Update improvement projects are summarized in Table 1.3-1. Elements of the project that will result in wetland, floodplain, stream, and drainage channel impacts include the following:

- Adding an 8,500-ft-long third parallel runway (16X/34X) with associated taxiway and navigational aids
- Establishing standard RSAs for existing runways 16R/34L and 16L/34R
- Relocating South 154th Street north of the extended RSAs and the new third runway
- Developing the South Aviation Support Area (SASA) for cargo and/or maintenance facilities
- Using on-site borrow sources for the third runway embankment
- Relocating, redeveloping, and expanding support facilities (passenger terminal facilities, stormwater facilities [including outfalls], electrical substations, utility corridors, etc.)

These elements of the project are described more fully below.

Table 1.3-1. Proposed Master Plan Update improvement projects at Seattle-Tacoma International Airport.

Project	Description
Runway and Taxiway Projects	
Property Acquisition, Street and Utility Vacation	Includes purchasing property and demolishing existing structures between existing STIA boundary west to Des Moines Memorial Drive and State Route (SR) 509. Required for third runway embankment fill and construction impact mitigation. Acquisition and demolition is also required for the south runway protection zone (RPZ).
Embankment Fill	Embankment for third runway, constructed using imported fill. Approximately 16.5 million cubic yards (cy) will be placed over a 5- to 7-year period. Existing roads and streets under embankment footprint will be removed.
Interconnecting Taxiways	New connecting taxiways between existing runway and third runway. Project is located on existing airfield, requiring only minimal grading.
Runway 16X/34X	Paving of third runway after completion of embankment fill.
Extension of Runway 34R by 600 ft	Extend runway by 600 ft for improved warm weather and large aircraft operations. Project is located at the southern end of the east runway.
Additional Taxiway Exits on 16L/34R	Construction of new ramps to the existing terminal apron.
Dual Taxiway 34R	Improvements to taxiways serving the South Aviation Support Area (SASA) and south apron.
Borrow Sites	
Borrow Sites	Sources of fill for third runway embankment, located on STIA property south of the airport. Approximately 6.7 million cy of material will be excavated from three sites and transported across airport property to the embankment.
Runway Safety Areas	
Runway 34R Safety Fill	Extend runway safety fill to meet FAA standards.
RSAs 16R/16L	Extend safety fills by 1,000 ft to meet FAA standards.
Relocation of Displaced Threshold on Runway 16L	Airfield taxiway improvements. The runway threshold (i.e., the emergency landing pad at end of runway pavement) to be relocated onto new RSA.

Table 1.3-1. Proposed Master Plan Update improvement projects at Seattle-Tacoma International Airport (continued).

Project	Description
Miller Creek Sewer Relocation	Relocate sewer around third runway embankment and runway safety fills. New sewer will run along new alignment of South 154th Street.
FAA Navigation Aids (NAVAIDS)	
New Airport Traffic Control Tower	New air traffic control tower will be located in existing developed area near terminal.
Relocate Airport Surveillance Radar (ASR), Airport Surface Detection Equipment (ASDE), NAVAIDS	Existing radar and navigation equipment will be relocated to allow construction of third runway.
Airfield Building Improvements	
New Snow Equipment Storage	New building to house snow removal equipment.
Weyerhaeuser Hangar Relocation	Relocate existing hangar on west side of airfield to allow construction of third runway. New hangar will be located near south end of third runway.
Terminal/Air Cargo Area Improvements	
Relocation of Airborne Cargo	Relocate existing cargo building from air traffic control tower site to north cargo area. Located in existing developed area near terminal.
Central Terminal Expansion	Passenger terminal remodel. Located in existing developed area at terminal.
South Terminal Expansion Project (STEP)	Passenger terminal remodel. Located in existing developed area to the south of the main passenger terminal.
Northwest Hangar Relocation	Relocate Northwest Airlines hangar to site now occupied by Delta hangar. Located in existing developed area.
Satellite Transit Shuttle (STS) System Rehabilitation	Remodel and upgrade underground transit system linking terminal to satellites.
Redevelopment of North Air Cargo	New or expanded air cargo facilities along Air Cargo Road at north end of airport.
Expansion of North Unit Terminal (North Pier)	Addition to new passenger terminal located north of existing terminal. Located in existing developed area (Doug Fox parking lot and airport access freeway).
New Airport Rescue and Fire Fighting Facility (ARFF)	Replaces facility displaced by new North Terminal. The new facility will be located to the north of the North Terminal.
Cargo Warehouse at 24th Avenue South	New air cargo facility located north of SR 518 on 24th Avenue South.
Westin Hotel	New hotel located immediately north of main passenger terminal. Located in existing developed area at terminal.
Roads[a]	
Temporary SR 518 and SR 509 Interchanges	Temporary access ramps to serve construction of third runway embankment and runway safety fill; will be removed after project completion.
South 154th Street /South 156th Way Relocation	Relocate public roadway to allow construction of third runway embankment and runway safety fills. Existing road will be demolished.

Table 1.3-1. Proposed Master Plan Update improvement projects at Seattle-Tacoma International Airport (continued).

Project	Description
South 154th Street /South 156th Way Bridge Replacement	Relocate existing South 156th Way bridge over Miller Creek to accommodate the third runway footprint and South 154th Street /South 156th Way relocation. In-water work associated with this project is limited to removal of the existing bridge and bank restoration.
Improvements to Main Terminal Roads	Transportation circulation, seismic, and other improvements to roadway systems serving terminal.
Improved Access and Circulation Roadway Improvements	Improvements to existing roadway system serving passenger terminal, garage, and air cargo facilities.
North Unit Terminal Roadways	Improvements to existing roadway system to serve the new North Terminal and garage.
Improvements to South Access Connector Roadway (South Link)	Improvements to existing roadway system serving passenger terminal, garage, and air cargo facilities. Will connect terminal and garage area to South Access roadway and SR 509 extension south of airport.
Parking	
Main Parking Garage Expansion	Expand parking facility at main passenger terminal on north and south sides (existing developed areas), and add floors to portions of existing garage.
North Employee Parking Lot (NEPL), Phase 1	New parking facility for employees, located north of SR 518.
North Unit Parking Structure	Construction of new garage serving new North Terminal facility. Facility will be located at existing Doug Fox parking lot.
The South Aviation Support Area	
SASA and Access Taxiways	New airport support facility for cargo and/or maintenance, located at the south end of the airport south of the Olympic Tank Farm and South 188th Street. Airplane access will be by new parallel taxiway constructed along Runway 34R.
Relocation of Existing Facilities to the SASA	Airport operation support facilities will be relocated to the SASA once SASA site development is completed. Many of these facilities must be relocated from their present locations due to main terminal expansion (i.e., STEP and North Terminal), including northwest hangar, ground support equipment, ground and corporate aviation facilities, new airport maintenance building, and United maintenance complex.
Stormwater Facilities[b]	
SASA Detention Pond	Create regional stormwater detention pond for the SASA project and other sites. Pond is 33.4 acre-ft and discharges to Des Moines Creek.
NEPL Vault	A 13.9 acre-ft vault to retrofit the NEPL; discharges to Miller Creek via Lake Reba.
Third Runway Vaults and Ponds	Stormwater detention vaults and ponds at the north, west, and south sides of the airport, discharging to Miller, Walker, and Des Moines Creeks.
STIA Retrofit Facilities	Detention vaults or ponds to provide flow control retrofitting for existing STIA discharges to Des Moines Creek. Vaults to be constructed in combination with third runway facilities when possible.
Cargo Vault	Detention vault for North Cargo Facility (4.5 acre-ft discharging to Miller Creek via Lake Reba).

Table 1.3-1. Proposed Master Plan Update improvement projects at Seattle-Tacoma International Airport (continued).

Project	Description
Natural Resource Mitigation	
Miller Creek Relocation	Approximately 980 ft of Miller Creek immediately downstream of the Miller Creek detention facility will be relocated to accommodate third runway embankment and runway safety fill.
Miller Creek Buffer and Wetland Enhancement	Establish a 100-ft buffer (average) along approximately 6,500 linear ft of Miller Creek and riparian wetlands associated with Miller Creek within the acquisition area. Enhance approximately 10.25 acres of existing wetlands along the stream and protect with 40.86 acres of enhanced wetland buffer.
Miller Creek Floodplain and Wetland Restoration	Excavate approximately 9,600 cy from the Vacca Farm site adjacent to Miller Creek to compensate for approximately 8,500 cy of floodplain fill for third runway embankment and north safety fill. Restore and enhance approximately 19 acres of stream habitat, floodplain wetlands, aquatic habitat in Lora Lake, and buffers at Vacca Farm.
Miller Creek Instream Habitat Enhancement	Project 1: South of the Vacca Farm site, approximately 440 ft of channel. Remove rock riprap, footbridges, and trash. Place large woody debris (LWD) throughout this section of the stream. Plant riparian areas along the stream with native wetland and upland plant species. Project 2: Approximately 150 ft upstream of South 160th Street, approximately 235 ft of channel. Install LWD in the stream channel, grade a small section of the west bank of the stream to create a gravel bench in the floodplain, remove two rock weirs to improve fish passage, and plant the upland area with native trees and shrubs. Project 3: Immediately downstream of South 160th Street, approximately 380 ft of channel. Grade a section of the east bank, remove a rubber-tire bulkhead, and install LWD in the stream and on its banks. Plant buffer areas with native trees and shrubs. Project 4: Miller Creek immediately upstream of 8th Avenue South, approximately 420 ft of channel. Grade portions of both banks. Remove footbridges and portions of concrete block walls. Install LWD in the stream and on its banks. Plant buffer areas with native trees and shrubs. In addition to these specific enhancements, debris such as tires, garbage, and fences will be removed throughout the entire stretch of Miller Creek from the Vacca Farm site south to Des Moines Memorial Drive. In areas where access is readily available, LWD will be selectively placed throughout the stream to improve instream habitat conditions.
Des Moines Way Nursery	Restore 2.2 acres of wetland by removing fill and commercial development from wetlands. Enhance about 0.8 acres of wetland lawn to shrub dominated wetland. Enhance 450 linear feet of Miller Creek. Protect site with about 2.7 acres of restored buffers.
Drainage Channels Relocation	Relocate a minimum of 1,290 linear ft of drainage channels to accommodate the third runway embankment. Plant buffers along the drainage channels with native grass and shrubs.
Restoration of Temporarily Impacted Wetlands	Approximately 2.05 acres of wetland located west of the third runway embankment, north of relocated South 154th Street, and west of the Miller Creek relocation project, will be temporarily filled or disturbed during embankment construction. When construction activities are completed, remove fill material, restore pre-disturbance topography, and plant wetlands with native shrub vegetation.

Table 1.3-1. Proposed Master Plan Update improvement projects at Seattle-Tacoma International Airport (continued).

Project	Description
Tyee Valley Golf Course Wetlands Enhancement and Des Moines Creek Buffer Enhancement	Restore approximately 4.5 acres of emergent wetland area and approximately 1.6 acres of buffer located within Tyee Valley Golf Course to a native shrub vegetation community. The enhancement actions will be integrated into plans to construct a regional detention facility (RDF) on the golf course (King County Capital Improvement Project Design Team 1999). The enhancement will convert the existing turf wetland to native shrub wetland community. Enhance approximately 3.4 acres (average 100 ft wide) of buffer and 1.0 acre of existing wetland along Des Moines Creek.
Wetland Habitat (including Avian Habitat) near the Green River in Auburn	Restore wetland functions to a 65-acre parcel near the Green River in the City of Auburn. Create and/or restore approximately 17.2 acres of forest, 6.0 acres of shrub, 6.2 acres of emergent, and 0.60 acre of open-water wetland. Enhance protective buffers totaling about 15.90 acres.

[a] Temporary roads used to haul fill material from three on-site borrow areas to construction sites are included in the analysis of the borrow areas and not listed here.

[b] Des Moines Creek Basin Plan Committee will construct an RDF on the Tyee Golf Course to provide regional flow control. This project will eliminate the need for STIA retrofit facilities described above. As this is a cumulative action subject to future federal action, it is not a Master Plan Update improvement.

1.3.1 Runways and Taxiways

To overcome aircraft arrival congestion during poor weather conditions, the Port proposes to build a new 8,500-ft runway on approximately 16.5 million cy of fill on the west side of the existing STIA airfield (Figure 1.3-1). The existing airfield plateau will be extended west over 12th Avenue South. The current location of 12th Avenue South will be the approximate centerline of the new runway. To construct the third runway and extend the airfield plateau, a large embankment with four mechanically stabilized earth (MSE) retaining walls will be constructed. The MSE retaining walls are located at the northern, central, and southern portions of the embankment (see Figure 1.3-1), and have been designed to avoid and minimize direct impacts from the embankment to Miller Creek and associated wetlands. Security and emergency access roads will be constructed around the runway perimeter. New and relocated interconnecting taxiways will also be constructed.

To accommodate the third runway embankment, stormwater management facilities, and a neighborhood noise abatement area, the Port has purchased land west of the existing runway. Most of this land consists of private residences. In this report, this area is referred to as the "acquisition area." The acquisition area is generally bounded by SR 518 to the north, South 176th Street to the south, Des Moines Memorial Drive to the west, and 12th Avenue South to the east (see Figure 1.3-1). Several parcels in and adjacent to the acquisition area are voluntary acquisitions and may or may not be acquired by the Port. However, no additional action, other than demolitions, will be taken in the voluntary acquisition areas. At the north end of the third runway, South 154th Street will be relocated to accommodate the new runway (see below).

1.3.2 Runway Safety Area Extensions / South 154th Street Relocation

RSA extensions are necessary for the existing runways and the new third runway to ensure that they meet current FAA standards. The RSA extensions are to be created at the north end of the existing airport runways south of SR 518, and at the southern end of the new third runway. The RSA