CHAPTER TWO
PURPOSE AND NEED

2.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

For an Environmental Assessment (EA), the purpose and need section should identify "the problem facing the proponent (that is, the need for an action), the purpose of the action (that is, the proposed solution to the problem), and the proposed timeframe for implementing the action".[1]

The following sections provide the need statements for the Proposed Action, the purpose of the project, and the proposed timeframe for implementing the action.

The need to comply with Federal Aviation Administration (FAA) Runway Safety Area (RSA) standards.

The standards provided by FAA AC 150/5300-13, *Airport Design*, provide the basis for planning airfield facilities. The FAA uses a coding system, referred to as the Airport Reference Code (ARC), to relate airport design standards to the operational and physical characteristics of the aircraft that use an airport. The ARC is made up of two components. The first component is the Aircraft Approach Category (AAC), which relates to aircraft approach speed and is designated by a letter (A through E). The second element of the ARC is the Airplane Design Group (ADG) and is based on wingspan. The ADG is identified by Roman numerals, ranging from I through VI. Based on FAA Enhanced Traffic Management System (ETMS) data (Calendar Year 2010), the existing ARC for Burke Lakefront Airport (Airport or BKL) is "C-II."

RSAs are the most stringent design requirements for a runway. They are designed and maintained to enhance safety in the event that an aircraft undershoots, overruns, or veers off the runway, and to provide greater accessibility for aircraft fire-fighting and rescue (ARFF) equipment during such incidents. The RSA is centered on the runway centerline and it extends both laterally from the centerline of the runway and beyond both ends of the runway. The RSA must be clear, graded, and devoid of hazardous ruts, depressions, or other surface variations. It must be drained to prevent water accumulation and must be capable, under dry conditions, of supporting snow removal equipment, ARFF equipment, and the occasional passage of aircraft, without causing structural damage. The RSA should be devoid of objects other than those that must be located in the RSA due to their aviation-related function.

[1] FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures*. Effective date: March 20, 2006; Paragraph 405c.

In order to comply with AC 150/5300-13, *Airport Design,* the RSA at BKL must extend 600 feet beyond the runway end with a width of 400 feet.[2] BKL RSA for Runway 6L/24R does not meet the standards contained in FAA Advisory Circular (AC) 150/5300-13. The *Burke Lakefront Airport Runway Safety Area Practicability Study*[3] documented seven deficiencies including, but not limited to, obstructions in the RSA, grading issues in the RSA, and location of the BKL service road in the Runway 6L/24R RSA.

In the late 1990s and early 2000s, a series of aircraft mishaps highlighted the need for airports to comply with RSA standards. These mishaps stimulated the passage of P.L. 109-115, which states "*not later than December 31, 2015, the owner or operator of an airport certificated under 49 United States Code 44706 shall improve the airport's RSAs to comply with the FAA design standards required by 14 Code of Federal Regulations Part 139"* (P.L. 109-115, November 30, 2005 [119 Statute 2401]). As a result, all RSAs at federally obligated airports and all RSAs at airports certificated under 14 Code of Federal Regulations (CFR) Part 139 must conform to the standards contained in AC 150/5300-13. Therefore, one purpose of the Proposed Action is to meet the need of complying with FAA RSA standards.

The need to maintain sufficient runway length to the extent practicable and to maintain existing instrument landing system capabilities to accommodate the current and projected fleet.

Runway Length

One way to correct a deficient RSA would be to add additional runway pavement to meet the standard. However BKL is in a constrained location. The Airport is located in downtown Cleveland and is bordered by Lake Erie, by the U.S. Army Corps of Engineers (USACE) Confined Disposal Facilities (CDFs), and by North Marginal Road and the Cleveland Memorial Shoreway. There is not enough existing area to just add additional runway pavement to meet the RSA standard.

Another way to correct a deficient RSA is to designate a portion of the runway as RSA which results in the loss of runway length. For some airports reducing runway takeoff or landing length does not affect operational capability. The runway length requirements for aircraft takeoffs typically exceed the requirements for aircraft landings. However, at BKL, reducing the length, specifically takeoff length, of Runway 6L/24R would have negative effects on the overall capability of the Airport.

Therefore, in addition to making the RSA compliant to FAA standards, the Proposed Action has another purpose which is to maintain sufficient runway length to the extent practicable to accommodate the current and projected fleet.

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[2] Per FAA AC 150/5300-13 the RSA length may be reduced from 1,000 feet to 600 feet prior to the landing threshold with the installation of a standard Engineered Materials Arresting System (EMAS) and declared distances are provided. Also for a runway designated Airport Reference Code C-I and C-II, an RSA width of 400 feet instead of 500 feet is permissible.

[3] Prepared for Cleveland Airport System by Ricondo & Associates, Inc. *Burke Lakefront Airport Runway Safety Area Practicability Study*, August 2006.

BKL serves a unique role in the Cleveland Airport System. The Airport is a highly effective reliever airport to Cleveland Hopkins International Airport (CLE) and provides convenient access to businesses, tourist attractions, and medical facilities in downtown Cleveland. BKL is able to serve a high level of corporate jet activity due to its runway length, instrumentation, and Air Traffic Control Tower (ATCT).

BKL is served by a wide variety of aircraft. If BKL's runway length was reduced and became unavailable for use by presently-based aircraft and itinerant operators that routinely fly into BKL, then 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. A runway length analysis[4] was conducted to determine the takeoff runway length needed for the different types of aircraft that operate at BKL. The Runway Length Analysis is provided in Appendix B, *Runway Length Requirements*.

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 require greater runway lengths. Virtually all jet aircraft weighing more than 20,000 pounds require runway lengths of 5,000 feet or more. The aircraft fleet mix at BKL is a combination of business jets such as the Global Express, Boeing Business Jet, Challengers, Lears, and Gulfstreams, and charter aircraft for the local sports team which include the B757, B737, and DC-9. Based on extensive review and analysis of the take-off and landing requirements for the family of aircraft that use BKL, it was determined the Airport needs to maintain landing length of at least 6,000 feet using the Runway 24R approach and a take-off length of at least 6,198 feet to maintain the existing operational capability. This will allow BKL to continue to serve the existing fleet mix as well as the sports teams and special charters that use the Airport today.[6,7]

Instrument Landing System Capabilities

In addition to the need to maintain runway length, there is a need for the Proposed Action to maintain current instrument landing system capabilities at BKL. Runway 6L at BKL has a visual approach and Runway 24R is equipped with a Category I Instrument Landing System (ILS). An ILS provides both vertical and horizontal guidance which allows for precision approaches to an airport in poor weather conditions. There are different ILS categories which allow landings under different weather minima. The Category I ILS for Runway 24R consists of a Medium Intensity Approach Lighting System with Sequenced Flashing Lights (MALSF), an electronic localizer (provides horizontal guidance), a glide slope facility

[4] City of Cleveland Department of Port Control. *Burke Lakefront Airport Runway Safety Area Study for Runway 6L/24R* prepared by Landrum & Brown and McGuiness Unlimited, 2011.

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

[6] City of Cleveland Department of Port Control. *Burke Lakefront Airport Runway Safety Area Study for Runway 6L/24R* prepared by Landrum & Brown and McGuiness Unlimited, 2011.

[7] City of Cleveland, Interim Airport Layout Plan (September 2012) recommends the implementation of declared distances. Based on planning information, the Landing Distance Available for Runway 24R will be 5,987 feet.

(provides vertical guidance), and middle and outer markers (to identify distance from the runway). The Runway 24R instrument approach has minimums of 1-mile visibility and a ceiling of 273 feet. Runway 6L/24R is equipped with High Intensity Runway Edge Lights (HIRL), a 4-box Visual Approach Slope Indicator (VASI) on each of the approaches, and Runway End Identifier Lights (REILs) on the end of Runway 6L.

The *Burke Lakefront Airport Runway Safety Area Practicability Study*[8] documented the need for BKL to maintain its only Instrument Flight Rules (IFR) approach on Runway 24R. 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 the 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' – 1 nautical mile visibility). Therefore, the purpose of the Proposed Action is to maintain current instrument landing system capabilities.

The need to maintain roadway access to the extent practicable in order to maintain Airport, U.S. Department of Agriculture (USDA), and U.S. Army Corps of Engineers (USACE) maintenance and operational activities.

The existing vehicle service road currently circles the airport perimeter and provides access for airport operations, USDA wildlife management and mitigation, and the USACE. Each group uses the road for different reasons but tied to their operational mission. Airport operations use the road to perform perimeter checks, maintenance operations, and wildlife management activities in accordance with their Part 139 certificate. The USDA uses the road as a part of their agreement with the City of Cleveland and the USACE to perform wildlife management and mitigation related to the activities associated with both the Combined Disposal Facilities and the proximity to Lake Erie. Lastly, the USACE uses portions of the vehicle service road to access the Combined Disposal Facility operation. This is the only land access to the operation. Three portions of the road will require relocation or closure to remove it out of the standard RSA. However there is a need to maintain roadway access to the extent practicable in order to maintain Airport, USDA, and USACE maintenance and operational activities. In correspondence provided in Appendix A, *Coordination and Comments,* the USDA states they are opposed to road closures and that the roadways should be relocated out of the standard RSA and remain operational for safety purposes. Therefore, the purpose of the Proposed Action is to maintain roadway access by relocating the vehicle service road out of the RSA to the extent practicable.

[8] Prepared for Cleveland Airport System by Ricondo & Associates, Inc. *Burke Lakefront Airport Runway Safety Area Practicability Study*, August 2006.

The need to provide ancillary development to support the safety area improvement project.

With any development project, there is a need for support facilities and infrastructure improvements to ensure the Proposed Action integrates with the existing facilities. The purpose of the Proposed Action is to provide the necessary development for the completion of the Safety Area Improvements Project. These developments include: relocation of existing FAA Navigational Aids (NAVAIDS)[9] (including Runway End 6L REILS, automated weather observing system (AWOS), and the addition of in-ground runway lights in the shift/extension), and new runway markings/striping.

2.2 FORECAST SENSITIVITY ANALYSIS

A sensitivity analysis was conducted to review the aircraft operation projections in the FAA's 2011 Terminal Area Forecast (TAF)[10] versus the 2008 forecasts prepared in the Draft Master Plan Update[11]. For comparison purposes, 2015 has been selected for discussion because it represents the timeframe for the first full year of anticipated project implementation and 2020 represents five-years past implementation.

The Draft 2008 Master Plan Update forecasts represented market-driven demand for air service and therefore were considered "unconstrained". For purposes of estimating future demand, the Draft 2008 Master Plan Update forecasts assumed that aviation facilities can be provided to the level required to meet the needs of future users of the Airport. The Draft 2008 Master Plan Update forecasts were used to evaluate the capacity of the existing airfield and landside facilities and determine the extent, if any, of additional facilities needed in the future.

The FAA TAF includes a forecast of enplanements and operations for BKL on an annual basis. TAF forecasts are based on historical trends and future socioeconomic and aviation trends. The TAF is used to plan the staff and equipment needs at airport traffic control towers and serves as the foundation for many airport capacity improvements. The 2011 TAF forecast and the 2008 Master Plan Update forecast are provided in **Table 2-1**.

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9 The existing Runway End 6L and Runway End 24R visual approach slope indicator (VASI) lights on the side of the runway threshold that provides visual descent guidance information during the approach will be replaced as part of a separate FAA project. The VASIs will be replaced by a Precision Approach Path Indicator (PAPI) which consists of four sets of lights in a line perpendicular to the runway, usually mounted to the left side of the runway. These have a similar purpose to the VASI, but the additional lights serve to show the pilot how far off the glide slope the aircraft is.

10 The FAA's Terminal Area Forecast (TAF) system is the official forecast of aviation activity at FAA facilities. FAA's most recent TAF was published in January 2012.

11 City of Cleveland Department of Port Control, Cleveland Burke Lakefront Airport Draft Master Plan Update, February 2008.

Table 2-1
2011 TAF VERSUS DRAFT 2008 MASTER PLAN UPDATE FORECAST
Burke Lakefront Airport

YEAR	2011 TAF	DRAFT 2008 MASTER PLAN UPDATE FORECAST	DIFFERENCE FROM 2011 TAF
2015	53,880	51,460	-4%
2020	55,325	56,848	3%

Note: The Draft 2008 Master Plan Update forecast did not include the analysis year for 2015 and 2020; therefore operations numbers were interpolated for this analysis.

Source: *FAA APO Terminal Area Forecast Summary Report*, FAA Forecast and Performance Analysis Division, Office of Aviation Policy and Plans. Forecast issued January 2012. Landrum & Brown, 2012.

The FAA standard for determining acceptable forecast consistency is when a non-FAA forecast is within 10 percent of the TAF for the five-year projection and 15 percent for the 10-year projection.[12] In this case, the Draft 2008 Master Plan Update forecast of aircraft operations are within four percent for the 2015 timeframe, well within the 10 percent consistency standard. The 2020 projection is within three percent for the forecast projections. Operations and category of aircraft remain substantially the same from the Draft 2008 Master Plan Update forecast to the FAA's 2011 TAF.

Because the 2011 TAF includes more operations than the Draft 2008 Master Plan Update forecast for 2015, the 2011 TAF will be used in this EA as it represents the more conservative case from an environmental impact perspective.

2.3 TIME FRAME

Initiation of the proposed Safety Area Improvements Project would occur when the FAA has issued a finding on this EA for the modification of the Airport Layout Plan (ALP). Subject to a Finding of No Significant Impact (FONSI), design and construction of the safety area improvement project is expected to begin in 2013 and would continue into 2014. Completion of the Proposed Action would occur before September 30, 2014. Should this EA indicate the potential for significant environmental impacts, an Environmental Impact Statement (EIS) would be conducted prior to implementation of any portion of the project.

[12] FAA Order 5100.38C *Airport Improvement Program Handbook*, paragraph 428.a. Aviation Forecasting. June 2005.