APPENDIX B
RUNWAY LENGTH REQUIREMENTS

Appendix B, *Runway Length Requirements*, contains an excerpt of the Runway Safety Area (RSA) Study for Runway 6L/24R. Section 1.3, BKL *Runway Length Requirements,* was appended to this Environmental Assessment (EA) document in order to provide the takeoff runway length needed for the different types of aircraft that operate at Burke Lakefront Airport (BKL). The entire RSA study, including the referenced appendices, is available upon request.

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BURKE LAKEFRONT AIRPORT

Cleveland, Ohio

RUNWAY SAFETY AREA STUDY
for
RUNWAY 6L/24R
2011

Prepared for
the City of Cleveland Department of Port Control

Prepared by:

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measured from the arrival threshold of a runway, taking into account that full RSA and OFAs must be provided behind the arrival threshold. The LDA is measured to (1) the point where the standard RSA or OFA begins at the rollout end of the runway, or (2) the runway end, whichever yields a shorter distance. The lengths of stopways are not included in the computation of the LDA. The LDA cannot be longer than the runway, however, if obstacles on the ground prevent the airport operator from providing standard RSA or OFA to meet runway design criteria off either end of the runway, the LDA may be shorter than the runway.

Existing Declared Distances

There are no published declared distances for BKL according to the Airports Facility Directory, the 5010 web portal or the Aeronautical Information Services website. However, due to the 265-foot displaced threshold on Runway 6L there is reduced LDA. The following represents the declared distances that this RSA study will use as baseline existing conditions for Runway 6L/24R.

- TODA – 6,198'/6,198'
- TORA – 6,198'/6,198'
- ASDA – 6,198'/6,198'
- LDA – 5,933'/6,198'

1.3 BKL RUNWAY LENGTH REQUIREMENTS

BKL is served by a wide variety of aircraft, from single-engine pistons to large air carrier jets. If BKL became unavailable for use by presently based aircraft and itinerant operators that routinely fly into BKL, these tenants and users would have to find an alternative facility that would meet certain minimum facility capabilities--most importantly of which is runway length. Takeoff runway length needs were assessed for the different types of aircraft that operate at BKL. While the typical turboprop aircraft that operate at BKL generally require between 2,000 to 3,000 feet of runway for takeoff and the single-engine piston aircraft generally requires 1,500 to 3,000 feet of takeoff runway length,[5] the majority of the BKL jet aircraft fleet requires greater runway lengths.

Exhibit 1.3-1 presents takeoff runway length requirements and **Exhibit 1.3-2** presents landing runway length requirements for a representative mix of corporate jet aircraft. Virtually all jet aircraft weighing more than 20,000 pounds require runway lengths of 5,000 feet or more when operating at maximum takeoff weight (MTOW) under standard day conditions (59 degrees Fahrenheit with no wind). As daily temperatures increase above standard day conditions, additional runway length is typically required. Based on a customer survey conducted from January through June 2005 by one of the Airport's FBOs at the time, approximately 22 percent of surveyed customers indicated that "on occasion" they require (takeoff) runway length greater than the current 6,198 feet available at BKL, necessitating a reduction in takeoff weight.

[5] Runway length requirements obtained from Jane's *All the World's Aircraft*, based on standard day temperatures at maximum takeoff weight.

Exhibit 1.3-1
TAKEOFF LENGTH REQUIREMENTS

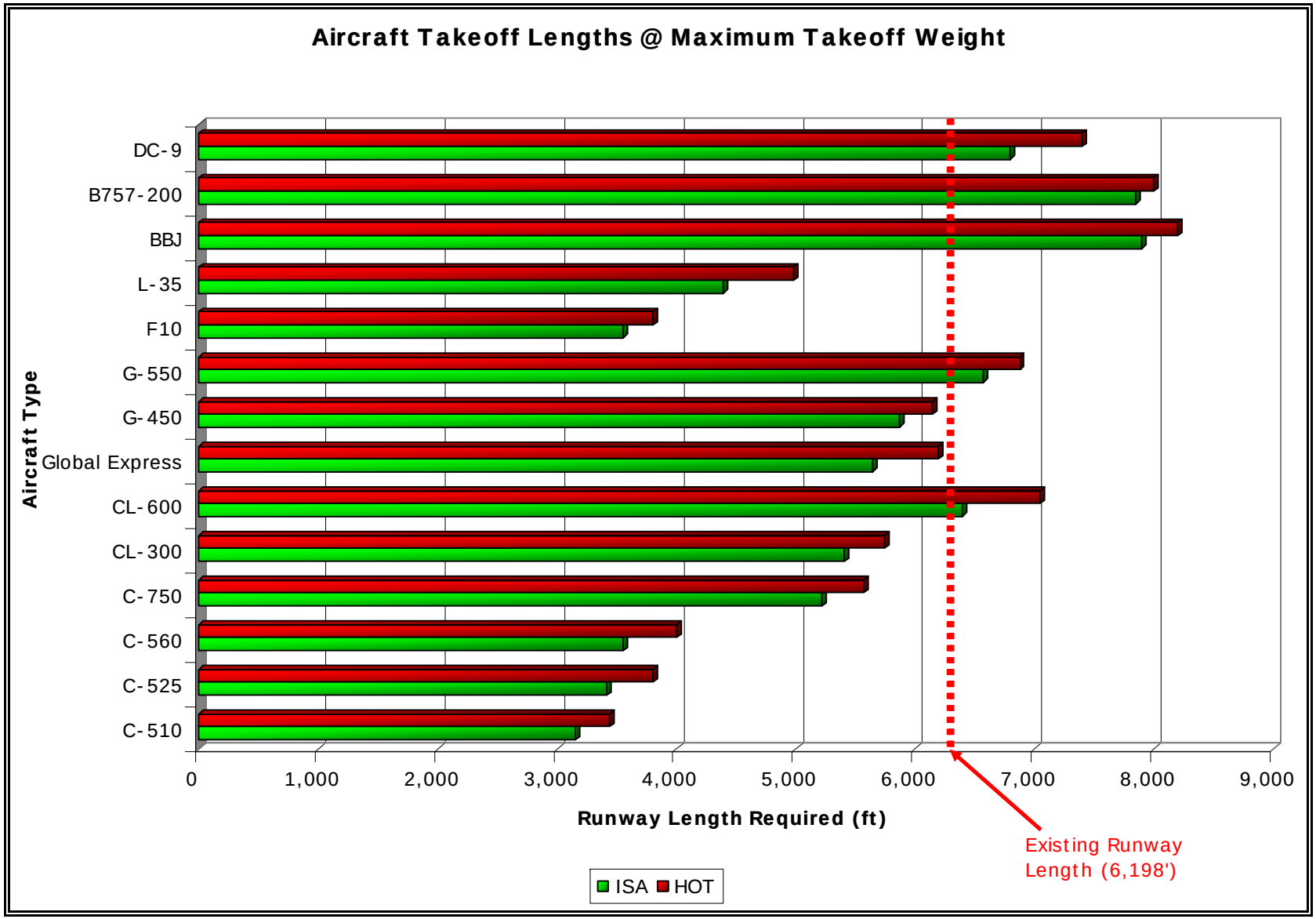
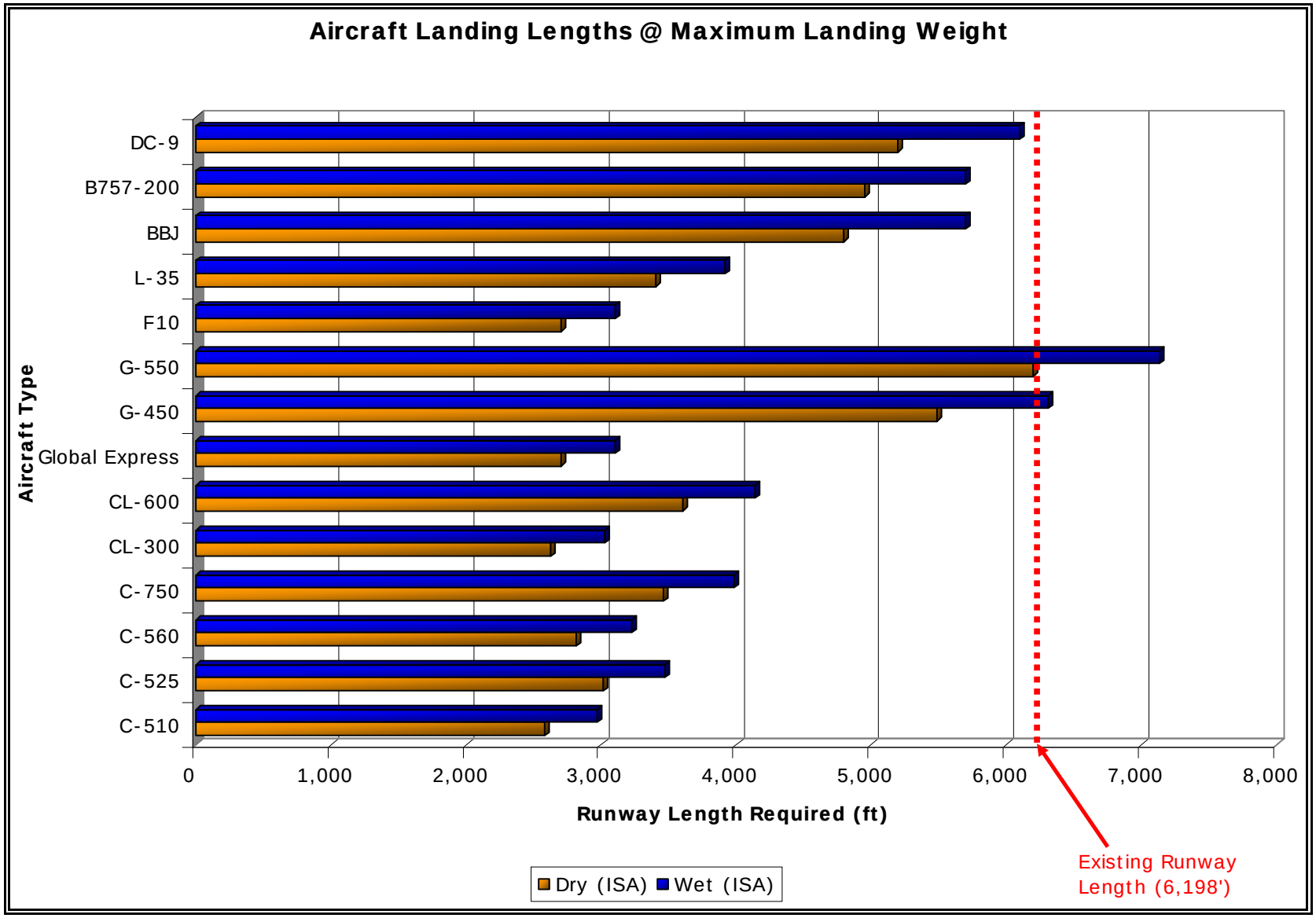


Exhibit 1.3-2
LANDING LENGTH REQUIREMENTS



In addition to the corporate jets, larger air carrier jet aircraft routinely fly in and out of BKL and are used by local and visiting professional sports teams. The large jets that use BKL include Boeing 737s, Boeing 727s, Airbus 320s, and DC-9s. These aircraft typically require longer runway lengths than corporate jets. When fully loaded, at takeoff these aircraft can require up to 10,500 feet of runway. However, at BKL these aircraft are used for professional sports teams and are typically not fully loaded; this allows the operators the flexibility to use BKL, which is better located for the teams given the proximity to a number of downtown Cleveland sporting venues.

Based on the results of this analysis, a runway length of no less than 6,198 feet is recommended; this is the existing length of Runway 6L/24R. A runway length of 6,198 feet allows the City of Cleveland to maintain the current operational capability of BKL by continuing to serve the existing fleet mix as well as the sports teams and special charters that use the airport today. Seven of the 14 aircraft analyzed in Exhibits 1.3-1 and 1.3-2 would be impacted by a runway length less than 6,000 feet; nine of the 14 aircraft analyzed would be impacted by a runway length less than 5,500 feet. These impacts would reduce the viability of BKL to serve its intended role as a reliever airport to CLE. **Appendix B** contains several letters from aircraft operators at BKL outlining the effects of reduced runway length on their operations.

If the Runway 6L arrival threshold is relocated or displaced to the east to achieve a full RSA and the Runway 24R arrival threshold is extended to east to maintain the existing runway length and BKL's intended role and viability, the Airport would lose its' existing ILS approach. The controlling obstruction is the stack on the Cleveland Municipal Power Plant. Based upon existing obstructions, the arrival threshold for 24R cannot be moved to the east and still maintain the ILS approach with existing minimums (273' - 1nm visibility).

1.4 RSA ENHANCEMENT ALTERNATIVES

The inventory of the existing Runway 6L/24R RSA identifies several deficiencies as listed below:

- Non-standard width at Runway 6L end
- Non-standard width along Combined Disposal Facility (CDF) berm wall (based on 500-foot wide RSA)
- Approximately 315 feet of available land beyond end of Runway 6L pavement
- Non-frangible Localizer (LOC) (reduces available land to 235 feet beyond end of Runway 6L pavement)
- Vehicle service roads inside the RSA

The FAA Order 5200.8 Appendix 2 identifies a range of RSA improvement concepts that are to be considered as part of any RSA improvement study, they include:

- Construct the traditional graded area surrounding the runway (where it is not practicable to obtain the entire safety area in this manner, as much as possible should be obtained)
- Relocate, shift, or realign the runway