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

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

July 2024

Report #89
Reporting Period: April 01 to June 30, 2024
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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 #89 provides WAAS performance data from the April 01 through June 30, 2024 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)	Grand Forks 1.428 meters	Memphis 0.619 meters	Cold Bay 0.860 meters	Barrow 0.717 meters
95% Vertical Accuracy (VPL <= 50 meters)	Atlantic City 2.102 meters	Denver 0.990 meters	Kotzebue 1.744 meters	Juneau 1.339 meters
LP Availability (HPL <= 40 meters)	Miami 99.33%	Grand Forks 98.73%	Barrow 99.39%	Kotzebue 99.16%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Albuquerque 99.31%	Grand Forks 98.73%	Cold Bay 99.35%	Kotzebue 99.09%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Cleveland 99.31%	Grand Forks 98.69%	Anchorage 99.28%	Barrow 98.90%
99% HPL	Grand Forks 102.469 meters*	Salt Lake City 11.515 meters	Cold Bay 22.326 meters	Fairbanks 14.818 meters
99% VPL	Elko 135.338 meters*	Salt Lake City 21.677 meters	Kotzebue 35.920 meters	Anchorage 25.689 meters

* The increased 99% HPL/VPL is explained in the notes under Table 3-1.

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1.0 INTRODUCTION

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

The objectives of this report are:

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

The evaluation uses the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN) 131 (SM9), 133 (S15), and 135 (G30). SM9, S15 and G30 GEOs provide a precision approach (PA) ranging capability that supports all levels of WAAS service.

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

Table 1-1 WAAS Service Levels

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

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

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

Table 1-2 PA Evaluation Sites

Location	Number of Days Evaluated	Number of Samples
NSTB:		
Arcata	79	6794791
Atlantic City	85	7324512
Elko	60	5195366
Grand Forks	50	4301911
Oklahoma City	74	6375415
WAAS:		
Albuquerque	91	7858549
Anchorage	91	7849079
Atlanta	91	7860578
Barrow	89	7681172
Bethel	88	7602141
Billings	90	7767706
Boston	91	7862387
Chicago	91	7859902
Cleveland	91	7837530
Cold Bay	91	7861413
Dallas	91	7860705
Denver	91	7860628
Fairbanks	90	7757647
Gander	91	7855562
Goose Bay	91	7860511
Houston	91	7854940
Iqaluit	91	7858103
Jacksonville	91	7859061
Juneau	91	7843434
Kansas City	91	7858316
Kotzebue	65	5638907
Los Angeles	91	7828225
Memphis	91	7860673
Merida	76	6540520
Mexico City	68	5862070
Miami	91	7859196
Minneapolis	91	7862107
New York	91	7862396
Oakland	91	7854060
Puerto Vallarta	88	7616677

Location	Number of Days Evaluated	Number of Samples
Salt Lake City	91	7860138
San Jose Del Cabo	63	5465686
Seattle	77	6649468
Washington, DC	91	7862165
Winnipeg	91	7861392

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	91	7862400
Anchorage	91	7847789
Atlanta	91	7862400
Barrow	90	7743291
Bethel	89	7668296
Billings	83	7208315
Boston	91	7862394
Cleveland	91	7845239
Cold Bay	91	7862393
Fairbanks	90	7782182
Gander	91	7862105
Honolulu	91	7862307
Houston	91	7862400
Iqaluit	91	7861486
Juneau	91	7851025
Kansas City	91	7854750
Kotzebue	66	5734017
Los Angeles	91	7862400
Merida	77	6634201
Miami	91	7862397
Minneapolis	91	7862397
Oakland	91	7862400
Salt Lake City	91	7862394
San Jose Del Cabo	68	5908186
San Juan	91	7862252
Seattle	78	6742188
Washington, DC	91	7862394

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 < 556m
Availability LNAV Alaska	99.9% availability with HPL < 556m
Availability En Route OCONUS	99.9% availability with HPL < 2nmi
Probability of Hazardous Misleading Information	< 10e-7 per approach

1.1 Event Summary

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

Analyses of events that merit more detailed investigations are documented in the Discrepancy Reports (DRs). The DRs are available at http://www.nstb.tc.faa.gov under “WAAS Technical Reports” and also accessible via hyperlink in Table 1-5. Note that “TOW” is the time of GPS week, which is the cumulative number of seconds beginning 00:00:00 Sunday (GMT without leap seconds). Table 1-6 lists events related to WAAS upgrades during this reporting period, andGUS Switchovers 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
04/04/2024	04/04/2024	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 21:00 UTC to 23:00 UTC. Please see plot(s): LPV200_4/4/2024 Cov_vs_Time_Canada_4/4/2024
04/16/2024	04/16/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV service coverage in Canada from 00:25 UTC to 01:50 UTC, 02:10 UTC to 02:30 UTC, and from 23:10 UTC to 23:40 UTC. The elevated GIVE values also caused moderate degradation of: (1) LPV200 service coverage in CONUS from 00:30 UTC to 01:30 UTC and from 21:30 UTC to 21:50 UTC; (2) LPV200 service coverage in Alaska from 01:30 UTC to 01:45 UTC, 05:40 UTC to 07:55 UTC, and from 08:30 UTC to 10:10 UTC; (3) LPV200 service coverage in Canada from 00:05 UTC to 04:10 UTC, and from 20:55 UTC to 23:40 UTC. Please see plot(s): LPV_4/16/2024 LPV200_4/16/2024 Cov_vs_Time_Alaska_4/16/2024 Cov_vs_Time_Canada_4/16/2024 Cov_vs_Time_Conus_4/16/2024
04/19/2024	04/19/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 7) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV service coverage in Canada from 16:40 UTC to 17:15 UTC and from 17:30 UTC to 21:45 UTC; (2) LPV200 service coverage in Canada from 06:05 UTC to 06:45 UTC, 09:20 UTC to 09:55 UTC, and from 16:25 UTC to 23:50 UTC. The elevated GIVE values also caused moderate degradation of LPV200 service coverage in Alaska from 06:00 UTC to 07:30 UTC and from 08:25 UTC to 10:00 UTC. Please see plot(s): LPV_4/19/2024 LPV200_4/19/2024 Cov_vs_Time_Alaska_4/19/2024 Cov_vs_Time_Canada_4/19/2024 Cov_vs_Time_Conus_4/19/2024

Start Date	End Date	Location Satellite	Service Affected	Event Description
04/20/2024	04/20/2024	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 significant degradation of LPV200 service coverage in Canada from 21:05 UTC on 4/20 to 21:40 UTC on 4/20 and from 23:05 UTC on 4/20 to 00:50 UTC on 4/21. Please see plot(s): LPV200_4/20/2024 Cov_vs_Time_Canada_4/20/2024
04/21/2024	04/21/2024	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 06:00 UTC to 06:30 UTC and from 16:00 UTC to 16:10 UTC. Please see plot(s): LPV200_4/21/2024 Cov_vs_Time_Canada_4/21/2024
04/23/2024	04/23/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 2.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 05:50 UTC to 06:20 UTC and from 12:15 UTC to 12:30 UTC. Please see plot(s): LPV200_4/23/2024 Cov_vs_Time_Canada_4/23/2024
04/26/2024	04/27/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 5.33) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 05:40 UTC on 4/26 to 06:10 UTC on 4/26, 11:20 UTC on 4/26 to 11:45 UTC on 4/26, 15:35 UTC on 4/26 to 15:50 UTC on 4/26, 16:25 UTC on 4/26 to 17:45 UTC on 4/26, and from 23:35 UTC on 4/26 to 00:40 UTC on 4/27. Please see plot(s): LPV200_4/26/2024 Cov_vs_Time_Canada_4/26/2024 LPV200_4/27/2024 Cov_vs_Time_Canada_4/27/2024
04/27/2024	04/27/2024	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 00:55 UTC to 01:25 UTC and from 05:35 UTC to 06:05 UTC. Please see plot(s): LPV200_4/27/2024 Cov_vs_Time_Canada_4/27/2024

Start Date	End Date	Location Satellite	Service Affected	Event Description
04/30/2024	05/01/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 4.33) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV200 service coverage in CONUS from 02:25 UTC on 4/30 to 02:30 UTC on 4/30 and from 10:50 UTC on 4/30 to 11:10 UTC on 4/30; (2) LPV200 service coverage in Alaska from 17:05 UTC on 4/30 to 18:05 UTC on 4/30; (3) LPV200 service coverage in Canada from 21:35 UTC on 4/30 to 00:10 UTC on 5/1. Please see plot(s): LPV200_4/30/2024 Cov_vs_Time_Alaska_4/30/2024 Cov_vs_Time_Canada_4/30/2024 Cov_vs_Time_Conus_4/30/2024 LPV200_5/1/2024 Cov_vs_Time_Canada_5/1/2024
05/01/2024	05/01/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	RNP3_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 00:40 UTC to 01:05 UTC, 01:10 UTC to 02:00 UTC, and from 05:20 UTC to 05:50 UTC. Please see plot(s): LPV200_5/1/2024 Cov_vs_Time_Canada_5/1/2024
05/02/2024	05/02/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 6.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in CONUS from from 19:25 UTC to 22:00 UTC. The elevated GIVE values also caused moderate degradation of: (1) LPV service coverage in CONUS from 19:30 UTC to 20:50 UTC; (2) LPV200 service coverage in Canada from 18:05 UTC to 18:15 UTC, 18:50 UTC to 19:00 UTC, 19:25 UTC to 20:05 UTC, and from 21:20 UTC to 21:35 UTC. Please see plot(s): LPV_5/2/2024 LPV200_5/2/2024 Cov_vs_Time_Canada_5/2/2024 Cov_vs_Time_Conus_5/2/2024
05/04/2024	05/04/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in Canada from 05:15 UTC to 05:35 UTC. Please see plot(s):

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV200_5/4/2024 Cov_vs_Time_Canada_5/4/2024
05/05/2024	05/06/2024	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 LPV200 service coverage in Canada from 23:30 UTC on 5/5 to 02:15 UTC on 5/6. The elevated GIVE values also caused minor degradation of LPV200 service coverage in Alaska from 05:10 UTC on 5/5 to 05:50 UTC on 5/5 and from 23:35 UTC on 5/5 to 23:45 UTC on 5/5. Please see plot(s): LPV200_5/5/2024 Cov_vs_Time_Alaska_5/5/2024 Cov_vs_Time_Canada_5/5/2024 LPV200_5/6/2024 Cov_vs_Time_Alaska_5/6/2024 Cov_vs_Time_Canada_5/6/2024
05/06/2024	05/06/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 5) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 05:00 UTC to 05:30 UTC. The elevated GIVE values also caused moderate degradation of: (1) LPV service coverage in Alaska from 01:10 UTC to 01:50 UTC; (2) LPV service coverage in Canada from 00:05 UTC to 00:15 UTC, 00:25 UTC to 00:30 UTC, 00:35 UTC to 01:25 UTC, and from 01:40 UTC to 02:00 UTC; (3) LPV200 service coverage in CONUS from 00:45 UTC to 02:00 UTC, 17:45 UTC to 18:00 UTC, and from 20:10 UTC to 20:55 UTC; (4) LPV200 service coverage in Alaska from 00:05 UTC to 03:00 UTC. Please see plot(s): LPV_5/6/2024 LPV200_5/6/2024 Cov_vs_Time_Alaska_5/6/2024 Cov_vs_Time_Canada_5/6/2024 Cov_vs_Time_Conus_5/6/2024
05/10/2024	05/11/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 9) caused by a G5 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This caused the WAAS Extreme Storm Detector (ESD) to trip from May 10 at 20:55 UTC to May 11 at 10:22 UTC, causing an extended loss of vertical service by WAAS over the entire WAAS service volume. There was significant degradation of: (1) LPV service coverage in CONUS from 18:45 UTC on 5/10 to 10:45 UTC on 5/11; (2) LPV service coverage in Alaska from 18:35 UTC on 5/10 to 10:35 UTC on 5/11; (3)

Start Date	End Date	Location Satellite	Service Affected	Event Description
				LPV service coverage in Canada from 18:30 UTC on 5/10 to 10:30 UTC on 5/11; (4) LPV200 service coverage in CONUS from 18:35 UTC on 5/10 to 10:40 UTC on 5/11; (5) LPV200 service coverage in Alaska from 18:25 UTC on 5/10 to 10:40 UTC on 5/11; (6) LPV200 service coverage in Canada from 18:10 UTC on 5/10 to 10:30 UTC on 5/11. Please see plot(s): LPV_5/10/2024 LPV200_5/10/2024 Cov_vs_Time_Alaska_5/10/2024 Cov_vs_Time_Canada_5/10/2024 Cov_vs_Time_Conus_5/10/2024 LPV_5/11/2024 LPV200_5/11/2024 Cov_vs_Time_Alaska_5/11/2024 Cov_vs_Time_Canada_5/11/2024 Cov_vs_Time_Conus_5/11/2024
05/11/2024	05/11/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Alaska, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 9) caused by a G5 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This caused the WAAS Extreme Storm Detector (ESD) to trip from May 10 at 20:55 UTC to May 11 at 10:22 UTC causing an extended loss of vertical service by WAAS over the entire WAAS service volume. There was significant degradation of: (1) LPV service coverage in CONUS from 19:50 UTC to 20:00 UTC; (2) LPV service coverage in Alaska from 12:35 UTC to 13:10 UTC; (3) LPV200 service coverage in CONUS from 19:45 UTC to 20:10 UTC; (4) LPV200 service coverage in Alaska from 12:30 UTC to 13:10 UTC, 16:25 UTC to 17:20 UTC, and from 18:40 UTC to 19:45 UTC; (6) LPV200 service coverage in Canada from 12:35 UTC to 13:05 UTC, 15:05 UTC to 15:20 UTC, 16:20 UTC to 16:50 UTC, and from 21:25 UTC to 21:50 UTC. Please see plot(s): LPV_5/11/2024 LPV200_5/11/2024 Cov_vs_Time_Alaska_5/11/2024 Cov_vs_Time_Canada_5/11/2024 Cov_vs_Time_Conus_5/11/2024
05/12/2024	05/12/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 7) caused by a G5 geomagnetic storm disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 04:05 UTC to 04:15

Start Date	End Date	Location Satellite	Service Affected	Event Description
				UTC, 04:30 UTC to 05:05 UTC, and from 22:10 UTC to 23:55 UTC. The elevated GIVE values also caused moderate degradation of: (1) LPV200 service coverage in CONUS from 22:30 UTC to 23:30 UTC; (2) LPV200 service coverage in Alaska from 04:05 UTC to 05:20 UTC. Please see plot(s): LPV200_5/12/2024 Cov_vs_Time_Alaska_5/12/2024 Cov_vs_Time_Canada_5/12/2024 Cov_vs_Time_Conus_5/12/2024
05/16/2024	05/16/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS, LPV200_Alaska	Geomagnetic activity (KP = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in CONUS from 17:45 UTC to 17:55 UTC, 18:05 UTC to 18:40 UTC, and from 19:10 UTC to 19:55 UTC. The elevated GIVE values also caused minor degradation of LPV200 service coverage in Alaska from 06:50 UTC to 08:55 UTC, 09:15 UTC to 09:55 UTC, and from 10:10 UTC to 10:50 UTC. Please see plot(s): LPV200_5/16/2024 Cov_vs_Time_Alaska_5/16/2024 Cov_vs_Time_Conus_5/16/2024
05/17/2024	05/18/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_CONUS, LPV_Canada, LPV200_CONUS, LPV200_Alaska, LPV200_Canada	Geomagnetic activity (KP = 6) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of: (1) LPV service coverage in Canada from 18:30 UTC on 5/17 to 21:35 UTC on 5/17 and from 22:05 UTC to 00:10 UTC on 5/18; (2) LPV200 service coverage in Canada from 17:00 UTC on 5/23 to 02:05 UTC on 5/18. The elevated GIVE values also caused moderate degradation of: (1) LPV200 service coverage in CONUS from 19:05 UTC on 5/17 to 20:55 UTC on 5/17, 22:20 UTC on 5/17 to 22:25 UTC on 5/17 and from 22:45 UTC on 5/17 to 23:05 UTC on 5/17; (2) LPV200 service coverage in Alaska from 23:20 UTC on 5/17 to the end of the day on 5/17. The elevated GIVE values also caused minor degradation of LPV service coverage in COUNUS from 09:15 UTC on 5/17 to 20:45 UTC on 5/17. Please see plot(s): LPV_5/17/2024 LPV200_5/17/2024 Cov_vs_Time_Alaska_5/17/2024 Cov_vs_Time_Canada_5/17/2024 Cov_vs_Time_Conus_5/17/2024

Start Date	End Date	Location Satellite	Service Affected	Event Description
05/18/2024	05/18/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV_Canada, LPV200_CONUS, LPV200_Canada	Geomagnetic activity (KP = 3.67) disturbed the ionosphere causing elevated GIVE values. This resulted in significant degradation of LPV200 service coverage in Canada from 03:55 UTC to 05:05 UTC. The elevated GIVE values also caused moderate degradation of LPV200 service coverage in CONUS from 00:00 UTC to 00:30 UTC and from 03:30 UTC to 03:55 UTC. The elevated GIVE values also caused minor degradation of LPV service coverage in Canada from 00:00 UTC to 00:35 UTC and from 04:10 UTC to 04:40 UTC. Please see plot(s): LPV_5/18/2024 LPV200_5/18/2024 Cov_vs_Time_Canada_5/18/2024 Cov_vs_Time_Conus_5/18/2024
05/25/2024	06/05/2024	PRN7	LPV200_Canada	There was a GPS NANU on PRN7 (see NANU2024030) which was unusable from 16:20 UTC on 5/25 to 18:22 on 6/5. The NANU caused moderate degradation of LPV200 service coverage in Canada from 08:00 UTC to 10:20 UTC. A GPS NANU on PRN16 (see NANU2024029) in conjunction with PRN7 caused greater degradation in Canada on 5/31. Please see plot(s): LPV200_5/27/2024 Cov_vs_Time_Canada_5/27/2024
05/31/2024	05/31/2024	PRN16	LPV200_Canada	There was a GPS NANU on PRN16 (see NANU2024029) which was unusable from 05:40 UTC to 11:23 UTC. The NANU in conjunction with a GPS NANU on PRN7 (see NANU2024030) caused a greater degradation of LPV200 service coverage in Canada from 08:00 UTC to 10:20 UTC. Please see plot(s): LPV200_5/31/2024 Cov_vs_Time_Canada_5/31/2024
06/04/2024	06/23/2024	GEO133	None	The Release 1 field test began on June 4th. As a result, GEO 133 was broadcasting in test mode from June 4th, 2024 and June 21st, 2024. GEO 133 stopped operational broadcast at 16:49:57 UTC on 6/04/24 and resumed 00:40:03 UTC on 6/21/24.
06/08/2024	06/08/2024	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 LPV200 service coverage in Canada from 02:40 UTC to 03:15 UTC. The elevated GIVE values also caused minor degradation of LPV200 service coverage in Alaska from 02:30 UTC to 02:55 UTC.

Start Date	End Date	Location Satellite	Service Affected	Event Description
				Please see plot(s): LPV200_6/8/2024 Cov_vs_Time_Alaska_6/8/2024 Cov_vs_Time_Canada_6/8/2024
06/11/2024	06/11/2024	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 02:30 UTC to 03:05 UTC. Please see plot(s): LPV200_6/11/2024 Cov_vs_Time_Canada_6/11/2024
06/12/2024	06/13/2024	Mexico City (MMX1), Mexico City (MMX2), Mexico City (MMX3), Puerto Vallarta (MPR1), Puerto Vallarta (MPR2), Puerto Vallarta (MPR3), San Jose Del Cabo (MSD1), San Jose Del Cabo (MSD2), San Jose Del Cabo	LPV200_CONUS	The Mexico City (MMX), Puerto Vallarta (MPR), and San Jose Del Cabo (MSD) reference stations went offline from 12:39 UTC on 6/12 to 18:59:20 UTC on 6/13. The lack of observations in the region caused elevated GIVEs which resulted in very minor degradation of LPV200 service coverage in CONUS from 23:05 UTC to 23:40 UTC on 6/12/24 and from 17:30 UTC to 18:05 UTC on 06/13/24. Please see plot(s): LPV200_6/12/2024 Cov_vs_Time_Conus_6/12/2024 LPV200_6/13/2024 Cov_vs_Time_Conus_6/13/2024
06/18/2024	06/18/2024	PRN20	LPV200_CONUS	There was a GPS NANU on PRN20 (see NANU 2024033) which was unusable from 14:49 UTC to 20:15 UTC. The NANU caused minor degradation of LPV200 service coverage in CONUS from 16:40 UTC to 17:00 UTC and from 17:15 UTC to 17:30 UTC. Please see plot(s): LPV200_6/18/2024 Cov_vs_Time_Conus_6/18/2024
6/18/2024	6/18/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in minor degradation of LPV200 service coverage in CONUS from 16:40 UTC to 17:35 UTC. Please see plot(s): LPV200_6/18/2024 Cov_vs_Time_Conus_6/18/2024

Start Date	End Date	Location Satellite	Service Affected	Event Description
6/26/2024	6/26/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_CONUS	Geomagnetic activity (KP = 3) disturbed the ionosphere causing elevated GIVE values. This resulted in very minor degradation of LPV200 service coverage in CONUS (NM, AZ, TX) from 16:40 UTC to 16:55 UTC and from 22:20 UTC to 22:35 UTC. Please see plot(s): LPV200_6/26/2024 Cov_vs_Time_Conus_6/26/2024
06/27/2024	06/27/2024	PRN23	LPV_Canada, LPV200_Canada	There was a GPS NANU on PRN23 (see NANU 2024036) which was unusable from 18:37 UTC to 23:49 UTC. The NANU caused significant degradation of LPV200 service coverage in CONUS from 21:45 UTC to 22:40 UTC and from 23:05 UTC to 23:50 UTC. The NANU also caused moderate degradation of LPV service coverage in CONUS from 23:10 UTC to 23:40 UTC. Please see plot(s): LPV_6/27/2024 LPV200_6/27/2024 Cov_vs_Time_Canada_6/27/2024
6/27/2024	6/27/2024	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 21:40 UTC to 22:15 UTC and from 23:05 UTC to 23:20 UTC. Please see plot(s): LPV200_6/27/2024 Cov_vs_Time_Canada_6/27/2024
6/28/2024	6/28/2024	Washington, DC (CnV), Los Angeles (CnV), Atlanta (CnV)	LPV200_Canada	Geomagnetic activity (KP = 7.67) disturbed the ionosphere causing elevated GIVE values. This resulted in moderate degradation of LPV200 service coverage in Canada from 01:30 UTC to 04:50 UTC. Please see plot(s): LPV200_6/28/2024 Cov_vs_Time_Canada_6/28/2024
6/29/2024	6/29/2024	Mexico City (MMX1), Mexico City (MMX2), Mexico City (MMX3), Puerto Vallarta (MPR1), Puerto Vallarta (MPR2), Puerto Vallarta (MPR3)	LPV200_CONUS	The Puerto Vallarta (MPR) and Mexico City (MMX) WRS went offline from 16:03:43 UTC to 16:55:39 UTC. The lack of observations from these WRS as well as other Mexico sites in the region caused elevated GIVEs which resulted in minor degradation of LPV200 service coverage in CONUS from 16:25 UTC to 17:00 UTC. Please see plot(s): LPV200_6/29/2024 Cov_vs_Time_Conus_6/29/2024

Table 1-6 WAAS Upgrades

Start Date	End Date	Location Satellite	Event Description
04/09/2024	04/09/2024	NOCC	SSM-WAAS-066: This system support modification (SSM) upgrades the NOCC O&M to build W7.402L. The upgrade was completed at 14:48 UTC on 4/9/2024.
04/09/2024	04/10/2024	Chicago (ZAU) COR-A	SSM-WAAS-066: This system support modification (SSM) upgrades the Chicago (ZAU) COR-A to build W7.402L. The upgrade was completed at 00:17 UTC on 4/10/24.
04/10/2024	04/10/2024	Barrow (BRW1), Barrow (BRW2), Barrow (BRW3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Barrow (BRW) WRS to build W7.403L. The upgrade was completed at 19:47 UTC on 4/10/24.
04/10/2024	04/10/2024	Anchorage (ZAN1), Anchorage (ZAN2), Anchorage (ZAN3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Anchorage (ZAN) WRS to build W7.403L. The upgrade was completed at 03:07 UTC on 4/10/24.
04/11/2024	04/12/2024	Kotzebue (OTZ1), Kotzebue (OTZ2), Kotzebue (OTZ3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Kotzebue (OTZ) WRS to build W7.403L. The upgrade was completed at 00:02 UTC on 04/12/24.
04/11/2024	04/12/2024	Los Angeles (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Los Angeles (ZLA) COR-B to build W7.402L. The upgrade was completed at 01:01 UTC on 4/12/24.
04/15/2024	04/15/2024	Washington, DC (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Washington, DC (ZDC) COR-A to build W7.402L. The upgrade was completed at 18:40 on 4/15/24.
04/16/2024	04/16/2024	Juneau (JNU1), Juneau (JNU2), Juneau (JNU3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Juneau (JNU) WRS to build W7.403L. The upgrade was completed at 20:50 on 4/16/24.
04/16/2024	04/16/2024	Atlanta (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Atlanta (ZTL) COR-B to build W7.402L. The upgrade was completed at 19:41 UTC on 4/17/24.
04/17/2024	04/17/2024	Fairbanks (FAI1), Fairbanks (FAI2), Fairbanks (FAI3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Fairbanks (FAI) WRS to build W7.403L. The upgrade was completed at 22:45 UTC on 4/17/24.
04/23/2024	04/23/2024	Bethel (BET1), Bethel (BET2), Bethel (BET3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Bethel (BET) WRS to build W7.403L. The upgrade was completed at 18:48 on 04/23/24.
04/23/2024	04/23/2024	Chicago (ZAU) COR-B	SSM-WAAS-066: This system support modification (SSM) upgrades the Chicago (ZAU) COR-B to build W7.402L. The upgrade was completed at 16:29 on 04/23/24.

Start Date	End Date	Location Satellite	Event Description
04/24/2024	04/24/2024	Seattle (ZSE1), Seattle (ZSE2), Seattle (ZSE3)	SSM-WAAS-066: This system support modification (SSM) upgrades the Seattle (ZSE) WRS to build W7.403L. The upgrade was completed at 19:42 UTC on 04/24/24.
04/24/2024	04/24/2024	Los Angeles (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Los Angeles (ZLA) COR-A to build W7.402L. The upgrade was completed at 19:31 UTC on 04/24/24.
04/25/2024	04/25/2024		SSM-WAAS-066: This system support modification (SSM) upgrades the POCC O&M to build W7.403L. The upgrade was completed at 15:35 UTC on 04/25/24.
04/25/2024	04/25/2024	Atlanta (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Atlanta (ZTL) COR-A to build W7.402L. The upgrade was completed at 16:21 UTC on 04/25/24.
04/25/2024	04/25/2024		SSM-WAAS-066: This system support modification (SSM) upgrades the NOCC O&M to build W7.403L. The upgrade was completed at 16:09 UTC on 04/25/24.
04/29/2024	04/29/2024	Washington, DC (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Washington, DC (ZDC) C&V to build W7.403L. The upgrade was completed at 17:10 UTC on 04/29/24.
05/01/2024	05/01/2024	Los Angeles (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Los Angeles (ZLA) C&V to build W7.403L. The upgrade was completed at 18:41 UTC on 05/01/24.
05/03/2024	05/03/2024	Atlanta (CnV)	SSM-WAAS-066: This system support modification (SSM) upgrades the Atlanta (ZTL) C&V to build W7.403L. The upgrade was completed at 15:52 UTC on 05/03/24.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
04/02/2024	04/02/2024	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 07:01:53 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 198131-198135
04/08/2024	04/08/2024	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 07:00:37 UTC. This caused a 3-second outage of the GEO 135 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN135. There was no impact on coverage. TOW 111655-111659

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
04/12/2024	04/12/2024	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 07:13:11 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 458009-458014
04/23/2024	04/23/2024	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 04:11:49 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 187927-187932
04/24/2024	04/24/2024	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 07:00:08 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 284426-284431
04/25/2024	04/25/2024	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Brewster uplink site to the Napa uplink site at 07:00:08 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 370826-370830
05/12/2024	05/12/2024	Faulted	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 04:25:12 UTC. This caused a 16-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 15930-15947
05/16/2024	05/16/2024	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 07:05:29 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 371147-371151

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
05/21/2024	05/21/2024	Missed Navigation Message	GEO135, Brewster (BR2), Atlanta (CnV)	None	Brewster had CnV Source Select from Atlanta to Los Angeles. TOW 237440-237442
05/22/2024	05/22/2024	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 04:09:14 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 274172-274176
06/01/2024	06/01/2024	Faulted	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 10:32:14 UTC. This caused a 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 556352-556371
06/04/2024	06/04/2024	Manual	GEO135,Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 06:46:54 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 197232-197236
06/06/2024	06/06/2024	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 23:27:55 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 430093-430097
06/07/2024	06/07/2024	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 00:48:44 UTC. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 434942-434947
06/07/2024	06/07/2024	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 20:47:41 UTC. This caused a 3-second outage of the GEO 133

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
					broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 506879-506883
06/13/2024	06/13/2024	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 00:01:28 UTC. This caused a 4-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. There was no impact on coverage. TOW 345706-345711
06/20/2024	06/20/2024	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 18:43:54 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 413052-413056
06/27/2024	06/27/2024	Manual	GEO135, Brewster (BR2)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 16:05:42 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 403560-403564
06/29/2024	06/29/2024	Manual	GEO135, Napa (AP1)	None	The uplink for the G30 GEO, PRN135 switched from the Napa uplink site to the Brewster uplink site at 20:24:40 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 591898-591903
06/20/2024	06/20/2024	Manual	GEO133, Brewster (BR1)		GEO 133, manual switchover from Brewster to South Mountain. TOW 413052-413056
06/27/2024	06/27/2024	Manual	GEO135, Brewster (BR2)		GEO 135, manual switchover from Brewster to Napa. TOW 403560-403564

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 1.428 meters observed at Grand Forks.
- The maximum 95% CONUS vertical LPV error was 2.102 meters observed at Atlantic City.
- The minimum 95% CONUS horizontal LPV errors was 0.619 meters observed at Memphis.
- The minimum 95% CONUS vertical LPV error was 0.990 meters observed at Denver.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40 m) (m)	Horizontal (HAL=556 m) (m)	Vertical (VAL=50 m) (m)	Percentage in PA Mode (%)	SPS Accuracy	
					95% Horizontal (m)	95% Vertical (m)
Arcata	1.419	1.444	1.859	100	*	*
Atlantic City	1.083	1.095	2.102	100	*	*
Elko	1.229	1.256	1.463	100	*	*
Grand Forks	1.428	1.444	1.581	100	*	*
Oklahoma City	1.425	1.441	1.503	100	*	*
Albuquerque	0.867	0.881	1.370	100	3.12	4.22
Anchorage	0.772	0.782	1.536	100	3.14	4.45
Atlanta	0.984	0.994	1.301	100	3.15	4.45
Barrow	0.717	0.721	1.590	100	3.33	4.87
Bethel	0.755	0.766	1.486	100	3.03	5.24
Billings	0.768	0.790	1.006	100	2.07	3.92
Boston	0.819	0.830	1.204	100	2.75	4.52
Chicago	0.920	0.933	1.091	100	*	*
Cleveland	0.793	0.805	1.130	100	2.49	4.04
Cold Bay	0.860	0.873	1.513	100	2.16	5.64
Dallas	0.691	0.705	1.447	100	*	*
Denver	0.727	0.740	0.990	100	*	*
Fairbanks	0.743	0.752	1.535	100	3.53	3.85
Gander	0.923	0.940	1.401	99.999	2.9	4.19
Goose Bay	0.857	0.877	1.391	100	*	*
Houston	0.858	0.877	1.665	100	3.76	4.58
Iqaluit	0.889	0.903	1.605	100	2.78	4.32
Jacksonville	0.827	0.839	1.385	100	*	*
Juneau	0.801	0.815	1.339	100	2.95	3.79
Kansas City	0.725	0.737	1.055	100	2.51	4
Kotzebue	0.792	0.803	1.744	100	*	*
Los Angeles	1.056	1.081	1.770	100	4.13	4.5
Memphis	0.619	0.630	1.201	100	*	*
Merida	1.259	1.286	2.691	99.992	*	*
Mexico City	1.188	1.245	3.123	99.994	*	*
Miami	1.168	1.180	1.857	100	3.96	5.52
Minneapolis	0.844	0.864	1.008	100	2.16	3.82
New York	0.885	0.898	1.149	100	*	*
Oakland	1.044	1.068	1.779	100	3.75	4.79
Puerto Vallarta	1.202	1.240	3.462	99.998	*	*
Salt Lake City	0.726	0.741	1.040	100	2.43	4.12

Location	Horizontal (HAL=40 m) (m)	Horizontal (HAL=556 m) (m)	Vertical (VAL=50 m) (m)	Percentage in PA Mode (%)	SPS Accuracy	
					95% Horizontal (m)	95% Vertical (m)
San Jose Del Cabo	1.233	1.285	3.364	99.993	*	*
Seattle	0.806	0.829	1.014	100	1.96	4.38
Washington, DC	0.818	0.829	1.041	100	2.77	4.33
Winnipeg	0.832	0.852	1.180	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 8.404 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 23.092 meters observed at Atlanta.
- The minimum 95% horizontal error was 1.608 meters observed at Seattle.
- The minimum 99.999% horizontal error was 5.915 meters observed at Cold Bay.

Note that Tapachula was out of service for this entire quarter.

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	2.480	19.171	100	19.834
Anchorage	3.203	7.764	100	8.056
Atlanta	2.806	23.092	100	23.280
Barrow	3.297	6.311	100	6.606
Bethel	2.773	7.168	100	7.327
Billings	1.758	19.230	100	21.116
Boston	2.628	11.170	100	11.907
Cleveland	2.202	13.656	100	14.504
Cold Bay	2.033	5.915	100	6.186
Fairbanks	3.439	7.144	100	7.322
Gander	2.635	8.369	99.999	8.500
Honolulu	8.404	22.233	100	22.865
Houston	3.089	13.589	100	14.298
Iqaluit	2.983	7.387	100	7.799
Juneau	2.711	9.381	100	9.623
Kansas City	1.986	19.778	100	20.406
Kotzebue	3.668	6.955	100	7.085
Los Angeles	3.039	18.774	100	21.011
Merida	3.653	12.938	100	16.359

Location	95% Horizontal (m)	99.999% Horizontal (m)	Percentage in NPA Mode (%)	Maximum Horizontal Error (m)
Miami	3.400	22.335	100	22.509
Minneapolis	1.965	15.021	100	15.959
Oakland	2.916	17.659	100	18.324
Salt Lake City	1.863	20.249	100	20.374
San Jose Del Cabo	4.244	16.173	100	16.331
San Juan	3.752	20.861	100	21.023
Seattle	1.608	19.175	100	19.353
Tapachula	0.000	0.000	0.000	0.000
Washington, DC	2.586	15.844	100	16.195

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 7.852 meters occurred at Puerto Vallarta and maximum vertical LPV error was 8.781 meters occurred at Bethel.

Table 2-3 Maximum LPV Error Statistics

Location	Horizontal Error (m)	Horizontal Error/ HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/ VPL	Vertical Maximum Ratio
Arcata	2.382	0.184	0.213	4.521	0.095	0.184
Atlantic City	2.373	0.189	0.213	4.932	0.262	0.262
Elko	2.186	0.222	0.223	3.717	0.097	0.181
Grand Forks	5.560	0.188	0.309	5.941	0.179	0.253
Oklahoma City	2.259	0.210	0.225	4.332	0.092	0.214
Albuquerque	2.052	0.155	0.187	3.615	0.108	0.192
Anchorage	2.867	0.181	0.215	5.253	0.189	0.204
Atlanta	2.217	0.124	0.200	3.175	0.071	0.196
Barrow	2.304	0.087	0.134	7.832	0.212	0.212
Bethel	3.404	0.224	0.228	8.781	0.224	0.224
Billings	2.725	0.263	0.263	4.413	0.147	0.207
Boston	2.651	0.089	0.183	4.882	0.242	0.248
Chicago	2.785	0.206	0.235	4.300	0.161	0.214
Cleveland	2.329	0.201	0.201	4.392	0.226	0.226
Cold Bay	4.935	0.144	0.205	6.303	0.138	0.159
Dallas	2.114	0.196	0.206	3.389	0.094	0.212
Denver	2.412	0.061	0.197	2.470	0.102	0.180
Fairbanks	2.902	0.080	0.190	5.326	0.198	0.258

Location	Horizontal Error (m)	Horizontal Error/ HPL	Horizontal Maximum Ratio	Vertical Error (m)	Vertical Error/ VPL	Vertical Maximum Ratio
Gander	4.726	0.128	0.160	4.050	0.081	0.170
Goose Bay	3.650	0.136	0.165	4.853	0.127	0.173
Houston	1.916	0.179	0.208	3.510	0.079	0.200
Iqaluit	3.016	0.158	0.169	7.773	0.177	0.240
Jacksonville	1.842	0.144	0.165	3.380	0.082	0.183
Juneau	2.908	0.233	0.233	4.750	0.236	0.236
Kansas City	1.959	0.056	0.201	3.396	0.158	0.186
Kotzebue	2.945	0.131	0.139	6.009	0.180	0.256
Los Angeles	3.328	0.083	0.191	4.584	0.216	0.216
Memphis	2.678	0.127	0.178	2.962	0.114	0.187
Merida	3.531	0.096	0.171	6.801	0.215	0.298
Mexico City	4.167	0.107	0.249	6.748	0.152	0.221
Miami	3.220	0.096	0.231	5.034	0.142	0.201
Minneapolis	2.709	0.274	0.274	4.426	0.181	0.217
New York	2.379	0.171	0.186	4.016	0.220	0.221
Oakland	2.808	0.198	0.203	4.741	0.131	0.186
Puerto Vallarta	7.852	0.582	0.582	7.424	0.218	0.252
Salt Lake City	3.070	0.095	0.231	3.300	0.073	0.147
San Jose Del Cabo	4.076	0.186	0.192	7.460	0.203	0.277
Seattle	3.681	0.267	0.280	3.002	0.141	0.141
Washington, DC	2.244	0.196	0.196	3.297	0.193	0.194
Winnipeg	3.326	0.237	0.237	6.693	0.185	0.297

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 16, 2024—Position errors in Alaska and Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 2.139 meters and 2.659 meters at Winnipeg and Juneau respectively. The Kp index was 5.0.
- May 2, 2024—Position errors in Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 1.974 meters and 4.708 meters at Merida and Mexico City respectively. The Kp index was 6.7.
- May 6, 2024—Position errors in CONUS and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.357 meters and 3.481 meters at Mexico City and Puerto Vallarta respectively. The Kp index was 5.
- May 10-12, 2024—Position errors in CONUS, Alaska, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.939 meters and 4.449 meters at Mexico City and Puerto Vallarta respectively. The Kp index was 9.0, 9.0, and 7.0 respectively.
- May 16-18, 2024—Position errors in CONUS, Canada, and Mexico were elevated. The maximum 95% horizontal and vertical LPV errors were 2.299 meters and 4.378 meters at Gander and Puerto Vallarta respectively. The Kp index was 6.0, 6.0, and 3.7 respectively.

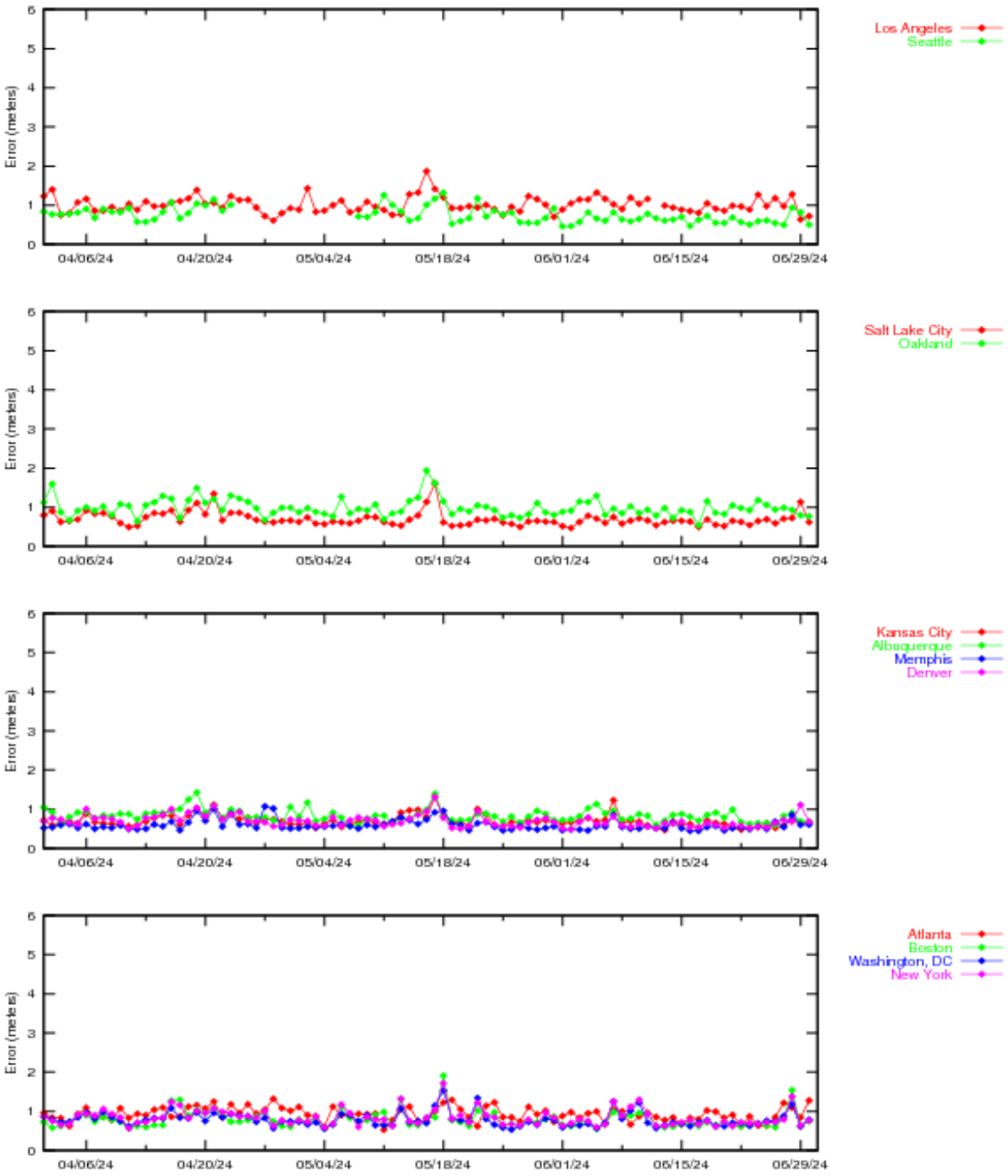

Figure 2-1 LPV 95% Horizontal Accuracy

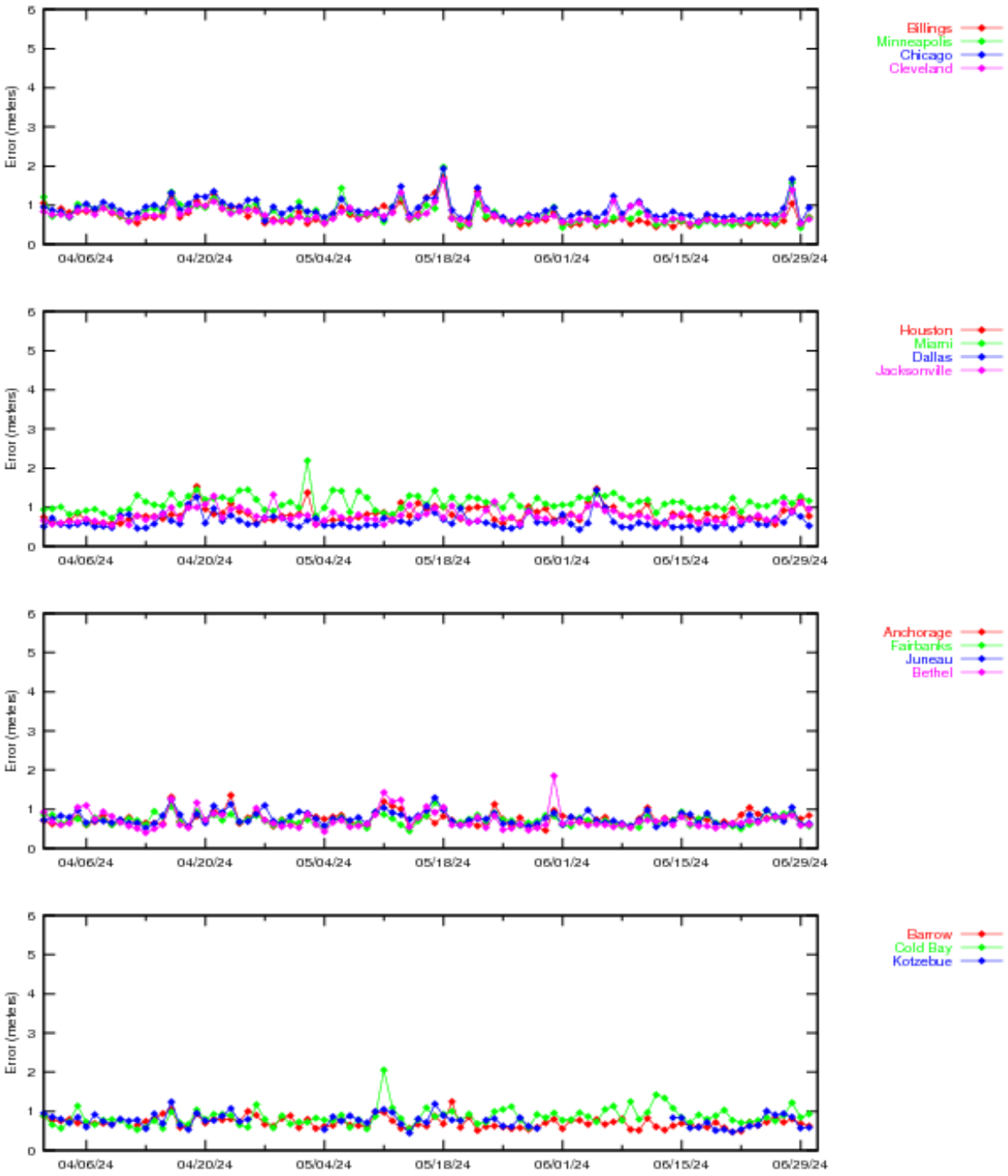

Figure 2-2 LPV 95% Horizontal Accuracy

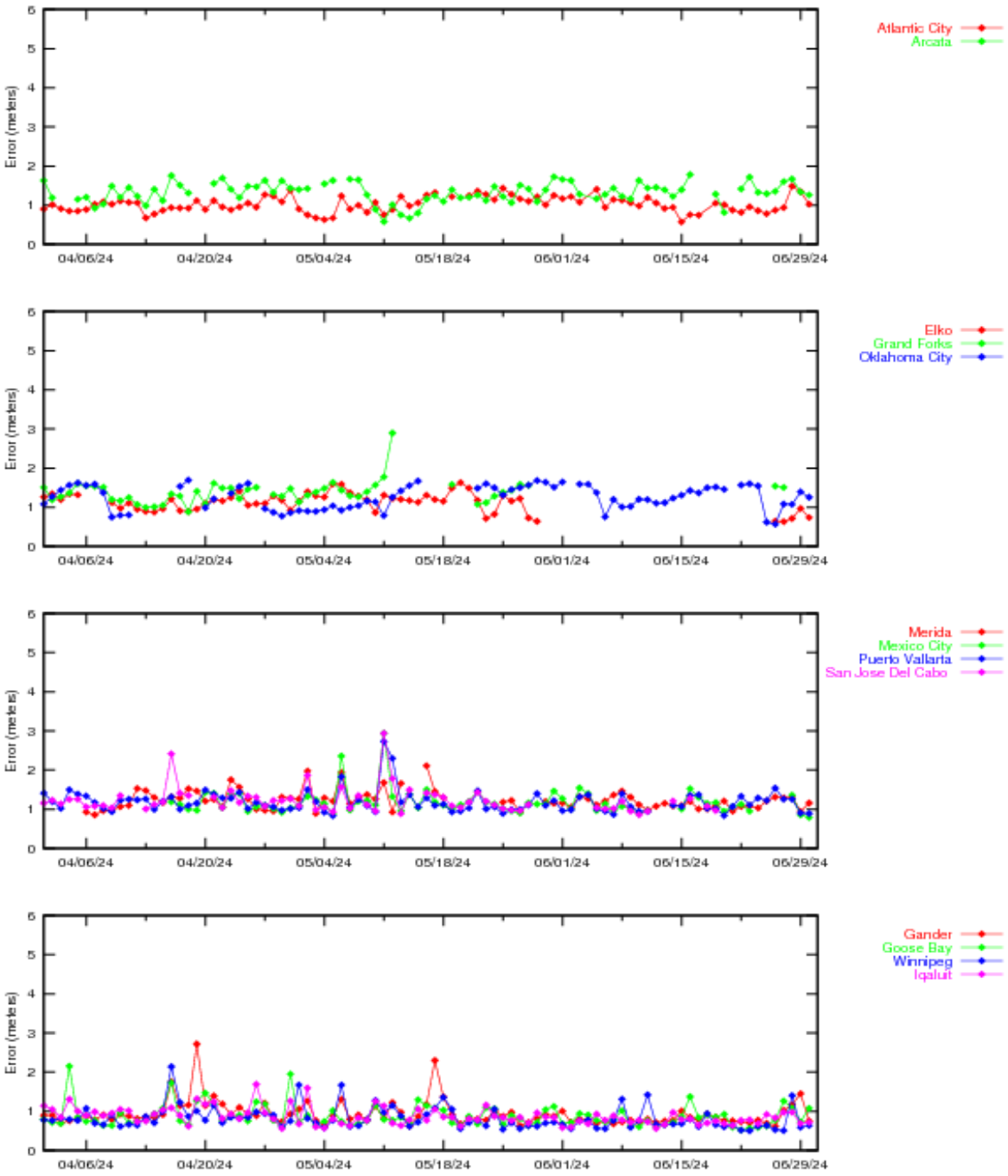

Figure 2-3 LPV 95% Horizontal Accuracy

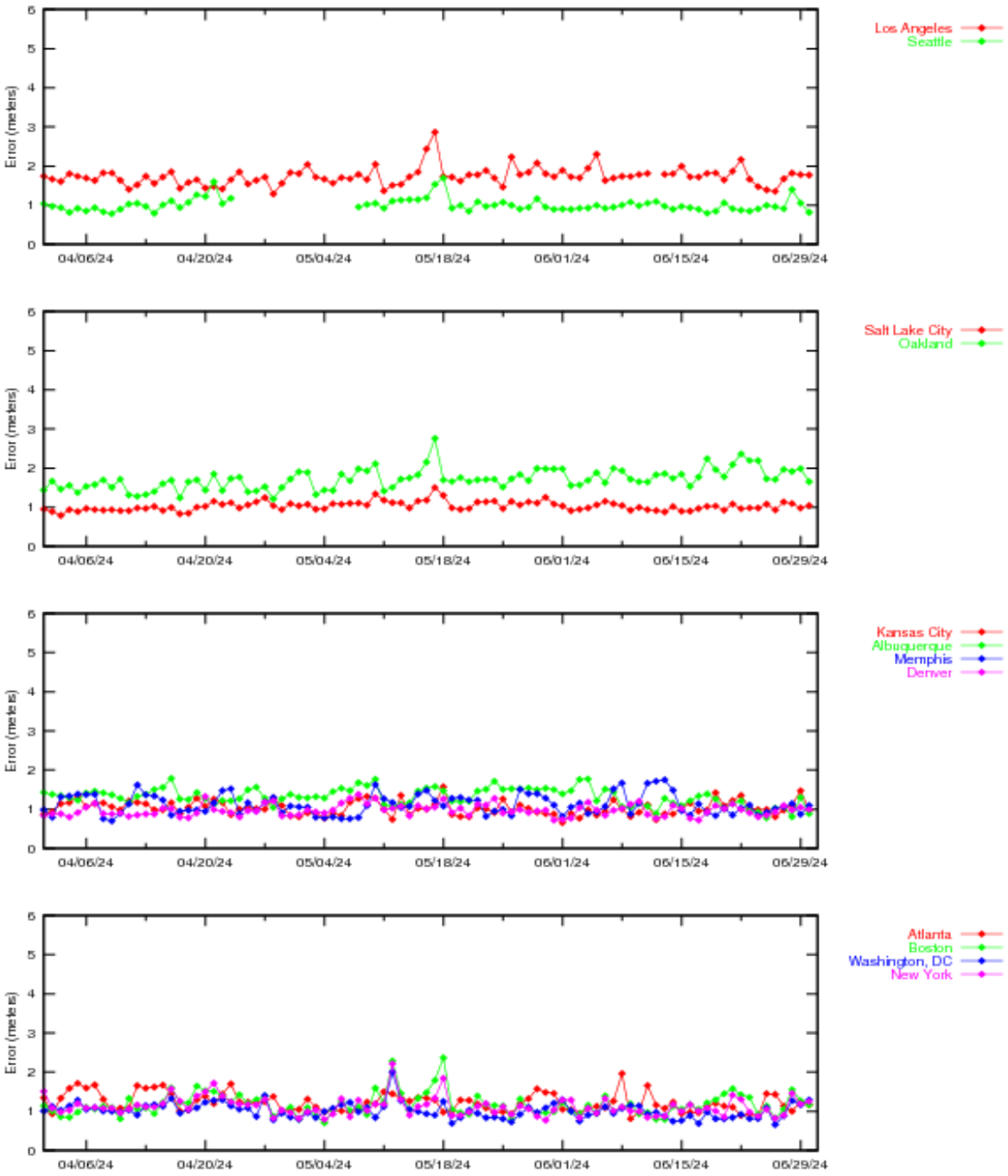

Figure 2-4 LPV 95% Vertical Accuracy

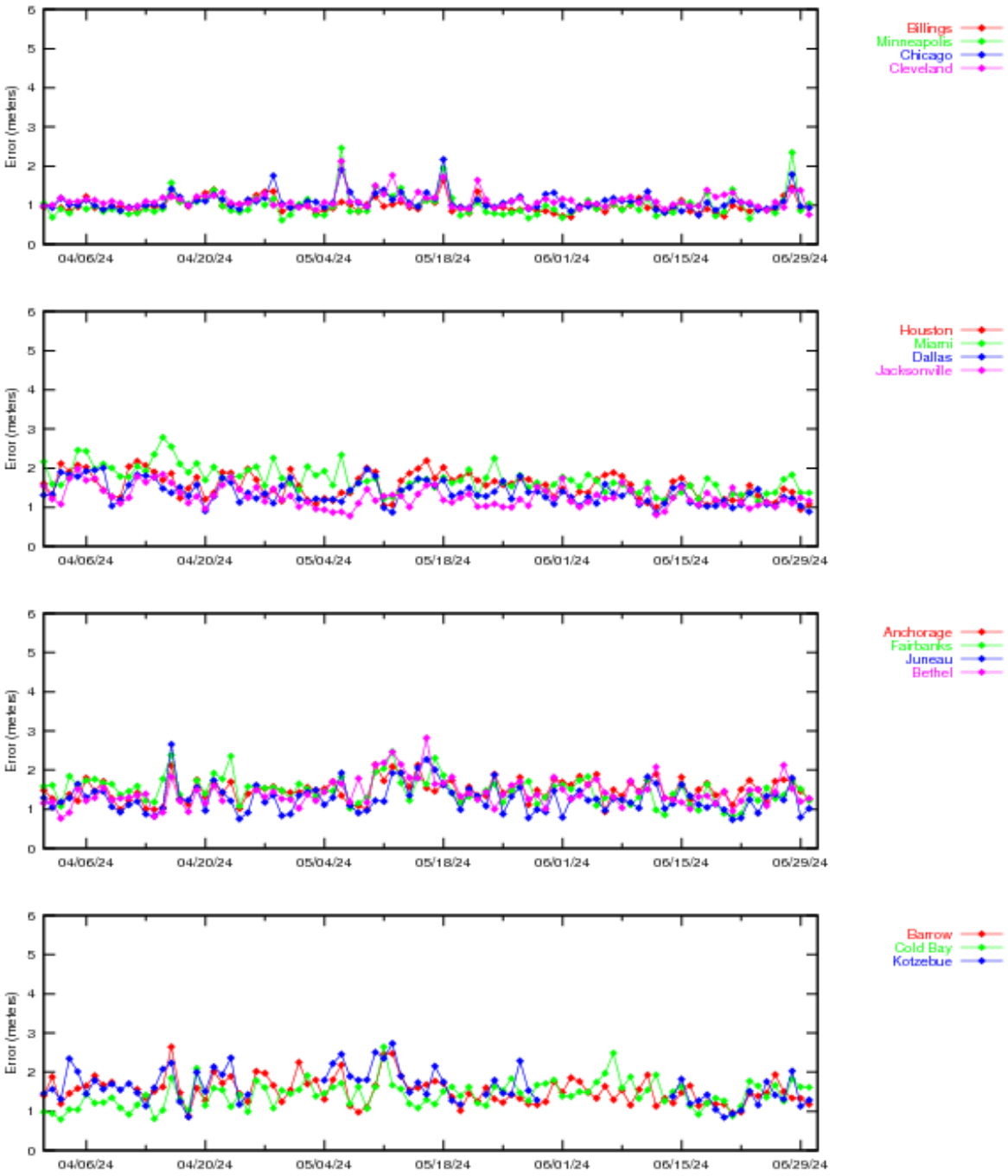

Figure 2-5 LPV 95% Vertical Accuracy

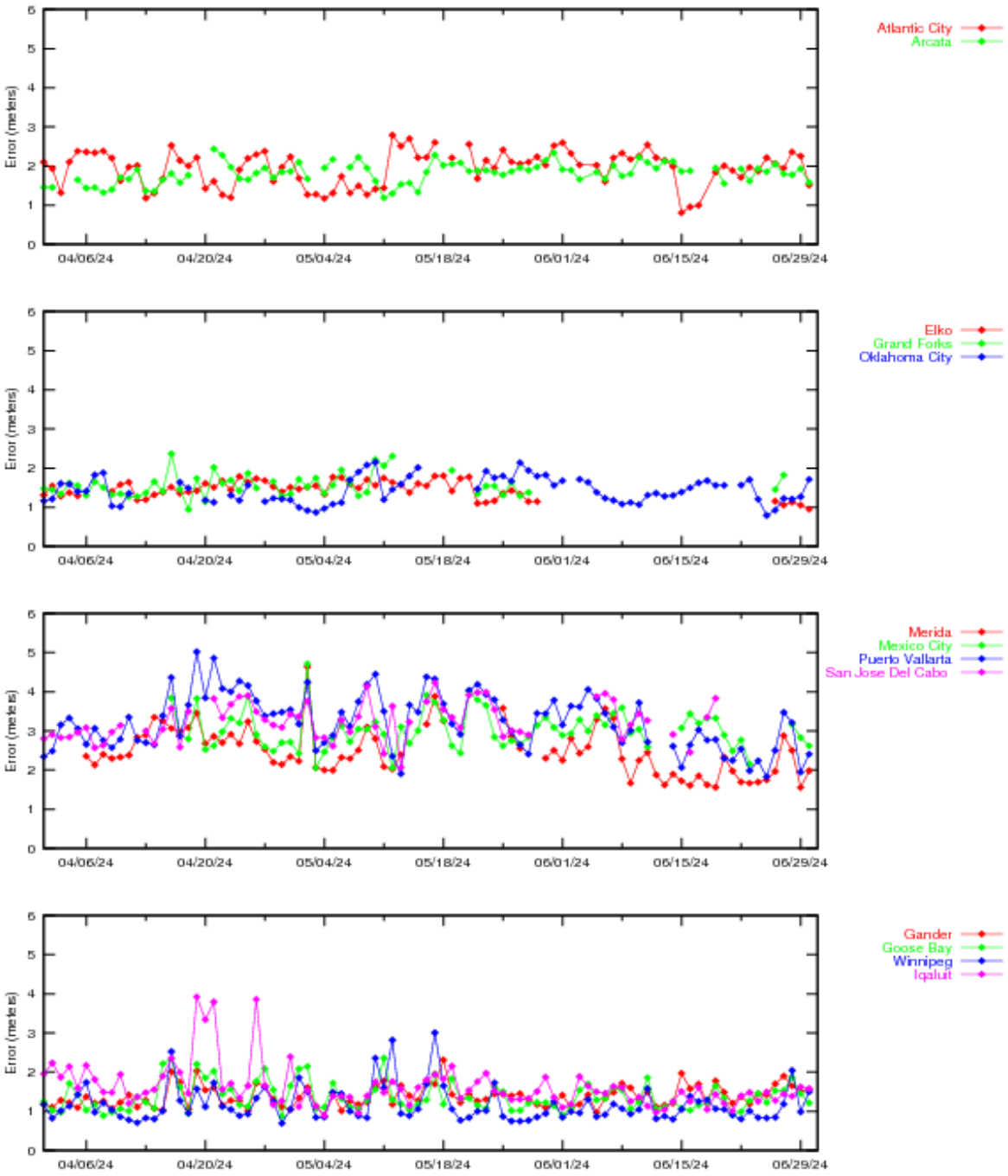

Figure 2-6 LPV 95% Vertical Accuracy

Figure 2-7 and Figure 2-8 show the daily NPA 95% horizontal accuracy at the NPA evaluation sites for the reporting period. The increases in 95% NPA position errors were due to geomagnetic activity that occurred on March 3, and March 23-24, 2024.

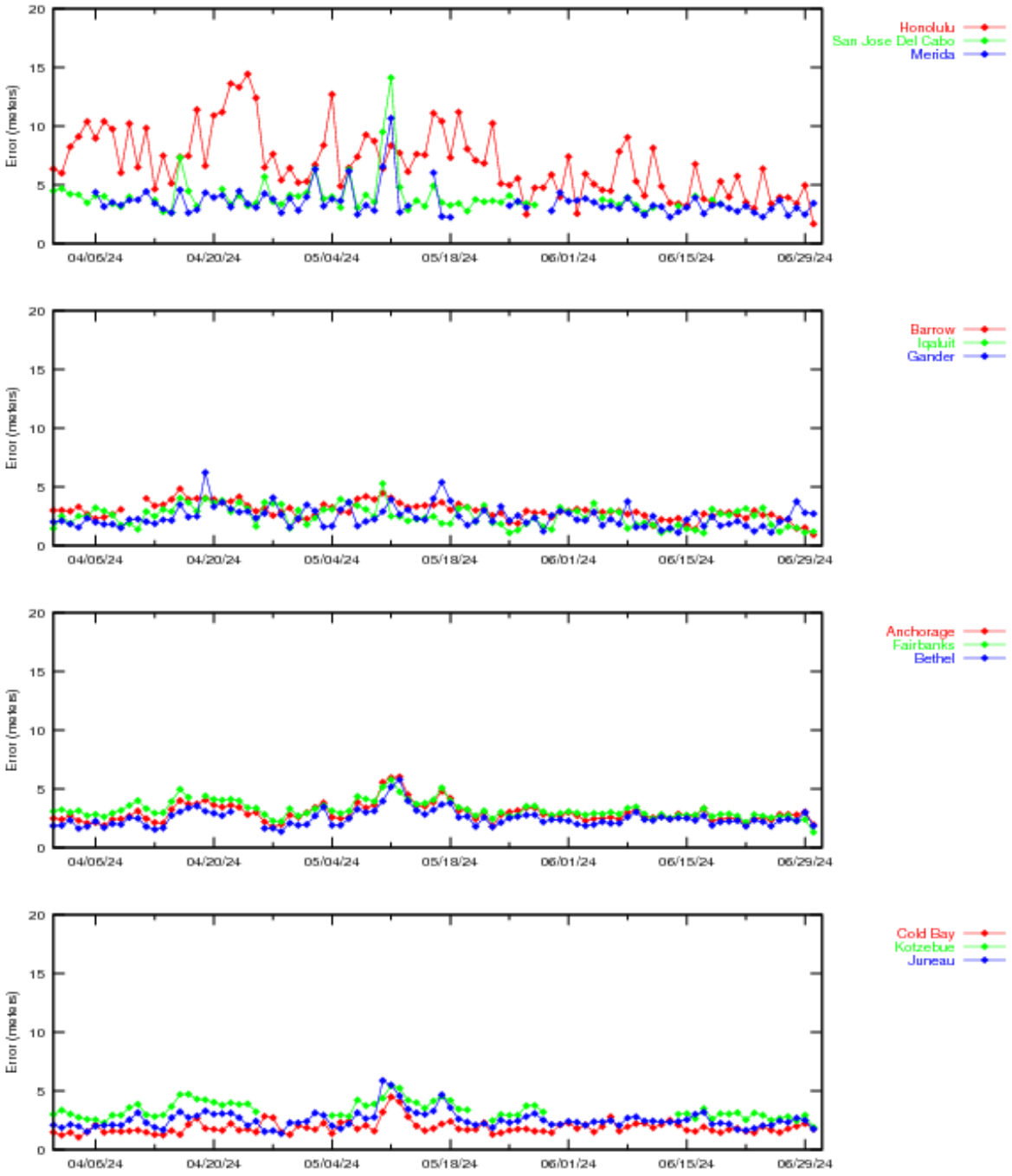

Figure 2-7 NPA 95% Horizontal Accuracy

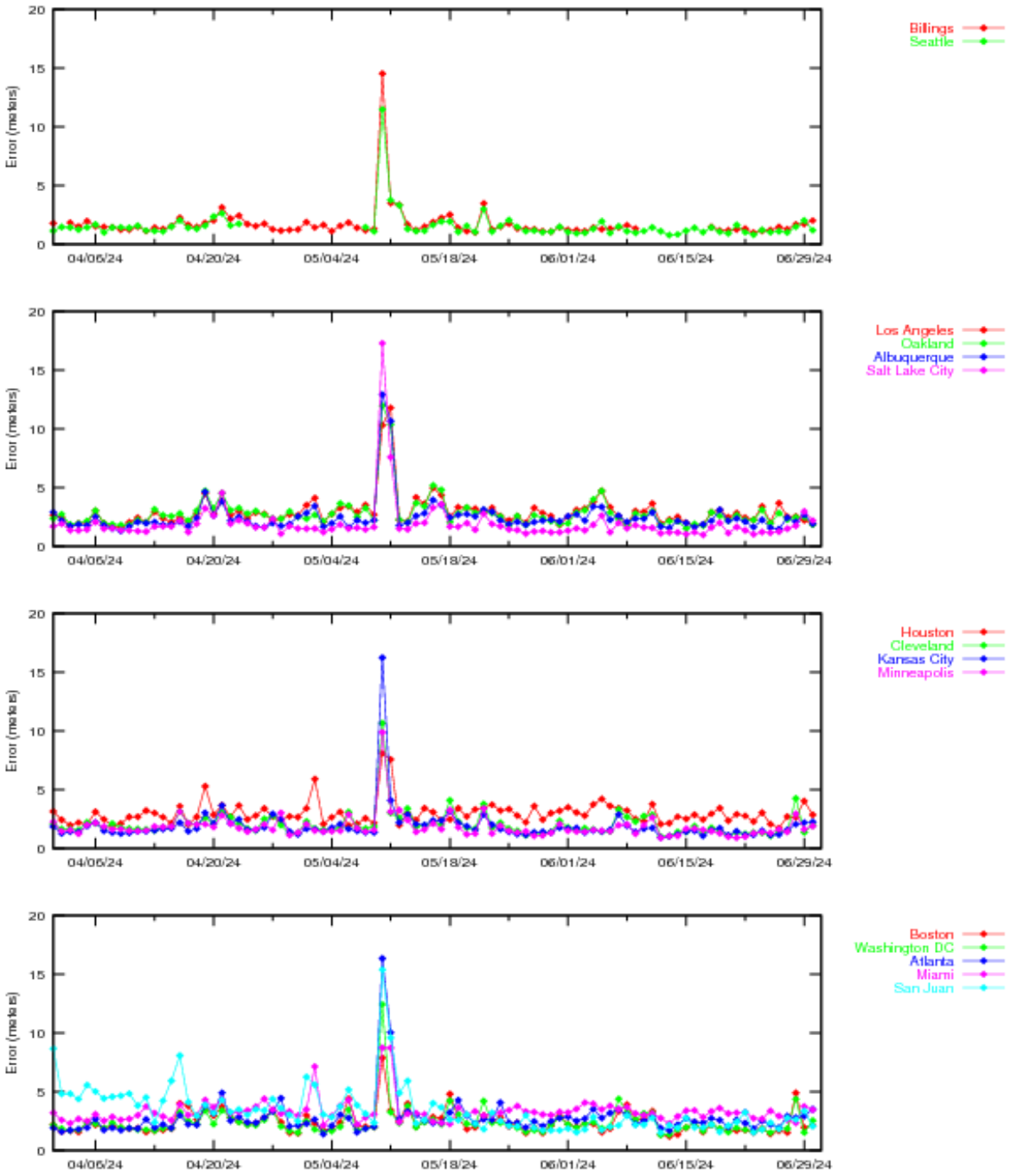

Figure 2-8 NPA 95% Horizontal Accuracy

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.

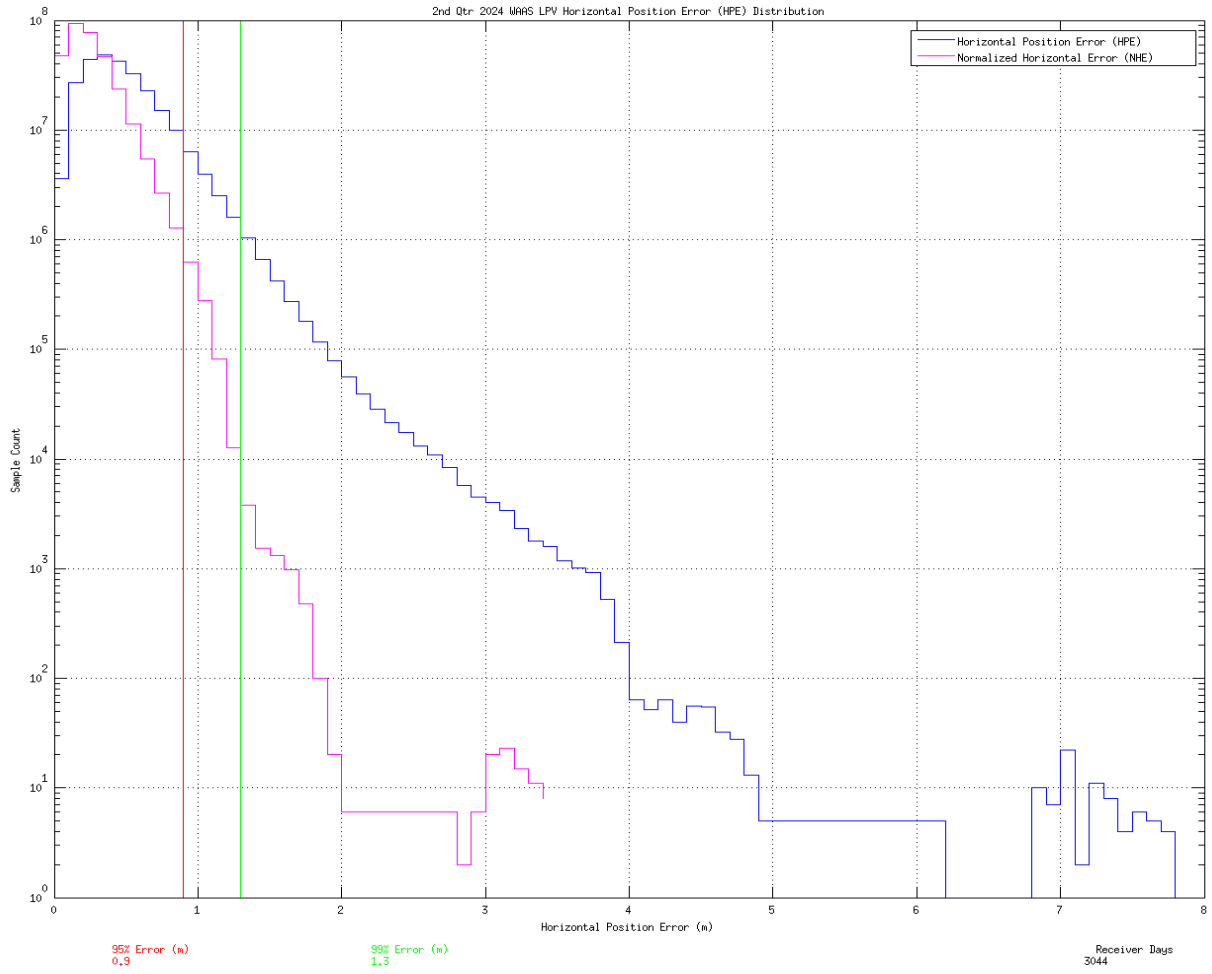

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

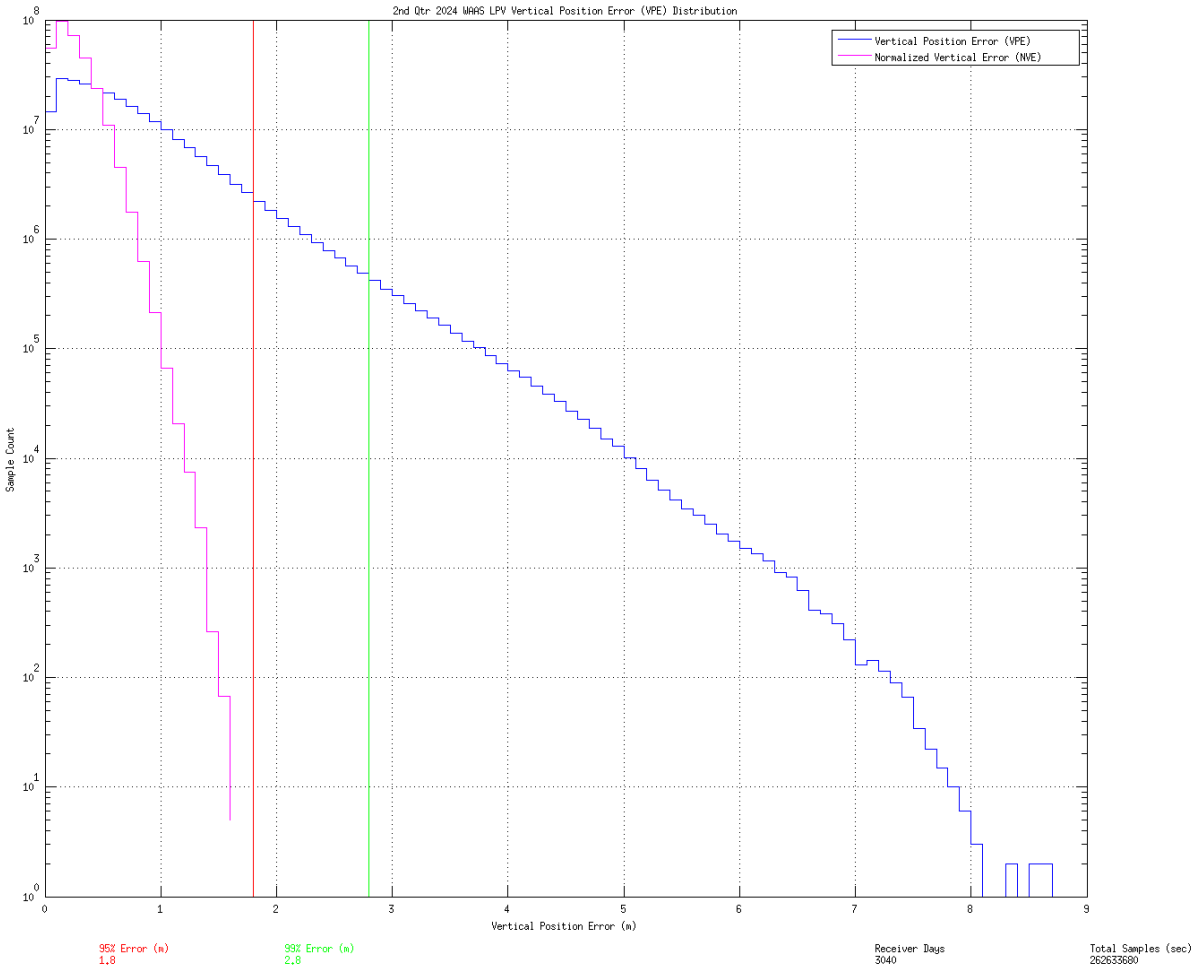

Figure 2-10 LPV Vertical Error Bounding Triangle Chart

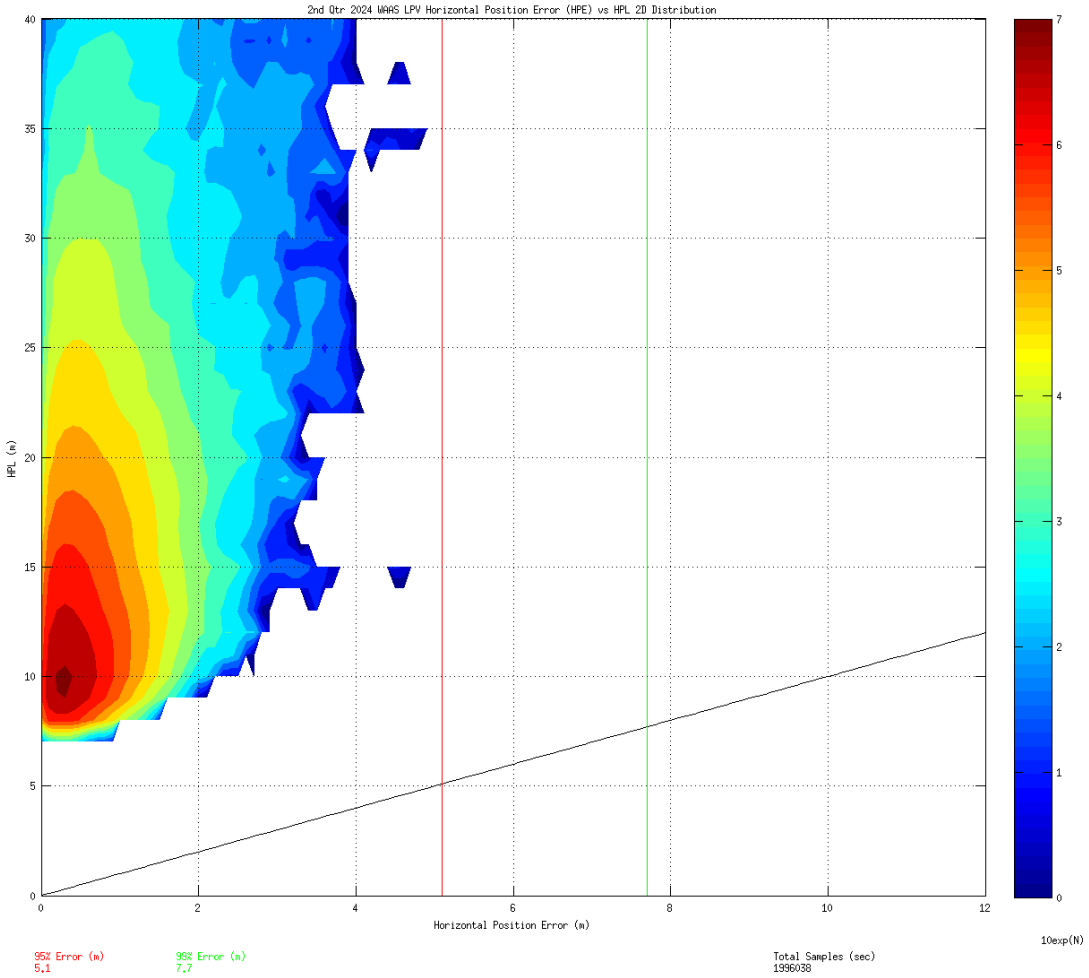

Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

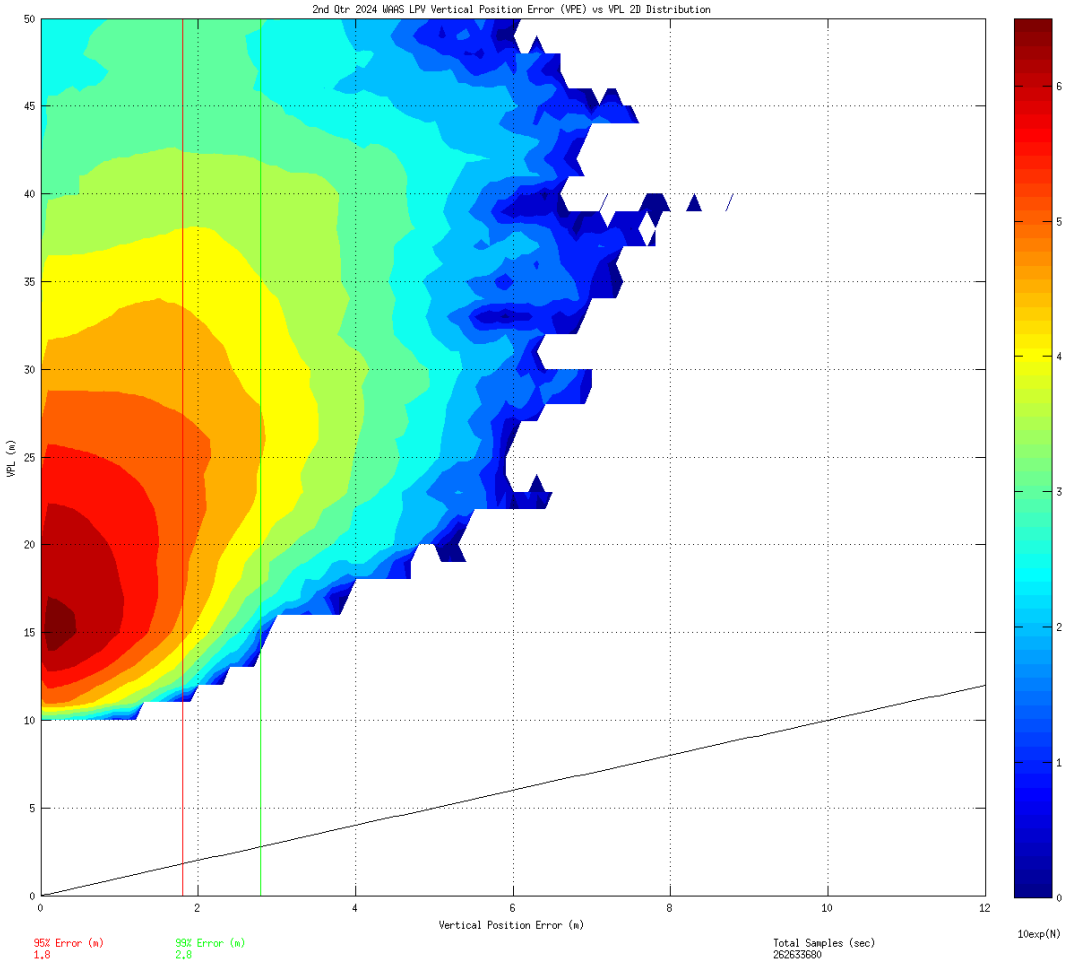

Figure 2-12 LPV 2-D Vertical Error Distribution Histogram

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 102.469 meters observed at Grand Forks
- The maximum 99% CONUS VPL was 135.338 meters observed at Elko
- The minimum 99% CONUS HPL was 11.515 meters observed at Salt Lake City
- The minimum 99% CONUS VPL was 21.677 meters observed at Salt Lake City
- The maximum 99% Alaska HPL was 22.326 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 35.920 meters observed at Kotzebue
- The minimum 99% Alaska HPL was 14.818 meters observed at Fairbanks
- The minimum 99% Alaska VPL was 25.689 meters observed at Anchorage

Table 3-1 99% Protection Level

Location	99% HPL (m)	99% VPL (m)	Max HPL (m) **	Max VPL (m)**	Percentage in PA Mode (%)
Arcata	15.717	29.291	175.551	350.555	100
Atlantic City	15.117	25.384	229.004	225.552	100
Elko	88.574*	135.338*	179.522	246.703	100
Grand Forks	102.469*	134.316*	170.008	249.867	100
Oklahoma City	14.521	25.658	150.769	271.43	100
Albuquerque	13.888	30.072	142.117	287.758	100
Anchorage	15.039	25.689	192.01	367.328	100
Atlanta	13.106	23.029	137.273	240.622	100
Barrow	17.825	34.531	144.797	363.369	100
Bethel	17.232	28.117	183.6	281.545	100
Billings	12.940	22.266	134.342	235.129	100
Boston	16.618	23.832	146.139	212.308	100
Chicago	12.786	24.629	134.956	245.414	100
Cleveland	14.982	23.452	160.499	301.638	100
Cold Bay	22.326	32.022	218.04	247.599	100
Dallas	13.388	23.828	165.339	270.239	100
Denver	11.803	23.980	138.875	298.893	100
Fairbanks	14.818	27.776	155.885	377.069	100
Gander	37.841	47.450	182.811	235.629	99.999
Goose Bay	36.483	44.426	141.095	269.736	100
Houston	14.475	25.540	159.029	276.717	100
Iqaluit	39.955	50.208	161.329	283.374	100
Jacksonville	14.490	25.329	143.383	247.154	100
Juneau	15.244	27.424	165.352	269.564	100
Kansas City	12.108	23.685	143.654	285.899	100
Kotzebue	20.067*	35.920*	168.705	305.685	100
Los Angeles	14.557	30.742	151.301	274.129	100
Memphis	12.397	25.235	162.907	305.612	100
Merida	31.322*	54.039*	322.006	532.272	99.992
Mexico City	66.358*	119.409*	607.679	1014.48	99.994
Miami	19.124	32.550	160.636	257.86	100
Minneapolis	13.461	23.702	134.892	222.363	100

Location	99% HPL (m)	99% VPL (m)	Max HPL (m) **	Max VPL (m)**	Percentage in PA Mode (%)
New York	15.704	24.661	141.079	216.129	100
Oakland	14.163	30.567	174.573	313.879	100
Puerto Vallarta	38.444*	62.015*	324.793	511.589	99.998
Salt Lake City	11.515	21.677	148.962	239.881	100
San Jose Del Cabo	87.731*	135.174*	259.519	465.632	99.993
Seattle	15.093	25.102	172.86	253.51	100
Washington, DC	14.155	22.946	133.424	226.85	100
Winnipeg	16.976	26.850	166.565	207.13	100

* The high 99% HPLs/VPLs at some receivers are due to the increased protection levels from a significant ionospheric event on May 10 – 11, 2024, accounting for at least 1% of the data from that receiver. These receivers have a smaller amount of data due to communication outages.

** Maximum HPLs/VPLs for this quarter were included in this report to show the effects of the May 10-11, 2024 ionospheric event across all receivers.

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 number of outages 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	99.17	99.17	99.17
Atlantic City	99.24	99.24	99.24
Elko	98.95	98.95	98.95
Grand Forks	98.73	98.73	98.69
Oklahoma City	99.15	99.15	99.14
Albuquerque	99.31	99.31	99.3
Anchorage	99.35	99.32	99.28
Atlanta	99.31	99.31	99.29
Barrow	99.39	99.32	98.9

Location	LP WAAS With 15-Minute Window (%)	LPV WAAS With 15-Minute Window (%)	LPV200 WAAS With 15-Minute Window (%)
Bethel	99.36	99.34	99.28
Billings	99.28	99.28	99.28
Boston	99.3	99.3	99.29
Chicago	99.3	99.3	99.3
Cleveland	99.31	99.31	99.31
Cold Bay	99.37	99.35	99.22
Dallas	99.31	99.31	99.3
Denver	99.31	99.3	99.29
Fairbanks	99.33	99.26	99.2
Gander	99	98.97	98.46
Goose Bay	99.02	99	98.78
Houston	99.31	99.31	99.3
Iqaluit	98.98	98.86	97.71
Jacksonville	99.31	99.31	99.28
Juneau	99.27	99.27	99.22
Kansas City	99.31	99.3	99.3
Kotzebue	99.16	99.09	98.92
Los Angeles	99.28	99.27	99.24
Memphis	99.31	99.31	99.31
Merida	99.02	98.4	94.27
Mexico City	98.63	96.27	84.49
Miami	99.33	99.29	99.11
Minneapolis	99.3	99.3	99.29
New York	99.3	99.3	99.29
Oakland	99.27	99.26	99.25
Puerto Vallarta	99.04	97.39	81.57
Salt Lake City	99.31	99.31	99.29
San Jose Del Cabo	98.83	97.43	87.95
Seattle	99.15	99.15	99.15
Washington, DC	99.3	99.3	99.29
Winnipeg	99.29	99.29	99.22

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	2	0.000045	2	0.000045	2	0.000045
Atlantic City	2	0.000041	2	0.000041	3	0.000062
Elko	2	0.000058	2	0.000058	3	0.000088

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Grand Forks	4	0.000141	4	0.000141	7	0.000247
Oklahoma City	2	0.000047	2	0.000047	2	0.000047
Albuquerque	2	0.000038	2	0.000038	5	0.000096
Anchorage	4	0.000077	5	0.000096	7	0.000135
Atlanta	2	0.000038	2	0.000038	3	0.000058
Barrow	3	0.000059	6	0.000118	40	0.000790
Bethel	3	0.000060	4	0.000079	8	0.000159
Billings	2	0.000039	2	0.000039	2	0.000039
Boston	2	0.000038	2	0.000038	2	0.000038
Chicago	2	0.000038	2	0.000038	2	0.000038
Cleveland	3	0.000058	3	0.000058	3	0.000058
Cold Bay	3	0.000058	4	0.000077	20	0.000385
Dallas	2	0.000038	2	0.000038	2	0.000038
Denver	2	0.000038	2	0.000038	2	0.000038
Fairbanks	4	0.000078	6	0.000117	11	0.000214
Gander	8	0.000154	9	0.000174	80	0.001552
Goose Bay	6	0.000116	6	0.000116	22	0.000425
Houston	2	0.000038	2	0.000038	3	0.000058
Iqaluit	12	0.000231	20	0.000386	94	0.001836
Jacksonville	2	0.000038	3	0.000058	4	0.000077
Juneau	2	0.000039	2	0.000039	7	0.000135
Kansas City	2	0.000038	2	0.000038	2	0.000038
Kotzebue	3	0.000080	5	0.000134	15	0.000403
Los Angeles	3	0.000058	3	0.000058	5	0.000097
Memphis	2	0.000038	2	0.000038	2	0.000038
Merida	11	0.000255	82	0.001911	252	0.006130
Mexico City	40	0.001038	235	0.006246	577	0.017475
Miami	3	0.000058	3	0.000058	20	0.000385
Minneapolis	2	0.000038	2	0.000038	3	0.000058
New York	2	0.000038	2	0.000038	3	0.000058
Oakland	3	0.000058	3	0.000058	5	0.000096
Puerto Vallarta	21	0.000418	198	0.004004	873	0.021077
Salt Lake City	2	0.000038	2	0.000038	2	0.000038
San Jose Del Cabo	12	0.000333	113	0.003183	426	0.013293
Seattle	2	0.000046	2	0.000046	2	0.000046
Washington, DC	2	0.000038	2	0.000038	3	0.000058
Winnipeg	2	0.000038	2	0.000038	8	0.000154

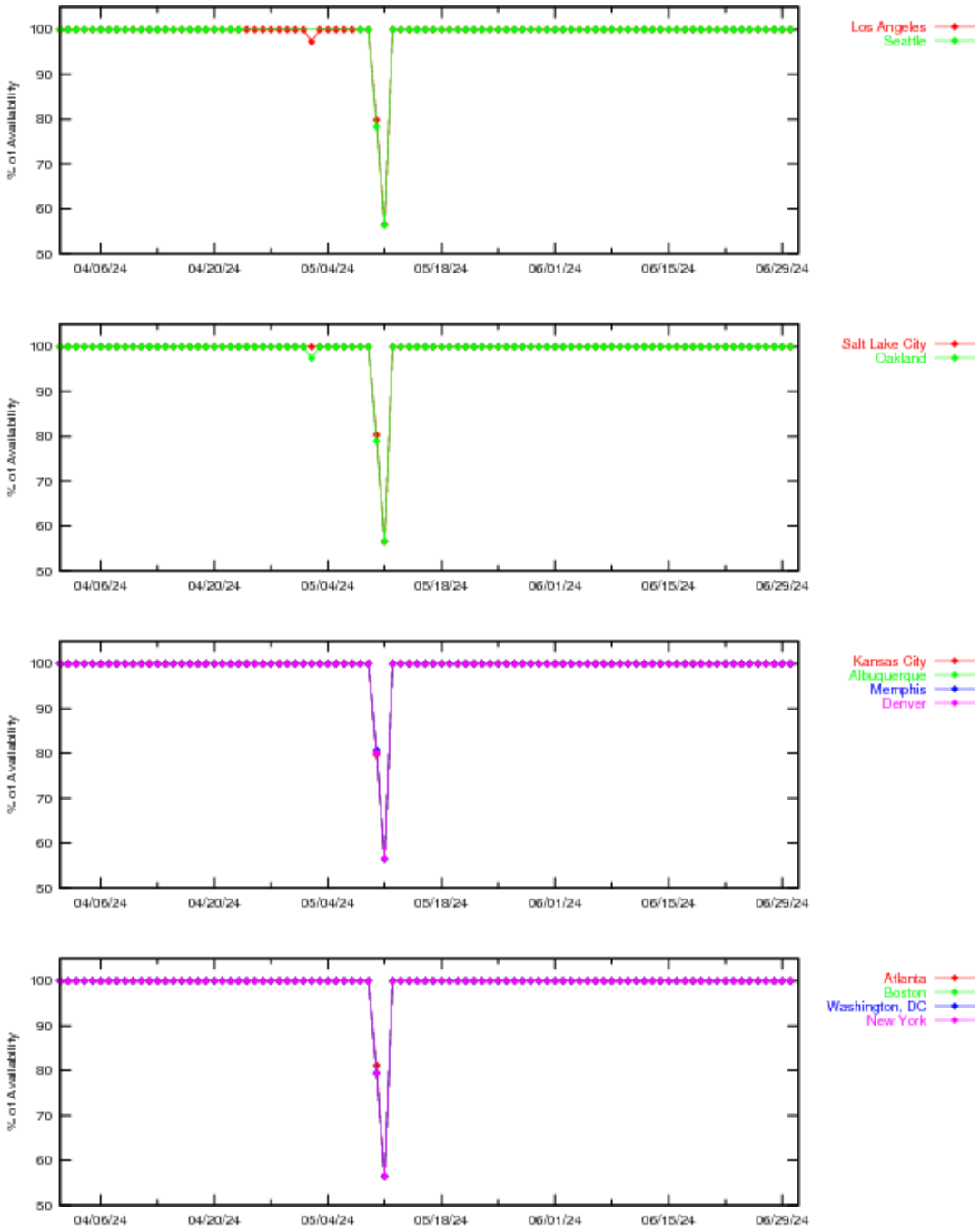

Figure 3-1 LPV Instantaneous Availability

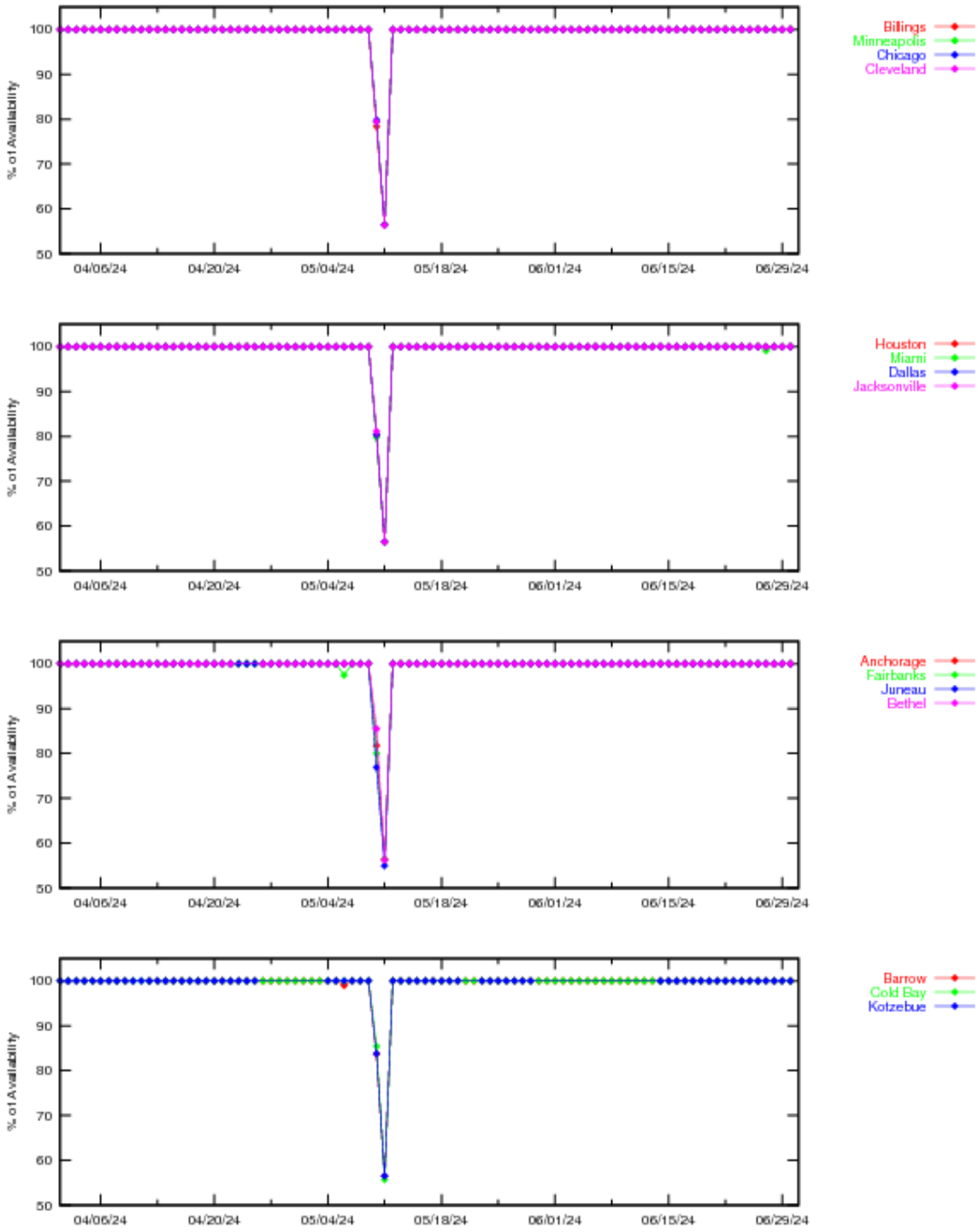

Figure 3-2 LPV Instantaneous Availability

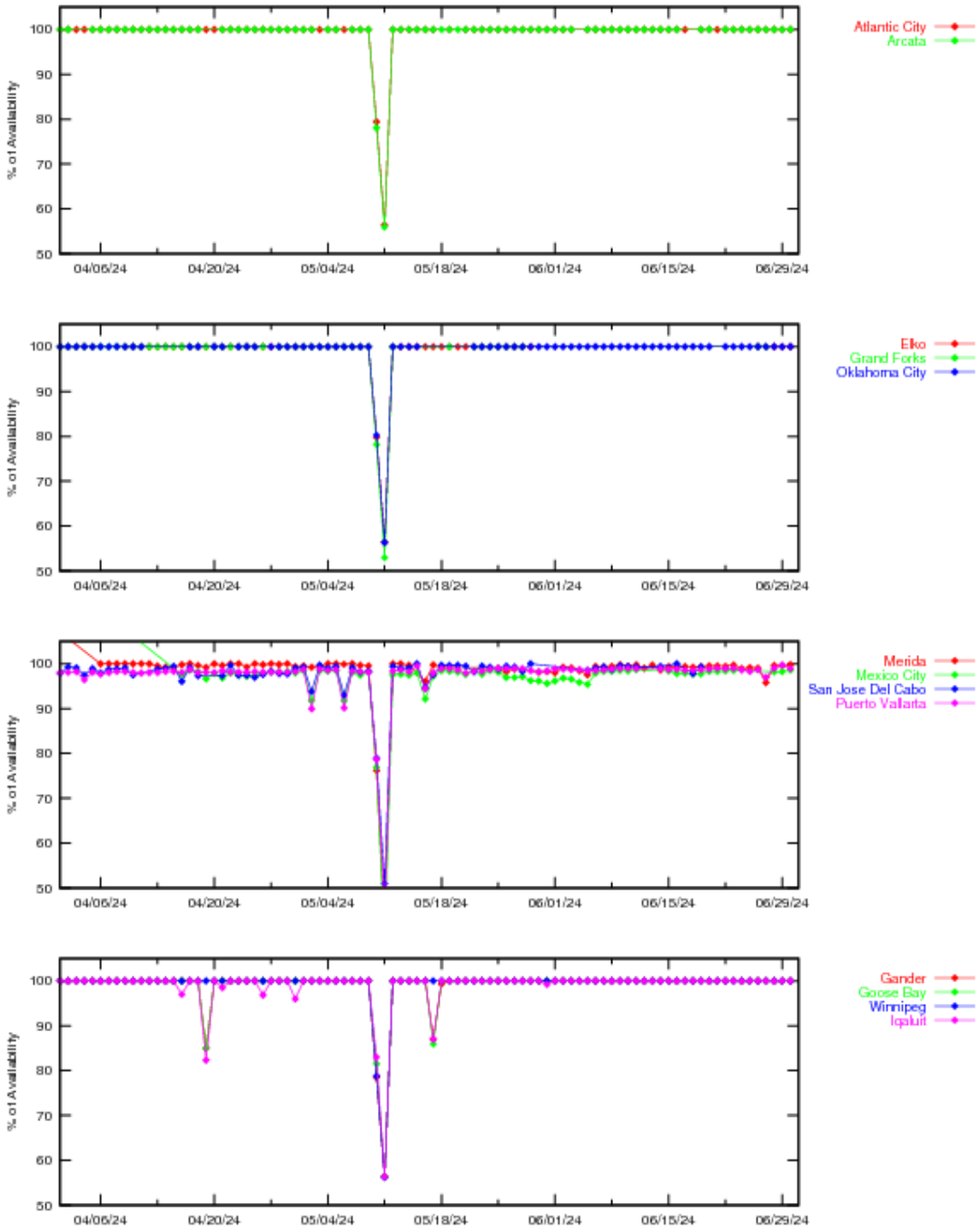

Figure 3-3 LPV Instantaneous Availability

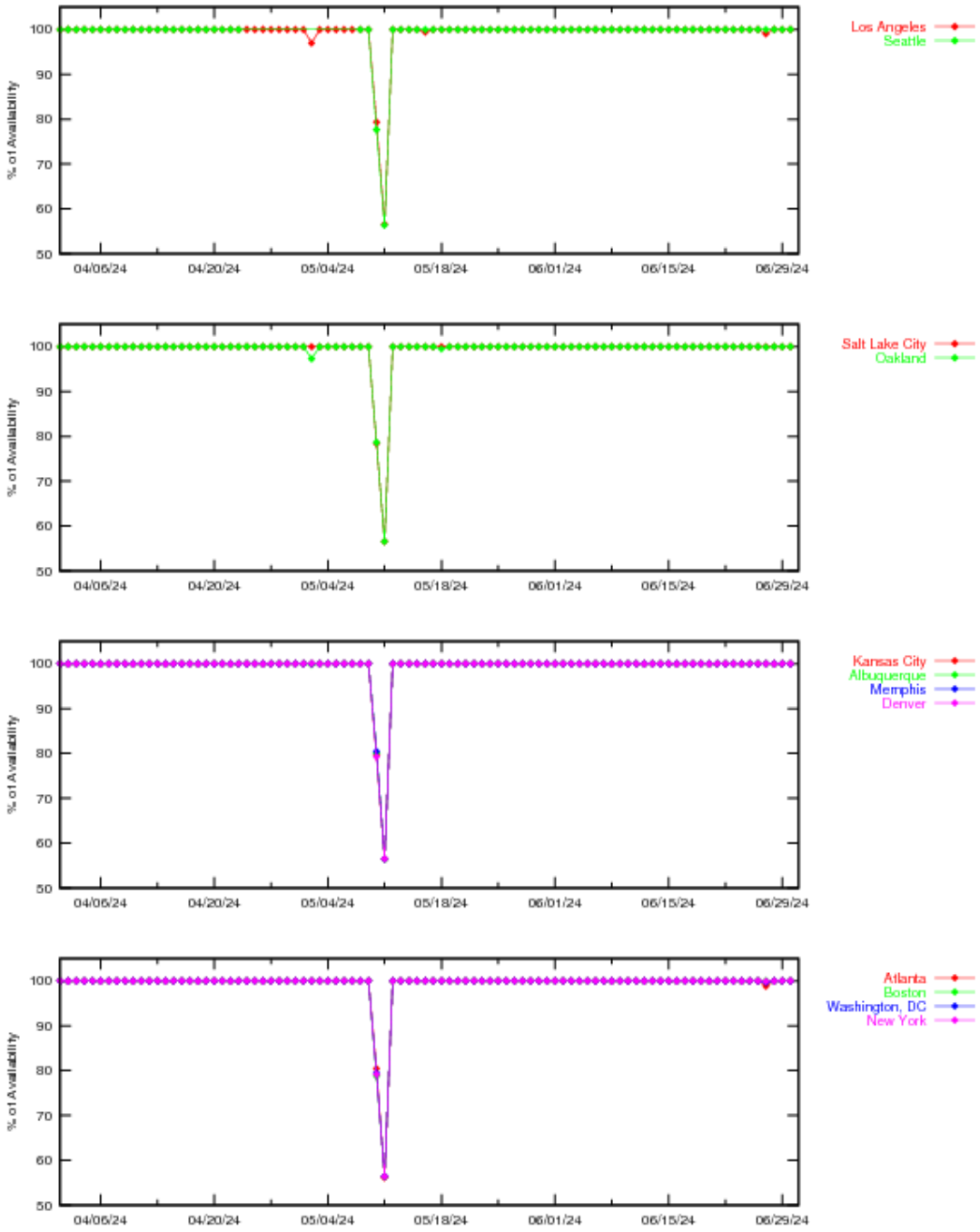

Figure 3-4 LPV200 Instantaneous Availability

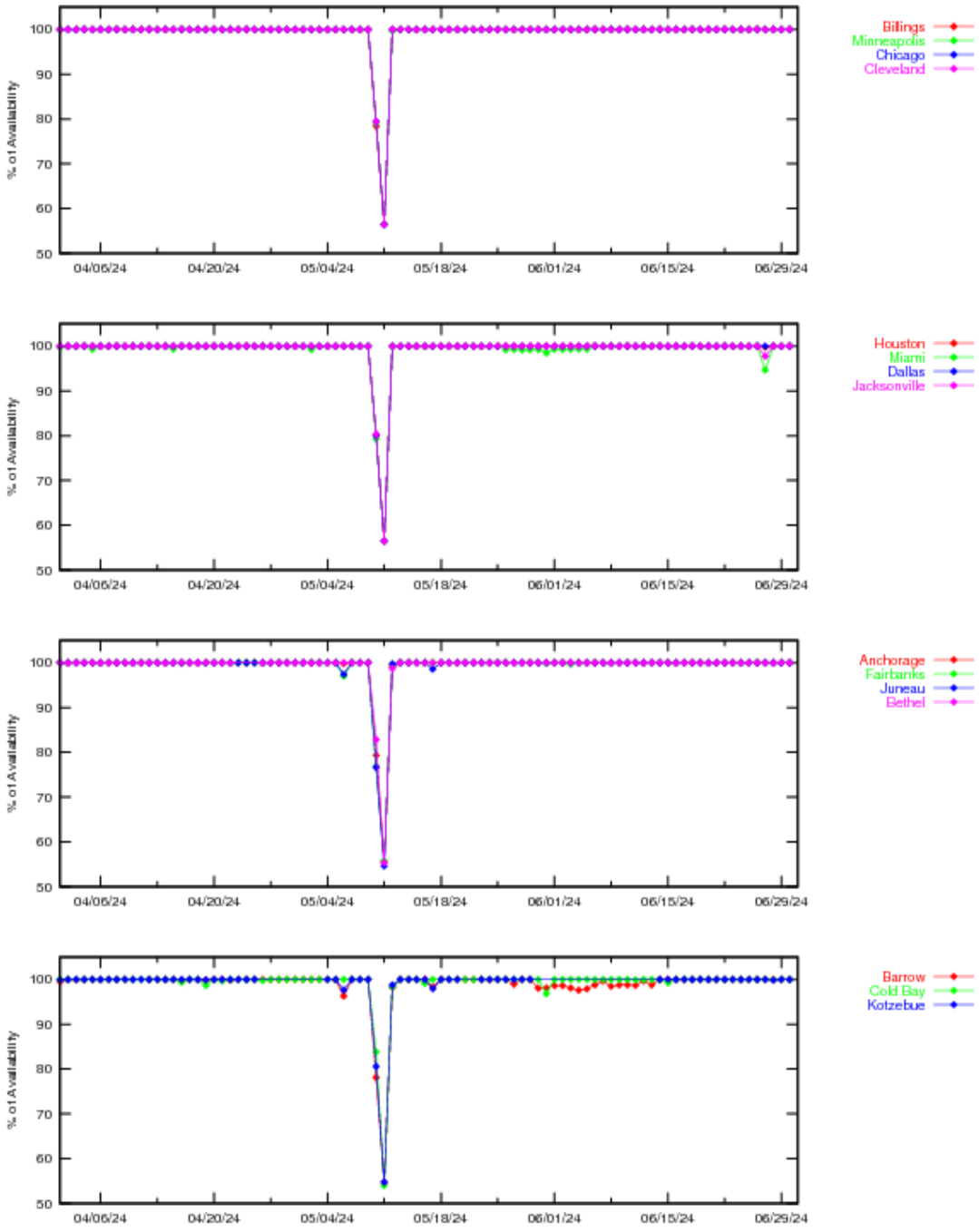

Figure 3-5 LPV200 Instantaneous Availability

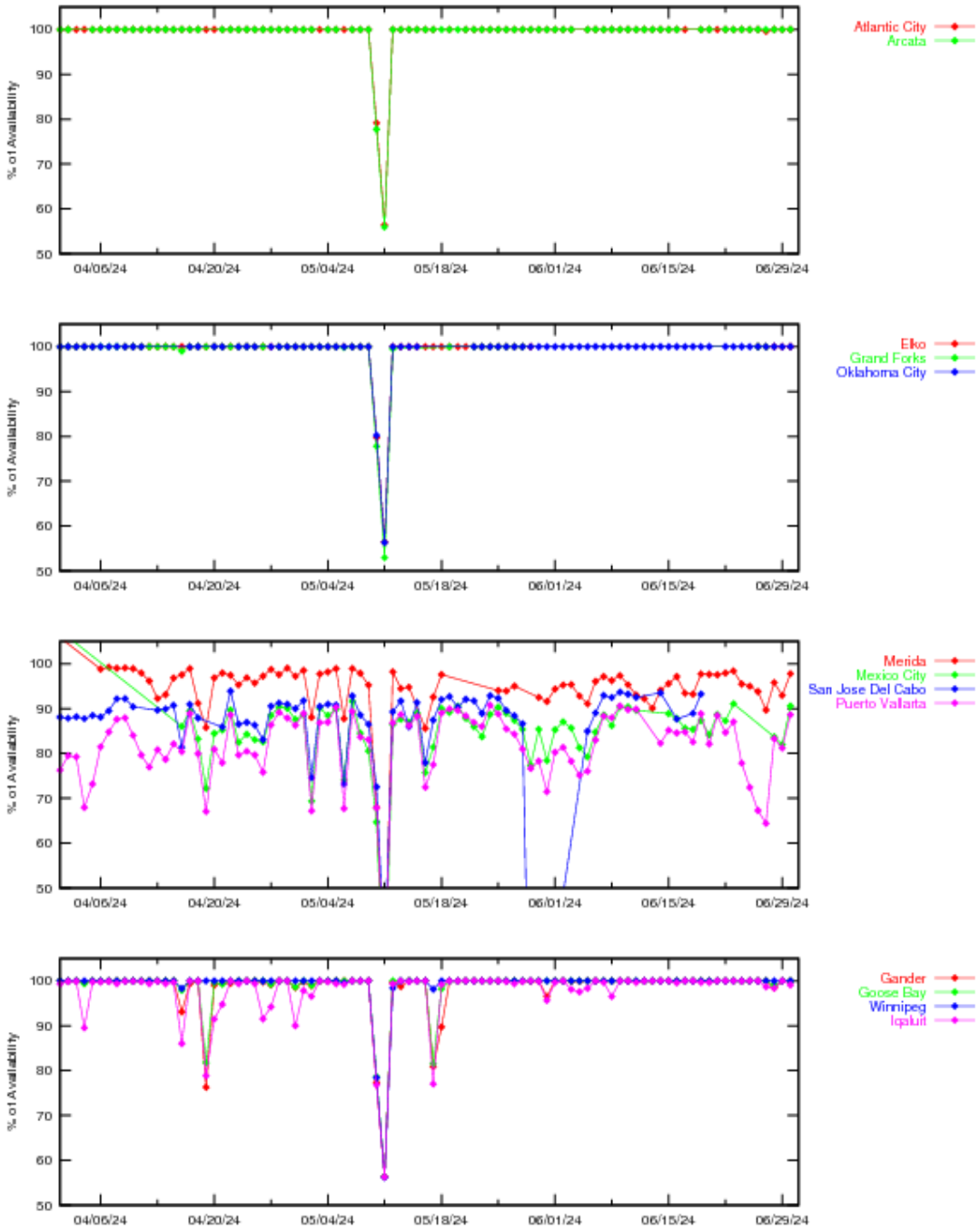

Figure 3-6 LPV200 Instantaneous Availability

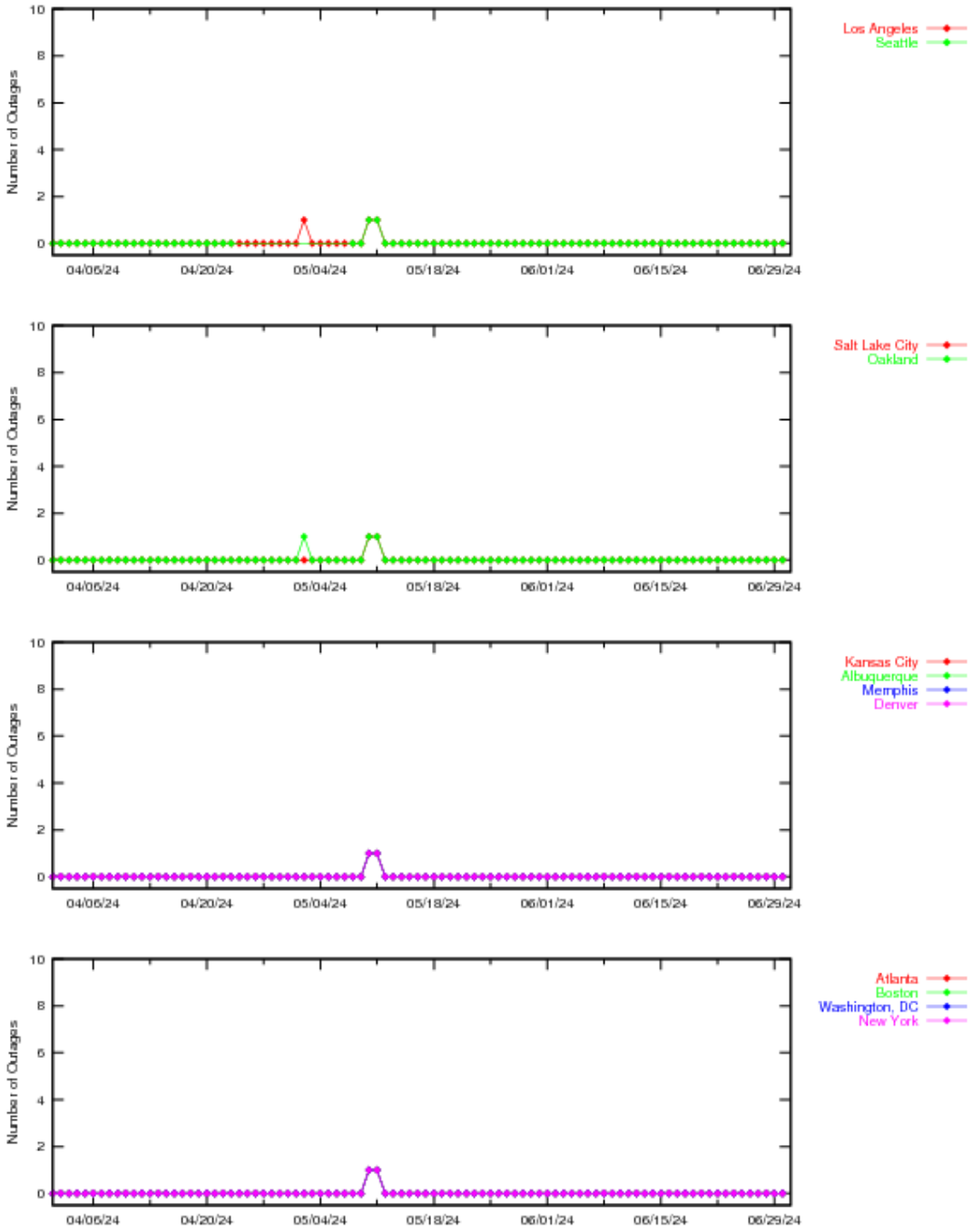

Figure 3-7 LPV Outages

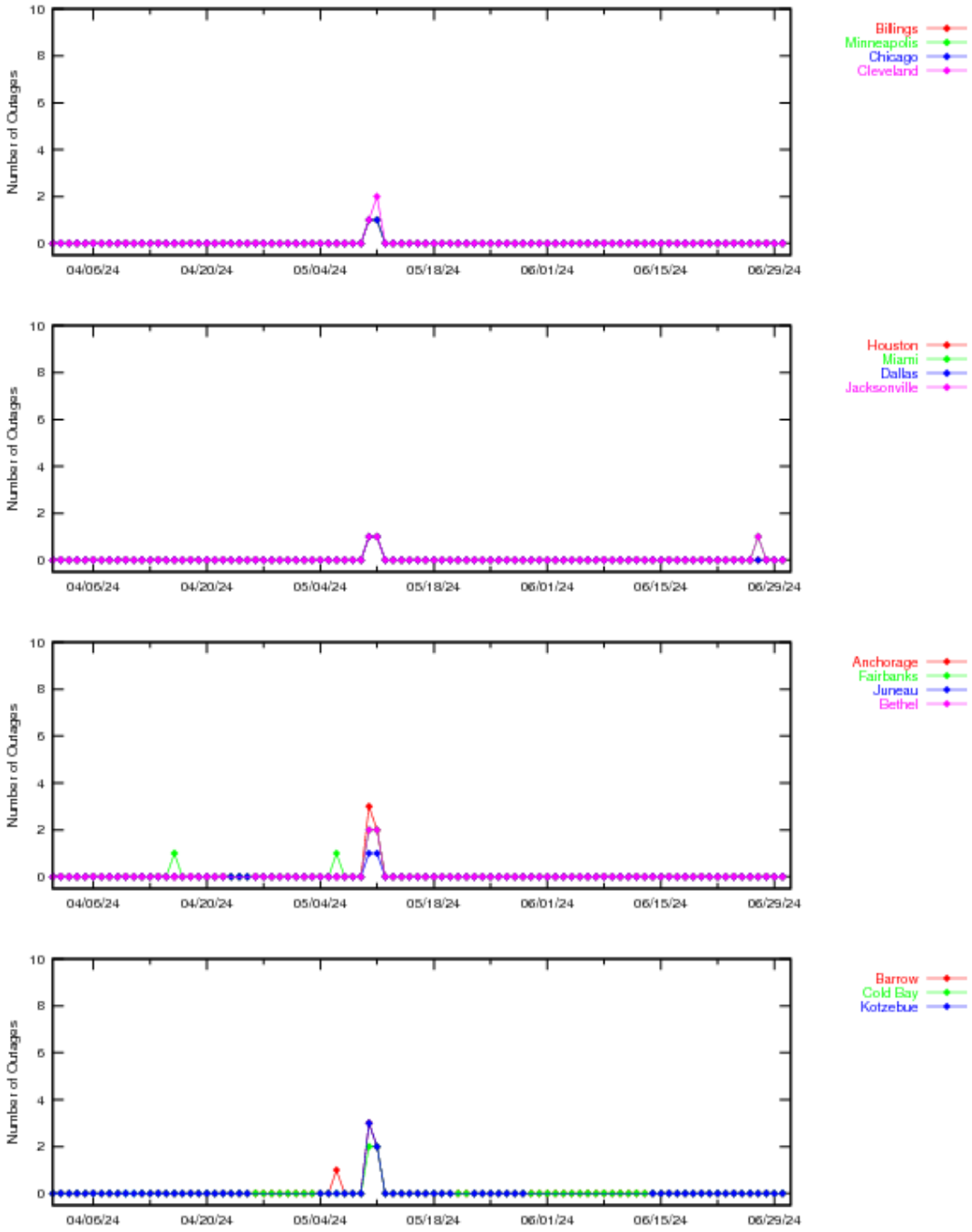

Figure 3-8 LPV Outages

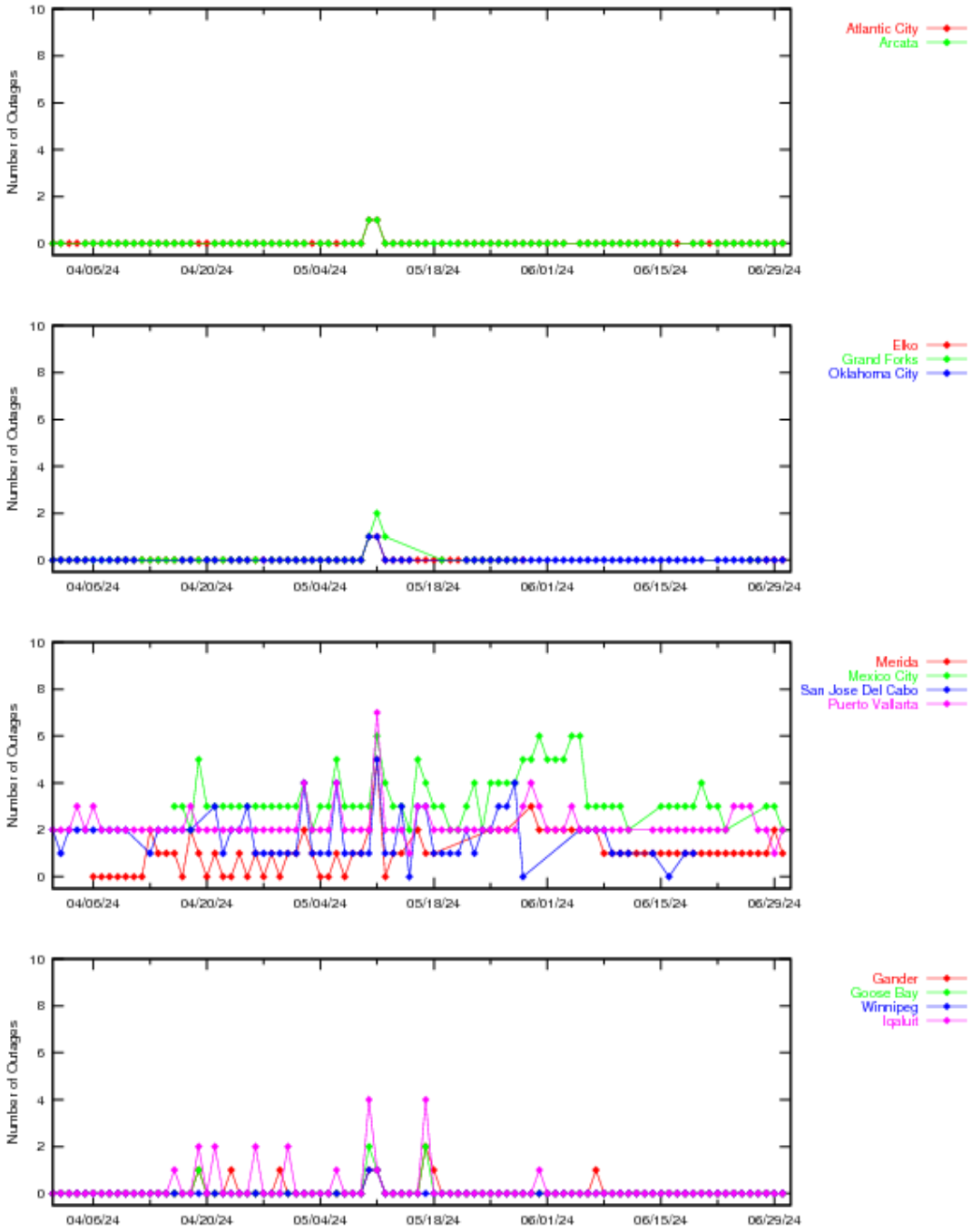

Figure 3-9 LPV Outages

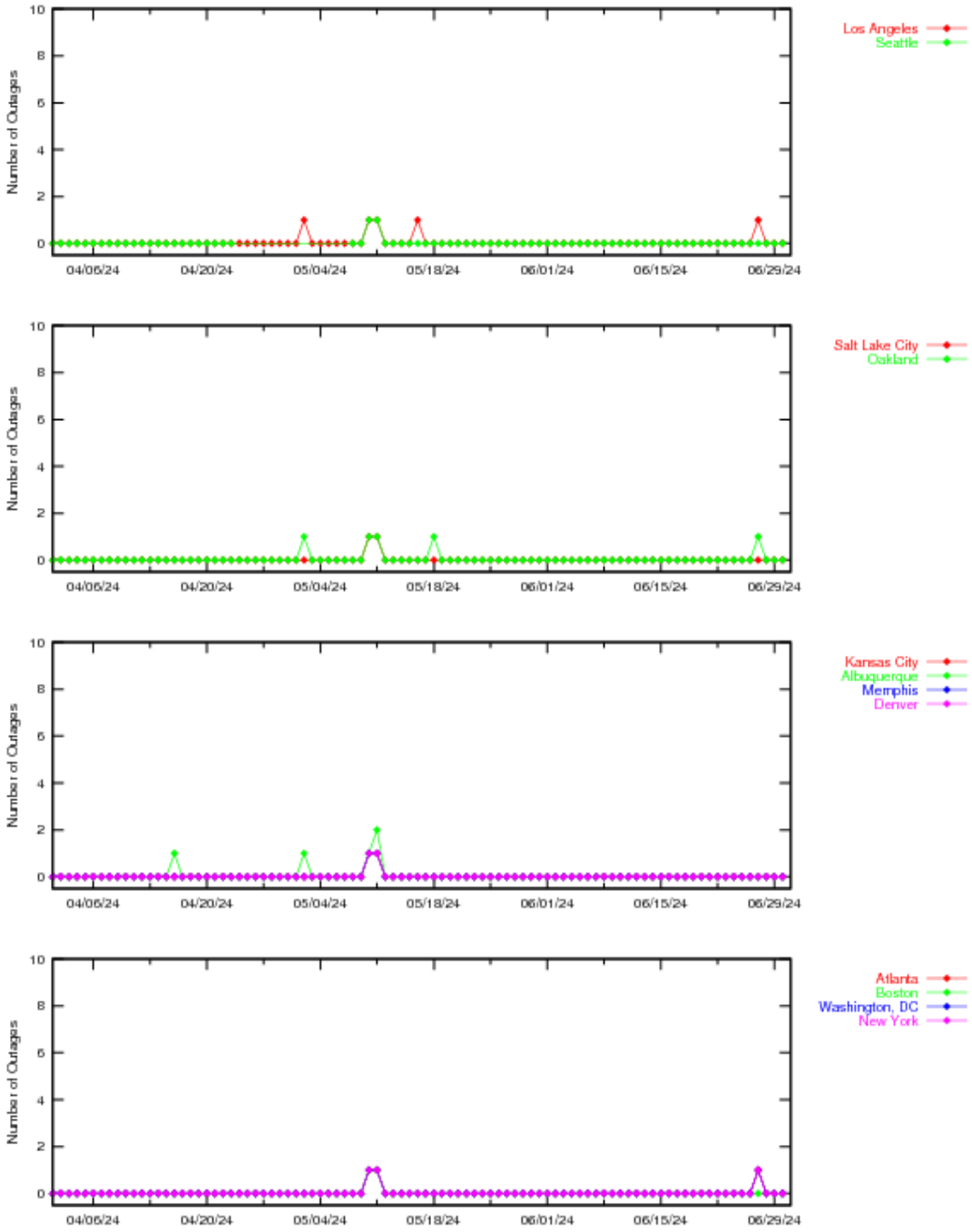

Figure 3-10 LPV200 Outages

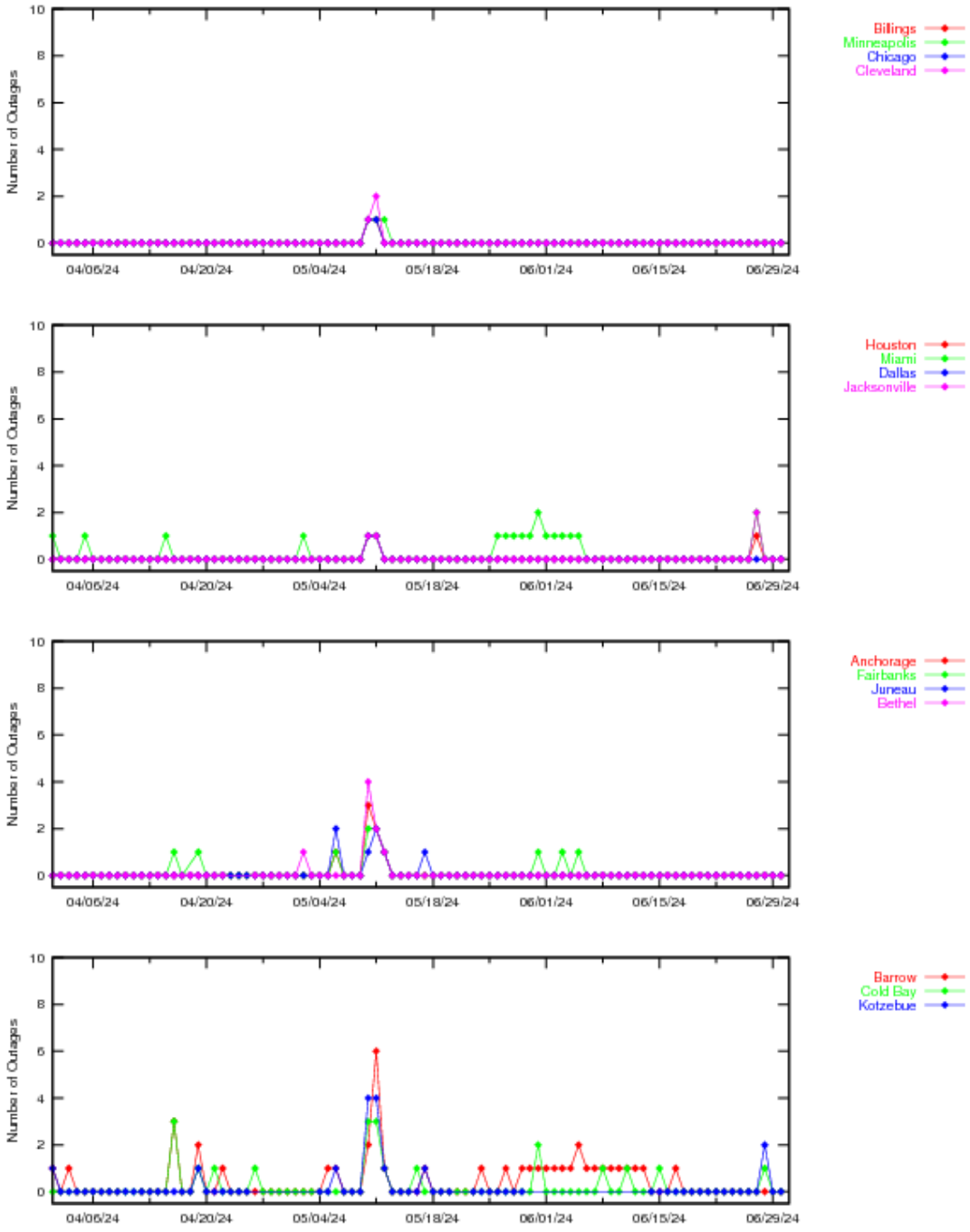

Figure 3-11 LPV200 Outages

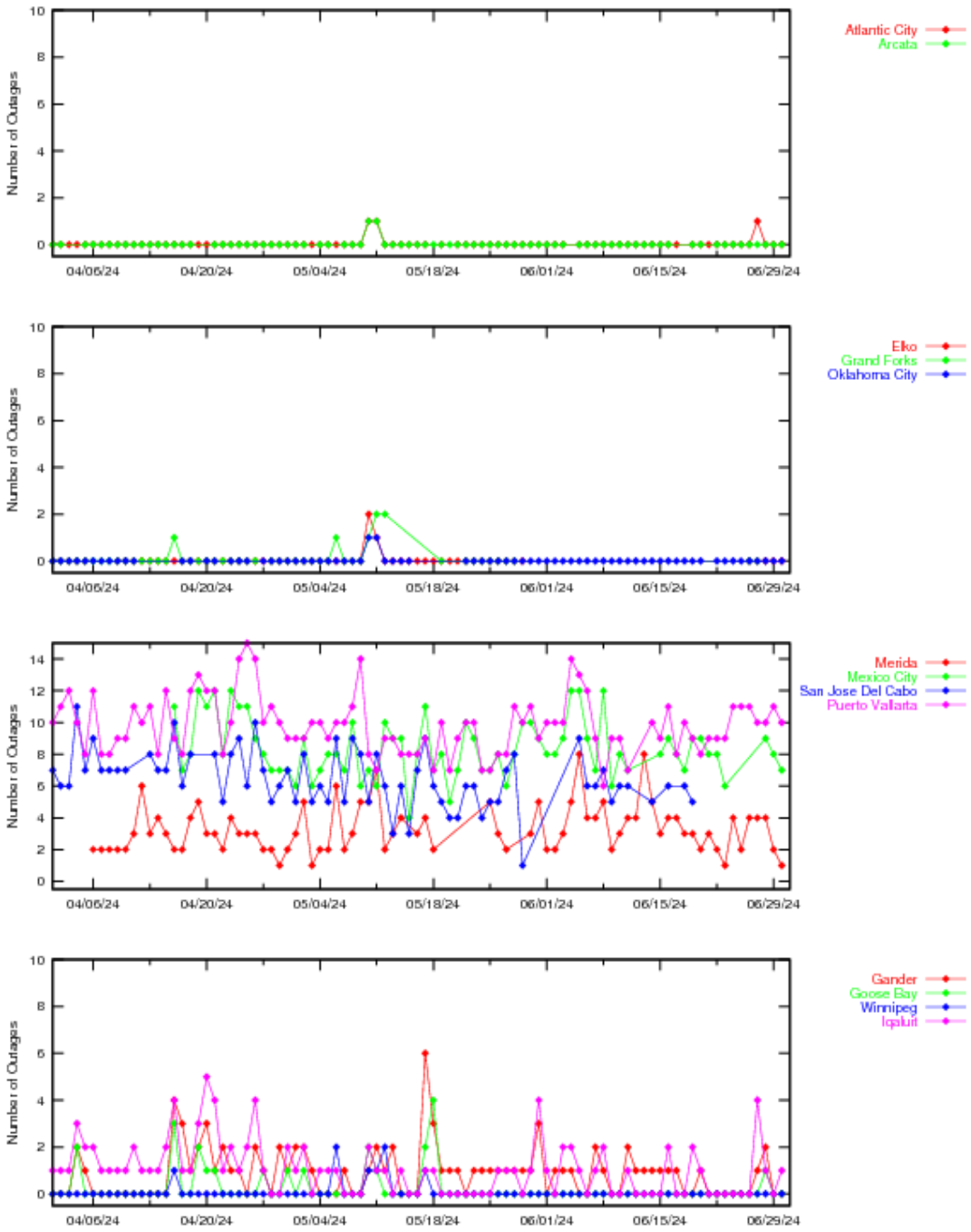

Figure 3-12 LPV200 Outages

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

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

Location	NPA Outages (Number)	NPA Outage Rates
Oklahoma City	0	0
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	2	0.000038
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
Washington, DC	0	0

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

- Apr 4 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Apr 16 – Geomagnetic activity increased GIVEs and reduced LPV availability in Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Apr 19 – Geomagnetic activity increased GIVEs and reduced LPV availability in Canada and LPV200 availability in CONUS, Alaska, and Canada.
- Apr 20 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.

- Apr 21 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Apr 23 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Apr 26 – 27 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Apr 30 – May 1 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS, Alaska, and Canada.
- May 1 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- May 2 – Geomagnetic activity increased GIVEs and reduced LPV availability in CONUS and LPV200 availability in CONUS and Canada.
- May 4 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- May 5 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Alaska and Canada.
- May 6 – Geomagnetic activity increased GIVEs and reduced LPV availability in Alaska and Canada and LPV200 availability in CONUS, Alaska, and Canada.
- May 10 – 11 - Geomagnetic activity increased GIVEs and reduced LPV and LPV200 availability in CONUS, Alaska, and Canada.
- May 12 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS, Alaska, and Canada.
- May 16 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS and Alaska.
- May 17 – 18 - Geomagnetic activity increased GIVEs and reduced LPV availability in CONUS and Canada and LPV200 availability in CONUS, Alaska, and Canada.
- May 25 – Jun 5 – Satellite maintenance elevated UDREs on PRN7 and reduced LPV200 availability in Canada.
- May 31 – Satellite maintenance elevated UDREs on PRN-16 and reduced LPV200 availability in Canada.
- Jun 8 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Alaska and Canada.
- Jun 11 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Jun 12 – 13 – Reference station outages in Mexico reduced observations and elevated GIVEs. This reduced LPV200 availability in CONUS.
- Jun 18 – Satellite maintenance elevated UDREs on PRN20 and reduced LPV200 availability in CONUS.
- Jun 26 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in CONUS.
- Jun 27 – Satellite maintenance elevated UDREs on PRN23 and reduced LPV and LPV200 availability in CONUS.
- Jun 27 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Jun 28 – Geomagnetic activity increased GIVEs and reduced LPV200 availability in Canada.
- Jun 29 – Reference station outages in Mexico reduced observations and elevated GIVEs. This reduced LPV200 availability in CONUS.

4.0 COVERAGE

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

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

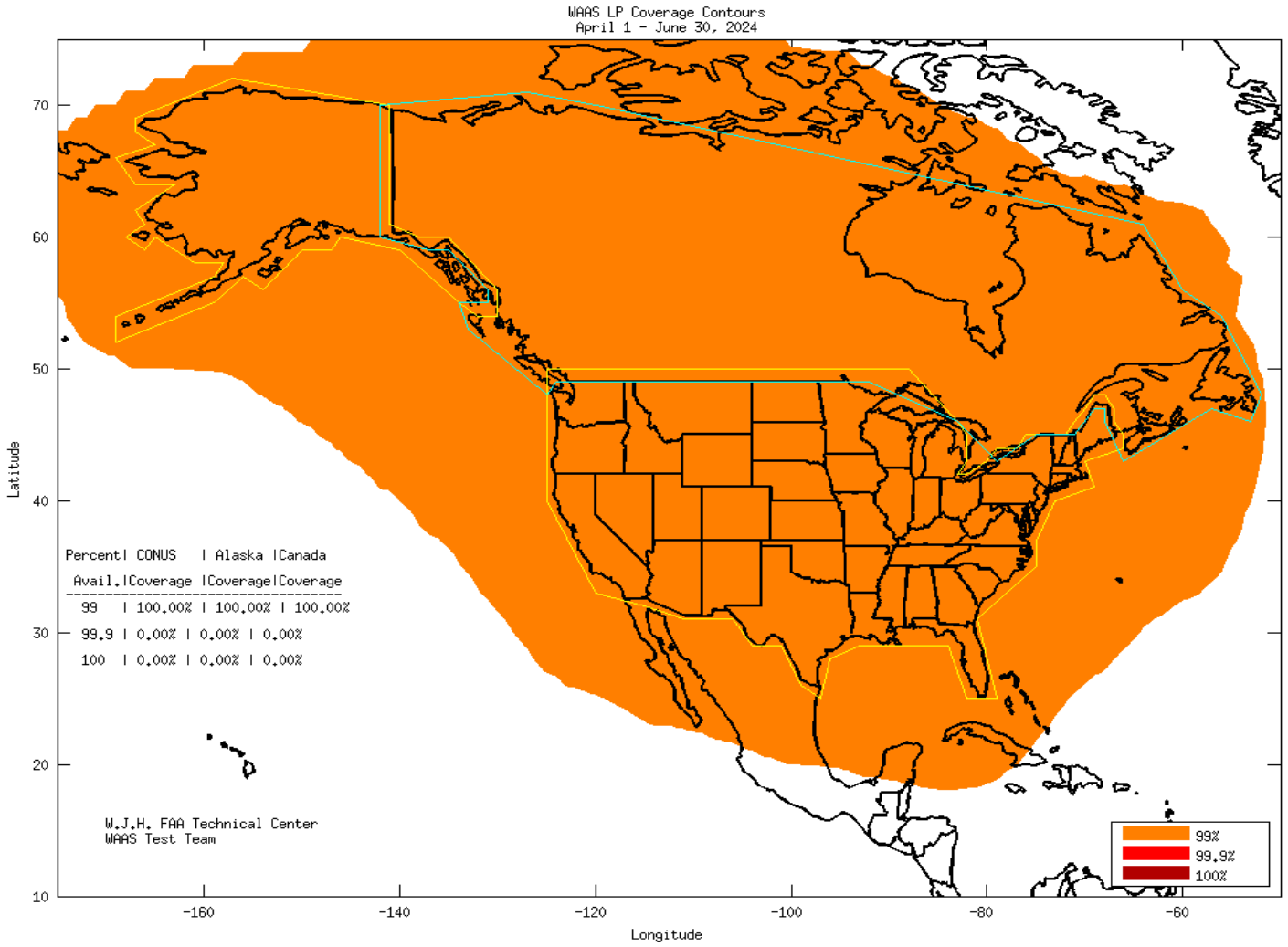

Figure 4-1 LP North America Coverage for the Quarter

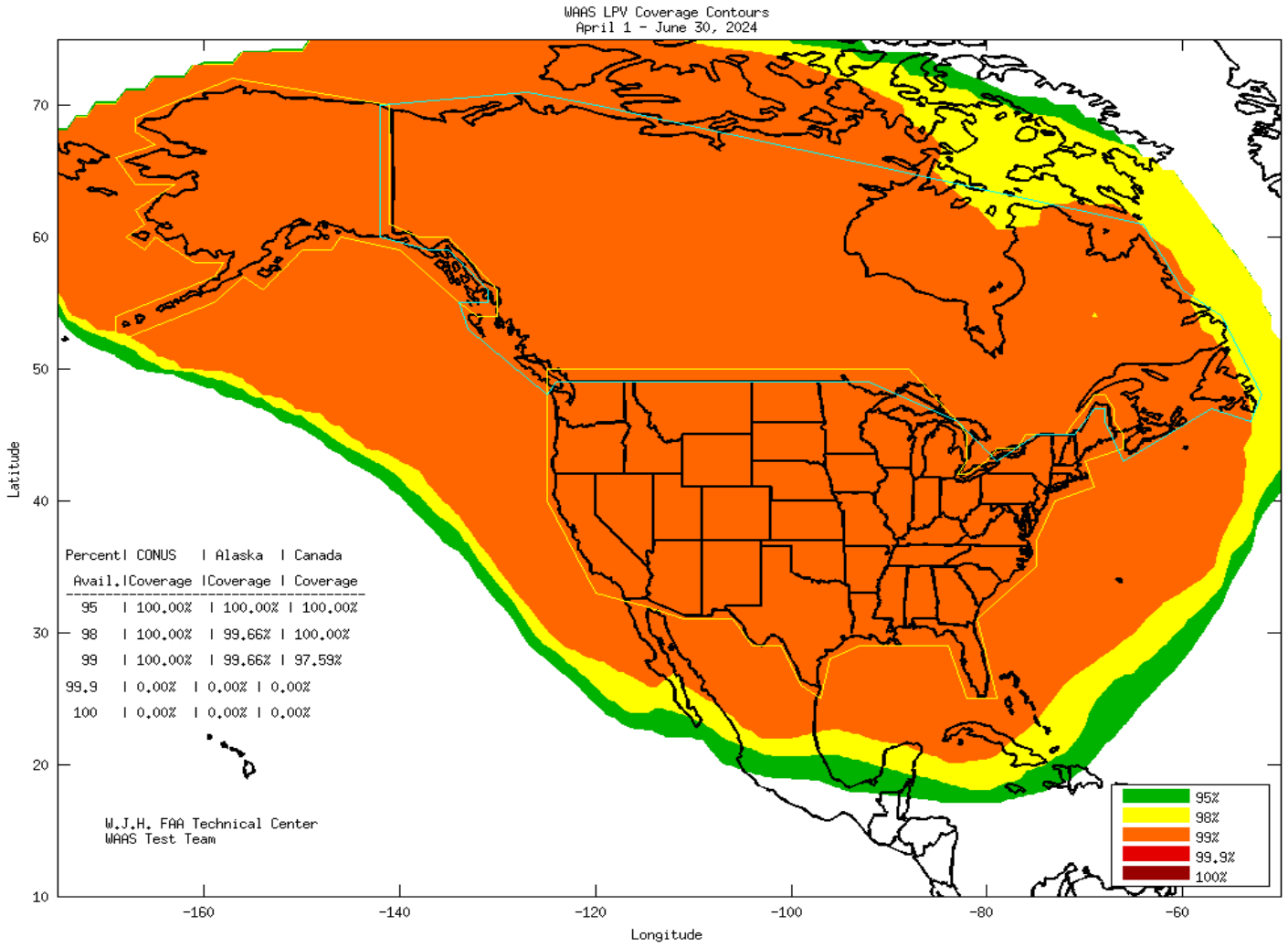

Figure 4-2 LPV North America Coverage for the Quarter

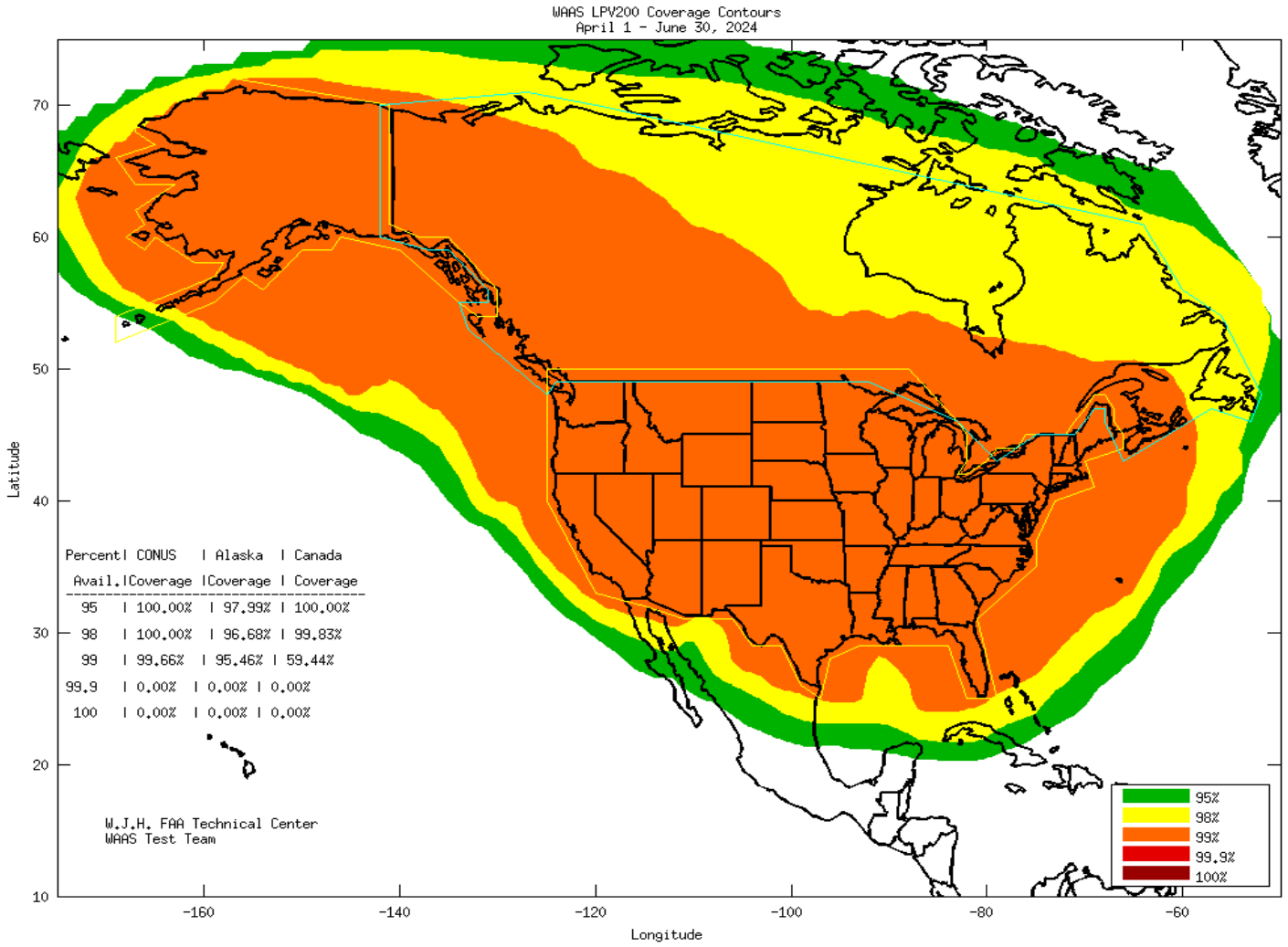

Figure 4-3 LPV200 North America Coverage for the Quarter

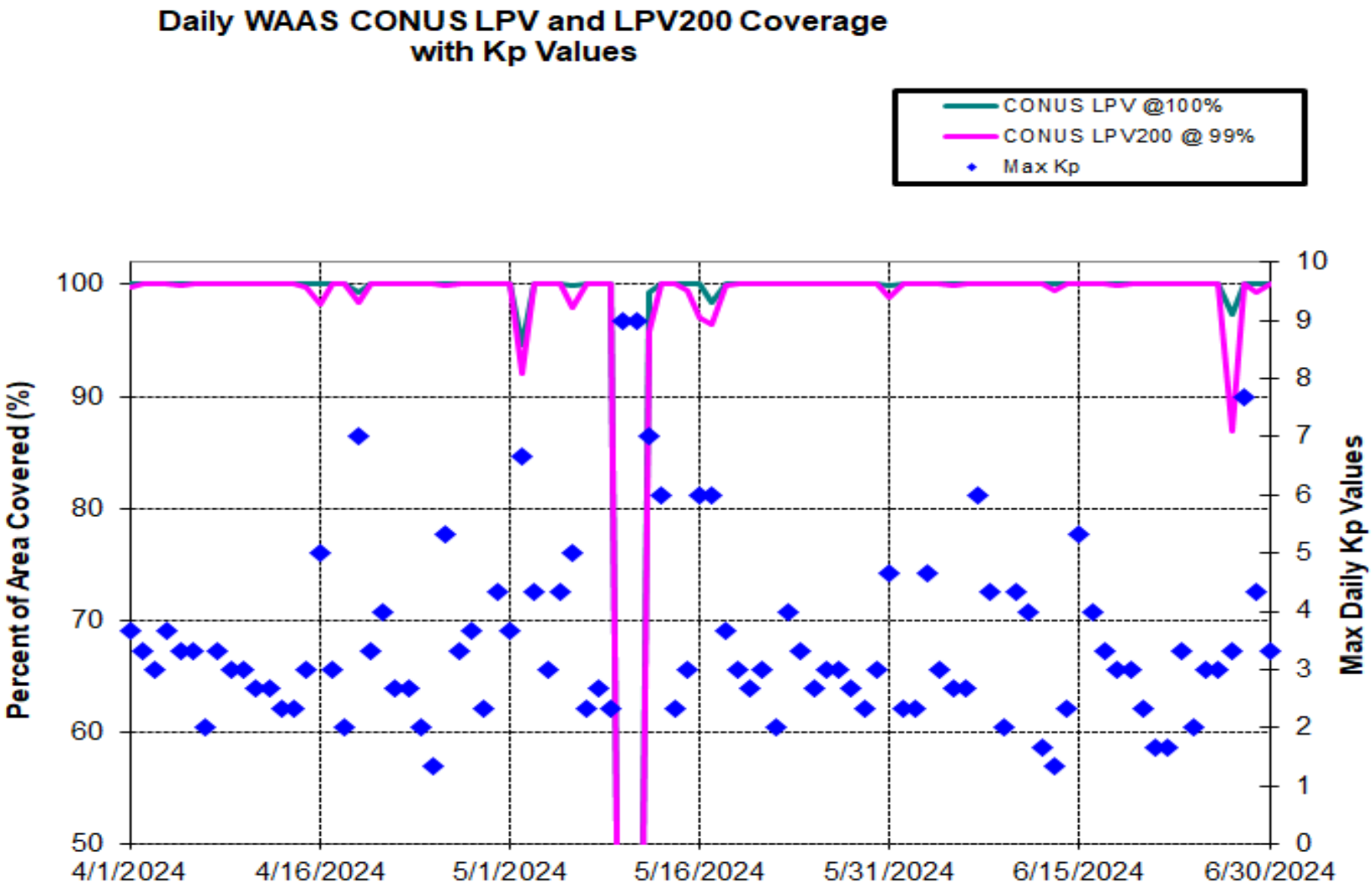

Figure 4-4 Daily LPV and LPV200 CONUS Coverage

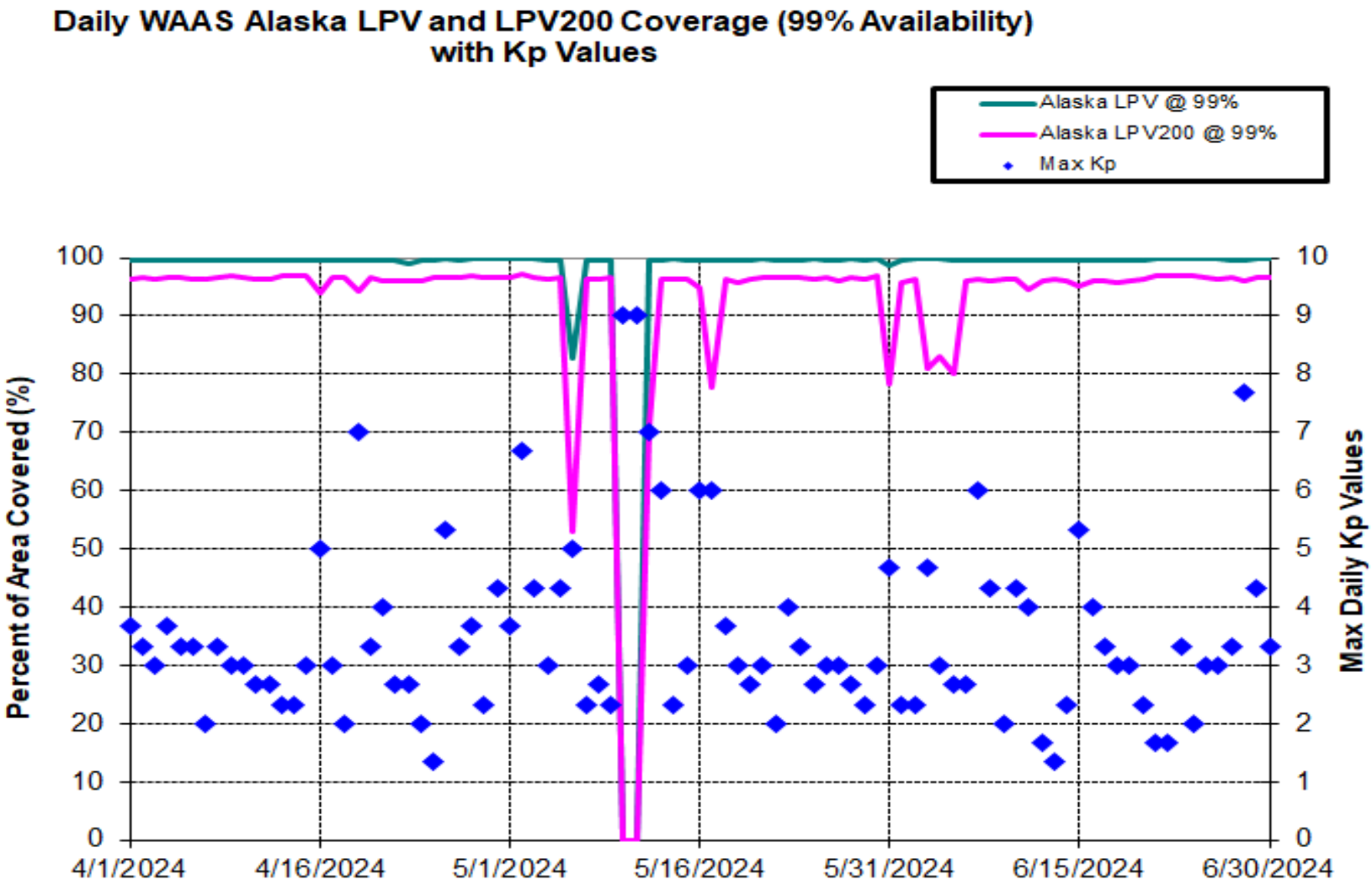

Figure 4-5 Daily LPV and LPV200 Alaska Coverage

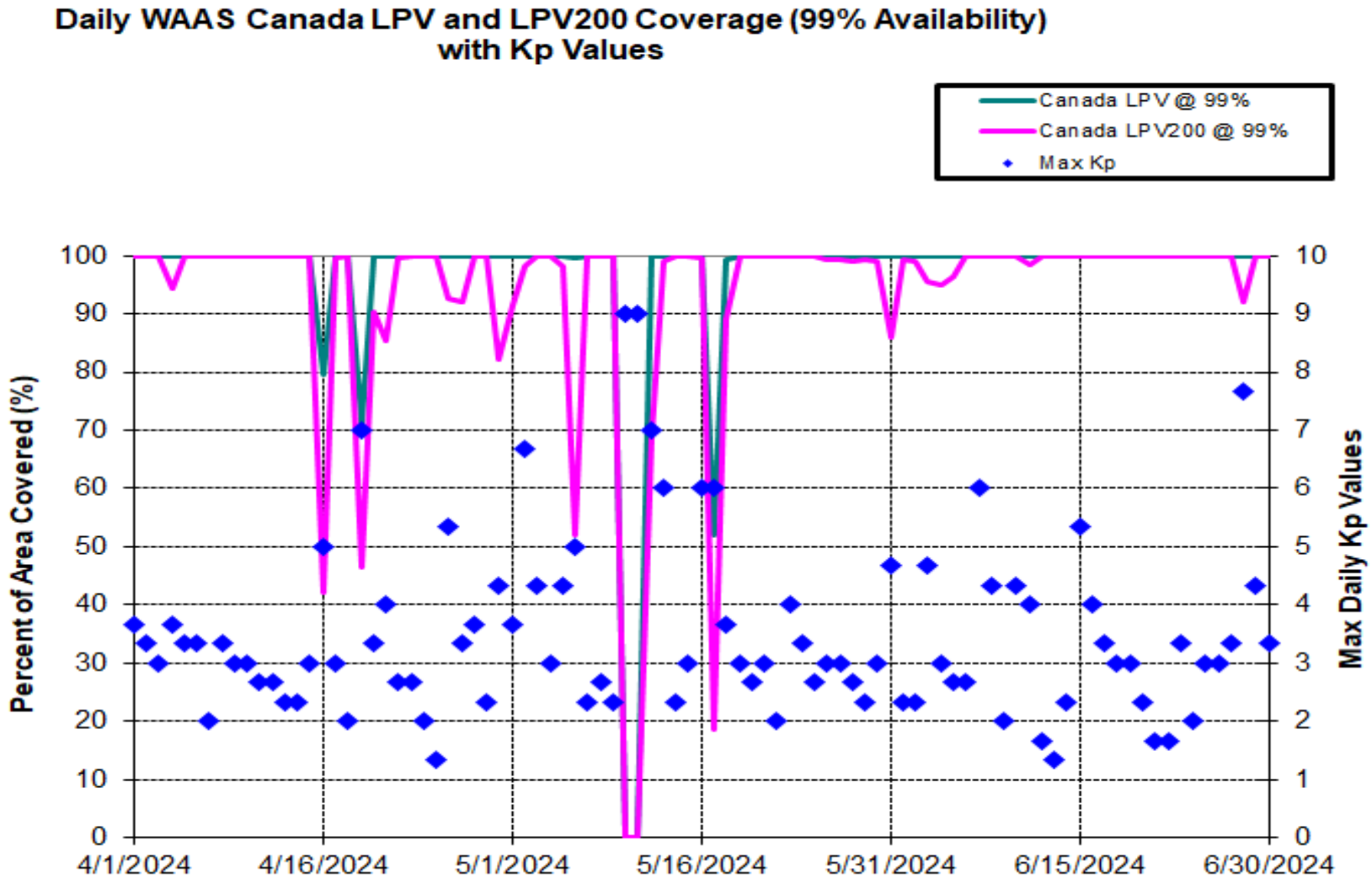

Figure 4-6 Daily LPV and LPV200 Canada Coverage

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

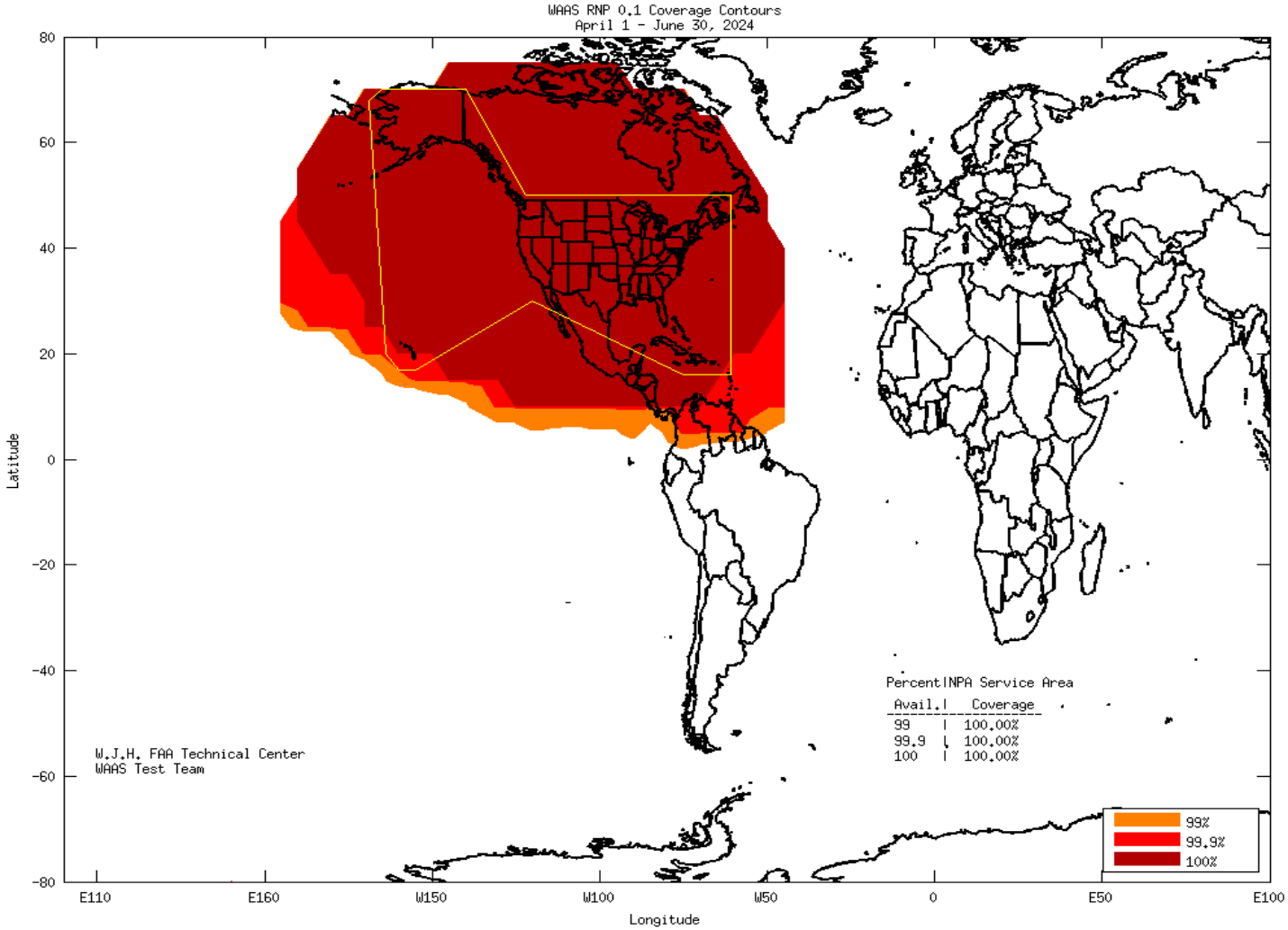

Figure 4-7 RNP 0.1 Coverage for the Quarter

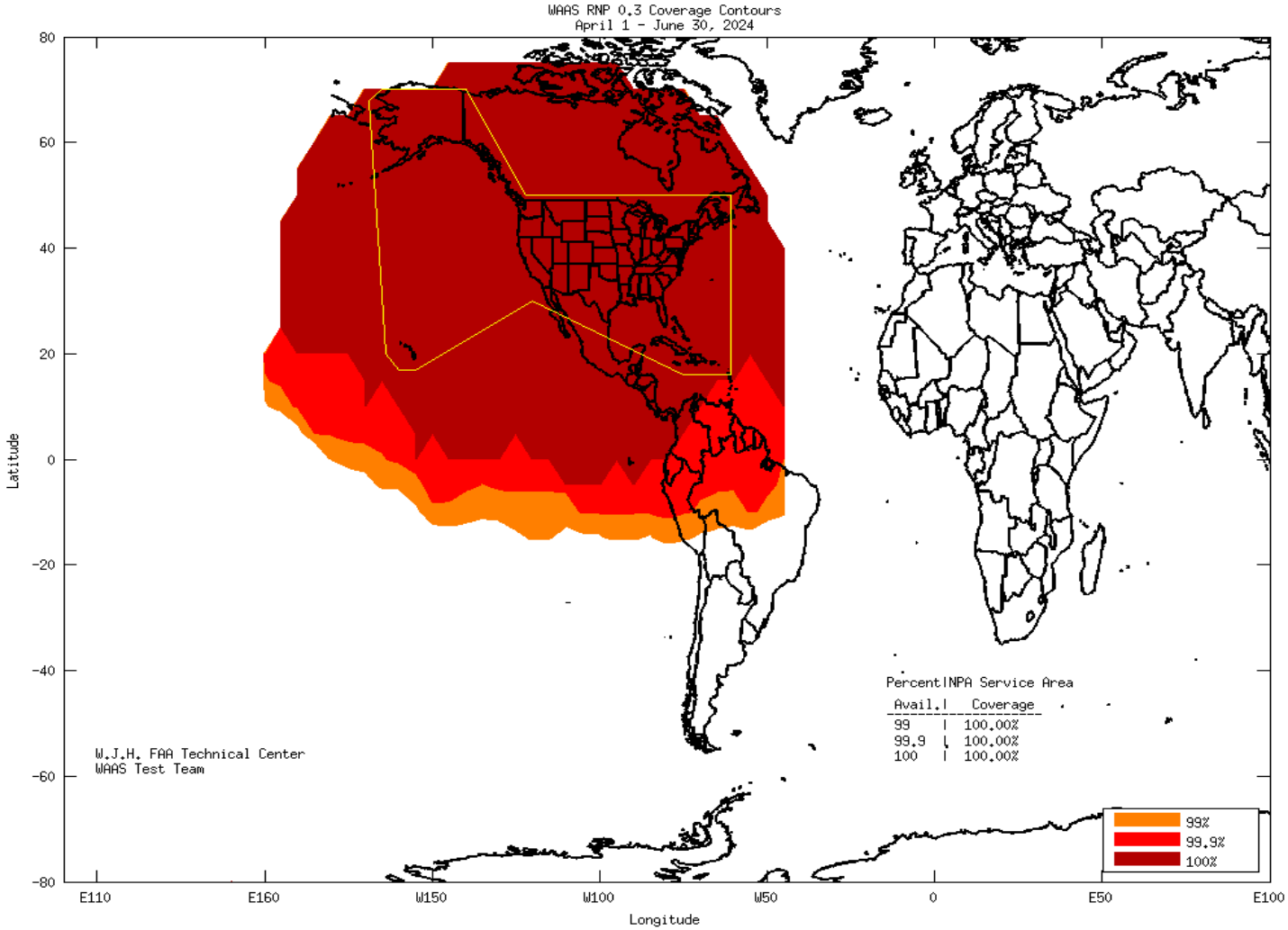

Figure 4-8 RNP 0.3 Coverage for the Quarter

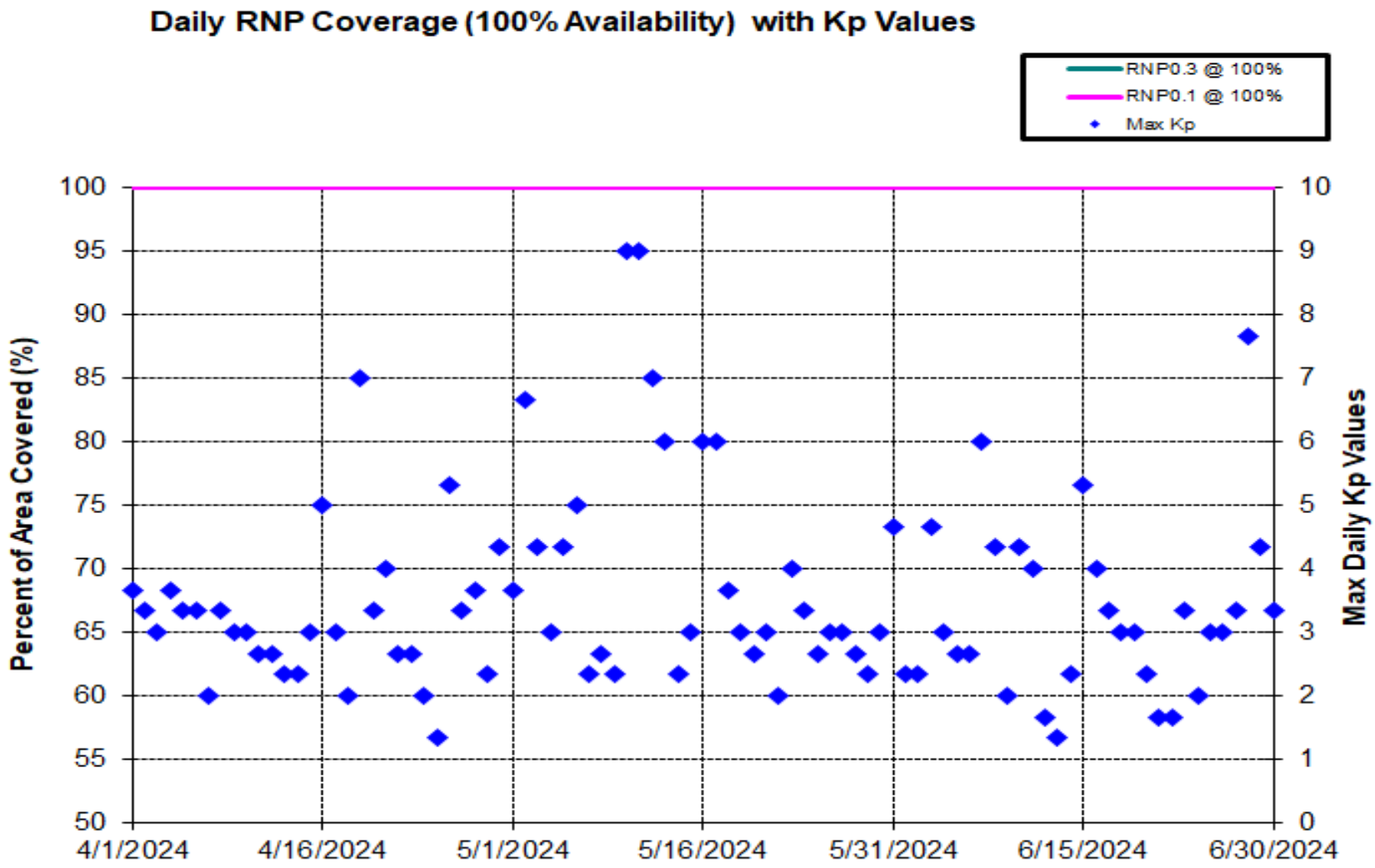

Figure 4-9 Daily RNP Coverage

The coverage decreases for this quarter were due to satellite maintenance, geomagnetic activity, GUS switchovers, and elevated UDRE values. Noteworthy events that affected coverage are listed below Table 3-5.

5.0 INTEGRITY

5.1 HMI Analysis

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

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

Table 5-1 lists the safety margin index and the number of HMI events. For this reporting period, the lowest safety margin index is 1.718 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	5.424	10.497	0
Atlantic City	5.301	3.818	0
Elko	4.504	10.266	0
Grand Forks	5.320	5.598	0
Oklahoma City	4.761	10.853	0
Albuquerque	6.465	9.258	0
Anchorage	5.531	5.300	0
Atlanta	8.068	14.085	0
Barrow	11.519	4.715	0
Bethel	4.466	4.458	0
Billings	3.798	6.780	0
Boston	11.216	4.140	0
Chicago	4.843	6.201	0
Cleveland	4.976	4.432	0
Cold Bay	6.957	7.233	0
Dallas	5.095	10.591	0
Denver	16.363	9.771	0
Fairbanks	12.447	5.060	0
Gander	7.822	12.334	0

Location	Horizontal Safety Index (m)	Vertical Safety Index (m)	Number of HMIs
Goose Bay	7.346	7.876	0
Houston	5.599	12.699	0
Iqaluit	6.335	5.654	0
Jacksonville	6.923	12.163	0
Juneau	4.299	4.229	0
Kansas City	17.960	6.323	0
Kotzebue	7.606	5.547	0
Los Angeles	11.977	4.635	0
Memphis	7.843	8.805	0
Merida	10.443	4.659	0
Mexico City	9.375	6.557	0
Miami	10.403	7.055	0
Minneapolis	3.649	5.539	0
New York	5.851	4.542	0
Oakland	5.055	7.628	0
Puerto Vallarta	1.718	4.594	0
Salt Lake City	10.492	13.643	0
San Jose Del Cabo	5.386	4.936	0
Seattle	3.750	7.089	0
Washington, DC	5.099	5.188	0
Winnipeg	4.213	5.409	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	2	1	1	0.022	0.011	0.011
T3	11	13	13	0.1209	0.1429	0.1429
T4	24	21	24	0.2637	0.2308	0.2637
T5	0	0	0	0	0	0
T6	0	0	0	0	0	0
T24	0	0	0	0	0	0
T26	0	0	0	0	0	0

Total SV Alerts	37	35	38	0.4066	0.3846	0.4176
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.

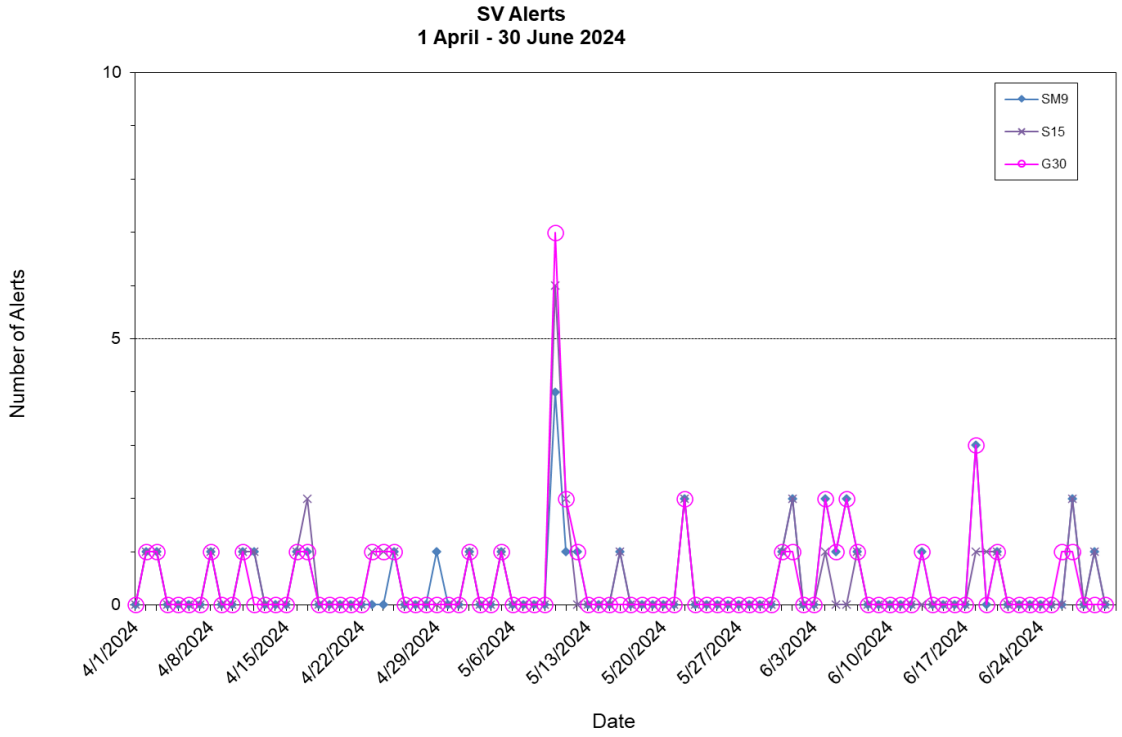

Figure 5-1 SV Daily Alert Trend

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 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 S15 GEO Type 28 messages occurred after PRN133 switched from Brewster (manual) to South Mountain on June 7, 2024, 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 (fault) to Napa on June 1, 2024, causing an 18-second message outage. The high Max Late Length reported by S15 GEO for SM9 and S15 GEO Type 28 messages occurred during PRN133 message gaps of 3356 and 2112 seconds, respectively, on June 6, 2024 during Release 1 field testing. In addition, high Max Late Length for GEO Types 0. 1, 3, 4, 7, 9, 10, 17, 18, 24, 25, and 26 messages occurred on June 6, 2024. The high Max Late Length reported by G30 GEO for SM9 GEO Type 28 messages occurred after PRN131 switched from Southbury (manual) to Santa Paula on April 23, 2024 causing a 4-second message outage. The high Max Late Length reported by G30 GEO for S15 GEO Type 28 messages occurred after PRN133 switched from South Mountain (manual) to Brewster on June 7, 2024, causing a 4-second message outage. The high Max Late Length reported by G30 GEO for G30 GEO Type 28 messages occurred after PRN135 switched from Brewster (fault) to Napa on June 1, 2024, causing an 18-second message outage.

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	103464	1	121
2	1310361	32	13
3	1310394	26	13
4	1310452	15	13
7	96286	4	130
9	92137	0	0
10	96156	8	148
17	31083	2	408

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	N/A	N/A	N/A
2	49447	1	183
3	47190	0	0
4	46499	0	0
5	47020	0	0
6	47266	0	0
7	41314	0	0
8	47976	0	0
9	46600	0	0
10	46930	0	0
11	46991	0	0
12	46962	0	0
13	48716	0	0
14	46020	0	0
15	47085	0	0
16	46796	0	0
17	45846	1	183
18	46608	0	0
19	45540	0	0
20	47469	0	0
21	50081	2	176
22	47153	2	176
23	46628	0	0
24	48790	0	0
25	48411	0	0
26	47546	0	0
27	48698	0	0
28	47258	0	0
29	46879	0	0
30	46763	0	0
31	46871	1	166
32	46768	1	166

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	N/A	N/A	N/A
2	40614	2	153
3	38782	2	158
4	38209	1	141
5	38604	0	0
6	38846	1	134
7	33904	0	0
8	39381	1	201
9	38246	1	134
10	38515	2	128
11	38576	1	152
12	38599	0	0
13	39978	1	130
14	37781	1	153
15	38669	1	201
16	38442	2	173
17	37598	0	0
18	38242	1	128
19	37400	0	0
20	38924	0	0
21	41130	4	203
22	38733	2	144
23	38282	1	202
24	40046	0	0
25	39758	1	152
26	39044	0	0
27	40043	1	139
28	38796	2	202
29	38515	1	152
30	38442	1	129
31	38478	0	0
32	38359	2	152
131	75419	1	148
133	73422	2	5464
135	74943	4	5499

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	27290	8	453
0	1	27297	9	479
0	2	27296	10	485
1	0	27297	5	465
1	1	27293	6	368
1	2	27294	5	370
1	3	27298	6	373
1	4	27293	7	368
2	0	27286	10	368
2	1	27316	5	320
2	2	27302	3	315
2	3	27297	4	320
2	4	27292	4	332
3	0	27303	5	338
3	1	27293	4	339
3	2	27297	7	337
9	0	27302	6	337
9	1	27297	10	369
9	2	27292	7	368
9	3	27295	7	509
9	4	27290	7	551
9	5	27297	5	509
9	6	27303	7	497

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35338	0	0
1	35298	2	321
2	35290	4	402
3	35299	1	349
9	35318	3	325

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	210446	9	3362
1	100865	3	3429
2	1074655	27	24
3	1285154	23	3362
4	1285189	16	3362
7	93742	16	3468
9	90346	4	3422
10	93786	12	3492
17	30400	2	3488

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	N/A	N/A	N/A
2	48793	2	172
3	46573	0	0
4	45675	0	0
5	45824	0	0
6	46397	0	0
7	40930	0	0
8	47127	0	0
9	45717	0	0
10	46060	1	185
11	45966	0	0
12	46003	0	0
13	47635	0	0
14	45292	0	0
15	46023	1	180
16	45821	0	0
17	45135	1	172
18	45477	0	0
19	44794	0	0
20	46543	0	0
21	49360	0	0
22	46402	0	0
23	45632	0	0
24	47798	0	0
25	47388	1	185

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
26	46522	1	180
27	47742	0	0
28	46353	0	0
29	45689	1	2135
30	45880	0	0
31	45961	1	180
32	45954	2	180

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	N/A	N/A	N/A
2	40049	1	148
3	38288	0	0
4	37525	0	0
5	37610	1	208
6	38135	0	0
7	33597	0	0
8	38679	0	0
9	37532	2	201
10	37805	3	205
11	37731	0	0
12	37819	0	0
13	39116	1	144
14	37179	0	0
15	37772	1	137
16	37650	1	152
17	37007	1	129
18	37321	0	0
19	36772	2	3535
20	38172	1	152
21	40531	3	247
22	38102	3	163
23	37452	0	0
24	39233	1	205
25	38923	2	3536
26	38180	2	148
27	39244	1	176
28	38069	1	140
29	37527	0	0

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
30	37703	1	158
31	37719	1	129
32	37700	1	208
131	73912	1	2273
133	73475	1	10887
135	73450	0	0

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	26766	3	q
0	1	26763	5	3746
0	2	26755	4	3744
1	0	26760	4	3464
1	1	26760	4	3459
1	2	26762	5	3469
1	3	26770	6	3462
1	4	26771	5	3462
2	0	26759	5	3458
2	1	26761	7	3464
2	2	26749	8	3458
2	3	26761	6	3744
2	4	26749	6	3746
3	0	26762	9	3752
3	1	26773	6	3745
3	2	26758	6	3746
9	0	26758	10	3752
9	1	26743	13	3752
9	2	26774	6	3746
9	3	26755	10	3750
9	4	26772	10	3747
9	5	26766	6	3758
9	6	26754	10	3744

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	34521	2	3670
1	34574	3	3656
2	34520	2	3637
3	34509	2	3643
9	34557	2	3453

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	101220	5	164
2	1310325	42	26
3	1310381	28	21
4	1310427	21	19
7	94175	14	196
9	92128	2	179
10	94161	12	171
17	30878	3	388

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	N/A	N/A	N/A
2	49455	1	163
3	47190	0	0
4	46490	3	169
5	47029	2	189
6	47270	0	0
7	41306	0	0
8	47966	1	171
9	46606	0	0
10	46916	0	0
11	46974	2	187
12	46957	0	0
13	48701	1	177
14	46004	1	177
15	47080	0	0
16	46776	2	169
17	45848	1	163

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
18	46612	1	158
19	45547	2	165
20	47452	2	189
21	50084	1	168
22	47170	1	168
23	46624	2	179
24	48774	0	0
25	48411	0	0
26	47559	2	187
27	48689	1	178
28	47256	0	0
29	46880	0	0
30	46771	0	0
31	46878	1	169
32	46767	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	N/A	N/A	N/A
2	40605	1	208
3	38786	1	138
4	38193	2	210
5	38590	0	0
6	38848	1	128
7	33906	0	0
8	39380	2	208
9	38265	0	0
10	38506	2	207
11	38565	2	210
12	38594	0	0
13	40007	2	208
14	37757	1	206
15	38641	0	0
16	38435	2	153
17	37589	2	208
18	38256	1	176
19	37396	2	136
20	38935	1	208
21	41132	4	206

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
22	38726	4	144
23	38258	1	210
24	40032	2	207
25	39756	3	209
26	39037	2	209
27	40035	2	210
28	38798	2	158
29	38521	1	208
30	38421	0	0
31	38466	0	0
32	38377	3	208
131	75414	4	5518
133	73454	3	18647
135	74910	1	5544

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	27284	9	543
0	1	27289	8	533
0	2	27290	6	535
1	0	27301	7	530
1	1	27287	5	513
1	2	27288	4	446
1	3	27300	8	441
1	4	27291	5	464
2	0	27293	9	579
2	1	27290	6	577
2	2	27279	11	579
2	3	27297	10	512
2	4	27279	11	578
3	0	27296	6	578
3	1	27282	6	495
3	2	27308	8	491
9	0	27310	6	578
9	1	27289	6	578
9	2	27288	10	582
9	3	27291	5	587
9	4	27288	5	439
9	5	27298	7	439

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
9	6	27304	9	531

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35070	3	429
1	35065	2	398
2	35026	3	360
3	35042	1	326
9	35034	0	0

5.4 Satellite Glitches

The GPS satellites will occasionally experience periods of signal carrier stability glitches of varying magnitude. These glitches are short degradations in the signal, which in severe cases may cause WAAS to lose track or cycle slip for some or all of the WAAS receivers. The more severe glitches will cause the WAAS-reported UDRE to increase to "Not Monitor" and result in an alert. Figure 5-2 shows the SV glitch trend for this quarter. Severity 0, displayed by blue dots, indicates fewer than 10 receivers lost track of the satellite. Severity 1, displayed by green dots, indicates a significant number of receivers, but not all receivers, lost track of the satellite. Severity 2, displayed by yellow dots, indicates only Signal Quality Monitoring (SQM) was affected, and all receivers lost track. Severity 3, displayed by red dots, indicates more than just SQM was affected, and all receivers lost track.

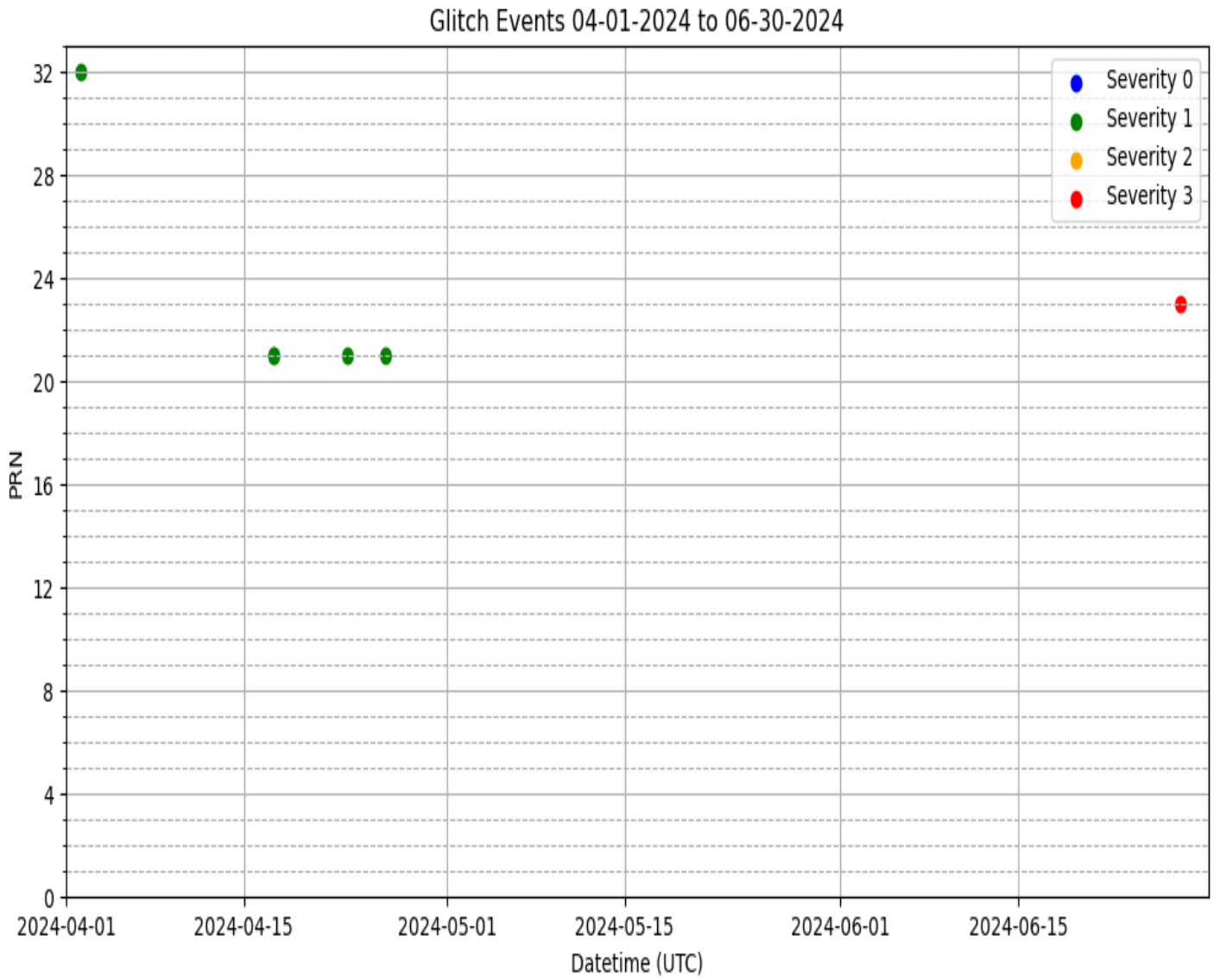

Figure 5-2 SV Glitch Trend

6.0 SV RANGE ACCURACY

WAAS transmits UDRE and GIVE values to support protection levels such that the position error is bounded 99.9999%. The position domain analysis in this report provides the information regarding how well the transmitted WAAS UDRE and GIVE values bound the position errors. A UDRE is broadcasted by the WAAS for each monitored satellite, and the 95% error bound and the maximum normalized value (divided by sigma_UDRE) of the pseudorange residual error after application of fast and long-term corrections is checked. The pseudorange residual error is determined by taking the difference between the raw pseudorange and a calculated reference range. The reference range is equal to the true range between the corrected satellite position and surveyed user antenna plus all corrections (i.e., WAAS fast clock, WAAS long-term clock, WAAS ionospheric delay, tropospheric delay, receiver clock bias, and multipath). Because the true ionospheric delay and multipath error are not precisely known, the estimated variance in these error sources are added to the UDRE before comparing it to the normalized residual error.

The GPS satellite range residual errors were calculated for 12 WAAS receivers during the quarter. Table 6-1 and Table 6-2 show the range error 95% index, maximum range error, and maximum normalized value (divided by sigma_UDRE) at the time of the maximum range error. Figure 6-1 through Figure 6-3show the 95% range error for each SV measured by the WAAS receivers at the Washington, DC reference station.

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

Site	Minneapolis			Chicago			Boston			Juneau			Honolulu			Salt Lake City		
PRN ↓	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1.062	3.681	1.217	1.354	4.550	2.670	1.109	2.301	1.141	1.407	2.964	1.387	1.292	4.123	1.039	0.947	6.216	1.783
3	0.932	4.131	2.827	1.297	4.640	1.449	1.504	4.724	3.828	1.126	3.009	1.407	1.847	4.221	2.571	1.655	4.592	1.343
4	1.156	3.401	1.169	1.648	4.750	1.455	1.010	2.506	1.046	1.449	3.387	1.509	1.431	4.080	1.599	1.153	3.767	1.471
5	0.927	8.428	7.411	0.996	3.721	2.141	0.991	7.222	5.541	1.308	6.932	3.067	1.238	4.065	2.386	1.249	11.751	7.956
6	1.088	4.419	3.157	1.157	4.230	2.300	1.022	5.132	3.249	1.319	3.885	1.685	1.140	4.385	3.083	1.123	6.163	2.887
7	1.336	3.536	2.470	1.128	4.137	1.605	1.635	2.976	1.154	1.402	7.104	2.410	1.419	2.364	1.426	0.873	2.292	0.759
8	1.451	6.767	2.426	1.016	2.644	0.818	1.022	2.197	0.653	1.243	3.025	1.475	1.255	4.162	1.818	1.206	5.828	3.356
9	1.196	4.238	1.432	0.941	2.911	1.162	0.991	3.963	1.713	1.301	3.387	1.746	2.125	4.585	2.086	1.013	2.657	0.887
10	1.013	4.974	3.186	1.296	4.144	2.005	1.273	4.381	2.447	1.255	3.992	1.673	1.276	4.660	3.354	1.000	5.929	3.693
11	0.964	8.885	5.072	1.082	3.903	2.781	1.027	7.471	5.803	1.519	3.865	1.449	1.616	8.543	2.602	1.287	11.678	5.470
12	1.110	7.689	3.859	1.331	3.638	2.256	1.038	4.210	2.749	1.232	4.083	2.490	1.525	5.682	1.777	1.381	10.928	5.202
13	2.168	7.921	2.971	1.510	4.390	1.806	1.699	7.184	5.432	1.063	6.195	2.353	1.414	4.868	2.993	1.123	11.510	5.408
14	1.077	4.098	3.004	1.159	3.894	2.500	1.181	4.256	3.270	1.277	3.045	0.904	1.205	3.750	2.805	1.443	4.112	2.578
15	1.815	8.565	4.329	0.997	3.786	1.632	1.041	6.899	4.272	1.220	6.836	2.730	1.201	4.584	3.103	0.917	11.420	5.582
16	1.192	6.037	2.661	0.942	2.361	1.244	1.105	2.092	0.753	1.284	6.209	3.353	1.799	2.901	1.724	1.046	9.875	2.854
17	0.947	4.361	3.826	1.923	4.517	2.657	1.042	4.431	3.009	1.400	3.615	1.829	3.015	8.812	1.707	1.153	3.908	2.463
18	1.318	8.906	5.324	1.323	4.109	2.288	1.391	7.718	4.020	1.125	6.491	2.360	1.487	4.664	3.422	1.080	10.588	7.222
19	1.292	4.439	4.169	1.192	4.440	2.398	1.420	4.802	3.006	1.306	4.162	2.225	1.148	4.714	0.834	1.412	5.190	1.539
20	1.605	8.211	4.826	1.323	3.494	2.230	1.114	6.962	5.907	1.471	5.863	2.736	1.483	4.198	1.341	1.174	11.704	7.437
21	0.931	4.064	1.245	1.060	2.559	1.030	1.140	2.690	0.894	1.536	3.269	1.386	1.359	3.786	1.315	1.459	5.860	2.343
22	1.444	4.171	1.390	1.269	3.509	2.101	1.275	3.690	2.617	1.497	3.142	1.642	1.760	3.198	2.257	1.589	4.150	1.346
23	1.344	9.505	3.146	0.884	3.589	1.909	1.054	7.585	3.568	1.545	6.133	2.490	1.261	7.724	2.092	2.330	9.472	4.099
24	1.434	4.717	2.869	1.199	4.268	2.213	1.517	6.254	2.183	1.488	4.907	3.438	1.777	4.987	2.909	1.378	5.782	3.343
25	1.020	8.420	5.072	1.093	4.671	1.384	1.249	4.471	2.855	1.257	4.052	1.417	1.729	4.401	1.330	1.433	11.579	6.759
26	0.945	10.173	3.308	1.301	3.755	1.254	0.923	2.164	0.677	1.076	4.544	2.175	1.198	4.887	1.801	1.031	11.402	5.217
27	1.785	7.006	2.245	0.998	3.628	1.883	1.328	4.040	2.225	1.380	5.192	1.642	1.259	4.714	2.992	1.283	6.407	4.841
28	1.048	2.904	1.159	1.113	2.572	2.027	1.028	2.269	0.746	1.427	4.565	1.571	1.063	4.599	0.910	1.490	5.307	2.276
29	1.179	6.789	5.189	1.158	3.742	1.950	1.246	7.393	5.062	1.268	5.566	2.034	1.483	3.835	1.844	1.270	11.470	9.427
30	1.042	4.321	1.564	1.253	3.921	1.393	1.277	7.254	3.663	1.185	3.469	0.875	1.842	5.566	2.444	1.074	2.346	1.314
31	0.991	2.561	2.232	1.095	2.391	1.557	0.909	2.117	1.544	1.540	4.923	1.660	1.718	3.994	1.078	0.995	5.730	2.282
32	1.069	4.433	2.203	1.192	4.664	1.696	0.904	3.551	1.747	1.054	4.315	2.270	1.447	4.828	3.359	1.064	5.997	4.720
131	1.822	5.415	0.492	1.264	5.685	0.956	1.822	4.083	0.792	1.478	4.848	1.025	1.501	4.828	0.391	1.327	4.955	1.644
133	1.648	5.981	0.223	1.684	5.576	0.982	1.679	5.777	0.188	1.377	6.269	0.760	1.525	6.788	0.397	1.288	9.088	0.424
135	2.037	5.617	1.367	1.303	4.823	0.508	1.328	5.322	0.628	1.950	5.301	0.662	1.905	5.598	0.411	1.279	4.888	1.396

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

Site	Billings			Miami			Albuquerque			Kansas City			Los Angeles			Atlanta		
PRN ↓	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma	0.95 Range Error (m)	Max Range Error (m)	Max Range Error Sigma
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	1.295	2.782	2.106	1.421	2.686	1.256	0.928	3.885	1.082	1.616	5.094	1.693	1.693	4.901	1.422	1.040	2.288	1.007
3	1.195	4.164	2.127	1.530	3.808	2.569	1.014	4.400	2.252	1.291	4.198	1.419	1.367	2.938	1.438	1.291	4.486	3.221
4	1.185	2.964	1.784	1.279	2.884	1.492	1.057	2.538	0.959	0.964	4.543	1.570	1.433	2.733	1.502	1.063	2.135	1.670
5	1.451	10.550	7.701	2.552	9.067	5.917	1.068	8.770	5.603	2.667	12.979	8.027	1.707	10.399	5.521	1.113	6.364	4.916
6	1.191	5.658	3.008	1.798	6.244	1.138	1.131	4.495	3.236	1.492	4.407	2.699	1.518	4.122	2.380	0.991	3.788	2.660
7	1.007	2.377	1.283	1.615	4.177	1.968	0.900	1.858	1.299	0.833	2.917	0.910	1.391	2.664	0.898	0.954	1.993	1.368
8	1.108	4.276	1.372	1.341	3.022	1.036	1.267	3.473	1.702	1.000	5.191	2.361	1.714	3.526	1.005	0.910	1.881	0.686
9	1.026	7.458	3.214	1.380	3.430	1.822	1.001	2.964	0.916	1.118	4.829	1.550	1.452	2.638	1.617	0.936	2.040	0.594
10	1.906	10.725	3.075	1.568	9.906	3.751	1.047	3.171	1.518	1.193	5.051	3.715	1.481	9.107	4.134	0.984	4.177	2.950
11	1.532	10.291	6.105	1.985	5.668	3.596	1.033	8.876	4.757	1.295	7.288	3.504	1.757	8.722	4.622	0.984	6.809	3.380
12	1.137	10.314	5.539	1.754	5.745	3.311	1.300	8.489	4.299	1.273	4.873	2.135	1.526	8.935	5.557	1.362	4.685	2.648
13	1.083	10.656	3.787	1.850	8.559	4.824	1.247	9.027	5.469	1.215	12.791	10.051	1.503	10.609	5.234	1.325	5.939	4.875
14	1.062	4.361	2.749	1.467	3.907	2.213	0.872	4.315	2.939	0.801	3.523	2.903	1.433	4.330	2.486	0.947	3.671	3.044
15	1.378	10.274	3.227	1.482	8.996	5.161	1.062	8.635	5.494	1.579	12.699	10.140	1.739	10.513	5.610	1.016	5.953	4.569
16	1.301	7.695	2.486	1.234	2.910	1.697	1.320	8.560	2.561	1.455	10.208	3.100	2.037	9.517	4.159	0.981	2.424	0.915
17	1.272	4.026	1.388	1.435	3.966	0.935	1.187	4.316	2.692	1.441	3.986	1.052	1.602	4.153	2.206	1.059	3.717	2.566
18	1.233	10.467	5.649	2.561	8.737	4.749	1.063	8.812	6.021	1.230	13.760	8.050	1.367	9.859	7.232	1.183	6.011	3.178
19	1.298	4.197	1.878	1.493	4.107	2.263	1.183	4.526	2.984	1.147	4.073	1.391	1.586	4.388	2.467	1.011	4.026	2.663
20	1.196	11.071	7.937	1.548	7.293	4.226	1.350	9.526	5.790	1.463	12.782	7.189	1.585	9.463	3.538	1.091	6.206	4.465
21	1.358	3.953	1.411	1.507	3.190	0.606	1.439	5.889	1.883	1.557	8.557	2.648	1.409	2.811	2.211	1.037	2.512	0.881
22	1.383	3.421	2.491	1.971	3.591	1.754	1.576	3.788	2.524	1.261	3.048	2.633	2.214	3.676	1.611	1.435	3.006	2.283
23	1.171	9.654	5.513	1.544	9.956	5.685	1.236	8.864	3.970	1.703	13.680	7.959	1.382	9.980	5.781	0.912	6.145	3.651
24	1.478	4.919	3.802	1.570	8.781	4.919	1.229	4.874	3.041	1.060	4.730	3.518	1.622	5.817	2.492	1.048	5.715	2.355
25	1.344	10.989	7.452	1.786	6.011	3.220	1.411	8.803	6.299	1.200	4.962	3.739	1.801	10.807	5.166	1.025	4.998	2.590
26	1.727	9.986	4.071	1.764	4.051	1.452	1.287	8.468	3.521	1.591	14.017	6.570	2.066	9.156	4.929	0.839	2.109	0.584
27	1.139	4.769	3.380	1.418	5.074	2.472	1.118	4.670	1.346	1.066	5.052	3.271	1.498	5.515	1.531	1.186	4.502	2.730
28	1.336	5.142	2.321	3.853	10.579	1.892	1.187	3.586	1.403	1.512	4.295	1.586	1.505	5.893	2.118	0.913	4.295	1.831
29	1.356	11.189	9.493	1.626	9.564	6.278	1.130	8.980	7.266	1.356	13.668	5.934	2.089	10.553	7.023	1.310	6.196	4.720
30	1.402	4.322	1.314	1.276	4.072	2.169	1.108	2.460	0.894	1.111	4.334	1.306	1.506	2.851	0.802	1.037	3.252	1.519
31	1.388	8.477	2.601	1.755	4.534	1.212	1.337	2.737	2.160	1.563	5.744	2.216	1.524	2.990	1.375	0.948	2.888	0.680
32	1.353	4.631	2.311	2.298	5.873	2.639	1.211	3.163	2.073	1.104	5.099	2.940	1.715	4.651	1.770	1.086	3.772	2.398
131	1.739	5.907	1.673	1.685	4.290	0.260	2.265	5.607	0.423	1.538	4.321	1.197	2.285	4.997	1.027	1.572	4.122	1.010
133	1.890	13.376	0.565	1.695	6.756	0.264	1.737	5.600	1.355	2.171	7.109	0.585	2.079	6.870	0.370	1.510	5.205	0.218
135	1.890	5.534	0.251	1.841	4.697	0.964	1.358	4.730	1.325	1.726	4.275	0.995	1.864	4.915	0.803	1.286	4.491	1.130

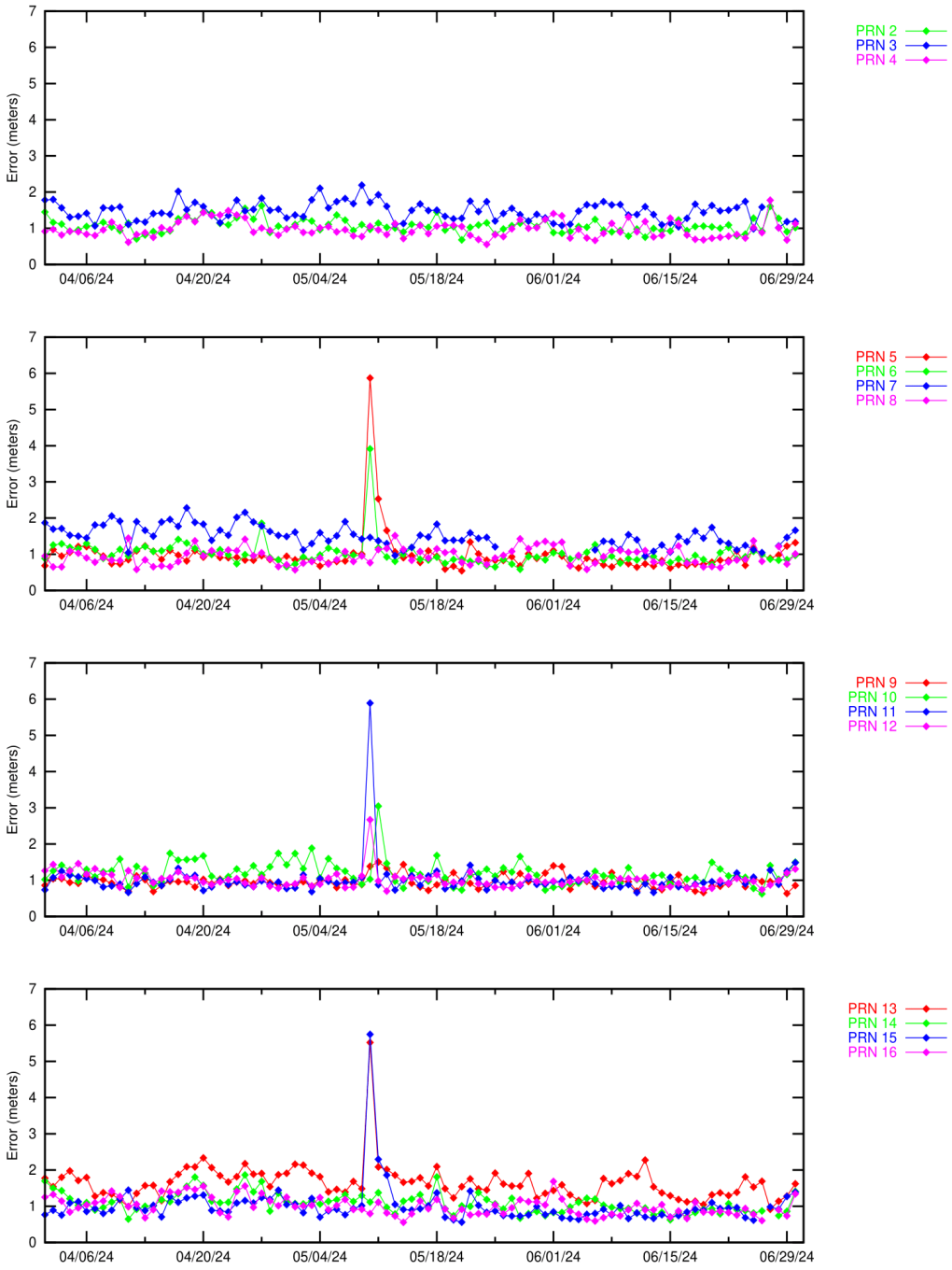

Figure 6-1 Range Error (PRN1–PRN16)–Washington, DC

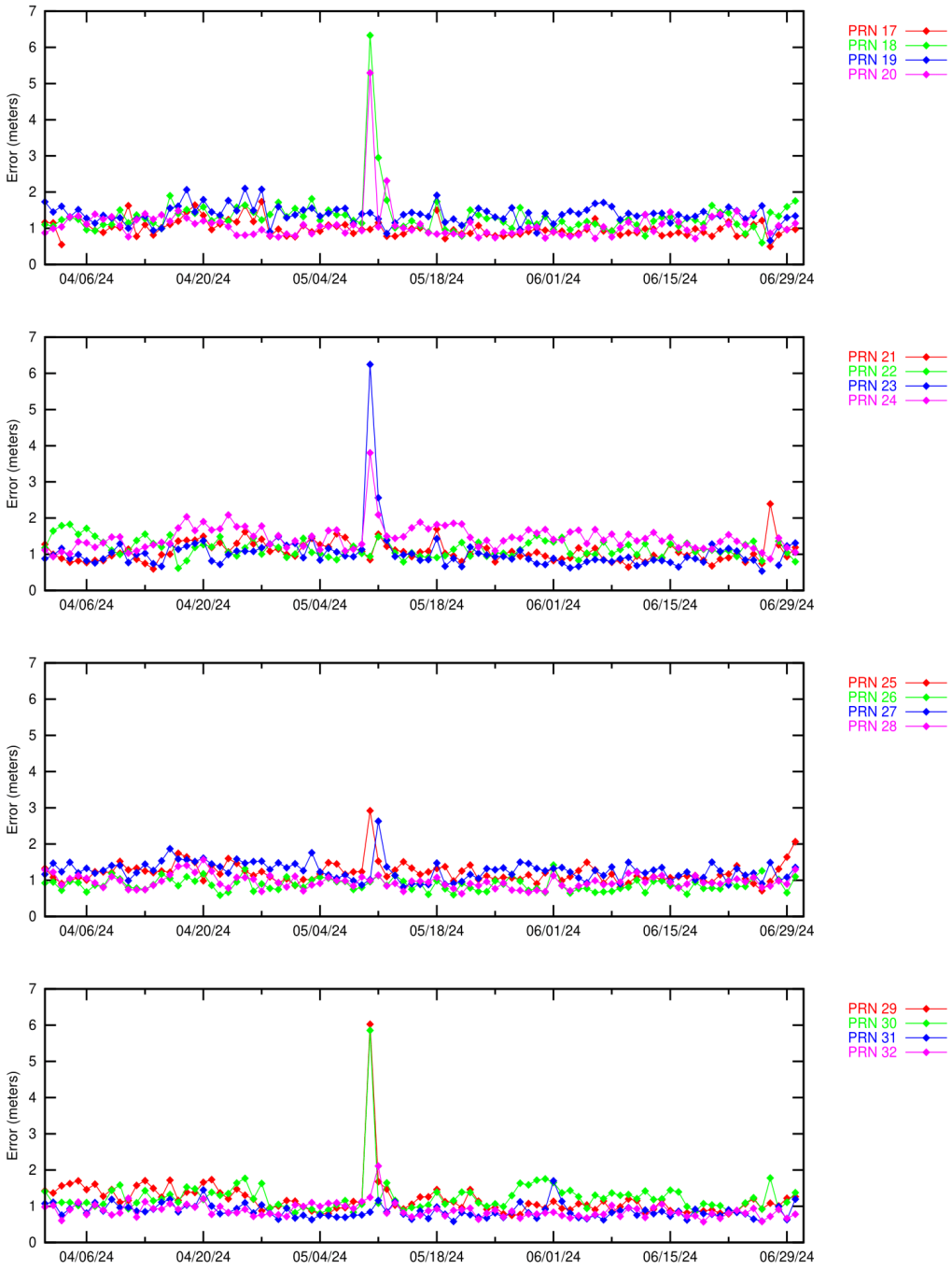

Figure 6-2 Range Error (PRN17–PRN32)–Washington, DC

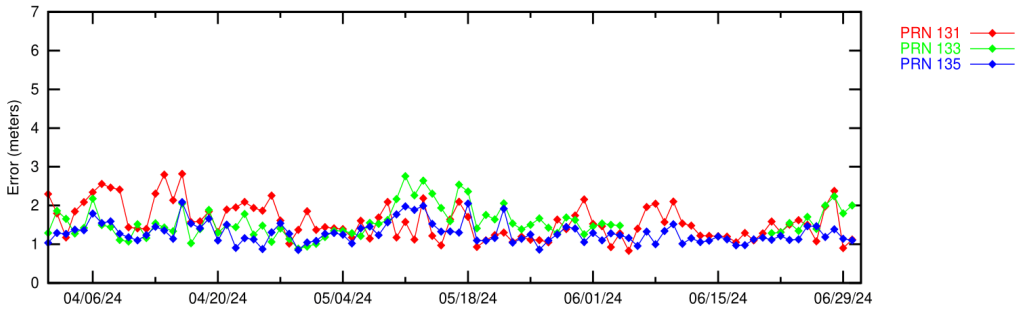

Figure 6-3 Range Error (PRN131, PRN133, and PRN135)–Washington, DC

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

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

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

Site	Minneapolis			Chicago			Boston			Juneau			Honolulu			Salt Lake City		
PRN ↓	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	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	PRN ↓	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	0.610	3.260	0.116	0.620	3.729	0.888	0.422	1.675	0.699	0.591	3.035	0.704	0.484	2.610	0.872	0.403	1.676	0.105
3	0.555	2.568	0.568	0.649	2.886	0.699	0.662	2.479	0.609	0.488	3.052	0.187	0.700	3.049	1.051	0.672	1.908	0.683
4	0.564	4.320	0.579	0.612	4.043	0.132	0.575	3.749	0.178	0.643	3.859	0.274	0.811	3.447	0.112	0.559	4.452	0.301
5	0.610	3.457	1.227	0.729	2.451	0.886	0.600	2.588	0.245	0.794	4.015	0.364	1.475	8.727	0.228	0.466	4.403	0.629
6	0.475	3.090	0.159	0.453	1.934	0.610	0.529	2.965	0.073	0.598	4.217	0.177	0.989	4.209	0.510	0.501	7.007	0.218
7	0.679	2.484	0.746	0.770	5.440	0.142	0.767	2.334	0.515	0.826	8.254	0.216	0.637	2.980	0.074	0.505	1.905	0.545
8	0.600	2.309	0.698	0.430	2.036	0.813	0.314	1.364	0.322	0.581	3.226	0.953	0.917	8.345	0.228	0.610	2.459	0.178
9	0.506	6.734	0.627	0.491	2.924	0.086	0.579	2.653	0.133	0.594	3.925	0.171	1.025	3.049	0.167	0.494	5.780	0.192
10	0.699	14.308	0.367	0.832	4.691	0.559	0.745	5.247	0.327	0.836	4.211	0.224	0.620	9.899	0.241	0.571	2.997	0.299
11	0.589	3.755	0.208	0.965	2.786	0.825	0.494	6.639	0.277	0.722	3.669	0.219	1.268	6.532	1.785	0.674	11.314	0.353
12	0.504	2.298	0.056	0.456	3.305	0.172	0.439	3.613	0.106	0.575	2.641	0.831	0.812	2.973	0.961	0.753	2.501	1.187
13	0.765	4.665	0.423	0.766	5.616	0.285	0.742	3.660	0.300	0.686	6.789	0.214	0.617	5.980	0.195	0.477	5.166	0.462
14	0.599	1.715	0.516	0.569	2.456	0.766	0.609	2.244	0.636	0.783	2.654	0.936	0.659	2.542	0.624	0.720	1.725	0.812
15	0.925	11.070	0.632	0.616	11.404	0.412	0.678	10.055	0.461	0.705	4.451	0.255	1.104	4.603	0.936	0.571	3.918	1.091
16	0.659	3.215	0.112	0.557	2.383	0.737	0.664	1.946	0.480	0.645	3.893	0.205	0.656	8.896	0.247	0.661	9.049	0.454
17	0.461	1.505	0.482	1.069	2.827	0.892	0.467	1.971	0.688	0.691	3.261	0.118	1.538	6.523	1.466	0.614	2.302	0.547
18	0.801	11.812	0.458	0.743	7.549	0.191	0.729	4.031	0.199	0.846	4.421	0.926	0.911	5.666	0.192	0.684	5.201	0.226
19	0.657	2.615	1.112	0.415	1.490	0.109	0.699	2.357	0.834	0.779	3.383	0.700	0.746	4.024	0.910	0.485	2.529	0.926
20	0.672	3.809	0.110	0.652	4.087	0.189	0.589	5.275	0.172	0.826	5.763	0.290	1.199	7.778	0.256	0.615	3.620	0.399
21	0.516	3.800	0.149	0.513	3.978	1.122	0.426	2.568	0.099	0.595	1.832	0.112	0.652	3.465	0.674	0.636	3.263	0.098
22	0.924	2.151	0.708	0.774	2.705	0.288	0.821	2.212	0.569	0.839	2.526	0.816	0.949	3.457	0.385	0.870	2.191	0.743
23	0.868	10.746	0.350	0.690	3.321	0.975	0.768	14.360	0.403	0.964	9.005	0.552	0.863	3.023	0.154	1.615	4.256	1.294
24	0.619	5.031	0.271	0.709	8.851	0.423	0.697	9.009	0.496	0.588	2.436	0.657	0.537	3.146	0.250	0.457	2.843	0.136
25	0.458	6.935	0.243	0.456	6.319	0.189	0.495	2.545	0.167	0.614	2.410	0.598	0.651	2.104	0.841	0.713	3.662	0.947
26	0.452	6.471	0.259	0.809	2.726	0.862	0.594	2.207	0.694	0.603	4.697	0.224	1.046	10.819	0.362	0.580	4.034	0.306
27	0.842	5.211	0.167	0.583	3.490	0.387	0.509	2.913	0.128	0.553	3.171	0.177	0.622	6.244	0.170	0.490	5.260	0.328
28	0.810	3.799	0.098	0.566	2.502	0.068	0.708	12.403	0.310	0.732	2.835	0.728	1.181	3.432	0.688	0.617	3.617	0.274
29	0.569	3.862	0.135	0.500	6.156	0.203	0.598	3.086	0.760	0.589	4.771	0.348	0.752	4.175	0.138	0.556	2.778	0.541
30	0.535	4.215	0.135	0.685	3.726	0.278	0.643	2.510	0.624	0.690	2.769	0.992	0.858	2.901	0.554	0.562	1.739	0.982
31	0.534	2.354	0.076	0.694	2.036	0.055	0.513	2.416	0.065	0.815	3.271	0.097	0.732	3.440	0.743	0.638	9.280	0.225
32	0.653	9.399	0.273	0.914	8.809	0.250	0.646	5.032	0.303	0.717	2.750	0.804	0.655	3.409	0.490	0.521	6.458	0.296

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

Site	Billings			Miami			Albuquerque			Kansas City			Atlanta			Los Angeles		
PRN ↓	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma	0.95 Iono Error (m)	Max Iono Error (m)	Max Iono Error Sigma
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	0.470	2.106	0.612	0.639	1.918	0.691	0.446	1.679	0.472	0.529	2.684	0.839	0.504	1.679	0.367	0.642	7.210	0.230
3	0.608	3.910	0.246	0.783	2.421	0.281	0.704	2.112	0.432	0.620	3.614	1.232	0.659	3.872	0.878	0.532	8.097	0.245
4	0.504	6.416	0.249	0.710	1.700	0.644	0.648	12.754	0.310	0.489	3.234	1.024	0.471	1.610	0.788	0.577	4.237	0.260
5	0.882	3.379	1.217	1.094	6.165	0.532	0.898	2.788	0.359	1.476	5.069	1.232	0.791	3.458	0.096	0.777	7.549	0.293
6	0.537	2.408	0.142	0.900	3.343	0.745	0.664	4.529	0.132	0.659	7.671	0.214	0.549	4.489	0.109	0.810	2.730	0.085
7	0.543	1.837	0.211	0.914	3.216	1.103	0.530	2.838	0.622	0.489	2.471	0.813	0.571	1.858	0.760	0.477	7.224	0.206
8	0.470	3.484	0.193	0.652	2.927	0.629	0.498	2.455	0.139	0.562	2.361	0.679	0.501	1.953	0.464	0.709	2.913	0.589
9	0.640	6.200	0.164	0.821	4.554	0.120	0.608	3.581	0.105	0.498	3.345	1.026	0.602	3.082	0.188	0.451	6.675	0.214
10	1.231	3.294	0.867	0.737	3.113	0.777	0.670	3.149	0.092	0.670	6.361	0.228	0.585	5.432	0.198	0.828	3.522	0.276
11	1.080	4.366	1.014	0.710	4.562	0.967	0.664	9.736	0.266	0.570	7.948	0.297	0.576	4.637	0.236	0.689	10.864	0.284
12	0.642	3.242	0.756	0.908	3.797	0.170	0.733	2.395	0.253	0.458	2.171	0.589	0.509	2.730	0.097	0.560	3.440	0.576
13	0.479	5.510	0.212	0.868	8.451	0.305	0.545	3.046	0.197	0.556	6.634	0.437	0.728	5.102	0.354	0.536	5.851	0.287
14	0.525	1.749	0.905	0.763	1.843	0.488	0.486	1.864	0.394	0.464	1.711	0.448	0.544	2.797	0.333	0.500	2.917	0.694
15	0.662	7.942	0.410	1.182	4.947	0.187	0.672	3.181	0.185	0.620	7.981	0.599	0.830	5.793	0.524	0.840	3.202	0.452
16	0.553	3.036	0.134	0.944	3.178	0.649	0.774	7.780	0.237	1.024	4.239	1.212	0.627	2.390	0.548	0.887	12.191	0.340
17	0.532	2.742	0.688	0.747	2.703	0.533	0.686	5.265	0.468	0.951	2.100	0.713	0.559	2.147	0.275	0.673	8.764	0.738
18	0.637	5.287	0.515	1.467	4.324	0.179	0.568	3.167	0.635	0.643	6.171	0.362	0.736	3.332	0.345	0.768	7.355	0.221
19	0.634	1.694	1.005	0.795	3.852	0.733	0.658	3.743	0.718	0.606	3.441	1.119	0.561	2.068	0.464	0.636	3.171	0.673
20	0.549	3.549	0.443	0.838	5.997	0.209	0.639	7.262	0.383	0.782	2.773	0.942	0.727	8.001	0.280	0.731	18.847	0.518
21	0.523	2.673	0.854	0.737	5.797	0.196	0.628	2.524	0.980	0.629	4.958	1.668	0.497	2.019	0.704	0.504	3.853	0.235
22	0.946	1.731	0.702	0.967	2.463	0.269	0.962	3.908	0.793	0.817	2.947	0.646	0.819	2.068	0.541	0.980	3.224	0.587
23	0.784	7.647	0.527	0.844	2.456	0.575	0.871	4.250	0.287	1.095	5.516	0.472	0.643	10.875	0.399	0.910	4.101	0.214
24	0.482	2.028	0.120	0.906	3.770	0.326	0.456	3.508	0.159	0.458	5.507	0.250	0.575	5.676	0.256	0.577	5.415	0.165
25	0.770	3.321	1.310	0.836	5.600	0.278	0.534	2.219	0.453	0.445	2.795	0.155	0.508	2.949	0.146	0.579	2.658	0.137
26	0.672	3.951	0.336	0.695	4.334	0.843	0.563	7.424	0.400	0.732	6.430	0.321	0.561	1.583	0.330	0.742	6.164	0.283
27	0.485	2.174	0.170	0.907	3.663	0.915	0.390	5.663	0.225	0.480	3.866	0.107	0.649	3.149	0.188	0.590	7.106	0.240
28	0.677	3.864	0.281	1.209	8.441	0.657	0.674	4.632	0.168	0.764	4.564	0.162	0.745	3.674	0.275	0.913	5.350	0.222
29	0.646	2.231	0.417	0.849	3.393	0.765	0.615	2.603	0.658	0.609	2.242	0.335	0.611	5.248	0.413	0.809	3.169	0.294
30	0.744	2.468	0.550	0.687	2.019	0.438	0.603	1.964	0.569	0.584	2.327	0.767	0.560	1.981	0.773	0.567	8.357	0.290
31	0.727	6.272	0.246	0.896	8.618	0.230	0.593	2.856	0.648	1.046	5.019	1.596	0.590	2.238	0.465	0.999	6.694	0.168
32	0.777	9.239	0.341	0.882	7.339	1.251	0.742	5.545	0.260	1.013	5.109	0.373	0.595	6.550	0.373	0.956	4.966	0.968

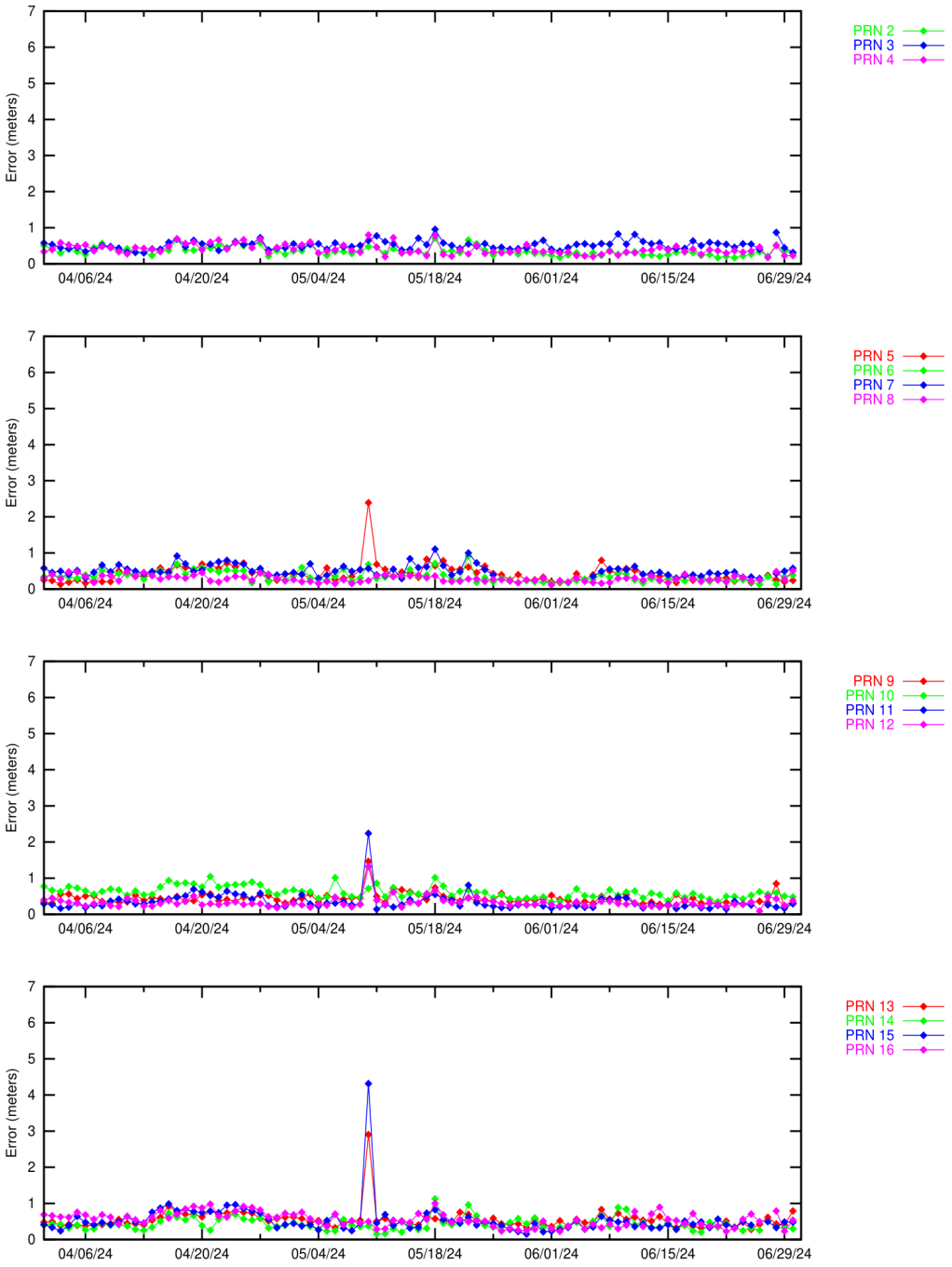

Figure 6-4 Ionospheric Error (PRN1–PRN16)–Washington, DC

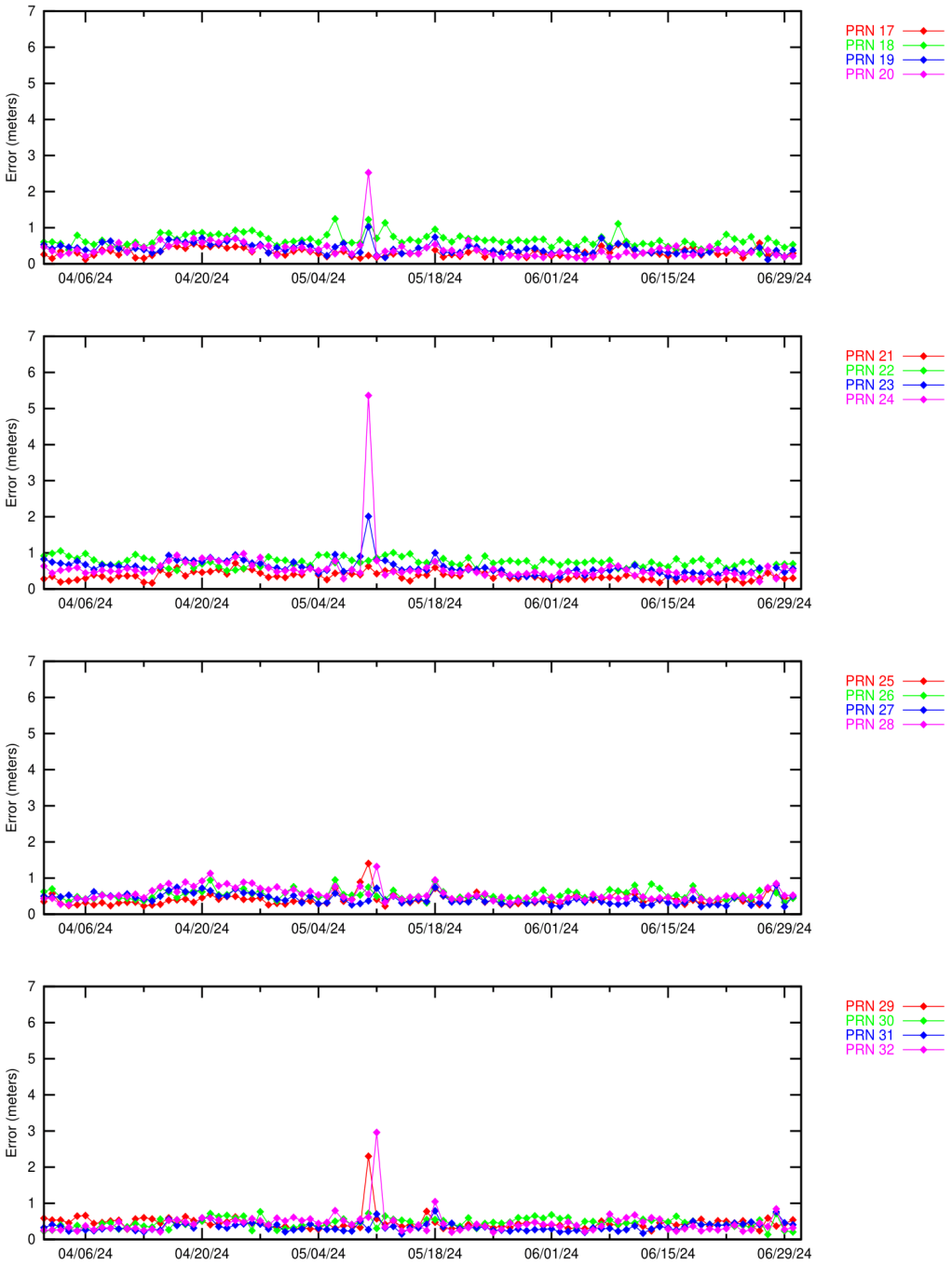

Figure 6-5 Ionospheric Error (PRN17–PRN32)–Washington, DC

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. PRN1 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. S15 reductions in GEO PA ranging availability occurred during Release 1 field testing from June 4th, 2024 to June 21, 2024.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	99.03	0.65	0.25	0.08
SM9 131	S15	96.30	0.76	1.89	1.05
SM9 131	G30	98.23	0.73	0.98	0.07
S15 133	SM9	98.90	0.69	0.33	0.08
S15 133	S15	98.13	0.78	0.84	0.25
S15 133	G30	98.08	0.76	1.09	0.07
G30 135	SM9	99.03	0.65	0.25	0.08
G30 135	S15	96.32	0.76	1.89	1.03
G30 135	G30	98.23	0.73	0.98	0.07

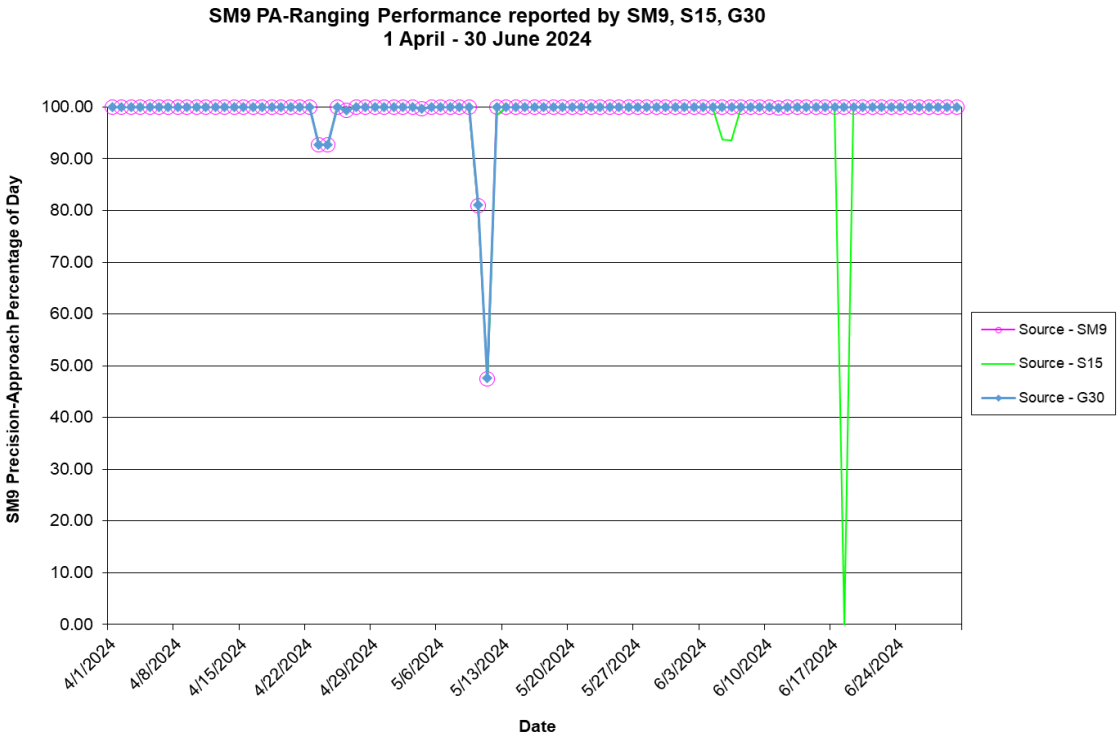

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

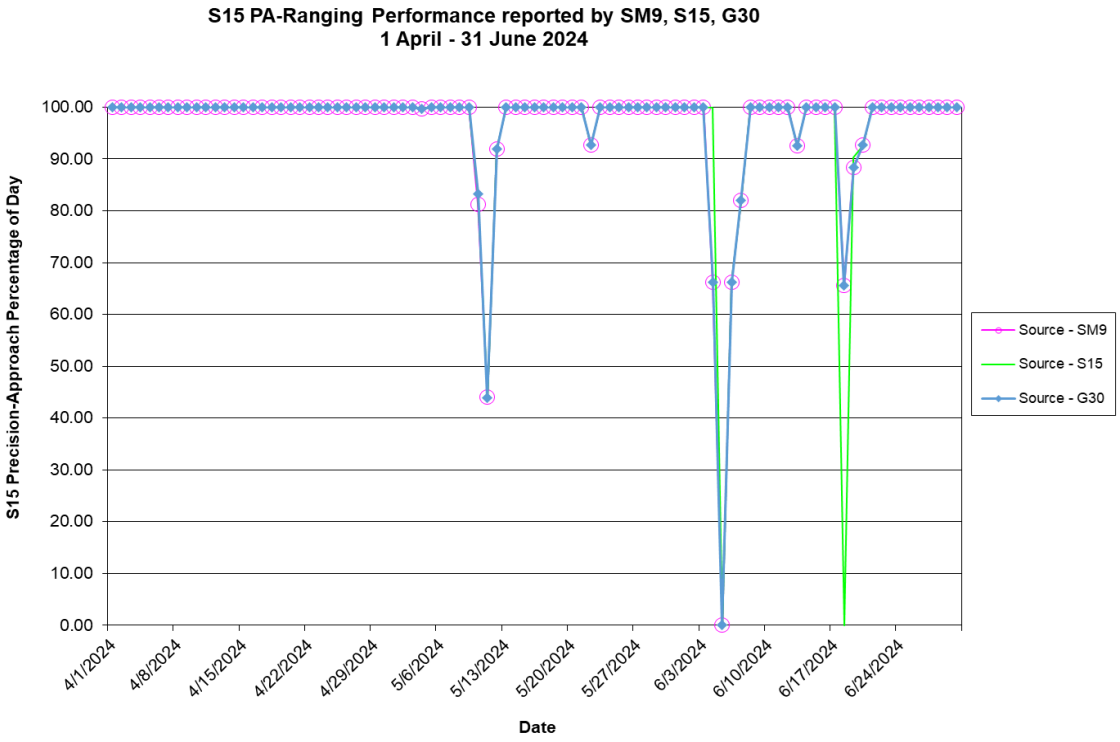

Figure 7-2 Daily PA S15 GEO Ranging Availability Trend

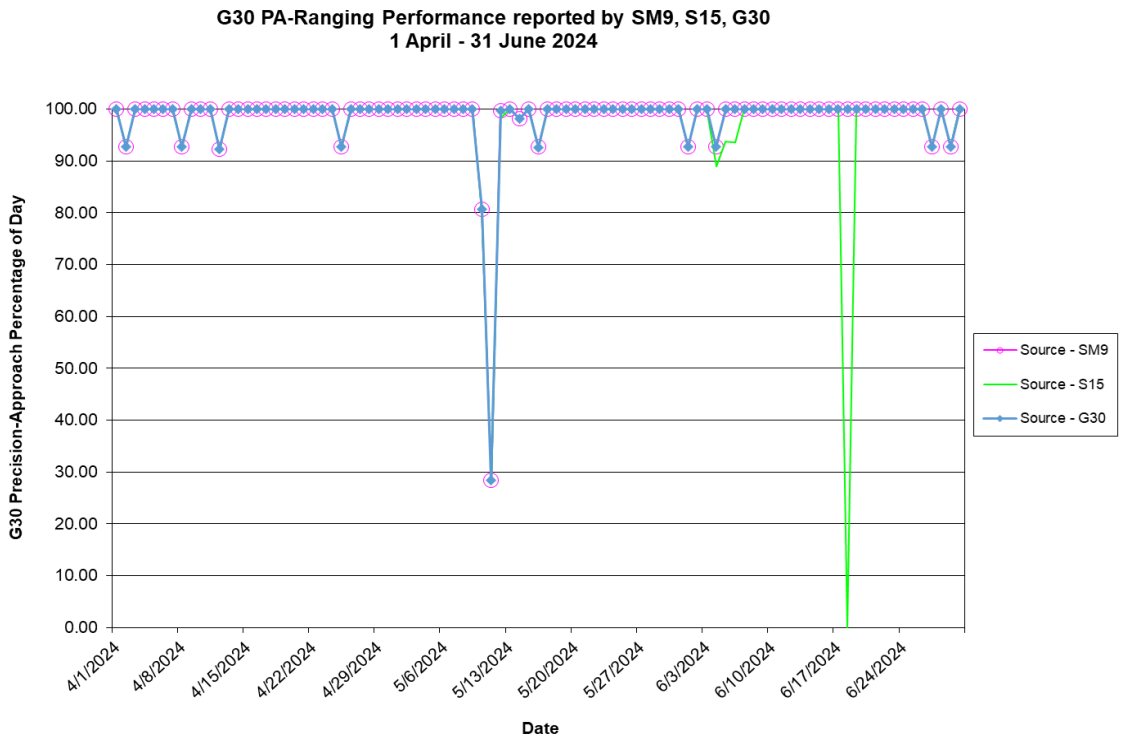

Figure 7-3 Daily PA G30 GEO Ranging Availability Trend

8.0 WAAS AIRPORT AVAILABILITY

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

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

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

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CAL4	ALBIAN	AB	LPV	1	99.282	1	99.282	9	99.183
CEA3	OLDS-DIDSBURY	AB	LPV	1	99.286	1	99.282	1	99.275
CEB5	FAIRVIEW	AB	LPV	1	99.274	1	99.274	4	99.260
CEC4	JASPER-HINTON	AB	LP	1	99.278	1	99.278	1	99.275
CEH3	PONOKA (LABRIE FIELD)	AB	LPV	1	99.285	1	99.278	1	99.275
CEH5	RED EARTH CREEK	AB	LP	1	99.282	1	99.272	5	99.241
CEH6	PROVOST	AB	LPV	1	99.286	1	99.286	1	99.275
CEN3	THREE HILLS	AB	LPV	1	99.286	1	99.285	1	99.275
CEN5	COLD LAKE REGIONAL	AB	LPV	1	99.285	1	99.275	8	99.231
CEQ3	CAMROSE	AB	LPV	1	99.285	1	99.278	2	99.274
CET2	CONKLIN (LEISMER)	AB	LPV	1	99.285	1	99.274	8	99.238
CEV3	VEGREVILLE	AB	LPV	1	99.285	1	99.275	4	99.265
CEW3	ST. PAUL	AB	LPV	1	99.285	1	99.275	4	99.265
CEX3	WETASKIWIN REGIONAL	AB	LPV	1	99.285	1	99.278	1	99.275
CEZ3	COOKING LAKE	AB	LPV	1	99.284	1	99.276	3	99.271
CFB6	JOSEPHBURG	AB	LPV	1	99.281	1	99.275	4	99.267
CFM4	DONNELLY	AB	LPV	1	99.275	1	99.274	4	99.262
CYBF	BONNYVILLE	AB	LPV	1	99.285	1	99.275	8	99.249
CYBW	SPRINGBANK	AB	LPV	1	99.286	1	99.285	1	99.278
CYEG	EDMONTON INTL	AB	LPV200	1	99.283	1	99.276	2	99.272
CYFI	FIREBAG	AB	LPV	1	99.282	1	99.282	9	99.161
CYLB	LAC LA BICHE	AB	LPV	1	99.277	1	99.274	4	99.264
CYLL	LLOYDMINSTER	AB	LPV	1	99.285	1	99.277	7	99.259
CYMM	FORT MCMURRAY	AB	LPV200	1	99.284	1	99.275	9	99.221
CYNR	HORIZON	AB	LPV	1	99.282	1	99.282	9	99.188
CYOD	GROUP CAPTAIN R.W. MCNAIR	AB	LP	1	99.285	1	99.275	8	99.231

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYOJ	HIGH LEVEL	AB	LPV	1	99.282	1	99.276	7	99.178
CYOP	RAINBOW LAKE	AB	LPV	1	99.282	1	99.274	6	99.206
CYPE	PEACE RIVER	AB	LPV	1	99.273	1	99.273	4	99.254
CYPY	FORT CHIPEWYAN	AB	LPV	1	99.282	1	99.282	11	99.081
CYQF	RED DEER REGIONAL	AB	LPV	1	99.285	1	99.282	1	99.275
CYQL	LETHBRIDGE	AB	LPV200	1	99.286	1	99.286	1	99.278
CYQU	GRANDE PRAIRIE	AB	LPV200	1	99.276	1	99.275	2	99.267
CYWM	ATHABASCA	AB	LPV	1	99.277	1	99.274	4	99.265
CYXH	MEDICINE HAT	AB	LPV	1	99.286	1	99.286	1	99.278
CYYC	YYC CALGARY INTL	AB	LPV200	1	99.286	1	99.285	1	99.278
CYZU	WHITECOURT	AB	LPV	1	99.278	1	99.276	1	99.274
CZPC	PINCHER CREEK	AB	LPV	1	99.286	1	99.285	1	99.278
CZVL	VILLENEUVE	AB	LPV	1	99.281	1	99.276	3	99.270
2C7	SHAKTOOLIK	AK	LPV	2	99.401	3	99.351	7	99.305
6A8	ALLAKAKET	AK	LP	3	99.392	4	99.289	8	99.207
7KA	TATITLEK	AK	LP	3	99.327	3	99.298	4	99.260
9A3	CHUATHBALUK	AK	LPV	2	99.384	4	99.360	5	99.313
ADQ	KODIAK	AK	LPV	4	99.354	4	99.329	4	99.275
AFM	AMBLER	AK	LPV	2	99.396	4	99.316	10	99.231
AKN	KING SALMON	AK	LPV	2	99.376	4	99.349	5	99.299
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	3	99.349	4	99.324	5	99.289
ANI	ANIAK	AK	LPV	2	99.386	3	99.362	5	99.316
AQH	QUINHAGAK	AK	LPV	2	99.383	3	99.364	7	99.327
AQT	NUIQSUT	AK	LPV	2	99.404	4	99.319	18	99.104
ATK	ATQASUK EDWARD BURNELL SR MEML	AK	LPV	2	99.409	4	99.335	23	99.104
AWI	WAINWRIGHT	AK	LPV	2	99.409	3	99.325	29	99.109
BET	BETHEL	AK	LPV200	2	99.385	3	99.362	6	99.316

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BRW	WILEY POST-WILL ROGERS MEML	AK	LPV	2	99.408	4	99.334	27	98.978
BVK	BUCKLAND	AK	LPV	2	99.398	2	99.352	11	99.277
CDB	COLD BAY	AK	LPV200	2	99.375	3	99.355	16	99.208
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	2	99.311	3	99.298	4	99.261
CEM	CENTRAL	AK	LP	2	99.329	4	99.297	7	99.224
CLP	CLARKS POINT	AK	LPV	2	99.377	4	99.353	5	99.296
CXF	COLDFOOT	AK	LP	3	99.369	3	99.281	10	99.195
D76	ROBERT/BOB/CURTIS MEML	AK	LPV	2	99.397	2	99.351	11	99.243
DEE	DEERING	AK	LPV	2	99.398	2	99.351	14	99.278
DLG	DILLINGHAM	AK	LPV	2	99.377	4	99.354	5	99.296
ELI	ELIM	AK	LPV	2	99.400	3	99.351	8	99.304
ENA	KENAI MUNICIPAL	AK	LPV200	3	99.353	4	99.331	4	99.293
ENM	EMMONAK	AK	LPV	2	99.387	5	99.372	8	99.304
FAI	FAIRBANKS INTL	AK	LPV200	3	99.347	4	99.274	7	99.233
FYU	FORT YUKON	AK	LPV	3	99.345	3	99.293	9	99.201
GAL	EDWARD G PITKA SR	AK	LPV	2	99.392	4	99.338	7	99.272
GAM	GAMBELL	AK	LPV	2	99.399	5	99.371	49	99.061
GKN	GULKANA	AK	LPV	2	99.311	3	99.299	4	99.254
GST	GUSTAVUS	AK	LP	1	99.275	2	99.275	4	99.251
HLA	HUSLIA	AK	LPV	2	99.392	4	99.336	7	99.246
HOM	HOMER	AK	LPV	3	99.351	4	99.330	5	99.297
HPB	HOOPER BAY	AK	LP	2	99.389	5	99.372	10	99.286
HRR	HEALY RIVER	AK	LP	3	99.355	4	99.278	6	99.231
IAN	BOB BAKER MEML	AK	LPV	2	99.396	2	99.351	10	99.237
IIK	KIPNUK	AK	LPV	2	99.383	4	99.375	8	99.305
ILI	ILIAMNA	AK	LPV	2	99.376	4	99.347	5	99.306
IWK	WALES	AK	LP	2	99.399	3	99.364	28	99.205

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IYS	WASILLA	AK	LPV	3	99.346	4	99.324	5	99.283
KAL	KALTAG	AK	LPV	2	99.397	3	99.351	8	99.292
KGX	GRAYLING	AK	LP	2	99.387	4	99.365	5	99.310
KKA	KOYUK ALFRED ADAMS	AK	LP	2	99.400	3	99.351	9	99.302
KSM	ST MARY'S	AK	LPV200	2	99.387	3	99.363	7	99.306
KTN	KETCHIKAN INTL	AK	LPV	1	99.274	1	99.274	3	99.266
KTS	BREVIG MISSION	AK	LPV	2	99.400	3	99.352	16	99.255
KWT	KWETHLUK	AK	LPV	2	99.385	3	99.362	6	99.324
KYU	KOYUKUK	AK	LPV	2	99.394	4	99.342	8	99.272
MCG	MC GRATH	AK	LP	2	99.383	4	99.344	7	99.301
MDM	MARSHALL DON HUNTER SR	AK	LP	2	99.388	3	99.364	7	99.308
MDO	MIDDLETON ISLAND	AK	LP	2	99.314	3	99.305	4	99.280
MLY	MANLEY HOT SPRINGS	AK	LP	3	99.361	4	99.281	6	99.236
MOU	MOUNTAIN VILLAGE	AK	LPV200	2	99.387	3	99.362	7	99.306
MYU	MEKORYUK	AK	LPV	2	99.385	3	99.376	13	99.293
OME	NOME	AK	LPV	2	99.401	4	99.363	12	99.284
OOK	TOKSOOK BAY	AK	LP	2	99.386	4	99.377	9	99.299
ORT	NORTHWAY	AK	LP	2	99.306	1	99.285	5	99.244
OTZ	RALPH WIEN MEML	AK	LPV	2	99.397	2	99.351	12	99.247
PAQ	WARREN 'BUD' WOODS PALMER MUNICIPAL	AK	LP	3	99.345	4	99.321	5	99.275
PBV	ST GEORGE	AK	LPV	2	99.381	4	99.354	77	98.821
PHO	POINT HOPE	AK	LPV	2	99.409	3	99.326	39	99.106
PTU	PLATINUM	AK	LPV	2	99.383	3	99.359	8	99.302
RBY	RUBY	AK	LPV	2	99.383	5	99.332	6	99.252
RSH	RUSSIAN MISSION	AK	LP	2	99.386	3	99.364	6	99.315
SCC	DEADHORSE	AK	LPV200	2	99.404	4	99.319	19	99.094
SCM	SCAMMON BAY	AK	LP	2	99.399	4	99.372	8	99.297

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SDP	SAND POINT	AK	LPV	2	99.373	3	99.335	11	99.217
SHG	SHUNGNAK	AK	LP	2	99.396	4	99.315	10	99.235
SHX	SHAGELUK	AK	LPV	2	99.386	3	99.355	5	99.309
SIT	SITKA ROCKY GUTIERREZ	AK	LP	1	99.274	1	99.274	5	99.248
SLQ	SLEETMUTE	AK	LP	2	99.383	4	99.357	5	99.313
SMK	ST MICHAEL	AK	LPV	2	99.389	4	99.363	8	99.314
SXQ	SOLDOTNA	AK	LP	3	99.348	4	99.331	4	99.292
TER	TELLER	AK	LPV200	2	99.400	3	99.352	16	99.259
TKA	TALKEETNA	AK	LPV	3	99.357	4	99.322	4	99.241
TOG	TOGIAK	AK	LP	2	99.382	3	99.360	6	99.309
WLK	SELAWIK	AK	LPV	2	99.397	2	99.353	10	99.243
WMO	WHITE MOUNTAIN	AK	LPV	2	99.400	3	99.351	10	99.301
WNA	NAPAKIAK	AK	LPV	2	99.384	4	99.374	6	99.319
WSN	SOUTH NAKNEK NR 2	AK	LPV	2	99.377	4	99.351	5	99.297
WTK	NOATAK	AK	LPV	2	99.395	2	99.351	16	99.231
YAK	YAKUTAT	AK	LPV200	2	99.289	1	99.275	6	99.246
02A	CHILTON COUNTY	AL	LP	1	99.314	1	99.310	2	99.299
06A	MOTON FLD MUNICIPAL	AL	LPV	1	99.315	1	99.310	2	99.296
09A	BUTLER/CHOCTAW COUNTY	AL	LPV	1	99.314	1	99.310	2	99.296
0J6	HEADLAND MUNICIPAL	AL	LPV	1	99.310	1	99.310	2	99.289
0R1	ATMORE MUNICIPAL	AL	LPV	1	99.310	1	99.310	21	99.273
11A	CLAYTON MUNICIPAL	AL	LPV	1	99.315	1	99.310	2	99.293
12J	BREWTON MUNICIPAL	AL	LPV	1	99.310	1	99.310	17	99.281
1A9	PRATTVILLE - GROUBY FLD	AL	LPV	1	99.314	1	99.310	2	99.298
1M4	POSEY FLD	AL	LPV	1	99.310	1	99.310	1	99.307
1R8	BAY MINETTE MUNICIPAL	AL	LPV	1	99.310	1	99.310	26	99.266
2R5	ST ELMO	AL	LPV	1	99.310	1	99.310	38	99.242

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
33J	GENEVA MUNICIPAL	AL	LP	1	99.310	1	99.310	3	99.288
3M8	NORTH PICKENS	AL	LP	1	99.310	1	99.310	1	99.307
4A9	ISBELL FLD	AL	LPV	1	99.310	1	99.310	1	99.307
5R1	ROY WILCOX	AL	LP	1	99.310	1	99.310	20	99.284
5R4	FOLEY MUNICIPAL	AL	LPV	1	99.310	1	99.310	30	99.251
71J	OZARK/BLACKWELL FLD	AL	LPV	1	99.310	1	99.310	2	99.291
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	1	99.310	1	99.310	5	99.290
8A0	ALBERTVILLE RGNL/THOMAS J BRUM	AL	LPV	1	99.310	1	99.310	1	99.307
8A1	GUNTERSVILLE MUNICIPAL/JOE STARNES	AL	LPV	1	99.310	1	99.310	1	99.307
9A4	COURTLAND	AL	LPV200	1	99.310	1	99.310	1	99.307
A08	VAIDEN FLD	AL	LPV	1	99.310	1	99.310	2	99.296
ALX	THOMAS C RUSSELL FLD	AL	LPV	1	99.314	1	99.311	2	99.298
ANB	ANNISTON RGNL	AL	LPV	1	99.315	1	99.310	2	99.302
ASN	TALLADEGA MUNICIPAL	AL	LPV200	1	99.314	1	99.310	2	99.302
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	1	99.318	1	99.310	2	99.297
BFM	MOBILE DOWNTOWN	AL	LPV200	1	99.310	1	99.310	36	99.252
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	1	99.314	1	99.310	2	99.306
CMD	CULLMAN RGNL-FOLSOM FLD	AL	LPV	1	99.310	1	99.310	1	99.307
CQF	H L SONNY CALLAHAN	AL	LPV200	1	99.310	1	99.310	35	99.247
DCU	PRYOR FLD RGNL	AL	LPV200	1	99.310	1	99.310	1	99.307
DHN	DOTHAN RGNL	AL	LPV200	1	99.310	1	99.310	2	99.289
DYA	DEMOPOLIS RGNL	AL	LPV	1	99.310	1	99.310	2	99.299
EDN	ENTERPRISE MUNICIPAL	AL	LPV	1	99.310	1	99.310	3	99.289
EET	SHELBY COUNTY	AL	LPV	1	99.314	1	99.311	2	99.301
EKY	BESSEMER	AL	LPV200	1	99.314	1	99.310	2	99.305
EUF	WEEDON FLD	AL	LPV	1	99.315	1	99.310	2	99.296
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	1	99.310	1	99.310	2	99.306

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GZH	EVERGREEN RGNL/MIDDLETON FLD	AL	LP	1	99.310	1	99.310	11	99.289
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	1	99.310	1	99.310	1	99.307
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	1	99.310	1	99.310	1	99.307
JFX	WALKER COUNTY-BEVILL FLD	AL	LPV	1	99.310	1	99.310	1	99.307
JKA	GULF SHORES INTL/JACK EDWARDS	AL	LPV200	1	99.310	1	99.310	33	99.246
M95	RICHARD ARTHUR FLD	AL	LPV	1	99.310	1	99.310	1	99.307
MDQ	HUNTSVILLE EXEC TOM SHARP JR F	AL	LPV200	1	99.310	1	99.310	1	99.307
MGM	MONTGOMERY RGNL (DANNELLY FLD)	AL	LPV200	1	99.314	1	99.310	2	99.296
MOB	MOBILE RGNL	AL	LPV200	1	99.310	1	99.310	35	99.248
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	1	99.310	1	99.310	1	99.307
PLR	ST CLAIR COUNTY	AL	LPV	1	99.314	1	99.310	2	99.304
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	1	99.310	1	99.310	2	99.306
SCD	MERKEL FLD SYLACAUGA MUNICIPAL	AL	LPV	1	99.314	1	99.311	2	99.300
SEM	CRAIG FLD	AL	LPV200	1	99.314	1	99.310	2	99.294
TCL	TUSCALOOSA NTL	AL	LPV	1	99.310	1	99.310	2	99.306
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	1	99.310	1	99.310	2	99.293
0M0	BILLY FREE MUNICIPAL	AR	LPV	1	99.310	1	99.307	1	99.307
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	1	99.307	1	99.307	1	99.306
4A5	SEARCY COUNTY	AR	LPV	1	99.307	1	99.307	1	99.307
4M1	CARROLL COUNTY	AR	LP	1	99.307	1	99.307	1	99.300
4M3	CARLISLE MUNICIPAL	AR	LPV	1	99.310	1	99.307	1	99.307
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	1	99.310	1	99.310	1	99.307
7M1	MC GEHEE MUNICIPAL	AR	LP	1	99.310	1	99.307	1	99.307
9M8	SHERIDAN-GRANT COUNTY RGNL	AR	LPV	1	99.310	1	99.307	1	99.307
ADF	DEXTER B FLORENCE MEML FLD	AR	LPV	1	99.310	1	99.307	1	99.307
ARG	WALNUT RIDGE RGNL	AR	LPV200	1	99.307	1	99.307	1	99.305
ASG	SPRINGDALE MUNICIPAL	AR	LPV	1	99.307	1	99.307	1	99.306

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	1	99.310	1	99.310	1	99.307
BPK	BAXTER COUNTY	AR	LPV	1	99.307	1	99.307	1	99.301
BVX	BATESVILLE RGNL	AR	LPV	1	99.307	1	99.307	1	99.307
BYH	ARKANSAS INTL	AR	LPV200	1	99.307	1	99.307	1	99.307
CDH	HARRELL FLD	AR	LPV	1	99.310	1	99.307	1	99.307
CXW	CONWAY RGNL	AR	LPV	1	99.310	1	99.307	1	99.307
DRP	DELTA RGNL	AR	LPV	1	99.310	1	99.310	1	99.307
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	1	99.310	1	99.307	1	99.307
FLP	MARION COUNTY RGNL	AR	LPV	1	99.307	1	99.307	1	99.306
FSM	FORT SMITH RGNL	AR	LPV200	1	99.307	1	99.307	1	99.306
FYV	DRAKE FLD	AR	LPV	1	99.307	1	99.307	1	99.306
H34	HUNTSVILLE MUNICIPAL	AR	LPV	1	99.307	1	99.307	1	99.306
HEE	THOMPSON-ROBBINS	AR	LPV	1	99.310	1	99.307	1	99.307
HRO	BOONE COUNTY	AR	LPV	1	99.307	1	99.307	1	99.306
JBR	JONESBORO MUNICIPAL	AR	LPV200	1	99.307	1	99.307	1	99.307
LIT	BILL AND HILLARY CLINTON NTL/A	AR	LPV200	1	99.310	1	99.307	1	99.307
LLQ	MONTICELLO MUNICIPAL/ELLIS FLD	AR	LPV	1	99.310	1	99.307	1	99.307
M18	HOPE MUNICIPAL	AR	LP	1	99.310	1	99.307	1	99.306
M19	NEWPORT RGNL	AR	LPV	1	99.307	1	99.307	1	99.307
M32	LAKE VILLAGE MUNICIPAL	AR	LP	1	99.312	1	99.310	1	99.307
M70	POCAHONTAS MUNICIPAL	AR	LPV	1	99.307	1	99.307	1	99.304
M77	HOWARD COUNTY	AR	LP	1	99.309	1	99.307	1	99.306
MXA	MANILA MUNICIPAL	AR	LPV	1	99.307	1	99.307	1	99.307
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	1	99.310	1	99.307	1	99.307
PBF	PINEBLUFF RGNL/GRIDER FLD	AR	LPV	1	99.310	1	99.307	1	99.307
ROG	ROGERS EXEC - CARTER FLD	AR	LPV	1	99.307	1	99.307	1	99.300
RUE	RUSSELLVILLE RGNL	AR	LPV	1	99.309	1	99.307	1	99.307

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	1	99.310	1	99.307	1	99.307
SLG	SMITH FLD	AR	LPV	1	99.307	1	99.307	1	99.306
SRC	SEARCY MUNICIPAL	AR	LPV	1	99.310	1	99.310	1	99.307
SUZ	SALINE COUNTY RGNL	AR	LPV	1	99.310	1	99.307	1	99.307
TXK	TEXARKANA RGNL-WEBB FLD	AR	LPV	1	99.310	1	99.307	1	99.306
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	1	99.307	1	99.307	1	99.306
XNA	NORTHWEST ARKANSAS NTL	AR	LPV200	1	99.307	1	99.307	1	99.306
AVQ	MARANA RGNL	AZ	LP	1	99.300	1	99.296	6	99.246
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	1	99.308	1	99.307	1	99.296
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	1	99.301	1	99.296	5	99.269
CHD	CHANDLER MUNICIPAL	AZ	LPV	1	99.304	1	99.297	5	99.275
DVT	PHOENIX DEER VALLEY	AZ	LPV	1	99.307	1	99.304	3	99.285
FFZ	FALCON FLD	AZ	LP	1	99.307	1	99.303	3	99.283
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	1	99.297	2	99.286	21	99.149
FLG	FLAGSTAFF PULLIAM	AZ	LPV	1	99.307	1	99.307	1	99.293
GCN	GRAND CANYON NTL PARK	AZ	LPV	1	99.307	1	99.307	1	99.293
GEU	GLENDALE MUNICIPAL	AZ	LPV	1	99.307	1	99.304	3	99.283
GYR	PHOENIX GOODYEAR	AZ	LP	1	99.304	1	99.300	4	99.276
HII	LAKE HAVASU CITY	AZ	LPV	1	99.308	1	99.307	4	99.277
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	1	99.307	1	99.304	3	99.286
IGM	KINGMAN	AZ	LPV	1	99.308	1	99.305	1	99.296
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	1	99.304	1	99.297	4	99.277
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	1	99.307	1	99.304	9	99.269
P08	COOLIDGE MUNICIPAL	AZ	LPV	1	99.301	1	99.296	5	99.274
P20	AVI SUQUILLA	AZ	LPV	1	99.308	1	99.304	5	99.271
P33	COCHISE COUNTY	AZ	LPV	1	99.297	1	99.296	19	99.189
PGA	PAGE MUNICIPAL	AZ	LPV	1	99.307	1	99.307	1	99.293

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	1	99.307	1	99.303	4	99.281
PRC	PRESCOTT RGNL - ERNEST A LOVE	AZ	LPV200	1	99.307	1	99.304	2	99.293
RQE	WINDOW ROCK	AZ	LP	1	99.307	1	99.307	1	99.293
RYN	RYAN FLD	AZ	LPV	1	99.300	1	99.296	7	99.226
SAD	SAFFORD RGNL	AZ	LPV	1	99.300	1	99.296	16	99.213
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LPV	1	99.307	1	99.304	4	99.291
SOW	SHOW LOW RGNL	AZ	LPV200	1	99.307	1	99.304	2	99.293
TUS	TUCSON INTL	AZ	LPV	1	99.297	1	99.296	7	99.228
TYL	TAYLOR	AZ	LPV	1	99.307	1	99.304	1	99.293
CAJ4	ANAHIM LAKE	BC	LPV	1	99.277	1	99.277	2	99.270
CAJ9	FORT WARE	BC	LP	1	99.274	1	99.274	3	99.255
CAU4	VANDERHOOF	BC	LPV	1	99.273	1	99.273	2	99.266
CBN9	TSAY KEH	BC	LP	1	99.274	1	99.274	3	99.256
CBW4	BOB QUINN LAKE	BC	LP	1	99.274	1	99.274	3	99.255
CYBL	CAMPBELL RIVER	BC	LPV	1	99.285	1	99.285	2	99.273
CYCD	NANAIMO	BC	LPV	1	99.285	1	99.285	2	99.276
CYCZ	FAIRMONT HOT SPRINGS	BC	LPV	1	99.285	1	99.285	1	99.278
CYDL	DEASE LAKE	BC	LP	1	99.274	1	99.273	3	99.240
CYDQ	DAWSON CREEK	BC	LPV	1	99.275	1	99.275	4	99.264
CYKA	KAMLOOPS	BC	LPV	1	99.285	1	99.285	1	99.275
CYLW	KELOWNA	BC	LPV	1	99.285	1	99.285	1	99.275
CYPK	PITT MEADOWS	BC	LPV	1	99.284	1	99.284	1	99.277
CYPR	PRINCE RUPERT	BC	LPV	1	99.274	1	99.274	2	99.264
CYQQ	COMOX	BC	LPV200	1	99.285	1	99.285	2	99.274
CYQZ	QUESNEL	BC	LPV	1	99.277	1	99.277	2	99.268
CYVR	VANCOUVER INTL	BC	LPV200	1	99.284	1	99.284	1	99.277
CYWL	WILLIAMS LAKE	BC	LPV	1	99.277	1	99.277	1	99.273

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYXJ	FORT ST. JOHN	BC	LPV200	1	99.277	1	99.277	4	99.257
CYXS	PRINCE GEORGE	BC	LPV200	1	99.277	1	99.277	2	99.267
CYXT	TERRACE	BC	LPV	1	99.275	1	99.274	2	99.264
CYXX	ABBOTSFORD	BC	LPV	1	99.284	1	99.284	1	99.277
CYYD	SMITHERS	BC	LPV	1	99.277	1	99.277	2	99.264
CYYE	FORT NELSON	BC	LPV200	1	99.274	1	99.274	5	99.217
CYYF	PENTICTON	BC	LPV	1	99.285	1	99.285	1	99.275
CYYJ	VICTORIA INTL	BC	LPV200	1	99.285	1	99.285	1	99.277
CYZP	SANDSPIT	BC	LPV	1	99.274	1	99.274	3	99.262
CYZT	PORT HARDY	BC	LPV	1	99.278	1	99.275	3	99.270
CZBB	BOUNDARY BAY	BC	LPV	1	99.285	1	99.285	1	99.277
AAT	ALTURAS MUNICIPAL	CA	LPV	1	99.293	1	99.289	1	99.285
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	1	99.290	1	99.285	1	99.285
APC	NAPA COUNTY	CA	LPV200	2	99.289	2	99.286	3	99.252
APV	APPLE VALLEY	CA	LPV	2	99.286	2	99.276	4	99.250
AUN	AUBURN MUNICIPAL	CA	LPV	1	99.295	1	99.294	3	99.262
BFL	MEADOWS FLD	CA	LPV	2	99.276	2	99.269	7	99.237
BLH	BLYTHE	CA	LP	2	99.303	2	99.303	4	99.247
BUR	BOB HOPE	CA	LP	2	99.281	2	99.273	8	99.231
C83	BYRON	CA	LPV	2	99.270	2	99.267	3	99.254
CCB	CABLE	CA	LP	2	99.285	2	99.276	5	99.240
CCR	BUCHANAN FLD	CA	LPV	2	99.278	2	99.275	3	99.254
CEC	JACK MC NAMARA FLD	CA	LPV	1	99.285	1	99.285	1	99.281
CIC	CHICO MUNICIPAL	CA	LPV	1	99.293	1	99.293	2	99.281
CMA	CAMARILLO	CA	LPV	2	99.270	2	99.261	8	99.205
CNO	CHINO	CA	LPV	2	99.274	2	99.266	5	99.229
CPU	CALAVERAS COUNTY-MAURY RASMUSS	CA	LP	2	99.276	2	99.275	3	99.262

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CRQ	MC CLELLAN-PALOMAR	CA	LPV	2	99.272	2	99.268	6	99.205
CVH	HOLLISTER MUNICIPAL	CA	LPV	2	99.267	2	99.264	4	99.251
DAG	BARSTOW-DAGGETT	CA	LPV	2	99.302	2	99.301	4	99.259
DWA	YOLO COUNTY	CA	LPV	1	99.295	1	99.293	3	99.252
F70	FRENCH VALLEY	CA	LPV	2	99.272	2	99.268	5	99.220
FAT	FRESNO YOSEMITE INTL	CA	LPV200	2	99.267	2	99.267	4	99.254
FCH	FRESNO CHANDLER EXEC	CA	LPV	2	99.267	2	99.267	4	99.254
GOO	NEVADA COUNTY	CA	LPV	1	99.296	1	99.295	3	99.273
HAF	HALF MOON BAY	CA	LPV	2	99.270	2	99.264	6	99.248
HHR	JACK NORTHROP FLD/HAWTHORNE MU	CA	LPV	2	99.272	2	99.264	8	99.217
HJO	HANFORD MUNICIPAL	CA	LPV	2	99.271	2	99.268	7	99.243
HWD	HAYWARD EXEC	CA	LPV	2	99.268	2	99.265	3	99.254
L35	BIG BEAR CITY	CA	LP	2	99.288	2	99.279	5	99.249
LAX	LOS ANGELES INTL	CA	LPV200	2	99.270	2	99.263	8	99.216
LGB	LONG BEACH (DAUGHERTY FLD)	CA	LPV	2	99.272	2	99.265	8	99.221
LHM	LINCOLN RGNL/KARL HARDER FLD	CA	LPV200	1	99.295	1	99.294	3	99.262
LLR	LITTLE RIVER	CA	LP	1	99.292	1	99.285	3	99.278
LSN	LOS BANOS MUNICIPAL	CA	LPV	2	99.268	2	99.266	4	99.259
LVK	LIVERMORE MUNICIPAL	CA	LPV200	2	99.268	2	99.265	3	99.254
MAE	MADERA MUNICIPAL	CA	LPV	2	99.267	2	99.267	3	99.257
MCE	MERCED RGNL/MACREADY FLD	CA	LPV200	2	99.268	2	99.267	3	99.260
MER	CASTLE	CA	LPV200	2	99.268	2	99.267	3	99.260
MHR	SACRAMENTO MATHER	CA	LPV200	1	99.295	1	99.294	3	99.254
MHV	MOJAVE AIR AND SPACE PORT	CA	LP	2	99.278	2	99.274	4	99.246
MIT	SHAFTER-MINTER FLD	CA	LPV	2	99.275	2	99.268	7	99.236
MOD	MODESTO CITY-COUNTY-HARRY SHAM	CA	LPV200	2	99.267	2	99.266	3	99.260
MRY	MONTEREY RGNL	CA	LPV	2	99.270	2	99.263	7	99.238

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MYF	MONTGOMERY-GIBBS EXEC	CA	LPV200	2	99.272	2	99.268	7	99.196
MYV	YUBA COUNTY	CA	LPV200	1	99.295	1	99.293	3	99.272
NUQ	MOFFETT FEDERAL AIRFIELD	CA	LPV200	2	99.267	2	99.263	4	99.253
O02	NERVINO	CA	LPV	1	99.296	1	99.296	1	99.286
O08	COLUSA COUNTY	CA	LPV	1	99.295	1	99.293	3	99.277
O27	OAKDALE	CA	LPV	2	99.268	2	99.267	3	99.260
O32	REEDLEY MUNICIPAL	CA	LPV	2	99.269	2	99.268	4	99.254
O69	PETALUMA MUNICIPAL	CA	LPV	1	99.295	1	99.291	4	99.251
O88	RIO VISTA MUNICIPAL	CA	LP	2	99.283	2	99.281	3	99.254
OAK	METRO OAKLAND INTL	CA	LPV200	2	99.272	2	99.267	3	99.254
ONT	ONTARIO INTL	CA	LPV200	2	99.285	2	99.277	5	99.239
OVE	OROVILLE MUNICIPAL	CA	LPV	1	99.295	1	99.293	2	99.281
OXR	OXNARD	CA	LPV	2	99.270	2	99.262	8	99.206
PMD	PALMDALE USAF PLANT 42	CA	LPV200	2	99.281	2	99.272	4	99.243
POC	BRACKETT FLD	CA	LPV	2	99.285	2	99.276	5	99.239
PRB	PASO ROBLES MUNICIPAL	CA	LPV	2	99.271	2	99.265	7	99.231
PVF	PLACERVILLE	CA	LPV	1	99.296	1	99.295	3	99.263
RAL	RIVERSIDE MUNICIPAL	CA	LPV	2	99.274	2	99.267	5	99.232
RBL	RED BLUFF MUNICIPAL	CA	LPV	1	99.293	1	99.285	3	99.280
RDD	REDDING MUNICIPAL	CA	LPV	1	99.293	1	99.285	3	99.281
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	2	99.267	2	99.264	4	99.253
RIV	MARCH ARB	CA	LPV200	2	99.275	2	99.268	5	99.224
SAC	SACRAMENTO EXEC	CA	LPV	1	99.295	1	99.293	3	99.252
SAN	SAN DIEGO INTL	CA	LPV	2	99.272	2	99.268	7	99.191
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	2	99.278	2	99.267	7	99.219
SBD	SAN BERNARDINO INTL	CA	LPV	2	99.287	2	99.278	5	99.245
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	2	99.274	2	99.267	7	99.228

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SCK	STOCKTON METRO	CA	LPV200	2	99.270	2	99.268	3	99.254
SDM	BROWN FLD MUNICIPAL	CA	LPV200	2	99.272	2	99.268	7	99.190
SEE	GILLESPIE FLD	CA	LP	2	99.272	2	99.268	7	99.199
SFO	SAN FRANCISCO INTL	CA	LPV200	2	99.271	2	99.265	5	99.253
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	2	99.267	2	99.263	4	99.253
SMF	SACRAMENTO INTL	CA	LPV200	1	99.295	1	99.293	3	99.252
SMO	SANTA MONICA MUNICIPAL	CA	LPV	2	99.270	2	99.263	8	99.217
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	2	99.275	2	99.271	7	99.222
SNA	JOHN WAYNE/ORANGE COUNTY	CA	LPV200	2	99.271	2	99.266	6	99.213
SNS	SALINAS MUNICIPAL	CA	LPV200	2	99.269	2	99.264	7	99.239
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	1	99.295	1	99.291	4	99.254
TCY	TRACY MUNICIPAL	CA	LPV	2	99.268	2	99.265	3	99.254
TNP	TWENTYNINE PALMS	CA	LP	3	99.302	3	99.302	4	99.260
TOA	ZAMPERINI FLD	CA	LPV	2	99.272	2	99.265	8	99.215
TRK	TRUCKEE-TAHOE	CA	LP	1	99.296	1	99.296	3	99.277
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	2	99.282	2	99.278	5	99.238
TVL	LAKE TAHOE	CA	LP	1	99.296	1	99.296	3	99.272
VCB	NUT TREE	CA	LPV	2	99.295	2	99.292	3	99.252
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	2	99.283	2	99.275	4	99.251
VIS	VISALIA MUNICIPAL	CA	LPV	2	99.272	2	99.268	7	99.246
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	2	99.277	2	99.271	4	99.244
WLW	WILLOWS/GLENN COUNTY	CA	LPV	1	99.292	1	99.292	2	99.281
WVI	WATSONVILLE MUNICIPAL	CA	LPV	2	99.267	2	99.263	6	99.250
1V6	FREMONT COUNTY	CO	LPV	1	99.307	1	99.305	1	99.300
20V	MC ELROY AIRFIELD	CO	LPV	1	99.307	1	99.307	1	99.293
2V5	WRAY MUNICIPAL	CO	LPV200	1	99.307	1	99.303	1	99.300
2V6	YUMA MUNICIPAL	CO	LPV200	1	99.307	1	99.303	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
33V	WALDEN-JACKSON COUNTY	CO	LPV	1	99.307	1	99.307	1	99.292
4V0	RANGELY	CO	LPV	1	99.307	1	99.307	1	99.289
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	1	99.307	1	99.307	1	99.301
AEJ	CENTRAL COLORADO RGNL	CO	LP	1	99.307	1	99.307	1	99.301
AJZ	BLAKE FLD	CO	LPV	1	99.307	1	99.307	1	99.304
AKO	COLORADO PLAINS RGNL	CO	LPV	1	99.307	1	99.303	1	99.300
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	1	99.307	1	99.307	1	99.303
APA	CENTENNIAL	CO	LPV200	1	99.307	1	99.303	1	99.300
BJC	ROCKY MOUNTAIN METRO	CO	LPV200	1	99.307	1	99.303	1	99.295
CAG	CRAIG-MOFFAT	CO	LP	1	99.307	1	99.307	1	99.292
CEZ	CORTEZ MUNICIPAL	CO	LPV	1	99.307	1	99.307	1	99.296
CFO	COLORADO AIR AND SPACE PORT	CO	LPV200	1	99.307	1	99.303	1	99.300
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	1	99.307	1	99.303	1	99.300
DEN	DENVER INTL	CO	LPV200	1	99.307	1	99.303	1	99.294
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	1	99.307	1	99.307	1	99.296
FMM	FORT MORGAN MUNICIPAL	CO	LPV	1	99.307	1	99.303	1	99.293
FNL	NORTHERN COLORADO RGNL	CO	LPV200	1	99.307	1	99.303	1	99.293
FTG	FRONT RANGE	CO	LPV200	1	99.307	1	99.303	1	99.300
GJT	GRAND JUNCTION RGNL	CO	LPV200	1	99.307	1	99.307	1	99.293
GXY	GREELEY-WELD COUNTY	CO	LPV200	1	99.307	1	99.303	1	99.293
HDN	YAMPA VALLEY	CO	LPV200	1	99.307	1	99.307	1	99.293
ITR	KIT CARSON COUNTY	CO	LPV	1	99.307	1	99.303	1	99.300
LAA	SOUTHEAST COLORADO RGNL	CO	LPV	1	99.307	1	99.303	1	99.300
LHX	LA JUNTA MUNICIPAL	CO	LPV	1	99.307	1	99.303	1	99.300
LMO	VANCE BRAND	CO	LPV	1	99.307	1	99.303	1	99.294
MTJ	MONTROSE RGNL	CO	LPV200	1	99.307	1	99.307	1	99.304
MVI	MONTE VISTA MUNICIPAL	CO	LPV	1	99.307	1	99.307	1	99.303

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PSO	STEVENS FLD	CO	LP	1	99.307	1	99.307	1	99.307
PUB	PUEBLO MEML	CO	LPV200	1	99.307	1	99.303	1	99.300
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	1	99.307	1	99.307	1	99.303
RIL	RIFLE GARFIELD COUNTY	CO	LPV	1	99.307	1	99.307	1	99.293
STK	STERLING MUNICIPAL	CO	LPV	1	99.307	1	99.300	1	99.293
TEX	TELLURIDE RGNL	CO	LP	1	99.307	1	99.307	1	99.304
4B8	ROBERTSON FLD	CT	LP	1	99.296	1	99.296	1	99.289
BDL	BRADLEY INTL	CT	LPV200	1	99.296	1	99.296	1	99.289
BDR	IGOR I SIKORSKY MEML	CT	LPV	1	99.296	1	99.296	1	99.292
DXR	DANBURY MUNICIPAL	CT	LP	1	99.296	1	99.296	1	99.292
GON	GROTON-NEW LONDON	CT	LPV	1	99.296	1	99.296	2	99.288
HVN	TWEED/NEW HAVEN	CT	LPV	1	99.296	1	99.296	1	99.292
IJD	WINDHAM	CT	LP	1	99.296	1	99.296	1	99.289
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	1	99.296	1	99.296	1	99.292
OXC	WATERBURY-OXFORD	CT	LPV	1	99.296	1	99.296	1	99.292
DCA	RONALD REAGAN WASHINGTON NTL	DC	LPV	1	99.296	1	99.296	3	99.292
HEF	MANASSAS RGNL/HARRY P DAVIS FL	DC	LPV	1	99.296	1	99.296	3	99.291
IAD	WASHINGTON DULLES INTL	DC	LPV200	1	99.296	1	99.296	3	99.292
33N	DELAWARE AIRPARK	DE	LP	1	99.296	1	99.296	3	99.293
DOV	DOVER AFB	DE	LPV200	1	99.296	1	99.296	3	99.292
EVY	SUMMIT	DE	LPV	1	99.296	1	99.296	3	99.294
GED	DELAWARE COASTAL	DE	LPV	1	99.296	1	99.296	3	99.289
ILG	NEW CASTLE	DE	LPV	1	99.296	1	99.296	3	99.294
1J0	TRI-COUNTY	FL	LP	1	99.310	1	99.310	2	99.288
24J	SUWANNEE COUNTY	FL	LPV	1	99.314	1	99.310	2	99.283
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	1	99.314	2	99.309	3	99.274
40J	PERRY-FOLEY	FL	LPV	1	99.314	1	99.310	2	99.280

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
54J	DEFUNIAK SPRINGS	FL	LP	1	99.310	1	99.310	5	99.287
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	1	99.310	1	99.307	2	99.281
APF	NAPLES MUNICIPAL	FL	LPV	2	99.326	2	99.297	17	99.156
AVO	AVON PARK EXEC	FL	LPV	1	99.312	2	99.304	16	99.231
BCR	TRI-COUNTY	FL	LPV	1	99.310	1	99.310	2	99.288
BCT	BOCA RATON	FL	LPV	2	99.330	2	99.296	17	99.166
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	1	99.312	1	99.307	4	99.272
BOW	BARTOW EXEC	FL	LPV	1	99.312	2	99.305	15	99.252
CEW	BOB SIKES	FL	LPV	1	99.310	1	99.310	11	99.283
CGC	CRYSTAL RIVER-CAPT TOM DAVIS F	FL	LP	1	99.313	1	99.307	4	99.274
CHN	WAUCHULA MUNICIPAL	FL	LP	1	99.312	2	99.305	16	99.232
COI	MERRITT ISLAND	FL	LPV	1	99.314	2	99.301	9	99.257
CRG	JACKSONVILLE EXEC AT CRAIG	FL	LPV200	1	99.314	2	99.309	3	99.279
CTY	CROSS CITY	FL	LPV	1	99.314	1	99.310	2	99.279
DAB	DAYTONA BEACH INTL	FL	LPV200	1	99.314	2	99.307	4	99.266
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FL	FL	LPV	1	99.314	2	99.304	4	99.267
DTS	DESTIN EXEC	FL	LPV	1	99.310	1	99.310	13	99.278
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	1	99.310	1	99.310	6	99.284
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	1	99.314	2	99.305	4	99.264
EYW	KEY WEST INTL	FL	LPV	2	99.323	3	99.293	27	99.038
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	2	99.330	2	99.298	17	99.189
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	1	99.314	2	99.308	3	99.280
FIN	FLAGLER EXEC	FL	LPV	1	99.314	2	99.307	4	99.271
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	2	99.331	2	99.289	18	99.147
FMY	PAGE FLD	FL	LPV	2	99.324	2	99.298	16	99.183
FPR	TREASURE COAST INTL	FL	LPV	2	99.330	2	99.299	16	99.217
FPY	PERRY-FOLEY	FL	LPV	1	99.314	1	99.310	2	99.280

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FXE	FORT LAUDERDALE EXEC	FL	LPV200	2	99.331	2	99.290	18	99.154
GIF	WINTER HAVEN RGNL	FL	LPV	1	99.314	2	99.305	15	99.258
GNV	GAINESVILLE RGNL	FL	LPV	1	99.314	1	99.310	3	99.277
HEG	HERLONG RECREATIONAL	FL	LPV	1	99.314	2	99.310	3	99.280
IMM	IMMOKALEE RGNL	FL	LPV	2	99.326	2	99.296	17	99.169
ISM	KISSIMMEE GATEWAY	FL	LPV200	1	99.314	2	99.304	8	99.263
JAX	JACKSONVILLE INTL	FL	LPV200	1	99.314	2	99.309	3	99.280
LAL	LAKELAND LINDER INTL	FL	LPV200	1	99.312	2	99.306	15	99.256
LCQ	LAKE CITY GATEWAY	FL	LPV	1	99.314	1	99.310	2	99.283
LEE	LEESBURG INTL	FL	LPV	1	99.314	2	99.306	4	99.269
LNA	PALM BEACH COUNTY PARK	FL	LP	2	99.330	2	99.297	17	99.176
MAI	MARIANNA MUNICIPAL	FL	LPV	1	99.310	1	99.310	2	99.287
MCO	ORLANDO INTL	FL	LPV200	1	99.314	2	99.303	4	99.264
MIA	MIAMI INTL	FL	LPV200	2	99.328	2	99.290	19	99.129
MKY	MARCO ISLAND EXEC	FL	LPV	2	99.326	2	99.297	17	99.141
MLB	MELBOURNE ORLANDO INTL	FL	LPV200	1	99.318	2	99.301	16	99.249
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	2	99.326	3	99.289	28	99.028
OBE	OKEECHOBEE COUNTY	FL	LPV	2	99.326	2	99.301	16	99.207
OCF	OCALA INTL-JIM TAYLOR FLD	FL	LPV200	1	99.314	1	99.307	4	99.273
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	1	99.314	2	99.307	4	99.267
OPF	MIAMI-OPA LOCKA EXEC	FL	LPV200	2	99.328	2	99.290	19	99.134
ORL	EXEC	FL	LPV200	1	99.314	2	99.303	4	99.265
PBI	PALM BEACH INTL	FL	LPV200	2	99.330	2	99.297	17	99.183
PCM	PLANT CITY	FL	LPV	1	99.312	2	99.307	15	99.258
PGD	PUNTA GORDA	FL	LPV200	2	99.323	2	99.299	16	99.200
PHK	PALM BEACH COUNTY GLADES	FL	LPV	2	99.326	2	99.301	17	99.185
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	1	99.310	1	99.307	15	99.260

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PMP	POMPANO BEACH AIRPARK	FL	LPV	2	99.331	2	99.291	18	99.157
PNS	PENSACOLA INTL	FL	LPV200	1	99.310	1	99.310	23	99.267
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	2	99.324	2	99.298	16	99.172
SEF	SEBRING RGNL	FL	LPV	2	99.324	2	99.303	16	99.219
SFB	ORLANDO SANFORD INTL	FL	LPV200	1	99.314	2	99.303	4	99.265
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	1	99.314	2	99.308	3	99.273
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	1	99.310	1	99.300	15	99.231
SUA	WITHAM FLD	FL	LPV	2	99.330	2	99.298	16	99.202
TIX	SPACE COAST RGNL	FL	LPV200	1	99.314	2	99.301	4	99.262
TLH	TALLAHASSEE INTL	FL	LPV200	1	99.310	1	99.310	2	99.285
TMB	MIAMI EXEC	FL	LPV200	2	99.328	2	99.290	20	99.111
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	2	99.328	2	99.293	18	99.140
TPA	TAMPA INTL	FL	LPV200	1	99.310	1	99.307	15	99.261
TPF	PETER O KNIGHT	FL	LP	1	99.310	1	99.307	15	99.257
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	1	99.314	2	99.301	4	99.262
VDF	TAMPA EXEC	FL	LPV	1	99.312	1	99.307	15	99.262
VNC	VENICE MUNICIPAL	FL	LP	2	99.319	1	99.300	16	99.212
VQQ	CECIL	FL	LPV200	1	99.314	2	99.310	3	99.281
VRB	VERO BEACH RGNL	FL	LPV200	2	99.330	2	99.299	16	99.225
X07	LAKE WALES MUNICIPAL	FL	LP	1	99.314	2	99.305	15	99.248
X14	LA BELLE MUNICIPAL	FL	LPV	2	99.324	2	99.296	16	99.187
X35	MARION COUNTY	FL	LP	1	99.314	1	99.307	4	99.273
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	2	99.328	2	99.291	21	99.101
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	1	99.312	2	99.307	9	99.267
09J	JEKYLL ISLAND	GA	LPV200	1	99.314	2	99.312	3	99.281
15J	COOK COUNTY	GA	LPV	1	99.314	1	99.310	2	99.286
17J	DONALSONVILLE MUNICIPAL	GA	LPV	1	99.310	1	99.310	2	99.288

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
18A	FRANKLIN-HART	GA	LPV	1	99.314	1	99.314	2	99.296
19A	JACKSON COUNTY	GA	LPV	1	99.314	1	99.314	2	99.298
2J3	LOUISVILLE MUNICIPAL	GA	LPV	1	99.317	1	99.314	2	99.292
2J5	MILLEN	GA	LPV	1	99.315	1	99.314	2	99.290
3J7	GREENE COUNTY RGNL	GA	LPV	1	99.318	1	99.314	2	99.294
48A	COCHRAN	GA	LPV	1	99.318	1	99.314	2	99.295
49A	GILMER COUNTY	GA	LPV	1	99.310	1	99.310	2	99.306
4A4	POLK COUNTY/CORNELIUS MOORE FL	GA	LPV	1	99.312	1	99.310	2	99.303
4J1	BRANTLEY COUNTY	GA	LPV	1	99.314	1	99.314	3	99.284
4J2	BERRIEN COUNTY	GA	LPV	1	99.314	1	99.310	2	99.286
4J5	QUITMAN BROOKS COUNTY	GA	LP	1	99.314	1	99.310	2	99.285
52A	MADISON MUNICIPAL	GA	LP	1	99.314	1	99.314	2	99.294
6A1	BUTLER MUNICIPAL	GA	LPV	1	99.314	1	99.314	2	99.296
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	1	99.314	1	99.314	2	99.294
70J	CAIRO-GRADY COUNTY	GA	LPV	1	99.314	1	99.310	2	99.286
75J	TURNER COUNTY	GA	LP	1	99.314	1	99.314	2	99.288
9A5	BARWICK LAFAYETTE	GA	LP	1	99.310	1	99.310	1	99.307
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	1	99.314	1	99.310	2	99.291
ACJ	JIMMY CARTER RGNL	GA	LPV	1	99.314	1	99.314	2	99.295
AGS	AUGUSTA RGNL AT BUSH FLD	GA	LPV200	1	99.314	1	99.314	2	99.292
AHN	ATHENS/BEN EPPS	GA	LPV200	1	99.314	1	99.314	2	99.296
AJR	HABERSHAM COUNTY	GA	LPV	1	99.311	1	99.311	2	99.299
AMG	BACON COUNTY	GA	LPV	1	99.314	1	99.314	2	99.286
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	1	99.314	1	99.314	2	99.297
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	1	99.314	1	99.314	2	99.285
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	1	99.314	1	99.310	2	99.287
BHC	BAXLEY MUNICIPAL	GA	LPV	1	99.314	1	99.314	2	99.287

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BIJ	EARLY COUNTY	GA	LPV	1	99.314	1	99.310	2	99.289
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	1	99.314	2	99.313	3	99.282
CCO	NEWNAN COWETA COUNTY	GA	LPV	1	99.314	1	99.314	2	99.296
CKF	CRISP COUNTY-CORDELE	GA	LPV	1	99.314	1	99.314	2	99.293
CNI	CHEROKEE COUNTY RGNL	GA	LPV	1	99.310	1	99.310	2	99.303
CSG	COLUMBUS	GA	LPV	1	99.314	1	99.311	2	99.296
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	1	99.315	1	99.311	2	99.299
CVC	COVINGTON MUNICIPAL	GA	LPV	1	99.314	1	99.314	2	99.294
CWV	CLAXTON-EVANS COUNTY	GA	LPV	1	99.314	1	99.314	3	99.287
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	1	99.314	1	99.310	2	99.288
CZL	TOM B DAVID FLD	GA	LPV	1	99.310	1	99.310	2	99.306
D73	CY NUNNALLY MEML	GA	LP	1	99.314	1	99.314	2	99.296
DBN	W H 'BUD' BARRON	GA	LPV200	1	99.318	1	99.314	2	99.295
DNL	DANIEL FLD	GA	LPV	1	99.314	1	99.314	2	99.292
DNN	DALTON MUNICIPAL	GA	LPV	1	99.310	1	99.310	1	99.307
DQH	DOUGLAS MUNICIPAL	GA	LPV200	1	99.314	1	99.314	2	99.288
EBA	ELBERT COUNTY-PATZ FLD	GA	LP	1	99.314	1	99.314	2	99.296
EZM	HEART OF GEORGIA RGNL	GA	LPV200	1	99.314	1	99.314	2	99.293
FFC	ATLANTA RGNL FALCON FLD	GA	LPV	1	99.314	1	99.314	2	99.296
FTY	FULTON COUNTY EXEC/CHARLIE BRO	GA	LPV	1	99.314	1	99.314	2	99.299
FZG	FITZGERALD MUNICIPAL	GA	LPV	1	99.314	1	99.314	2	99.287
GVL	LEE GILMER MEML	GA	LPV	1	99.312	1	99.312	2	99.298
HMP	ATLANTA SPEEDWAY	GA	LPV200	1	99.314	1	99.314	2	99.294
HOE	HOMERVILLE	GA	LPV	1	99.314	1	99.310	2	99.286
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	1	99.314	1	99.314	2	99.293
IIY	WASHINGTON/WILKES COUNTY	GA	LPV	1	99.316	1	99.314	2	99.294
JCA	JACKSON COUNTY	GA	LPV	1	99.314	1	99.314	2	99.298

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
JES	JESUP-WAYNE COUNTY	GA	LPV	1	99.314	2	99.314	3	99.284
JYL	PLANTATION AIRPARK	GA	LPV	1	99.315	2	99.314	3	99.289
JZP	PICKENS COUNTY	GA	LPV	1	99.310	1	99.310	2	99.303
LGC	LAGRANGE/CALLAWAY	GA	LPV200	1	99.317	1	99.317	2	99.298
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	1	99.314	2	99.313	3	99.285
LZU	GWINNETT COUNTY/BRISCOE FLD	GA	LPV200	1	99.314	1	99.314	2	99.298
MAC	MACON DOWNTOWN	GA	LPV	1	99.314	1	99.314	2	99.297
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	1	99.314	1	99.314	2	99.296
MGR	MOULTRIE MUNICIPAL	GA	LPV200	1	99.314	1	99.310	2	99.286
MHP	JOHN EDWIN JONES SR FLD/METTER	GA	LPV	1	99.318	1	99.314	2	99.290
MLJ	BALDWIN COUNTY RGNL	GA	LPV	1	99.318	1	99.314	2	99.293
MQW	TELFAIR-WHEELER	GA	LPV	1	99.314	1	99.314	2	99.289
OKZ	KAOLIN FLD	GA	LPV	1	99.318	1	99.314	2	99.292
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	1	99.314	1	99.314	2	99.297
PIM	HARRIS COUNTY	GA	LPV	1	99.314	1	99.314	2	99.297
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	1	99.314	1	99.311	2	99.302
PXE	PERRY-HOUSTON COUNTY	GA	LPV	1	99.314	1	99.314	2	99.296
RMG	RICHARD B RUSSELL RGNL - J H T	GA	LPV	1	99.310	1	99.310	2	99.306
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	1	99.314	1	99.314	2	99.287
RYY	COBB COUNTY INTL/MCCOLLUM FLD	GA	LPV200	1	99.314	1	99.314	2	99.300
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	1	99.314	2	99.312	3	99.284
SBO	EAST GEORGIA RGNL	GA	LPV	1	99.318	1	99.314	2	99.294
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	1	99.318	2	99.314	3	99.290
TMA	HENRY TIFT MYERS	GA	LPV	1	99.314	1	99.310	2	99.288
TOC	TOCCOA RG LETOURNEAU FLD	GA	LPV	1	99.312	1	99.312	2	99.295
TVI	THOMASVILLE RGNL	GA	LPV	1	99.314	1	99.310	2	99.286
VDI	VIDALIA RGNL	GA	LPV200	1	99.314	1	99.314	2	99.289

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VLD	VALDOSTA RGNL	GA	LPV	1	99.314	1	99.310	2	99.285
VPC	CARTERSVILLE	GA	LPV	1	99.311	1	99.311	2	99.303
WDR	BARROW COUNTY	GA	LPV	1	99.314	1	99.314	2	99.296
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.296
4C8	ALBIA MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.297
AIO	ATLANTIC MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
ALO	WATERLOO RGNL	IA	LPV200	1	99.296	1	99.296	1	99.296
AMW	AMES MUNICIPAL	IA	LPV	1	99.300	1	99.296	1	99.296
AWG	WASHINGTON MUNICIPAL	IA	LPV200	1	99.300	1	99.300	1	99.299
BNW	BOONE MUNICIPAL	IA	LPV	1	99.299	1	99.296	1	99.296
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	1	99.300	1	99.300	1	99.300
C25	WAVERLY MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.296
CAV	CLARION MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.293
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	1	99.300	1	99.300	1	99.296
CCY	NORTHEAST IOWA RGNL	IA	LPV	1	99.296	1	99.296	2	99.294
CID	THE EASTERN IOWA	IA	LPV200	1	99.300	1	99.297	1	99.296
CIN	ARTHUR N NEU	IA	LPV	1	99.300	1	99.296	1	99.296
CKP	CHEROKEE COUNTY RGNL	IA	LPV	1	99.296	1	99.296	2	99.296
CSQ	CRESTON MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
CWI	CLINTON MUNICIPAL	IA	LPV200	1	99.300	1	99.297	1	99.296
DBQ	DUBUQUE RGNL	IA	LPV200	1	99.296	1	99.296	1	99.296
DEH	DECORAH MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.294
DNS	DENISON MUNICIPAL	IA	LPV	1	99.300	1	99.296	1	99.296
DSM	DES MOINES INTL	IA	LPV200	1	99.300	1	99.300	1	99.296
DVN	DAVENPORT MUNICIPAL	IA	LPV200	1	99.300	1	99.300	1	99.296
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.293
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.294

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EFW	JEFFERSON MUNICIPAL	IA	LPV	1	99.300	1	99.296	1	99.296
EOK	KEOKUK MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.300
EST	ESTHERVILLE MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.289
FFL	FAIRFIELD MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.299
FOD	FORT DODGE RGNL	IA	LPV200	1	99.296	1	99.296	2	99.294
FSW	FORT MADISON MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.300
FXY	FOREST CITY MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.290
GCT	GUTHRIE COUNTY RGNL	IA	LPV	1	99.300	1	99.300	1	99.296
GFZ	GREENFIELD MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
GGI	GRINNELL RGNL	IA	LPV	1	99.300	1	99.300	1	99.296
HPT	HAMPTON MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.295
I75	OSCEOLA MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
ICL	SCHENCK FLD	IA	LPV	1	99.300	1	99.300	1	99.299
IFA	IOWA FALLS MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.294
IIB	JAMES H CONNELL FLD AT INDEPEN	IA	LPV	1	99.296	1	99.296	1	99.296
IKV	ANKENY RGNL	IA	LPV200	1	99.300	1	99.300	1	99.296
IOW	IOWA CITY MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
LRJ	LE MARS MUNICIPAL	IA	LPV	1	99.300	1	99.296	1	99.292
LWD	LAMONI MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.299
MCW	MASON CITY MUNICIPAL	IA	LPV200	1	99.296	1	99.296	2	99.291
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.296
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.299
MUT	MUSCATINE MUNICIPAL	IA	LPV200	1	99.300	1	99.300	1	99.296
MXO	MONTICELLO RGNL	IA	LP	1	99.296	1	99.296	1	99.296
OOA	OSKALOOSA MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.297
OQW	MAQUOKETA MUNICIPAL	IA	LPV	1	99.296	1	99.296	1	99.296
ORC	ORANGE CITY MUNICIPAL	IA	LPV	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OTM	OTTUMWA RGNL	IA	LPV	1	99.300	1	99.300	1	99.297
OXV	KNOXVILLE MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
PEA	PELLA MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
POH	POCAHONTAS MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.294
PRO	PERRY MUNICIPAL	IA	LPV200	1	99.300	1	99.297	1	99.296
RDK	RED OAK MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.296
RRQ	ROCK RAPIDS MUNICIPAL	IA	LP	1	99.296	1	99.296	2	99.292
SDA	SHENANDOAH MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.299
SHL	SHELDON RGNL	IA	LPV	1	99.296	1	99.296	2	99.291
SKI	SAC CITY MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.296
SLB	STORM LAKE MUNICIPAL	IA	LPV	1	99.296	1	99.296	2	99.296
SPW	SPENCER MUNICIPAL	IA	LPV200	1	99.296	1	99.296	2	99.293
SUX	SIOUX GATEWAY/BRIG GENERAL BUD	IA	LPV200	1	99.300	1	99.296	1	99.296
SXK	SIOUX COUNTY RGNL	IA	LPV200	1	99.296	1	99.296	1	99.292
TNU	NEWTON MUNICIPAL-EARL JOHNSON FLD	IA	LPV200	1	99.300	1	99.300	1	99.296
TVK	CENTERVILLE MUNICIPAL	IA	LPV	1	99.300	1	99.300	1	99.299
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	1	99.300	1	99.297	1	99.296
VTI	VINTON VETERANS MEML AIRPARK	IA	LPV	1	99.296	1	99.296	1	99.296
1U7	BEAR LAKE COUNTY	ID	LPV	1	99.289	1	99.289	1	99.286
BOI	BOISE AIR TRML/GOWEN FLD	ID	LPV200	1	99.286	1	99.286	1	99.282
COE	COEUR D'ALENE/PAPPY BOYINGTON	ID	LPV200	1	99.286	1	99.286	1	99.278
DIJ	DRIGGS-REED MEML	ID	LP	1	99.286	1	99.286	1	99.286
EUL	TREASURE VALLEY EXEC AT CALDWE	ID	LPV	1	99.286	1	99.286	1	99.282
GNG	GOODING MUNICIPAL	ID	LPV	1	99.286	1	99.286	1	99.285
IDA	IDAHO FALLS RGNL	ID	LPV200	1	99.286	1	99.286	1	99.286
JER	JEROME COUNTY	ID	LPV	1	99.286	1	99.286	1	99.285
LWS	LEWISTON/NEZ PERCE COUNTY	ID	LPV200	1	99.286	1	99.286	1	99.281

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MAN	NAMPA MUNICIPAL	ID	LPV	1	99.286	1	99.286	1	99.282
MYL	MC CALL MUNICIPAL	ID	LPV	1	99.286	1	99.286	1	99.281
PIH	POCATELLO RGNL	ID	LPV200	1	99.286	1	99.286	1	99.286
SUN	FRIEDMAN MEML	ID	LP	1	99.286	1	99.286	1	99.282
SZT	SANDPOINT	ID	LP	1	99.286	1	99.286	1	99.278
TWF	JOSLIN FLD/MAGIC VALLEY RGNL	ID	LPV200	1	99.289	1	99.288	1	99.285
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	1	99.286	1	99.286	1	99.282
1H2	EFFINGHAM COUNTY MEML	IL	LPV	1	99.305	1	99.300	1	99.300
3LF	LITCHFIELD MUNICIPAL	IL	LPV	1	99.304	1	99.300	1	99.300
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	1	99.300	1	99.300	1	99.296
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	1	99.306	1	99.300	1	99.300
ALN	ST LOUIS RGNL	IL	LPV200	1	99.304	1	99.300	1	99.300
ARR	AURORA MUNICIPAL	IL	LPV200	1	99.300	1	99.300	1	99.296
BLV	SCOTT AFB/MIDAMERICA ST LOUIS	IL	LPV200	1	99.304	1	99.300	1	99.300
BMI	CENTRAL IL RGNL/BLOOMINGTON-NO	IL	LPV	1	99.300	1	99.300	1	99.300
C15	PEKIN MUNICIPAL	IL	LPV	1	99.300	1	99.300	1	99.300
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	1	99.299	1	99.297	1	99.296
C75	MARSHALL COUNTY	IL	LP	1	99.300	1	99.300	1	99.296
CIR	CAIRO RGNL	IL	LP	1	99.307	1	99.306	1	99.300
CMI	UNIVERSITY OF ILLINOIS/WILLARD	IL	LPV200	1	99.300	1	99.300	1	99.300
CPS	ST LOUIS DOWNTOWN	IL	LPV200	1	99.304	1	99.300	1	99.300
CTK	INGERSOLL	IL	LPV	1	99.300	1	99.300	1	99.300
CUL	CARMI MUNICIPAL	IL	LPV	1	99.306	1	99.300	1	99.300
DEC	DECATUR	IL	LPV200	1	99.300	1	99.300	1	99.300
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	1	99.296	1	99.296	1	99.296
DNV	VERMILION RGNL	IL	LPV	1	99.300	1	99.300	1	99.300
DPA	DUPAGE	IL	LPV200	1	99.298	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ENL	CENTRALIA MUNICIPAL	IL	LPV	1	99.305	1	99.300	1	99.300
EZI	KEWANEE MUNICIPAL	IL	LPV	1	99.300	1	99.300	1	99.296
FEP	ALBERTUS	IL	LPV	1	99.296	1	99.296	1	99.296
FOA	FLORA MUNICIPAL	IL	LPV	1	99.306	1	99.300	1	99.300
GBG	GALESBURG MUNICIPAL	IL	LPV200	1	99.300	1	99.300	1	99.296
GRE	GREENVILLE	IL	LPV	1	99.305	1	99.300	1	99.300
HSB	HARRISBURG-RALEIGH	IL	LPV	1	99.306	1	99.300	1	99.300
I63	MOUNT STERLING MUNICIPAL	IL	LPV	1	99.301	1	99.300	1	99.300
IGQ	LANSING MUNICIPAL	IL	LPV	1	99.300	1	99.300	1	99.296
IKK	GREATER KANKAKEE	IL	LPV200	1	99.300	1	99.300	1	99.296
LOT	LEWIS UNIVERSITY	IL	LPV200	1	99.300	1	99.300	1	99.296
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	1	99.306	1	99.300	1	99.300
MDW	CHICAGO MIDWAY INTL	IL	LPV	1	99.299	1	99.299	1	99.296
MLI	QUAD CITIES INTL	IL	LPV200	1	99.300	1	99.300	1	99.296
MQB	MACOMB MUNICIPAL	IL	LPV200	1	99.300	1	99.300	1	99.300
MTO	COLES COUNTY MEML	IL	LPV200	1	99.302	1	99.300	1	99.300
MVN	MOUNT VERNON	IL	LPV	1	99.306	1	99.300	1	99.300
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	1	99.307	1	99.300	1	99.300
OLY	OLNEY-NOBLE	IL	LPV	1	99.306	1	99.300	1	99.300
ORD	CHICAGO O'HARE INTL	IL	LPV200	1	99.297	1	99.296	1	99.296
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	1	99.300	1	99.300	1	99.296
PJY	PINCKNEYVILLE/DU QUOIN	IL	LPV	1	99.307	1	99.300	1	99.300
PNT	PONTIAC MUNICIPAL	IL	LPV	1	99.300	1	99.300	1	99.296
PPQ	PITTSFIELD PENSTONE MUNICIPAL	IL	LPV	1	99.302	1	99.300	1	99.300
PRG	EDGAR COUNTY	IL	LPV	1	99.300	1	99.300	1	99.300
PWK	CHICAGO EXEC	IL	LPV	1	99.296	1	99.296	1	99.296
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RPJ	ROCHELLE MUNICIPAL/KORITZ FLD	IL	LPV	1	99.296	1	99.296	1	99.296
RSV	CRAWFORD COUNTY	IL	LPV	1	99.305	1	99.300	1	99.300
SAR	SPARTA COMMUNICIPALTY-HUNTER FLD	IL	LPV	1	99.305	1	99.300	1	99.300
SFY	TRI-TOWNSHIP	IL	LP	1	99.296	1	99.296	1	99.296
SLO	SALEM-LECKRONE	IL	LPV200	1	99.305	1	99.300	1	99.300
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	1	99.302	1	99.300	1	99.300
SQI	WHITESIDE COUNTY/JOS H BITTORF	IL	LPV200	1	99.300	1	99.300	1	99.296
TIP	RANTOUL NTL AVN CNTR-FRANK ELL	IL	LPV	1	99.300	1	99.300	1	99.300
UGN	WAUKEGAN NTL	IL	LPV	1	99.296	1	99.296	1	99.296
UIN	QUINCY RGNL-BALDWIN FLD	IL	LPV200	1	99.301	1	99.300	1	99.300
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	1	99.300	1	99.300	1	99.296
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	1	99.300	1	99.300	1	99.300
50I	KENTLAND MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
AID	ANDERSON MUNICIPAL-DARLINGTON FLD	IN	LPV	1	99.300	1	99.300	1	99.296
ASW	WARSAW MUNICIPAL	IN	LPV200	1	99.300	1	99.300	1	99.296
BAK	COLUMBUS MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.300
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	1	99.305	1	99.300	1	99.300
BMG	MONROE COUNTY	IN	LPV200	1	99.303	1	99.300	1	99.300
C62	KENDALLVILLE MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
C65	PLYMOUTH MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
CEV	METTEL FLD	IN	LPV	1	99.300	1	99.300	1	99.300
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	1	99.300	1	99.300	1	99.300
DCY	DAVIESS COUNTY	IN	LPV	1	99.306	1	99.300	1	99.300
EKM	ELKHART MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
EVV	EVANSVILLE RGNL	IN	LPV200	1	99.306	1	99.300	1	99.300
EYE	EAGLE CREEK AIRPARK	IN	LPV	1	99.300	1	99.300	1	99.300
FKR	FRANKFORT CLINTON COUNTY RGNL	IN	LPV	1	99.300	1	99.300	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
FRH	FRENCH LICK MUNICIPAL	IN	LPV	1	99.306	1	99.300	1	99.300
FWA	FORT WAYNE INTL	IN	LPV200	1	99.300	1	99.300	1	99.296
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.300
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	1	99.300	1	99.300	1	99.296
GPC	PUTNAM COUNTY RGNL	IN	LPV	1	99.300	1	99.300	1	99.300
GSH	GOSHEN MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
GWB	DE KALB COUNTY	IN	LPV	1	99.300	1	99.300	1	99.296
GYY	GARY/CHICAGO INTL	IN	LPV200	1	99.300	1	99.300	1	99.296
HFY	INDY SOUTH GREENWOOD	IN	LPV	1	99.300	1	99.300	1	99.300
HNB	HUNTINGBURG	IN	LPV	1	99.306	1	99.300	1	99.300
HUF	TERRE HAUTE RGNL	IN	LPV200	1	99.300	1	99.300	1	99.300
I22	RANDOLPH COUNTY	IN	LPV	1	99.300	1	99.300	1	99.296
I76	PERU MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
IMS	MADISON MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.300
IND	INDIANAPOLIS INTL	IN	LPV200	1	99.300	1	99.300	1	99.300
JVY	CLARK RGNL	IN	LPV200	1	99.306	1	99.300	1	99.300
LAF	PURDUE UNIVERSITY	IN	LPV	1	99.300	1	99.300	1	99.296
MCX	WHITE COUNTY	IN	LP	1	99.300	1	99.300	1	99.296
MIE	DELAWARE COUNTY RGNL	IN	LPV	1	99.300	1	99.300	1	99.296
MQJ	INDIANAPOLIS RGNL	IN	LPV200	1	99.300	1	99.300	1	99.300
MZZ	MARION MUNICIPAL - MCKINNEY FLD	IN	LPV200	1	99.300	1	99.300	1	99.296
OKK	KOKOMO MUNICIPAL	IN	LPV200	1	99.300	1	99.300	1	99.296
OVO	NORTH VERNON	IN	LPV	1	99.300	1	99.300	1	99.300
OXI	STARKE COUNTY	IN	LPV	1	99.300	1	99.300	1	99.296
PLD	PORTLAND MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
PPO	LA PORTE MUNICIPAL	IN	LPV	1	99.300	1	99.300	1	99.296
RCR	FULTON COUNTY	IN	LPV	1	99.300	1	99.300	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RID	RICHMOND MUNICIPAL	IN	LPV200	1	99.300	1	99.300	1	99.300
RWN	ARENS FLD	IN	LPV	1	99.300	1	99.300	1	99.296
RZL	JASPER COUNTY	IN	LPV	1	99.300	1	99.300	1	99.296
SBN	SOUTH BEND INTL	IN	LPV200	1	99.300	1	99.300	1	99.296
SER	FREEMAN MUNICIPAL	IN	LPV	1	99.303	1	99.300	1	99.300
SIV	SULLIVAN COUNTY	IN	LPV	1	99.304	1	99.300	1	99.300
SMD	SMITH FLD	IN	LPV	1	99.300	1	99.300	1	99.296
TEL	PERRY COUNTY MUNICIPAL	IN	LP	1	99.306	1	99.300	1	99.300
TYQ	INDIANAPOLIS EXEC	IN	LPV	1	99.300	1	99.300	1	99.300
UWL	NEW CASTLE HENRY COUNTY MARLAT	IN	LPV	1	99.300	1	99.300	1	99.300
VPZ	PORTER COUNTY RGNL	IN	LPV	1	99.300	1	99.300	1	99.296
1QK	GOVE COUNTY	KS	LPV	1	99.307	1	99.303	1	99.300
3AU	AUGUSTA MUNICIPAL	KS	LP	1	99.307	1	99.304	1	99.300
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
3K7	MARK HOARD MEML	KS	LPV	1	99.307	1	99.303	1	99.300
3K8	COMANCHE COUNTY	KS	LPV	1	99.307	1	99.304	1	99.300
5K2	TRIBUNE MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
9K8	KINGMAN/CLYDE CESSNA FLD	KS	LP	1	99.307	1	99.304	1	99.300
AAO	COLONEL JAMES JABARA	KS	LPV	1	99.307	1	99.304	1	99.300
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	1	99.307	1	99.303	1	99.300
ANY	ANTHONY MUNICIPAL	KS	LPV	1	99.307	1	99.304	1	99.300
BEC	BEECH FACTORY	KS	LPV	1	99.307	1	99.304	1	99.300
CBK	SHALZ FLD	KS	LPV	1	99.307	1	99.303	1	99.300
CFV	COFFEYVILLE MUNICIPAL	KS	LPV	1	99.307	1	99.306	1	99.300
CNK	BLOSSER MUNICIPAL	KS	LP	1	99.307	1	99.301	1	99.300
DDC	DODGE CITY RGNL	KS	LPV200	1	99.307	1	99.304	1	99.300
EGT	WELLINGTON MUNICIPAL	KS	LPV200	1	99.307	1	99.304	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EHA	ELKHART-MORTON COUNTY	KS	LPV	1	99.307	1	99.307	1	99.301
EMP	EMPORIA MUNICIPAL	KS	LPV	1	99.307	1	99.304	1	99.300
EQA	EL DORADO/CAPT JACK THOMAS MEM	KS	LPV200	1	99.307	1	99.304	1	99.300
EWK	NEWTON-CITY-COUNTY	KS	LPV	1	99.307	1	99.304	1	99.300
FOE	TOPEKA RGNL	KS	LPV	1	99.307	1	99.303	1	99.300
FSK	FORT SCOTT MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
GBD	GREAT BEND MUNICIPAL	KS	LPV200	1	99.307	1	99.304	1	99.300
GCK	GARDEN CITY RGNL	KS	LPV	1	99.307	1	99.303	1	99.300
GLD	RENNER FLD /GOODLAND MUNICIPAL/	KS	LPV200	1	99.307	1	99.303	1	99.300
HLC	HILL CITY MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
HQG	HUGOTON MUNICIPAL	KS	LPV	1	99.307	1	99.307	1	99.300
HRU	HERINGTON RGNL	KS	LPV	1	99.307	1	99.304	1	99.300
HUT	HUTCHINSON RGNL	KS	LPV200	1	99.307	1	99.304	1	99.300
HYS	HAYS RGNL	KS	LPV200	1	99.307	1	99.303	1	99.300
ICT	WICHITA DWIGHT D EISENHOWER NT	KS	LPV200	1	99.307	1	99.304	1	99.300
IDP	INDEPENDENCE MUNICIPAL	KS	LPV200	1	99.307	1	99.304	1	99.300
IXD	NEW CENTURY AIRCENTER	KS	LPV	1	99.307	1	99.300	1	99.300
K38	WASHINGTON COUNTY VETERAN'S ME	KS	LPV	1	99.307	1	99.300	1	99.300
K78	ABILENE MUNICIPAL	KS	LPV	1	99.307	1	99.304	1	99.300
K79	JETMORE MUNICIPAL	KS	LPV	1	99.307	1	99.304	1	99.300
K81	MIAMI COUNTY	KS	LPV	1	99.307	1	99.303	1	99.300
K82	SMITH CENTER MUNICIPAL	KS	LPV200	1	99.307	1	99.300	1	99.300
K88	ALLEN COUNTY	KS	LPV	1	99.307	1	99.303	1	99.300
LBL	LIBERAL MID-AMERICA RGNL	KS	LPV200	1	99.307	1	99.307	1	99.300
LQR	LARNED-PAWNEE COUNTY	KS	LPV	1	99.307	1	99.304	1	99.300
LWC	LAWRENCE RGNL	KS	LPV200	1	99.307	1	99.300	1	99.300
LYO	LYONS-RICE COUNTY MUNICIPAL	KS	LPV	1	99.307	1	99.304	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MHK	MANHATTAN RGNL	KS	LPV200	1	99.307	1	99.304	1	99.300
MPR	MC PHERSON	KS	LPV	1	99.307	1	99.304	1	99.300
MYZ	MARYSVILLE MUNICIPAL	KS	LPV	1	99.307	1	99.300	1	99.300
NRN	NORTON MUNICIPAL	KS	LPV	1	99.307	1	99.302	1	99.300
OEL	OAKLEY MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
OIN	OBERLIN MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
OJC	JOHNSON COUNTY EXEC	KS	LPV	1	99.307	1	99.300	1	99.300
OWI	OTTAWA MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	1	99.307	1	99.301	1	99.300
PPF	TRI-CITY	KS	LPV	1	99.307	1	99.303	1	99.300
PTS	ATKINSON MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
PTT	PRATT RGNL	KS	LPV	1	99.307	1	99.304	1	99.300
RCP	ROOKS COUNTY RGNL	KS	LPV	1	99.307	1	99.303	1	99.300
RPB	BELLEVILLE MUNICIPAL	KS	LPV	1	99.307	1	99.300	1	99.300
RSL	RUSSELL MUNICIPAL	KS	LPV	1	99.307	1	99.304	1	99.300
SLN	SALINA RGNL	KS	LPV	1	99.307	1	99.304	1	99.300
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
TQK	SCOTT CITY MUNICIPAL	KS	LPV	1	99.307	1	99.303	1	99.300
UKL	COFFEY COUNTY	KS	LPV	1	99.307	1	99.303	1	99.300
ULS	ULYSSES	KS	LPV	1	99.307	1	99.304	1	99.300
WLD	STROTHER FLD	KS	LPV	1	99.307	1	99.304	1	99.300
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	1	99.300	1	99.300	1	99.300
18I	MC CREARY COUNTY	KY	LP	1	99.300	1	99.300	1	99.300
1M7	FULTON	KY	LPV	1	99.307	1	99.307	1	99.300
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	1	99.300	1	99.300	1	99.300
2I0	MADISONVILLE RGNL	KY	LPV	1	99.306	1	99.300	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	1	99.307	1	99.306	1	99.300
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
5M9	MARION-CRITTENDEN COUNTY JAMES	KY	LPV	1	99.307	1	99.302	1	99.300
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	1	99.300	1	99.300	1	99.300
AAS	TAYLOR COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
BRY	SAMUELS FLD	KY	LPV	1	99.300	1	99.300	1	99.300
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	1	99.300	1	99.300	1	99.300
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
CEY	KYLE-OAKLEY FLD	KY	LPV	1	99.307	1	99.306	1	99.300
CPF	WENDELL H FORD	KY	LPV200	1	99.300	1	99.300	1	99.297
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	1	99.300	1	99.300	1	99.300
DVK	STUART POWELL FLD	KY	LPV	1	99.300	1	99.300	1	99.300
DWU	ASHLAND RGNL	KY	LP	1	99.300	1	99.296	1	99.296
EHR	HENDERSON CITY-COUNTY	KY	LPV	1	99.306	1	99.300	1	99.300
EKQ	WAYNE COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
EKX	ADDINGTON FLD	KY	LPV	1	99.300	1	99.300	1	99.300
FFT	CAPITAL CITY	KY	LPV	1	99.300	1	99.300	1	99.300
FGX	FLEMING-MASON	KY	LPV	1	99.300	1	99.300	1	99.296
GLW	GLASGOW MUNICIPAL	KY	LPV	1	99.300	1	99.300	1	99.300
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	1	99.307	1	99.306	1	99.300
I93	BRECKINRIDGE COUNTY	KY	LPV	1	99.306	1	99.300	1	99.300
IOB	MOUNT STERLING/MONTGOMERY COUN	KY	LPV	1	99.300	1	99.300	1	99.296
JQD	OHIO COUNTY	KY	LPV	1	99.306	1	99.300	1	99.300
K24	RUSSELL COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
K62	GENE SNYDER	KY	LP	1	99.300	1	99.300	1	99.300
KY8	HANCOCK COUNTY/RON LEWIS FLD	KY	LPV	1	99.306	1	99.300	1	99.300
LEX	BLUE GRASS	KY	LPV	1	99.300	1	99.300	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LOU	BOWMAN FLD	KY	LPV	1	99.300	1	99.300	1	99.300
LOZ	LONDON/CORBIN/MAGEE	KY	LPV	1	99.300	1	99.300	1	99.300
M20	LEITCHFIELD-GRAYSON COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
M21	MUHLENBERG COUNTY	KY	LP	1	99.307	1	99.302	1	99.300
M25	MAYFIELD GRAVES COUNTY	KY	LPV	1	99.307	1	99.306	1	99.300
OWB	OWENSBORO/DAVIESS COUNTY RGNL	KY	LPV200	1	99.306	1	99.300	1	99.300
PAH	BARKLEY RGNL	KY	LPV200	1	99.307	1	99.306	1	99.300
PBX	PIKE COUNTY/HATCHER FLD	KY	LPV200	1	99.300	1	99.300	1	99.296
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	1	99.300	1	99.300	1	99.300
SDF	LOUISVILLE MUHAMMAD ALI INTL	KY	LPV200	1	99.300	1	99.300	1	99.300
SJS	BIG SANDY RGNL	KY	LPV	1	99.300	1	99.300	1	99.296
SME	LAKE CUMBERLAND RGNL	KY	LPV	1	99.300	1	99.300	1	99.300
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	1	99.300	1	99.300	1	99.296
TWT	STURGIS MUNICIPAL	KY	LPV	1	99.306	1	99.300	1	99.300
TZV	TOMPKINSVILLE/MONROE COUNTY	KY	LPV	1	99.300	1	99.300	1	99.300
0R4	CONCORDIA PARISH	LA	LPV	1	99.312	1	99.308	2	99.306
0R7	THE RED RIVER	LA	LPV	1	99.310	1	99.307	1	99.306
3R4	HART	LA	LPV	1	99.310	1	99.307	1	99.306
3R7	JENNINGS	LA	LPV	1	99.307	1	99.307	5	99.299
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	1	99.307	1	99.307	2	99.301
ACP	ALLEN PARISH	LA	LPV	1	99.307	1	99.307	2	99.302
AEX	ALEXANDRIA INTL	LA	LPV200	1	99.310	1	99.307	2	99.305
APS	PORT OF SOUTH LOUISIANA EXEC R	LA	LPV	1	99.310	1	99.307	51	99.191
ARA	ACADIANA RGNL	LA	LPV200	1	99.307	1	99.307	22	99.270
BQP	MOREHOUSE MEML	LA	LPV	1	99.310	1	99.307	1	99.307
BTR	BATON ROUGE METRO` RYAN FLD	LA	LPV200	1	99.310	1	99.307	37	99.270
BXA	GEORGE R CARR MEML AIR FLD	LA	LPV	1	99.310	1	99.310	43	99.255

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CWF	CHENNAULT INTL	LA	LPV200	1	99.307	1	99.307	2	99.300
DTN	SHREVEPORT DOWNTOWN	LA	LPV	1	99.310	1	99.307	1	99.306
ESF	ESLER RGNL	LA	LPV200	1	99.310	1	99.307	2	99.305
F88	JONESBORO	LA	LP	1	99.310	1	99.307	1	99.307
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	1	99.310	1	99.307	65	99.131
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	1	99.310	1	99.307	45	99.240
HUM	HOUMA-TERREBONNE	LA	LPV200	1	99.310	1	99.307	63	99.140
HZR	FALSE RIVER RGNL	LA	LPV	1	99.310	1	99.307	15	99.292
IER	NATCHITOCHES RGNL	LA	LPV	1	99.310	1	99.307	1	99.307
IYA	ABBEVILLE CHRIS CRUSTA MEML	LA	LPV	1	99.307	1	99.307	17	99.275
L39	LEESVILLE	LA	LPV	1	99.308	1	99.307	2	99.305
LCH	LAKE CHARLES RGNL	LA	LPV200	1	99.307	1	99.307	2	99.297
LFT	LAFAYETTE RGNL/PAUL FOURNET FL	LA	LPV200	1	99.307	1	99.307	14	99.279
M79	JOHN H HOOKS JR MEML	LA	LPV	1	99.310	1	99.307	1	99.307
MLU	MONROE RGNL	LA	LPV200	1	99.310	1	99.307	1	99.307
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	1	99.310	1	99.307	57	99.181
NEW	LAKEFRONT	LA	LPV	1	99.310	1	99.307	56	99.186
OPL	ST LANDRY PARISH-AHART FLD	LA	LPV	1	99.308	1	99.307	8	99.297
PTN	HARRY P WILLIAMS MEML	LA	LPV200	1	99.310	1	99.307	55	99.204
REG	LOUISIANA RGNL	LA	LPV	1	99.310	1	99.307	50	99.230
RSN	RUSTON RGNL	LA	LPV	1	99.310	1	99.307	1	99.307
SHV	SHREVEPORT RGNL	LA	LPV200	1	99.310	1	99.307	1	99.306
SPH	SPRINGHILL	LA	LPV	1	99.310	1	99.307	1	99.306
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	1	99.310	1	99.310	1	99.307
UXL	SOUTHLAND FLD	LA	LPV	1	99.307	1	99.307	2	99.297
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	1	99.296	1	99.296	1	99.289
ACK	NANTUCKET MEML	MA	LPV200	1	99.296	1	99.296	2	99.286

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BAF	WESTFIELD-BARNES RGNL	MA	LPV	1	99.296	1	99.296	1	99.289
BED	LAURENCE G HANSCOM FLD	MA	LPV200	1	99.296	1	99.296	1	99.288
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	1	99.296	1	99.296	1	99.288
BVY	BEVERLY RGNL	MA	LPV	1	99.296	1	99.296	1	99.288
EWB	NEW BEDFORD RGNL	MA	LPV200	1	99.296	1	99.296	2	99.288
GBR	WALTER J KOLADZA	MA	LP	1	99.296	1	99.296	1	99.289
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	1	99.296	1	99.296	2	99.288
HYA	CAPE COD GATEWAY	MA	LPV200	1	99.296	1	99.296	2	99.286
LWM	LAWRENCE MUNICIPAL	MA	LPV200	1	99.296	1	99.296	1	99.288
MVY	MARTHA'S VINEYARD	MA	LPV200	1	99.296	1	99.296	2	99.286
ORE	ORANGE MUNICIPAL	MA	LPV	1	99.296	1	99.296	1	99.288
ORH	WORCESTER RGNL	MA	LPV200	1	99.296	1	99.296	1	99.288
OWD	NORWOOD MEML	MA	LPV	1	99.296	1	99.296	2	99.288
PSF	PITTSFIELD MUNICIPAL	MA	LPV	1	99.296	1	99.296	1	99.289
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	1	99.296	1	99.296	2	99.287
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	1	99.296	1	99.296	2	99.287
TAN	TAUNTON MUNICIPAL - KING FLD	MA	LPV	1	99.296	1	99.296	2	99.288
CJA3	MORDEN REGIONAL	MB	LPV	1	99.289	1	99.289	5	99.244
CJJ4	DELORAINE	MB	LPV	1	99.288	1	99.288	4	99.263
CJW5	RUSSELL	MB	LPV	1	99.286	1	99.286	6	99.230
CKK7	STEINBACH (SOUTH)	MB	LPV	1	99.292	1	99.292	5	99.231
CKZ7	WINKLER	MB	LPV	1	99.289	1	99.289	5	99.243
CYAV	ST. ANDREWS	MB	LPV	1	99.289	1	99.289	8	99.214
CYBR	BRANDON MUNICIPALCIPALITY	MB	LPV	1	99.288	1	99.288	5	99.252
CYFO	FLIN FLON	MB	LPV	2	99.281	3	99.279	14	99.017
CYGX	GILLAM	MB	LPV	3	99.236	4	99.183	14	98.907
CYIV	ISLAND LAKE	MB	LPV	2	99.274	2	99.235	14	98.953

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYQD	THE PAS	MB	LPV	2	99.280	3	99.278	12	99.032
CYTH	THOMPSON	MB	LPV200	2	99.259	3	99.234	13	98.924
CYVD	R.J. (BOB) ANDREW FIELD REGIONAL	MB	LPV	1	99.288	1	99.288	4	99.256
CYWG	JAMES ARMSTRONG RICHARDSON INTL	MB	LPV200	1	99.289	1	99.289	7	99.226
CYYQ	CHURCHILL	MB	LPV	3	99.219	5	99.168	18	98.804
CZJG	JENPEG	MB	LPV	2	99.280	2	99.275	13	98.940
2G4	GARRETT COUNTY	MD	LPV	1	99.296	1	99.296	2	99.294
2W5	MARYLAND	MD	LP	1	99.296	1	99.296	3	99.291
2W6	ST MARY'S COUNTY RGNL	MD	LPV	1	99.296	1	99.296	3	99.289
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	1	99.296	1	99.296	3	99.293
CBE	GREATER CUMBERLAND RGNL	MD	LPV	1	99.296	1	99.296	2	99.293
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	1	99.296	1	99.296	3	99.290
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	1	99.296	1	99.296	2	99.294
ESN	EASTON/NEWNAM FLD	MD	LPV200	1	99.296	1	99.296	3	99.291
FDK	FREDERICK MUNICIPAL	MD	LPV	1	99.296	1	99.296	2	99.293
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	1	99.296	1	99.296	2	99.293
HGR	HAGERSTOWN RGNL/RICHARD A HENS	MD	LPV200	1	99.296	1	99.296	2	99.293
MTN	MARTIN STATE	MD	LPV	1	99.296	1	99.296	3	99.293
OXB	OCEAN CITY MUNICIPAL	MD	LPV	1	99.296	1	99.296	3	99.288
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	1	99.296	1	99.296	3	99.288
W29	BAY BRIDGE	MD	LPV	1	99.296	1	99.296	3	99.291
1B0	DEXTER RGNL	ME	LP	1	99.296	1	99.289	4	99.250
2B7	PITTSFIELD MUNICIPAL	ME	LPV	1	99.296	1	99.292	3	99.262
3B1	GREENVILLE MUNICIPAL	ME	LPV	1	99.289	1	99.289	5	99.245
59B	NEWTON FLD	ME	LP	1	99.288	1	99.288	5	99.242
81B	OXFORD COUNTY RGNL	ME	LP	1	99.296	1	99.296	2	99.283
AUG	AUGUSTA STATE	ME	LPV200	1	99.296	1	99.296	2	99.282

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BGR	BANGOR INTL	ME	LPV200	1	99.296	1	99.296	4	99.250
BHB	HANCOCK COUNTY/BAR HARBOR	ME	LPV200	1	99.296	1	99.296	5	99.255
BST	BELFAST MUNICIPAL	ME	LPV	1	99.296	1	99.296	3	99.278
BXM	BRUNSWICK EXEC	ME	LPV200	1	99.296	1	99.296	2	99.283
CAR	CARIBOU MUNICIPAL	ME	LPV	3	99.257	4	99.253	5	99.091
EPM	EASTPORT MUNICIPAL	ME	LPV	1	99.296	1	99.292	4	99.191
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV200	3	99.224	3	99.218	6	99.077
HUL	HOULTON INTL	ME	LP	2	99.267	3	99.267	6	99.148
IZG	EASTERN SLOPES RGNL	ME	LPV	1	99.296	1	99.296	2	99.283
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	1	99.296	1	99.296	2	99.283
LRG	LINCOLN RGNL	ME	LP	1	99.296	1	99.289	4	99.227
MLT	MILLINOCKET MUNICIPAL	ME	LPV	1	99.292	1	99.289	4	99.207
OWK	CENTRAL MAINE /NORRIDGEWOCK	ME	LPV	1	99.296	1	99.289	3	99.273
PQI	PRESQUE ISLE INTL	ME	LPV200	2	99.267	3	99.264	7	99.127
PWM	PORTLAND INTL JETPORT	ME	LPV200	1	99.296	1	99.296	2	99.285
RKD	KNOX COUNTY RGNL	ME	LPV200	1	99.296	1	99.296	3	99.281
SFM	SANFORD SEACOAST RGNL	ME	LPV200	1	99.296	1	99.296	1	99.285
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	1	99.296	1	99.292	3	99.281
48D	CLARE MUNICIPAL	MI	LP	1	99.296	1	99.296	1	99.292
4D0	ABRAMS MUNICIPAL	MI	LP	1	99.296	1	99.296	1	99.292
6Y1	BOIS BLANC ISLAND	MI	LP	1	99.296	1	99.296	3	99.282
77G	MARLETTE TOWNSHIP	MI	LPV	1	99.296	1	99.296	1	99.292
9D9	HASTINGS	MI	LPV	1	99.296	1	99.296	1	99.296
ACB	ANTRIM COUNTY	MI	LPV	1	99.296	1	99.296	2	99.289
ADG	LENAWEE COUNTY	MI	LPV	1	99.296	1	99.296	1	99.296
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	1	99.296	1	99.296	1	99.292
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	1	99.296	1	99.292	4	99.279

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
APN	ALPENA COUNTY RGNL	MI	LPV	1	99.296	1	99.296	2	99.289
ARB	ANN ARBOR MUNICIPAL	MI	LPV	1	99.296	1	99.296	1	99.296
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV200	1	99.296	1	99.296	1	99.296
BAX	HURON COUNTY MEML	MI	LPV	1	99.296	1	99.296	1	99.292
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	1	99.296	1	99.296	1	99.296
BIV	WEST MICHIGAN RGNL	MI	LPV200	1	99.296	1	99.296	1	99.296
BTL	BATTLE CREEK EXEC AT KELLOGG F	MI	LPV200	1	99.296	1	99.296	1	99.296
C04	OCEANA COUNTY	MI	LPV	1	99.296	1	99.296	1	99.292
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	1	99.296	1	99.296	1	99.296
CAD	WEXFORD COUNTY	MI	LPV200	1	99.296	1	99.296	2	99.289
CFS	TUSCOLA AREA	MI	LP	1	99.296	1	99.296	1	99.292
CIU	CHIPPEWA COUNTY INTL	MI	LPV	1	99.296	1	99.292	3	99.282
CMX	HOUGHTON COUNTY MEML	MI	LPV	1	99.296	2	99.295	5	99.259
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	1	99.296	1	99.296	3	99.283
D95	DUPONT-LAPEER	MI	LP	1	99.296	1	99.296	1	99.292
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	1	99.296	1	99.296	1	99.296
DTW	DETROIT METRO WAYNE COUNTY	MI	LPV200	1	99.296	1	99.296	1	99.296
ERY	LUCE COUNTY	MI	LPV	1	99.296	1	99.296	4	99.280
ESC	DELTA COUNTY	MI	LPV200	1	99.296	1	99.296	3	99.282
FFX	FREMONT MUNICIPAL	MI	LPV	1	99.296	1	99.296	1	99.292
FNT	BISHOP INTL	MI	LPV200	1	99.296	1	99.296	1	99.292
GDW	GLADWIN ZETTEL MEML	MI	LP	1	99.296	1	99.296	1	99.292
GLR	GAYLORD RGNL	MI	LPV	1	99.296	1	99.296	2	99.289
GRR	GERALD R FORD INTL	MI	LPV200	1	99.296	1	99.296	1	99.292
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	1	99.296	1	99.296	1	99.292
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	1	99.296	1	99.296	1	99.292
IKW	JACK BARSTOW	MI	LPV	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IMT	FORD	MI	LPV	1	99.296	1	99.296	3	99.279
IRS	KIRSCH MUNICIPAL	MI	LPV	1	99.296	1	99.296	1	99.296
ISQ	SCHOOLCRAFT COUNTY	MI	LP	1	99.296	1	99.296	3	99.279
IWD	GOGEBIC/IRON COUNTY	MI	LPV200	1	99.296	1	99.296	2	99.278
JXN	JACKSON COUNTY-REYNOLDS FLD	MI	LPV200	1	99.296	1	99.296	1	99.296
JYM	HILLSDALE MUNICIPAL	MI	LPV	1	99.296	1	99.296	1	99.296
LAN	CAPITAL REGION INTL	MI	LPV200	1	99.296	1	99.296	1	99.292
LDM	MASON COUNTY	MI	LPV	1	99.296	1	99.296	2	99.289
MBL	MANISTEE COUNTY/BLACKER	MI	LPV200	1	99.296	1	99.296	2	99.289
MBS	MBS INTL	MI	LPV200	1	99.296	1	99.296	1	99.292
MCD	MACKINAC ISLAND	MI	LPV	1	99.296	1	99.296	3	99.281
MKG	MUSKEGON COUNTY	MI	LPV200	1	99.296	1	99.296	1	99.292
MNM	MENOMINEE RGNL	MI	LPV200	1	99.296	1	99.296	3	99.283
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	1	99.296	1	99.296	1	99.292
N98	BOYNE CITY MUNICIPAL	MI	LP	1	99.296	1	99.296	3	99.286
OEB	BRANCH COUNTY MEML	MI	LPV	1	99.296	1	99.296	1	99.296
OGM	ONTONAGON COUNTY - SCHUSTER FL	MI	LPV	1	99.296	1	99.296	3	99.274
OSC	OSCODA-WURTSMITH	MI	LPV200	1	99.296	1	99.296	1	99.292
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	1	99.296	1	99.296	1	99.293
PHN	ST CLAIR COUNTY INTL	MI	LPV200	1	99.296	1	99.296	1	99.292
PLN	PELLSTON RGNL/EMMET COUNTY	MI	LPV200	1	99.296	1	99.296	3	99.282
PTK	OAKLAND COUNTY INTL	MI	LPV200	1	99.296	1	99.296	1	99.292
RMY	BROOKS FLD	MI	LP	1	99.296	1	99.296	1	99.296
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	1	99.296	1	99.296	1	99.292
RQB	ROBEN-HOOD	MI	LPV200	1	99.296	1	99.296	1	99.292
SAW	SAWYER INTL	MI	LPV200	1	99.296	1	99.296	3	99.280
SLH	CHEBOYGAN COUNTY	MI	LPV	1	99.296	1	99.296	3	99.286

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TEW	MASON JEWETT FLD	MI	LP	1	99.296	1	99.296	1	99.296
TTF	CUSTER	MI	LPV	1	99.296	1	99.296	1	99.296
TVC	CHERRY CAPITAL	MI	LPV200	1	99.296	1	99.296	2	99.289
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	1	99.296	1	99.296	1	99.292
Y70	IONIA COUNTY	MI	LPV	1	99.296	1	99.296	1	99.292
YIP	WILLOW RUN	MI	LPV200	1	99.296	1	99.296	1	99.296
16D	PERHAM MUNICIPAL	MN	LPV	1	99.296	1	99.296	3	99.280
3N8	MAHNOMEN COUNTY	MN	LPV	1	99.296	1	99.296	4	99.272
ACQ	WASECA MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.290
ADC	WADENA MUNICIPAL	MN	LPV	1	99.296	1	99.296	3	99.284
AEL	ALBERT LEA MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.290
AIT	AITKIN MUNICIPAL/STEVE KURTZ FLD	MN	LPV	1	99.296	1	99.296	2	99.278
ANE	ANOKA COUNTY-BLAINE (JANES FLD	MN	LPV	1	99.296	1	99.296	2	99.289
AUM	AUSTIN MUNICIPAL	MN	LPV200	1	99.296	1	99.296	2	99.291
AXN	CHANDLER FLD	MN	LPV	1	99.296	1	99.296	2	99.285
BBB	BENSON MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
BDE	BAUDETTE INTL	MN	LPV	1	99.292	1	99.292	5	99.235
BDH	WILLMAR MUNICIPAL/JOHN L RICE FLD	MN	LPV200	1	99.296	1	99.296	2	99.289
BJI	BEMIDJI RGNL	MN	LPV200	1	99.296	1	99.296	3	99.268
BRD	BRAINERD LAKES RGNL	MN	LPV200	1	99.296	1	99.296	3	99.277
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.285
CFE	BUFFALO MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	1	99.296	1	99.295	4	99.254
CKN	CROOKSTON MUNICIPAL/KIRKWOOD FLD	MN	LPV	1	99.292	1	99.292	4	99.272
CNB	MYERS FLD	MN	LPV	1	99.296	1	99.296	2	99.289
COQ	CLOQUET/CARLTON COUNTY	MN	LPV	1	99.296	1	99.296	3	99.276
CQM	COOK MUNICIPAL	MN	LP	1	99.292	1	99.292	5	99.247

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
D39	SAUK CENTRE MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.285
D42	SPRINGFIELD MUNICIPAL	MN	LP	1	99.296	1	99.296	2	99.289
DLH	DULUTH INTL	MN	LPV200	1	99.296	1	99.296	4	99.275
DTL	DETROIT LAKES/WETHING FLD	MN	LPV	1	99.296	1	99.296	3	99.280
DVP	SLAYTON MUNICIPAL	MN	LP	1	99.296	1	99.296	2	99.289
DXX	LAC QUI PARLE COUNTY	MN	LPV200	1	99.296	1	99.296	2	99.289
ELO	ELY MUNICIPAL	MN	LPV200	1	99.296	1	99.293	4	99.257
ETH	WHEATON MUNICIPAL	MN	LP	1	99.296	1	99.296	2	99.285
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	1	99.296	1	99.292	5	99.270
FBL	FARIBAULT MUNICIPAL-LIZ WALL STROHF	MN	LPV	1	99.296	1	99.296	2	99.289
FCM	FLYING CLOUD	MN	LPV200	1	99.296	1	99.296	2	99.289
FFM	FERGUS FALLS MUNICIPAL/EINAR MICKEL	MN	LPV200	1	99.296	1	99.296	2	99.285
FKA	FILLMORE COUNTY	MN	LPV	1	99.296	1	99.296	2	99.292
FOZ	BIGFORK MUNICIPAL	MN	LP	1	99.292	1	99.292	4	99.267
FRM	FAIRMONT MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
FSE	FOSSTON MUNICIPAL-ANDERSON FLD	MN	LP	1	99.292	1	99.292	4	99.266
GHW	GLENWOOD MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.285
GPZ	GRAND RAPIDS/ITASCA COUNTY-GOR	MN	LPV200	1	99.296	1	99.296	4	99.272
GYL	GLENCOE MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
HCD	HUTCHINSON MUNICIPAL/BUTLER FLD	MN	LPV	1	99.296	1	99.296	2	99.289
HCO	HALLOCK MUNICIPAL	MN	LPV	1	99.292	1	99.292	5	99.257
HIB	RANGE RGNL	MN	LPV200	1	99.296	1	99.292	5	99.270
INL	FALLS INTL/EINARSON FLD	MN	LPV	1	99.292	1	99.292	6	99.222
JKJ	MOORHEAD MUNICIPAL	MN	LPV	1	99.292	1	99.292	3	99.280
JMR	MORA MUNICIPAL	MN	LPV	1	99.296	1	99.296	3	99.279
JYG	ST JAMES MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
LJF	LITCHFIELD MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LVN	AIRLAKE	MN	LPV200	1	99.296	1	99.296	2	99.289
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	1	99.296	1	99.296	2	99.285
LYV	QUENTIN AANENSON FLD	MN	LPV200	1	99.296	1	99.296	2	99.291
MJQ	JACKSON MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
MKT	MANKATO RGNL	MN	LPV200	1	99.296	1	99.296	2	99.289
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	1	99.296	1	99.296	2	99.289
MOX	MORRIS MUNICIPAL/CHARLIE SCHMIDT FL	MN	LPV	1	99.296	1	99.296	2	99.289
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	1	99.296	1	99.296	2	99.289
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	1	99.296	1	99.296	2	99.289
MWM	WINDOM MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	1	99.296	1	99.296	2	99.278
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	1	99.296	1	99.296	2	99.289
ORB	ORR RGNL	MN	LP	1	99.292	1	99.292	5	99.246
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	1	99.296	1	99.296	2	99.289
OWA	OWATONNA DEGNER RGNL	MN	LPV200	1	99.296	1	99.296	2	99.290
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	1	99.296	1	99.296	2	99.289
PKD	PARK RAPIDS MUNICIPAL/KONSHOK FLD	MN	LPV200	1	99.296	1	99.296	3	99.274
PQN	PIPESTONE MUNICIPAL	MN	LPV200	1	99.296	1	99.296	2	99.290
RGK	RED WING RGNL	MN	LPV200	1	99.296	1	99.296	2	99.289
ROS	RUSH CITY RGNL	MN	LPV	1	99.296	1	99.296	3	99.281
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FLD	MN	LPV	1	99.292	1	99.292	5	99.251
RRT	WARROAD INTL MEML	MN	LPV200	1	99.292	1	99.292	6	99.240
RST	ROCHESTER INTL	MN	LPV200	1	99.296	1	99.296	2	99.291
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
SAZ	STAPLES MUNICIPAL	MN	LPV	1	99.296	1	99.296	3	99.280
SBU	BLUE EARTH MUNICIPAL	MN	LPV	1	99.296	1	99.296	2	99.289
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	1	99.296	1	99.296	2	99.289

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
STC	ST CLOUD RGNL	MN	LPV200	1	99.296	1	99.296	2	99.285
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	1	99.296	1	99.296	2	99.289
TOB	DODGE CENTER	MN	LPV	1	99.296	1	99.296	2	99.291
TVF	THIEF RIVER FALLS RGNL	MN	LPV	1	99.292	1	99.292	3	99.266
TWM	RICHARD B HELGESON	MN	LPV	1	99.296	1	99.293	4	99.275
ULM	NEW ULM MUNICIPAL	MN	LPV200	1	99.296	1	99.296	2	99.289
VVV	ORTONVILLE MUNICIPAL-MARTINSON FLD	MN	LP	1	99.296	1	99.296	2	99.285
Y49	WALKER MUNICIPAL	MN	LP	1	99.296	1	99.296	3	99.271
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	1	99.296	1	99.296	2	99.285
03D	MEMPHIS MEML	MO	LPV	1	99.300	1	99.300	1	99.300
1H0	CREVE COEUR	MO	LPV	1	99.303	1	99.300	1	99.300
1MO	MOUNTAIN GROVE MEML	MO	LP	1	99.307	1	99.301	1	99.300
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	1	99.307	1	99.306	1	99.300
6M6	LEWIS COUNTY RGNL	MO	LPV	1	99.300	1	99.300	1	99.300
8WC	WASHINGTON COUNTY	MO	LPV	1	99.307	1	99.303	1	99.300
94K	CASSVILLE MUNICIPAL	MO	LPV	1	99.307	1	99.307	1	99.300
AIZ	LEE C FINE MEML	MO	LPV	1	99.307	1	99.300	1	99.300
BBG	BRANSON	MO	LPV200	1	99.307	1	99.307	1	99.300
BUM	BUTLER MEML	MO	LPV	1	99.307	1	99.303	1	99.300
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	1	99.307	1	99.306	1	99.300
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	1	99.300	1	99.300	1	99.300
COU	COLUMBIA RGNL	MO	LPV200	1	99.300	1	99.300	1	99.300
DMO	SEDALIA RGNL	MO	LPV	1	99.303	1	99.300	1	99.300
DXE	DEXTER MUNICIPAL	MO	LPV	1	99.307	1	99.306	1	99.300
EIW	COUNTY MEML	MO	LPV	1	99.307	1	99.307	1	99.300
EOS	NEOSHO HUGH ROBINSON	MO	LPV	1	99.307	1	99.307	1	99.300
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	1	99.300	1	99.300	1	99.299

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EZZ	CAMERON MEML	MO	LPV	1	99.303	1	99.300	1	99.300
FAM	FARMINGTON RGNL	MO	LPV	1	99.307	1	99.304	1	99.300
FTT	ELTON HENSLEY MEML	MO	LPV	1	99.300	1	99.300	1	99.300
FWB	BRANSON WEST MUNICIPAL - EMERSON FL	MO	LPV200	1	99.307	1	99.307	1	99.300
FYG	WASHINGTON RGNL	MO	LPV	1	99.302	1	99.302	1	99.300
GLY	CLINTON RGNL	MO	LPV	1	99.307	1	99.306	1	99.300
GPH	MIDWEST NTL AIR CENTER	MO	LPV	1	99.303	1	99.300	1	99.300
H19	BOWLING GREEN MUNICIPAL	MO	LPV	1	99.301	1	99.300	1	99.300
H79	ELDON MODEL AIRPARK	MO	LP	1	99.303	1	99.300	1	99.300
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	1	99.307	1	99.304	1	99.300
HAE	HANNIBAL RGNL	MO	LPV	1	99.300	1	99.300	1	99.300
HFJ	MONETT RGNL	MO	LPV	1	99.307	1	99.307	1	99.300
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	1	99.303	1	99.300	1	99.300
IRK	KIRKSVILLE RGNL	MO	LPV200	1	99.300	1	99.300	1	99.300
JEF	JEFFERSON CITY MEML	MO	LPV	1	99.300	1	99.300	1	99.300
JLN	JOPLIN RGNL	MO	LPV	1	99.307	1	99.306	1	99.300
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	1	99.307	1	99.300	1	99.300
K57	GOULD PETERSON MUNICIPAL	MO	LPV	1	99.306	1	99.300	1	99.299
K89	MACON-FOWER MEML	MO	LPV	1	99.300	1	99.300	1	99.300
LLU	LAMAR MUNICIPAL	MO	LPV	1	99.307	1	99.303	1	99.300
LRY	LAWRENCE SMITH MEML	MO	LPV	1	99.307	1	99.303	1	99.300
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	1	99.307	1	99.300	1	99.300
M05	CARUTHERSVILLE MEML	MO	LPV	1	99.307	1	99.307	1	99.306
M12	STEELE MUNICIPAL	MO	LPV	1	99.307	1	99.307	1	99.306
M17	BOLIVAR MUNICIPAL	MO	LPV	1	99.307	1	99.306	1	99.300
M48	HOUSTON MEML	MO	LPV	1	99.307	1	99.304	1	99.300
MAW	MALDEN RGNL	MO	LPV	1	99.307	1	99.306	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MBY	OMAR N BRADLEY	MO	LPV	1	99.300	1	99.300	1	99.300
MCI	KANSAS CITY INTL	MO	LPV200	1	99.307	1	99.300	1	99.300
MHL	MARSHALL MEML MUNICIPAL	MO	LPV	1	99.300	1	99.300	1	99.300
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	1	99.307	1	99.300	1	99.300
MNF	MOUNTAIN VIEW	MO	LP	1	99.307	1	99.306	1	99.300
MO3	STOCKTON MUNICIPAL	MO	LP	1	99.307	1	99.306	1	99.300
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	1	99.300	1	99.300	1	99.300
MYJ	MEXICO MEML	MO	LPV	1	99.300	1	99.300	1	99.300
NVD	NEVADA MUNICIPAL	MO	LPV200	1	99.307	1	99.303	1	99.300
OZS	CAMDENTON MEML-LAKE RGNL	MO	LPV	1	99.307	1	99.300	1	99.300
PCD	PERRYVILLE RGNL	MO	LPV	1	99.307	1	99.301	1	99.300
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	1	99.307	1	99.307	1	99.300
POF	POPLAR BLUFF RGNL BUSINESS	MO	LPV	1	99.307	1	99.305	1	99.300
RAW	WARSAW MUNICIPAL	MO	LPV200	1	99.307	1	99.306	1	99.300
RCM	SKYHAVEN	MO	LPV	1	99.307	1	99.300	1	99.300
SGF	SPRINGFIELD-BRANSON NTL	MO	LPV	1	99.307	1	99.306	1	99.300
SIK	SIKESTON MEML MUNICIPAL	MO	LPV	1	99.307	1	99.306	1	99.300
STJ	ROSECRANS MEML	MO	LPV200	1	99.307	1	99.300	1	99.300
STL	ST LOUIS LAMBERT INTL	MO	LPV200	1	99.303	1	99.300	1	99.300
SUS	SPIRIT OF ST LOUIS	MO	LPV200	1	99.303	1	99.301	1	99.300
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	1	99.307	1	99.301	1	99.300
TKX	KENNETT MEML	MO	LPV	1	99.307	1	99.307	1	99.306
TRX	TRENTON MUNICIPAL	MO	LPV	1	99.300	1	99.300	1	99.300
UBX	CUBA MUNICIPAL	MO	LPV	1	99.307	1	99.302	1	99.300
UNO	WEST PLAINS RGNL	MO	LPV	1	99.307	1	99.306	1	99.300
UUV	SULLIVAN RGNL	MO	LPV	1	99.303	1	99.302	1	99.300
VER	JESSE VIERTEL MEML	MO	LPV	1	99.300	1	99.300	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VIH	ROLLA NTL	MO	LPV	1	99.307	1	99.301	1	99.300
0R0	COLUMBIA/MARION COUNTY	MS	LPV	1	99.310	1	99.310	28	99.285
17M	MAGEE MUNICIPAL	MS	LP	1	99.314	1	99.310	2	99.303
5A4	OKOLONA MUNICIPAL/RICHARD STOVALL F	MS	LPV	1	99.310	1	99.310	1	99.307
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	1	99.310	1	99.310	1	99.307
87I	YAZOO COUNTY	MS	LPV	1	99.310	1	99.310	1	99.307
8M1	BOONEVILLE/BALDWYN	MS	LPV	1	99.310	1	99.310	1	99.307
CKM	FLETCHER FLD	MS	LPV	1	99.310	1	99.307	1	99.307
CRX	ROSCOE TURNER	MS	LPV200	1	99.310	1	99.310	1	99.307
GLH	GREENVILLE MID-DELTA	MS	LPV200	1	99.312	1	99.310	1	99.307
GNF	GRENADA MUNICIPAL	MS	LPV	1	99.310	1	99.310	1	99.307
GPT	GULFPORT-BILOXI INTL	MS	LPV200	1	99.310	1	99.310	43	99.224
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	1	99.310	1	99.310	1	99.307
GWO	GREENWOOD-LEFLORE	MS	LPV	1	99.310	1	99.310	1	99.307
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	1	99.310	1	99.310	28	99.281
HEZ	HARDY-ANDERS FLD/NATCHEZ-ADAMS	MS	LPV200	1	99.313	1	99.310	1	99.307
HKS	HAWKINS FLD	MS	LPV	1	99.310	1	99.310	1	99.307
HSA	STENNIS INTL	MS	LPV200	1	99.310	1	99.307	48	99.217
IDL	INDIANOLA MUNICIPAL	MS	LPV	1	99.312	1	99.310	1	99.307
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	1	99.310	1	99.310	1	99.307
JVW	JOHN BELL WILLIAMS	MS	LPV200	1	99.310	1	99.310	1	99.307
LMS	LOUISVILLE/WINSTON COUNTY	MS	LPV	1	99.310	1	99.310	1	99.307
LUL	HESLER-NOBLE FLD	MS	LPV	1	99.310	1	99.310	10	99.294
M11	COPIAH COUNTY	MS	LPV	1	99.314	1	99.310	1	99.307
M40	MONROE COUNTY	MS	LPV	1	99.310	1	99.310	1	99.307
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	1	99.310	1	99.310	1	99.307
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	1	99.313	1	99.310	13	99.297

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MBO	BRUCE CAMPBELL FLD	MS	LPV	1	99.310	1	99.310	1	99.307
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	1	99.310	1	99.310	27	99.289
MEI	KEY FLD	MS	LPV200	1	99.310	1	99.310	2	99.302
MJD	PICAYUNE MUNICIPAL	MS	LPV	1	99.310	1	99.310	49	99.227
MMS	SELFS	MS	LPV	1	99.310	1	99.308	1	99.307
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	1	99.310	1	99.310	1	99.307
OLV	OLIVE BRANCH/TAYLOR FLD	MS	LPV200	1	99.310	1	99.310	1	99.307
PIB	HATTIESBURG/LAUREL RGNL	MS	LPV200	1	99.310	1	99.310	17	99.291
PMU	PANOLA COUNTY	MS	LPV	1	99.310	1	99.309	1	99.307
PQL	TRENT LOTT INTL	MS	LPV200	1	99.310	1	99.310	40	99.233
RNV	CLEVELAND MUNICIPAL	MS	LPV	1	99.310	1	99.310	1	99.307
STF	GEORGE M BRYAN	MS	LPV200	1	99.310	1	99.310	1	99.307
TUP	TUPELO RGNL	MS	LPV200	1	99.310	1	99.310	1	99.307
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	1	99.310	1	99.310	1	99.307
UOX	UNIVERSITY-OXFORD	MS	LPV	1	99.310	1	99.310	1	99.307
UTA	TUNICA MUNICIPAL	MS	LPV200	1	99.310	1	99.310	1	99.307
VKS	VICKSBURG MUNICIPAL	MS	LP	1	99.310	1	99.310	1	99.307
00U	BIG HORN COUNTY	MT	LPV200	1	99.286	1	99.286	1	99.286
1S3	TILLITT FLD	MT	LPV	1	99.289	1	99.289	1	99.286
4U6	CIRCLE TOWN COUNTY	MT	LPV	1	99.288	1	99.288	1	99.285
6S0	BIG TIMBER	MT	LPV	1	99.286	1	99.286	1	99.286
6S8	LAUREL MUNICIPAL	MT	LPV	1	99.286	1	99.286	1	99.286
7S0	RONAN	MT	LPV	1	99.286	1	99.286	1	99.281
7S1	TWIN BRIDGES	MT	LPV	1	99.286	1	99.286	1	99.285
BHK	BAKER MUNICIPAL	MT	LPV	1	99.288	1	99.288	1	99.285
BIL	BILLINGS LOGAN INTL	MT	LPV200	1	99.286	1	99.286	1	99.286
BTM	BERT MOONEY	MT	LPV	1	99.286	1	99.286	1	99.282

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	1	99.286	1	99.286	1	99.285
CII	CHOTEAU	MT	LPV200	1	99.286	1	99.286	1	99.282
CTB	CUT BANK INTL	MT	LPV200	1	99.286	1	99.286	1	99.282
DLN	DILLON	MT	LPV	1	99.286	1	99.286	1	99.285
EKS	ENNIS BIG SKY	MT	LPV	1	99.286	1	99.286	1	99.285
GDV	DAWSON COMMUNICIPALTY	MT	LPV	1	99.288	1	99.288	1	99.285
GGW	WOKAL FLD/GLASGOW-VALLEY COUNT	MT	LPV200	1	99.288	1	99.285	1	99.285
GPI	GLACIER PARK INTL	MT	LPV	1	99.286	1	99.286	1	99.278
GTF	GREAT FALLS INTL	MT	LPV200	1	99.286	1	99.286	1	99.282
HLN	HELENA RGNL	MT	LPV	1	99.286	1	99.286	1	99.285
HRF	RAVALLI COUNTY	MT	LPV	1	99.286	1	99.286	1	99.282
HVR	HAVRE CITY-COUNTY	MT	LPV	1	99.286	1	99.286	1	99.282
HWQ	WHEATLAND COUNTY AT HARLOWTON	MT	LPV	1	99.286	1	99.286	1	99.286
LVM	MISSION FLD	MT	LP	1	99.286	1	99.286	1	99.286
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	1	99.286	1	99.286	1	99.285
M75	MALTA	MT	LP	1	99.286	1	99.286	1	99.282
MLS	FRANK WILEY FLD	MT	LPV	1	99.288	1	99.288	1	99.285
MSO	MISSOULA MONTANA	MT	LPV200	1	99.286	1	99.286	1	99.281
OLF	L M CLAYTON	MT	LPV200	1	99.288	1	99.288	1	99.285
PO1	POPLAR MUNICIPAL	MT	LPV200	1	99.288	1	99.288	1	99.285
PWD	SHER-WOOD	MT	LPV200	1	99.288	1	99.288	1	99.285
RPX	ROUNDUP	MT	LPV	1	99.286	1	99.286	1	99.286
RVF	RUBY VALLEY FLD	MT	LPV	1	99.286	1	99.286	1	99.285
S01	CONRAD	MT	LPV	1	99.286	1	99.286	1	99.282
SBX	SHELBY	MT	LPV	1	99.286	1	99.286	1	99.282
SDY	SIDNEY-RICHLAND RGNL	MT	LPV	1	99.288	1	99.288	1	99.285
WYS	YELLOWSTONE	MT	LPV200	1	99.286	1	99.286	1	99.286

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CCE3	JUNIPER	NB	LP	3	99.253	4	99.251	6	99.111
CCN2	GRAND MANAN	NB	LPV	1	99.296	1	99.296	6	99.191
CCR3	FLORENCEVILLE	NB	LPV	2	99.267	3	99.265	7	99.131
CDJ4	CLEARWATER	NB	LPV	4	99.247	4	99.235	5	99.086
CYCH	MIRAMICHI	NB	LPV	5	99.175	5	99.157	5	99.062
CYCL	CHARLO	NB	LPV	4	99.147	4	99.140	6	99.046
CYFC	FREDERICTON INTL	NB	LPV	2	99.268	3	99.266	5	99.137
CYQM	GREATER MONCTON ROMEO LEBLANC INTL	NB	LPV200	5	99.202	5	99.198	6	99.088
CYSJ	SAINT JOHN	NB	LPV	2	99.292	2	99.285	5	99.139
CYSL	ST. LEONARD	NB	LPV	4	99.243	4	99.239	6	99.072
CZBF	BATHURST	NB	LPV	5	99.159	5	99.149	6	99.044
43A	MONTGOMERY COUNTY	NC	LP	1	99.307	1	99.307	3	99.281
7W6	HYDE COUNTY	NC	LP	1	99.303	1	99.303	3	99.279
ACZ	HENDERSON FLD	NC	LPV	1	99.307	1	99.307	3	99.277
AFP	ANSON COUNTY/JEFF CLOUD FLD	NC	LPV	1	99.314	1	99.314	3	99.281
AKH	GASTONIA MUNICIPAL	NC	LPV	1	99.314	1	99.314	2	99.288
ASJ	TRI-COUNTY AT HENRY JOYNER FIE	NC	LPV	1	99.300	1	99.300	3	99.280
AVL	ASHEVILLE RGNL	NC	LPV200	1	99.314	1	99.314	2	99.296
BUY	BURLINGTON/ALAMANCE RGNL	NC	LPV	1	99.300	1	99.300	3	99.283
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	1	99.314	1	99.314	2	99.288
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	1	99.314	1	99.311	3	99.278
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	1	99.307	1	99.307	3	99.277
DPL	DUPLIN COUNTY	NC	LPV200	1	99.307	1	99.307	3	99.277
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	1	99.300	1	99.300	3	99.280
EDE	NORTHEASTERN RGNL	NC	LPV200	1	99.300	1	99.300	3	99.279
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	1	99.314	1	99.314	2	99.293
EQY	CHARLOTTE/MONROE EXEC	NC	LPV200	1	99.314	1	99.314	3	99.284

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EWN	COASTAL CAROLINA RGNL	NC	LPV	1	99.307	1	99.307	3	99.280
EXX	DAVIDSON COUNTY	NC	LPV	1	99.300	1	99.300	3	99.286
EYF	CURTIS L BROWN JR FLD	NC	LPV	1	99.310	1	99.310	3	99.278
FAY	FAYETTEVILLE RGNL/GRANNIS FLD	NC	LPV200	1	99.309	1	99.309	3	99.279
FFA	FIRST FLIGHT	NC	LP	1	99.300	1	99.300	3	99.279
FQD	RUTHERFORD COUNTY/MARCHMAN FLD	NC	LPV	1	99.307	1	99.307	2	99.294
GEV	ASHE COUNTY	NC	LP	1	99.300	1	99.300	2	99.290
GSO	PIEDMONT TRIAD INTL	NC	LPV200	1	99.300	1	99.300	3	99.286
GWW	WAYNE EXEC JETPORT	NC	LPV200	1	99.303	1	99.303	3	99.281
HBI	ASHEBORO RGNL	NC	LPV	1	99.300	1	99.300	3	99.282
HKY	HICKORY RGNL	NC	LPV200	1	99.302	1	99.302	2	99.290
HNZ	HENDERSON/OXFORD	NC	LPV	1	99.300	1	99.300	3	99.280
HRJ	HARNETT RGNL JETPORT	NC	LPV	1	99.307	1	99.307	3	99.280
ILM	WILMINGTON INTL	NC	LPV200	1	99.313	1	99.307	3	99.275
INT	SMITH REYNOLDS	NC	LPV200	1	99.300	1	99.300	3	99.286
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	1	99.307	1	99.307	2	99.289
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	1	99.307	1	99.307	3	99.280
IXA	HALIFAX/NORTHAMPTON RGNL	NC	LPV200	1	99.300	1	99.300	3	99.280
JNX	JOHNSTON RGNL	NC	LPV	1	99.300	1	99.300	3	99.280
JQF	CONCORD-PADGETT RGNL	NC	LPV	1	99.307	1	99.307	3	99.287
LBT	LUMBERTON RGNL	NC	LPV	1	99.314	1	99.312	3	99.278
LHZ	TRIANGLE NORTH EXEC	NC	LPV200	1	99.300	1	99.300	3	99.282
MCZ	MARTIN COUNTY	NC	LPV	1	99.300	1	99.300	3	99.281
MEB	LAURINBURG/MAXTON	NC	LPV200	1	99.310	1	99.310	3	99.279
MQI	DARE COUNTY RGNL	NC	LPV	1	99.300	1	99.300	3	99.279
MRH	MICHAEL J SMITH FLD	NC	LPV	1	99.307	1	99.307	3	99.276
MRN	FOOTHILLS RGNL	NC	LPV	1	99.300	1	99.300	2	99.291

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	1	99.300	1	99.300	2	99.286
OAJ	ALBERT J ELLIS	NC	LPV200	1	99.307	1	99.307	3	99.277
OCW	WASHINGTON-WARREN	NC	LPV	1	99.301	1	99.301	3	99.281
ONX	CURRITUCK COUNTY RGNL	NC	LPV	1	99.300	1	99.300	3	99.280
PGV	PITT-GREENVILLE	NC	LPV	1	99.300	1	99.300	3	99.281
PMZ	PLYMOUTH MUNICIPAL	NC	LP	1	99.300	1	99.300	3	99.280
RCZ	RICHMOND COUNTY	NC	LPV	1	99.314	1	99.314	3	99.280
RDU	RALEIGH-DURHAM INTL	NC	LPV200	1	99.300	1	99.300	3	99.281
RHP	WESTERN CAROLINA RGNL	NC	LP	1	99.310	1	99.310	1	99.303
RUQ	MID-CAROLINA RGNL	NC	LPV200	1	99.303	1	99.303	3	99.287
RWI	ROCKY MOUNT/WILSON RGNL	NC	LPV	1	99.300	1	99.300	3	99.281
SCR	SILER CITY MUNICIPAL	NC	LPV	1	99.300	1	99.300	3	99.282
SOP	MOORE COUNTY	NC	LPV200	1	99.307	1	99.307	3	99.280
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	1	99.314	1	99.311	3	99.275
SVH	STATESVILLE RGNL	NC	LPV200	1	99.300	1	99.300	2	99.289
TDF	RALEIGH RGNL AT PERSON COUNTY	NC	LPV200	1	99.300	1	99.300	3	99.282
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	1	99.300	1	99.300	3	99.280
UKF	WILKES COUNTY	NC	LPV200	1	99.300	1	99.300	2	99.291
VUJ	STANLY COUNTY	NC	LPV200	1	99.307	1	99.307	3	99.283
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	1	99.300	1	99.300	3	99.281
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	1	99.307	1	99.307	3	99.278
ZEF	ELKIN MUNICIPAL	NC	LP	1	99.300	1	99.300	2	99.290
06D	ROLLA MUNICIPAL	ND	LPV	1	99.289	1	99.289	3	99.264
20U	BEACH	ND	LPV	1	99.288	1	99.288	1	99.285
2C8	CAVALIER MUNICIPAL	ND	LPV	1	99.292	1	99.292	4	99.261
3H4	HILLSBORO MUNICIPAL	ND	LPV	1	99.292	1	99.292	4	99.278
46D	CARRINGTON MUNICIPAL	ND	LPV	1	99.292	1	99.292	2	99.281

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4E7	ELLENDALE MUNICIPAL	ND	LPV	1	99.292	1	99.292	2	99.282
51D	EDGELEY MUNICIPAL	ND	LPV	1	99.292	1	99.292	2	99.281
5L0	LAKOTA MUNICIPAL	ND	LPV	1	99.292	1	99.292	4	99.270
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	1	99.292	1	99.292	2	99.281
6L3	LISBON MUNICIPAL	ND	LPV	1	99.292	1	99.292	2	99.281
7L2	LINTON MUNICIPAL	ND	LPV	1	99.292	1	99.292	1	99.288
9D7	CANDO MUNICIPAL	ND	LPV	1	99.292	1	99.292	4	99.267
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	1	99.292	1	99.292	2	99.281
BIS	BISMARCK MUNICIPAL	ND	LPV200	1	99.292	1	99.292	1	99.288
BWP	HARRY STERN	ND	LPV	1	99.296	1	99.296	2	99.285
BWW	BOWMAN RGNL	ND	LPV	1	99.288	1	99.288	1	99.285
D05	GARRISON MUNICIPAL	ND	LPV	1	99.289	1	99.289	2	99.283
D09	BOTTINEAU MUNICIPAL	ND	LPV	1	99.288	1	99.288	4	99.264
D55	ROBERTSON FLD	ND	LPV	1	99.292	1	99.292	5	99.265
D57	GLEN ULLIN RGNL	ND	LPV	1	99.293	1	99.293	1	99.285
D60	TIOGA MUNICIPAL	ND	LPV	1	99.288	1	99.288	2	99.282
DIK	DICKINSON/THEODORE ROOSEVELT R	ND	LPV200	1	99.288	1	99.288	1	99.285
DVL	DEVILS LAKE RGNL	ND	LPV200	1	99.292	1	99.292	3	99.270
FAR	HECTOR INTL	ND	LPV200	1	99.292	1	99.292	3	99.280
GAF	HUTSON FLD	ND	LPV	1	99.292	1	99.292	5	99.270
GFK	GRAND FORKS INTL	ND	LPV	1	99.292	1	99.292	4	99.270
GWR	GWINNER-ROGER MELROE FLD	ND	LPV	1	99.292	1	99.292	2	99.282
HEI	HETTINGER/JB LINDQUIST RGNL	ND	LPV	1	99.293	1	99.293	1	99.285
HZE	MERCER COUNTY RGNL	ND	LPV	1	99.292	1	99.292	1	99.285
ISN	SLOULIN FLD INTL	ND	LPV200	1	99.288	1	99.288	1	99.285
JMS	JAMESTOWN RGNL	ND	LPV200	1	99.292	1	99.292	2	99.281
K74	ROBERT ODEGAARD FLD	ND	LP	1	99.292	1	99.292	2	99.281

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MOT	MINOT INTL	ND	LPV	1	99.288	1	99.288	3	99.278
RUG	RUGBY MUNICIPAL	ND	LP	1	99.289	1	99.289	4	99.267
S25	WATFORD CITY MUNICIPAL	ND	LPV	1	99.288	1	99.288	1	99.285
XWA	WILLISTON BASIN INTL	ND	LPV200	1	99.288	1	99.288	1	99.285
Y19	MANDAN RGNL/LAWLER FLD	ND	LPV	1	99.292	1	99.292	1	99.288
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	1	99.307	1	99.300	1	99.300
08K	HARVARD STATE	NE	LPV	1	99.307	1	99.300	1	99.300
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	1	99.300	1	99.296	1	99.292
0C4	PENDER MUNICIPAL	NE	LPV	1	99.300	1	99.296	1	99.296
0F4	LOUP CITY MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.296
0G3	TECUMSEH MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
0V3	PIONEER VILLAGE FLD	NE	LPV	1	99.307	1	99.300	1	99.300
12K	SUPERIOR MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
47V	CURTIS MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
4D9	ALMA MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
4V9	ANTELOPE COUNTY	NE	LPV	1	99.300	1	99.296	1	99.296
6K3	CREIGHTON MUNICIPAL	NE	LPV	1	99.300	1	99.296	1	99.292
7V7	RED CLOUD MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	1	99.300	1	99.296	1	99.293
93Y	DAVID CITY MUNICIPAL	NE	LPV	1	99.300	1	99.300	1	99.300
9V5	MODISETT	NE	LPV	1	99.307	1	99.296	1	99.288
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.299
AHQ	WAHOO MUNICIPAL	NE	LPV	1	99.300	1	99.300	1	99.299
AIA	ALLIANCE MUNICIPAL	NE	LPV200	1	99.307	1	99.296	1	99.293
ANW	AINSWORTH RGNL	NE	LPV200	1	99.307	1	99.296	1	99.293
AUH	AURORA MUNICIPAL - AL POTTER FLD	NE	LPV	1	99.307	1	99.300	1	99.300
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	1	99.307	1	99.300	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	1	99.307	1	99.296	1	99.289
BIE	BEATRICE MUNICIPAL	NE	LPV200	1	99.307	1	99.300	1	99.300
BTA	BLAIR MUNICIPAL	NE	LPV	1	99.300	1	99.300	1	99.296
BUB	CRAM FLD	NE	LPV	1	99.307	1	99.300	1	99.296
BVN	ALBION MUNICIPAL	NE	LPV	1	99.300	1	99.300	1	99.296
CDR	CHADRON MUNICIPAL	NE	LPV200	1	99.307	1	99.296	1	99.288
CEK	CRETE MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
CZD	COZAD MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
EAR	KEARNEY RGNL	NE	LPV200	1	99.307	1	99.300	1	99.300
FBY	FAIRBURY MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
FET	FREMONT MUNICIPAL	NE	LPV	1	99.300	1	99.300	1	99.296
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	1	99.307	1	99.300	1	99.300
FNB	BRENNER FLD	NE	LPV	1	99.307	1	99.300	1	99.300
GGF	GRANT MUNICIPAL	NE	LPV	1	99.307	1	99.302	1	99.300
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	1	99.307	1	99.300	1	99.300
GRN	GORDON MUNICIPAL	NE	LPV	1	99.307	1	99.296	1	99.289
HDE	BREWSTER FLD	NE	LPV	1	99.307	1	99.300	1	99.300
HSI	HASTINGS MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FL	NE	LPV	1	99.307	1	99.300	1	99.293
IML	IMPERIAL MUNICIPAL	NE	LPV	1	99.307	1	99.303	1	99.300
JYR	YORK MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
K01	FARINGTON FLD	NE	LPV	1	99.307	1	99.300	1	99.300
LBF	NORTH PLATTE RGNL/LEE BIRD FLD	NE	LPV200	1	99.307	1	99.300	1	99.300
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	1	99.300	1	99.296	1	99.296
LNK	LINCOLN	NE	LPV200	1	99.303	1	99.300	1	99.299
LXN	JIM KELLY FLD	NE	LPV	1	99.307	1	99.300	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MCK	MC COOK BEN NELSON RGNL	NE	LPV	1	99.307	1	99.302	1	99.300
MLE	MILLARD	NE	LPV	1	99.300	1	99.300	1	99.299
ODX	EVELYN SHARP FLD	NE	LPV	1	99.307	1	99.300	1	99.296
OFK	NORFOLK RGNL/KARL STEFAN MEML	NE	LPV200	1	99.300	1	99.296	1	99.296
OGA	SEARLE FLD	NE	LPV	1	99.307	1	99.300	1	99.300
OKS	GARDEN COUNTY/KING RHILEY FLD	NE	LPV	1	99.307	1	99.300	1	99.293
OLU	COLUMBUS MUNICIPAL	NE	LPV	1	99.300	1	99.300	1	99.296
OMA	EPPLEY AIRFIELD	NE	LPV200	1	99.300	1	99.300	1	99.296
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	1	99.300	1	99.296	1	99.293
PMV	PLATTSMOUTH MUNICIPAL/DOUGLAS V DUE	NE	LPV	1	99.300	1	99.300	1	99.299
RBE	ROCK COUNTY	NE	LPV	1	99.304	1	99.296	1	99.293
SCB	SCRIBNER STATE	NE	LPV	1	99.300	1	99.300	1	99.296
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FLD	NE	LPV	1	99.307	1	99.300	1	99.293
SWT	SEWARD MUNICIPAL	NE	LPV	1	99.307	1	99.300	1	99.300
TIF	THOMAS COUNTY	NE	LPV	1	99.307	1	99.296	1	99.293
TQE	TEKAMAH MUNICIPAL	NE	LPV	1	99.300	1	99.299	1	99.296
VTN	MILLER FLD	NE	LPV	1	99.307	1	99.296	1	99.293
ASH	BOIRE FLD	NH	LPV200	1	99.296	1	99.296	1	99.288
CON	CONCORD MUNICIPAL	NH	LPV	1	99.296	1	99.296	1	99.288
DAW	SKYHAVEN	NH	LPV	1	99.296	1	99.296	1	99.286
EEN	DILLANT/HOPKINS	NH	LPV	1	99.296	1	99.296	1	99.288
HIE	MOUNT WASHINGTON RGNL	NH	LPV	1	99.296	1	99.292	2	99.283
LCI	LACONIA MUNICIPAL	NH	LPV	1	99.296	1	99.296	1	99.288
LEB	LEBANON MUNICIPAL	NH	LPV	1	99.296	1	99.296	1	99.288
MHT	MANCHESTER BOSTON RGNL	NH	LPV200	1	99.296	1	99.296	1	99.288
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	1	99.296	1	99.296	1	99.286
47N	CENTRAL JERSEY RGNL	NJ	LP	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4N1	GREENWOOD LAKE	NJ	LP	1	99.296	1	99.296	1	99.292
ACY	ATLANTIC CITY INTL	NJ	LPV200	1	99.296	1	99.296	3	99.292
CDW	ESSEX COUNTY	NJ	LPV	1	99.296	1	99.296	1	99.292
EWR	NEWARK LIBERTY INTL	NJ	LPV200	1	99.296	1	99.296	1	99.292
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	1	99.296	1	99.296	3	99.292
MJX	OCEAN COUNTY	NJ	LPV	1	99.296	1	99.296	3	99.291
MMU	MORRISTOWN MUNICIPAL	NJ	LPV200	1	99.296	1	99.296	1	99.292
N12	LAKEWOOD	NJ	LP	1	99.296	1	99.296	3	99.291
N14	FLYING W	NJ	LPV	1	99.296	1	99.296	3	99.291
N40	SKY MANOR	NJ	LP	1	99.296	1	99.296	2	99.292
TEB	TETERBORO	NJ	LPV	1	99.296	1	99.296	1	99.292
TTN	TRENTON MERCER	NJ	LPV	1	99.296	1	99.296	3	99.292
VAY	SOUTH JERSEY RGNL	NJ	LP	1	99.296	1	99.296	3	99.291
WWD	CAPE MAY COUNTY	NJ	LPV	1	99.296	1	99.296	3	99.290
CVB2	VOISEY'S BAY	NL	LPV	6	99.041	6	98.988	16	98.718
CYDF	DEER LAKE	NL	LPV200	4	99.029	4	99.028	11	98.845
CYJT	STEPHENVILLE	NL	LPV	5	99.055	5	99.055	9	98.869
CYQX	GANDER INTL	NL	LPV200	5	99.000	5	98.972	49	98.469
CYWK	WABUSH	NL	LPV	4	99.012	4	98.986	9	98.915
CYYR	GOOSE BAY	NL	LPV	5	99.020	5	99.001	18	98.780
CYYT	ST. JOHN'S INTL	NL	LPV	7	98.994	27	98.940	105	97.807
CZUM	CHURCHILL FALLS	NL	LPV	5	99.005	4	98.983	11	98.877
LFVM	MIQUELON	NL	LPV	6	99.060	6	99.042	11	98.835
LFVP	ST PIERRE	NL	LPV	6	99.059	6	99.040	13	98.820
0E0	MORIARTY MUNICIPAL	NM	LPV	1	99.307	1	99.307	1	99.303
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	1	99.307	1	99.307	1	99.303
AEG	DOUBLE EAGLE II	NM	LPV200	1	99.307	1	99.307	1	99.303

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	1	99.307	1	99.307	18	99.260
ATS	ARTESIA MUNICIPAL	NM	LPV200	1	99.307	1	99.307	2	99.302
CAO	CLAYTON MUNICIPAL AIRPARK	NM	LPV	1	99.307	1	99.307	1	99.304
CNM	CAVERN CITY AIR TRML	NM	LPV200	1	99.307	1	99.307	2	99.302
CVN	CLOVIS RGNL	NM	LPV200	1	99.307	1	99.307	1	99.304
DMN	DEMING MUNICIPAL	NM	LPV	1	99.304	2	99.294	23	99.171
E06	LEA COUNTY/ZIP FRANKLIN MEML	NM	LPV	1	99.307	1	99.307	1	99.303
FMN	FOUR CORNERS RGNL	NM	LPV200	1	99.307	1	99.307	1	99.296
HOB	LEA COUNTY RGNL	NM	LPV	1	99.307	1	99.307	1	99.303
LAM	LOS ALAMOS	NM	LP	1	99.307	1	99.307	1	99.303
LRU	LAS CRUCES INTL	NM	LPV200	1	99.307	2	99.301	21	99.203
ONM	SOCORRO MUNICIPAL	NM	LP	1	99.307	1	99.307	10	99.268
ROW	ROSWELL AIR CENTER	NM	LPV	1	99.307	1	99.307	3	99.302
SAF	SANTA FE MUNICIPAL	NM	LPV200	1	99.307	1	99.307	1	99.303
SRR	SIERRA BLANCA RGNL	NM	LPV200	1	99.307	1	99.307	9	99.287
SVC	GRANT COUNTY	NM	LPV	1	99.304	2	99.294	23	99.170
CCQ3	DEBERT	NS	LPV	4	99.191	4	99.184	6	99.103
CYHZ	STANFIELD INTL	NS	LPV200	4	99.246	4	99.229	6	99.108
CYQI	YARMOUTH	NS	LPV	1	99.296	1	99.296	5	99.200
CYQY	J.A. DOUGLAS MCCURDY	NS	LPV200	4	99.133	4	99.130	6	99.002
CYTN	TRENTON	NS	LPV	4	99.182	4	99.173	6	99.059
CYZX	GREENWOOD	NS	LP	2	99.292	2	99.286	4	99.129
CDK2	DIAVIK	NT	LPV	1	99.282	2	99.272	24	98.830
CEU9	SAMBAA K'E	NT	LPV	1	99.275	1	99.274	8	99.175
CGK2	GAHCHO KUE	NT	LPV	1	99.281	2	99.274	23	98.829
CSK6	SNAP LAKE	NT	LPV	1	99.281	2	99.274	23	98.844
CYEV	INUVIK (MIKE ZUBKO)	NT	LPV	1	99.310	2	99.275	22	99.064

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYFR	FORT RESOLUTION	NT	LPV	1	99.282	1	99.277	15	99.025
CYFS	FORT SIMPSON	NT	LPV	1	99.275	1	99.273	14	99.135
CYGH	FORT GOOD HOPE	NT	LPV	1	99.288	2	99.274	19	99.069
CYHY	MERLYN CARTER AIRPORT	NT	LPV	1	99.282	1	99.282	14	99.094
CYJP	FORT PROVIDENCE	NT	LPV	1	99.281	1	99.274	14	99.096
CYKD	FREDDIE CARMICHAEL	NT	LPV	2	99.329	2	99.276	17	99.082
CYOA	EKATI	NT	LPV	1	99.282	2	99.272	25	98.820
CYOC	OLD CROW	NT	LPV	2	99.335	2	99.285	14	99.153
CYPC	PAULATUK (NORA ALIQATCHIALUK RUBEN)	NT	LPV	1	99.303	3	99.249	42	98.808
CYSM	FORT SMITH	NT	LPV	1	99.282	1	99.282	16	99.048
CYSY	SACHS HARBOUR (DAVID NASOGALUAK JR. SAARYUAQ)	NT	LPV	2	99.330	5	99.231	81	98.273
CYUB	JAMES GRUBEN	NT	LPV	1	99.310	3	99.263	31	98.980
CYVQ	NORMAN WELLS	NT	LPV	1	99.281	2	99.271	14	99.095
CYWJ	DELINE	NT	LPV	1	99.281	2	99.273	20	99.046
CYZF	YELLOWKNIFE	NT	LPV200	1	99.283	1	99.274	21	98.994
CZFM	FORT MCPHERSON	NT	LPV	2	99.328	2	99.278	16	99.127
CZFN	TULITA	NT	LPV	1	99.281	2	99.273	16	99.107
CMB2	MEADOWBANK	NU	LPV	3	99.234	6	99.122	29	98.397
CMR2	MARY RIVER	NU	LPV	325	96.014	361	94.808	1147	75.254
CYBK	BAKER LAKE	NU	LPV	3	99.235	5	99.118	29	98.463
CYCS	CHESTERFIELD INLET	NU	LPV	5	99.201	5	99.078	31	98.507
CYEK	ARVIAT	NU	LPV	4	99.228	4	99.169	28	98.686
CYFB	IQALUIT	NU	LPV200	11	98.993	18	98.881	79	97.799
CYRB	RESOLUTE BAY	NU	LPV	228	97.798	290	96.537	1444	70.090
CYRT	RANKIN INLET	NU	LPV	5	99.209	5	99.111	30	98.552
CYSK	SANIKILUAQ	NU	LPV	8	99.125	7	99.041	16	98.816
CYTE	KINNGAIT AIRPORT	NU	LPV	5	98.998	10	98.933	41	98.291

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYYH	TALOYOAK	NU	LPV	7	99.150	13	99.050	76	97.789
05U	EUREKA	NV	LP	1	99.304	1	99.304	1	99.285
10U	OWYHEE	NV	LPV200	1	99.293	1	99.289	1	99.285
67L	MESQUITE	NV	LP	1	99.307	1	99.304	1	99.296
BAM	BATTLE MOUNTAIN	NV	LPV	1	99.296	1	99.296	1	99.285
BVU	BOULDER CITY MUNICIPAL	NV	LP	1	99.307	1	99.304	1	99.296
CXP	CARSON CITY	NV	LP	1	99.296	1	99.296	2	99.277
ELY	ELY/YELLAND FLD	NV	LPV	1	99.306	1	99.306	1	99.293
HTH	HAWTHORNE INDUSTRIAL	NV	LP	1	99.296	1	99.296	2	99.267
LAS	HARRY REID INTL	NV	LPV200	1	99.306	1	99.304	2	99.296
LOL	DERBY FLD	NV	LPV	1	99.296	1	99.296	1	99.285
RNO	RENO/TAHOE INTL	NV	LPV	1	99.296	1	99.296	2	99.281
RTS	RENO/STEAD	NV	LPV	1	99.296	1	99.296	1	99.286
SPZ	SILVER SPRINGS	NV	LPV	1	99.296	1	99.296	2	99.279
TPH	TONOPAH	NV	LP	1	99.304	1	99.302	2	99.281
VGT	NORTH LAS VEGAS	NV	LP	1	99.306	1	99.304	1	99.296
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	1	99.296	1	99.296	1	99.285
06N	RANDALL	NY	LP	1	99.296	1	99.296	1	99.292
0G7	FINGER LAKES RGNL	NY	LPV	1	99.296	1	99.296	1	99.292
1B1	COLUMBIA COUNTY	NY	LPV	1	99.296	1	99.296	1	99.289
20N	KINGSTON-ULSTER	NY	LPV	1	99.296	1	99.296	1	99.292
44N	SKY ACRES	NY	LPV	1	99.296	1	99.296	1	99.292
4B6	TICONDEROGA MUNICIPAL	NY	LPV	1	99.296	1	99.296	1	99.288
5B2	SARATOGA COUNTY	NY	LPV	1	99.296	1	99.296	1	99.288
5G0	LE ROY	NY	LP	1	99.296	1	99.296	1	99.292
9G0	BUFFALO AIRFIELD	NY	LP	1	99.296	1	99.296	1	99.292
9G3	AKRON/JESSON FLD	NY	LP	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ALB	ALBANY INTL	NY	LPV200	1	99.296	1	99.296	1	99.289
ART	WATERTOWN INTL	NY	LPV200	1	99.296	1	99.296	1	99.289
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	1	99.296	1	99.296	1	99.292
BUF	BUFFALO NIAGARA INTL	NY	LPV200	1	99.296	1	99.296	1	99.292
ELM	ELMIRA/CORNING RGNL	NY	LPV200	1	99.296	1	99.296	1	99.292
ELZ	WELLSVILLE MUNICIPAL/TARANTINE FLD	NY	LPV200	1	99.296	1	99.296	1	99.292
FOK	FRANCIS S GABRESKI	NY	LPV200	1	99.296	1	99.296	2	99.290
FRG	REPUBLIC	NY	LPV200	1	99.296	1	99.296	2	99.291
FZY	OSWEGO COUNTY	NY	LPV	1	99.296	1	99.296	1	99.292
GFL	FLOYD BENNETT MEML	NY	LPV200	1	99.296	1	99.296	1	99.288
GVQ	GENESEE COUNTY	NY	LPV200	1	99.296	1	99.296	1	99.292
HPN	WESTCHESTER COUNTY	NY	LPV	1	99.296	1	99.296	1	99.292
HTF	HORNELL MUNICIPAL	NY	LPV	1	99.296	1	99.296	1	99.292
HTO	EAST HAMPTON	NY	LPV	1	99.296	1	99.296	2	99.290
HWV	BROOKHAVEN	NY	LPV	1	99.296	1	99.296	2	99.291
IAG	NIAGARA FALLS INTL	NY	LPV	1	99.296	1	99.296	1	99.292
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	1	99.296	1	99.296	2	99.291
ITH	ITHACA TOMPKINS INTL	NY	LPV	1	99.296	1	99.296	1	99.292
IUA	CANANDAIGUA	NY	LPV	1	99.296	1	99.296	1	99.292
JFK	JOHN F KENNEDY INTL	NY	LPV200	1	99.296	1	99.296	2	99.291
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	1	99.296	1	99.296	1	99.292
K09	PISECO	NY	LP	1	99.296	1	99.296	1	99.288
LGA	LAGUARDIA	NY	LPV	1	99.296	1	99.296	1	99.292
MAL	MALONE-DUFORT	NY	LPV	1	99.296	1	99.292	1	99.288
MGJ	ORANGE COUNTY	NY	LPV	1	99.296	1	99.296	1	99.292
MSS	MASSENA INTL-RICHARDS FLD	NY	LPV	1	99.296	1	99.292	1	99.288
MSV	SULLIVAN COUNTY INTL	NY	LPV	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
N23	SIDNEY MUNICIPAL	NY	LP	1	99.296	1	99.296	1	99.292
N66	ALBERT S NADER RGNL	NY	LPV	1	99.296	1	99.296	1	99.292
NY0	FULTON COUNTY	NY	LPV	1	99.296	1	99.296	1	99.289
OGS	OGDENSBURG INTL	NY	LPV	1	99.296	1	99.293	1	99.288
OIC	LT WARREN EATON	NY	LP	1	99.296	1	99.296	1	99.292
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	1	99.296	1	99.296	1	99.292
PBG	PLATTSBURGH INTL	NY	LPV	1	99.296	1	99.292	1	99.288
PEO	PENN YAN	NY	LPV	1	99.296	1	99.296	1	99.292
POU	HUDSON VALLEY RGNL	NY	LPV	1	99.296	1	99.296	1	99.292
RME	GRIFFISS INTL	NY	LPV200	1	99.296	1	99.296	1	99.289
ROC	FREDERICK DOUGLASS/GREATER ROC	NY	LPV200	1	99.296	1	99.296	1	99.292
SCH	SCHENECTADY COUNTY	NY	LPV200	1	99.296	1	99.296	1	99.289
SDC	WILLIAMSON-SODUS	NY	LPV	1	99.296	1	99.296	1	99.292
SLK	ADIRONDACK RGNL	NY	LPV200	1	99.296	1	99.296	1	99.288
SWF	NEW YORK STEWART INTL	NY	LPV200	1	99.296	1	99.296	1	99.292
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	1	99.296	1	99.296	1	99.292
VGC	HAMILTON MUNICIPAL	NY	LPV	1	99.296	1	99.296	1	99.292
0G6	WILLIAMS COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
10G	HOLMES COUNTY	OH	LP	1	99.296	1	99.296	1	99.296
16G	SENECA COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	1	99.296	1	99.296	1	99.296
1G0	WOOD COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
1G3	KENT STATE UNIVERSITY	OH	LPV	1	99.296	1	99.296	1	99.296
2G2	GEARY A BATES/JEFFERSON COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
4G5	MONROE COUNTY	OH	LP	1	99.296	1	99.296	1	99.296
4I3	KNOX COUNTY	OH	LPV200	1	99.296	1	99.296	1	99.296
5A1	NORWALK-HURON COUNTY	OH	LP	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
6G5	BARNESVILLE-BRADFIELD	OH	LP	1	99.296	1	99.296	1	99.296
7G8	GEAUGA COUNTY	OH	LP	1	99.296	1	99.296	1	99.296
AKR	AKRON FULTON INTL	OH	LP	1	99.296	1	99.296	1	99.296
AOH	LIMA ALLEN COUNTY	OH	LPV200	1	99.300	1	99.296	1	99.296
AXV	NEIL ARMSTRONG	OH	LPV	1	99.300	1	99.300	1	99.296
BJJ	WAYNE COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
BKL	BURKE LAKEFRONT	OH	LPV	1	99.296	1	99.296	1	99.296
CAK	AKRON-CANTON RGNL	OH	LPV200	1	99.296	1	99.296	1	99.296
CDI	CAMBRIDGE MUNICIPAL	OH	LP	1	99.296	1	99.296	1	99.296
CGF	CUYAHOGA COUNTY	OH	LPV200	1	99.296	1	99.296	1	99.296
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	1	99.296	1	99.296	1	99.296
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	1	99.300	1	99.296	1	99.296
CQA	LAKEFIELD	OH	LPV	1	99.300	1	99.300	1	99.296
CYO	PICKAWAY COUNTY MEML	OH	LPV	1	99.300	1	99.296	1	99.296
DAY	JAMES M COX DAYTON INTL	OH	LPV200	1	99.300	1	99.300	1	99.296
DLZ	DELAWARE MUNICIPAL/JIM MOORE FLD	OH	LPV	1	99.296	1	99.296	1	99.296
EDJ	BELLEFONTAINE RGNL	OH	LPV	1	99.300	1	99.296	1	99.296
EOP	PIKE COUNTY	OH	LP	1	99.300	1	99.296	1	99.296
FDY	FINDLAY	OH	LPV	1	99.296	1	99.296	1	99.296
FZI	FOSTORIA METRO	OH	LPV	1	99.296	1	99.296	1	99.296
GQQ	GALION MUNICIPAL	OH	LP	1	99.296	1	99.296	1	99.296
HAO	BUTLER COUNTY RGNL/HOGAN FLD	OH	LPV	1	99.300	1	99.300	1	99.300
HOC	HIGHLAND COUNTY	OH	LP	1	99.300	1	99.296	1	99.296
HZY	NORTHEAST OHIO RGNL	OH	LPV	1	99.296	1	99.296	1	99.296
I10	NOBLE COUNTY	OH	LP	1	99.296	1	99.296	1	99.296
I19	GREENE COUNTY/LEWIS A JACKSON	OH	LPV	1	99.300	1	99.300	1	99.296
I40	RICHARD DOWNING	OH	LPV	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
I66	CLINTON FLD	OH	LPV	1	99.300	1	99.300	1	99.296
I68	WARREN COUNTY/JOHN LANE FLD	OH	LPV	1	99.300	1	99.300	1	99.296
I69	CLERMONT COUNTY	OH	LP	1	99.300	1	99.300	1	99.296
I74	GRIMES FLD	OH	LPV	1	99.300	1	99.296	1	99.296
ILN	WILMINGTON AIR PARK	OH	LPV200	1	99.300	1	99.300	1	99.296
LCK	RICKENBACKER INTL	OH	LPV200	1	99.300	1	99.296	1	99.296
LHQ	FAIRFIELD COUNTY	OH	LPV200	1	99.300	1	99.296	1	99.296
LNN	LAKE COUNTY EXEC	OH	LPV	1	99.296	1	99.296	1	99.296
LPR	LORAIN COUNTY RGNL	OH	LPV200	1	99.296	1	99.296	1	99.296
LUK	CINCINNATI MUNICIPAL/LUNKEN FLD	OH	LPV	1	99.300	1	99.300	1	99.300
MFD	MANSFIELD LAHM RGNL	OH	LPV200	1	99.296	1	99.296	1	99.296
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	1	99.300	1	99.300	1	99.296
MNN	MARION MUNICIPAL	OH	LPV	1	99.296	1	99.296	1	99.296
MRT	UNION COUNTY	OH	LP	1	99.300	1	99.296	1	99.296
MWO	MIDDLETOWN RGNL/HOOK FLD	OH	LPV	1	99.300	1	99.300	1	99.300
OSU	OHIO STATE UNIVERSITY	OH	LPV200	1	99.300	1	99.296	1	99.296
OWX	PUTNAM COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
OXD	MIAMI UNIVERSITY	OH	LPV	1	99.300	1	99.300	1	99.300
PCW	ERIE-OTTAWA INTL	OH	LPV	1	99.296	1	99.296	1	99.296
PHD	HARRY CLEVER FLD	OH	LP	1	99.296	1	99.296	1	99.296
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	1	99.300	1	99.296	1	99.296
POV	PORTAGE COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
RZT	ROSS COUNTY	OH	LPV	1	99.300	1	99.296	1	99.296
S24	SANDUSKY COUNTY RGNL	OH	LPV	1	99.296	1	99.296	1	99.296
SCA	SIDNEY MUNICIPAL	OH	LPV	1	99.300	1	99.300	1	99.296
SGH	SPRINGFIELD/BECKLEY MUNICIPAL	OH	LPV200	1	99.300	1	99.300	1	99.296
TDZ	TOLEDO EXEC	OH	LPV	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TOL	EUGENE F KRANZ TOLEDO EXPRESS	OH	LPV200	1	99.296	1	99.296	1	99.296
TSO	CARROLL COUNTY-TOLSON	OH	LP	1	99.296	1	99.296	1	99.296
TZR	BOLTON FLD	OH	LPV	1	99.300	1	99.296	1	99.296
UNI	OHIO UNIVERSITY	OH	LPV200	1	99.300	1	99.296	1	99.296
USE	FULTON COUNTY	OH	LPV	1	99.296	1	99.296	1	99.296
UYF	MADISON COUNTY	OH	LPV	1	99.300	1	99.296	1	99.296
VES	DARKE COUNTY	OH	LPV	1	99.300	1	99.300	1	99.296
VTA	NEWARK-HEATH	OH	LP	1	99.300	1	99.296	1	99.296
YNG	YOUNGSTOWN/WARREN RGNL	OH	LPV	1	99.296	1	99.296	1	99.296
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	1	99.296	1	99.296	1	99.296
1F0	ARDMORE DOWNTOWN EXEC	OK	LP	1	99.307	1	99.307	1	99.307
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	1	99.307	1	99.307	1	99.300
1O4	THOMAS MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.307
2K4	SCOTT FLD	OK	LPV	1	99.307	1	99.307	1	99.305
3F7	JONES MEML	OK	LPV	1	99.307	1	99.307	1	99.307
4O4	MC CURTAIN COUNTY RGNL	OK	LP	1	99.307	1	99.307	1	99.306
6K4	FAIRVIEW MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.300
80F	ANTLERS MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.307
ADH	ADA RGNL	OK	LPV	1	99.307	1	99.307	1	99.307
ADM	ARDMORE MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.307
AVK	ALVA RGNL	OK	LPV	1	99.307	1	99.304	1	99.300
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	1	99.307	1	99.307	1	99.304
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.300
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.300
CHK	CHICKASHA MUNICIPAL	OK	LPV200	1	99.307	1	99.307	1	99.307
CLK	CLINTON RGNL	OK	LPV	1	99.307	1	99.307	1	99.307
CSM	CLINTON/SHERMAN	OK	LPV200	1	99.307	1	99.307	1	99.307

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CUH	CUSHING MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.307
DUA	DURANT RGNL/EAKER FLD	OK	LPV	1	99.307	1	99.307	1	99.307
DUC	HALLIBURTON FLD	OK	LPV200	1	99.307	1	99.307	1	99.307
ELK	ELK CITY RGNL BUSINESS	OK	LPV	1	99.307	1	99.307	1	99.307
F22	PERRY MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.300
FDR	FREDERICK RGNL	OK	LPV200	1	99.307	1	99.307	1	99.304
GCM	CLAREMORE RGNL	OK	LPV	1	99.307	1	99.307	1	99.306
GMJ	GROVE MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.300
GOK	GUTHRIE/EDMOND RGNL	OK	LPV	1	99.307	1	99.307	1	99.307
GUY	GUYMON MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.304
GZL	STIGLER RGNL	OK	LPV	1	99.307	1	99.307	1	99.306
H71	MID-AMERICA INDUSTRIAL	OK	LPV	1	99.307	1	99.307	1	99.306
HBR	HOBART RGNL	OK	LPV	1	99.307	1	99.307	1	99.307
HHW	STAN STAMPER MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.306
HSD	SUNDANCE	OK	LPV	1	99.307	1	99.307	1	99.307
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	1	99.307	1	99.307	1	99.307
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	1	99.307	1	99.307	1	99.306
MLC	MC ALESTER RGNL	OK	LPV	1	99.307	1	99.307	1	99.307
OJA	WEATHERFORD STAFFORD	OK	LPV	1	99.307	1	99.307	1	99.307
OKC	WILL ROGERS WORLD	OK	LPV200	1	99.307	1	99.307	1	99.307
OKM	OKMULGEE RGNL	OK	LPV200	1	99.307	1	99.307	1	99.307
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	1	99.307	1	99.307	1	99.307
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.307
PNC	PONCA CITY RGNL	OK	LPV	1	99.307	1	99.307	1	99.300
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	1	99.307	1	99.307	1	99.307
PWA	WILEY POST	OK	LPV200	1	99.307	1	99.307	1	99.307
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.307

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RKR	ROBERT S KERR	OK	LPV	1	99.307	1	99.307	1	99.306
RQO	EL RENO RGNL	OK	LPV	1	99.307	1	99.307	1	99.307
RVS	TULSA RIVERSIDE	OK	LPV200	1	99.307	1	99.307	1	99.307
SNL	SHAWNEE RGNL	OK	LPV200	1	99.307	1	99.307	1	99.307
SWO	STILLWATER RGNL	OK	LPV200	1	99.307	1	99.307	1	99.304
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	1	99.307	1	99.307	1	99.306
TUL	TULSA INTL	OK	LPV200	1	99.307	1	99.307	1	99.307
WDG	ENID WOODRING RGNL	OK	LPV200	1	99.307	1	99.307	1	99.300
WWR	WEST WOODWARD	OK	LPV	1	99.307	1	99.307	1	99.304
CNV8	EDENVALE	ON	LPV	1	99.296	1	99.296	1	99.292
CNY3	COLLINGWOOD	ON	LPV	1	99.296	1	99.296	1	99.292
CYAC	CAT LAKE	ON	LPV	1	99.289	4	99.252	9	99.030
CYAM	SAULT STE. MARIE	ON	LPV200	1	99.296	1	99.296	4	99.278
CYCC	CORNWALL REGIONAL	ON	LPV	1	99.296	1	99.292	1	99.285
CYCK	CHATHAM-KENT	ON	LPV	1	99.296	1	99.296	1	99.296
CYEE	HURONIA	ON	LPV	1	99.296	1	99.296	1	99.292
CYFA	FORT ALBANY	ON	LPV	3	99.224	4	99.197	11	98.978
CYGK	KINGSTON	ON	LPV	1	99.296	1	99.296	1	99.289
CYHD	DRYDEN REGIONAL	ON	LPV	1	99.292	2	99.286	9	99.146
CYHF	HEARST (RENE FONTAINE) MUNICIPALCIPALITY	ON	LPV	2	99.276	2	99.276	11	99.139
CYHM	HAMILTON	ON	LPV	1	99.296	1	99.296	1	99.292
CYHS	SAUGEEN MUNICIPALCIPALITY	ON	LPV	1	99.296	1	99.296	1	99.292
CYKF	WATERLOO	ON	LPV200	1	99.296	1	99.296	1	99.292
CYKM	KINCARDINE	ON	LPV	1	99.296	1	99.296	1	99.292
CYKZ	BUTTONVILLE MUNICIPALCIPAL	ON	LPV	1	99.296	1	99.296	1	99.292
CYLS	LAKE SIMCOE	ON	LPV	1	99.296	1	99.296	1	99.292
CYMG	MANITOUWADGE	ON	LPV	2	99.290	2	99.290	9	99.160

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYMO	MOOSONEE	ON	LPV	3	99.233	4	99.228	12	99.015
CYOO	OSHAWA EXECUTIVE AIRPORT	ON	LPV	1	99.296	1	99.296	1	99.292
CYOS	BILLY BISHOP REGIONAL	ON	LPV	1	99.296	1	99.296	1	99.292
CYOW	MACDONALD-CARTIER INTL	ON	LPV200	1	99.296	1	99.292	1	99.285
CYPL	PICKLE LAKE	ON	LPV	3	99.280	4	99.247	10	99.055
CYPQ	PETERBOROUGH	ON	LPV	1	99.296	1	99.296	1	99.292
CYPT	PELEE ISLAND	ON	LPV	1	99.296	1	99.296	1	99.296
CYQG	WINDSOR	ON	LPV	1	99.296	1	99.296	1	99.296
CYQK	KENORA	ON	LPV	1	99.292	2	99.291	10	99.187
CYQS	ST. THOMAS MUNICIPALCIPALITY	ON	LPV	1	99.296	1	99.296	1	99.292
CYQT	THUNDER BAY	ON	LPV200	1	99.296	2	99.294	7	99.239
CYRL	RED LAKE	ON	LPV	1	99.289	2	99.273	8	99.079
CYSA	STRATFORD MUNICIPALCIPALITY	ON	LPV	1	99.296	1	99.296	1	99.292
CYSB	SUDBURY	ON	LPV	1	99.296	1	99.292	3	99.281
CYSN	NIAGARA DISTRICT	ON	LPV	1	99.296	1	99.296	1	99.292
CYTL	BIG TROUT LAKE	ON	LPV	4	99.237	3	99.210	12	98.966
CYTS	TIMMINS (VICTOR M. POWER)	ON	LPV200	2	99.286	2	99.286	9	99.221
CYTZ	BILLY BISHOP TORONTO CITY AIRPORT	ON	LPV	1	99.296	1	99.296	1	99.292
CYVV	WIARTON	ON	LPV	1	99.296	1	99.296	1	99.292
CYWP	WEBEQUIE	ON	LPV	4	99.225	4	99.212	9	99.008
CYXL	SIOUX LOOKOUT	ON	LPV	1	99.292	2	99.284	8	99.122
CYXR	EARLTON (TIMISKAMING REGIONAL)	ON	LPV	1	99.296	1	99.292	6	99.265
CYXU	LONDON	ON	LPV200	1	99.296	1	99.296	1	99.292
CYYB	NORTH BAY	ON	LPV200	1	99.296	1	99.292	2	99.285
CYYU	KAPUSKASING	ON	LPV	2	99.274	2	99.274	11	99.149
CYYW	ARMSTRONG	ON	LPV	1	99.292	2	99.267	9	99.121
CYYZ	LESTER B. PEARSON INTL	ON	LPV200	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYZD	DOWNSVIEW	ON	LPV	1	99.296	1	99.296	1	99.292
CYZR	SARNIA (CHRIS HADFIELD)	ON	LPV	1	99.296	1	99.296	1	99.292
CZPB	SACHIGO LAKE	ON	LP	3	99.254	3	99.224	14	98.981
3S8	GRANTS PASS	OR	LP	1	99.285	1	99.285	1	99.284
77S	HOBBY FLD	OR	LPV	1	99.285	1	99.285	1	99.281
AST	ASTORIA RGNL	OR	LPV	1	99.285	1	99.285	1	99.277
BDN	BEND MUNICIPAL	OR	LPV	1	99.285	1	99.285	1	99.281
BKE	BAKER CITY MUNICIPAL	OR	LPV	1	99.286	1	99.286	1	99.282
CVO	CORVALLIS MUNICIPAL	OR	LPV200	1	99.285	1	99.285	1	99.281
EUG	MAHLON SWEET FLD	OR	LPV200	1	99.285	1	99.285	1	99.281
GCD	GRANT COUNTY RGNL/OGILVIE FLD	OR	LPV	1	99.285	1	99.285	1	99.282
HIO	PORTLAND-HILLSBORO	OR	LPV200	1	99.285	1	99.285	1	99.277
LGD	LA GRANDE/UNION COUNTY	OR	LPV	1	99.285	1	99.285	1	99.282
LKV	LAKE COUNTY	OR	LPV	1	99.290	1	99.289	1	99.285
LMT	CRATER LAKE/KLAMATH RGNL	OR	LPV	1	99.288	1	99.285	1	99.284
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	1	99.285	1	99.285	1	99.277
ONO	ONTARIO MUNICIPAL	OR	LPV	1	99.286	1	99.286	1	99.282
ONP	NEWPORT MUNICIPAL	OR	LPV	1	99.285	1	99.285	1	99.278
OTH	SOUTHWEST OREGON RGNL	OR	LPV	1	99.285	1	99.285	1	99.281
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	1	99.285	1	99.285	1	99.282
PDX	PORTLAND INTL	OR	LPV200	1	99.285	1	99.285	1	99.277
RDM	ROBERTS FLD	OR	LPV200	1	99.285	1	99.285	1	99.281
S33	MADRAS MUNICIPAL	OR	LPV	1	99.285	1	99.285	1	99.281
S39	PRINEVILLE	OR	LP	1	99.285	1	99.285	1	99.281
SLE	MCNARY FLD	OR	LPV200	1	99.285	1	99.285	1	99.281
SPB	SCAPPOOSE	OR	LPV	1	99.285	1	99.285	1	99.277
UAO	AURORA STATE	OR	LPV	1	99.285	1	99.285	1	99.277

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
22N	JAKE ARNER MEML	PA	LP	1	99.296	1	99.296	1	99.293
29D	GROVE CITY	PA	LP	1	99.296	1	99.296	1	99.296
2G9	SOMERSET COUNTY	PA	LPV	1	99.296	1	99.296	1	99.296
6G1	TITUSVILLE	PA	LPV	1	99.296	1	99.296	1	99.296
6P7	MCVILLE	PA	LP	1	99.296	1	99.296	1	99.296
8G2	CORRY-LAWRENCE	PA	LPV	1	99.296	1	99.296	1	99.296
8N8	DANVILLE	PA	LP	1	99.296	1	99.296	2	99.293
9D4	DECK	PA	LPV	1	99.296	1	99.296	2	99.295
ABE	LEHIGH VALLEY INTL	PA	LPV200	1	99.296	1	99.296	1	99.293
AFJ	WASHINGTON COUNTY	PA	LPV200	1	99.296	1	99.296	1	99.296
AGC	ALLEGHENY COUNTY	PA	LPV200	1	99.296	1	99.296	1	99.296
AOO	ALTOONA/BLAIR COUNTY	PA	LPV	1	99.296	1	99.296	1	99.296
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	1	99.296	1	99.296	1	99.292
AXQ	CLARION COUNTY	PA	LPV	1	99.296	1	99.296	1	99.296
BFD	BRADFORD RGNL	PA	LPV	1	99.296	1	99.296	1	99.296
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	1	99.296	1	99.296	1	99.296
BVI	BEAVER COUNTY	PA	LPV	1	99.296	1	99.296	1	99.296
CXY	CAPITAL CITY	PA	LPV	1	99.296	1	99.296	2	99.294
DUJ	DUBOIS RGNL	PA	LPV200	1	99.296	1	99.296	1	99.296
ERI	ERIE INTL/TOM RIDGE FLD	PA	LPV	1	99.296	1	99.296	1	99.296
FIG	CLEARFIELD-LAWRENCE	PA	LPV	1	99.296	1	99.296	1	99.296
FKL	VENANGO RGNL	PA	LPV	1	99.296	1	99.296	1	99.296
FWQ	ROSTRAVER	PA	LPV	1	99.296	1	99.296	1	99.296
GKJ	PORT MEADVILLE	PA	LP	1	99.296	1	99.296	1	99.296
HMZ	BEDFORD COUNTY	PA	LPV	1	99.296	1	99.296	2	99.296
HZL	HAZLETON RGNL	PA	LPV	1	99.296	1	99.296	2	99.292
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
IPT	WILLIAMSPORT RGNL	PA	LPV	1	99.296	1	99.296	1	99.293
JST	JOHN MURTHA JOHNSTOWN/CAMBRIA	PA	LPV200	1	99.296	1	99.296	1	99.296
LBE	ARNOLD PALMER RGNL	PA	LPV200	1	99.296	1	99.296	1	99.296
LNS	LANCASTER	PA	LPV200	1	99.296	1	99.296	2	99.294
LOM	WINGS FLD	PA	LPV	1	99.296	1	99.296	2	99.293
MDT	HARRISBURG INTL	PA	LPV	1	99.296	1	99.296	2	99.294
MPO	POCONO MOUNTAINS RGNL	PA	LPV	1	99.296	1	99.296	2	99.291
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	1	99.296	1	99.296	2	99.294
N38	GRAND CANYON RGNL	PA	LP	1	99.296	1	99.296	1	99.292
N57	NEW GARDEN	PA	LP	1	99.296	1	99.296	3	99.294
N79	NORTHUMBERLAND COUNTY	PA	LPV	1	99.296	1	99.296	2	99.293
N96	BELLEFONTE	PA	LPV	1	99.296	1	99.296	1	99.296
OQN	BRANDYWINE RGNL	PA	LP	1	99.296	1	99.296	2	99.295
OYM	ST MARYS MUNICIPAL	PA	LPV	1	99.296	1	99.296	1	99.296
PHL	PHILADELPHIA INTL	PA	LPV200	1	99.296	1	99.296	3	99.294
PIT	PITTSBURGH INTL	PA	LPV200	1	99.296	1	99.296	1	99.296
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	1	99.296	1	99.296	3	99.292
PSB	MID-STATE	PA	LPV	1	99.296	1	99.296	1	99.296
PTW	HERITAGE FLD	PA	LPV	1	99.296	1	99.296	2	99.295
RDG	READING RGNL/CARL A SPAATZ FLD	PA	LPV	1	99.296	1	99.296	2	99.295
RVL	MIFFLIN COUNTY	PA	LPV	1	99.296	1	99.296	1	99.296
SEG	PENN VALLEY	PA	LP	1	99.296	1	99.296	2	99.295
THV	YORK	PA	LP	1	99.296	1	99.296	2	99.294
UCP	NEW CASTLE MUNICIPAL	PA	LPV	1	99.296	1	99.296	1	99.296
UKT	QUAKERTOWN	PA	LP	1	99.296	1	99.296	1	99.293
UNV	UNIVERSITY PARK	PA	LPV200	1	99.296	1	99.296	1	99.296
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
WAY	GREENE COUNTY	PA	LPV	1	99.296	1	99.296	1	99.296
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	1	99.296	1	99.296	1	99.292
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	1	99.296	1	99.296	1	99.293
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	1	99.296	1	99.296	2	99.295
CYYG	CHARLOTTETOWN	PE	LPV	4	99.173	4	99.164	6	99.047
CEL8	ELEONORE	QC	LPV	5	99.181	6	99.162	11	98.933
CFX5	RENARD	QC	LPV	5	99.082	4	99.036	9	98.914
CSC3	DRUMMONDVILLE	QC	LPV	1	99.288	1	99.288	3	99.253
CSD4	MONT-LAURIER	QC	LPV	1	99.296	1	99.289	2	99.264
CSF3	POSTE MONTAGNAIS (MILE 134)	QC	LPV	4	99.017	5	99.004	7	98.948
CSH4	LEBEL-SUR-QUEVILLON	QC	LPV	2	99.252	2	99.249	9	99.154
CSR3	VICTORIAVILLE (ANDRE-FORTIN)	QC	LPV	1	99.288	1	99.288	4	99.244
CSU2	CHISASIBI	QC	LPV	4	99.198	7	99.164	13	98.879
CTP9	DONALDSON	QC	LPV	5	99.054	7	98.981	28	98.458
CTT5	LA ROMAINE	QC	LPV	4	99.022	4	99.022	9	98.887
CTU2	FONTANGES	QC	LPV	4	99.009	4	99.005	11	98.860
CYAD	LA GRANDE-3	QC	LPV	7	99.136	6	99.093	12	98.888
CYAH	LA GRANDE-4	QC	LPV	7	99.079	6	99.044	11	98.895
CYAS	KANGIRSUK	QC	LPV	6	99.062	7	99.013	22	98.499
CYBC	BAIE-COMEAU	QC	LPV200	4	99.149	4	99.149	7	99.037
CYBG	BAGOTVILLE	QC	LPV200	2	99.252	3	99.244	7	99.093
CYBX	LOURDES-DE-BLANC-SABLON	QC	LPV	5	99.003	5	98.980	19	98.570
CYEY	MAGNY	QC	LPV	2	99.278	2	99.278	9	99.195
CYFJ	MONT-TREMBLANT	QC	LPV	1	99.296	1	99.289	3	99.260
CYGL	LA GRANDE RIVIERE	QC	LPV	5	99.193	8	99.161	11	98.890
CYGP	GASPE (MICHEL-POULIOT)	QC	LPV	4	99.124	4	99.118	6	98.998
CYGR	ILES-DE-LA-MADELEINE	QC	LPV	4	99.130	4	99.125	7	98.999

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYGV	HAVRE ST-PIERRE	QC	LPV	4	99.039	4	99.035	9	98.976
CYGW	KUUJJUARAPIK	QC	LPV	7	99.122	9	99.078	14	98.813
CYHA	QUAQTAQ	QC	LPV	7	99.090	8	99.019	24	98.422
CYHH	NEMISCAU	QC	LPV	5	99.211	7	99.191	9	98.966
CYHR	CHEVERY	QC	LPV	4	99.032	4	99.032	10	98.861
CYHU	ST-HUBERT	QC	LPV	1	99.296	1	99.289	4	99.279
CYIF	ST-AUGUSTIN	QC	LPV	5	99.029	4	98.982	12	98.854
CYIK	IVUJIVIK	QC	LPV	5	99.057	7	98.936	29	98.423
CYKG	KANGIQSUJUAQ (WAKEHAM BAY)	QC	LPV	6	99.073	7	98.984	30	98.440
CYKL	SCHEFFERVILLE	QC	LPV	5	99.002	5	98.996	14	98.831
CYKO	AKULIVIK	QC	LPV	4	99.048	5	98.959	26	98.552
CYKQ	WASKAGANISH	QC	LPV	3	99.232	4	99.225	11	99.024
CYLA	AUPALUK	QC	LPV	5	99.059	7	99.022	21	98.571
CYLQ	LA TUQUE	QC	LPV	2	99.267	2	99.267	9	99.198
CYLU	KANGIQSUALUJJUAQ (GEORGES RIVER)	QC	LPV	7	99.040	8	99.006	17	98.418
CYME	RUSSELL-BURNETT	QC	LPV	4	99.147	4	99.144	7	99.035
CYMT	CHAPAIS	QC	LPV	2	99.237	4	99.227	7	99.088
CYMU	UMIUJAQ	QC	LPV	7	99.070	6	99.026	16	98.798
CYMW	MANIWAKI	QC	LPV	1	99.296	1	99.292	2	99.267
CYMX	MONTREAL INTL (MIRABEL)	QC	LPV200	1	99.296	1	99.289	4	99.279
CYNA	NATASHQUAN	QC	LPV	4	99.021	4	99.021	9	98.965
CYNC	WEMINDJI	QC	LPV	4	99.209	6	99.185	12	98.907
CYND	GATINEAU	QC	LPV	1	99.296	1	99.292	1	99.285
CYNM	MATAGAMI	QC	LPV	3	99.248	3	99.244	9	99.114
CYPH	INUKJUAK	QC	LPV	6	99.073	7	99.013	15	98.700
CYPN	PORT-MENIER	QC	LPV	4	99.077	4	99.070	7	98.989
CYPX	PUVIRNITUQ	QC	LPV	4	99.042	5	98.973	23	98.592

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYQB	JEAN LESAGE INTL	QC	LPV200	3	99.275	2	99.264	8	99.221
CYRI	RIVIERE-DU-LOUP	QC	LPV	2	99.231	3	99.223	6	99.073
CYRJ	ROBERVAL	QC	LPV	2	99.252	2	99.252	6	99.107
CYRQ	TROIS-RIVIERES	QC	LPV200	1	99.288	1	99.288	4	99.247
CYSC	SHERBROOKE	QC	LPV	1	99.289	1	99.288	4	99.265
CYSG	ST-GEORGES	QC	LPV	1	99.288	1	99.288	5	99.240
CYTF	ALMA	QC	LPV	2	99.252	3	99.245	6	99.106
CYTQ	TASIUJAQ	QC	LPV	6	99.057	6	99.023	17	98.614
CYUL	PIERRE-ELLIOTT-TRUDEAU INTL	QC	LPV200	1	99.296	1	99.289	3	99.281
CYUY	ROUYN-NORANDA	QC	LPV200	1	99.292	1	99.292	8	99.211
CYVB	BONAVENTURE	QC	LPV	4	99.147	4	99.135	6	99.038
CYVO	VAL-DOR	QC	LPV200	2	99.283	2	99.283	7	99.208
CYVP	KUUJJUAQ	QC	LPV200	7	99.032	6	98.994	16	98.627
CYYY	MONT-JOLI	QC	LPV	5	99.194	5	99.190	5	99.044
CYZG	SALLUIT	QC	LPV	5	99.041	8	98.953	34	98.436
CYZV	SEPT-ILES	QC	LPV200	4	99.080	4	99.067	7	98.994
BID	BLOCK ISLAND STATE	RI	LPV	1	99.296	1	99.296	2	99.287
OQU	QUONSET STATE	RI	LPV200	1	99.296	1	99.296	2	99.288
PVD	RHODE ISLAND TF GREEN INTL	RI	LPV200	1	99.296	1	99.296	2	99.288
SFZ	NORTH CENTRAL STATE	RI	LPV	1	99.296	1	99.296	2	99.289
35A	UNION COUNTY` TROY SHELTON FLD	SC	LP	1	99.314	1	99.314	2	99.292
6J0	LEXINGTON COUNTY	SC	LPV	1	99.314	2	99.314	3	99.286
AIK	AIKEN RGNL	SC	LPV200	1	99.314	1	99.314	2	99.292
AND	ANDERSON RGNL	SC	LPV200	1	99.314	1	99.314	2	99.293
AQX	ALLENDALE COUNTY	SC	LPV	1	99.314	2	99.313	3	99.289
ARW	BEAUFORT EXEC	SC	LPV200	1	99.316	2	99.310	3	99.284
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	1	99.314	1	99.314	3	99.280

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BNL	BARNWELL RGNL	SC	LPV	1	99.314	2	99.314	3	99.290
CAE	COLUMBIA METRO	SC	LPV200	1	99.314	2	99.313	3	99.288
CDN	WOODWARD FLD	SC	LPV	1	99.314	2	99.314	3	99.281
CEU	OCONEE COUNTY RGNL	SC	LPV200	1	99.314	1	99.314	2	99.293
CHS	CHARLESTON AFB/INTL	SC	LPV200	1	99.314	2	99.310	3	99.284
CKI	WILLIAMSBURG RGNL	SC	LPV	1	99.314	2	99.313	3	99.278
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FL	SC	LPV	1	99.314	1	99.314	3	99.280
CRE	GRAND STRAND	SC	LPV200	1	99.314	1	99.311	3	99.276
CUB	JIM HAMILTON L B OWENS	SC	LPV	1	99.314	2	99.313	3	99.286
DCM	CHESTER CATAWBA RGNL	SC	LPV	1	99.314	1	99.314	2	99.290
DYB	SUMMERVILLE	SC	LPV200	1	99.314	2	99.311	3	99.285
FDW	FAIRFIELD COUNTY	SC	LPV	1	99.314	2	99.314	3	99.288
FLO	FLORENCE RGNL	SC	LPV	1	99.314	1	99.314	3	99.278
GGE	GEORGETOWN COUNTY	SC	LPV	1	99.314	2	99.313	3	99.279
GMU	GREENVILLE DOWNTOWN	SC	LPV200	1	99.314	1	99.314	2	99.293
GRD	GREENWOOD COUNTY	SC	LPV	1	99.314	1	99.314	2	99.290
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	1	99.314	1	99.314	2	99.293
GYH	DONALDSON FLD	SC	LPV	1	99.314	1	99.314	2	99.293
HVS	HARTSVILLE RGNL	SC	LPV	1	99.314	1	99.314	3	99.280
HXD	HILTON HEAD	SC	LPV	1	99.314	2	99.310	3	99.283
HYW	CONWAY-HORRY COUNTY	SC	LPV	1	99.314	2	99.314	3	99.276
JZI	CHARLESTON EXEC	SC	LPV200	1	99.314	2	99.310	3	99.283
LKR	LANCASTER COUNTY-MC WHIRTER FL	SC	LPV200	1	99.314	1	99.314	3	99.285
LQK	PICKENS COUNTY	SC	LPV	1	99.314	1	99.314	2	99.293
LRO	MT PLEASANT RGNL-FAISON FLD	SC	LPV	1	99.314	2	99.311	3	99.283
LUX	LAURENS COUNTY	SC	LPV	1	99.314	1	99.314	2	99.292
MAO	MARION COUNTY	SC	LPV	1	99.314	1	99.314	3	99.278

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MKS	BERKELEY COUNTY	SC	LPV	1	99.314	2	99.312	3	99.285
MYR	MYRTLE BEACH INTL	SC	LPV200	1	99.314	2	99.312	3	99.276
OGB	ORANGEBURG MUNICIPAL	SC	LPV	1	99.314	2	99.312	3	99.288
PYG	PAGELAND	SC	LPV	1	99.314	1	99.314	3	99.282
RBW	LOWCOUNTRY RGNL	SC	LPV200	1	99.314	2	99.310	3	99.286
SMS	SUMTER	SC	LPV200	1	99.314	2	99.313	3	99.280
SPA	SPARTANBURG DOWNTOWN MEML/SIMP	SC	LPV200	1	99.314	1	99.314	2	99.293
UDG	DARLINGTON COUNTY	SC	LPV	1	99.314	1	99.314	3	99.280
UZA	ROCK HILL/YORK COUNTY/BRYANT F	SC	LPV200	1	99.314	1	99.314	2	99.286
0D8	GETTYSBURG MUNICIPAL	SD	LP	1	99.296	1	99.292	1	99.292
49B	STURGIS MUNICIPAL	SD	LPV	1	99.293	1	99.293	1	99.285
4X4	WESSINGTON SPRINGS	SD	LP	1	99.296	1	99.296	1	99.292
8D3	SISSETON MUNICIPAL	SD	LPV	1	99.296	1	99.296	2	99.285
8D7	CLARK COUNTY	SD	LP	1	99.296	1	99.296	1	99.292
8V3	PARKSTON MUNICIPAL	SD	LPV	1	99.296	1	99.296	1	99.292
98D	ONIDA MUNICIPAL	SD	LP	1	99.296	1	99.296	1	99.293
9D0	HIGHMORE MUNICIPAL	SD	LPV	1	99.296	1	99.296	1	99.292
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	1	99.300	1	99.296	1	99.293
9V6	MARTIN MUNICIPAL	SD	LPV	1	99.307	1	99.296	1	99.293
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	1	99.296	1	99.296	1	99.293
ABR	ABERDEEN RGNL	SD	LPV200	1	99.296	1	99.292	1	99.292
AGZ	WAGNER MUNICIPAL	SD	LPV	1	99.300	1	99.296	1	99.292
ATY	WATERTOWN RGNL	SD	LPV200	1	99.296	1	99.296	2	99.290
BKX	BROOKINGS RGNL	SD	LPV200	1	99.296	1	99.296	2	99.292
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	1	99.293	1	99.293	1	99.285
FSD	JOE FOSS FLD	SD	LPV200	1	99.296	1	99.296	1	99.292
HON	HURON RGNL	SD	LPV200	1	99.296	1	99.296	1	99.292

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HSR	HOT SPRINGS MUNICIPAL	SD	LP	1	99.307	1	99.296	1	99.288
ICR	WINNER RGNL	SD	LPV	1	99.300	1	99.296	1	99.293
IEN	PINE RIDGE	SD	LPV	1	99.307	1	99.296	1	99.288
LEM	LEMMON MUNICIPAL	SD	LPV	1	99.293	1	99.293	1	99.285
MBG	MOBRIDGE MUNICIPAL	SD	LPV	1	99.292	1	99.292	1	99.288
MDS	MADISON MUNICIPAL	SD	LPV	1	99.296	1	99.296	1	99.292
MHE	MITCHELL MUNICIPAL	SD	LPV	1	99.296	1	99.296	1	99.292
MKA	MILLER MUNICIPAL	SD	LPV	1	99.296	1	99.296	1	99.292
PHP	PHILIP	SD	LPV	1	99.307	1	99.296	1	99.293
PIR	PIERRE RGNL	SD	LPV	1	99.296	1	99.296	1	99.293
RAP	RAPID CITY RGNL	SD	LPV200	1	99.307	1	99.296	1	99.288
SPF	BLACK HILLS-CLYDE ICE FLD	SD	LPV	1	99.293	1	99.293	1	99.285
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	1	99.307	1	99.296	1	99.293
VMR	HAROLD DAVIDSON FLD	SD	LPV	1	99.300	1	99.296	1	99.292
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	1	99.300	1	99.296	1	99.292
CCB2	SEABEE MINE	SK	LPV	1	99.285	2	99.273	12	99.034
CJC5	SHAUNAVON	SK	LPV	1	99.286	1	99.286	1	99.279
CJE3	WEYBURN	SK	LPV	1	99.288	1	99.288	2	99.274
CJH3	MAIDSTONE	SK	LPV	1	99.285	1	99.277	7	99.255
CJP9	CHARLOT RIVER	SK	LP	1	99.284	1	99.282	17	98.993
CJQ4	MAPLE CREEK	SK	LPV	1	99.286	1	99.286	1	99.280
CJU4	HUMBOLDT	SK	LPV	1	99.285	1	99.285	7	99.217
CJW7	CIGAR LAKE	SK	LPV	2	99.262	2	99.262	14	99.012
CJY3	TISDALE	SK	LPV	1	99.285	1	99.285	10	99.169
CJZ3	MELFORT (MILLER FIELD)	SK	LPV	1	99.285	1	99.285	9	99.182
CKQ8	MCARTHUR RIVER	SK	LPV	3	99.275	3	99.275	14	99.044
CYBE	URANIUM CITY	SK	LPV	1	99.284	1	99.283	16	98.995

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYBU	NIPAWIN	SK	LPV	1	99.285	1	99.285	10	99.129
CYEN	ESTEVAN REGIONAL	SK	LPV	1	99.288	1	99.288	2	99.282
CYES	EDMUNDSTON	SK	LPV	3	99.222	3	99.218	6	99.069
CYKC	COLLINS BAY	SK	LPV	2	99.262	3	99.249	16	98.974
CYKJ	KEY LAKE	SK	LPV	1	99.284	1	99.275	13	99.056
CYLJ	MEADOW LAKE	SK	LPV	1	99.285	1	99.277	9	99.188
CYMJ	AIR VICE MARSHAL C.M. MCEWEN	SK	LPV200	1	99.285	1	99.285	1	99.285
CYNL	POINTS NORTH LANDING	SK	LPV	2	99.262	2	99.254	16	98.985
CYPA	PRINCE ALBERT (GLASS FIELD)	SK	LPV	1	99.285	1	99.285	9	99.182
CYQR	REGINA INTL	SK	LPV200	1	99.285	1	99.285	3	99.272
CYQV	YORKTON MUNICIPALCIPALITY	SK	LPV	1	99.285	1	99.285	6	99.235
CYQW	NORTH BATTLEFORD	SK	LPV	1	99.285	1	99.285	6	99.258
CYVC	LA RONGE (BARBER FIELD)	SK	LPV	1	99.285	1	99.276	13	99.095
CYXE	JOHN G. DIEFENBAKER INTL	SK	LPV200	1	99.285	1	99.285	4	99.250
CYYN	SWIFT CURRENT	SK	LPV	1	99.286	1	99.286	1	99.278
0A3	SMITHVILLE MUNICIPAL	TN	LPV	1	99.307	1	99.307	1	99.307
0M3	PAUL BRIDGES FLD	TN	LP	1	99.307	1	99.307	1	99.307
0M4	BENTON COUNTY	TN	LPV	1	99.307	1	99.307	1	99.306
0M5	HUMPHREYS COUNTY	TN	LP	1	99.307	1	99.307	1	99.306
1A3	MARTIN CAMPBELL FLD	TN	LP	1	99.310	1	99.310	1	99.307
1M5	PORTLAND MUNICIPAL	TN	LPV	1	99.300	1	99.300	1	99.300
2A0	MARK ANTON	TN	LPV	1	99.310	1	99.310	1	99.307
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	1	99.310	1	99.310	1	99.307
2M8	CHARLES W BAKER	TN	LPV	1	99.310	1	99.310	1	99.307
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	1	99.300	1	99.300	1	99.300
3M7	LAFAYETTE MUNICIPAL	TN	LPV	1	99.300	1	99.300	1	99.300
8A3	LIVINGSTON MUNICIPAL	TN	LP	1	99.300	1	99.300	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BGF	WINCHESTER MUNICIPAL	TN	LPV	1	99.310	1	99.310	1	99.307
BNA	NASHVILLE INTL	TN	LPV200	1	99.307	1	99.307	1	99.305
CHA	LOVELL FLD	TN	LPV200	1	99.310	1	99.310	1	99.307
CKV	OUTLAW FLD	TN	LPV	1	99.307	1	99.307	1	99.300
CSV	CROSSVILLE MEML-WHITSON FLD	TN	LPV200	1	99.303	1	99.303	1	99.303
DYR	DYERSBURG RGNL	TN	LPV	1	99.307	1	99.307	1	99.307
FYE	FAYETTE COUNTY	TN	LPV	1	99.310	1	99.310	1	99.307
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	1	99.310	1	99.310	1	99.307
GCY	GREENEVILLE MUNICIPAL	TN	LPV	1	99.300	1	99.300	1	99.300
GHM	CENTERVILLE MUNICIPAL	TN	LP	1	99.307	1	99.307	1	99.307
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	1	99.303	1	99.303	1	99.303
GZS	ABERNATHY FLD	TN	LPV	1	99.310	1	99.310	1	99.307
HZD	CARROLL COUNTY	TN	LPV	1	99.307	1	99.307	1	99.306
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	1	99.300	1	99.300	1	99.300
JWN	JOHN C TUNE	TN	LPV	1	99.307	1	99.307	1	99.304
LUG	ELLINGTON	TN	LPV	1	99.307	1	99.307	1	99.307
M01	GENERAL DEWITT SPAIN	TN	LPV	1	99.310	1	99.310	1	99.307
M08	WILLIAM L WHITEHURST FLD	TN	LP	1	99.310	1	99.310	1	99.307
M53	HUMBOLDT MUNICIPAL	TN	LPV	1	99.307	1	99.307	1	99.307
M54	LEBANON MUNICIPAL	TN	LPV	1	99.307	1	99.307	1	99.301
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	1	99.307	1	99.307	1	99.300
MBT	MURFREESBORO MUNICIPAL	TN	LPV	1	99.307	1	99.307	1	99.307
MEM	MEMPHIS INTL	TN	LPV200	1	99.310	1	99.310	1	99.307
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	1	99.307	1	99.307	1	99.307
MMI	MCMINN COUNTY	TN	LPV	1	99.310	1	99.310	1	99.303
MNV	MONROE COUNTY	TN	LPV	1	99.307	1	99.307	1	99.303
MOR	MOORE-MURRELL	TN	LPV	1	99.300	1	99.300	1	99.300

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MQY	SMYRNA	TN	LPV200	1	99.307	1	99.307	1	99.306
MRC	MAURY COUNTY RGNL	TN	LPV	1	99.307	1	99.307	1	99.307
NQA	MILLINGTON/MEMPHIS	TN	LPV200	1	99.310	1	99.310	1	99.307
PHT	HENRY COUNTY	TN	LPV200	1	99.307	1	99.307	1	99.302
PVE	BEECH RIVER RGNL	TN	LPV	1	99.307	1	99.307	1	99.307
RKW	ROCKWOOD MUNICIPAL	TN	LPV	1	99.303	1	99.303	1	99.303
RNC	WARREN COUNTY MEML	TN	LPV	1	99.307	1	99.307	1	99.307
RVN	HAWKINS COUNTY	TN	LP	1	99.300	1	99.300	1	99.300
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	1	99.310	1	99.310	1	99.307
SCX	SCOTT MUNICIPAL	TN	LPV	1	99.300	1	99.300	1	99.300
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	1	99.310	1	99.310	1	99.307
SRB	UPPER CUMBERLAND RGNL	TN	LPV	1	99.307	1	99.307	1	99.306
SYI	BOMAR FLD/SHELBYVILLE MUNICIPAL	TN	LPV	1	99.307	1	99.307	1	99.307
SZY	ROBERT SIBLEY	TN	LPV	1	99.310	1	99.310	1	99.307
TGC	GIBSON COUNTY	TN	LP	1	99.307	1	99.307	1	99.307
THA	TULLAHOMA RGNL/WM NORTHERN FLD	TN	LPV	1	99.310	1	99.310	1	99.307
TRI	TRI-CITIES	TN	LPV200	1	99.300	1	99.300	2	99.299
TYS	MC GHEE TYSON	TN	LPV200	1	99.303	1	99.303	1	99.303
UCY	EVERETT-STEWART RGNL	TN	LPV200	1	99.307	1	99.307	1	99.301
XNX	MUSIC CITY EXEC	TN	LPV	1	99.307	1	99.307	1	99.300
0F2	BOWIE MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
11R	BRENHAM MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.300
2R9	KENEDY RGNL	TX	LP	1	99.300	1	99.300	2	99.292
3R9	LAKEWAY AIRPARK	TX	LP	1	99.307	1	99.307	1	99.297
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	1	99.307	1	99.307	1	99.297
41F	FLOYDADA MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.304
45R	HAWTHORNE FLD	TX	LP	1	99.307	1	99.307	2	99.301

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
4T2	KENNETH COPELAND	TX	LPV	1	99.307	1	99.307	1	99.304
50R	LOCKHART MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.297
5C1	BOERNE STAGE FLD	TX	LP	1	99.304	1	99.304	1	99.294
5T9	MAVERICK COUNTY MEML INTL	TX	LPV	1	99.300	1	99.298	5	99.276
60R	NAVASOTA MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.303
6R3	CLEVELAND MUNICIPAL	TX	LPV	1	99.307	1	99.307	2	99.302
77F	WINTERS MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.304
8F3	CROSBYTON MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.304
ABI	ABILENE RGNL	TX	LPV200	1	99.307	1	99.307	1	99.304
ACT	WACO RGNL	TX	LPV200	1	99.307	1	99.307	1	99.304
ADS	ADDISON	TX	LPV	1	99.307	1	99.307	1	99.305
AFW	FORT WORTH ALLIANCE	TX	LPV200	1	99.307	1	99.307	1	99.304
ALI	ALICE INTL	TX	LPV	1	99.296	1	99.296	4	99.275
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	1	99.307	1	99.307	1	99.304
ARM	WHARTON RGNL	TX	LPV	1	99.303	1	99.303	2	99.295
ASL	HARRISON COUNTY	TX	LPV	1	99.307	1	99.307	1	99.306
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	1	99.307	1	99.307	1	99.297
AXH	HOUSTON/SOUTHWEST	TX	LPV	1	99.307	1	99.307	2	99.299
BAZ	NEW BRAUNFELS NTL	TX	LPV	1	99.304	1	99.304	1	99.297
BBD	CURTIS FLD	TX	LPV	1	99.307	1	99.307	1	99.302
BEA	BEEVILLE MUNICIPAL	TX	LPV	1	99.300	1	99.300	2	99.280
BFE	TERRY COUNTY	TX	LPV	1	99.307	1	99.307	1	99.304
BGD	HUTCHINSON COUNTY	TX	LPV	1	99.307	1	99.307	1	99.307
BKD	STEPHENS COUNTY	TX	LP	1	99.307	1	99.307	1	99.304
BKS	BROOKS COUNTY	TX	LPV	1	99.296	1	99.296	7	99.245
BMT	BEAUMONT MUNICIPAL	TX	LPV	1	99.307	1	99.307	2	99.299
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	1	99.307	1	99.307	1	99.303

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BPT	JACK BROOKS RGNL	TX	LPV200	1	99.307	1	99.307	2	99.298
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	1	99.296	1	99.292	19	99.181
BWD	BROWNWOOD RGNL	TX	LPV	1	99.307	1	99.307	1	99.304
BYY	BAY CITY RGNL	TX	LPV	1	99.303	1	99.303	2	99.295
CDS	CHILDRESS MUNICIPAL	TX	LPV200	1	99.307	1	99.307	1	99.304
CFD	COULTER FLD	TX	LPV	1	99.307	1	99.307	1	99.303
CLL	EASTERWOOD FLD	TX	LPV200	1	99.307	1	99.307	1	99.303
CNW	TSTC WACO	TX	LPV200	1	99.307	1	99.307	1	99.304
COM	COLEMAN MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
COT	COTULLA-LA SALLE COUNTY	TX	LPV	1	99.299	1	99.297	4	99.284
CPT	CLEBURNE RGNL	TX	LPV	1	99.307	1	99.307	1	99.304
CRP	CORPUS CHRISTI INTL	TX	LPV200	1	99.297	1	99.296	3	99.277
CVB	CASTROVILLE MUNICIPAL	TX	LPV	1	99.300	1	99.300	1	99.291
CWC	KICKAPOO DOWNTOWN	TX	LPV	1	99.307	1	99.307	1	99.304
CXO	CONROE/NORTH HOUSTON RGNL	TX	LPV200	1	99.307	1	99.307	1	99.303
CZT	DIMMIT COUNTY	TX	LPV	1	99.296	1	99.296	4	99.281
DAL	DALLAS LOVE FLD	TX	LPV200	1	99.307	1	99.307	1	99.305
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	1	99.307	1	99.307	1	99.304
DHT	DALHART MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.307
DKR	HOUSTON COUNTY	TX	LP	1	99.307	1	99.307	1	99.306
DRT	DEL RIO INTL	TX	LPV	1	99.300	1	99.300	5	99.280
DTO	DENTON ENTERPRISE	TX	LPV200	1	99.307	1	99.307	1	99.304
DUX	MOORE COUNTY	TX	LPV200	1	99.307	1	99.307	1	99.307
DWH	DAVID WAYNE HOOKS MEML	TX	LPV	1	99.307	1	99.307	2	99.302
E01	ROY HURD MEML	TX	LP	1	99.307	1	99.307	2	99.299
E11	ANDREWS COUNTY	TX	LPV	1	99.307	1	99.307	1	99.303
E19	GRUVER MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.307

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
E30	BRUCE FLD	TX	LPV	1	99.307	1	99.307	1	99.304
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	1	99.306	1	99.303	5	99.265
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	1	99.296	1	99.296	12	99.189
EDC	AUSTIN EXEC	TX	LPV200	1	99.307	1	99.307	1	99.297
EFD	ELLINGTON	TX	LPV200	1	99.307	1	99.307	2	99.300
ELA	EAGLE LAKE	TX	LP	1	99.307	1	99.307	2	99.296
ELP	EL PASO INTL	TX	LP	1	99.307	2	99.301	23	99.212
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	1	99.307	1	99.305	1	99.297
ETN	EASTLAND MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.304
F00	JONES FLD	TX	LPV	1	99.307	1	99.307	1	99.307
F05	WILBARGER COUNTY	TX	LPV	1	99.307	1	99.307	1	99.304
F49	CITY OF SLATON/LARRY T NEAL ME	TX	LPV	1	99.307	1	99.307	1	99.304
F98	YOAKUM COUNTY	TX	LPV	1	99.307	1	99.307	1	99.303
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	1	99.307	1	99.307	4	99.287
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	1	99.307	1	99.307	1	99.304
FWS	FORT WORTH SPINKS	TX	LPV200	1	99.307	1	99.307	1	99.304
GDJ	GRANBURY RGNL	TX	LPV	1	99.307	1	99.307	1	99.304
GGG	EAST TEXAS RGNL	TX	LPV	1	99.307	1	99.307	1	99.306
GKY	ARLINGTON MUNICIPAL	TX	LPV200	1	99.307	1	99.307	1	99.304
GLE	GAINESVILLE MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.307
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	1	99.306	1	99.306	2	99.298
GNC	GAINES COUNTY	TX	LPV	1	99.307	1	99.307	1	99.303
GRK	ROBERT GRAY AAF	TX	LPV200	1	99.307	1	99.307	1	99.303
GTU	GEORGETOWN MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.301
GVT	MAJORS	TX	LPV200	1	99.307	1	99.307	1	99.307
GYI	NORTH TEXAS RGNL/PERRIN FLD	TX	LPV200	1	99.307	1	99.307	1	99.307
GZN	GREGORY M SIMMONS MEML	TX	LPV	1	99.307	1	99.307	1	99.304

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HBV	JIM HOGG COUNTY	TX	LPV	1	99.296	1	99.296	7	99.247
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	1	99.300	1	99.300	2	99.289
HHF	HEMPHILL COUNTY	TX	LPV	1	99.307	1	99.307	1	99.307
HOU	WILLIAM P HOBBY	TX	LPV200	1	99.307	1	99.307	2	99.300
HQZ	MESQUITE METRO	TX	LPV	1	99.307	1	99.307	1	99.307
HRL	VALLEY INTL	TX	LPV200	1	99.296	1	99.293	15	99.196
HRX	HEREFORD MUNICIPAL	TX	LPV200	1	99.307	1	99.307	1	99.304
HYI	SAN MARCOS RGNL	TX	LPV200	1	99.307	1	99.307	1	99.297
IAH	GEORGE BUSH INTCNTL/HOUSTON	TX	LPV200	1	99.307	1	99.307	2	99.301
IKG	KLEBERG COUNTY	TX	LPV	1	99.296	1	99.296	5	99.262
ILE	SKYLARK FLD	TX	LPV200	1	99.307	1	99.307	1	99.303
INJ	HILLSBORO MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
INK	WINKLER COUNTY	TX	LPV200	1	99.307	1	99.307	2	99.299
IWS	WEST HOUSTON	TX	LP	1	99.307	1	99.307	2	99.301
JAS	JASPER COUNTY/BELL FLD	TX	LPV	1	99.307	1	99.307	2	99.303
JSO	CHEROKEE COUNTY	TX	LPV	1	99.307	1	99.307	1	99.306
JWY	MID-WAY RGNL	TX	LPV200	1	99.307	1	99.307	1	99.304
JXI	FOX STEPHENS FLD - GILMER MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.306
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	1	99.307	1	99.307	1	99.304
LBX	TEXAS GULF COAST RGNL	TX	LPV	1	99.305	1	99.305	2	99.298
LFK	ANGELINA COUNTY	TX	LPV	1	99.307	1	99.307	1	99.306
LHB	HEARNE MUNICIPAL	TX	LPV200	1	99.307	1	99.307	1	99.303
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
LLN	LEVELLAND MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
LNC	LANCASTER RGNL	TX	LPV200	1	99.307	1	99.307	1	99.305
LRD	LAREDO INTL	TX	LPV200	1	99.296	1	99.296	6	99.253
LUD	DECATUR MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LUV	LAMESA MUNICIPAL	TX	LPV200	1	99.307	1	99.307	1	99.303
LVJ	PEARLAND RGNL	TX	LPV	1	99.307	1	99.307	2	99.299
LXY	MEXIA-LIMESTONE COUNTY	TX	LP	1	99.307	1	99.307	1	99.304
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	1	99.307	1	99.307	1	99.303
MDD	MIDLAND AIRPARK	TX	LPV	1	99.307	1	99.307	1	99.303
MFE	MC ALLEN MILLER INTL	TX	LPV200	1	99.296	1	99.292	13	99.160
MKN	COMANCHE COUNTY-CITY	TX	LPV	1	99.307	1	99.307	1	99.304
MNZ	HAMILTON MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
MWL	MINERAL WELLS RGNL	TX	LPV200	1	99.307	1	99.307	1	99.304
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	1	99.307	1	99.307	1	99.306
ODO	ODESSA-SCHLEMEYER FLD	TX	LPV200	1	99.307	1	99.307	1	99.303
ONY	OLNEY MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
ORG	ORANGE COUNTY	TX	LPV	1	99.307	1	99.307	2	99.298
PEQ	PECOS MUNICIPAL	TX	LPV200	1	99.307	1	99.307	4	99.295
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	1	99.296	1	99.293	15	99.211
PKV	CALHOUN COUNTY	TX	LPV	1	99.300	1	99.300	2	99.281
PPA	PERRY LEFORS FLD	TX	LPV	1	99.307	1	99.307	1	99.307
PRX	COX FLD	TX	LPV	1	99.307	1	99.307	1	99.306
PSX	PALACIOS MUNICIPAL	TX	LPV	1	99.300	1	99.300	2	99.285
PVW	HALE COUNTY	TX	LPV	1	99.307	1	99.307	1	99.304
PWG	MC GREGOR EXEC	TX	LPV	1	99.307	1	99.307	1	99.304
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	1	99.307	1	99.307	1	99.304
RAS	MUSTANG BEACH	TX	LPV	1	99.300	1	99.296	2	99.277
RBD	DALLAS EXEC	TX	LPV200	1	99.307	1	99.307	1	99.304
RBO	NUECES COUNTY	TX	LPV	1	99.297	1	99.296	3	99.277
RKP	ARANSAS COUNTY	TX	LPV	1	99.300	1	99.296	2	99.279
RYW	LAGO VISTA TX/RUSTY ALLEN	TX	LPV	1	99.307	1	99.307	1	99.298

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SAT	SAN ANTONIO INTL	TX	LPV200	1	99.302	1	99.300	1	99.293
SGR	SUGAR LAND RGNL	TX	LPV200	1	99.307	1	99.307	2	99.300
SJT	SAN ANGELO RGNL/MATHIS FLD	TX	LPV	1	99.307	1	99.307	1	99.301
SLR	SULPHUR SPRINGS MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.307
SNK	WINSTON FLD	TX	LPV200	1	99.307	1	99.307	1	99.304
SWI	SHERMAN MUNICIPAL	TX	LP	1	99.307	1	99.307	1	99.307
SWW	AVENGER FLD	TX	LPV	1	99.307	1	99.307	1	99.304
T23	ALBANY MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
T41	LA PORTE MUNICIPAL	TX	LPV	1	99.307	1	99.307	2	99.300
T74	TAYLOR MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.301
T78	LIBERTY MUNICIPAL	TX	LP	1	99.307	1	99.307	2	99.300
T82	GILLESPIE COUNTY	TX	LPV	1	99.307	1	99.307	1	99.297
TDW	TRADEWIND	TX	LPV	1	99.307	1	99.307	1	99.304
TFP	MCCAMPBELL-PORTER	TX	LPV	1	99.300	1	99.296	2	99.278
TKI	MCKINNEY NTL	TX	LPV200	1	99.307	1	99.307	1	99.307
TME	HOUSTON EXEC	TX	LPV	1	99.307	1	99.306	2	99.299
TPL	DRAUGHON-MILLER CENTRAL TEXAS	TX	LPV200	1	99.307	1	99.307	1	99.303
TRL	TERRELL MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.307
TX2	CHASE FLD INDUSTRIAL	TX	LPV	1	99.300	1	99.300	2	99.283
TXW	MID VALLEY	TX	LPV	1	99.296	1	99.292	15	99.181
TYR	TYLER POUNDS RGNL	TX	LPV200	1	99.307	1	99.307	1	99.306
UTS	HUNTSVILLE MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.303
VCT	VICTORIA RGNL	TX	LPV200	1	99.300	1	99.300	2	99.287
XBP	BRIDGEPORT MUNICIPAL	TX	LPV	1	99.307	1	99.307	1	99.304
41U	MANTI-EPHRAIM	UT	LPV	1	99.307	1	99.307	1	99.289
74V	ROOSEVELT MUNICIPAL	UT	LPV	1	99.307	1	99.307	1	99.289
BCE	BRYCE CANYON	UT	LPV	1	99.307	1	99.307	1	99.294

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BDG	BLANDING MUNICIPAL	UT	LPV	1	99.307	1	99.307	1	99.296
BMC	BRIGHAM CITY RGNL	UT	LP	1	99.304	1	99.293	1	99.286
CDC	CEDAR CITY RGNL	UT	LPV	1	99.308	1	99.307	1	99.296
CNY	CANYONLANDS RGNL	UT	LP	1	99.307	1	99.307	1	99.304
DTA	DELTA MUNICIPAL	UT	LP	1	99.307	1	99.307	1	99.289
ENV	WENDOVER	UT	LPV	1	99.307	1	99.307	1	99.286
FOM	FILLMORE MUNICIPAL	UT	LPV	1	99.307	1	99.307	1	99.293
LGU	LOGAN-CACHE	UT	LPV	1	99.296	1	99.293	1	99.286
OGD	OGDEN-HINCKLEY	UT	LPV	1	99.307	1	99.293	1	99.286
PUC	CARBON COUNTY RGNL/BUCK DAVIS	UT	LP	1	99.307	1	99.307	1	99.289
PVU	PROVO MUNICIPAL	UT	LPV200	1	99.307	1	99.307	1	99.289
RIF	RICHFIELD MUNICIPAL	UT	LP	1	99.307	1	99.307	1	99.296
SGU	ST GEORGE RGNL	UT	LPV	1	99.307	1	99.304	1	99.296
SLC	SALT LAKE CITY INTL	UT	LPV200	1	99.307	1	99.307	1	99.286
SPK	SPANISH FORK MUNICIPAL/WOODHOUSE FL	UT	LP	1	99.307	1	99.307	1	99.289
TVY	BOLINDER FLD-TOOELE VALLEY	UT	LPV200	1	99.307	1	99.307	1	99.286
U14	NEPHI MUNICIPAL	UT	LPV	1	99.307	1	99.307	1	99.289
U42	SOUTH VALLEY RGNL	UT	LPV	1	99.307	1	99.307	1	99.286
U55	PANGUITCH MUNICIPAL	UT	LPV200	1	99.307	1	99.307	1	99.296
VEL	VERNAL RGNL	UT	LPV	1	99.307	1	99.307	1	99.289
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	1	99.300	1	99.296	3	99.285
0VG	LEE COUNTY	VA	LPV	1	99.300	1	99.300	1	99.300
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	1	99.300	1	99.296	3	99.281
BCB	VIRGINIA TECH/MONTGOMERY EXEC	VA	LPV	1	99.300	1	99.296	2	99.288
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	1	99.300	1	99.296	3	99.284
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	1	99.296	1	99.296	3	99.291
CJR	CULPEPER RGNL	VA	LPV	1	99.296	1	99.296	3	99.291

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CPK	CHESAPEAKE RGNL	VA	LPV200	1	99.300	1	99.296	3	99.280
DAN	DANVILLE RGNL	VA	LPV200	1	99.300	1	99.300	3	99.282
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	1	99.300	1	99.296	3	99.281
FCI	RICHMOND EXEC/CHESTERFIELD COU	VA	LPV	1	99.297	1	99.296	3	99.285
FKN	FRANKLIN RGNL	VA	LPV	1	99.300	1	99.296	3	99.280
FVX	FARMVILLE RGNL	VA	LPV	1	99.300	1	99.296	3	99.286
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	1	99.296	1	99.296	3	99.286
HLX	TWIN COUNTY	VA	LPV	1	99.300	1	99.300	2	99.287
HSP	INGALLS FLD	VA	LPV	1	99.300	1	99.296	2	99.290
HWY	WARRENTON/FAUQUIER	VA	LPV200	1	99.296	1	99.296	3	99.291
JFZ	TAZEWELL COUNTY	VA	LPV	1	99.300	1	99.300	2	99.296
JYO	LEESBURG EXEC	VA	LPV	1	99.296	1	99.296	2	99.293
LKU	LOUISA COUNTY/FREEMAN FLD	VA	LPV	1	99.296	1	99.296	3	99.289
LNP	LONESOME PINE	VA	LPV	1	99.300	1	99.300	1	99.296
LUA	LURAY CAVERNS	VA	LP	1	99.296	1	99.296	2	99.291
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	1	99.300	1	99.296	3	99.287
MFV	ACCOMACK COUNTY	VA	LPV	1	99.296	1	99.296	3	99.286
MKJ	MOUNTAIN EMPIRE	VA	LPV	1	99.300	1	99.300	2	99.288
MTV	BLUE RIDGE	VA	LPV	1	99.300	1	99.300	3	99.285
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	1	99.296	1	99.296	3	99.287
OKV	WINCHESTER RGNL	VA	LPV200	1	99.296	1	99.296	2	99.292
ORF	NORFOLK INTL	VA	LPV200	1	99.297	1	99.296	3	99.281
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	1	99.297	1	99.296	3	99.283
PSK	NEW RIVER VALLEY	VA	LPV200	1	99.300	1	99.297	2	99.288
PTB	DINWIDDIE COUNTY	VA	LPV	1	99.300	1	99.296	3	99.285
PVG	HAMPTON ROADS EXEC	VA	LPV200	1	99.300	1	99.296	3	99.281
RIC	RICHMOND INTL	VA	LPV200	1	99.296	1	99.296	3	99.286

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RMN	STAFFORD RGNL	VA	LPV	1	99.296	1	99.296	3	99.290
ROA	ROANOKE/BLACKSBURG RGNL (WOODR	VA	LPV	1	99.300	1	99.296	3	99.288
SFQ	SUFFOLK EXEC	VA	LPV	1	99.300	1	99.296	3	99.280
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	1	99.296	1	99.296	3	99.291
VJI	VIRGINIA HIGHLANDS	VA	LPV	1	99.300	1	99.300	2	99.294
W78	WILLIAM M TUCK	VA	LPV	1	99.300	1	99.296	3	99.283
W96	NEW KENT COUNTY	VA	LP	1	99.296	1	99.296	3	99.286
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	1	99.296	1	99.296	3	99.286
XSA	TAPPAHANNOCK/ESSEX COUNTY	VA	LPV	1	99.296	1	99.296	3	99.287
BTV	BURLINGTON INTL	VT	LPV200	1	99.296	1	99.292	1	99.288
EFK	NORTHEAST KINGDOM INTL	VT	LP	1	99.296	1	99.289	2	99.283
FSO	FRANKLIN COUNTY STATE	VT	LPV	1	99.296	1	99.289	2	99.283
MPV	EDWARD F KNAPP STATE	VT	LPV	1	99.296	1	99.296	2	99.288
MVL	MORRISVILLE-STOWE STATE	VT	LPV	1	99.296	1	99.292	2	99.284
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	1	99.296	1	99.296	1	99.288
ALW	WALLA WALLA RGNL	WA	LPV200	1	99.285	1	99.285	1	99.282
AWO	ARLINGTON MUNICIPAL	WA	LPV200	1	99.285	1	99.285	1	99.277
BLI	BELLINGHAM INTL	WA	LPV200	1	99.285	1	99.285	1	99.277
BVS	SKAGIT RGNL	WA	LPV	1	99.285	1	99.285	1	99.277
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	1	99.285	1	99.285	1	99.277
CLS	CHEHALIS-CENTRALIA	WA	LPV	1	99.285	1	99.285	1	99.277
DEW	DEER PARK	WA	LPV	1	99.286	1	99.286	1	99.281
EPH	EPHRATA MUNICIPAL	WA	LPV	1	99.285	1	99.285	1	99.281
FHR	FRIDAY HARBOR	WA	LPV	1	99.285	1	99.285	1	99.277
GEG	SPOKANE INTL	WA	LPV200	1	99.286	1	99.286	1	99.281
HQM	BOWERMAN	WA	LPV200	1	99.285	1	99.285	1	99.277
KLS	SOUTHWEST WASHINGTON RGNL	WA	LPV	1	99.285	1	99.285	1	99.277

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MWH	GRANT COUNTY INTL	WA	LPV200	1	99.285	1	99.285	1	99.281
OLM	OLYMPIA RGNL	WA	LPV200	1	99.285	1	99.285	1	99.277
ORS	ORCAS ISLAND	WA	LP	1	99.285	1	99.285	1	99.277
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	1	99.285	1	99.285	1	99.277
PLU	PIERCE COUNTY - THUN FLD	WA	LPV	1	99.285	1	99.285	1	99.277
PSC	TRI-CITIES	WA	LPV200	1	99.285	1	99.285	1	99.282
PWT	BREMERTON NTL	WA	LPV200	1	99.285	1	99.285	1	99.277
RLD	RICHLAND	WA	LPV	1	99.285	1	99.285	1	99.282
RNT	RENTON MUNICIPAL	WA	LPV	1	99.285	1	99.285	1	99.277
SEA	SEATTLE-TACOMA INTL	WA	LPV200	1	99.285	1	99.285	1	99.277
SFF	FELTS FLD	WA	LPV	1	99.286	1	99.286	1	99.281
SHN	SANDERSON FLD	WA	LPV	1	99.285	1	99.285	1	99.277
TDO	ED CARLSON MEML FLD - SOUTH LE	WA	LPV	1	99.285	1	99.285	1	99.277
TIW	TACOMA NARROWS	WA	LPV	1	99.285	1	99.285	1	99.277
YKM	YAKIMA AIR TRML/MCALLISTER FLD	WA	LPV200	1	99.285	1	99.285	1	99.281
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
57C	EAST TROY MUNICIPAL	WI	LPV	1	99.296	1	99.296	1	99.296
61C	FORT ATKINSON MUNICIPAL	WI	LP	1	99.296	1	99.296	1	99.296
82C	MAUSTON/NEW LISBON UNION	WI	LP	1	99.296	1	99.296	2	99.289
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
AHH	AMERY MUNICIPAL	WI	LP	1	99.296	1	99.296	2	99.285
AIG	LANGLADE COUNTY	WI	LPV	1	99.296	1	99.296	2	99.285
ARV	LAKELAND/NOBLE F LEE MEML FLD	WI	LPV	1	99.296	1	99.296	3	99.276
ASX	JOHN F KENNEDY MEML	WI	LPV	1	99.296	1	99.296	3	99.277
ATW	APPLETON INTL	WI	LPV200	1	99.296	1	99.296	2	99.285
AUW	WAUSAU DOWNTOWN	WI	LPV200	1	99.296	1	99.296	2	99.285
BCK	BLACK RIVER FALLS AREA	WI	LPV	1	99.296	1	99.296	2	99.289

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BUU	BURLINGTON MUNICIPAL	WI	LP	1	99.296	1	99.296	1	99.296
C29	MIDDLETON MUNICIPAL/MOREY FLD	WI	LPV	1	99.296	1	99.296	2	99.294
C35	REEDSBURG MUNICIPAL	WI	LP	1	99.296	1	99.296	2	99.293
C47	PORTAGE MUNICIPAL	WI	LP	1	99.296	1	99.296	2	99.289
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
CMY	SPARTA/FORT MC COY	WI	LPV	1	99.296	1	99.296	2	99.293
CWA	CENTRAL WISCONSIN	WI	LPV200	1	99.296	1	99.296	2	99.285
DLL	BARABOO/WISCONSIN DELLS RGNL	WI	LPV	1	99.296	1	99.296	2	99.291
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	1	99.296	1	99.296	2	99.285
EGV	EAGLE RIVER UNION	WI	LPV	1	99.296	1	99.296	3	99.275
ENW	KENOSHA RGNL	WI	LPV200	1	99.296	1	99.296	1	99.296
ETB	WEST BEND MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.289
EZS	SHAWANO MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
FLD	FOND DU LAC COUNTY	WI	LPV	1	99.296	1	99.296	2	99.289
GRB	GREEN BAY/AUSTIN STRAUBEL INTL	WI	LPV200	1	99.296	1	99.296	2	99.285
GTG	GRANTSBURG MUNICIPAL	WI	LP	1	99.296	1	99.296	2	99.278
HXF	HARTFORD MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.289
HYR	SAWYER COUNTY	WI	LPV	1	99.296	1	99.296	2	99.278
ISW	ALEXANDER FLD SOUTH WOOD COUNT	WI	LPV	1	99.296	1	99.296	2	99.285
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	1	99.296	1	99.296	1	99.296
LNR	TRI-COUNTY RGNL	WI	LPV	1	99.296	1	99.296	2	99.293
LSE	LA CROSSE RGNL	WI	LPV	1	99.296	1	99.296	2	99.293
LUM	MENOMONIE MUNICIPAL/SCORE FLD	WI	LPV	1	99.296	1	99.296	2	99.285
MDZ	TAYLOR COUNTY	WI	LPV	1	99.296	1	99.296	2	99.285
MFI	MARSHFIELD MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
MKE	GENERAL MITCHELL INTL	WI	LPV200	1	99.296	1	99.296	1	99.296
MRJ	IOWA COUNTY	WI	LPV200	1	99.296	1	99.296	1	99.296

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MSN	DANE COUNTY RGNL/TRUAX FLD	WI	LPV200	1	99.296	1	99.296	2	99.295
MTW	MANITOWOC COUNTY	WI	LPV200	1	99.296	1	99.296	2	99.285
MWC	LAWRENCE J TIMMERMAN	WI	LPV	1	99.296	1	99.296	1	99.296
OCQ	OCONTO/J DOUGLAS BAKE MUNICIPAL	WI	LP	1	99.296	1	99.296	2	99.285
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	1	99.296	1	99.296	2	99.285
OSH	WITTMAN RGNL	WI	LPV200	1	99.296	1	99.296	2	99.285
OVS	BOSCOBEL	WI	LPV	1	99.296	1	99.296	2	99.295
PBH	PRICE COUNTY	WI	LPV	1	99.296	1	99.296	2	99.280
PCZ	WAUPACA MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	1	99.296	1	99.296	1	99.296
RAC	BATTEN INTL	WI	LPV	1	99.296	1	99.296	1	99.296
RCX	RUSK COUNTY	WI	LPV	1	99.296	1	99.296	2	99.281
RHI	RHINELANDER/ONEIDA COUNTY	WI	LPV200	1	99.296	1	99.296	2	99.281
RNH	NEW RICHMOND RGNL	WI	LPV	1	99.296	1	99.296	2	99.286
RPD	RICE LAKE RGNL/CARL'S FLD	WI	LPV200	1	99.296	1	99.296	2	99.281
RRL	MERRILL MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
SBM	SHEBOYGAN COUNTY MEML	WI	LPV200	1	99.296	1	99.296	2	99.289
STE	STEVENS POINT MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	1	99.296	1	99.296	2	99.285
SUW	RICHARD I BONG	WI	LP	1	99.296	1	99.296	3	99.276
TKV	TOMAHAWK RGNL	WI	LP	1	99.296	1	99.296	2	99.281
UBE	CUMBERLAND MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.281
UES	WAUKESHA COUNTY	WI	LPV200	1	99.296	1	99.296	1	99.296
UNU	DODGE COUNTY	WI	LPV	1	99.296	1	99.296	2	99.289
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	1	99.296	1	99.296	2	99.285
Y50	WAUTOMA MUNICIPAL	WI	LP	1	99.296	1	99.296	2	99.288
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	1	99.296	1	99.296	3	99.280

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
Y72	BLOYER FLD	WI	LP	1	99.296	1	99.296	2	99.289
3I2	MASON COUNTY	WV	LPV	1	99.300	1	99.296	1	99.296
6L4	LOGAN COUNTY	WV	LPV	1	99.300	1	99.296	1	99.296
BKW	RALEIGH COUNTY MEML	WV	LPV200	1	99.300	1	99.296	2	99.292
BLF	MERCER COUNTY	WV	LPV	1	99.300	1	99.300	2	99.291
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	1	99.296	1	99.296	2	99.295
CRW	WEST VIRGINIA INTL YEAGER	WV	LPV200	1	99.300	1	99.296	2	99.296
HLG	WHEELING OHIO COUNTY	WV	LPV200	1	99.296	1	99.296	1	99.296
HTS	TRI-STATE/MILTON J FERGUSON FL	WV	LPV200	1	99.300	1	99.296	1	99.296
I18	JACKSON COUNTY	WV	LPV200	1	99.300	1	99.296	1	99.296
LWB	GREENBRIER VALLEY	WV	LPV	1	99.300	1	99.296	2	99.290
MGW	MORGANTOWN MUNICIPAL (WALTER L BILL	WV	LPV200	1	99.296	1	99.296	1	99.296
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	1	99.296	1	99.296	2	99.293
PKB	MID-OHIO VALLEY RGNL	WV	LPV	1	99.296	1	99.296	1	99.296
USW	BOGGS FLD	WV	LPV	1	99.300	1	99.296	2	99.295
W22	UPSHUR COUNTY RGNL	WV	LPV	1	99.296	1	99.296	2	99.293
W35	POTOMAC AIRPARK	WV	LP	1	99.296	1	99.296	2	99.293
W99	GRANT COUNTY	WV	LP	1	99.296	1	99.296	2	99.292
BYG	JOHNSON COUNTY	WY	LPV	1	99.289	1	99.289	1	99.286
COD	YELLOWSTONE RGNL	WY	LPV	1	99.287	1	99.286	1	99.286
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	1	99.307	1	99.293	1	99.289
CYS	CHEYENNE RGNL/JERRY OLSON FLD	WY	LPV200	1	99.307	1	99.301	1	99.292
DGW	CONVERSE COUNTY	WY	LPV200	1	99.307	1	99.296	1	99.289
DWX	DIXON	WY	LP	1	99.307	1	99.307	1	99.289
EAN	PHIFER AIRFIELD	WY	LPV200	1	99.307	1	99.296	1	99.290
ECS	MONDELL FLD	WY	LPV	1	99.293	1	99.293	1	99.285
EMM	KEMMERER MUNICIPAL	WY	LPV	1	99.304	1	99.293	1	99.286

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EVW	EVANSTON-UINTA COUNTY BURNS FL	WY	LPV	1	99.307	1	99.299	1	99.286
FBR	FORT BRIDGER	WY	LP	1	99.307	1	99.297	1	99.286
GCC	NORTHEAST WYOMING RGNL	WY	LPV	1	99.288	1	99.288	1	99.286
GEY	SOUTH BIG HORN COUNTY	WY	LPV	1	99.289	1	99.286	1	99.286
GUR	CAMP GUERNSEY	WY	LP	1	99.307	1	99.296	1	99.289
HSG	HOT SPRINGS COUNTY	WY	LPV	1	99.289	1	99.287	1	99.286
JAC	JACKSON HOLE	WY	LPV200	1	99.286	1	99.286	1	99.286
LAR	LARAMIE RGNL	WY	LPV	1	99.307	1	99.303	1	99.292
LND	HUNT FLD	WY	LPV	1	99.289	1	99.289	1	99.286
PNA	RALPH WENZ FLD	WY	LPV	1	99.289	1	99.289	1	99.286
POY	POWELL MUNICIPAL	WY	LPV	1	99.286	1	99.286	1	99.286
RIW	CENTRAL WYOMING RGNL	WY	LPV200	1	99.289	1	99.289	1	99.286
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	1	99.307	1	99.297	1	99.286
RWL	RAWLINS MUNICIPAL/HARVEY FLD	WY	LPV	1	99.307	1	99.297	1	99.289
SAA	SHIVELY FLD	WY	LPV	1	99.307	1	99.304	1	99.290
SHR	SHERIDAN COUNTY	WY	LPV	1	99.287	1	99.287	1	99.286
U68	NORTH BIG HORN COUNTY	WY	LPV	1	99.286	1	99.286	1	99.286
W43	HULETT MUNICIPAL	WY	LPV	1	99.288	1	99.288	1	99.285
WRL	WORLAND MUNICIPAL	WY	LPV	1	99.289	1	99.288	1	99.286
CYMA	MAYO	YT	LPV	2	99.300	1	99.275	6	99.197
CYQH	WATSON LAKE	YT	LPV	1	99.275	2	99.269	6	99.216
CYXY	ERIK NIELSEN INTL	YT	LPV200	1	99.275	1	99.275	4	99.193
CYZW	TESLIN	YT	LPV	1	99.275	2	99.272	6	99.204

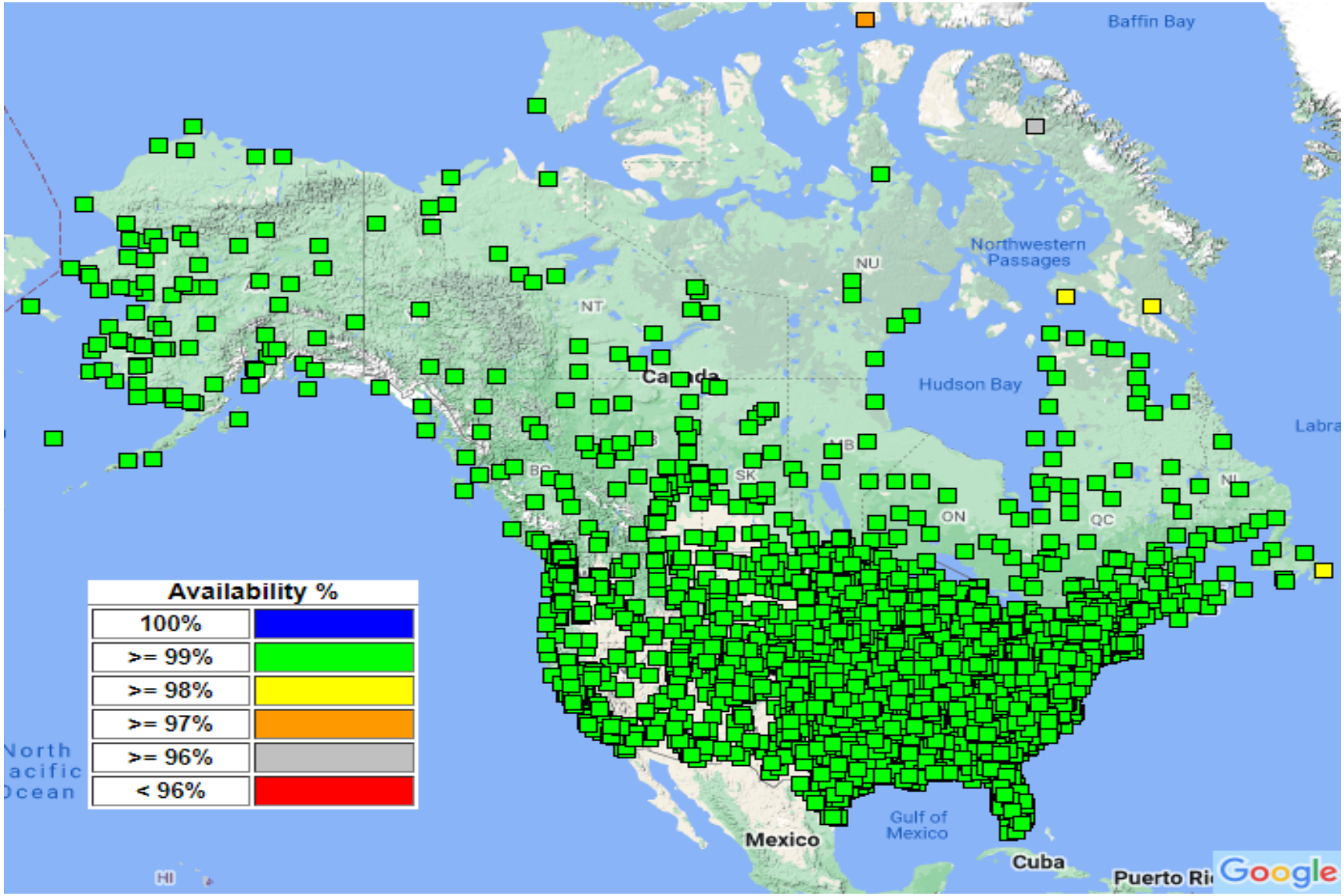

Figure 8-1 WAAS LP Availability at Airports in the U.S. and Canada with GPS RNAV IAPs

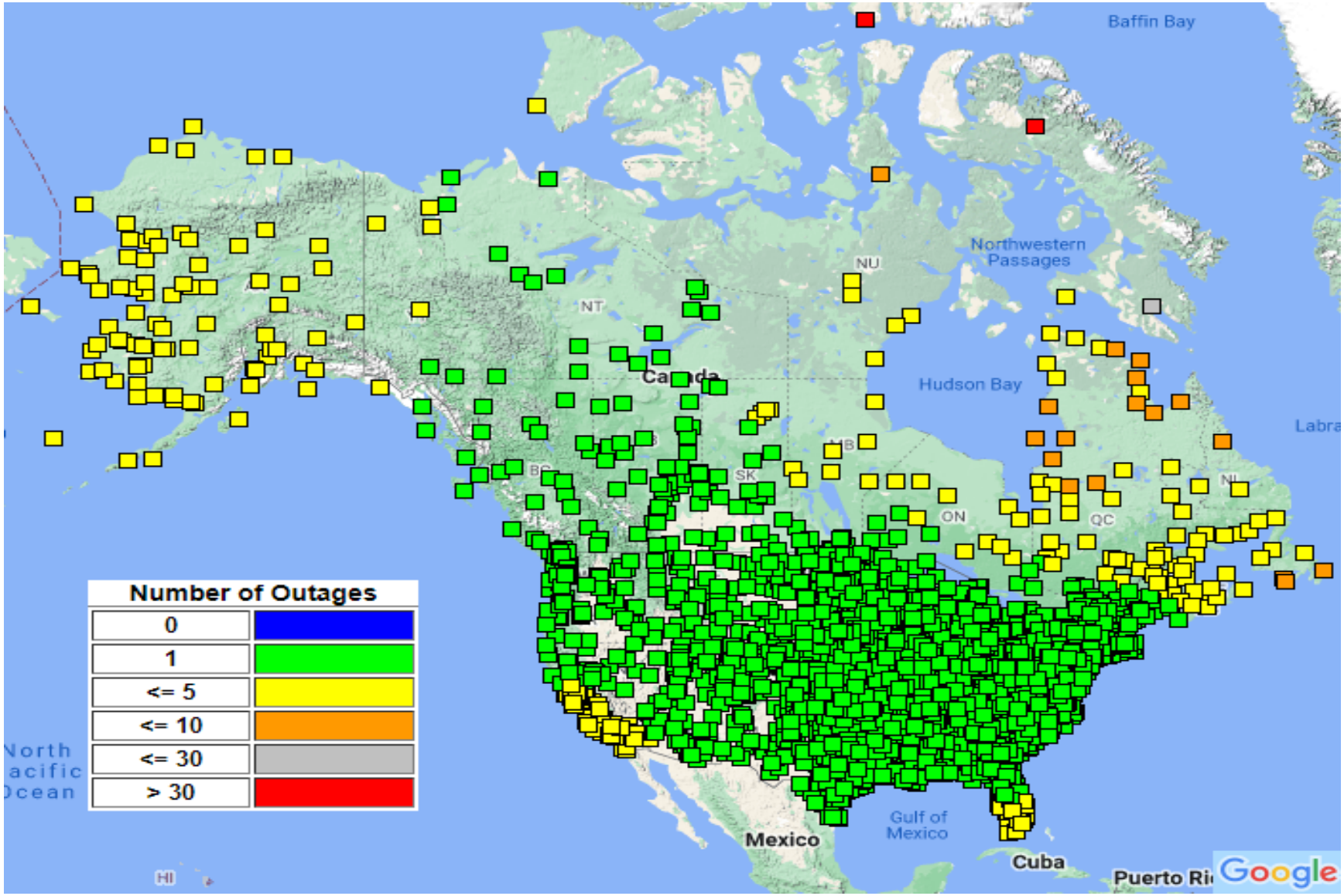

Figure 8-2 WAAS LP Outages at Airports in the U.S. and Canada with GPS RNAV IAPs

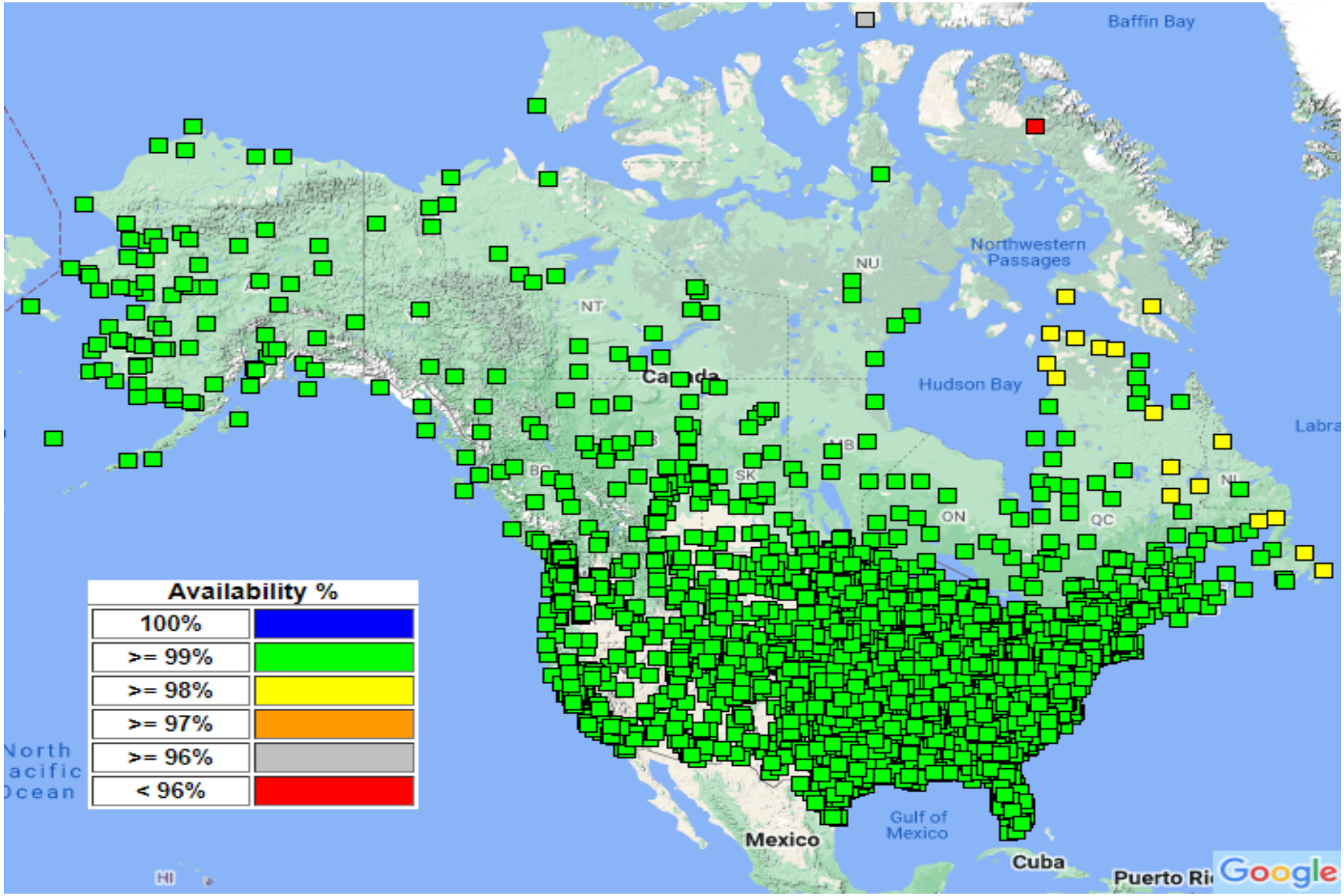

Figure 8-3 WAAS LPV Availability Airports in the U.S. and Canada with GPS RNAV IAPs

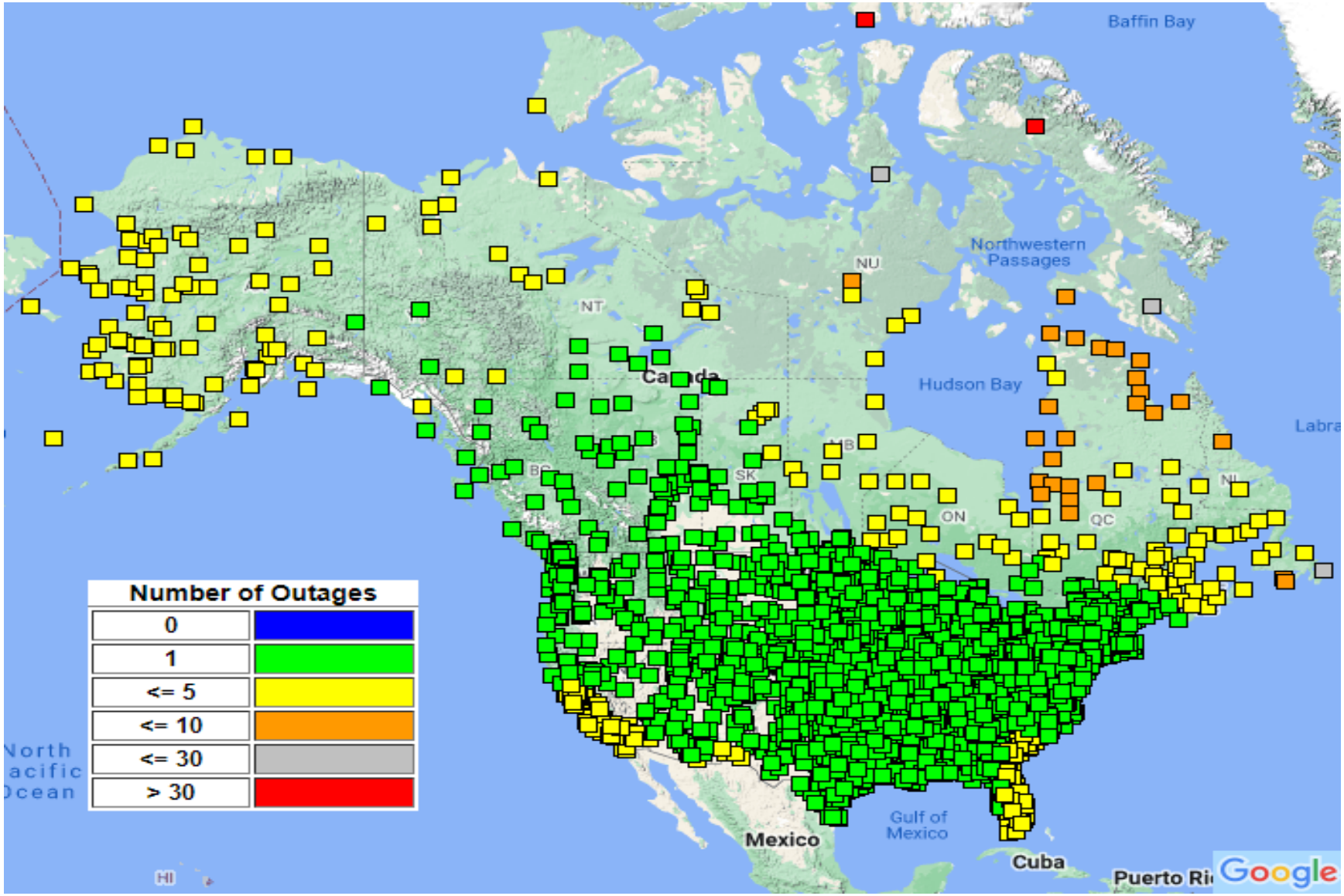

Figure 8-4 WAAS LPV Outages at Airports in the U.S. and Canada with GPS RNAV IAPs

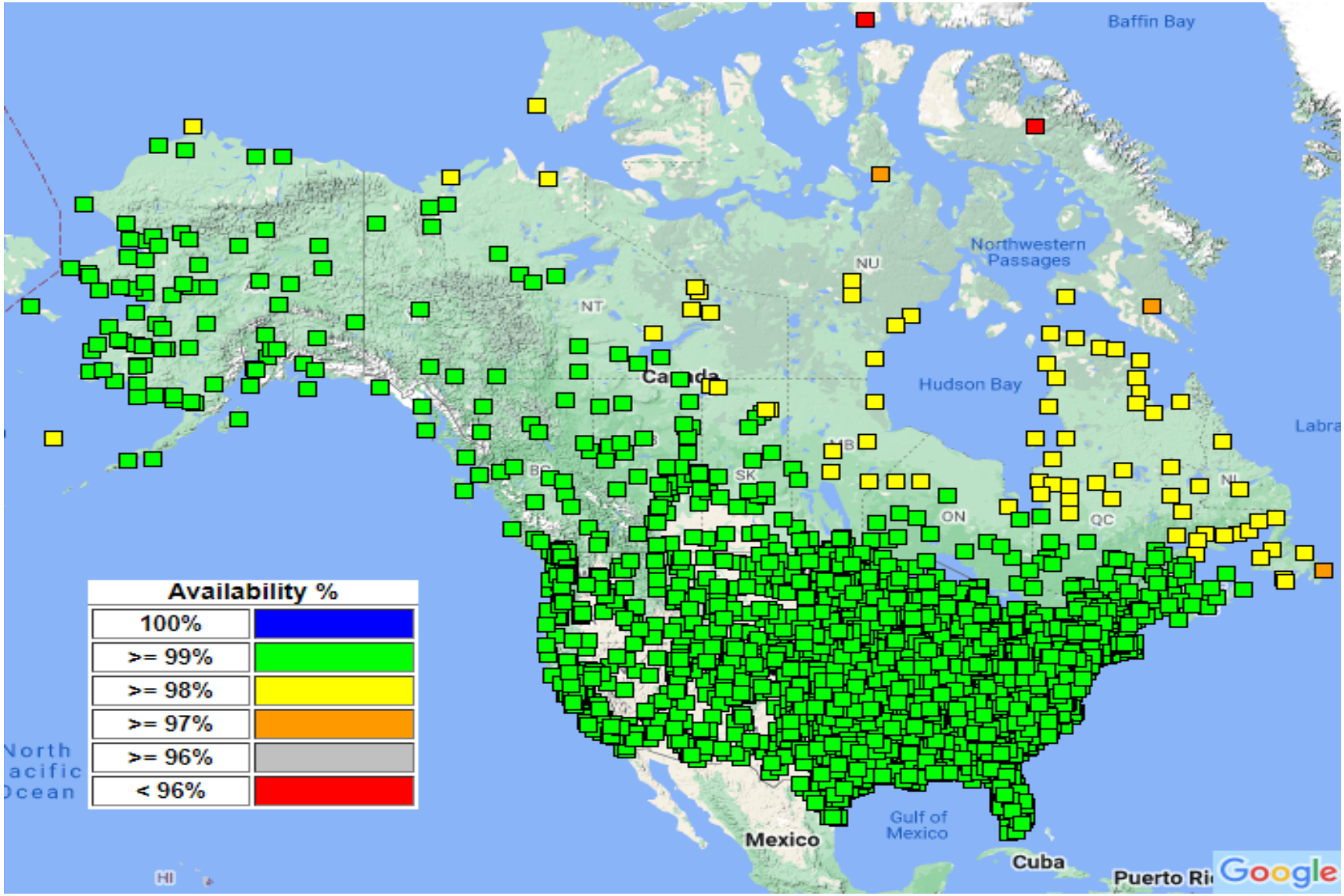

Figure 8-5 WAAS LPV200 Availability at Airports in the U.S. and Canada with GPS RNAV IAPs

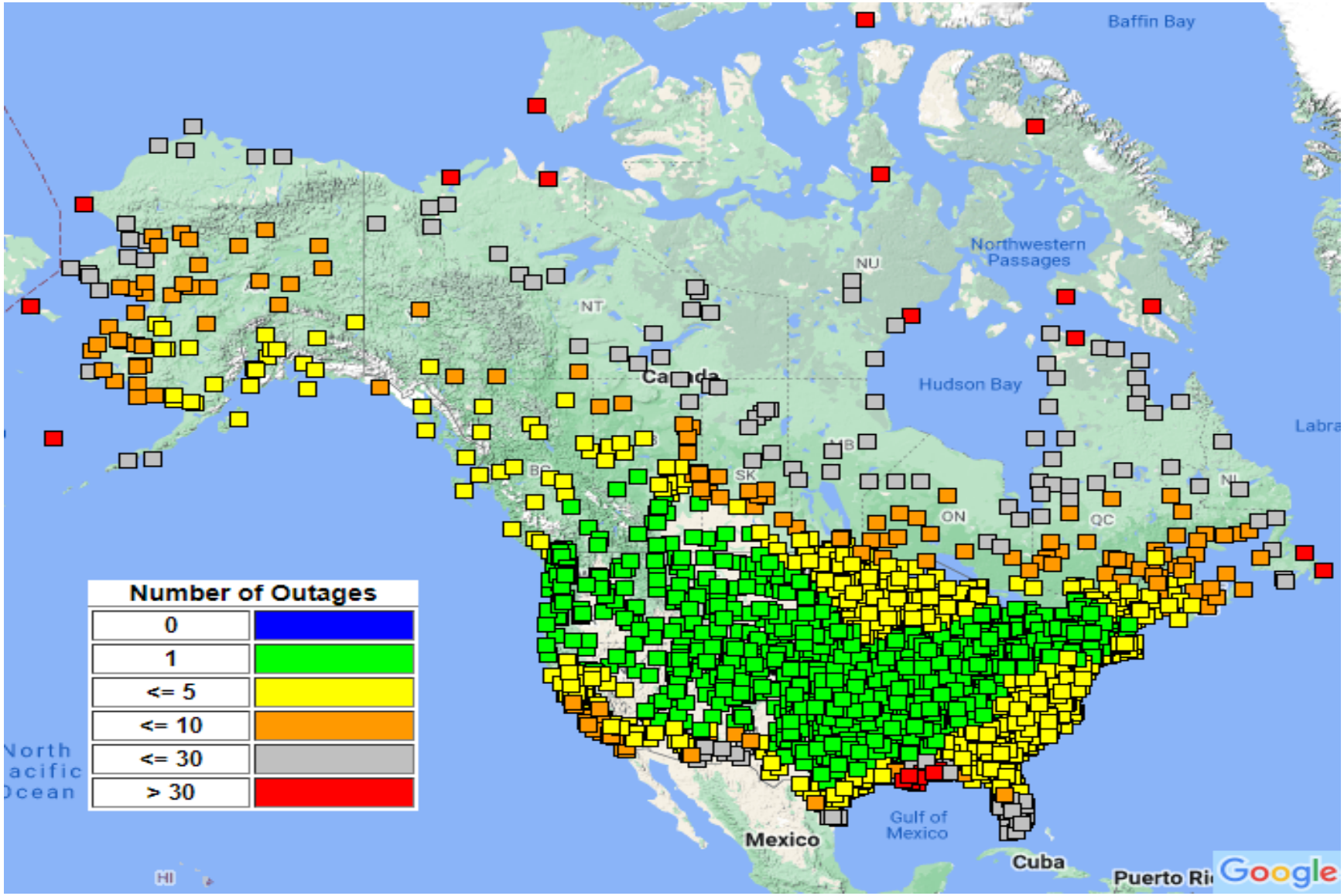

Figure 8-6 WAAS LPV200 Outages at Airports in the U.S. and Canada with GPS RNAV IAPs

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 CNMP Bounding Statisticsshows 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 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24
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 23	Aug 23	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	Jun 24
Juneau	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kansas City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Kotzebue	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Los Angeles	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Memphis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Merida	A	•	•	–	–	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Mexico City	A	•	•	•	–	–	–	–	–	–	•	•	•
	B	–	–	–	–	–	–	–	–	–	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	–
Miami	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Minneapolis	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
New York	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Oakland	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Puerto Vallarta	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	–	–
	C	•	•	•	•	•	•	•	•	•	•	•	•
Salt Lake City	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	–	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Jose Del Cabo	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
San Juan	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Seattle	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Tapachula	A	•	•	•	•	•	•	•	•	•	–	–	–
	B	–	–	–	–	–	–	–	–	–	–	–	–
	C	•	•	•	•	•	•	•	•	•	–	–	–
Washington, DC	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	•	•	•	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•
Winnipeg	A	•	•	•	•	•	•	•	•	•	•	•	•
	B	•	•	–	–	–	•	•	•	•	•	•	•
	C	•	•	•	•	•	•	•	•	•	•	•	•

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

10.0 WRS ANTENNA SURVEY VALIDATION

Antenna L1 phase center position surveys were performed for all the WAAS Reference Station antennas using 24 hour sets on 06/30/2024. The San Jose Del Cabo Thread A (MSD1), San Jose Del Cabo Thread B (MSD2), and San Jose Del Cabo Thread C (MSD3) survey was performed on 06/19/2024 due to data outages on the initial survey. Mexico City Thread C (MMX3), Puerto Vallerta Thread B (MPR2), Tapachula Thread A (MTP1), Tapachula Thread B (MTP2), and Tapachula Thread C (MTP3) are excluded from this since they were out of service. Each WAAS WRS has three independent threads of WRE: (1) Thread A is also referred to as Thread 1, (2) Thread B is also referred to as Thread 2, and (3) Thread C is referred to as Thread 3.

Duplicate surveys were performed using both the NGS OPUS and the CSRS PPP services. The International GPS Service (IGS) 08 reference frame is used for the OPUS solutions. A value of -0.4445 meters was used for the antenna reference point (ARP) to antenna phase center (APC) offset for the MicroPulse MPL-WAAS-2225W WAAS antennas in the processing of the data.

The OPUS-reported RMS quality metrics were 2.5 cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 12.1 mm or less. The OPUS and CSRS surveys agreed to an average of 1.11 cm with a standard deviation of 5.25 mm. The maximum of difference was 2.63 cm at Bethel Thread A (BET1).

The OPUS positions were compared to the positions computed by the WAAS C&Vs. The survey was completed on June 30, 2024. The OPUS surveys agree with the calculated positions to better or equal to 1.81 cm for most sites. The maximum difference was 8.57 cm at Bethel Thread A (BET1).

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	-2965385.271	-972576.669	5543892.758	60.7879131	-161.8417254	52.172
BET2	-2965386.036	-972580.394	5543891.695	60.7878936	-161.8416648	52.166
BET3	-2965388.611	-972577.521	5543890.839	60.7878777	-161.8417297	52.176
BIL1	-1416446.043	-4223577.019	4550862.065	45.803706	-108.539725	1112.218
BIL2	-1416450.119	-4223574.87	4550862.795	45.8037153	-108.5397835	1112.225
BIL3	-1416441.741	-4223574.272	4550865.922	45.8037558	-108.5396838	1112.215
BRW1	-1886759.158	-809058.709	6018494.384	71.2827627	-156.7899261	15.559
BRW2	-1886756.576	-809055.961	6018495.566	71.2827954	-156.7899682	15.57
BRW3	-1886755.479	-809059.75	6018495.385	71.2827908	-156.789859	15.554
CDB1	-3484099.295	-1084748.833	5213678.482	55.1923716	-162.7064051	49.717
CDB2	-3484105.927	-1084741.642	5213675.534	55.1923255	-162.7065438	49.691
CDB3	-3484112.213	-1084734.861	5213672.787	55.192282	-162.7066748	49.711
FAI1	-2304742.059	-1448715.353	5748843.655	64.8096279	-147.8473423	150.014
FAI2	-2304741.598	-1448706.542	5748846.05	64.8096782	-147.8474941	150.02
FAI3	-2304733.071	-1448707.479	5748849.213	64.8097449	-147.8473819	150.021
JNU1	-2354255.191	-2388549.728	5407043.186	58.3625729	-134.5857097	16.301
JNU2	-2354253.107	-2388565.839	5407037.018	58.3624674	-134.5854911	16.301
JNU3	-2354239.889	-2388568.691	5407041.477	58.3625438	-134.5852961	16.295
MMD1	35070.303	-5959686.649	2264365.767	20.9319093	-89.6628418	29.102
MMD2	35065.384	-5959687.025	2264364.987	20.9319016	-89.6628891	29.147
MMD3	35065.058	-5959685.226	2264369.634	20.9319466	-89.6628922	29.125
MMX1	-948700.68	-5943932.419	2109211.625	19.431654	-99.0683905	2232.206
MMX2	-948696.243	-5943932.246	2109214.059	19.4316773	-99.068349	2232.195
MMX3	N/A	N/A	N/A	N/A	N/A	N/A
MPR1	-1570142.299	-5759530.58	2238184.727	20.6790031	-105.249204	10.965
MPR2	N/A	N/A	N/A	N/A	N/A	N/A
MPR3	-1570143.583	-5759527.973	2238190.542	20.6790592	-105.2492224	10.982

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
MSD1	-1979520.27	-5523222.74	2493107.026	23.1604492	-109.7176542	104.277
MSD2	-1979521.837	-5523225.079	2493100.635	23.1603865	-109.7176609	104.274
MSD3	-1979526.287	-5523221.805	2493104.299	23.1604225	-109.7177126	104.262
MTP1	N/A	N/A	N/A	N/A	N/A	N/A
MTP2	N/A	N/A	N/A	N/A	N/A	N/A
MTP3	N/A	N/A	N/A	N/A	N/A	N/A
OTZ1	-2396056.254	-750356.219	5843502.379	66.8873297	-162.6113732	10.854
OTZ2	-2396053.08	-750354.389	5843503.9	66.8873646	-162.6113915	10.849
OTZ3	-2396053.064	-750358.33	5843503.418	66.8873533	-162.6113055	10.862
YFB1	1035381.223	-2634289.679	5696539.613	63.7314912	-68.5431879	10.072
YFB2	1035372.013	-2634296.103	5696538.252	63.7314648	-68.543409	10.007
YFB3	1035365.938	-2634306.865	5696534.478	63.7313871	-68.5436032	10.072
YQX1	2430424.451	-3419640.421	4788223.929	48.9664911	-54.5976344	146.897
YQX2	2430432.395	-3419639.073	4788220.87	48.9664493	-54.5975353	146.89
YQX3	2430440.302	-3419637.72	4788217.884	48.9664081	-54.5974366	146.921
YWG1	-520164.609	-4083475.996	4855842.99	49.9005735	-97.2594007	222.117
YWG2	-520150.731	-4083468.93	4855850.387	49.9006766	-97.2592216	222.131
YWG3	-520152.607	-4083478.052	4855842.564	49.9005674	-97.2592314	222.128
YYR1	1885341.228	-3321428.387	5091171.753	53.3086482	-60.4194711	37.881
YYR2	1885344.191	-3321419.92	5091176.176	53.3087144	-60.4193697	37.902
YYR3	1885339.912	-3321413.101	5091182.178	53.3088046	-60.419375	37.909
ZAB1	-1488637.0	-5003946.543	3654557.658	35.1735748	-106.5673515	1620.136
ZAB2	-1488631.664	-5003948.23	3654557.634	35.1735741	-106.56729	1620.2
ZAB3	-1488632.442	-5003950.813	3654553.78	35.1735317	-106.5672901	1620.185
ZAN1	-2659536.817	-1549114.672	5567750.726	61.2292009	-149.7802541	80.714
ZAN2	-2659548.574	-1549110.716	5567746.238	61.2291173	-149.7804279	80.712
ZAN3	-2659541.523	-1549106.592	5567750.713	61.2292008	-149.7804282	80.703
ZAU1	138703.94	-4761244.125	4227763.918	41.7826581	-88.3313388	195.863
ZAU2	138704.203	-4761248.751	4227758.76	41.7825957	-88.3313373	195.88

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZAU3	138710.908	-4761248.482	4227758.838	41.7825966	-88.3312565	195.877
ZBW1	1490299.037	-4448983.184	4306010.535	42.735721	-71.480428	39.107
ZBW2	1490304.156	-4448981.177	4306010.884	42.735725	-71.480361	39.141
ZBW3	1490305.862	-4448984.806	4306006.571	42.7356722	-71.4803553	39.139
ZDC1	1069125.589	-4839598.984	4001126.522	39.1015962	-77.5427485	80.041
ZDC2	1069127.99	-4839603.619	4001120.322	39.1015242	-77.5427329	80.045
ZDC3	1069123.887	-4839602.697	4001122.514	39.1015497	-77.542777	80.042
ZDV1	-1273628.779	-4711375.565	4094890.06	40.1873027	-105.1272263	1541.349
ZDV2	-1273623.077	-4711377.08	4094890.073	40.187303	-105.1271571	1541.338
ZDV3	-1273625.088	-4711380.276	4094885.781	40.1872525	-105.12717	1541.326
ZFW1	-659983.339	-5324060.777	3438276.448	32.8306495	-97.0664733	155.621
ZFW2	-659988.615	-5324063.333	3438271.453	32.830596	-97.0665258	155.589
ZFW3	-659983.637	-5324063.862	3438271.662	32.8305981	-97.0664724	155.629
ZHN1	-5508637.235	-2234492.571	2303722.586	21.3129941	-157.9208346	24.67
ZHN2	-5508656.413	-2234482.896	2303687.333	21.3126511	-157.9209905	25.025
ZHN3	-5508647.81	-2234496.813	2303694.424	21.3127197	-157.9208351	25.049
ZHU1	-513864.603	-5506451.612	3166720.412	29.9618962	-95.3314277	10.749
ZHU2	-513867.244	-5506455.018	3166714.25	29.9618317	-95.3314517	10.822
ZHU3	-513873.53	-5506457.664	3166708.657	29.9617735	-95.331514	10.817
ZJX1	772646.307	-5434462.192	3237231.764	30.6988599	-81.9081865	2.133
ZJX2	772649.642	-5434463.748	3237228.373	30.6988243	-81.9081544	2.13
ZJX3	772645.57	-5434466.174	3237225.258	30.6987918	-81.9082	2.112
ZKC1	-415247.676	-4954556.393	3982161.1	38.8801592	-94.7908357	305.901
ZKC2	-415231.283	-4954557.711	3982161.151	38.8801599	-94.7906461	305.89
ZKC3	-415237.405	-4954561.05	3982155.956	38.8801017	-94.7907132	305.617
ZLA1	-2474410.184	-4637294.457	3602183.608	34.6035191	-118.0838987	763.51
ZLA2	-2474404.894	-4637297.249	3602183.605	34.6035192	-118.0838335	763.486
ZLA3	-2474411.508	-4637296.939	3602179.63	34.6034752	-118.0838987	763.567
ZLC1	-1808273.405	-4486410.823	4145302.964	40.7860425	-111.9521796	1287.451

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZLC2	-1808274.792	-4486414.441	4145298.466	40.785989	-111.9521789	1287.446
ZLC3	-1808270.587	-4486416.149	4145298.47	40.785989	-111.9521251	1287.458
ZMA1	966042.181	-5662999.821	2761581.536	25.8246126	-80.319191	-7.591
ZMA2	966029.205	-5662999.111	2761586.015	25.8246603	-80.3193174	-8.234
ZMA3	966037.285	-5662997.956	2761586.374	25.8246624	-80.319236	-7.88
ZME1	4070.732	-5226189.308	3644028.416	35.067394	-89.9553717	68.608
ZME2	4070.764	-5226186.759	3644032.534	35.0674376	-89.9553714	68.888
ZME3	4064.571	-5226186.616	3644032.683	35.0674394	-89.9554393	68.852
ZMP1	-249978.557	-4539297.488	4458955.01	44.637463	-93.1520877	262.623
ZMP2	-249972.752	-4539297.829	4458955.012	44.6374629	-93.1520144	262.64
ZMP3	-249973.851	-4539302.107	4458950.535	44.6374068	-93.1520253	262.577
ZNY1	1406144.458	-4627343.976	4144322.114	40.7843293	-73.0971677	6.442
ZNY2	1406146.258	-4627347.024	4144317.313	40.7842764	-73.0971578	5.91
ZNY3	1406140.701	-4627348.687	4144317.35	40.7842767	-73.0972265	5.916
ZOA1	-2684437.127	-4293337.159	3865351.956	37.543055	-122.0159517	-3.503
ZOA2	-2684434.119	-4293341.242	3865349.529	37.5430274	-122.0158984	-3.501
ZOA3	-2684438.492	-4293342.117	3865345.673	37.542983	-122.0159351	-3.425
ZOB1	650770.008	-4754715.661	4187420.752	41.2971547	-82.2064468	223.656
ZOB2	650777.688	-4754714.835	4187422.771	41.297167	-82.2063546	225.156
ZOB3	650776.019	-4754719.66	4187414.98	41.2970872	-82.2063822	223.436
ZSE1	-2308930.385	-3668169.666	4663526.408	47.2869925	-122.1883741	82.084
ZSE2	-2308934.782	-3668175.208	4663520.001	47.2869069	-122.1883843	82.147
ZSE3	-2308935.839	-3668179.487	4663516.059	47.2868552	-122.188366	82.089
ZSU1	2462589.502	-5529372.049	2003724.617	18.4313371	-65.9934759	-28.091
ZSU2	2462587.565	-5529377.419	2003712.327	18.43122	-65.9935134	-28.07
ZSU3	2462594.197	-5529375.157	2003710.246	18.4312004	-65.9934473	-28.129
ZTL1	529840.255	-5305248.81	3489342.86	33.3796887	-84.2967276	261.128
ZTL2	529846.634	-5305247.979	3489343.149	33.3796919	-84.2966585	261.126
ZTL3	529847.32	-5305251.424	3489337.917	33.3796351	-84.2966548	261.167

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

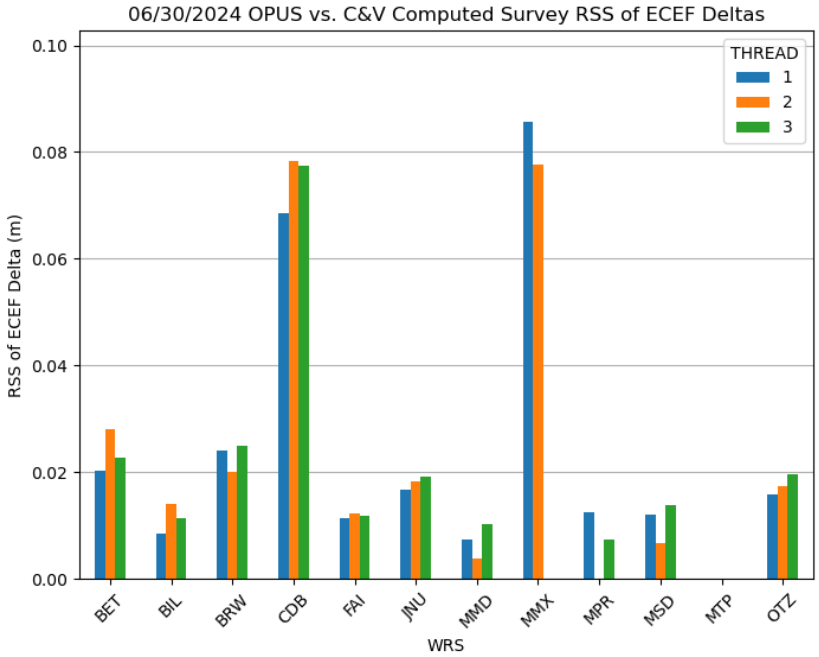

Figure 10-1 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

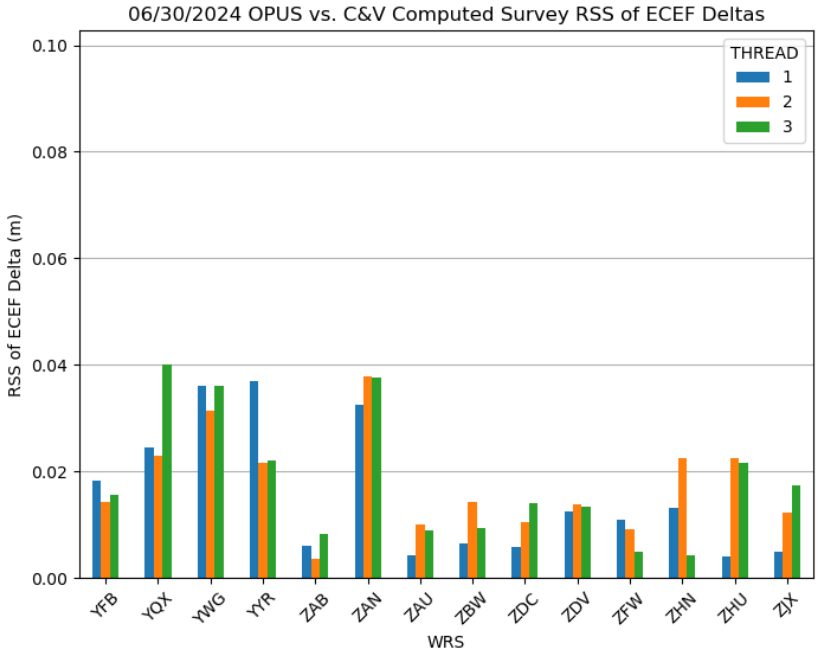

Figure 10-2 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

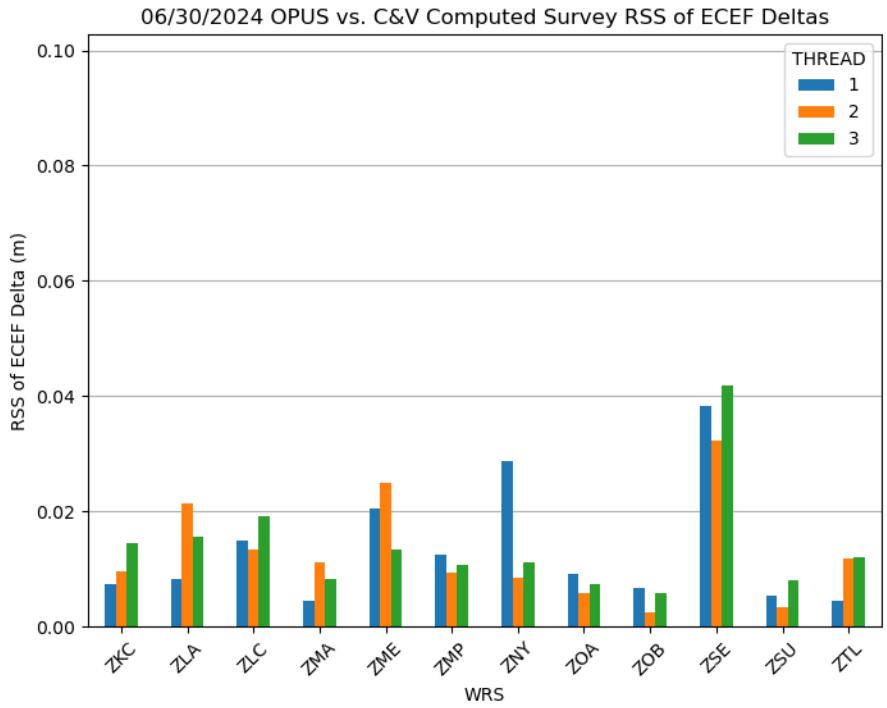

Figure 10-3 WAAS C&V Calculated Antenna Positions Deltas OPUS Survey

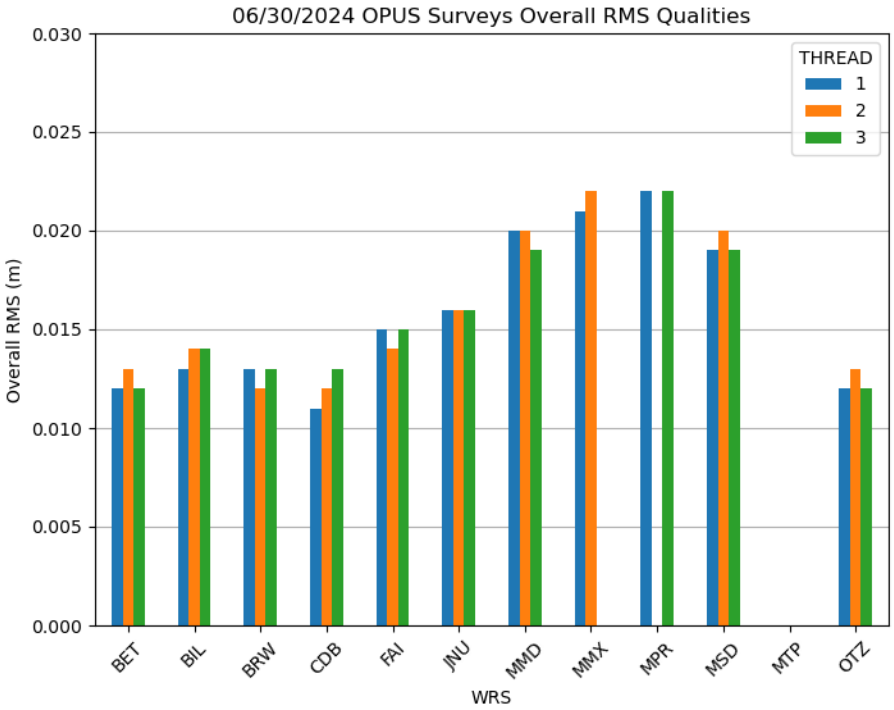

Figure 10-4 OPUS Survey Overall RMS Qualities

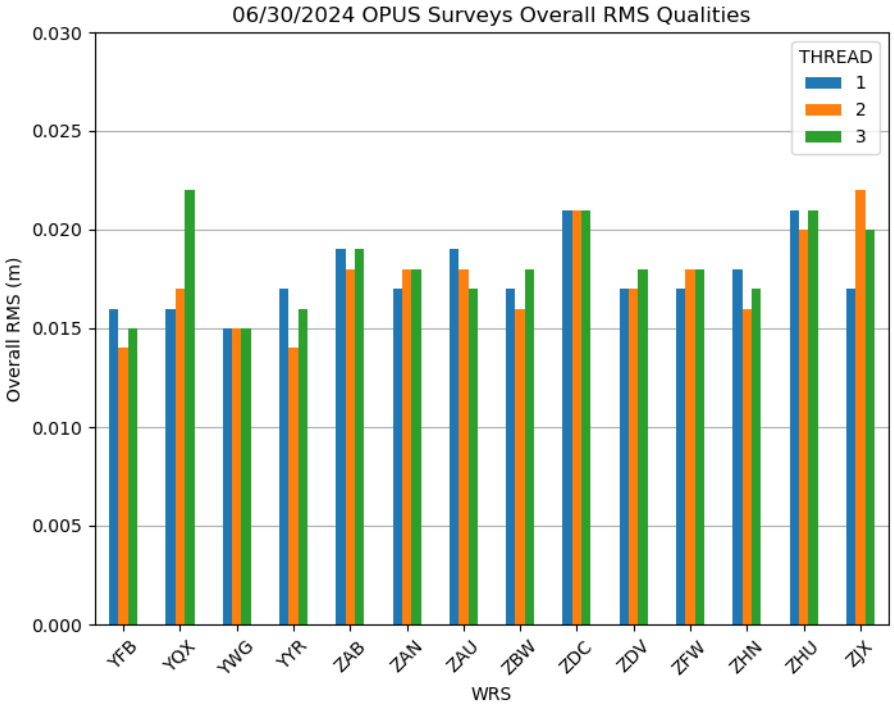

Figure 10-5 OPUS Survey Overall RMS Qualities

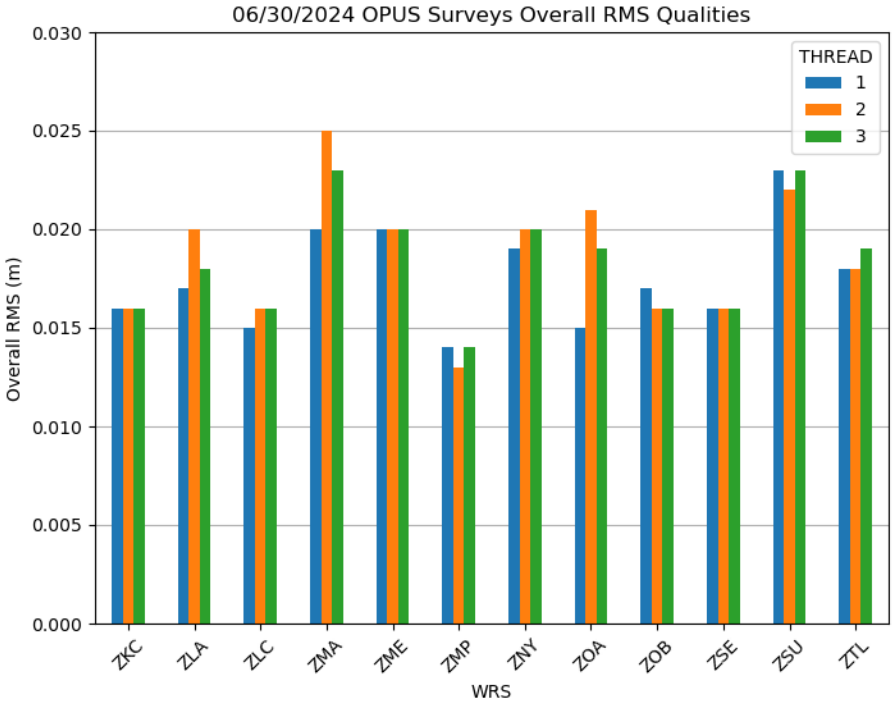

Figure 10-6 OPUS Survey Overall RMS Qualities

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

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

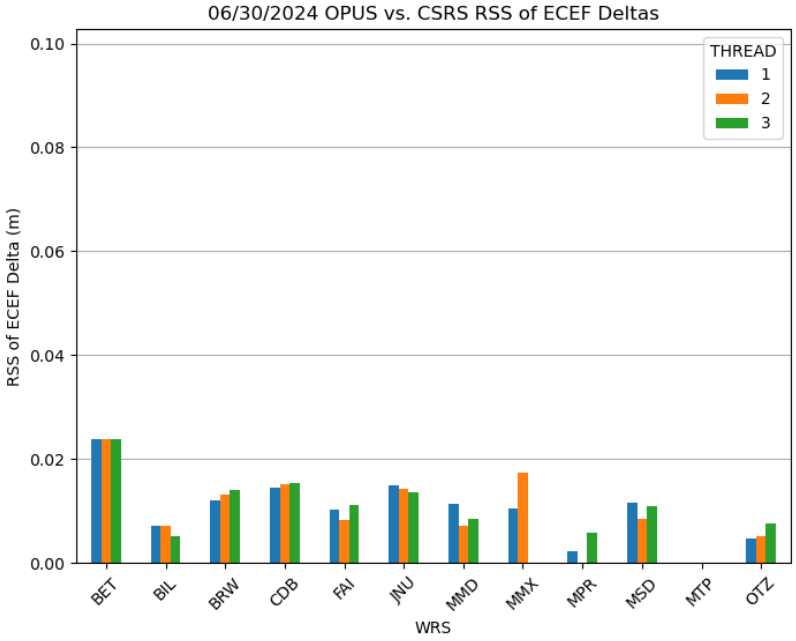

Figure 10-7 OPUS vs. CSRS RSS ECEF Deltas

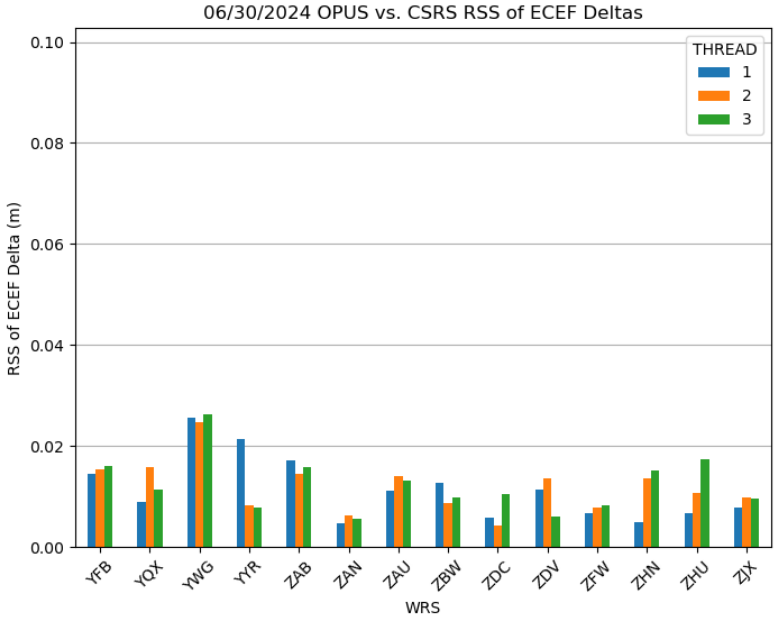

Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

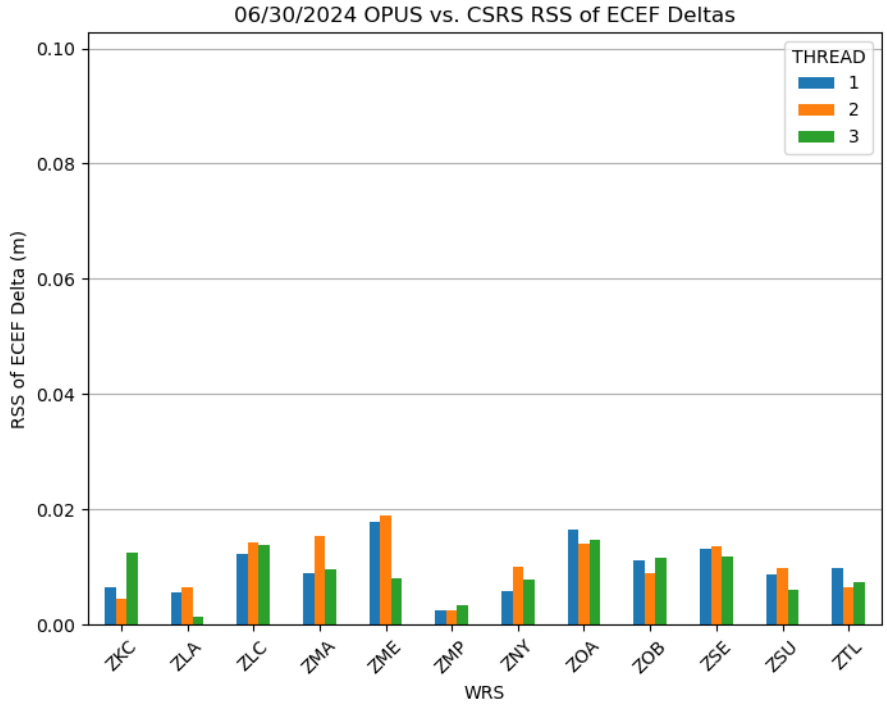

Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

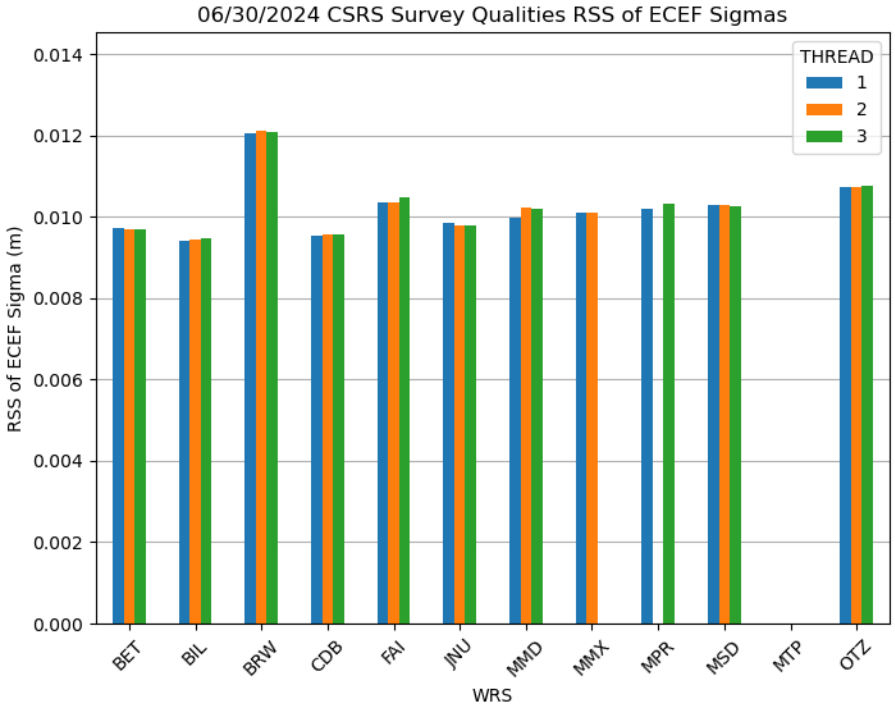

Figure 10-10 CSRS Survey Qualities

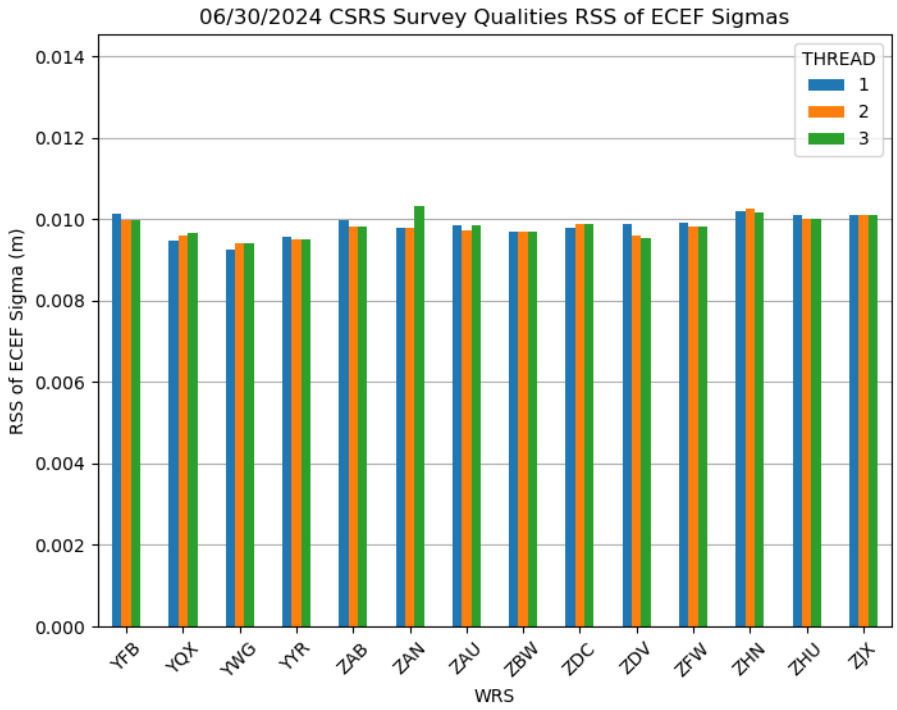

Figure 10-11 CSRS Survey Qualities

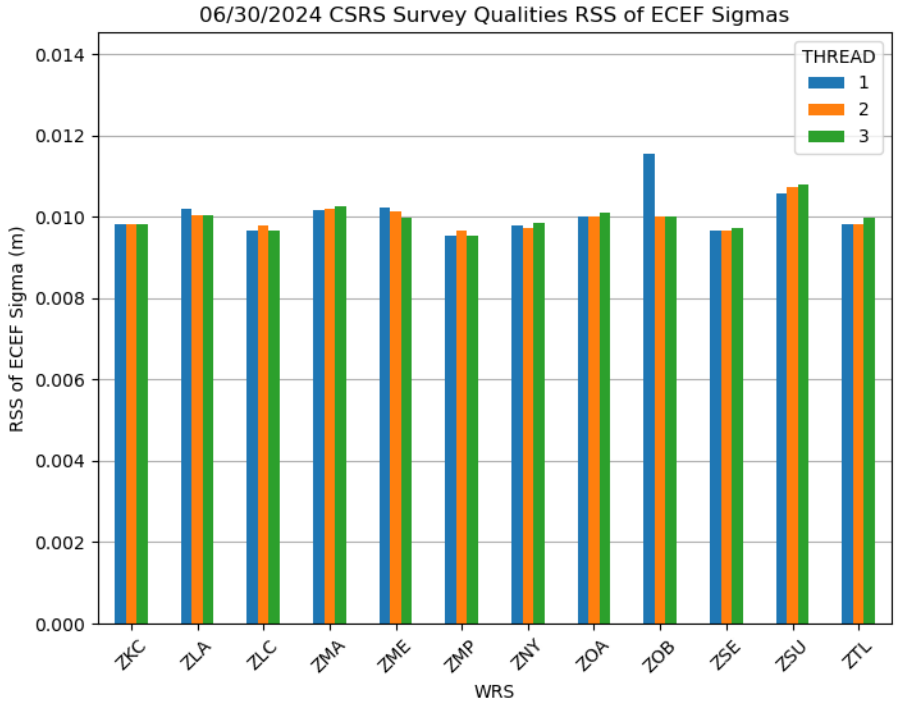

Figure 10-12 CSRS Survey Qualities

11.0 SQM

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

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

11.1 Alpha Metrics

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

Table 11-1 Alpha Metrics

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

11.2 Type Bias

The PRN type biases are evaluated as part of the WAAS SQM offline monitoring effort. Depending on the PRN number of any given GPS satellite, it can be classified into three categories of correlation function shapes: skinny (Type 0), nominal (Type 1), and broad (Type 2). Note that wideband GEOs are considered a different type (Type 3). The PRN type biases are estimates that are computed at each epoch, and daily averages are computed for each type, for four detection metrics. Table 11-2 shows the rollup for Type Bias Average for the Quarter. Table 11-3 shows the rollup for the Type Bias Average since January 1, 2008.

For this reporting period, the GEO-type biases were not evaluated. Figure 11-2 PRN Bias Average for the Quartershows the rollup averages for the quarter. Figure 11-3 PRN Bias Average Trend (PRN1–PRN4)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	1.31773	1.31942	1.32142
DM 2	0.243314	0.246371	0.249517
DM 3	0.972669	0.973118	0.973794
DM 4	-0.188013	-0.189875	-0.191911

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.3159	1.31807	1.31983
DM 2	0.241528	0.244707	0.247835
DM 3	0.970675	0.971166	0.971748
DM 4	-0.186895	-0.188564	-0.190572

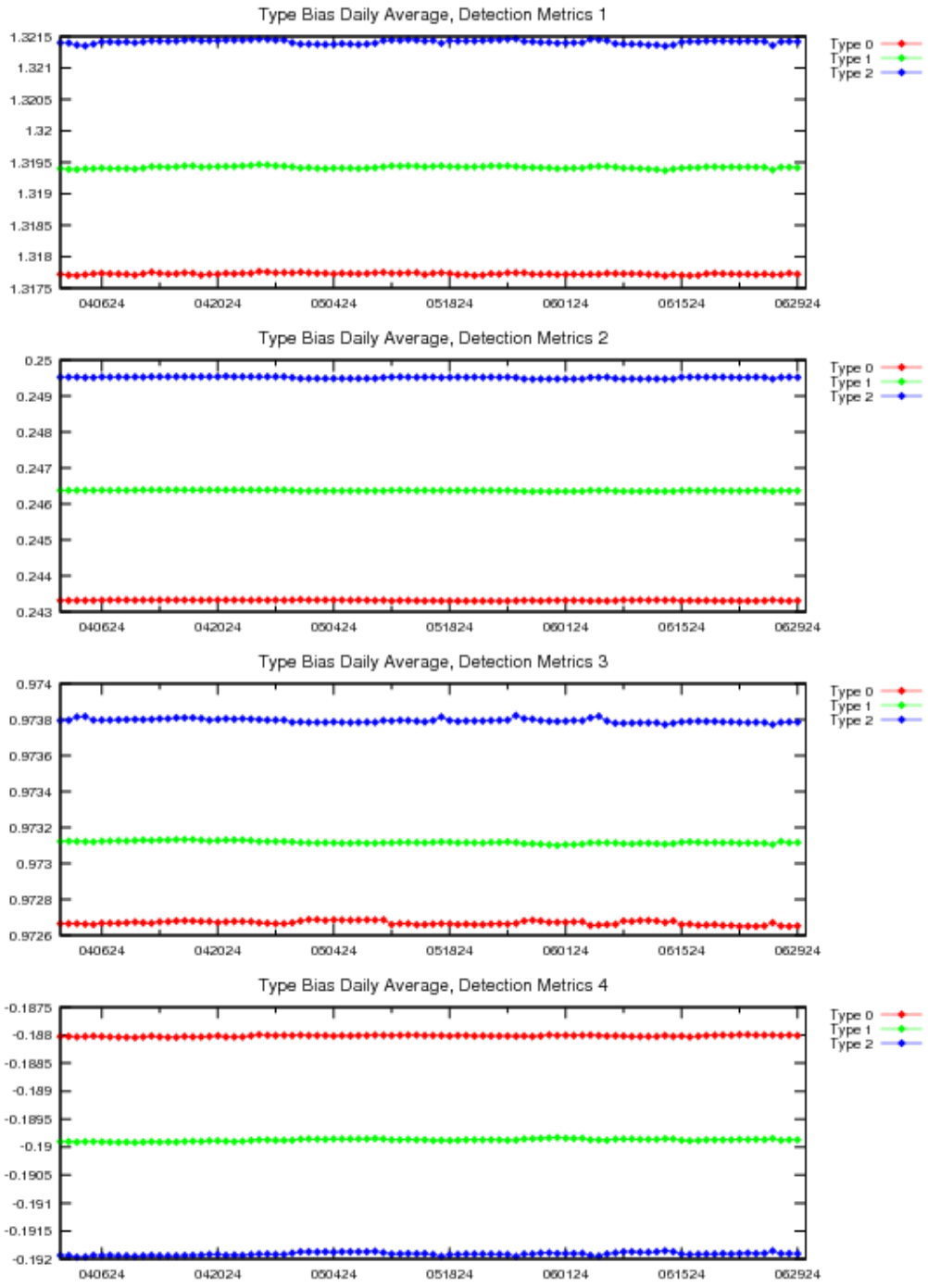

Figure 11-1 Type Bias Average Trend

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 0.0014440 observed on PRN22, (2) the maximum average for DM2 is 0.0002034 observed on PRN19, (3) the maximum average for DM3 is 0.0004515 observed on PRN18, (4) the maximum average for DM4 is 0.0006289 observed on PRN22.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1				
2	0.00024953	6.60978e-05	9.91678e-05	0.00011425
3	0.000180607	5.59656e-05	7.98078e-05	9.84744e-05
4	0.000708684	0.000236434	0.000396857	0.000243371
5	0.000163731	6.18367e-05	0.000108723	9.70456e-05
6	0.000750318	8.42467e-05	7.87389e-05	0.000297117
7	0.000164352	0.000146013	5.34575e-05	0.00013234
8	0.000339129	0.000124241	9.79822e-05	0.000142103
9	0.000251712	8.42489e-05	0.000139819	0.00012245
10	0.000183179	6.38922e-05	7.64178e-05	0.000125861
11	0.000349414	0.000118746	0.000390817	0.000313619
12	0.000360603	4.46622e-05	5.42822e-05	0.000104867
13	0.000625143	6.84867e-05	5.47567e-05	0.000257766
14	0.000528318	0.000200464	0.000388872	0.00025361
15	0.000370918	0.000115318	5.09678e-05	0.000101818
16	0.000202612	5.12478e-05	0.000117224	0.0002071
17	0.000341922	9.59216e-05	6.13625e-05	9.21489e-05
18	0.00064087	0.000166113	0.000451512	0.000260798
19	0.00069139	0.000203436	7.83544e-05	0.0001215
20	0.000161813	9.20111e-05	4.36467e-05	0.000159727
21	0.000226043	8.548e-05	0.000118218	0.000457156
22	0.00144396	0.000148227	6.94811e-05	0.000628914
23	0.000400042	0.000168563	0.000371117	0.000267479
24	0.000204446	6.57967e-05	0.000204442	0.00027338
25	0.000450957	0.000109131	4.25656e-05	0.00016686
26	0.000174567	6.90556e-05	0.000106122	0.000147113
27	0.000298086	0.000168956	0.000206956	0.00030591
28	0.00029102	0.000108221	0.000383528	0.000338473
29	0.000350141	0.000139007	0.000155497	0.000274537
30	0.000274164	0.000106596	0.000113021	0.000115003
31	0.000191432	0.000107716	6.10878e-05	0.000144322
32	0.000286571	0.000120909	5.87589e-05	0.000274501

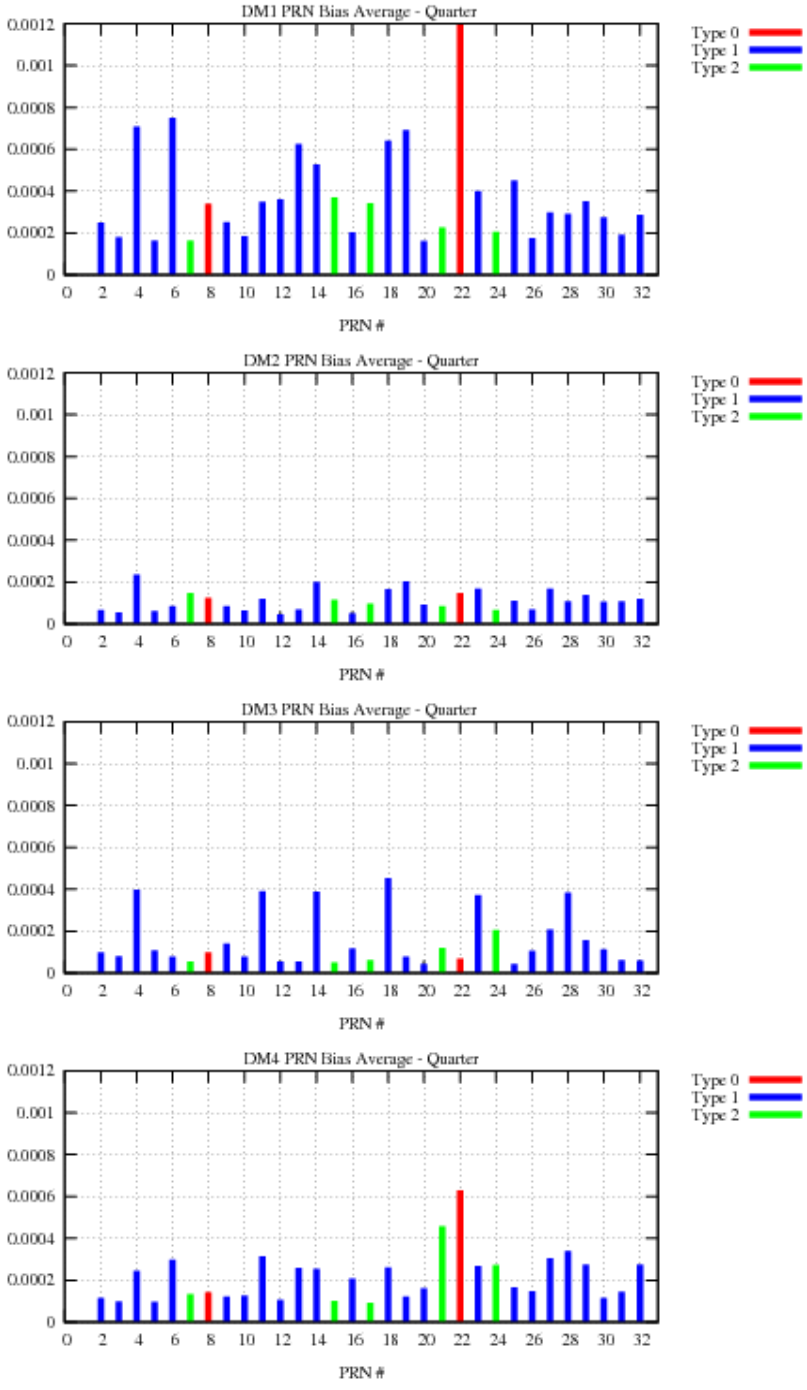

Figure 11-2 PRN Bias Average for the Quarter

Figure 11-3 to Figure 11-10 show the daily PRN bias for each PRN, for four detection metrics. Small bumps were due to NANUs. Figure 11-3 shows no SQM data for PRN1 as a result of its decommissioning. Figure 11-4 shows no data for PRN7 Bias from 05-25-2024 to 06-05-2024 due to extended NANU. Figure 11-7 shows no data for PRN17 Bias from 04-03-2024 to 04-05-2024 due to NANU on PRN17. Figure 11-7 shows no data for PRN17 Bias on 05-17-2024

due to UNUSABLE NANU. Figure 11-2 and Figure 11-8 shows high average biases for DM1 since PRN22 was switched to SVN 44 on 08-18-2023. There were no trips on PRN22.

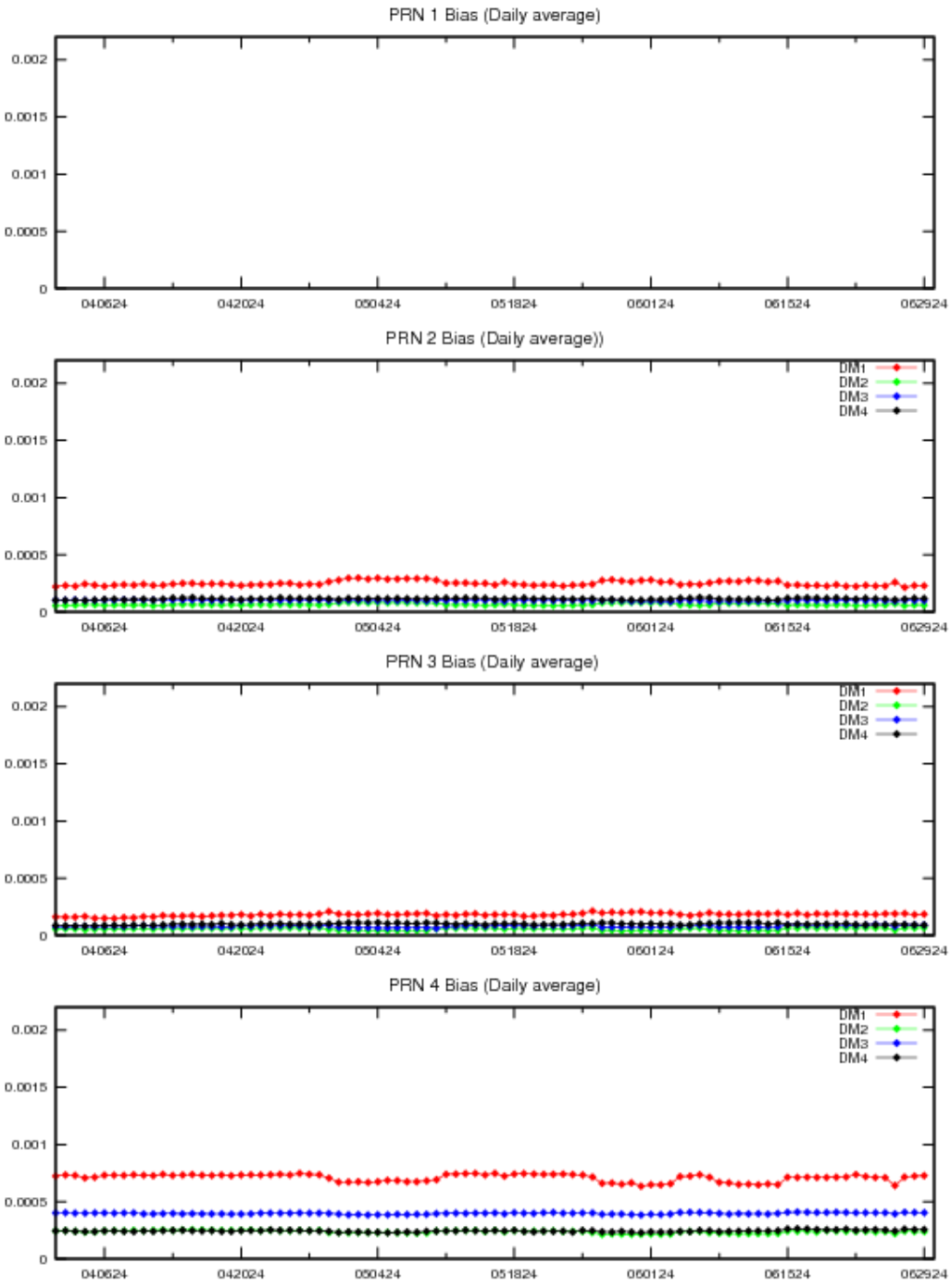

Figure 11-3 PRN Bias Average Trend (PRN1–PRN4)

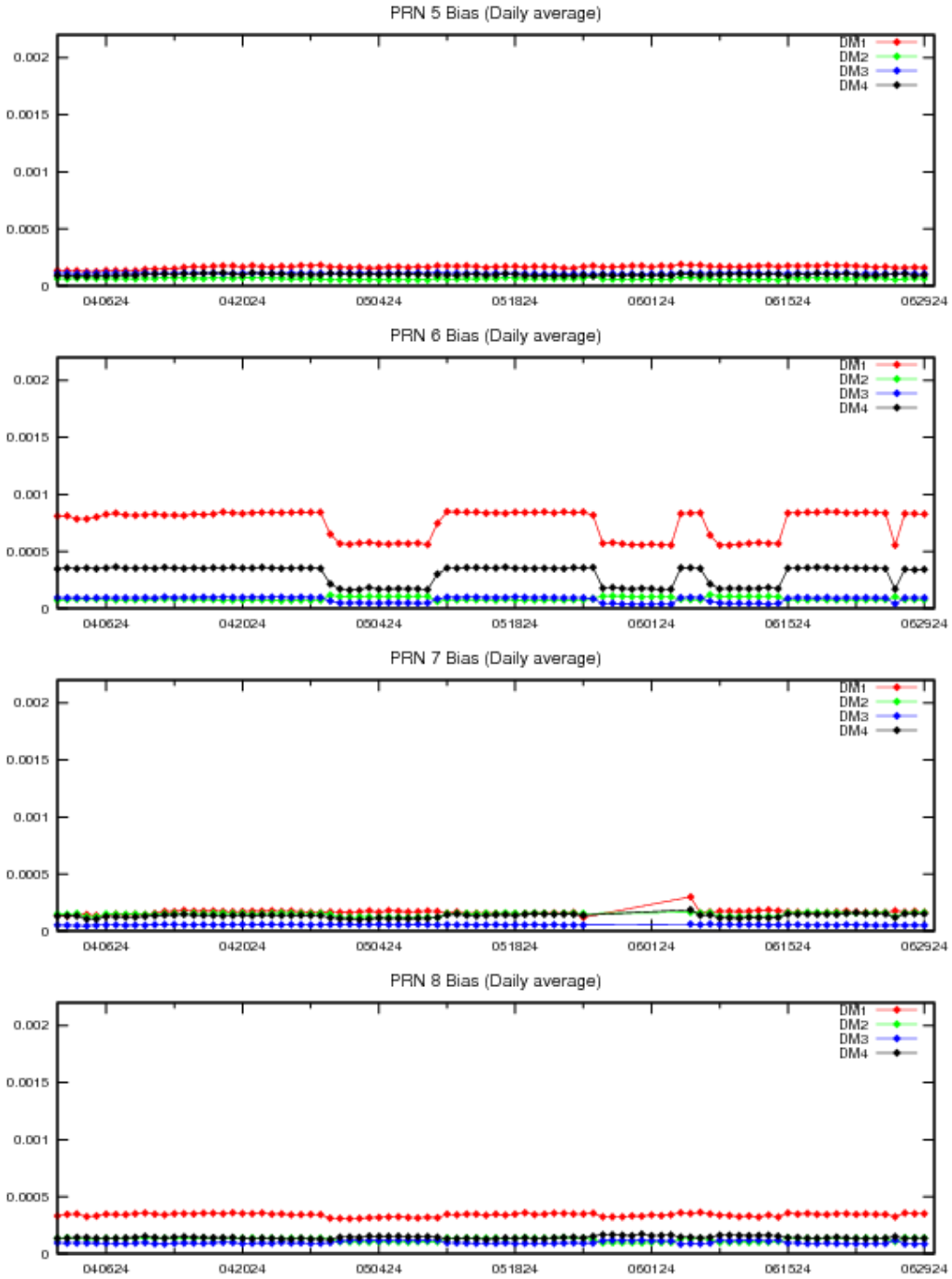

Figure 11-4 PRN Bias Average Trend (PRN5–PRN8)

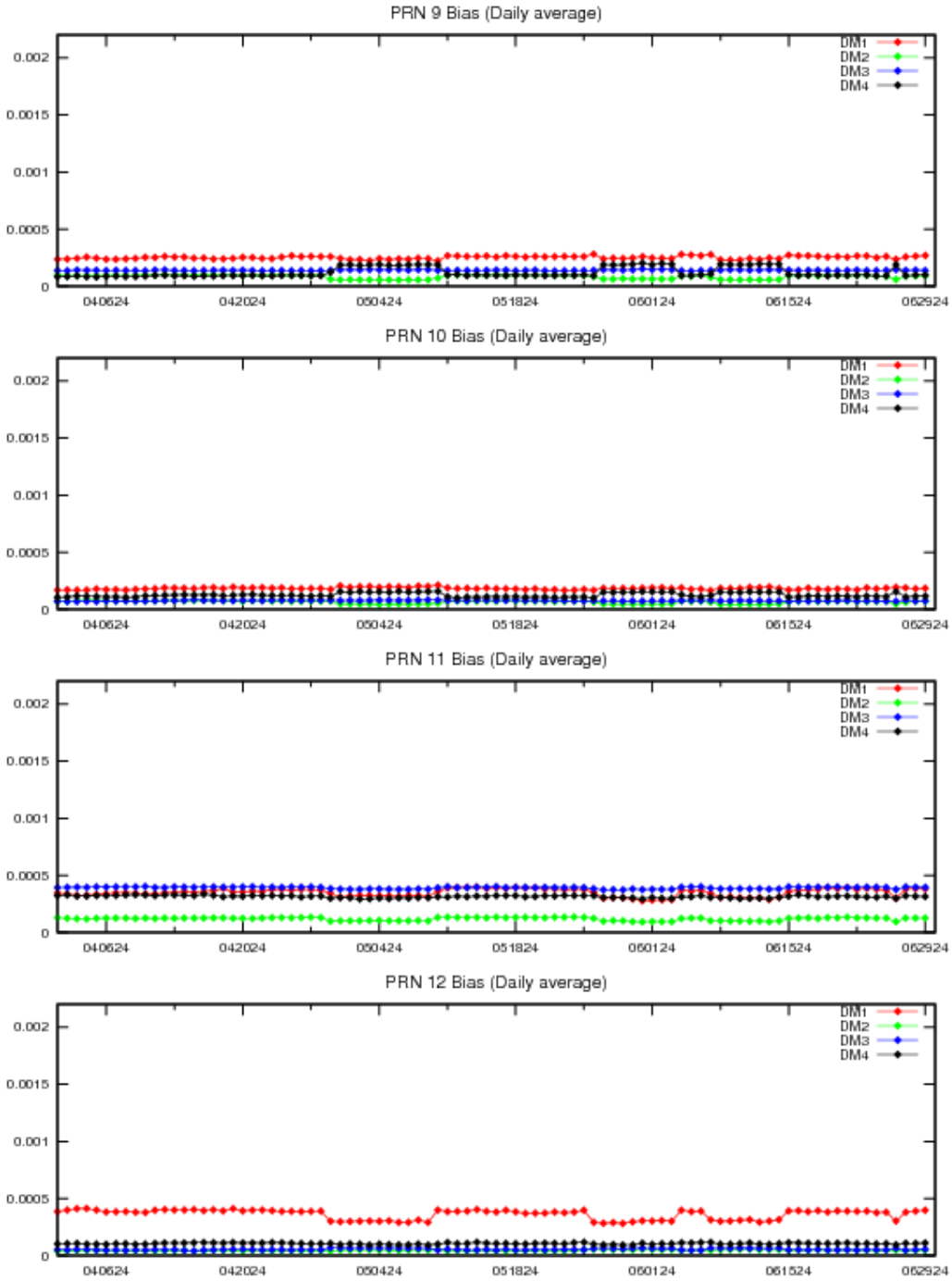

Figure 11-5 PRN Bias Average Trend (PRN9–PRN12)

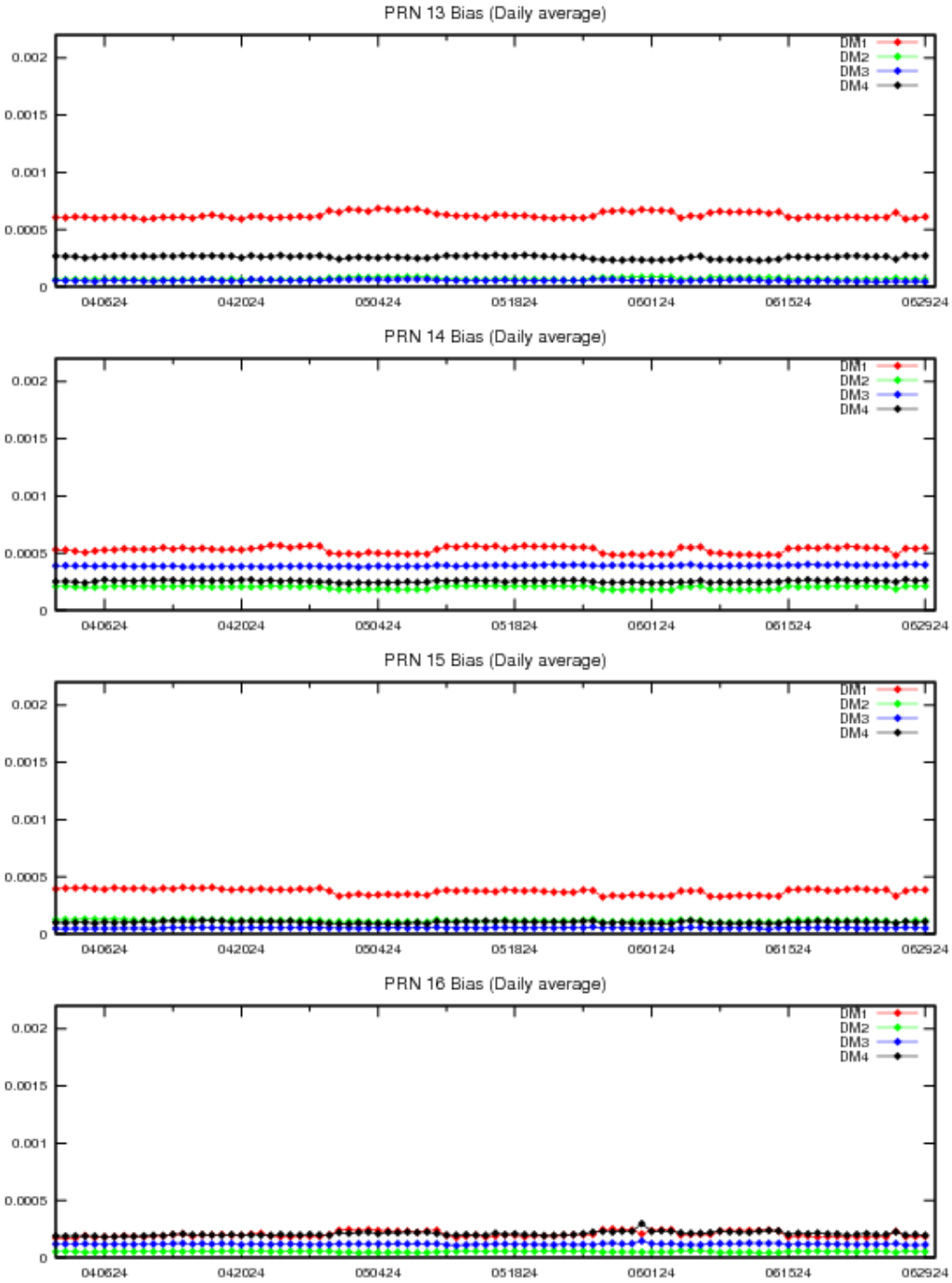

Figure 11-6 PRN Bias Average Trend (PRN13–PRN16)

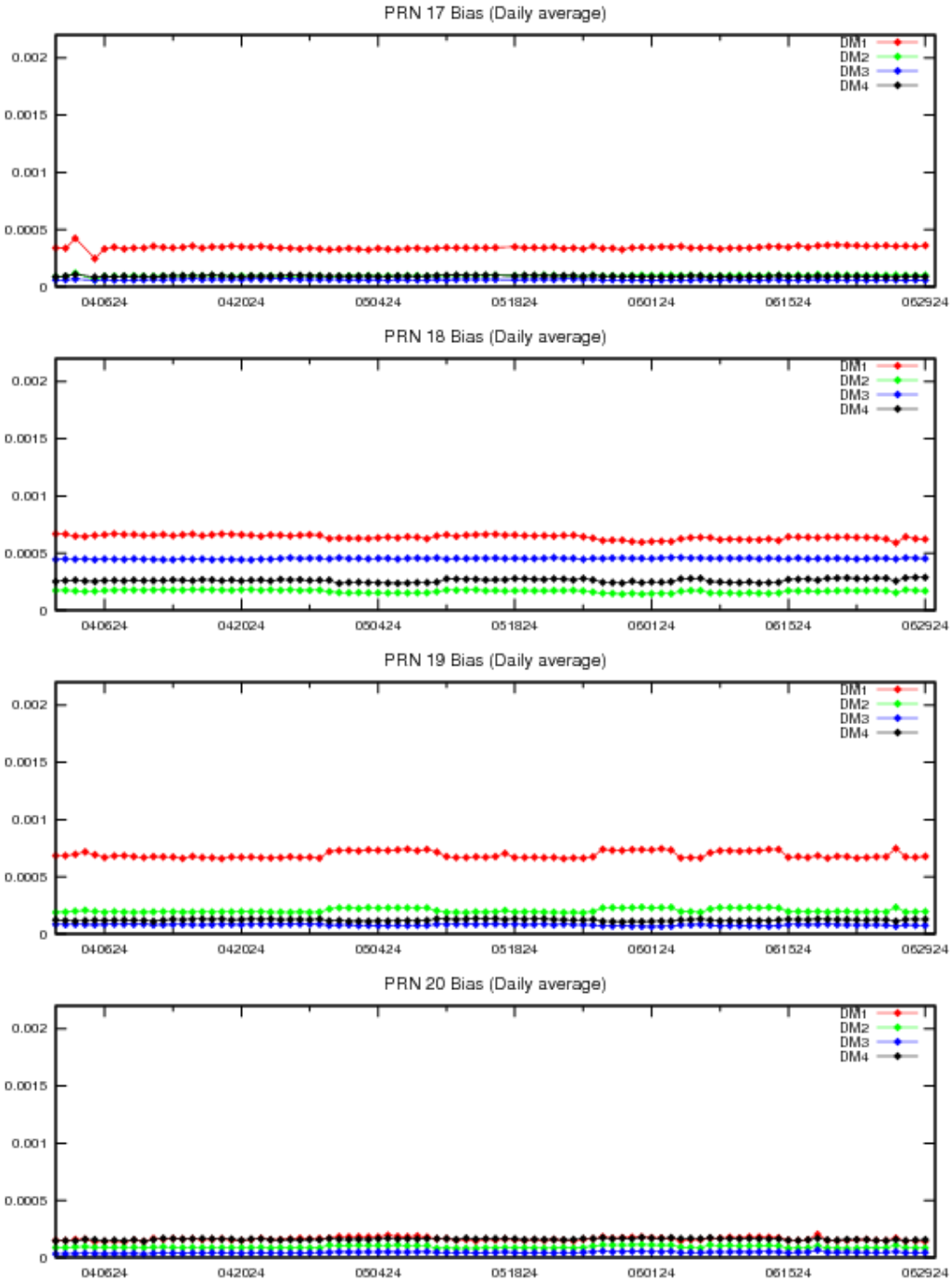

Figure 11-7 PRN Bias Average Trend (PRN17–PRN20)

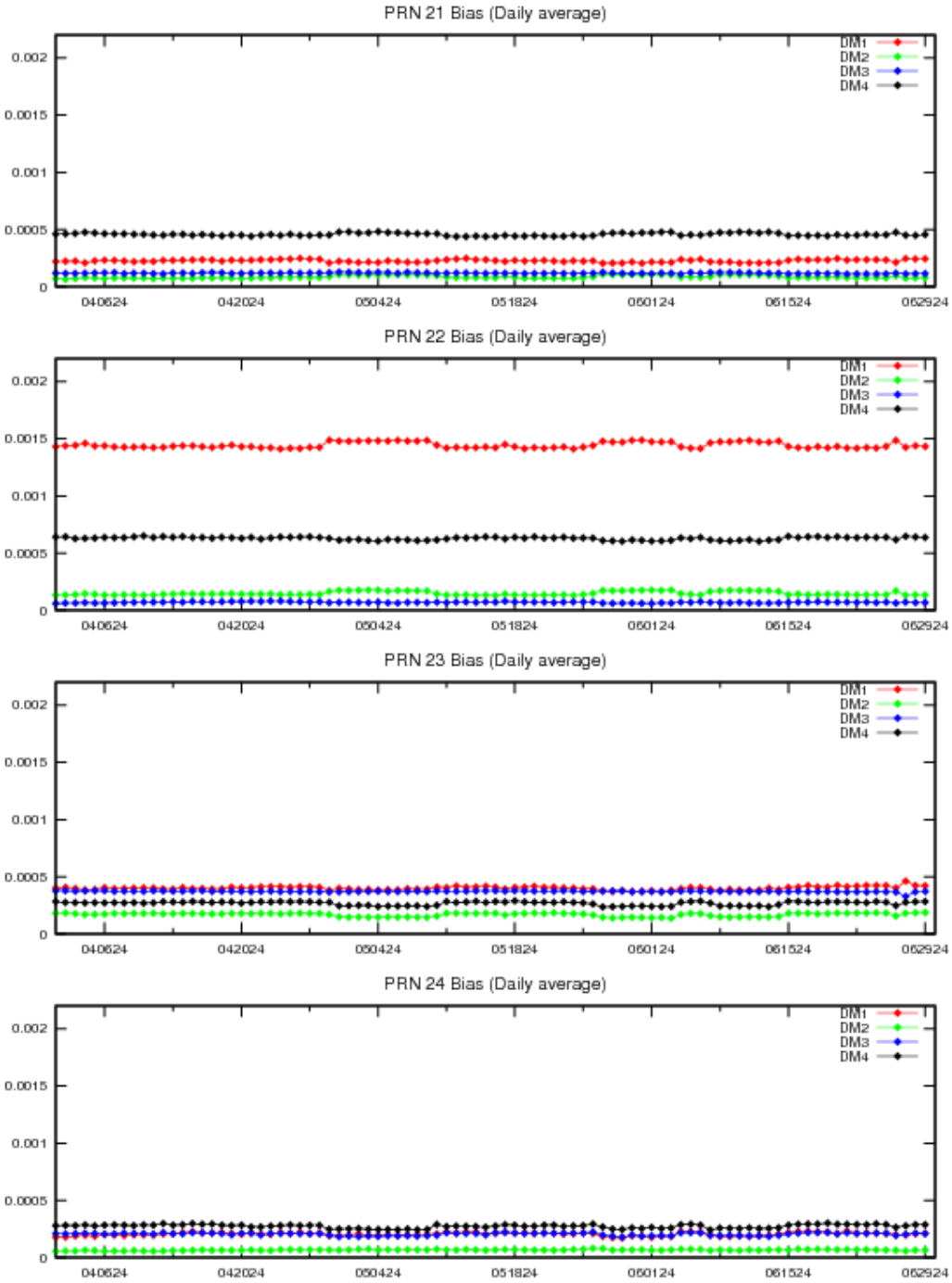

Figure 11-8 PRN Bias Average Trend (PRN21–PRN24)

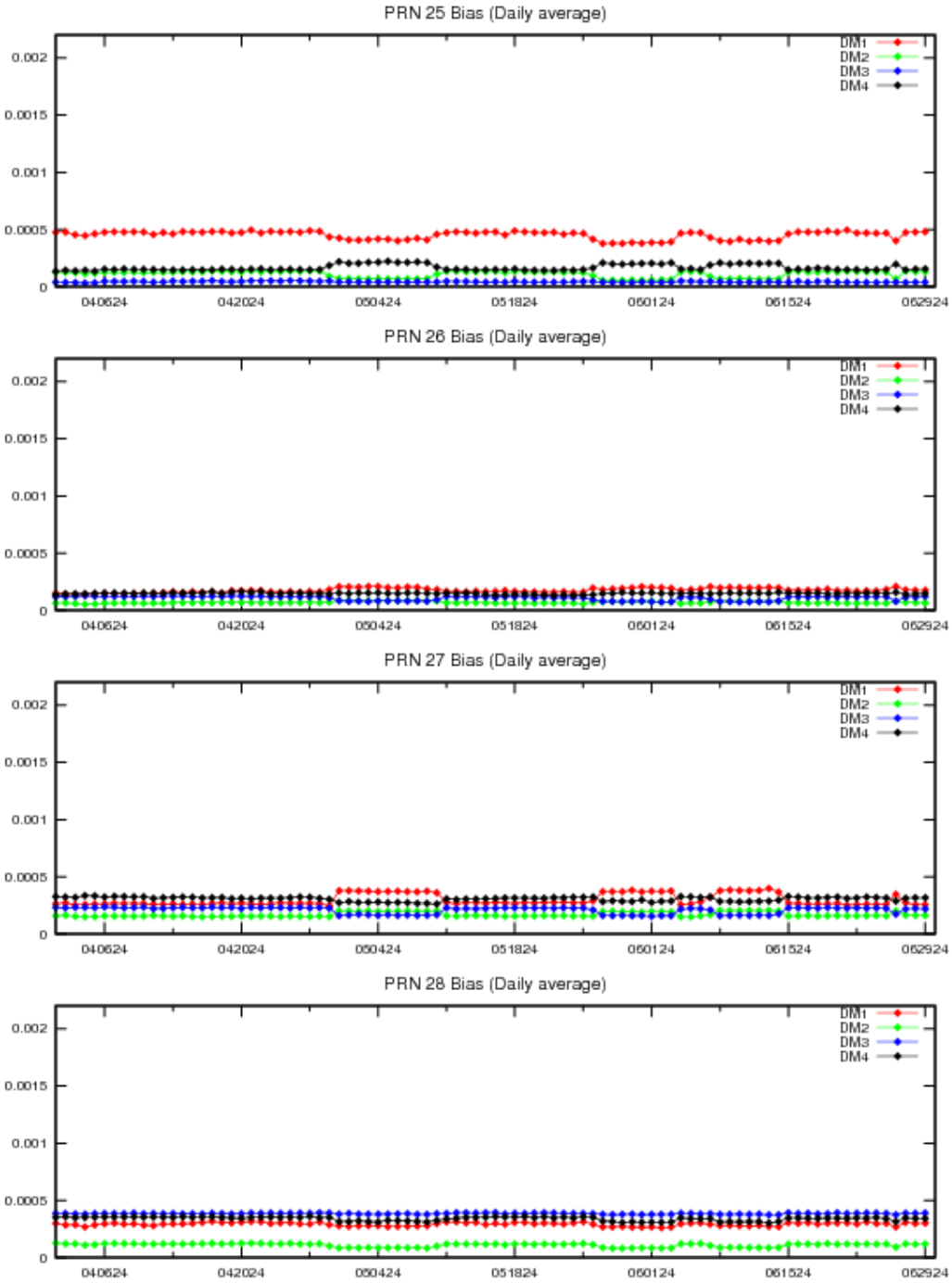

Figure 11-9 PRN Bias Average Trend (PRN25–PRN28)

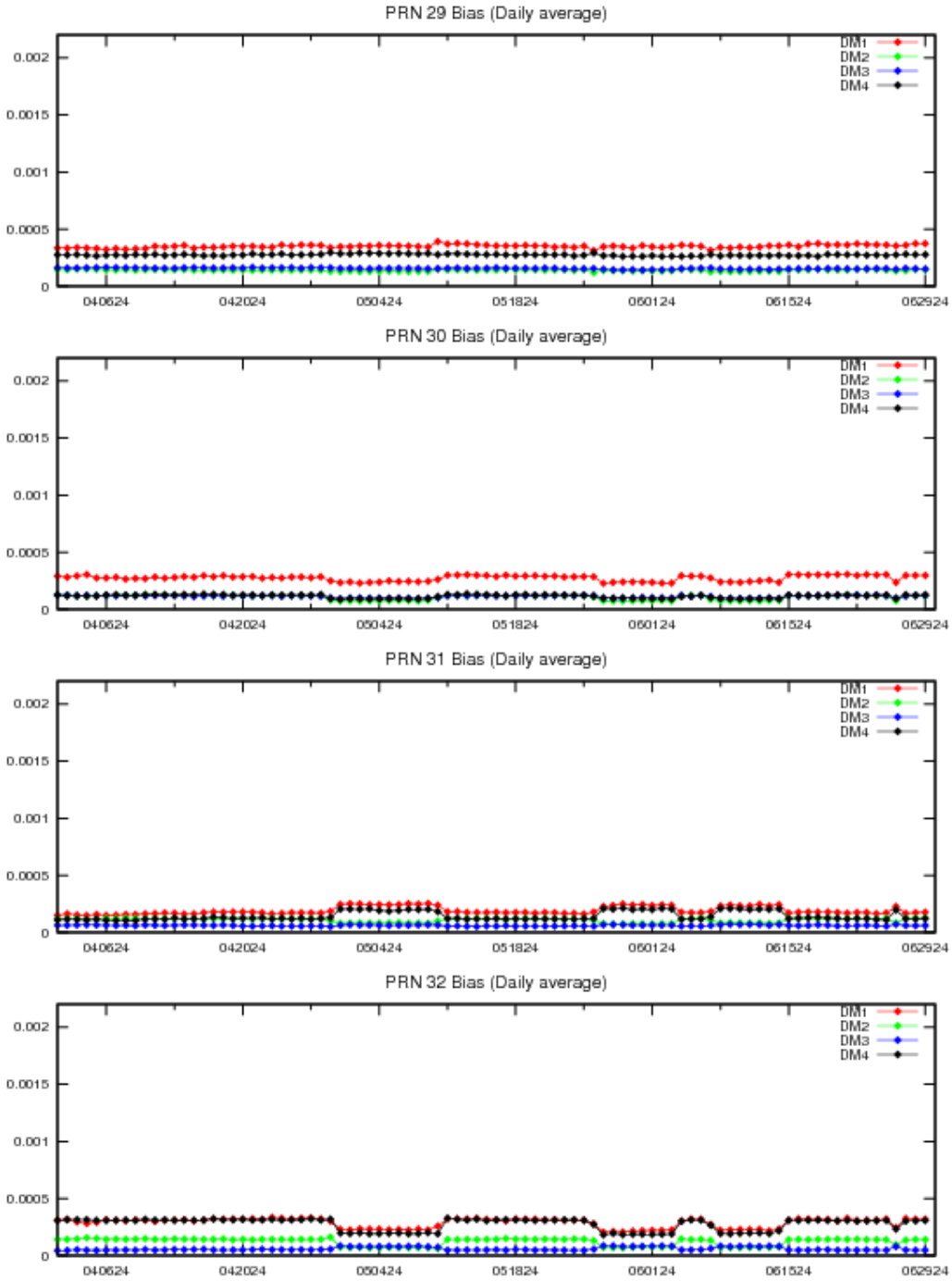

Figure 11-10 PRN Bias Average Trend (PRN29–PRN32)

11.4 SQM Trips

There we no SQM trips observed in this quarter.

APPENDIX A: GLOSSARY AND ACRONYMS

General Terms and Definitions

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

AMR. GEO PRN133

APC. Antenna phase center

ARP. Antenna reference point

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

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

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

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

CSRS. Canadian Spatial Reference System

DM. Detection metrics

DR. Discrepancy Report.

ECEF. Earth-centered, Earth-fixed.

FAA. Federal Aviation Administration

FD. Fault Detection

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

G30. GEO PRN135

GEO. Geostationary satellite

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

UTC. Coordinated Universal Time

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.

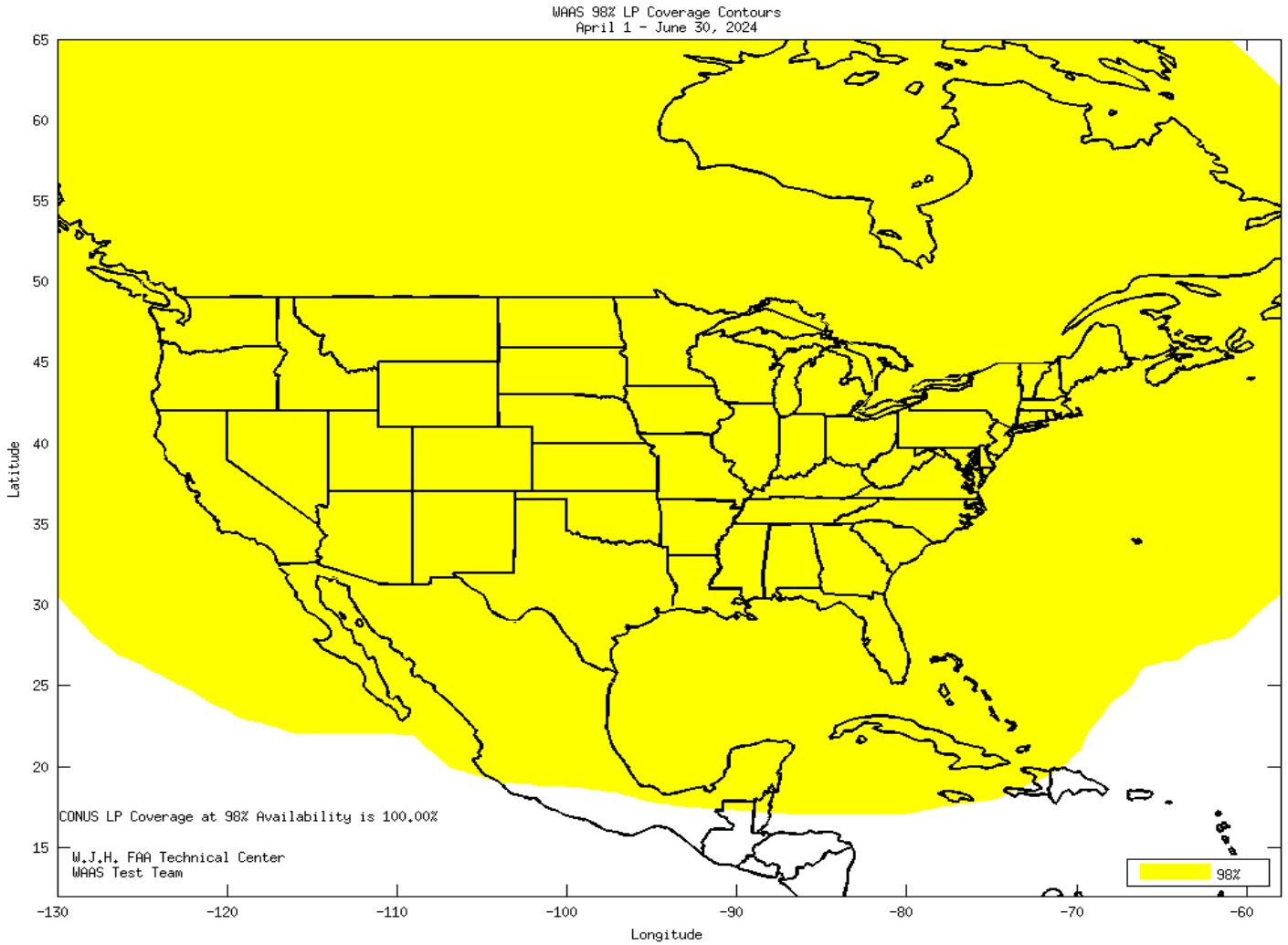

Figure B-1 98% CONUS LP Availability Contour

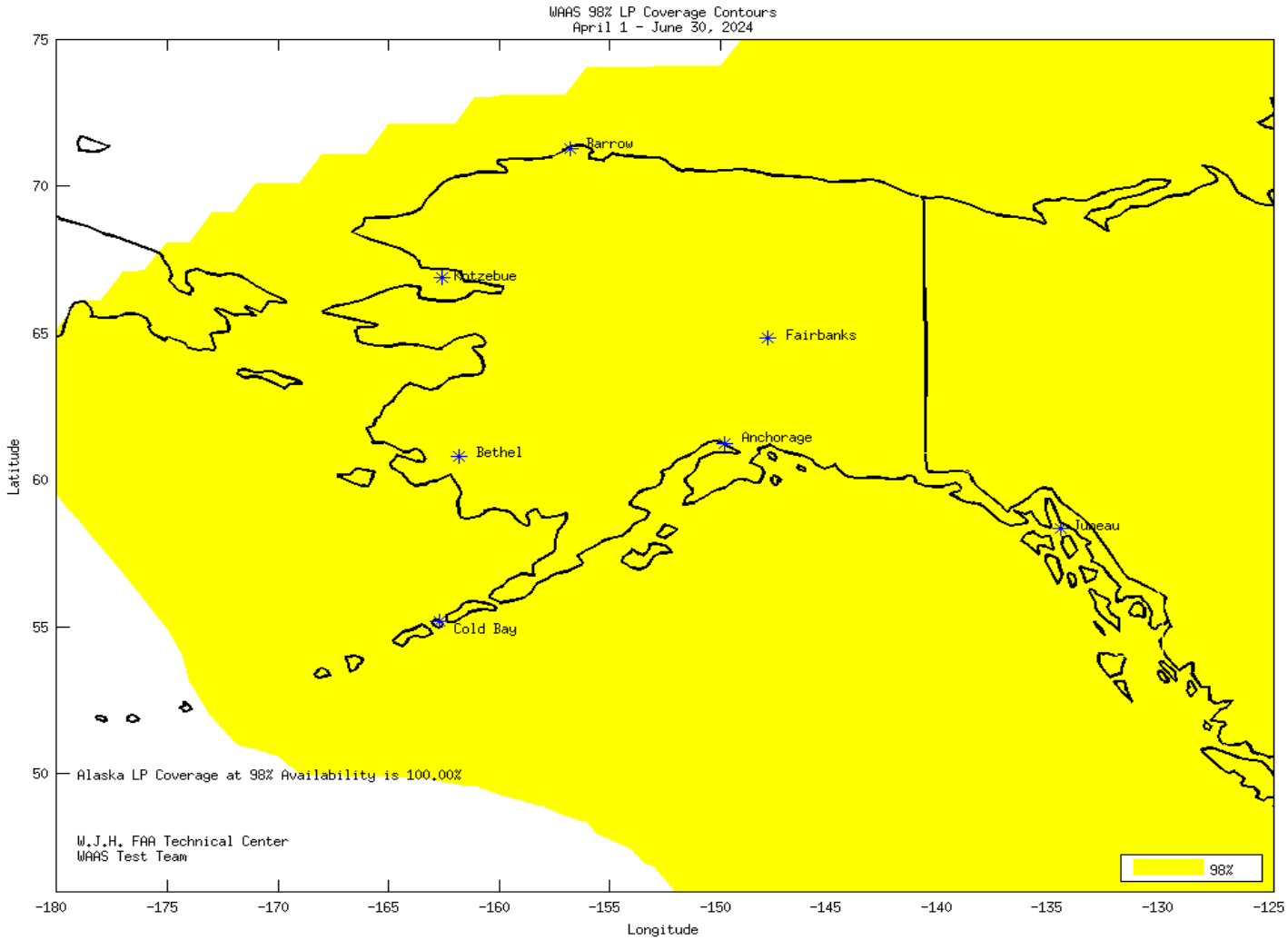

Figure B-2 98% Alaska LP Availability Contour

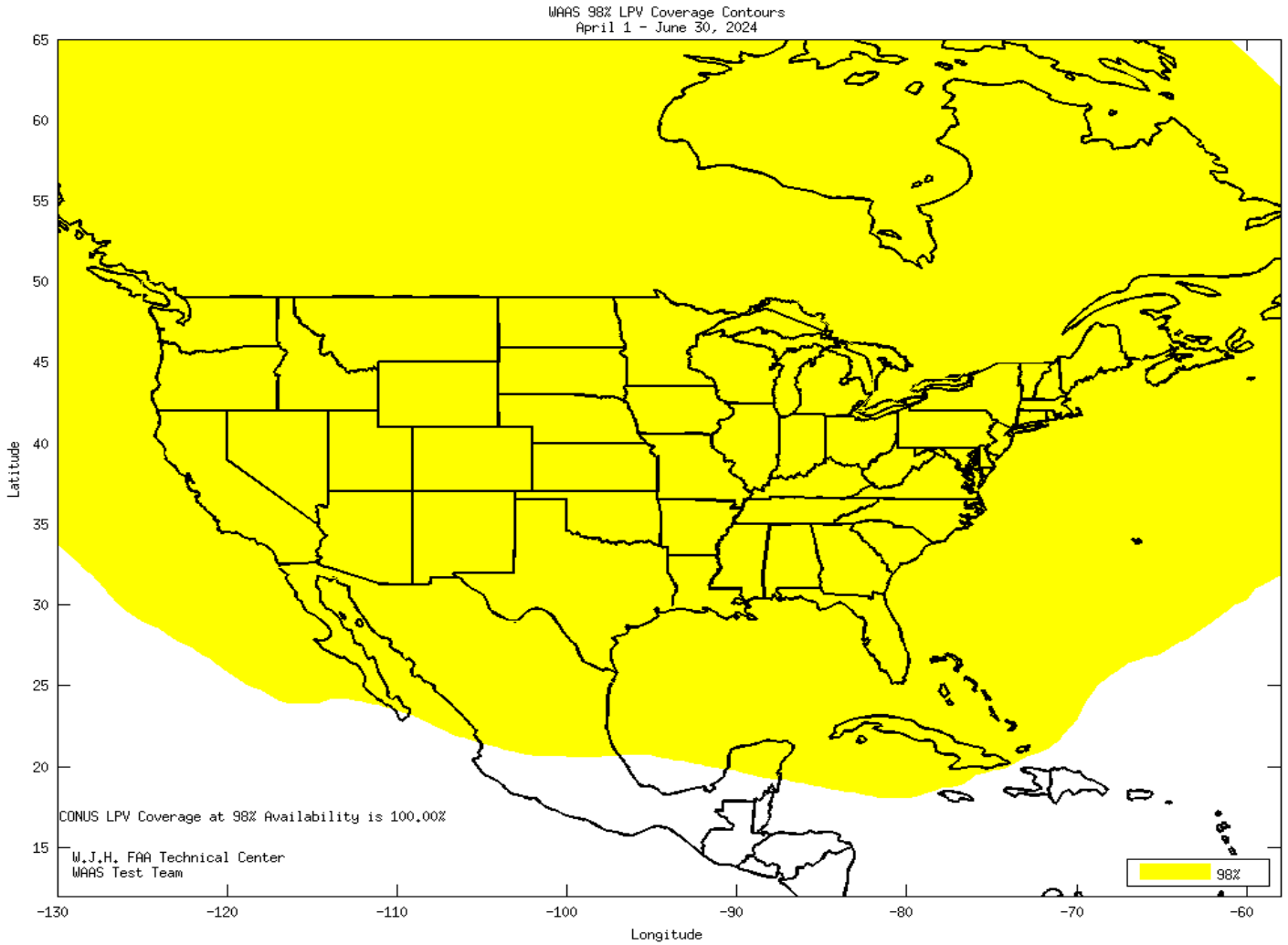

Figure B-3 98% CONUS LPV Availability Contour

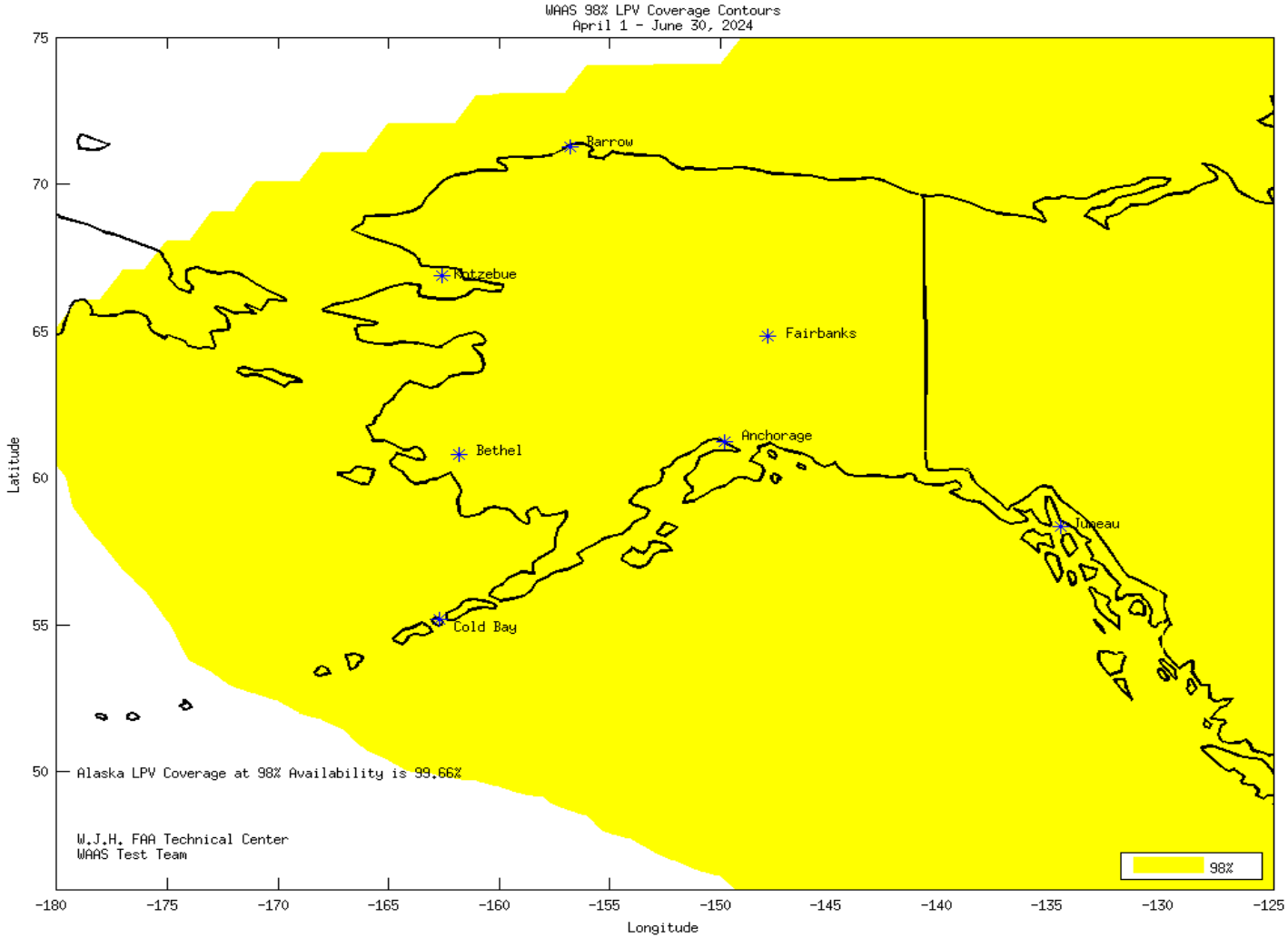

Figure B-4 98% Alaska LPV Availability Contour

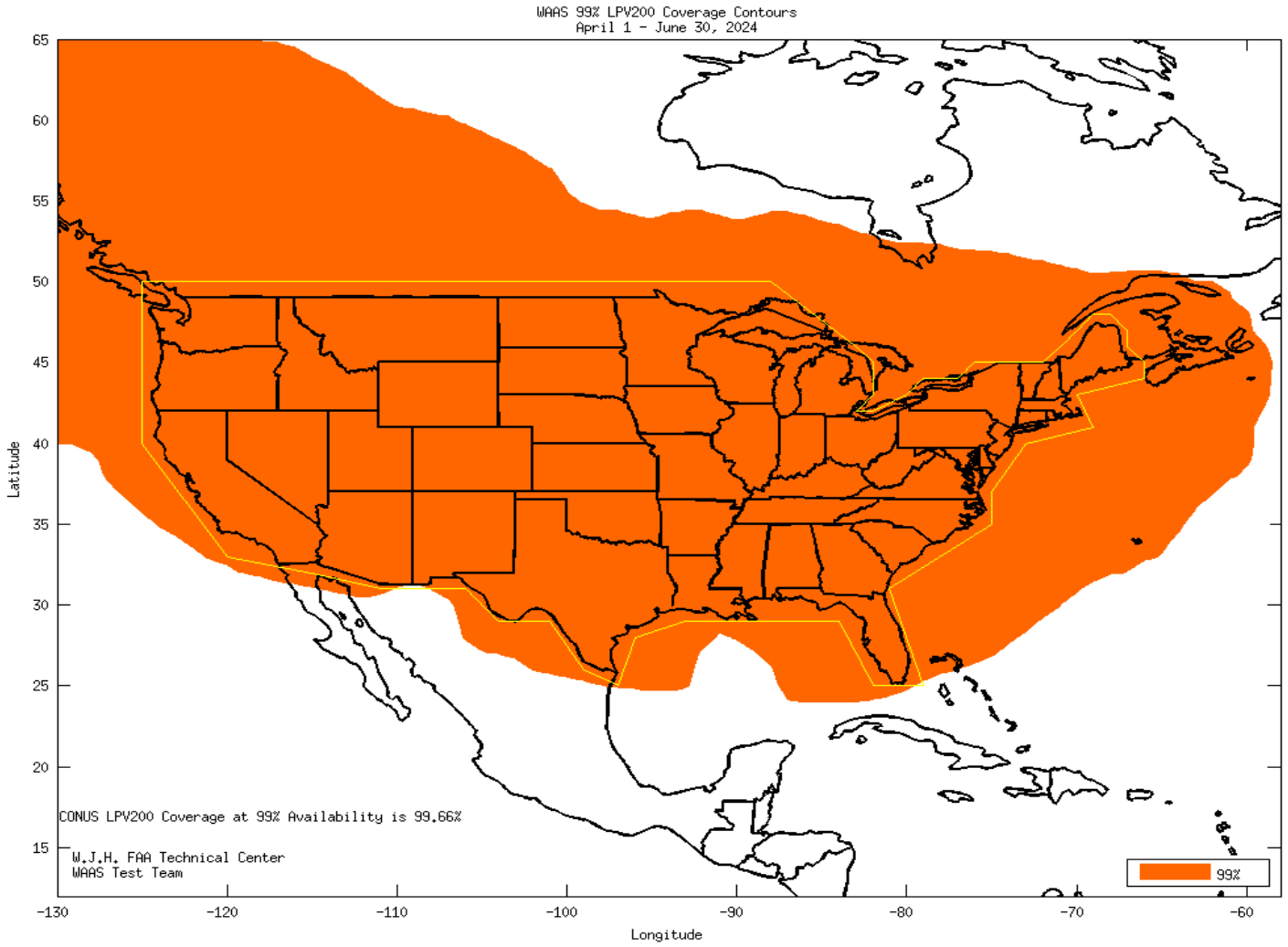

Figure B-5 99% CONUS LPV200 Availability Contour

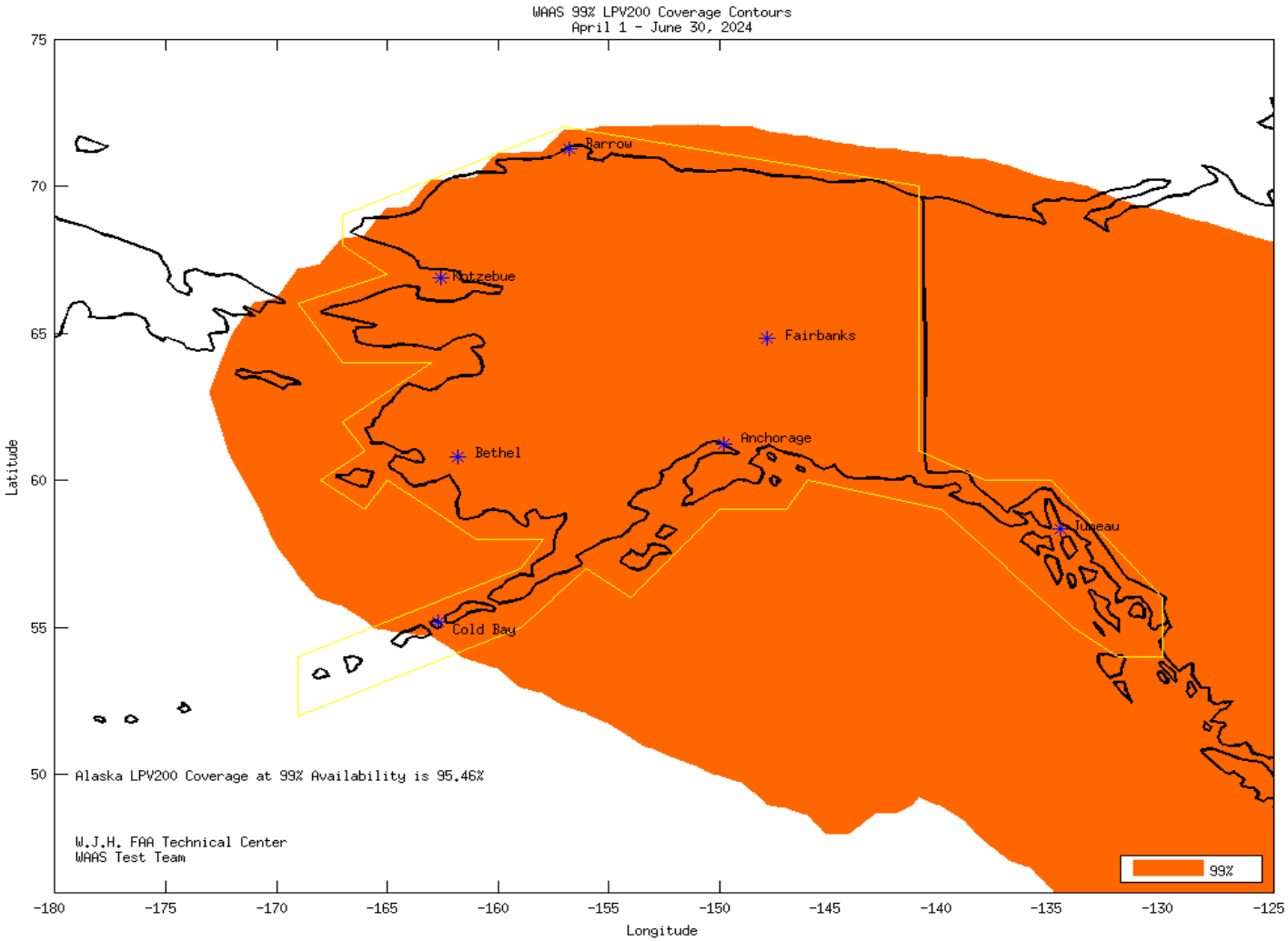

Figure B-6 99% Alaska LPV200 Availability Contour