Airport Development Plan

Introduction

The purpose of this chapter is to present the Development Plan for King County International Airport, in terms of both its concept and reasoning. This chapter provides a description of the various factors and influences that will form the basis for the ultimate plan and program. The primary factors that direct the development of the airport in the future include the anticipated amount and type of aviation activity, facility enhancement requirements, and community needs.

To help formulate the Development Plan recommendations for the airport, several factors which influence how the airport will develop over the next two decades have been identified. These include:

- The airport is a vital component of the regional and national airport system. Having a diverse aviation role, it is the primary general aviation/industrial aviation airport serving the Seattle metropolitan area. The mission statement for the airport is as follows:

  The mission of the King County International Airport is to support the national air transportation system and the economic vitality of the county by providing safe and continuous general aviation airport services to King County businesses and residents and serving as a gateway to the county. In fulfilling this mission, the Airport will strive to be a good neighbor and to provide high quality facilities to Airport tenants and operators in an efficient and fiscally prudent manner.

  The development plan for the airport must support the mission statement.

- The development plan will be a guide for airport management in directing the future development of the airport. The planning guidelines established must be flexible enough to allow management to adapt to changing aviation demands.

- To a large degree, demand will dictate development at the airport. As required by Grant Assurances to the Federal government and the Equal Protection Clause of the 14th Amendment, the airport must be available for public use, on fair and reasonable terms without unjust discrimination among or between classes of aircraft. In addition, the airport proprietor (King County) cannot attempt to regulate aircraft safety and operation of flight, which remain the exclusive jurisdiction of the federal government; cannot regulate rates, routes, or services of an air carrier; and, cannot create an undue burden on interstate air commerce.

- The airport has a relatively small land area and the majority of the airport property outside of the runway/taxiway/approach reserve areas has been fully developed. The lack of a significant quantity of undeveloped land on or adjacent to the airport that could accommodate future development indicates that the County must make the best use of its limited land resource. In other words, the developable land surrounding the runway system will continue to be in high demand for aviation use facilities and will continue to be developed/redeveloped in the attempt to best accommodate that demand.

- Because of anticipated demand, the limited quantity of on-airport land, and the goals expressed in the airport's mission statement, each parcel of airport property which could support aviation use should be programmed for that potential. Additionally, the development justification for any specific parcel of land for aviation use must include a favorable financial analysis (development costs must be recoverable through leases and fees) and the ability to mitigate potential negative effects on surrounding communities.

Consideration of these factors indicates that a balanced approach (accommodating existing aviation use types to the greatest extent possible) to airport development provides the most appropriate basis for the future layout of KCIA's on-airport facilities. A balanced approach best achieves the airport's mission by supporting the broadest mix of aviation uses, allowing flexibility in responding to changing needs among the diverse general aviation markets, and efficiently utilizing scarce airport property. This approach is physically and financially most feasible; will allow safe, high quality facilities; will meet FAA requirements; and will enhance the region's economic vitality.

In addition there is a set of more specific development assumptions that will continue to help define how the airport will develop:

Assumption One. The first assumption states that the airport facility will be developed to accommodate aircraft operations under almost all weather conditions. Thus, the airport should be designed to precision instrument approach standards, with visibility and decision height (cloud ceiling) minimums as low as technically feasible, and with proper clearances appropriate to these designations.

Assumption Two. The second assumption focuses on the need to accommodate the forecast operations of all aviation types, as expressed by the Annual Service Volume capabilities. Forecasts of operational activity and the analysis of the capacity of the airport's runway layout indicate that the airport's existing runway configuration can accommodate aircraft landings and takeoffs forecast until the end of the planning period; however, it is vital to preserve the existing runway system. This analysis indicates that, although no new runway facilities are recommended, the airport's system of taxiways and approaches should be programmed for improvements that will maximize the ability to efficiently use the existing runway layout.

Assumption Three. The third assumption relates to the requirement that the airport is to be developed to complement and enhance on-airport and off-airport regional economic development activities.

Assumption Four. The fourth assumption focuses on the relationship of the airport to off-airport land uses and the compatible and complementary development of each. This is inherent in the design considerations and placement of facilities so as to complement, to the maximum extent possible, off-airport development.

Airfield Development Recommendations

Introduction

The forecast operations and previously stated factors and assumptions relative to aviation development and economic enhancement were considered in the formulation of the airfield development recommendations. The purpose of this section is to describe the basic runway and taxiway configuration recommendations.

Runway Configuration and Instrument Approaches

Runway Capacity, Orientation, and Length

- The airport's runway system, consisting of the primary runway (Runway 13R/31L) and the secondary runway (Runway 13L/31R), can accommodate the forecast number of aircraft operations.

  Using FAA's standardized methodology and in consideration of the number of aircraft operations currently accommodated at the KCIA, a capacity analysis of an airport with KCIA's runway/ taxiway layout would indicate that the airport is approaching its capacity to efficiently accommodate aircraft operations; however, because of the type of aircraft operations accommodated at KCIA (primarily non-scheduled with a diverse mix of aircraft types) and the relatively small percentage of growth in aircraft operations forecast, under most conditions the airport is expected to be able to operate without unacceptable delay throughout the 20-year planning period. Also, because of the limited amount of airport property and the urbanized nature of the airport environs, development of a new runway is impractical and not considered.

- As stated in the previously presented *Capacity Analysis and Facility Requirements* chapter, using FAA planning criteria the existing runway configuration provides adequate crosswind coverage for the large and medium size aircraft fleets operating at the airport and is only minimally lacking for the small aircraft fleet. No new runways are recommended to add crosswind operational capability for the airport.

- The lengths of the existing runways are adequate to accommodate the existing and forecast fleet without significant restrictions. No runway extensions are recommended to add operational capability to the airport. To properly accommodate Boeing Company test flight activity and the AWACS activity at the airport, it is also critical to maintain the primary runway's existing takeoff length of 10,000 feet. This is an important issue in consideration of the runway safety area issue discussed below.

Runway Dimensional Criteria – Runway 13R/31L Safety Area

As identified in the previous chapter, the safety area on the south end of the main runway (Runway 13R/31L) does not meet current FAA standards. It has also been documented that maintaining a 10,000 foot takeoff runway length is a vital

component necessary to support some of the operational activity at the airport (primarily the Boeing flight test program and the AWACS modification and maintenance program).

It should be noted that there is an on-airport service road within the inner approach area on the south end of the main runway. Due to restricted utilization and limited traffic volume on this service road, its location has been determined to be acceptable by the FAA.

A system of improvements is recommended to bring the safety area up to FAA standards, maintain the 10,000-foot takeoff runway length, and minimize potential effects on surrounding land uses. The first component of this system of recommendations is to shift the start-point for Runway 13R departures (departures to the south) approximately 880 feet to the north. The basic improvement is to construct approximately 880 feet of pavement on the north end of the main runway. This new 880 feet of pavement will only be utilized by those aircraft that require a takeoff Accelerate Stop Distance Available (ASDA) length which exceeds 9,120 feet or require a takeoff runway length beyond 9,120 feet for special operations such as aircraft testing (e.g., the Boeing flight test program and the AWACS modification/maintenance program).

The second component of the system is to implement FAA's declared distances criteria, which defines the usable runway length in consideration of required safety area standards. Declared distances allow an airport operator to light and mark the runway in a manner that designates where landing thresholds are located and where the takeoff roll begins and ends. The recommended system of improvements provide the following operational characteristics:

1. The landing threshold on the north end of the runway remains in its existing location. In consideration of the safety area available, there is 9,120 feet of length declared available for aircraft landing on Runway 13R.
2. The landing threshold on the south end of the runway will be displaced about an additional 80 feet to the north (the threshold was displaced 800 feet for the implementation of a new Instrument Landing System Approach to Runway 31L in 1998). In consideration of safety area available, there is (and will be in the future) 9,120 feet declared available for aircraft landing on Runway 31L.
3. For south departures, aircraft that require a takeoff ASDA beyond 9,120 feet or require a takeoff runway length beyond 9,120 feet for special operations such as aircraft testing (e.g., the Boeing flight test program and the AWACS modification/maintenance program), can begin their take-off roll 880 feet to the north of the existing runway end on the proposed new pavement. Those

aircraft that do not need an ASDA beyond 9,120 feet will utilize the existing runway end for the beginning of their takeoff roll.

4. For departures to the north, aircraft will utilize the existing southern runway end for the beginning of their takeoff roll. In consideration of declared distances, north departures will have a 10,000-foot takeoff runway length available.

Note that the new pavement on the north end of the runway will not be available for landing or takeoff to the north (i.e., operations on Runway 31L).

Instrument Approach Capabilities

Existing instrument approach capabilities at the airport include precision ILS approaches to Runway 13R and to Runway 31L. Runway 13L/31R has only visual approaches. Precision instrument approach (instrument approaches which offer horizontal and vertical guidance) capabilities should be maintained on Runway 13R/31L while only visual approaches are recommended in the future for Runway 13L/31R.

There is a dual purpose for providing improved instrument approach capabilities at King County International Airport. The first consideration would be to improve the airport's ability to safely accommodate aircraft operations during periods of inclement (low visibility) weather conditions. The ability to lower the weather minimums for Runway 13R and Runway 31L instrument approaches is controlled to a great extent by the terrain, structures, and trees that surround KCIA. The goal is to lower the weather minimums if it can be facilitated by removal of existing obstructions, or if technological advances in instrumentation would allow safe implementation. Because of surrounding terrain, trees, and structures and given existing instrument approach technology, it appears that it is unfeasible to lower the existing visibility minimums. This does not alter the goal of trying to achieve lower minimums if future technological advances provide the opportunity.

The second consideration is related to the routing of approaching traffic to minimize noise impacts on surrounding land uses. At the present time three new approach procedures are being analyzed to determine potential benefits: a Transponder Landing System (TLS) approach, a Localizer Type Directional Aid (LDA), and a Global Positioning System/Flight Management System (GPS/FMS). Newly proposed Instrument Approach Procedures (IAPs) must first be evaluated by the FAA to assess the impact on existing air traffic. Noise reduction benefits of a new IPA must be balanced against air traffic controller work load, aviation safety, and efficient air traffic routing.

Taxiway System

The existing taxiway system at the airport provides efficient routing for taxiing aircraft between the runway system and various landside use areas on the airport in consideration of present activity levels. The airport currently has full parallel taxiway systems serving the west side of main runway and the east side of the secondary runway.

Taxiway access to the new pavement on the north end of the main runway is to be provided by an extension of the existing parallel taxiway. Because the new runway pavement will receive only limited use as described above, the new parallel Taxiway pavement will be designated with a different name than the existing parallel taxiway (Taxiway Bravo). The new Taxiway is proposed to be designated as Taxiway Zulu. The different designation of the new taxiway pavement will allow air traffic control tower personnel to more easily direct taxiing aircraft to the proper position for the start of the takeoff role. In addition, the new taxiway pavement will be marked and lighted to indicate its limited use role.

The primary other recommendation for taxiway system improvements is to add two new exit taxiways on the northern portion of Runway 13R/31L. The first is to increase the width of Taxiway B2 to accommodate large aircraft and the second is to construct a taxiway in approximately the A3 location (this new taxiway would emulate the function of Taxiway A4 for northbound traffic and its necessity is amplified by the displacement of the Runway 31L threshold).

Helipads

Several helipads have been identified at KCIA in the past; however, none of those have been formally designated as approach and departure locations nor have they been reviewed using FAA airspace and obstruction clearance criteria. As a part of this Master Plan Update, two helipads are being designated within the Airport Layout Plan drawing set, with full consideration being given to approach and departure airspace design criteria.

The first helipad is to be constructed on the east side of airport property at the north end of the aviation use development area. The North Helipad is to be located north of Taxiway A1, west of the Classic Helicopter facilities. The North Helipad is programmed for approach/takeoff paths to the north, south, and west.

The second helipad is also located on the east side of airport property. It is located on the southern portion of the east side development area, adjacent to Apron 12, south of Taxiway A10. The South Helipad has approach/takeoff paths to the north and south.

Airside Development Plan

The *AIRSIDE DEVELOPMENT PLAN*, which is illustrated in the following figure, is intended to provide King County International Airport with a long-term depiction of the ultimate layout of the airport's runway/taxiway system. The plan is based on the recommendations provided in the text above.

Landside Development Recommendations

On-Airport Land Use Plan

Because of the airport's constrained site and the lack of significant airside alternatives (the airport will retain its basic runway/taxiway configuration), the landside considerations at KCIA are the focus of the Recommended Development Plan proposal. The landside refers to all of the land uses on airport property that are outside of the areas which are reserved for the runway, taxiway and approach obstruction free areas.

The overall objective of a landside plan is to allocate development sites for various uses in consideration of the mission statement for the airport, forecast demand, and runway/taxiway/airspace obstruction criteria. In addition, compatibility with surrounding land uses (both on-airport and off-airport) is a critical site layout and design aspect. The landside considerations for the Recommended Development Plan include aircraft parking aprons, hangar development areas, industrial aviation use areas, air cargo facilities, terminal functions, auto/truck access and parking, along with non-aviation uses.

As stated previously, demand will play an important role in defining the actual use of the airport's land. In light of the airport's role as a mixed-use aviation facility, and the forecast demand, the following description identifies the on-airport land use plan recommended for airport management to use in directing future development. The airport will continue to support the various existing aviation use components that it does today, i.e. industrial aviation, general aviation uses, air cargo activity, and commercial passenger activity. The proposed development plan reflects the need to accommodate this mixed-use aviation demand. **However, because of the airport's limited land resource, the "balanced growth" development plan will not fully accommodate the forecast demand related to any single aviation use component.** In light of landside and airside access issues, avoidance of potential hazards to navigation created by inappropriate structure heights, existing lease patterns, and other physical design considerations, the proposed development plan identifies the "best" places for the various components to be accommodated.

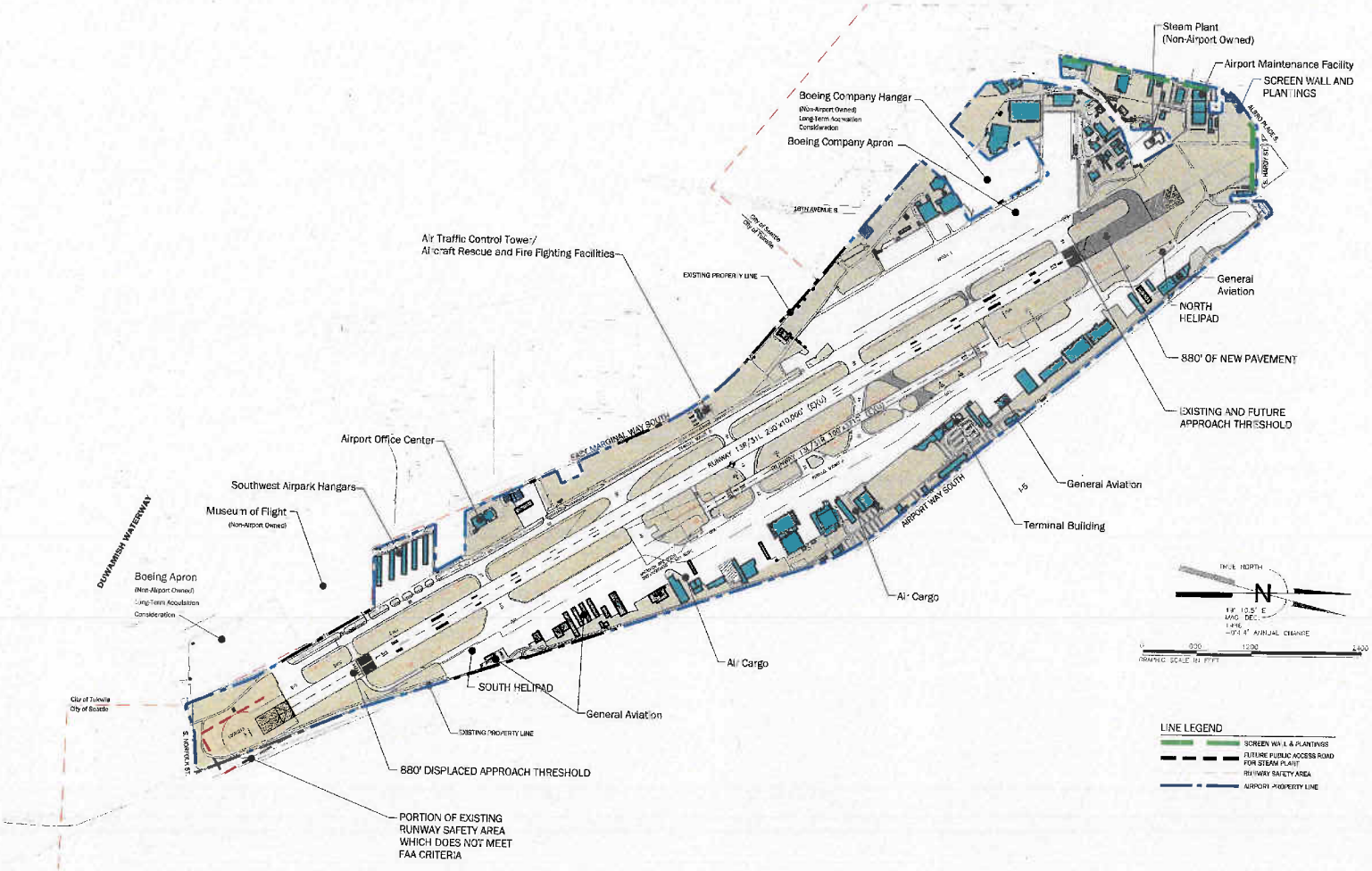

Figure D1 ***Airside Development Plan***

King County
INTERNATIONAL AIRPORT/ Boeing Field

West Side Development. The property on the west side of the airport is primarily occupied by Boeing Company facilities, along with some small general aviation uses, the Air Traffic Control Tower (ATCT) facilities, the Aircraft Rescue and Fire Fighting (ARFF) facility, and several parcels currently occupied by non-aviation uses. In light of the airport's mission statement and because of anticipated demand for corporate and small general aviation use development sites, the Recommended Development Plan is based on maximizing the aviation use area on the west side of the airport. The preferred development recommendations include:

- *Industrial Aviation.* It is anticipated that the Boeing Company will continue to utilize the majority of its extensive west side leasehold for industrial aviation and industrial aviation support activities for the foreseeable future. However, if at some point the Boeing Company should release some of its owned or leased property, that property should be utilized to serve some other aviation demand.

- *Small General Aviation.* Small general aviation activities will continue to occupy the existing hangar/apron sites north of the Museum of Flight. As an effect of the proposal to expand the Museum of Flight (resulting in the loss of some general aviation storage space), additional small general aviation facilities are proposed for a portion of the existing Boeing lease area north of the State Aeronautics hangar and office. The parcel of non-airport property north of the existing T-hangar site is proposed for acquisition and development for general aviation facilities. It is programmed in the near-term that the existing airport owned structures in the vicinity of the State Aeronautics building will be rehabilitated or removed and replaced to better meet current general aviation demands.

- *Federal Aviation Administration (FAA).* The FAA will continue to utilize areas on the west side of the airport related to the Air Traffic Control Tower and the Flight Service Station at the north. The air traffic control tower is programmed for replacement.

- *Northwest Development Area.* This area is located west of the Runway Protection Zone associated with Runway 13R on the north end of airport property. The northwest corner of the airport is currently occupied by facilities that do not require taxiway access. Existing facilities include: Washington Air National Guard, Airport Maintenance, and a garden center, among others. Because future taxiway access to this area is not feasible (flight safety concerns where the taxiway would pass through the inner approach area associated with Runway 13R), the area will continue to be utilized for facilities that do not require taxiway access. New/renovated airport maintenance facilities are programmed for the area along with an improved access road for the Georgetown Steam Plant which

is located off of airport property north of the west side Boeing Company lease area and south of the northwest airport development area. Airport management's long-term goal for the development of the northwest area is that, to the greatest extent possible, it be the location for aviation/airport related facilities which do not need taxiway access. In addition, a screen wall along the airport property line is proposed for the east side of Ellis Avenue.

- *Runup Noise Enclosure.* The benefits and feasibility of an aircraft Ground Runup Enclosure (GRE) are being analyzed in the Part 150 Noise and Land Use Compatibility Study that is currently being prepared for KCIA. If that analysis indicates a benefit that justifies its construction, the GRE's proposed location will likely be on the west side of the airport.

- *Museum of Flight.* The potential to expand the Museum of Flight to the north is being discussed.

East Side Development. The east side of the airport currently accommodates a variety of uses, including general aviation, corporate aviation, FBO, air cargo terminal, and others. The future development proposal identifies the need for the east side to continue to serve a wide variety of aviation demand. **Again, it should be emphasized that due to lack of land available for airport development, the forecast demand for aviation use facilities cannot be completely accommodated. Therefore, the development plan proposal focuses on the best use of the various development parcels in consideration of potential future demands.**

- *Small General Aviation.* Continued use and development for small general aviation (single-engine and small twin-engine prop aircraft) is recommended for several areas on the east side of the airport. Because of building height restrictions, both the north and south ends of the development area on the east side of the runway system are programmed as best utilized for small general aviation facilities.

- *Large General Aviation/Corporate Aviation.* Preferred use areas for corporate aviation functions are primarily the medium-height building restriction areas on the east side of the airport. These medium-height development areas are located on the north and south ends of the airport, adjacent to the areas of preferred small general aviation use. In addition, the sites in the middle of the east side development area that are currently utilized for large general aviation functions are programmed to remain as such.

- *Air Cargo.* A large portion of the center portion of the east side development area is identified for air cargo use. The center portion of the east side development contains the sites which are least impacted by airspace related height restrictions.

- *Passenger Use Areas/Terminal.* The existing passenger terminal building at the airport is currently underutilized. Although forecasts indicate that there could be demand for commercial passenger service at the airport, no airline is proposing such service and no specific facilities can be programmed. The development plan indicates the terminal building, the adjacent automobile parking area, and the adjacent parking ramp will be utilized to accommodate increased passenger activity when it occurs. In addition, the building on the north side of the terminal parking area (currently utilized for airport administrative offices) is programmed for additional passenger terminal facility development area if demand dictates.

  Until additional passenger facilities are required, alternative income producing uses are recommended to be accommodated in the passenger terminal facility area. This Master Plan Update also recognizes capital needs associated with the renovation of the aging Terminal structure. Post-renovation uses are likely to involve continued use for commuter airline offices/ticketing counter, etc.; airport/county administration offices; community meeting/conference facilities; and food service facilities.

- *Special Considerations.* Because the airport's primary fuel storage facility is located within the Runway Protection Zone associated with the approach end of Runway 13R, it is programmed for relocation. The likely location for the relocated facility is on the east side of the airport, south of the terminal area. The concept is that the relocated fuel storage facility will be constructed in conjunction with a site redevelopment project.

Conceptual Airport Development Plan

The recommended development plan for landside facilities as described above, along with airside recommendations, is presented in the following illustration, entitled *CONCEPTUAL AIRPORT DEVELOPMENT PLAN.*

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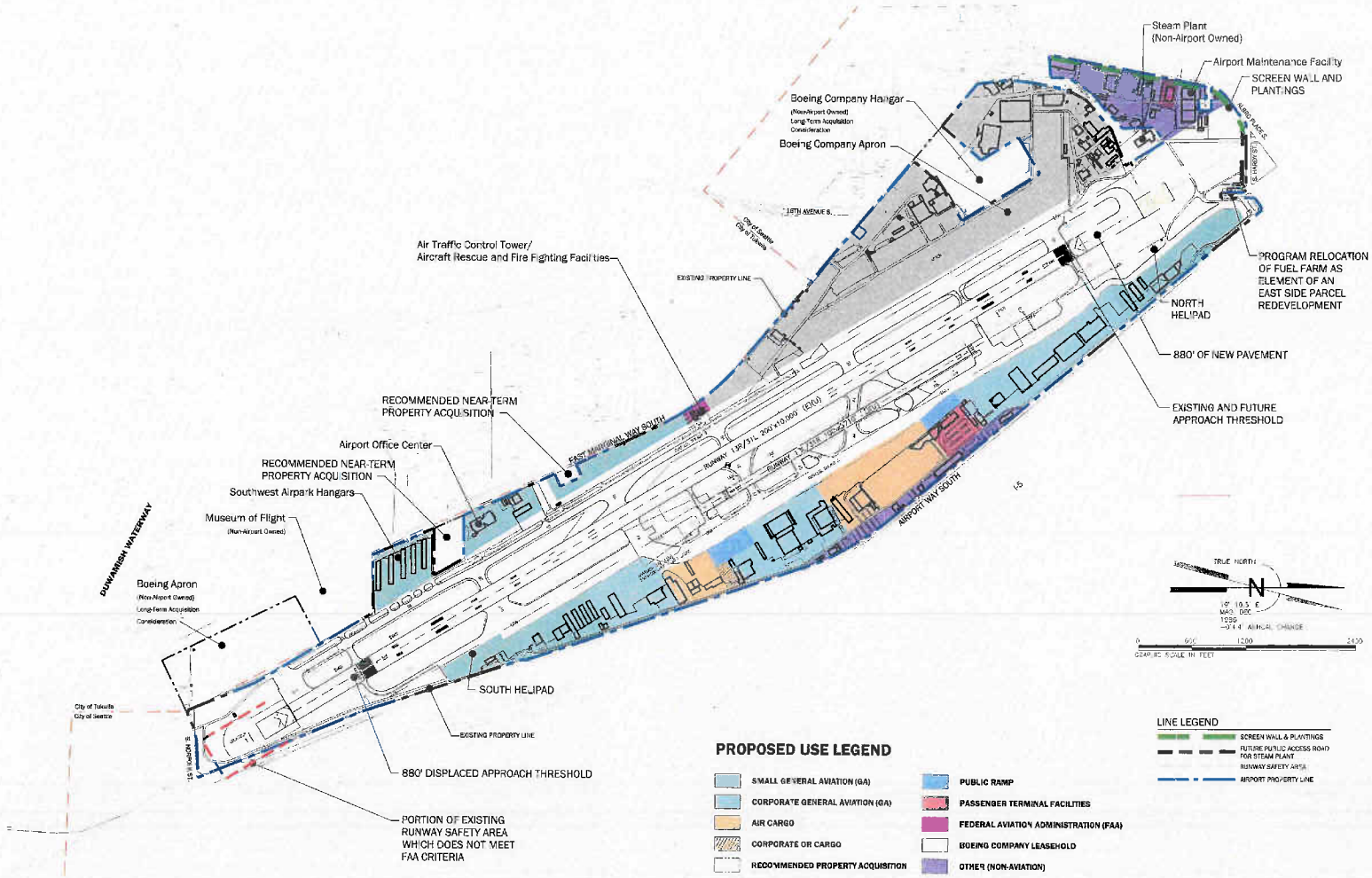

Figure D2 ***Conceptual Airport Development Plan***