U.S. Department
of Transportation

**Federal Aviation
Administration**

Northwest Mountain Region
Colorado, Idaho, Montana
Oregon, Utah, Washington,
Wyoming

1601 Lind Avenue, S. W.
Renton, Washington 98055-4056

June 19, 2001

Ms. Muffy Walker
U.S. Army Corps of Engineers
Regulatory Branch, Seattle District Office
P.O. Box 3755
Seattle, WA 98124-3766

Dear Ms. Walker:

This is a followup to our letter to you of May 31, 2001, in which we indicated we would provide you additional information on issues related to new technologies; the mechanically stabilized earth (MSE) wall; and Section 106 activities, as noted in your April 30, 2001, Memorandum for the Record. We offer the following clarifying information.

a. ***New Technologies***

The Port of Seattle (Port) proposes the development of the third runway to address the airport's existing poor weather arrival constraints. The existing parallel runways at Seattle-Tacoma International Airport (STIA) have a centerline-to-centerline separation of 800 feet. Due to separation standards imposed by Air Traffic regulations, only during visual flight rules 1 (VFR1) conditions (good weather) are two arrival streams possible. In "just below visibility minimums" (VFR2) and under instrument flight rules weather conditions, the airport operates in a single arrival stream. Even with the introduction of current and future technology, the existing runway separations will prevent poor-weather-dual-arrival streams. This is because the existing runway separation criterion requires 4,300 feet to operate dual independent precision instrument approaches, and separations are allowed down to 3,400 feet only with **precision runway monitors (PRM).**

The Federal Aviation Administration (FAA) has considered alternative technologies to address this poor weather arrival constraint, as documented in the 1996 Final Environmental Impact Statement (EIS) and the 1997 Final Supplemental EIS. As we discussed during our recent meeting, no new technology exists that will provide the

operational benefit during poor weather conditions as would be afforded by the development of the new runway.

Passive final approach spacing tool (pFAST) is an automation tool that assists terminal controllers to sequence aircraft, approaching the airport from different directions, and balance aircraft flows to multiple runways with mixed operations. This tool presents the controller a recommended order for aircraft on arrival and it is used for complex runway configurations with the required separation, such as that seen at Dallas-Ft. Worth International Airport. With only two closely spaced parallels (800 feet) at STIA, pFAST benefits would be minimal (2-3 percent).

Localizer directional aid (LDA) approaches, using simultaneous offset instrument approach procedures, would enhance efficiency at STIA during VFR2, which occurs around 20 percent of the time. While the LDA would reduce delays, it would not reduce the most severe delays that occur during IFR weather conditions that occur about 24 percent of the time. The LDA procedure is complex, requiring two turns below the clouds - one toward the final approach path and another to line up with the runway. Visual contact between the aircraft performing the maneuver and the aircraft on final to runway 16L is required during these maneuvers. Because the LDA procedure is more complex, it is less efficient than two straight-in approaches to parallel runways with centerlines separated by 2,500 feet. This is discussed by FAA memorandum dated March 29, 2001, in response to your 404 permit comments, and in Volume 1 of 7, Chapter II of the Final Environmental Impact Statement for the Proposed Master Plan Update at STIA, dated February 1996.

Global positioning system (GPS) is part of FAA's plan to transition to satellite-based navigation. It consists of the deployment of the **wide area augmentation system,** to provide en route/terminal navigation and category (CAT) I precision approaches; and the **local area augmentation system,** to augment GPS for CAT I/II/III precision approaches. This satellite-based navigation provides operational and safety benefits and replaces the instrument landing system. As such, it provides no capacity or delay reduction benefit.

Traffic alert and collision avoidance system (TCAS) is an alerting tool that enhances safety and provides pilot awareness. Aircraft with TCAS can display nearby traffic, which improves pilot and controller situational awareness. In the future, in combination with TCAS, **automated dependent surveillance - broadcast (ADS-B)** with **cockpit display of traffic information (CDTI)** will enable pilots to safely perform some tactical maneuvering and self-separation. For similarly equipped aircraft, this broadcast information may be received and processed by each aircraft or ground systems for use in conflict avoidance, surveillance, and airspace management. These future systems will not be implemented until after 2010.

In the *distant* future (beyond 2010), separation may be allowed down to 2,500 feet (not 800 feet) with **airborne information for lateral spacing (AILS),** in conjunction with **automatic dependence surveillance-broadcast (ADS-B).** The objective of AILS/ADS-B is to increase instrument operations and reduce required lateral spacing for dual simultaneous operations on parallel runways separated by at least 2,500 feet. This system

is expected to use technologies such as GPS, PRM and TCAS. The AILS is still in the research/development stage.

Considering all this, existing and upcoming new technology will only provide incremental benefits to address the poor weather delay; all of which are significantly less than the benefits of constructing a third parallel runway. As referenced in the *2001 Airport Capacity Benchmark Report*, new technology and new procedures are expected to provide an approximate 5-percent increase in hourly operating capability benefit, while the new runway provides almost a 50-percent benefit, as it solves the poor weather arrival constraint. Our review of technologies currently available, under study, or in demonstration, has not found a technological solution that would allow the simultaneous dependent use of the existing runways in all weather conditions. This is largely because of wake turbulence and human factor limitations, for which solutions have not yet been identified.

b. ***MSE Wall***

The MSE wall is being constructed to limit impacts on Miller Creek and wetlands. There are no known standards or models available for airports, with respect to wind shear and embankments relative to runway surfaces. We are relatively certain that the wall will not cause a wind shear situation for several reasons:

(1) The terrain on the north end of the existing runway has a 90-foot drop, and no wind shear problem has been experienced.

(2) The existing terrain and vegetation will likely reduce the exposed wall surface by almost 50 percent.

(3) Through our Flight Standards Safety Office, the airport at Worcester, Massachusetts, has been identified as an air-carrier airport with similarly high embankments. This airport reports no problems with wind shear related to the embankment slopes.

(4) Prior to the runway being opened, Flight Standards will perform a flight check to verify the safety of the runway. If any wind shear safety-related problems caused by the MSE wall are noted prior to commissioning or during normal operations, the Port will be required to take corrective action through techniques such as wind baffles.

c. ***Section 106 Activities***

As documented in our Final EIS and Final Supplemental EIS, the Port and the FAA have conducted consultation with the State Historic Preservation Officer during preparation of the EIS. Since completion of the EIS, the Port has also conducted further coordination, per your request. In accordance with Section 106 of the National Historic Preservation Act, we have coordinated the May 12, 2000, report entitled "Port of Seattle, Seattle-Tacoma International Airport Master Plan, Proposed Third Runway Archaeological

Resources and Traditional Cultural Places Assessment," prepared by Larson Anthropological Archaeological Services Limited, with the State Historic Preservation Office (SHPO). We have received concurrence with the report's findings and recommendations from Mr. Robert G. Whitlam, State Archeologist, in a letter dated May 18, 2001. The Port is preparing the monitoring plan and we will provide copies to your office and the SHPO. We will also notify the SHPO of your concurring party status. It is our understanding that this will complete our responsibilities under Section 106 and no further FAA action is necessary to satisfy your concurring party status.

Further information will soon be provided regarding the Clean Air Act, airport delays, and Terminal Area Forecast impacts, as related to the adequacy of the Final Supplemental EIS, and this should satisfy the questions raised in your April 30 memorandum. If you have any further questions, please contact our office.

Sincerely,

Lowell H. Johnson
Manager, Airports Division
Northwest Mountain Region