

# National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



DCA23FA149

## **PERFORMANCE ADDENDUM**

Aircraft Performance Addendum

By

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## **A. INCIDENT**

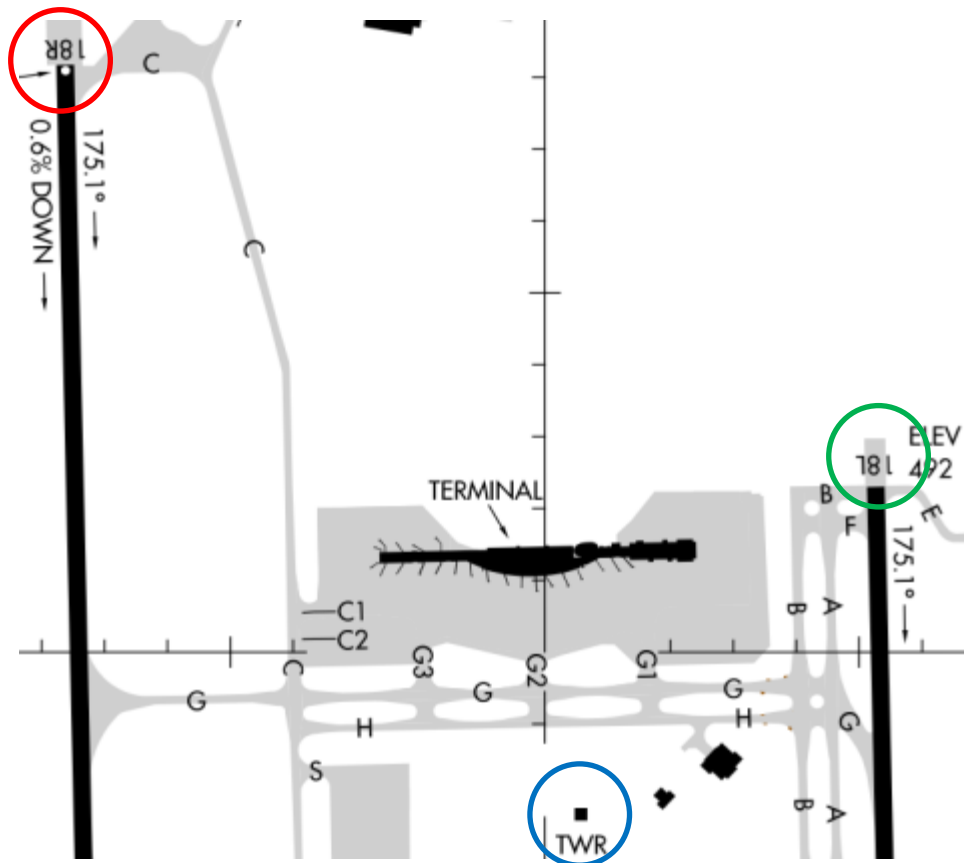
Location: Austin, Texas  
Date: February 4, 2023  
Time: 06:40 central standard time (CST)  
Airplane 1: Boeing 737-79P, N7827A  
Airplane 2: Boeing 767-32LF, N297FE

## **B. PERFORMANCE ADDENDUM**

Of interest to the investigation were the communications between the Austin Airport Traffic Control Tower (ATCT) and the airplane ground traffic prior to the incident event. The Air Traffic Control (ATC) Audio Transcript [1] began at 05:45 with the change of controllers to the incident controller. Communications with ten flights prior to SWA708 were recorded.

The ten prior flights were all take-offs. The position data for these airplanes was provided by SAAB Aerobahn who had a SAAB ADS-B ground station in the tower for demonstration purposes on the day of the event [2]. The location data provided in this report was not available to the local controller.

Seven of the prior airplanes took off from 18L and three from 18R. The runway thresholds and the tower are shown in Figure 1. In this report, the data gathered for each flight consisted of when, where, and how each airplane reported it was ready for departure. When and where each airplane was cleared for take-off was recorded and when the airplane's take-off roll began. The definition used in this report for the beginning the take-off roll was when acceleration on the runway exceeded 5 kts/s.

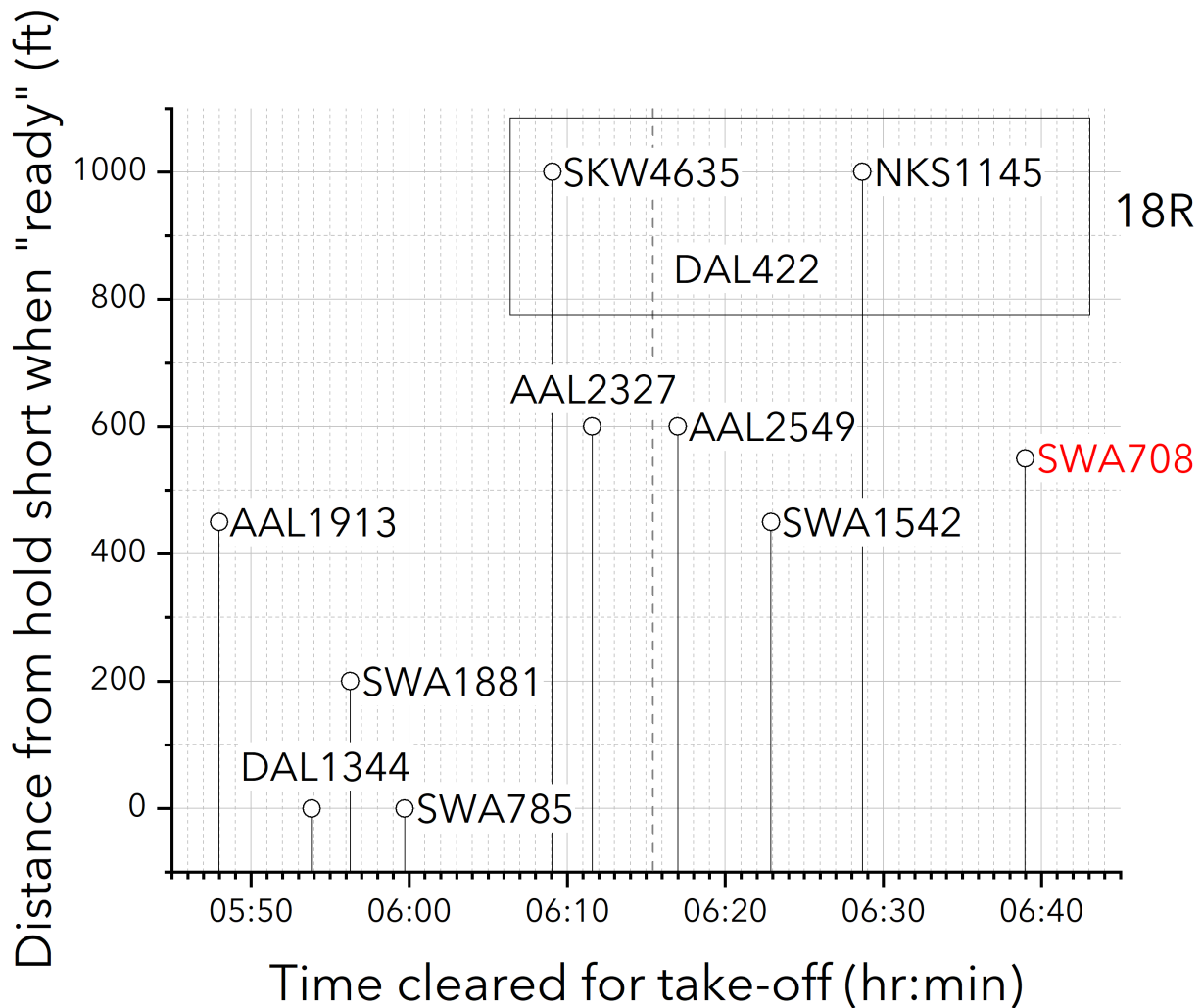


**Figure 1.** Portion of the airport diagram for AUS. The threshold of 18R is circled in red, the threshold of 18L is circled in green, and the control tower is circled in blue.

Table 1 contains when, how, and where each airplane reported to ATCT that they were prepared for take-off. Two airplanes reported from the hold short line and the eight other airplanes reported between 200 ft and 1,000 ft before the hold short line. Some airplanes specified where they were on the airport surface when reporting and some did not. Figure 2 shows time of clearance versus distance from runway hold short when reporting ready. Of note, DAL422 did not report to ATCT that they were ready for take-off before they were provided clearance for take-off. Time between take-offs varied from one minute 30 seconds to ten minutes.

**Table 1.** Airplane Communication with ATCT, ready for take-off. Flights taking off from 18R are shaded grey. SWA708 is shown in red.

Flight number	Time of comment	Prepared for take-off comment	Distance from hold short line at comment	Take-off runway
AAL1913	5:47:52	tower American nineteen thirteens ready for takeoff one eight left	450 ft	18L
DAL1344	5:53:44	tower Delta thirteen forty-four holding short runway one eight left ready for departure	0	18L
SWA1881	5:56:01	tower Southwest eighteen eighty-one we're uh one eight left ready	200 ft	18L
SWA785	5:59:17	seven eighty-five we're all set at the end we're holding short one eight left	0	18L
SKW4635	6:08:52	uh tower SkyWest forty-six thirty-five good morning approaching one eight right at Charlie	1000 ft	18R
AAL2327	6:11:28	and tower American uh twenty-three twenty-seven holding short one eight left at Bravo	600 ft	18L
DAL422				18R
AAL2549	6:16:51	hey good morning tower American twenty-five forty-nine we'll be ready at one eight left	600 ft	18L
SWA1542	6:22:44	tower Southwest fifteen forty-twos ready at eighteen left	450 ft	18L
NKS1145	6:28:26	and tower Spirit Wings eleven forty-five uh on Charlie gonna be holding short one eight right we're ready to go	1000	18R
SWA708	6:38:47	tower Southwest seven o eight we're short of one eight left we're ready	550 ft	18L



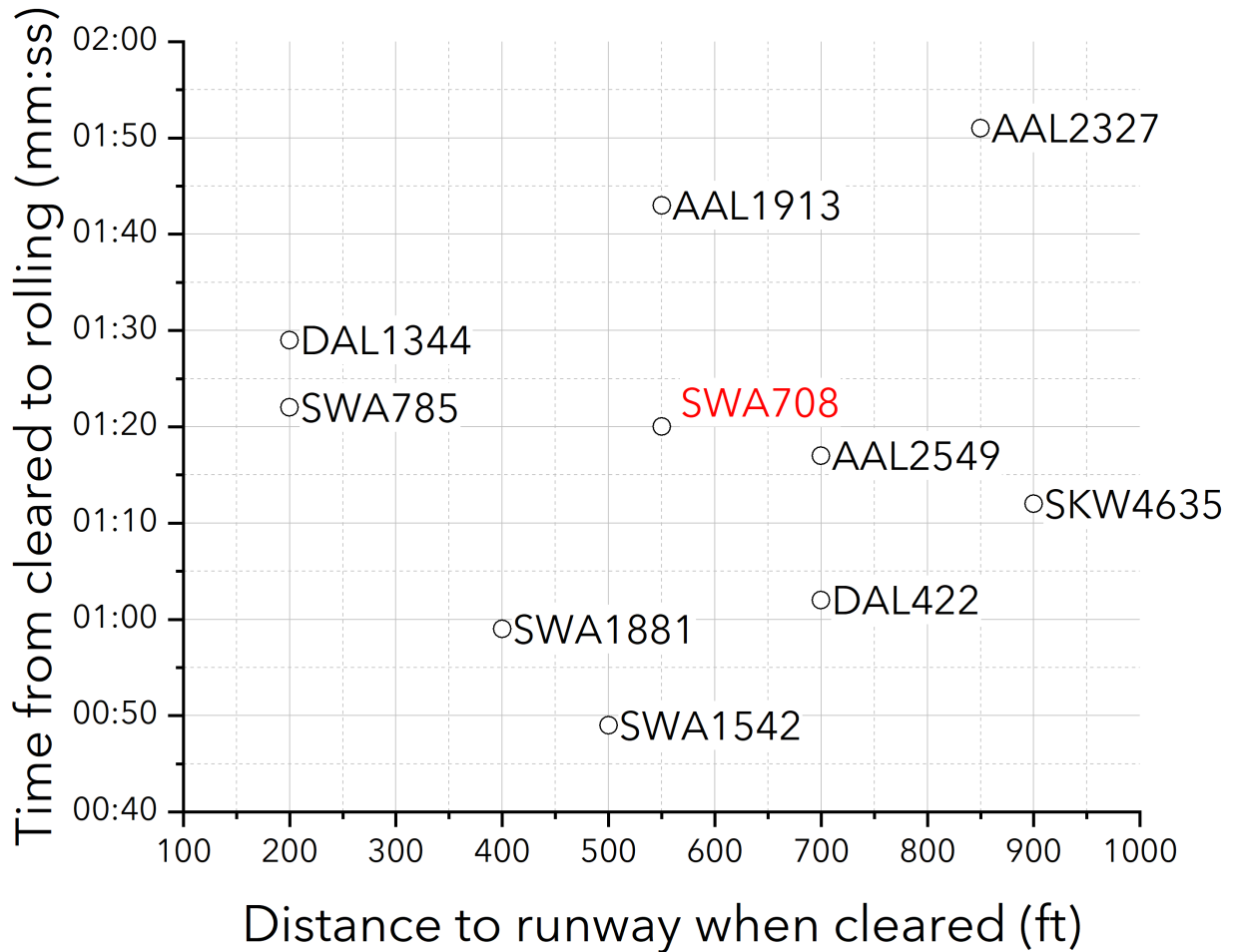
**Figure 2.** Time when each airplane was cleared versus the distance it was from the hold short line when ready for departure. Airplanes taking off from runway 18R are marked. SWA708 is shown in red.

Table 2 shows the time from when ATCT cleared the airplane until they were on their take-off roll. Times varied between 49 seconds and one minute 51 seconds. SWA708 took 1 minute 20 seconds from the time it was cleared until it began its take-off roll. Four other airplanes took more time than SWA708 and five took less time. The take-off roll time for NKS1145 could not be determined due to missing position data. Also shown is the minimum speed on the runway heading and its duration. No other airplane came to a complete stop on the runway before take-off, but five did spend a few seconds below 5 kts of groundspeed.

Figure 3 shows the distance to the runway when the airplane was cleared versus the time from cleared to on the take-off roll. There is no relationship between the distance to the runway when cleared and the time from clearance to take-off roll (defined as when acceleration on the runway exceeded 5 kts/s).

**Table 2.** Airplane Communication with ATCT, ready for take-off. Flights taking off from 18R are shaded grey. SWA708 is shown in red.

Flight number	Time of clearance	Distance to runway at clearance, ft	Time from clearance to on take-off roll	Minimum speed on runway heading, kts	Time at minimum speed, seconds
AAL1913	5:47:59	550	1:43	4	3
DAL1344	5:53:50	200	1:29	4	5
SWA1881	5:56:17	400	0:59	4	10
SWA785	5:59:43	200	1:22	1	6
SKW4635	6:09:04	900	1:12	Missing data	
AAL2327	6:11:35	850	1:51	10	7
DAL422	6:15:26	700	1:02	1	6
AAL2549	6:17:00	700	1:17	7	3
SWA1542	6:22:54	500	0:49	10	2
NKS1145	6:28:41	900	Missing data		
SWA708	6:38:58	550	1:20	0	18



**Figure 3.** Distance to runway when cleared versus time from cleared to rolling. SWA708 is shown in red.

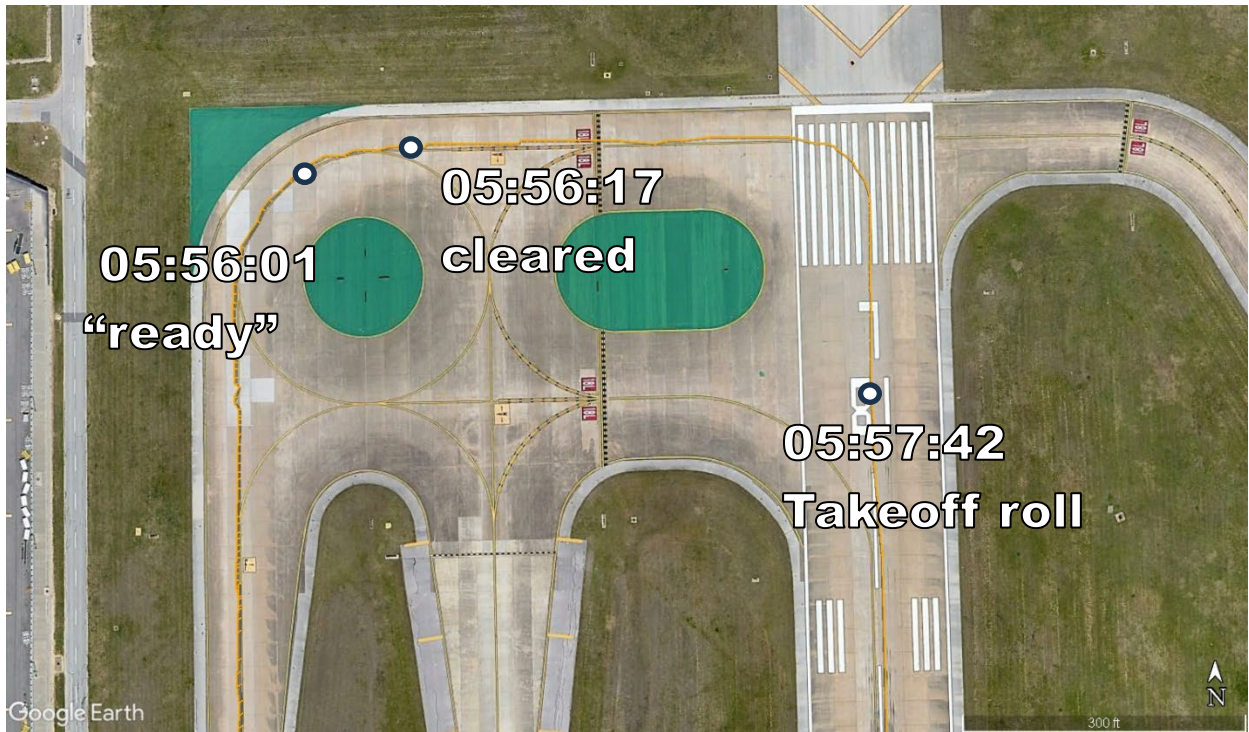
Figure 4 through Figure 13 shows each airplane's taxi onto the runway with select ATC communications marked. Each airplane contacted ATCT to announce that they were prepared for departure, the location and time of which is marked on the figure. ATCT then cleared each airplane for take-off. Finally, on each figure, the time and location of the start of the take-off roll is marked.



**Figure 4.** AAL1913's departure. Time was 1:43 from clearance to take-off roll.



**Figure 5.** DAL1344's departure. Time was 1:29 from clearance to take-off roll.

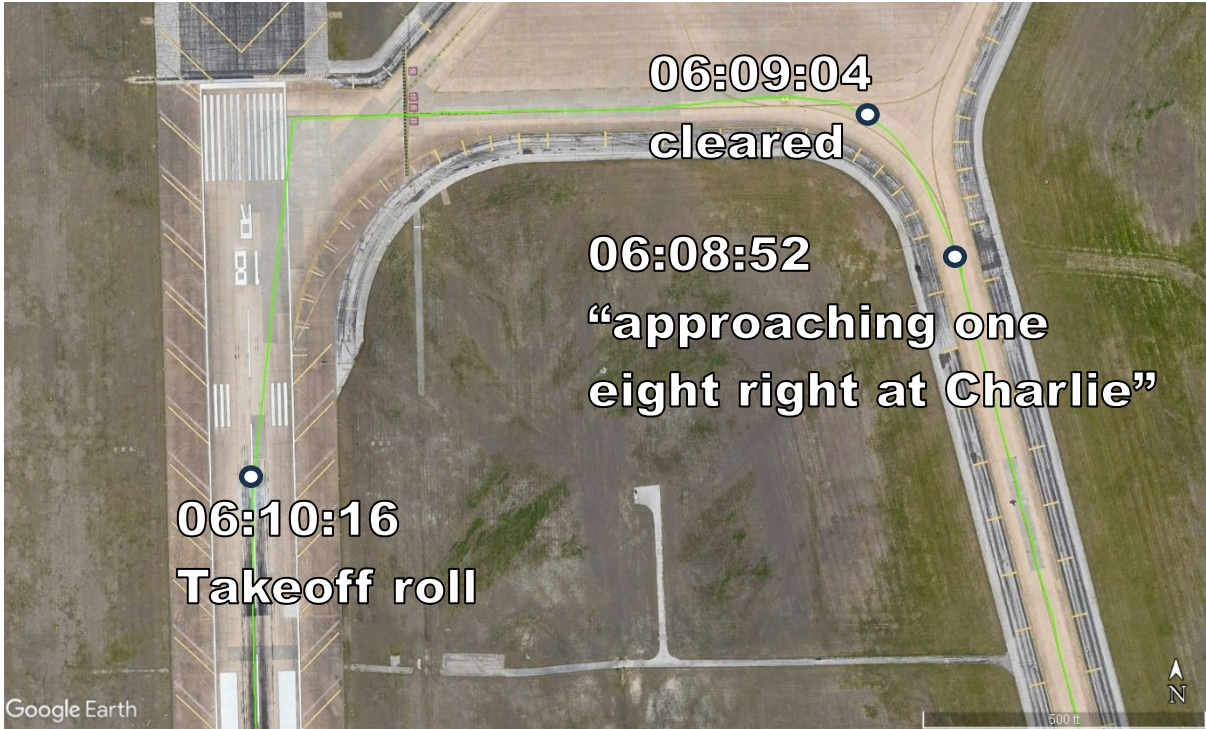


**Figure 6.** SWA1881's departure. Time was 0:59 from clearance to take-off roll.

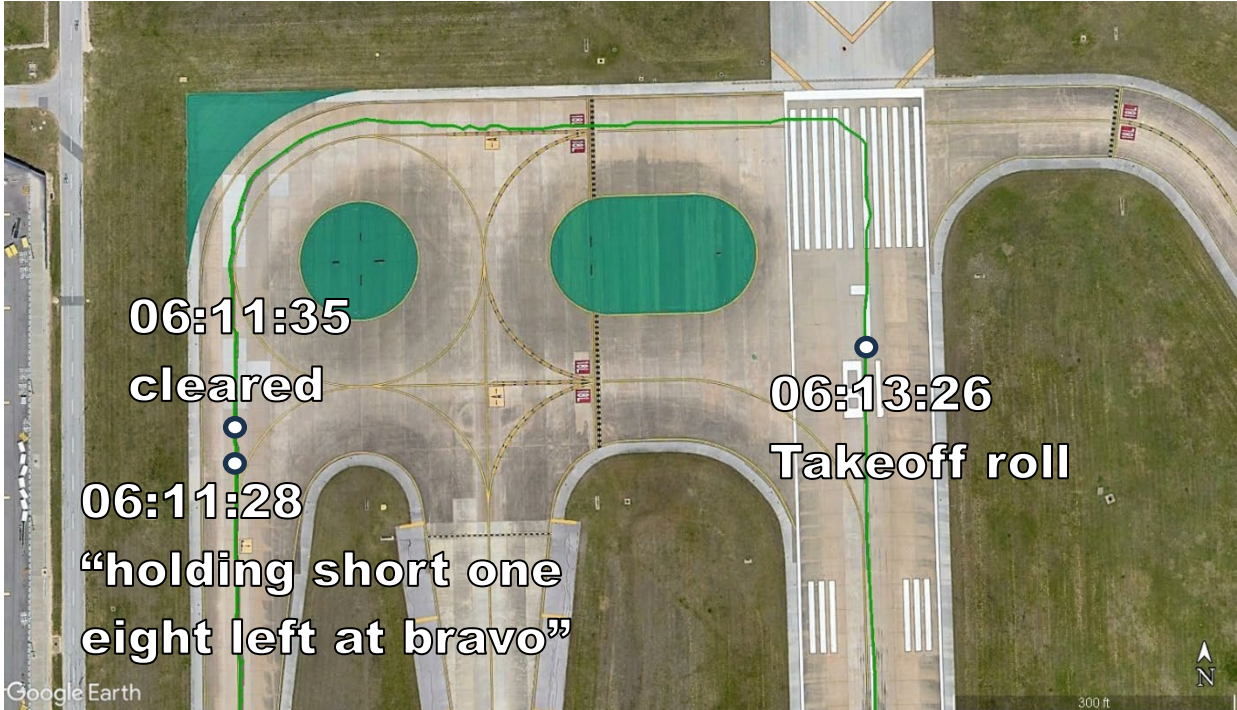


**Figure 7.** SWA785's departure. Time was 1:22 from clearance to take-off roll.





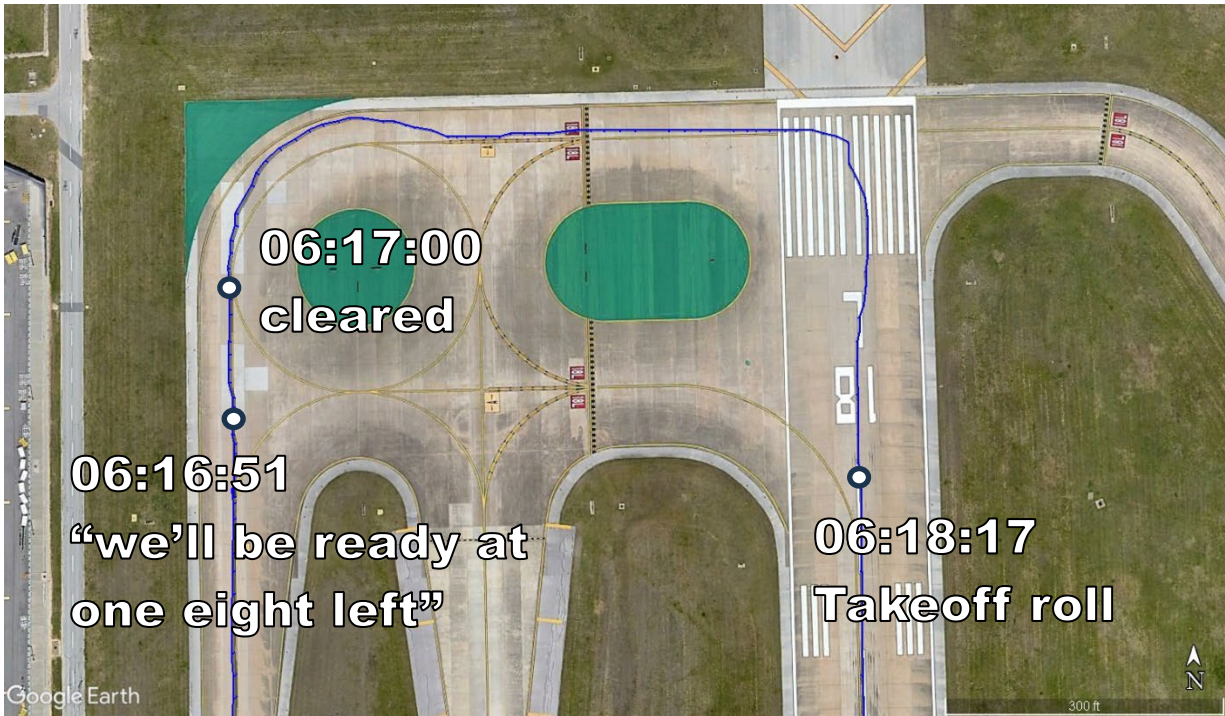
**Figure 8.** SKW4635's departure. Time was 1:12 from clearance to take-off roll.



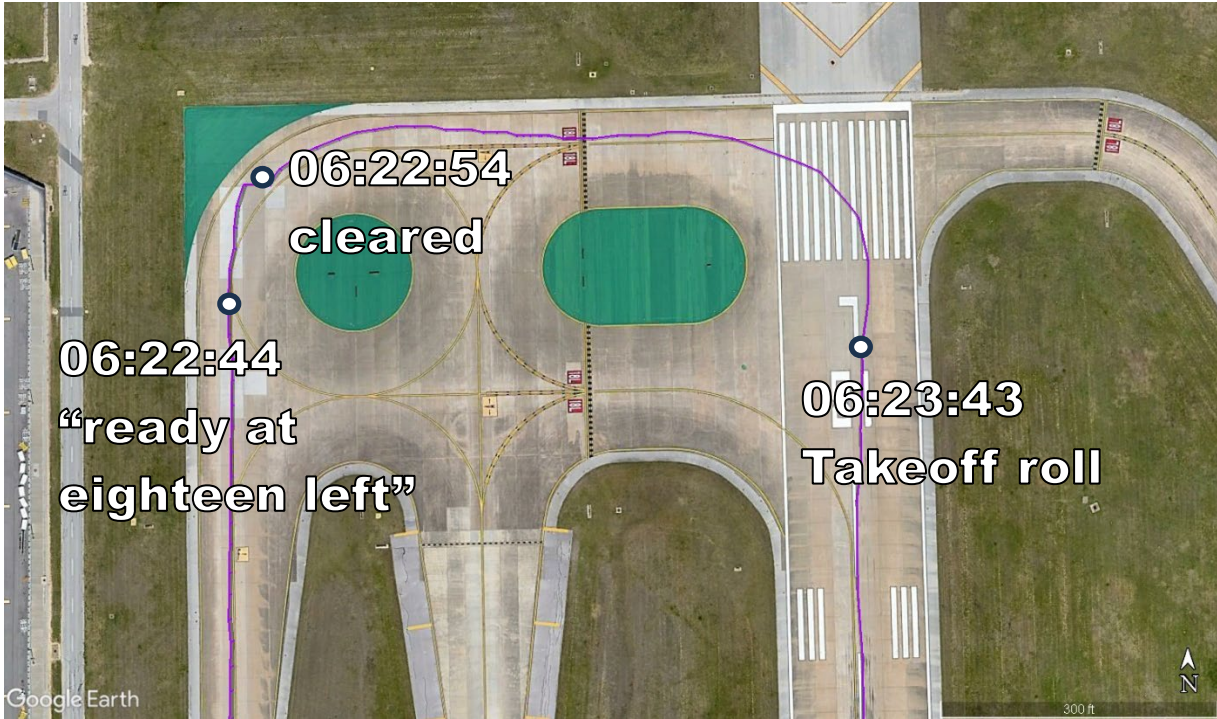
**Figure 9.** AAL2327's departure. Time was 1:51 from clearance to take-off roll.



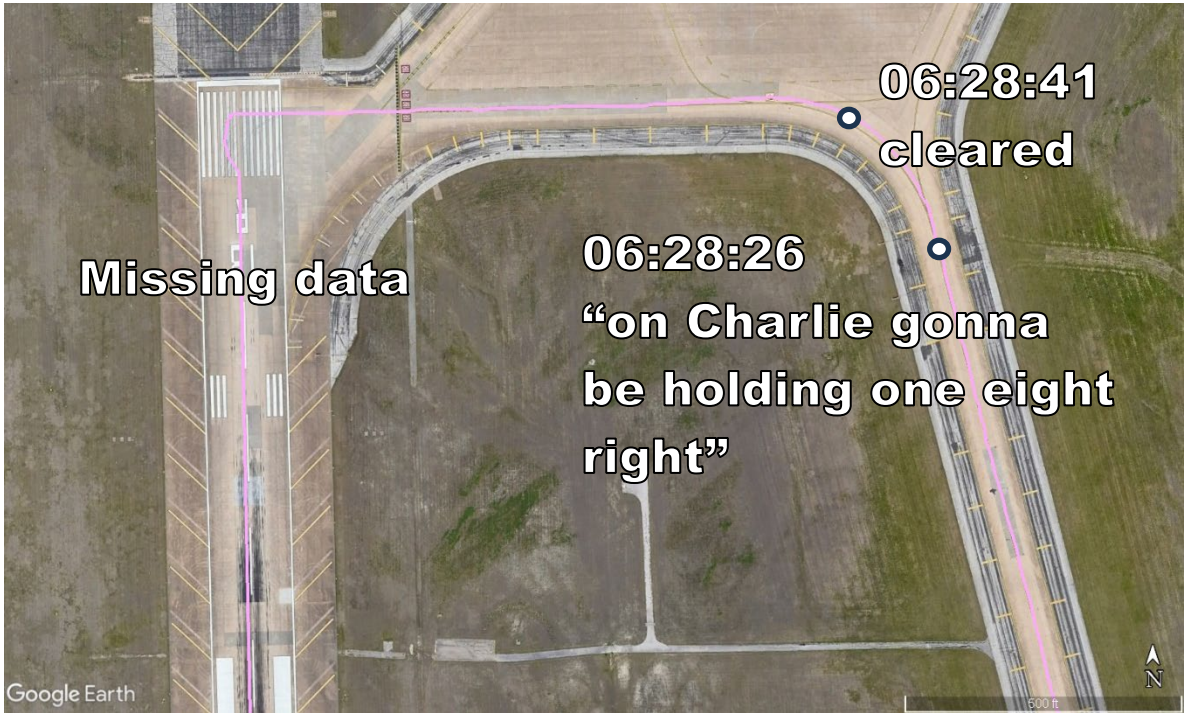
**Figure 10.** DAL422's departure. Time was 1:02 from clearance to take-off roll.



**Figure 11.** AAL2549's departure. Time was 1:17 from clearance to take-off roll.



**Figure 12.** SWA1542's departure. Time was 0:49 from clearance to take-off roll.



**Figure 13.** NKS1145's departure. Time from clearance was undetermined due to missing data.

## **C. REFERENCES**

1. Air Traffic Control Factual Report – Attachment 1, ATC Voice Transcription, DCA23LA149, National Transportation Safety Board, 2023.
2. Aerobahn ADS-B data, DCA23LA149, National Transportation Safety Board, 2023.