Implementation Plan Alternatives

The planning team used the established guiding principles listed in Section 1.3 *Approach* to first create a baseline Implementation Plan alternative for the long-range vision and then develop order of magnitude costs for the majority of projects. The project costs and insights into constructability were then used to develop alternatives that strove to achieve one or more of the following:

- Deliver needed capacity more quickly;
- Reduce or defer costs;
- Further minimize impacts to existing facilities.

Discussion of each alternative documents a progression of the implementation planning process, and as such, the alternatives are listed in the sequence they were devised and evaluated. Discussion of each alternative focuses on projects required to deliver capacity for passenger and cargo operations to meet the unconstrained 20-year forecast of airport activity. Subsection 2.3 *Project Descriptions & Schedules* includes a full listing and description of projects in all key functional areas required to accommodate near-term activity, along with construction schedules and project linkages.

**Alternative 1 - Baseline**

Alternative 1 constructs enabling projects and subsequent capacity enhancement projects as quickly as possible in areas the planning team determined were the most beneficial and reasonable given the established guiding principles. It envisions construction that can be roughly divided into two phases described and illustrated below.

**Phase 1**

- **Area 1 – SASA - Construction of SASA platform and bridge allows aircraft access to new aircraft maintenance and cargo facilities.** Relocation of aircraft maintenance facilities to SASA enables development of the South Hardstand in Phase 2. Construction of new cargo facilities in SASA enables gate expansion and cargo redevelopment in Phase 2.

- **Area 2 – Westside Maintenance Campus – Relocation of the Port's Aviation Maintenance Facility (AMF) enables construction of the North Hardstand. Relocation of the Transit Operations Center and Distribution Center to the Westside Maintenance Campus enables construction of the SASA platform.**

- **Area 3 – North Gates & North Terminal – Relocation of the southbound lanes of the North Airport Expressway (NER), the fuel rack, and the ARFF station along with demolition of the Swissport cargo warehouse and Cargo 6 hardstand, enables**
construction of gates immediately north of the existing terminal complex (North Gates). The location/extent of the gate expansion to the north allows these gates to be connected to a new, second terminal (North Terminal) as soon as possible. In Phase 1, hardstand is constructed in the area between the existing Concourse D and the new North Gates (Concourse D Hardstand). In Phase 2, gates are constructed in this area as a single loaded concourse connecting the north end of the existing Concourse D and the North Gates (Concourse D Extension). Demolition of the Doug Fox parking lot and Gate Gourmet flight kitchen enables construction of the North Terminal.

- Area 4 – North Hardstand & Cargo Warehouses Redevelopment/Expansion – Relocation of the Port’s AMF to the Westside Maintenance Campus and demolition of the United Airlines maintenance building enables expansion of hardstand in the north cargo area (North Hardstand). Redevelopment of the Cargo 4 South building and new construction of cargo warehouse facilities on the L-Shape property provides additional warehouse capacity to replace capacity lost with the demolition of the Swissport warehouse and to accommodate increased demand.

Figure A-1 shows the locations of many key facilities that must be relocated to accommodate the necessary new facilities for the Alternative 1 – Baseline concept. Phase 1 of construction related to Alternative 1 is illustrated on Figure A-2.

Phase 2

- Area 1 – South Hardstand - Construction the South Hardstand is enabled by the relocation of aircraft maintenance facilities to SASA in Phase 1.

- Area 2 – Concourse B Reconstruction – Construction of additional gate capacity in Phase 1 enables gates to be taken out of service as Concourse B is reconstructed to accommodate widebody aircraft connected to the International Arrivals Facility (IAF). [Note – Reconstruction of Concourse B was subsequently eliminated from consideration as described in Alternative 2 below]

- Area 3 – North Gates & Terminal Expansion – Expansion of gates further into the north cargo area is enabled by construction of new cargo facilities in SASA. Additional gates are also constructed in the Concourse D Hardstand area as a single loaded concourse connecting the north end of the existing Concourse D and the North Gates (Concourse D Extension). Expansion of the North Terminal is required to support additional north end gates.

- Area 4 – North Cargo Redevelopment – Construction of additional cargo facilities in SASA enables redevelopment of cargo facilities in the far North Cargo area.

Phase 2 of construction related to Alternative 1 is illustrated on Figure A-3.
Figure A-1
Existing Airport Facilities
Seattle-Tacoma International Airport

Figure A-2
Alternative 1 – Baseline, Phase 1
Seattle-Tacoma International Airport

Figure A-3
Alternative 1 – Baseline, Phase 2
Seattle-Tacoma International Airport

Alternative 2 – Baseline with SASA deferred and Concourse B reconstruction removed (Adjusted Baseline)

Alternative 2 pushes SASA and required enabling projects to the outer years due to the high cost. SASA enables redevelopment/expansion of facilities in phase 2 of the baseline implementation plan and so delay of SASA has the potential to delay some capacity projects and will most definitely delay others. Construction of replacement aircraft maintenance facilities and additional cargo facilities in SASA enables phase 2 gate expansion, hardstand expansion south of the South Satellite, and cargo facility redevelopment in the far north cargo area. Since SASA provides additional cargo capacity, the delay of SASA may cause the delay of phase 2 gate expansion further into the north cargo area if future cargo demand is high and existing cargo facilities in the north cargo area are highly utilized. For the same reason, the delay of SASA may also delay the redevelopment of cargo facilities the far north cargo area as existing capacity would be taken out while facilities are redeveloped to make more efficient use of space. Extension of gates on Concourse A and expansion of the south hardstand would presumably have to wait for replacement aircraft maintenance facilities in SASA.

Alternative 2 eliminates the reconstruction of Concourse B from further consideration due to the 500’ runway/taxiway separation design standard.

These adjustments to the Baseline under Alternative 2 were carried forward in Alternatives 3 & 4 and the Recommended Development Plan.

Alternative 3 – Adjusted Baseline with Concourse D Extension in Phase 1

Alternative 3 assumes the adjusted baseline and considers an alternative sequence of phase 1 North Gates construction where Concourse D is extended prior to construction of the gates in the Cargo 6 area. In addition to relocation of the southbound lanes of the NER, Extension of Concourse D requires a widening of the existing Concourse D and associated enabling projects prior to the gates becoming operational. The existing Concourse D is 40’ wide at its most constricted point in the area of gates D1 & D2 (20’ holdroom width and 20’ wide circulation area). Passengers queueing to board aircraft at these gates often spill out into the circulation area impeding flow to/from gates further north on Concourse D. With the extension of Concourse D, this pinch point will become more congested and level of service will degrade. Alternative 3, phase 1, is illustrated on Figure A-4.

The SAMP assumes construction of the Concourse D hardstand holdroom as an existing condition (assumed operational in 2018). In order to provide space for the widening of Concourse D, this facility would need to be demolished and replacement hardstand holdroom capacity constructed. In addition to providing replacement of hardstand holdroom facilities, additional holdroom capacity will be needed to enable gate holdroom capacity to be taken out as Concourse D is widened. A first phase of Alternative 3 is a limited extension of Concourse D which will provide the replacement hardstand holdroom space at the ramp level and the gate holdroom space at the concourse level.
Figure A-4
Alternative 3 – Adjusted Baseline with Concourse D Extension in Phase 1
Seattle-Tacoma International Airport

While gates and prerequisite enabling projects in both areas can be constructed in roughly the same timeframe, the planning team determined that construction of gates in the Cargo 6 area as a first phase of North Gates, as planned in the adjusted baseline, is preferred to construction of gates on an extended Concourse D as a first phase of North Gates. A primary reason is that gates in the Cargo 6 area are positioned to be readily connected to the planned North Terminal. Connecting gates to the North Terminal as soon as possible is one of the established guiding principles because it provides relief to the existing Main Terminal, increasing level of service and decreasing the potential of over investing in the Main Terminal. Another primary reason for building gates at Cargo 6 first is that it delivers a greater number of gates and gates that have the flexibility to accommodate a wider range of aircraft gauge.

Alternative 4 – Adjusted Baseline with Concourse A Extension in Phase 1

Alternative 4 assumes the adjusted baseline and adds a new project that constructs gates on an extension of Concourse A as soon as possible in addition to constructing the North Gates. The planning team decided to explore this alternative in hopes that it could deliver gates relatively quickly and increase level of service by reducing the need for hardstand operations. In developing this alternative, the planning team determined that extending Concourse A to the south to the extent shown, fits with the long-range vision as it provides flexible gates that can accommodate a wide range of aircraft gauge that can be connected to the IAF and would also not impact the Delta Cargo building.

The planning team worked closely with stakeholders to evaluate the benefits and impacts of constructing these gates as soon as possible. One of the impacts was that Delta Air Lines’ aircraft maintenance hangar would need to be relocated to another location on the airfield because SASA would not be available in the same time frame. The best location for the hangar was determined to be the far northeast corner of the north cargo area, which would eliminate a large area used for GSE storage and a significant amount of cargo hardstand leased to FedEx. In addition to the impacts to cargo facilities, the hangar would be located at the opposite end of the airfield to where Delta currently operates and the gates on the extension of Concourse A would only be constructed one year sooner than the North Gates. While it was eventually decided to include the Concourse A Extension in the long-range vision, it was decided that the Concourse A Extension would not be included in the RDP. Alternative 4 is illustrated on Figure A-5.
Figure A-5
Alternative 4 – Adjusted Baseline with Concourse A Extension in Phase 1
Seattle-Tacoma International Airport