U.S. Department
of Transportation
**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave., SW.,
Washington, DC 20591

Office of Accident Investigation & Prevention

September 13, 2018

Mr. John Lovell
Investigator-in-charge
National Transportation Safety Board
Office of Aviation Safety; Major Investigation Division (AS-10)
490 L'Enfant Plaza East, SW
Washington, DC 20594

Dear John:

As per your request, I have enclosed a 2-page attachment that provides a comprehensive summary of the FAA's recent accomplishments and ongoing work with regard to ASDE-X Taxiway Arrival Prediction enhancements.

Key technical staff and managers from FAA's Air Traffic Organization (ATO) prepared this summary. While these efforts began before the Air Canada flight 759 incident at San Francisco, last year (*NTSB Case no. DCA17IA148*), please feel free to place this correspondence into the public docket for this investigation, and/or utilize its content in the NTSB final report that you will be discussing at the upcoming Board Meeting on September 25.

Should you have any questions or concerns related to this matter, please contact me at ([redacted], or Bob Hendrickson at ([redacted].

Sincerely,

[redacted]

Jeffrey B. Guzzetti
Director
Accident Investigation Division (AVP-100)

Enclosure

FAA Accomplishments: ASDE-X Taxiway Arrival Prediction

Provided to NTSB by the FAA Office of Accident Investigation - September 13, 2018

On December 19, 2015, at 0833 local time, an Alaska Airlines B737-900 landed on Taxiway Tango instead of the intended runway (16C) at the Seattle-Tacoma International Airport (SEA). Prior to the landing, the SEA local controller offered the flight crew a change from a visual approach to Runway 16R to Runway 16C, which the flight crew accepted. Visual meteorological conditions prevailed at the time with broken and scattered clouds. The flight crew reported seeing three surfaces illuminated by the sun, which they interpreted as three runways. The surfaces were in fact Runway 16R, Taxiway Tango, and Runway 16C. This incident was the third Part 121 air carrier taxiway landing within a 10-year period at an airport equipped with Airport Surface Detection Equipment Model X (ASDE-X).

Following this incident, the FAA's Northwest Mountain Regional Administrator (David Suomi) convened a cross-organizational "tiger team" to discuss possible mitigations for taxiway landings at SEA. The team focused on understanding the situation from many different perspectives, and also on identifying a solution. This led to the FAA revisiting the concept of a safety logic adaptation to the ASDE-X that would alert the controller when a landing aircraft was lined up to a taxiway. The FAA had considered this concept nearly five years earlier when the NTSB recommended that the FAA consider such an enhancement in 2011 following a taxiway landing in Atlanta (*NTSB Recommendations A-11-012 and A-11-013*). At that time, however, the FAA determined the ASDE-X system performance trade-offs would outweigh the potential safety benefit of the capability.

In revisiting this concept after the Alaska Airlines event, the FAA discovered that modifying the taxiway arrival regions greatly reduced the risk of decreased system performance. As a result, in 2017, the FAA began developing the "Taxiway Arrival Prediction" software enhancement to the ASDE-X. This enhancement was first implemented at SEA on May 8, 2018, and is about to be implemented at four other major airports (details below). The evaluation and rollout of the Taxiway Arrival Prediction enhancement will be complete at all 34 airports that are equipped with ASDE-X by the end of fiscal year (FY) 2020.

Taxiway Arrival Prediction functionality performs in the same manner as Runway Arrival Prediction, except that it works with taxiways rather than runways. FAA engineers created and tested new taxiway surfaces and arrival regions prior to implementation at the key site at SEA. Taxiway arrival regions are "thinner" and do not flare out as much as runway arrival regions to reduce the possibility of nuisance alerts caused by normal runway arrivals being predicted to a taxiway. The taxiway arrival alert parameters are the same as those for a closed runway. Specifically, any aircraft predicted to land on a taxiway within 3,000 feet or 20 seconds of the taxiway threshold will generate a visual and aural alert in the Air Traffic Control (ATC) tower.

Additional details regarding FAA's completed and on-going actions with regard to this safety enhancement are presented on the next page.

FAA Actions Completed for ASDE-X Enhancement

As of August 31, 2018, the FAA has completed the following actions with regard to ASDE-X:

- Chartered a Collaborative Workgroup (CWG) to coordinate the analysis, optimization and flight check testing of the ASDE-X taxiway landing alert capability at SEA.
- Assessed the alert performance of the data collected at SEA with alerts disabled.
- Developed a testing plan for the enhancement, including a flight check.
- Developed training for ATC personnel, including a simulation of the Alaska Airlines Taxiway Tango landing at SEA in December 2015.
- Completed testing of the ASDE-X Taxiway Arrival Prediction enhancement at SEA on January 9, 2018, and enabled it on May 8, 2018.
- Established a waterfall schedule for the evaluation and rollout of the Taxiway Arrival Prediction enhancement to all 34 airports equipped with ASDE-X.
- Completed the evaluations to implement the Taxiway Arrival Prediction at four more airports equipped with ASDE-X:
    - Hartsfield-Jackson Atlanta International Airport (ATL) – *Atlanta, Georgia*
    - Bradley International Airport (BDL) – *Windsor Locks, Connecticut*
    - Boston Logan International Airport (BOS) – *Boston, Massachusetts*
    - Charlotte Douglas International Airport (CLT) – *Charlotte, North Carolina*

On-going and Planned Efforts for ASDE-X Enhancement

The FAA expects to complete the following activities by the end of FY 2020:

- Communicating wrong surface landing risks -- and specifically taxiway landing risks -- to internal and external stakeholders.
- Completing the evaluations of all 34 ASDE-X facilities for the Taxiway Arrival Prediction capability.
- Enabling the Taxiway Arrival Prediction capability at all ASDE-X facilities, where feasible.
- Completing training for ATC personnel at all ASDE-X facilities that intend to enable the capability.
- Exploring the feasibility of providing an indication in the Standard Terminal Automation Replacement System (STARS) of when an aircraft is misaligned with a runway, taxiway, or airport.