PORT OF OAKLAND

Runway 11-29 Capacity and Delay with Master Plan 2010 Operations Forecasts

May 2005

Runway 11-29 is the main air carrier runway at Oakland International Airport (OAK). Today, it operates at about 80% of its capacity, and during peak periods, aircraft experience only a minor amount of delay (1.5 minutes of delay per aircraft on average). In 2010, it is estimated that Runway 11-29 will operate at about 98% of its capacity, and during peak periods, such as the morning departures peak, aircraft will experience an increase in delay (over 3 minutes of delay per aircraft on average). The estimates assume the aircraft operations forecasts for 2010 from the master plan.

Important Note: These estimates of runway capacity and delay are rough approximations, contain numerous simplifications, and are derived using the Annual Service Volume (ASV) methodology for long-range airfield planning outlined in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay. They provide only a rough indication of runway usage compared to its capacity, and would not be sufficient for detailed planning or decision making. These calculations were requested by the master plan Stakeholder Advisory Committee and may not accurately reflect actual runway capacity or delay. Although a rough adjustment was made to account for nighttime airline operations (see Methodology below), ASV methodology described in FAA AC 150/5060-5 does not anticipate 24-hour airline operations and is therefore not an appropriate tool for detailed planning or decision making at OAK.

Methodology

The ASV methodology is described in FAA AC 150/5060-5, Airport Capacity and Delay, Chapter 2 (Capacity and Delay Calculations for Long Range Planning). According to the AC, ASV is an estimate of an airport's annual capacity, accounting for some differences in runway use, aircraft mix, weather conditions, etc. The ASV methodology uses simplifications that limit its accuracy. For example, it assumes there are no airspace constraints and operations occur over a less than 24-hour day (i.e., there are no late night take-offs or landings).

The first step is to estimate annual demand (in terms of operations, or take-offs and landings) in 2010. The table on Page 3 summarizes the results. Today, there are approximately 191,625 annual operations. Based on the master plan operations forecasts, there will be approximately 234,330 operations in 2010. These operations are only those that occur on Runway 11-29 at South Field (and exclude all operations at North Field). They include all passenger airline operations, large cargo airline operations, and general aviation (corporate) jet departures (arrivals are assumed to occur at North Field). These assumptions are consistent with the Port of Oakland's existing, voluntary noise abatement procedures. Annual demand is then adjusted to remove late night cargo airline operations, as they are not accounted for in ASV calculations.

The second step is to compute ASV using FAA AC 150/5060-5, Airport Capacity and Delay. From Figure 2-1, runway configuration No. 1 is selected to approximate Runway 11-29, excluding North Field. The Mix Index is then computed. Both today and in 2010, it is estimated that 86% of the aircraft fleet mix using Runway 11-29 will be Class C, with a maximum take-off weight of between 12,500 lbs. and 300,000 lbs., and that 12% of the aircraft fleet mix using Runway 11-29 will be Class D, with a maximum take-off weight over 300,000 lbs. (based on the master plan fleet mix forecasts). See Table 1-1 in FAA AC 150/5060-5, Airport Capacity and Delay. The Mix Index is then computed:

Mix Index = % Class C + (3 x % Class D), or 86 + (3 x 12) = 122. Figure 2-1 shows an ASV of 240,000 operations per year, using runway configuration No. 1 and a Mix Index of 122. Dividing annual demand by ASV provides an estimate of runway capacity utilization (in terms of a ratio or percentage of runway capacity used on an annual basis). Figure 2-1 can be used to estimate average delay per aircraft.

The ASV methodology provides a rough approximation of how runway demand compares to capacity on an annual basis. It should be noted that the annual demand to ASV ratio (or percentage) can exceed 1 (or 100%), as outlined in the Figure 2-1 of the FAA AC 150/5060-5, Airport Capacity and Delay. That is, ASV is not an absolute capacity limit, and it is possible for a runway to exceed the calculated ASV. When this happens, the average delay per aircraft increases. More precise tools, such as airfield simulation (see Chapter 5 of FAA AC 150/5060-5, Airport Capacity and Delay), can be used to refine runway capacity and delay estimates, identify airfield congestion, and study potential solutions in detail.

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PORT OF OAKLAND

Demand to Annual Service Volume Comparison
Runway 11-29
Master Plan 2010 Operations Forecasts
Oakland International Airport

	Existing		2010	
	Daily [A]	Annual [A x 365]	Daily [B]	Annual [B x 365]
Demand				
Passenger Airlines	430	156,950	542	197,830
Cargo Airlines	102	37,230	102	37,230
General Aviation - Jet(1)	23	8,395	28	10,220
Subtotal	555	202,575	672	245,280
Nighttime Cargo Adjustment(2)	(30)	(10,950)	(30)	(10,950)
Total Demand [D]	525	191,625	642	234,330
Annual Service Volume [ASV](3)		240,000		240,000
Demand / Annual Service Volume [D / ASV]		0.80		0.98

(1) Includes departures on Runway 11-29 only (assumes arrivals occur at North Field).

(2) ASV assumes less than a 24 hr./day operation; late night operations must be excluded from demand.

(3) From FAA AC 1150/5060-5, *Airport Capacity and Delay* , Chapter 2, Figure 2-1, No. 1 (Mix Index = 122).
Annual Service Volume (ASV) is a simplified estimate of annual runway capacity.

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