	99.854	1	99.831
PIT	PITTSBURGH INTL	PA	LPV200	1	99.864	1	99.850	1	99.839
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	1	99.857	1	99.853	1	99.831
PSB	MID-STATE	PA	LPV	1	99.854	1	99.853	1	99.835
PTW	HERITAGE FLD	PA	LPV	1	99.857	1	99.857	1	99.829
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	1	99.857	1	99.857	1	99.830
RVL	MIFFLIN COUNTY	PA	LPV	1	99.854	1	99.853	1	99.834
SEG	PENN VALLEY	PA	LP	1	99.857	1	99.857	1	99.832
THV	YORK	PA	LP	1	99.857	1	99.857	1	99.831
UCP	NEW CASTLE MUNICIPAL	PA	LPV	1	99.863	1	99.843	2	99.836
UKT	QUAKERTOWN	PA	LP	1	99.857	1	99.854	1	99.830
UNV	UNIVERSITY PARK	PA	LPV200	1	99.853	1	99.853	1	99.835
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	1	99.866	1	99.853	1	99.837
WAY	GREENE COUNTY	PA	LPV	1	99.868	1	99.853	1	99.841
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	1	99.857	1	99.856	1	99.831
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	1	99.857	1	99.854	1	99.830
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	1	99.857	1	99.857	1	99.831
BID	BLOCK ISLAND STATE	RI	LPV	1	99.850	1	99.850	1	99.848
OQU	QUONSET STATE	RI	LPV200	1	99.850	1	99.850	1	99.848
PVD	RHODE ISLAND TF GREEN INTL	RI	LPV200	1	99.850	1	99.850	1	99.848
SFZ	NORTH CENTRAL STATE	RI	LPV	1	99.850	1	99.850	1	99.848
35A	UNION COUNTY` TROY SHELTON FLD	SC	LP	1	99.894	1	99.882	2	99.864
6J0	LEXINGTON COUNTY	SC	LPV	1	99.894	1	99.882	1	99.850
AIK	AIKEN RGNL	SC	LPV200	1	99.894	1	99.882	2	99.864

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AND	ANDERSON RGNL	SC	LPV200	1	99.894	1	99.884	1	99.871
AQX	ALLENDALE COUNTY	SC	LPV	1	99.894	1	99.882	1	99.851
ARW	BEAUFORT EXEC	SC	LPV200	1	99.894	1	99.882	1	99.847
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	1	99.894	1	99.879	1	99.835
BNL	BARNWELL RGNL	SC	LPV	1	99.894	1	99.882	1	99.852
CAE	COLUMBIA METRO	SC	LPV200	1	99.894	1	99.882	1	99.849
CDN	WOODWARD FLD	SC	LPV	1	99.894	1	99.879	1	99.844
CEU	OCONEE COUNTY RGNL	SC	LPV200	1	99.894	1	99.884	1	99.870
CHS	CHARLESTON AFB/INTL	SC	LPV200	1	99.894	1	99.879	1	99.842
CKI	WILLIAMSBURG RGNL	SC	LPV	1	99.894	1	99.879	1	99.841
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FL	SC	LPV	1	99.894	1	99.879	1	99.836
CRE	GRAND STRAND	SC	LPV200	1	99.894	1	99.879	1	99.832
CUB	JIM HAMILTON L B OWENS	SC	LPV	1	99.894	1	99.881	1	99.848
DCM	CHESTER CATAWBA RGNL	SC	LPV	1	99.894	1	99.879	2	99.861
DYB	SUMMERVILLE	SC	LPV200	1	99.894	1	99.879	1	99.843
FDW	FAIRFIELD COUNTY	SC	LPV	1	99.894	1	99.882	2	99.860
FLO	FLORENCE RGNL	SC	LPV	1	99.894	1	99.879	1	99.835
GGE	GEORGETOWN COUNTY	SC	LPV	1	99.894	1	99.879	1	99.833
GMU	GREENVILLE DOWNTOWN	SC	LPV200	1	99.894	1	99.882	1	99.868
GRD	GREENWOOD COUNTY	SC	LPV	1	99.894	1	99.882	2	99.866
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	1	99.894	1	99.882	1	99.868
GYH	DONALDSON FLD	SC	LPV	1	99.894	1	99.882	1	99.868
HVS	HARTSVILLE RGNL	SC	LPV	1	99.894	1	99.879	1	99.838
HXD	HILTON HEAD	SC	LPV	1	99.894	1	99.882	1	99.849
HYW	CONWAY-HORRY COUNTY	SC	LPV	1	99.894	1	99.879	1	99.833
JZI	CHARLESTON EXEC	SC	LPV200	1	99.894	1	99.879	1	99.843
LKR	LANCASTER COUNTY-MC WHIRTER FL	SC	LPV200	1	99.894	1	99.879	2	99.856
LQK	PICKENS COUNTY	SC	LPV	1	99.894	1	99.883	1	99.868
LRO	MT PLEASANT RGNL-FAISON FLD	SC	LPV	1	99.894	1	99.879	1	99.841
LUX	LAURENS COUNTY	SC	LPV	1	99.894	1	99.882	2	99.864
MAO	MARION COUNTY	SC	LPV	1	99.894	1	99.879	1	99.834
MKS	BERKELEY COUNTY	SC	LPV	1	99.894	1	99.879	1	99.842
MYR	MYRTLE BEACH INTL	SC	LPV200	1	99.894	1	99.879	1	99.833
OGB	ORANGEBURG MUNICIPAL	SC	LPV	1	99.894	1	99.882	1	99.847
PYG	PAGELAND	SC	LPV	1	99.894	1	99.879	1	99.843
RBW	LOWCOUNTRY RGNL	SC	LPV200	1	99.894	1	99.882	1	99.845
SMS	SUMTER	SC	LPV200	1	99.894	1	99.879	1	99.843

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SPA	SPARTANBURG DOWNTOWN MEML/SIMP	SC	LPV200	1	99.894	1	99.881	2	99.867
UDG	DARLINGTON COUNTY	SC	LPV	1	99.894	1	99.879	1	99.835
UZA	ROCK HILL/YORK COUNTY/BRYANT F	SC	LPV200	1	99.894	1	99.879	2	99.858
0D8	GETTYSBURG MUNICIPAL	SD	LP	2	99.727	3	99.720	2	99.692
49B	STURGIS MUNICIPAL	SD	LPV	2	99.748	3	99.736	2	99.713
4X4	WESSINGTON SPRINGS	SD	LP	2	99.724	3	99.720	2	99.692
8D3	SISSETON MUNICIPAL	SD	LPV	2	99.716	2	99.707	2	99.689
8D7	CLARK COUNTY	SD	LP	2	99.716	2	99.707	2	99.692
8V3	PARKSTON MUNICIPAL	SD	LPV	2	99.733	2	99.722	2	99.699
98D	ONIDA MUNICIPAL	SD	LP	2	99.726	3	99.721	2	99.692
9D0	HIGHMORE MUNICIPAL	SD	LPV	2	99.726	3	99.720	2	99.692
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	2	99.752	2	99.726	2	99.692
9V6	MARTIN MUNICIPAL	SD	LPV	4	99.806	3	99.770	2	99.711
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	2	99.736	2	99.725	2	99.692
ABR	ABERDEEN RGNL	SD	LPV200	2	99.725	2	99.707	2	99.692
AGZ	WAGNER MUNICIPAL	SD	LPV	2	99.747	2	99.722	2	99.707
ATY	WATERTOWN RGNL	SD	LPV200	2	99.716	2	99.707	2	99.692
BKX	BROOKINGS RGNL	SD	LPV200	2	99.715	2	99.707	2	99.699
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	2	99.737	2	99.723	2	99.708
FSD	JOE FOSS FLD	SD	LPV200	4	99.743	2	99.707	2	99.707
HON	HURON RGNL	SD	LPV200	2	99.724	2	99.707	2	99.692
HSR	HOT SPRINGS MUNICIPAL	SD	LP	4	99.823	3	99.785	2	99.718
ICR	WINNER RGNL	SD	LPV	2	99.745	2	99.725	2	99.692
IEN	PINE RIDGE	SD	LPV	4	99.831	3	99.785	2	99.715
LEM	LEMMON MUNICIPAL	SD	LPV	2	99.726	2	99.711	2	99.680
MBG	MOBRIDGE MUNICIPAL	SD	LPV	2	99.727	2	99.692	2	99.689
MDS	MADISON MUNICIPAL	SD	LPV	2	99.715	2	99.707	2	99.699
MHE	MITCHELL MUNICIPAL	SD	LPV	2	99.723	2	99.722	2	99.696
MKA	MILLER MUNICIPAL	SD	LPV	2	99.725	2	99.707	2	99.692
PHP	PHILIP	SD	LPV	2	99.740	2	99.729	3	99.707
PIR	PIERRE RGNL	SD	LPV	2	99.731	2	99.722	2	99.692
RAP	RAPID CITY RGNL	SD	LPV200	2	99.764	2	99.737	2	99.711
SPF	BLACK HILLS-CLYDE ICE FLD	SD	LPV	3	99.761	3	99.745	2	99.713
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	3	99.773	2	99.740	2	99.692
VMR	HAROLD DAVIDSON FLD	SD	LPV	4	99.780	3	99.736	2	99.707
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	4	99.774	3	99.737	2	99.707
0A3	SMITHVILLE MUNICIPAL	TN	LPV	1	99.894	1	99.885	1	99.875

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
0M3	PAUL BRIDGES FLD	TN	LP	2	99.917	1	99.893	1	99.882
0M4	BENTON COUNTY	TN	LPV	1	99.895	1	99.895	1	99.879
0M5	HUMPHREYS COUNTY	TN	LP	1	99.894	1	99.894	1	99.879
1A3	MARTIN CAMPBELL FLD	TN	LP	1	99.894	1	99.887	1	99.879
1M5	PORTLAND MUNICIPAL	TN	LPV	1	99.893	1	99.888	1	99.877
2A0	MARK ANTON	TN	LPV	1	99.894	1	99.888	1	99.875
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	2	99.920	1	99.892	1	99.881
2M8	CHARLES W BAKER	TN	LPV	3	99.952	2	99.921	1	99.891
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	1	99.888	1	99.879	1	99.879
3M7	LAFAYETTE MUNICIPAL	TN	LPV	1	99.893	1	99.883	1	99.876
8A3	LIVINGSTON MUNICIPAL	TN	LP	2	99.906	1	99.886	1	99.875
BGF	WINCHESTER MUNICIPAL	TN	LPV	1	99.894	1	99.891	1	99.879
BNA	NASHVILLE INTL	TN	LPV200	1	99.893	1	99.889	1	99.877
CHA	LOVELL FLD	TN	LPV200	1	99.894	1	99.889	1	99.876
CKV	OUTLAW FLD	TN	LPV	1	99.893	1	99.892	1	99.879
CSV	CROSSVILLE MEML-WHITSON FLD	TN	LPV200	1	99.894	1	99.886	1	99.875
DYR	DYERSBURG RGNL	TN	LPV	1	99.898	1	99.898	1	99.879
FYE	FAYETTE COUNTY	TN	LPV	2	99.934	2	99.917	1	99.890
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	1	99.905	1	99.893	1	99.880
GCY	GREENEVILLE MUNICIPAL	TN	LPV	1	99.888	1	99.879	1	99.869
GHM	CENTERVILLE MUNICIPAL	TN	LP	1	99.893	1	99.893	1	99.882
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	1	99.894	1	99.879	1	99.879
GZS	ABERNATHY FLD	TN	LPV	1	99.905	1	99.893	1	99.881
HZD	CARROLL COUNTY	TN	LPV	1	99.895	1	99.895	1	99.879
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	1	99.893	1	99.879	1	99.879
JWN	JOHN C TUNE	TN	LPV	1	99.893	1	99.890	1	99.877
LUG	ELLINGTON	TN	LPV	1	99.894	1	99.890	1	99.881
M01	GENERAL DEWITT SPAIN	TN	LPV	3	99.954	2	99.922	1	99.891
M08	WILLIAM L WHITEHURST FLD	TN	LP	2	99.932	1	99.897	1	99.889
M53	HUMBOLDT MUNICIPAL	TN	LPV	1	99.897	1	99.897	1	99.879
M54	LEBANON MUNICIPAL	TN	LPV	1	99.893	1	99.887	1	99.876
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	1	99.893	1	99.890	1	99.875
MBT	MURFREESBORO MUNICIPAL	TN	LPV	1	99.894	1	99.888	1	99.876
MEM	MEMPHIS INTL	TN	LPV200	2	99.954	2	99.925	1	99.891
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	2	99.924	1	99.897	1	99.879
MMI	MCMINN COUNTY	TN	LPV	1	99.894	1	99.887	1	99.879
MNV	MONROE COUNTY	TN	LPV	1	99.894	1	99.886	1	99.879

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MOR	MOORE-MURRELL	TN	LPV	1	99.894	1	99.879	1	99.879
MQY	SMYRNA	TN	LPV200	1	99.893	1	99.889	1	99.877
MRC	MAURY COUNTY RGNL	TN	LPV	1	99.894	1	99.892	1	99.881
NQA	MILLINGTON/MEMPHIS	TN	LPV200	3	99.951	2	99.919	1	99.891
PHT	HENRY COUNTY	TN	LPV200	1	99.895	1	99.895	1	99.879
PVE	BEECH RIVER RGNL	TN	LPV	2	99.907	1	99.895	1	99.879
RKW	ROCKWOOD MUNICIPAL	TN	LPV	1	99.894	1	99.886	1	99.875
RNC	WARREN COUNTY MEML	TN	LPV	1	99.894	1	99.886	1	99.875
RVN	HAWKINS COUNTY	TN	LP	1	99.888	1	99.879	1	99.869
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	1	99.894	1	99.888	1	99.875
SCX	SCOTT MUNICIPAL	TN	LPV	1	99.893	1	99.879	1	99.879
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	2	99.926	1	99.895	1	99.887
SRB	UPPER CUMBERLAND RGNL	TN	LPV	1	99.893	1	99.882	1	99.875
SYI	BOMAR FLD/SHELBYVILLE MUNICIPAL	TN	LPV	1	99.894	1	99.889	1	99.880
SZY	ROBERT SIBLEY	TN	LPV	2	99.928	1	99.895	1	99.888
TGC	GIBSON COUNTY	TN	LP	1	99.897	1	99.897	1	99.879
THA	TULLAHOMA RGNL/WM NORTHERN FLD	TN	LPV	1	99.894	1	99.891	1	99.879
TRI	TRI-CITIES	TN	LPV200	1	99.888	1	99.879	1	99.861
TYS	MC GHEE TYSON	TN	LPV200	1	99.894	1	99.882	1	99.879
UCY	EVERETT-STEWART RGNL	TN	LPV200	1	99.897	1	99.897	1	99.879
XNX	MUSIC CITY EXEC	TN	LPV	1	99.893	1	99.888	1	99.877
0F2	BOWIE MUNICIPAL	TX	LPV	1	99.960	1	99.948	1	99.929
11R	BRENHAM MUNICIPAL	TX	LPV	1	99.952	1	99.940	1	99.918
2R9	KENEDY RGNL	TX	LP	1	99.940	1	99.929	1	99.908
3R9	LAKEWAY AIRPARK	TX	LP	1	99.952	1	99.937	1	99.923
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	1	99.952	1	99.934	1	99.916
41F	FLOYDADA MUNICIPAL	TX	LP	1	99.952	1	99.948	1	99.926
45R	HAWTHORNE FLD	TX	LP	1	99.968	1	99.945	1	99.918
4T2	KENNETH COPELAND	TX	LPV	1	99.956	1	99.946	1	99.935
50R	LOCKHART MUNICIPAL	TX	LPV	1	99.952	1	99.937	1	99.916
5C1	BOERNE STAGE FLD	TX	LP	1	99.949	1	99.938	1	99.920
5T9	MAVERICK COUNTY MEML INTL	TX	LPV	1	99.938	1	99.926	1	99.920
60R	NAVASOTA MUNICIPAL	TX	LPV	1	99.952	1	99.945	1	99.921
6R3	CLEVELAND MUNICIPAL	TX	LPV	1	99.967	1	99.945	1	99.919
77F	WINTERS MUNICIPAL	TX	LP	1	99.956	1	99.946	1	99.933
8F3	CROSBYTON MUNICIPAL	TX	LP	1	99.952	1	99.948	1	99.926
ABI	ABILENE RGNL	TX	LPV200	1	99.956	1	99.950	1	99.937

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ACT	WACO RGNL	TX	LPV200	1	99.964	1	99.945	1	99.935
ADS	ADDISON	TX	LPV	1	99.960	1	99.952	1	99.934
AFW	FORT WORTH ALLIANCE	TX	LPV200	1	99.957	1	99.946	1	99.935
ALI	ALICE INTL	TX	LPV	1	99.924	1	99.913	1	99.908
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	1	99.956	1	99.948	1	99.927
ARM	WHARTON RGNL	TX	LPV	1	99.952	1	99.921	1	99.908
ASL	HARRISON COUNTY	TX	LPV	1	99.967	1	99.961	1	99.929
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	1	99.952	1	99.936	1	99.919
AXH	HOUSTON/SOUTHWEST	TX	LPV	1	99.952	2	99.932	1	99.908
BAZ	NEW BRAUNFELS NTL	TX	LPV	1	99.951	1	99.937	1	99.919
BBD	CURTIS FLD	TX	LPV	1	99.952	1	99.940	1	99.923
BEA	BEEVILLE MUNICIPAL	TX	LPV	1	99.926	1	99.918	1	99.908
BFE	TERRY COUNTY	TX	LPV	1	99.956	1	99.951	1	99.927
BGD	HUTCHINSON COUNTY	TX	LPV	1	99.953	1	99.944	1	99.921
BKD	STEPHENS COUNTY	TX	LP	1	99.956	1	99.952	1	99.939
BKS	BROOKS COUNTY	TX	LPV	1	99.923	1	99.913	1	99.908
BMT	BEAUMONT MUNICIPAL	TX	LPV	1	99.964	1	99.942	1	99.913
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	1	99.948	1	99.946	1	99.934
BPT	JACK BROOKS RGNL	TX	LPV200	1	99.964	1	99.940	1	99.912
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	1	99.908	1	99.908	4	99.889
BWD	BROWNWOOD RGNL	TX	LPV	1	99.955	1	99.945	1	99.931
BYY	BAY CITY RGNL	TX	LPV	1	99.945	1	99.921	1	99.908
CDS	CHILDRESS MUNICIPAL	TX	LPV200	1	99.952	1	99.945	1	99.926
CFD	COULTER FLD	TX	LPV	1	99.952	1	99.943	1	99.922
CLL	EASTERWOOD FLD	TX	LPV200	1	99.952	1	99.942	1	99.922
CNW	TSTC WACO	TX	LPV200	1	99.965	1	99.945	1	99.934
COM	COLEMAN MUNICIPAL	TX	LPV	1	99.955	1	99.945	1	99.931
COT	COTULLA-LA SALLE COUNTY	TX	LPV	1	99.930	1	99.923	1	99.908
CPT	CLEBURNE RGNL	TX	LPV	1	99.958	1	99.952	1	99.935
CRP	CORPUS CHRISTI INTL	TX	LPV200	1	99.922	1	99.913	1	99.908
CVB	CASTROVILLE MUNICIPAL	TX	LPV	1	99.948	1	99.938	1	99.910
CWC	KICKAPOO DOWNTOWN	TX	LPV	1	99.956	1	99.941	1	99.927
CXO	CONROE/NORTH HOUSTON RGNL	TX	LPV200	1	99.967	1	99.945	1	99.919
CZT	DIMMIT COUNTY	TX	LPV	1	99.933	1	99.923	1	99.908
DAL	DALLAS LOVE FLD	TX	LPV200	1	99.966	1	99.952	1	99.936
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	1	99.958	1	99.952	1	99.934
DHT	DALHART MUNICIPAL	TX	LPV	1	99.959	1	99.946	1	99.923

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
DKR	HOUSTON COUNTY	TX	LP	1	99.979	2	99.974	1	99.922
DRT	DEL RIO INTL	TX	LPV	1	99.946	1	99.937	1	99.920
DTO	DENTON ENTERPRISE	TX	LPV200	1	99.952	1	99.943	1	99.934
DUX	MOORE COUNTY	TX	LPV200	1	99.956	1	99.944	1	99.920
DWH	DAVID WAYNE HOOKS MEML	TX	LPV	1	99.952	2	99.938	1	99.916
E01	ROY HURD MEML	TX	LP	1	99.951	1	99.948	1	99.930
E11	ANDREWS COUNTY	TX	LPV	1	99.952	1	99.948	1	99.939
E19	GRUVER MUNICIPAL	TX	LP	1	99.943	1	99.935	1	99.920
E30	BRUCE FLD	TX	LPV	1	99.952	1	99.942	1	99.929
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	1	99.948	1	99.946	1	99.924
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	1	99.919	1	99.908	2	99.898
EDC	AUSTIN EXEC	TX	LPV200	1	99.952	1	99.937	1	99.919
EFD	ELLINGTON	TX	LPV200	1	99.952	2	99.935	1	99.908
ELA	EAGLE LAKE	TX	LP	1	99.952	1	99.923	1	99.908
ELP	EL PASO INTL	TX	LP	1	99.953	1	99.948	60	99.779
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	1	99.952	1	99.940	1	99.922
ETN	EASTLAND MUNICIPAL	TX	LP	1	99.956	1	99.952	1	99.939
F00	JONES FLD	TX	LPV	1	99.973	1	99.953	1	99.932
F05	WILBARGER COUNTY	TX	LPV	1	99.952	1	99.943	1	99.927
F49	CITY OF SLATON/LARRY T NEAL ME	TX	LPV	1	99.953	1	99.949	1	99.926
F98	YOAKUM COUNTY	TX	LPV	1	99.953	1	99.948	1	99.928
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	1	99.953	1	99.948	1	99.926
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	1	99.957	1	99.952	1	99.935
FWS	FORT WORTH SPINKS	TX	LPV200	1	99.958	1	99.952	1	99.935
GDJ	GRANBURY RGNL	TX	LPV	1	99.957	1	99.952	1	99.936
GGG	EAST TEXAS RGNL	TX	LPV	1	99.974	1	99.968	1	99.927
GKY	ARLINGTON MUNICIPAL	TX	LPV200	1	99.958	1	99.952	1	99.935
GLE	GAINESVILLE MUNICIPAL	TX	LPV	1	99.967	1	99.951	1	99.931
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	1	99.952	1	99.918	1	99.908
GNC	GAINES COUNTY	TX	LPV	1	99.952	1	99.948	1	99.930
GRK	ROBERT GRAY AAF	TX	LPV200	1	99.955	1	99.943	1	99.923
GTU	GEORGETOWN MUNICIPAL	TX	LPV	1	99.952	1	99.942	1	99.923
GVT	MAJORS	TX	LPV200	1	99.967	1	99.961	1	99.932
GYI	NORTH TEXAS RGNL/PERRIN FLD	TX	LPV200	1	99.967	1	99.951	1	99.934
GZN	GREGORY M SIMMONS MEML	TX	LPV	1	99.956	1	99.950	1	99.939
HBV	JIM HOGG COUNTY	TX	LPV	1	99.923	1	99.913	1	99.908
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	1	99.948	1	99.938	1	99.912

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HHF	HEMPHILL COUNTY	TX	LPV	1	99.948	1	99.940	1	99.922
HOU	WILLIAM P HOBBY	TX	LPV200	1	99.952	2	99.935	1	99.912
HQZ	MESQUITE METRO	TX	LPV	1	99.960	1	99.952	1	99.937
HRL	VALLEY INTL	TX	LPV200	1	99.919	1	99.908	2	99.898
HRX	HEREFORD MUNICIPAL	TX	LPV200	1	99.956	1	99.950	1	99.927
HYI	SAN MARCOS RGNL	TX	LPV200	1	99.952	1	99.937	1	99.916
IAH	GEORGE BUSH INTCNTL/HOUSTON	TX	LPV200	2	99.966	2	99.936	1	99.915
IKG	KLEBERG COUNTY	TX	LPV	1	99.924	1	99.913	1	99.908
ILE	SKYLARK FLD	TX	LPV200	1	99.956	1	99.943	1	99.923
INJ	HILLSBORO MUNICIPAL	TX	LPV	1	99.959	1	99.956	1	99.934
INK	WINKLER COUNTY	TX	LPV200	1	99.952	1	99.948	1	99.930
IWS	WEST HOUSTON	TX	LP	1	99.952	2	99.936	1	99.915
JAS	JASPER COUNTY/BELL FLD	TX	LPV	1	99.979	1	99.971	1	99.922
JSO	CHEROKEE COUNTY	TX	LPV	1	99.976	1	99.970	1	99.938
JWY	MID-WAY RGNL	TX	LPV200	1	99.959	1	99.952	1	99.934
JXI	FOX STEPHENS FLD - GILMER MUNICIPAL	TX	LP	1	99.967	1	99.959	1	99.938
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	1	99.952	1	99.950	1	99.926
LBX	TEXAS GULF COAST RGNL	TX	LPV	1	99.952	1	99.919	1	99.908
LFK	ANGELINA COUNTY	TX	LPV	1	99.982	1	99.971	1	99.923
LHB	HEARNE MUNICIPAL	TX	LPV200	1	99.952	1	99.943	1	99.922
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	1	99.956	1	99.951	1	99.927
LLN	LEVELLAND MUNICIPAL	TX	LPV	1	99.956	1	99.951	1	99.927
LNC	LANCASTER RGNL	TX	LPV200	1	99.964	1	99.952	1	99.936
LRD	LAREDO INTL	TX	LPV200	1	99.924	1	99.916	1	99.908
LUD	DECATUR MUNICIPAL	TX	LPV	1	99.952	1	99.942	1	99.931
LUV	LAMESA MUNICIPAL	TX	LPV200	1	99.951	1	99.947	1	99.929
LVJ	PEARLAND RGNL	TX	LPV	1	99.952	2	99.935	1	99.908
LXY	MEXIA-LIMESTONE COUNTY	TX	LP	1	99.969	1	99.957	1	99.933
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	1	99.950	1	99.948	1	99.934
MDD	MIDLAND AIRPARK	TX	LPV	1	99.950	1	99.947	1	99.934
MFE	MC ALLEN MILLER INTL	TX	LPV200	1	99.919	1	99.908	5	99.895
MKN	COMANCHE COUNTY-CITY	TX	LPV	1	99.956	1	99.947	1	99.933
MNZ	HAMILTON MUNICIPAL	TX	LPV	1	99.956	1	99.945	1	99.931
MWL	MINERAL WELLS RGNL	TX	LPV200	1	99.956	1	99.952	1	99.937
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	1	99.982	1	99.969	1	99.923
ODO	ODESSA-SCHLEMEYER FLD	TX	LPV200	1	99.951	1	99.948	1	99.934
ONY	OLNEY MUNICIPAL	TX	LPV	1	99.952	1	99.942	1	99.926

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ORG	ORANGE COUNTY	TX	LPV	1	99.965	1	99.942	1	99.913
PEQ	PECOS MUNICIPAL	TX	LPV200	1	99.951	1	99.948	1	99.926
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	1	99.912	1	99.908	2	99.899
PKV	CALHOUN COUNTY	TX	LPV	1	99.935	1	99.919	1	99.908
PPA	PERRY LEFORS FLD	TX	LPV	1	99.952	1	99.943	1	99.922
PRX	COX FLD	TX	LPV	1	99.967	1	99.951	1	99.938
PSX	PALACIOS MUNICIPAL	TX	LPV	1	99.937	1	99.922	1	99.908
PVW	HALE COUNTY	TX	LPV	1	99.952	1	99.949	1	99.926
PWG	MC GREGOR EXEC	TX	LPV	1	99.959	1	99.945	1	99.932
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	1	99.934	1	99.932	1	99.920
RAS	MUSTANG BEACH	TX	LPV	1	99.921	1	99.913	1	99.908
RBD	DALLAS EXEC	TX	LPV200	1	99.959	1	99.952	1	99.935
RBO	NUECES COUNTY	TX	LPV	1	99.922	1	99.913	1	99.908
RKP	ARANSAS COUNTY	TX	LPV	1	99.920	1	99.913	1	99.908
RYW	LAGO VISTA TX/RUSTY ALLEN	TX	LPV	1	99.952	1	99.937	1	99.923
SAT	SAN ANTONIO INTL	TX	LPV200	1	99.948	1	99.938	1	99.913
SGR	SUGAR LAND RGNL	TX	LPV200	1	99.952	2	99.936	1	99.908
SJT	SAN ANGELO RGNL/MATHIS FLD	TX	LPV	1	99.952	1	99.943	1	99.926
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV	1	99.967	1	99.959	1	99.937
SNK	WINSTON FLD	TX	LPV200	1	99.952	1	99.951	1	99.938
SWI	SHERMAN MUNICIPAL	TX	LP	1	99.967	1	99.953	1	99.934
SWW	AVENGER FLD	TX	LPV	1	99.952	1	99.950	1	99.937
T23	ALBANY MUNICIPAL	TX	LPV	1	99.956	1	99.951	1	99.940
T41	LA PORTE MUNICIPAL	TX	LPV	1	99.952	2	99.935	1	99.912
T74	TAYLOR MUNICIPAL	TX	LPV	1	99.952	1	99.941	1	99.923
T78	LIBERTY MUNICIPAL	TX	LP	1	99.964	1	99.942	1	99.915
T82	GILLESPIE COUNTY	TX	LPV	1	99.952	1	99.940	1	99.923
TDW	TRADEWIND	TX	LPV	1	99.956	1	99.948	1	99.927
TFP	MCCAMPBELL-PORTER	TX	LPV	1	99.921	1	99.913	1	99.908
TKI	MCKINNEY NTL	TX	LPV200	1	99.967	1	99.953	1	99.933
TME	HOUSTON EXEC	TX	LPV	1	99.952	2	99.937	1	99.915
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	1	99.956	1	99.943	1	99.923
TRL	TERRELL MUNICIPAL	TX	LPV	1	99.967	1	99.952	1	99.937
TX2	CHASE FLD INDUSTRIAL	TX	LPV	1	99.926	1	99.917	1	99.908
TXW	MID VALLEY	TX	LPV	1	99.919	1	99.908	3	99.897
TYR	TYLER POUNDS RGNL	TX	LPV200	1	99.971	1	99.964	1	99.937
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	1	99.967	1	99.948	1	99.920

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VCT	VICTORIA RGNL	TX	LPV200	1	99.937	1	99.924	1	99.908
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	1	99.952	1	99.942	1	99.930
41U	MANTI-EPHRAIM	UT	LPV	1	99.996	1	99.960	1	99.944
74V	ROOSEVELT MUNICIPAL	UT	LPV	1	99.982	1	99.953	1	99.937
BCE	BRYCE CANYON	UT	LPV	0	100	1	99.963	1	99.950
BDG	BLANDING MUNICIPAL	UT	LPV	0	100	1	99.959	1	99.945
BMC	BRIGHAM CITY RGNL	UT	LP	2	99.963	2	99.940	4	99.860
CDC	CEDAR CITY RGNL	UT	LPV	0	100	1	99.963	1	99.950
CNY	CANYONLANDS RGNL	UT	LP	0	100	1	99.958	1	99.938
DTA	DELTA MUNICIPAL	UT	LP	0	100	1	99.960	1	99.946
ENV	WENDOVER	UT	LPV	1	99.985	1	99.956	3	99.935
FOM	FILLMORE MUNICIPAL	UT	LPV	0	100	1	99.960	1	99.947
LGU	LOGAN-CACHE	UT	LPV	3	99.941	2	99.927	3	99.812
OGD	OGDEN-HINCKLEY	UT	LPV	1	99.963	1	99.942	4	99.881
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	1	99.984	1	99.959	1	99.939
PVU	PROVO MUNICIPAL	UT	LPV200	1	99.982	1	99.960	1	99.938
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	1	99.960	1	99.946
SGU	ST GEORGE RGNL	UT	LPV	0	100	1	99.963	1	99.950
SLC	SALT LAKE CITY INTL	UT	LPV200	1	99.982	1	99.953	4	99.934
SPK	SPANISH FORK MUNICIPAL/WOODHOUSE FL	UT	LP	1	99.982	1	99.960	1	99.938
TVY	BOLINDER FLD-TOOELE VALLEY	UT	LPV200	1	99.982	1	99.956	2	99.936
U14	NEPHI MUNICIPAL	UT	LPV	1	99.982	1	99.960	1	99.941
U42	SOUTH VALLEY RGNL	UT	LPV	1	99.982	1	99.955	3	99.935
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	1	99.963	1	99.947
VEL	VERNAL RGNL	UT	LPV	1	99.981	1	99.952	2	99.936
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	1	99.879	1	99.862	1	99.842
0VG	LEE COUNTY	VA	LPV	1	99.888	1	99.879	1	99.879
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	1	99.879	1	99.856	1	99.834
BCB	VIRGINIA TECH/MONTGOMERY EXEC	VA	LPV	1	99.879	1	99.870	1	99.842
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	1	99.872	1	99.853	1	99.834
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	1	99.870	1	99.853	1	99.842
CJR	CULPEPER RGNL	VA	LPV	1	99.868	1	99.853	1	99.839
CPK	CHESAPEAKE RGNL	VA	LPV200	1	99.863	1	99.853	1	99.831
DAN	DANVILLE RGNL	VA	LPV200	1	99.879	1	99.868	1	99.842
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	1	99.866	1	99.853	1	99.834
FCI	RICHMOND EXEC/CHESTERFIELD COU	VA	LPV	1	99.868	1	99.853	1	99.834
FKN	FRANKLIN RGNL	VA	LPV	1	99.864	1	99.853	1	99.833

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FVX	FARMVILLE RGNL	VA	LPV	1	99.879	1	99.853	1	99.842
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	1	99.864	1	99.853	1	99.831
HLX	TWIN COUNTY	VA	LPV	1	99.879	1	99.876	1	99.842
HSP	INGALLS FLD	VA	LPV	1	99.879	2	99.868	1	99.842
HWY	WARRENTON/FAUQUIER	VA	LPV200	1	99.868	1	99.853	1	99.839
JFZ	TAZEWELL COUNTY	VA	LPV	1	99.882	1	99.879	1	99.843
JYO	LEESBURG EXEC	VA	LPV	1	99.861	1	99.857	1	99.838
LKU	LOUISA COUNTY/FREEMAN FLD	VA	LPV	1	99.869	1	99.853	1	99.842
LNP	LONESOME PINE	VA	LPV	1	99.883	1	99.879	1	99.874
LUA	LURAY CAVERNS	VA	LP	1	99.868	1	99.853	1	99.842
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	1	99.879	1	99.863	1	99.842
MFV	ACCOMACK COUNTY	VA	LPV	1	99.861	1	99.853	1	99.828
MKJ	MOUNTAIN EMPIRE	VA	LPV	1	99.882	1	99.877	1	99.842
MTV	BLUE RIDGE	VA	LPV	1	99.879	1	99.871	1	99.842
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	1	99.868	1	99.853	1	99.834
OKV	WINCHESTER RGNL	VA	LPV200	1	99.858	1	99.853	1	99.839
ORF	NORFOLK INTL	VA	LPV200	1	99.863	1	99.853	1	99.828
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	1	99.863	1	99.853	1	99.830
PSK	NEW RIVER VALLEY	VA	LPV200	1	99.879	1	99.873	1	99.842
PTB	DINWIDDIE COUNTY	VA	LPV	1	99.870	1	99.853	1	99.834
PVG	HAMPTON ROADS EXEC	VA	LPV200	1	99.863	1	99.853	1	99.831
RIC	RICHMOND INTL	VA	LPV200	1	99.865	1	99.853	1	99.834
RMN	STAFFORD RGNL	VA	LPV	1	99.872	1	99.857	1	99.831
ROA	ROANOKE/BLACKSBURG RGNL (WOODR	VA	LPV	1	99.879	1	99.868	1	99.842
SFQ	SUFFOLK EXEC	VA	LPV	1	99.864	1	99.853	1	99.831
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	1	99.869	1	99.853	1	99.842
VJI	VIRGINIA HIGHLANDS	VA	LPV	1	99.883	1	99.879	1	99.849
W78	WILLIAM M TUCK	VA	LPV	1	99.879	1	99.863	1	99.842
W96	NEW KENT COUNTY	VA	LP	1	99.865	1	99.853	1	99.834
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	1	99.864	1	99.857	1	99.831
XSA	TAPPAHANNOCK/ESSEX COUNTY	VA	LPV	1	99.864	1	99.853	1	99.831
BTV	BURLINGTON INTL	VT	LPV200	1	99.861	1	99.861	1	99.847
EFK	NORTHEAST KINGDOM INTL	VT	LP	1	99.861	1	99.861	1	99.847
FSO	FRANKLIN COUNTY STATE	VT	LPV	1	99.861	1	99.861	1	99.847
MPV	EDWARD F KNAPP STATE	VT	LPV	1	99.861	1	99.861	1	99.847
MVL	MORRISVILLE-STOWE STATE	VT	LPV	1	99.861	1	99.861	1	99.847
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	1	99.850	1	99.850	1	99.850

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ALW	WALLA WALLA RGNL	WA	LPV200	2	99.850	2	99.772	4	99.735
AWO	ARLINGTON MUNICIPAL	WA	LPV200	2	99.788	3	99.752	3	99.734
BLI	BELLINGHAM INTL	WA	LPV200	2	99.788	2	99.751	3	99.728
BVS	SKAGIT RGNL	WA	LPV	2	99.788	2	99.751	3	99.733
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	2	99.785	3	99.749	3	99.729
CLS	CHEHALIS-CENTRALIA	WA	LPV	2	99.832	3	99.758	3	99.738
DEW	DEER PARK	WA	LPV	3	99.803	2	99.751	5	99.710
EPH	EPHRATA MUNICIPAL	WA	LPV	3	99.826	3	99.765	4	99.725
FHR	FRIDAY HARBOR	WA	LPV	2	99.785	3	99.748	3	99.726
GEG	SPOKANE INTL	WA	LPV200	2	99.825	2	99.752	5	99.712
HQM	BOWERMAN	WA	LPV200	3	99.831	3	99.754	3	99.732
KLS	SOUTHWEST WASHINGTON RGNL	WA	LPV	2	99.847	3	99.755	4	99.736
MWH	GRANT COUNTY INTL	WA	LPV200	2	99.843	3	99.765	4	99.723
OLM	OLYMPIA RGNL	WA	LPV200	4	99.831	3	99.758	3	99.737
ORS	ORCAS ISLAND	WA	LP	2	99.785	3	99.749	3	99.724
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	2	99.788	3	99.750	3	99.737
PLU	PIERCE COUNTY - THUN FLD	WA	LPV	3	99.808	3	99.753	3	99.738
PSC	TRI-CITIES	WA	LPV200	2	99.850	3	99.769	4	99.720
PWT	BREMERTON NTL	WA	LPV200	2	99.788	3	99.751	3	99.736
RLD	RICHLAND	WA	LPV	2	99.847	3	99.768	4	99.720
RNT	RENTON MUNICIPAL	WA	LPV	2	99.788	3	99.752	3	99.737
SEA	SEATTLE-TACOMA INTL	WA	LPV200	2	99.788	3	99.753	3	99.737
SFF	FELTS FLD	WA	LPV	2	99.825	2	99.752	5	99.710
SHN	SANDERSON FLD	WA	LPV	3	99.805	3	99.752	3	99.736
TDO	ED CARLSON MEML FLD - SOUTH LE	WA	LPV	2	99.835	3	99.755	3	99.739
TIW	TACOMA NARROWS	WA	LPV	3	99.804	3	99.753	3	99.737
YKM	YAKIMA AIR TRML/MCALLISTER FLD	WA	LPV200	2	99.847	3	99.771	4	99.725
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	3	99.732	2	99.718	2	99.703
57C	EAST TROY MUNICIPAL	WI	LPV	2	99.865	3	99.845	4	99.794
61C	FORT ATKINSON MUNICIPAL	WI	LP	3	99.860	5	99.833	3	99.775
82C	MAUSTON/NEW LISBON UNION	WI	LP	3	99.834	3	99.787	2	99.731
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	3	99.849	5	99.825	3	99.774
AHH	AMERY MUNICIPAL	WI	LP	3	99.730	2	99.718	2	99.703
AIG	LANGLADE COUNTY	WI	LPV	3	99.794	3	99.750	2	99.724
ARV	LAKELAND/NOBLE F LEE MEML FLD	WI	LPV	3	99.763	2	99.722	2	99.696
ASX	JOHN F KENNEDY MEML	WI	LPV	2	99.733	2	99.718	2	99.689
ATW	APPLETON INTL	WI	LPV200	3	99.841	4	99.798	3	99.741

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AUW	WAUSAU DOWNTOWN	WI	LPV200	4	99.808	4	99.754	2	99.718
BCK	BLACK RIVER FALLS AREA	WI	LPV	3	99.789	3	99.740	2	99.715
BUU	BURLINGTON MUNICIPAL	WI	LP	2	99.866	3	99.847	4	99.796
C29	MIDDLETON MUNICIPAL/MOREY FLD	WI	LPV	3	99.850	4	99.805	3	99.759
C35	REEDSBURG MUNICIPAL	WI	LP	3	99.840	4	99.799	2	99.742
C47	PORTAGE MUNICIPAL	WI	LP	3	99.843	4	99.802	2	99.742
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	3	99.834	3	99.785	2	99.726
CMY	SPARTA/FORT MC COY	WI	LPV	4	99.816	4	99.762	2	99.715
CWA	CENTRAL WISCONSIN	WI	LPV200	4	99.819	4	99.763	2	99.726
DLL	BARABOO/WISCONSIN DELLS RGNL	WI	LPV	3	99.842	4	99.801	2	99.742
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	3	99.737	2	99.718	2	99.703
EGV	EAGLE RIVER UNION	WI	LPV	3	99.763	2	99.722	2	99.696
ENW	KENOSHA RGNL	WI	LPV200	2	99.868	2	99.853	4	99.798
ETB	WEST BEND MUNICIPAL	WI	LPV	2	99.858	4	99.835	3	99.777
EZS	SHAWANO MUNICIPAL	WI	LPV	3	99.826	3	99.784	2	99.722
FLD	FOND DU LAC COUNTY	WI	LPV	3	99.847	5	99.821	3	99.777
GRB	GREEN BAY/AUSTIN STRAUBEL INTL	WI	LPV200	3	99.839	3	99.797	3	99.742
GTG	GRANTSBURG MUNICIPAL	WI	LP	3	99.727	2	99.715	2	99.703
HXF	HARTFORD MUNICIPAL	WI	LPV	2	99.858	4	99.834	3	99.776
HYR	SAWYER COUNTY	WI	LPV	4	99.744	2	99.718	2	99.697
ISW	ALEXANDER FLD SOUTH WOOD COUNT	WI	LPV	3	99.831	3	99.772	2	99.726
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	3	99.863	4	99.827	3	99.777
LNR	TRI-COUNTY RGNL	WI	LPV	3	99.844	4	99.801	2	99.741
LSE	LA CROSSE RGNL	WI	LPV	3	99.797	3	99.736	2	99.715
LUM	MENOMONIE MUNICIPAL/SCORE FLD	WI	LPV	3	99.734	2	99.718	2	99.703
MDZ	TAYLOR COUNTY	WI	LPV	2	99.747	2	99.722	2	99.707
MFI	MARSHFIELD MUNICIPAL	WI	LPV	4	99.803	4	99.753	2	99.718
MKE	GENERAL MITCHELL INTL	WI	LPV200	2	99.863	3	99.848	4	99.791
MRJ	IOWA COUNTY	WI	LPV200	3	99.848	4	99.803	2	99.740
MSN	DANE COUNTY RGNL/TRUAX FLD	WI	LPV200	3	99.851	5	99.817	3	99.760
MTW	MANITOWOC COUNTY	WI	LPV200	3	99.848	5	99.831	3	99.769
MWC	LAWRENCE J TIMMERMAN	WI	LPV	2	99.861	3	99.844	4	99.789
OCQ	OCONTO/J DOUGLAS BAKE MUNICIPAL	WI	LP	3	99.834	3	99.794	3	99.731
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	2	99.718	2	99.718	2	99.703
OSH	WITTMAN RGNL	WI	LPV200	3	99.844	4	99.799	3	99.759
OVS	BOSCOBEL	WI	LPV	3	99.839	3	99.788	2	99.736
PBH	PRICE COUNTY	WI	LPV	4	99.758	2	99.721	2	99.701

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PCZ	WAUPACA MUNICIPAL	WI	LPV	3	99.837	4	99.797	2	99.727
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	3	99.852	4	99.804	3	99.752
RAC	BATTEN INTL	WI	LPV	2	99.866	2	99.853	4	99.796
RCX	RUSK COUNTY	WI	LPV	3	99.737	2	99.718	2	99.703
RHI	RHINELANDER/ONEIDA COUNTY	WI	LPV200	4	99.784	3	99.742	2	99.701
RNH	NEW RICHMOND RGNL	WI	LPV	2	99.718	2	99.718	2	99.703
RPD	RICE LAKE RGNL/CARL'S FLD	WI	LPV200	3	99.731	2	99.718	2	99.703
RRL	MERRILL MUNICIPAL	WI	LPV	3	99.771	3	99.742	2	99.707
SBM	SHEBOYGAN COUNTY MEML	WI	LPV200	3	99.853	5	99.834	3	99.773
STE	STEVENS POINT MUNICIPAL	WI	LPV	3	99.824	3	99.773	2	99.726
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	3	99.837	3	99.800	3	99.740
SUW	RICHARD I BONG	WI	LP	4	99.744	2	99.718	2	99.673
TKV	TOMAHAWK RGNL	WI	LP	2	99.750	2	99.722	2	99.707
UBE	CUMBERLAND MUNICIPAL	WI	LPV	3	99.731	2	99.718	2	99.703
UES	WAUKESHA COUNTY	WI	LPV200	2	99.862	3	99.842	4	99.788
UNU	DODGE COUNTY	WI	LPV	3	99.853	5	99.824	3	99.776
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	3	99.788	3	99.740	2	99.715
Y50	WAUTOMA MUNICIPAL	WI	LP	3	99.840	4	99.799	2	99.730
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	3	99.772	3	99.743	2	99.705
Y72	BLOYER FLD	WI	LP	3	99.828	3	99.766	2	99.718
3I2	MASON COUNTY	WV	LPV	1	99.879	1	99.877	1	99.856
6L4	LOGAN COUNTY	WV	LPV	1	99.882	1	99.879	1	99.845
BKW	RALEIGH COUNTY MEML	WV	LPV200	1	99.879	1	99.876	1	99.842
BLF	MERCER COUNTY	WV	LPV	1	99.879	1	99.876	1	99.842
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	1	99.872	1	99.853	1	99.842
CRW	WEST VIRGINIA INTL YEAGER	WV	LPV200	1	99.879	1	99.876	1	99.842
HLG	WHEELING OHIO COUNTY	WV	LPV200	1	99.867	1	99.853	1	99.842
HTS	TRI-STATE/MILTON J FERGUSON FL	WV	LPV200	1	99.879	1	99.879	1	99.873
I18	JACKSON COUNTY	WV	LPV200	1	99.879	1	99.876	1	99.843
LWB	GREENBRIER VALLEY	WV	LPV	1	99.879	1	99.868	1	99.842
MGW	MORGANTOWN MUNICIPAL (WALTER L BILL	WV	LPV200	1	99.868	1	99.853	1	99.842
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	1	99.857	1	99.857	1	99.838
PKB	MID-OHIO VALLEY RGNL	WV	LPV	1	99.879	1	99.874	1	99.843
USW	BOGGS FLD	WV	LPV	1	99.879	1	99.875	1	99.842
W22	UPSHUR COUNTY RGNL	WV	LPV	1	99.876	1	99.853	1	99.842
W35	POTOMAC AIRPARK	WV	LP	1	99.854	1	99.853	1	99.837
W99	GRANT COUNTY	WV	LP	1	99.868	1	99.853	1	99.842

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BYG	JOHNSON COUNTY	WY	LPV	2	99.799	2	99.758	2	99.713
COD	YELLOWSTONE RGNL	WY	LPV	3	99.832	2	99.774	3	99.739
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	2	99.856	3	99.792	2	99.748
CYS	CHEYENNE RGNL/JERRY OLSON FLD	WY	LPV200	3	99.907	4	99.880	4	99.819
DGW	CONVERSE COUNTY	WY	LPV200	5	99.863	4	99.806	2	99.743
DWX	DIXON	WY	LP	2	99.962	2	99.925	4	99.849
EAN	PHIFER AIRFIELD	WY	LPV200	3	99.894	4	99.858	2	99.752
ECS	MONDELL FLD	WY	LPV	3	99.800	2	99.764	2	99.714
EMM	KEMMERER MUNICIPAL	WY	LPV	3	99.924	3	99.924	3	99.810
EVW	EVANSTON-UINTA COUNTY BURNS FL	WY	LPV	1	99.963	1	99.938	4	99.862
FBR	FORT BRIDGER	WY	LP	2	99.962	2	99.937	4	99.843
GCC	NORTHEAST WYOMING RGNL	WY	LPV	2	99.795	3	99.771	2	99.713
GEY	SOUTH BIG HORN COUNTY	WY	LPV	3	99.817	2	99.760	2	99.736
GUR	CAMP GUERNSEY	WY	LP	3	99.893	4	99.857	2	99.747
HSG	HOT SPRINGS COUNTY	WY	LPV	3	99.856	2	99.790	2	99.747
JAC	JACKSON HOLE	WY	LPV200	2	99.864	4	99.819	3	99.747
LAR	LARAMIE RGNL	WY	LPV	2	99.920	3	99.898	3	99.813
LND	HUNT FLD	WY	LPV	2	99.882	4	99.847	3	99.766
PNA	RALPH WENZ FLD	WY	LPV	2	99.883	5	99.866	3	99.772
POY	POWELL MUNICIPAL	WY	LPV	3	99.821	2	99.761	3	99.738
RIW	CENTRAL WYOMING RGNL	WY	LPV200	2	99.866	4	99.824	2	99.752
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	4	99.929	4	99.929	3	99.794
RWL	RAWLINS MUNICIPAL/HARVEY FLD	WY	LPV	3	99.911	4	99.895	3	99.767
SAA	SHIVELY FLD	WY	LPV	3	99.924	4	99.904	4	99.785
SHR	SHERIDAN COUNTY	WY	LPV	2	99.795	2	99.758	2	99.711
U68	NORTH BIG HORN COUNTY	WY	LPV	2	99.798	2	99.757	3	99.715
W43	HULETT MUNICIPAL	WY	LPV	3	99.762	2	99.732	2	99.711
WRL	WORLAND MUNICIPAL	WY	LPV	3	99.837	2	99.788	2	99.740
CAL4	ALBIAN	AB	LPV	2	99.736	2	99.670	3	99.635
CEA3	OLDS-DIDSBURY	AB	LPV	2	99.703	2	99.697	5	99.649
CEB5	FAIRVIEW	AB	LPV	2	99.733	3	99.707	2	99.642
CEC4	JASPER-HINTON	AB	LP	2	99.728	2	99.712	4	99.656
CEH3	PONOKA (LABRIE FIELD)	AB	LPV	2	99.702	3	99.696	5	99.655
CEH5	RED EARTH CREEK	AB	LP	2	99.731	2	99.682	2	99.634
CEH6	PROVOST	AB	LPV	2	99.699	2	99.678	4	99.659
CEN3	THREE HILLS	AB	LPV	2	99.702	2	99.697	5	99.650
CEN5	COLD LAKE REGIONAL	AB	LPV	2	99.713	2	99.667	3	99.626

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CEQ3	CAMROSE	AB	LPV	2	99.701	2	99.686	4	99.655
CET2	CONKLIN (LEISMER)	AB	LPV	2	99.727	2	99.667	3	99.642
CEV3	VEGREVILLE	AB	LPV	2	99.703	2	99.675	4	99.663
CEW3	ST. PAUL	AB	LPV	2	99.710	2	99.668	3	99.628
CEX3	WETASKIWIN REGIONAL	AB	LPV	2	99.702	2	99.682	4	99.661
CEZ3	COOKING LAKE	AB	LPV	2	99.705	2	99.682	3	99.661
CFB6	JOSEPHBURG	AB	LPV	2	99.708	2	99.681	4	99.658
CFM4	DONNELLY	AB	LPV	2	99.734	3	99.696	2	99.645
CYBF	BONNYVILLE	AB	LPV	2	99.712	2	99.667	3	99.623
CYBW	SPRINGBANK	AB	LPV	2	99.735	2	99.715	5	99.650
CYEG	EDMONTON INTL	AB	LPV200	2	99.705	2	99.682	4	99.661
CYFI	FIREBAG	AB	LPV	2	99.736	2	99.669	4	99.629
CYLB	LAC LA BICHE	AB	LPV	2	99.717	2	99.668	3	99.658
CYLL	LLOYDMINSTER	AB	LPV	2	99.701	2	99.671	3	99.657
CYMM	FORT MCMURRAY	AB	LPV200	2	99.729	2	99.667	2	99.640
CYNR	HORIZON	AB	LPV	2	99.736	2	99.674	3	99.635
CYOD	GROUP CAPTAIN R.W. MCNAIR	AB	LP	2	99.712	2	99.667	3	99.624
CYOJ	HIGH LEVEL	AB	LPV	2	99.745	2	99.687	2	99.640
CYOP	RAINBOW LAKE	AB	LPV	2	99.746	2	99.708	2	99.652
CYPE	PEACE RIVER	AB	LPV	2	99.736	3	99.698	2	99.643
CYPY	FORT CHIPEWYAN	AB	LPV	2	99.733	2	99.675	4	99.629
CYQF	RED DEER REGIONAL	AB	LPV	2	99.702	2	99.696	5	99.647
CYQL	LETHBRIDGE	AB	LPV200	3	99.768	2	99.722	5	99.660
CYQU	GRANDE PRAIRIE	AB	LPV200	2	99.732	3	99.707	3	99.650
CYWM	ATHABASCA	AB	LPV	2	99.721	2	99.675	3	99.648
CYXH	MEDICINE HAT	AB	LPV	2	99.714	2	99.704	5	99.644
CYYC	YYC CALGARY INTL	AB	LPV200	2	99.734	2	99.714	5	99.652
CYZU	WHITECOURT	AB	LPV	3	99.729	3	99.697	2	99.660
CZPC	PINCHER CREEK	AB	LPV	3	99.770	2	99.734	5	99.668
CZVL	VILLENEUVE	AB	LPV	2	99.710	3	99.696	4	99.657
CAJ4	ANAHIM LAKE	BC	LPV	2	99.769	2	99.755	3	99.671
CAJ9	FORT WARE	BC	LP	2	99.776	2	99.744	2	99.676
CAU4	VANDERHOOF	BC	LPV	2	99.770	2	99.758	2	99.667
CBN9	TSAY KEH	BC	LP	2	99.776	2	99.743	2	99.674
CBW4	BOB QUINN LAKE	BC	LP	2	99.766	2	99.744	3	99.695
CYBL	CAMPBELL RIVER	BC	LPV	2	99.772	3	99.752	4	99.692
CYCD	NANAIMO	BC	LPV	2	99.777	3	99.748	3	99.717

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYCZ	FAIRMONT HOT SPRINGS	BC	LPV	3	99.770	2	99.733	5	99.662
CYDL	DEASE LAKE	BC	LP	2	99.771	2	99.740	3	99.697
CYDQ	DAWSON CREEK	BC	LPV	2	99.733	3	99.707	2	99.663
CYKA	KAMLOOPS	BC	LPV	2	99.775	3	99.745	5	99.687
CYLW	KELOWNA	BC	LPV	2	99.777	3	99.742	5	99.707
CYPK	PITT MEADOWS	BC	LPV	2	99.785	2	99.751	3	99.719
CYPR	PRINCE RUPERT	BC	LPV	2	99.765	2	99.744	4	99.695
CYQQ	COMOX	BC	LPV200	2	99.774	3	99.752	4	99.707
CYQZ	QUESNEL	BC	LPV	2	99.765	2	99.744	2	99.671
CYVR	VANCOUVER INTL	BC	LPV200	2	99.777	2	99.751	3	99.719
CYWL	WILLIAMS LAKE	BC	LPV	2	99.769	2	99.741	3	99.669
CYXJ	FORT ST. JOHN	BC	LPV200	2	99.736	2	99.708	2	99.663
CYXS	PRINCE GEORGE	BC	LPV200	2	99.765	2	99.743	2	99.667
CYXT	TERRACE	BC	LPV	2	99.764	2	99.755	2	99.677
CYXX	ABBOTSFORD	BC	LPV	2	99.787	2	99.750	3	99.727
CYYD	SMITHERS	BC	LPV	2	99.766	2	99.755	2	99.673
CYYE	FORT NELSON	BC	LPV200	3	99.769	3	99.730	2	99.668
CYYF	PENTICTON	BC	LPV	2	99.779	3	99.741	4	99.715
CYYJ	VICTORIA INTL	BC	LPV200	2	99.785	3	99.748	3	99.721
CYZP	SANDSPIT	BC	LPV	2	99.766	2	99.755	4	99.701
CYZT	PORT HARDY	BC	LPV	2	99.758	3	99.743	4	99.687
CZBB	BOUNDARY BAY	BC	LPV	2	99.785	2	99.750	3	99.719
CJA3	MORDEN REGIONAL	MB	LPV	2	99.679	2	99.666	3	99.636
CJJ4	DELORAINE	MB	LPV	2	99.683	2	99.653	3	99.634
CJW5	RUSSELL	MB	LPV	2	99.672	2	99.655	3	99.637
CKK7	STEINBACH (SOUTH)	MB	LPV	2	99.685	2	99.659	3	99.637
CKZ7	WINKLER	MB	LPV	2	99.683	2	99.675	3	99.632
CYAV	ST. ANDREWS	MB	LPV	2	99.682	2	99.659	3	99.639
CYBR	BRANDON MUNICIPALCIPALITY	MB	LPV	2	99.681	2	99.653	3	99.636
CYFO	FLIN FLON	MB	LPV	2	99.673	2	99.669	5	99.600
CYGX	GILLAM	MB	LPV	2	99.753	2	99.680	2	99.631
CYIV	ISLAND LAKE	MB	LPV	3	99.728	2	99.670	4	99.615
CYQD	THE PAS	MB	LPV	2	99.674	2	99.669	4	99.614
CYTH	THOMPSON	MB	LPV200	3	99.730	2	99.680	5	99.586
CYVD	R.J. (BOB) ANDREW FIELD REGIONAL	MB	LPV	2	99.682	2	99.653	3	99.633
CYWG	JAMES ARMSTRONG RICHARDSON INTL	MB	LPV200	2	99.684	2	99.659	3	99.639
CYYQ	CHURCHILL	MB	LPV	2	99.779	2	99.696	5	99.598

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CZJG	JENPEG	MB	LPV	2	99.695	2	99.673	4	99.591
CCE3	JUNIPER	NB	LP	1	99.872	1	99.872	1	99.861
CCN2	GRAND MANAN	NB	LPV	1	99.861	1	99.861	1	99.850
CCR3	FLORENCEVILLE	NB	LPV	1	99.872	1	99.872	1	99.861
CDJ4	CLEARWATER	NB	LPV	1	99.871	1	99.871	1	99.861
CYCH	MIRAMICHI	NB	LPV	1	99.872	1	99.872	1	99.861
CYCL	CHARLO	NB	LPV	1	99.871	1	99.871	1	99.861
CYFC	FREDERICTON INTL	NB	LPV	1	99.868	1	99.865	1	99.850
CYQM	GREATER MONCTON ROMEO LEBLANC INTL	NB	LPV200	1	99.872	1	99.866	1	99.850
CYSJ	SAINT JOHN	NB	LPV	1	99.857	1	99.857	1	99.850
CYSL	ST. LEONARD	NB	LPV	1	99.871	1	99.871	1	99.861
CZBF	BATHURST	NB	LPV	1	99.871	1	99.871	1	99.861
CVB2	VOISEY'S BAY	NL	LPV	1	99.964	2	99.964	5	99.894
CYDF	DEER LAKE	NL	LPV200	1	99.861	1	99.861	1	99.842
CYJT	STEPHENVILLE	NL	LPV	1	99.861	1	99.861	2	99.858
CYQX	GANDER INTL	NL	LPV200	1	99.842	1	99.842	9	99.792
CYWK	WABUSH	NL	LPV	1	99.952	1	99.949	1	99.927
CYYR	GOOSE BAY	NL	LPV	1	99.959	1	99.959	3	99.921
CYYT	ST. JOHN'S INTL	NL	LPV	2	99.838	2	99.825	41	99.436
CZUM	CHURCHILL FALLS	NL	LPV	1	99.959	1	99.952	2	99.926
CCQ3	DEBERT	NS	LPV	1	99.857	1	99.857	1	99.850
CYHZ	STANFIELD INTL	NS	LPV200	1	99.857	1	99.857	1	99.850
CYQI	YARMOUTH	NS	LPV	1	99.856	1	99.856	1	99.850
CYQY	J.A. DOUGLAS MCCURDY	NS	LPV200	1	99.858	1	99.858	1	99.850
CYTN	TRENTON	NS	LPV	1	99.859	1	99.858	1	99.850
CYZX	GREENWOOD	NS	LP	1	99.857	1	99.857	1	99.850
CDK2	DIAVIK	NT	LPV	2	99.766	2	99.745	4	99.621
CEU9	SAMBAA K'E	NT	LPV	2	99.746	2	99.716	2	99.658
CGK2	GAHCHO KUE	NT	LPV	3	99.776	3	99.740	3	99.599
CSK6	SNAP LAKE	NT	LPV	2	99.764	2	99.744	3	99.597
CYEV	INUVIK (MIKE ZUBKO)	NT	LPV	3	99.883	2	99.814	8	99.723
CYFR	FORT RESOLUTION	NT	LPV	2	99.747	3	99.704	3	99.608
CYFS	FORT SIMPSON	NT	LPV	3	99.769	3	99.745	3	99.659
CYGH	FORT GOOD HOPE	NT	LPV	3	99.853	3	99.808	5	99.675
CYHY	MERLYN CARTER AIRPORT	NT	LPV	2	99.743	3	99.705	3	99.625
CYJP	FORT PROVIDENCE	NT	LPV	2	99.744	3	99.715	2	99.642
CYKD	FREDDIE CARMICHAEL	NT	LPV	3	99.883	2	99.823	6	99.715

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYOA	EKATI	NT	LPV	2	99.767	2	99.745	4	99.634
CYPC	PAULATUK (NORA ALIQATCHIALUK RUBEN)	NT	LPV	2	99.876	3	99.809	16	99.601
CYSM	FORT SMITH	NT	LPV	2	99.741	3	99.698	3	99.602
CYSY	SACHS HARBOUR (DAVID NASOGALUAK JR. SAARYUAQ)	NT	LPV	2	99.913	3	99.820	38	99.487
CYUB	JAMES GRUBEN	NT	LPV	3	99.892	2	99.817	10	99.733
CYVQ	NORMAN WELLS	NT	LPV	2	99.817	3	99.782	6	99.670
CYWJ	DELINE	NT	LPV	2	99.813	2	99.774	9	99.632
CYZF	YELLOWKNIFE	NT	LPV200	2	99.766	3	99.705	3	99.602
CZFM	FORT MCPHERSON	NT	LPV	3	99.877	2	99.824	5	99.724
CZFN	TULITA	NT	LPV	2	99.813	2	99.773	8	99.662
CMB2	MEADOWBANK	NU	LPV	2	99.825	3	99.767	10	99.635
CMR2	MARY RIVER	NU	LPV	258	97.797	351	96.670	1032	80.352
CYBK	BAKER LAKE	NU	LPV	2	99.821	3	99.768	9	99.649
CYCS	CHESTERFIELD INLET	NU	LPV	2	99.829	3	99.799	8	99.634
CYEK	ARVIAT	NU	LPV	2	99.810	3	99.761	9	99.649
CYFB	IQALUIT	NU	LPV200	4	99.942	4	99.931	103	99.150
CYRB	RESOLUTE BAY	NU	LPV	146	99.147	229	97.644	1399	74.785
CYRT	RANKIN INLET	NU	LPV	2	99.828	3	99.797	7	99.633
CYSK	SANIKILUAQ	NU	LPV	4	99.883	4	99.883	7	99.705
CYTE	KINNGAIT AIRPORT	NU	LPV	3	99.961	4	99.940	24	99.526
CYYH	TALOYOAK	NU	LPV	5	99.929	7	99.824	59	99.188
CNV8	EDENVALE	ON	LPV	1	99.850	1	99.850	2	99.816
CNY3	COLLINGWOOD	ON	LPV	1	99.858	1	99.850	2	99.816
CYAC	CAT LAKE	ON	LPV	3	99.716	3	99.702	3	99.634
CYAM	SAULT STE. MARIE	ON	LPV200	2	99.816	3	99.805	2	99.708
CYCC	CORNWALL REGIONAL	ON	LPV	1	99.861	1	99.861	1	99.850
CYCK	CHATHAM-KENT	ON	LPV	1	99.860	1	99.857	2	99.835
CYEE	HURONIA	ON	LPV	1	99.850	1	99.850	2	99.813
CYFA	FORT ALBANY	ON	LPV	2	99.787	2	99.742	2	99.733
CYGK	KINGSTON	ON	LPV	1	99.860	2	99.858	2	99.848
CYHD	DRYDEN REGIONAL	ON	LPV	2	99.699	2	99.678	2	99.654
CYHF	HEARST (RENE FONTAINE) MUNICIPALITY	ON	LPV	3	99.769	3	99.759	2	99.697
CYHM	HAMILTON	ON	LPV	1	99.853	1	99.839	2	99.832
CYHS	SAUGEEN MUNICIPALCIPALITY	ON	LPV	1	99.858	1	99.850	2	99.816
CYKF	WATERLOO	ON	LPV200	1	99.859	1	99.840	2	99.832
CYKM	KINCARDINE	ON	LPV	1	99.857	1	99.849	2	99.816

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYKZ	BUTTONVILLE MUNICIPAL	ON	LPV	1	99.853	1	99.850	2	99.816
CYLS	LAKE SIMCOE	ON	LPV	1	99.850	1	99.850	2	99.817
CYMG	MANITOUWADGE	ON	LPV	2	99.758	2	99.748	2	99.678
CYMO	MOOSONEE	ON	LPV	2	99.828	3	99.809	2	99.733
CYOO	OSHAWA EXECUTIVE AIRPORT	ON	LPV	1	99.850	1	99.838	2	99.821
CYOS	BILLY BISHOP REGIONAL	ON	LPV	1	99.857	2	99.850	2	99.818
CYOW	MACDONALD-CARTIER INTL	ON	LPV200	1	99.861	1	99.861	1	99.850
CYPL	PICKLE LAKE	ON	LPV	3	99.712	2	99.697	3	99.633
CYPQ	PETERBOROUGH	ON	LPV	1	99.850	1	99.838	2	99.818
CYPT	PELEE ISLAND	ON	LPV	1	99.870	1	99.867	3	99.856
CYQG	WINDSOR	ON	LPV	1	99.871	1	99.868	3	99.845
CYQK	KENORA	ON	LPV	2	99.690	2	99.667	2	99.647
CYQS	ST. THOMAS MUNICIPALITY	ON	LPV	1	99.860	1	99.845	2	99.832
CYQT	THUNDER BAY	ON	LPV200	2	99.737	2	99.718	2	99.667
CYRL	RED LAKE	ON	LPV	2	99.681	2	99.669	2	99.634
CYSA	STRATFORD MUNICIPALITY	ON	LPV	1	99.859	1	99.841	2	99.814
CYSB	SUDBURY	ON	LPV	3	99.843	2	99.826	3	99.768
CYSN	NIAGARA DISTRICT	ON	LPV	1	99.853	1	99.838	2	99.832
CYTL	BIG TROUT LAKE	ON	LPV	2	99.758	3	99.724	3	99.644
CYTS	TIMMINS (VICTOR M. POWER)	ON	LPV200	2	99.811	3	99.786	3	99.736
CYTZ	BILLY BISHOP TORONTO CITY AIRPORT	ON	LPV	1	99.860	1	99.850	2	99.832
CYVV	WIARTON	ON	LPV	1	99.856	2	99.852	2	99.801
CYWP	WEBEQUIE	ON	LPV	3	99.751	3	99.742	4	99.669
CYXL	SIOUX LOOKOUT	ON	LPV	2	99.699	2	99.687	2	99.643
CYXR	EARLTON (TIMISKAMING REGIONAL)	ON	LPV	3	99.845	2	99.818	3	99.781
CYXU	LONDON	ON	LPV200	1	99.860	1	99.845	2	99.832
CYYB	NORTH BAY	ON	LPV200	3	99.850	2	99.832	2	99.791
CYYU	KAPUSKASING	ON	LPV	3	99.805	3	99.768	2	99.707
CYYW	ARMSTRONG	ON	LPV	4	99.742	3	99.708	2	99.647
CYYZ	LESTER B. PEARSON INTL	ON	LPV200	1	99.859	1	99.840	2	99.832
CYZD	DOWNSVIEW	ON	LPV	1	99.859	1	99.850	2	99.821
CYZR	SARNIA (CHRIS HADFIELD)	ON	LPV	1	99.866	1	99.859	2	99.814
CZPB	SACHIGO LAKE	ON	LP	2	99.734	3	99.700	4	99.632
CYYG	CHARLOTTETOWN	PE	LPV	1	99.861	1	99.861	1	99.850
CEL8	ELEONORE	QC	LPV	2	99.869	2	99.869	3	99.800
CFX5	RENARD	QC	LPV	1	99.934	1	99.934	2	99.864
CSC3	DRUMMONDVILLE	QC	LPV	1	99.864	1	99.864	1	99.850

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CSD4	MONT-LAURIER	QC	LPV	1	99.875	1	99.875	2	99.832
CSF3	POSTE MONTAGNAIS (MILE 134)	QC	LPV	1	99.952	1	99.952	2	99.920
CSH4	LEBEL-SUR-QUEVILLON	QC	LPV	2	99.852	2	99.852	3	99.787
CSR3	VICTORIAVILLE (ANDRE-FORTIN)	QC	LPV	1	99.863	1	99.863	1	99.851
CSU2	CHISASIBI	QC	LPV	4	99.859	4	99.839	6	99.748
CTP9	DONALDSON	QC	LPV	2	99.976	3	99.963	18	99.705
CTT5	LA ROMAINE	QC	LPV	1	99.898	1	99.898	3	99.877
CTU2	FONTANGES	QC	LPV	1	99.953	1	99.952	5	99.870
CYAD	LA GRANDE-3	QC	LPV	3	99.889	3	99.882	5	99.800
CYAH	LA GRANDE-4	QC	LPV	1	99.947	1	99.932	3	99.846
CYAS	KANGIRSUK	QC	LPV	2	99.992	3	99.966	14	99.824
CYBC	BAIE-COMEAU	QC	LPV200	1	99.871	1	99.871	1	99.861
CYBG	BAGOTVILLE	QC	LPV200	1	99.872	1	99.871	1	99.860
CYBX	LOURDES-DE-BLANC-SABLON	QC	LPV	1	99.953	1	99.952	3	99.865
CYEY	MAGNY	QC	LPV	3	99.847	2	99.832	3	99.787
CYFJ	MONT-TREMBLANT	QC	LPV	1	99.875	1	99.875	1	99.848
CYGL	LA GRANDE RIVIERE	QC	LPV	4	99.877	5	99.868	5	99.788
CYGP	GASPE (MICHEL-POULIOT)	QC	LPV	1	99.872	1	99.871	1	99.861
CYGR	ILES-DE-LA-MADELEINE	QC	LPV	1	99.861	1	99.861	1	99.861
CYGV	HAVRE ST-PIERRE	QC	LPV	1	99.900	1	99.900	2	99.878
CYGW	KUUJJUARAPIK	QC	LPV	3	99.896	4	99.893	10	99.763
CYHA	QUAQTAQ	QC	LPV	2	99.983	2	99.971	14	99.763
CYHH	NEMISCAU	QC	LPV	2	99.870	2	99.870	3	99.801
CYHR	CHEVERY	QC	LPV	2	99.915	1	99.899	3	99.878
CYHU	ST-HUBERT	QC	LPV	1	99.864	1	99.864	1	99.847
CYIF	ST-AUGUSTIN	QC	LPV	1	99.953	1	99.953	2	99.885
CYIK	IVUJIVIK	QC	LPV	0	100	4	99.908	19	99.614
CYKG	KANGIQSUJUAQ (WAKEHAM BAY)	QC	LPV	2	99.977	2	99.971	17	99.750
CYKL	SCHEFFERVILLE	QC	LPV	1	99.959	1	99.959	4	99.927
CYKO	AKULIVIK	QC	LPV	2	99.987	3	99.888	12	99.674
CYKQ	WASKAGANISH	QC	LPV	2	99.828	3	99.817	3	99.750
CYLA	AUPALUK	QC	LPV	1	99.969	2	99.940	12	99.855
CYLQ	LA TUQUE	QC	LPV	1	99.879	1	99.875	1	99.860
CYLU	KANGIQSUALUJJUAQ (GEORGES RIVER)	QC	LPV	1	99.969	2	99.939	8	99.857
CYME	RUSSELL-BURNETT	QC	LPV	1	99.871	1	99.871	1	99.861
CYMT	CHAPAIS	QC	LPV	3	99.873	3	99.873	2	99.834
CYMU	UMIUJAQ	QC	LPV	2	99.929	2	99.922	8	99.758

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYMW	MANIWAKI	QC	LPV	1	99.875	1	99.875	2	99.820
CYMX	MONTREAL INTL (MIRABEL)	QC	LPV200	1	99.864	1	99.864	1	99.847
CYNA	NATASHQUAN	QC	LPV	1	99.898	1	99.898	2	99.872
CYNC	WEMINDJI	QC	LPV	3	99.846	3	99.827	4	99.773
CYND	GATINEAU	QC	LPV	1	99.864	1	99.864	1	99.850
CYNM	MATAGAMI	QC	LPV	2	99.850	2	99.850	3	99.778
CYPH	INUKJUAK	QC	LPV	2	99.932	2	99.906	9	99.744
CYPN	PORT-MENIER	QC	LPV	2	99.887	2	99.887	1	99.861
CYPX	PUVIRNITUQ	QC	LPV	2	99.983	3	99.930	11	99.711
CYQB	JEAN LESAGE INTL	QC	LPV200	1	99.873	1	99.873	1	99.861
CYRI	RIVIERE-DU-LOUP	QC	LPV	1	99.871	1	99.871	1	99.860
CYRJ	ROBERVAL	QC	LPV	1	99.876	1	99.872	1	99.860
CYRQ	TROIS-RIVIERES	QC	LPV200	1	99.864	1	99.864	1	99.861
CYSC	SHERBROOKE	QC	LPV	1	99.864	1	99.864	1	99.850
CYSG	ST-GEORGES	QC	LPV	1	99.869	1	99.869	1	99.850
CYTF	ALMA	QC	LPV	1	99.875	1	99.871	1	99.860
CYTQ	TASIUJAQ	QC	LPV	1	99.969	2	99.939	9	99.848
CYUL	PIERRE-ELLIOTT-TRUDEAU INTL	QC	LPV200	1	99.864	1	99.864	1	99.847
CYUY	ROUYN-NORANDA	QC	LPV200	3	99.845	2	99.818	3	99.785
CYVB	BONAVENTURE	QC	LPV	1	99.871	1	99.871	1	99.861
CYVO	VAL-DOR	QC	LPV200	2	99.851	2	99.843	3	99.785
CYVP	KUUJJUAQ	QC	LPV200	1	99.969	2	99.939	6	99.887
CYYY	MONT-JOLI	QC	LPV	1	99.871	1	99.871	1	99.861
CYZG	SALLUIT	QC	LPV	2	99.979	3	99.941	21	99.679
CYZV	SEPT-ILES	QC	LPV200	1	99.900	1	99.900	2	99.875
CCB2	SEABEE MINE	SK	LPV	3	99.687	2	99.671	3	99.599
CJC5	SHAUNAVON	SK	LPV	2	99.708	2	99.689	4	99.642
CJE3	WEYBURN	SK	LPV	2	99.696	2	99.671	3	99.637
CJH3	MAIDSTONE	SK	LPV	2	99.697	2	99.671	3	99.651
CJP9	CHARLOT RIVER	SK	LP	2	99.736	2	99.678	4	99.592
CJQ4	MAPLE CREEK	SK	LPV	2	99.707	2	99.694	6	99.640
CJU4	HUMBOLDT	SK	LPV	2	99.690	2	99.673	3	99.641
CJW7	CIGAR LAKE	SK	LPV	3	99.696	2	99.672	4	99.607
CJY3	TISDALE	SK	LPV	2	99.686	2	99.669	3	99.621
CJZ3	MELFORT (MILLER FIELD)	SK	LPV	2	99.689	2	99.673	3	99.621
CKQ8	MCARTHUR RIVER	SK	LPV	3	99.696	2	99.672	3	99.613
CYBE	URANIUM CITY	SK	LPV	2	99.736	2	99.678	4	99.592

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYBU	NIPAWIN	SK	LPV	2	99.678	2	99.673	3	99.617
CYEN	ESTEVAN REGIONAL	SK	LPV	2	99.692	2	99.678	3	99.632
CYES	EDMUNDSTON	SK	LPV	1	99.871	1	99.871	1	99.861
CYKC	COLLINS BAY	SK	LPV	3	99.700	2	99.667	4	99.600
CYKJ	KEY LAKE	SK	LPV	3	99.696	2	99.668	3	99.614
CYLJ	MEADOW LAKE	SK	LPV	3	99.702	2	99.671	3	99.620
CYMJ	AIR VICE MARSHAL C.M. MCEWEN	SK	LPV200	2	99.699	2	99.671	3	99.640
CYNL	POINTS NORTH LANDING	SK	LPV	3	99.700	2	99.669	4	99.604
CYPA	PRINCE ALBERT (GLASS FIELD)	SK	LPV	2	99.688	2	99.672	3	99.612
CYQR	REGINA INTL	SK	LPV200	2	99.697	2	99.671	3	99.638
CYQV	YORKTON MUNICIPALCIPALITY	SK	LPV	2	99.674	2	99.659	3	99.637
CYQW	NORTH BATTLEFORD	SK	LPV	2	99.693	2	99.671	3	99.641
CYVC	LA RONGE (BARBER FIELD)	SK	LPV	3	99.689	2	99.673	3	99.617
CYXE	JOHN G. DIEFENBAKER INTL	SK	LPV200	2	99.690	2	99.678	2	99.616
CYYN	SWIFT CURRENT	SK	LPV	2	99.703	2	99.687	4	99.644
CYMA	MAYO	YT	LPV	2	99.831	2	99.774	2	99.728
CYOC	OLD CROW	YT	LPV	3	99.878	2	99.834	4	99.744
CYQH	WATSON LAKE	YT	LPV	3	99.790	2	99.740	3	99.697
CYXY	ERIK NIELSEN INTL	YT	LPV200	2	99.787	2	99.746	2	99.728
CYZW	TESLIN	YT	LPV	3	99.793	2	99.744	3	99.716

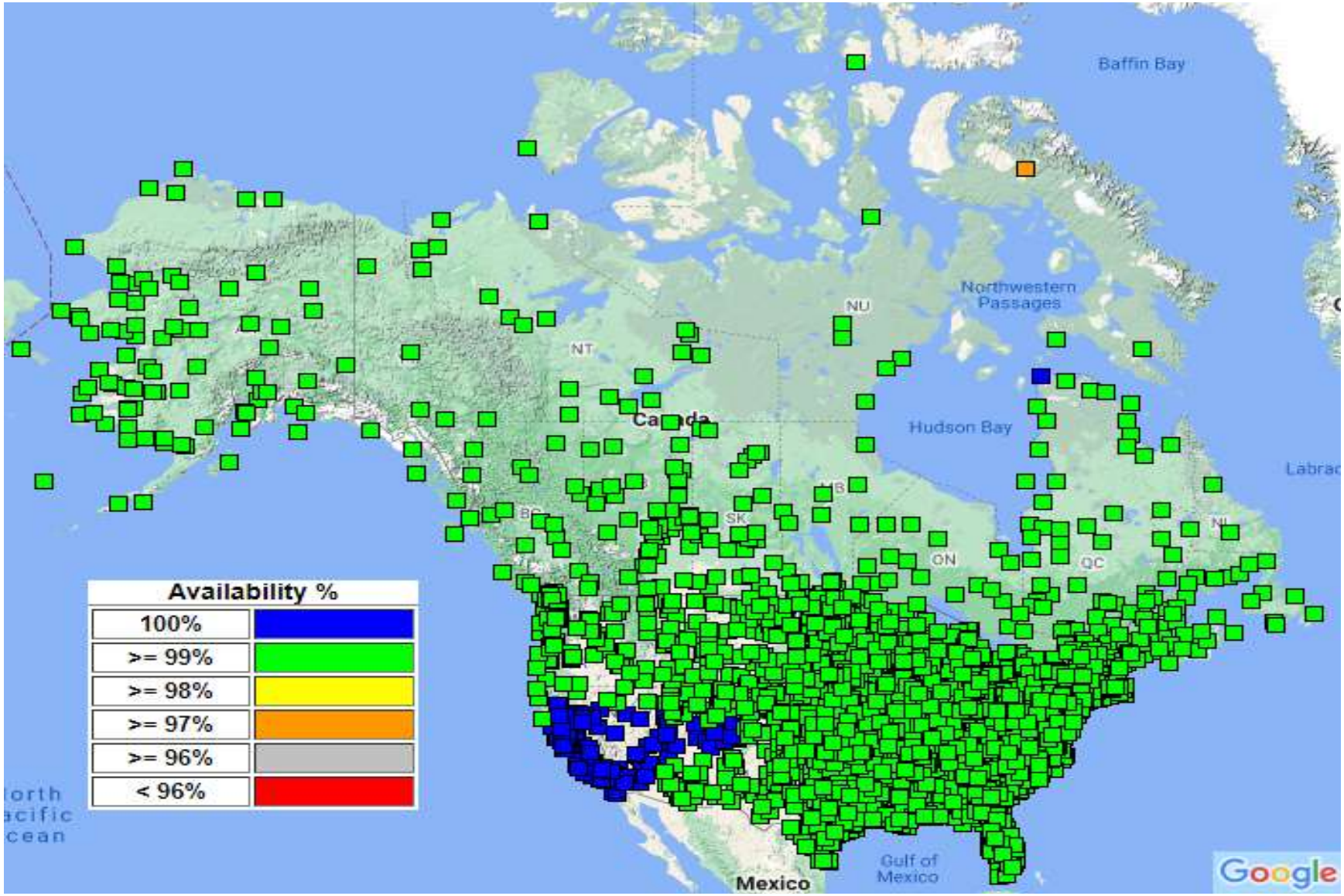

Figure 8-1 WAAS LP Availability at Airports in the U.S. and Canada With GPS RNAV IAPs

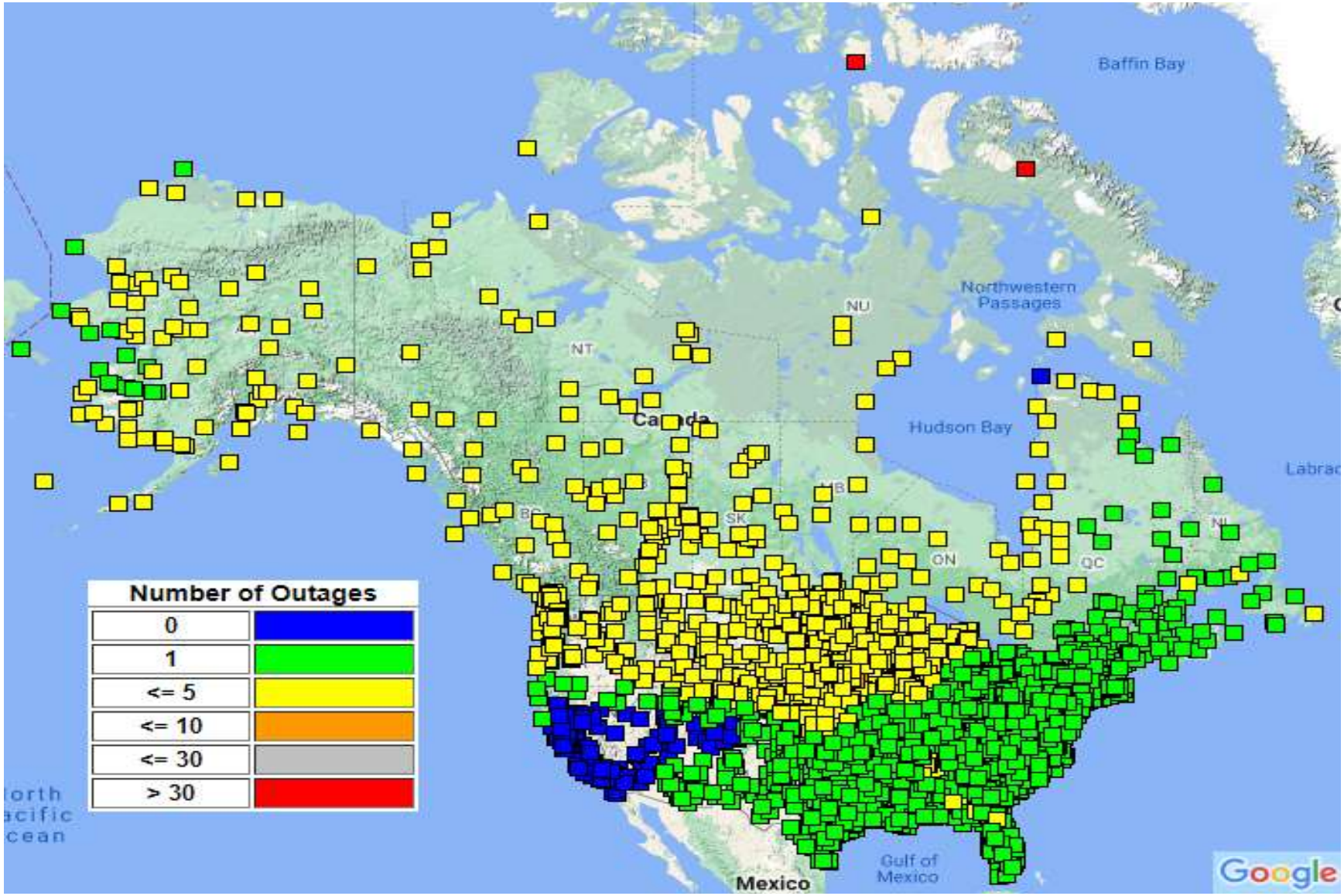

Figure 8-2 WAAS LP Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

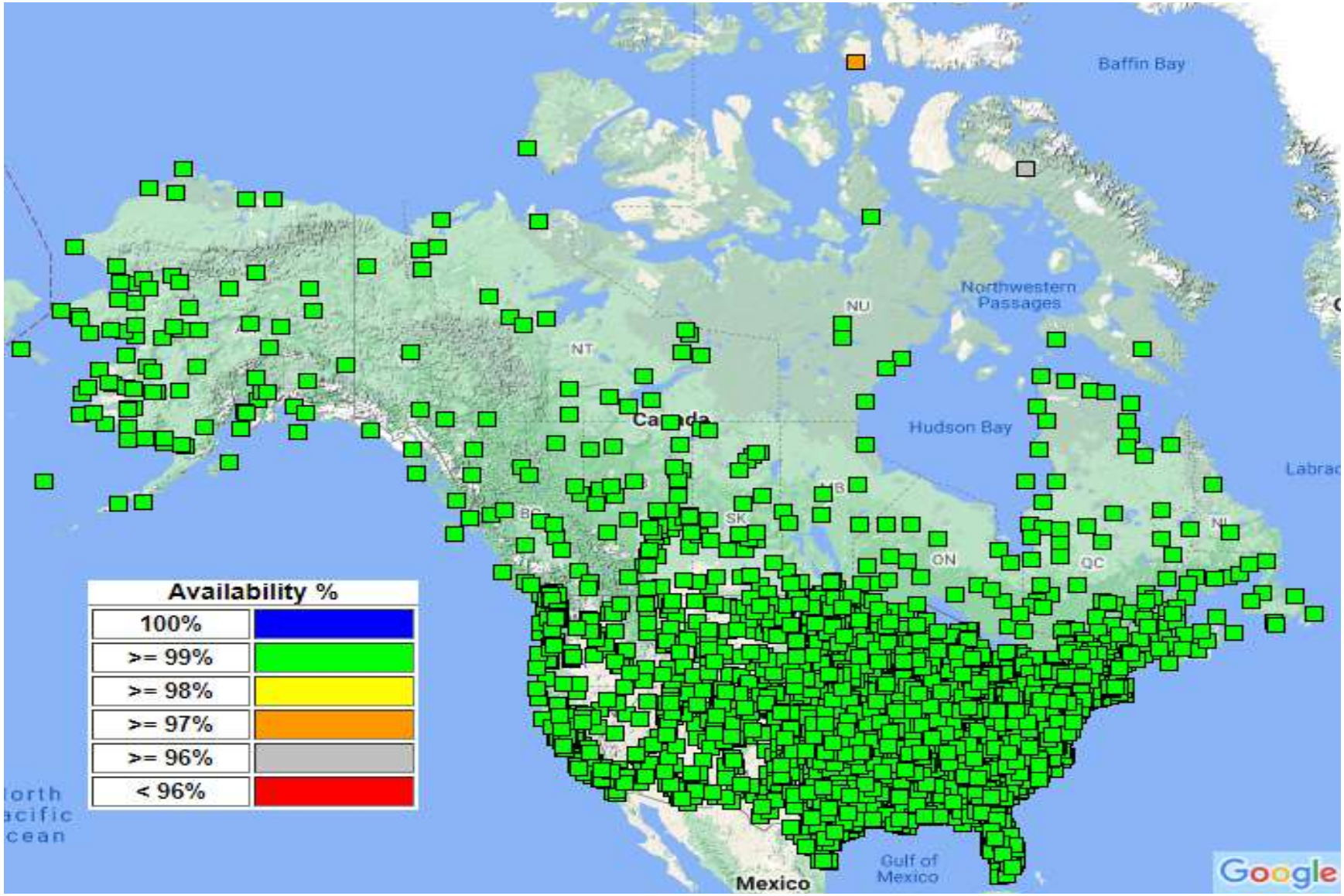

Figure 8-3 WAAS LPV Availability Airports in the U.S. and Canada With GPS RNAV IAPs

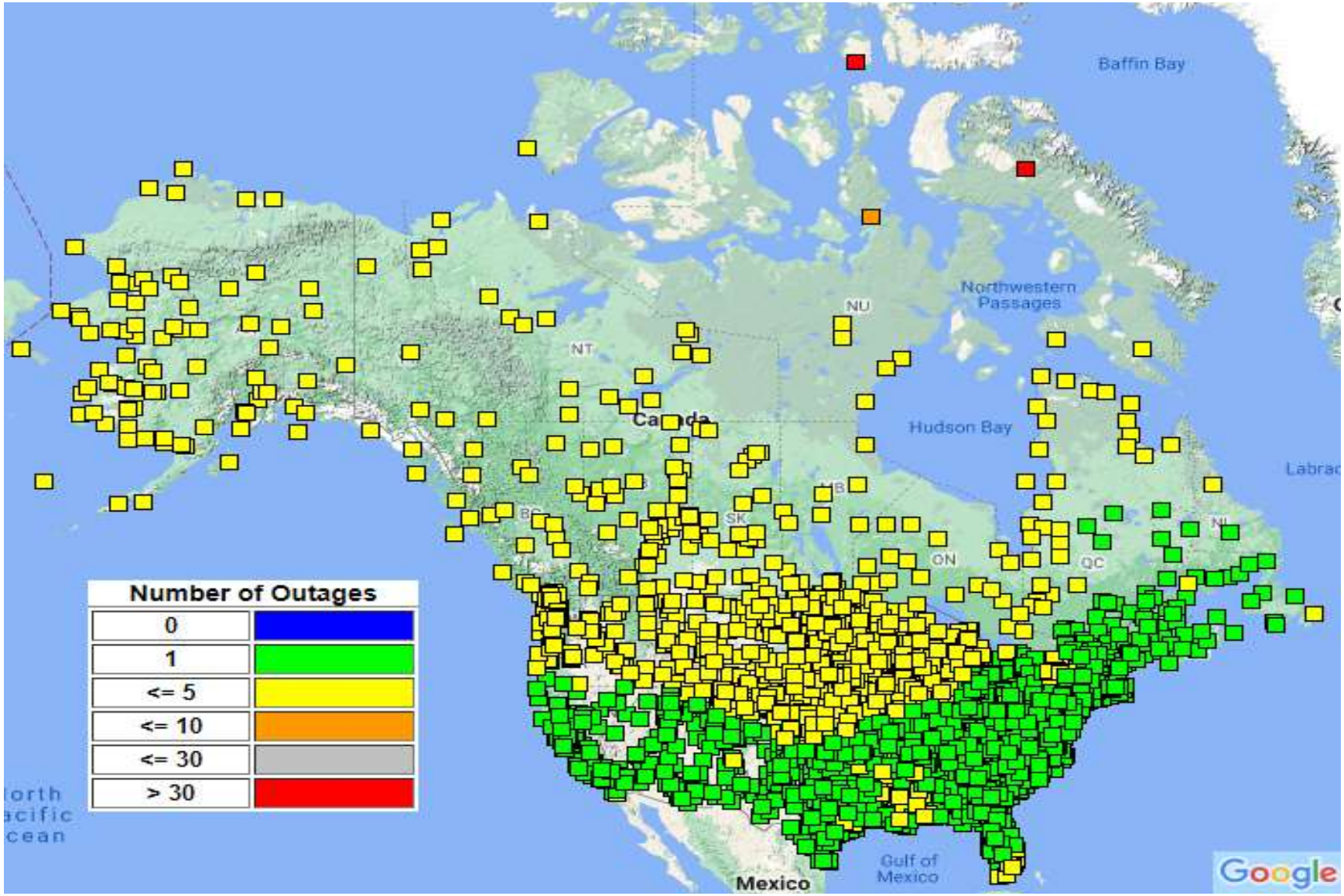

Figure 8-4 WAAS LPV Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

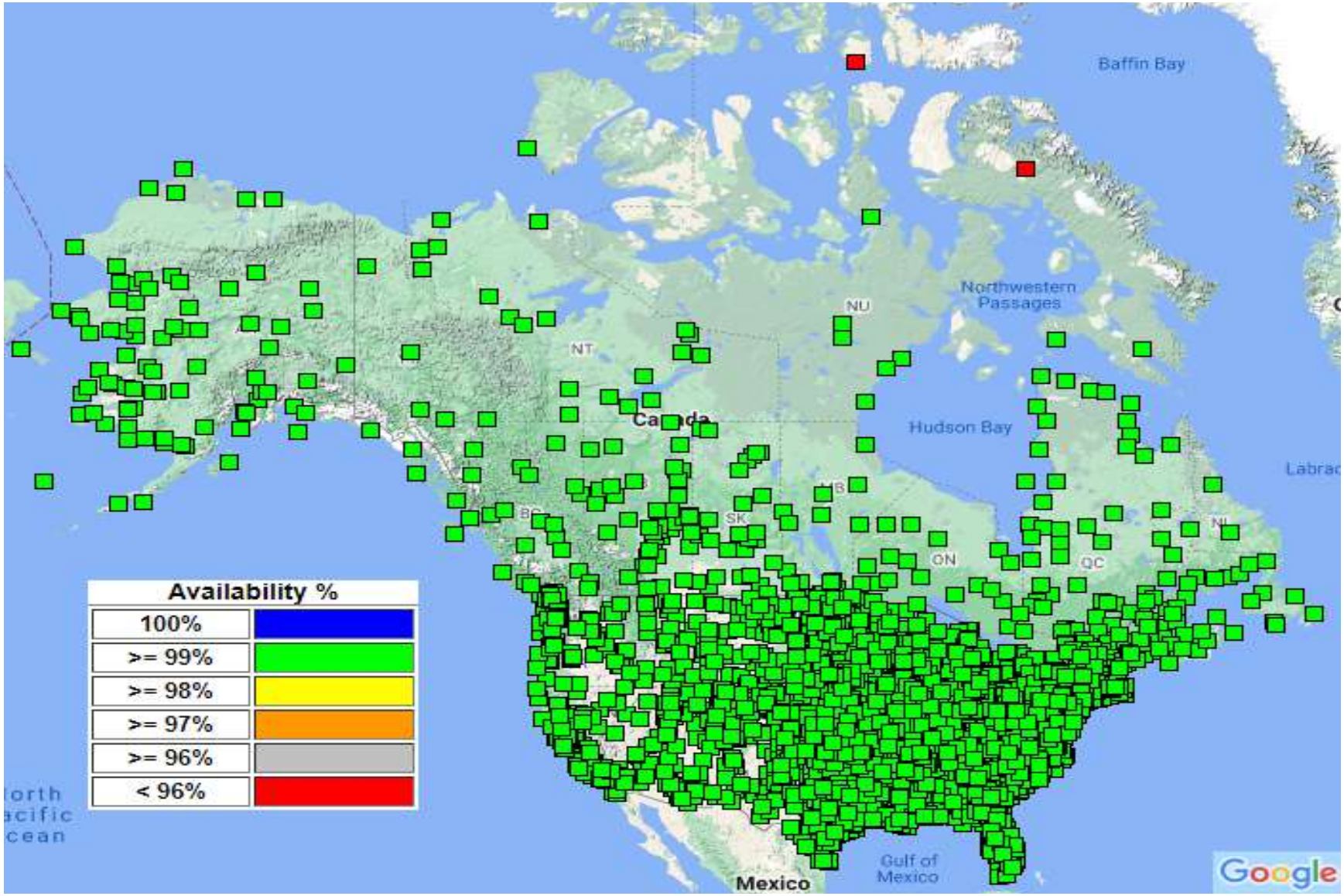

Figure 8-5 WAAS LPV200 Availability at Airports in the U.S. and Canada With GPS RNAV IAPs

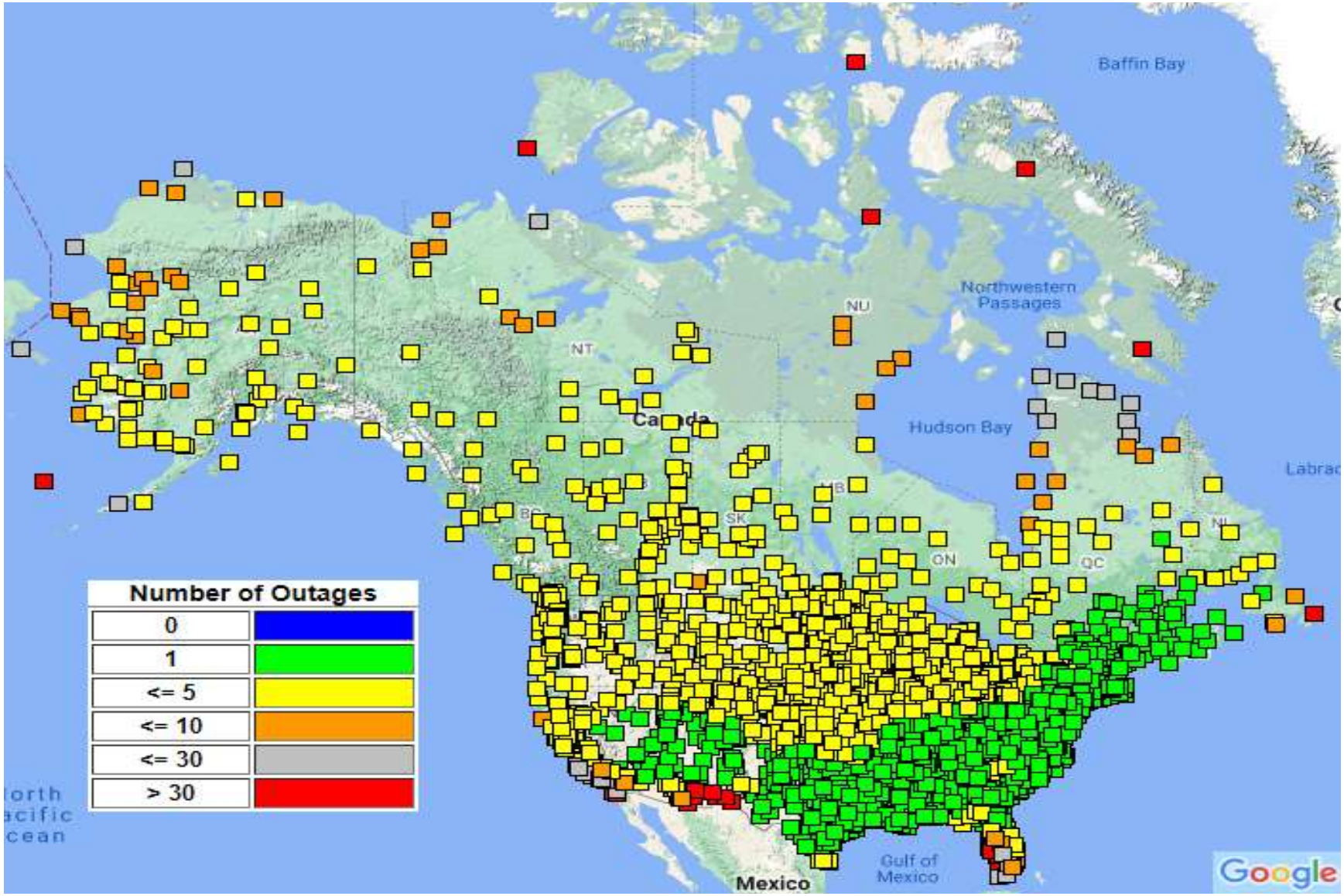

Figure 8-6 WAAS LPV200 Outages at Airports in the U.S. and Canada With GPS RNAV IAPs

9.0 WAAS CNMP BOUNDING ANALYSIS

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

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

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

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

Table 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23
Albuquerque	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Anchorage	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Atlanta	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Barrow	A	•	•	•	•	•	•	•	•	•	–	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Bethel	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	–	•	•	•
Billings	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Boston	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Chicago	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Cleveland	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Cold Bay	A	•	•	•	–	•	•	•	•	•	•	•	•
	B	•	•	•	–	•	•	•	•	•	•	•	•
	C	•	•	•	–	•	•	•	•	•	•	•	•
Dallas	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Denver	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Fairbanks	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Gander	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Goose Bay	A	–	–	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Honolulu	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Houston	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Iqaluit	A	•	•	•	•	•	•	–	•	–	•	•	•
	B	•	•	•	•	•	•	–	•	–	•	•	•
	C	•	•	•	•	•	•	–	•	–	•	•	•
Jacksonville	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•

WAAS Site	WRE	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23
Juneau	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kansas City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kotzebue	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Los Angeles	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Memphis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Merida	A	•	•	•	•	•	•	•	•	–	–	–	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Mexico City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	–	–	–	–	–	–	–	–	–	–	–	–
	C	•	•	•	•	•	•	•	•	•	•	•	•
Miami	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Minneapolis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	–	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
New York	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Oakland	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Puerto Vallarta	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Salt Lake City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Jose Del Cabo	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Juan	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Seattle	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Tapachula	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	–	–	–	–	–	–	–
	C	•	•	•	•	•	•	•	•	•	•	•	•
Washington, DC	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Winnipeg	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•

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

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for most of the WAAS Reference Station antennas using 24-hour sets on 07/02/2023. Tapachula Thread A (MTP1) and Tapachula Thread C (MTP3) surveys were performed on 07/05/2023 due to data outages on the initial survey. Mexico City Thread B (MMX2), Tapachula Thread B (MTP2), and Iqaluit Thread B (YFB2) are excluded from this since they were out of service. Each WAAS WRS has three independent threads of WRE: (1) Thread A is also referred to as Thread 1, (2) Thread B is also referred to as Thread 2, and (3) Thread C is referred to as Thread 3.

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

The OPUS-reported RMS quality metrics were 2.6 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 12.0 mm or less. The OPUS and CSRS surveys agreed to an average of 1.47 cm with a standard deviation of 5.90 mm. The maximum difference was 2.95 cm at Los Angeles Thread C (ZLA3).

The OPUS positions were compared to the positions computed by the WAAS C&Vs. The survey was completed on July 02, 2023. The OPUS surveys agree with the calculated positions to better or equal to 1.80 cm for most sites. The maximum difference was 5.96 cm at Mexico City A (MMX1).

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	-2965385.249	-972576.66	5543892.77	60.7879133	-161.8417254	52.171
BET2	-2965386.013	-972580.384	5543891.704	60.7878939	-161.8416648	52.162
BET3	-2965388.588	-972577.511	5543890.848	60.787878	-161.8417297	52.172
BIL1	-1416446.022	-4223577.018	4550862.072	45.803706	-108.5397248	1112.218
BIL2	-1416450.099	-4223574.862	4550862.805	45.8037155	-108.5397833	1112.222
BIL3	-1416441.722	-4223574.27	4550865.933	45.8037559	-108.5396836	1112.217
BRW1	-1886759.135	-809058.705	6018494.392	71.2827629	-156.789926	15.56
BRW2	-1886756.551	-809055.965	6018495.572	71.2827956	-156.7899679	15.569
BRW3	-1886755.458	-809059.746	6018495.393	71.282791	-156.7898588	15.555
CDB1	-3484099.265	-1084748.81	5213678.492	55.1923719	-162.7064053	49.705
CDB2	-3484105.897	-1084741.615	5213675.547	55.1923258	-162.7065441	49.68
CDB3	-3484112.18	-1084734.838	5213672.804	55.1922824	-162.706675	49.703
FAI1	-2304742.035	-1448715.349	5748843.665	64.8096281	-147.8473421	150.014
FAI2	-2304741.575	-1448706.54	5748846.064	64.8096785	-147.8474939	150.023
FAI3	-2304733.047	-1448707.475	5748849.217	64.8097451	-147.8473817	150.015
JNU1	-2354255.167	-2388549.722	5407043.18	58.3625731	-134.5857095	16.284
JNU2	-2354253.081	-2388565.832	5407037.015	58.3624675	-134.5854909	16.286
JNU3	-2354239.857	-2388568.679	5407041.471	58.362544	-134.5852958	16.274
MMD1	35070.32	-5959686.649	2264365.766	20.9319093	-89.6628416	29.102
MMD2	35065.405	-5959687.019	2264364.986	20.9319016	-89.6628889	29.142
MMD3	35065.069	-5959685.238	2264369.641	20.9319467	-89.662892	29.139
MMX1	-948700.726	-5943932.694	2109211.718	19.4316539	-99.0683905	2232.499
MMX2	N/A	N/A	N/A	N/A	N/A	N/A
MMX3	-948705.142	-5943932.884	2109209.311	19.4316308	-99.0684317	2232.532
MPR1	-1570142.293	-5759530.584	2238184.743	20.6790032	-105.2492039	10.973
MPR2	-1570139.474	-5759530.095	2238188.783	20.6790412	-105.249179	11.265
MPR3	-1570143.583	-5759527.965	2238190.551	20.6790593	-105.2492225	10.978
MSD1	-1979520.219	-5523222.78	2493107.02	23.1604491	-109.7176536	104.293
MSD2	-1979521.793	-5523225.112	2493100.615	23.1603863	-109.7176604	104.281
MSD3	-1979526.234	-5523221.849	2493104.292	23.1604224	-109.7177119	104.281
MTP1	-254854.405	-6162909.132	1617805.084	14.7913662	-92.3679997	54.916

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
MTP2	N/A	N/A	N/A	N/A	N/A	N/A
MTP3	-254855.55	-6162910.277	1617800.133	14.7913202	-92.3680099	54.804
OTZ1	-2396056.233	-750356.217	5843502.394	66.8873299	-162.6113732	10.86
OTZ2	-2396053.058	-750354.386	5843503.913	66.8873648	-162.6113914	10.853
OTZ3	-2396053.039	-750358.327	5843503.427	66.8873535	-162.6113054	10.861
YFB1	1035381.239	-2634289.678	5696539.618	63.7314912	-68.5431876	10.079
YFB2	N/A	N/A	N/A	N/A	N/A	N/A
YFB3	1035365.961	-2634306.865	5696534.484	63.7313871	-68.5436027	10.081
YQX1	2430424.474	-3419640.426	4788223.935	48.9664911	-54.5976342	146.913
YQX2	2430432.418	-3419639.08	4788220.879	48.9664492	-54.5975351	146.909
YQX3	2430440.317	-3419637.716	4788217.872	48.966408	-54.5974364	146.915
YWG1	-520164.584	-4083475.985	4855842.992	49.9005736	-97.2594004	222.109
YWG2	-520150.71	-4083468.923	4855850.39	49.9006766	-97.2592213	222.127
YWG3	-520152.583	-4083478.042	4855842.562	49.9005675	-97.2592311	222.118
YYR1	1885341.251	-3321428.401	5091171.759	53.308648	-60.4194709	37.9
YYR2	1885344.208	-3321419.917	5091176.164	53.3087143	-60.4193694	37.895
YYR3	1885339.925	-3321413.105	5091182.17	53.3088045	-60.4193749	37.908
ZAB1	-1488636.98	-5003946.54	3654557.663	35.1735749	-106.5673513	1620.132
ZAB2	-1488631.647	-5003948.221	3654557.638	35.1735742	-106.5672899	1620.191
ZAB3	-1488632.428	-5003950.8	3654553.776	35.1735318	-106.56729	1620.169
ZAN1	-2659536.798	-1549114.672	5567750.734	61.2292011	-149.7802539	80.714
ZAN2	-2659548.557	-1549110.717	5567746.245	61.2291174	-149.7804277	80.711
ZAN3	-2659541.505	-1549106.593	5567750.724	61.229201	-149.780428	80.705
ZAU1	138703.954	-4761244.122	4227763.916	41.7826581	-88.3313386	195.86
ZAU2	138704.217	-4761248.742	4227758.753	41.7825957	-88.3313371	195.869
ZAU3	138710.923	-4761248.478	4227758.833	41.7825966	-88.3312564	195.871
ZBW1	1490299.061	-4448983.199	4306010.542	42.735721	-71.4804278	39.128
ZBW2	1490304.175	-4448981.186	4306010.885	42.735725	-71.4803608	39.152
ZBW3	1490305.883	-4448984.812	4306006.574	42.7356721	-71.4803551	39.15
ZDC1	1069125.606	-4839598.987	4001126.522	39.1015962	-77.5427483	80.047
ZDC2	1069128.003	-4839603.617	4001120.32	39.1015242	-77.5427328	80.045
ZDC3	1069123.904	-4839602.702	4001122.518	39.1015497	-77.5427768	80.051
ZDV1	-1273628.763	-4711375.576	4094890.073	40.1873028	-105.1272261	1541.362

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZDV2	-1273623.063	-4711377.092	4094890.084	40.187303	-105.1271569	1541.351
ZDV3	-1273625.078	-4711380.299	4094885.799	40.1872525	-105.1271699	1541.353
ZFW1	-659983.326	-5324060.773	3438276.452	32.8306495	-97.0664731	155.618
ZFW2	-659988.602	-5324063.328	3438271.459	32.8305961	-97.0665257	155.587
ZFW3	-659983.625	-5324063.859	3438271.665	32.8305981	-97.0664723	155.627
ZHN1	-5508637.216	-2234492.631	2303722.55	21.3129938	-157.920834	24.662
ZHN2	-5508656.381	-2234482.947	2303687.296	21.3126508	-157.92099	25.002
ZHN3	-5508647.793	-2234496.882	2303694.393	21.3127194	-157.9208344	25.047
ZHU1	-513864.587	-5506451.625	3166720.422	29.9618963	-95.3314275	10.764
ZHU2	-513867.236	-5506455.018	3166714.255	29.9618317	-95.3314516	10.824
ZHU3	-513873.515	-5506457.662	3166708.66	29.9617735	-95.3315138	10.816
ZJX1	772646.324	-5434462.184	3237231.756	30.6988599	-81.9081863	2.124
ZJX2	772649.652	-5434463.748	3237228.365	30.6988243	-81.9081542	2.127
ZJX3	772645.587	-5434466.175	3237225.255	30.6987917	-81.9081998	2.114
ZKC1	-415247.663	-4954556.382	3982161.098	38.8801592	-94.7908355	305.891
ZKC2	-415231.267	-4954557.711	3982161.157	38.8801599	-94.790646	305.893
ZKC3	-415237.387	-4954561.05	3982155.954	38.8801017	-94.790713	305.615
ZLA1	-2474410.165	-4637294.476	3602183.603	34.603519	-118.0838984	763.514
ZLA2	-2474404.881	-4637297.271	3602183.605	34.6035192	-118.0838333	763.497
ZLA3	-2474411.509	-4637296.97	3602179.632	34.6034751	-118.0838986	763.591
ZLC1	-1808273.385	-4486410.812	4145302.966	40.7860426	-111.9521795	1287.439
ZLC2	-1808274.771	-4486414.434	4145298.466	40.7859891	-111.9521787	1287.435
ZLC3	-1808270.567	-4486416.141	4145298.47	40.7859891	-111.9521249	1287.446
ZMA1	966042.192	-5662999.816	2761581.533	25.8246126	-80.3191908	-7.595
ZMA2	966029.217	-5662999.116	2761586.02	25.8246603	-80.3193172	-8.226
ZMA3	966037.297	-5662997.951	2761586.372	25.8246624	-80.3192358	-7.883
ZME1	4070.751	-5226189.315	3644028.428	35.0673941	-89.9553715	68.62
ZME2	4070.779	-5226186.745	3644032.535	35.0674377	-89.9553712	68.877
ZME3	4064.586	-5226186.628	3644032.691	35.0674394	-89.9554391	68.867
ZMP1	-249978.546	-4539297.485	4458955.014	44.6374631	-93.1520876	262.624
ZMP2	-249972.739	-4539297.827	4458955.012	44.6374629	-93.1520142	262.638
ZMP3	-249973.838	-4539302.107	4458950.534	44.6374068	-93.1520251	262.576
ZNY1	1406144.471	-4627343.968	4144322.106	40.7843293	-73.0971675	6.434

WRE	X (m)	Y (m)	Z (m)	LATITUDE	LONGITUDE	H (m)
ZNY2	1406146.273	-4627347.016	4144317.304	40.7842763	-73.0971576	5.902
ZNY3	1406140.715	-4627348.676	4144317.341	40.7842767	-73.0972263	5.905
ZOA1	-2684437.105	-4293337.183	3865351.951	37.5430549	-122.0159514	-3.499
ZOA2	-2684434.094	-4293341.26	3865349.525	37.5430273	-122.015898	-3.502
ZOA3	-2684438.471	-4293342.142	3865345.669	37.5429829	-122.0159347	-3.419
ZOB1	650770.022	-4754715.663	4187420.755	41.2971547	-82.2064466	223.661
ZOB2	650777.702	-4754714.828	4187422.768	41.297167	-82.2063544	225.151
ZOB3	650776.033	-4754719.653	4187414.975	41.2970872	-82.206382	223.429
ZSE1	-2308930.38	-3668169.669	4663526.415	47.2869925	-122.1883741	82.089
ZSE2	-2308934.77	-3668175.21	4663520.003	47.286907	-122.1883842	82.145
ZSE3	-2308935.836	-3668179.489	4663516.067	47.2868553	-122.188366	82.095
ZSU1	2462589.493	-5529372.052	2003724.605	18.431337	-65.993476	-28.095
ZSU2	2462587.558	-5529377.418	2003712.313	18.4312199	-65.9935134	-28.078
ZSU3	2462594.192	-5529375.157	2003710.234	18.4312003	-65.9934474	-28.134
ZTL1	529840.271	-5305248.814	3489342.858	33.3796887	-84.2967274	261.132
ZTL2	529846.647	-5305247.974	3489343.144	33.3796918	-84.2966584	261.12
ZTL3	529847.333	-5305251.417	3489337.912	33.3796351	-84.2966547	261.159

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

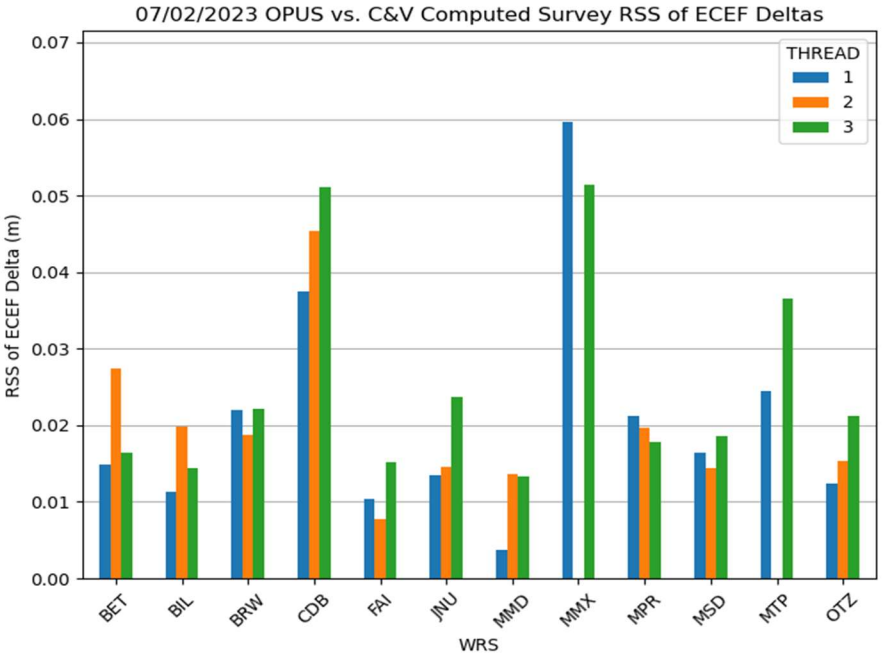

Figure 10-1 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

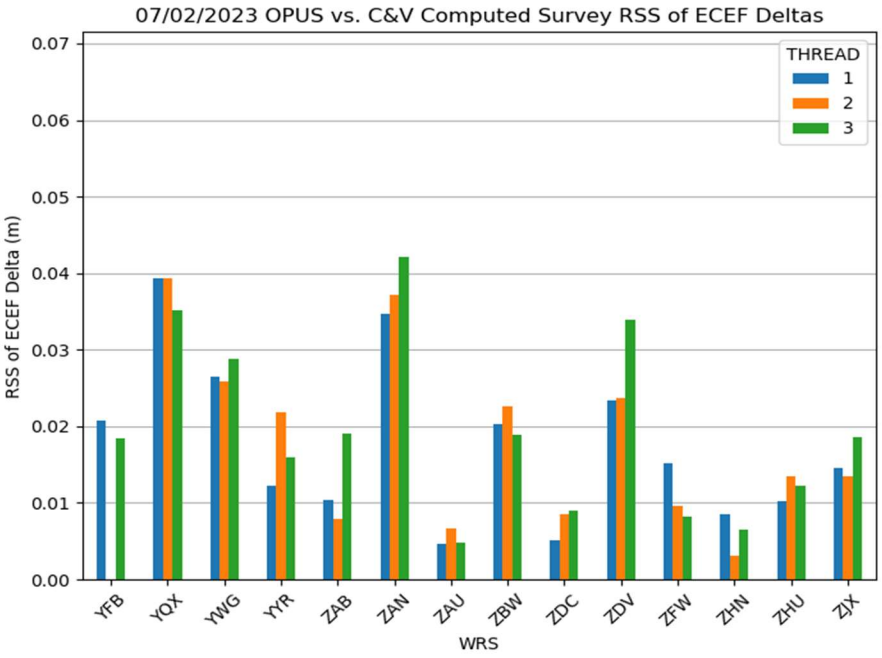

Figure 10-2 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

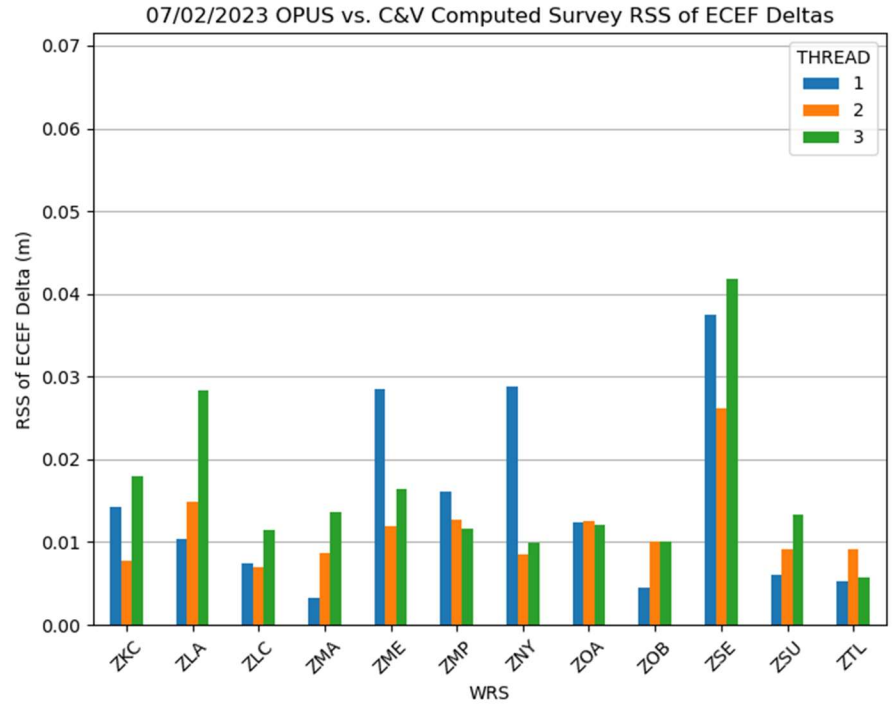

Figure 10-3 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

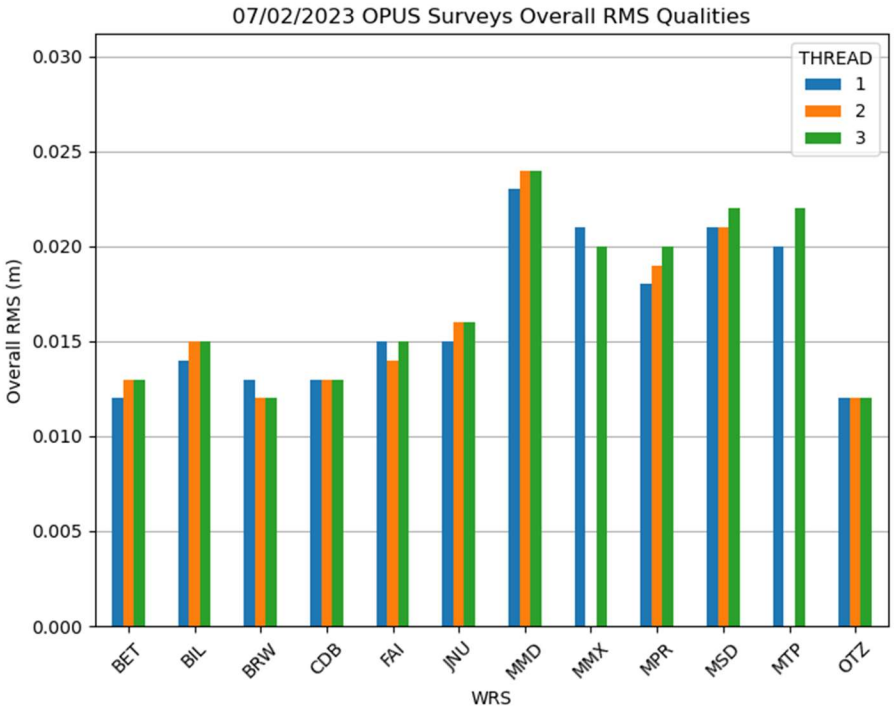

Figure 10-4 OPUS Survey Overall RMS Qualities

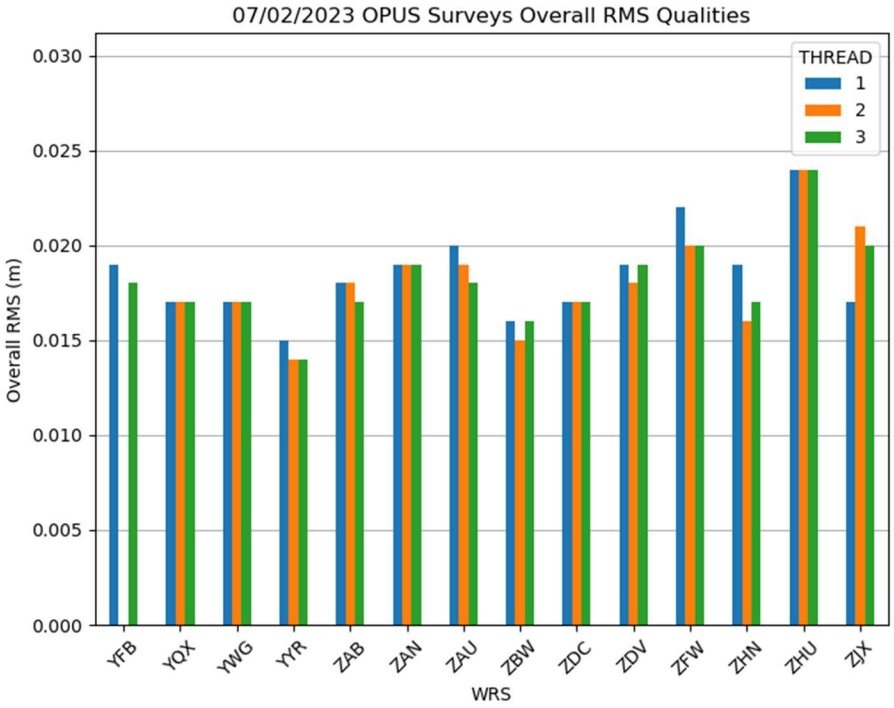

Figure 10-5 OPUS Survey Overall RMS Qualities

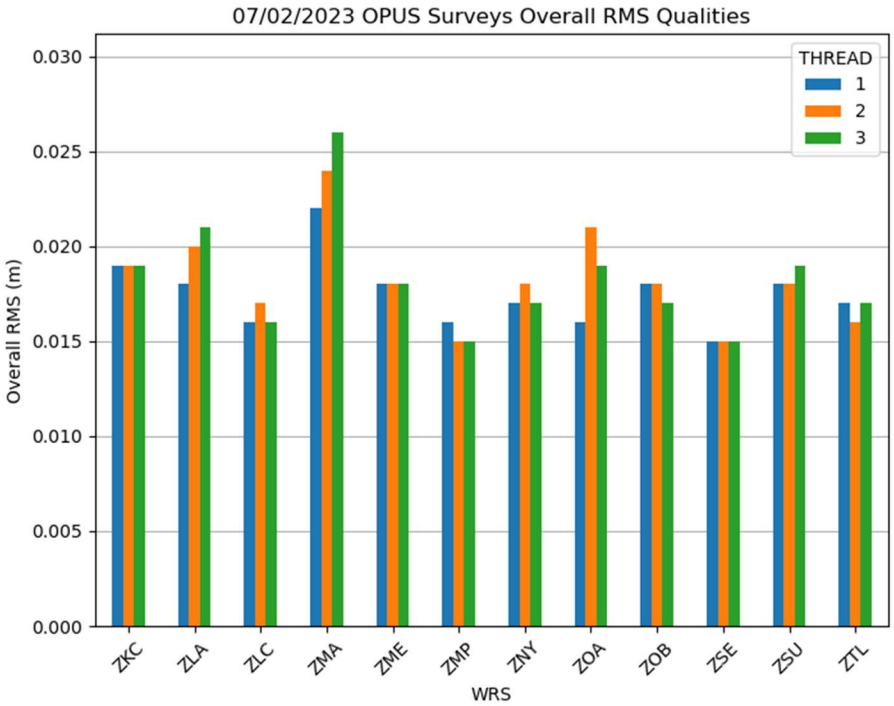

Figure 10-6 OPUS Survey Overall RMS Qualities

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

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

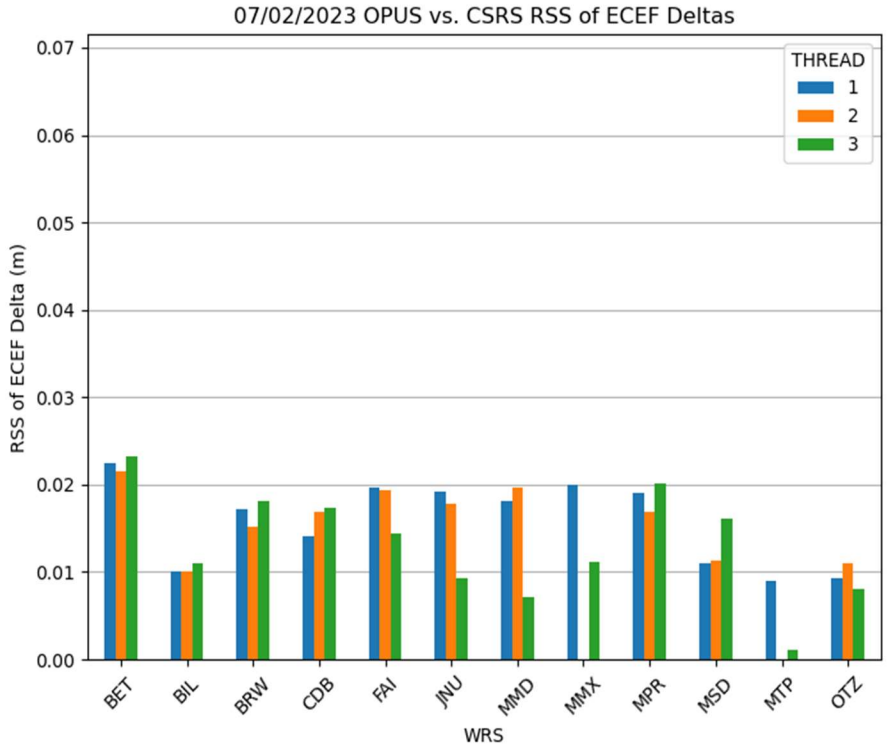

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

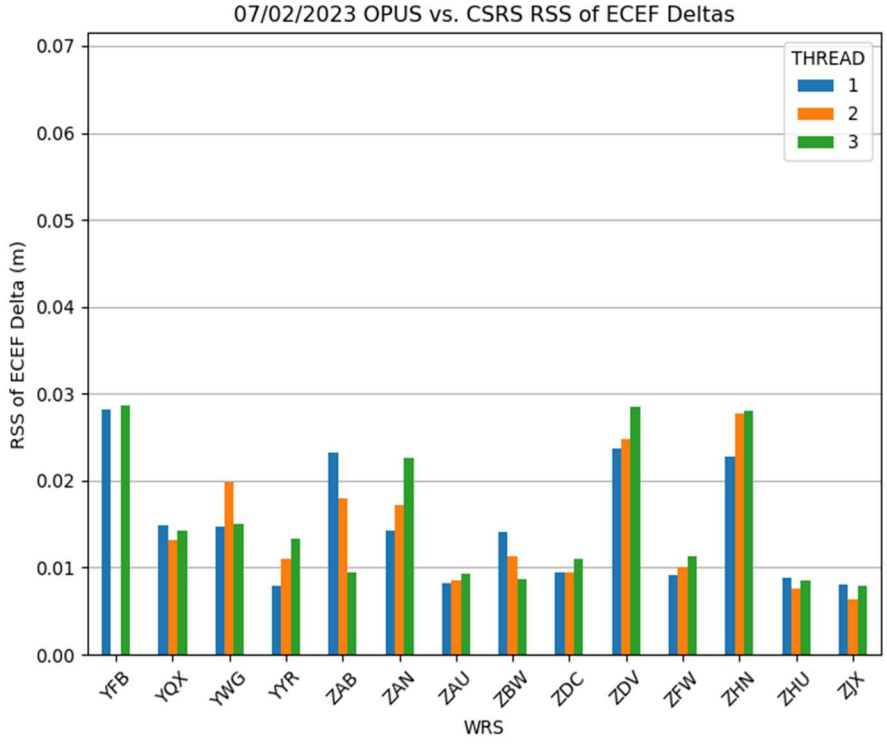

Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

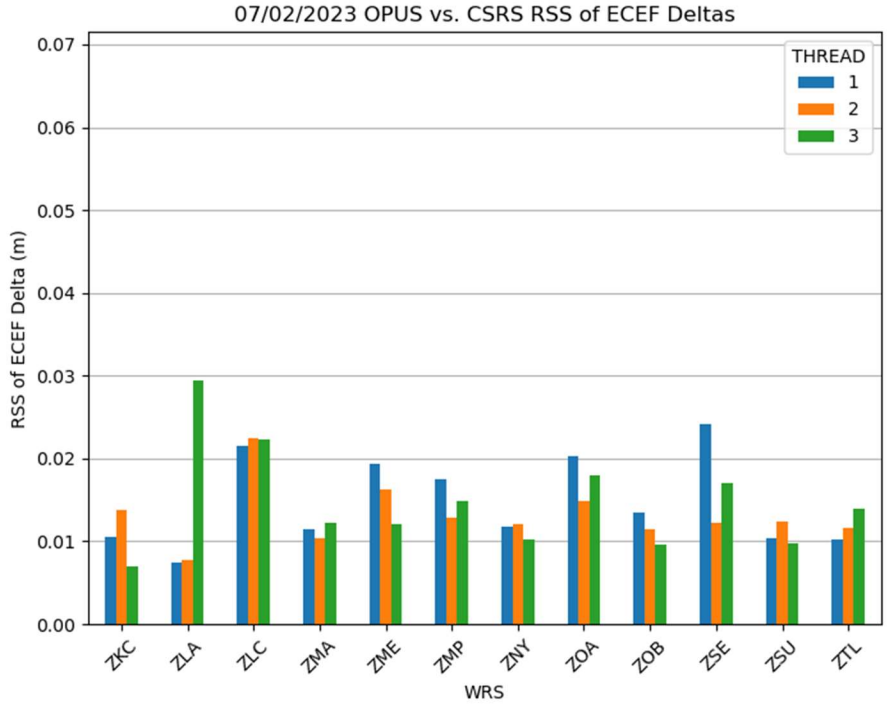

Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

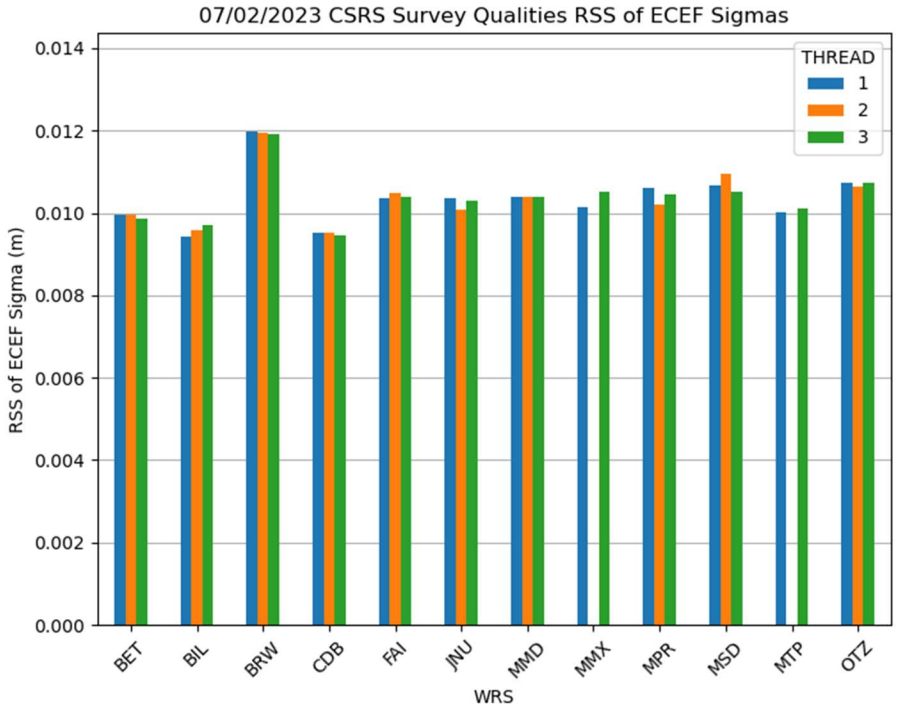

Figure 10-10 CSRS Survey Qualities

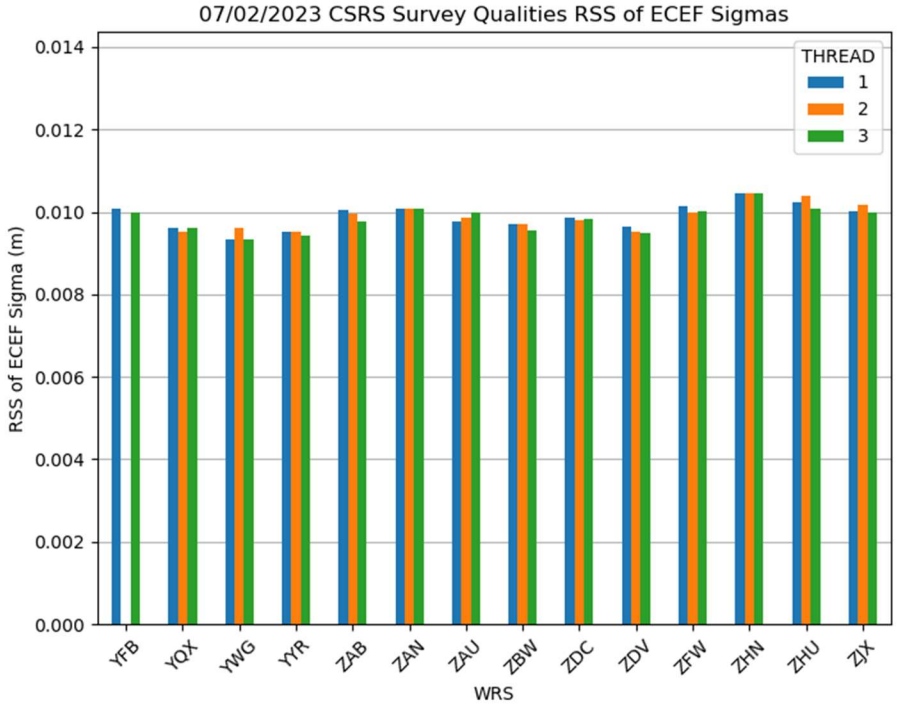

Figure 10-11 CSRS Survey Qualities

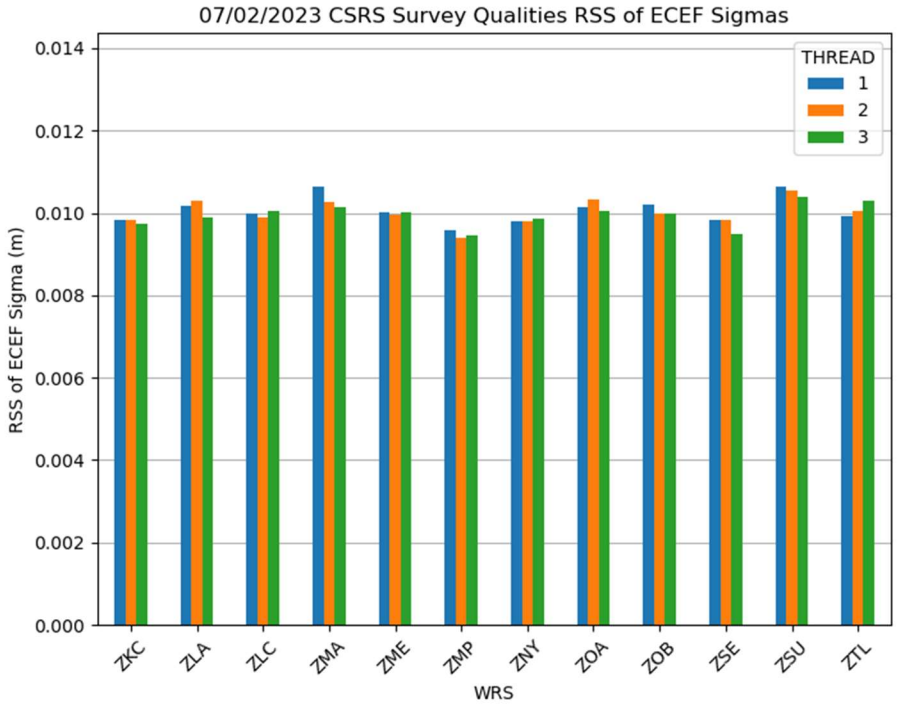

Figure 10-12 CSRS Survey Qualities

11.0 SQM

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

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

11.1 Alpha Metrics

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

Table 11-1 Alpha Metrics

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

11.2 Type Bias

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

For this reporting period, 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	1.31692	1.31938	1.32136
DM 2	0.243235	0.246382	0.249509
DM 3	0.972771	0.973134	0.973797
DM 4	-0.188417	-0.189908	-0.191915

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31882	1.32103	1.32278
DM 2	0.241974	0.245168	0.248303
DM 3	0.972793	0.973287	0.973864
DM 4	-0.187254	-0.188917	-0.190929

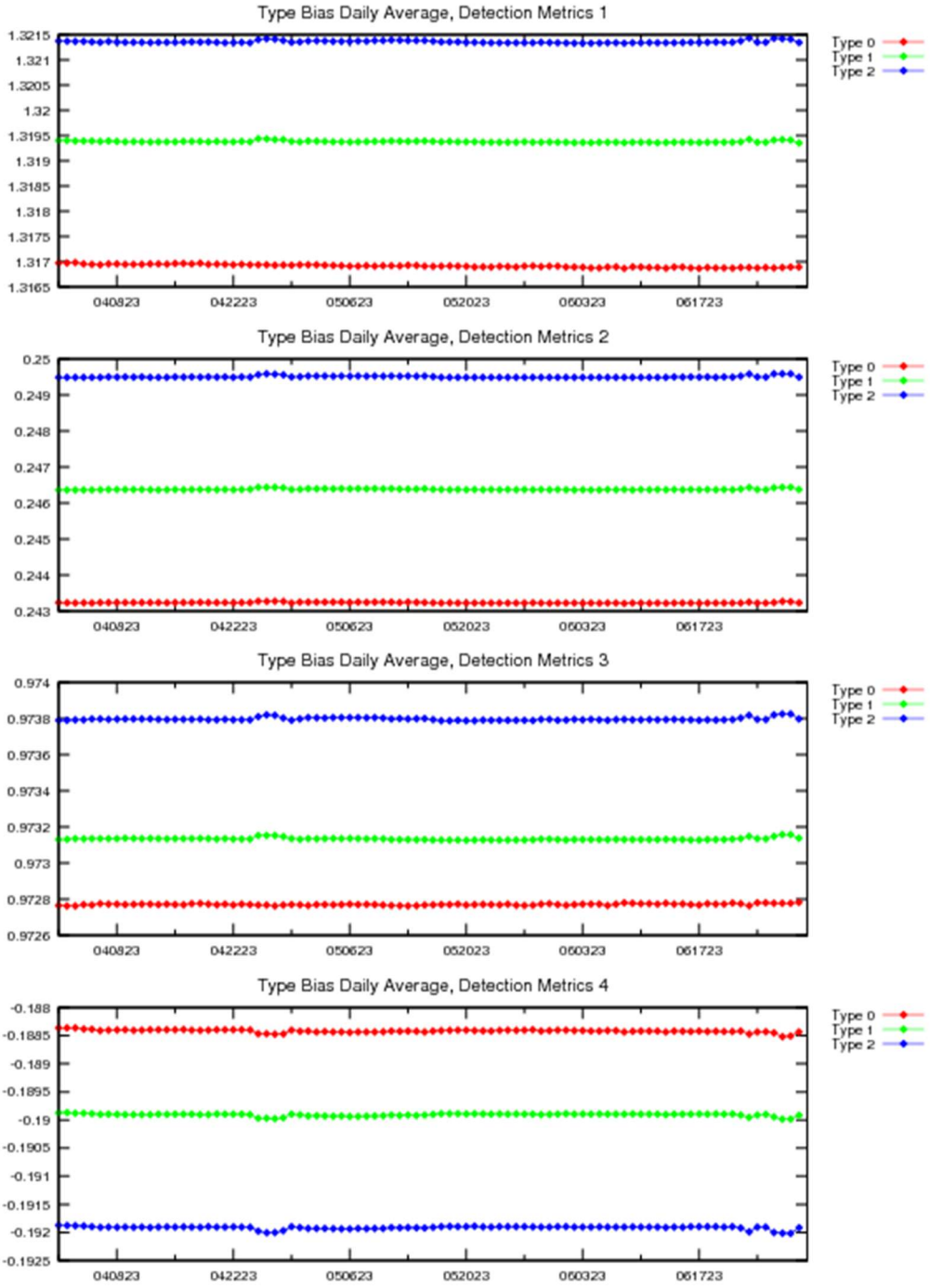

Figure 11-1 Type Bias Average Trend

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 0.0007456 observed on PRN19, (2) the maximum average for DM2 is 0.0002093 observed on PRN19, (3) the maximum average for DM3 is 0.0004515 observed on PRN18, (4) the maximum average for DM4 is 0.0004534 observed on PRN21.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000188383	9.06567e-05	4.54644e-05	0.000139492
2	0.00027208	6.97489e-05	0.000110416	0.000112441
3	0.000208919	6.02078e-05	0.000101092	0.000124999
4	0.000682048	0.000245577	0.000396983	0.000261142
5	0.000162963	7.00267e-05	0.000105442	0.000103748
6	0.000558963	9.17144e-05	5.73556e-05	0.000234732
7	0.000159898	0.000122664	4.75233e-05	0.00011778
8	0.000340088	9.30589e-05	0.000122786	0.000167156
9	0.000247362	4.49344e-05	0.000169337	0.00017197
10	0.000181468	5.96178e-05	7.68822e-05	0.000154252
11	0.000303924	0.000134686	0.000386977	0.000336714
12	0.000334924	9.61989e-05	8.253e-05	8.226e-05
13	0.000638273	5.68944e-05	5.78289e-05	0.000264886
14	0.000476744	0.000192344	0.00039009	0.000268196
15	0.000362077	0.000122773	4.94122e-05	9.66189e-05
16	0.000213182	4.67989e-05	0.000119958	0.000193472
17	0.000393449	0.000115412	6.20689e-05	8.05533e-05
18	0.0006315	0.000181816	0.000451509	0.000268468
19	0.00074561	0.000209296	8.14289e-05	0.000137578
20	0.000163651	7.36556e-05	4.84044e-05	0.0001447
21	0.00020645	8.75278e-05	0.000117246	0.00045337
22				
23	0.0003854	0.000169963	0.000372394	0.000262788
24	0.000209909	9.09667e-05	0.00020598	0.000248446
25	0.000444197	7.95633e-05	4.14911e-05	0.000193859
26	0.000213267	9.60122e-05	0.000120574	0.0001686
27	0.000354252	0.000153897	0.000202406	0.00034864
28	0.000173023	0.00010013	0.000350894	0.00038561
29	0.000316707	0.000132476	0.0001507	0.000270193
30	0.000343393	7.446e-05	0.000106749	9.24233e-05
31	0.000223162	6.80278e-05	9.27289e-05	0.000186252
32	0.000234983	5.99411e-05	6.38322e-05	0.000199657

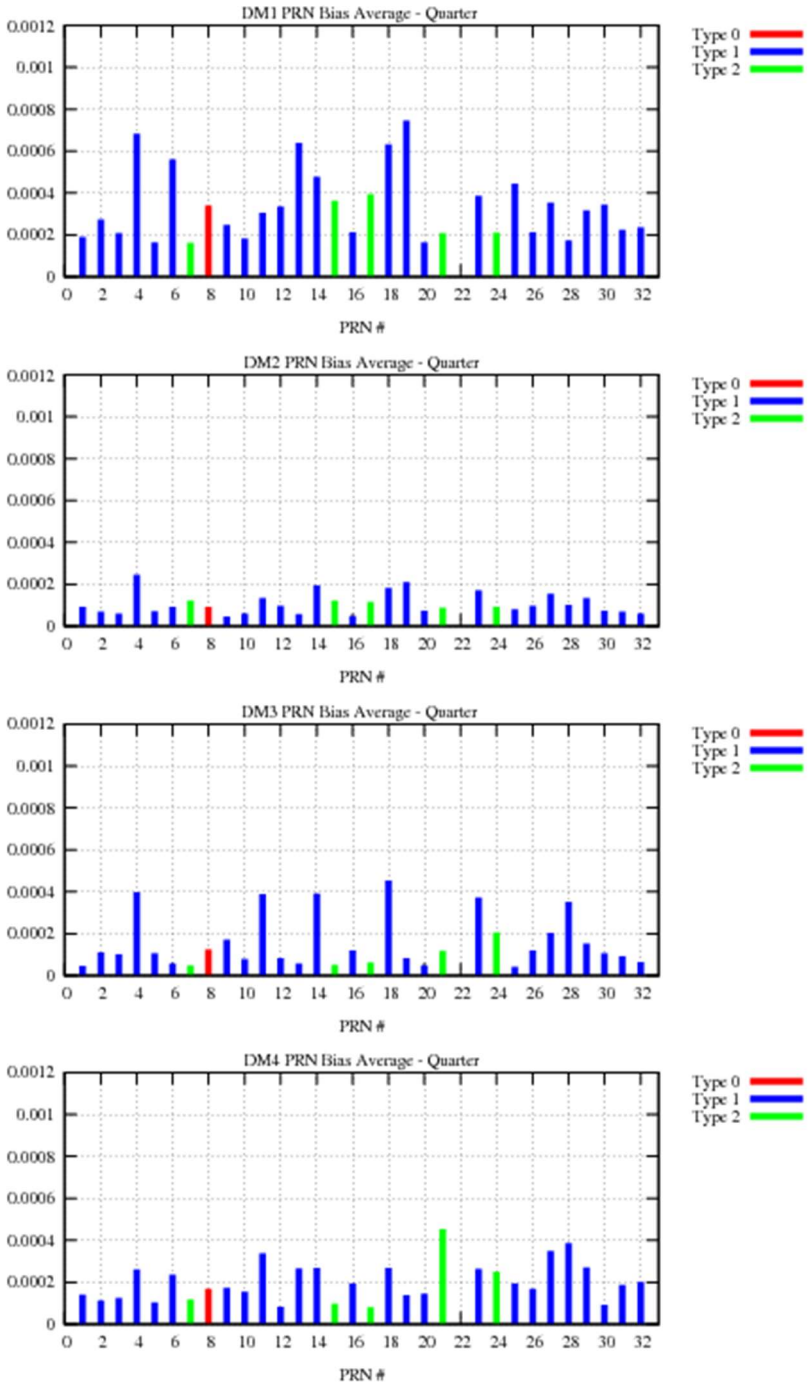

Figure 11-2 PRN Bias Average for the Quarter

Figure 11-3 to Figure 11-10 show the daily PRN bias for each PRN for four detection metrics. PRN bias for most PRNs show deviation from 04/24/2023 to 04/29/2023, on 06/23/2023, and from 06/26/2023 to 06/28/2023 likely due to L2 signal power testing.

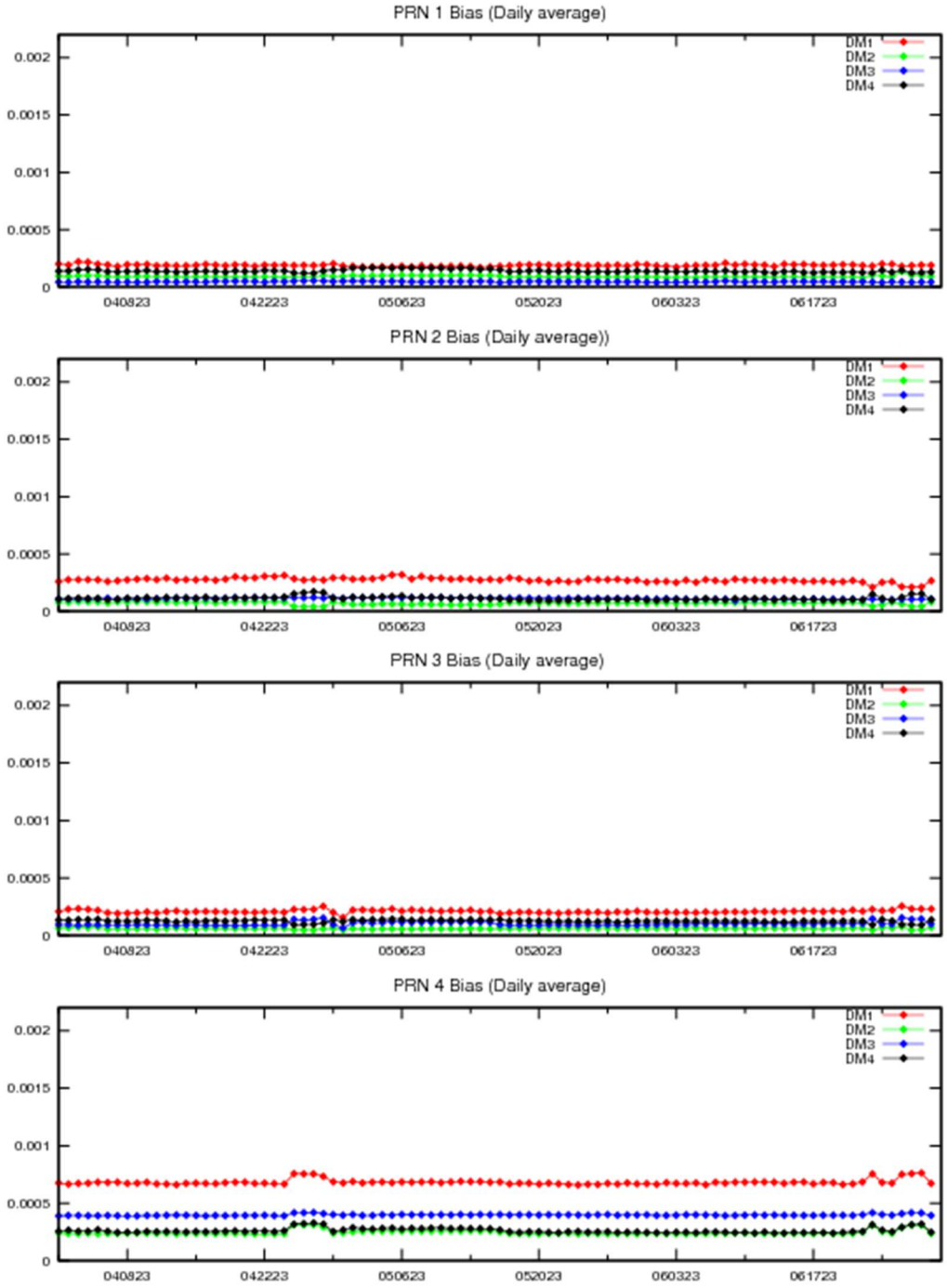

Figure 11-3 PRN Bias Average Trend (PRN1–PRN4)

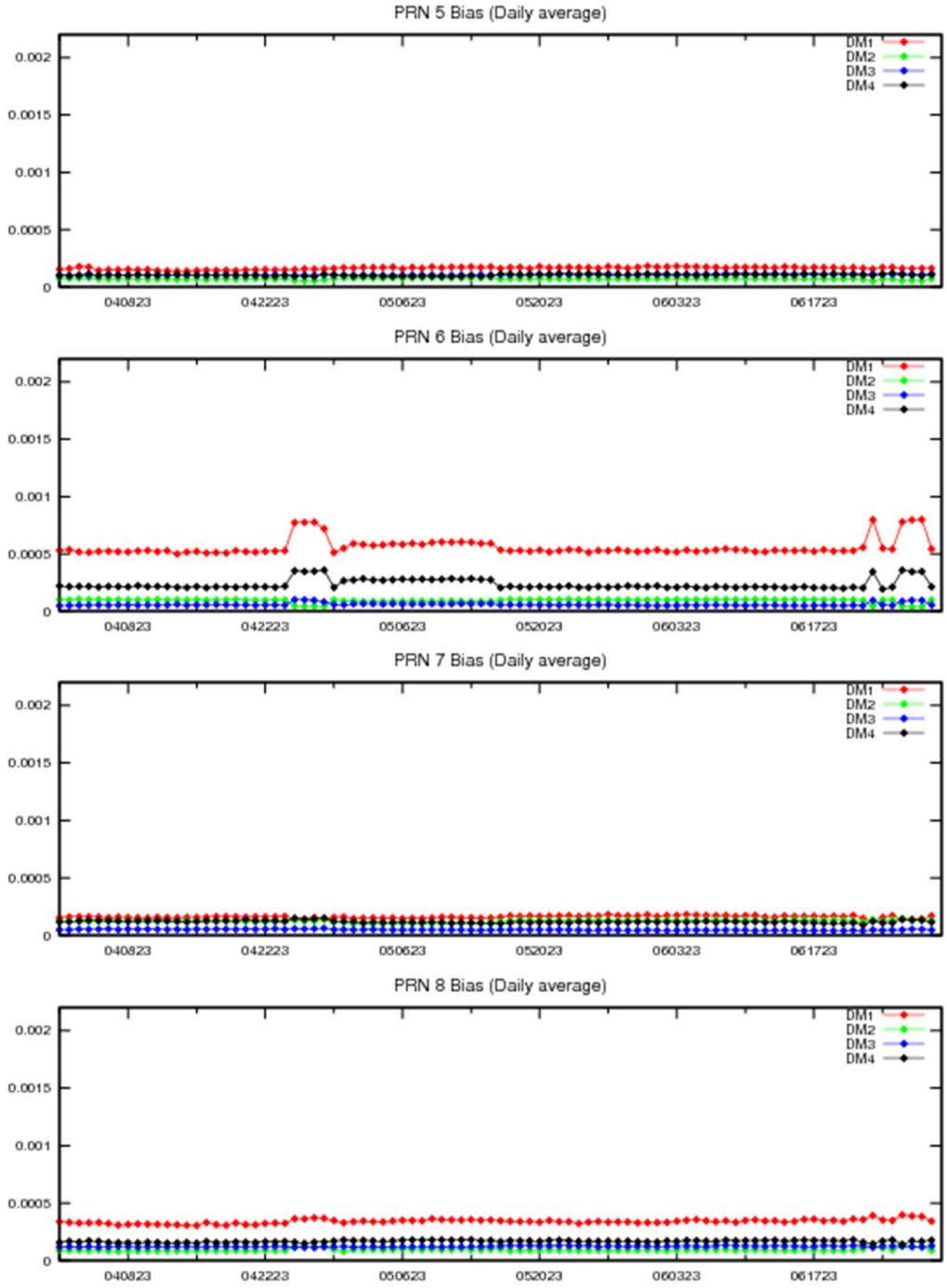

Figure 11-4 PRN Bias Average Trend (PRN5–PRN8)

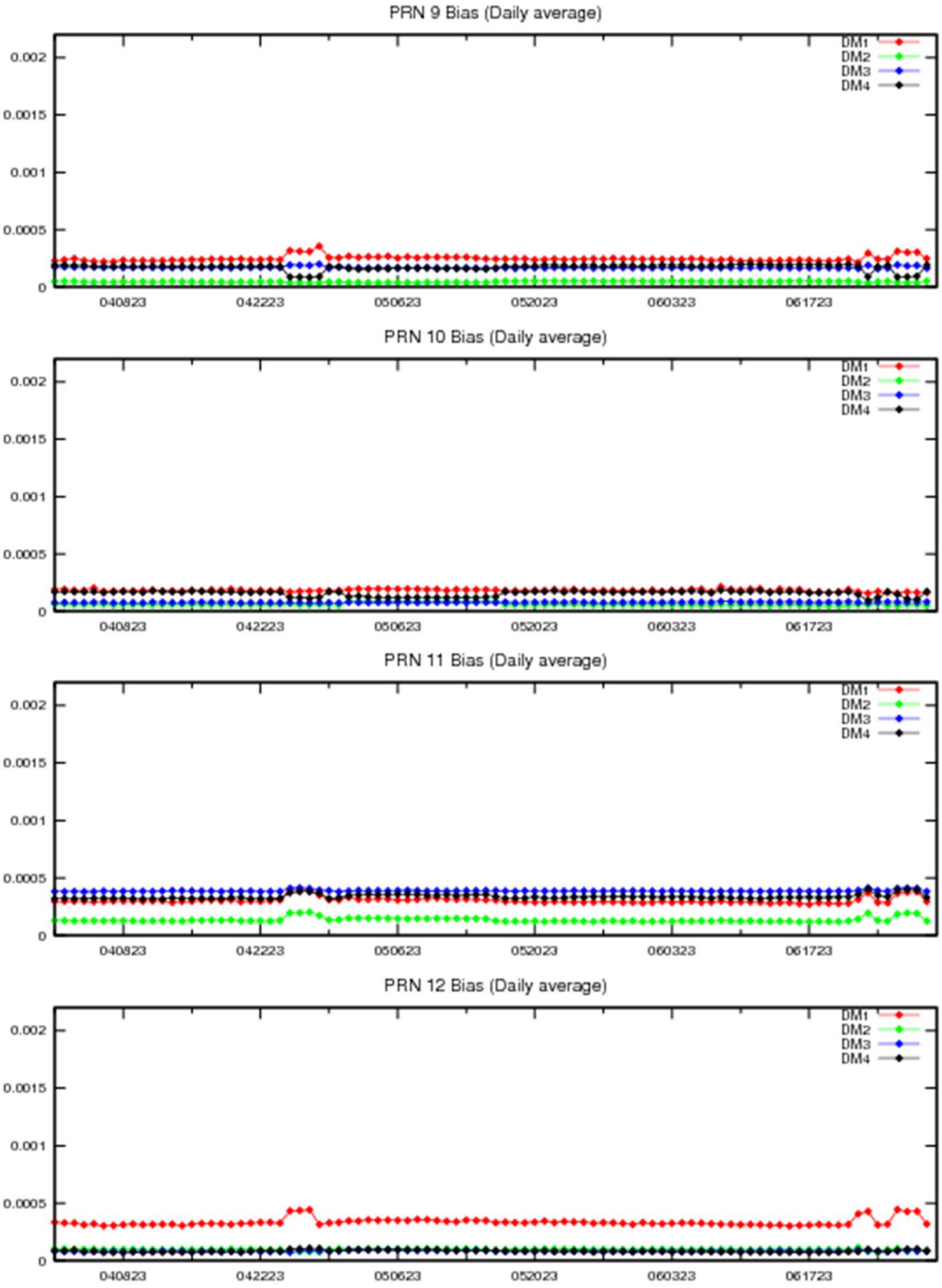

Figure 11-5 PRN Bias Average Trend (PRN9–PRN12)

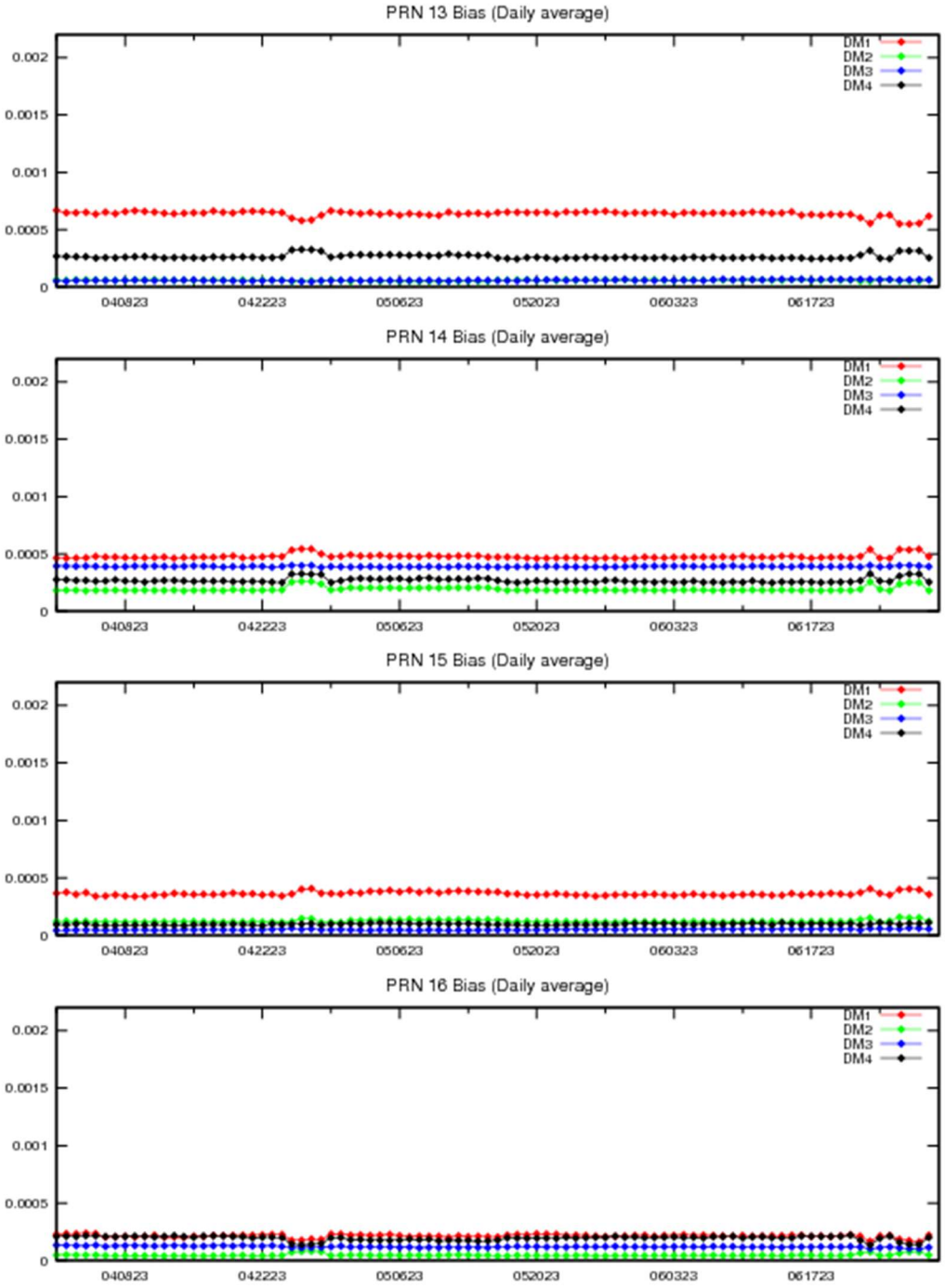

Figure 11-6 PRN Bias Average Trend (PRN13–PRN16)

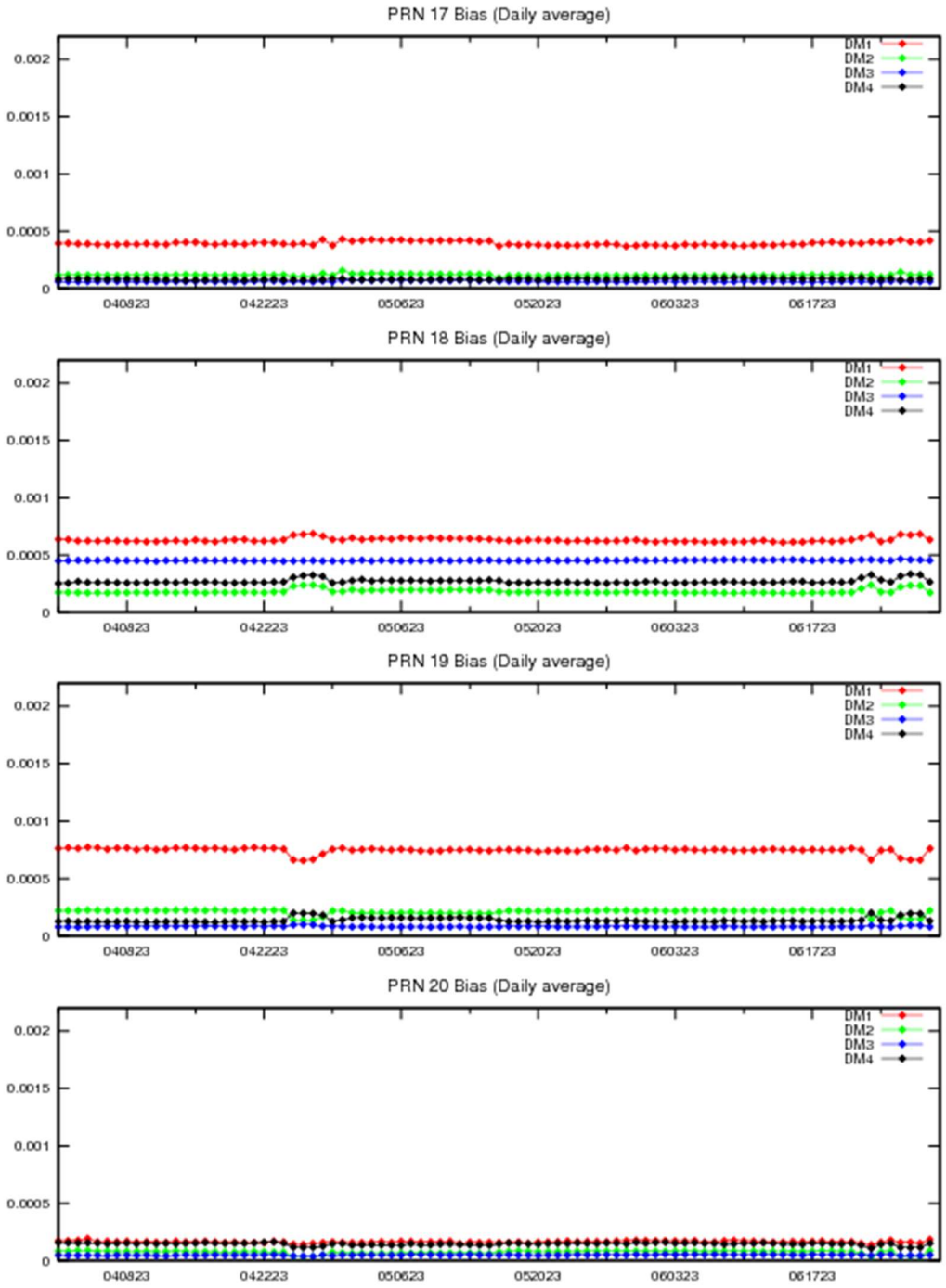

Figure 11-7 PRN Bias Average Trend (PRN17–PRN20)

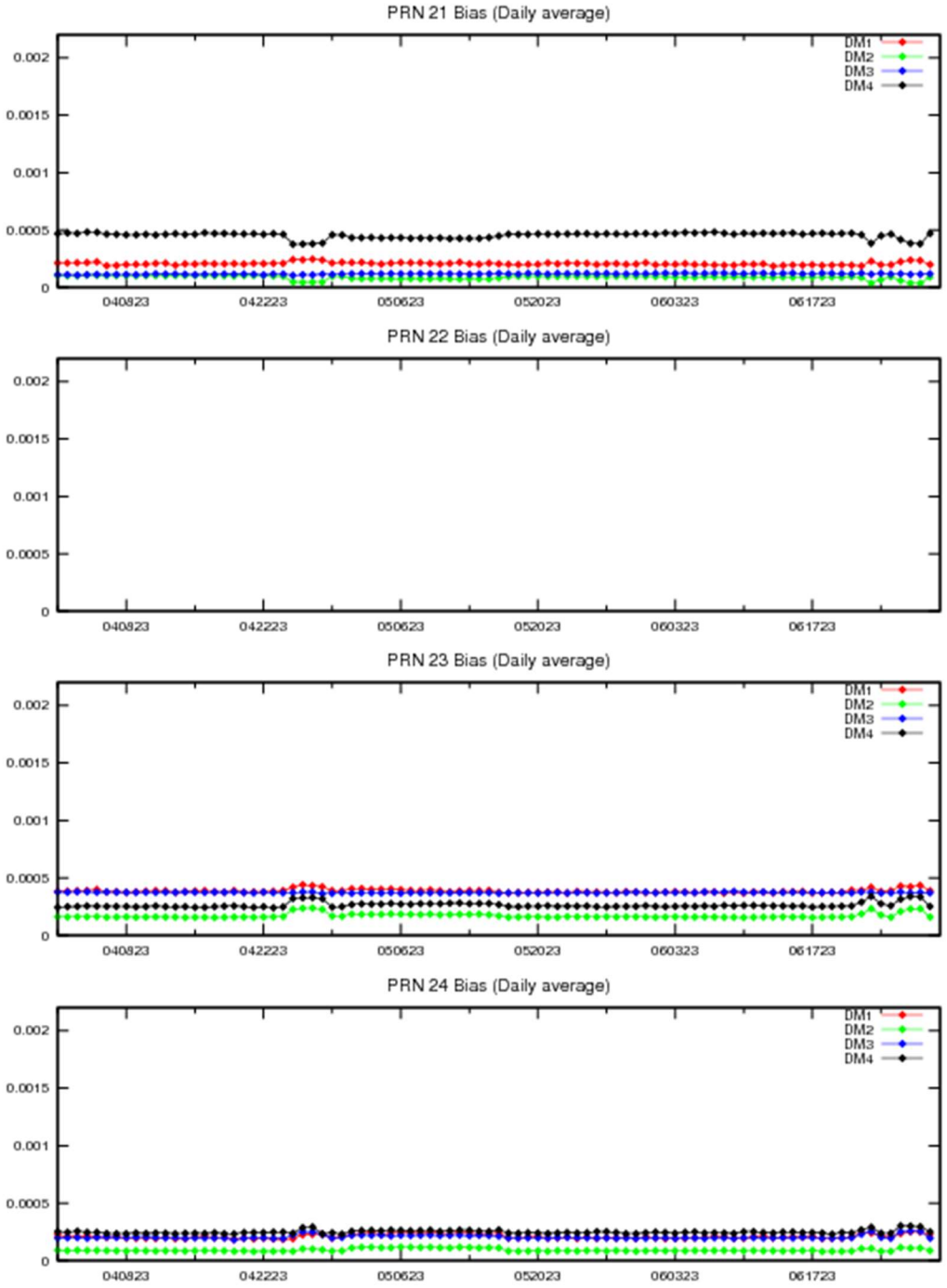

Figure 11-8 PRN Bias Average Trend (PRN21–PRN24)

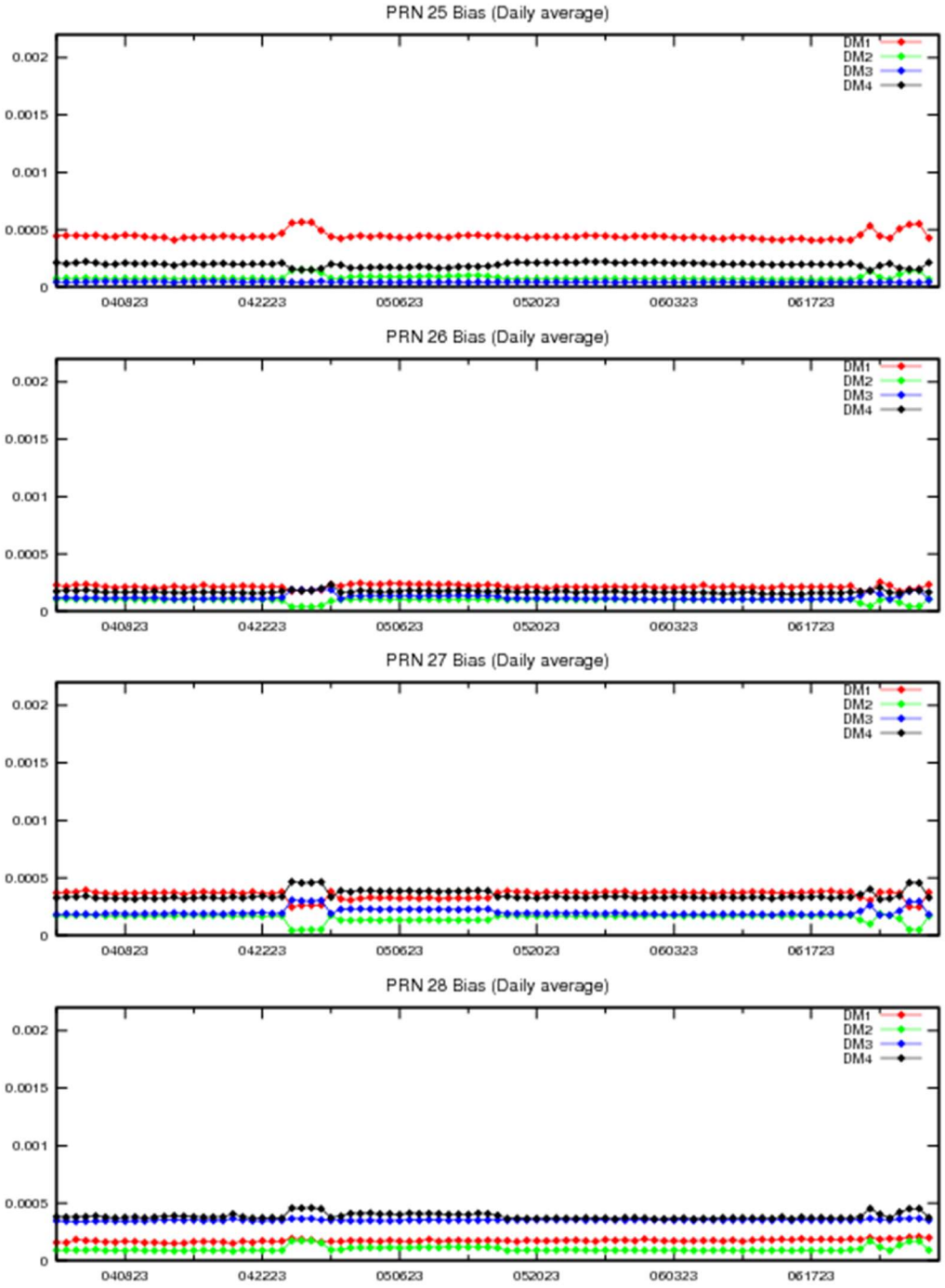

Figure 11-9 PRN Bias Average Trend (PRN25–PRN28)

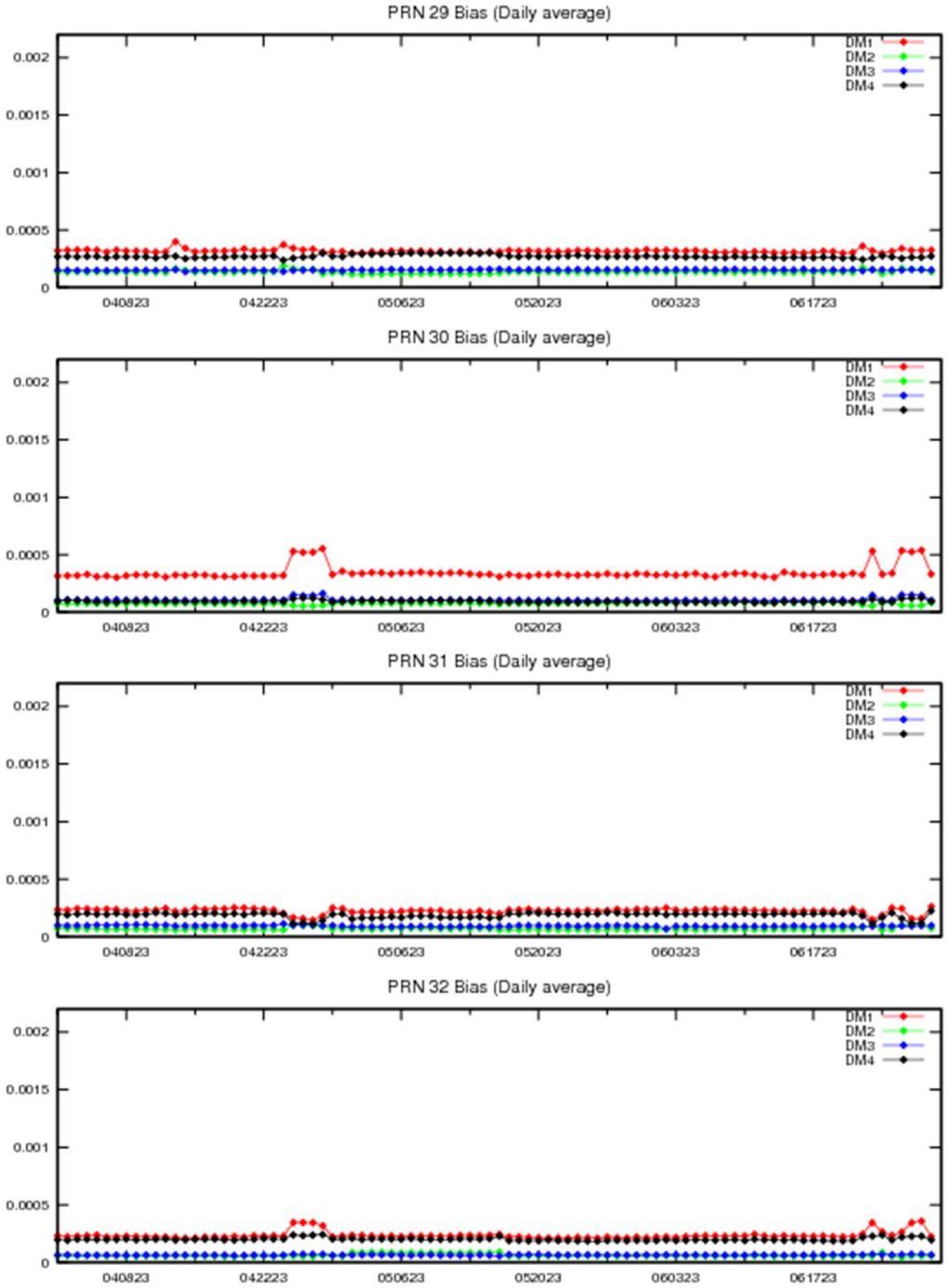

Figure 11-10 PRN Bias Average Trend (PRN29–PRN32)

11.4 SQM Trips

An SQM trip occurs when the estimated deformation exceeds threshold. There were no SQM trips observed in this quarter.

Appendix A: Glossary and Acronyms

General Terms and Definitions

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

AMR. GEO PRN133

APC. Antenna phase center

ARP. Antenna reference point

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

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

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

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

CSRS. Canadian Spatial Reference System

DM. Detection metrics

DR. Discrepancy Report.

ECEF. Earth-centered, Earth-fixed.

FAA. Federal Aviation Administration

FD. Fault Detection

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

G30. GEO PRN135

GEO. Geostationary satellite

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

GMT. Greenwich Mean Time

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

GUS. Ground uplink station

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

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

HPE. Horizontal position error

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

IAP. Instrument Approach Procedures

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

IGS. International GPS Service.

Kp. Planetary index

LNAV. Lateral navigation

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

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

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

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

NAS. National Airspace System

Navigation Message. Message structure designed to carry navigation data.

NGS. National Geodetic Survey

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

NTSB. National Satellite Test Bed

OCONUS. Outside Contiguous United States

OPUS. Online Positioning Use Server

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

PAN. Performance Analysis Network

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

PPP. Precise Point Positioning.

PRN. Pseudo-random noise

RAIM. Receiver autonomous integrity monitoring

RFI. Radio frequency interference

RNAV. Area navigation

RNP. Required Navigation Performance

RSS. Residual sum of squares.

S15. GEO PRN133

SBAS. Space Based Augmentation System

SIS. Signal in space

SM9. GEO PRN131

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

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

SSM. System support modification

SV. Space vehicle.

SVN. Space Vehicle Number.

TOW. Time of GPS week

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

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

VNAV. Vertical navigation

VPE. Vertical position error

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

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

WIPP. WAAS Integrity Performance Panel

WJHTC. William J. Hughes Technical Center

WRE. Wide-Area Reference Equipment

WRS. WAAS reference station

Appendix B: Additional Coverage Plots

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

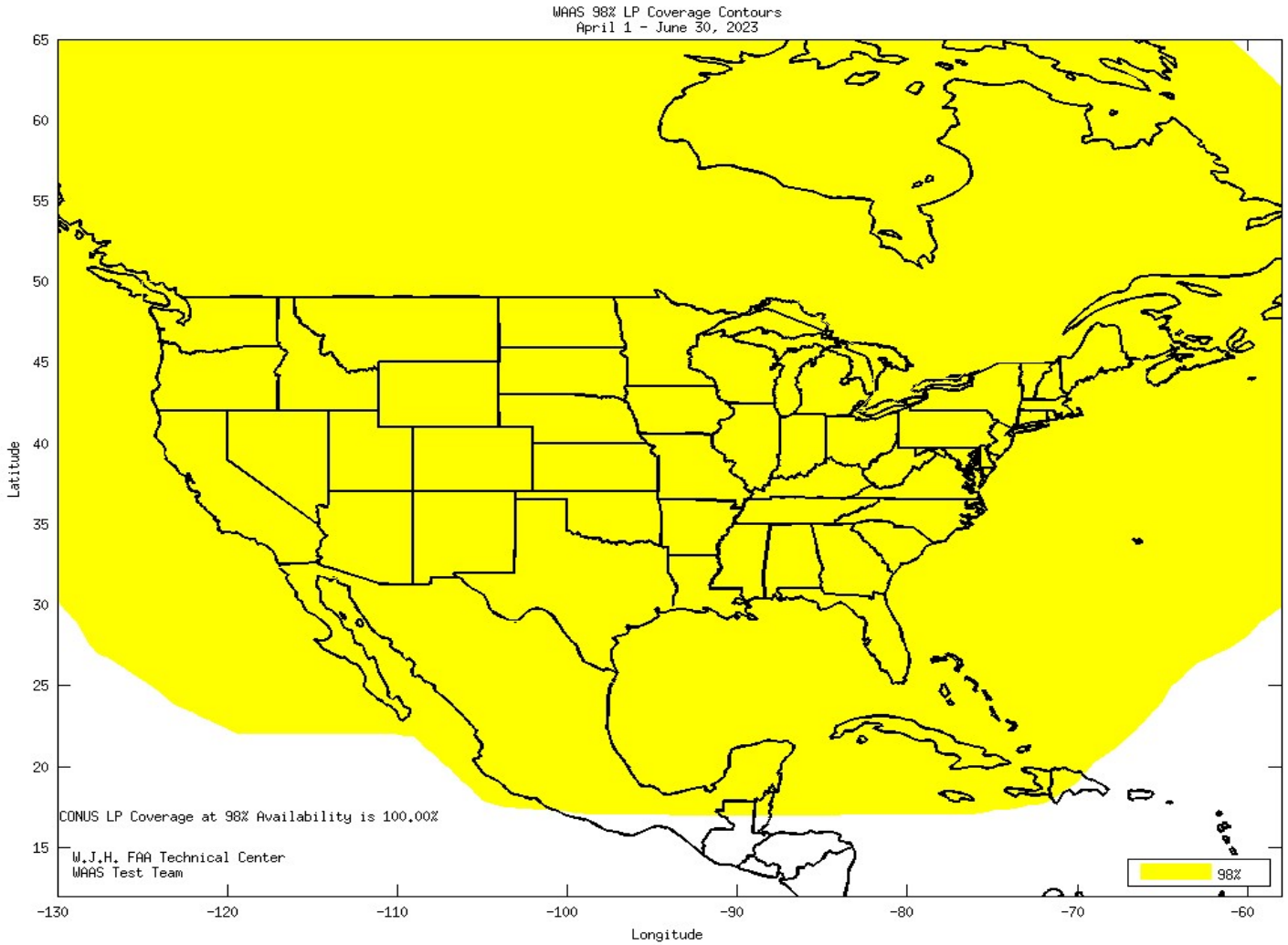

Figure B-1 98% CONUS LP Availability Contour

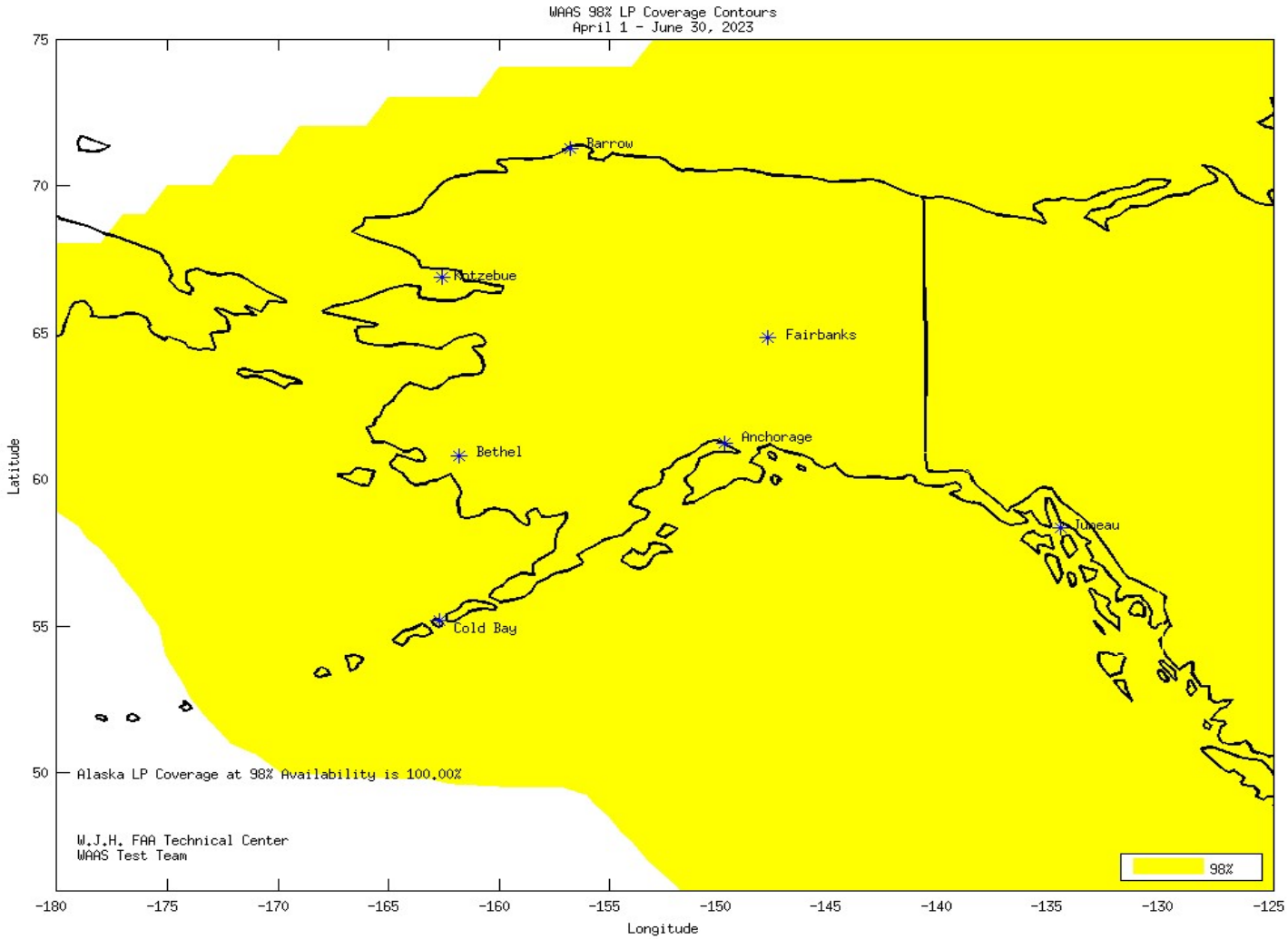

Figure B-2 98% Alaska LP Availability Contour

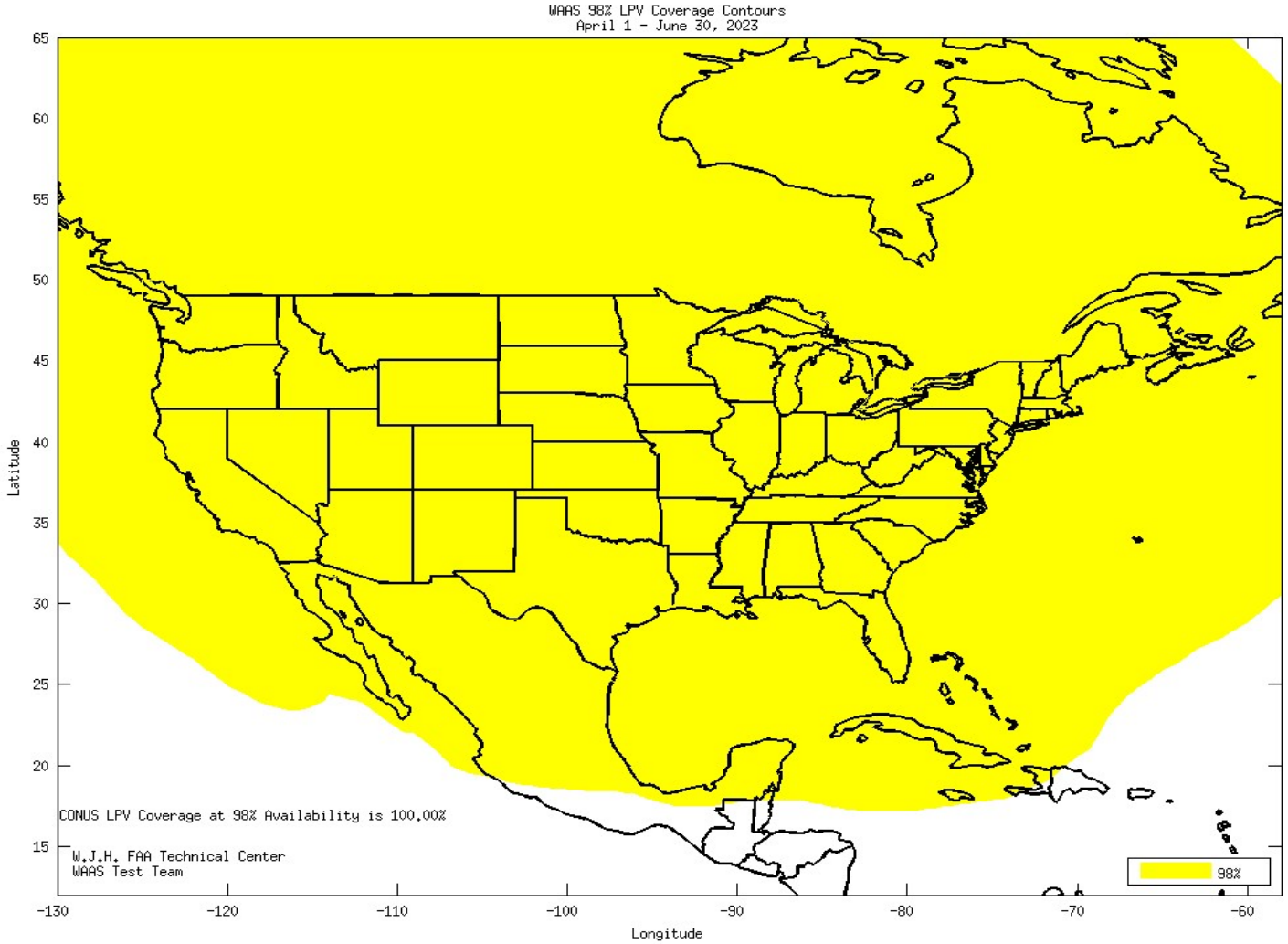

Figure B-3 98% CONUS LPV Availability Contour

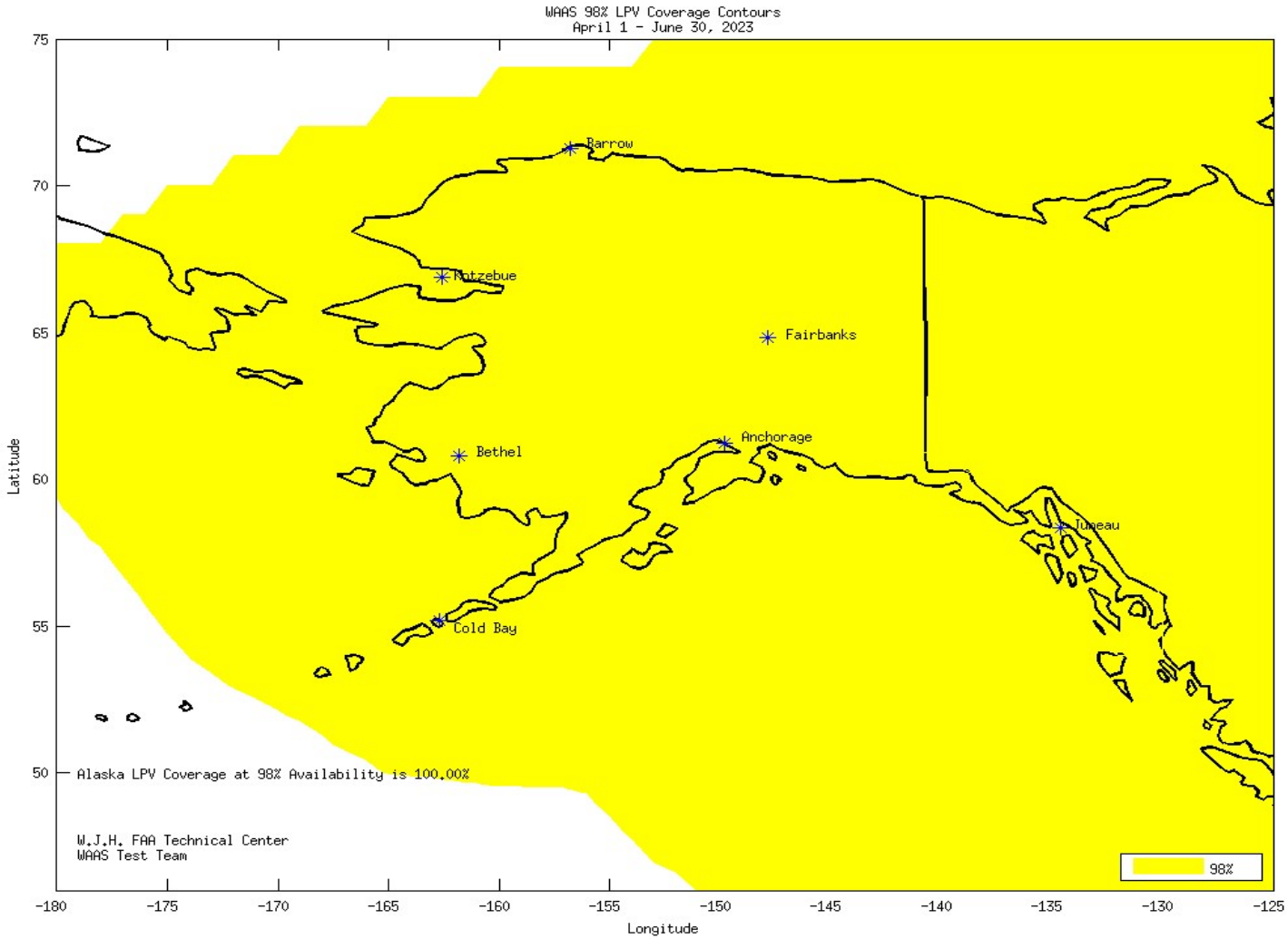

Figure B-4 98% Alaska LPV Availability Contour

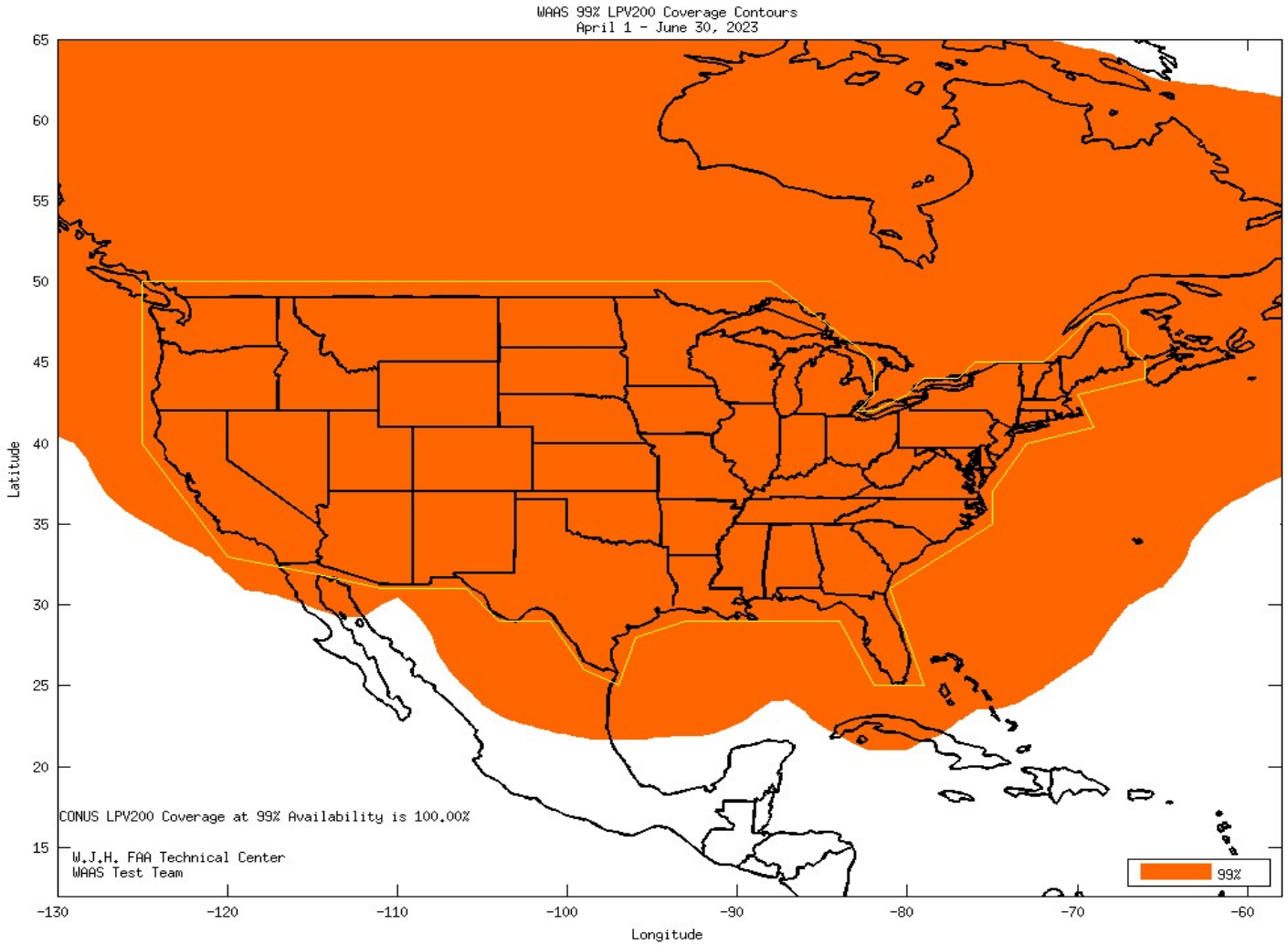

Figure B-5 99% CONUS LPV200 Availability Contour

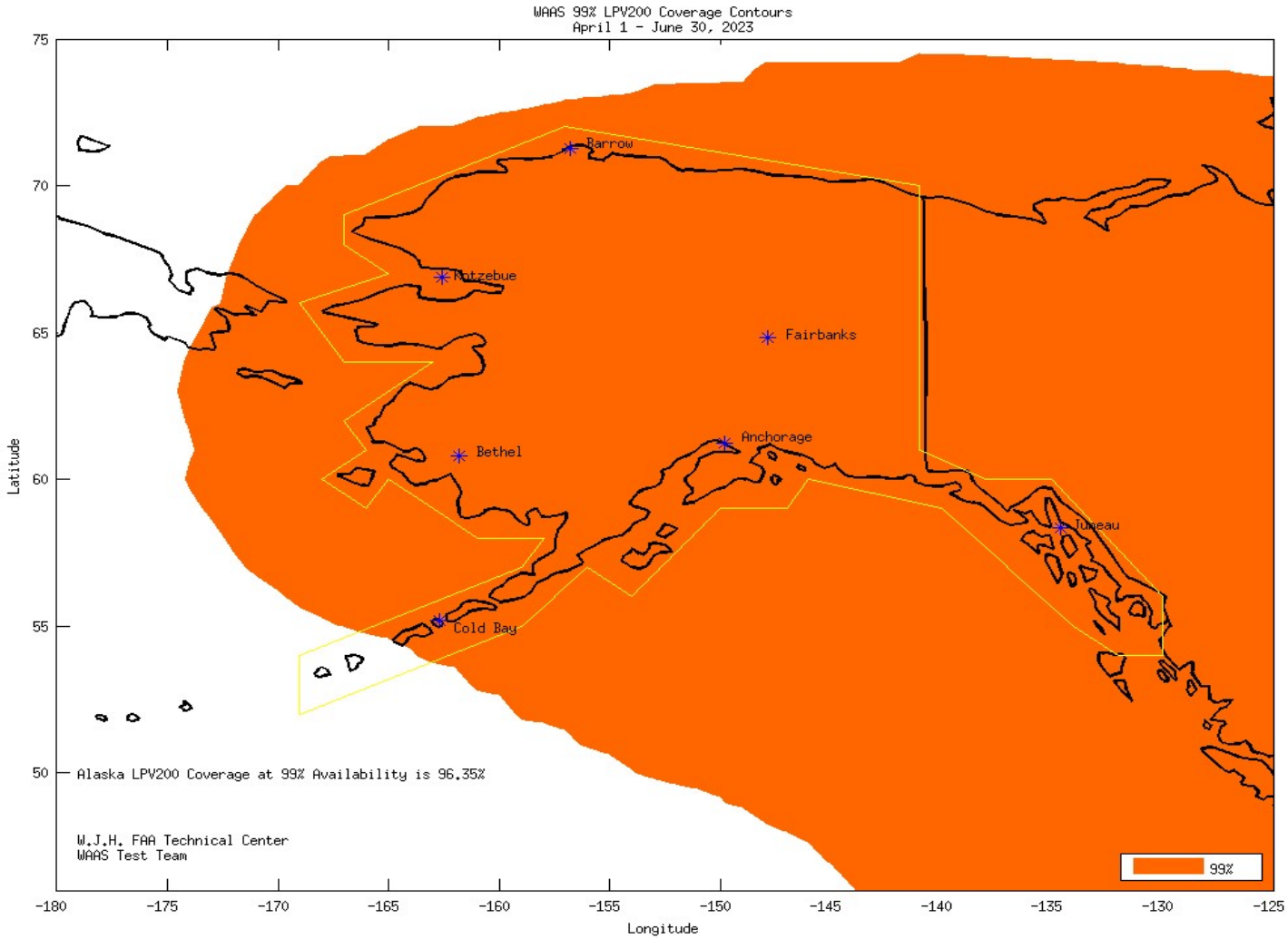

Figure B-6 99% Alaska LPV200 Availability Contour