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

WIDE AREA AUGMENTATION SYSTEM PERFORMANCE ANALYSIS REPORT

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Executive Summary

Since 1999, the Wide Area Augmentation System (WAAS) Test Team at the FAA William J. Hughes Technical Center has reported GPS performance as measured against the GPS Standard Positioning Service (SPS) Signal Specification in quarterly GPS Performance Analysis Network (PAN) Reports. In addition to the GPS PAN reports, the WAAS Test Team has provided quarterly reports on WAAS performance. The current WAAS PAN Report #78 provides WAAS performance data from the July 01 through September 30, 2021 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—Atlantic City, New Jersey, and Arcata, California—are outliers due to receiver quality issues, and not because of the WAAS signal in space quality.

Parameter	CONUS Site/Maximum	CONUS Site/Minimum	Alaska Site/Maximum	Alaska Site/Minimum
95% Horizontal Accuracy (HPL <= 40 meters)	Arcata 1.497 meters	Dallas 0.464 meters	Juneau 0.608 meters	Bethel 0.515 meters
95% Vertical Accuracy (VPL <= 50 meters)	Arcata 1.625 meters	Albuquerque 0.836 meters	Barrow 1.248 meters	Cold Bay 0.929 meters
LP Availability (HPL <= 40 meters)	Multiple Sites 100%	Multiple Sites 100%	All Sites 100%	All Sites 100%
LPV Availability (HPL <= 40 meters & VPL <= 50 meters)	Multiple Sites 100%	Multiple Sites 100%	Multiple Sites 100%	Barrow 99.99%
LPV200 Availability (HPL <= 40 meters & VPL <= 35 meters)	Multiple Sites 100%	Los Angeles 99.99%	Anchorage 100%	Barrow 99.67%
99% HPL	Miami 17.920 meters	Denver 10.564 meters	Cold Bay 20.230 meters	Juneau 13.015 meters
99% VPL	Arcata 30.354 meters	Billings 20.843 meters	Barrow 33.108 meters	Juneau 21.920 meters

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1.0 INTRODUCTION

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

The objectives of this report are:

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

The evaluation uses the WAAS data transmitted from geostationary satellites (GEOs) pseudo-random noise (PRN) 131 (SM9), 133 (S15), and 138 (CRE). SM9, S15 and CRE 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	80	6910589
Atlantic City	85	7311279
Oklahoma City	86	7401707
WAAS:		
Albuquerque	92	7942169
Anchorage	92	7934996
Atlanta	92	7939422
Barrow	92	7918199
Bethel	91	7861436
Billings	91	7856181
Boston	92	7942778
Chicago	92	7941970
Cleveland	92	7920213
Cold Bay	92	7942813
Dallas	92	7941856
Denver	92	7932168
Fairbanks	92	7942096
Gander	92	7933208
Goose Bay	91	7854067
Houston	92	7942243
Iqaluit	92	7936243
Jacksonville	92	7942824
Juneau	92	7937847
Kansas City	92	7931327
Kotzebue	92	7941239
Los Angeles	92	7920760
Memphis	92	7941360
Merida	81	6978793
Mexico City	89	7680577
Miami	92	7938919
Minneapolis	92	7941231
New York	92	7942837
Oakland	92	7941256
Puerto Vallarta	92	7934463
Salt Lake City	92	7942556
San Jose Del Cabo	90	7747493
Seattle	92	7906072
Washington DC	92	7940558
Winnipeg	92	7941655

Table 1-3 NPA Evaluation Site

Location	Number of Days Evaluated	Number of Samples
Albuquerque	92	7943078
Anchorage	92	7941463
Atlanta	92	7941096
Barrow	92	7916239
Bethel	80	6904886
Billings	92	7912158
Boston	92	7943080
Cleveland	92	7943080
Cold Bay	92	7943034
Fairbanks	92	7943062
Gander	92	7941059
Honolulu	92	7943074
Houston	92	7943086
Iqaluit	92	7940836
Juneau	92	7933402
Kansas City	92	7941393
Kotzebue	92	7941834
Los Angeles	92	7943083
Merida	81	7030160
Miami	92	7941198
Minneapolis	92	7941316
Oakland	92	7943082
Salt Lake City	92	7943082
San Jose Del Cabo	90	7810208
San Juan	90	7765292
Seattle	92	7943079
Washington DC	92	7941602

The report is divided by the performance category:

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

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

Table 1-4 WAAS Performance Parameters

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

1.1 Event Summary

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

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

Table 1-5 Events

Start Date	End Date	Location Satellite	Service Affected	Event Description
07/07/2021	07/07/2021	South Mountain (CM1), Brewster (BR1)	None	Brewster (BR1) faulted multiple times between 7/7 and 7/8 due to a KPA failure. Since South Mountain (CM1) was in maintenance mode during these faults (due to the Ka-Band upgrade) there was no primary GUS. As a result, there was a sum total SIS Loss of 06:39:37. There was no impact on coverage. TOW 341447-345599, 325620-328437, 345600-352978, 358304-367956

Start Date	End Date	Location Satellite	Service Affected	Event Description
07/09/2021	07/09/2021	PRN6	LPV200 CONUS	There was a GPS NANU on PRN6 (see NANU2021038) which was unusable from 06:10 UTC to 13:27 UTC. The NANU on PRN6 caused very minor degradation of LPV200 service coverage in CONUS (California and Oregon). Please see plot(s): LPV200_7/9/2021 Cov_vs_Time_Conus_7/9/2021
07/18/2021	07/18/2021		LPV Canada, LPV200 Canada	Subframe reasonability warnings and PID Down faults at Iqaluit resulted in IGPs at Latitude 70 and Longitudes -70 to -50 getting set to a "not monitored" state from 03:30 UTC to 04:00 UTC. The elevated IGPs caused moderate degradation of LPV200 and LPV service coverage in Canada. Please see plot(s): LPV_7/18/2021 LPV200_7/18/2021 Cov_vs_Time_Canada_7/18/2021
07/23/2021	07/23/2021		LPV200 Canada	Subframe reasonability warnings and PID Down faults at Iqaluit resulted in IGPs at Latitude 70 and Longitudes -70 to -50 getting set to a "not monitored" state from 16:00 UTC to 17:00 UTC. The elevated IGPs caused moderate degradation of LPV200 and LPV service coverage in Canada. Please see plot(s): LPV_7/23/2021 LPV200_7/23/2021 Cov_vs_Time_Canada_7/23/2021
07/30/2021	07/30/2021	PRN14	LPV200 CONUS, LPV200 Alaska	The reduction in LPV200 service in Alaska and Canada was due to a GPS NANU on PRN14 (see NANU2021044) which was unusable from 06:35 UTC to 20:20 UTC. The NANU caused moderate degradation of: (1) LPV200 service coverage in Alaska from START 11:00 UTC to 12:05 UTC and from 19:05 UTC to 19:18 UTC; and (2) LPV200 service coverage in Canada from 11:15 UTC to 12:00 UTC. Please see plot(s): LPV200_7/30/2021 Cov_vs_Time_Alaska_7/30/2021 Cov_vs_Time_Conus_7/30/2021

Start Date	End Date	Location Satellite	Service Affected	Event Description
08/04/2021	08/04/2021		LPV Canada, LPV200 Canada	Subframe reasonability warnings and PID Down faults at Iqaluit resulted in IGPs at Latitude 70 and Longitudes -70 to -50 getting set to a "not monitored" state from 15:30 UTC to 16:30 UTC. The elevated IGPs caused moderate degradation of LPV200 and LPV service coverage in Canada. Please see plot(s): LPV_8/4/2021 LPV200_8/4/2021 Cov_vs_Time_Canada_8/4/2021
08/05/2021	08/05/2021		LPV200 Canada	PRN10 had a UDREi spike to "Not-Monitored" at 23:12:37 UTC and again at 23:25:04 UTC. The elevated UDREs on PRN10 caused moderate degradation of LPV200 service coverage in Canada for 30 seconds.
08/05/2021	08/05/2021	PRN10	LPV200 Canada	PRN10 had a UDREi spike to "Not-Monitored" at 23:12:37 UTC and again at 23:25:04 UTC. The elevated UDREs on PRN10 caused moderate degradation of LPV200 service coverage in Canada for 30 seconds. Please see plot(s): LPV200_8/5/2021 Cov_vs_Time_Canada_8/5/2021
08/19/2021	08/19/2021	PRN4	LPV200 CONUS, LPV200 Canada	The reduction in LPV200 service in CONUS and Canada was due to a GPS NANU on PRN4 (see NANU2021047) which was unusable from 04:00 UTC to 09:17 UTC. The NANU caused moderate degradation of: (1) LPV200 service coverage in CONUS from START 04:05 UTC to 04:30 UTC; and (2) LPV200 service coverage in Canada from 04:00 UTC to 04:15 UTC. Please see plot(s): LPV200_8/19/2021 Cov_vs_Time_Canada_8/19/2021 Cov_vs_Time_Conus_8/19/2021
08/26/2021	08/30/2021	GEO131	LPV CONUS	Ranging for GEO 131 was disabled. The lack of ranging on PRN131 caused a reduction of LPV200 service coverage in CONUS (Gulf of Mexico). Please see plot(s): LPV200_8/29/2021 Cov_vs_Time_Conus_8/29/2021

Start Date	End Date	Location Satellite	Service Affected	Event Description
08/27/2021	08/27/2021		LPV200 Alaska, LPV200 Canada	PRN9 went to "Not-Monitored" earlier than it typically would around 17:00 UTC. The elevated UDREs on PRN9 caused minor degradation of: (1) LPV200 service coverage in Alaska from 17:05 UTC to 17:35 UTC; and (2) LPV200 service coverage in Canada from 17:15 UTC to 17:25 UTC. Please see plot(s): LPV200_8/27/2021 Cov_vs_Time_Alaska_8/27/2021 Cov_vs_Time_Canada_8/27/2021
08/29/2021	08/29/2021	PRN10	LPV200 CONUS	PRN10 had a UDREi spike to "Not-Monitored" at 20:53:39 UTC. The elevated UDREs on PRN10 caused moderate degradation of LPV200 service coverage in CONUS (CA, NV, AZ) for 30 seconds. Please see plot(s): LPV200_8/29/2021
09/08/2021	09/08/2021	GEO133, Brewster (BR1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 07:14:36 UTC. This caused a 3-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 caused minor degradation of LPV200 service coverage in Alaska from 09:00 UTC to 09:30 UTC. TOW 285290-285294 Please see plot(s): LPV200_9/8/2021
09/14/2021	09/14/2021	PRN6	LPV200 CONUS	There was an SV alert on PRN6 at 14:04:30 UTC for 9-seconds. During this time there was an LPV200 service outage in CONUS stretching from Texas through New Mexico up to Colorado. Please see plot(s): LPV200_9/14/2021
09/24/2021	09/24/2021	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	LPV Canada, LPV200 Canada	SSM-59: This system support modification (SSM) supports the cutover to CY-21. This updates the software at YFB WRS to Software build W7.336L. The upgrade started at 01:34 UTC and ended at 02:30 UTC on 9/24. All three threads were upgraded simultaneously. The reduction of observations in the region increased GIVE values and caused moderate degradation of: (1) LPV service coverage in Canada from 01:50 UTC to 02:15 UTC; and (2) LPV200 service coverage in Canada from 01:45 UTC to 02:30 UTC. Please see plot(s): LPV_9/24/2021 LPV200_9/24/2021

Table 1-6 WAAS Upgrades

Start Date	End Date	Location Satellite	Event Description
08/24/2021	08/24/2021		SSM-59: This SSM supports the cutover to CY-21. This updates the software at NOCC O&M to Software build W7.336L. The upgrade started at 20:08 UTC on 8/24 and ended at 20:38 UTC on 8/24.
08/25/2021	08/25/2021		SSM-59: This SSM supports the cutover to CY-21. This updates the software at POCC O&M to Software build W7.336L. The upgrade started at 18:44 UTC on 8/25 and ended at 19:14 UTC on 8/25.
08/26/2021	08/26/2021		SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZDC WMS to Software build W7.336L. The upgrade started at 00:01 UTC and ended at 01:57 UTC on 8/26.
09/01/2021	09/01/2021	Los Angeles (CnV)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZLA WMS to Software build W7.336L. The upgrade started at 15:07 UTC and ended at 16:56 UTC on 9/1.
09/02/2021	09/02/2021	Atlanta (CnV)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZLA WMS to Software build W7.336L. The upgrade started at 11:00 UTC to 12:09 UTC on 9/2.
09/08/2021	09/08/2021	Brewster (BRE-B)	SSM-59: This SSM supports the cutover to CY-21. This updates the software on the Brewster (BRE-B) GUS receiver to Software build W7.336L. The upgrade started at 16:30 UTC and ended at 21:35 UTC on 9/8.
09/09/2021	09/09/2021	Brewster (BR1)	SSM-59: This SSM supports the cutover to CY-21. This updates the software on the Brewster (BR1) GUS receiver to Software build W7.336L. The upgrade started at 16:20 UTC and ended at 18:09 UTC on 9/9.
09/14/2021	09/14/2021	South Mountain (CM1)	SSM-59: This SSM supports the cutover to CY-21. This updates the firmware on the South Mountain (CM1) GUS receiver to Software build W7.336L. The upgrade started at 16:32 UTC to 18:47 UTC on 9/14.
09/15/2021	09/15/2021	Santa Paula (SZ1)	SSM-59: This SSM supports the cutover to CY-21. This updates the firmware on the Santa Paula(SZ1) GUS receiver to Software build W7.336L. The upgrade started at 15:59 UTC and ended at 18:20 UTC on 9/15.
09/21/2021	09/21/2021	Woodbine (QWE)	SSM-59: This SSM supports the cutover to CY-21. This updates the firmware on the Woodbine(QWE) GUS receiver to Software build W7.336L. The upgrade started at 13:36 UTC and ended at 15:59 UTC on 9/21.
09/22/2021	09/22/2021	Southbury (DX1)	SSM-59: This SSM supports the cutover to CY-21. This updates the firmware on the Southbury(DX1) GUS receiver to Software build W7.336L. The upgrade started at 12:53 UTC and ended at 16:05 UTC on 2/22.
09/23/2021	09/23/2021	San Jose Del Cabo (MSD1), San Jose Del Cabo (MSD2), San Jose Del Cabo (MSD3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at MSD WRS to Software build W7.336L. The upgrade started at 15:54 on 09/23 and ended at 17:02 on 09/23.

Start Date	End Date	Location Satellite	Event Description
09/24/2021	09/24/2021	Winnipeg (YWG1), Winnipeg (YWG2), Winnipeg (YWG3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at YWG WRS to Software build W7.336L. The upgrade started at 14:08 on 09/24 and ended at 14:46 on 09/24.
09/24/2021	09/24/2021	Iqaluit (YFB1), Iqaluit (YFB2), Iqaluit (YFB3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at YFB WRS to Software build W7.336L. The upgrade started at 01:34 UTC and ended at 02:30 UTC on 9/24. All three threads were upgraded simultaneously. The reduction of observations in the region increased GIVE values and caused moderate degradation of: (1) LPV service coverage in Canada from 01:50 UTC to 02:15 UTC; and (2) LPV200 service coverage in Canada from 01:45 UTC to 02:30 UTC.
09/27/2021	09/27/2021	Atlanta (ZTL1), Atlanta (ZTL2), Atlanta (ZTL3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZTL WRS to Software build W7.336L. The upgrade started at 17:01 on 09/27 and ended at 19:52 on 09/27.
09/27/2021	09/27/2021	Gander (YQX1), Gander (YQX2), Gander (YQX3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at YQX WRS to Software build W7.336L. The upgrade started at 19:13 on 09/27 and ended at 19:52 on 09/27.
09/28/2021	09/28/2021	Minneapolis (ZMP1), Minneapolis (ZMP2), Minneapolis (ZMP3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZMP WRS to Software build W7.336L. The upgrade started at 22:27 on 09/28 and ended at 23:52 on 09/28.
09/28/2021	09/28/2021	Merida (MMD1), Merida (MMD2), Merida (MMD3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at MMD WRS to Software build W7.336L. The upgrade started at 05:09 on 09/28 and ended at 05:43 on 09/28.
09/28/2021	09/28/2021	Kansas City (ZKC1), Kansas City (ZKC2), Kansas City (ZKC3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZKC WRS to Software build W7.336L. The upgrade started at 16:06 on 09/28 and ended at 17:41 on 09/28.
09/29/2021	09/29/2021	Washington DC (ZDC1), Washington DC (ZDC2), Washington DC (ZDC3)	SSM-59: This SSM supports the cutover to CY-21. This updates the software at ZDC WRS to Software build W7.336L. The upgrade started at 17:49 on 09/29 and ended at 19:03 on 09/29.

Table 1-7 GUS Switchovers

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/02/2021	07/02/2021	Missed Navigation Message	GEO131, Southbury (DX1), Washington DC (CnV)	None	Southbury had CnV Source Select from Washington DC to Atlanta. TOW 468661-468665

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/04/2021	07/04/2021	Manual	GEO138, Brewster-B (BRE-B)	None	The uplink for the CRE GEO, PRN138 switched from the Brewster-B uplink site to the Woodbine uplink site at 07:01:16 UTC. This caused a 3-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 25294-25298
07/05/2021	07/05/2021	Manual	GEO133, South Mountain (CM1)	None	The uplink for the S15 GEO, PRN133 switched from the South Mountain uplink site to the Brewster uplink site at 07:01:27 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 111705-111709
07/07/2021	07/07/2021	Faulted Mode	South Mountain (CM1), Brewster (BR1)	None	Brewster (BR1) faulted multiple times between 7/7 and 7/8 due to a KPA failure. Since South Mountain (CM1) was in maintenance mode during these faults (due to the Ka-Band upgrade) there was no primary GUS. As a result, there was a sum total SIS Loss of 06:39:37. There was no impact on coverage. TOW 341447-345599, 325620-328437, 345600-352978, 358304-367956
07/20/2021	07/20/2021	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 07:00:31 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 198049-198053
07/20/2021	07/20/2021	Missed Navigation Message	GEO131, Southbury (DX1), Washington DC (CnV)	None	Southbury had CnV Source Select from Washington DC to Atlanta. TOW 251587-251591

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
07/30/2021	07/30/2021	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 10:42:54 UTC. This caused a 19-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 470592-470612
08/03/2021	08/03/2021	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 08:18:51 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 202749-202753
08/25/2021	08/25/2021	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 16:24:45 UTC. This caused a 3-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 318303-318307
08/26/2021	08/26/2021	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 08:02:33 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 374571-374575
08/26/2021	08/26/2021	Missed Navigation Message	GEO133, Brewster (BR1), Atlanta (CnV)	None	Brewster had CnV Source Select from Atlanta to Los Angeles. TOW 423579-423581

Start Date	End Date	GUS Switch	Location Satellite	Service Affected	Event Description
09/08/2021	09/08/2021	Manual	GEO133, Brewster (BR1)	LPV200 Alaska	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 07:14:36 UTC. This caused a 3-second outage of the GEO 133 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN133. The elevated UDREs on PRN133 caused minor degradation of LPV200 service coverage in Alaska from 09:00 UTC to 09:30 UTC. TOW 285290-285294
09/18/2021	09/18/2021	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 09:28:35 UTC. This caused a 3-second outage of the GEO 131 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN131. There was no impact on coverage. TOW 552533-552537
09/19/2021	09/19/2021	Manual	GEO133, Brewster (BR1)	None	The uplink for the S15 GEO, PRN133 switched from the Brewster uplink site to the South Mountain uplink site at 07:00:23 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 25241-25245
09/20/2021	09/20/2021	Manual	GEO138, Woodbine (QWE)	None	The uplink for the CRE GEO, PRN138 switched from the Woodbine uplink site to the Brewster-B uplink site at 07:22:12 UTC. This caused a 3-second outage of the GEO 138 broadcast and also caused the WAAS carrier smoothing algorithm to reinitialize for PRN138. There was no impact on coverage. TOW 112950-112954

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 CRE, SM9, and S15.

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 CRE, SM9 and S15.

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. 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 1.497 meters observed at Arcata.
- The maximum 95% CONUS vertical LPV error was 1.625 meters observed at Arcata.
- The minimum 95% CONUS horizontal LPV errors was 0.464 meters observed at Dallas.
- The minimum 95% CONUS vertical LPV error was 0.836 meters observed at Albuquerque.

Table 2-1 PA 95% Horizontal and Vertical Accuracy

Location	Horizontal (HAL=40m) (Meters)	Horizontal (HAL=556m) (Meters)	Vertical (VAL=50m) (Meters)	Percentage in PA mode (%)	SPS Accuracy	
					95% Horizontal	95% Vertical
Arcata	1.497	1.497	1.625	100	*	*
Atlantic City	1.177	1.177	1.351	100	*	*
Oklahoma City	1.417	1.417	1.347	100	*	*
Albuquerque	0.566	0.566	0.836	100	1.53	3.48
Anchorage	0.583	0.583	0.948	100	1.6	3.13
Atlanta	0.661	0.661	1.039	100	1.24	3.38
Barrow	0.583	0.583	1.248	100	1.55	3.55
Bethel	0.515	0.515	0.973	100	1.53	3.74
Billings	0.496	0.496	0.887	100	1.45	3.03
Boston	0.590	0.590	1.071	100	1.41	3.17
Chicago	0.758	0.758	1.072	100	*	*
Cleveland	0.519	0.519	1.074	100	1.44	3.28
Cold Bay	0.598	0.598	0.929	100	1.39	3.56
Dallas	0.464	0.464	1.124	100	*	*
Denver	0.522	0.522	0.856	100	*	*
Fairbanks	0.522	0.522	0.999	100	1.71	3.2
Gander	0.700	0.700	1.057	100	1.52	3.01
Goose Bay	0.635	0.635	0.943	100	*	*
Houston	0.581	0.581	1.309	100	1.63	3.58
Iqaluit	0.726	0.727	1.074	100	1.33	2.9
Jacksonville	0.564	0.564	1.085	100	*	*
Juneau	0.608	0.608	1.003	100	1.5	2.58
Kansas City	0.469	0.469	0.958	100	1.49	3.26
Kotzebue	0.579	0.579	1.132	100	1.85	3.51
Los Angeles	0.818	0.818	1.438	100	1.97	4.22
Memphis	0.540	0.540	1.131	100	*	*
Merida	0.623	0.623	1.303	100	2.63	3.48
Mexico City	0.681	0.681	1.612	100	*	*
Miami	0.679	0.679	1.035	100	1.78	3.31
Minneapolis	0.626	0.626	1.035	100	1.49	3.15
New York	0.533	0.533	0.916	100	*	*
Oakland	0.762	0.762	1.571	100	1.9	4.45
Puerto Vallarta	0.706	0.706	1.139	100	*	*
Salt Lake City	0.515	0.515	0.839	100	1.48	3.61
San Jose Del Cabo	0.757	0.757	1.501	100	2.92	3.54
Seattle	0.603	0.603	0.844	100	1.39	3.33
Washington DC	0.692	0.692	0.981	100	1.33	3.35
Winnipeg	0.514	0.514	0.880	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 3.100 meters observed at Honolulu.
- The maximum 99.999% horizontal error was 7.572 meters observed at Honolulu.
- The minimum 95% horizontal error was 0.464 meters observed at Dallas.
- The minimum 99.999% horizontal error was 0.836 meters observed at Albuquerque.

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

Location	95% Horizontal (Meters)	99.999% Horizontal (Meters)	Percentage in NPA Mode (%)	Maximum Horizontal Error (Meters)
Albuquerque	0.974	2.253	100	2.430
Anchorage	1.604	3.175	100	3.362
Atlanta	0.950	2.856	100	2.986
Barrow	1.404	4.142	100	4.415
Bethel	1.423	3.062	100	3.186
Billings	1.089	1.819	100	1.955
Boston	1.149	2.335	100	2.467
Cleveland	1.008	2.196	100	2.484
Cold Bay	1.195	2.461	100	2.636
Fairbanks	1.649	3.016	100	3.103
Gander	1.315	3.944	100	4.256
Honolulu	3.100	7.572	100	7.793
Houston	1.489	3.834	100	3.941
Iqaluit	0.966	2.393	100	3.523
Juneau	1.393	2.734	100	2.874
Kansas City	1.055	2.308	100	2.541
Kotzebue	1.749	3.965	100	4.104
Los Angeles	1.603	2.986	100	3.240
Merida	1.807	6.064	100	6.393
Miami	1.531	3.542	100	3.785
Minneapolis	1.241	1.921	100	2.169
Oakland	1.527	2.685	100	2.835
Salt Lake City	1.077	1.688	100	1.794
San Jose Del Cabo	2.092	4.439	100	4.600
San Juan	1.297	5.846	100	6.046
Seattle	1.141	2.088	100	2.281
Tapachula	0.000	0.000	0.000	0.000
Washington DC	1.225	2.133	100	2.291

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 2.683 meters occurred at Fairbanks and maximum vertical LPV error was 4.831 meters occurred at Barrow.

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	2.420	0.184	0.208	3.456	0.149	0.178
Atlantic City	2.324	0.186	0.235	3.365	0.158	0.195
Albuquerque	1.450	0.118	0.118	2.195	0.070	0.129
Anchorage	1.380	0.113	0.126	2.387	0.130	0.134
Atlanta	1.673	0.138	0.143	3.111	0.129	0.177
Barrow	1.875	0.114	0.135	4.831	0.133	0.176
Bethel	1.312	0.097	0.098	2.045	0.111	0.118
Billings	1.160	0.131	0.131	1.958	0.095	0.129
Boston	1.258	0.090	0.114	2.399	0.159	0.159
Chicago	1.465	0.164	0.164	2.590	0.123	0.160
Cleveland	1.264	0.109	0.113	2.256	0.145	0.157
Cold Bay	1.589	0.081	0.086	2.191	0.085	0.114
Dallas	1.206	0.105	0.113	2.628	0.147	0.160
Denver	1.252	0.118	0.123	2.216	0.123	0.156
Fairbanks	2.683	0.079	0.149	3.959	0.149	0.151
Gander	1.916	0.145	0.145	2.960	0.099	0.128
Goose Bay	2.478	0.123	0.135	3.354	0.127	0.156
Houston	1.534	0.166	0.166	3.110	0.190	0.190
Iqaluit	2.146	0.137	0.146	3.969	0.102	0.128
Jacksonville	1.365	0.095	0.115	2.675	0.161	0.169
Juneau	1.536	0.145	0.147	3.114	0.148	0.148
Kansas City	1.125	0.091	0.121	2.582	0.197	0.209
Kotzebue	1.954	0.171	0.171	4.113	0.095	0.153
Los Angeles	1.812	0.129	0.133	2.910	0.146	0.174
Memphis	1.308	0.116	0.132	2.840	0.115	0.175
Merida	1.958	0.096	0.155	3.343	0.080	0.134
Mexico City	1.969	0.173	0.177	3.811	0.081	0.135
Miami	1.853	0.103	0.146	2.866	0.101	0.135
Minneapolis	1.256	0.111	0.131	2.699	0.145	0.174
New York	1.384	0.111	0.111	2.427	0.146	0.146
Oakland	1.678	0.123	0.124	2.809	0.073	0.186
Puerto Vallarta	2.421	0.204	0.204	4.320	0.086	0.115
Salt Lake City	1.276	0.118	0.121	1.991	0.108	0.142
San Jose Del Cabo	1.809	0.133	0.161	4.026	0.110	0.155
Seattle	1.402	0.118	0.129	2.810	0.154	0.154
Washington DC	1.599	0.134	0.134	2.652	0.126	0.152
Winnipeg	1.282	0.101	0.116	3.085	0.144	0.150

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.

- August 27, 2021—Position errors in Canada were elevated. The maximum 95% horizontal and vertical LPV errors were 1.410 meters and 1.655 meters at Gander and Goose Bay, respectively. The Kp index was 4.

Figure 2-1 LPV 95% Horizontal Accuracy

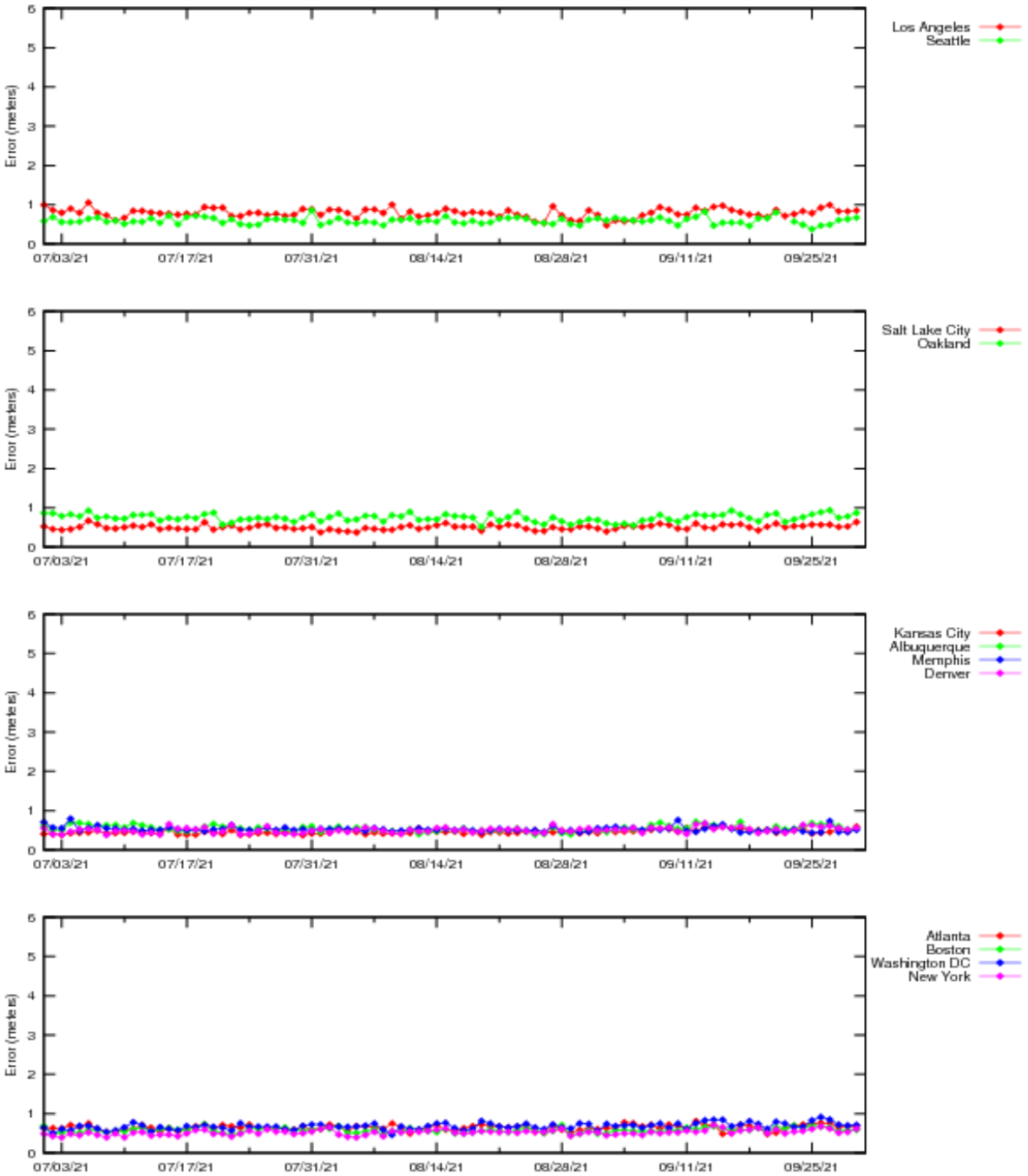


Figure 2-2 LPV 95% Horizontal Accuracy

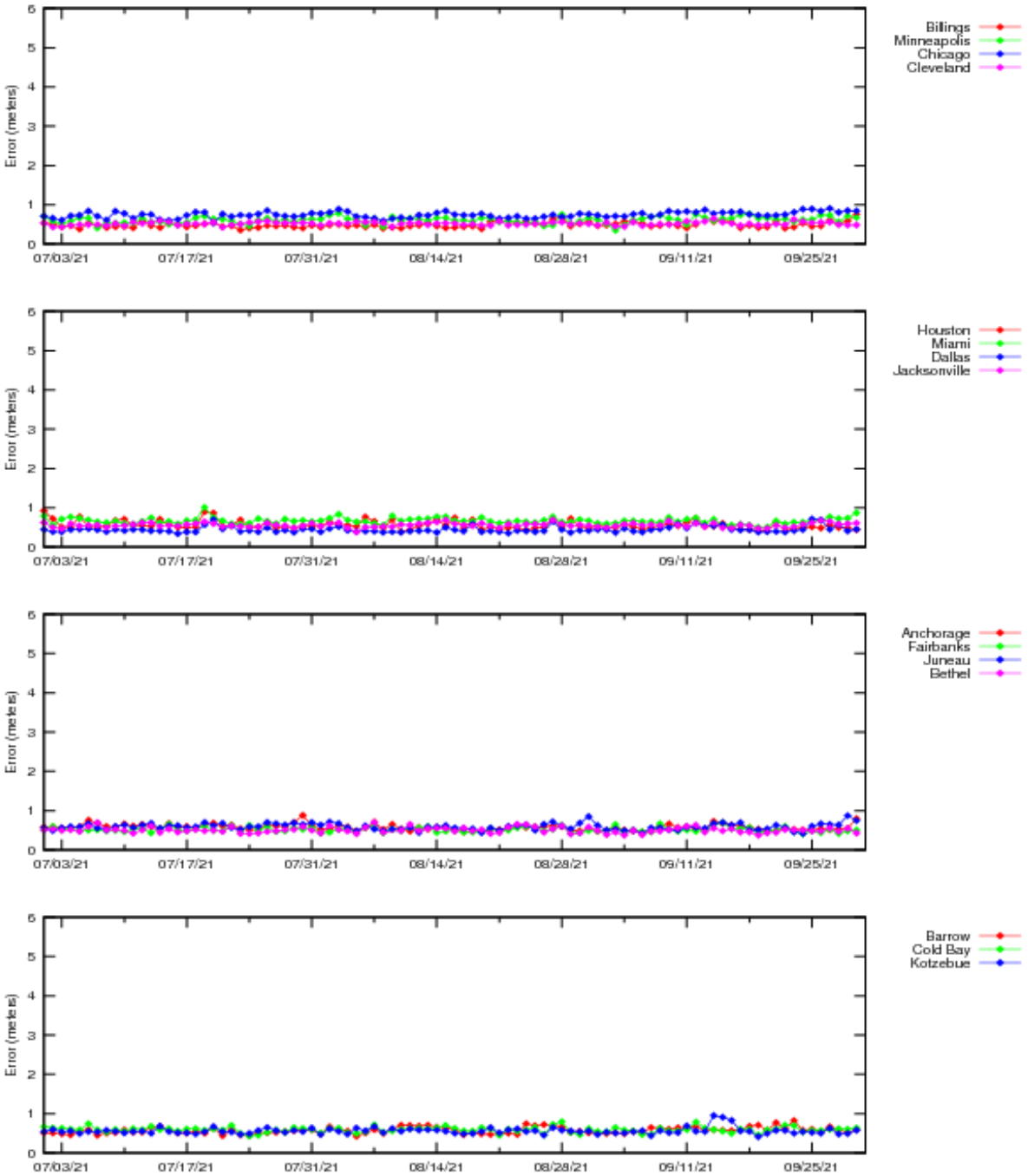


Figure 2-3 LPV 95% Horizontal Accuracy

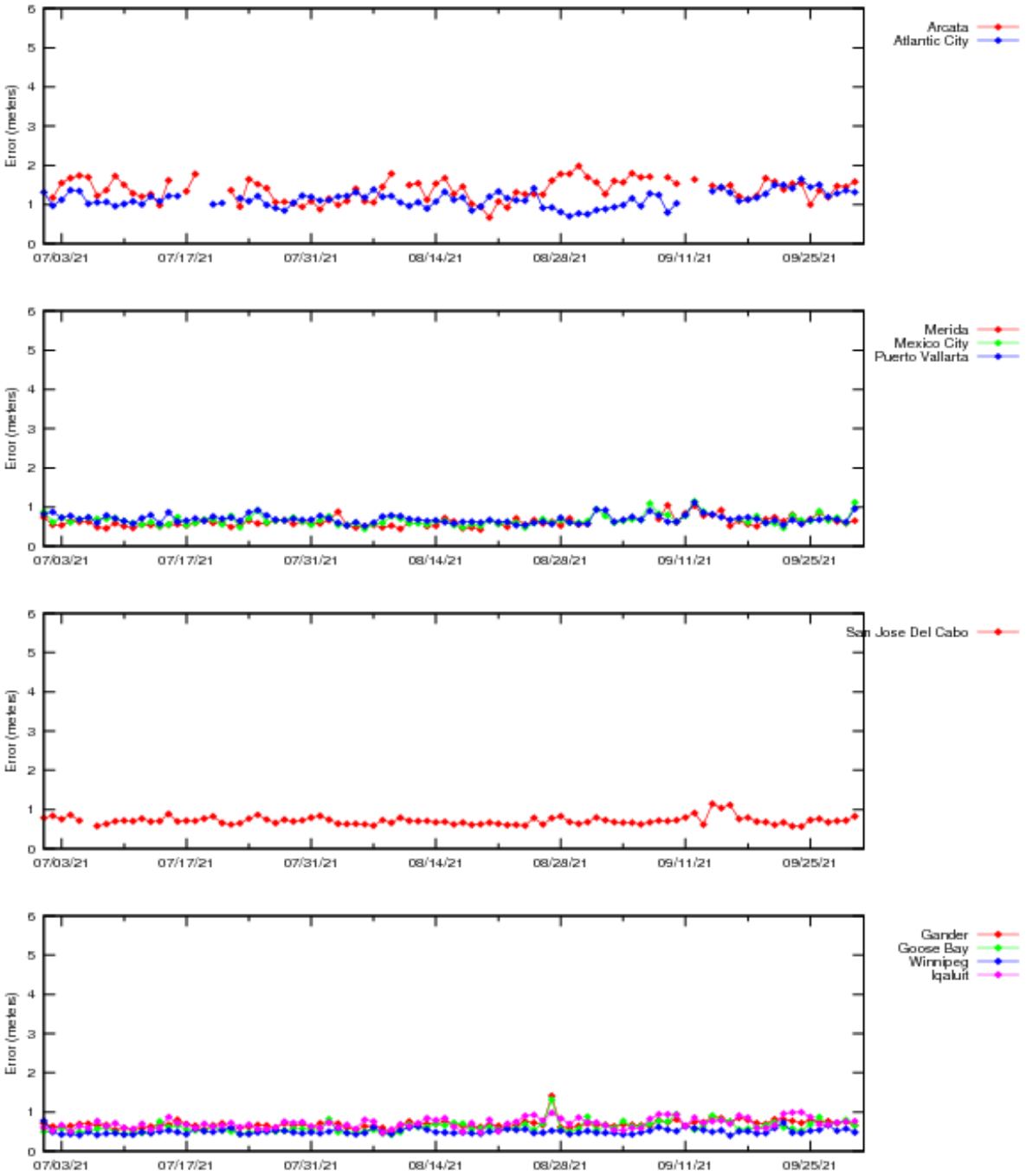


Figure 2-4 LPV 95% Vertical Accuracy

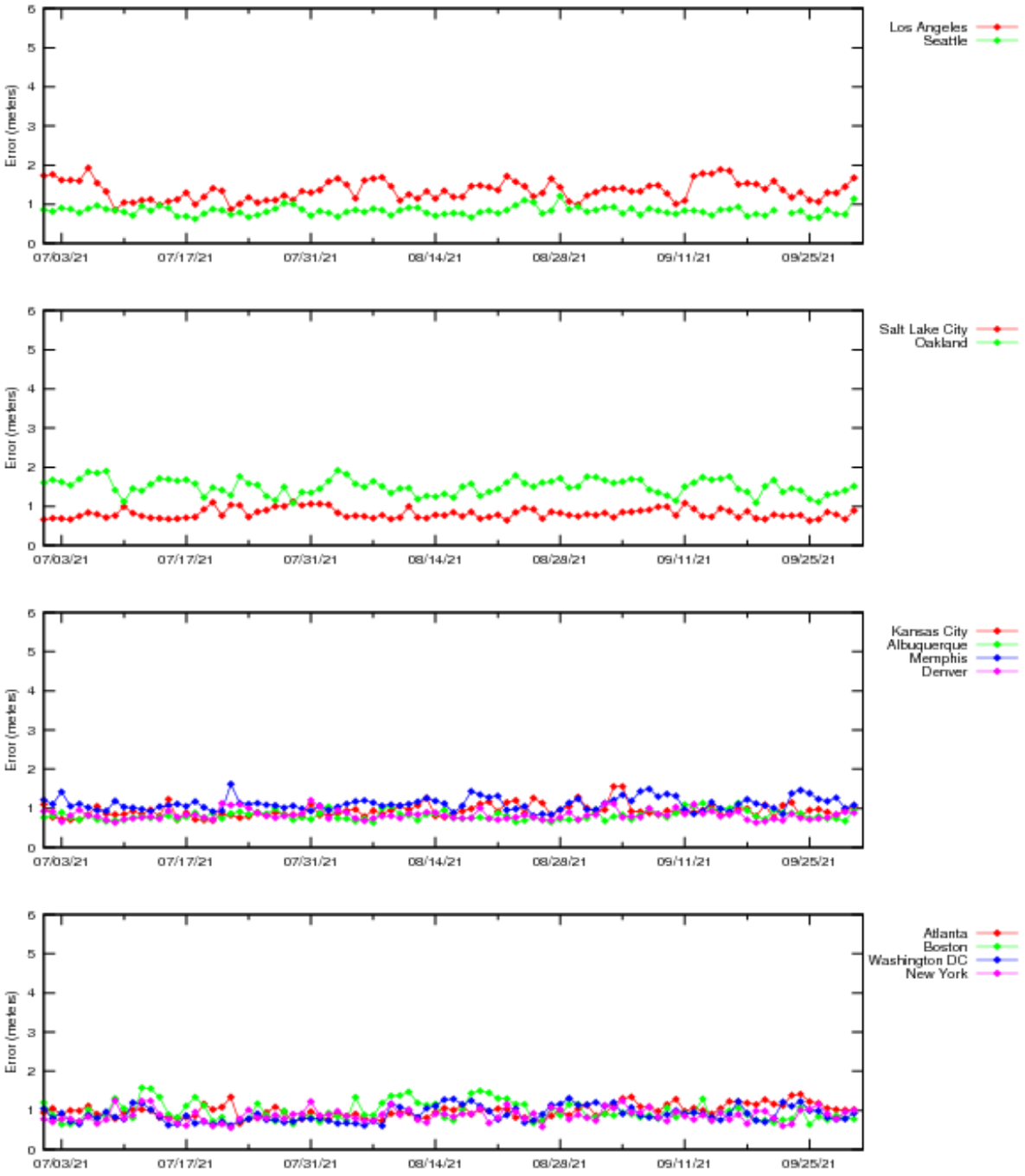


Figure 2-5 LPV 95% Vertical Accuracy

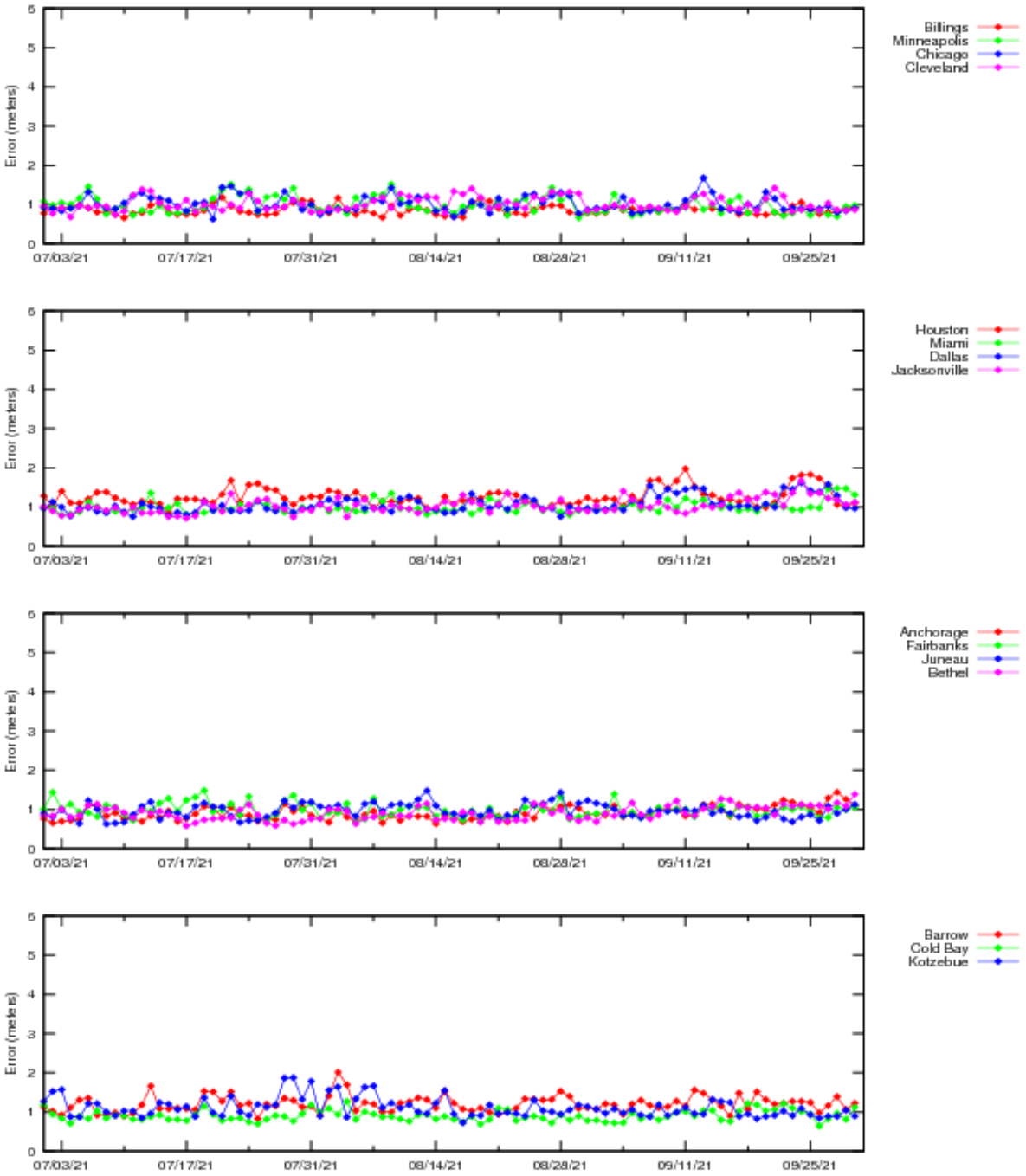


Figure 2-6 LPV 95% Vertical Accuracy

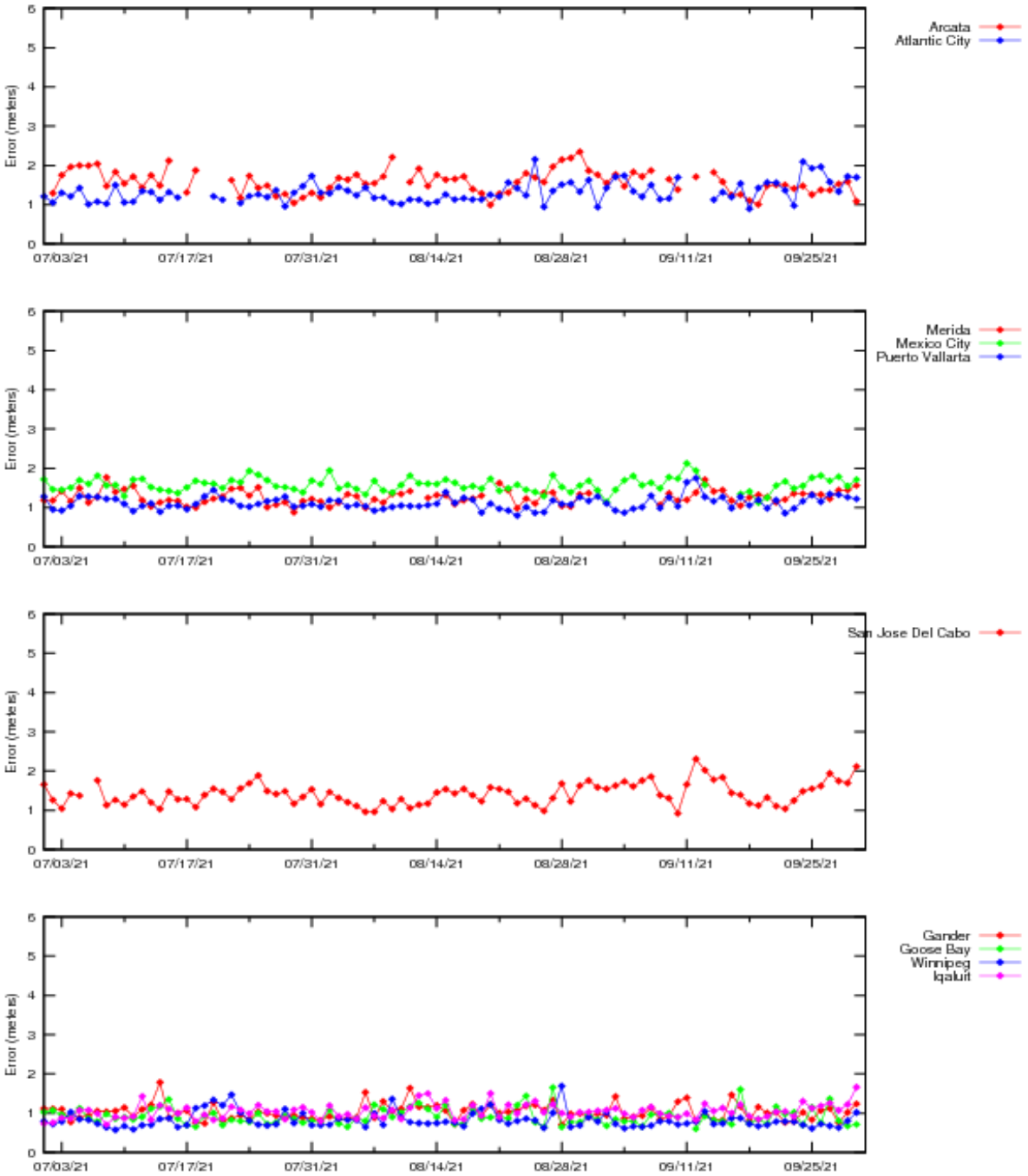


Figure 2-7 and Figure 2-8 show the daily NPA 95% horizontal accuracy at the NPA evaluation sites for the reporting period. There were no noteworthy increases in 95% NPA position errors due to geomagnetic activity.

Figure 2-7 NPA 95% Horizontal Accuracy

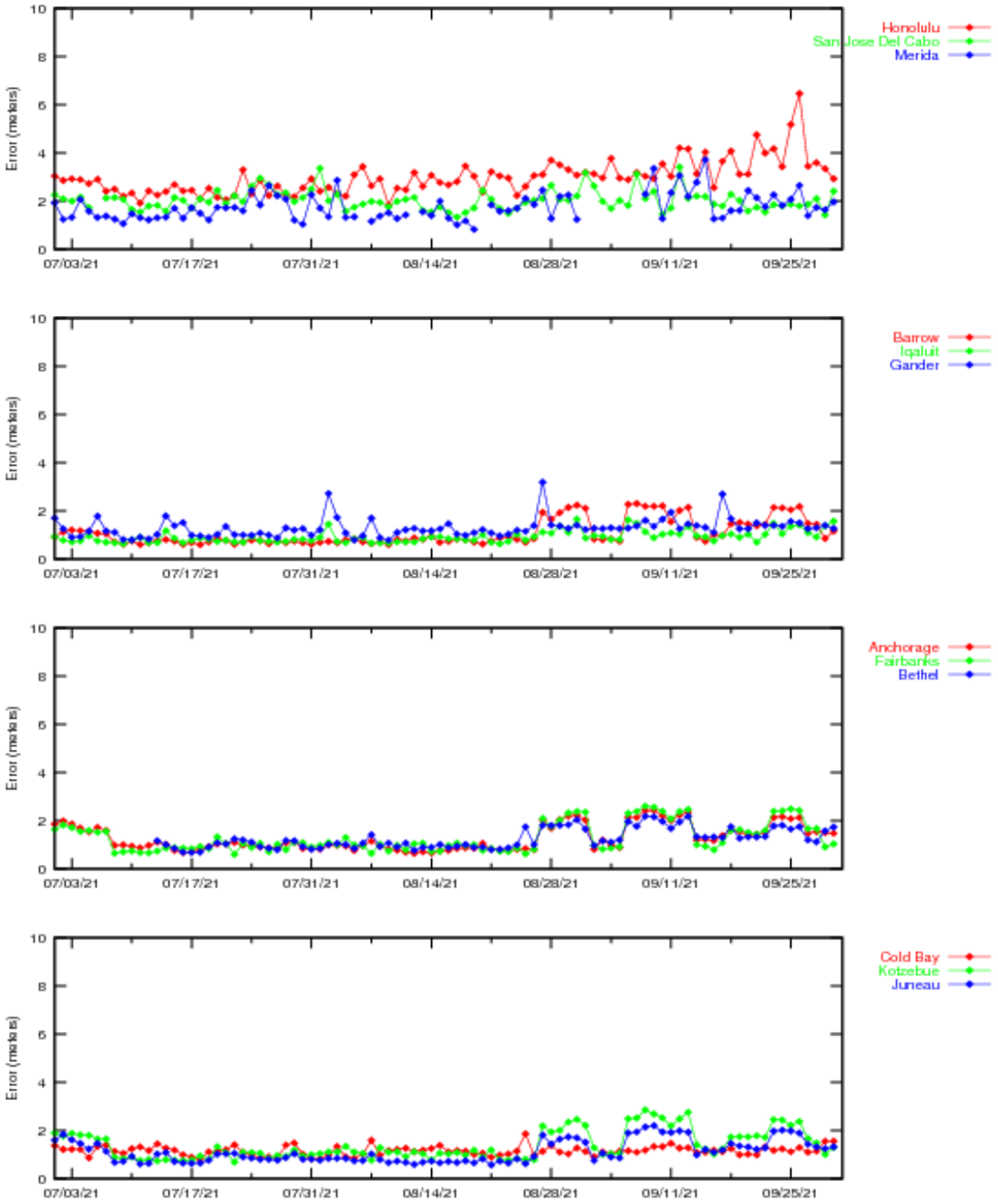


Figure 2-8 NPA 95% Horizontal Accuracy

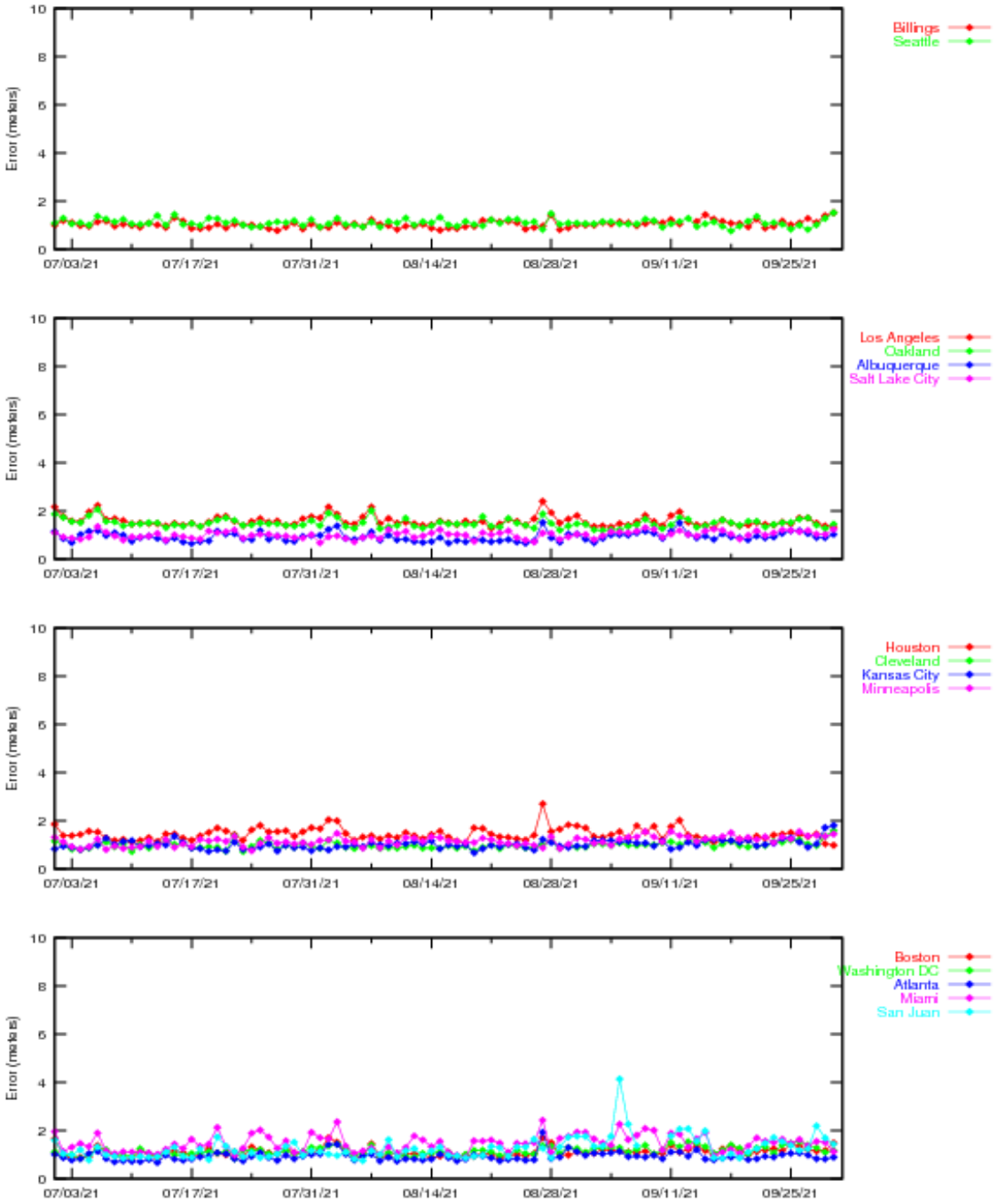


Figure 2-9 through Figure 2-12 show the distributions of the vertical and horizontal errors at all 38 WAAS receiver for the quarter. Figure 2-9 and Figure 2-10 show the triangular distributions of vertical position error (VPE) versus VPL and horizontal position error (HPE) versus HPL: (1) the horizontal axis is the position error, (2) the vertical axis is the WAAS protection level where lower protection levels equate to better availability, (3) the diagonal line shows the point where error equals protection level, (4) above and to the left of the diagonal line show where errors are bounded (WAAS is providing integrity in the position domain), and (5) below and to the right show where errors are not bounded (HMI could be present). Figure 2-11 and Figure 2-12 show the 2-D histograms of HPE, VPE, and normalized position errors: (1) the blue trace shows the distributions of the actual HPE and VPE; (2) the horizontal

axis is the position errors and the vertical axis is the total count of data samples (log scale) in each 0.1-meter bin; (3) the magenta trace shows the distributions of the actual horizontal and vertical errors normalized by one-sigma value of the protection level: horizontal protection level (HPL/6.0) and vertical protection level (VPL/5.33); (4) the horizontal axis is the standard units and vertical axis is the observed distribution of normalized errors data samples in each 0.1-sigma bin. The narrowness of the normalized error distributions indicates good safety performance.

Figure 2-9 LPV Horizontal Error Bounding Triangle Chart

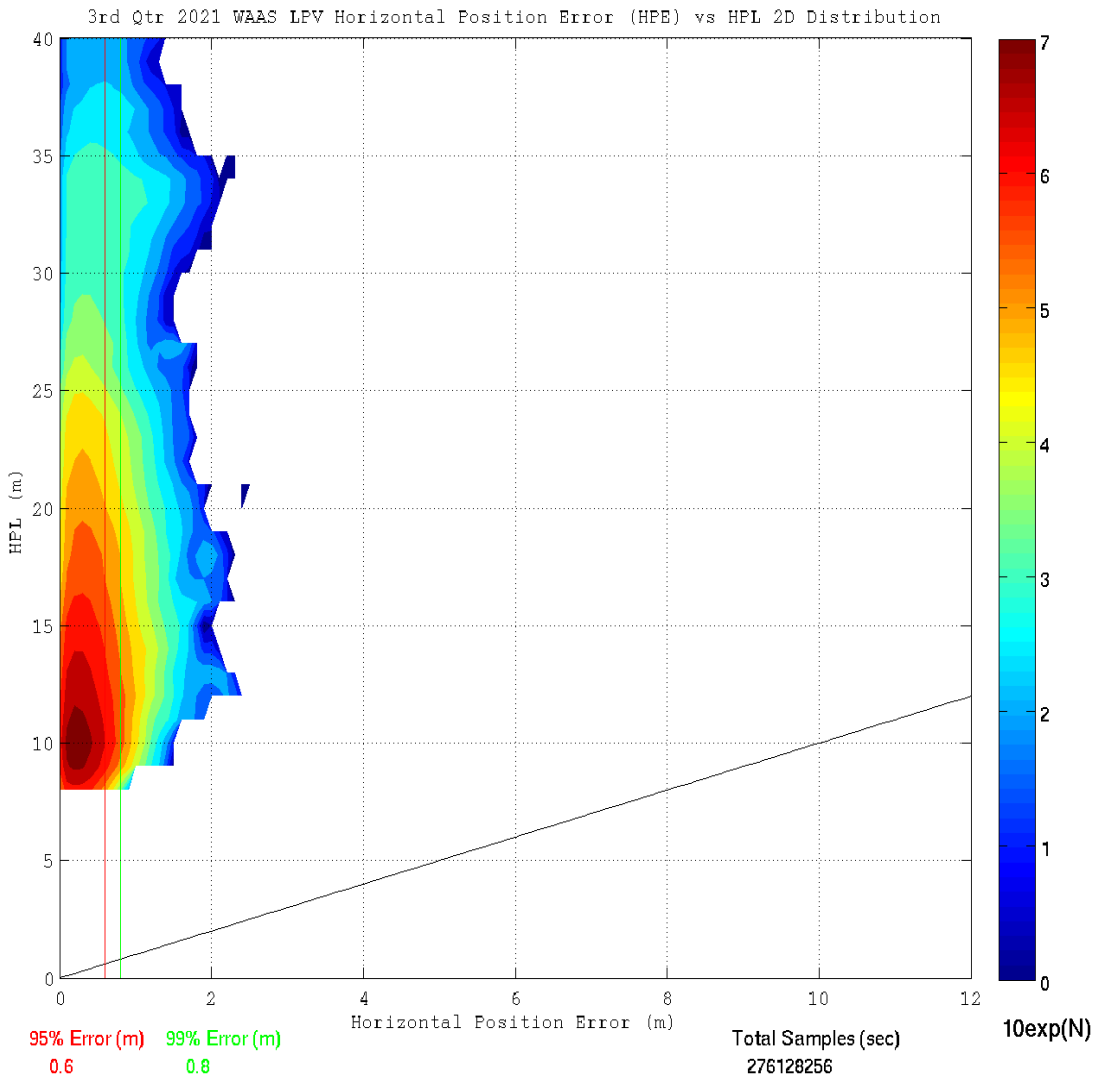


Figure 2-10 LPV Vertical Error Bounding Triangle Chart

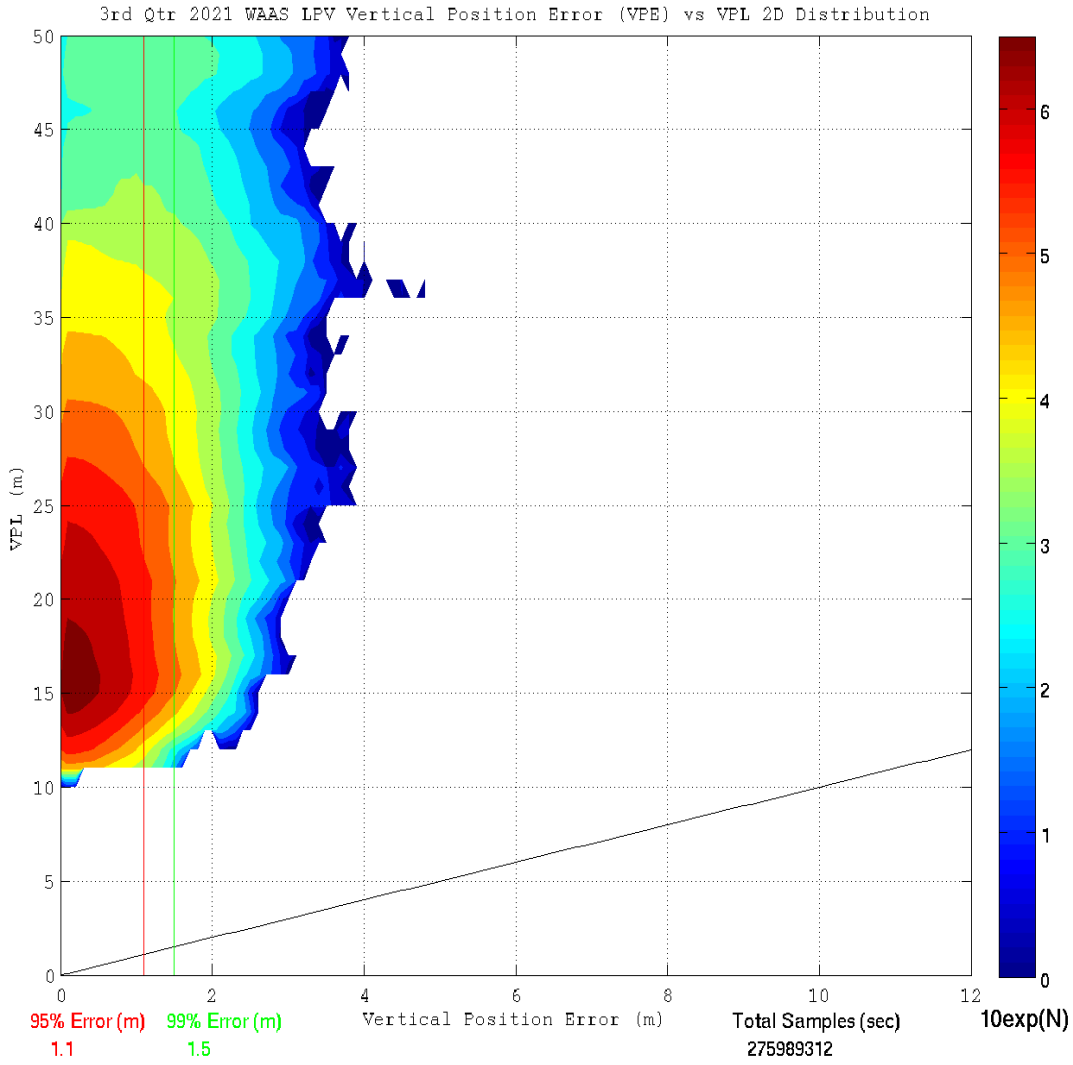


Figure 2-11 LPV 2-D Horizontal Error Distribution Histogram

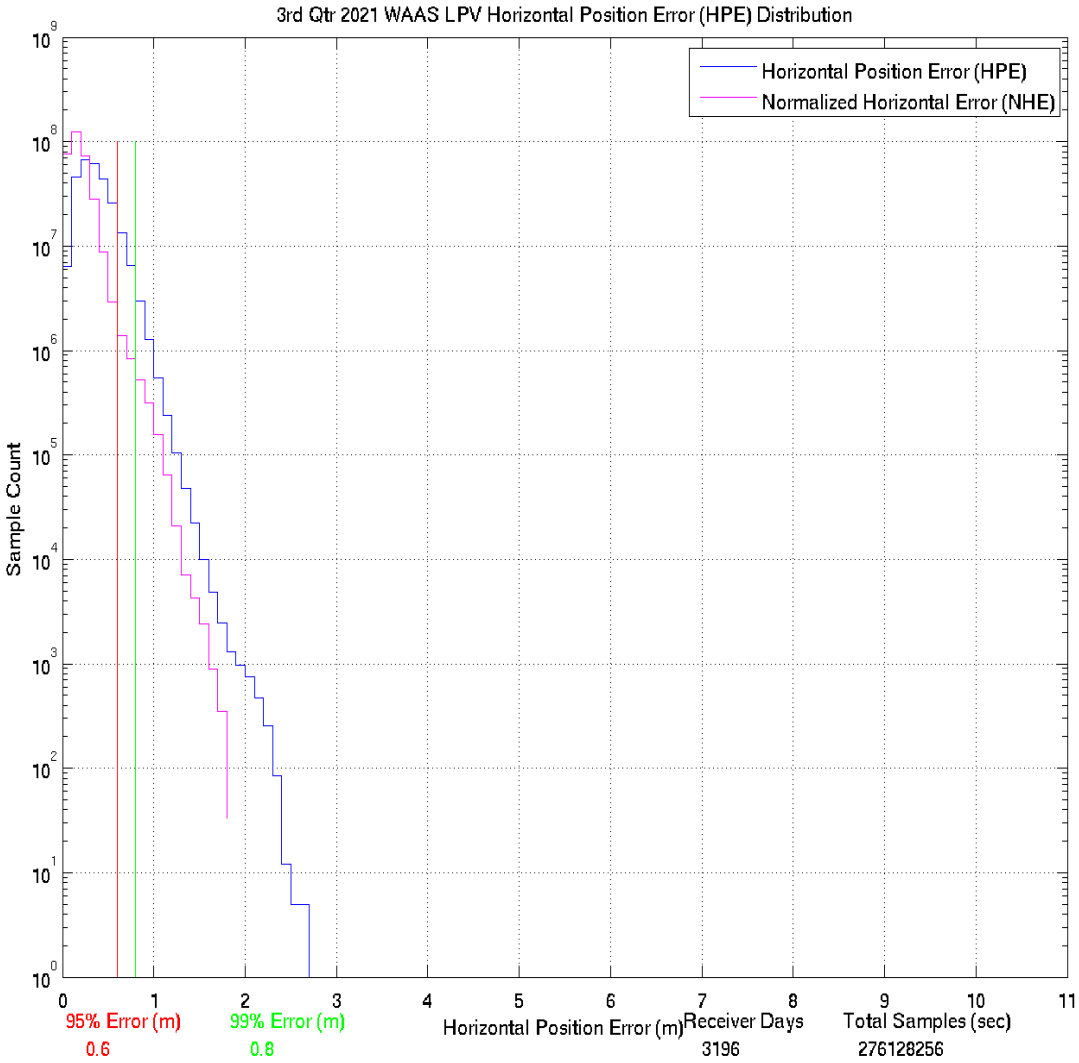
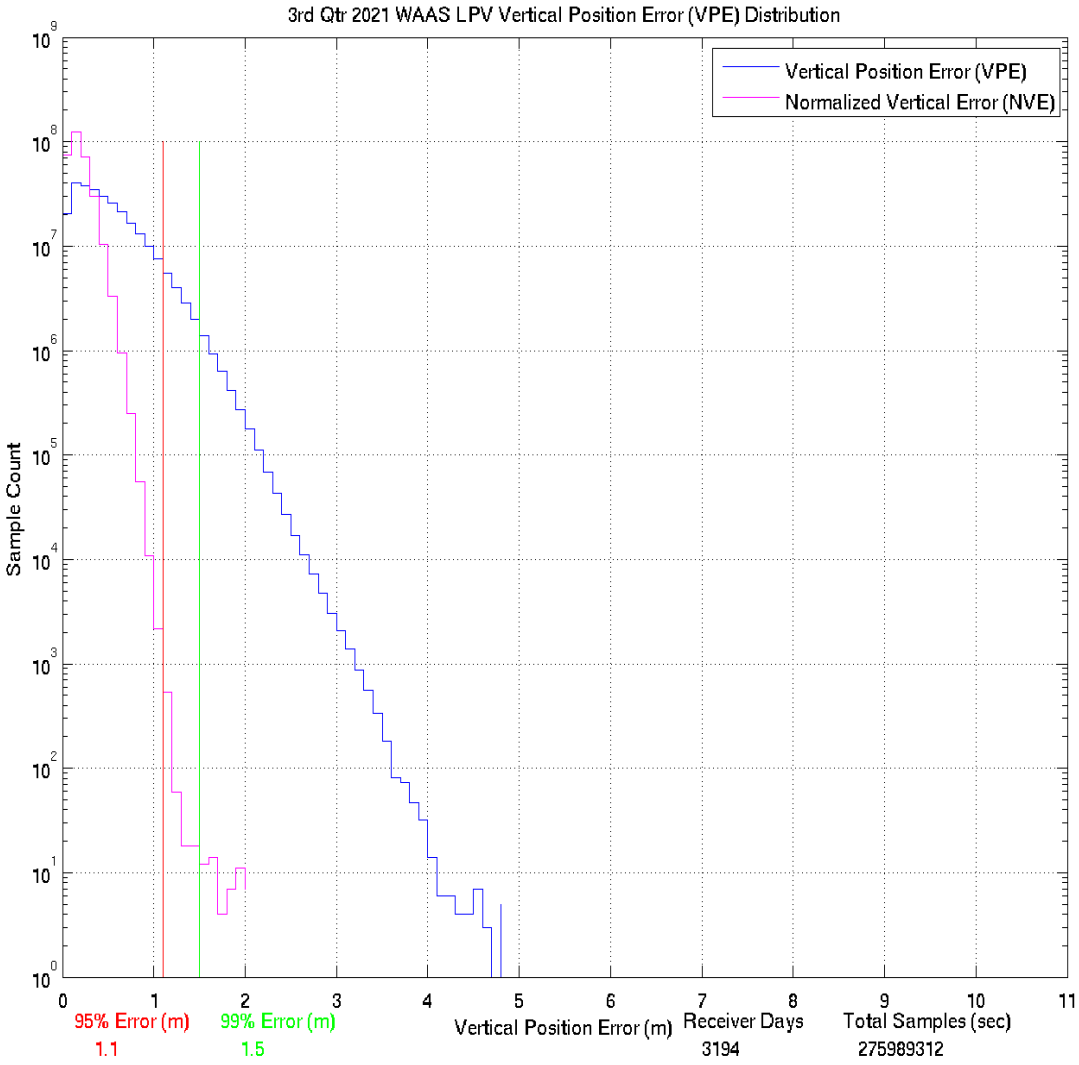


Figure 2-12 LPV 2-D Vertical Error Distribution Histogram



3.0 AVAILABILITY

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

- The maximum 99% CONUS HPL was 17.920 meters observed at Miami
- The maximum 99% CONUS VPL was 30.354 meters observed at Arcata
- The minimum 99% CONUS HPL was 10.564 meters observed at Denver
- The minimum 99% CONUS VPL was 20.843 meters observed at Billings
- The maximum 99% Alaska HPL was 20.230 meters observed at Cold Bay
- The maximum 99% Alaska VPL was 33.108 meters observed at Barrow
- The minimum 99% Alaska HPL was 13.015 meters observed at Juneau
- The minimum 99% Alaska VPL was 21.920 meters observed at Juneau

Table 3-1 99% Protection Level

Location	99% HPL (Meters)	99% VPL (Meters)	Percentage in PA mode (%)
Arcata	14.586	30.354	100
Atlantic City	14.406	22.285	100
Oklahoma City	12.188	24.630	100
Albuquerque	11.533	23.930	100
Anchorage	13.739	21.927	100
Atlanta	11.975	24.184	100
Barrow	15.002	33.108	100
Bethel	16.012	24.516	100
Billings	11.882	20.843	100
Boston	15.816	21.475	100
Chicago	11.451	22.216	100
Cleveland	14.343	23.387	100
Cold Bay	20.230	28.093	100
Dallas	11.306	23.556	100
Denver	10.564	21.932	100
Fairbanks	13.247	22.785	100
Gander	23.159	28.664	100
Goose Bay	18.213	26.179	100
Houston	12.766	24.913	100
Iqaluit	17.863	32.733	100
Jacksonville	14.014	25.948	100
Juneau	13.015	21.920	100
Kansas City	10.638	22.622	100
Kotzebue	15.499	27.962	100
Los Angeles	14.550	29.631	100
Memphis	10.769	23.370	100
Merida	23.084	41.687	100
Mexico City	24.709	47.743	100
Miami	17.920	27.718	100
Minneapolis	11.540	20.863	100
New York	14.926	21.742	100
Oakland	13.992	29.140	100
Puerto Vallarta	30.193	51.723	100
Salt Lake City	10.993	21.624	100
San Jose Del Cabo	22.110	37.788	100
Seattle	12.474	22.120	100
Washington DC	13.437	23.274	100
Winnipeg	13.162	21.122	100

Availability of LP, LPV, and LPV200 services are evaluated by monitoring the WAAS protection levels at receiver locations. Service is available when the VPL is less than the vertical alert limit (VAL) and the HPL is less than the horizontal alert limit (HAL). When the protection level exceeds the alert limit, the service is unavailable and an outage in service is recorded along with its duration. The operational service is not available again until both protection levels are within the alert limits for at least 15 minutes. Although this will cause minimal reduction in operational service availability, it will substantially reduce the number of service outages and prevent excessive switching in/out of service availability.

Table 3-2 shows the percentage of time LP, LPV, and LPV200 service is available using the 15-minute window criteria. Table 3-3 shows LP, LPV, and LPV200 service outages and associated outage rates. The outage rate is the

percentage of theoretically interrupted approaches through a loss of operational service once the approach had started. Figure 3-1 through Figure 3-6 show the daily availability of LPV and LPV200 service levels. Figure 3-7 through Figure 3-12 show the daily interruptions of LPV and LPV200 service levels.

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

Location	LP WAAS With 15 Minute Window (%)	LPV WAAS With 15 Minute Window (%)	LPV200 WAAS With 15 Minute Window (%)
Arcata	100	100	100
Atlantic City	100	100	100
Oklahoma City	100	100	100
Albuquerque	100	100	100
Anchorage	100	100	100
Atlanta	100	100	100
Barrow	100	99.99	99.67
Bethel	100	100	99.98
Billings	100	100	100
Boston	100	100	100
Chicago	100	100	100
Cleveland	100	100	100
Cold Bay	100	100	99.97
Dallas	100	100	100
Denver	100	100	100
Fairbanks	100	100	99.99
Gander	100	100	99.99
Goose Bay	100	100	100
Houston	100	100	100
Iqaluit	99.89	99.88	99.5
Jacksonville	100	100	100
Juneau	100	100	100
Kansas City	100	100	100
Kotzebue	100	100	99.92
Los Angeles	100	100	99.99
Memphis	100	100	100
Merida	100	99.99	95.98
Mexico City	100	99.55	92.54
Miami	100	100	99.99
Minneapolis	100	100	100
New York	100	100	100
Oakland	100	100	99.99
Puerto Vallarta	99.99	98.79	93.76
Salt Lake City	100	100	100
San Jose Del Cabo	100	99.66	95.47
Seattle	100	100	100
Washington DC	100	100	100
Winnipeg	100	100	100

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

Location	LP Outages (Number)	LP Outage Rates	LPV Outages (Number)	LPV Outage Rates	LPV200 Outages (Number)	LPV200 Outage Rates
Arcata	0	0.000000	0	0.000000	1	0.000022
Atlantic City	0	0.000000	0	0.000000	0	0.000000
Oklahoma City	0	0.000000	0	0.000000	0	0.000000
Albuquerque	0	0.000000	0	0.000000	1	0.000019
Anchorage	0	0.000000	0	0.000000	0	0.000000
Atlanta	0	0.000000	0	0.000000	0	0.000000
Barrow	0	0.000000	5	0.000095	66	0.001254
Bethel	0	0.000000	0	0.000000	1	0.000019
Billings	0	0.000000	0	0.000000	0	0.000000
Boston	0	0.000000	0	0.000000	0	0.000000
Chicago	0	0.000000	0	0.000000	0	0.000000
Cleveland	0	0.000000	0	0.000000	0	0.000000
Cold Bay	0	0.000000	0	0.000000	1	0.000019
Dallas	0	0.000000	0	0.000000	0	0.000000
Denver	0	0.000000	0	0.000000	0	0.000000
Fairbanks	1	0.000019	1	0.000019	2	0.000038
Gander	0	0.000000	0	0.000000	1	0.000019
Goose Bay	0	0.000000	0	0.000000	0	0.000000
Houston	0	0.000000	0	0.000000	0	0.000000
Iqaluit	6	0.000114	9	0.000170	67	0.001273
Jacksonville	0	0.000000	0	0.000000	0	0.000000
Juneau	0	0.000000	0	0.000000	0	0.000000
Kansas City	0	0.000000	0	0.000000	0	0.000000
Kotzebue	0	0.000000	0	0.000000	17	0.000321
Los Angeles	0	0.000000	0	0.000000	2	0.000038
Memphis	0	0.000000	0	0.000000	0	0.000000
Merida	0	0.000000	5	0.000107	173	0.003874
Mexico City	0	0.000000	80	0.001569	469	0.009898
Miami	0	0.000000	0	0.000000	8	0.000151
Minneapolis	0	0.000000	0	0.000000	0	0.000000
New York	0	0.000000	0	0.000000	0	0.000000
Oakland	0	0.000000	0	0.000000	3	0.000057
Puerto Vallarta	1	0.000019	99	0.001895	517	0.010424
Salt Lake City	0	0.000000	0	0.000000	0	0.000000
San Jose Del Cabo	0	0.000000	86	0.001671	405	0.008214
Seattle	0	0.000000	0	0.000000	0	0.000000
Washington DC	0	0.000000	0	0.000000	0	0.000000
Winnipeg	0	0.000000	0	0.000000	0	0.000000

Figure 3-1 LPV Instantaneous Availability

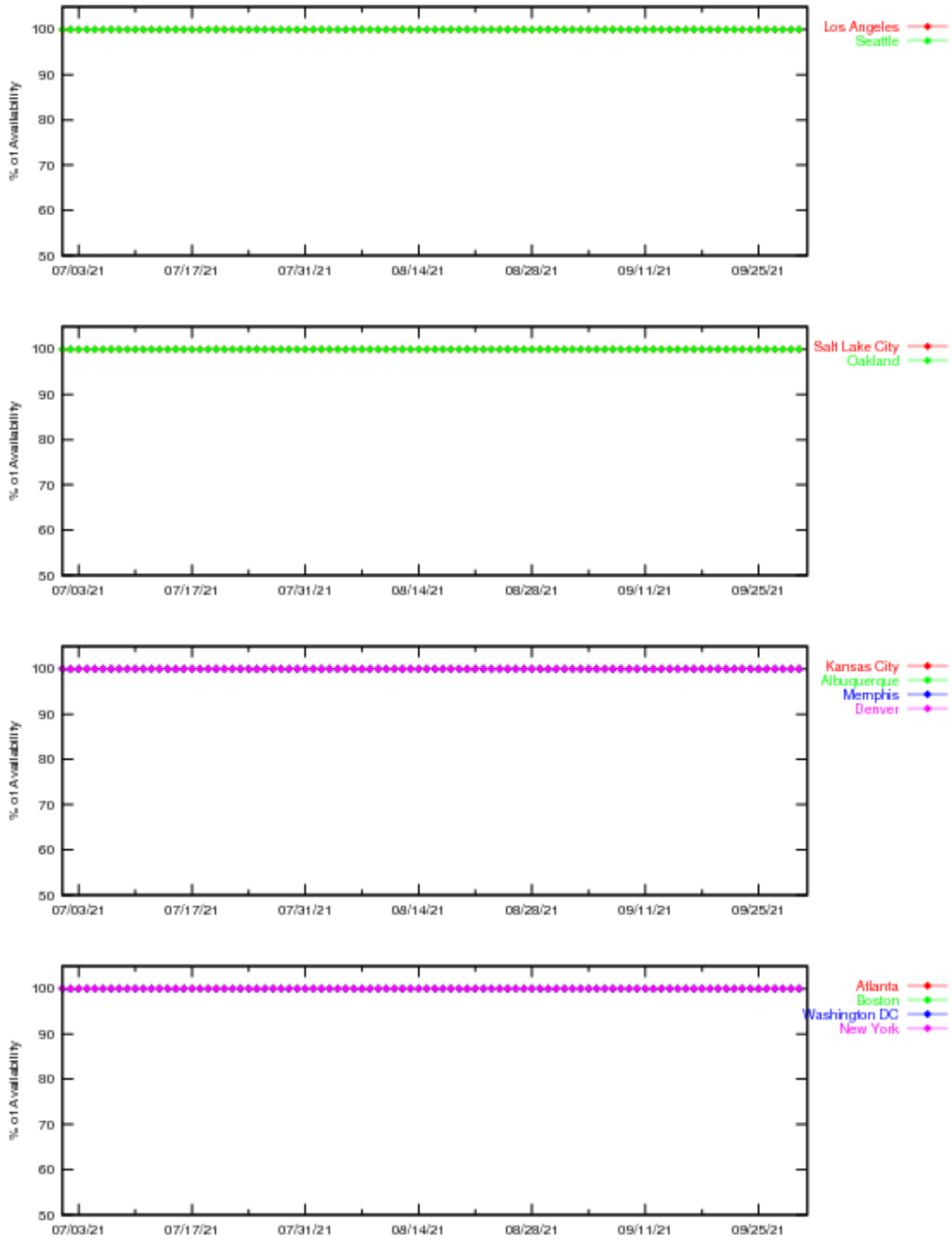


Figure 3-2 LPV Instantaneous Availability

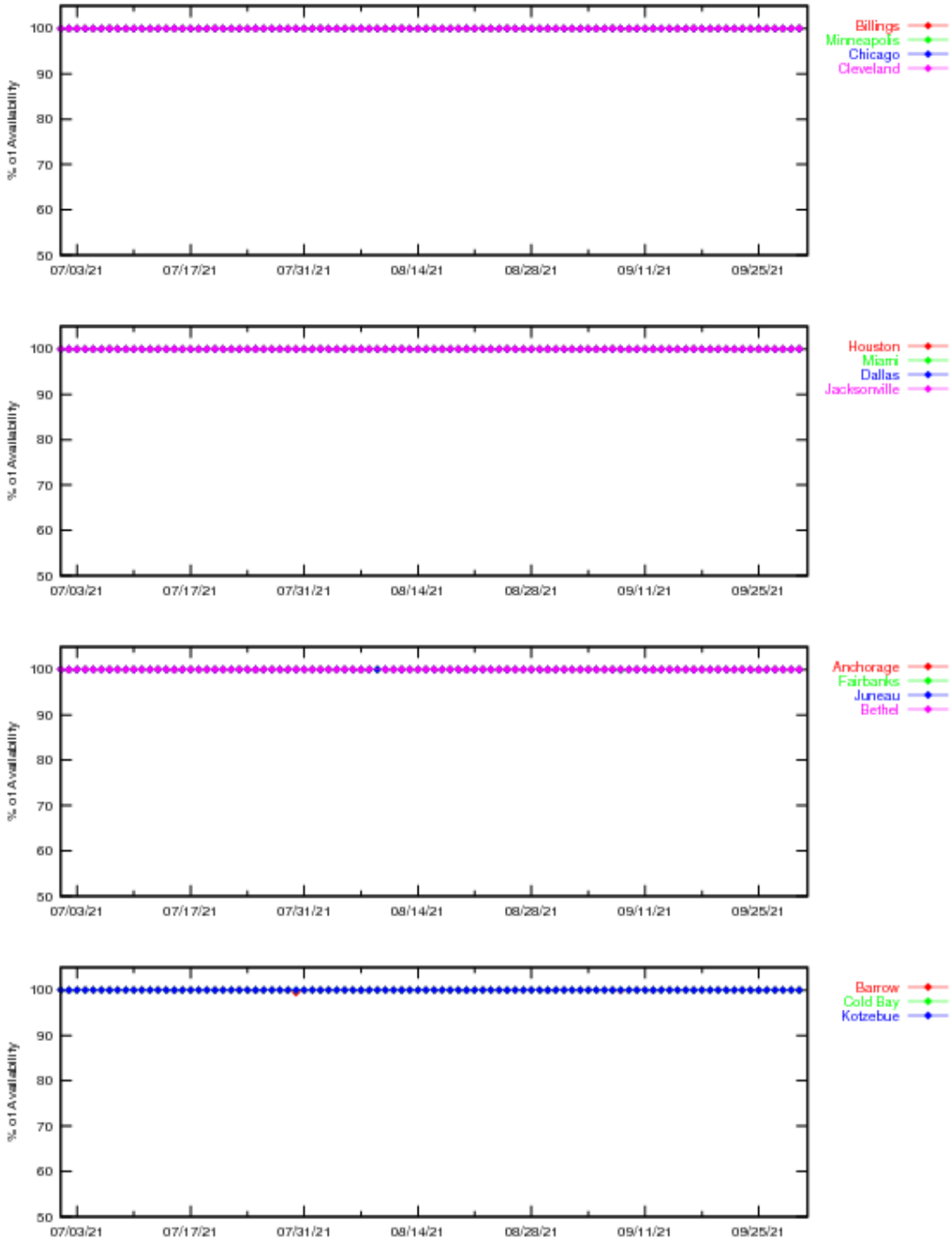


Figure 3-3 LPV Instantaneous Availability

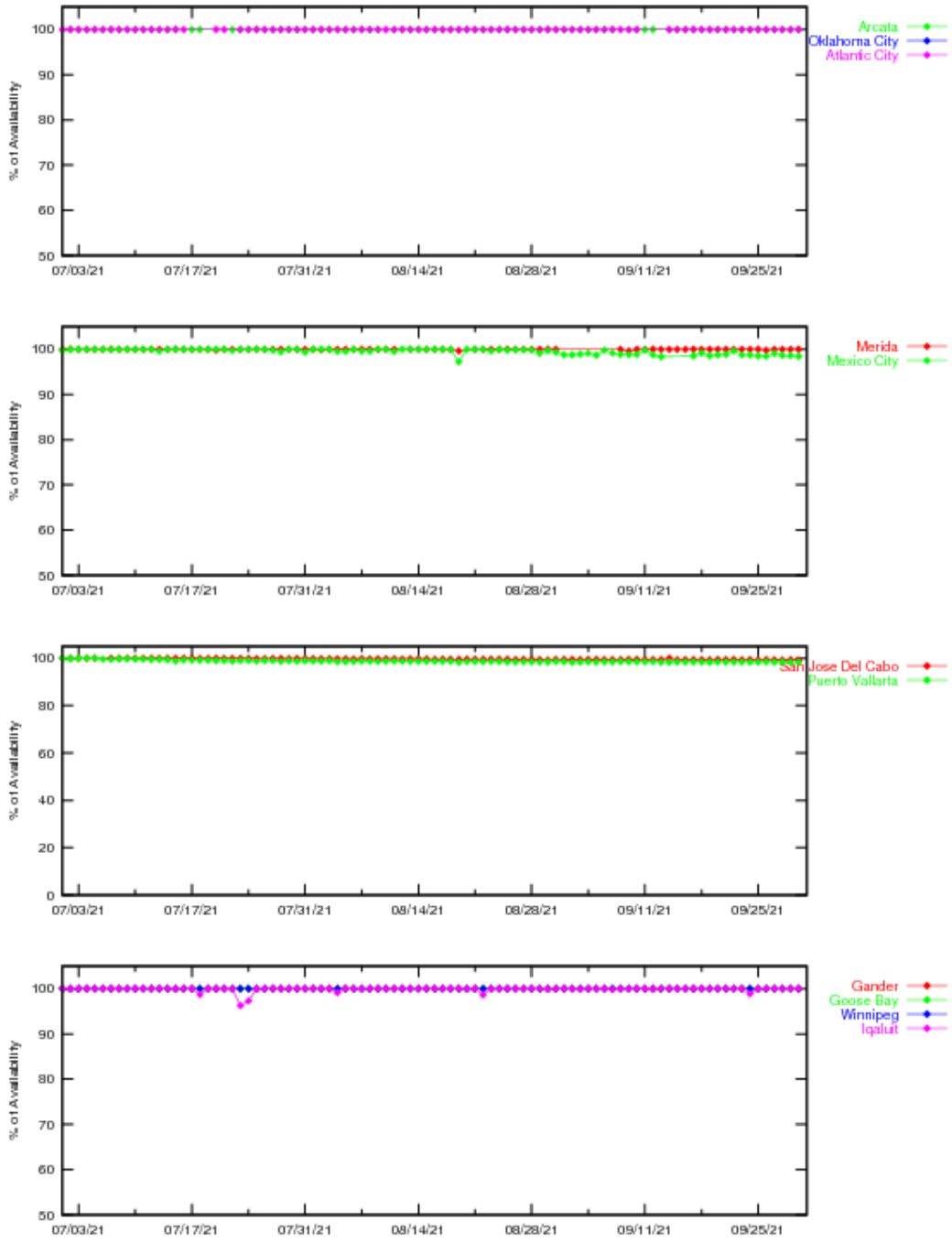


Figure 3-4 LPV200 Instantaneous Availability

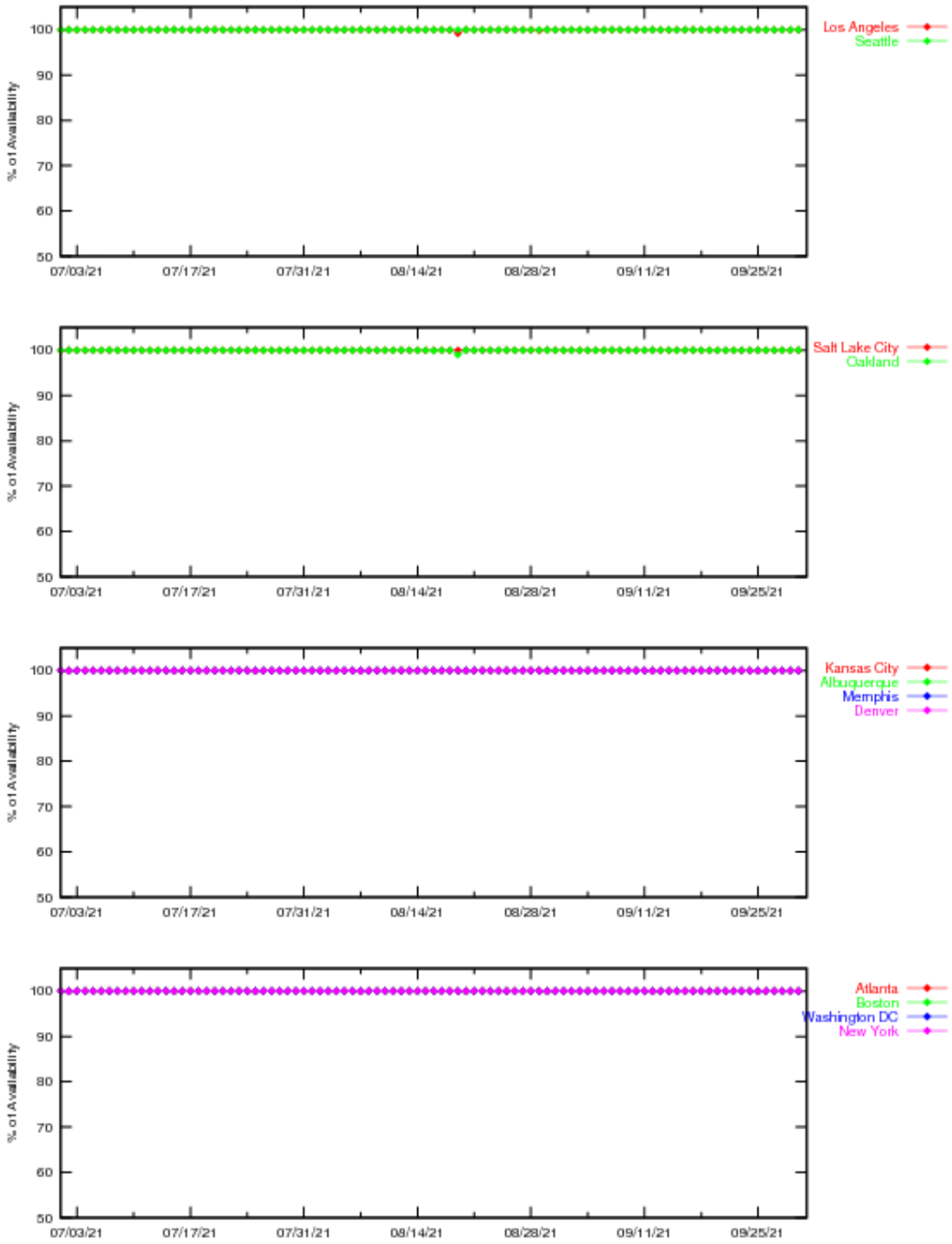


Figure 3-5 LPV200 Instantaneous Availability

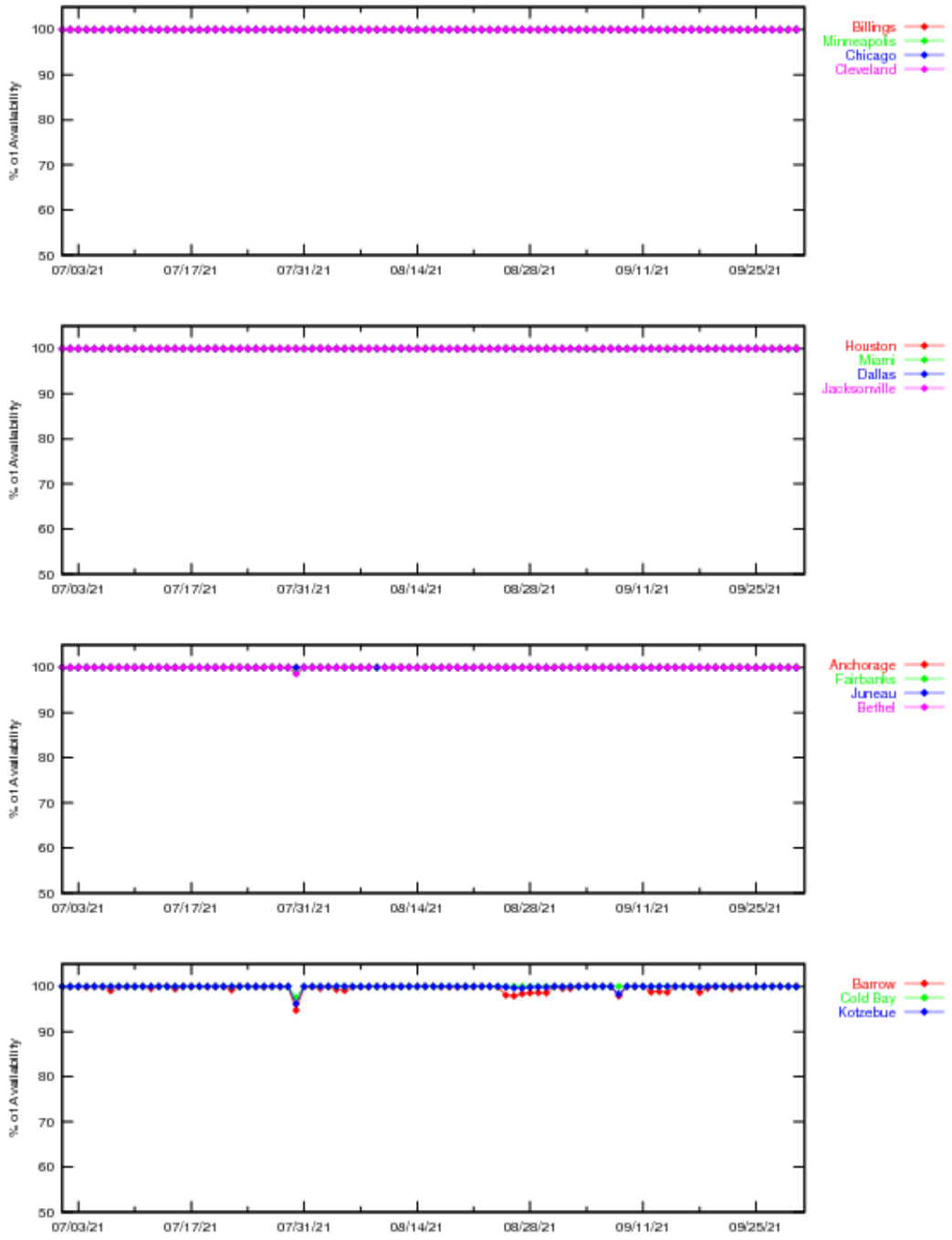


Figure 3-6 LPV200 Instantaneous Availability

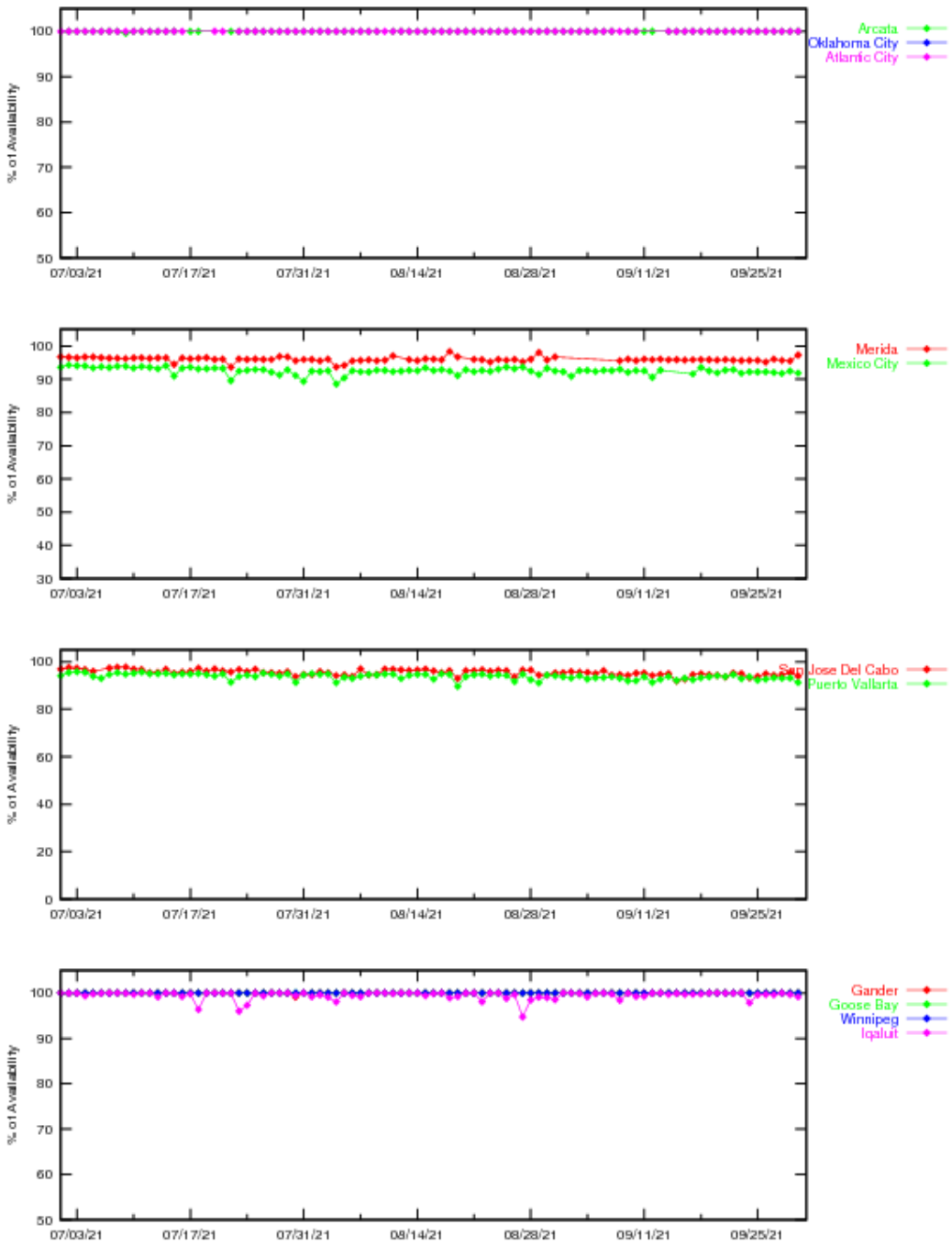


Figure 3-7 LPV Outages

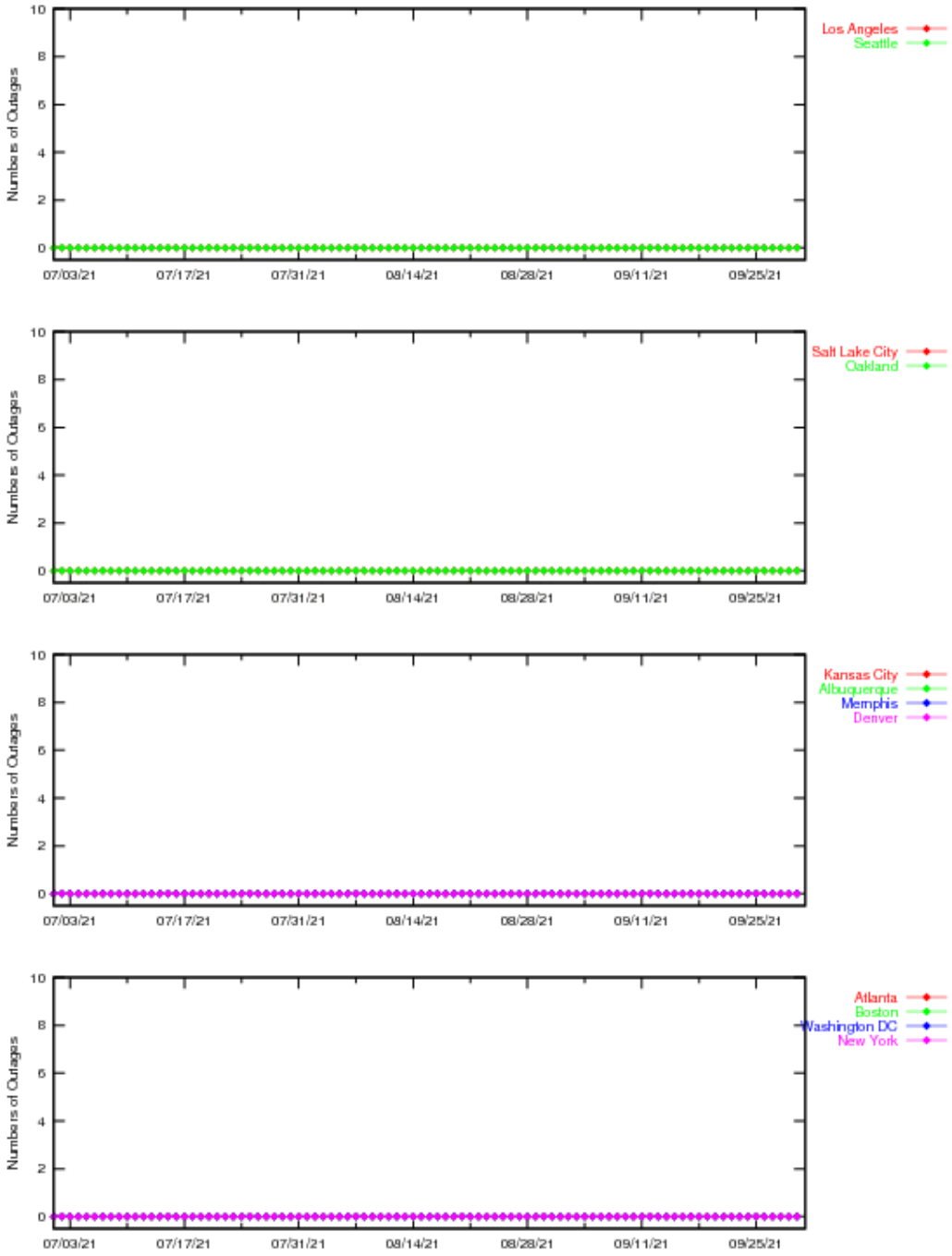


Figure 3-8 LPV Outages

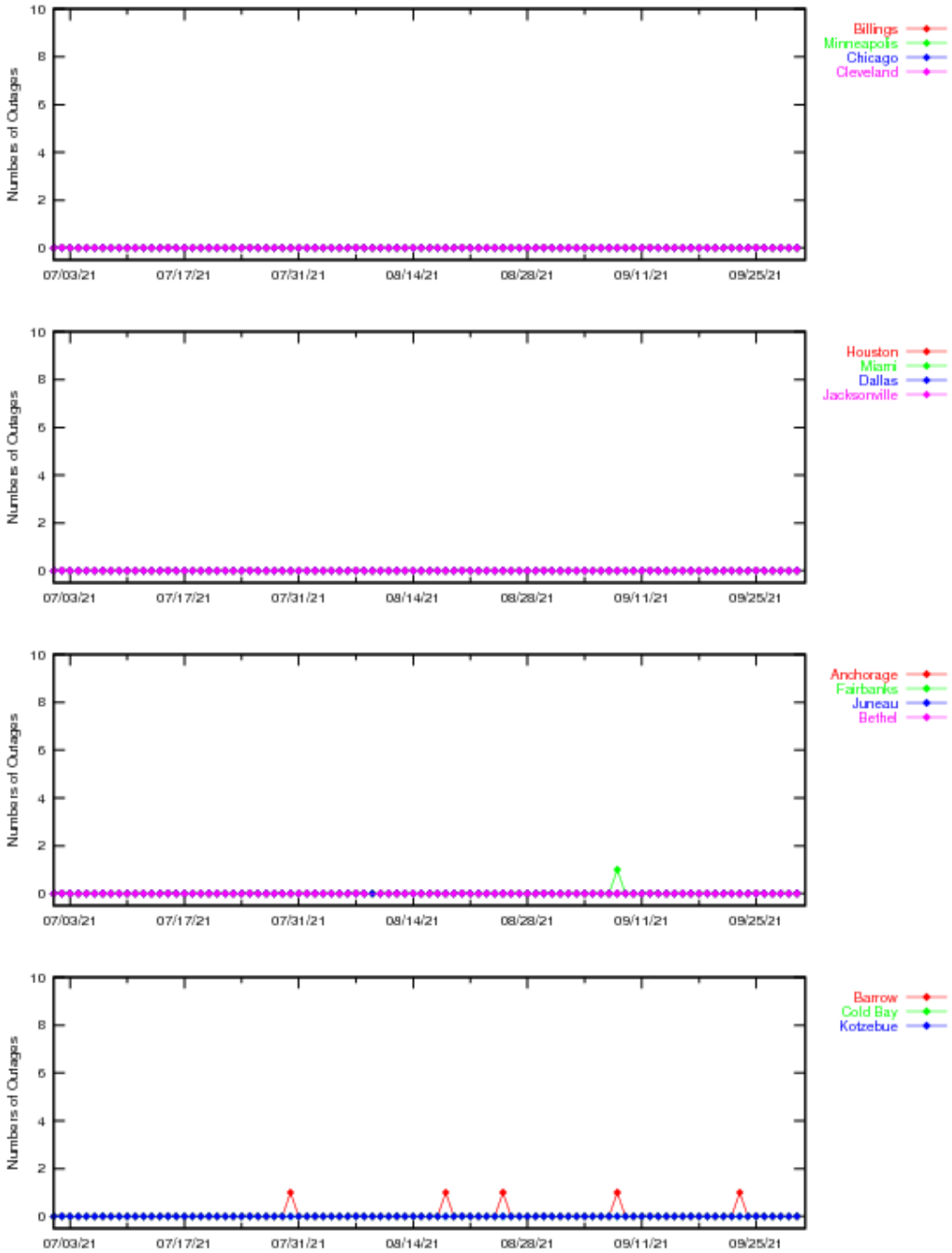


Figure 3-9 LPV Outages

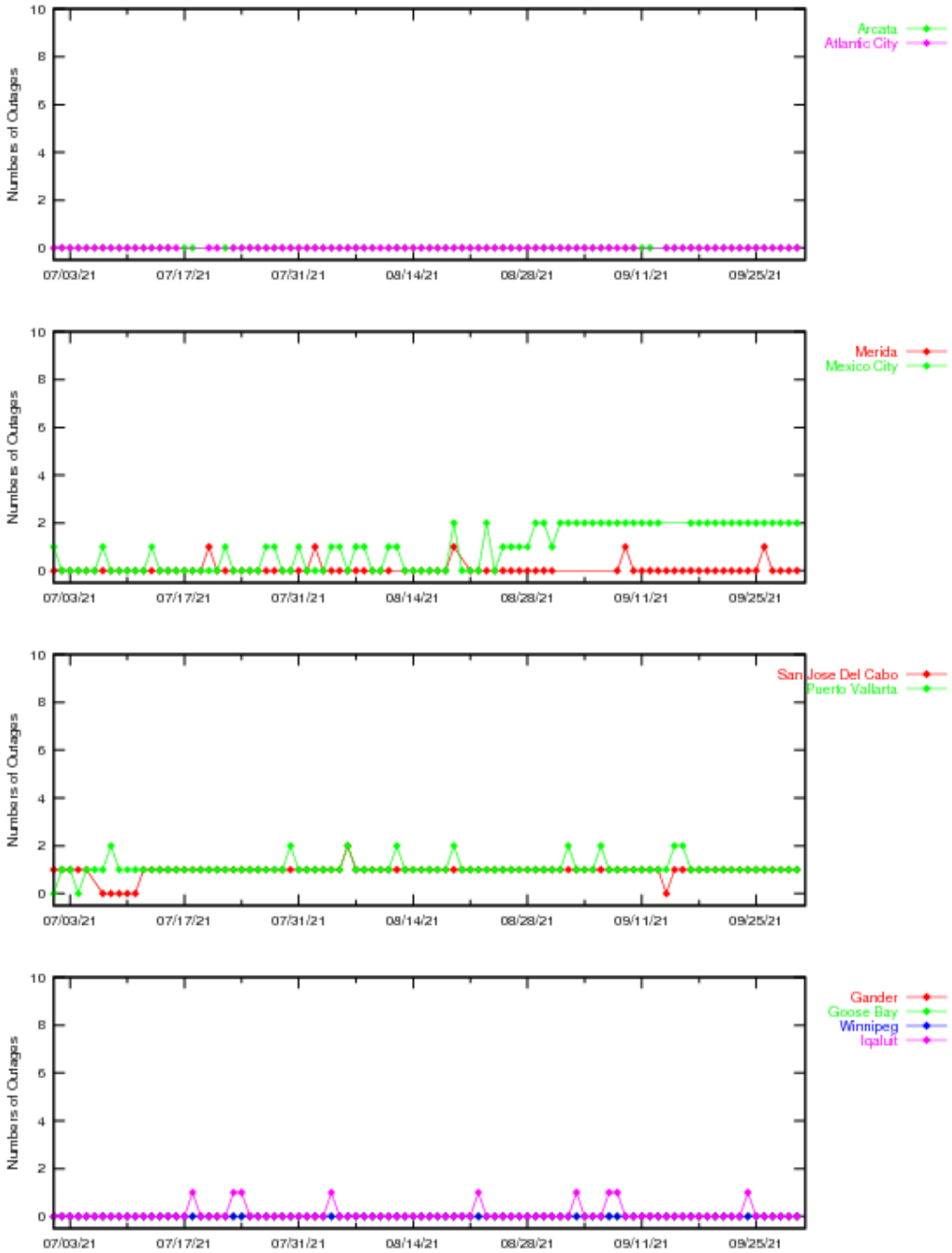


Figure 3-10 LPV200 Outages

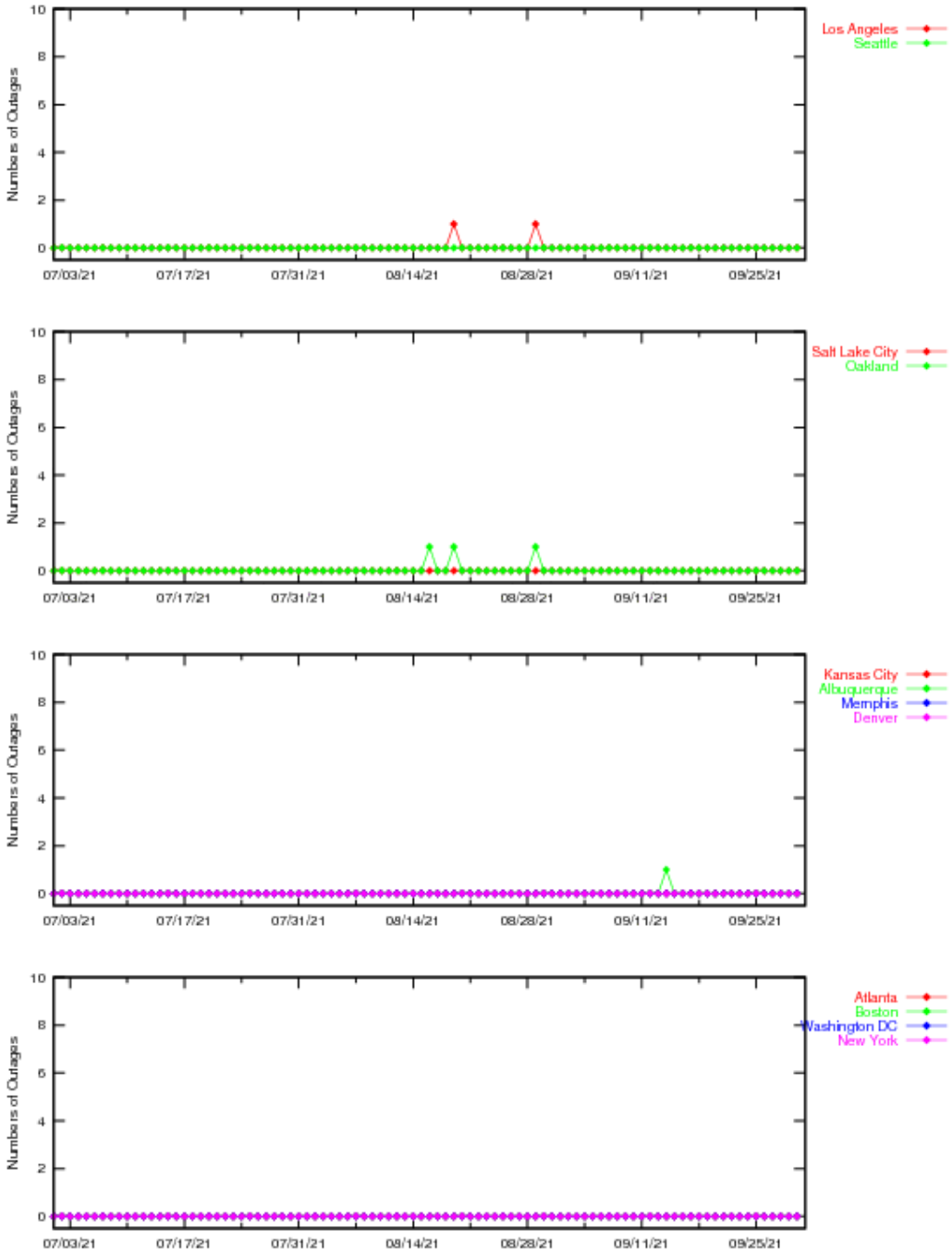


Figure 3-11 LPV200 Outages

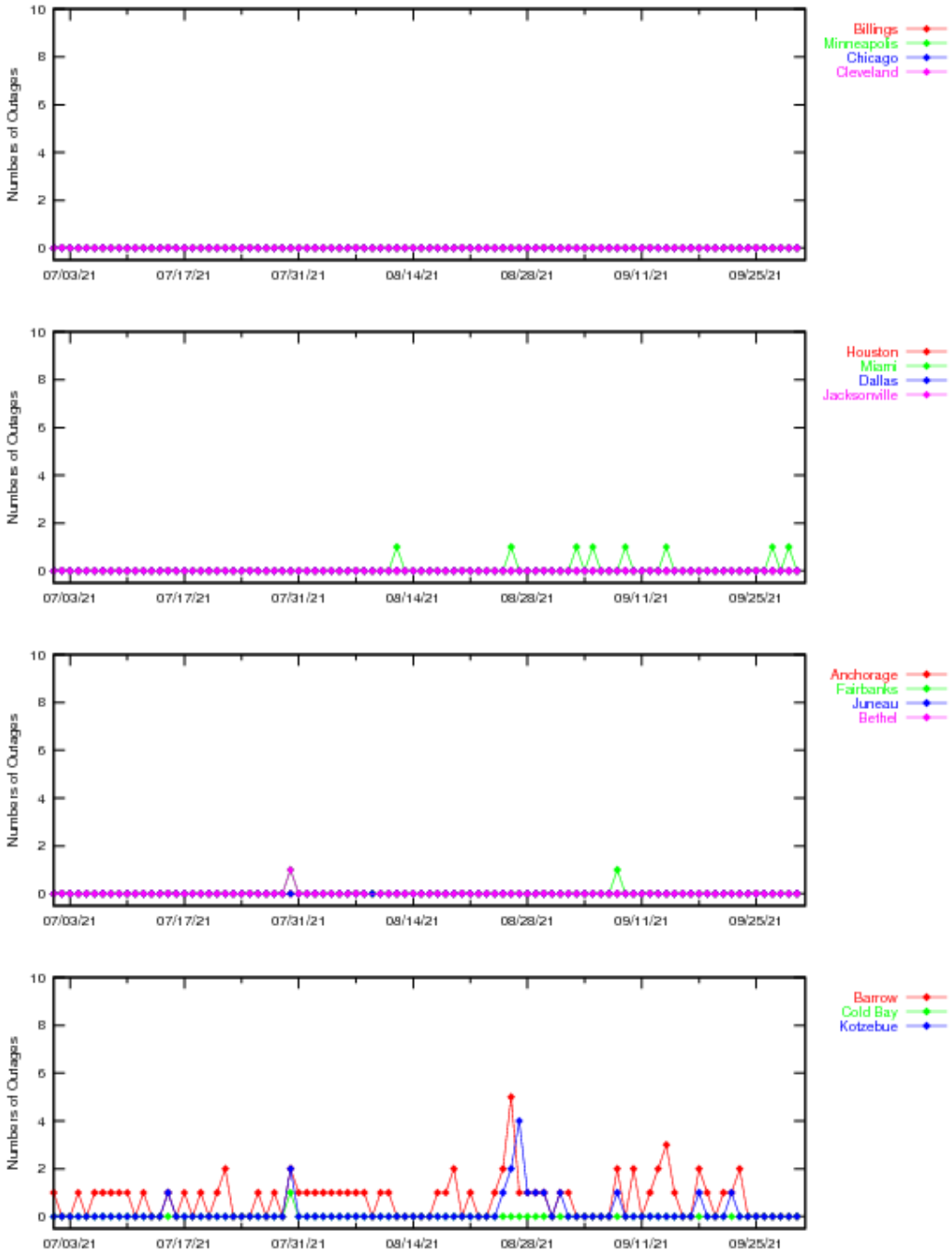
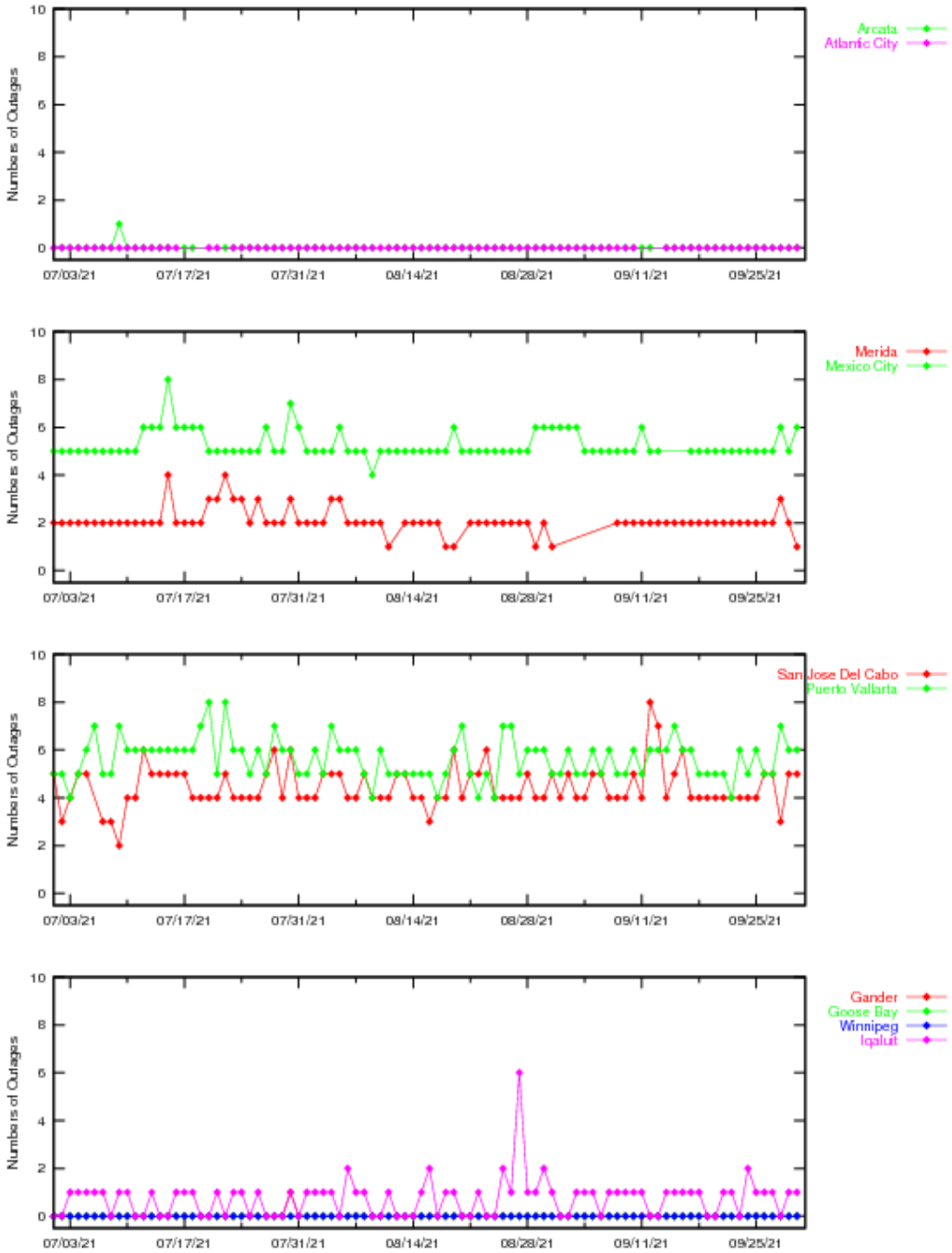


Figure 3-12 LPV200 Outages



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) (%)
Albuquerque	100
Anchorage	100
Atlanta	100
Barrow	100
Bethel	100
Billings	100
Boston	100
Cleveland	100
Cold Bay	100
Fairbanks	100
Gander	100
Honolulu	100
Houston	100
Iqaluit	100
Juneau	100
Kansas City	100
Kotzebue	100
Los Angeles	100
Merida	100
Miami	100
Minneapolis	100
Oakland	100
Salt Lake City	100
San Jose Del Cabo	100
San Juan	100
Seattle	100
Washington DC	100

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

Location	NPA Outages (Number)	NPA Outage Rates
Albuquerque	0	0
Anchorage	0	0
Atlanta	0	0
Barrow	0	0
Bethel	0	0
Billings	0	0
Boston	0	0
Cleveland	0	0
Cold Bay	0	0
Fairbanks	0	0
Gander	0	0
Honolulu	0	0
Houston	0	0
Iqaluit	0	0
Juneau	0	0
Kansas City	0	0
Kotzebue	0	0
Los Angeles	0	0
Merida	0	0
Miami	0	0
Minneapolis	0	0
Oakland	0	0
Salt Lake City	0	0
San Jose Del Cabo	0	0
San Juan	0	0
Seattle	0	0
Washington DC	0	0

The availability decreases for this quarter were due to satellite outages, geomagnetic activity, communication outages, radio frequency interference (RFI), and elevated UDRE and GIVE values. Noteworthy events that affected availability are:

- July 7 – Brewster (BR1) faulted multiple times resulting in a SIS loss for 6 hours and 40 minutes.
- July 9 – Satellite maintenance elevated UDREs on PRN6 and reduced LPV200 availability in CONUS.
- July 18 – Subframe reasonability at Iqaluit increased GIVEs and reduced LPV and LPV200 availability in Canada.
- July 23 – Subframe reasonability at Iqaluit increased GIVEs and reduced LPV and LPV200 availability in Canada.
- July 30 – Satellite maintenance elevated UDREs on PRN14 and reduced LPV200 availability in CONUS and Alaska.
- Aug 4 – Subframe reasonability at Iqaluit increased GIVEs and reduced LPV and LPV200 availability in Canada.
- Aug 5 – Elevated UDREs on PRN10 reduced LPV200 availability in Canada.
- Aug 19 – Satellite maintenance elevated UDREs on PRN4 and reduced LPV200 availability in CONUS and Canada.
- Aug 26 – Ranging for GEO-131 was disabled, reducing LPV200 availability in CONUS.
- Aug 27 – Elevated UDREs on PRN9 reduced LPV200 availability in Alaska and Canada.
- Aug 29 – Elevated UDREs on PRN10 reduced LPV200 availability in CONUS.
- Sep 8 – A GUS switchover on S15 caused a reduction of LPV200 availability in Alaska.

- Sep 14 – An SV alert on PRN6 elevated UDREs and reduced LPV200 availability in CONUS.
- Sep 24 – Iqaluit underwent a software upgraded. All three threads were out simultaneously. The lack of observations from this reference station reduced LPV and LPV200 availability in Canada.

4.0 COVERAGE

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

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

Figure 4-1 LP North America Coverage for the Quarter

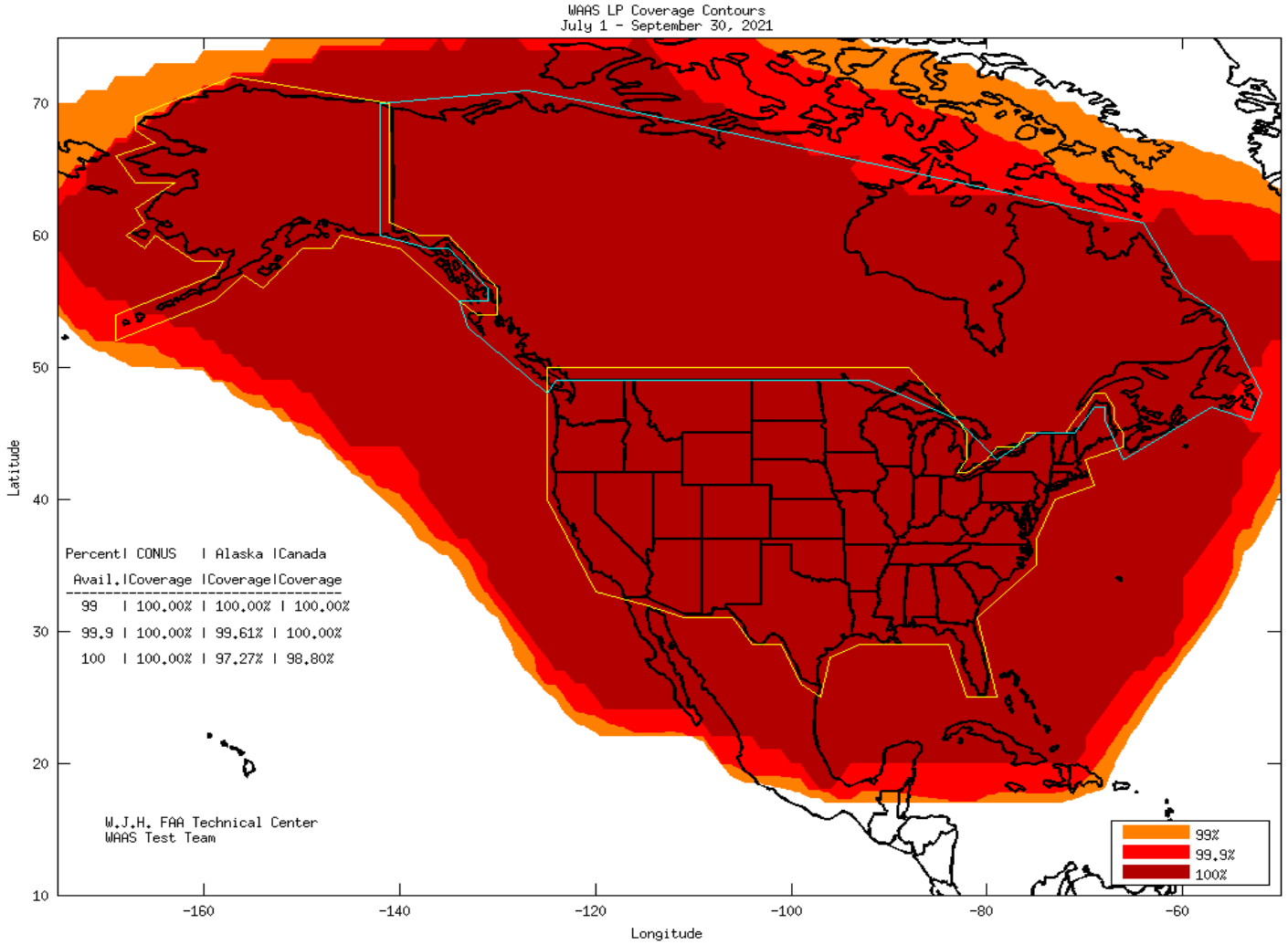


Figure 4-2 LPV North America Coverage for the Quarter

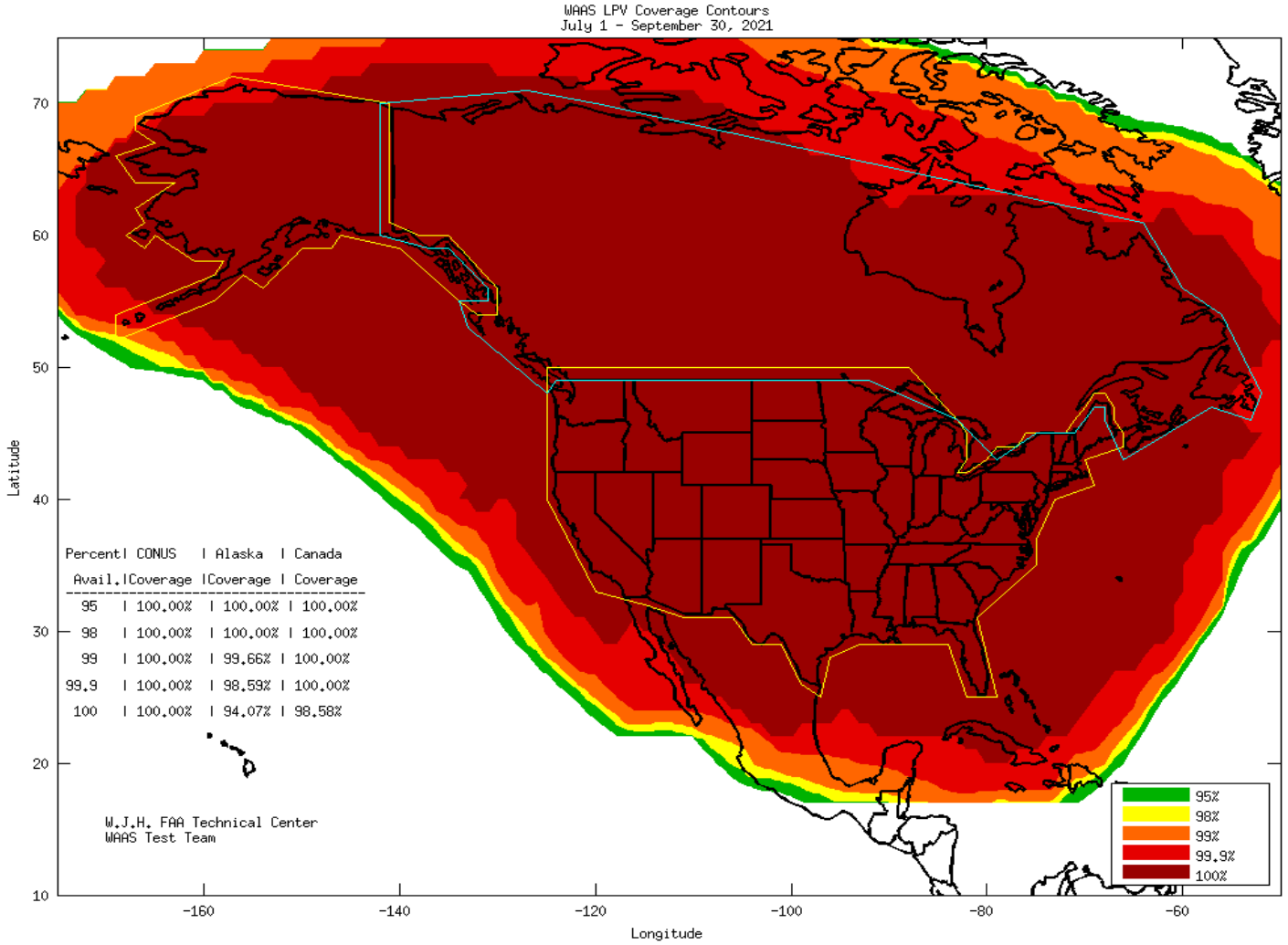


Figure 4-3 LPV200 North America Coverage for the Quarter

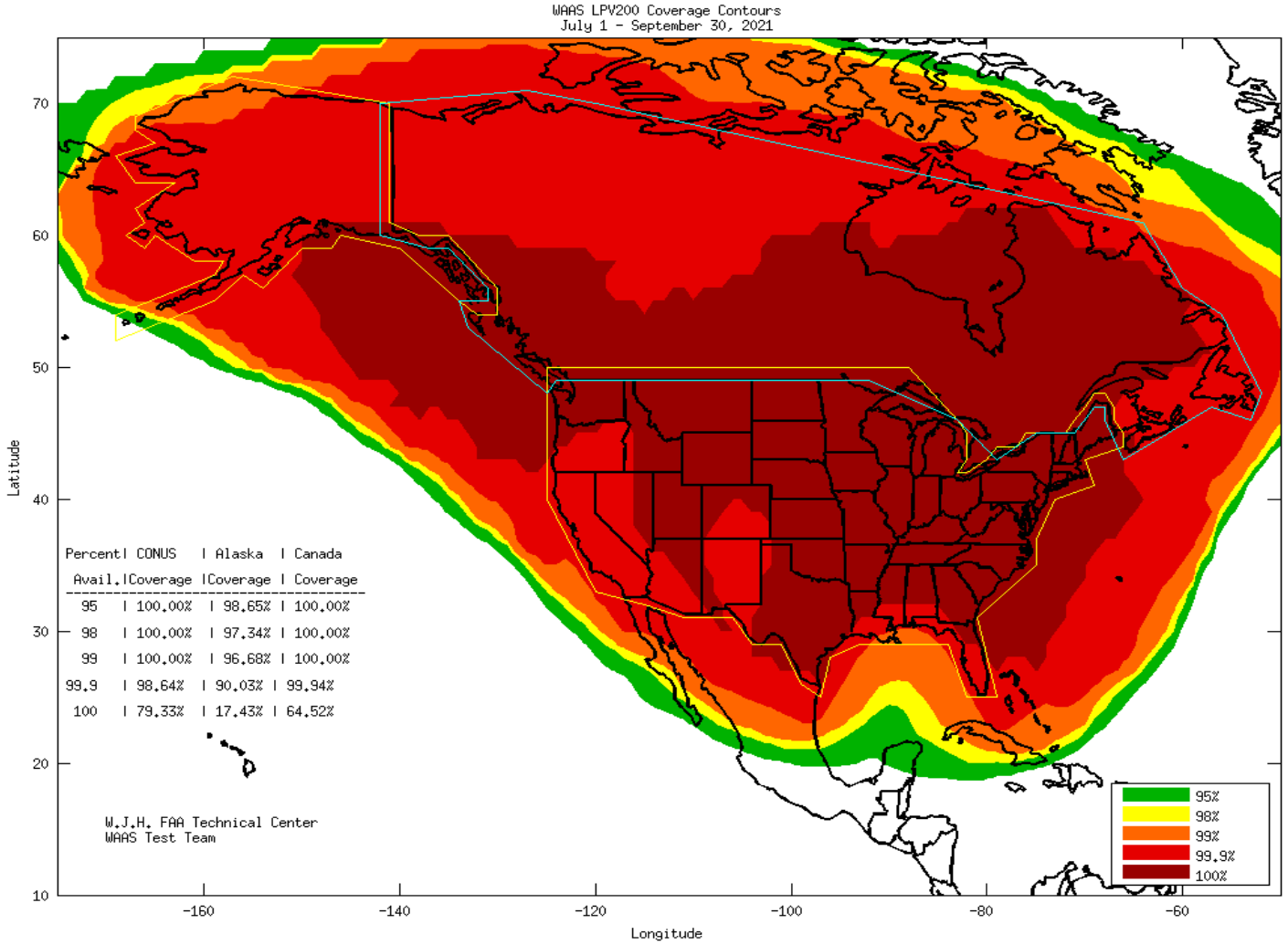


Figure 4-4 Daily LPV and LPV200 CONUS Coverage

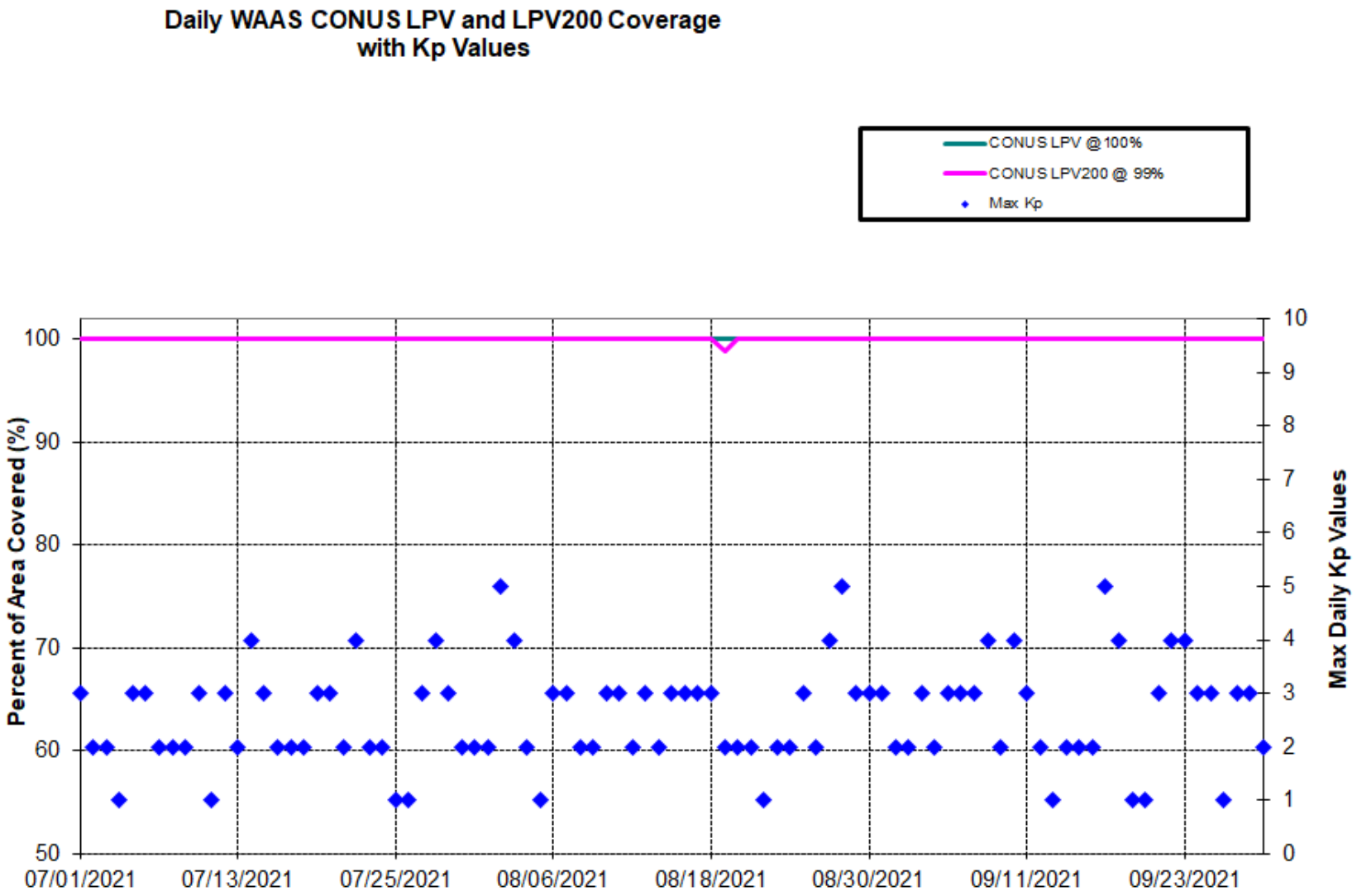


Figure 4-5 Daily LPV and LPV200 Alaska Coverage

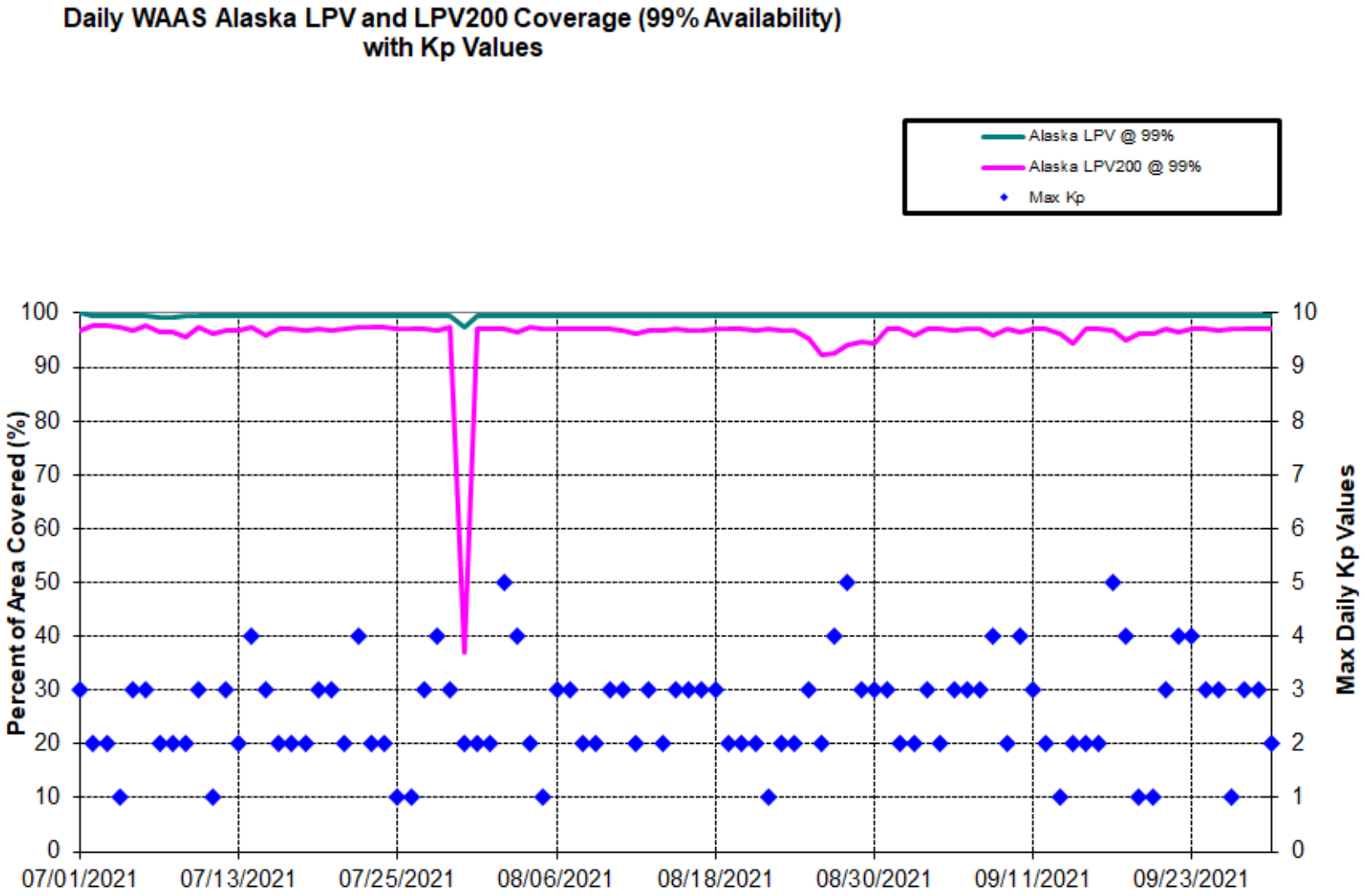
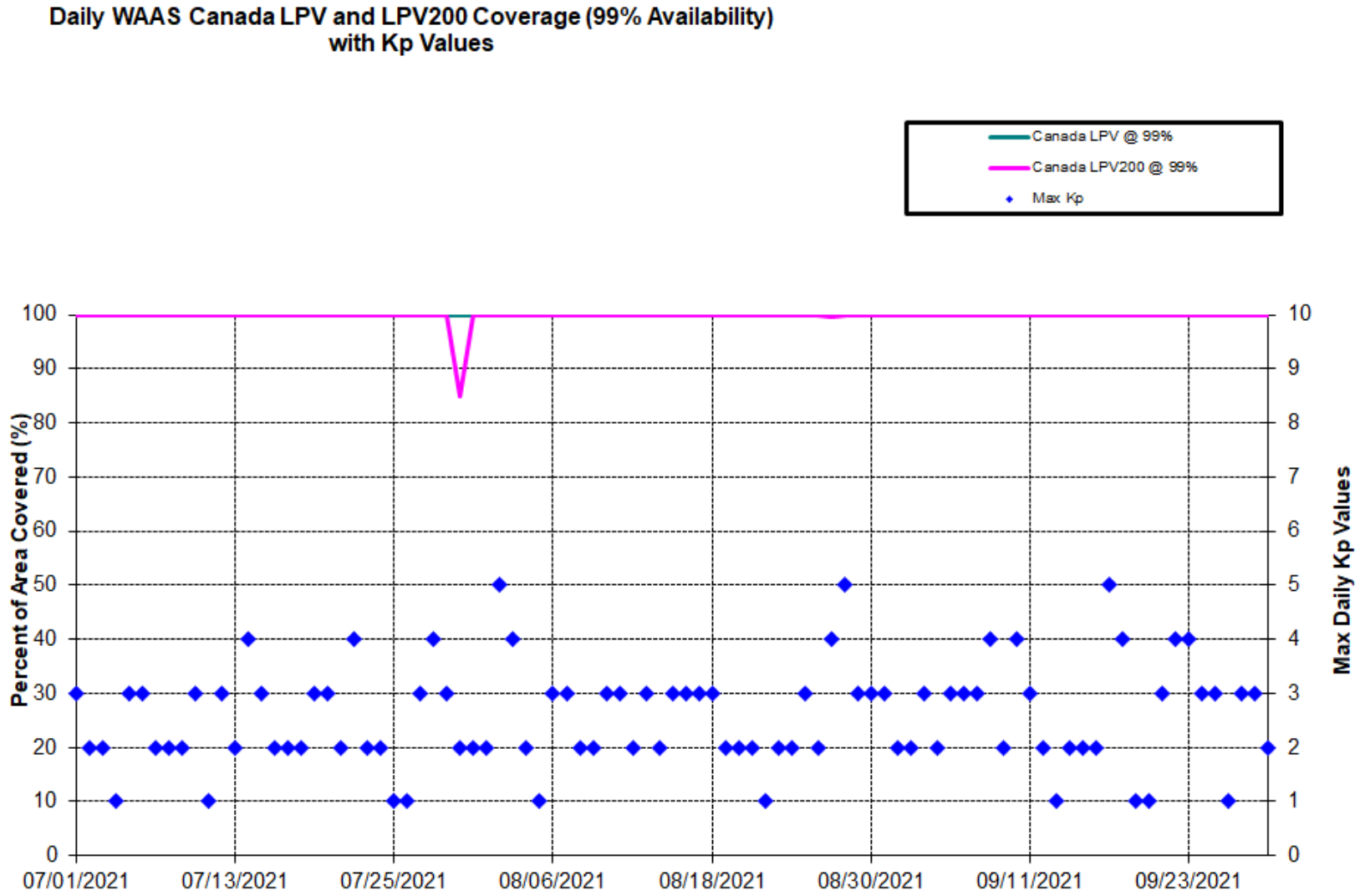


Figure 4-6 Daily LPV and LPV200 Canada Coverage



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

Figure 4-7 RNP 0.1 Coverage for the Quarter

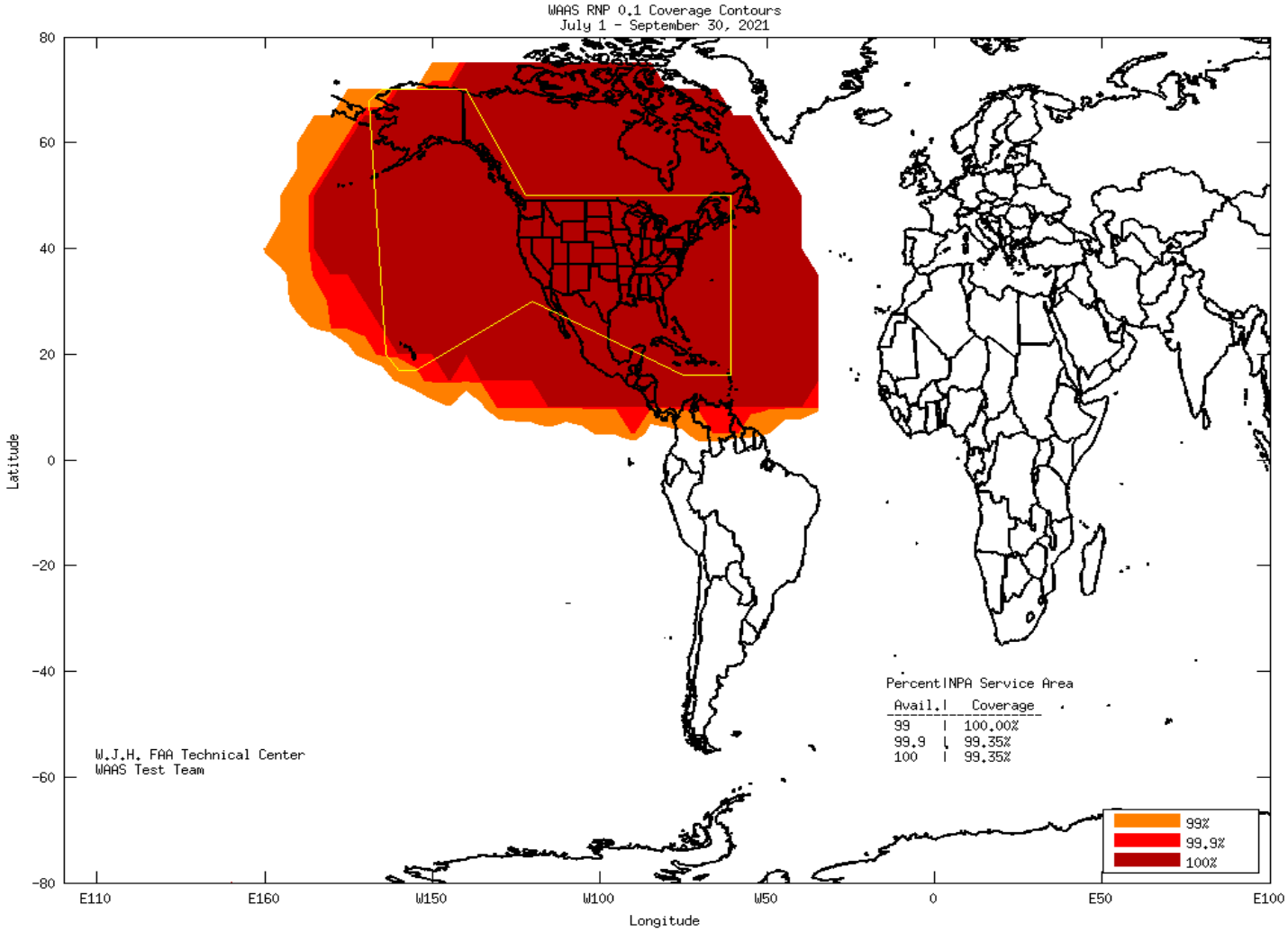


Figure 4-8 RNP 0.3 Coverage for the Quarter

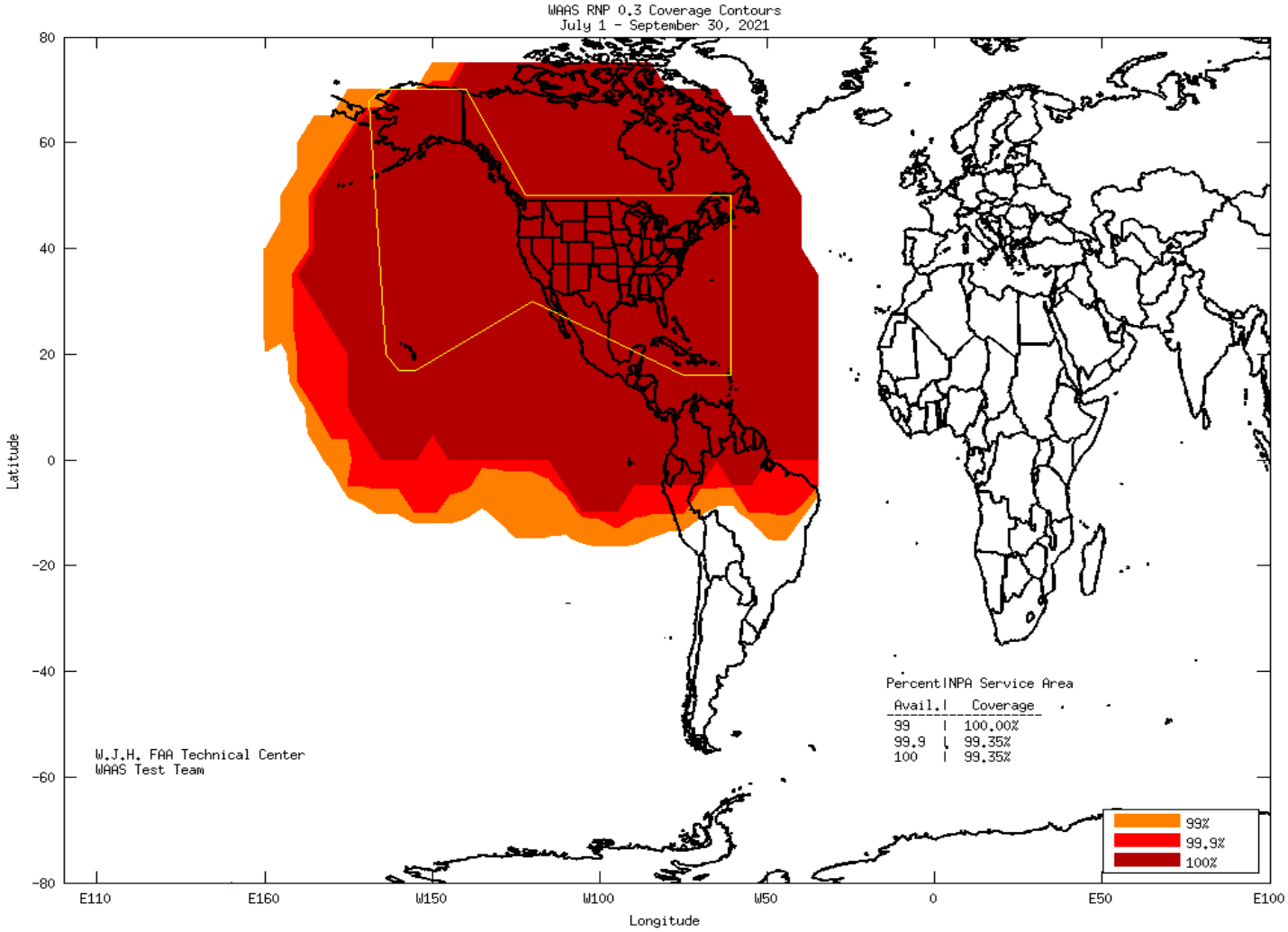
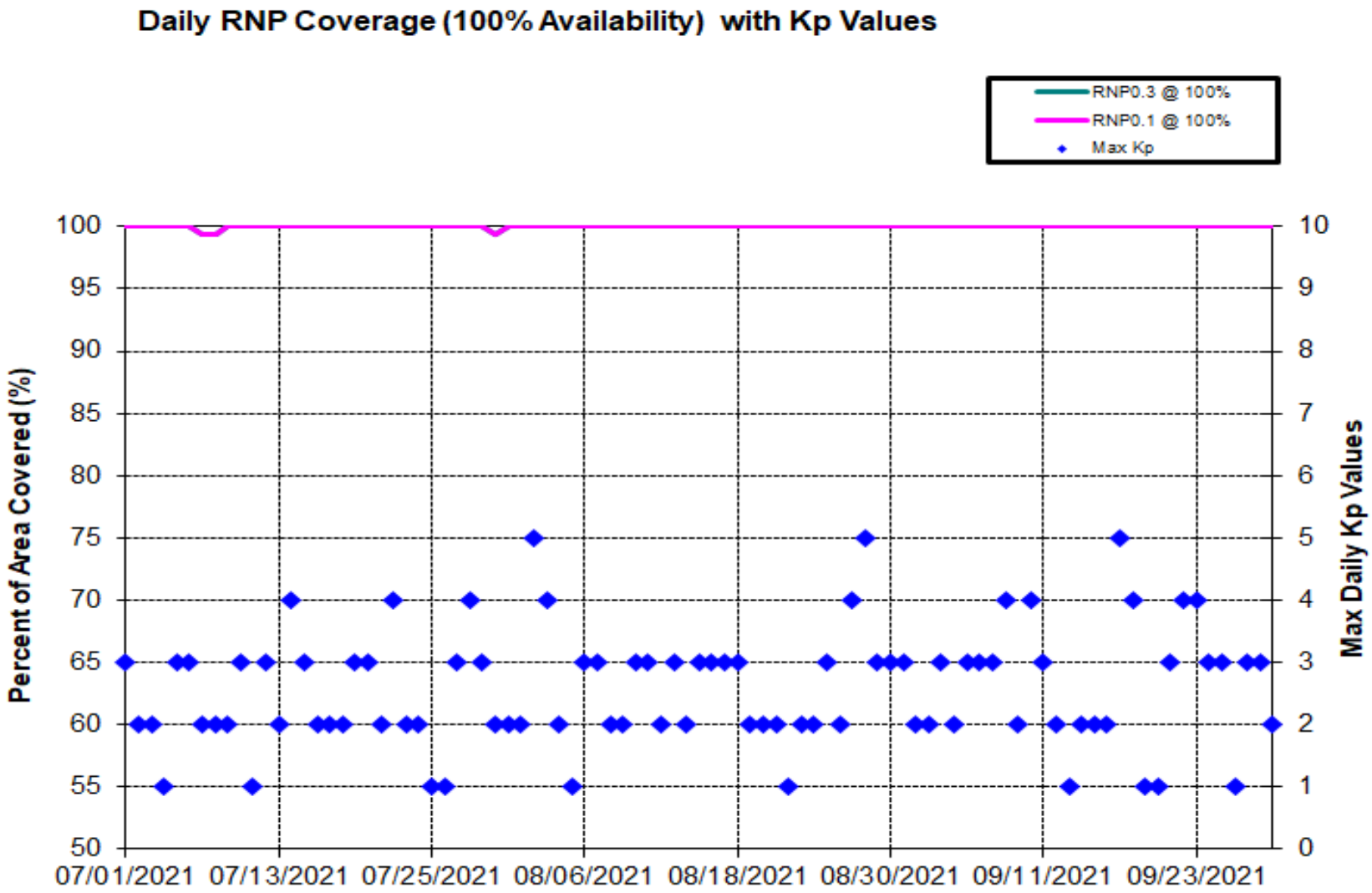


Figure 4-9 Daily RNP Coverage



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

- July 7 – Brewster (BR1) faulted multiple times resulting in a SIS loss for 6 hours and 40 minutes.
- July 9 – Satellite maintenance elevated UDREs on PRN6 and reduced LPV200 coverage in CONUS.
- July 18 – Subframe reasonability at Iqaluit increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- July 23 – Subframe reasonability at Iqaluit increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- July 30 – Satellite maintenance elevated UDREs on PRN14 and reduced LPV200 coverage in CONUS and Alaska.
- Aug 4 – Subframe reasonability at Iqaluit increased GIVEs and reduced LPV and LPV200 coverage in Canada.
- Aug 5 – Elevated UDREs on PRN10 reduced LPV200 coverage in Canada.
- Aug 19 – Satellite maintenance elevated UDREs on PRN4 and reduced LPV200 coverage in CONUS and Canada.
- Aug 26 – Ranging for GEO-131 was disabled, reducing LPV200 coverage in CONUS.
- Aug 27 – Elevated UDREs on PRN9 reduced LPV200 coverage in Alaska and Canada.
- Aug 29 – Elevated UDREs on PRN10 reduced LPV200 coverage in CONUS.
- Sep 8 – A GUS switchover on S15 caused a reduction of LPV200 coverage in Alaska.
- Sep 14 – An SV alert on PRN6 elevated UDREs and reduced LPV200 coverage in CONUS.
- Sep 24 – Iqaluit underwent a software upgraded. All three threads were out simultaneously. The lack of observations from this reference station reduced LPV and LPV200 coverage in Canada.

5.0 INTEGRITY

5.1 HMI Analysis

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

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

Table 5-1 lists the safety margin index and the number of HMI events. For this reporting period, the lowest safety margin index is 3.198 at Oklahoma City and there were no HMI events. There has not been an HMI event since WAAS was made available to the public in August 2000. In July 2003, WAAS was commissioned by the FAA for safety of life services.

Table 5-1 Minimum Safety Margin Index and HMI Statistics

Location	Horizontal Safety Index (meters)	Vertical Safety Index (meters)	Number of HMIs
Arcata	5.439	6.714	0
Atlantic City	5.933	4.924	0
Oklahoma City	3.198	5.096	0
Albuquerque	8.475	14.332	0
Anchorage	8.827	7.719	0
Atlanta	7.247	7.741	0
Barrow	8.773	7.526	0
Bethel	10.289	8.996	0
Billings	7.636	10.519	0
Boston	11.167	6.294	0
Chicago	6.112	8.116	0
Cleveland	9.151	6.898	0
Cold Bay	12.319	11.705	0
Dallas	9.564	6.790	0
Denver	8.488	8.121	0
Fairbanks	12.657	6.704	0
Gander	6.894	10.078	0
Goose Bay	8.150	7.900	0
Houston	6.031	5.259	0
Iqaluit	7.311	9.809	0
Jacksonville	10.476	6.201	0
Juneau	6.914	6.741	0
Kansas City	11.001	5.085	0
Kotzebue	5.836	10.498	0
Los Angeles	7.727	6.865	0
Memphis	8.596	8.662	0
Merida	10.412	12.487	0
Mexico City	5.774	12.344	0
Miami	9.749	9.876	0
Minneapolis	9.028	6.904	0
New York	9.030	6.861	0
Oakland	8.121	13.677	0
Puerto Vallarta	4.908	11.562	0
Salt Lake City	8.486	9.299	0
San Jose Del Cabo	7.516	9.057	0
Seattle	8.468	6.490	0
Washington DC	7.447	7.918	0
Winnipeg	9.908	6.924	0

5.2 Broadcast Alerts

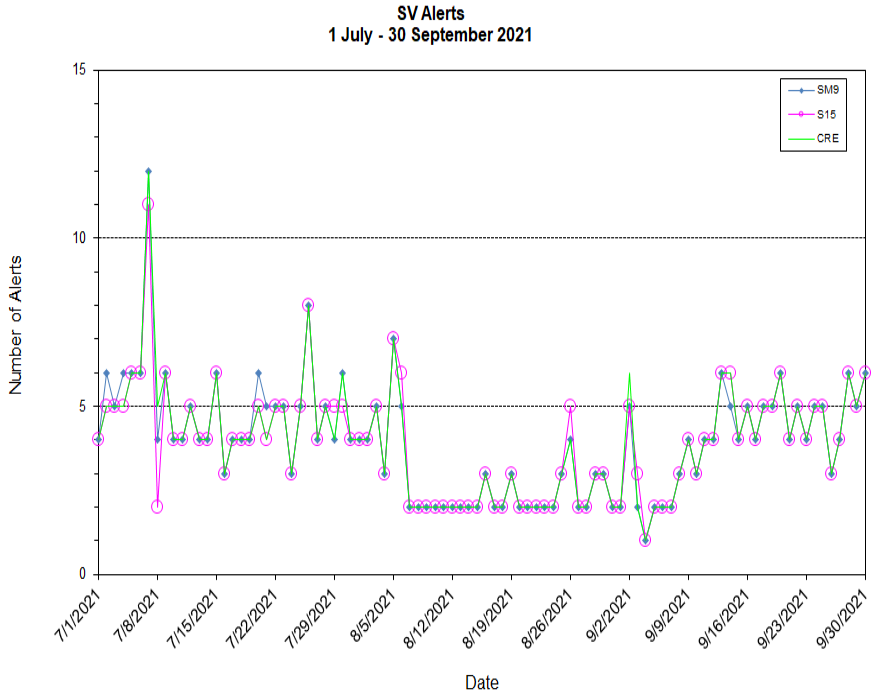
The WAAS transmits alert messages for user protection when the active WAAS corrections are no longer bound by the UDREs. Alerts increase the UDRE for one or more PRNs, which can reduce the weighting of the satellite or exclude the satellite from the navigation solution. An increase in UDREs after an 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**	**CRE**	**SM9**	**S15**	**CRE**
T2	155	152	152	1.684782609	1.652173913	1.652173913
T3	7	8	7	0.076086957	0.086956522	0.076086957
T4	200	199	202	2.173913043	2.163043478	2.195652174
T5	0	0	0	0	0	0
T6	1	1	1	0.010869565	0.010869565	0.010869565
T24	0	0	0	0	0	0
T26	0	0	0	0	0	0
Total SV Alerts :	363	360	362	3.945652174	3.913043478	3.934782609
Days in Service	92	92	92			

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

Figure 5-1 SV Daily Alert Trend



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

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

Table 5-3 Update Rates for WAAS Messages

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

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

For this quarter, statistics reported for late messages were mainly caused by GEO SIS outages, GUS switchovers, and SV alerts; excluding message type 7 and 10. Furthermore, the delay of message types 7 and 10 had little or no impact on user performance and safety, and were not caused by GEO SIS outages, GUS switchovers, or SV alerts. Table 5-4 through Table 5-8 show statistics for fast correction, long correction, ephemeris covariance, ionosphere correction, and ionospheric mask message rates broadcasted on SM9 GEO. Table 5-9 through Table 5-13 show statistics for message rates broadcasted on S15 GEO. Table 5-14 through Table 5-18 show statistics for message rates broadcasted on CRE GEO. The high Max Late Length for S15 GEO messages occurred after Brewster (BR1) faulted multiple times between July 7 and 8 due to a KPA failure.

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	103703	2	166
2	1325110	136	13
3	1324667	107	13
4	1325216	151	10
7	97243	4	131
9	93143	3	177
10	97248	3	126
17	31410	1	373

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	49174	1	162
2	47833	0	0
3	47859	0	0
4	47082	0	0
5	47313	0	0
6	47718	0	0
7	47322	0	0
8	48718	0	0
9	47286	0	0
10	47406	0	0
12	47551	0	0
13	48940	0	0
14	46750	0	0
15	47900	3	179
16	47809	0	0
17	48133	0	0
18	47060	0	0
19	46805	0	0
20	47881	0	0
21	51268	0	0
22	48465	1	179
23	46950	0	0
24	49396	0	0
25	48948	0	0
26	48373	0	0
27	48938	0	0
29	47477	0	0
30	47129	1	165
31	48073	0	0
32	46962	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	40403	1	160
2	39321	1	163
3	39323	1	141
4	38676	1	128
5	38871	0	0
6	39186	2	137
7	38828	1	198
8	39985	0	0
9	38778	0	0
10	38934	2	162
12	39077	1	160
13	40199	6	180
14	38437	0	0
15	39275	0	0
16	39278	0	0
17	39487	1	187
18	38647	0	0
19	38420	2	187
20	39255	2	198
21	42144	7	192
22	39806	1	132
23	38523	0	0
24	40544	0	0
25	40210	0	0
26	39729	1	139
27	40249	1	137
29	38991	1	132
30	38727	2	137
31	39390	1	160
32	38533	0	0
131	72352	3	5474
133	75711	4	188
138	76402	0	0

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	27586	6	426
0	1	27602	5	483
0	2	27590	5	479
1	0	27600	3	467
1	1	27599	4	449
1	2	27599	4	430
1	3	27596	3	447
1	4	27589	6	437
2	0	27600	6	577
2	1	27609	3	427
2	2	27597	3	418
2	3	27604	4	412
2	4	27615	5	432
3	0	27594	5	541
3	1	27593	4	464
3	2	27612	5	456
9	0	27595	6	457
9	1	27599	6	464
9	2	27600	5	451
9	3	27598	6	457
9	4	27595	4	450
9	5	27595	4	465
9	6	27606	6	454

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35679	2	358
1	35681	1	429
2	35712	2	354
3	35655	2	478
9	35634	1	329

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	105890	4	11605
2	1321080	140	11534
3	1320646	113	11533
4	1321192	152	11538
7	99044	5	11589
9	92845	4	11588
10	99167	5	11599
17	31511	4	11863

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	48965	1	193
2	47754	0	0
3	47723	0	0
4	46924	0	0
5	47211	1	2903
6	47592	0	0
7	47275	0	0
8	48560	0	0
9	47183	0	0
10	47173	0	0
12	47350	0	0
13	48810	1	180
14	46609	0	0
15	47751	0	0
16	47661	1	179
17	47986	1	150
18	46892	0	0
19	46647	0	0
20	47815	1	2903
21	51021	2	9706
22	48271	0	0
23	46760	0	0
24	49230	0	0
25	48742	0	0
26	48191	0	0
27	48783	1	180
29	47315	0	0
30	47071	0	0
31	47870	0	0
32	46690	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	40224	2	195
2	39261	0	0
3	39210	0	0
4	38560	0	0
5	38777	1	168
6	39100	0	0
7	38785	1	206
8	39849	2	206
9	38697	3	2920
10	38743	0	0
12	38901	1	121
13	40106	1	130
14	38330	1	131
15	39140	2	206
16	39160	1	26655
17	39386	1	126
18	38525	2	158
19	38283	1	126
20	39218	2	2932
21	41921	0	0
22	39633	3	208
23	38380	2	206
24	40391	0	0
25	40043	0	0
26	39575	3	9728
27	40147	2	206
29	38844	0	0
30	38666	1	206
31	39215	2	9776
32	38304	1	9776
131	72091	6	11676
133	75700	4	33175
138	76124	6	11676

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	27498	10	11862
0	1	27486	8	11910
0	2	27499	8	11905
1	0	27481	9	11911
1	1	27499	10	11624
1	2	27505	8	11628
1	3	27512	6	11611
1	4	27497	8	11616
2	0	27506	8	11622
2	1	27495	8	11618
2	2	27489	6	11623
2	3	27505	6	11652
2	4	27495	7	11917
3	0	27503	6	11887
3	1	27494	6	11885
3	2	27493	4	11880
9	0	27501	5	11904
9	1	27503	6	11869
9	2	27502	6	11869
9	3	27488	8	11869
9	4	27497	7	11882
9	5	27494	8	11893
9	6	27491	7	11925

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

Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35898	4	11855
1	35899	4	11748
2	35894	3	11832
3	35899	6	11568
9	35924	3	11828

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

Message Type	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	105679	1	163
2	1325088	136	12
3	1324652	108	13
4	1325211	147	12
7	99226	4	146
9	93133	1	181
10	99328	3	180
17	31607	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	49153	0	0
2	47828	0	0
3	47855	0	0
4	47077	0	0
5	47323	0	0
6	47716	0	0
7	47301	1	163
8	48695	1	162
9	47285	0	0
10	47386	0	0
12	47526	0	0
13	48940	0	0
14	46727	0	0
15	47891	0	0
16	47809	0	0
17	48119	0	0
18	47049	0	0
19	46803	0	0
20	47882	0	0
21	51240	0	0
22	48440	0	0
23	46922	1	162
24	49368	0	0
25	48935	0	0
26	48369	0	0
27	48913	1	172
29	47481	0	0
30	47135	0	0
31	48065	0	0
32	46938	0	0

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

PRN	On Time (number received)	Late (number received)	Max Late Length (seconds)
1	40380	1	152
2	39332	0	0
3	39312	1	122
4	38684	0	0
5	38867	1	128
6	39204	0	0
7	38817	1	208
8	39969	0	0
9	38772	1	144
10	38924	0	0
12	39056	1	122
13	40201	0	0
14	38414	1	126
15	39265	0	0
16	39273	0	0
17	39468	0	0
18	38651	0	0
19	38421	0	0
20	39258	1	208
21	42115	0	0
22	39787	0	0
23	38503	1	139
24	40528	0	0
25	40200	1	128
26	39724	0	0
27	40251	0	0
29	38979	2	136
30	38721	2	156
31	39368	1	168
32	38511	0	0
131	72330	1	177
133	75721	0	0
138	76364	3	177

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

Band	Block	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	0	27597	3	331
0	1	27578	1	305
0	2	27592	3	319
1	0	27584	3	319
1	1	27597	1	311
1	2	27587	3	305
1	3	27581	2	312
1	4	27593	5	558
2	0	27586	1	301
2	1	27593	2	305
2	2	27578	1	311
2	3	27587	5	318
2	4	27589	2	302
3	0	27583	0	0
3	1	27595	0	0
3	2	27591	4	305
9	0	27585	2	302
9	1	27590	2	306
9	2	27586	4	576
9	3	27592	6	524
9	4	27583	3	533
9	5	27591	4	319
9	6	27589	2	304

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

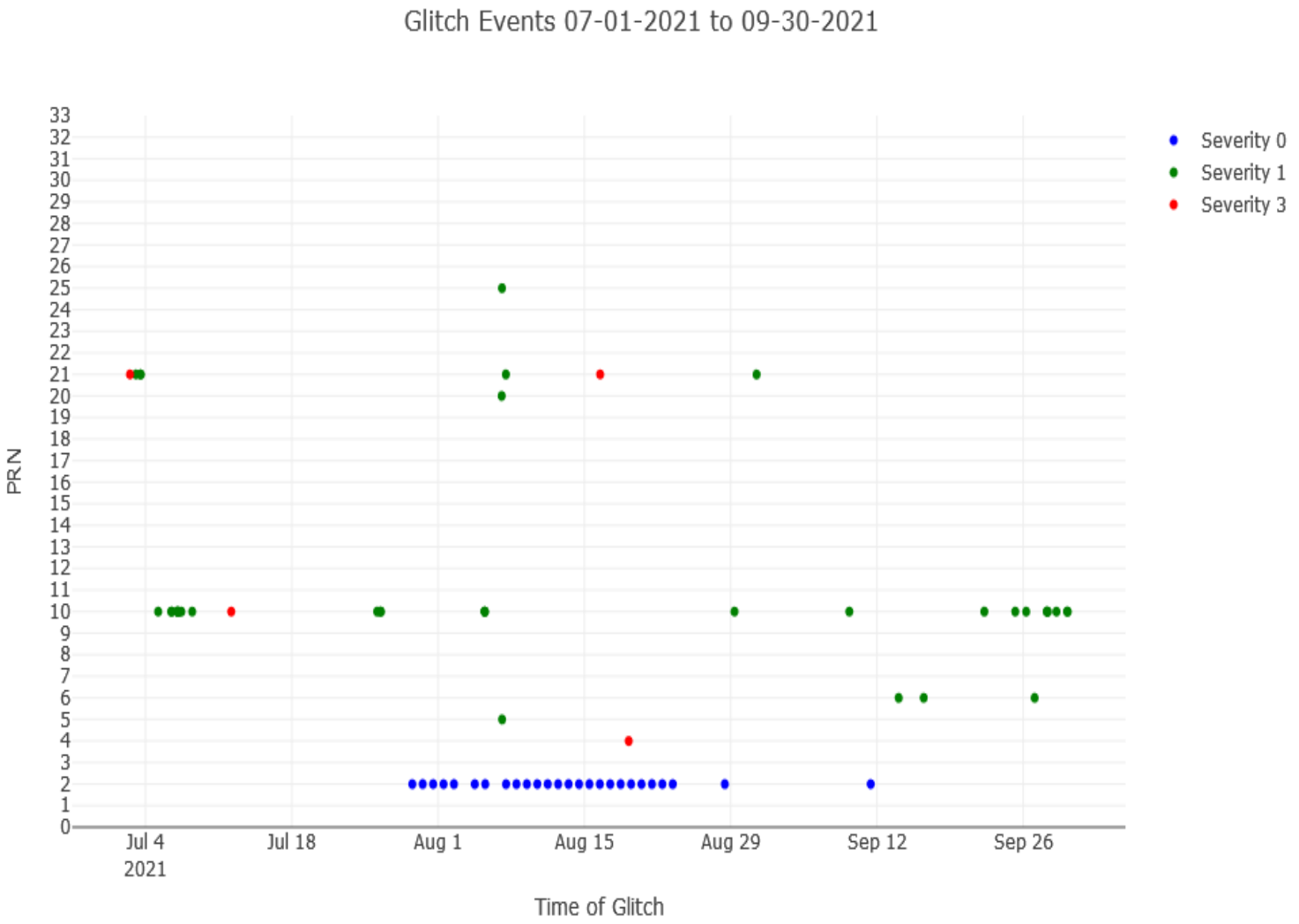
Band	On Time (number received)	Late (number received)	Max Late Length (seconds)
0	35937	0	0
1	35929	1	324
2	35989	1	314
3	36016	0	0
9	35995	0	0

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 satellite glitches visible to WAAS for the quarter. Glitches are categorized into four severity levels. Severity zero glitches occur when a WAAS reference station receiver tracks more than 14 satellites. The WAAS reference station software is limited to sending data for no more than 14 satellites. Severity one glitches cause a significant number of the receivers to report bad subframe parity data, cycle slips, or when the receivers lose track of L1 and/or L2. Severity two glitches cause all of the receivers to report bad subframe parity data and no SQM data. Severity three glitches cause all of the receivers to lose track of both L1 and L2.

Figure 5-2 SV Glitch Trend



6.0 SV RANGE ACCURACY

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

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

Table 6-1 Range Error 95% index, Range Error Max, and Range Error Sigma @ Max

Site	Minneapolis			Chicago			Boston			Juneau			Honolulu			Salt Lake City		
PRN ↓	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma
1	0.993	3.992	1.208	1.379	3.069	0.966	1.101	3.049	0.960	0.888	3.914	1.754	1.112	2.723	0.820	0.961	5.381	1.467
2	0.783	1.985	0.820	0.969	3.164	1.129	0.766	1.789	0.683	0.845	3.904	1.759	1.325	3.540	1.445	0.905	3.825	1.177
3	0.972	2.871	1.091	1.368	4.147	1.235	1.498	4.223	1.315	0.838	2.012	0.724	1.431	3.121	1.133	1.547	3.815	1.166
4	1.055	2.743	0.923	1.032	3.315	1.025	1.074	4.664	1.281	0.926	2.253	0.687	1.113	2.538	1.475	0.880	3.137	0.926
5	0.712	2.079	0.676	0.976	2.019	1.111	0.842	1.731	0.749	0.955	2.413	1.146	1.355	4.539	0.877	0.930	2.864	1.128
6	0.733	2.548	0.822	1.289	2.539	1.056	0.776	1.730	0.747	0.976	2.191	0.671	1.025	3.252	1.033	1.065	2.769	1.038
7	1.378	2.585	1.679	1.405	2.513	1.160	1.532	2.868	1.482	1.429	3.227	0.993	1.245	2.279	1.514	1.380	4.252	1.463
8	1.522	5.076	1.473	0.967	2.460	0.840	0.936	3.138	0.930	0.971	2.368	0.880	1.123	4.566	1.235	0.909	3.112	1.031
9	1.249	3.444	1.095	1.082	2.206	0.663	1.015	2.701	0.931	1.093	2.335	0.651	1.476	3.686	1.210	0.897	2.042	0.694
10	0.734	2.114	0.683	1.092	3.246	1.045	0.947	1.972	0.571	0.877	2.898	0.865	0.981	3.497	0.600	0.705	2.582	0.691
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	0.701	2.375	0.747	0.959	4.521	1.313	0.964	2.523	0.467	1.014	2.746	0.901	1.526	5.475	1.724	1.274	2.844	1.111
13	1.102	3.134	0.981	1.081	2.440	0.770	1.040	3.177	0.972	1.444	4.208	1.379	1.061	3.217	0.866	0.839	4.126	1.183
14	1.783	3.802	1.266	1.898	2.651	1.258	1.557	2.523	1.347	1.895	3.783	1.114	1.208	2.375	0.713	1.204	2.427	1.019
15	1.157	2.592	1.095	0.734	1.659	0.534	0.744	1.730	1.039	1.211	2.815	0.876	1.100	2.427	0.792	0.911	2.226	0.924
16	1.126	2.644	0.854	0.936	2.022	0.710	1.046	2.924	0.955	0.997	2.486	0.836	1.075	2.476	1.863	0.899	2.038	0.810
17	0.883	2.328	0.762	2.006	3.042	1.378	0.937	2.137	0.698	0.935	2.714	0.812	1.573	5.287	1.985	1.072	2.835	0.974
18	1.424	2.671	1.221	0.887	2.312	0.418	0.996	5.829	1.737	1.216	2.644	0.862	1.035	2.361	0.765	1.081	2.920	0.948
19	0.908	2.033	0.664	0.781	1.404	0.776	0.846	1.745	0.838	0.945	2.092	0.615	1.002	3.602	0.993	1.327	5.135	1.660
20	1.374	3.243	1.287	1.075	3.046	0.940	0.987	2.374	0.975	1.136	2.253	0.694	1.554	3.082	1.912	1.018	3.369	1.009
21	1.078	2.734	0.869	1.009	2.815	0.938	0.962	3.280	0.880	1.114	6.367	2.653	1.472	3.756	1.564	0.913	3.226	0.795
22	0.966	2.163	0.722	1.265	3.012	0.921	1.169	3.058	0.979	1.385	2.749	0.916	1.263	3.654	1.146	1.202	2.348	1.091
23	1.143	2.299	1.195	0.845	1.743	0.849	0.951	1.851	1.006	1.154	2.398	0.903	0.938	2.450	0.574	1.105	2.878	1.237
24	0.995	2.374	0.757	0.935	2.440	0.737	1.118	2.897	0.872	1.094	3.030	0.971	1.331	3.137	1.034	0.906	2.538	0.748
25	1.238	2.441	0.754	1.001	3.184	0.995	1.380	2.855	1.383	0.910	2.005	0.646	1.263	2.996	1.000	1.276	4.870	1.426
26	0.949	3.216	1.003	1.084	4.172	1.254	1.001	2.421	0.754	1.002	3.509	1.162	1.065	2.940	0.956	0.959	2.023	1.235
27	1.203	3.930	1.216	1.144	2.678	0.960	1.000	2.502	0.712	0.827	2.161	0.692	0.994	3.637	0.935	0.893	2.075	0.488
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	0.995	2.696	1.057	0.812	2.265	0.667	0.910	2.426	0.733	0.962	1.950	0.973	1.207	2.921	1.029	1.037	2.898	0.845
30	1.159	2.423	0.793	1.266	3.707	1.212	1.102	2.121	0.586	1.174	2.381	1.345	1.858	3.036	1.373	0.909	2.151	0.590
31	0.895	2.861	0.986	0.863	2.645	0.884	0.858	2.134	0.693	0.984	2.440	0.745	1.039	3.996	0.713	1.101	3.073	0.938
32	0.790	2.061	0.664	0.927	2.207	0.945	0.973	2.328	0.743	0.886	2.160	0.652	1.610	6.862	2.197	0.885	3.440	1.197
131	1.898	4.328	1.000	1.488	3.213	0.539	1.654	3.295	0.640	1.929	4.382	0.963	1.983	4.614	1.468	1.367	3.285	1.090
133	2.303	4.224	0.885	1.258	3.854	0.676	1.354	2.785	0.567	1.133	2.734	0.620	1.337	3.187	0.867	1.230	2.740	0.657
138	1.517	3.598	0.986	1.214	3.260	0.870	1.724	4.000	1.190	1.664	3.512	0.728	1.527	3.655	0.914	1.171	3.029	0.774

Table 6-2 Range Error 95% index, Range Error Max, and Range Error Sigma @ Max

Site_	Billings			Miami			Albuquerque			KansasCity			LosAngeles			Atlanta		
PRN ↓	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma	0.95 Range Error (Meters)	Max Range Error (Meters)	Max Range Error Sigma
1	0.909	2.190	1.003	1.149	2.463	1.129	1.526	3.325	1.067	0.926	2.354	0.784	1.466	2.648	0.898	0.977	1.876	0.767
2	1.363	5.237	1.888	1.416	3.497	1.026	0.823	1.957	0.527	0.996	4.521	1.388	1.668	2.809	1.208	0.924	1.967	1.356
3	0.845	2.058	0.727	1.714	4.433	1.455	0.971	3.701	1.116	0.910	3.394	1.062	1.369	3.062	0.794	1.272	3.000	1.067
4	0.857	2.078	0.667	0.824	1.983	1.124	0.957	2.184	0.662	0.772	2.816	1.761	1.221	2.573	0.392	0.850	1.949	0.617
5	0.880	2.615	0.830	1.504	8.876	2.645	0.782	2.030	0.727	1.066	5.423	1.660	1.254	2.568	0.763	0.820	3.040	0.893
6	1.025	2.755	0.882	2.658	11.220	1.838	0.790	2.864	1.591	1.376	5.370	1.613	1.501	2.596	1.481	0.856	2.700	0.700
7	1.134	2.839	0.893	2.000	5.599	1.925	0.702	2.015	0.599	0.919	2.108	0.989	1.380	2.194	1.180	0.933	1.899	1.202
8	0.844	1.840	1.022	0.811	2.140	0.662	1.168	4.335	1.348	0.928	2.176	1.050	1.552	4.432	1.536	0.873	2.447	0.928
9	1.024	2.901	0.907	1.003	2.864	0.973	0.713	2.141	0.647	0.996	4.690	1.498	1.360	2.161	1.298	0.808	2.667	0.885
10	1.148	3.704	1.123	0.810	2.937	0.879	0.707	2.434	0.855	1.297	3.621	1.179	0.932	2.013	1.122	0.741	1.483	0.980
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	1.098	3.484	1.112	1.127	4.026	1.330	0.935	3.663	1.060	0.864	3.101	0.955	1.310	3.026	0.908	1.098	2.246	0.802
13	0.890	2.325	0.772	0.752	2.125	0.881	0.770	3.331	0.995	0.859	2.052	0.970	1.267	3.392	1.057	0.784	1.605	0.438
14	1.334	2.384	1.418	1.555	3.559	1.195	1.335	3.723	2.004	1.151	3.309	1.059	0.868	2.299	0.640	1.443	2.549	1.103
15	0.894	2.658	0.866	0.876	2.200	0.855	0.884	3.565	1.116	1.264	4.054	1.285	1.400	2.696	0.920	0.721	1.684	0.455
16	1.590	3.079	1.264	0.953	3.546	1.167	1.275	3.063	0.871	1.541	5.622	1.800	1.442	2.891	0.988	0.837	1.787	0.980
17	1.068	4.276	1.359	0.941	3.509	0.858	0.852	1.677	0.731	0.792	3.108	1.019	1.451	2.592	0.977	0.795	1.906	0.585
18	0.896	2.688	0.710	1.215	3.438	1.110	0.915	1.833	0.511	0.886	2.532	0.785	1.102	2.227	0.440	0.838	1.865	0.603
19	0.877	2.617	0.806	1.111	2.732	0.808	0.992	2.829	0.773	1.048	4.336	1.599	1.463	2.516	1.201	0.859	2.081	0.621
20	1.185	3.319	1.095	0.999	4.487	0.824	1.032	3.082	1.107	1.444	6.185	2.369	1.444	3.165	0.915	1.072	2.302	0.692
21	1.342	3.155	0.921	0.883	3.098	0.955	1.303	5.314	1.538	1.440	7.318	2.259	1.323	2.865	0.970	0.830	2.364	0.663
22	1.399	3.005	1.005	1.130	5.897	1.942	1.045	2.766	1.076	1.081	4.604	1.435	1.152	2.680	0.829	1.167	2.460	0.895
23	1.027	2.578	0.938	0.886	2.706	0.786	0.830	2.546	0.791	0.818	2.061	0.644	1.019	1.993	0.638	0.707	1.508	0.585
24	0.934	1.932	0.828	0.801	2.252	0.734	0.945	3.463	1.068	0.866	2.487	0.761	1.205	2.858	0.875	0.877	1.930	1.022
25	1.519	3.230	1.008	0.982	2.867	0.954	1.062	2.401	0.730	0.993	5.394	1.853	1.373	2.987	0.876	0.936	2.638	1.042
26	1.049	3.055	1.137	0.790	2.749	0.946	1.048	4.012	1.208	1.083	4.230	1.340	1.519	3.551	1.086	0.911	1.917	0.598
27	0.940	2.095	0.702	1.018	2.188	1.020	1.528	4.171	1.268	2.109	4.685	1.473	1.525	4.355	1.343	0.725	2.247	0.707
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	1.071	2.994	1.282	0.930	3.286	1.132	0.766	1.985	0.624	1.076	3.338	1.341	1.561	3.188	0.845	0.824	2.723	0.916
30	1.096	3.334	1.012	1.002	1.889	1.125	1.027	2.816	0.957	0.995	3.880	1.145	1.424	2.523	0.869	1.033	1.842	1.134
31	2.089	3.766	1.467	1.749	8.406	2.382	0.980	1.883	1.013	1.002	3.302	1.045	1.660	4.326	1.313	0.850	2.621	0.778
32	1.124	2.540	1.099	0.909	2.108	0.628	1.034	2.013	0.911	0.790	2.619	0.821	1.161	2.336	0.911	0.886	1.697	1.448
131	1.970	3.773	1.071	1.381	3.211	0.714	1.904	3.229	1.090	1.591	3.670	1.007	2.173	3.773	1.161	1.465	3.006	0.737
133	1.408	2.928	0.680	1.096	2.783	0.680	1.963	3.155	0.755	2.073	3.466	0.844	1.904	3.351	0.705	1.189	2.607	0.650
138	1.208	3.227	0.839	1.997	4.592	1.129	1.171	2.786	0.682	2.029	4.475	1.248	2.791	4.414	0.984	1.122	2.631	0.793

Figure 6-1 Range Error (PRN1 – PRN16) – Washington D.C.

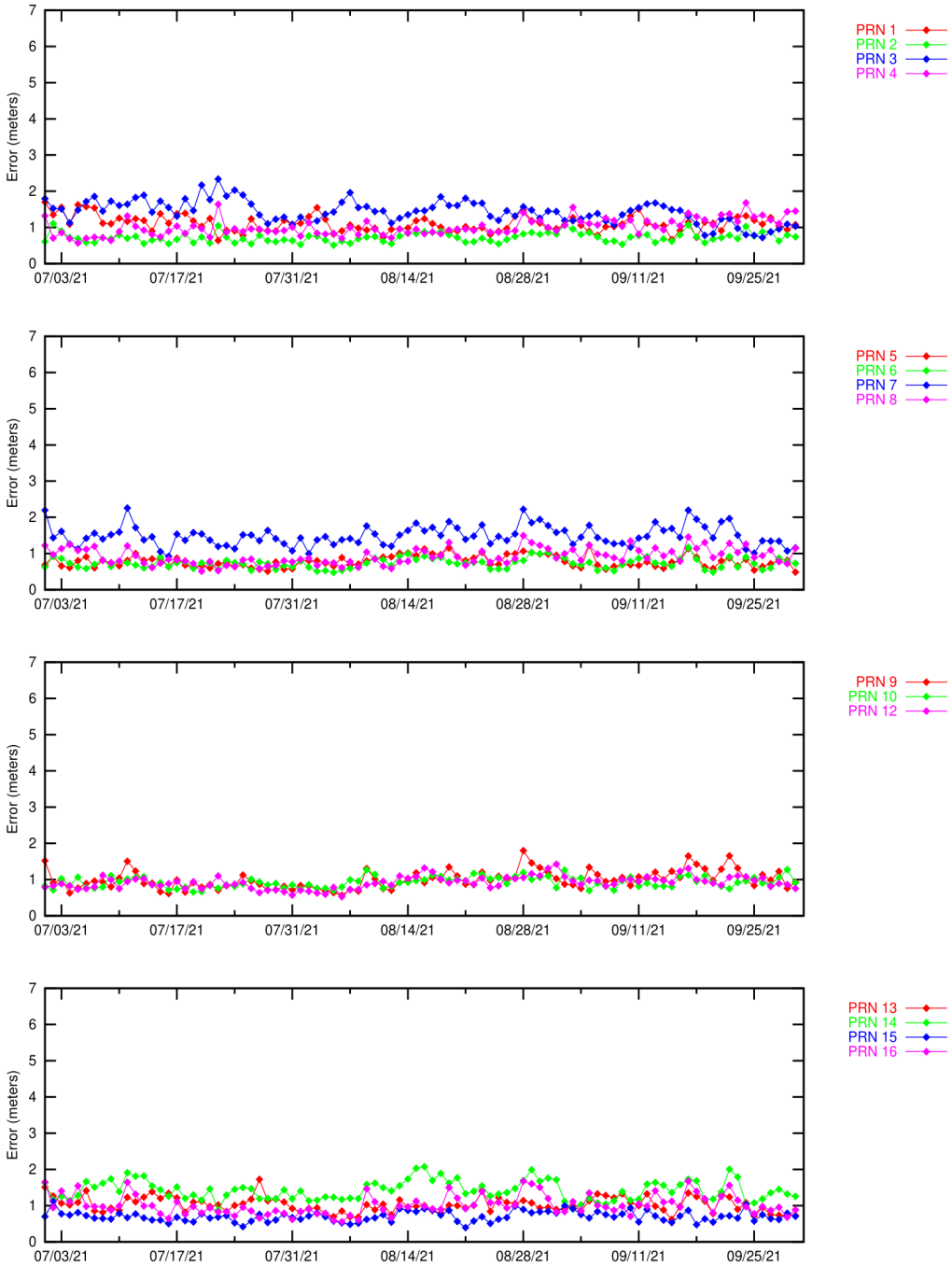


Figure 6-2 Range Error (PRN17 – PRN32) – Washington D.C.

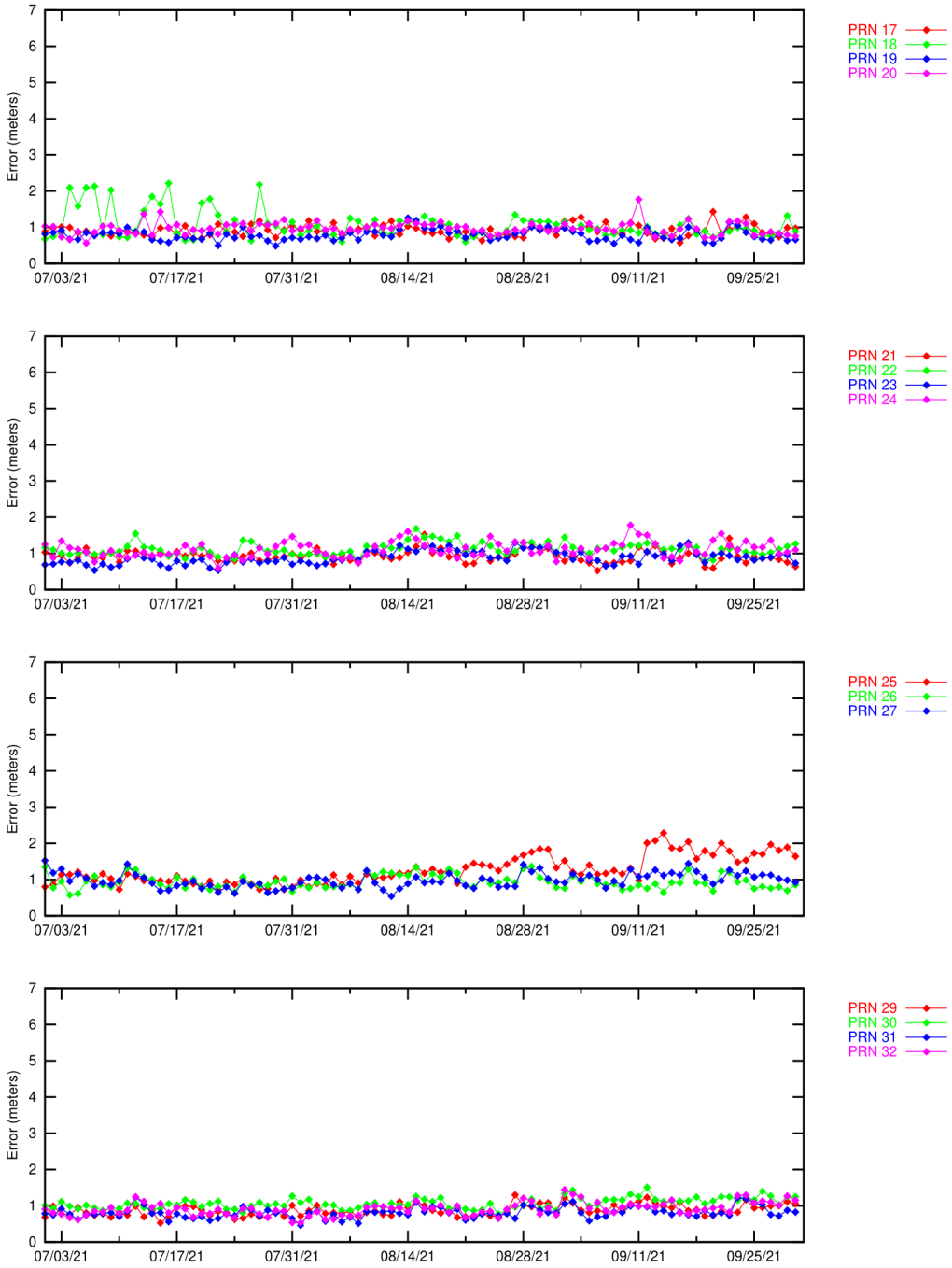
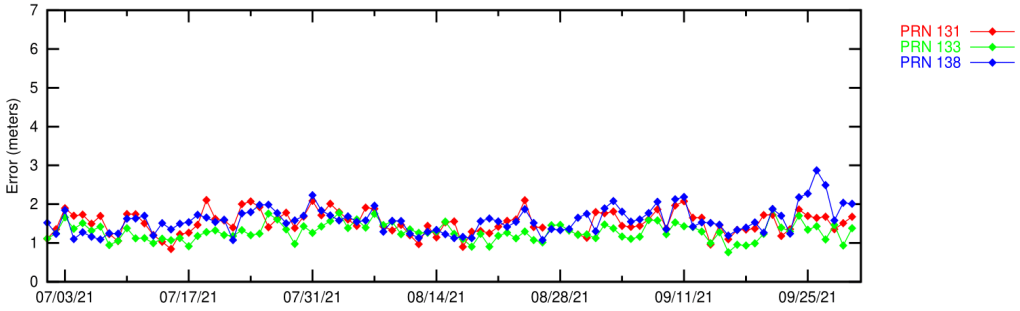


Figure 6-3 Range Error (PRN131, PRN133, and PRN138) – Washington D.C.



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

The GPS satellite ionospheric errors were calculated for 12 WAAS receivers during the quarter. Table 6-3 and Table 6-4 show the ionospheric error 95% index and 99.9% bounding statistics for each SV at the selected locations. Figure 6-4 and Figure 6-5 show the 95% ionospheric error for each SV measured by the WAAS receiver at the Chicago reference station.

Table 6-3 Ionospheric Error 95%, Ionospheric Error Max, and Ionospheric Error Sigma @ Max

Site_	Minneapolis			Chicago			Boston			Juneau			Honolulu			Salt Lake City		
PRN ↓	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma
1	0.281	1.540	0.462	0.567	2.235	0.531	0.271	1.155	0.423	0.639	2.124	0.994	0.330	1.524	0.415	0.357	1.942	0.650
2	0.389	1.367	0.536	0.468	2.310	0.712	0.324	0.928	0.325	0.436	1.600	0.463	0.480	1.852	0.584	0.417	2.653	0.797
3	0.449	2.105	0.643	0.431	2.584	0.803	0.482	1.950	0.664	0.316	1.324	0.514	0.512	1.834	0.702	0.551	1.378	0.422
4	0.299	1.652	0.459	0.343	1.825	0.463	0.617	2.121	0.940	0.342	1.093	0.258	0.504	1.494	0.620	0.355	1.286	0.279
5	0.249	1.080	0.326	0.439	1.217	0.582	0.255	1.185	0.364	0.337	1.253	0.439	0.664	2.391	0.670	0.532	1.740	0.556
6	0.306	1.638	0.556	0.569	1.994	0.610	0.305	1.158	0.453	0.336	1.680	0.506	0.560	2.255	0.642	0.629	2.799	0.770
7	0.546	1.994	0.750	0.508	1.263	0.380	0.505	1.625	0.473	0.479	1.868	0.447	0.456	1.424	0.350	0.520	3.590	1.059
8	0.531	2.977	0.698	0.326	1.365	0.359	0.257	1.407	0.368	0.278	1.524	0.405	0.628	3.041	0.928	0.254	1.784	0.577
9	0.419	2.074	0.537	0.398	1.152	0.565	0.343	1.383	0.445	0.305	1.436	0.327	0.542	2.125	0.631	0.357	1.293	0.351
10	0.238	1.156	0.344	0.449	2.418	0.719	0.452	1.635	0.537	0.374	2.326	0.723	0.362	1.533	0.883	0.280	1.154	0.305
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	0.323	2.217	0.584	0.368	2.836	0.745	0.309	1.261	0.319	0.391	1.769	0.466	0.589	2.586	0.822	0.691	1.643	0.452
13	0.353	1.593	0.426	0.388	1.261	0.505	0.327	1.200	0.339	0.353	4.443	1.615	0.463	2.347	0.714	0.316	1.967	0.768
14	1.060	2.647	0.762	0.845	1.460	0.466	0.868	1.717	0.513	0.945	2.381	0.577	0.761	1.412	0.471	0.729	1.112	0.654
15	0.425	1.254	0.449	0.300	1.446	0.447	0.226	1.083	0.335	0.298	1.182	0.472	0.641	1.981	0.532	0.310	0.933	0.361
16	0.315	2.030	0.605	0.370	1.157	0.286	0.259	2.390	0.769	0.348	1.844	0.497	0.711	2.356	0.625	0.399	1.934	0.621
17	0.365	1.418	0.427	1.106	2.197	0.978	0.401	1.566	0.472	0.503	1.699	0.570	1.184	4.324	1.090	0.509	2.139	0.511
18	0.658	2.165	0.591	0.428	1.445	0.317	0.421	3.422	0.984	0.394	1.951	0.604	0.386	1.972	0.666	0.458	1.500	0.440
19	0.424	1.281	0.497	0.399	1.000	0.433	0.254	0.828	0.268	0.306	1.745	0.646	0.409	2.012	0.535	0.895	4.134	1.102
20	0.333	1.364	0.465	0.536	2.796	0.725	0.339	1.145	0.318	0.339	1.733	0.567	0.532	1.882	0.502	0.462	1.513	0.471
21	0.440	1.476	0.370	0.309	1.767	0.539	0.290	0.912	0.694	0.328	1.894	0.894	0.484	2.443	0.849	0.529	1.774	0.612
22	0.323	1.586	0.530	0.393	2.154	0.563	0.404	1.761	0.559	0.537	2.602	0.751	0.427	2.520	0.769	0.539	1.246	0.517
23	0.509	1.564	0.529	0.328	1.030	0.249	0.407	1.457	0.461	0.390	1.706	1.154	0.310	1.550	0.374	0.662	1.690	0.675
24	0.350	1.269	0.349	0.375	1.286	0.393	0.369	1.222	0.567	0.304	1.239	0.318	0.370	1.234	0.355	0.250	1.741	0.610
25	0.362	1.604	0.447	0.388	1.700	0.437	0.338	1.175	0.357	0.270	1.517	0.547	0.468	1.671	0.761	0.661	3.231	1.019
26	0.369	1.772	0.421	0.431	2.017	0.608	0.415	1.215	0.358	0.316	1.322	0.439	0.483	2.298	0.638	0.342	1.135	0.394
27	0.364	2.100	0.547	0.647	2.400	0.510	0.250	1.053	0.299	0.478	1.427	0.441	0.461	2.424	0.806	0.300	0.847	0.376
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	0.385	1.353	0.428	0.296	1.349	0.392	0.365	1.638	0.468	0.285	1.217	0.316	0.520	1.772	0.531	0.514	1.739	0.380
30	0.360	1.499	0.561	0.527	2.565	0.608	0.539	1.543	0.397	0.347	1.546	0.695	0.790	1.526	0.433	0.264	0.912	0.199
31	0.228	1.478	0.446	0.261	1.754	0.555	0.363	1.539	0.625	0.376	1.363	0.426	0.705	4.226	0.924	0.461	1.586	0.438
32	0.346	1.293	0.570	0.377	1.441	0.564	0.356	0.934	0.449	0.337	1.514	0.417	0.616	4.528	1.176	0.443	1.608	0.416

Table 6-4 Ionospheric Error 95%, Ionospheric Error Max, and Ionospheric Error Sigma @ Max

Site_	Billings			Miami			Albuquerque			Kansas City			Atlanta			Los Angeles		
PRN ↓	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma	0.95 Iono Error (Meters)	Max Iono Error (Meters)	Max Iono Error Sigma
1	0.272	0.966	0.364	0.404	1.537	0.525	0.411	1.145	0.477	0.392	1.311	0.541	0.371	0.891	0.215	0.474	1.268	0.343
2	0.749	4.031	1.263	0.638	2.176	0.552	0.402	1.495	0.476	0.340	1.863	0.571	0.269	1.092	0.343	0.477	2.015	0.509
3	0.319	1.105	0.358	0.740	2.892	0.867	0.536	2.307	0.717	0.413	2.177	0.703	0.701	1.833	0.806	0.573	1.977	0.448
4	0.373	1.423	0.494	0.351	1.111	0.326	0.663	1.703	0.436	0.357	2.112	0.643	0.343	1.191	0.343	0.456	1.797	0.470
5	0.443	1.896	0.598	0.688	5.638	1.380	0.354	2.011	0.520	0.567	3.652	1.047	0.281	1.428	0.405	0.510	2.473	0.597
6	0.457	2.212	0.740	1.185	6.203	1.186	0.441	2.240	0.544	0.735	2.773	0.917	0.342	2.351	0.613	0.837	2.311	0.524
7	0.476	1.512	0.417	1.027	3.911	1.136	0.342	1.387	0.341	0.468	1.450	0.395	0.459	0.993	0.662	0.282	1.108	0.347
8	0.243	1.193	0.441	0.388	1.088	0.348	0.488	2.436	0.870	0.467	1.408	0.464	0.334	1.315	0.376	0.798	3.287	0.951
9	0.449	1.885	0.549	0.525	1.837	0.713	0.402	1.728	0.447	0.392	2.289	0.783	0.346	1.286	0.328	0.418	1.549	0.366
10	0.538	2.169	0.628	0.368	1.698	0.476	0.280	1.387	0.419	0.506	2.210	0.665	0.304	1.126	0.354	0.248	1.496	0.346
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	0.467	1.923	0.538	0.634	2.505	0.847	0.509	2.260	0.607	0.333	1.589	0.594	0.330	1.390	0.395	0.418	2.335	0.425
13	0.416	0.974	0.443	0.290	1.347	0.443	0.275	1.076	0.535	0.286	1.099	0.420	0.287	0.931	0.260	0.408	1.937	0.701
14	0.790	1.390	0.405	0.882	1.531	0.496	0.858	1.515	0.581	0.709	1.363	0.379	0.925	1.545	0.489	0.685	1.752	0.413
15	0.284	1.759	0.782	0.332	1.132	0.342	0.296	1.506	0.480	0.429	1.770	0.618	0.233	0.782	0.202	0.413	1.771	0.513
16	0.653	2.254	0.817	0.476	2.228	0.569	0.361	1.749	0.510	0.624	3.886	1.140	0.256	1.702	0.417	0.472	2.207	0.516
17	0.613	2.441	0.609	0.448	1.919	0.412	0.503	2.156	0.544	0.460	1.894	0.600	0.297	1.374	0.444	0.451	2.180	0.454
18	0.393	1.614	0.447	0.796	2.369	0.676	0.339	1.350	0.407	0.367	1.251	0.361	0.349	1.112	0.323	0.301	1.231	0.125
19	0.454	1.601	0.419	0.435	2.015	0.425	0.525	3.017	0.676	0.456	2.805	0.862	0.261	0.916	0.282	0.448	1.611	0.362
20	0.446	1.859	0.682	0.388	1.562	0.396	0.427	2.107	0.530	0.619	4.575	1.491	0.298	1.597	0.379	0.534	2.973	0.790
21	0.358	1.614	0.524	0.343	1.785	0.680	0.400	2.443	0.811	0.623	4.895	1.624	0.298	1.489	0.394	0.402	1.190	0.447
22	0.593	1.809	0.470	0.455	3.723	1.113	0.526	1.316	0.499	0.401	2.906	0.961	0.500	1.422	0.442	0.333	1.677	0.319
23	0.393	1.411	0.570	0.383	1.455	0.531	0.281	1.220	0.323	0.407	0.984	0.304	0.260	1.605	0.403	0.485	2.152	0.721
24	0.332	0.977	0.411	0.323	0.942	0.339	0.310	1.494	0.727	0.330	1.417	0.588	0.299	0.993	0.284	0.495	1.312	0.485
25	0.580	1.736	0.567	0.382	1.455	0.450	0.515	1.863	0.647	0.529	2.884	1.183	0.275	1.609	0.402	0.485	1.571	0.577
26	0.496	1.655	0.609	0.420	2.608	0.772	0.313	1.881	0.606	0.431	3.230	0.930	0.390	1.459	0.343	0.493	3.242	0.851
27	0.231	0.756	0.301	0.480	1.442	0.526	0.547	1.878	0.853	0.692	3.180	0.924	0.227	0.746	0.290	0.451	2.180	0.610
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	0.581	1.552	0.417	0.452	2.127	0.577	0.311	1.465	0.345	0.436	2.038	0.923	0.307	1.271	0.400	0.620	2.727	0.249
30	0.483	2.325	0.538	0.466	0.896	0.285	0.479	1.774	0.489	0.354	2.065	0.656	0.341	0.790	0.615	0.353	1.542	0.349
31	1.049	3.216	1.426	0.961	9.106	1.744	0.368	1.475	0.337	0.326	1.523	0.440	0.328	2.000	0.470	0.551	2.735	0.599
32	0.877	1.782	0.837	0.546	3.546	0.763	0.630	2.102	0.519	0.514	1.461	0.683	0.415	1.229	0.377	0.315	1.501	0.262

Figure 6-4 Ionospheric Error (PRN1 – PRN16) – Washington D.C.

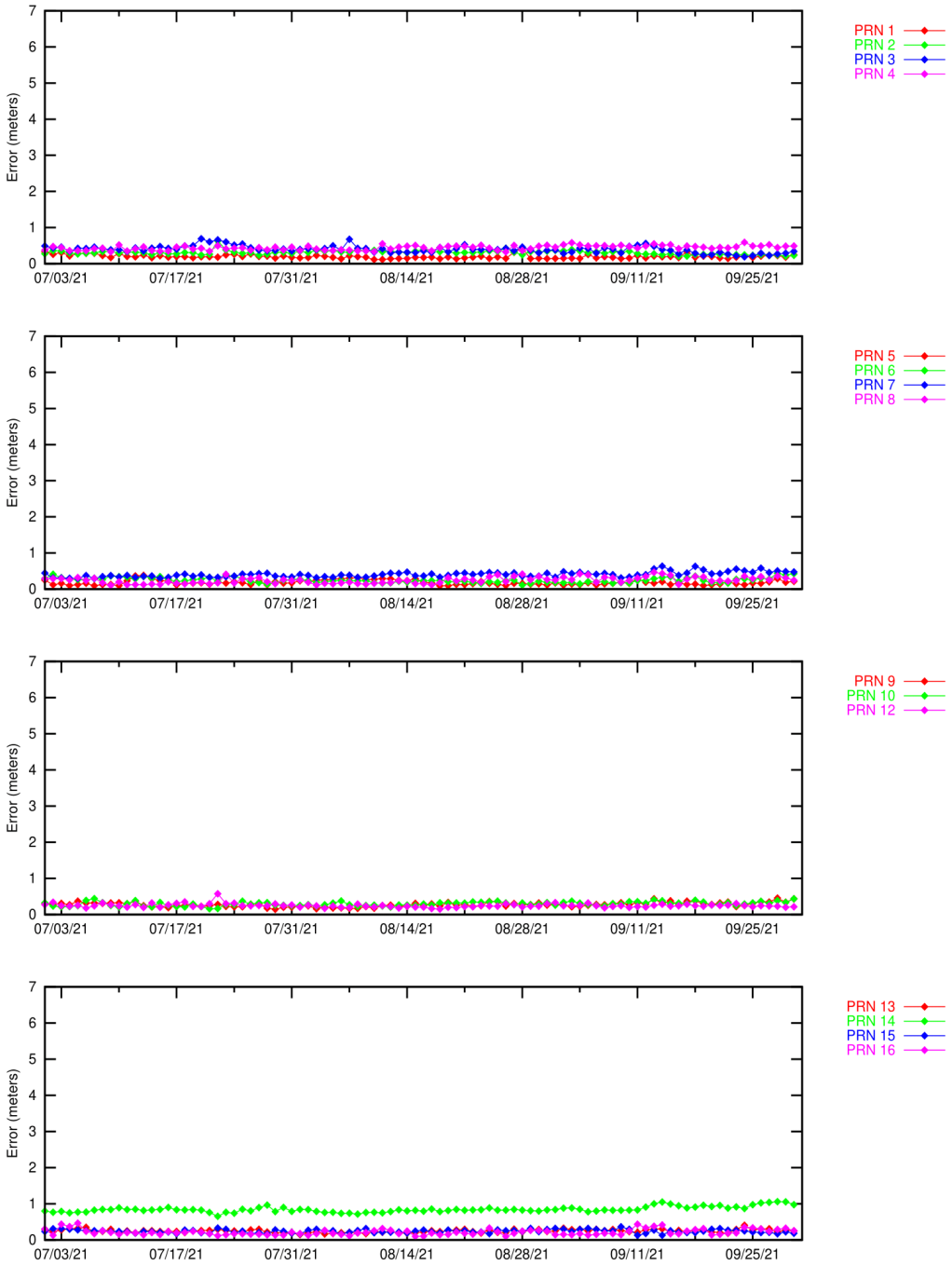
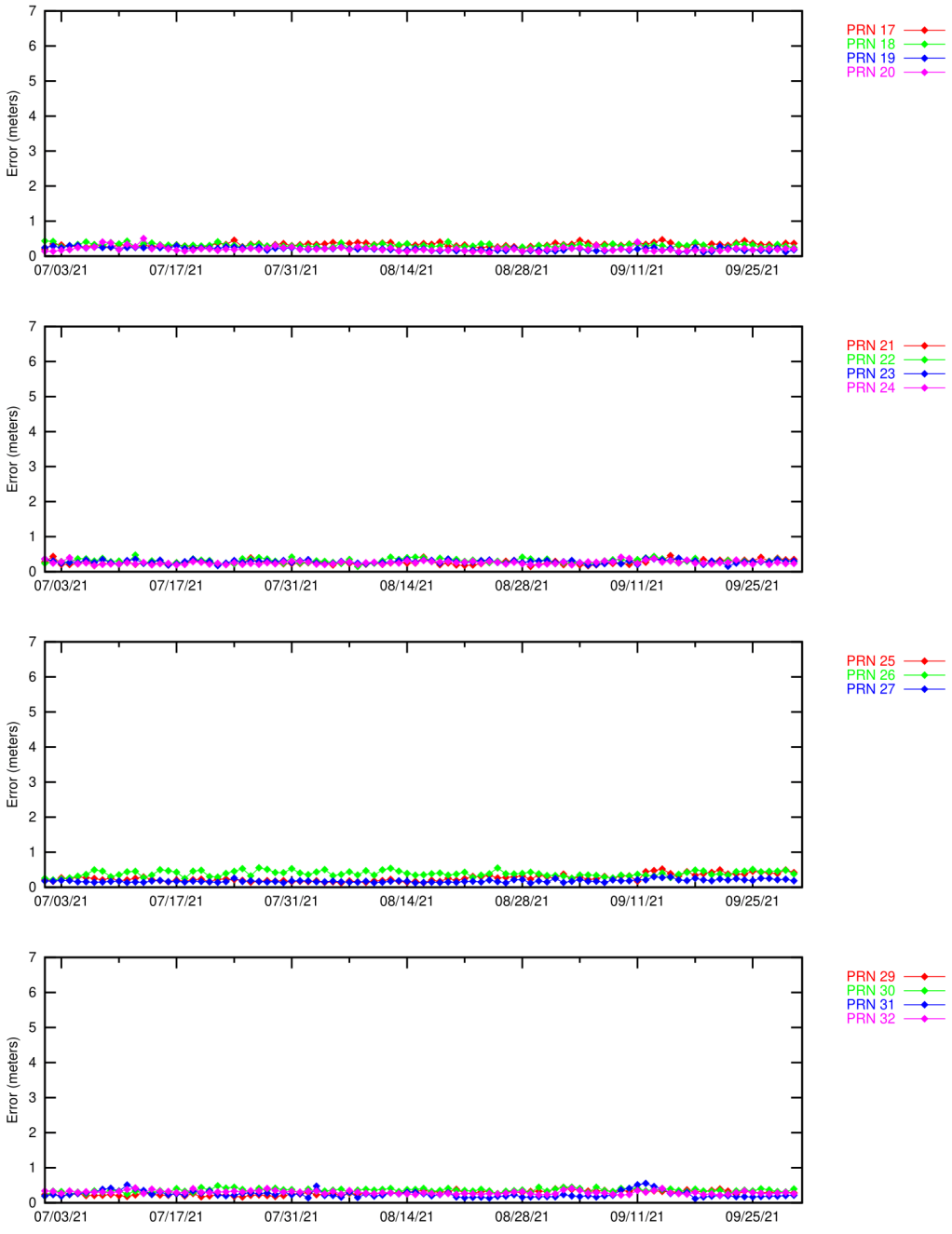


Figure 6-5 Ionospheric Error (PRN17 – PRN32) – Washington D.C.



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 7-3show the trend of SM9, S15 and CRE GEO PA ranging availability, respectively.

The reductions in SM9 GEO PA, S15 GEO PA and CRE GEO PA ranging availability were due to GUS switchovers (see Figure 7-1 to Figure 7-3). Additional reductions in S15 GEO PA ranging availability were due to Brewster (BR1) faulting multiple times between July 7th and 8th due to a KPA failure. Refer to Table 1-7 for detailed information on the GUS switchovers for this reporting period.

Table 7-1 GEO Ranging Availability

GEO Source	GEO	PA (%)	NPA (%)	Not Monitored (%)	Do Not Use (%)
SM9 131	SM9	94.29	0.05	5.66	0.00
SM9 131	S15	98.56	0.11	1.33	0.00
SM9 131	CRE	99.59	0.02	0.39	0.00
S15 133	SM9	94.12	0.05	5.84	0.00
S15 133	S15	98.69	0.11	1.19	0.00
S15 133	CRE	99.42	0.02	0.56	0.00
CRE 138	SM9	94.29	0.05	5.67	0.00
CRE 138	S15	98.55	0.11	1.34	0.00
CRE 138	CRE	99.58	0.02	0.40	0.00

Figure 7-1 Daily PA SM9 GEO Ranging Availability Trend

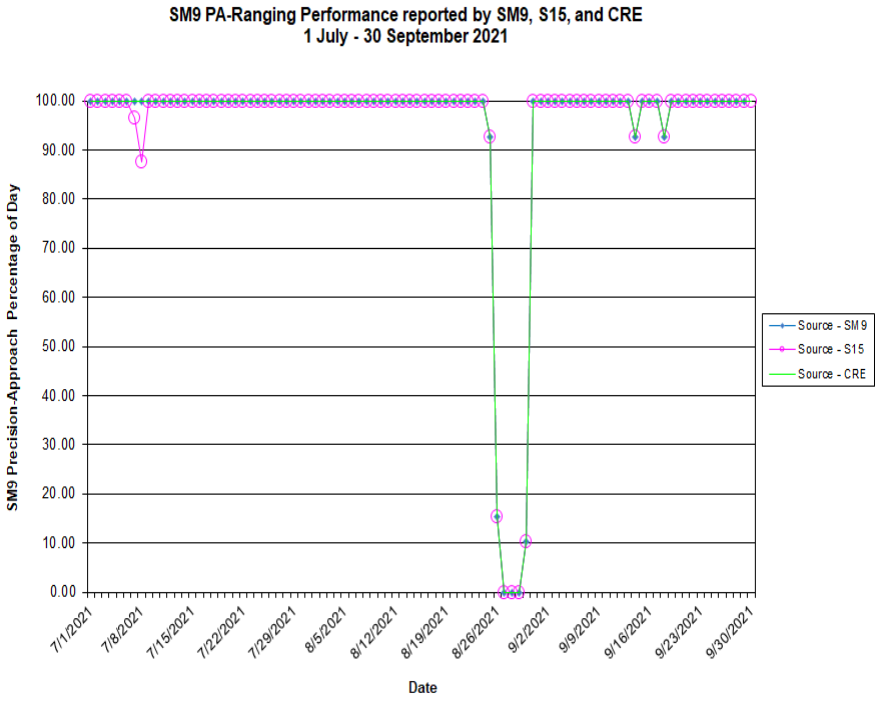


Figure 7-2 Daily PA S15 GEO Ranging Availability Trend

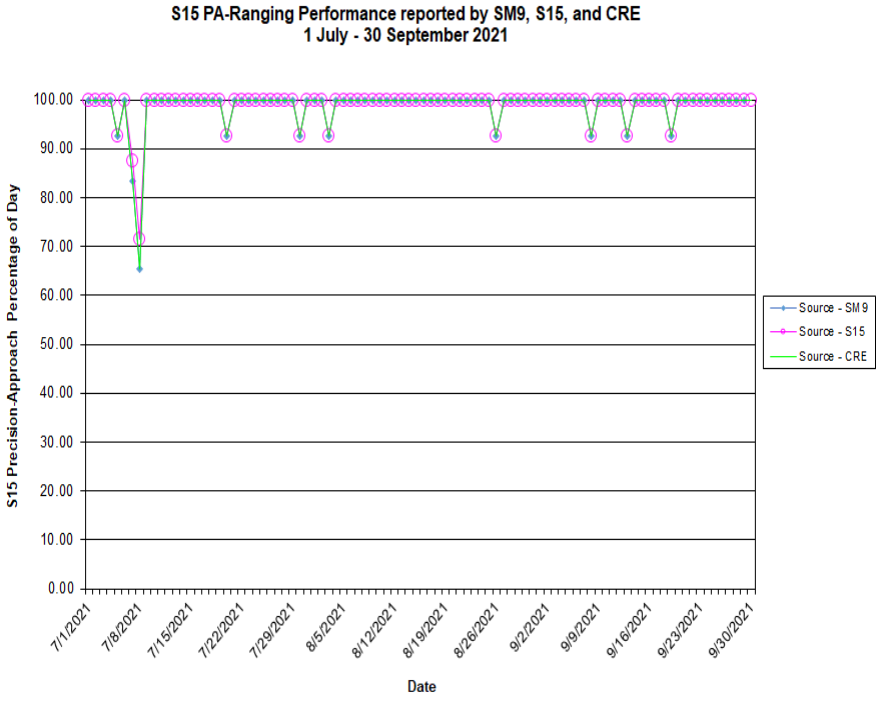
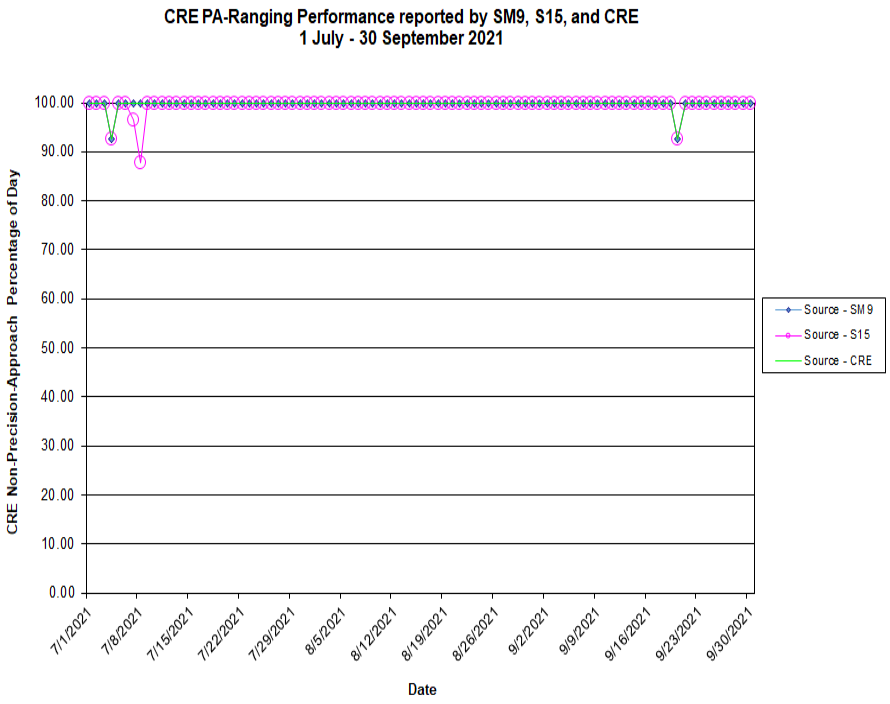


Figure 7-3 Daily PA CRE GEO Ranging Availability Trend



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 US 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 US and Canada that have published GPS area navigation (RNAV) Instrument Approach Procedures (IAPs). These results are geographically depicted on an interactive web page and are accessible at http://www.nstb.tc.faa.gov/AirportOutages/.

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

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
2C7	SHAKTOOLIK	AK	LPV	0	100	0	100	1	99.983
6A8	ALLAKAKET	AK	LP	0	100	0	100	1	99.981
7KA	TATITLEK	AK	LP	0	100	0	100	0	100
9A3	CHUATHBALUK	AK	LPV	0	100	0	100	1	99.987
ADQ	KODIAK	AK	LPV	0	100	0	100	1	99.998
AFM	AMBLER	AK	LPV	0	100	0	100	1	99.969
AKN	KING SALMON	AK	LPV	0	100	0	100	1	99.989
AKW	KLAWOCK	AK	LP	0	100	0	100	0	100
ANC	TED STEVENS ANCHORAGE INTL	AK	LPV200	0	100	0	100	1	99.998
ANI	ANIAK	AK	LPV	0	100	0	100	1	99.986
AQH	QUINHAGAK	AK	LPV	0	100	0	100	1	99.982
AQT	NUIQSUT	AK	LPV	0	100	0	100	2	99.960
AWI	WAINWRIGHT	AK	LPV	0	100	1	99.998	41	99.809
BET	BETHEL	AK	LPV200	0	100	0	100	1	99.983
BRW	WILEY POST-WILL ROGERS MEMORIA	AK	LPV	0	100	1	99.998	43	99.768
BVK	BUCKLAND	AK	LPV	0	100	0	100	1	99.980
CDB	COLD BAY	AK	LPV200	0	100	0	100	1	99.973
CDV	MERLE K (MUDHOLE) SMITH	AK	LPV	0	100	0	100	0	100
CEM	CENTRAL	AK	LP	0	100	0	100	1	99.986
CLP	CLARKS POINT	AK	LPV	0	100	0	100	1	99.987
CXF	COLDFOOT	AK	LP	0	100	0	100	1	99.979
D76	ROBERT/BOB/CURTIS MEMORIAL	AK	LPV	0	100	0	100	8	99.950
DEE	DEERING	AK	LPV	0	100	0	100	1	99.960
DLG	DILLINGHAM	AK	LPV	0	100	0	100	1	99.987
ELI	ELIM	AK	LPV	0	100	0	100	1	99.981
ENA	KENAI MUNICIPAL	AK	LPV200	0	100	0	100	1	99.998
ENM	EMMONAK	AK	LPV	0	100	0	100	1	99.980
FAI	FAIRBANKS INTL	AK	LPV200	0	100	0	100	1	99.988
FYU	FORT YUKON	AK	LPV	0	100	0	100	1	99.981
GAL	EDWARD G PITKA SR	AK	LPV	0	100	0	100	1	99.986
GAM	GAMBELL	AK	LPV	0	100	0	100	17	99.850
GKN	GULKANA	AK	LPV	0	100	0	100	1	99.998
GST	GUSTAVUS	AK	LP	0	100	0	100	0	100
HLA	HUSLIA	AK	LPV	0	100	0	100	1	99.983

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HOM	HOMER	AK	LPV	0	100	0	100	1	99.998
HPB	HOOPER BAY	AK	LP	0	100	0	100	1	99.975
HRR	HEALY RIVER	AK	LP	0	100	0	100	1	99.990
IIK	KIPNUK	AK	LPV	0	100	0	100	1	99.981
ILI	ILIAMNA	AK	LPV	0	100	0	100	1	99.992
IWK	WALES	AK	LP	0	100	0	100	10	99.938
IYS	WASILLA	AK	LPV	0	100	0	100	1	99.998
KAL	KALTAG	AK	LPV	0	100	0	100	1	99.985
KGX	GRAYLING	AK	LP	0	100	0	100	1	99.985
KSM	ST MARY'S	AK	LPV200	0	100	0	100	1	99.981
KTN	KETCHIKAN INTL	AK	LPV	0	100	0	100	0	100
KTS	BREVIG MISSION	AK	LPV	0	100	0	100	3	99.950
KWT	KWETHLUK	AK	LPV	0	100	0	100	1	99.984
KYU	KOYUKUK	AK	LPV	0	100	0	100	1	99.985
MCG	MC GRATH	AK	LP	0	100	0	100	1	99.989
MDM	MARSHALL DON HUNTER SR	AK	LP	0	100	0	100	1	99.983
MDO	MIDDLETON ISLAND	AK	LP	0	100	0	100	0	100
MLY	MANLEY HOT SPRINGS	AK	LP	0	100	0	100	1	99.987
OME	NOME	AK	LPV	0	100	0	100	2	99.958
OOK	TOKSOOK BAY	AK	LP	0	100	0	100	1	99.980
ORT	NORTHWAY	AK	LP	0	100	0	100	1	99.993
OTZ	RALPH WIEN MEMORIAL	AK	LPV	0	100	0	100	10	99.950
PAQ	""" WARREN """"BUD""""" WOODS PALMER MUNICIPAL"""	AK	LP	0	100	0	100	1	99.998
PBV	ST GEORGE	AK	LPV	0	100	0	100	4	99.962
PHO	POINT HOPE	AK	LPV	0	100	0	100	29	99.901
PTU	PLATINUM	AK	LPV	0	100	0	100	1	99.983
RBY	RUBY	AK	LPV	0	100	0	100	1	99.987
RSH	RUSSIAN MISSION	AK	LP	0	100	0	100	1	99.984
SCC	DEADHORSE	AK	LPV200	0	100	0	100	2	99.961
SCM	SCAMMON BAY	AK	LP	0	100	0	100	1	99.976
SDP	SAND POINT	AK	LPV	0	100	0	100	1	99.978
SHG	SHUNGNAK	AK	LP	0	100	0	100	1	99.980
SHX	SHAGELUK	AK	LPV	0	100	0	100	1	99.986
SIT	SITKA ROCKY GUTIERREZ	AK	LP	0	100	0	100	0	100
SMK	ST MICHAEL	AK	LPV	0	100	0	100	1	99.983

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SXQ	SOLDOTNA	AK	LP	0	100	0	100	1	99.998
TKA	TALKEETNA	AK	LPV	0	100	0	100	1	99.993
TOG	TOGIAK	AK	LP	0	100	0	100	1	99.984
WLK	SELAWIK	AK	LPV	0	100	0	100	1	99.969
WMO	WHITE MOUNTAIN	AK	LP	0	100	0	100	1	99.980
WNA	NAPAKIAK	AK	LPV	0	100	0	100	1	99.983
WSN	SOUTH NAKNEK NR 2	AK	LPV	0	100	0	100	1	99.988
WTK	NOATAK	AK	LPV	0	100	0	100	12	99.932
YAK	YAKUTAT	AK	LPV200	0	100	0	100	0	100
02A	CHILTON COUNTY	AL	LP	0	100	0	100	0	100
06A	MOTON FIELD MUNICIPAL	AL	LPV	0	100	0	100	0	100
09A	BUTLER-CHOCTAW COUNTY	AL	LPV	0	100	0	100	0	100
0J6	HEADLAND MUNICIPAL	AL	LPV	0	100	0	100	6	99.997
0R1	ATMORE MUNICIPAL	AL	LPV	0	100	0	100	33	99.975
11A	CLAYTON MUNICIPAL	AL	LPV	0	100	0	100	0	100
12J	BREWTON MUNICIPAL	AL	LPV	0	100	0	100	29	99.978
1A9	PRATTVILLE - GROUBY FIELD	AL	LPV	0	100	0	100	0	100
1M4	POSEY FIELD	AL	LPV	0	100	0	100	0	100
1R8	BAY MINETTE MUNICIPAL	AL	LPV	0	100	0	100	36	99.967
2R5	ST ELMO	AL	LPV	0	100	0	100	38	99.935
33J	GENEVA MUNICIPAL	AL	LP	0	100	0	100	15	99.988
3M8	NORTH PICKENS	AL	LP	0	100	0	100	0	100
4A9	ISBELL FIELD	AL	LPV	0	100	0	100	0	100
5R1	ROY WILCOX	AL	LP	0	100	0	100	6	99.997
5R4	FOLEY MUNICIPAL	AL	LPV	0	100	0	100	39	99.924
71J	OZARK-BLACKWELL FIELD	AL	LPV	0	100	0	100	6	99.997
79J	SOUTH ALABAMA RGNL AT BILL BEN	AL	LPV	0	100	0	100	17	99.992
8A0	ALBERTVILLE RGNL-THOMAS J BRUM	AL	LPV	0	100	0	100	0	100
8A1	GUNTERSVILLE MUNICIPAL - JOE STARNE	AL	LPV	0	100	0	100	0	100
9A4	COURTLAND	AL	LPV200	0	100	0	100	0	100
A08	VAIDEN FIELD	AL	LPV	0	100	0	100	0	100
ALX	THOMAS C RUSSELL FLD	AL	LPV	0	100	0	100	0	100
ANB	ANNISTON RGNL	AL	LPV	0	100	0	100	0	100
ASN	TALLADEGA MUNICIPAL	AL	LPV200	0	100	0	100	0	100
AUO	AUBURN UNIVERSITY RGNL	AL	LPV200	0	100	0	100	0	100
BFM	MOBILE DOWNTOWN	AL	LPV200	0	100	0	100	38	99.947

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BHM	BIRMINGHAM-SHUTTLESWORTH INTL	AL	LPV200	0	100	0	100	0	100
CMD	CULLMAN RGNL-FOLSOM FIELD	AL	LPV	0	100	0	100	0	100
CQF	H L SONNY CALLAHAN	AL	LPV200	0	100	0	100	40	99.930
DCU	PRYOR FIELD RGNL	AL	LPV200	0	100	0	100	0	100
DHN	DOTHAN RGNL	AL	LPV200	0	100	0	100	8	99.996
DYA	DEMOPOLIS RGNL	AL	LPV	0	100	0	100	0	100
EDN	ENTERPRISE MUNICIPAL	AL	LPV	0	100	0	100	10	99.995
EET	SHELBY COUNTY	AL	LPV	0	100	0	100	0	100
EKY	BESSEMER	AL	LPV	0	100	0	100	0	100
EUF	WEEDON FIELD	AL	LPV	0	100	0	100	0	100
GAD	NORTHEAST ALABAMA RGNL	AL	LPV200	0	100	0	100	0	100
GZH	EVERGREEN RGNL/MIDDLETON FIELD	AL	LP	0	100	0	100	16	99.994
HAB	MARION COUNTY-RANKIN FITE	AL	LPV	0	100	0	100	0	100
HSV	HUNTSVILLE INTL-CARL T JONES F	AL	LPV200	0	100	0	100	0	100
JFX	WALKER COUNTY-BEVILL FIELD	AL	LPV	0	100	0	100	0	100
JKA	JACK EDWARDS NATIONAL	AL	LPV200	0	100	0	100	41	99.912
M95	RICHARD ARTHUR FIELD	AL	LPV	0	100	0	100	0	100
MDQ	HUNTSVILLE EXECUTIVE TOM SHARP	AL	LPV200	0	100	0	100	0	100
MGM	MONTGOMERY RGNL (DANNELLY FIEL	AL	LPV200	0	100	0	100	0	100
MOB	MOBILE RGNL	AL	LPV200	0	100	0	100	36	99.960
MSL	NORTHWEST ALABAMA RGNL	AL	LPV200	0	100	0	100	0	100
PLR	ST CLAIR COUNTY	AL	LPV	0	100	0	100	0	100
PYP	CENTRE-PIEDMONT-CHEROKEE COUNT	AL	LPV	0	100	0	100	0	100
SCD	MERKEL FIELD SYLACAUGA MUNICIPAL	AL	LPV	0	100	0	100	0	100
SEM	CRAIG FIELD	AL	LPV200	0	100	0	100	0	100
TCL	TUSCALOOSA RGNL	AL	LPV	0	100	0	100	0	100
TOI	TROY MUNICIPAL AT N KENNETH CAMPBEL	AL	LPV	0	100	0	100	0	100
0M0	BILLY FREE MUNICIPAL	AR	LPV	0	100	0	100	0	100
42A	MELBOURNE MUNICIPAL - JOHN E MILLER	AR	LP	0	100	0	100	0	100
4A5	SEARCY COUNTY	AR	LPV	0	100	0	100	0	100
4M1	CARROLL COUNTY	AR	LP	0	100	0	100	0	100
4M3	CARLISLE MUNICIPAL	AR	LPV	0	100	0	100	0	100
6M7	MARIANNA/LEE COUNTY-STEVE EDWA	AR	LPV	0	100	0	100	0	100
7M1	MC GEHEE MUNICIPAL	AR	LP	0	100	0	100	0	100
9M8	SHERIDAN MUNICIPAL	AR	LPV	0	100	0	100	0	100
ADF	DEXTER B FLORENCE MEMORIAL FIE	AR	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ARG	WALNUT RIDGE RGNL	AR	LPV200	0	100	0	100	0	100
ASG	SPRINGDALE MUNICIPAL	AR	LPV	0	100	0	100	0	100
AWM	WEST MEMPHIS MUNICIPAL	AR	LPV	0	100	0	100	0	100
BPK	BAXTER COUNTY	AR	LPV	0	100	0	100	0	100
BVX	BATESVILLE RGNL	AR	LPV	0	100	0	100	0	100
BYH	ARKANSAS INTL	AR	LPV200	0	100	0	100	0	100
CDH	HARRELL FIELD	AR	LPV	0	100	0	100	0	100
CXW	CANTRELL FLD	AR	LPV	0	100	0	100	0	100
DRP	DELTA RGNL	AR	LPV	0	100	0	100	0	100
ELD	SOUTH ARKANSAS RGNL AT GOODWIN	AR	LPV	0	100	0	100	0	100
FLP	MARION COUNTY RGNL	AR	LPV	0	100	0	100	0	100
FSM	FORT SMITH RGNL	AR	LPV200	0	100	0	100	0	100
FYV	DRAKE FIELD	AR	LPV	0	100	0	100	0	100
H34	HUNTSVILLE MUNICIPAL	AR	LPV	0	100	0	100	0	100
HEE	THOMPSON-ROBBINS	AR	LPV	0	100	0	100	0	100
HRO	BOONE COUNTY	AR	LPV	0	100	0	100	0	100
JBR	JONESBORO MUNICIPAL	AR	LPV200	0	100	0	100	0	100
LIT	BILL AND HILLARY CLINTON NATIO	AR	LPV200	0	100	0	100	0	100
LLQ	MONTICELLO MUNICIPAL/ELLIS FIELD	AR	LPV	0	100	0	100	0	100
M18	HOPE MUNICIPAL	AR	LP	0	100	0	100	0	100
M19	NEWPORT RGNL	AR	LPV	0	100	0	100	0	100
M32	LAKE VILLAGE MUNICIPAL	AR	LP	0	100	0	100	0	100
M70	POCAHONTAS MUNICIPAL	AR	LPV	0	100	0	100	0	100
M77	HOWARD COUNTY	AR	LP	0	100	0	100	0	100
MXA	MANILA MUNICIPAL	AR	LPV	0	100	0	100	0	100
ORK	NORTH LITTLE ROCK MUNICIPAL	AR	LPV	0	100	0	100	0	100
PBF	PINE BLUFF RGNL AIRPORT GRIDER	AR	LPV	0	100	0	100	0	100
ROG	ROGERS EXECUTIVE - CARTER FIEL	AR	LPV	0	100	0	100	0	100
RUE	RUSSELLVILLE RGNL	AR	LPV	0	100	0	100	0	100
SGT	STUTTGART MUNICIPAL CARL HUMPHREY F	AR	LPV	0	100	0	100	0	100
SLG	SMITH FIELD	AR	LPV	0	100	0	100	0	100
SRC	SEARCY MUNICIPAL	AR	LPV	0	100	0	100	0	100
SUZ	SALINE COUNTY RGNL	AR	LPV	0	100	0	100	0	100
TXK	TEXARKANA RGNL-WEBB FIELD	AR	LPV	0	100	0	100	0	100
VBT	BENTONVILLE MUNICIPAL/LOUISE M THAD	AR	LPV	0	100	0	100	0	100
XNA	NORTHWEST ARKANSAS RGNL	AR	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AVQ	MARANA RGNL	AZ	LP	0	100	0	100	1	99.999
AZC	COLORADO CITY MUNICIPAL	AZ	LPV	0	100	0	100	0	100
CGZ	CASA GRANDE MUNICIPAL	AZ	LPV	0	100	0	100	1	99.999
DVT	PHOENIX DEER VALLEY	AZ	LPV	0	100	0	100	1	99.999
FFZ	FALCON FLD	AZ	LP	0	100	0	100	1	99.999
FHU	SIERRA VISTA MUNICIPAL-LIBBY AAF	AZ	LPV200	0	100	0	100	1	99.999
FLG	FLAGSTAFF PULLIAM	AZ	LPV	0	100	0	100	0	100
GCN	GRAND CANYON NATIONAL PARK	AZ	LPV	0	100	0	100	0	100
GEU	GLENDALE MUNICIPAL	AZ	LPV	0	100	0	100	1	99.999
GYR	PHOENIX GOODYEAR	AZ	LP	0	100	0	100	1	99.999
HII	LAKE HAVASU CITY	AZ	LPV	0	100	0	100	1	99.999
IFP	LAUGHLIN/BULLHEAD INTL	AZ	LPV	0	100	0	100	1	99.999
IGM	KINGMAN	AZ	LPV	0	100	0	100	1	99.999
IWA	PHOENIX-MESA GATEWAY	AZ	LPV200	0	100	0	100	1	99.999
JTC	SPRINGERVILLE MUNICIPAL	AZ	LP	0	100	0	100	0	100
P20	AVI SUQUILLA	AZ	LPV	0	100	0	100	1	99.999
P33	COCHISE COUNTY	AZ	LPV	0	100	0	100	1	99.999
PGA	PAGE MUNICIPAL	AZ	LPV	0	100	0	100	0	100
PHX	PHOENIX SKY HARBOR INTL	AZ	LPV	0	100	0	100	1	99.999
PRC	PRESCOTT RGNL - ERNEST A LOVE	AZ	LPV200	0	100	0	100	0	100
RQE	WINDOW ROCK	AZ	LP	0	100	0	100	0	100
RYN	RYAN FIELD	AZ	LPV	0	100	0	100	1	99.999
SAD	SAFFORD RGNL	AZ	LPV	0	100	0	100	0	100
SJN	ST JOHNS INDUSTRIAL AIR PARK	AZ	LP	0	100	0	100	0	100
SOW	SHOW LOW RGNL	AZ	LPV200	0	100	0	100	0	100
TUS	TUCSON INTL	AZ	LPV	0	100	0	100	1	99.999
AAT	ALTURAS MUNICIPAL	CA	LPV	0	100	0	100	1	99.998
ACV	CALIFORNIA REDWOOD COAST-HUMBO	CA	LPV	0	100	0	100	2	99.992
APC	NAPA COUNTY	CA	LPV	0	100	0	100	2	99.989
APV	APPLE VALLEY	CA	LPV	0	100	0	100	3	99.994
AUN	AUBURN MUNICIPAL	CA	LPV	0	100	0	100	2	99.995
BFL	MEADOWS FIELD	CA	LPV	0	100	0	100	3	99.989
BLH	BLYTHE	CA	LP	0	100	0	100	1	99.999
BUR	BOB HOPE	CA	LP	0	100	0	100	3	99.985
C83	BYRON	CA	LPV	0	100	0	100	3	99.990
CCB	CABLE	CA	LP	0	100	0	100	3	99.990

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CCR	BUCHANAN FIELD	CA	LPV	0	100	0	100	2	99.989
CEC	JACK MC NAMARA FIELD	CA	LPV	0	100	0	100	1	99.994
CIC	CHICO MUNICIPAL	CA	LPV	0	100	0	100	2	99.995
CMA	CAMARILLO	CA	LPV	0	100	0	100	3	99.982
CNO	CHINO	CA	LPV	0	100	0	100	3	99.990
CPU	CALAVERAS CO-MAURY RASMUSSEN F	CA	LP	0	100	0	100	3	99.993
CRQ	MC CLELLAN-PALOMAR	CA	LPV	0	100	0	100	3	99.987
CVH	HOLLISTER MUNICIPAL	CA	LPV	0	100	0	100	3	99.987
DAG	BARSTOW-DAGGETT	CA	LPV	0	100	0	100	3	99.997
DWA	YOLO COUNTY	CA	LPV	0	100	0	100	2	99.992
F70	FRENCH VALLEY	CA	LPV	0	100	0	100	3	99.992
FAT	FRESNO YOSEMITE INTL	CA	LPV200	0	100	0	100	3	99.992
GOO	NEVADA COUNTY	CA	LPV	0	100	0	100	2	99.995
HAF	HALF MOON BAY	CA	LPV	0	100	0	100	2	99.987
HHR	JACK NORTHROP FIELD/HAWTHORNE	CA	LPV	0	100	0	100	3	99.984
HJO	HANFORD MUNICIPAL	CA	LPV	0	100	0	100	3	99.989
HWD	HAYWARD EXECUTIVE	CA	LPV	0	100	0	100	2	99.989
L35	BIG BEAR CITY	CA	LP	0	100	0	100	3	99.994
LAX	LOS ANGELES INTL	CA	LPV200	0	100	0	100	3	99.983
LGB	LONG BEACH /DAUGHERTY FIELD/	CA	LPV	0	100	0	100	3	99.985
LHM	LINCOLN RGNL/KARL HARDER FIELD	CA	LPV200	0	100	0	100	2	99.994
LLR	LITTLE RIVER	CA	LP	0	100	0	100	2	99.988
LSN	LOS BANOS MUNICIPAL	CA	LPV	0	100	0	100	3	99.988
LVK	LIVERMORE MUNICIPAL	CA	LPV200	0	100	0	100	3	99.989
MAE	MADERA MUNICIPAL	CA	LPV	0	100	0	100	3	99.991
MCE	MERCED RGNL/MACREADY FIELD	CA	LPV	0	100	0	100	3	99.991
MER	CASTLE	CA	LPV200	0	100	0	100	3	99.991
MHR	SACRAMENTO MATHER	CA	LPV200	0	100	0	100	2	99.993
MIT	SHAFTER-MINTER FIELD	CA	LPV	0	100	0	100	3	99.989
MOD	MODESTO CITY-CO-HARRY SHAM FLD	CA	LPV	0	100	0	100	3	99.991
MRY	MONTEREY RGNL	CA	LPV	0	100	0	100	3	99.984
MYF	MONTGOMERY-GIBBS EXECUTIVE	CA	LPV200	0	100	0	100	2	99.989
MYV	YUBA COUNTY	CA	LPV200	0	100	0	100	2	99.994
NUQ	MOFFETT FEDERAL AFLD	CA	LPV200	0	100	0	100	3	99.987
O02	NERVINO	CA	LPV	0	100	0	100	2	99.998
O08	COLUSA COUNTY	CA	LPV	0	100	0	100	2	99.992

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
O27	OAKDALE	CA	LPV	0	100	0	100	3	99.992
O32	REEDLEY MUNICIPAL	CA	LPV	0	100	0	100	3	99.992
O69	PETALUMA MUNICIPAL	CA	LPV	0	100	0	100	2	99.989
O88	RIO VISTA MUNICIPAL	CA	LP	0	100	0	100	2	99.991
OAK	METROPOLITAN OAKLAND INTL	CA	LPV200	0	100	0	100	2	99.988
ONT	ONTARIO INTL	CA	LPV200	0	100	0	100	3	99.990
OVE	OROVILLE MUNICIPAL	CA	LPV	0	100	0	100	2	99.995
OXR	OXNARD	CA	LPV	0	100	0	100	3	99.981
PMD	PALMDALE USAF PLANT 42	CA	LPV200	0	100	0	100	3	99.990
POC	BRACKETT FIELD	CA	LPV	0	100	0	100	3	99.990
PRB	PASO ROBLES MUNICIPAL	CA	LPV	0	100	0	100	3	99.982
PVF	PLACERVILLE	CA	LPV	0	100	0	100	3	99.995
RAL	RIVERSIDE MUNICIPAL	CA	LPV	0	100	0	100	3	99.990
RBL	RED BLUFF MUNICIPAL	CA	LPV	0	100	0	100	2	99.995
RDD	REDDING MUNICIPAL	CA	LPV	0	100	0	100	2	99.995
RHV	REID-HILLVIEW OF SANTA CLARA C	CA	LPV	0	100	0	100	3	99.988
RIV	MARCH ARB	CA	LPV200	0	100	0	100	3	99.992
SAC	SACRAMENTO EXECUTIVE	CA	LPV	0	100	0	100	2	99.992
SAN	SAN DIEGO INTL	CA	LPV	0	100	0	100	2	99.989
SBA	SANTA BARBARA MUNICIPAL	CA	LPV	0	100	0	100	3	99.980
SBD	SAN BERNARDINO INTL	CA	LPV	0	100	0	100	3	99.992
SBP	SAN LUIS COUNTY RGNL	CA	LPV200	0	100	0	100	3	99.980
SCK	STOCKTON METROPOLITAN	CA	LPV200	0	100	0	100	3	99.991
SDM	BROWN FIELD MUNICIPAL	CA	LPV200	0	100	0	100	2	99.989
SEE	GILLESPIE FIELD	CA	LP	0	100	0	100	2	99.989
SFO	SAN FRANCISCO INTL	CA	LPV200	0	100	0	100	2	99.987
SJC	NORMAN Y MINETA SAN JOSE INTL	CA	LPV200	0	100	0	100	3	99.987
SMF	SACRAMENTO INTL	CA	LPV200	0	100	0	100	2	99.992
SMO	SANTA MONICA MUNICIPAL	CA	LPV	0	100	0	100	3	99.984
SMX	SANTA MARIA PUB/CAPT G ALLAN H	CA	LPV200	0	100	0	100	3	99.979
SNA	JOHN WAYNE AIRPORT-ORANGE COUN	CA	LPV200	0	100	0	100	3	99.986
SNS	SALINAS MUNICIPAL	CA	LPV200	0	100	0	100	3	99.986
STS	CHARLES M SCHULZ - SONOMA COUN	CA	LPV200	0	100	0	100	2	99.989
TCY	TRACY MUNICIPAL	CA	LPV	0	100	0	100	3	99.990
TNP	TWENTYNINE PALMS	CA	LP	0	100	0	100	2	99.998
TOA	ZAMPERINI FIELD	CA	LPV	0	100	0	100	3	99.983

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TRK	TRUCKEE-TAHOE	CA	LP	0	100	0	100	3	99.997
TRM	JACQUELINE COCHRAN RGNL	CA	LPV	0	100	0	100	2	99.996
TVL	LAKE TAHOE	CA	LP	0	100	0	100	3	99.997
VCB	NUT TREE	CA	LPV	0	100	0	100	2	99.991
VCV	SOUTHERN CALIFORNIA LOGISTICS	CA	LPV	0	100	0	100	3	99.993
VIS	VISALIA MUNICIPAL	CA	LPV	0	100	0	100	3	99.990
WJF	GENERAL WM J FOX AIRFIELD	CA	LPV	0	100	0	100	3	99.990
WLW	WILLOWS-GLENN COUNTY	CA	LPV	0	100	0	100	2	99.993
WVI	WATSONVILLE MUNICIPAL	CA	LPV	0	100	0	100	3	99.986
1V6	FREMONT COUNTY	CO	LPV	0	100	0	100	1	99.999
20V	MC ELROY AIRFIELD	CO	LPV	0	100	0	100	0	100
2V5	WRAY MUNICIPAL	CO	LPV200	0	100	0	100	0	100
2V6	YUMA MUNICIPALCIPAL	CO	LPV200	0	100	0	100	0	100
4V0	RANGELY	CO	LPV	0	100	0	100	0	100
4V1	SPANISH PEAKS AIRFIELD	CO	LPV	0	100	0	100	1	99.999
AEJ	CENTRAL COLORADO RGNL	CO	LP	0	100	0	100	1	99.999
AJZ	BLAKE FIELD	CO	LPV	0	100	0	100	0	100
AKO	COLORADO PLAINS RGNL	CO	LPV	0	100	0	100	0	100
ALS	SAN LUIS VALLEY RGNL/BERGMAN F	CO	LPV200	0	100	0	100	1	99.999
APA	CENTENNIAL	CO	LPV200	0	100	0	100	0	100
BJC	ROCKY MOUNTAIN METROPOLITAN	CO	LPV200	0	100	0	100	0	100
CAG	CRAIG-MOFFAT	CO	LP	0	100	0	100	0	100
CEZ	CORTEZ MUNICIPAL	CO	LPV	0	100	0	100	0	100
COS	CITY OF COLORADO SPRINGS MUNICIPAL	CO	LPV200	0	100	0	100	1	99.999
DEN	DENVER INTL	CO	LPV200	0	100	0	100	0	100
DRO	DURANGO-LA PLATA COUNTY	CO	LPV200	0	100	0	100	1	99.999
FMM	FORT MORGAN MUNICIPAL	CO	LPV	0	100	0	100	0	100
FNL	NORTHERN COLORADO RGNL	CO	LPV200	0	100	0	100	0	100
FTG	FRONT RANGE	CO	LPV200	0	100	0	100	0	100
GJT	GRAND JUNCTION REGIONAL	CO	LPV200	0	100	0	100	0	100
GXY	GREELEY-WELD COUNTY	CO	LPV200	0	100	0	100	0	100
HDN	YAMPA VALLEY	CO	LPV200	0	100	0	100	0	100
ITR	KIT CARSON COUNTY	CO	LPV	0	100	0	100	0	100
LAA	LAMAR MUNICIPAL	CO	LPV	0	100	0	100	0	100
LHX	LA JUNTA MUNICIPAL	CO	LPV	0	100	0	100	1	99.999
LMO	VANCE BRAND	CO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MTJ	MONTROSE RGNL	CO	LPV	0	100	0	100	0	100
MVI	MONTE VISTA MUNICIPAL	CO	LPV	0	100	0	100	1	99.999
PSO	STEVENS FIELD	CO	LP	0	100	0	100	1	99.999
PUB	PUEBLO MEMORIAL	CO	LPV200	0	100	0	100	1	99.999
RCV	ASTRONAUT KENT ROMINGER	CO	LPV	0	100	0	100	1	99.999
RIL	RIFLE GARFIELD COUNTY	CO	LPV	0	100	0	100	0	100
STK	STERLING MUNICIPAL	CO	LPV	0	100	0	100	0	100
TEX	TELLURIDE RGNL	CO	LP	0	100	0	100	0	100
4B8	ROBERTSON FIELD	CT	LP	0	100	0	100	0	100
BDL	BRADLEY INTL	CT	LPV200	0	100	0	100	0	100
BDR	IGOR I SIKORSKY MEMORIAL	CT	LPV	0	100	0	100	0	100
DXR	DANBURY MUNICIPAL	CT	LP	0	100	0	100	0	100
GON	GROTON-NEW LONDON	CT	LPV	0	100	0	100	0	100
HVN	TWEED-NEW HAVEN	CT	LPV	0	100	0	100	0	100
IJD	WINDHAM	CT	LP	0	100	0	100	0	100
MMK	MERIDEN MARKHAM MUNICIPAL	CT	LP	0	100	0	100	0	100
OXC	WATERBURY-OXFORD	CT	LPV	0	100	0	100	0	100
DCA	RONALD REAGAN WASHINGTON NATIO	DC	LPV	0	100	0	100	0	100
HEF	MANASSAS RGNL/HARRY P DAVIS FI	DC	LPV	0	100	0	100	0	100
IAD	WASHINGTON DULLES INTL	DC	LPV200	0	100	0	100	0	100
33N	DELAWARE AIRPARK	DE	LP	0	100	0	100	0	100
DOV	DOVER AFB	DE	LPV200	0	100	0	100	0	100
EVY	SUMMIT	DE	LPV	0	100	0	100	0	100
GED	DELAWARE COASTAL	DE	LPV	0	100	0	100	0	100
ILG	NEW CASTLE	DE	LPV	0	100	0	100	0	100
1J0	TRI-COUNTY	FL	LP	0	100	0	100	14	99.984
24J	SUWANNEE COUNTY	FL	LPV	0	100	0	100	0	100
28J	PALATKA MUNICIPAL - LT KAY LARKIN F	FL	LPV	0	100	0	100	0	100
40J	PERRY-FOLEY	FL	LPV	0	100	0	100	0	100
54J	DEFUNIAK SPRINGS	FL	LP	0	100	0	100	26	99.971
AAF	APALACHICOLA RGNL-CLEVE RANDOL	FL	LPV	0	100	0	100	32	99.954
APF	NAPLES MUNICIPAL	FL	LPV	0	100	0	100	32	99.954
AVO	AVON PARK EXECUTIVE	FL	LPV	0	100	0	100	4	99.997
BCT	BOCA RATON	FL	LPV	0	100	0	100	6	99.997
BKV	BROOKSVILLE-TAMPA BAY RGNL	FL	LPV	0	100	0	100	0	100
BOW	BARTOW EXECUTIVE	FL	LPV	0	100	0	100	2	99.999

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CEW	BOB SIKES	FL	LPV	0	100	0	100	29	99.966
CGC	CRYSTAL RIVER-CAPTAIN TOM DAVI	FL	LP	0	100	0	100	0	100
CHN	WAUCHULA MUNICIPAL	FL	LP	0	100	0	100	3	99.998
COI	MERRITT ISLAND	FL	LPV	0	100	0	100	1	99.999
CRG	JACKSONVILLE EXECUTIVE AT CRAI	FL	LPV200	0	100	0	100	0	100
CTY	CROSS CITY	FL	LPV	0	100	0	100	0	100
DAB	DAYTONA BEACH INTL	FL	LPV200	0	100	0	100	0	100
DED	DELAND MUNICIPAL-SIDNEY H TAYLOR FI	FL	LPV	0	100	0	100	0	100
DTS	DESTIN EXECUTIVE	FL	LPV	0	100	0	100	33	99.943
ECP	NORTHWEST FLORIDA BEACHES INTL	FL	LPV200	0	100	0	100	30	99.959
EVB	NEW SMYRNA BEACH MUNICIPAL	FL	LPV	0	100	0	100	0	100
EYW	KEY WEST INTL	FL	LPV	0	100	0	100	67	99.823
F45	NORTH PALM BEACH COUNTY GENERA	FL	LPV	0	100	0	100	3	99.998
FHB	FERNANDINA BEACH MUNICIPAL	FL	LPV	0	100	0	100	0	100
FIN	FLAGLER EXECUTIVE	FL	LPV	0	100	0	100	0	100
FLL	FORT LAUDERDALE/HOLLYWOOD INTL	FL	LPV200	0	100	0	100	7	99.996
FMY	PAGE FIELD	FL	LPV	0	100	0	100	27	99.974
FPR	TREASURE COAST INTL	FL	LPV	0	100	0	100	2	99.998
FXE	FORT LAUDERDALE EXECUTIVE	FL	LPV200	0	100	0	100	7	99.996
GIF	WINTER HAVEN RGNL	FL	LPV	0	100	0	100	1	99.999
GNV	GAINESVILLE RGNL	FL	LPV	0	100	0	100	0	100
HEG	HERLONG RECREATIONAL	FL	LPV	0	100	0	100	0	100
IMM	IMMOKALEE RGNL	FL	LPV	0	100	0	100	11	99.988
ISM	KISSIMMEE GATEWAY	FL	LPV200	0	100	0	100	1	99.999
JAX	JACKSONVILLE INTL	FL	LPV200	0	100	0	100	0	100
LAL	LAKELAND LINDER INTL	FL	LPV200	0	100	0	100	1	99.999
LCQ	LAKE CITY GATEWAY	FL	LPV	0	100	0	100	0	100
LEE	LEESBURG INTL	FL	LPV	0	100	0	100	0	100
LNA	PALM BEACH COUNTY PARK	FL	LP	0	100	0	100	3	99.998
MAI	MARIANNA MUNICIPAL	FL	LPV	0	100	0	100	13	99.990
MCO	ORLANDO INTL	FL	LPV200	0	100	0	100	1	99.999
MIA	MIAMI INTL	FL	LPV200	0	100	0	100	8	99.995
MKY	MARCO ISLAND EXECUTIVE	FL	LPV	0	100	0	100	33	99.958
MLB	MELBOURNE INTL	FL	LPV200	0	100	0	100	1	99.999
MTH	THE FLORIDA KEYS MARATHON INTL	FL	LPV	0	100	0	100	48	99.933
OBE	OKEECHOBEE COUNTY	FL	LPV	0	100	0	100	6	99.996

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OCF	OCALA INTL-JIM TAYLOR FIELD	FL	LPV200	0	100	0	100	0	100
OMN	ORMOND BEACH MUNICIPAL	FL	LPV	0	100	0	100	0	100
OPF	MIAMI-OPA LOCKA EXECUTIVE	FL	LPV200	0	100	0	100	8	99.995
ORL	EXECUTIVE	FL	LPV200	0	100	0	100	1	99.999
PBI	PALM BEACH INTL	FL	LPV200	0	100	0	100	3	99.998
PCM	PLANT CITY	FL	LPV	0	100	0	100	1	99.999
PGD	PUNTA GORDA	FL	LPV200	0	100	0	100	25	99.984
PHK	PALM BEACH CO GLADES	FL	LPV	0	100	0	100	7	99.996
PIE	ST PETE-CLEARWATER INTL	FL	LPV200	0	100	0	100	23	99.985
PMP	POMPANO BEACH AIRPARK	FL	LPV	0	100	0	100	7	99.996
PNS	PENSACOLA INTL	FL	LPV200	0	100	0	100	36	99.937
RSW	SOUTHWEST FLORIDA INTL	FL	LPV	0	100	0	100	25	99.977
SEF	SEBRING RGNL	FL	LPV	0	100	0	100	5	99.997
SFB	ORLANDO SANFORD INTL	FL	LPV200	0	100	0	100	0	100
SGJ	NORTHEAST FLORIDA RGNL	FL	LPV	0	100	0	100	0	100
SRQ	SARASOTA/BRADENTON INTL	FL	LPV200	0	100	0	100	28	99.969
SUA	WITHAM FIELD	FL	LPV	0	100	0	100	2	99.998
TIX	SPACE COAST RGNL	FL	LPV200	0	100	0	100	1	99.999
TLH	TALLAHASSEE INTL	FL	LPV200	0	100	0	100	9	99.995
TMB	MIAMI EXECUTIVE	FL	LPV200	0	100	0	100	8	99.995
TNT	DADE-COLLIER TRAINING AND TRAN	FL	LPV200	0	100	0	100	10	99.994
TPA	TAMPA INTL	FL	LPV200	0	100	0	100	15	99.994
TPF	PETER O KNIGHT	FL	LP	0	100	0	100	13	99.995
TTS	NASA SHUTTLE LANDING FACILITY	FL	LPV200	0	100	0	100	0	100
VDF	TAMPA EXECUTIVE	FL	LPV	0	100	0	100	5	99.998
VNC	VENICE MUNICIPAL	FL	LP	0	100	0	100	33	99.962
VQQ	CECIL	FL	LPV200	0	100	0	100	0	100
VRB	VERO BEACH RGNL	FL	LPV200	0	100	0	100	1	99.999
X07	LAKE WALES MUNICIPAL	FL	LP	0	100	0	100	3	99.998
X14	LA BELLE MUNICIPAL	FL	LPV	0	100	0	100	8	99.995
X23	UMATILLA MUNICIPAL	FL	LP	0	100	0	100	0	100
X35	MARION COUNTY	FL	LP	0	100	0	100	0	100
X50	MASSEY RANCH AIRPARK	FL	LP	0	100	0	100	0	100
X51	MIAMI HOMESTEAD GENERAL AVIATI	FL	LPV	0	100	0	100	11	99.994
ZPH	ZEPHYRHILLS MUNICIPAL	FL	LPV	0	100	0	100	1	99.999
09J	JEKYLL ISLAND	GA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
15J	COOK COUNTY	GA	LPV	0	100	0	100	0	100
17J	DONALSONVILLE MUNICIPAL	GA	LPV	0	100	0	100	6	99.996
18A	FRANKLIN COUNTY	GA	LPV	0	100	0	100	0	100
19A	JACKSON COUNTY	GA	LPV	0	100	0	100	0	100
2J3	LOUISVILLE MUNICIPAL	GA	LPV	0	100	0	100	0	100
2J5	MILLEN	GA	LPV	0	100	0	100	0	100
3J7	GREENE COUNTY RGNL	GA	LPV	0	100	0	100	0	100
48A	COCHRAN	GA	LPV	0	100	0	100	0	100
49A	GILMER COUNTY	GA	LPV	0	100	0	100	0	100
4A4	POLK COUNTY AIRPORT- CORNELIUS	GA	LPV	0	100	0	100	0	100
4J1	BRANTLEY COUNTY	GA	LPV	0	100	0	100	0	100
4J2	BERRIEN CO	GA	LPV	0	100	0	100	0	100
4J5	QUITMAN BROOKS COUNTY	GA	LP	0	100	0	100	0	100
52A	MADISON MUNICIPAL	GA	LP	0	100	0	100	0	100
6A1	BUTLER MUNICIPAL	GA	LPV	0	100	0	100	0	100
6A2	GRIFFIN-SPALDING COUNTY	GA	LPV	0	100	0	100	0	100
70J	CAIRO-GRADY COUNTY	GA	LPV	0	100	0	100	1	99.999
75J	TURNER COUNTY	GA	LP	0	100	0	100	0	100
9A5	BARWICK LAFAYETTE	GA	LP	0	100	0	100	0	100
ABY	SOUTHWEST GEORGIA RGNL	GA	LPV200	0	100	0	100	0	100
ACJ	JIMMY CARTER RGNL	GA	LPV	0	100	0	100	0	100
AGS	AUGUSTA RGNL AT BUSH FIELD	GA	LPV200	0	100	0	100	0	100
AHN	ATHENS/BEN EPPS	GA	LPV200	0	100	0	100	0	100
AJR	HABERSHAM COUNTY	GA	LPV	0	100	0	100	0	100
AMG	BACON COUNTY	GA	LPV	0	100	0	100	0	100
ATL	HARTSFIELD - JACKSON ATLANTA I	GA	LPV200	0	100	0	100	0	100
AYS	WAYCROSS-WARE COUNTY	GA	LPV200	0	100	0	100	0	100
BGE	DECATUR COUNTY INDUSTRIAL AIR	GA	LPV200	0	100	0	100	4	99.998
BHC	BAXLEY MUNICIPAL	GA	LPV	0	100	0	100	0	100
BIJ	EARLY COUNTY	GA	LPV	0	100	0	100	2	99.999
BQK	BRUNSWICK GOLDEN ISLES	GA	LPV200	0	100	0	100	0	100
CCO	NEWNAN COWETA COUNTY	GA	LPV	0	100	0	100	0	100
CKF	CRISP COUNTY-CORDELE	GA	LPV	0	100	0	100	0	100
CNI	CHEROKEE COUNTY	GA	LPV	0	100	0	100	0	100
CSG	COLUMBUS	GA	LPV	0	100	0	100	0	100
CTJ	WEST GEORGIA RGNL - O V GRAY F	GA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CVC	COVINGTON MUNICIPAL	GA	LPV	0	100	0	100	0	100
CWV	CLAXTON-EVANS COUNTY	GA	LPV	0	100	0	100	0	100
CXU	CAMILLA-MITCHELL COUNTY	GA	LPV	0	100	0	100	0	100
CZL	TOM B DAVID FLD	GA	LPV	0	100	0	100	0	100
D73	MONROE-WALTON COUNTY	GA	LP	0	100	0	100	0	100
DBN	W H 'BUD' BARRON	GA	LPV200	0	100	0	100	0	100
DNL	DANIEL FIELD	GA	LPV	0	100	0	100	0	100
DNN	DALTON MUNICIPAL	GA	LPV	0	100	0	100	0	100
DQH	DOUGLAS MUNICIPAL	GA	LPV200	0	100	0	100	0	100
EBA	ELBERT COUNTY-PATZ FIELD	GA	LP	0	100	0	100	0	100
EZM	HEART OF GEORGIA RGNL	GA	LPV200	0	100	0	100	0	100
FFC	ATLANTA RGNL FALCON FIELD	GA	LPV	0	100	0	100	0	100
FTY	FULTON COUNTY AIRPORT-BROWN FI	GA	LPV	0	100	0	100	0	100
FZG	FITZGERALD MUNICIPAL	GA	LPV	0	100	0	100	0	100
GVL	LEE GILMER MEMORIAL	GA	LPV	0	100	0	100	0	100
HOE	HOMERVILLE	GA	LPV	0	100	0	100	0	100
HQU	THOMSON-MCDUFFIE COUNTY	GA	LPV	0	100	0	100	0	100
IIY	WASHINGTON-WILKES COUNTY	GA	LPV	0	100	0	100	0	100
JCA	JACKSON COUNTY	GA	LPV	0	100	0	100	0	100
JES	JESUP-WAYNE COUNTY	GA	LPV	0	100	0	100	0	100
JYL	PLANTATION ARPK	GA	LPV	0	100	0	100	0	100
JZP	PICKENS COUNTY	GA	LPV	0	100	0	100	0	100
LGC	LAGRANGE-CALLAWAY	GA	LPV200	0	100	0	100	0	100
LHW	WRIGHT AAF (FORT STEWART)/MIDC	GA	LPV	0	100	0	100	0	100
LZU	GWINNETT COUNTY - BRISCOE FIEL	GA	LPV200	0	100	0	100	0	100
MAC	MACON DOWNTOWN	GA	LPV	0	100	0	100	0	100
MCN	MIDDLE GEORGIA RGNL	GA	LPV200	0	100	0	100	0	100
MGR	MOULTRIE MUNICIPAL	GA	LPV200	0	100	0	100	0	100
MHP	METTER MUNICIPAL	GA	LPV	0	100	0	100	0	100
MLJ	BALDWIN COUNTY RGNL	GA	LPV	0	100	0	100	0	100
MQW	TELFAIR-WHEELER	GA	LPV	0	100	0	100	0	100
OKZ	KAOLIN FIELD	GA	LPV	0	100	0	100	0	100
OPN	THOMASTON-UPSON COUNTY	GA	LPV200	0	100	0	100	0	100
PIM	HARRIS COUNTY	GA	LPV	0	100	0	100	0	100
PUJ	PAULDING NORTHWEST ATLANTA	GA	LPV200	0	100	0	100	0	100
PXE	PERRY-HOUSTON COUNTY	GA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RMG	RICHARD B RUSSELL REGIONAL - J	GA	LPV	0	100	0	100	0	100
RVJ	SWINTON SMITH FLD AT REIDSVILL	GA	LP	0	100	0	100	0	100
RYY	COBB COUNTY INTL-MCCOLLUM FIEL	GA	LPV200	0	100	0	100	0	100
SAV	SAVANNAH/HILTON HEAD INTL	GA	LPV200	0	100	0	100	0	100
SBO	EAST GEORGIA REGIONAL	GA	LPV	0	100	0	100	0	100
TBR	STATESBORO-BULLOCH COUNTY	GA	LPV	0	100	0	100	0	100
TMA	HENRY TIFT MYERS	GA	LPV	0	100	0	100	0	100
TOC	TOCCOA RG LETOURNEAU FIELD	GA	LPV	0	100	0	100	0	100
TVI	THOMASVILLE RGNL	GA	LPV	0	100	0	100	0	100
VDI	VIDALIA RGNL	GA	LPV200	0	100	0	100	0	100
VLD	VALDOSTA RGNL	GA	LPV	0	100	0	100	0	100
VPC	CARTERSVILLE	GA	LPV	0	100	0	100	0	100
WDR	BARROW COUNTY	GA	LPV	0	100	0	100	0	100
3Y2	GEORGE L SCOTT MUNICIPAL	IA	LPV	0	100	0	100	0	100
4C8	ALBIA MUNICIPAL	IA	LPV	0	100	0	100	0	100
AIO	ATLANTIC MUNICIPAL	IA	LPV	0	100	0	100	0	100
ALO	WATERLOO RGNL	IA	LPV200	0	100	0	100	0	100
AMW	AMES MUNICIPAL	IA	LPV	0	100	0	100	0	100
AWG	WASHINGTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
BNW	BOONE MUNICIPAL	IA	LPV	0	100	0	100	0	100
BRL	SOUTHEAST IOWA RGNL	IA	LPV200	0	100	0	100	0	100
CAV	CLARION MUNICIPAL	IA	LPV	0	100	0	100	0	100
CBF	COUNCIL BLUFFS MUNICIPAL	IA	LPV200	0	100	0	100	0	100
CCY	NORTHEAST IOWA RGNL	IA	LPV	0	100	0	100	0	100
CID	THE EASTERN IOWA	IA	LPV200	0	100	0	100	0	100
CIN	ARTHUR N NEU	IA	LPV	0	100	0	100	0	100
CKP	CHEROKEE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
CSQ	CRESTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
CWI	CLINTON MUNICIPAL	IA	LPV200	0	100	0	100	0	100
DBQ	DUBUQUE RGNL	IA	LPV200	0	100	0	100	0	100
DEH	DECORAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
DNS	DENISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
DSM	DES MOINES INTL	IA	LPV200	0	100	0	100	0	100
DVN	DAVENPORT MUNICIPAL	IA	LPV200	0	100	0	100	0	100
EAG	EAGLE GROVE MUNICIPAL	IA	LPV	0	100	0	100	0	100
EBS	WEBSTER CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EFW	JEFFERSON MUNICIPAL	IA	LPV	0	100	0	100	0	100
EOK	KEOKUK MUNICIPAL	IA	LPV	0	100	0	100	0	100
EST	ESTHERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
FFL	FAIRFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
FOD	FORT DODGE RGNL	IA	LPV200	0	100	0	100	0	100
FSW	FORT MADISON MUNICIPAL	IA	LPV	0	100	0	100	0	100
FXY	FOREST CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
GCT	GUTHRIE COUNTY RGNL	IA	LPV	0	100	0	100	0	100
GFZ	GREENFIELD MUNICIPAL	IA	LPV	0	100	0	100	0	100
GGI	GRINNELL RGNL	IA	LPV	0	100	0	100	0	100
HPT	HAMPTON MUNICIPAL	IA	LPV	0	100	0	100	0	100
I75	OSCEOLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ICL	SCHENCK FIELD	IA	LPV	0	100	0	100	0	100
IFA	IOWA FALLS MUNICIPAL	IA	LPV	0	100	0	100	0	100
IIB	INDEPENDENCE MUNICIPAL	IA	LPV	0	100	0	100	0	100
IKV	ANKENY RGNL	IA	LPV200	0	100	0	100	0	100
IOW	IOWA CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
LRJ	LE MARS MUNICIPAL	IA	LPV	0	100	0	100	0	100
MCW	MASON CITY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MIW	MARSHALLTOWN MUNICIPAL	IA	LPV	0	100	0	100	0	100
MPZ	MOUNT PLEASANT MUNICIPAL	IA	LPV	0	100	0	100	0	100
MUT	MUSCATINE MUNICIPAL	IA	LPV200	0	100	0	100	0	100
MXO	MONTICELLO RGNL	IA	LP	0	100	0	100	0	100
OOA	OSKALOOSA MUNICIPAL	IA	LPV	0	100	0	100	0	100
OQW	MAQUOKETA MUNICIPAL	IA	LPV	0	100	0	100	0	100
ORC	ORANGE CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100
OTM	OTTUMWA RGNL	IA	LPV	0	100	0	100	0	100
OXV	KNOXVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
PEA	PELLA MUNICIPAL	IA	LPV	0	100	0	100	0	100
POH	POCAHONTAS MUNICIPAL	IA	LPV	0	100	0	100	0	100
PRO	PERRY MUNICIPAL	IA	LPV200	0	100	0	100	0	100
RDK	RED OAK MUNICIPAL	IA	LPV	0	100	0	100	0	100
RRQ	ROCK RAPIDS MUNICIPAL	IA	LP	0	100	0	100	0	100
SDA	SHENANDOAH MUNICIPAL	IA	LPV	0	100	0	100	0	100
SHL	SHELDON RGNL	IA	LPV	0	100	0	100	0	100
SKI	SAC CITY MUNICIPAL	IA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
SLB	STORM LAKE MUNICIPAL	IA	LPV	0	100	0	100	0	100
SPW	SPENCER MUNICIPAL	IA	LPV200	0	100	0	100	0	100
SUX	SIOUX GATEWAY/BRIG GEN BUD DAY	IA	LPV200	0	100	0	100	0	100
SXK	SIOUX COUNTY RGNL	IA	LPV200	0	100	0	100	0	100
TNU	NEWTON MUNICIPAL-EARL JOHNSON FIELD	IA	LPV200	0	100	0	100	0	100
TVK	CENTERVILLE MUNICIPAL	IA	LPV	0	100	0	100	0	100
TZT	BELLE PLAINE MUNICIPAL	IA	LPV	0	100	0	100	0	100
VTI	VINTON VETERANS MEMORIAL ARPK	IA	LPV	0	100	0	100	0	100
1U7	BEAR LAKE COUNTY	ID	LPV	0	100	0	100	0	100
BOI	BOISE AIR TERMINAL/GOWEN FLD	ID	LPV200	0	100	0	100	0	100
COE	COEUR D'ALENE - PAPPY BOYINGTO	ID	LPV200	0	100	0	100	0	100
DIJ	DRIGGS-REED MEMORIAL	ID	LP	0	100	0	100	0	100
EUL	CALDWELL INDUSTRIAL	ID	LPV	0	100	0	100	1	99.999
GNG	GOODING MUNICIPAL	ID	LPV	0	100	0	100	0	100
IDA	IDAHO FALLS RGNL	ID	LPV200	0	100	0	100	0	100
JER	JEROME COUNTY	ID	LPV	0	100	0	100	0	100
LWS	LEWISTON-NEZ PERCE COUNTY	ID	LPV200	0	100	0	100	0	100
MAN	NAMPA MUNICIPAL	ID	LPV	0	100	0	100	1	99.999
MYL	MC CALL MUNICIPAL	ID	LPV	0	100	0	100	0	100
PIH	POCATELLO RGNL	ID	LPV200	0	100	0	100	0	100
SUN	FRIEDMAN MEMORIAL	ID	LP	0	100	0	100	0	100
SZT	SANDPOINT	ID	LP	0	100	0	100	0	100
TWF	JOSLIN FIELD - MAGIC VALLEY RG	ID	LPV200	0	100	0	100	0	100
U76	MOUNTAIN HOME MUNICIPAL	ID	LPV	0	100	0	100	0	100
1H2	EFFINGHAM COUNTY MEMORIAL	IL	LPV	0	100	0	100	0	100
3LF	LITCHFIELD MUNICIPAL	IL	LPV	0	100	0	100	0	100
3MY	MOUNT HAWLEY AUXILIARY	IL	LPV	0	100	0	100	0	100
AJG	MOUNT CARMEL MUNICIPAL	IL	LPV	0	100	0	100	0	100
ALN	ST LOUIS RGNL	IL	LPV200	0	100	0	100	0	100
ARR	AURORA MUNICIPAL	IL	LPV200	0	100	0	100	0	100
BLV	SCOTT AFB/MIDAMERICA	IL	LPV200	0	100	0	100	0	100
BMI	CENTRAL IL RGNL ARPT AT BLOOMI	IL	LPV	0	100	0	100	0	100
C15	PEKIN MUNICIPAL	IL	LPV	0	100	0	100	0	100
C73	DIXON MUNICIPAL-CHARLES R WALGREEN	IL	LPV	0	100	0	100	0	100
C75	MARSHALL COUNTY	IL	LP	0	100	0	100	0	100
CIR	CAIRO RGNL	IL	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CMI	UNIVERSITY OF ILLINOIS-WILLARD	IL	LPV200	0	100	0	100	0	100
CPS	ST LOUIS DOWNTOWN	IL	LPV200	0	100	0	100	0	100
CTK	INGERSOLL	IL	LPV	0	100	0	100	0	100
CUL	CARMI MUNICIPAL	IL	LP	0	100	0	100	0	100
DEC	DECATUR	IL	LPV200	0	100	0	100	0	100
DKB	DE KALB TAYLOR MUNICIPAL	IL	LPV	0	100	0	100	0	100
DNV	VERMILION REGIONAL	IL	LPV	0	100	0	100	0	100
DPA	DUPAGE	IL	LPV200	0	100	0	100	0	100
ENL	CENTRALIA MUNICIPAL	IL	LPV	0	100	0	100	0	100
EZI	KEWANEE MUNICIPAL	IL	LPV	0	100	0	100	0	100
FEP	ALBERTUS	IL	LPV	0	100	0	100	0	100
FOA	FLORA MUNICIPAL	IL	LPV	0	100	0	100	0	100
GBG	GALESBURG MUNICIPAL	IL	LPV200	0	100	0	100	0	100
GRE	GREENVILLE	IL	LPV	0	100	0	100	0	100
HSB	HARRISBURG-RALEIGH	IL	LPV	0	100	0	100	0	100
I63	MOUNT STERLING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IGQ	LANSING MUNICIPAL	IL	LPV	0	100	0	100	0	100
IKK	GREATER KANKAKEE	IL	LPV200	0	100	0	100	0	100
LOT	LEWIS UNIVERSITY	IL	LPV200	0	100	0	100	0	100
LWV	LAWRENCEVILLE-VINCENNES INTL	IL	LPV200	0	100	0	100	0	100
MDW	CHICAGO MIDWAY INTL	IL	LPV	0	100	0	100	0	100
MLI	QUAD CITY INTL	IL	LPV200	0	100	0	100	0	100
MQB	MACOMB MUNICIPAL	IL	LPV200	0	100	0	100	0	100
MTO	COLES COUNTY MEMORIAL	IL	LPV200	0	100	0	100	0	100
MVN	MOUNT VERNON	IL	LPV	0	100	0	100	0	100
MWA	VETERANS AIRPORT OF SOUTHERN I	IL	LPV200	0	100	0	100	0	100
OLY	OLNEY-NOBLE	IL	LPV	0	100	0	100	0	100
ORD	CHICAGO O'HARE INTL	IL	LPV200	0	100	0	100	0	100
PIA	GENERAL DOWNING - PEORIA INTL	IL	LPV	0	100	0	100	0	100
PJY	PINCKNEYVILLE-DU QUOIN	IL	LPV	0	100	0	100	0	100
PNT	PONTIAC MUNICIPAL	IL	LPV	0	100	0	100	0	100
PPQ	PITTSFIELD PENSTONE MUNICIPAL	IL	LPV	0	100	0	100	0	100
PRG	EDGAR COUNTY	IL	LPV	0	100	0	100	0	100
PWK	CHICAGO EXECUTIVE	IL	LPV	0	100	0	100	0	100
RFD	CHICAGO/ROCKFORD INTL	IL	LPV200	0	100	0	100	0	100
RPJ	ROCHELLE MUNICIPAL AIRPORT-KORITZ F	IL	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
RSV	CRAWFORD CO	IL	LPV	0	100	0	100	0	100
SAR	SPARTA COMMUNICIPALTY-HUNTER FIELD	IL	LPV	0	100	0	100	0	100
SFY	TRI-TOWNSHIP	IL	LP	0	100	0	100	0	100
SLO	SALEM-LECKRONE	IL	LPV200	0	100	0	100	0	100
SPI	ABRAHAM LINCOLN CAPITAL	IL	LPV	0	100	0	100	0	100
SQI	WHITESIDE CO ARPT-JOS H BITTOR	IL	LPV200	0	100	0	100	0	100
TIP	RANTOUL NATL AVN CNTR-FRANK EL	IL	LPV	0	100	0	100	0	100
UGN	WAUKEGAN NATIONAL	IL	LPV	0	100	0	100	0	100
UIN	QUINCY RGNL-BALDWIN FIELD	IL	LPV200	0	100	0	100	0	100
VYS	ILLINOIS VALLEY RGNL-WALTER A	IL	LPV	0	100	0	100	0	100
2R2	HENDRICKS COUNTY-GORDON GRAHAM	IN	LPV	0	100	0	100	0	100
50I	KENTLAND MUNICIPAL	IN	LPV	0	100	0	100	0	100
AID	ANDERSON MUNICIPAL-DARLINGTON FIELD	IN	LPV	0	100	0	100	0	100
ASW	WARSAW MUNICIPAL	IN	LPV	0	100	0	100	0	100
BAK	COLUMBUS MUNICIPAL	IN	LPV	0	100	0	100	0	100
BFR	VIRGIL I GRISSOM MUNICIPAL	IN	LP	0	100	0	100	0	100
BMG	MONROE COUNTY	IN	LPV200	0	100	0	100	0	100
C62	KENDALLVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
C65	PLYMOUTH MUNICIPAL	IN	LPV	0	100	0	100	0	100
CEV	METTEL FIELD	IN	LPV	0	100	0	100	0	100
CFJ	CRAWFORDSVILLE RGNL	IN	LPV	0	100	0	100	0	100
DCY	DAVIESS COUNTY	IN	LPV	0	100	0	100	0	100
EKM	ELKHART MUNICIPAL	IN	LPV	0	100	0	100	0	100
EVV	EVANSVILLE RGNL	IN	LPV200	0	100	0	100	0	100
EYE	EAGLE CREEK AIRPARK	IN	LPV	0	100	0	100	0	100
FKR	FRANKFORT MUNICIPAL	IN	LPV	0	100	0	100	0	100
FRH	FRENCH LICK MUNICIPAL	IN	LPV	0	100	0	100	0	100
FWA	FORT WAYNE INTL	IN	LPV200	0	100	0	100	0	100
GEZ	SHELBYVILLE MUNICIPAL	IN	LPV	0	100	0	100	0	100
GGP	LOGANSPORT/CASS COUNTY	IN	LPV200	0	100	0	100	0	100
GPC	PUTNAM COUNTY RGNL	IN	LPV	0	100	0	100	0	100
GSH	GOSHEN MUNICIPAL	IN	LPV	0	100	0	100	0	100
GWB	DE KALB COUNTY	IN	LPV	0	100	0	100	0	100
GYY	GARY/CHICAGO INTL	IN	LPV200	0	100	0	100	0	100
HFY	INDY SOUTH GREENWOOD	IN	LPV	0	100	0	100	0	100
HNB	HUNTINGBURG	IN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HUF	TERRE HAUTE RGNL	IN	LPV200	0	100	0	100	0	100
I22	RANDOLPH COUNTY	IN	LPV	0	100	0	100	0	100
I76	PERU MUNICIPAL	IN	LPV	0	100	0	100	0	100
IMS	MADISON MUNICIPAL	IN	LPV	0	100	0	100	0	100
IND	INDIANAPOLIS INTL	IN	LPV200	0	100	0	100	0	100
JVY	CLARK RGNL	IN	LPV200	0	100	0	100	0	100
LAF	PURDUE UNIVERSITY	IN	LPV	0	100	0	100	0	100
MCX	WHITE COUNTY	IN	LP	0	100	0	100	0	100
MIE	DELAWARE COUNTY RGNL	IN	LPV	0	100	0	100	0	100
MQJ	INDIANAPOLIS RGNL	IN	LPV200	0	100	0	100	0	100
MZZ	MARION MUNICIPAL	IN	LPV	0	100	0	100	0	100
OKK	KOKOMO MUNICIPAL	IN	LPV200	0	100	0	100	0	100
OVO	NORTH VERNON	IN	LPV	0	100	0	100	0	100
OXI	STARKE COUNTY	IN	LPV	0	100	0	100	0	100
PLD	PORTLAND MUNICIPAL	IN	LPV	0	100	0	100	0	100
PPO	LA PORTE MUNICIPAL	IN	LPV	0	100	0	100	0	100
RCR	FULTON COUNTY	IN	LPV	0	100	0	100	0	100
RID	RICHMOND MUNICIPAL	IN	LPV200	0	100	0	100	0	100
RWN	ARENS FIELD	IN	LPV	0	100	0	100	0	100
RZL	JASPER COUNTY	IN	LPV	0	100	0	100	0	100
SBN	SOUTH BEND INTL	IN	LPV200	0	100	0	100	0	100
SER	FREEMAN MUNICIPAL	IN	LPV	0	100	0	100	0	100
SIV	SULLIVAN COUNTY	IN	LPV	0	100	0	100	0	100
SMD	SMITH FIELD	IN	LPV	0	100	0	100	0	100
TEL	PERRY COUNTY MUNICIPAL	IN	LP	0	100	0	100	0	100
TYQ	INDIANAPOLIS EXECUTIVE	IN	LPV	0	100	0	100	0	100
UWL	NEW CASTLE HENRY COUNTY MARLAT	IN	LPV	0	100	0	100	0	100
VPZ	PORTER COUNTY RGNL	IN	LPV	0	100	0	100	0	100
3AU	AUGUSTA MUNICIPAL	KS	LP	0	100	0	100	0	100
3K3	SYRACUSE-HAMILTON COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
3K8	COMANCHE COUNTY	KS	LPV	0	100	0	100	0	100
5K2	TRIBUNE MUNICIPAL	KS	LPV	0	100	0	100	0	100
9K8	KINGMAN AIRPORT - CLYDE CESSNA	KS	LP	0	100	0	100	0	100
AAO	COLONEL JAMES JABARA	KS	LPV	0	100	0	100	0	100
ADT	ATWOOD-RAWLINS COUNTY CITY-COU	KS	LPV	0	100	0	100	0	100
ANY	ANTHONY MUNICIPAL	KS	LPV	0	100	0	100	0	100

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
NRN	NORTON MUNICIPAL	KS	LPV	0	100	0	100	0	100
OEL	OAKLEY MUNICIPAL	KS	LPV	0	100	0	100	0	100
OIN	OBERLIN MUNICIPAL	KS	LPV	0	100	0	100	0	100
OJC	JOHNSON COUNTY EXECUTIVE	KS	LPV	0	100	0	100	0	100
OWI	OTTAWA MUNICIPAL	KS	LPV	0	100	0	100	0	100
PHG	PHILLIPSBURG MUNICIPAL	KS	LPV	0	100	0	100	0	100
PPF	TRI-CITY	KS	LPV	0	100	0	100	0	100
PTS	ATKINSON MUNICIPAL	KS	LPV	0	100	0	100	0	100
PTT	PRATT RGNL	KS	LPV	0	100	0	100	0	100
RCP	ROOKS COUNTY RGNL	KS	LPV	0	100	0	100	0	100
RPB	BELLEVILLE MUNICIPAL	KS	LPV	0	100	0	100	0	100
RSL	RUSSELL MUNICIPAL	KS	LPV	0	100	0	100	0	100
SLN	SALINA RGNL	KS	LPV	0	100	0	100	0	100
SYF	CHEYENNE COUNTY MUNICIPAL	KS	LPV	0	100	0	100	0	100
TOP	PHILIP BILLARD MUNICIPAL	KS	LPV	0	100	0	100	0	100
TQK	SCOTT CITY MUNICIPAL	KS	LPV	0	100	0	100	0	100
UKL	COFFEY COUNTY	KS	LPV	0	100	0	100	0	100
ULS	ULYSSES	KS	LPV	0	100	0	100	0	100
WLD	STROTHER FIELD	KS	LPV	0	100	0	100	0	100
0I8	CYNTHIANA-HARRISON COUNTY	KY	LP	0	100	0	100	0	100
18I	MC CREARY COUNTY	KY	LP	0	100	0	100	0	100
27K	GEORGETOWN-SCOTT COUNTY RGNL	KY	LPV200	0	100	0	100	0	100
2I0	MADISONVILLE RGNL	KY	LPV	0	100	0	100	0	100
2M0	PRINCETON-CALDWELL COUNTY	KY	LPV	0	100	0	100	0	100
4M7	RUSSELLVILLE-LOGAN COUNTY	KY	LPV	0	100	0	100	0	100
5M9	MARION-CRITTENDEN COUNTY	KY	LPV	0	100	0	100	0	100
6I2	LEBANON SPRINGFIELD-GEORGE HOE	KY	LPV	0	100	0	100	0	100
AAS	TAYLOR COUNTY	KY	LPV	0	100	0	100	0	100
BRY	SAMUELS FIELD	KY	LPV	0	100	0	100	0	100
BWG	BOWLING GREEN-WARREN COUNTY RG	KY	LPV200	0	100	0	100	0	100
BYL	WILLIAMSBURG-WHITLEY COUNTY	KY	LPV	0	100	0	100	0	100
CEY	KYLE-OAKLEY FIELD	KY	LPV	0	100	0	100	0	100
CPF	WENDELL H FORD	KY	LPV200	0	100	0	100	0	100
CVG	CINCINNATI/NORTHERN KENTUCKY I	KY	LPV200	0	100	0	100	0	100
DVK	STUART POWELL FIELD	KY	LPV	0	100	0	100	0	100
DWU	ASHLAND RGNL	KY	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EHR	HENDERSON CITY-COUNTY	KY	LPV	0	100	0	100	0	100
EKQ	WAYNE COUNTY	KY	LPV	0	100	0	100	0	100
EKX	ADDINGTON FIELD	KY	LPV	0	100	0	100	0	100
FFT	CAPITAL CITY	KY	LPV	0	100	0	100	0	100
FGX	FLEMING-MASON	KY	LPV	0	100	0	100	0	100
GLW	GLASGOW MUNICIPAL	KY	LPV	0	100	0	100	0	100
HVC	HOPKINSVILLE-CHRISTIAN COUNTY	KY	LPV	0	100	0	100	0	100
I93	BRECKINRIDGE COUNTY	KY	LPV	0	100	0	100	0	100
IOB	MOUNT STERLING-MONTGOMERY COUN	KY	LPV	0	100	0	100	0	100
JQD	OHIO COUNTY	KY	LPV	0	100	0	100	0	100
K24	RUSSELL COUNTY	KY	LPV	0	100	0	100	0	100
K62	GENE SNYDER	KY	LP	0	100	0	100	0	100
KY8	HANCOCK CO-RON LEWIS FIELD	KY	LPV	0	100	0	100	0	100
LEX	BLUE GRASS	KY	LPV	0	100	0	100	0	100
LOU	BOWMAN FIELD	KY	LPV	0	100	0	100	0	100
LOZ	LONDON-CORBIN ARPT-MAGEE FIELD	KY	LPV	0	100	0	100	0	100
M20	LEITCHFIELD-GRAYSON CO	KY	LPV	0	100	0	100	0	100
M21	MUHLENBERG COUNTY	KY	LP	0	100	0	100	0	100
M25	MAYFIELD GRAVES COUNTY	KY	LPV	0	100	0	100	0	100
OWB	OWENSBORO-DAVIESS COUNTY RGNL	KY	LPV200	0	100	0	100	0	100
PAH	BARKLEY RGNL	KY	LPV200	0	100	0	100	0	100
PBX	PIKE COUNTY-HATCHER FIELD	KY	LPV200	0	100	0	100	0	100
RGA	CENTRAL KENTUCKY RGNL	KY	LPV	0	100	0	100	0	100
SDF	LOUISVILLE MUHAMMAD ALI INTL	KY	LPV200	0	100	0	100	0	100
SJS	BIG SANDY RGNL	KY	LPV	0	100	0	100	0	100
SME	LAKE CUMBERLAND RGNL	KY	LPV	0	100	0	100	0	100
SYM	MOREHEAD-ROWAN COUNTY CLYDE A	KY	LPV200	0	100	0	100	0	100
TWT	STURGIS MUNICIPAL	KY	LPV	0	100	0	100	0	100
TZV	TOMPKINSVILLE-MONROE COUNTY	KY	LPV	0	100	0	100	0	100
0R4	CONCORDIA PARISH	LA	LPV	0	100	0	100	0	100
0R7	THE RED RIVER	LA	LPV	0	100	0	100	0	100
3R4	HART	LA	LPV	0	100	0	100	0	100
3R7	JENNINGS	LA	LPV	0	100	0	100	6	99.997
5R8	DE QUINCY INDUSTRIAL AIRPARK	LA	LPV	0	100	0	100	0	100
ACP	ALLEN PARISH	LA	LPV	0	100	0	100	0	100
AEX	ALEXANDRIA INTL	LA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
APS	PORT OF SOUTH LOUISIANA EXECUT	LA	LPV	0	100	0	100	39	99.942
ARA	ACADIANA RGNL	LA	LPV200	0	100	0	100	23	99.977
BQP	MOREHOUSE MEMORIAL	LA	LPV	0	100	0	100	0	100
BTR	BATON ROUGE METROPOLITAN` RYAN	LA	LPV200	0	100	0	100	22	99.985
BXA	GEORGE R CARR MEMORIAL AIR FLD	LA	LPV	0	100	0	100	29	99.982
CWF	CHENNAULT INTL	LA	LPV200	0	100	0	100	1	99.999
DTN	SHREVEPORT DOWNTOWN	LA	LPV	0	100	0	100	0	100
ESF	ESLER RGNL	LA	LPV200	0	100	0	100	0	100
F88	JONESBORO	LA	LP	0	100	0	100	0	100
GAO	SOUTH LAFOURCHE LEONARD MILLER	LA	LPV200	0	100	0	100	56	99.848
HDC	HAMMOND NORTHSHORE RGNL	LA	LPV200	0	100	0	100	31	99.973
HUM	HOUMA-TERREBONNE	LA	LPV200	0	100	0	100	49	99.885
HZR	FALSE RIVER RGNL	LA	LPV	0	100	0	100	13	99.994
IER	NATCHITOCHES RGNL	LA	LPV	0	100	0	100	0	100
IYA	ABBEVILLE CHRIS CRUSTA MEMORIA	LA	LPV	0	100	0	100	21	99.981
L39	LEESVILLE	LA	LPV	0	100	0	100	0	100
LCH	LAKE CHARLES RGNL	LA	LPV200	0	100	0	100	2	99.999
LFT	LAFAYETTE RGNL/PAUL FOURNET FI	LA	LPV200	0	100	0	100	19	99.987
M79	JOHN H HOOKS JR MEMORIAL	LA	LPV	0	100	0	100	0	100
MLU	MONROE RGNL	LA	LPV200	0	100	0	100	0	100
MSY	LOUIS ARMSTRONG NEW ORLEANS IN	LA	LPV200	0	100	0	100	43	99.918
NEW	LAKEFRONT	LA	LPV	0	100	0	100	45	99.916
OPL	ST LANDRY PARISH-AHART FIELD	LA	LPV	0	100	0	100	7	99.997
PTN	HARRY P WILLIAMS MEMORIAL	LA	LPV200	0	100	0	100	39	99.934
REG	LOUISIANA RGNL	LA	LPV	0	100	0	100	32	99.960
RSN	RUSTON RGNL	LA	LPV	0	100	0	100	0	100
SHV	SHREVEPORT RGNL	LA	LPV200	0	100	0	100	0	100
SPH	SPRINGHILL	LA	LPV	0	100	0	100	0	100
TVR	VICKSBURG TALLULAH RGNL	LA	LPV200	0	100	0	100	0	100
UXL	SOUTHLAND FIELD	LA	LPV	0	100	0	100	1	99.999
3B0	SOUTHBRIDGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ACK	NANTUCKET MEMORIAL	MA	LPV200	0	100	0	100	0	100
BAF	WESTFIELD-BARNES RGNL	MA	LPV	0	100	0	100	0	100
BED	LAURENCE G HANSCOM FLD	MA	LPV200	0	100	0	100	0	100
BOS	GENERAL EDWARD LAWRENCE LOGAN	MA	LPV200	0	100	0	100	0	100
BVY	BEVERLY RGNL	MA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
EWB	NEW BEDFORD RGNL	MA	LPV200	0	100	0	100	0	100
GBR	WALTER J KOLADZA	MA	LP	0	100	0	100	0	100
GHG	MARSHFIELD MUNICIPAL - GEORGE HARLO	MA	LPV	0	100	0	100	0	100
HYA	BARNSTABLE MUNICIPAL-BOARDMAN/POLAN	MA	LPV200	0	100	0	100	0	100
LWM	LAWRENCE MUNICIPAL	MA	LPV200	0	100	0	100	0	100
MVY	MARTHA'S VINEYARD	MA	LPV200	0	100	0	100	0	100
ORE	ORANGE MUNICIPAL	MA	LPV	0	100	0	100	0	100
ORH	WORCESTER RGNL	MA	LPV200	0	100	0	100	0	100
OWD	NORWOOD MEMORIAL	MA	LPV	0	100	0	100	0	100
PSF	PITTSFIELD MUNICIPAL	MA	LPV	0	100	0	100	0	100
PVC	PROVINCETOWN MUNICIPAL	MA	LPV200	0	100	0	100	0	100
PYM	PLYMOUTH MUNICIPAL	MA	LPV200	0	100	0	100	0	100
TAN	TAUNTON MUNICIPAL - KING FIELD	MA	LPV	0	100	0	100	0	100
2G4	GARRETT COUNTY	MD	LPV	0	100	0	100	0	100
2W5	MARYLAND	MD	LP	0	100	0	100	0	100
2W6	ST MARY'S COUNTY RGNL	MD	LPV	0	100	0	100	0	100
BWI	BALTIMORE/WASHINGTON INTL THUR	MD	LPV200	0	100	0	100	0	100
CBE	GREATER CUMBERLAND RGNL	MD	LPV	0	100	0	100	0	100
CGE	CAMBRIDGE-DORCHESTER RGNL	MD	LPV	0	100	0	100	0	100
DMW	CARROLL COUNTY RGNL/JACK B POA	MD	LPV200	0	100	0	100	0	100
ESN	EASTON/NEWNAM FIELD	MD	LPV200	0	100	0	100	0	100
FDK	FREDERICK MUNICIPAL	MD	LPV	0	100	0	100	0	100
GAI	MONTGOMERY COUNTY AIRPARK	MD	LPV	0	100	0	100	0	100
HGR	HAGERSTOWN RGNL-RICHARD A HENS	MD	LPV200	0	100	0	100	0	100
MTN	MARTIN STATE	MD	LPV	0	100	0	100	0	100
OXB	OCEAN CITY MUNICIPAL	MD	LPV	0	100	0	100	0	100
SBY	SALISBURY-OCEAN CITY WICOMICO	MD	LPV200	0	100	0	100	0	100
W29	BAY BRIDGE	MD	LPV	0	100	0	100	0	100
1B0	DEXTER RGNL	ME	LP	0	100	0	100	0	100
2B7	PITTSFIELD MUNICIPAL	ME	LPV	0	100	0	100	0	100
3B1	GREENVILLE MUNICIPAL	ME	LPV	0	100	0	100	0	100
59B	NEWTON FIELD	ME	LP	0	100	0	100	0	100
81B	OXFORD COUNTY RGNL	ME	LP	0	100	0	100	0	100
AUG	AUGUSTA STATE	ME	LPV200	0	100	0	100	0	100
BGR	BANGOR INTL	ME	LPV200	0	100	0	100	0	100
BHB	HANCOCK COUNTY-BAR HARBOR	ME	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BST	BELFAST MUNICIPAL	ME	LPV	0	100	0	100	0	100
BXM	BRUNSWICK EXECUTIVE	ME	LPV200	0	100	0	100	0	100
CAR	CARIBOU MUNICIPAL	ME	LPV	0	100	0	100	0	100
EPM	EASTPORT MUNICIPAL	ME	LPV	0	100	0	100	0	100
FVE	NORTHERN AROOSTOOK RGNL	ME	LPV200	0	100	0	100	0	100
HUL	HOULTON INTL	ME	LP	0	100	0	100	0	100
IZG	EASTERN SLOPES RGNL	ME	LPV	0	100	0	100	0	100
LEW	AUBURN/LEWISTON MUNICIPAL	ME	LPV200	0	100	0	100	0	100
LRG	LINCOLN RGNL	ME	LP	0	100	0	100	0	100
MLT	MILLINOCKET MUNICIPAL	ME	LPV	0	100	0	100	0	100
OWK	CENTRAL MAINE ARPT OF NORRIDGE	ME	LPV	0	100	0	100	0	100
PQI	PRESQUE ISLE INTL	ME	LPV200	0	100	0	100	0	100
PWM	PORTLAND INTL JETPORT	ME	LPV200	0	100	0	100	0	100
RKD	KNOX COUNTY RGNL	ME	LPV200	0	100	0	100	0	100
SFM	SANFORD SEACOAST RGNL	ME	LPV200	0	100	0	100	0	100
WVL	WATERVILLE ROBERT LAFLEUR	ME	LPV200	0	100	0	100	0	100
48D	CLARE MUNICIPAL	MI	LP	0	100	0	100	0	100
4D0	ABRAMS MUNICIPAL	MI	LP	0	100	0	100	0	100
6Y1	BOIS BLANC ISLAND	MI	LP	0	100	0	100	0	100
77G	MARLETTE TOWNSHIP	MI	LPV	0	100	0	100	0	100
9D9	HASTINGS	MI	LPV	0	100	0	100	0	100
ACB	ANTRIM COUNTY	MI	LPV	0	100	0	100	0	100
ADG	LENAWEE COUNTY	MI	LPV	0	100	0	100	0	100
AMN	GRATIOT COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
ANJ	SAULT STE MARIE MUNICIPAL/SANDERSON	MI	LPV	0	100	0	100	0	100
APN	ALPENA COUNTY RGNL	MI	LPV	0	100	0	100	0	100
ARB	ANN ARBOR MUNICIPAL	MI	LPV	0	100	0	100	0	100
AZO	KALAMAZOO/BATTLE CREEK INTL	MI	LPV200	0	100	0	100	0	100
BAX	HURON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
BEH	SOUTHWEST MICHIGAN RGNL	MI	LPV200	0	100	0	100	0	100
BIV	WEST MICHIGAN RGNL	MI	LPV	0	100	0	100	0	100
BTL	W K KELLOGG	MI	LPV200	0	100	0	100	0	100
C04	OCEANA COUNTY	MI	LPV	0	100	0	100	0	100
C20	ANDREWS UNIVERSITY AIRPARK	MI	LP	0	100	0	100	0	100
CAD	WEXFORD COUNTY	MI	LPV200	0	100	0	100	0	100
CFS	TUSCOLA AREA	MI	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CIU	CHIPPEWA COUNTY INTL	MI	LPV	0	100	0	100	0	100
CMX	HOUGHTON COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
CVX	CHARLEVOIX MUNICIPAL	MI	LPV	0	100	0	100	0	100
D95	DUPONT-LAPEER	MI	LP	0	100	0	100	0	100
DET	COLEMAN A YOUNG MUNICIPAL	MI	LPV	0	100	0	100	0	100
DTW	DETROIT METROPOLITAN WAYNE COU	MI	LPV200	0	100	0	100	0	100
ERY	LUCE COUNTY	MI	LPV	0	100	0	100	0	100
ESC	DELTA COUNTY	MI	LPV200	0	100	0	100	0	100
FFX	FREMONT MUNICIPAL	MI	LPV	0	100	0	100	0	100
FNT	BISHOP INTL	MI	LPV200	0	100	0	100	0	100
GDW	GLADWIN ZETTEL MEMORIAL	MI	LP	0	100	0	100	0	100
GLR	GAYLORD RGNL	MI	LPV	0	100	0	100	0	100
GRR	GERALD R FORD INTL	MI	LPV200	0	100	0	100	0	100
HTL	ROSCOMMON COUNTY - BLODGETT ME	MI	LP	0	100	0	100	0	100
HYX	SAGINAW COUNTY H W BROWNE	MI	LPV200	0	100	0	100	0	100
IKW	JACK BARSTOW	MI	LPV	0	100	0	100	0	100
IMT	FORD	MI	LPV	0	100	0	100	0	100
IRS	KIRSCH MUNICIPAL	MI	LPV	0	100	0	100	0	100
ISQ	SCHOOLCRAFT COUNTY	MI	LP	0	100	0	100	0	100
IWD	GOGEBIC-IRON COUNTY	MI	LPV200	0	100	0	100	0	100
JXN	JACKSON COUNTY-REYNOLDS FIELD	MI	LPV200	0	100	0	100	0	100
JYM	HILLSDALE MUNICIPAL	MI	LPV	0	100	0	100	0	100
LAN	CAPITAL REGION INTL	MI	LPV200	0	100	0	100	0	100
LDM	MASON COUNTY	MI	LPV	0	100	0	100	0	100
MBL	MANISTEE CO-BLACKER	MI	LPV200	0	100	0	100	0	100
MBS	MBS INTL	MI	LPV200	0	100	0	100	0	100
MCD	MACKINAC ISLAND	MI	LPV	0	100	0	100	0	100
MKG	MUSKEGON COUNTY	MI	LPV200	0	100	0	100	0	100
MNM	MENOMINEE RGNL	MI	LPV200	0	100	0	100	0	100
MOP	MOUNT PLEASANT MUNICIPAL	MI	LPV	0	100	0	100	0	100
N98	BOYNE CITY MUNICIPAL	MI	LP	0	100	0	100	0	100
OEB	BRANCH COUNTY MEMORIAL	MI	LPV	0	100	0	100	0	100
OGM	ONTONAGON COUNTY - SCHUSTER FI	MI	LPV	0	100	0	100	0	100
OSC	OSCODA-WURTSMITH	MI	LPV200	0	100	0	100	0	100
OZW	LIVINGSTON COUNTY SPENCER J HA	MI	LPV200	0	100	0	100	0	100
PHN	ST CLAIR COUNTY INTL	MI	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PLN	PELLSTON RGNL AIRPORT OF EMMET	MI	LPV200	0	100	0	100	0	100
PTK	OAKLAND COUNTY INTL	MI	LPV200	0	100	0	100	0	100
RMY	BROOKS FIELD	MI	LP	0	100	0	100	0	100
RNP	OWOSSO COMMUNICIPALTY	MI	LPV	0	100	0	100	0	100
RQB	ROBEN-HOOD	MI	LPV200	0	100	0	100	0	100
SAW	SAWYER INTL	MI	LPV200	0	100	0	100	0	100
SLH	CHEBOYGAN COUNTY	MI	LPV	0	100	0	100	0	100
TEW	MASON JEWETT FIELD	MI	LP	0	100	0	100	0	100
TTF	CUSTER	MI	LPV	0	100	0	100	0	100
TVC	CHERRY CAPITAL	MI	LPV200	0	100	0	100	0	100
Y31	WEST BRANCH COMMUNICIPALTY	MI	LP	0	100	0	100	0	100
YIP	WILLOW RUN	MI	LPV200	0	100	0	100	0	100
16D	PERHAM MUNICIPAL	MN	LPV	0	100	0	100	0	100
3N8	MAHNOMEN COUNTY	MN	LPV	0	100	0	100	0	100
ACQ	WASECA MUNICIPAL	MN	LPV	0	100	0	100	0	100
ADC	WADENA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AEL	ALBERT LEA MUNICIPAL	MN	LPV	0	100	0	100	0	100
AIT	AITKIN MUNICIPAL-STEVE KURTZ FIELD	MN	LPV	0	100	0	100	0	100
ANE	ANOKA COUNTY-BLAINE (JANES FIE	MN	LPV	0	100	0	100	0	100
AUM	AUSTIN MUNICIPAL	MN	LPV200	0	100	0	100	0	100
AXN	CHANDLER FIELD	MN	LPV	0	100	0	100	0	100
BBB	BENSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
BDE	BAUDETTE INTL	MN	LPV	0	100	0	100	0	100
BDH	WILLMAR MUNICIPAL-JOHN L RICE FIELD	MN	LPV200	0	100	0	100	0	100
BJI	BEMIDJI RGNL	MN	LPV200	0	100	0	100	0	100
BRD	BRAINERD LAKES RGNL	MN	LPV200	0	100	0	100	0	100
CBG	CAMBRIDGE MUNICIPAL	MN	LPV	0	100	0	100	0	100
CFE	BUFFALO MUNICIPAL	MN	LPV	0	100	0	100	0	100
CKC	GRAND MARAIS/COOK COUNTY	MN	LPV	0	100	0	100	0	100
CKN	CROOKSTON MUNICIPAL KIRKWOOD FLD	MN	LPV	0	100	0	100	0	100
CNB	MYERS FIELD	MN	LPV	0	100	0	100	0	100
COQ	CLOQUET CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
CQM	COOK MUNICIPAL	MN	LP	0	100	0	100	0	100
D39	SAUK CENTRE MUNICIPAL	MN	LPV	0	100	0	100	0	100
D42	SPRINGFIELD MUNICIPAL	MN	LP	0	100	0	100	0	100
DLH	DULUTH INTL	MN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
DTL	DETROIT LAKES-WETHING FIELD	MN	LPV	0	100	0	100	0	100
DVP	SLAYTON MUNICIPAL	MN	LP	0	100	0	100	0	100
DXX	LAC QUI PARLE COUNTY	MN	LPV200	0	100	0	100	0	100
ELO	ELY MUNICIPAL	MN	LPV200	0	100	0	100	0	100
ETH	WHEATON MUNICIPAL	MN	LP	0	100	0	100	0	100
EVM	EVELETH-VIRGINIA MUNICIPAL	MN	LPV	0	100	0	100	0	100
FBL	FARIBAULT MUNICIPAL-LIZ WALL STROHF	MN	LPV	0	100	0	100	0	100
FCM	FLYING CLOUD	MN	LPV200	0	100	0	100	0	100
FFM	FERGUS FALLS MUNICIPAL-EINAR MICKEL	MN	LPV200	0	100	0	100	0	100
FKA	FILLMORE COUNTY	MN	LPV	0	100	0	100	0	100
FOZ	BIGFORK MUNICIPAL	MN	LP	0	100	0	100	0	100
FRM	FAIRMONT MUNICIPAL	MN	LPV	0	100	0	100	0	100
FSE	FOSSTON MUNICIPAL-ANDERSON FIELD	MN	LP	0	100	0	100	0	100
GHW	GLENWOOD MUNICIPAL	MN	LPV	0	100	0	100	0	100
GPZ	GRAND RAPIDS/ITASCA CO-GORDON	MN	LPV	0	100	0	100	0	100
GYL	GLENCOE MUNICIPAL	MN	LPV	0	100	0	100	0	100
HCD	HUTCHINSON MUNICIPAL-BUTLER FIELD	MN	LPV	0	100	0	100	0	100
HCO	HALLOCK MUNICIPAL	MN	LPV	0	100	0	100	0	100
HIB	RANGE RGNL	MN	LPV200	0	100	0	100	0	100
INL	FALLS INTL-EINARSON FIELD	MN	LPV	0	100	0	100	0	100
JKJ	MOORHEAD MUNICIPAL	MN	LPV	0	100	0	100	0	100
JMR	MORA MUNICIPAL	MN	LPV	0	100	0	100	0	100
JYG	ST JAMES MUNICIPAL	MN	LPV	0	100	0	100	0	100
LJF	LITCHFIELD MUNICIPAL	MN	LPV	0	100	0	100	0	100
LVN	AIRLAKE	MN	LPV200	0	100	0	100	0	100
LXL	LITTLE FALLS/MORRISON COUNTY-L	MN	LPV	0	100	0	100	0	100
LYV	QUENTIN AANENSON FIELD	MN	LPV200	0	100	0	100	0	100
MJQ	JACKSON MUNICIPAL	MN	LPV	0	100	0	100	0	100
MKT	MANKATO RGNL	MN	LPV200	0	100	0	100	0	100
MML	SOUTHWEST MINNESOTA RGNL MARSH	MN	LPV200	0	100	0	100	0	100
MOX	MORRIS MUNICIPAL - CHARLIE SCHMIDT	MN	LPV	0	100	0	100	0	100
MSP	MINNEAPOLIS-ST PAUL INTL/WOLD-	MN	LPV200	0	100	0	100	0	100
MVE	MONTEVIDEO-CHIPPEWA COUNTY	MN	LPV	0	100	0	100	0	100
MWM	WINDOM MUNICIPAL	MN	LPV	0	100	0	100	0	100
MZH	MOOSE LAKE CARLTON COUNTY	MN	LPV	0	100	0	100	0	100
ONA	WINONA MUNICIPAL-MAX CONRAD FLD	MN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ORB	ORR RGNL	MN	LP	0	100	0	100	0	100
OTG	WORTHINGTON MUNICIPAL	MN	LPV200	0	100	0	100	0	100
OWA	OWATONNA DEGNER RGNL	MN	LPV200	0	100	0	100	0	100
PEX	PAYNESVILLE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
PKD	PARK RAPIDS MUNICIPAL-KONSHOK FIELD	MN	LPV200	0	100	0	100	0	100
PQN	PIPESTONE MUNICIPAL	MN	LPV200	0	100	0	100	0	100
RGK	RED WING RGNL	MN	LPV200	0	100	0	100	0	100
ROS	RUSH CITY RGNL	MN	LPV	0	100	0	100	0	100
ROX	ROSEAU MUNICIPAL/RUDY BILLBERG FIEL	MN	LPV	0	100	0	100	0	100
RRT	WARROAD INTL MEMORIAL	MN	LPV200	0	100	0	100	0	100
RST	ROCHESTER INTL	MN	LPV200	0	100	0	100	0	100
RWF	REDWOOD FALLS MUNICIPAL	MN	LPV	0	100	0	100	0	100
SAZ	STAPLES MUNICIPAL	MN	LPV	0	100	0	100	0	100
SBU	BLUE EARTH MUNICIPAL	MN	LPV	0	100	0	100	0	100
SGS	SOUTH ST PAUL MUNICIPAL-RICHARD E F	MN	LPV	0	100	0	100	0	100
STC	ST CLOUD RGNL	MN	LPV200	0	100	0	100	0	100
STP	ST PAUL DOWNTOWN HOLMAN FLD	MN	LPV	0	100	0	100	0	100
TOB	DODGE CENTER	MN	LPV	0	100	0	100	0	100
TVF	THIEF RIVER FALLS RGNL	MN	LPV	0	100	0	100	0	100
TWM	RICHARD B HELGESON	MN	LPV	0	100	0	100	0	100
ULM	NEW ULM MUNICIPAL	MN	LPV200	0	100	0	100	0	100
VVV	ORTONVILLE MUNICIPAL-MARTINSON FIEL	MN	LP	0	100	0	100	0	100
Y49	WALKER MUNICIPAL	MN	LP	0	100	0	100	0	100
Y63	ELBOW LAKE MUNICIPAL - PRIDE OF THE	MN	LPV	0	100	0	100	0	100
03D	MEMPHIS MEMORIAL	MO	LPV	0	100	0	100	0	100
1H0	CREVE COEUR	MO	LPV	0	100	0	100	0	100
1MO	MOUNTAIN GROVE MEMORIAL	MO	LP	0	100	0	100	0	100
2H2	JERRY SUMNERS SR AURORA MUNICIPAL	MO	LP	0	100	0	100	0	100
6M6	LEWIS COUNTY RGNL	MO	LPV	0	100	0	100	0	100
8WC	WASHINGTON COUNTY	MO	LPV	0	100	0	100	0	100
94K	CASSVILLE MUNICIPAL	MO	LPV	0	100	0	100	0	100
AIZ	LEE C FINE MEMORIAL	MO	LPV	0	100	0	100	0	100
BBG	BRANSON	MO	LPV200	0	100	0	100	0	100
BUM	BUTLER MEMORIAL	MO	LPV	0	100	0	100	0	100
CGI	CAPE GIRARDEAU RGNL	MO	LPV200	0	100	0	100	0	100
CHT	CHILLICOTHE MUNICIPAL	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
COU	COLUMBIA RGNL	MO	LPV200	0	100	0	100	0	100
DMO	SEDALIA RGNL	MO	LPV	0	100	0	100	0	100
DXE	DEXTER MUNICIPAL	MO	LPV	0	100	0	100	0	100
EIW	COUNTY MEMORIAL	MO	LPV	0	100	0	100	0	100
EOS	NEOSHO HUGH ROBINSON	MO	LPV	0	100	0	100	0	100
EVU	NORTHWEST MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
EZZ	CAMERON MEMORIAL	MO	LPV	0	100	0	100	0	100
FAM	FARMINGTON RGNL	MO	LPV	0	100	0	100	0	100
FTT	ELTON HENSLEY MEMORIAL	MO	LPV	0	100	0	100	0	100
FWB	BRANSON WEST MUNICIPAL - EMERSON FI	MO	LPV200	0	100	0	100	0	100
FYG	WASHINGTON RGNL	MO	LPV	0	100	0	100	0	100
GLY	CLINTON RGNL	MO	LPV	0	100	0	100	0	100
GPH	MIDWEST NATIONAL AIR CENTER	MO	LPV	0	100	0	100	0	100
H79	ELDON MODEL AIRPARK	MO	LP	0	100	0	100	0	100
H88	A PAUL VANCE FREDERICKTOWN RGN	MO	LPV	0	100	0	100	0	100
HAE	HANNIBAL RGNL	MO	LPV	0	100	0	100	0	100
HFJ	MONETT RGNL	MO	LPV	0	100	0	100	0	100
HIG	HIGGINSVILLE INDUSTRIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
IRK	KIRKSVILLE RGNL	MO	LPV200	0	100	0	100	0	100
JEF	JEFFERSON CITY MEMORIAL	MO	LPV	0	100	0	100	0	100
JLN	JOPLIN RGNL	MO	LPV	0	100	0	100	0	100
K15	GRAND GLAIZE-OSAGE BEACH	MO	LP	0	100	0	100	0	100
K57	GOULD PETERSON MUNICIPAL	MO	LPV	0	100	0	100	0	100
K89	MACON-FOWER MEMORIAL	MO	LPV	0	100	0	100	0	100
LLU	LAMAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
LRY	LAWRENCE SMITH MEMORIAL	MO	LPV	0	100	0	100	0	100
LXT	LEE'S SUMMIT MUNICIPAL	MO	LPV	0	100	0	100	0	100
M05	CARUTHERSVILLE MEMORIAL	MO	LPV	0	100	0	100	0	100
M12	STEELE MUNICIPAL	MO	LPV	0	100	0	100	0	100
M17	BOLIVAR MUNICIPAL	MO	LPV	0	100	0	100	0	100
M48	HOUSTON MEMORIAL	MO	LPV	0	100	0	100	0	100
MAW	MALDEN RGNL	MO	LPV	0	100	0	100	0	100
MBY	OMAR N BRADLEY	MO	LPV	0	100	0	100	0	100
MCI	KANSAS CITY INTL	MO	LPV200	0	100	0	100	0	100
MHL	MARSHALL MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
MKC	CHARLES B WHEELER DOWNTOWN	MO	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MNF	MOUNTAIN VIEW	MO	LP	0	100	0	100	0	100
MO3	STOCKTON MUNICIPAL	MO	LP	0	100	0	100	0	100
MO8	NORTH CENTRAL MISSOURI RGNL	MO	LPV	0	100	0	100	0	100
MYJ	MEXICO MEMORIAL	MO	LPV	0	100	0	100	0	100
NVD	NEVADA MUNICIPAL	MO	LPV200	0	100	0	100	0	100
OZS	CAMDENTON MEMORIAL-LAKE RGNL	MO	LPV	0	100	0	100	0	100
PCD	PERRYVILLE RGNL	MO	LPV	0	100	0	100	0	100
PLK	M GRAHAM CLARK DOWNTOWN	MO	LPV200	0	100	0	100	0	100
POF	POPLAR BLUFF MUNICIPAL	MO	LPV	0	100	0	100	0	100
RAW	WARSAW MUNICIPAL	MO	LPV200	0	100	0	100	0	100
RCM	SKYHAVEN	MO	LPV	0	100	0	100	0	100
SGF	SPRINGFIELD-BRANSON NATIONAL	MO	LPV	0	100	0	100	0	100
SIK	SIKESTON MEMORIAL MUNICIPAL	MO	LPV	0	100	0	100	0	100
STJ	ROSECRANS MEMORIAL	MO	LPV200	0	100	0	100	0	100
STL	ST LOUIS LAMBERT INTL	MO	LPV200	0	100	0	100	0	100
SUS	SPIRIT OF ST LOUIS	MO	LPV200	0	100	0	100	0	100
TBN	WAYNESVILLE-ST ROBERT RGNL FOR	MO	LPV	0	100	0	100	0	100
TKX	KENNETT MEMORIAL	MO	LPV	0	100	0	100	0	100
TRX	TRENTON MUNICIPAL	MO	LPV	0	100	0	100	0	100
UBX	CUBA MUNICIPAL	MO	LPV	0	100	0	100	0	100
UNO	WEST PLAINS RGNL	MO	LPV	0	100	0	100	0	100
UUV	SULLIVAN RGNL	MO	LPV	0	100	0	100	0	100
VER	JESSE VIERTEL MEMORIAL	MO	LPV	0	100	0	100	0	100
VIH	ROLLA NATIONAL	MO	LPV	0	100	0	100	0	100
0R0	COLUMBIA-MARION COUNTY	MS	LPV	0	100	0	100	4	99.998
17M	MAGEE MUNICIPAL	MS	LP	0	100	0	100	0	100
5A4	OKOLONA MUNICIPAL-RICHARD STOVALL F	MS	LPV	0	100	0	100	0	100
5A6	WINONA-MONTGOMERY COUNTY	MS	LP	0	100	0	100	0	100
87I	YAZOO COUNTY	MS	LPV	0	100	0	100	0	100
8M1	BOONEVILLE/BALDWYN	MS	LPV	0	100	0	100	0	100
CKM	FLETCHER FIELD	MS	LPV	0	100	0	100	0	100
CRX	ROSCOE TURNER	MS	LPV200	0	100	0	100	0	100
GLH	GREENVILLE MID-DELTA	MS	LPV200	0	100	0	100	0	100
GNF	GRENADA MUNICIPAL	MS	LPV	0	100	0	100	0	100
GPT	GULFPORT-BILOXI INTL	MS	LPV200	0	100	0	100	40	99.935
GTR	GOLDEN TRIANGLE RGNL	MS	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GWO	GREENWOOD-LEFLORE	MS	LPV	0	100	0	100	0	100
HBG	HATTIESBURG BOBBY L CHAIN MUNICIPAL	MS	LPV200	0	100	0	100	11	99.995
HEZ	HARDY-ANDERS FIELD NATCHEZ-ADA	MS	LPV200	0	100	0	100	0	100
HKS	HAWKINS FIELD	MS	LPV	0	100	0	100	0	100
HSA	STENNIS INTL	MS	LPV200	0	100	0	100	41	99.938
IDL	INDIANOLA MUNICIPAL	MS	LPV	0	100	0	100	0	100
JAN	JACKSON-MEDGAR WILEY EVERS INT	MS	LPV200	0	100	0	100	0	100
JVW	JOHN BELL WILLIAMS	MS	LPV200	0	100	0	100	0	100
LMS	LOUISVILLE WINSTON COUNTY	MS	LPV	0	100	0	100	0	100
LUL	HESLER-NOBLE FIELD	MS	LPV	0	100	0	100	0	100
M11	COPIAH COUNTY	MS	LPV	0	100	0	100	0	100
M40	MONROE COUNTY	MS	LPV	0	100	0	100	0	100
M41	HOLLY SPRINGS-MARSHALL COUNTY	MS	LPV	0	100	0	100	0	100
M43	PRENTISS-JEFFERSON DAVIS COUNT	MS	LPV	0	100	0	100	0	100
MBO	BRUCE CAMPBELL FIELD	MS	LPV	0	100	0	100	0	100
MCB	MC COMB/PIKE COUNTY/JOHN E LEW	MS	LPV200	0	100	0	100	2	99.999
MEI	KEY FIELD	MS	LPV200	0	100	0	100	0	100
MJD	PICAYUNE MUNICIPAL	MS	LPV	0	100	0	100	37	99.954
MMS	SELFS	MS	LPV	0	100	0	100	0	100
MPE	PHILADELPHIA MUNICIPAL	MS	LPV	0	100	0	100	0	100
OLV	OLIVE BRANCH	MS	LPV200	0	100	0	100	0	100
PIB	HATTIESBURG-LAUREL RGNL	MS	LPV200	0	100	0	100	0	100
PMU	PANOLA COUNTY	MS	LPV	0	100	0	100	0	100
PQL	TRENT LOTT INTL	MS	LPV200	0	100	0	100	37	99.934
RNV	CLEVELAND MUNICIPAL	MS	LPV	0	100	0	100	0	100
STF	GEORGE M BRYAN	MS	LPV200	0	100	0	100	0	100
TUP	TUPELO RGNL	MS	LPV200	0	100	0	100	0	100
UBS	COLUMBUS-LOWNDES COUNTY	MS	LPV	0	100	0	100	0	100
UOX	UNIVERSITY-OXFORD	MS	LPV	0	100	0	100	0	100
UTA	TUNICA MUNICIPAL	MS	LPV200	0	100	0	100	0	100
VKS	VICKSBURG MUNICIPAL	MS	LP	0	100	0	100	0	100
1S3	TILLITT FIELD	MT	LPV	0	100	0	100	0	100
4U6	CIRCLE TOWN COUNTY	MT	LPV	0	100	0	100	0	100
6S0	BIG TIMBER	MT	LPV	0	100	0	100	0	100
6S8	LAUREL MUNICIPAL	MT	LPV	0	100	0	100	0	100
7S0	RONAN	MT	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
7S1	TWIN BRIDGES	MT	LPV	0	100	0	100	0	100
BHK	BAKER MUNICIPAL	MT	LPV	0	100	0	100	0	100
BIL	BILLINGS LOGAN INTL	MT	LPV200	0	100	0	100	0	100
BTM	BERT MOONEY	MT	LPV	0	100	0	100	0	100
BZN	BOZEMAN YELLOWSTONE INTL	MT	LPV	0	100	0	100	0	100
CTB	CUT BANK INTL	MT	LPV200	0	100	0	100	0	100
DLN	DILLON	MT	LPV	0	100	0	100	0	100
EKS	ENNIS - BIG SKY	MT	LPV	0	100	0	100	0	100
GDV	DAWSON COMMUNICIPALTY	MT	LPV	0	100	0	100	0	100
GGW	WOKAL FIELD/GLASGOW-VALLEY COU	MT	LPV200	0	100	0	100	0	100
GPI	GLACIER PARK INTL	MT	LPV	0	100	0	100	0	100
GTF	GREAT FALLS INTL	MT	LPV200	0	100	0	100	0	100
HLN	HELENA RGNL	MT	LPV	0	100	0	100	0	100
HVR	HAVRE CITY-COUNTY	MT	LPV	0	100	0	100	0	100
LVM	MISSION FIELD	MT	LP	0	100	0	100	0	100
LWT	LEWISTOWN MUNICIPAL	MT	LPV200	0	100	0	100	0	100
M75	MALTA	MT	LP	0	100	0	100	0	100
MLS	FRANK WILEY FIELD	MT	LPV	0	100	0	100	0	100
MSO	MISSOULA INTL	MT	LPV200	0	100	0	100	0	100
OLF	L M CLAYTON	MT	LPV200	0	100	0	100	0	100
PO1	POPLAR MUNICIPAL	MT	LPV200	0	100	0	100	0	100
PWD	SHER-WOOD	MT	LPV200	0	100	0	100	0	100
RPX	ROUNDUP	MT	LPV	0	100	0	100	0	100
S01	CONRAD	MT	LPV	0	100	0	100	0	100
SBX	SHELBY	MT	LPV	0	100	0	100	0	100
SDY	SIDNEY-RICHLAND RGNL	MT	LPV	0	100	0	100	0	100
WYS	YELLOWSTONE	MT	LPV200	0	100	0	100	0	100
43A	MONTGOMERY COUNTY	NC	LP	0	100	0	100	0	100
7W6	HYDE COUNTY	NC	LP	0	100	0	100	0	100
ACZ	HENDERSON FIELD	NC	LPV	0	100	0	100	0	100
AFP	ANSON COUNTY - JEFF CLOUD FIEL	NC	LPV	0	100	0	100	0	100
AKH	GASTONIA MUNICIPAL	NC	LPV	0	100	0	100	0	100
ASJ	TRI-COUNTY	NC	LPV	0	100	0	100	0	100
AVL	ASHEVILLE RGNL	NC	LPV200	0	100	0	100	0	100
BUY	BURLINGTON-ALAMANCE RGNL	NC	LPV	0	100	0	100	0	100
CLT	CHARLOTTE/DOUGLAS INTL	NC	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CPC	COLUMBUS COUNTY MUNICIPAL	NC	LPV	0	100	0	100	0	100
CTZ	CLINTON-SAMPSON COUNTY	NC	LPV200	0	100	0	100	0	100
DPL	DUPLIN CO	NC	LPV200	0	100	0	100	0	100
ECG	ELIZABETH CITY CG AIR STATION/	NC	LPV	0	100	0	100	0	100
EDE	NORTHEASTERN RGNL	NC	LPV200	0	100	0	100	0	100
EHO	SHELBY-CLEVELAND COUNTY RGNL	NC	LPV	0	100	0	100	0	100
EQY	CHARLOTTE-MONROE EXECUTIVE	NC	LPV200	0	100	0	100	0	100
EWN	COASTAL CAROLINA REGIONAL	NC	LPV	0	100	0	100	0	100
EXX	DAVIDSON COUNTY	NC	LPV	0	100	0	100	0	100
EYF	CURTIS L BROWN JR FIELD	NC	LPV	0	100	0	100	0	100
FAY	FAYETTEVILLE RGNL/GRANNIS FIEL	NC	LPV200	0	100	0	100	0	100
FFA	FIRST FLIGHT	NC	LP	0	100	0	100	0	100
FQD	RUTHERFORD CO - MARCHMAN FIELD	NC	LPV	0	100	0	100	0	100
GEV	ASHE COUNTY	NC	LP	0	100	0	100	0	100
GSO	PIEDMONT TRIAD INTL	NC	LPV200	0	100	0	100	0	100
GWW	WAYNE EXECUTIVE JETPORT	NC	LPV200	0	100	0	100	0	100
HBI	ASHEBORO RGNL	NC	LPV	0	100	0	100	0	100
HKY	HICKORY RGNL	NC	LPV200	0	100	0	100	0	100
HNZ	HENDERSON-OXFORD	NC	LPV	0	100	0	100	0	100
HRJ	HARNETT RGNL JETPORT	NC	LPV	0	100	0	100	0	100
ILM	WILMINGTON INTL	NC	LPV200	0	100	0	100	0	100
INT	SMITH REYNOLDS	NC	LPV200	0	100	0	100	0	100
IPJ	LINCOLNTON-LINCOLN COUNTY RGNL	NC	LPV	0	100	0	100	0	100
ISO	KINSTON RGNL JETPORT AT STALLI	NC	LPV200	0	100	0	100	0	100
IXA	HALIFAX-NORTHAMPTON RGNL	NC	LPV200	0	100	0	100	0	100
JNX	JOHNSTON RGNL	NC	LPV	0	100	0	100	0	100
JQF	CONCORD-PADGETT RGNL	NC	LPV	0	100	0	100	0	100
LBT	LUMBERTON RGNL	NC	LPV	0	100	0	100	0	100
LHZ	TRIANGLE NORTH EXECUTIVE	NC	LPV200	0	100	0	100	0	100
MCZ	MARTIN COUNTY	NC	LPV	0	100	0	100	0	100
MEB	LAURINBURG-MAXTON	NC	LPV200	0	100	0	100	0	100
MQI	DARE COUNTY RGNL	NC	LPV	0	100	0	100	0	100
MRH	MICHAEL J SMITH FIELD	NC	LPV	0	100	0	100	0	100
MRN	FOOTHILLS REGIONAL	NC	LPV	0	100	0	100	0	100
MWK	MOUNT AIRY/SURRY COUNTY	NC	LPV	0	100	0	100	0	100
OAJ	ALBERT J ELLIS	NC	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OCW	WASHINGTON-WARREN	NC	LPV	0	100	0	100	0	100
ONX	CURRITUCK COUNTY RGNL	NC	LPV	0	100	0	100	0	100
PGV	PITT-GREENVILLE	NC	LPV	0	100	0	100	0	100
PMZ	PLYMOUTH MUNICIPAL	NC	LP	0	100	0	100	0	100
RCZ	RICHMOND COUNTY	NC	LPV	0	100	0	100	0	100
RDU	RALEIGH-DURHAM INTL	NC	LPV200	0	100	0	100	0	100
RHP	WESTERN CAROLINA RGNL	NC	LP	0	100	0	100	0	100
RUQ	MID-CAROLINA RGNL	NC	LPV200	0	100	0	100	0	100
RWI	ROCKY MOUNT-WILSON RGNL	NC	LPV	0	100	0	100	0	100
SCR	SILER CITY MUNICIPAL	NC	LPV	0	100	0	100	0	100
SOP	MOORE COUNTY	NC	LPV200	0	100	0	100	0	100
SUT	CAPE FEAR RGNL JETPORT/HOWIE F	NC	LPV	0	100	0	100	0	100
SVH	STATESVILLE RGNL	NC	LPV200	0	100	0	100	0	100
TDF	PERSON COUNTY	NC	LPV200	0	100	0	100	0	100
TTA	RALEIGH EXEC JETPORT AT SANFOR	NC	LPV200	0	100	0	100	0	100
UKF	WILKES COUNTY	NC	LPV200	0	100	0	100	0	100
VUJ	STANLY COUNTY	NC	LPV200	0	100	0	100	0	100
W03	WILSON INDUSTRIAL AIR CENTER	NC	LPV	0	100	0	100	0	100
W40	MOUNT OLIVE MUNICIPAL	NC	LPV	0	100	0	100	0	100
ZEF	ELKIN MUNICIPAL	NC	LP	0	100	0	100	0	100
06D	ROLLA MUNICIPAL	ND	LPV	0	100	0	100	0	100
20U	BEACH	ND	LPV	0	100	0	100	0	100
2C8	CAVALIER MUNICIPAL	ND	LPV	0	100	0	100	0	100
3H4	HILLSBORO MUNICIPAL	ND	LPV	0	100	0	100	0	100
46D	CARRINGTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
4E7	ELLENDALE MUNICIPAL	ND	LPV	0	100	0	100	0	100
51D	EDGELEY MUNICIPAL	ND	LPV	0	100	0	100	0	100
5L0	LAKOTA MUNICIPAL	ND	LPV	0	100	0	100	0	100
5N8	CASSELTON ROBERT MILLER RGNL	ND	LPV	0	100	0	100	0	100
6L3	LISBON MUNICIPAL	ND	LPV	0	100	0	100	0	100
7L2	LINTON MUNICIPAL	ND	LPV	0	100	0	100	0	100
9D7	CANDO MUNICIPAL	ND	LPV	0	100	0	100	0	100
BAC	BARNES COUNTY MUNICIPAL	ND	LPV	0	100	0	100	0	100
BIS	BISMARCK MUNICIPAL	ND	LPV200	0	100	0	100	0	100
BWP	HARRY STERN	ND	LPV	0	100	0	100	0	100
BWW	BOWMAN RGNL	ND	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
D05	GARRISON MUNICIPAL	ND	LPV	0	100	0	100	0	100
D09	BOTTINEAU MUNICIPAL	ND	LPV	0	100	0	100	0	100
D55	ROBERTSON FIELD	ND	LPV	0	100	0	100	0	100
D57	GLEN ULLIN RGNL	ND	LPV	0	100	0	100	0	100
D60	TIOGA MUNICIPAL	ND	LPV	0	100	0	100	0	100
DIK	DICKINSON - THEODORE ROOSEVELT	ND	LPV200	0	100	0	100	0	100
DVL	DEVILS LAKE RGNL	ND	LPV200	0	100	0	100	0	100
FAR	HECTOR INTL	ND	LPV200	0	100	0	100	0	100
GAF	HUTSON FIELD	ND	LPV	0	100	0	100	0	100
GFK	GRAND FORKS INTL	ND	LPV	0	100	0	100	0	100
GWR	GWINNER-ROGER MELROE FIELD	ND	LPV	0	100	0	100	0	100
HEI	HETTINGER MUNICIPAL	ND	LPV	0	100	0	100	0	100
HZE	MERCER COUNTY RGNL	ND	LPV	0	100	0	100	0	100
ISN	SLOULIN FLD INTL	ND	LPV200	0	100	0	100	0	100
JMS	JAMESTOWN RGNL	ND	LPV200	0	100	0	100	0	100
K74	ROBERT ODEGAARD FIELD	ND	LP	0	100	0	100	0	100
MOT	MINOT INTL	ND	LPV	0	100	0	100	0	100
RUG	RUGBY MUNICIPAL	ND	LP	0	100	0	100	0	100
S25	WATFORD CITY MUNICIPAL	ND	LPV	0	100	0	100	0	100
Y19	MANDAN MUNICIPAL	ND	LPV	0	100	0	100	0	100
07K	CENTRAL CITY MUNICIPAL - LARRY REIN	NE	LPV	0	100	0	100	0	100
08K	HARVARD STATE	NE	LPV	0	100	0	100	0	100
0B4	HARTINGTON MUNICIPAL/ BUD BECKER FL	NE	LPV	0	100	0	100	0	100
0C4	PENDER MUNICIPAL	NE	LPV	0	100	0	100	0	100
0F4	LOUP CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
0G3	TECUMSEH MUNICIPAL	NE	LPV	0	100	0	100	0	100
0V3	PIONEER VILLAGE FIELD	NE	LPV	0	100	0	100	0	100
12K	SUPERIOR MUNICIPAL	NE	LPV	0	100	0	100	0	100
47V	CURTIS MUNICIPAL	NE	LPV	0	100	0	100	0	100
4D9	ALMA MUNICIPAL	NE	LPV	0	100	0	100	0	100
4V9	ANTELOPE COUNTY	NE	LPV	0	100	0	100	0	100
6K3	CREIGHTON MUNICIPAL	NE	LPV	0	100	0	100	0	100
7V7	RED CLOUD MUNICIPAL	NE	LPV	0	100	0	100	0	100
8V2	STUART-ATKINSON MUNICIPAL	NE	LPV	0	100	0	100	0	100
93Y	DAVID CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
9V5	MODISETT	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AFK	NEBRASKA CITY MUNICIPAL	NE	LPV	0	100	0	100	0	100
AHQ	WAHOO MUNICIPAL	NE	LPV	0	100	0	100	0	100
AIA	ALLIANCE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
ANW	AINSWORTH RGNL	NE	LPV200	0	100	0	100	0	100
AUH	AURORA MUNICIPAL - AL POTTER FIELD	NE	LPV	0	100	0	100	0	100
BBW	BROKEN BOW MUNICIPAL/KEITH GLAZE FL	NE	LPV	0	100	0	100	0	100
BFF	WESTERN NEBRASKA RGNL/WILLIAM	NE	LPV	0	100	0	100	0	100
BIE	BEATRICE MUNICIPAL	NE	LPV200	0	100	0	100	0	100
BTA	BLAIR MUNICIPAL	NE	LPV	0	100	0	100	0	100
BUB	CRAM FIELD	NE	LPV	0	100	0	100	0	100
BVN	ALBION MUNICIPAL	NE	LPV	0	100	0	100	0	100
CDR	CHADRON MUNICIPAL	NE	LPV200	0	100	0	100	0	100
CEK	CRETE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CSB	CAMBRIDGE MUNICIPAL	NE	LPV	0	100	0	100	0	100
CZD	COZAD MUNICIPAL	NE	LPV	0	100	0	100	0	100
EAR	KEARNEY RGNL	NE	LPV200	0	100	0	100	0	100
FBY	FAIRBURY MUNICIPAL	NE	LPV	0	100	0	100	0	100
FET	FREMONT MUNICIPAL	NE	LPV	0	100	0	100	0	100
FMZ	FAIRMONT STATE AIRFIELD	NE	LPV	0	100	0	100	0	100
FNB	BRENNER FIELD	NE	LPV	0	100	0	100	0	100
GGF	GRANT MUNICIPAL	NE	LPV	0	100	0	100	0	100
GRI	CENTRAL NEBRASKA RGNL	NE	LPV	0	100	0	100	0	100
GRN	GORDON MUNICIPAL	NE	LPV	0	100	0	100	0	100
HDE	BREWSTER FIELD	NE	LPV	0	100	0	100	0	100
HSI	HASTINGS MUNICIPAL	NE	LPV	0	100	0	100	0	100
IBM	KIMBALL MUNICIPAL/ROBERT E ARRAJ FI	NE	LPV	0	100	0	100	0	100
IML	IMPERIAL MUNICIPAL	NE	LPV	0	100	0	100	0	100
JYR	YORK MUNICIPAL	NE	LPV	0	100	0	100	0	100
K01	FARINGTON FIELD	NE	LPV	0	100	0	100	0	100
LBF	NORTH PLATTE RGNL AIRPORT LEE	NE	LPV200	0	100	0	100	0	100
LCG	WAYNE MUNICIPAL/ STAN MORRIS FLD	NE	LPV	0	100	0	100	0	100
LNK	LINCOLN	NE	LPV200	0	100	0	100	0	100
LXN	JIM KELLY FIELD	NE	LPV	0	100	0	100	0	100
MCK	MC COOK BEN NELSON RGNL	NE	LPV	0	100	0	100	0	100
MLE	MILLARD	NE	LPV	0	100	0	100	0	100
ODX	EVELYN SHARP FIELD	NE	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OFK	NORFOLK RGNL/KARL STEFAN MEMOR	NE	LPV	0	100	0	100	0	100
OGA	SEARLE FIELD	NE	LPV	0	100	0	100	0	100
OKS	GARDEN COUNTY/KING RHILEY FIEL	NE	LPV	0	100	0	100	0	100
OLU	COLUMBUS MUNICIPAL	NE	LPV	0	100	0	100	0	100
OMA	EPPLEY AIRFIELD	NE	LPV200	0	100	0	100	0	100
ONL	THE O'NEILL MUNICIPAL-JOHN L BAKER	NE	LPV	0	100	0	100	0	100
PMV	PLATTSMOUTH MUNICIPAL	NE	LPV	0	100	0	100	0	100
RBE	ROCK COUNTY	NE	LPV	0	100	0	100	0	100
SCB	SCRIBNER STATE	NE	LPV	0	100	0	100	0	100
SNY	SIDNEY MUNICIPAL/LLOYD W CARR FIELD	NE	LPV	0	100	0	100	0	100
SWT	SEWARD MUNICIPAL	NE	LPV	0	100	0	100	0	100
TIF	THOMAS COUNTY	NE	LPV	0	100	0	100	0	100
TQE	TEKAMAH MUNICIPAL	NE	LPV	0	100	0	100	0	100
VTN	MILLER FIELD	NE	LPV	0	100	0	100	0	100
ASH	BOIRE FIELD	NH	LPV200	0	100	0	100	0	100
CON	CONCORD MUNICIPAL	NH	LPV	0	100	0	100	0	100
DAW	SKYHAVEN	NH	LPV	0	100	0	100	0	100
EEN	DILLANT-HOPKINS	NH	LPV	0	100	0	100	0	100
HIE	MOUNT WASHINGTON RGNL	NH	LPV	0	100	0	100	0	100
LCI	LACONIA MUNICIPAL	NH	LPV	0	100	0	100	0	100
LEB	LEBANON MUNICIPAL	NH	LPV	0	100	0	100	0	100
MHT	MANCHESTER	NH	LPV200	0	100	0	100	0	100
PSM	PORTSMOUTH INTL AT PEASE	NH	LPV200	0	100	0	100	0	100
47N	CENTRAL JERSEY RGNL	NJ	LP	0	100	0	100	0	100
4N1	GREENWOOD LAKE	NJ	LP	0	100	0	100	0	100
ACY	ATLANTIC CITY INTL	NJ	LPV200	0	100	0	100	0	100
CDW	ESSEX COUNTY	NJ	LPV	0	100	0	100	0	100
EWR	NEWARK LIBERTY INTL	NJ	LPV200	0	100	0	100	0	100
MIV	MILLVILLE MUNICIPAL	NJ	LPV200	0	100	0	100	0	100
MJX	OCEAN COUNTY	NJ	LPV	0	100	0	100	0	100
MMU	MORRISTOWN MUNICIPAL	NJ	LPV	0	100	0	100	0	100
N12	LAKEWOOD	NJ	LP	0	100	0	100	0	100
N14	FLYING W	NJ	LPV	0	100	0	100	0	100
N40	SKY MANOR	NJ	LP	0	100	0	100	0	100
TEB	TETERBORO	NJ	LPV	0	100	0	100	0	100
TTN	TRENTON MERCER	NJ	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
VAY	SOUTH JERSEY RGNL	NJ	LP	0	100	0	100	0	100
WWD	CAPE MAY COUNTY	NJ	LPV	0	100	0	100	0	100
LFVM	MIQUELON	NL	LPV	0	100	0	100	2	99.986
LFVP	ST PIERRE	NL	LPV	0	100	0	100	2	99.986
0E0	MORIARTY MUNICIPAL	NM	LPV	0	100	0	100	1	99.999
ABQ	ALBUQUERQUE INTL SUNPORT	NM	LPV200	0	100	0	100	1	99.997
AEG	DOUBLE EAGLE II	NM	LPV200	0	100	0	100	1	99.997
ALM	ALAMOGORDO-WHITE SANDS RGNL	NM	LPV	0	100	0	100	1	99.999
ATS	ARTESIA MUNICIPAL	NM	LPV200	0	100	0	100	1	99.999
CAO	CLAYTON MUNICIPAL ARPK	NM	LPV	0	100	0	100	1	99.999
CNM	CAVERN CITY AIR TRML	NM	LPV200	0	100	0	100	1	99.999
CVN	CLOVIS MUNICIPAL	NM	LPV200	0	100	0	100	1	99.999
DMN	DEMING MUNICIPAL	NM	LPV	0	100	0	100	0	100
E06	LEA COUNTY-ZIP FRANKLIN MEMORI	NM	LPV	0	100	0	100	0	100
FMN	FOUR CORNERS RGNL	NM	LPV200	0	100	0	100	1	99.999
HOB	LEA COUNTY RGNL	NM	LPV	0	100	0	100	0	100
LAM	LOS ALAMOS	NM	LP	0	100	0	100	1	99.999
LRU	LAS CRUCES INTL	NM	LPV200	0	100	0	100	0	100
ONM	SOCORRO MUNICIPAL	NM	LP	0	100	0	100	1	99.999
ROW	ROSWELL INTL AIR CENTER	NM	LPV	0	100	0	100	1	99.999
SAF	SANTA FE MUNICIPAL	NM	LPV200	0	100	0	100	1	99.999
SRR	SIERRA BLANCA RGNL	NM	LPV200	0	100	0	100	1	99.999
SVC	GRANT COUNTY	NM	LPV	0	100	0	100	0	100
05U	EUREKA	NV	LP	0	100	0	100	0	100
67L	MESQUITE	NV	LP	0	100	0	100	0	100
BAM	BATTLE MOUNTAIN	NV	LPV	0	100	0	100	1	99.998
CXP	CARSON	NV	LP	0	100	0	100	3	99.998
ELY	ELY ARPT /YELLAND FLD/	NV	LPV	0	100	0	100	0	100
HTH	HAWTHORNE INDUSTRIAL	NV	LP	0	100	0	100	2	99.998
LAS	MC CARRAN INTL	NV	LPV	0	100	0	100	1	99.999
LOL	DERBY FIELD	NV	LPV	0	100	0	100	1	99.998
RNO	RENO/TAHOE INTL	NV	LPV	0	100	0	100	2	99.998
RTS	RENO/STEAD	NV	LPV	0	100	0	100	2	99.998
SPZ	SILVER SPRINGS	NV	LPV	0	100	0	100	2	99.998
TPH	TONOPAH	NV	LP	0	100	0	100	2	99.998
WMC	WINNEMUCCA MUNICIPAL	NV	LPV	0	100	0	100	1	99.998

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
06N	RANDALL	NY	LP	0	100	0	100	0	100
0G7	FINGER LAKES RGNL	NY	LPV	0	100	0	100	0	100
1B1	COLUMBIA COUNTY	NY	LPV	0	100	0	100	0	100
20N	KINGSTON-ULSTER	NY	LPV	0	100	0	100	0	100
44N	SKY ACRES	NY	LPV	0	100	0	100	0	100
4B6	TICONDEROGA MUNICIPAL	NY	LPV	0	100	0	100	0	100
5B2	SARATOGA COUNTY	NY	LPV	0	100	0	100	0	100
5G0	LE ROY	NY	LP	0	100	0	100	0	100
9G0	BUFFALO AIRFIELD	NY	LP	0	100	0	100	0	100
9G3	AKRON/JESSON FIELD	NY	LP	0	100	0	100	0	100
ALB	ALBANY INTL	NY	LPV200	0	100	0	100	0	100
ART	WATERTOWN INTL	NY	LPV200	0	100	0	100	0	100
BGM	GREATER BINGHAMTON/EDWIN A LIN	NY	LPV200	0	100	0	100	0	100
BUF	BUFFALO NIAGARA INTL	NY	LPV200	0	100	0	100	0	100
ELM	ELMIRA/CORNING RGNL	NY	LPV200	0	100	0	100	0	100
ELZ	WELLSVILLE MUNICIPAL ARPT`TARANTINE	NY	LPV200	0	100	0	100	0	100
FOK	FRANCIS S GABRESKI	NY	LPV200	0	100	0	100	0	100
FRG	REPUBLIC	NY	LPV200	0	100	0	100	0	100
FZY	OSWEGO COUNTY	NY	LPV	0	100	0	100	0	100
GFL	FLOYD BENNETT MEMORIAL	NY	LPV200	0	100	0	100	0	100
GVQ	GENESEE COUNTY	NY	LPV200	0	100	0	100	0	100
HPN	WESTCHESTER COUNTY	NY	LPV	0	100	0	100	0	100
HTF	HORNELL MUNICIPAL	NY	LPV	0	100	0	100	0	100
HTO	EAST HAMPTON	NY	LPV	0	100	0	100	0	100
HWV	BROOKHAVEN	NY	LPV	0	100	0	100	0	100
IAG	NIAGARA FALLS INTL	NY	LPV	0	100	0	100	0	100
ISP	LONG ISLAND MAC ARTHUR	NY	LPV200	0	100	0	100	0	100
ITH	ITHACA TOMPKINS RGNL	NY	LPV	0	100	0	100	0	100
IUA	CANANDAIGUA	NY	LPV	0	100	0	100	0	100
JFK	JOHN F KENNEDY INTL	NY	LPV200	0	100	0	100	0	100
JHW	CHAUTAUQUA COUNTY/JAMESTOWN	NY	LPV200	0	100	0	100	0	100
K09	PISECO	NY	LP	0	100	0	100	0	100
LGA	LAGUARDIA	NY	LPV	0	100	0	100	0	100
MAL	MALONE-DUFORT	NY	LPV	0	100	0	100	0	100
MGJ	ORANGE COUNTY	NY	LPV	0	100	0	100	0	100
MSS	MASSENA INTL-RICHARDS FIELD	NY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
MSV	SULLIVAN COUNTY INTL	NY	LPV	0	100	0	100	0	100
N23	SIDNEY MUNICIPAL	NY	LP	0	100	0	100	0	100
N66	ONEONTA MUNICIPAL	NY	LPV	0	100	0	100	0	100
NY0	FULTON COUNTY	NY	LPV	0	100	0	100	0	100
OGS	OGDENSBURG INTL	NY	LPV	0	100	0	100	0	100
OIC	LT WARREN EATON	NY	LP	0	100	0	100	0	100
OLE	CATTARAUGUS COUNTY-OLEAN	NY	LPV	0	100	0	100	0	100
PBG	PLATTSBURGH INTL	NY	LPV	0	100	0	100	0	100
PEO	PENN YAN	NY	LPV	0	100	0	100	0	100
POU	HUDSON VALLEY RGNL	NY	LPV	0	100	0	100	0	100
RME	GRIFFISS INTL	NY	LPV200	0	100	0	100	0	100
ROC	GREATER ROCHESTER INTL	NY	LPV200	0	100	0	100	0	100
SCH	SCHENECTADY COUNTY	NY	LPV200	0	100	0	100	0	100
SDC	WILLIAMSON-SODUS	NY	LPV	0	100	0	100	0	100
SLK	ADIRONDACK RGNL	NY	LPV200	0	100	0	100	0	100
SWF	NEW YORK STEWART INTL	NY	LPV200	0	100	0	100	0	100
SYR	SYRACUSE HANCOCK INTL	NY	LPV200	0	100	0	100	0	100
VGC	HAMILTON MUNICIPAL	NY	LPV	0	100	0	100	0	100
0G6	WILLIAMS COUNTY	OH	LPV	0	100	0	100	0	100
10G	HOLMES COUNTY	OH	LP	0	100	0	100	0	100
16G	SENECA COUNTY	OH	LPV	0	100	0	100	0	100
17G	PORT BUCYRUS-CRAWFORD COUNTY	OH	LP	0	100	0	100	0	100
1G0	WOOD COUNTY	OH	LPV	0	100	0	100	0	100
1G3	KENT STATE UNIV	OH	LPV	0	100	0	100	0	100
2G2	JEFFERSON COUNTY AIRPARK	OH	LPV	0	100	0	100	0	100
4G5	MONROE COUNTY	OH	LP	0	100	0	100	0	100
4I3	KNOX COUNTY	OH	LPV200	0	100	0	100	0	100
5A1	NORWALK-HURON COUNTY	OH	LP	0	100	0	100	0	100
6G5	BARNESVILLE-BRADFIELD	OH	LP	0	100	0	100	0	100
7G8	GEAUGA COUNTY	OH	LP	0	100	0	100	0	100
AKR	AKRON FULTON INTL	OH	LP	0	100	0	100	0	100
AOH	LIMA ALLEN COUNTY	OH	LPV200	0	100	0	100	0	100
AXV	NEIL ARMSTRONG	OH	LPV	0	100	0	100	0	100
BJJ	WAYNE COUNTY	OH	LPV	0	100	0	100	0	100
BKL	BURKE LAKEFRONT	OH	LPV	0	100	0	100	0	100
CAK	AKRON-CANTON RGNL	OH	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CDI	CAMBRIDGE MUNICIPAL	OH	LP	0	100	0	100	0	100
CGF	CUYAHOGA COUNTY	OH	LPV200	0	100	0	100	0	100
CLE	CLEVELAND-HOPKINS INTL	OH	LPV200	0	100	0	100	0	100
CMH	JOHN GLENN COLUMBUS INTL	OH	LPV200	0	100	0	100	0	100
CQA	LAKEFIELD	OH	LPV	0	100	0	100	0	100
CYO	PICKAWAY COUNTY MEMORIAL	OH	LPV	0	100	0	100	0	100
DAY	JAMES M COX DAYTON INTL	OH	LPV200	0	100	0	100	0	100
DLZ	DELAWARE MUNICIPAL - JIM MOORE FIEL	OH	LPV	0	100	0	100	0	100
EDJ	BELLEFONTAINE RGNL	OH	LPV	0	100	0	100	0	100
EOP	PIKE COUNTY	OH	LP	0	100	0	100	0	100
FDY	FINDLAY	OH	LPV	0	100	0	100	0	100
FZI	FOSTORIA METROPOLITAN	OH	LPV	0	100	0	100	0	100
GQQ	GALION MUNICIPAL	OH	LP	0	100	0	100	0	100
HAO	BUTLER CO RGNL-HOGAN FIELD	OH	LPV	0	100	0	100	0	100
HOC	HIGHLAND COUNTY	OH	LP	0	100	0	100	0	100
HZY	NORTHEAST OHIO RGNL	OH	LPV	0	100	0	100	0	100
I10	NOBLE COUNTY	OH	LP	0	100	0	100	0	100
I19	GREENE COUNTY-LEWIS A JACKSON	OH	LPV	0	100	0	100	0	100
I40	RICHARD DOWNING	OH	LPV	0	100	0	100	0	100
I66	CLINTON FIELD	OH	LPV	0	100	0	100	0	100
I68	WARREN COUNTY/JOHN LANE FIELD	OH	LPV	0	100	0	100	0	100
I69	CLERMONT COUNTY	OH	LP	0	100	0	100	0	100
I74	GRIMES FIELD	OH	LPV	0	100	0	100	0	100
ILN	WILMINGTON AIR PARK	OH	LPV200	0	100	0	100	0	100
LCK	RICKENBACKER INTL	OH	LPV200	0	100	0	100	0	100
LHQ	FAIRFIELD COUNTY	OH	LPV200	0	100	0	100	0	100
LNN	WILLOUGHBY LOST NATION MUNICIPAL	OH	LPV	0	100	0	100	0	100
LPR	LORAIN COUNTY RGNL	OH	LPV200	0	100	0	100	0	100
LUK	CINCINNATI MUNICIPAL AIRPORT LUNKEN	OH	LPV	0	100	0	100	0	100
MFD	MANSFIELD LAHM RGNL	OH	LPV200	0	100	0	100	0	100
MGY	DAYTON-WRIGHT BROTHERS	OH	LPV	0	100	0	100	0	100
MNN	MARION MUNICIPAL	OH	LPV	0	100	0	100	0	100
MRT	UNION COUNTY	OH	LP	0	100	0	100	0	100
MWO	MIDDLETOWN REGIONAL/HOOK FIELD	OH	LPV	0	100	0	100	0	100
OSU	OHIO STATE UNIVERSITY	OH	LPV200	0	100	0	100	0	100
OWX	PUTNAM COUNTY	OH	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OXD	MIAMI UNIVERSITY	OH	LPV	0	100	0	100	0	100
PCW	ERIE-OTTAWA INTL	OH	LPV	0	100	0	100	0	100
PHD	HARRY CLEVER FIELD	OH	LP	0	100	0	100	0	100
PMH	GREATER PORTSMOUTH RGNL	OH	LPV	0	100	0	100	0	100
POV	PORTAGE COUNTY	OH	LPV	0	100	0	100	0	100
RZT	ROSS COUNTY	OH	LPV	0	100	0	100	0	100
S24	SANDUSKY COUNTY RGNL	OH	LPV	0	100	0	100	0	100
SCA	SIDNEY MUNICIPAL	OH	LPV	0	100	0	100	0	100
SGH	SPRINGFIELD-BECKLEY MUNICIPAL	OH	LPV200	0	100	0	100	0	100
TDZ	TOLEDO EXECUTIVE	OH	LPV	0	100	0	100	0	100
TOL	TOLEDO EXPRESS	OH	LPV200	0	100	0	100	0	100
TSO	CARROLL COUNTY-TOLSON	OH	LP	0	100	0	100	0	100
TZR	BOLTON FIELD	OH	LPV	0	100	0	100	0	100
UNI	OHIO UNIVERSITY	OH	LPV200	0	100	0	100	0	100
USE	FULTON COUNTY	OH	LPV	0	100	0	100	0	100
UYF	MADISON COUNTY	OH	LPV	0	100	0	100	0	100
VES	DARKE COUNTY	OH	LPV	0	100	0	100	0	100
VTA	NEWARK-HEATH	OH	LP	0	100	0	100	0	100
YNG	YOUNGSTOWN-WARREN RGNL	OH	LPV	0	100	0	100	0	100
ZZV	ZANESVILLE MUNICIPAL	OH	LPV200	0	100	0	100	0	100
1F0	ARDMORE DOWNTOWN EXECUTIVE	OK	LP	0	100	0	100	0	100
1K8	SOUTH GRAND LAKE RGNL	OK	LPV	0	100	0	100	0	100
1O4	THOMAS MUNICIPAL	OK	LPV	0	100	0	100	0	100
2K4	SCOTT FIELD	OK	LPV	0	100	0	100	0	100
4O4	MC CURTAIN COUNTY RGNL	OK	LP	0	100	0	100	0	100
6K4	FAIRVIEW MUNICIPAL	OK	LPV	0	100	0	100	0	100
80F	ANTLERS MUNICIPAL	OK	LPV	0	100	0	100	0	100
ADH	ADA RGNL	OK	LPV	0	100	0	100	0	100
ADM	ARDMORE MUNICIPAL	OK	LPV	0	100	0	100	0	100
AVK	ALVA RGNL	OK	LPV	0	100	0	100	0	100
AXS	ALTUS/QUARTZ MOUNTAIN RGNL	OK	LPV	0	100	0	100	0	100
BKN	BLACKWELL-TONKAWA MUNICIPAL	OK	LPV	0	100	0	100	0	100
BVO	BARTLESVILLE MUNICIPAL	OK	LPV	0	100	0	100	0	100
CHK	CHICKASHA MUNICIPAL	OK	LPV200	0	100	0	100	0	100
CLK	CLINTON RGNL	OK	LPV	0	100	0	100	0	100
CSM	CLINTON-SHERMAN	OK	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CUH	CUSHING MUNICIPAL	OK	LPV	0	100	0	100	0	100
DUA	DURANT RGNL - EAKER FIELD	OK	LPV	0	100	0	100	0	100
DUC	HALLIBURTON FIELD	OK	LPV200	0	100	0	100	0	100
ELK	ELK CITY RGNL BUSINESS	OK	LPV	0	100	0	100	0	100
F22	PERRY MUNICIPAL	OK	LPV	0	100	0	100	0	100
FDR	FREDERICK RGNL	OK	LPV200	0	100	0	100	0	100
GCM	CLAREMORE RGNL	OK	LPV	0	100	0	100	0	100
GMJ	GROVE MUNICIPAL	OK	LPV	0	100	0	100	0	100
GOK	GUTHRIE-EDMOND RGNL	OK	LPV	0	100	0	100	0	100
GUY	GUYMON MUNICIPAL	OK	LPV	0	100	0	100	0	100
GZL	STIGLER RGNL	OK	LPV	0	100	0	100	0	100
H71	MID-AMERICA INDUSTRIAL	OK	LPV	0	100	0	100	0	100
HBR	HOBART RGNL	OK	LPV	0	100	0	100	0	100
HHW	STAN STAMPER MUNICIPAL	OK	LPV	0	100	0	100	0	100
HSD	SUNDANCE	OK	LPV	0	100	0	100	0	100
LAW	LAWTON-FORT SILL RGNL	OK	LPV200	0	100	0	100	0	100
MKO	MUSKOGEE-DAVIS RGNL	OK	LPV	0	100	0	100	0	100
MLC	MC ALESTER RGNL	OK	LPV	0	100	0	100	0	100
OJA	THOMAS P STAFFORD	OK	LPV	0	100	0	100	0	100
OKC	WILL ROGERS WORLD	OK	LPV200	0	100	0	100	0	100
OKM	OKMULGEE RGNL	OK	LPV200	0	100	0	100	0	100
OUN	UNIVERSITY OF OKLAHOMA WESTHEI	OK	LPV200	0	100	0	100	0	100
OWP	WILLIAM R POGUE MUNICIPAL	OK	LPV	0	100	0	100	0	100
PNC	PONCA CITY RGNL	OK	LPV	0	100	0	100	0	100
PVJ	PAULS VALLEY MUNICIPAL	OK	LPV200	0	100	0	100	0	100
PWA	WILEY POST	OK	LPV200	0	100	0	100	0	100
RCE	CLARENCE E PAGE MUNICIPAL	OK	LPV	0	100	0	100	0	100
RVS	RICHARD LLOYD JONES JR	OK	LPV200	0	100	0	100	0	100
SNL	SHAWNEE RGNL	OK	LPV200	0	100	0	100	0	100
SWO	STILLWATER RGNL	OK	LPV200	0	100	0	100	0	100
TQH	TAHLEQUAH MUNICIPAL	OK	LPV	0	100	0	100	0	100
TUL	TULSA INTL	OK	LPV200	0	100	0	100	0	100
WDG	ENID WOODRING RGNL	OK	LPV200	0	100	0	100	0	100
WWR	WEST WOODWARD	OK	LPV	0	100	0	100	0	100
3S8	GRANTS PASS	OR	LP	0	100	0	100	1	99.996
77S	HOBBY FIELD	OR	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
AST	ASTORIA RGNL	OR	LPV	0	100	0	100	0	100
BDN	BEND MUNICIPAL	OR	LPV	0	100	0	100	1	99.999
BKE	BAKER CITY MUNICIPAL	OR	LPV	0	100	0	100	1	99.998
CVO	CORVALLIS MUNICIPAL	OR	LPV200	0	100	0	100	0	100
EUG	MAHLON SWEET FIELD	OR	LPV200	0	100	0	100	0	100
GCD	GRANT CO RGNL/OGILVIE FIELD	OR	LPV	0	100	0	100	1	99.998
HIO	PORTLAND-HILLSBORO	OR	LPV200	0	100	0	100	0	100
LGD	LA GRANDE/UNION COUNTY	OR	LPV	0	100	0	100	1	99.999
LKV	LAKE COUNTY	OR	LPV	0	100	0	100	1	99.998
LMT	CRATER LAKE-KLAMATH RGNL	OR	LPV	0	100	0	100	1	99.998
MMV	MC MINNVILLE MUNICIPAL	OR	LPV	0	100	0	100	0	100
ONO	ONTARIO MUNICIPAL	OR	LPV	0	100	0	100	1	99.998
ONP	NEWPORT MUNICIPAL	OR	LPV	0	100	0	100	0	100
OTH	SOUTHWEST OREGON RGNL	OR	LPV	0	100	0	100	0	100
PDT	EASTERN OREGON RGNL AT PENDLET	OR	LPV200	0	100	0	100	0	100
PDX	PORTLAND INTL	OR	LPV200	0	100	0	100	0	100
RDM	ROBERTS FIELD	OR	LPV200	0	100	0	100	1	99.999
S33	MADRAS MUNICIPALCIPAL	OR	LPV	0	100	0	100	0	100
S39	PRINEVILLE	OR	LP	0	100	0	100	1	99.999
SLE	MCNARY FLD	OR	LPV200	0	100	0	100	0	100
SPB	SCAPPOOSE INDUSTRIAL AIRPARK	OR	LPV	0	100	0	100	0	100
UAO	AURORA STATE	OR	LPV	0	100	0	100	0	100
22N	JAKE ARNER MEMORIAL	PA	LP	0	100	0	100	0	100
29D	GROVE CITY	PA	LP	0	100	0	100	0	100
2G9	SOMERSET COUNTY	PA	LPV	0	100	0	100	0	100
6G1	TITUSVILLE	PA	LPV	0	100	0	100	0	100
6P7	MCVILLE	PA	LP	0	100	0	100	0	100
8G2	CORRY-LAWRENCE	PA	LPV	0	100	0	100	0	100
8N8	DANVILLE	PA	LP	0	100	0	100	0	100
9D4	DECK	PA	LPV	0	100	0	100	0	100
ABE	LEHIGH VALLEY INTL	PA	LPV200	0	100	0	100	0	100
AFJ	WASHINGTON COUNTY	PA	LPV200	0	100	0	100	0	100
AGC	ALLEGHENY COUNTY	PA	LPV200	0	100	0	100	0	100
AOO	ALTOONA-BLAIR COUNTY	PA	LPV	0	100	0	100	0	100
AVP	WILKES-BARRE/SCRANTON INTL	PA	LPV200	0	100	0	100	0	100
AXQ	CLARION COUNTY	PA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BFD	BRADFORD RGNL	PA	LPV	0	100	0	100	0	100
BTP	PITTSBURGH/BUTLER RGNL	PA	LPV	0	100	0	100	0	100
BVI	BEAVER COUNTY	PA	LPV	0	100	0	100	0	100
CXY	CAPITAL CITY	PA	LPV	0	100	0	100	0	100
DUJ	DUBOIS RGNL	PA	LPV200	0	100	0	100	0	100
ERI	ERIE INTL/TOM RIDGE FIELD	PA	LPV	0	100	0	100	0	100
FIG	CLEARFIELD-LAWRENCE	PA	LPV	0	100	0	100	0	100
FKL	VENANGO RGNL	PA	LPV	0	100	0	100	0	100
FWQ	ROSTRAVER	PA	LPV	0	100	0	100	0	100
GKJ	PORT MEADVILLE	PA	LP	0	100	0	100	0	100
HMZ	BEDFORD COUNTY	PA	LPV	0	100	0	100	0	100
HZL	HAZLETON RGNL	PA	LPV	0	100	0	100	0	100
IDI	INDIANA COUNTY/JIMMY STEWART F	PA	LPV	0	100	0	100	0	100
IPT	WILLIAMSPORT RGNL	PA	LPV	0	100	0	100	0	100
JST	JOHN MURTHA JOHNSTOWN-CAMBRIA	PA	LPV200	0	100	0	100	0	100
LBE	ARNOLD PALMER RGNL	PA	LPV200	0	100	0	100	0	100
LNS	LANCASTER	PA	LPV200	0	100	0	100	0	100
LOM	WINGS FIELD	PA	LPV	0	100	0	100	0	100
MDT	HARRISBURG INTL	PA	LPV	0	100	0	100	0	100
MPO	POCONO MOUNTAINS MUNICIPAL	PA	LPV	0	100	0	100	0	100
MQS	CHESTER COUNTY G O CARLSON	PA	LPV	0	100	0	100	0	100
N38	WELLSBORO JOHNSTON	PA	LP	0	100	0	100	0	100
N79	NORTHUMBERLAND COUNTY	PA	LPV	0	100	0	100	0	100
N96	BELLEFONTE	PA	LPV	0	100	0	100	0	100
OQN	BRANDYWINE RGNL	PA	LP	0	100	0	100	0	100
OYM	ST MARYS MUNICIPAL	PA	LPV	0	100	0	100	0	100
PHL	PHILADELPHIA INTL	PA	LPV200	0	100	0	100	0	100
PIT	PITTSBURGH INTL	PA	LPV200	0	100	0	100	0	100
PNE	NORTHEAST PHILADELPHIA	PA	LPV200	0	100	0	100	0	100
PSB	MID-STATE	PA	LPV	0	100	0	100	0	100
PTW	HERITAGE FIELD	PA	LPV	0	100	0	100	0	100
RDG	READING RGNL/CARL A SPAATZ FIE	PA	LPV	0	100	0	100	0	100
RVL	MIFFLIN COUNTY	PA	LPV	0	100	0	100	0	100
SEG	PENN VALLEY	PA	LP	0	100	0	100	0	100
THV	YORK	PA	LP	0	100	0	100	0	100
UCP	NEW CASTLE MUNICIPAL	PA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UKT	QUAKERTOWN	PA	LP	0	100	0	100	0	100
UNV	UNIVERSITY PARK	PA	LPV200	0	100	0	100	0	100
VVS	JOSEPH A HARDY CONNELLSVILLE	PA	LPV	0	100	0	100	0	100
WAY	GREENE COUNTY	PA	LPV	0	100	0	100	0	100
WBW	WILKES-BARRE WYOMING VALLEY	PA	LPV	0	100	0	100	0	100
XLL	ALLENTOWN QUEEN CITY MUNICIPAL	PA	LP	0	100	0	100	0	100
ZER	SCHUYLKILL COUNTY/JOE ZERBEY	PA	LPV200	0	100	0	100	0	100
BID	BLOCK ISLAND STATE	RI	LPV	0	100	0	100	0	100
OQU	QUONSET STATE	RI	LPV200	0	100	0	100	0	100
PVD	THEODORE FRANCIS GREEN STATE	RI	LPV200	0	100	0	100	0	100
SFZ	NORTH CENTRAL STATE	RI	LPV	0	100	0	100	0	100
35A	UNION COUNTY` TROY SHELTON FIE	SC	LP	0	100	0	100	0	100
6J0	LEXINGTON COUNTY	SC	LPV	0	100	0	100	0	100
AIK	AIKEN RGNL	SC	LPV200	0	100	0	100	0	100
AND	ANDERSON RGNL	SC	LPV200	0	100	0	100	0	100
AQX	ALLENDALE COUNTY	SC	LPV	0	100	0	100	0	100
ARW	BEAUFORT COUNTY	SC	LPV200	0	100	0	100	0	100
BBP	MARLBORO COUNTY JETPORT - H E	SC	LPV	0	100	0	100	0	100
BNL	BARNWELL RGNL	SC	LPV	0	100	0	100	0	100
CAE	COLUMBIA METROPOLITAN	SC	LPV200	0	100	0	100	0	100
CDN	WOODWARD FIELD	SC	LPV	0	100	0	100	0	100
CEU	OCONEE COUNTY RGNL	SC	LPV200	0	100	0	100	0	100
CHS	CHARLESTON AFB/INTL	SC	LPV200	0	100	0	100	0	100
CKI	WILLIAMSBURG RGNL	SC	LPV	0	100	0	100	0	100
CQW	CHERAW MUNICIPAL/LYNCH BELLINGER FI	SC	LPV	0	100	0	100	0	100
CRE	GRAND STRAND	SC	LPV200	0	100	0	100	0	100
CUB	JIM HAMILTON L B OWENS	SC	LPV	0	100	0	100	0	100
DCM	CHESTER CATAWBA RGNL	SC	LPV	0	100	0	100	0	100
DYB	SUMMERVILLE	SC	LPV200	0	100	0	100	0	100
FDW	FAIRFIELD COUNTY	SC	LPV	0	100	0	100	0	100
FLO	FLORENCE RGNL	SC	LPV	0	100	0	100	0	100
GGE	GEORGETOWN COUNTY	SC	LPV	0	100	0	100	0	100
GMU	GREENVILLE DOWNTOWN	SC	LPV200	0	100	0	100	0	100
GRD	GREENWOOD COUNTY	SC	LPV	0	100	0	100	0	100
GSP	GREENVILLE SPARTANBURG INTL	SC	LPV200	0	100	0	100	0	100
GYH	DONALDSON FIELD	SC	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HVS	HARTSVILLE RGNL	SC	LPV	0	100	0	100	0	100
HXD	HILTON HEAD	SC	LPV	0	100	0	100	0	100
HYW	CONWAY-HORRY COUNTY	SC	LPV	0	100	0	100	0	100
JZI	CHARLESTON EXECUTIVE	SC	LPV200	0	100	0	100	0	100
LKR	LANCASTER COUNTY-MC WHIRTER FI	SC	LPV200	0	100	0	100	0	100
LQK	PICKENS COUNTY	SC	LPV	0	100	0	100	0	100
LRO	MT PLEASANT RGNL-FAISON FIELD	SC	LPV	0	100	0	100	0	100
LUX	LAURENS COUNTY	SC	LPV	0	100	0	100	0	100
MAO	MARION COUNTY	SC	LPV	0	100	0	100	0	100
MKS	BERKELEY COUNTY	SC	LPV	0	100	0	100	0	100
MYR	MYRTLE BEACH INTL	SC	LPV200	0	100	0	100	0	100
OGB	ORANGEBURG MUNICIPAL	SC	LPV	0	100	0	100	0	100
PYG	PAGELAND	SC	LPV	0	100	0	100	0	100
RBW	LOWCOUNTRY RGNL	SC	LPV200	0	100	0	100	0	100
SMS	SUMTER	SC	LPV200	0	100	0	100	0	100
SPA	SPARTANBURG DOWNTOWN MEMORIAL/	SC	LPV200	0	100	0	100	0	100
UDG	DARLINGTON COUNTY	SC	LPV	0	100	0	100	0	100
UZA	ROCK HILL/YORK CO/BRYANT FIELD	SC	LPV200	0	100	0	100	0	100
0D8	GETTYSBURG MUNICIPAL	SD	LP	0	100	0	100	0	100
49B	STURGIS MUNICIPAL	SD	LPV	0	100	0	100	0	100
4X4	WESSINGTON SPRINGS	SD	LP	0	100	0	100	0	100
8D3	SISSETON MUNICIPAL	SD	LPV	0	100	0	100	0	100
8D7	CLARK COUNTY	SD	LP	0	100	0	100	0	100
8V3	PARKSTON MUNICIPAL	SD	LPV	0	100	0	100	0	100
98D	ONIDA MUNICIPAL	SD	LP	0	100	0	100	0	100
9D0	HIGHMORE MUNICIPAL	SD	LPV	0	100	0	100	0	100
9D1	GREGORY MUNICIPAL - FLYNN FLD	SD	LPV	0	100	0	100	0	100
9V6	MARTIN MUNICIPAL	SD	LPV	0	100	0	100	0	100
9V9	CHAMBERLAIN MUNICIPAL	SD	LP	0	100	0	100	0	100
ABR	ABERDEEN RGNL	SD	LPV200	0	100	0	100	0	100
AGZ	WAGNER MUNICIPAL	SD	LPV	0	100	0	100	0	100
ATY	WATERTOWN RGNL	SD	LPV200	0	100	0	100	0	100
BKX	BROOKINGS RGNL	SD	LPV200	0	100	0	100	0	100
EFC	BELLE FOURCHE MUNICIPAL	SD	LPV	0	100	0	100	0	100
FSD	JOE FOSS FIELD	SD	LPV200	0	100	0	100	0	100
HON	HURON RGNL	SD	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
HSR	HOT SPRINGS MUNICIPAL	SD	LP	0	100	0	100	0	100
ICR	WINNER RGNL	SD	LPV	0	100	0	100	0	100
IEN	PINE RIDGE	SD	LPV	0	100	0	100	0	100
LEM	LEMMON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MBG	MOBRIDGE MUNICIPAL	SD	LPV	0	100	0	100	0	100
MDS	MADISON MUNICIPAL	SD	LPV	0	100	0	100	0	100
MHE	MITCHELL MUNICIPAL	SD	LPV	0	100	0	100	0	100
MKA	MILLER MUNICIPAL	SD	LPV	0	100	0	100	0	100
PHP	PHILIP	SD	LPV	0	100	0	100	0	100
PIR	PIERRE RGNL	SD	LPV	0	100	0	100	0	100
RAP	RAPID CITY RGNL	SD	LPV200	0	100	0	100	0	100
SPF	BLACK HILLS-CLYDE ICE FIELD	SD	LPV	0	100	0	100	0	100
SUO	ROSEBUD SIOUX TRIBAL	SD	LPV	0	100	0	100	0	100
VMR	HAROLD DAVIDSON FIELD	SD	LPV	0	100	0	100	0	100
YKN	CHAN GURNEY MUNICIPAL	SD	LPV200	0	100	0	100	0	100
0A3	SMITHVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
0M3	JOHN A BAKER FLD	TN	LP	0	100	0	100	0	100
0M4	BENTON COUNTY	TN	LPV	0	100	0	100	0	100
0M5	HUMPHREYS COUNTY	TN	LP	0	100	0	100	0	100
1A3	MARTIN CAMPBELL FIELD	TN	LP	0	100	0	100	0	100
1M5	PORTLAND MUNICIPAL	TN	LPV	0	100	0	100	0	100
2A0	MARK ANTON	TN	LPV	0	100	0	100	0	100
2M2	LAWRENCEBURG-LAWRENCE COUNTY	TN	LPV	0	100	0	100	0	100
2M8	CHARLES W BAKER	TN	LPV	0	100	0	100	0	100
3A2	NEW TAZEWELL MUNICIPAL	TN	LP	0	100	0	100	0	100
3M7	LAFAYETTE MUNICIPAL	TN	LPV	0	100	0	100	0	100
8A3	LIVINGSTON MUNICIPAL	TN	LP	0	100	0	100	0	100
BGF	WINCHESTER MUNICIPAL	TN	LPV	0	100	0	100	0	100
BNA	NASHVILLE INTL	TN	LPV200	0	100	0	100	0	100
CHA	LOVELL FIELD	TN	LPV200	0	100	0	100	0	100
CKV	OUTLAW FIELD	TN	LPV	0	100	0	100	0	100
CSV	CROSSVILLE MEMORIAL-WHITSON FI	TN	LPV200	0	100	0	100	0	100
DYR	DYERSBURG RGNL	TN	LPV	0	100	0	100	0	100
FYE	FAYETTE COUNTY	TN	LPV	0	100	0	100	0	100
FYM	FAYETTEVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
GCY	GREENEVILLE-GREENE COUNTY MUNICIPAL	TN	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GHM	CENTERVILLE MUNICIPAL	TN	LP	0	100	0	100	0	100
GKT	GATLINBURG-PIGEON FORGE	TN	LPV	0	100	0	100	0	100
GZS	ABERNATHY FIELD	TN	LPV	0	100	0	100	0	100
HZD	CARROLL COUNTY	TN	LPV	0	100	0	100	0	100
JAU	COLONEL TOMMY C STINER AIRFIEL	TN	LP	0	100	0	100	0	100
JWN	JOHN C TUNE	TN	LPV	0	100	0	100	0	100
LUG	ELLINGTON	TN	LPV	0	100	0	100	0	100
M01	GENERAL DEWITT SPAIN	TN	LPV	0	100	0	100	0	100
M08	WILLIAM L WHITEHURST FIELD	TN	LP	0	100	0	100	0	100
M53	HUMBOLDT MUNICIPAL	TN	LPV	0	100	0	100	0	100
M54	LEBANON MUNICIPAL	TN	LPV	0	100	0	100	0	100
M91	SPRINGFIELD ROBERTSON COUNTY	TN	LPV	0	100	0	100	0	100
MBT	MURFREESBORO MUNICIPAL	TN	LPV	0	100	0	100	0	100
MEM	MEMPHIS INTL	TN	LPV200	0	100	0	100	0	100
MKL	MC KELLAR-SIPES RGNL	TN	LPV200	0	100	0	100	0	100
MMI	MCMINN COUNTY	TN	LPV	0	100	0	100	0	100
MNV	MONROE COUNTY	TN	LPV	0	100	0	100	0	100
MOR	MOORE-MURRELL	TN	LPV	0	100	0	100	0	100
MQY	SMYRNA	TN	LPV200	0	100	0	100	0	100
MRC	MAURY COUNTY	TN	LPV	0	100	0	100	0	100
NQA	MILLINGTON-MEMPHIS	TN	LPV200	0	100	0	100	0	100
PHT	HENRY COUNTY	TN	LPV200	0	100	0	100	0	100
PVE	BEECH RIVER RGNL	TN	LPV	0	100	0	100	0	100
RKW	ROCKWOOD MUNICIPAL	TN	LPV	0	100	0	100	0	100
RNC	WARREN COUNTY MEMORIAL	TN	LPV	0	100	0	100	0	100
RVN	HAWKINS COUNTY	TN	LP	0	100	0	100	0	100
RZR	CLEVELAND RGNL JETPORT	TN	LPV200	0	100	0	100	0	100
SCX	SCOTT MUNICIPAL	TN	LPV	0	100	0	100	0	100
SNH	SAVANNAH-HARDIN COUNTY	TN	LPV	0	100	0	100	0	100
SRB	UPPER CUMBERLAND RGNL	TN	LPV	0	100	0	100	0	100
SYI	BOMAR FIELD-SHELBYVILLE MUNICIPAL	TN	LPV	0	100	0	100	0	100
SZY	ROBERT SIBLEY	TN	LPV	0	100	0	100	0	100
TGC	GIBSON COUNTY	TN	LP	0	100	0	100	0	100
THA	TULLAHOMA RGNL ARPT/WM NORTHER	TN	LPV	0	100	0	100	0	100
TRI	TRI-CITIES	TN	LPV200	0	100	0	100	0	100
TYS	MC GHEE TYSON	TN	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
UCY	EVERETT-STEWART RGNL	TN	LPV200	0	100	0	100	0	100
XNX	SUMNER COUNTY RGNL	TN	LPV	0	100	0	100	0	100
0F2	BOWIE MUNICIPAL	TX	LPV	0	100	0	100	0	100
11R	BRENHAM MUNICIPAL	TX	LPV	0	100	0	100	0	100
2R9	KENEDY RGNL	TX	LP	0	100	0	100	0	100
3R9	LAKEWAY AIRPARK	TX	LP	0	100	0	100	0	100
3T5	FAYETTE RGNL AIR CENTER	TX	LPV	0	100	0	100	0	100
41F	FLOYDADA MUNICIPAL	TX	LP	0	100	0	100	0	100
45R	HAWTHORNE FIELD	TX	LP	0	100	0	100	0	100
4T2	KENNETH COPELAND	TX	LPV	0	100	0	100	0	100
50R	LOCKHART MUNICIPAL	TX	LPV	0	100	0	100	0	100
5C1	BOERNE STAGE FIELD	TX	LP	0	100	0	100	0	100
5T9	MAVERICK COUNTY MEMORIAL INTL	TX	LPV	0	100	0	100	0	100
60R	NAVASOTA MUNICIPAL	TX	LPV	0	100	0	100	0	100
6R3	CLEVELAND MUNICIPAL	TX	LPV	0	100	0	100	0	100
77F	WINTERS MUNICIPAL	TX	LP	0	100	0	100	0	100
8F3	CROSBYTON MUNICIPAL	TX	LP	0	100	0	100	0	100
ABI	ABILENE RGNL	TX	LPV200	0	100	0	100	0	100
ACT	WACO RGNL	TX	LPV200	0	100	0	100	0	100
ADS	ADDISON	TX	LPV	0	100	0	100	0	100
AFW	FORT WORTH ALLIANCE	TX	LPV200	0	100	0	100	0	100
ALI	ALICE INTL	TX	LPV	0	100	0	100	0	100
AMA	RICK HUSBAND AMARILLO INTL	TX	LPV200	0	100	0	100	0	100
ARM	WHARTON RGNL	TX	LPV	0	100	0	100	0	100
ASL	HARRISON COUNTY	TX	LPV	0	100	0	100	0	100
AUS	AUSTIN-BERGSTROM INTL	TX	LPV200	0	100	0	100	0	100
AXH	HOUSTON-SOUTHWEST	TX	LPV	0	100	0	100	0	100
BAZ	NEW BRAUNFELS RGNL	TX	LPV	0	100	0	100	0	100
BBD	CURTIS FIELD	TX	LPV	0	100	0	100	0	100
BEA	BEEVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
BFE	TERRY COUNTY	TX	LPV	0	100	0	100	0	100
BGD	HUTCHINSON COUNTY	TX	LPV	0	100	0	100	0	100
BKD	STEPHENS COUNTY	TX	LP	0	100	0	100	0	100
BKS	BROOKS COUNTY	TX	LPV	0	100	0	100	0	100
BMT	BEAUMONT MUNICIPAL	TX	LPV	0	100	0	100	0	100
BPG	BIG SPRING MC MAHON-WRINKLE	TX	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
BPT	JACK BROOKS RGNL	TX	LPV200	0	100	0	100	0	100
BRO	BROWNSVILLE/SOUTH PADRE ISLAND	TX	LPV200	0	100	0	100	0	100
BWD	BROWNWOOD RGNL	TX	LPV	0	100	0	100	0	100
BYY	BAY CITY RGNL	TX	LPV	0	100	0	100	0	100
CDS	CHILDRESS MUNICIPAL	TX	LPV200	0	100	0	100	0	100
CFD	COULTER FIELD	TX	LPV	0	100	0	100	0	100
CLL	EASTERWOOD FIELD	TX	LPV200	0	100	0	100	0	100
CNW	TSTC WACO	TX	LPV200	0	100	0	100	0	100
COM	COLEMAN MUNICIPAL	TX	LPV	0	100	0	100	0	100
COT	COTULLA-LA SALLE COUNTY	TX	LPV	0	100	0	100	0	100
CPT	CLEBURNE RGNL	TX	LPV	0	100	0	100	0	100
CRP	CORPUS CHRISTI INTL	TX	LPV200	0	100	0	100	0	100
CVB	CASTROVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
CWC	KICKAPOO DOWNTOWN	TX	LPV	0	100	0	100	0	100
CXO	CONROE-NORTH HOUSTON RGNL	TX	LPV200	0	100	0	100	0	100
CZT	DIMMIT COUNTY	TX	LPV	0	100	0	100	0	100
DAL	DALLAS LOVE FIELD	TX	LPV200	0	100	0	100	0	100
DFW	DALLAS-FORT WORTH INTL	TX	LPV200	0	100	0	100	0	100
DHT	DALHART MUNICIPAL	TX	LPV	0	100	0	100	1	99.999
DKR	HOUSTON COUNTY	TX	LP	0	100	0	100	0	100
DRT	DEL RIO INTL	TX	LPV	0	100	0	100	0	100
DTO	DENTON ENTERPRISE	TX	LPV200	0	100	0	100	0	100
DUX	MOORE COUNTY	TX	LPV200	0	100	0	100	0	100
DWH	DAVID WAYNE HOOKS MEMORIAL	TX	LPV	0	100	0	100	0	100
E01	ROY HURD MEMORIAL	TX	LP	0	100	0	100	0	100
E11	ANDREWS COUNTY	TX	LPV	0	100	0	100	0	100
E19	GRUVER MUNICIPAL	TX	LP	0	100	0	100	0	100
E30	BRUCE FIELD	TX	LPV	0	100	0	100	0	100
E38	ALPINE-CASPARIS MUNICIPAL	TX	LPV	0	100	0	100	0	100
EBG	SOUTH TEXAS INTL AT EDINBURG	TX	LPV	0	100	0	100	0	100
EDC	AUSTIN EXECUTIVE	TX	LPV200	0	100	0	100	0	100
EFD	ELLINGTON	TX	LPV200	0	100	0	100	0	100
ELA	EAGLE LAKE	TX	LP	0	100	0	100	0	100
ELP	EL PASO INTL	TX	LP	0	100	0	100	1	99.999
ERV	KERRVILLE MUNICIPAL/LOUIS SCHREINER	TX	LPV	0	100	0	100	0	100
ETN	EASTLAND MUNICIPAL	TX	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
F00	JONES FIELD	TX	LPV	0	100	0	100	0	100
F05	WILBARGER COUNTY	TX	LPV	0	100	0	100	0	100
F49	SLATON MUNICIPAL	TX	LPV	0	100	0	100	0	100
F98	YOAKUM COUNTY	TX	LPV	0	100	0	100	0	100
FST	FORT STOCKTON-PECOS COUNTY	TX	LPV	0	100	0	100	0	100
FTW	FORT WORTH MEACHAM INTL	TX	LPV200	0	100	0	100	0	100
FWS	FORT WORTH SPINKS	TX	LPV200	0	100	0	100	0	100
GDJ	GRANBURY RGNL	TX	LPV	0	100	0	100	0	100
GGG	EAST TEXAS RGNL	TX	LPV	0	100	0	100	0	100
GKY	ARLINGTON MUNICIPAL	TX	LPV200	0	100	0	100	0	100
GLE	GAINESVILLE MUNICIPAL	TX	LPV	0	100	0	100	0	100
GLS	SCHOLES INTL AT GALVESTON	TX	LPV200	0	100	0	100	0	100
GNC	GAINES COUNTY	TX	LPV	0	100	0	100	0	100
GRK	ROBERT GRAY AAF	TX	LPV200	0	100	0	100	0	100
GTU	GEORGETOWN MUNICIPAL	TX	LPV	0	100	0	100	0	100
GVT	MAJORS	TX	LPV200	0	100	0	100	0	100
GYI	NORTH TEXAS RGNL/PERRIN FIELD	TX	LPV200	0	100	0	100	0	100
HBV	JIM HOGG COUNTY	TX	LPV	0	100	0	100	0	100
HDO	SOUTH TEXAS RGNL AT HONDO	TX	LPV	0	100	0	100	0	100
HHF	HEMPHILL COUNTY	TX	LPV	0	100	0	100	0	100
HOU	WILLIAM P HOBBY	TX	LPV200	0	100	0	100	0	100
HQZ	MESQUITE METRO	TX	LPV	0	100	0	100	0	100
HRL	VALLEY INTL	TX	LPV200	0	100	0	100	0	100
HRX	HEREFORD MUNICIPAL	TX	LPV200	0	100	0	100	0	100
HYI	SAN MARCOS RGNL	TX	LPV200	0	100	0	100	0	100
IAH	GEORGE BUSH INTERCONTINENTAL/H	TX	LPV200	0	100	0	100	0	100
IKG	KLEBERG COUNTY	TX	LPV	0	100	0	100	0	100
ILE	SKYLARK FIELD	TX	LPV200	0	100	0	100	0	100
INJ	HILLSBORO MUNICIPAL	TX	LPV	0	100	0	100	0	100
INK	WINKLER COUNTY	TX	LPV200	0	100	0	100	0	100
IWS	WEST HOUSTON	TX	LP	0	100	0	100	0	100
JAS	JASPER COUNTY-BELL FIELD	TX	LPV	0	100	0	100	0	100
JSO	CHEROKEE COUNTY	TX	LPV	0	100	0	100	0	100
JWY	MID-WAY RGNL	TX	LPV200	0	100	0	100	0	100
JXI	FOX STEPHENS FIELD - GILMER MU	TX	LP	0	100	0	100	0	100
LBB	LUBBOCK PRESTON SMITH INTL	TX	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
LBX	TEXAS GULF COAST RGNL	TX	LPV	0	100	0	100	0	100
LFK	ANGELINA COUNTY	TX	LPV	0	100	0	100	0	100
LHB	HEARNE MUNICIPAL	TX	LPV200	0	100	0	100	0	100
LIU	LITTLEFIELD TAYLOR BROWN MUNICIPAL	TX	LPV	0	100	0	100	0	100
LLN	LEVELLAND MUNICIPAL	TX	LPV	0	100	0	100	0	100
LNC	LANCASTER RGNL	TX	LPV200	0	100	0	100	0	100
LRD	LAREDO INTL	TX	LPV200	0	100	0	100	0	100
LUD	DECATUR MUNICIPAL	TX	LPV	0	100	0	100	0	100
LUV	LAMESA MUNICIPAL	TX	LPV200	0	100	0	100	0	100
LVJ	PEARLAND RGNL	TX	LPV	0	100	0	100	0	100
LXY	MEXIA-LIMESTONE CO	TX	LP	0	100	0	100	0	100
MAF	MIDLAND INTL AIR AND SPACE POR	TX	LPV200	0	100	0	100	0	100
MDD	MIDLAND AIRPARK	TX	LPV	0	100	0	100	0	100
MFE	MC ALLEN MILLER INTL	TX	LPV200	0	100	0	100	0	100
MKN	COMANCHE COUNTY-CITY	TX	LPV	0	100	0	100	0	100
MNZ	HAMILTON MUNICIPAL	TX	LPV	0	100	0	100	0	100
MWL	MINERAL WELLS	TX	LPV200	0	100	0	100	0	100
OCH	NACOGDOCHES A L MANGHAM JR RGN	TX	LPV200	0	100	0	100	0	100
ODO	ODESSA-SCHLEMEYER FIELD	TX	LPV200	0	100	0	100	0	100
ONY	OLNEY MUNICIPAL	TX	LPV	0	100	0	100	0	100
ORG	ORANGE COUNTY	TX	LPV	0	100	0	100	0	100
PEQ	PECOS MUNICIPAL	TX	LPV200	0	100	0	100	0	100
PIL	PORT ISABEL-CAMERON COUNTY	TX	LPV	0	100	0	100	0	100
PKV	CALHOUN COUNTY	TX	LPV	0	100	0	100	0	100
PPA	PERRY LEFORS FIELD	TX	LPV	0	100	0	100	0	100
PRX	COX FIELD	TX	LPV	0	100	0	100	0	100
PSX	PALACIOS MUNICIPAL	TX	LPV	0	100	0	100	0	100
PVW	HALE COUNTY	TX	LPV	0	100	0	100	0	100
PWG	MC GREGOR EXECUTIVE	TX	LPV	0	100	0	100	0	100
PYX	PERRYTON OCHILTREE COUNTY	TX	LPV	0	100	0	100	0	100
RAS	MUSTANG BEACH	TX	LPV	0	100	0	100	0	100
RBD	DALLAS EXECUTIVE	TX	LPV200	0	100	0	100	0	100
RBO	NUECES COUNTY	TX	LPV	0	100	0	100	0	100
RKP	ARANSAS CO	TX	LPV	0	100	0	100	0	100
RYW	LAGO VISTA TX - RUSTY ALLEN	TX	LPV	0	100	0	100	0	100
SAT	SAN ANTONIO INTL	TX	LPV200	0	100	0	100	0	100

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

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
PVU	PROVO MUNICIPAL	UT	LPV200	0	100	0	100	0	100
RIF	RICHFIELD MUNICIPAL	UT	LP	0	100	0	100	0	100
SGU	ST GEORGE RGNL	UT	LPV	0	100	0	100	0	100
SLC	SALT LAKE CITY INTL	UT	LPV200	0	100	0	100	0	100
SPK	SPANISH FORK ARPT SPRINGVILLE-	UT	LP	0	100	0	100	0	100
TVY	BOLINDER FIELD-TOOELE VALLEY	UT	LPV200	0	100	0	100	0	100
U14	NEPHI MUNICIPAL	UT	LPV	0	100	0	100	0	100
U42	SOUTH VALLEY RGNL	UT	LPV	0	100	0	100	0	100
U55	PANGUITCH MUNICIPAL	UT	LPV200	0	100	0	100	0	100
VEL	VERNAL RGNL	UT	LPV	0	100	0	100	0	100
0V4	BROOKNEAL/CAMPBELL COUNTY	VA	LPV	0	100	0	100	0	100
0VG	LEE COUNTY	VA	LPV	0	100	0	100	0	100
AVC	MECKLENBURG-BRUNSWICK RGNL	VA	LPV	0	100	0	100	0	100
BCB	VIRGINIA TECH/MONTGOMERY EXECU	VA	LPV	0	100	0	100	0	100
BKT	ALLEN C PERKINSON BLACKSTONE A	VA	LPV	0	100	0	100	0	100
CHO	CHARLOTTESVILLE-ALBEMARLE	VA	LPV200	0	100	0	100	0	100
CJR	CULPEPER RGNL	VA	LPV	0	100	0	100	0	100
CPK	CHESAPEAKE RGNL	VA	LPV200	0	100	0	100	0	100
DAN	DANVILLE RGNL	VA	LPV200	0	100	0	100	0	100
EMV	EMPORIA-GREENSVILLE RGNL	VA	LPV	0	100	0	100	0	100
FCI	RICHMOND EXECUTIVE-CHESTERFIEL	VA	LPV	0	100	0	100	0	100
FKN	FRANKLIN RGNL	VA	LPV	0	100	0	100	0	100
FVX	FARMVILLE RGNL	VA	LPV	0	100	0	100	0	100
FYJ	MIDDLE PENINSULA RGNL	VA	LPV	0	100	0	100	0	100
HLX	TWIN COUNTY	VA	LPV	0	100	0	100	0	100
HSP	INGALLS FIELD	VA	LPV	0	100	0	100	0	100
HWY	WARRENTON-FAUQUIER	VA	LPV200	0	100	0	100	0	100
JFZ	TAZEWELL COUNTY	VA	LPV	0	100	0	100	0	100
JYO	LEESBURG EXECUTIVE	VA	LPV	0	100	0	100	0	100
LKU	LOUISA COUNTY/FREEMAN FIELD	VA	LPV	0	100	0	100	0	100
LNP	LONESOME PINE	VA	LPV	0	100	0	100	0	100
LUA	LURAY CAVERNS	VA	LP	0	100	0	100	0	100
LYH	LYNCHBURG RGNL/PRESTON GLENN F	VA	LPV	0	100	0	100	0	100
MFV	ACCOMACK COUNTY	VA	LPV	0	100	0	100	0	100
MKJ	MOUNTAIN EMPIRE	VA	LPV	0	100	0	100	0	100
MTV	BLUE RIDGE	VA	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
OFP	HANOVER COUNTY MUNICIPAL	VA	LPV	0	100	0	100	0	100
OKV	WINCHESTER RGNL	VA	LPV200	0	100	0	100	0	100
ORF	NORFOLK INTL	VA	LPV200	0	100	0	100	0	100
PHF	NEWPORT NEWS/WILLIAMSBURG INTL	VA	LPV200	0	100	0	100	0	100
PSK	NEW RIVER VALLEY	VA	LPV200	0	100	0	100	0	100
PTB	DINWIDDIE COUNTY	VA	LPV	0	100	0	100	0	100
PVG	HAMPTON ROADS EXECUTIVE	VA	LPV200	0	100	0	100	0	100
RIC	RICHMOND INTL	VA	LPV200	0	100	0	100	0	100
RMN	STAFFORD RGNL	VA	LPV	0	100	0	100	0	100
ROA	ROANOKE-BLACKSBURG RGNL/WOODRU	VA	LPV	0	100	0	100	0	100
SFQ	SUFFOLK EXECUTIVE	VA	LPV	0	100	0	100	0	100
SHD	SHENANDOAH VALLEY RGNL	VA	LPV200	0	100	0	100	0	100
VJI	VIRGINIA HIGHLANDS	VA	LPV	0	100	0	100	0	100
W78	WILLIAM M TUCK	VA	LPV	0	100	0	100	0	100
W96	NEW KENT COUNTY	VA	LP	0	100	0	100	0	100
WAL	WALLOPS FLIGHT FACILITY	VA	LPV	0	100	0	100	0	100
XSA	TAPPAHANNOCK-ESSEX COUNTY	VA	LPV	0	100	0	100	0	100
BTV	BURLINGTON INTL	VT	LPV200	0	100	0	100	0	100
EFK	NORTHEAST KINGDOM INTL	VT	LP	0	100	0	100	0	100
FSO	FRANKLIN COUNTY STATE	VT	LPV	0	100	0	100	0	100
MPV	EDWARD F KNAPP STATE	VT	LPV	0	100	0	100	0	100
MVL	MORRISVILLE-STOWE STATE	VT	LPV	0	100	0	100	0	100
RUT	RUTLAND - SOUTHERN VERMONT RGN	VT	LPV	0	100	0	100	0	100
ALW	WALLA WALLA RGNL	WA	LPV200	0	100	0	100	0	100
AWO	ARLINGTON MUNICIPAL	WA	LPV200	0	100	0	100	0	100
BLI	BELLINGHAM INTL	WA	LPV200	0	100	0	100	0	100
BVS	SKAGIT RGNL	WA	LPV	0	100	0	100	0	100
CLM	WILLIAM R FAIRCHILD INTL	WA	LPV	0	100	0	100	0	100
CLS	CHEHALIS-CENTRALIA	WA	LPV	0	100	0	100	0	100
DEW	DEER PARK	WA	LPV	0	100	0	100	0	100
EPH	EPHRATA MUNICIPAL	WA	LPV	0	100	0	100	0	100
FHR	FRIDAY HARBOR	WA	LPV	0	100	0	100	0	100
GEG	SPOKANE INTL	WA	LPV200	0	100	0	100	0	100
HQM	BOWERMAN	WA	LPV200	0	100	0	100	0	100
MWH	GRANT CO INTL	WA	LPV200	0	100	0	100	0	100
OLM	OLYMPIA RGNL	WA	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ORS	ORCAS ISLAND	WA	LP	0	100	0	100	0	100
PAE	SNOHOMISH COUNTY (PAINE FLD)	WA	LPV200	0	100	0	100	0	100
PLU	PIERCE COUNTY - THUN FIELD	WA	LPV	0	100	0	100	0	100
PSC	TRI-CITIES	WA	LPV200	0	100	0	100	0	100
PWT	BREMERTON NATIONAL	WA	LPV200	0	100	0	100	0	100
RLD	RICHLAND	WA	LPV	0	100	0	100	0	100
RNT	RENTON MUNICIPAL	WA	LPV	0	100	0	100	0	100
SEA	SEATTLE-TACOMA INTL	WA	LPV200	0	100	0	100	0	100
SFF	FELTS FIELD	WA	LPV	0	100	0	100	0	100
SHN	SANDERSON FIELD	WA	LPV	0	100	0	100	0	100
TDO	ED CARLSON MEMORIAL FIELD - SO	WA	LPV	0	100	0	100	0	100
TIW	TACOMA NARROWS	WA	LPV	0	100	0	100	0	100
YKM	YAKIMA AIR TERMINAL/MCALLISTER	WA	LPV200	0	100	0	100	0	100
3T3	BOYCEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
57C	EAST TROY MUNICIPAL	WI	LPV	0	100	0	100	0	100
61C	FORT ATKINSON MUNICIPAL	WI	LP	0	100	0	100	0	100
82C	MAUSTON-NEW LISBON UNION	WI	LP	0	100	0	100	0	100
8D1	NEW HOLSTEIN MUNICIPAL	WI	LPV	0	100	0	100	0	100
AHH	AMERY MUNICIPAL	WI	LP	0	100	0	100	0	100
AIG	LANGLADE COUNTY	WI	LPV	0	100	0	100	0	100
ARV	LAKELAND/NOBLE F LEE MEMORIAL	WI	LPV	0	100	0	100	0	100
ASX	JOHN F KENNEDY MEMORIAL	WI	LPV	0	100	0	100	0	100
ATW	APPLETON INTL	WI	LPV200	0	100	0	100	0	100
AUW	WAUSAU DOWNTOWN	WI	LPV200	0	100	0	100	0	100
BCK	BLACK RIVER FALLS AREA	WI	LPV	0	100	0	100	0	100
BUU	BURLINGTON MUNICIPAL	WI	LP	0	100	0	100	0	100
C29	MIDDLETON MUNICIPAL - MOREY FIELD	WI	LPV	0	100	0	100	0	100
C35	REEDSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
C47	PORTAGE MUNICIPAL	WI	LP	0	100	0	100	0	100
CLI	CLINTONVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
CMY	SPARTA/FORT MC COY	WI	LPV	0	100	0	100	0	100
CWA	CENTRAL WISCONSIN	WI	LPV200	0	100	0	100	0	100
DLL	BARABOO-WISCONSIN DELLS RGNL	WI	LPV	0	100	0	100	0	100
EAU	CHIPPEWA VALLEY RGNL	WI	LPV200	0	100	0	100	0	100
EGV	EAGLE RIVER UNION	WI	LPV	0	100	0	100	0	100
ENW	KENOSHA RGNL	WI	LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
ETB	WEST BEND MUNICIPAL	WI	LPV	0	100	0	100	0	100
EZS	SHAWANO MUNICIPAL	WI	LPV	0	100	0	100	0	100
FLD	FOND DU LAC COUNTY	WI	LPV	0	100	0	100	0	100
GRB	GREEN BAY-AUSTIN STRAUBEL INTL	WI	LPV200	0	100	0	100	0	100
GTG	GRANTSBURG MUNICIPAL	WI	LP	0	100	0	100	0	100
HXF	HARTFORD MUNICIPAL	WI	LPV	0	100	0	100	0	100
HYR	SAWYER COUNTY	WI	LPV	0	100	0	100	0	100
ISW	ALEXANDER FIELD SOUTH WOOD COU	WI	LPV	0	100	0	100	0	100
JVL	SOUTHERN WISCONSIN RGNL	WI	LPV200	0	100	0	100	0	100
LNR	TRI-COUNTY RGNL	WI	LPV	0	100	0	100	0	100
LSE	LA CROSSE RGNL	WI	LPV	0	100	0	100	0	100
LUM	MENOMONIE MUNICIPAL-SCORE FIELD	WI	LPV	0	100	0	100	0	100
MDZ	TAYLOR COUNTY	WI	LPV	0	100	0	100	0	100
MFI	MARSHFIELD MUNICIPAL	WI	LPV	0	100	0	100	0	100
MKE	GENERAL MITCHELL INTL	WI	LPV200	0	100	0	100	0	100
MRJ	IOWA COUNTY	WI	LPV200	0	100	0	100	0	100
MSN	DANE COUNTY RGNL-TRUAX FIELD	WI	LPV200	0	100	0	100	0	100
MTW	MANITOWOC COUNTY	WI	LPV200	0	100	0	100	0	100
MWC	LAWRENCE J TIMMERMAN	WI	LPV	0	100	0	100	0	100
OCQ	OCONTO-J DOUGLAS BAKE MUNICIPAL	WI	LP	0	100	0	100	0	100
OEO	L O SIMENSTAD MUNICIPAL	WI	LPV200	0	100	0	100	0	100
OSH	WITTMAN RGNL	WI	LPV200	0	100	0	100	0	100
OVS	BOSCOBEL	WI	LPV	0	100	0	100	0	100
PBH	PRICE COUNTY	WI	LPV	0	100	0	100	0	100
PCZ	WAUPACA MUNICIPAL	WI	LPV	0	100	0	100	0	100
PVB	PLATTEVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
RAC	BATTEN INTL	WI	LPV	0	100	0	100	0	100
RCX	RUSK COUNTY	WI	LPV	0	100	0	100	0	100
RHI	RHINELANDER-ONEIDA COUNTY	WI	LPV200	0	100	0	100	0	100
RNH	NEW RICHMOND RGNL	WI	LPV	0	100	0	100	0	100
RPD	RICE LAKE RGNL - CARL'S FIELD	WI	LPV200	0	100	0	100	0	100
RRL	MERRILL MUNICIPAL	WI	LPV	0	100	0	100	0	100
SBM	SHEBOYGAN COUNTY MEMORIAL	WI	LPV200	0	100	0	100	0	100
STE	STEVENS POINT MUNICIPAL	WI	LPV	0	100	0	100	0	100
SUE	DOOR COUNTY CHERRYLAND	WI	LPV	0	100	0	100	0	100
SUW	RICHARD I BONG	WI	LP	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
TKV	TOMAHAWK RGNL	WI	LP	0	100	0	100	0	100
UBE	CUMBERLAND MUNICIPAL	WI	LPV	0	100	0	100	0	100
UES	WAUKESHA COUNTY	WI	LPV200	0	100	0	100	0	100
UNU	DODGE COUNTY	WI	LPV	0	100	0	100	0	100
VIQ	NEILLSVILLE MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y50	WAUTOMA MUNICIPAL	WI	LP	0	100	0	100	0	100
Y55	CRANDON/STEVE CONWAY MUNICIPAL	WI	LPV	0	100	0	100	0	100
Y72	BLOYER FIELD	WI	LP	0	100	0	100	0	100
3I2	MASON COUNTY	WV	LPV	0	100	0	100	0	100
6L4	LOGAN COUNTY	WV	LPV	0	100	0	100	0	100
BKW	RALEIGH COUNTY MEMORIAL	WV	LPV200	0	100	0	100	0	100
BLF	MERCER COUNTY	WV	LPV	0	100	0	100	0	100
CKB	NORTH CENTRAL WEST VIRGINIA	WV	LPV200	0	100	0	100	0	100
CRW	YEAGER	WV	LPV200	0	100	0	100	0	100
HLG	WHEELING OHIO CO	WV	LPV200	0	100	0	100	0	100
HTS	TRI-STATE/MILTON J FERGUSON FI	WV	LPV200	0	100	0	100	0	100
I18	JACKSON COUNTY	WV	LPV200	0	100	0	100	0	100
LWB	GREENBRIER VALLEY	WV	LPV	0	100	0	100	0	100
MGW	MORGANTOWN MUNICIPAL-WALTER L BILL	WV	LPV200	0	100	0	100	0	100
MRB	EASTERN WV RGNL/SHEPHERD FLD	WV	LPV	0	100	0	100	0	100
PKB	MID-OHIO VALLEY RGNL	WV	LPV	0	100	0	100	0	100
USW	BOGGS FIELD	WV	LPV	0	100	0	100	0	100
W22	UPSHUR COUNTY RGNL	WV	LPV	0	100	0	100	0	100
W35	POTOMAC AIRPARK	WV	LP	0	100	0	100	0	100
W99	GRANT COUNTY	WV	LPV	0	100	0	100	0	100
BYG	JOHNSON COUNTY	WY	LPV	0	100	0	100	0	100
COD	YELLOWSTONE RGNL	WY	LPV	0	100	0	100	0	100
CPR	CASPER/NATRONA COUNTY INTL	WY	LPV	0	100	0	100	0	100
CYS	CHEYENNE RGNL/JERRY OLSON FIEL	WY	LPV200	0	100	0	100	0	100
DGW	CONVERSE COUNTY	WY	LPV200	0	100	0	100	0	100
DWX	DIXON	WY	LP	0	100	0	100	0	100
ECS	MONDELL FIELD	WY	LPV	0	100	0	100	0	100
EMM	KEMMERER MUNICIPAL	WY	LPV	0	100	0	100	0	100
EVW	EVANSTON-UINTA COUNTY BURNS FI	WY	LPV	0	100	0	100	0	100
FBR	FORT BRIDGER	WY	LP	0	100	0	100	0	100
GCC	GILLETTE-CAMPBELL COUNTY	WY	LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
GEY	SOUTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
GUR	CAMP GUERNSEY	WY	LP	0	100	0	100	0	100
HSG	HOT SPRINGS COUNTY	WY	LPV	0	100	0	100	0	100
JAC	JACKSON HOLE	WY	LPV200	0	100	0	100	0	100
LAR	LARAMIE RGNL	WY	LPV	0	100	0	100	0	100
PNA	RALPH WENZ FIELD	WY	LPV	0	100	0	100	0	100
POY	POWELL MUNICIPAL	WY	LPV	0	100	0	100	0	100
RIW	RIVERTON RGNL	WY	LPV200	0	100	0	100	0	100
RKS	SOUTHWEST WYOMING RGNL	WY	LPV200	0	100	0	100	0	100
RWL	RAWLINS MUNICIPAL/HARVEY FIELD	WY	LPV	0	100	0	100	0	100
SAA	SHIVELY FIELD	WY	LPV	0	100	0	100	0	100
SHR	SHERIDAN COUNTY	WY	LPV	0	100	0	100	0	100
U68	NORTH BIG HORN COUNTY	WY	LPV	0	100	0	100	0	100
W43	HULETT MUNICIPAL	WY	LPV	0	100	0	100	0	100
WRL	WORLAND MUNICIPAL	WY	LPV	0	100	0	100	0	100
CAJ4	ANAHIM LAKE		LPV	0	100	0	100	0	100
CAL4	ALBIAN		LPV	0	100	0	100	1	99.997
CAU4	VANDERHOOF		LPV	0	100	0	100	0	100
CBN9	TSAY KEH		LP	0	100	0	100	0	100
CCN2	GRAND MANAN		LPV	0	100	0	100	0	100
CDJ4	CLEARWATER		LPV	0	100	0	100	1	99.999
CDK2	DIAVIK		LPV	0	100	0	100	2	99.976
CEB5	FAIRVIEW		LPV	0	100	0	100	0	100
CEC4	JASPER-HINTON		LP	0	100	0	100	0	100
CEL8	ELEONORE		LPV	0	100	0	100	0	100
CEQ3	CAMROSE		LPV	0	100	0	100	0	100
CET2	CONKLIN (LEISMER)		LPV	0	100	0	100	0	100
CEV3	VEGREVILLE		LPV	0	100	0	100	0	100
CEW3	ST. PAUL		LPV	0	100	0	100	0	100
CEZ3	COOKING LAKE		LPV	0	100	0	100	0	100
CFB6	JOSEPHBURG		LPV	0	100	0	100	0	100
CFM4	DONNELLY		LPV	0	100	0	100	1	99.998
CFX5	RENARD		LPV	0	100	0	100	0	100
CGK2	GAHCHO KUE		LPV	0	100	0	100	2	99.980
CJA3	MORDEN REGIONAL		LPV	0	100	0	100	0	100
CJC5	SHAUNAVON		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CJE3	WEYBURN		LPV	0	100	0	100	0	100
CJH3	MAIDSTONE		LPV	0	100	0	100	0	100
CJP9	CHARLOT RIVER		LP	0	100	0	100	1	99.991
CJQ4	MAPLE CREEK		LPV	0	100	0	100	0	100
CJW7	CIGAR LAKE		LPV	0	100	0	100	1	99.999
CJY3	TISDALE		LPV	0	100	0	100	0	100
CJZ3	MELFORT (MILLER FIELD)		LPV	0	100	0	100	0	100
CKQ8	MCARTHUR RIVER		LPV	0	100	0	100	1	99.998
CKZ7	WINKLER		LPV	0	100	0	100	0	100
CMB2	MEADOWBANK		LPV	0	100	0	100	2	99.986
CNV8	EDENVALE		LPV	0	100	0	100	0	100
CNY3	COLLINGWOOD		LPV	0	100	0	100	0	100
CRL4	KIRBY LAKE		LP	0	100	0	100	0	100
CSC3	DRUMMONDVILLE		LPV	0	100	0	100	0	100
CSD4	MONT-LAURIER		LPV	0	100	0	100	0	100
CSE5	MONTMAGNY		LPV	0	100	0	100	0	100
CSH4	LEBEL-SUR-QUEVILLON		LPV	0	100	0	100	0	100
CSK6	SNAP LAKE		LPV	0	100	0	100	1	99.980
CSR3	VICTORIAVILLE		LPV	0	100	0	100	0	100
CTP9	DONALDSON		LPV	0	100	0	100	1	99.999
CTT5	LA ROMAINE		LPV	0	100	0	100	0	100
CTU2	FONTANGES		LPV	0	100	0	100	0	100
CVB2	VOISEY'S BAY		LPV	0	100	0	100	0	100
CYAC	CAT LAKE		LPV	0	100	0	100	0	100
CYAD	LA GRANDE-3		LPV	0	100	0	100	0	100
CYAH	LA GRANDE-4		LPV	0	100	0	100	0	100
CYAS	KANGIRSUK		LPV	0	100	0	100	2	99.996
CYBE	URANIUM CITY		LPV	0	100	0	100	1	99.990
CYBF	BONNYVILLE		LPV	0	100	0	100	0	100
CYBK	BAKER LAKE		LPV	0	100	0	100	2	99.989
CYBL	CAMPBELL RIVER		LPV	0	100	0	100	0	100
CYBR	BRANDON MUNICIPALCIPALITY		LPV	0	100	0	100	0	100
CYBU	NIPAWIN		LPV	0	100	0	100	0	100
CYBW	SPRINGBANK		LPV	0	100	0	100	0	100
CYBX	LOURDES-DE-BLANC-SABLON		LPV	0	100	0	100	0	100
CYCD	NANAIMO		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYCH	MIRAMICHI		LPV	0	100	0	100	1	99.999
CYCK	CHATHAM-KENT		LPV	0	100	0	100	0	100
CYCL	CHARLO		LPV	0	100	0	100	0	100
CYCS	CHESTERFIELD INLET		LPV	0	100	0	100	3	99.992
CYCZ	FAIRMONT HOT SPRINGS		LPV	0	100	0	100	0	100
CYDF	DEER LAKE		LPV200	0	100	0	100	1	99.999
CYDQ	DAWSON CREEK		LPV	0	100	0	100	0	100
CYEE	HURONIA		LPV	0	100	0	100	0	100
CYEG	EDMONTON INTL		LPV200	0	100	0	100	0	100
CYEK	ARVIAT		LPV	0	100	0	100	0	100
CYEN	ESTEVAN REGIONAL		LPV	0	100	0	100	0	100
CYES	EDMUNDSTON		LPV	0	100	0	100	0	100
CYEV	INUVIK (MIKE ZUBKO)		LPV	0	100	0	100	2	99.974
CYEY	MAGNY		LPV	0	100	0	100	0	100
CYFA	FORT ALBANY		LPV	0	100	0	100	0	100
CYFB	IQALUIT		LPV	5	99.881	6	99.869	46	99.562
CYFC	FREDERICTON INTL		LPV	0	100	0	100	1	99.999
CYFI	FIREBAG		LPV	0	100	0	100	1	99.997
CYFO	FLIN FLON		LPV	0	100	0	100	0	100
CYFS	FORT SIMPSON		LPV	0	100	0	100	2	99.986
CYGH	FORT GOOD HOPE		LPV	0	100	0	100	1	99.977
CYGK	KINGSTON		LPV	0	100	0	100	0	100
CYGL	LA GRANDE RIVIERE		LPV	0	100	0	100	0	100
CYGR	ILES-DE-LA-MADELEINE		LPV	0	100	0	100	1	99.999
CYGV	HAVRE ST-PIERRE		LPV	0	100	0	100	0	100
CYGW	KUUJJUARAPIK		LPV	0	100	0	100	0	100
CYGX	GILLAM		LPV	0	100	0	100	0	100
CYHA	QUAQTAQ		LPV	0	100	0	100	4	99.988
CYHD	DRYDEN REGIONAL		LPV	0	100	0	100	0	100
CYHH	NEMISCAU		LPV	0	100	0	100	0	100
CYHM	HAMILTON		LPV	0	100	0	100	0	100
CYHR	CHEVERY		LPV	0	100	0	100	0	100
CYHU	ST-HUBERT		LPV	0	100	0	100	0	100
CYHZ	STANFIELD INTL		LPV200	0	100	0	100	1	99.994
CYIF	ST-AUGUSTIN		LPV	0	100	0	100	0	100
CYIK	IVUJIVIK		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYIV	ISLAND LAKE		LPV	0	100	0	100	0	100
CYJT	STEPHENVILLE		LPV	0	100	0	100	1	99.999
CYKA	KAMLOOPS		LPV	0	100	0	100	0	100
CYKC	COLLINS BAY		LPV	0	100	0	100	0	100
CYKF	WATERLOO		LPV200	0	100	0	100	0	100
CYKG	KANGIQSUJUAQ (WAKEHAM BAY)		LPV	0	100	0	100	2	99.992
CYKJ	KEY LAKE		LPV	0	100	0	100	1	99.998
CYKM	KINCARDINE		LPV	0	100	0	100	0	100
CYKO	AKULIVIK		LPV	0	100	0	100	0	100
CYKQ	WASKAGANISH		LPV	0	100	0	100	0	100
CYLB	LAC LA BICHE		LPV	0	100	0	100	0	100
CYLL	LLOYDMINSTER		LPV	0	100	0	100	0	100
CYLS	LAKE SIMCOE		LPV	0	100	0	100	0	100
CYLU	KANGIQSUALUJJUAQ (GEORGES RIVER)		LPV	0	100	0	100	2	99.989
CYLW	KELOWNA		LPV	0	100	0	100	0	100
CYMJ	AIR VICE MARSHAL C.M. MCEWEN		LP	0	100	0	100	0	100
CYMM	FORT MCMURRAY		LPV	0	100	0	100	1	99.998
CYMT	CHAPAIS		LPV	0	100	0	100	0	100
CYMU	UMIUJAQ		LPV	0	100	0	100	0	100
CYMX	MONTREAL INTL (MIRABEL)		LPV200	0	100	0	100	0	100
CYNC	WEMINDJI		LPV	0	100	0	100	0	100
CYND	GATINEAU		LPV	0	100	0	100	0	100
CYNL	POINTS NORTH LANDING		LPV	0	100	0	100	0	100
CYNR	HORIZON		LPV	0	100	0	100	1	99.997
CYOA	EKATI		LPV	0	100	0	100	2	99.975
CYOC	OLD CROW		LPV	0	100	0	100	1	99.977
CYOD	GROUP CAPTAIN R.W. MCNAIR		LP	0	100	0	100	0	100
CYOO	OSHAWA EXECUTIVE AIRPORT		LPV	0	100	0	100	0	100
CYOP	RAINBOW LAKE		LPV	0	100	0	100	0	100
CYOS	BILLY BISHOP REGIONAL		LPV	0	100	0	100	0	100
CYOW	MACDONALD-CARTIER INTL		LPV200	0	100	0	100	0	100
CYPA	PRINCE ALBERT (GLASS FIELD)		LPV	0	100	0	100	0	100
CYPE	PEACE RIVER		LPV	0	100	0	100	1	99.998
CYPK	PITT MEADOWS		LPV	0	100	0	100	0	100
CYPL	PICKLE LAKE		LPV	0	100	0	100	0	100
CYPQ	PETERBOROUGH		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYPR	PRINCE RUPERT		LPV	0	100	0	100	0	100
CYPX	PUVIRNITUQ		LPV	0	100	0	100	0	100
CYPZ	BURNS LAKE		LP	0	100	0	100	0	100
CYQB	JEAN LESAGE INTL		LPV200	0	100	0	100	0	100
CYQD	THE PAS		LPV	0	100	0	100	0	100
CYQF	RED DEER REGIONAL		LPV	0	100	0	100	0	100
CYQH	WATSON LAKE		LPV	0	100	0	100	1	99.999
CYQI	YARMOUTH		LPV	0	100	0	100	0	100
CYQL	LETHBRIDGE		LPV200	0	100	0	100	0	100
CYQM	GREATER MONCTON ROMEO LEBLANC INTL		LPV	0	100	0	100	1	99.994
CYQR	REGINA INTL		LPV200	0	100	0	100	0	100
CYQS	ST. THOMAS MUNICIPALCIPALITY		LPV	0	100	0	100	0	100
CYQT	THUNDER BAY		LPV200	0	100	0	100	0	100
CYQU	GRANDE PRAIRIE		LPV	0	100	0	100	0	100
CYQW	NORTH BATTLEFORD		LPV	0	100	0	100	0	100
CYQX	GANDER INTL		LPV200	0	100	0	100	2	99.990
CYQY	J.A. DOUGLAS MCCURDY		LPV	0	100	0	100	1	99.991
CYQZ	QUESNEL		LPV	0	100	0	100	0	100
CYRB	RESOLUTE BAY		LPV	145	99.565	148	99.526	651	95.784
CYRI	RIVIERE-DU-LOUP		LPV	0	100	0	100	0	100
CYRJ	ROBERVAL		LPV	0	100	0	100	0	100
CYRL	RED LAKE		LPV	0	100	0	100	0	100
CYRQ	TROIS-RIVIERES		LPV200	0	100	0	100	0	100
CYRT	RANKIN INLET		LPV	0	100	0	100	1	99.998
CYSA	STRATFORD MUNICIPALCIPALITY		LPV	0	100	0	100	0	100
CYSB	SUDBURY		LPV	0	100	0	100	0	100
CYSC	SHERBROOKE		LPV	0	100	0	100	0	100
CYSG	ST-GEORGES		LPV	0	100	0	100	0	100
CYSJ	SAINT JOHN		LPV200	0	100	0	100	0	100
CYSK	SANIKILUAQ		LPV	0	100	0	100	0	100
CYSM	FORT SMITH		LPV	0	100	0	100	2	99.994
CYSN	NIAGARA DISTRICT		LPV	0	100	0	100	0	100
CYTF	ALMA		LPV	0	100	0	100	0	100
CYTH	THOMPSON		LPV200	0	100	0	100	0	100
CYTL	BIG TROUT LAKE		LPV	0	100	0	100	0	100
CYTQ	TASIUJAQ		LPV	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYTS	TIMMINS (VICTOR M. POWER)		LPV	0	100	0	100	0	100
CYTZ	BILLY BISHOP TORONTO CITY AIRPORT		LPV	0	100	0	100	0	100
CYUL	PIERRE-ELLIOTT-TRUDEAU INTL		LPV200	0	100	0	100	0	100
CYUY	ROUYN-NORANDA		LPV200	0	100	0	100	0	100
CYVB	BONAVENTURE		LPV	0	100	0	100	0	100
CYVO	VAL-DOR		LPV200	0	100	0	100	0	100
CYVQ	NORMAN WELLS		LPV	0	100	0	100	2	99.979
CYVR	VANCOUVER INTL		LPV200	0	100	0	100	0	100
CYVV	WIARTON		LPV	0	100	0	100	0	100
CYWG	JAMES ARMSTRONG RICHARDSON INTL		LPV200	0	100	0	100	0	100
CYWK	WABUSH		LPV	0	100	0	100	0	100
CYWL	WILLIAMS LAKE		LPV	0	100	0	100	0	100
CYWM	ATHABASCA		LPV	0	100	0	100	0	100
CYWP	WEBEQUIE		LPV	0	100	0	100	0	100
CYXE	JOHN G. DIEFENBAKER INTL		LPV200	0	100	0	100	0	100
CYXH	MEDICINE HAT		LPV	0	100	0	100	0	100
CYXJ	FORT ST. JOHN		LPV	0	100	0	100	0	100
CYXL	SIOUX LOOKOUT		LPV	0	100	0	100	0	100
CYXS	PRINCE GEORGE		LPV200	0	100	0	100	0	100
CYXT	TERRACE		LPV	0	100	0	100	0	100
CYXU	LONDON		LPV200	0	100	0	100	0	100
CYXX	ABBOTSFORD		LPV	0	100	0	100	0	100
CYXY	ERIK NIELSEN INTL		LPV200	0	100	0	100	0	100
CYYB	NORTH BAY		LPV200	0	100	0	100	0	100
CYYC	YYC CALGARY INTL		LPV200	0	100	0	100	0	100
CYYD	SMITHERS		LPV	0	100	0	100	0	100
CYYF	PENTICTON		LPV	0	100	0	100	0	100
CYYG	CHARLOTTETOWN		LPV	0	100	0	100	1	99.994
CYYH	TALOYOAK		LPV	5	99.948	5	99.948	12	99.857
CYYJ	VICTORIA INTL		LPV200	0	100	0	100	0	100
CYYQ	CHURCHILL		LPV	0	100	0	100	0	100
CYYR	GOOSE BAY		LP	0	100	0	100	0	100
CYYT	ST. JOHN'S INTL		LPV	1	99.997	1	99.997	7	99.946
CYYW	ARMSTRONG		LPV	0	100	0	100	0	100
CYYY	MONT-JOLI		LPV	0	100	0	100	0	100
CYYZ	LESTER B. PEARSON INTL		LPV200	0	100	0	100	0	100

Airport	Airport Name	State/ Province	Service	LP Outages	LP Avail (%)	LPV Outages	LPV Avail (%)	LPV200 Outages	LPV200 Avail (%)
CYZD	DOWNSVIEW		LPV	0	100	0	100	0	100
CYZF	YELLOWKNIFE		LPV	0	100	0	100	2	99.982
CYZG	SALLUIT		LPV	0	100	0	100	0	100
CYZP	SANDSPIT		LPV	0	100	0	100	0	100
CYZR	SARNIA (CHRIS HADFIELD)		LPV	0	100	0	100	0	100
CYZT	PORT HARDY		LPV	0	100	0	100	0	100
CYZU	WHITECOURT		LPV	0	100	0	100	0	100
CYZV	SEPT-ILES		LPV200	0	100	0	100	0	100
CYZX	GREENWOOD		LP	0	100	0	100	1	99.999
CZBB	BOUNDARY BAY		LPV	0	100	0	100	0	100
CZBF	BATHURST		LPV	0	100	0	100	1	99.999
CZJG	JENPEG		LPV	0	100	0	100	0	100
CZPB	SACHIGO LAKE		LP	0	100	0	100	0	100
CZPC	PINCHER CREEK		LPV	0	100	0	100	0	100
CZVL	VILLENEUVE		LPV	0	100	0	100	0	100

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

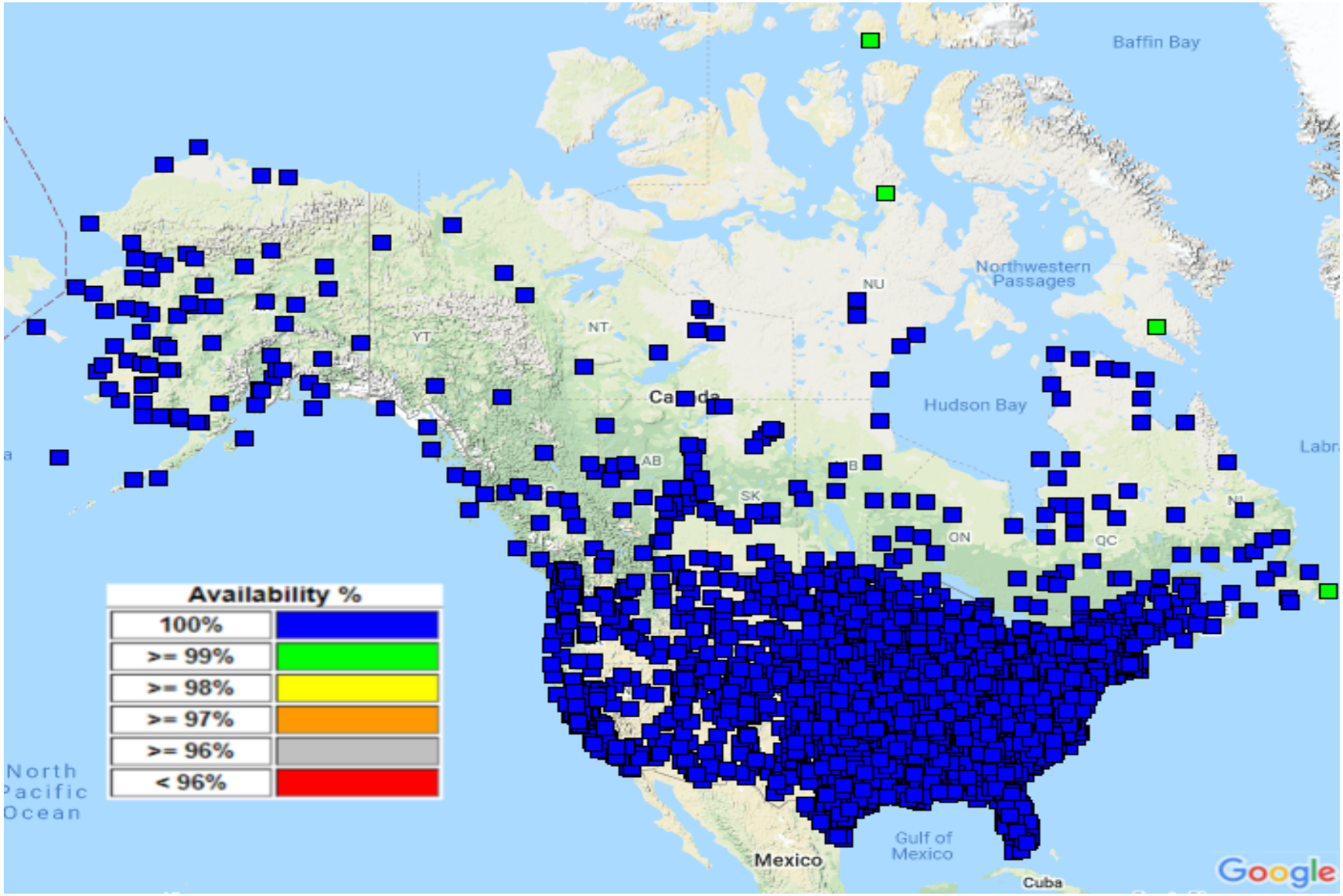


Figure 8-2 WAAS LP Outages at Airports in the US and Canada with GPS RNAV IAPs

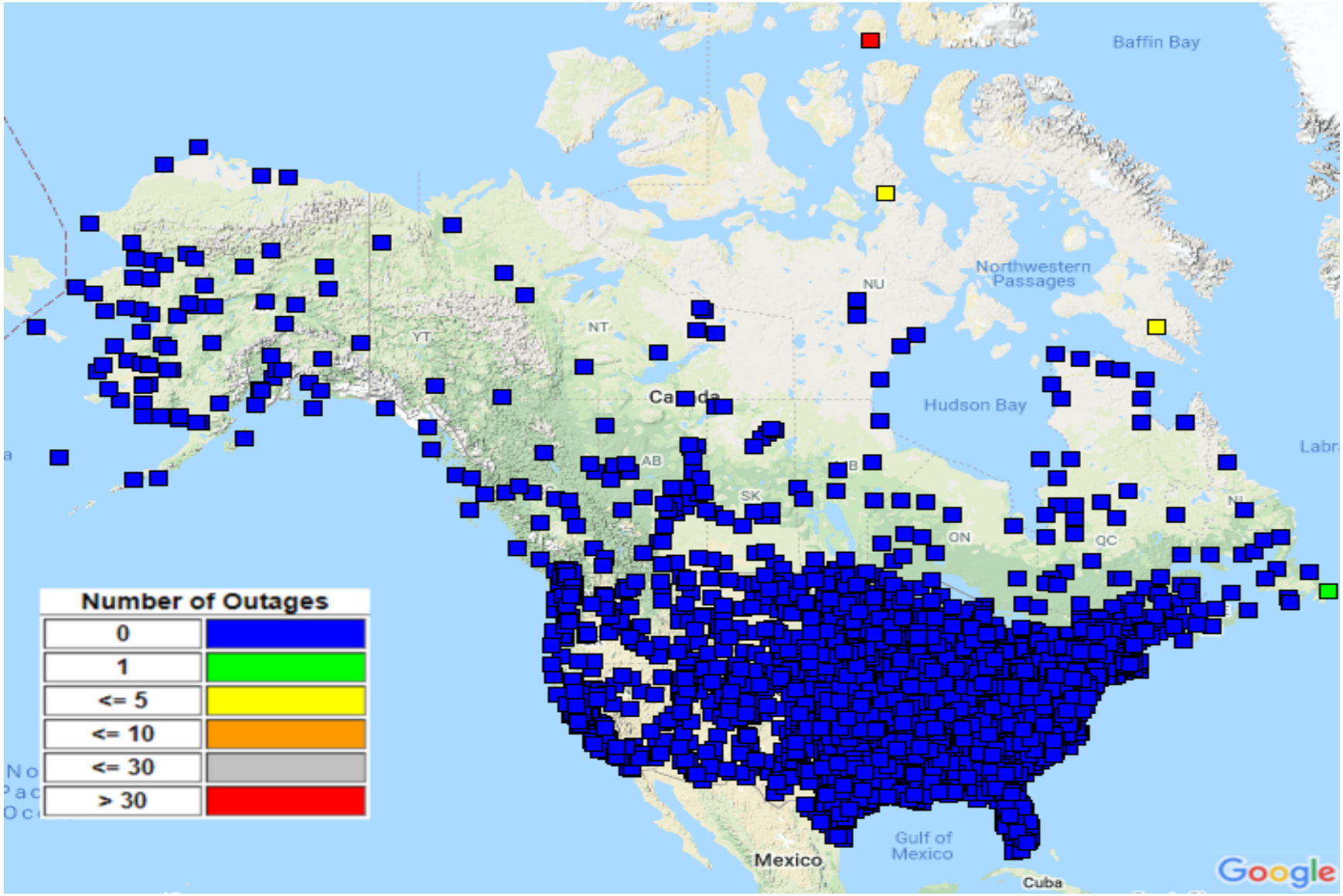


Figure 8-3 WAAS LPV Availability Airports in the US and Canada with GPS RNAV IAPs

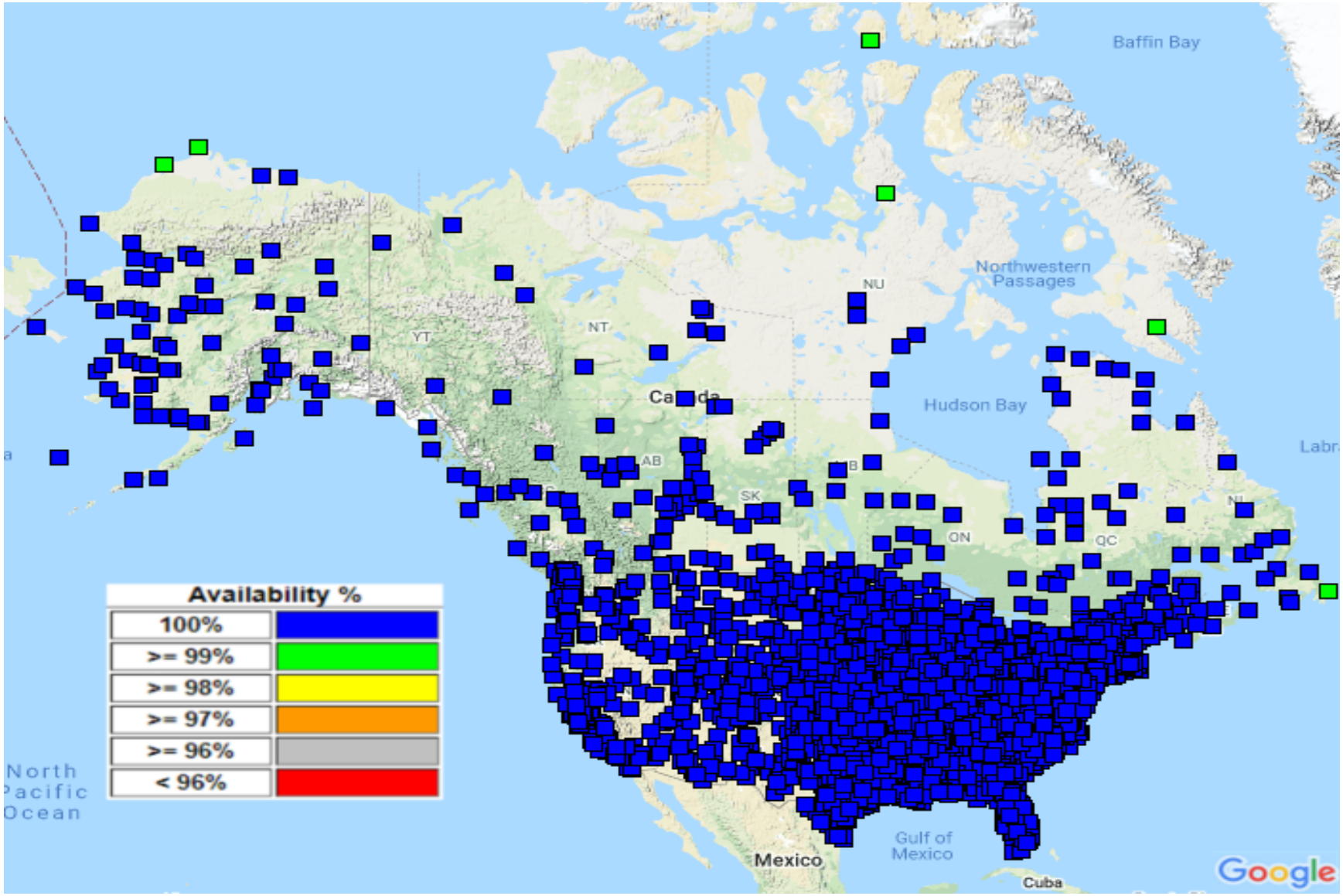


Figure 8-4 WAAS LPV Outages at Airports in the US and Canada with GPS RNAV IAPs

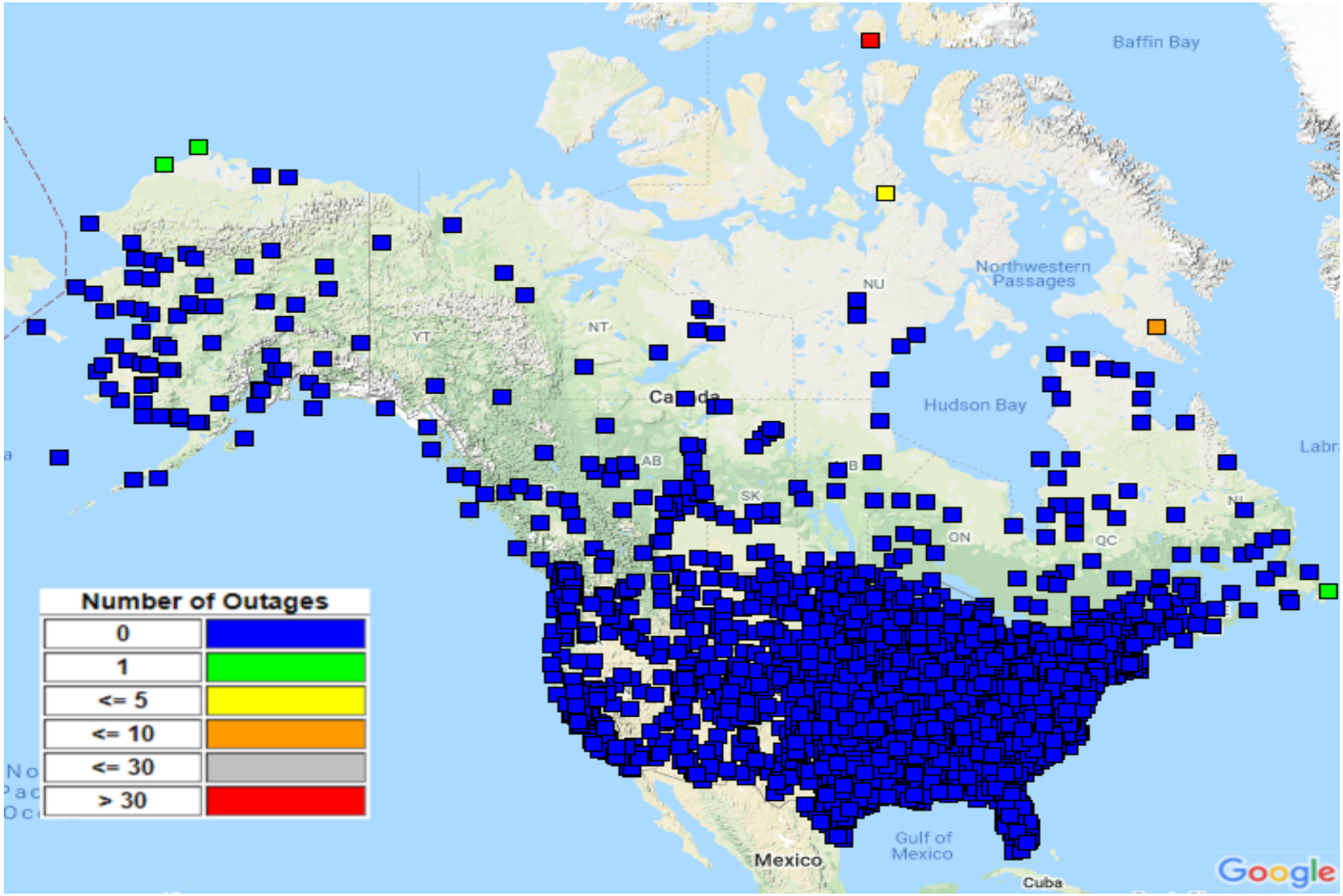


Figure 8-5 WAAS LPV200 Availability at Airports in the US and Canada with GPS RNAV IAPs

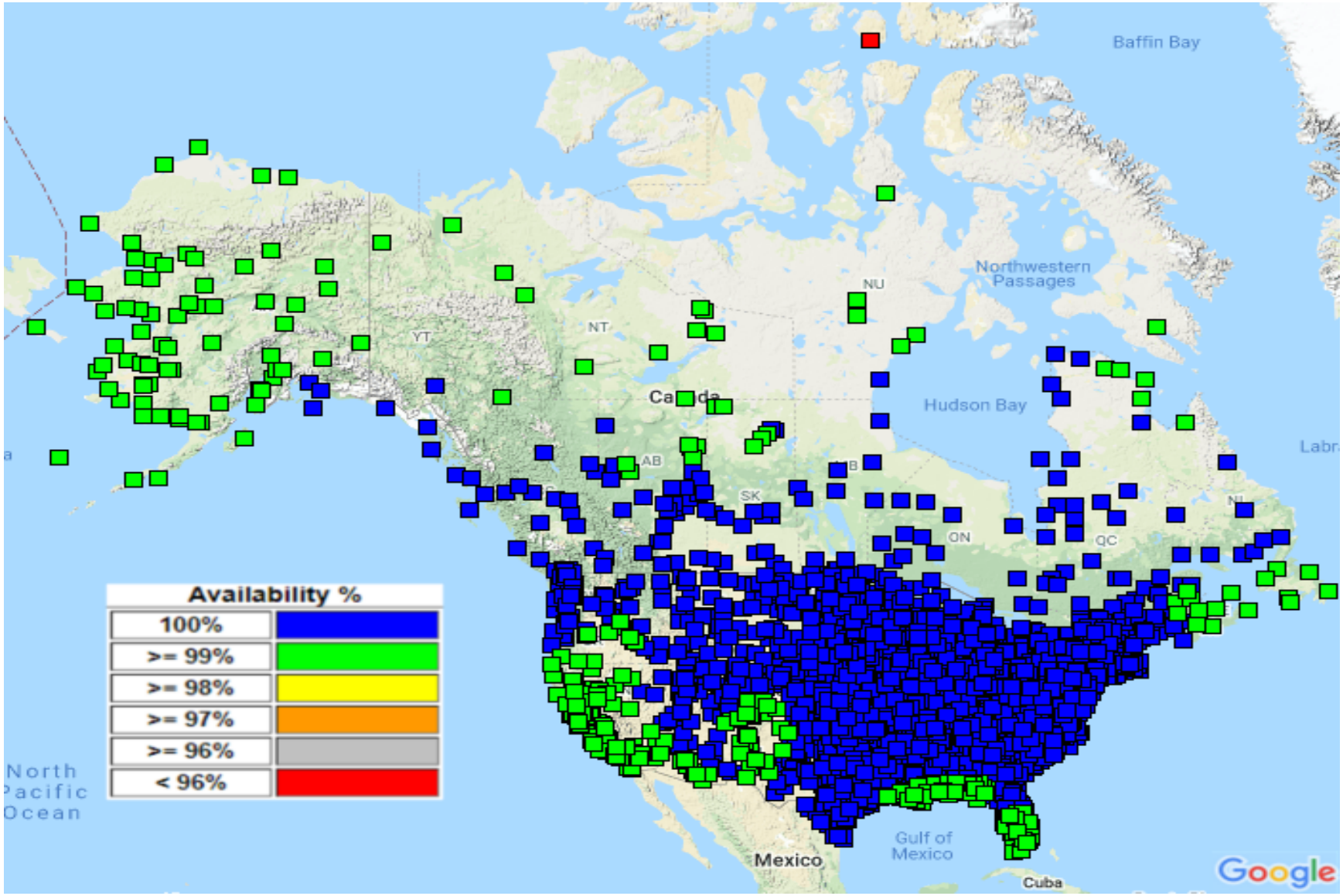
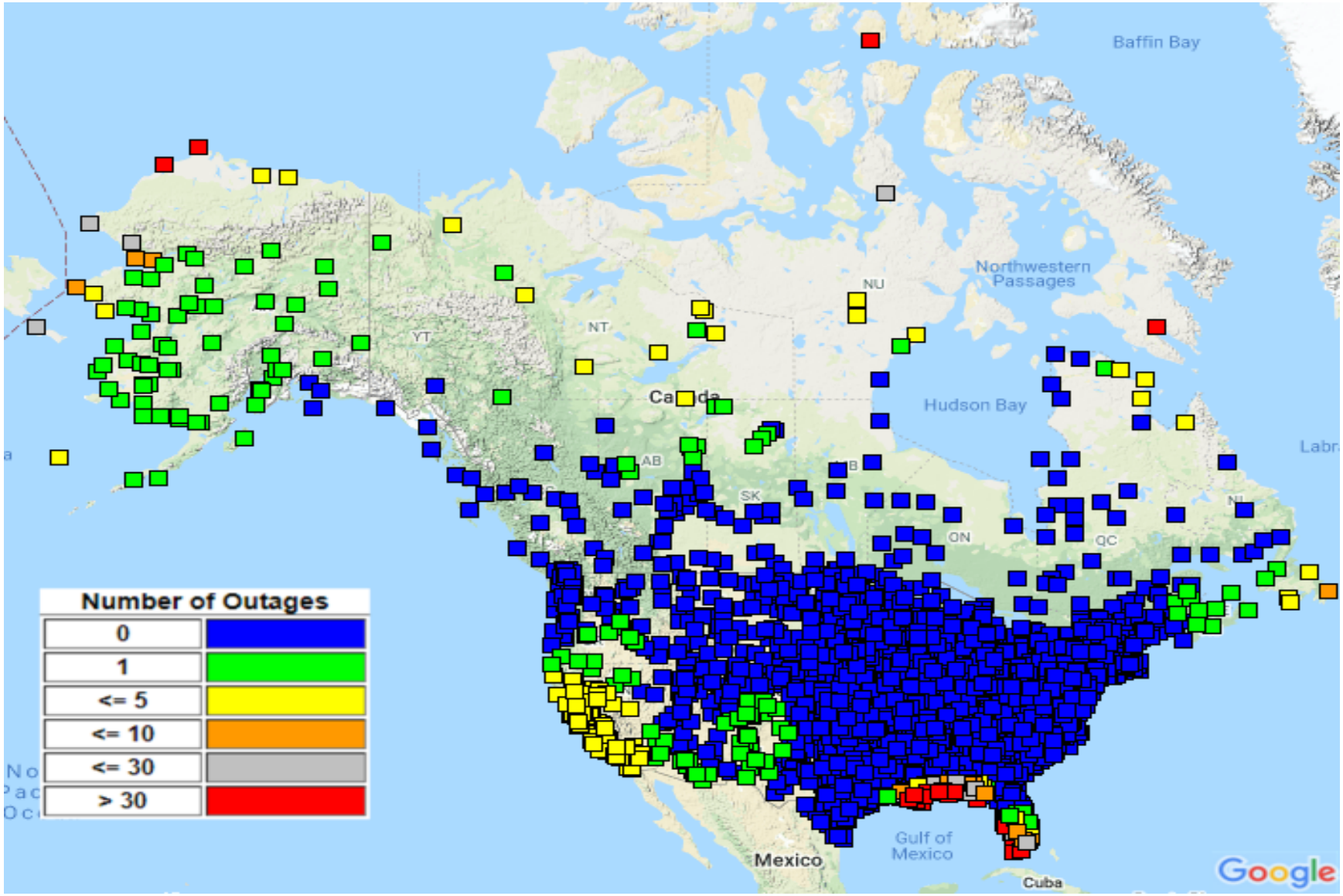


Figure 8-6 WAAS LPV200 Outages at Airports in the US and Canada with GPS RNAV IAPs



9.0 WAAS CNMP BOUNDING ANALYSIS

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

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

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

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

Figure 9-1 CNMP Bounding Statistics

WAAS Site	WRE	Oct 20	Nov 20	Dec 20	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21
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	Oct 20	Nov 20	Dec 20	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21
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 10/02/2021. 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 27cm or less. The CSRS surveys' RSSs of the reported ECEF sigmas were 12.0mm or less. The OPUS and CSRS surveys agreed to an average of 1.2cm with a standard deviation of 6.4mm. The maximum of difference was 3.3 cm at Jacksonville Thread A (ZJX1).

The OPUS positions were compared to the positions in Release 53. The survey was completed on April 10th, 2020. The OPUS surveys agree with Release 53 to better or equal to 4.3 cm for most sites. The maximum difference excluding outliers was 8.6 cm at Honolulu A (ZHN1). The antenna positions are interpolated forward in time.

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 10/02/2021

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
BET1	-2965385.211	-972576.642	5543892.811	60.7879138	161.8417255	52.187
BET2	-2965385.974	-972580.365	5543891.745	60.7878944	161.8416649	52.176
BET3	-2965388.55	-972577.494	5543890.891	60.7878785	161.8417298	52.189
BIL1	-1416445.995	-4223577.017	4550862.082	45.8037062	108.5397244	1112.219
BIL2	-1416450.077	-4223574.877	4550862.811	45.8037155	108.539783	1112.232
BIL3	-1416441.695	-4223574.274	4550865.946	45.803756	108.5396832	1112.223
BRW1	-1886759.094	-809058.699	6018494.404	71.2827633	156.7899257	15.558
BRW2	-1886756.507	-809055.956	6018495.589	71.282796	156.7899676	15.571
BRW3	-1886755.415	-809059.74	6018495.403	71.2827914	156.7898585	15.551
CDB1	-3484099.217	-1084748.789	5213678.517	55.1923724	162.7064054	49.696
CDB2	-3484105.848	-1084741.598	5213675.573	55.1923264	162.7065441	49.672
CDB3	-3484112.131	-1084734.822	5213672.823	55.1922829	162.706675	49.689
FAI1	-2304741.992	-1448715.343	5748843.685	64.8096285	147.8473417	150.015
FAI2	-2304741.532	-1448706.533	5748846.081	64.8096788	147.8474936	150.022
FAI3	-2304733.004	-1448707.469	5748849.236	64.8097454	147.8473814	150.016
JNU1	-2354255.122	-2388549.713	5407043.16	58.3625733	134.585709	16.247
JNU2	-2354253.037	-2388565.826	5407036.994	58.3624677	134.5854904	16.25
JNU3	-2354239.813	-2388568.674	5407041.456	58.3625442	134.5852954	16.243
MMD1	35070.335	-5959686.646	2264365.762	20.9319093	89.6628415	29.097
MMD2	35065.412	-5959687.046	2264364.974	20.9319015	89.6628888	29.162
MMD3	35065.075	-5959685.245	2264369.645	20.9319467	89.662892	29.147
MMX1	-948700.784	-5943933.255	2109211.918	19.431654	99.0683902	2233.097
MMX2	-948696.347	-5943933.075	2109214.351	19.4316773	99.0683488	2233.079
MMX3	-948705.211	-5943933.443	2109209.501	19.4316307	99.0684316	2233.126
MPR1	-1570142.283	-5759530.592	2238184.746	20.6790032	105.2492038	10.979
MPR2	-1570139.454	-5759530.106	2238188.788	20.6790412	105.2491788	11.271
MPR3	-1570143.56	-5759527.978	2238190.559	20.6790593	105.2492222	10.986
MSD1	-1979520.133	-5523222.829	2493106.981	23.1604487	109.7176526	104.294
MSD2	-1979521.699	-5523225.158	2493100.578	23.1603859	109.7176593	104.277
MSD3	-1979526.144	-5523221.897	2493104.251	23.160422	109.7177109	104.278
MTP1	-254854.389	-6162909.139	1617805.088	14.7913662	92.3679995	54.923
MTP2	-254850.777	-6162910.16	1617801.65	14.7913342	92.3679656	54.887
MTP3	-254855.563	-6162910.263	1617800.118	14.7913201	92.36801	54.787
OTZ1	-2396056.19	-750356.208	5843502.427	66.8873304	162.611373	10.873
OTZ2	-2396053.02	-750354.377	5843503.939	66.8873652	162.6113913	10.861

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
OTZ3	-2396052.998	-750358.319	5843503.461	66.887354	162.6113053	10.876
YFB1	1035381.281	-2634289.669	5696539.587	63.731491	68.5431868	10.054
YFB2	1035372.072	-2634296.095	5696538.229	63.7314646	68.5434078	9.992
YFB3	1035365.998	-2634306.851	5696534.454	63.7313869	68.5436019	10.054
YQX1	2430424.505	-3419640.423	4788223.917	48.9664908	54.5976338	146.91
YQX2	2430432.451	-3419639.077	4788220.863	48.966449	54.5975347	146.908
YQX3	2430440.355	-3419637.714	4788217.859	48.9664078	54.597436	146.919
YWG1	-520164.546	-4083475.99	4855843.009	49.9005737	97.2593999	222.123
YWG2	-520150.673	-4083468.926	4855850.41	49.9006768	97.2592208	222.141
YWG3	-520152.542	-4083478.044	4855842.584	49.9005676	97.2592305	222.133
YYR1	1885341.276	-3321428.385	5091171.723	53.3086478	60.4194704	37.87
YYR2	1885344.244	-3321419.912	5091176.156	53.3087142	60.419369	37.897
YYR3	1885339.959	-3321413.096	5091182.153	53.3088043	60.4193744	37.9
ZAB1	-1488636.958	-5003946.542	3654557.664	35.1735749	106.567351	1620.129
ZAB2	-1488631.624	-5003948.231	3654557.647	35.1735742	106.5672896	1620.199
ZAB3	-1488632.404	-5003950.811	3654553.791	35.1735319	106.5672898	1620.181
ZAN1	-2659536.772	-1549114.708	5567750.724	61.229201	149.7802531	80.703
ZAN2	-2659548.527	-1549110.742	5567746.245	61.2291175	149.780427	80.705
ZAN3	-2659541.478	-1549106.627	5567750.712	61.229201	149.7804272	80.692
ZAU1	138703.984	-4761244.127	4227763.918	41.7826581	88.3313383	195.865
ZAU2	138704.247	-4761248.751	4227758.759	41.7825957	88.3313367	195.88
ZAU3	138710.954	-4761248.481	4227758.836	41.7825966	88.331256	195.876
ZBW1	1490299.088	-4448983.18	4306010.522	42.7357209	71.4804274	39.108
ZBW2	1490304.202	-4448981.17	4306010.868	42.7357249	71.4803604	39.136
ZBW3	1490305.914	-4448984.802	4306006.56	42.735672	71.4803547	39.141
ZDC1	1069125.633	-4839598.984	4001126.514	39.1015961	77.542748	80.044
ZDC2	1069128.033	-4839603.611	4001120.308	39.1015241	77.5427324	80.038
ZDC3	1069123.934	-4839602.705	4001122.511	39.1015496	77.5427764	80.054
ZDV1	-1273628.731	-4711375.569	4094890.074	40.1873029	105.1272258	1541.352
ZDV2	-1273623.027	-4711377.084	4094890.088	40.1873031	105.1271565	1541.341
ZDV3	-1273625.039	-4711380.282	4094885.8	40.1872526	105.1271695	1541.333
ZFW1	-659983.301	-5324060.773	3438276.449	32.8306495	97.0664729	155.614
ZFW2	-659988.575	-5324063.319	3438271.455	32.8305962	97.0665254	155.575
ZFW3	-659983.598	-5324063.857	3438271.662	32.8305981	97.066472	155.621
ZHN1	-5508637.193	-2234492.751	2303722.484	21.3129931	157.9208329	24.66
ZHN2	-5508656.358	-2234483.071	2303687.232	21.3126502	157.9209888	25.002
ZHN3	-5508647.77	-2234497.008	2303694.328	21.3127188	157.9208332	25.048

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZHU1	-513864.564	-5506451.652	3166720.443	29.9618963	95.3314273	10.796
ZHU2	-513867.208	-5506455.029	3166714.274	29.9618318	95.3314513	10.841
ZHU3	-513873.495	-5506457.68	3166708.681	29.9617736	95.3315136	10.84
ZJX1	772646.35	-5434462.222	3237231.776	30.6988598	81.9081861	2.17
ZJX2	772649.679	-5434463.778	3237228.384	30.6988243	81.908154	2.166
ZJX3	772645.616	-5434466.198	3237225.268	30.6987917	81.9081996	2.143
ZKC1	-415247.633	-4954556.377	3982161.095	38.8801593	94.7908352	305.883
ZKC2	-415231.239	-4954557.703	3982161.154	38.88016	94.7906456	305.883
ZKC3	-415237.359	-4954561.046	3982155.955	38.8801018	94.7907127	305.611
ZLA1	-2474410.117	-4637294.502	3602183.587	34.6035189	118.0838978	763.505
ZLA2	-2474404.835	-4637297.303	3602183.592	34.603519	118.0838327	763.495
ZLA3	-2474411.451	-4637296.997	3602179.617	34.603475	118.0838979	763.579
ZLC1	-1808273.353	-4486410.805	4145302.97	40.7860428	111.9521792	1287.427
ZLC2	-1808274.741	-4486414.435	4145298.473	40.7859892	111.9521783	1287.432
ZLC3	-1808270.535	-4486416.135	4145298.474	40.7859892	111.9521246	1287.436
ZMA1	966042.212	-5662999.814	2761581.52	25.8246125	80.3191906	-7.6
ZMA2	966029.237	-5662999.121	2761586.009	25.8246602	80.319317	-8.223
ZMA3	966037.316	-5662997.949	2761586.361	25.8246623	80.3192356	-7.887
ZME1	4070.778	-5226189.303	3644028.427	35.0673941	89.9553712	68.61
ZME2	4070.807	-5226186.756	3644032.54	35.0674376	89.9553709	68.889
ZME3	4064.611	-5226186.631	3644032.695	35.0674395	89.9554388	68.871
ZMP1	-249978.515	-4539297.482	4458955.02	44.6374631	93.1520872	262.624
ZMP2	-249972.709	-4539297.826	4458955.023	44.637463	93.1520139	262.644
ZMP3	-249973.808	-4539302.101	4458950.542	44.6374069	93.1520247	262.576
ZNY1	1406144.507	-4627343.988	4144322.081	40.7843289	73.0971672	6.44
ZNY2	1406146.306	-4627347.023	4144317.303	40.7842762	73.0971572	5.914
ZNY3	1406140.744	-4627348.672	4144317.334	40.7842766	73.0972259	5.904
ZOA1	-2684437.059	-4293337.229	3865351.931	37.5430546	122.0159506	-3.5
ZOA2	-2684434.053	-4293341.314	3865349.515	37.5430271	122.0158973	-3.489
ZOA3	-2684438.426	-4293342.19	3865345.653	37.5429827	122.015934	-3.415
ZOB1	650770.053	-4754715.653	4187420.748	41.2971547	82.2064462	223.652
ZOB2	650777.73	-4754714.821	4187422.762	41.297167	82.2063541	225.144
ZOB3	650776.059	-4754719.65	4187414.972	41.2970872	82.2063817	223.427
ZSE1	-2308930.356	-3668169.676	4663526.428	47.2869927	122.1883738	82.094
ZSE2	-2308934.744	-3668175.212	4663520.014	47.2869071	122.1883839	82.145
ZSE3	-2308935.813	-3668179.495	4663516.077	47.2868554	122.1883657	82.097
ZSU1	2462589.47	-5529372.053	2003724.571	18.4313367	65.9934762	-28.114

WRE	X(m)	Y(m)	Z(m)	LATITUDE	LONGITUDE	H(m)
ZSU2	2462587.543	-5529377.418	2003712.285	18.4312197	65.9935136	-28.093
ZSU3	2462594.167	-5529375.15	2003710.201	18.4312	65.9934475	-28.16
ZTL1	529840.3	-5305248.815	3489342.86	33.3796887	84.2967271	261.136

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 Build WE7.164c software. Figure 10-4 through Figure 10-6 shows the OPUS surveys overall RMS quality indications.

Figure 10-1 Build WE7164c Antenna Positions Deltas OPUS Survey

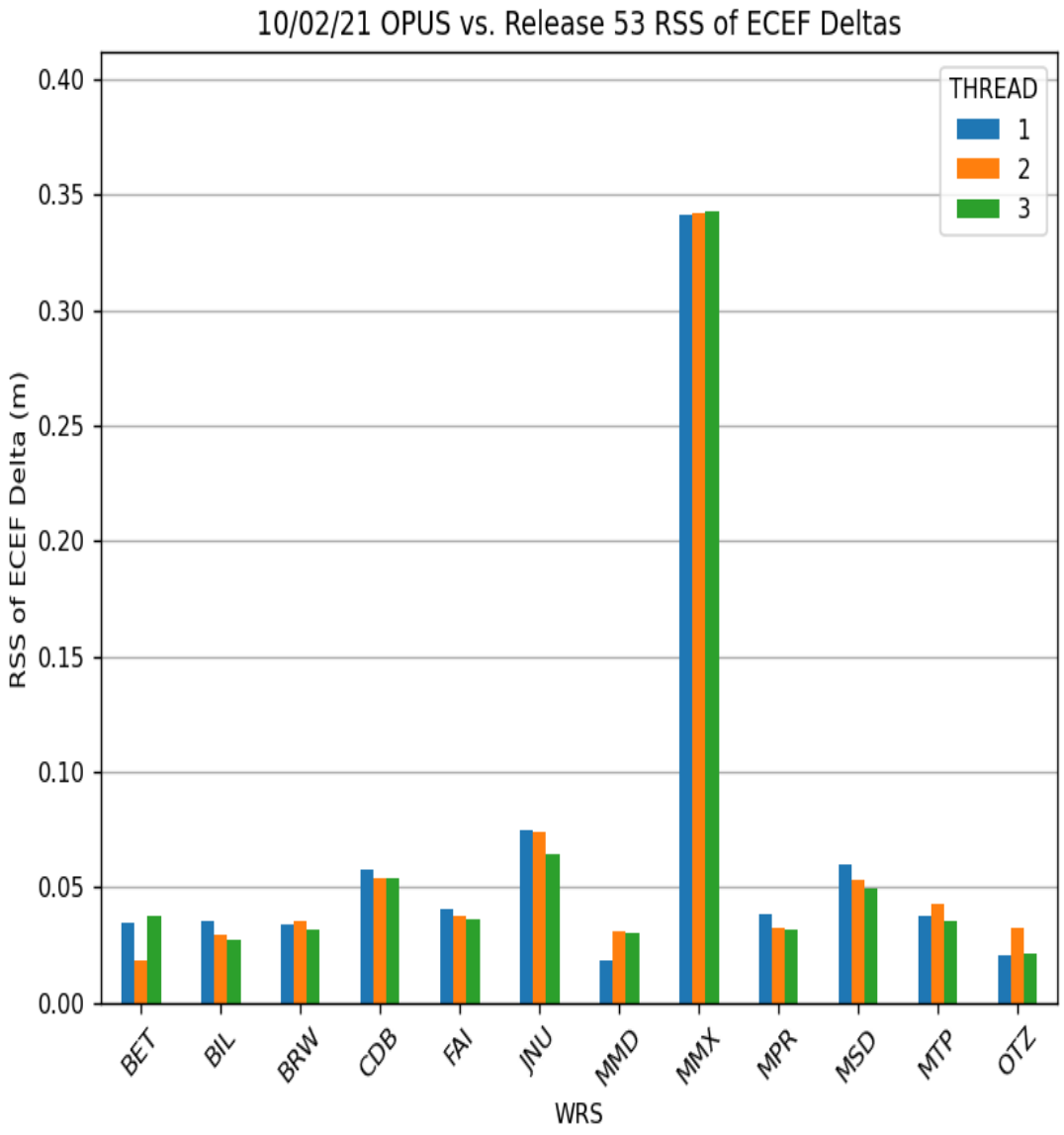


Figure 10-2 Build WE7.164c Antenna Positions Deltas OPUS Survey

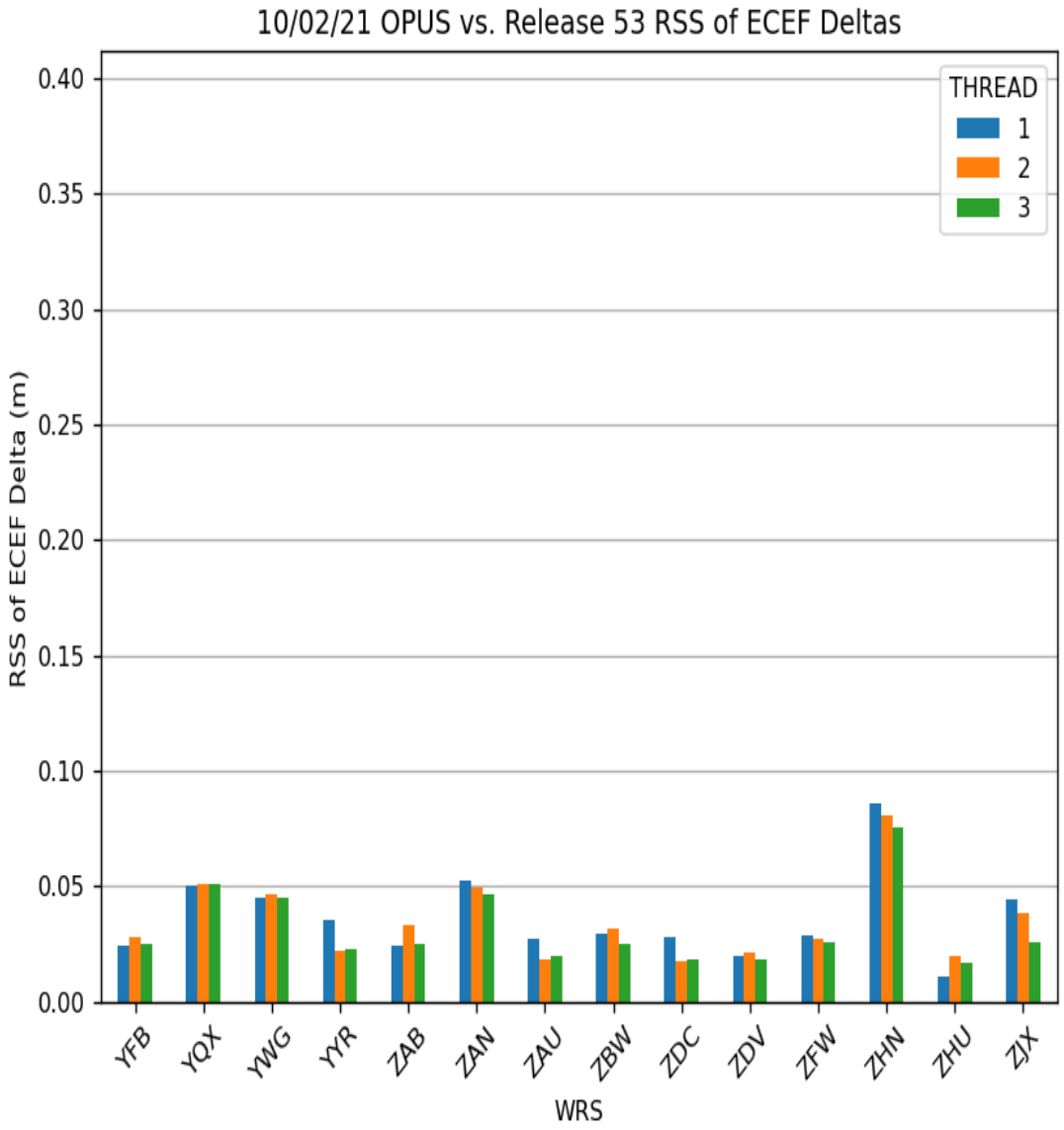


Figure 10-3 Build WE7.164c Antenna Positions Deltas OPUS Survey

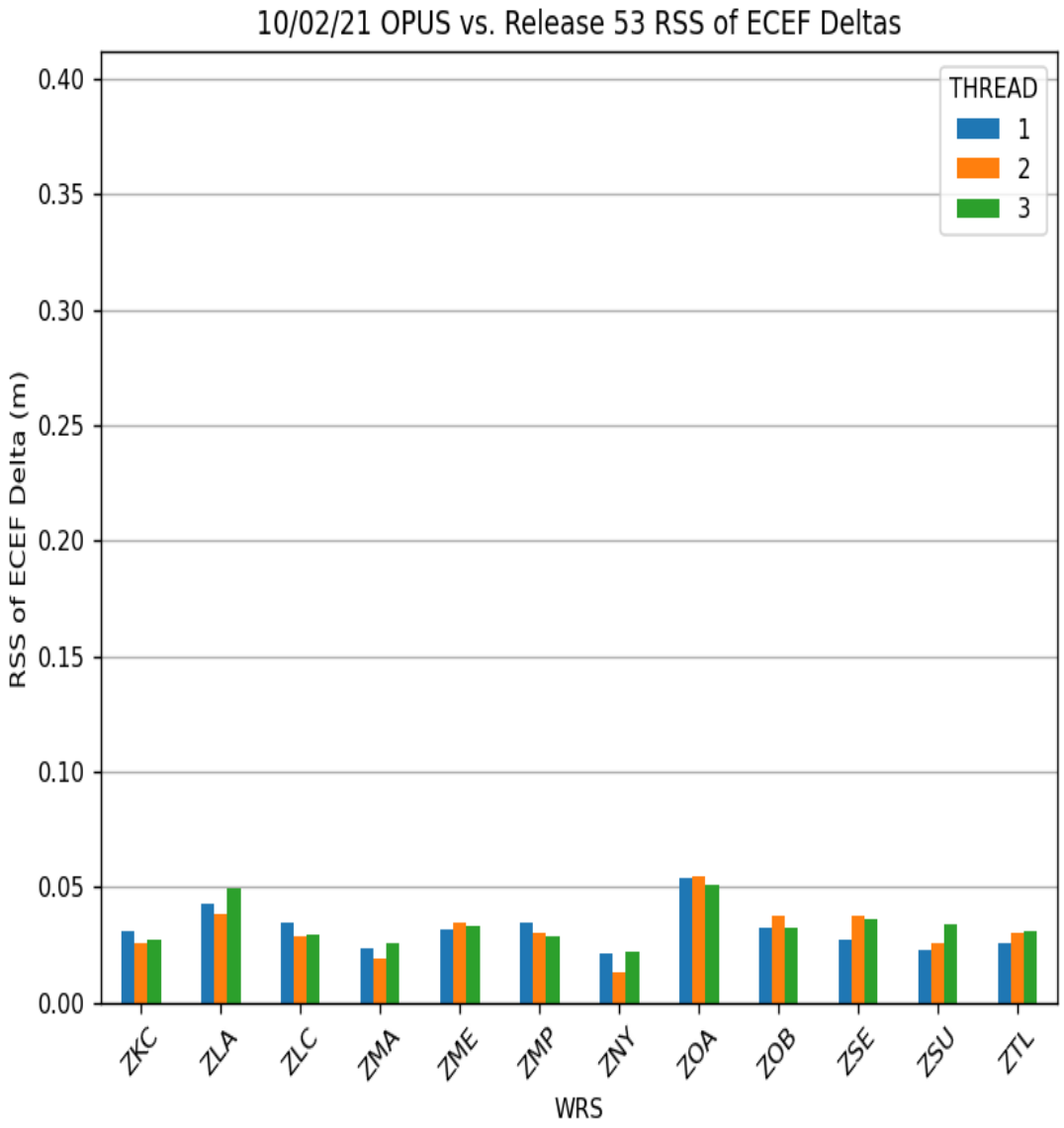


Figure 10-4 OPUS Survey Overall RMS Qualities

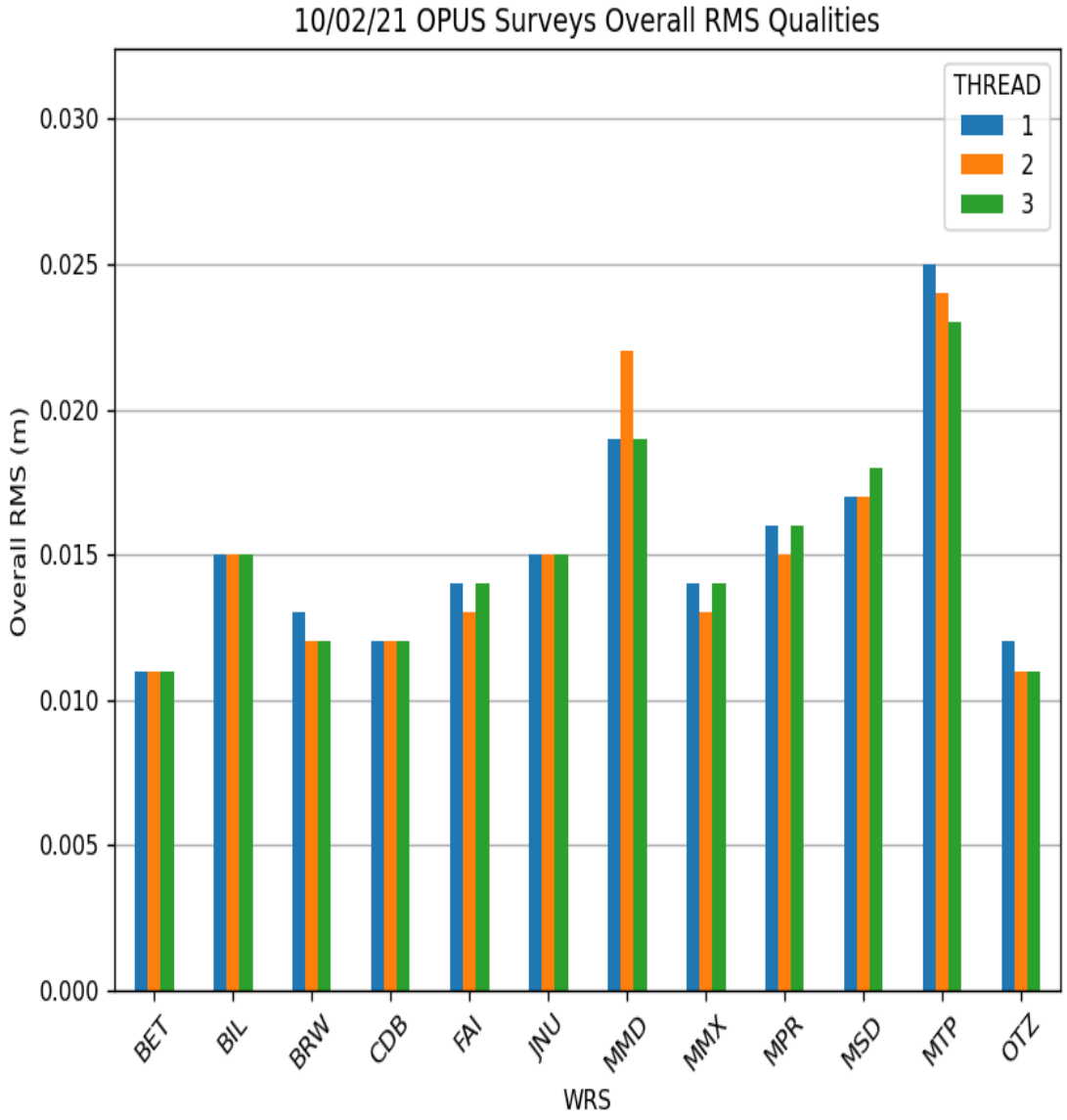


Figure 10-5 OPUS Survey Overall RMS Qualities

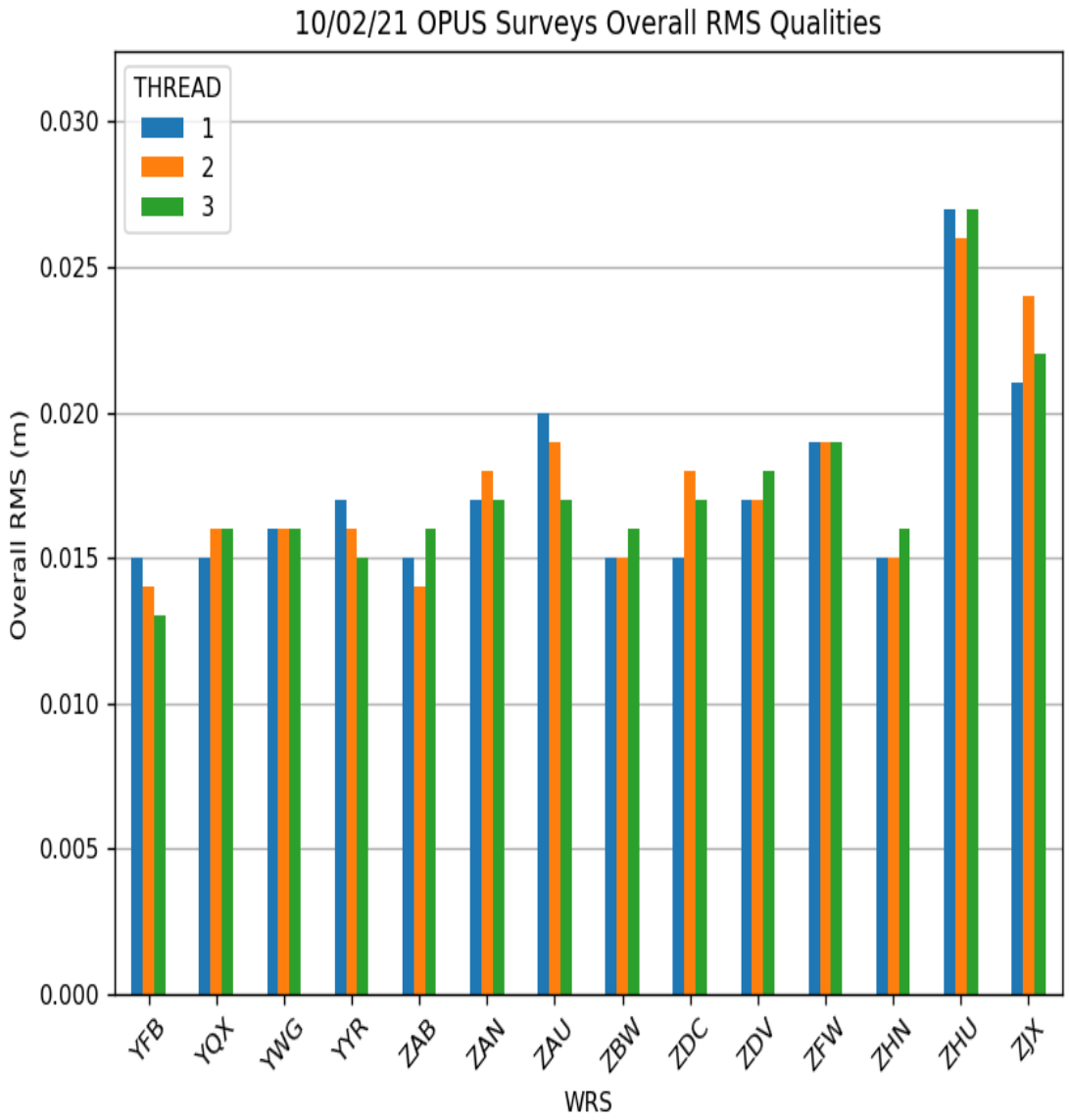
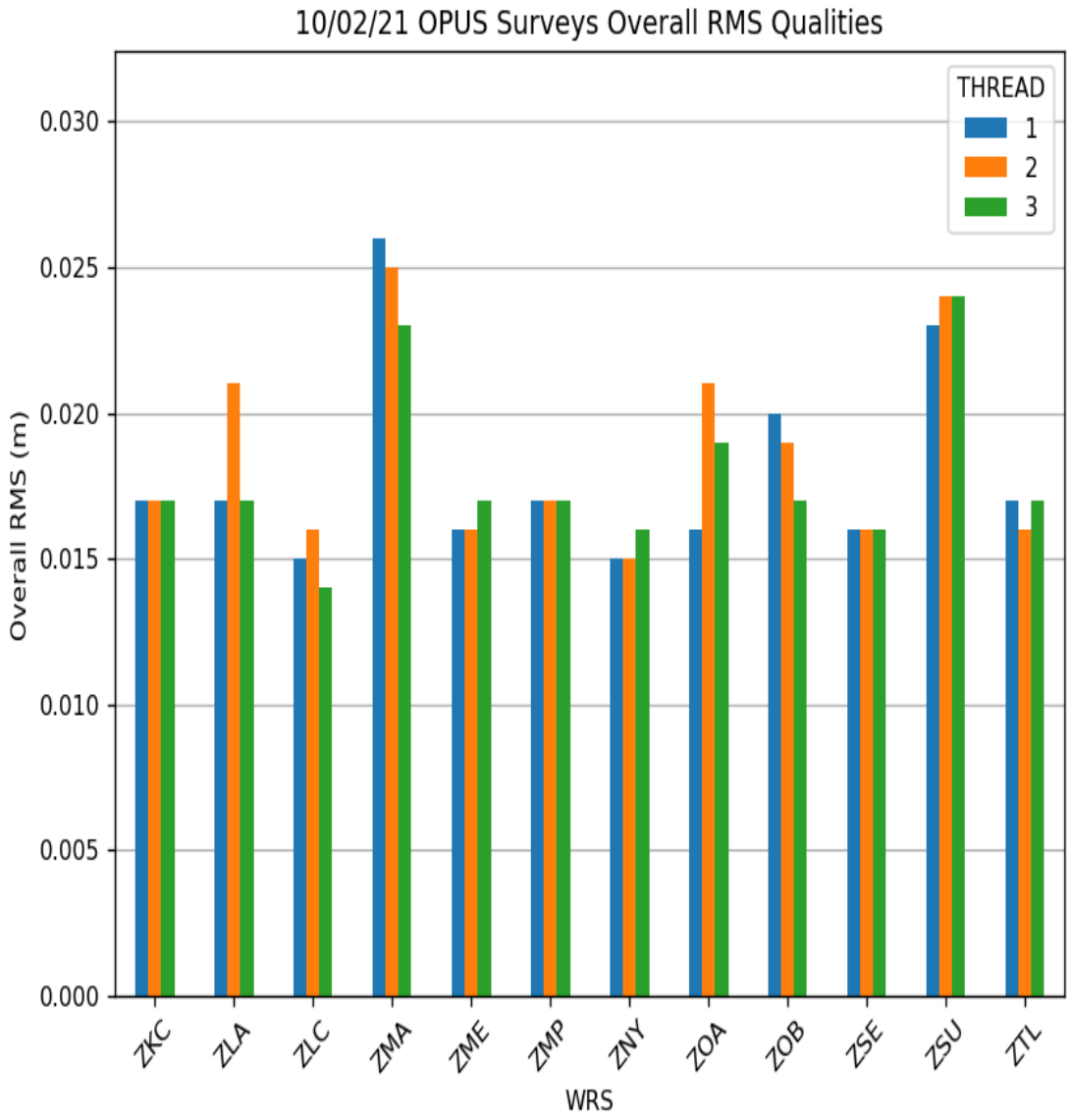


Figure 10-6 OPUS Survey Overall RMS Qualities



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 10-7 OPUS vs. CSRS RSS ECEF Deltas

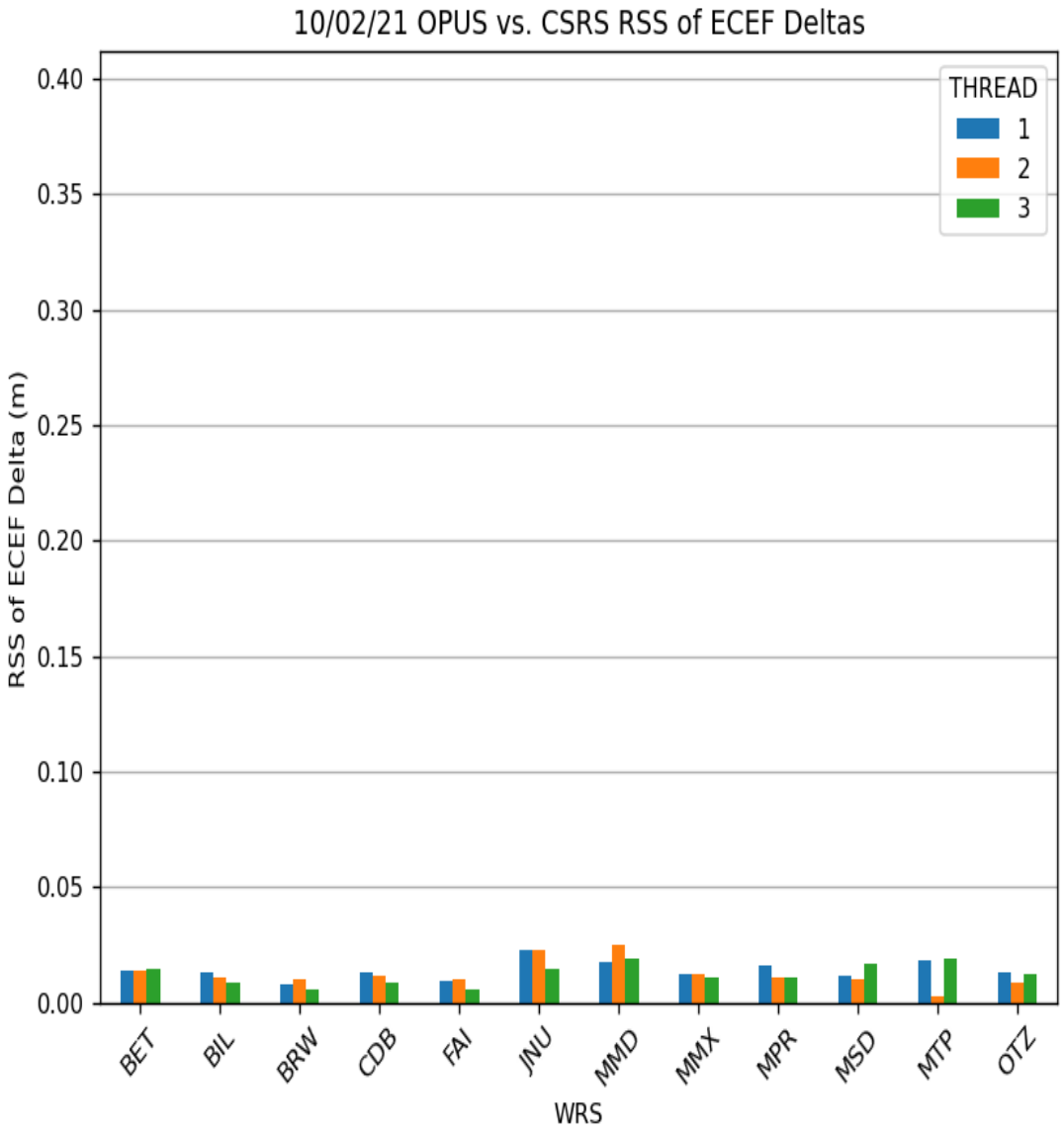


Figure 10-8 OPUS vs. CSRS RSS ECEF Deltas

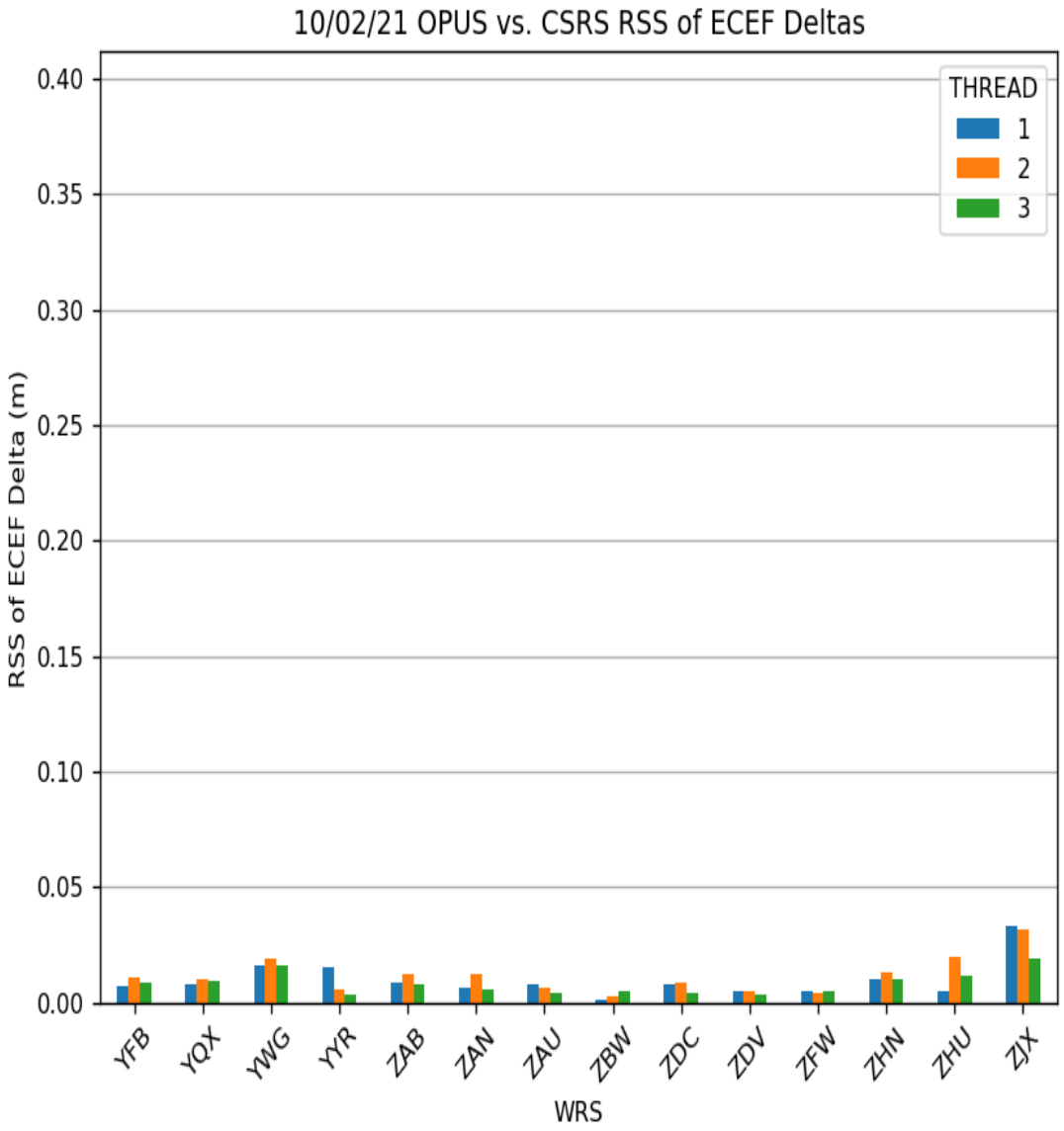


Figure 10-9 OPUS vs. CSRS RSS ECEF Deltas

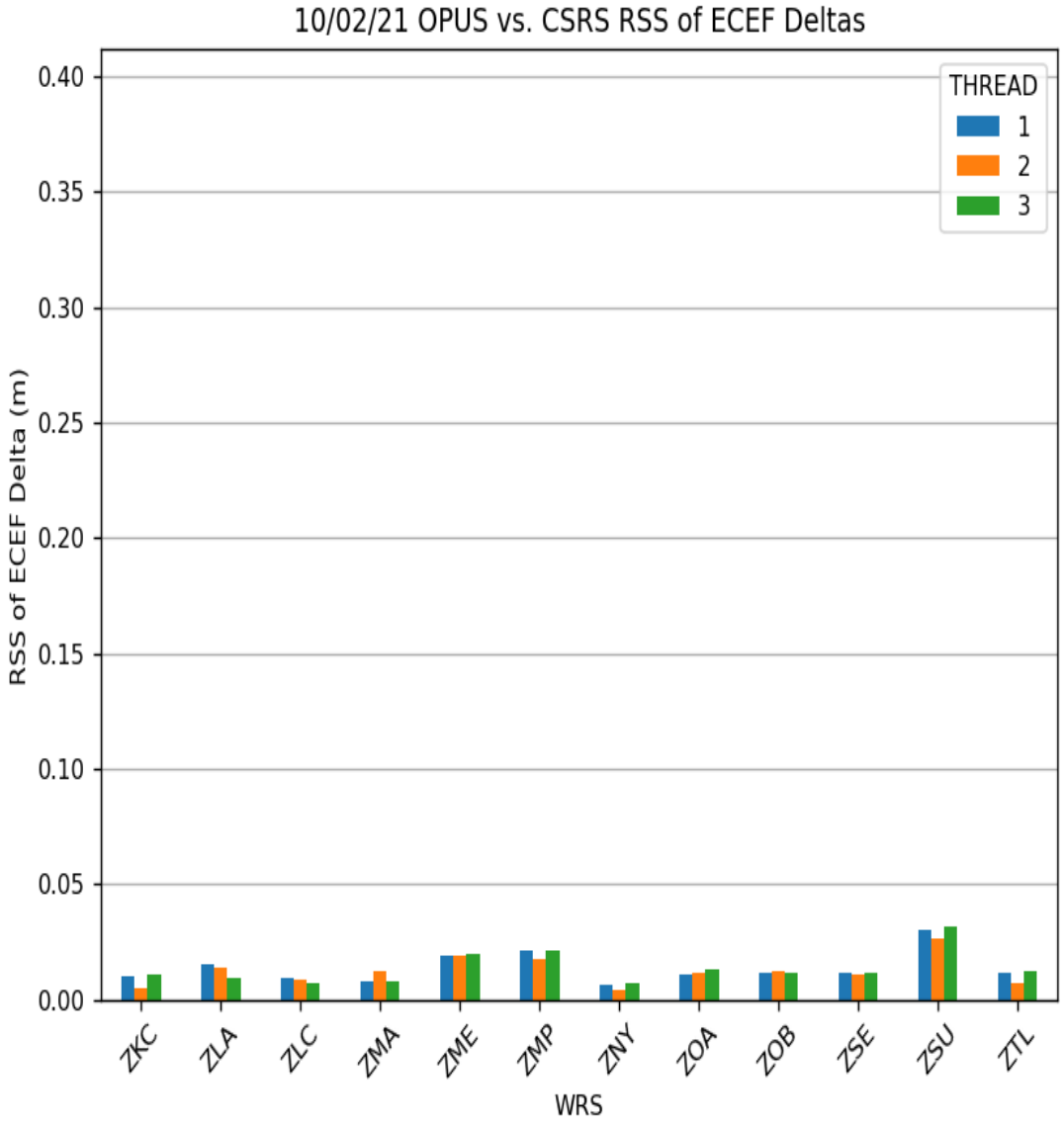


Figure 10-10 CSRS Survey Qualities

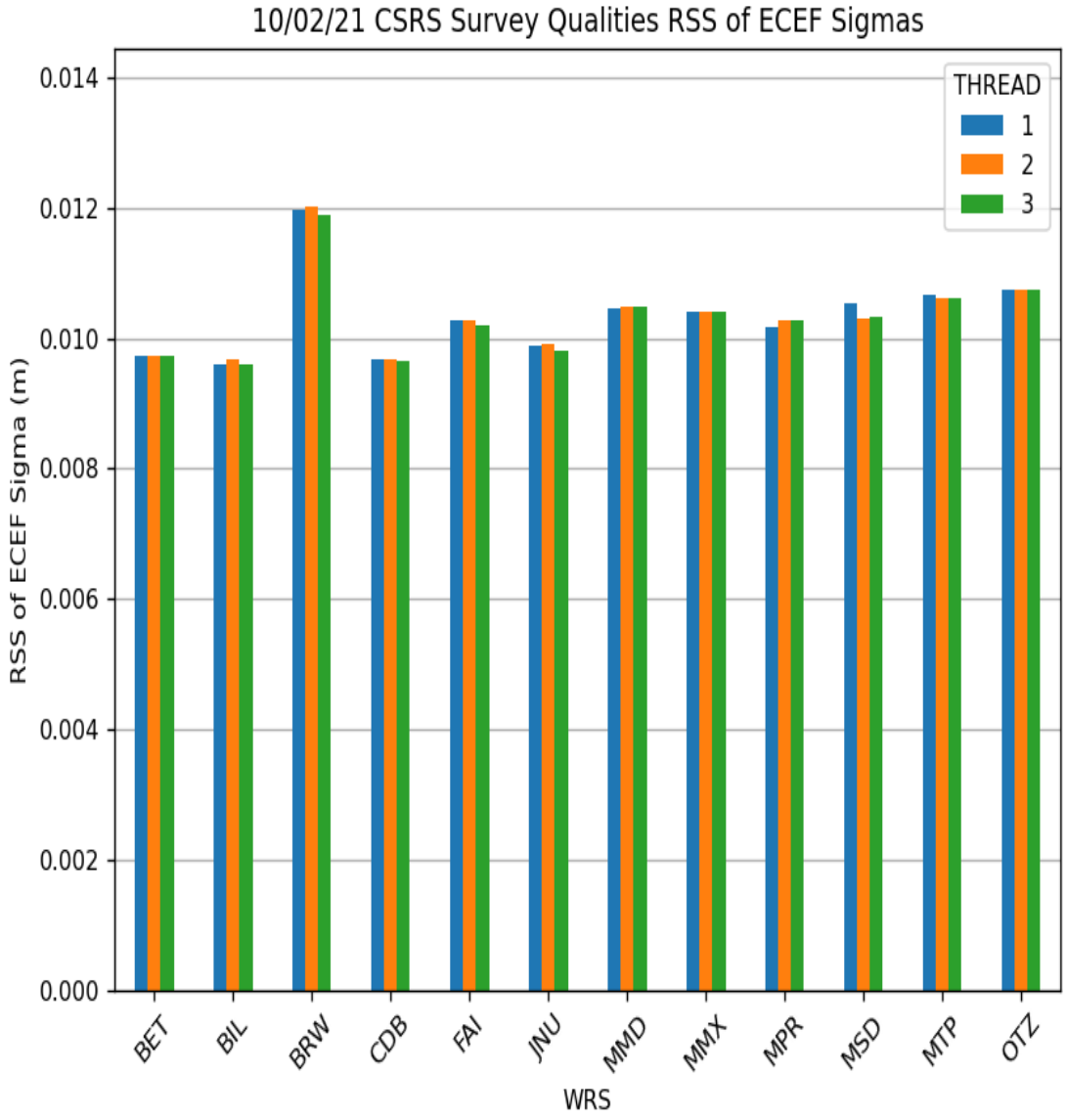


Figure 10-11 CSRS Survey Qualities

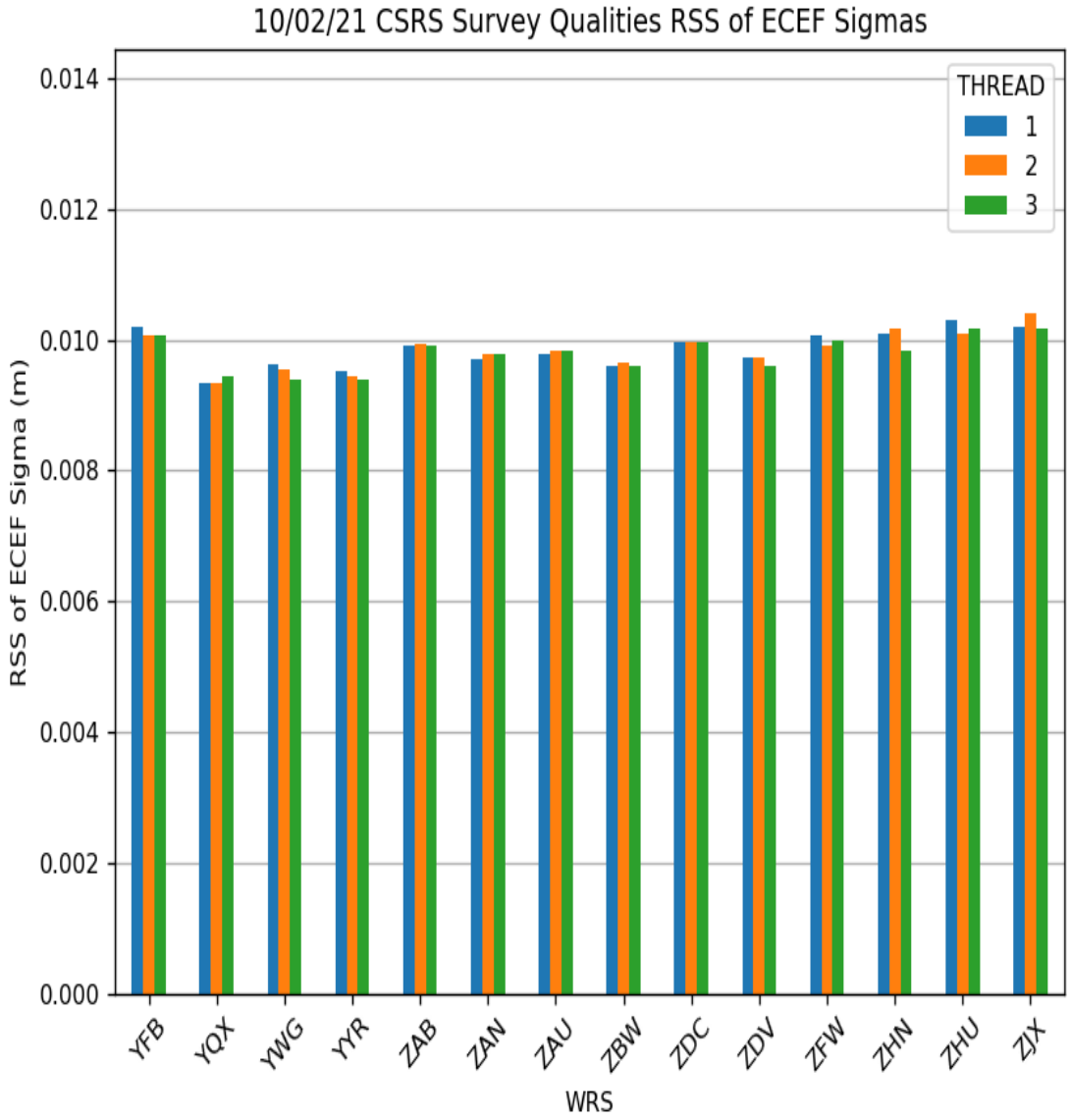
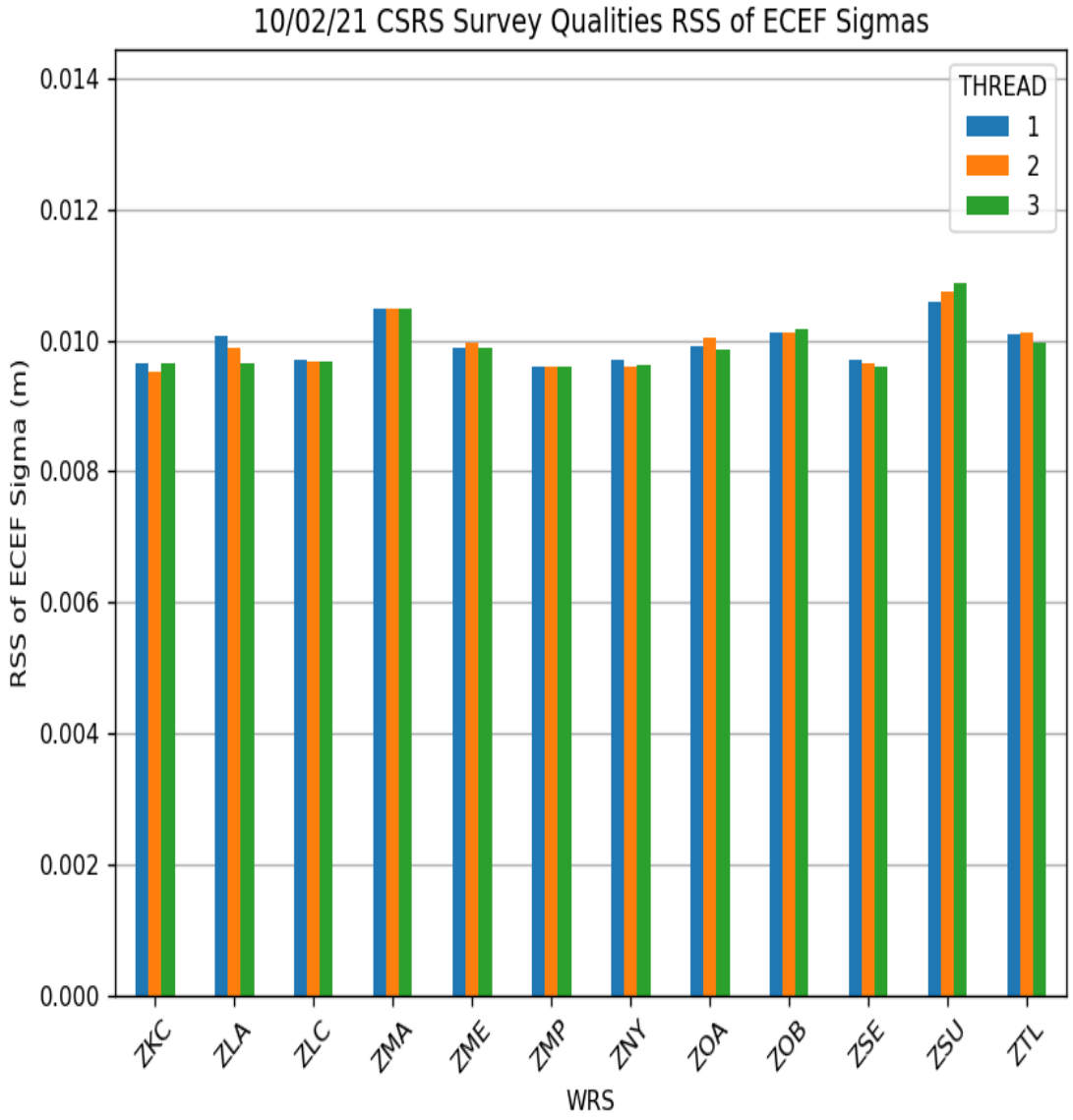


Figure 10-12 CSRS Survey Qualities



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). Please note that, for this reporting period, the missing data for 7/22/21 to 7/25/21 was due to local power outages.

11.1 Alpha Metrics

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

Table 11-1 Alpha Metrics

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

11.2 Type Bias

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

For this reporting period, the GEO-type biases were not evaluated. Table 11-2 shows the rollup averages for the quarter. Table 11-3 shows the rollup averages since January 1, 2008. Figure 11-1 shows the daily averages of the four detection metrics for the quarter.

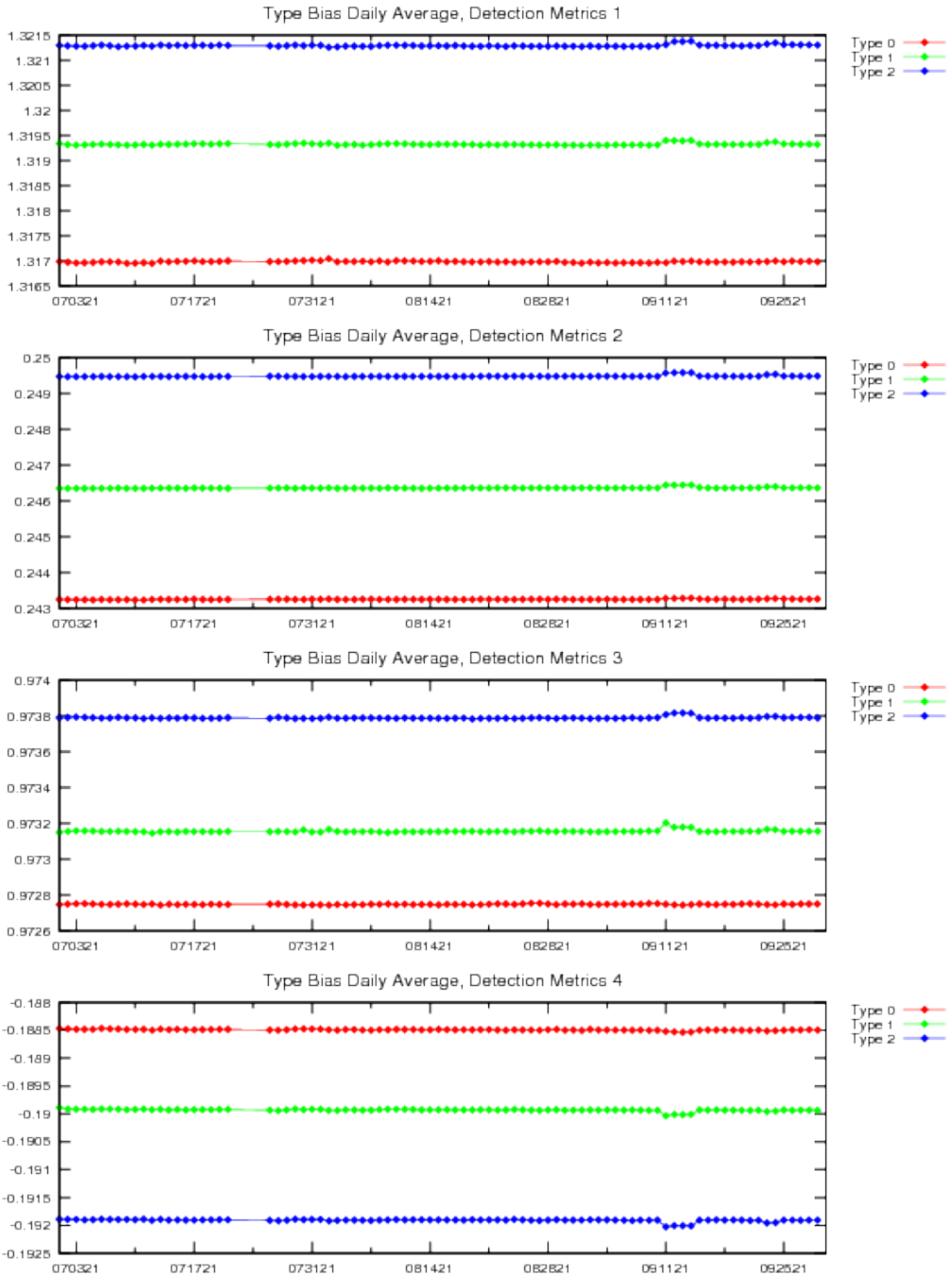
Table 11-2 Type Bias Average for the Quarter

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31698	1.31933	1.3213
DM 2	0.243254	0.246365	0.249487
DM 3	0.972748	0.973156	0.973789
DM 4	-0.18849	-0.18993	-0.19191

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

Detection Metric	Type 0	Type 1	Type 2
DM 1	1.31929	1.3215	1.32323
DM 2	0.241859	0.245066	0.248203
DM 3	0.972997	0.973499	0.974068
DM 4	-0.18717	-0.18883	-0.19085

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 0.0007423 observed on PRN19, (2) the maximum average for DM2 is 0.0002107 observed on PRN19, (3) the maximum average for DM3 is 0.0004598 observed on PRN18, (4) the maximum average for DM4 is 0.0004108 observed on PRN21.

Table 11-4 PRN Bias Average for the Quarter

PRN	DM 1	DM 2	DM 3	DM 4
1	0.000201	9.14E-05	4.51E-05	0.000143
2	0.00022	5.74E-05	0.000104	0.000111
3	0.000212	5.42E-05	9.27E-05	0.000132
4	0.000707	0.000254	0.000415	0.000283
5	0.000163	7.61E-05	0.000113	0.000115
6	0.000603	9.88E-05	6.46E-05	0.000224
7	0.000168	0.000122	4.62E-05	0.000126
8	0.000337	9.00E-05	0.000105	0.00015
9	0.000224	3.87E-05	0.000155	0.00016
10	0.000205	5.34E-05	8.25E-05	0.00019
11				
12	0.000317	0.000104	8.01E-05	8.86E-05
13	0.000625	5.74E-05	5.13E-05	0.000284
14	0.000475	0.000194	0.000413	0.000298
15	0.000353	0.000119	4.79E-05	0.0001
16	0.000205	4.50E-05	0.000108	0.000183
17	0.00034	0.000105	4.88E-05	8.30E-05
18	0.000638	0.000184	0.00046	0.000291
19	0.000741	0.00021	9.69E-05	0.000164
20	0.00016	6.59E-05	4.57E-05	0.000128
21	0.000193	9.22E-05	9.50E-05	0.00041
22	0.000147	5.01E-05	0.00011	0.000275
23	0.000381	0.000169	0.000385	0.000294
24	0.000213	8.95E-05	0.000178	0.000217
25	0.000455	8.50E-05	3.91E-05	0.00017
26	0.000206	0.000103	0.000105	0.000153
27	0.000367	0.00017	0.000175	0.000313
28				
29	0.000283	0.000118	0.000167	0.000292
30	0.000323	7.31E-05	9.35E-05	9.66E-05
31	0.000245	8.41E-05	8.90E-05	0.000158
32	0.000231	5.27E-05	5.49E-05	0.0002

Figure 11-2 PRN Bias Average for the Quarter

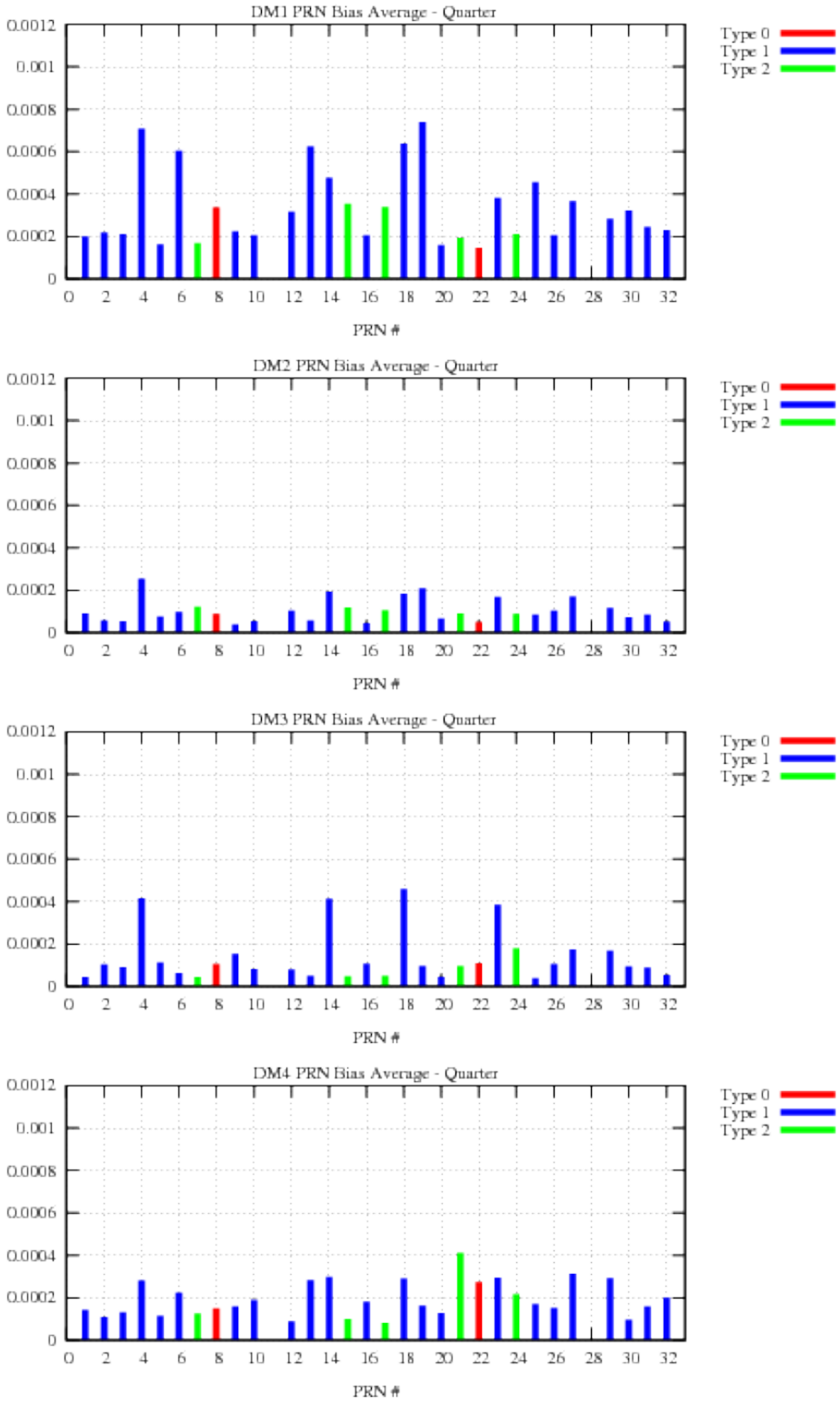


Figure 11-3 to Figure 11-10 show the daily PRN bias for each PRN, for four detection metrics. Please note, missing data for 7/22/21 to 7/25/21 was due to local power outages.

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

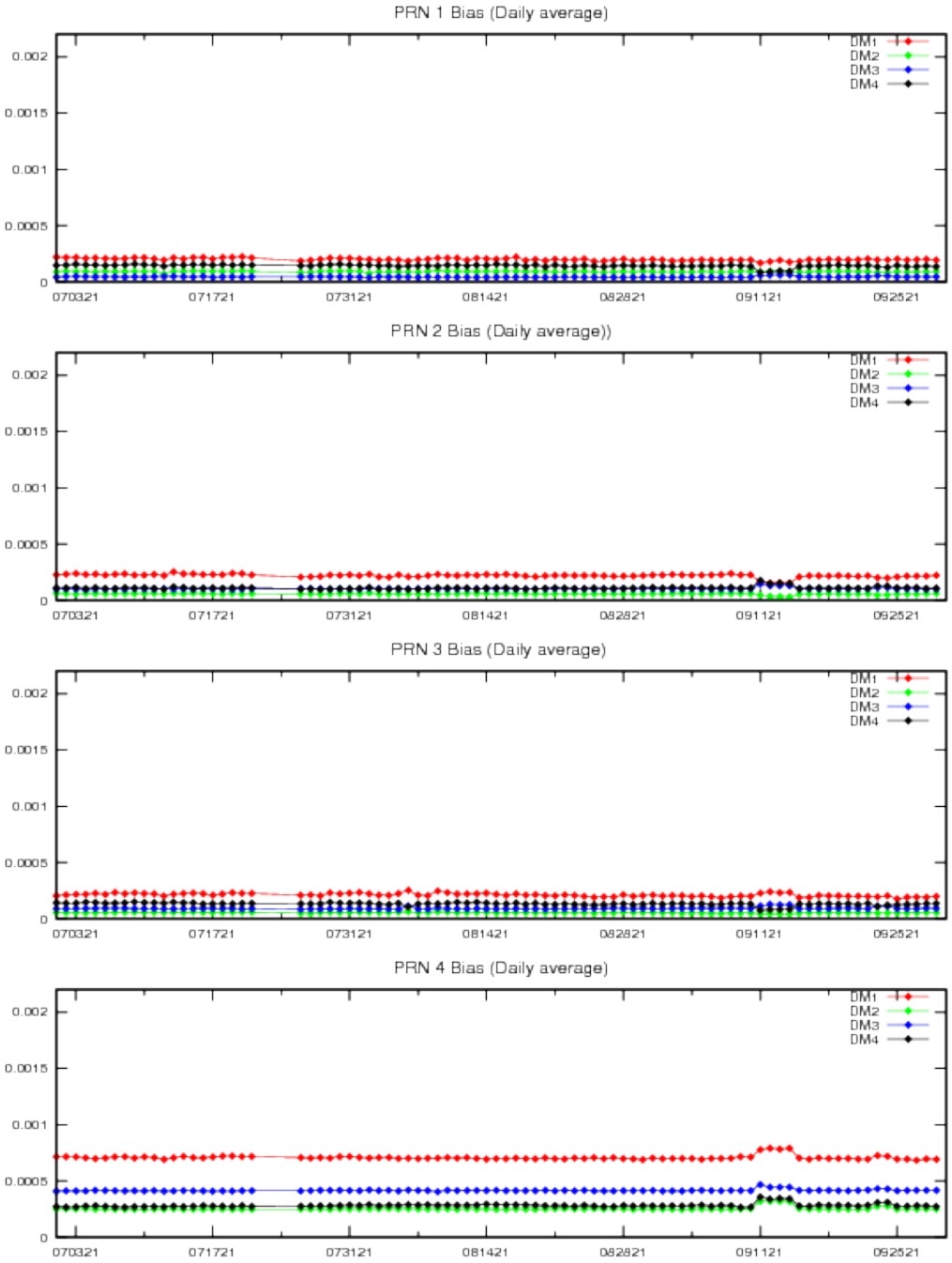


Figure 11-4 PRN Bias Average Trend (PRN5 – PRN8)

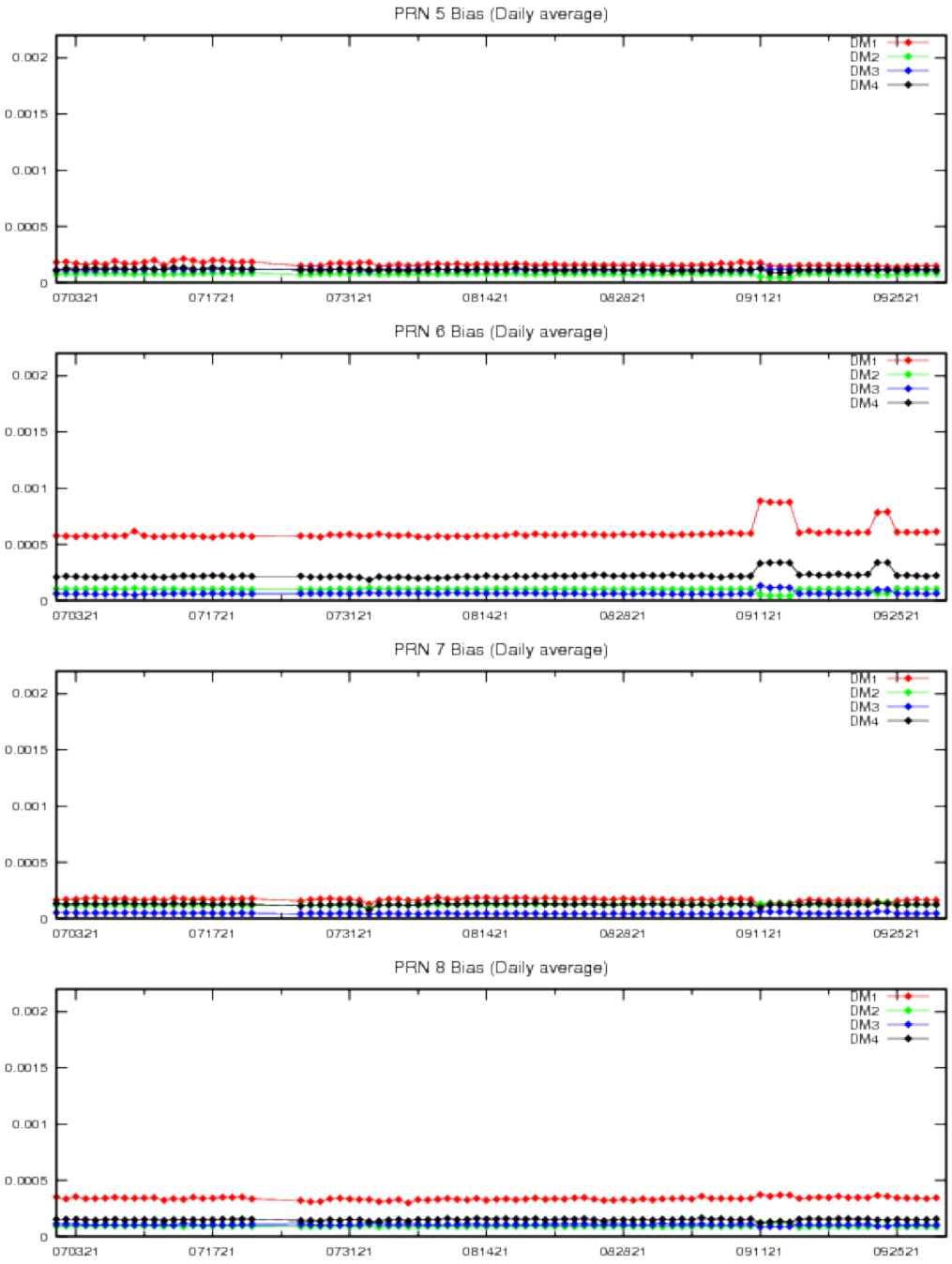


Figure 11-5 PRN Bias Average Trend (PRN9 – PRN12)

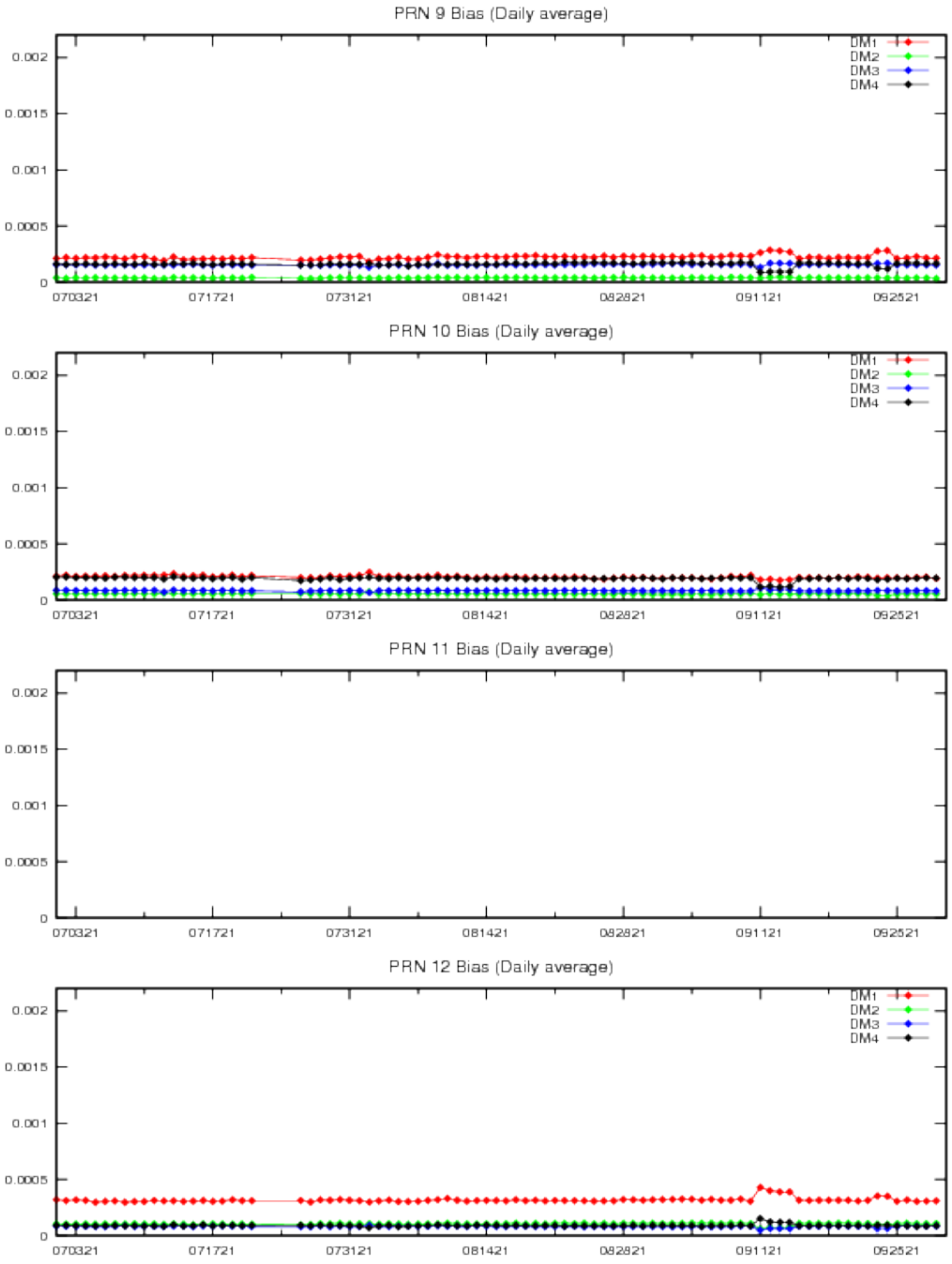


Figure 11-6 PRN Bias Average Trend (PRN13 – PRN16)

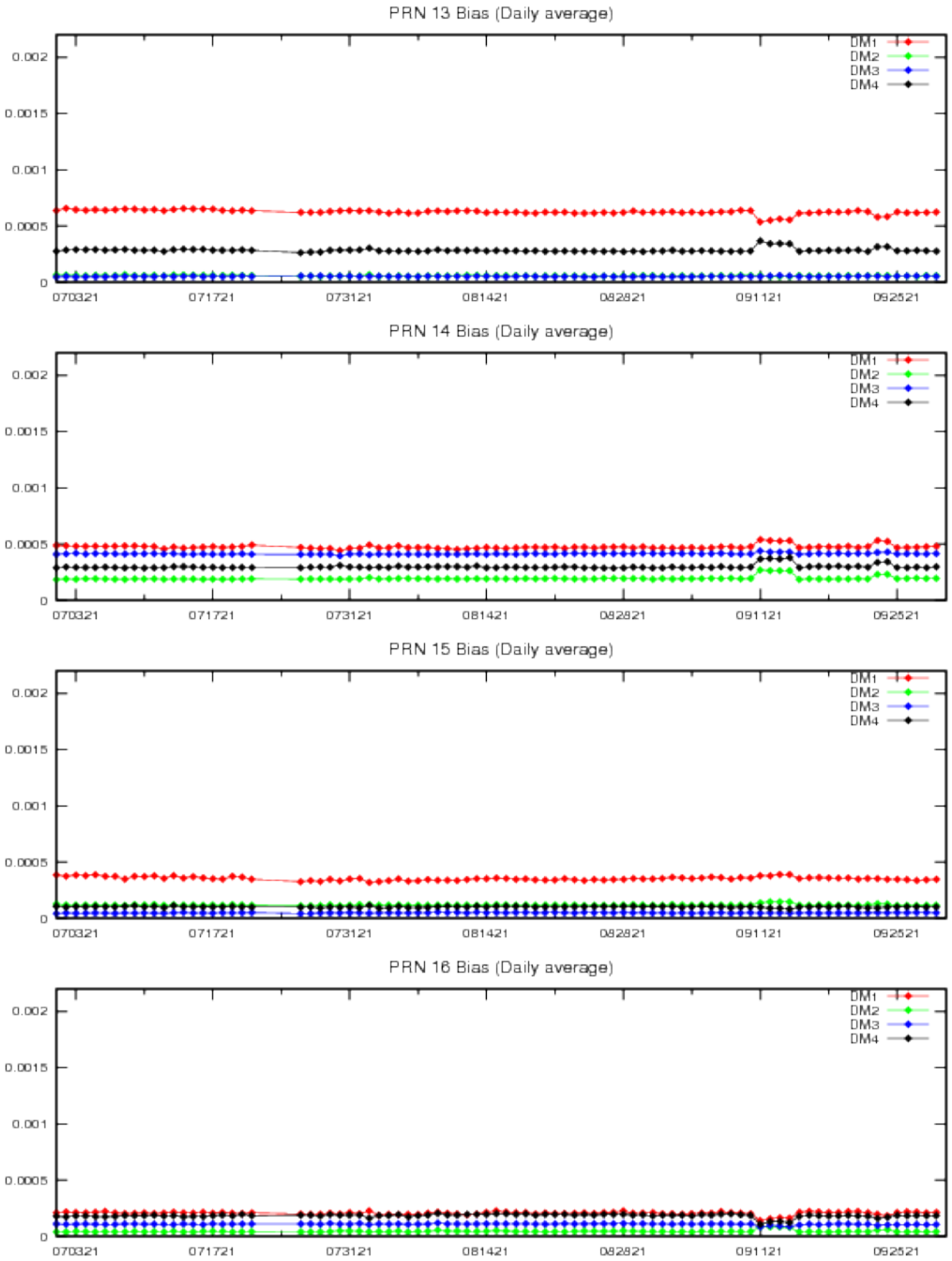


Figure 11-7 PRN Bias Average Trend (PRN17 – PRN20)

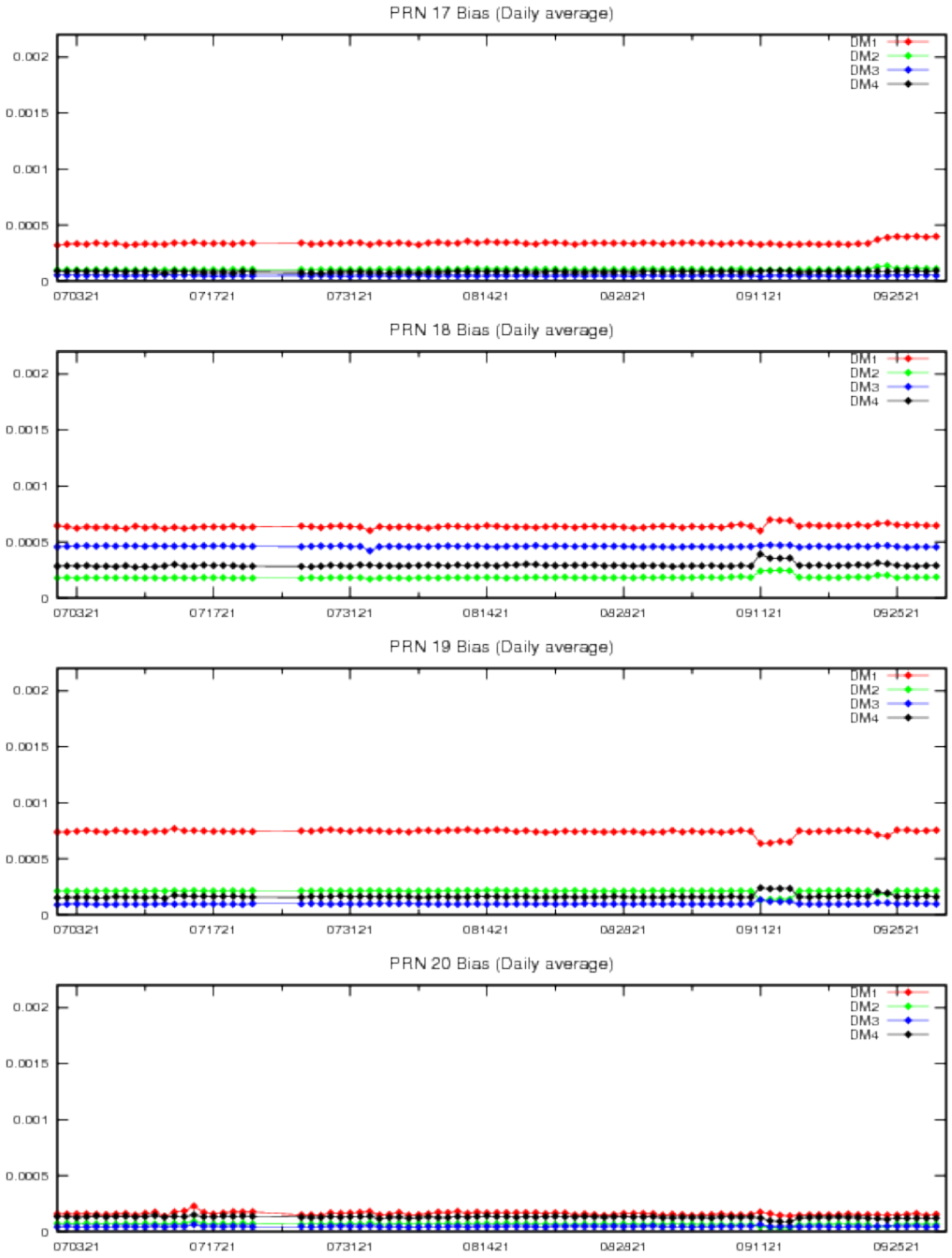


Figure 11-8 PRN Bias Average Trend (PRN21 – PRN24)

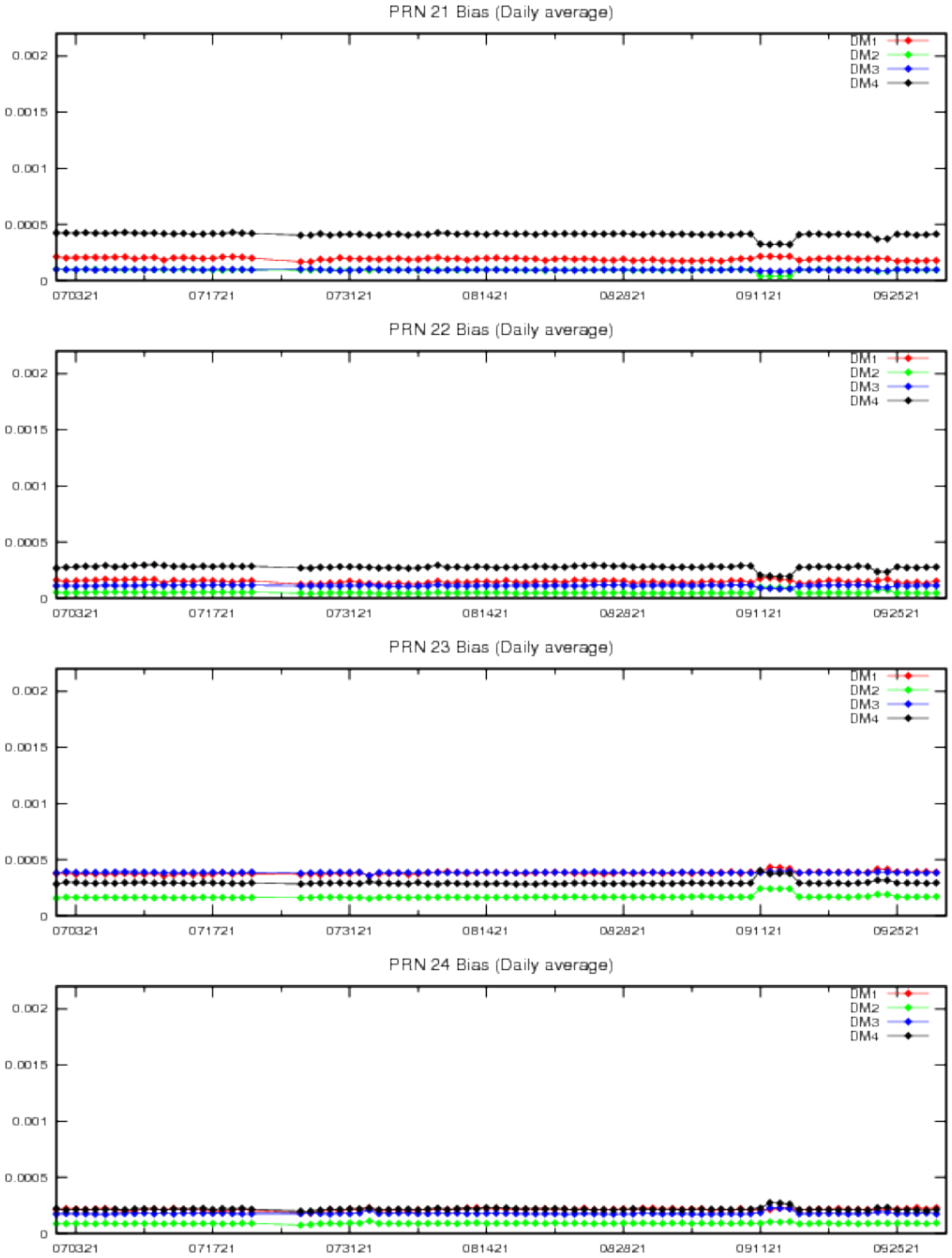


Figure 11-9 PRN Bias Average Trend (PRN25 – PRN28)

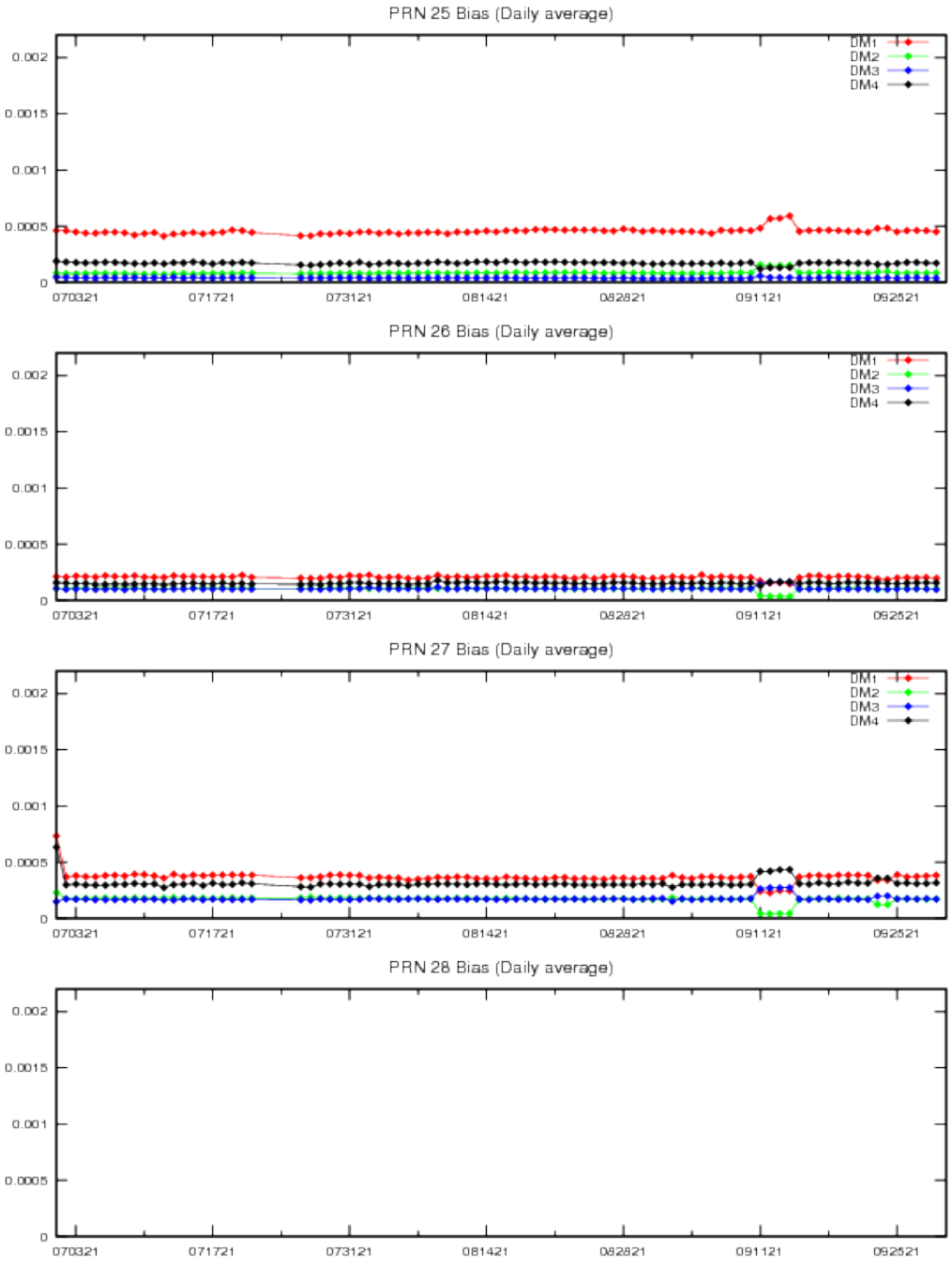
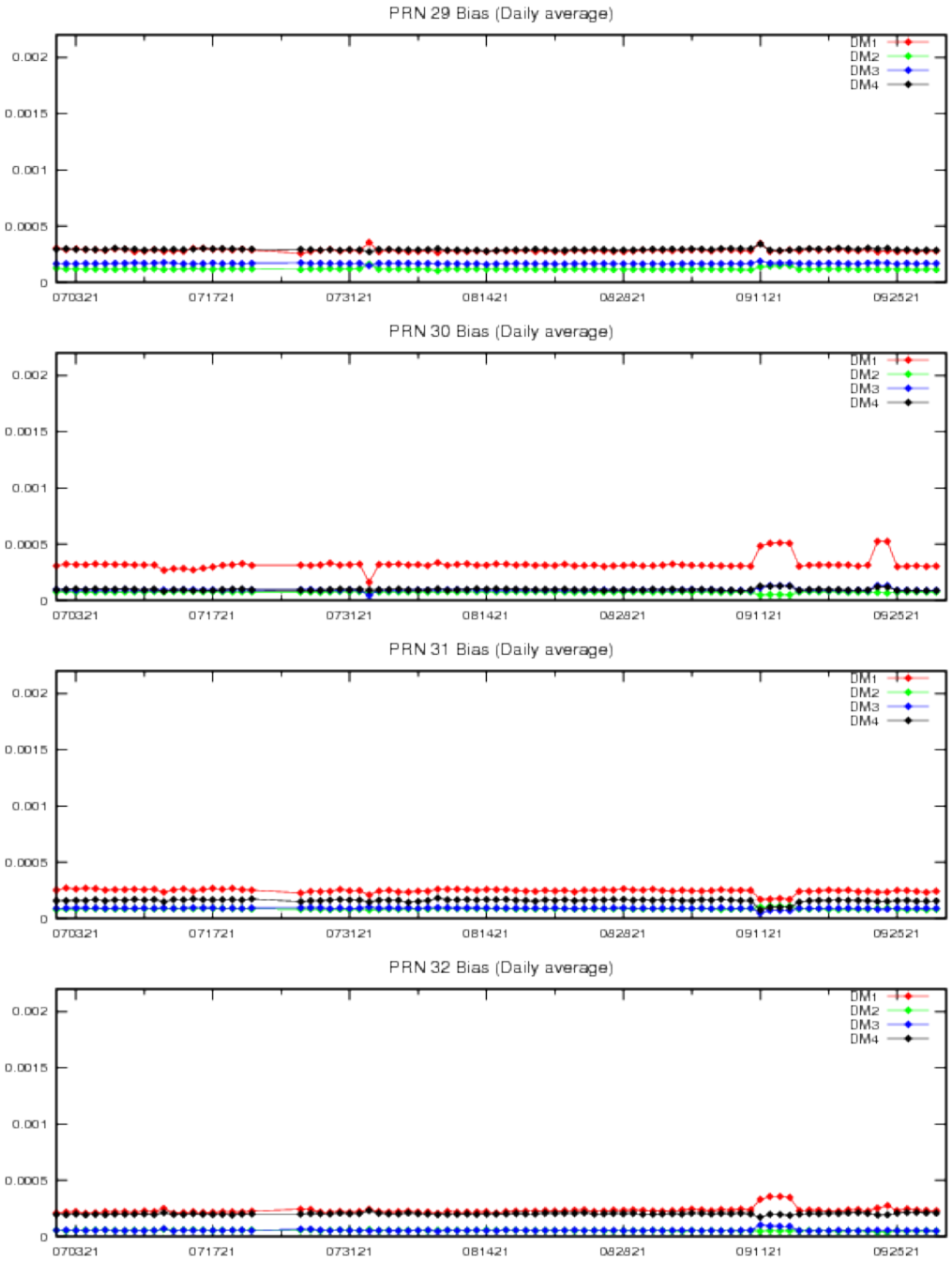


Figure 11-10 PRN Bias Average Trend (PRN29 – PRN32)



11.4 SQM Trips

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

Appendix A: Glossary and Acronyms

General Terms and Definitions

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

AMR. GEO PRN133

APC. Antenna phase center

ARP. Antenna reference point

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

C&V. The Correction and Verification Subsystem

CNMP. Code noise and multipath

CONUS. Continental United States

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

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

CRE. GEO PRN138

CRW. GEO PRN135

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.

GEO. Geostationary satellite

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.

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.

GUS. Ground uplink station

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).

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.

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

IGS. International GPS Service.

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

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

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.

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.

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

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

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.

SV. Space vehicle.

SVN. Space Vehicle Number.

TOW. Time of GPS week

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

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

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.

VNAV. Vertical navigation

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

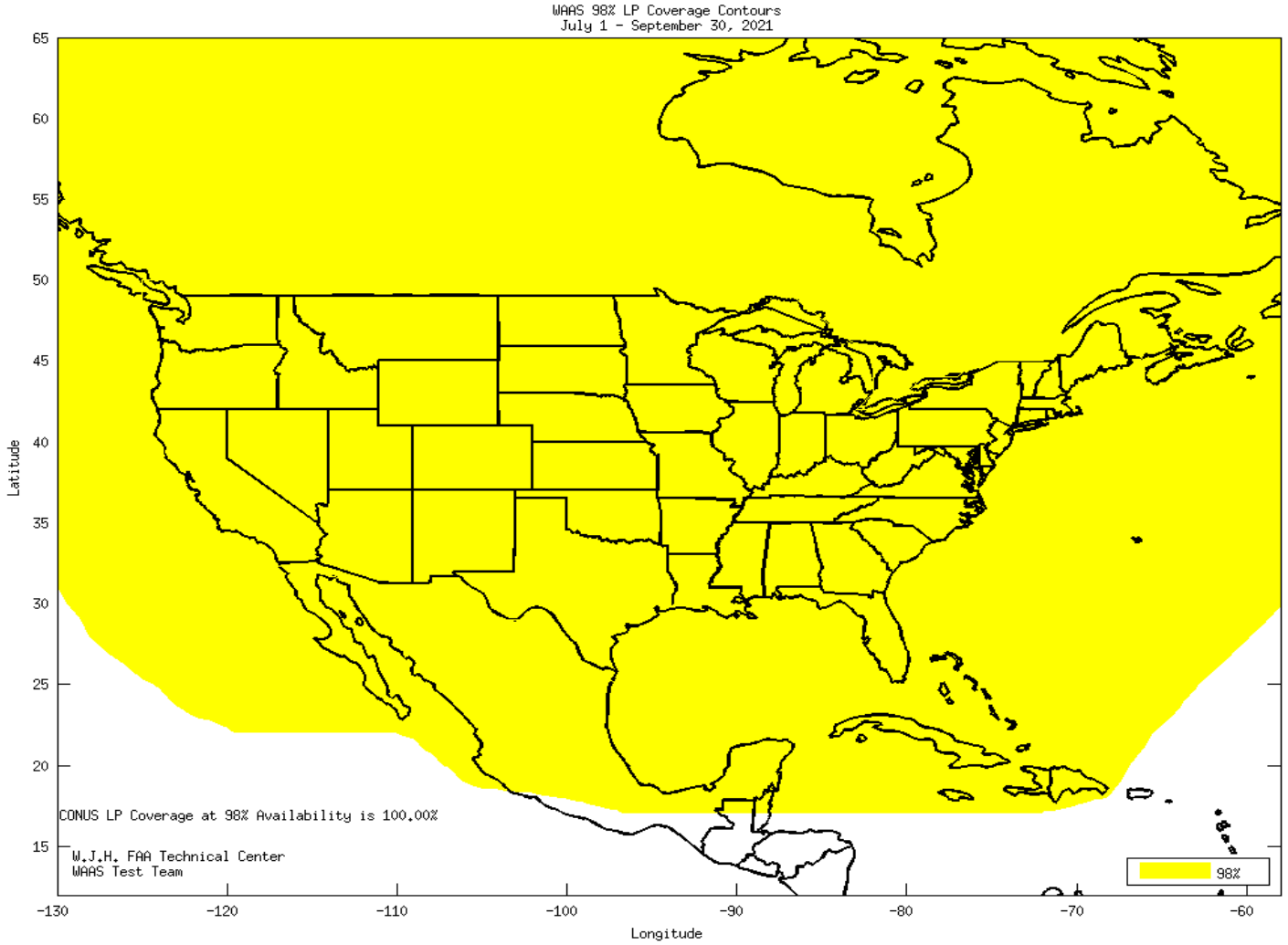


Figure B-2 98% Alaska LP Availability Contour

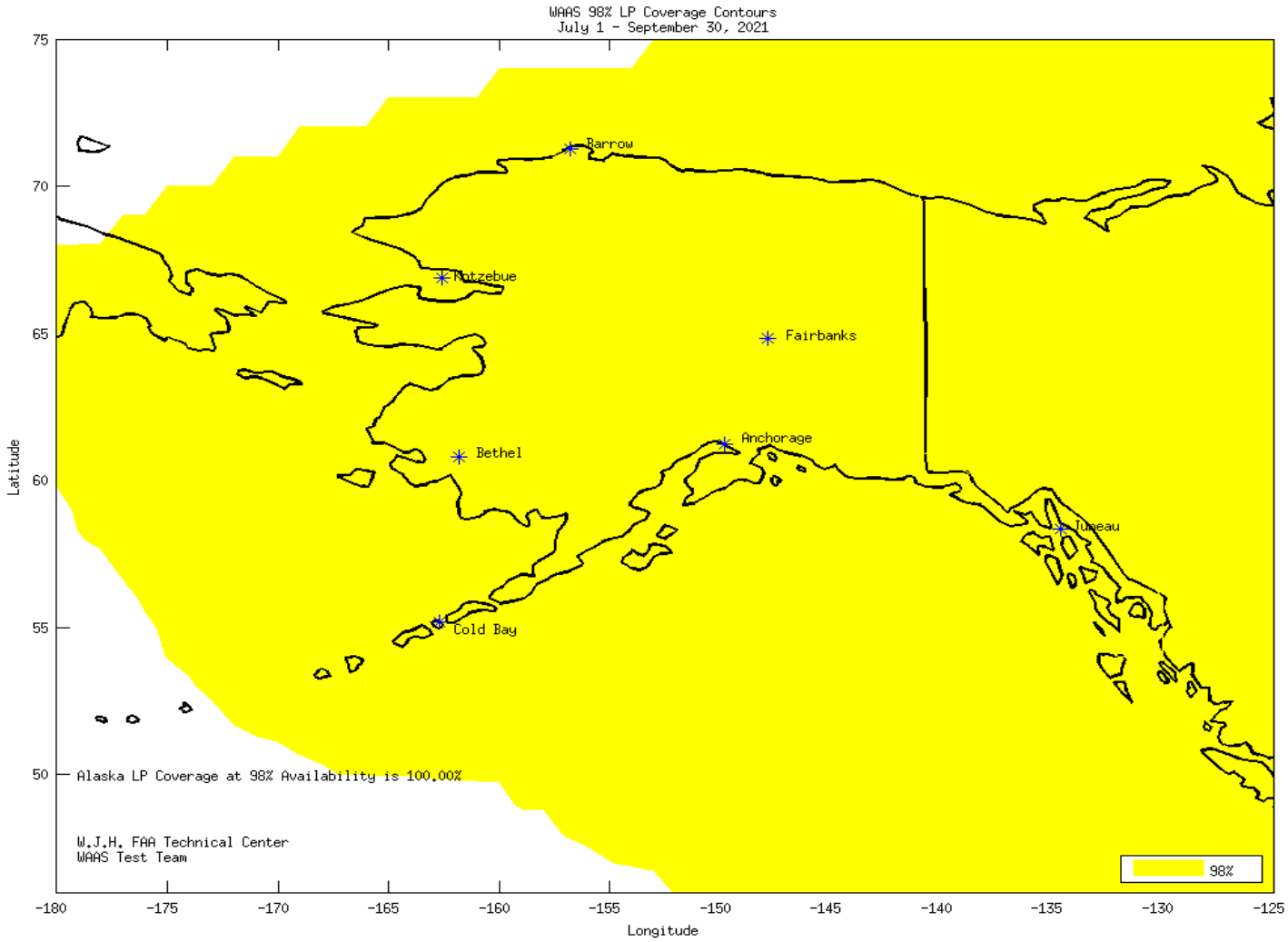


Figure B-3 98% CONUS LPV Availability Contour

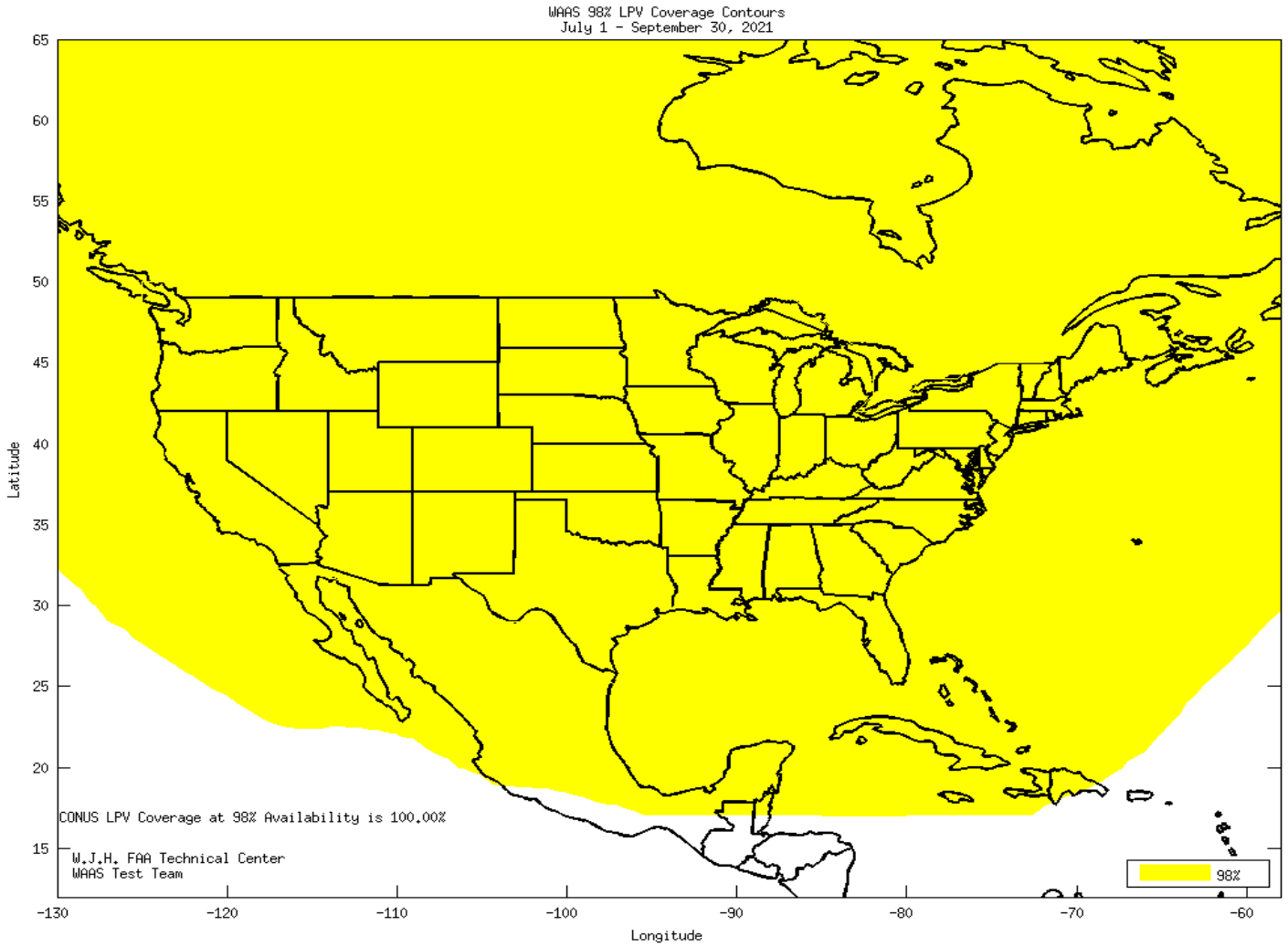


Figure B-4 98% Alaska LPV Availability Contour

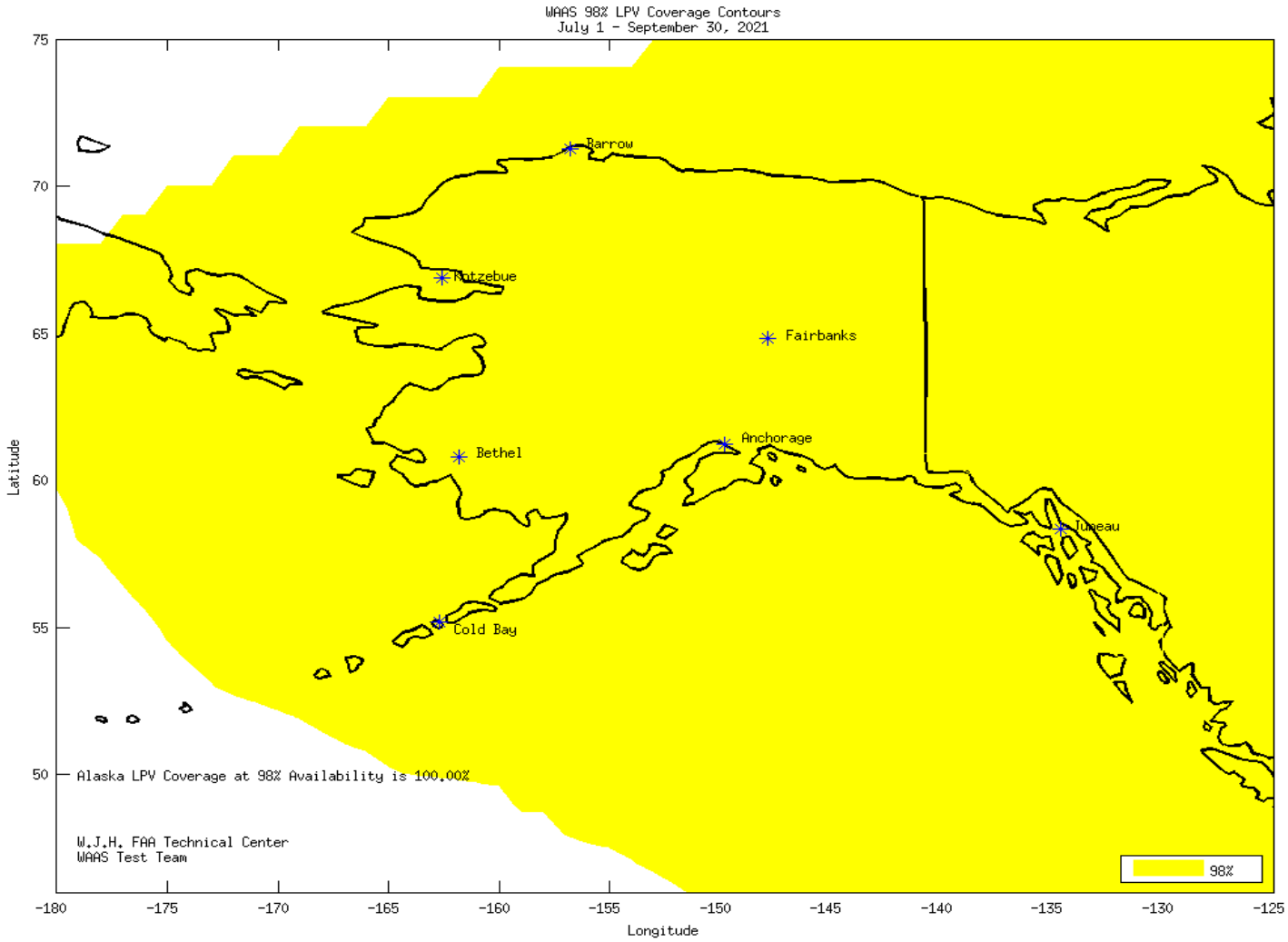


Figure B-5 98% CONUS LPV200 Availability Contour

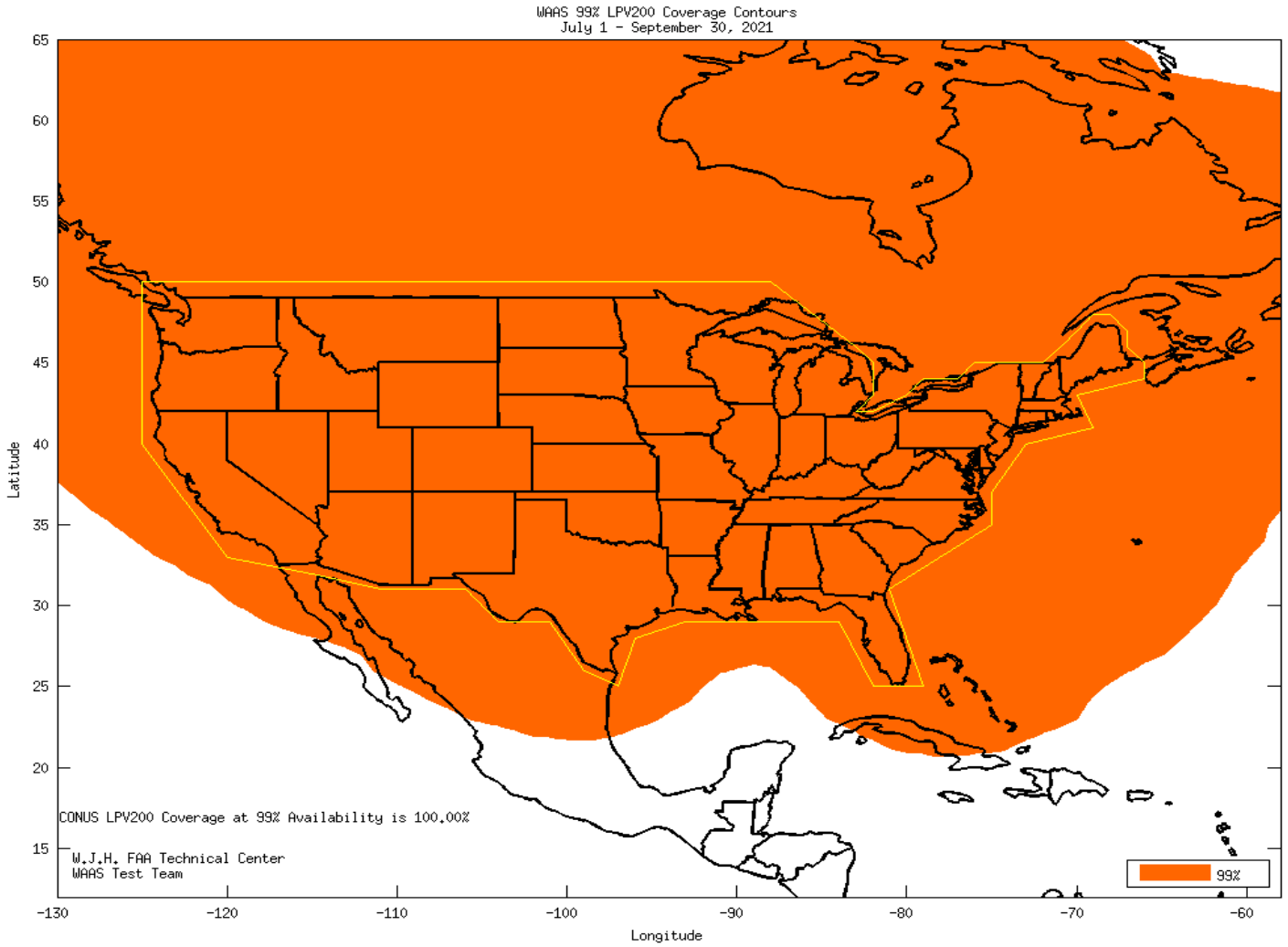


Figure B-6 98% Alaska LPV200 Availability Contour