

EXECUTIVE SUMMARY

In December 2008, the Federal Aviation Administration (FAA) issued a Record of Decision (ROD) for the Final Environmental Impact Statement (FEIS) for the development and expansion of Runway 9R/27L and other associated airport projects at Fort Lauderdale-Hollywood International Airport (FLL). The cost of the Runway 9R/27L expansion program is currently estimated at \$791 million dollars. As part of its capital funding strategy for the project, Broward County intends to apply for a \$300 million Airport Improvement Program Letter of Intent (LOI) from the FAA. The FAA requires that a benefit-cost analysis (BCA) is conducted for all capacity projects for which LOI funding is sought. The primary role of the BCA is to communicate quantitatively to the FAA that the total benefits of the proposed project exceed the total costs of the project. The County has a strong case to receive what will be a 10-year LOI commitment from the FAA based on positive BCA ratios that range from 2.8 to 5.4 with a base value of 4.0.

In order to maintain continuity with analysis completed for the FEIS, the BCA analysis uses the same net benefits methodology to evaluate the planned expansion of Runway 9R/27L. Where appropriate this BCA analysis incorporates and evaluates new or more up to date information including: revised capital project costs and schedule, updated O&M costs, new demand forecasts for FLL, and updated aircraft operating costs.¹

INSUFFICIENT AIRFIELD CAPACITY

The key driver of the Runway 9R/27L expansion project is that FLL does not currently have adequate runway capacity to meet the number and mix of aircraft operations forecast for the Airport without delays reaching unacceptable levels.

FLL's current airfield consists of three runways: two widely spaced parallel runways oriented in an east/west direction (Runways 9R/27L and 9L/27R) and one crosswind runway oriented in a northwest/southeast direction (Runway 13/31).

- Runway 9R/27L – 5,276' x 100'
- Runway 9L/27R – 9,000' x 150'
- Runway 13/31 – 6,930' x 150'

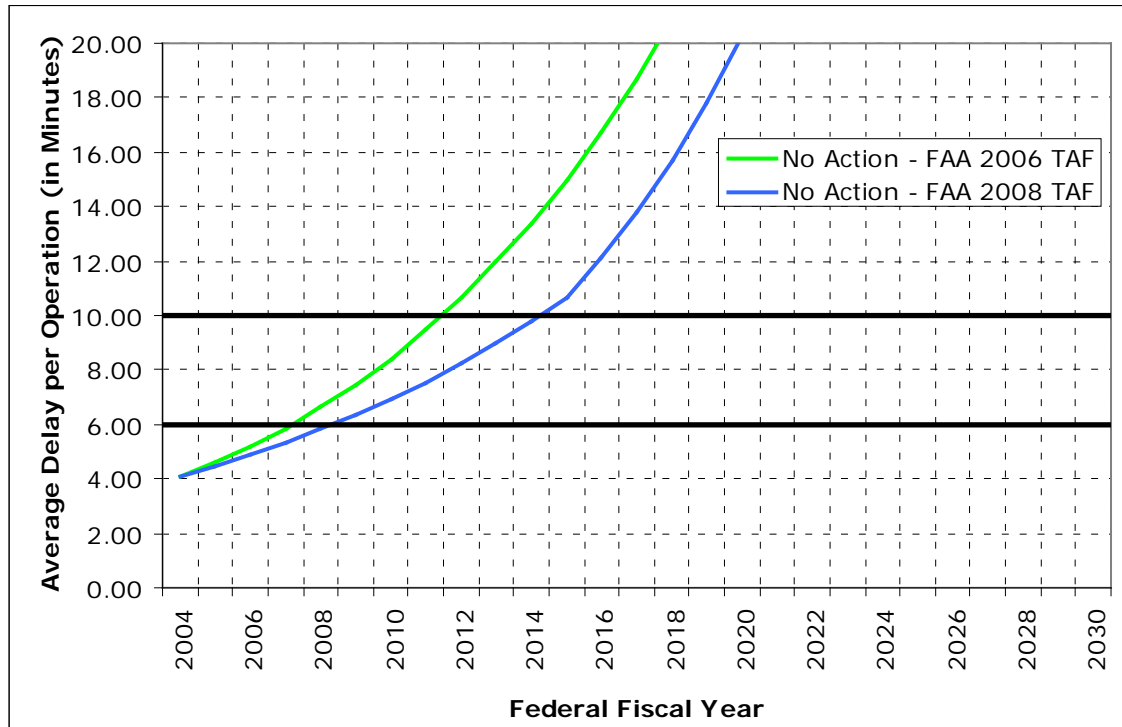
Runway 9L/27R (North Runway) is the only runway that can handle large air carrier aircraft such as the A320 and Boeing 767 without weight and size restrictions. The existing parallel runway, Runway 9R/27L, can accommodate only limited types of commuter jet and general aviation aircraft due to insufficient runway length, width, and inadequate separation from its taxiway. While Runway 13/31 provides sufficient length and width to accommodate a portion of the aviation fleet, its use is limited because of its length, crosswind orientation and intersection with the parallel runways. These runway infrastructure conditions create a deficiency in airfield capacity for the large air carrier aircraft operating at FLL. The operational

¹ All data is presented on a fiscal year basis i.e. the 12 months ended September 30.

delay caused by this deficiency will increase because the number of large air carrier aircraft operating at FLL is forecast to increase through the forecast period (FY2030). The primary runway, Runway 9L/27R, at its existing length and width, can accommodate all aircraft types currently operating, and forecast to operate, at FLL. The primary runway does not, however, provide sufficient capacity to meet the forecast demand for larger aircraft. Runway 9R/27L and Runway 13/31 cannot accommodate all aircraft types currently operating, or projected to operate, at FLL. The airfield, as currently configured, cannot accommodate the existing and forecast demand of the large air carrier aircraft projected to operate at FLL by 2012 and 2020. The deficiency in FLL airfield capacity is due to the forecast level of air carrier demand.

On October 26, 2004, the Broward County Commission adopted an "Airfield Development Program Objective Statement". One of the key tenants of this statement was to enhance FLL capacity to accommodate forecast traffic through the year 2020 in a manner that will maintain annual average aircraft delay at or below the 6 to 10 minute average delay range. The FAA's 2006 Terminal Area Forecast (2006 TAF) was used as the basis for projected operational demand at FLL for the FEIS analysis. The forecast suggested that if no capacity improvements were implemented, FLL would exceed the 10-minute delay range as early as FY2012.

**EXHIBIT ES-1
DELAY PER AIRCRAFT OPERATION—NO ACTION SCENARIO
Fort Lauderdale-Hollywood International Airport**



Sources: FAA 2006 and 2008 Terminal Area Forecast; Landrum & Brown analysis.

The 2006 TAF could not have reasonably anticipated the short term reduction in air travel demand and related decline in aircraft operations at FLL resulting from the most recent economic recession which began in December 2007. For the BCA, the more recent 2008 TAF was also modeled to assess the impact of a lower aircraft operations forecast on the delay curve. As **Exhibit ES-1** shows, delays levels are lower under the 2008 TAF but are expected to reach the 10 minute threshold by FY2015, just a three year deferral.

PROPOSED PROJECT

The FEIS defined an ultimate build-out for FLL which includes the extension of Runway 9R/27L, associated taxiways, navigational upgrades, and the expansion of the terminal area in order to reach a future requirement of up to 77 gates. For purposes of the LOI application, Broward County is focusing on the first phase of implementation which includes the extension of Runway 9R/27L, associated taxiways, and navigational upgrades but excludes the ultimate terminal build out. **Exhibit ES-2** provides an illustration of the proposed project for which Broward County is seeking LOI funding assistance. It should be noted that the terminal replacement gates shown in green, the planned taxiway C extension, and high speed exit on the North Runway shown in purple are not part of the LOI application.

CAPITAL COSTS

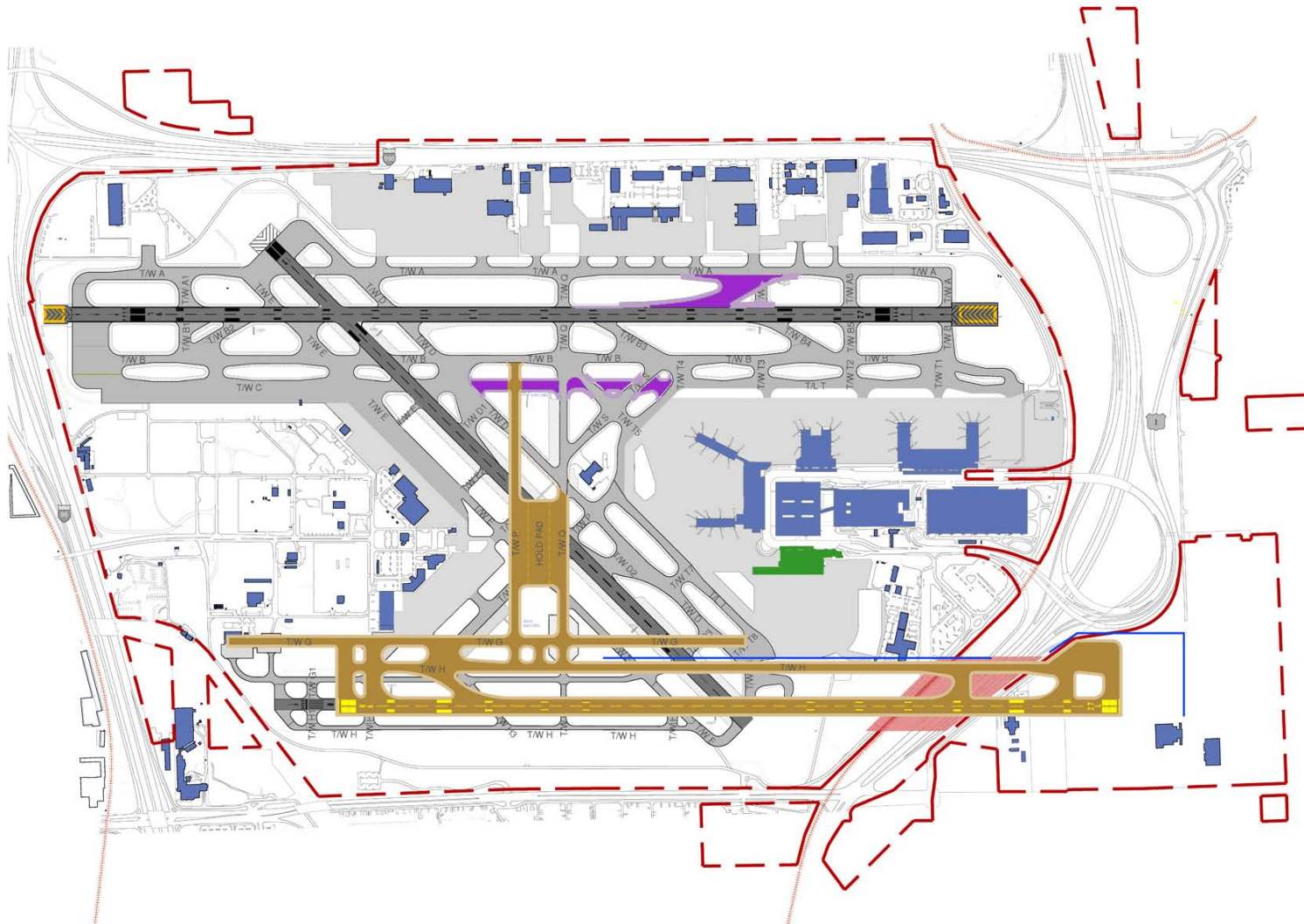
The Runway 9R/27L program is estimated to cost \$791 million.² This includes all construction costs, navigational aids, program management services, professional services, permits, and land acquisition costs.

The BCA must also consider incremental capital costs that are incurred as a direct result of the proposed project but are not necessarily included for funding in the LOI application. For example, Terminal 4 will need to be modified so adequate space can be provided for the extension of Runway 9R/27L. The cost of building replacement gates for Terminal 4 is estimated at \$90 million and is a cost directly related to the expansion of the runway and therefore included in the BCA analysis. As a result, a total capital cost of \$881 million was used for the BCA.

Cash flows equal to \$881 million are expected to be incurred over a period of six fiscal years (FY2009-2014), culminating in the extended Runway 9R/27L re-opening in July 2014 (see **Exhibit ES-3**).

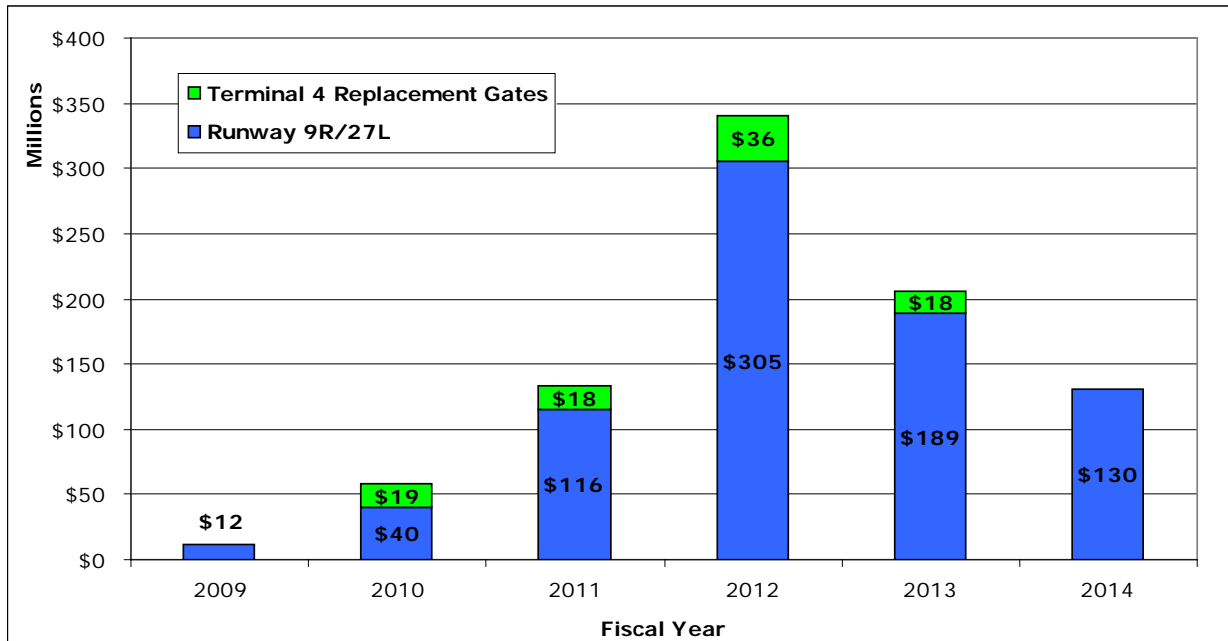
² The Corradino Group, *Final Runway Element Cash Flow*, September 30, 2009.

**EXHIBIT ES-2
PROPOSED PROJECT
Fort Lauderdale-Hollywood International Airport**



Source: Broward County Aviation Department.
Prepared by: Montgomery Consulting Group and Landrum & Brown.

**EXHIBIT ES-3
CASH FLOWS FOR RUNWAY 9R/27L & T4 REPLACEMENT GATES
Fort Lauderdale-Hollywood International Airport**



Sources: Broward County Aviation Department.

INCREMENTAL O&M COSTS

The expansion of Runway 9R/27L and associated projects will add approximately 19 percent more pavement to the airfield. It is assumed in the final BCA that airfield operations such as fire/rescue and security will be able to absorb the incremental pavement area without increasing airfield operations expenses. However, maintenance expenses are projected to increase due to the additional pavement. Broward County Aviation Department estimates current airfield maintenance costs at \$1.9 million annually, rising to approximately \$2.3 million once Runway 9R/27L comes online. As a result, an annual recurring value of \$400,000 is recommended for use in the final BCA, equal to the incremental maintenance cost associated with the runway program³. The Nav aids on runway ends 9R and 27L will also be upgraded to Category I Instrument Landing Systems (ILS) which includes a Medium Intensity Approach Light System with runway alignment indicator lights (MALSR), localizer, and glideslope antennae. The additional maintenance costs due to the navigational upgrade are estimated at \$100,000 a year, and, although these

³ The FEIS originally estimated that incremental operating and maintenance costs could be as high as \$2.5 million annually. This estimate was based on a conservative assumption that airfield operations costs as well as maintenance costs would increase in proportion to the estimated 19 percent increase in pavement area. Subsequent discussions with BCAD indicate that this assumption was overly conservative and a 19 percent increase applied to maintenance expenses only is more appropriate.

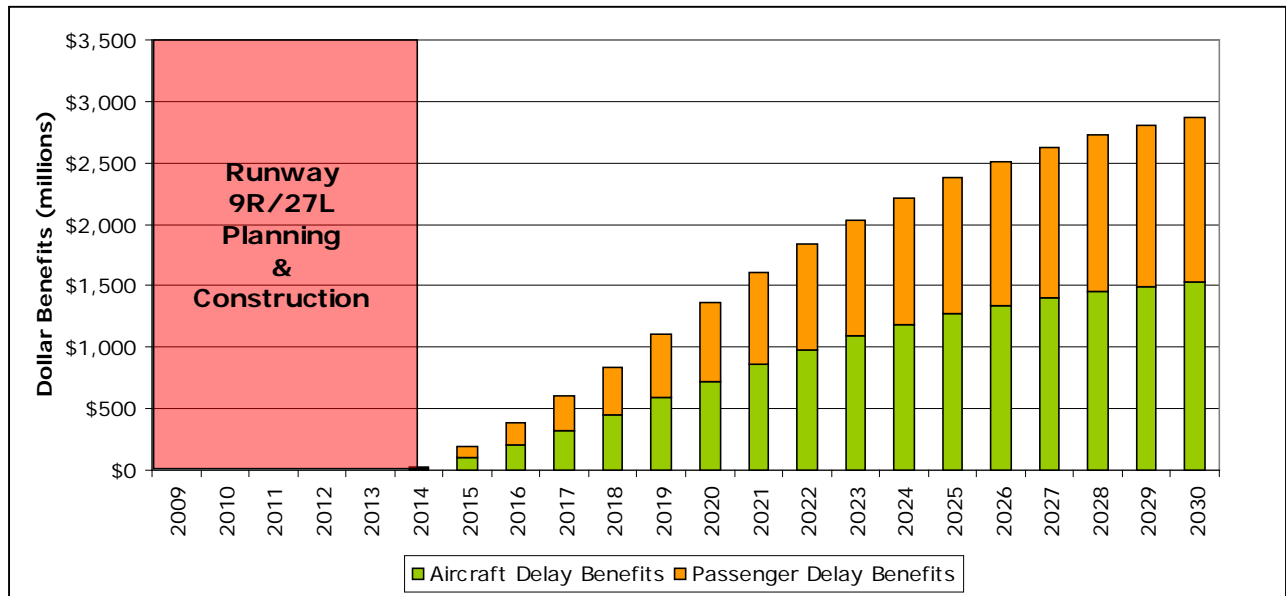
maintenance costs will be borne by the FAA, they must be evaluated as part of the cost equation for the BCA.

BENEFITS OF PROPOSED PROJECT

The primary benefit of the expansion of Runway 9R/27L is that average aircraft delays are maintained at reasonable levels though the 2030 evaluation period. Without the proposed project delays could reach unacceptable levels within the next five to six years based on FAA forecasts. Delay levels indicate the extent to which an airport is becoming constrained and, without remedial action, airlines will forego adding markets and frequency at FLL. The indirect opportunity cost of not proceeding with the Runway project is the associated negative impact on the Broward County economy, FLL’s role in the South Florida transportation infrastructure, and its competitive position as a tourist destination.

For purposes of the BCA, benefits of the proposed project versus a No Action alternative were quantified in terms of reduced aircraft and passenger delay. The delay benefits resulting from the Runway 9R/27L expansion project are illustrated in **Exhibit ES-4**.

**EXHIBIT ES-4
CUMULATIVE AIRCRAFT AND PASSENGER DELAY BENEFITS
Fort Lauderdale-Hollywood International Airport**



Sources: FAA, 2008 Terminal Area Forecast; Landrum & Brown analysis.

Note: Benefit data is expressed in 2009 constant dollars using a 7 percent discount rate.

The dollar value of annual delay benefits are quantified by multiplying the total annual delay savings (expressed in minutes) from the proposed project by the average cost of operating an aircraft at FLL per minute and the per minute cost of

passenger time. Aircraft operating costs were calculated based on Department of Transportation statistics and applied to the specific mix of aircraft forecast to operate at FLL over the evaluation period. The FAA provides an economic value of \$28.60 per hour of passenger time or \$0.48 expressed in minutes. The evaluation period for benefits for the BCA is July 2014 through September 2030, coinciding with the scheduled re-opening of Runway 9R/27L and the last month of the evaluation period.

BENEFIT COST EVALUATION

The critical component of the BCA analysis entails the quantification of annual costs and benefits of the proposed project from FY2009 through FY2030. The net present value (NPV) of costs and benefits is then calculated and expressed in 2009 dollars. The NPV of benefits divided by the NPV of costs yields a BCA ratio that can be used to evaluate the benefits of the project versus the associated costs. A BCA ratio with a value greater than one (1.0) indicates that the project has economic justification given that the benefits yielded by the project outweigh the costs of developing the project. A BCA ratio of 2.0, for example, indicates that the net present value of the benefits is twice as large as the net present value of the costs. The higher the BCA ratio, the greater the benefits provided by the project.

The recommended scenario for the final BCA is predicated on the following key assumptions:

- ✓ FAA 2008 Terminal Area Forecast is used as the forecast of aircraft operations and annual passenger volumes. The 2008 TAF projects aircraft operations at FLL will average growth of 2.1 percent per year, increasing from 305,000 operations in FY2008 to 480,000 operations at FLL by FY2030. Passengers are forecast to average growth of 2.8 percent a year, increasing from 22.3 million annual passengers in FY2008 to 40.6 million annual passengers in FY2030. The 2008 TAF is more conservative than the 2006 TAF used for the FEIS as it accounts for a near term reduction in activity at FLL due to the economic recession.
- ✓ Capital costs for the project will be incurred between FY2009 and FY2014. O&M costs will be incurred for the last two months of FY2014 through FY2030.
- ✓ The total capital costs of the project considered for the BCA are \$881 million and include the Runway 9R/27L expansion program and Terminal 4 replacement gates.
- ✓ Incremental O&M costs are assumed to be \$500,000 annually reflecting increased maintenance costs due to additional pavement and increased maintenance costs for upgraded navigation aids on the runway ends.
- ✓ Benefits of the project accrue from the last two months of FY2009 through FY2030.
- ✓ Delay savings per operation and per passenger are approximately 9 minutes in FY2015, 17 minutes in FY2020, and 6 minutes in FY2030.

- ✓ Aircraft operating costs are reflective of 2007 aircraft operating costs escalated to 2009 dollars. It is assumed that the long term price of oil is reasonably reflected in airline operating costs during this period.
- ✓ The value of passenger time is \$28.60 per hour or \$0.48 per minute.
- ✓ A 7 percent discount rate is used to calculate the NPV of benefits and costs per FAA BCA guidance.

The ratios associated with the recommended BCA scenario are shown in **Table ES-1**. A number of individual variables that could affect the BCA ratios both positively and negatively were tested.

The scenario reflecting an upper range uses a 4 percent discount rate and includes benefits associated with meeter/greeter delay. A scenario reflecting a lower range uses a 10 percent discount rate, excludes meeter/greeter delay, and uses 2004 aircraft operating costs which reflect oil at approximately \$40 a barrel.

**TABLE ES-1
BENEFIT COST EVALUATION
RUNWAY 9R/27L EXPANSION & T4 REPLACEMENT GATES
Fort Lauderdale-Hollywood International Airport**

	Recommended	Upper Range	Lower Range
Present Value of Benefits	\$2,864,530,000	\$4,220,702,000	\$1,836,876,000
Present Value of Costs	\$712,247,000	\$779,131,000	\$653,548,000
Net Present Value	\$2,152,283,000	\$3,441,571,000	\$1,183,328,000
BCA Ratio	4.0	5.4	2.8
Payback Period	3 years	3 years	4 years

Sources: FAA, 2008 Terminal Area Forecast; BCAD; Landrum & Brown analysis.

CONCLUSION

The proposed project produces large, quantifiable, benefits as reflected in the positive 4.0 BCA ratio for the recommended scenario. The payback period for the proposed project is estimated to be approximately three years in non-discounted dollars.

The sensitivity analysis provides BCA ratios of 5.4 as an upper range and 2.8 as a lower range which confirm the strong economic justification for the proposed project.