

# **APPENDIX F**

## **NOISE ABATEMENT ALTERNATIVES (RE-EVALUATED ALTERNATIVES FOR 2006)**

This appendix discusses the noise abatement alternatives that were suggested for inclusion in the Cincinnati/Northern Kentucky International Airport (CVG) Noise Compatibility Program (NCP). Each alternative was evaluated for the anticipated benefits and costs associated with its implementation. As part of the Part 150 planning process, a noise abatement alternatives working paper was presented and distributed to the Planning Advisory Committee (PAC) for review and comment. A copy of this working paper, and additional materials as presented to the PAC, is provided in Appendix I, *Planning Advisory Committee*.

**ALTERNATIVE NA-A:**

Modify nighttime runway use program to include Runway 18L/36R.

**CATEGORY:**

Nighttime Runway Utilization

**DESCRIPTION:**

The intent of Alternative NA-A is to minimize the impact of nighttime overflights. The current nighttime runway use program results in the use of a single runway for nighttime operations.<sup>1</sup> That procedure is effective when operations are either all arrivals or all departures, which was the typical nighttime operating condition at the time the program was originally developed (1993). Over time, the operations of both the passenger airlines and the smaller cargo operators have increased during the nighttime hours. This increase in operations is a combination of arrivals and departures, particularly during the 10:00 p.m. to Midnight period. In order to maintain the operational efficiency and safety of the airfield, the nighttime runway use program should be modified to provide multiple runways for nighttime operations (when necessary) in order to accommodate both arrivals and departures at the same time while minimizing noise impacts.

**This alternative would continue the preference for nighttime departures on Runway 27 (to the west) and nighttime arrivals on Runway 9 (from the west).** However, during periods of operational necessity, such as wind/weather conditions, snow removal, periods of high delay, construction, or maintenance work, a series of "operating configurations" have been developed that would offer the Air Traffic Control Tower (ATCT) two or more runways. Where possible, the most compatible corridors were selected; and in the case of Runway 36R, it is anticipated that a left turn up the Ohio River (Alternative NA-F) would be developed to minimize noise impacts.

The current nighttime runway utilization program includes a left turn over the river corridor from Runway 36C. By moving departures to Runway 36R (when required for operational necessity) in conjunction with the river turn (NA-F), aircraft turning over the river will overfly the river corridor at higher altitudes as compared to departures from Runway 36C, thereby reducing the level of noise exposure. The proposed operating configurations would continue the Kenton County Airport Board (KCAB) policy of departures using the most compatible land use corridor and arrivals being accommodated as necessary. Typically departing aircraft are louder than arriving aircraft and therefore departures take precedence over arrivals in assigning runway

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<sup>1</sup> KCAB defines nighttime as 10:00 p.m. to 7:00 a.m., which is consistent with the requirements for calculating DNL noise exposure. However, the KCAB recognizes that between the hours of 9:00 p.m. and 11:00 p.m., the current traffic levels make it difficult for the ATCT to efficiently accommodate the level of demand. Therefore, it is understood that the ATCT may need to continue to operate the airfield in a daytime mode between 10:00 p.m. and 11:00 p.m. KCAB has requested that when conditions require the ATCT to continue operating in a daytime mode beyond 10:00 p.m. that the ATCT begins using the established nighttime runway use program as soon as possible, and no later than 11:00 p.m.

priorities. Listed below are the proposed operating configurations. Where multiple runways are listed, the first runway is the preferred (primary), with the second runway (secondary) being used only when operationally necessary. In each configuration, the intent of the alternative is to maximize the use of the primary runway prior to utilizing the secondary runway for operations. The configurations are as follows:

<b>Departures</b>	<b>Arrivals</b>	<b>Remarks</b>	<b>Primary Factors for Selecting the Operational Configuration</b>
<b>27 Primary</b>	<b>9 Primary</b>	Would remain the airport's number one priority for nighttime operations.	Most preferred choice. Used for separate arrival and departure bank periods. No wind condition.
<b>27 – Primary 36R - Secondary</b>	<b>36R – Primary 36C - Secondary</b>	Maximize the use of Runway 27 for departures and Runway 36R for arrivals. Runway 36R (for departures) and Runway 36C (for arrivals) are to be used as overflow when wind/operational conditions require the use of a second runway.	Second choice when required for operational reasons. Typically used during heavy departure bank periods with minimal arrival operations. No wind condition or a north wind condition
<b>27 – Primary 18L - Secondary</b>	<b>18C – Primary 18L - Secondary</b>	Maximize the use of Runway 27 for departures and Runway 18C for arrivals. Runway 18L (for departures and arrivals) is to be used as overflow when wind/operational conditions require the use of a second runway.	Third choice when required for operational reasons. Typically used during heavy departure banks with minimal arrival operations. South wind condition.
<b>36R – Primary 36C - Secondary</b>	<b>9 – Primary 36R - Secondary</b>	Maximize the use of Runway 36R for departures and Runway 9 for arrivals. Runway 36C (for departures) and Runway 36R (for arrivals) are to be used during high arrival periods with a few departures.	Fourth choice when required for operational reasons. Typically used during heavy arrival banks with minimal departures. No wind condition or a north wind condition

**BENEFITS:**

This alternative would increase efficiency and enhance safety by reducing intersecting runway operations during the nighttime and would continue the KCAB policy of using the most compatible land use corridor off Runway 27 west of the airport. There would be a reduction in arrival overflights along the extended centerline south of Runway 36C and north of Runway 18C. Combining Alternative NA-A with Alternative NA-F increases the altitude of aircraft over the river corridor when the second configuration is required (in comparison to the existing nighttime program).

**DRAWBACKS:**

This alternative would increase nighttime arrival overflights along the extended centerline south of Runway 36R. It would also increase departure overflights along the new Alternative NA-F corridor prior to intersecting the existing Runway 36L departure corridor.

**EXPECTED COSTS:**

Nominal costs for modifying the ATCT Tower Order. This alternative would require environmental review prior to implementation.

**EVALUATION METHOD:**

INM modeling

**RESULTS:**

The noise contour for Alternative NA-A **increases** in total size by 0.3 square miles in comparison to the Future (2011) Baseline Noise Contour. Alternative NA-A, in conjunction with Alternative NA-F, **decreases** housing impacts in the 65 DNL by three homes. Between the 60 – 65 DNL noise contour, the number of housing units would **decrease** from 2,270 homes in the Future (2011) Baseline Noise Contour to 2,215 homes with the implementation of Alternative NA-A in conjunction with Alternative NA-F.

**RECOMMENDATION:**

Recommended for inclusion in the Noise Compatibility Program, in conjunction with Alternative NA-F.

**Table F-1  
 ALTERNATIVE NA-A DEPARTURE RUNWAY UTILIZATION  
 Cincinnati/Northern Kentucky International Airport**

Future (2011) Baseline – Departure Runway Use										Alternative NA-A – Departure Runway Use								
Daytime (7:00 a.m. - 11:00 p.m.)*										Daytime (7:00 a.m. - 11:00 p.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	26	0.0%	60.8%	60.8%	6.1%	3.4%	1.2%	2.1%	25.8%	Heavy Cargo	0.6%	27.0%	13.5%	0.0%	31.9%	0.0%	4.9%	22.1%
Jet	139	0.0%	46.5%	15.0%	10.6%	0.4%	3.8%	7.1%	16.6%	Jet	0.0%	19.9%	17.5%	0.0%	41.7%	0.0%	10.3%	10.6%
Jet Cargo	2	0.0%	7.6%	49.5%	12.4%	1.0%	6.7%	21.4%	1.4%	Jet Cargo	0.0%	3.5%	39.0%	0.0%	39.5%	0.0%	4.5%	13.5%
Propeller	27	0.0%	56.2%	12.6%	3.9%	2.5%	1.2%	5.6%	18.0%	Propeller	0.5%	43.3%	4.5%	0.2%	29.1%	0.0%	4.5%	18.0%
RJ/BJ	546	0.0%	30.2%	25.2%	17.3%	0.3%	7.0%	9.9%	10.1%	RJ/BJ	0.0%	25.3%	19.0%	0.0%	33.9%	0.0%	8.3%	13.5%
Night - Period 1 (11:00 p.m. - 12:00 a.m.)										Night - Period 1 (11:00 p.m. - 12:00 a.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Heavy Cargo	0.0%	0.0%	0.0%	0.0%	100%	0.0%	0.0%	0.0%
Jet	0	1.0%	0.0%	39.0%	1.0%	1.0%	0.0%	3.0%	55.0%	Jet	0.0%	0.0%	0.0%	0.0%	91.7%	0.0%	8.3%	0.0%
Jet Cargo	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	75.0%	25.0%	Jet Cargo	0.0%	0.0%	4.9%	0.0%	90.2%	0.0%	4.9%	0.0%
Propeller	0	22.9%	0.0%	29.0%	2.3%	0.8%	0.8%	22.8%	21.4%	Propeller	4.2%	0.0%	4.2%	0.0%	87.4%	0.0%	4.2%	0.0%
RJ/BJ	29	2.6%	0.0%	51.2%	0.2%	0.7%	0.0%	17.2%	28.1%	RJ/BJ	1.9%	7.7%	1.9%	0.0%	82.7%	0.0%	5.8%	0.0%
Night - Period 2 (12:00 a.m. - 3:00 a.m.)										Night - Period 2 (12:00 a.m. - 3:00 a.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Heavy Cargo	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Jet	0	3.2%	0.0%	38.7%	0.0%	3.2%	0.0%	0.0%	54.9%	Jet	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Jet Cargo	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	Jet Cargo	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Propeller	4	12.1%	0.5%	40.7%	0.3%	5.5%	0.0%	8.8%	32.1%	Propeller	0.3%	1.0%	0.0%	0.0%	69.0%	0.0%	2.0%	0.7%
RJ/BJ	0	3.4%	0.0%	43.2%	0.5%	5.9%	0.0%	11.4%	35.7%	RJ/BJ	0.0%	0.5%	0.0%	0.0%	97.1%	0.0%	2.4%	0.0%
Night - Period 3 (3:00 a.m. - 7:00 a.m.)										Night - Period 3 (3:00 a.m. - 7:00 a.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	11	0.0%	0.0%	58.3%	5.6%	0.0%	2.8%	11.1%	22.2%	Heavy Cargo	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Jet	1	2.0%	1.0%	68.8%	2.0%	0.7%	0.3%	8.1%	17.1%	Jet	0.0%	20.0%	0.0%	0.0%	80.0%	0.0%	0.0%	0.0%
Jet Cargo	14	0.0%	0.0%	71.6%	2.5%	0.0%	1.2%	23.5%	1.2%	Jet Cargo	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Propeller	12	0.0%	2.9%	66.8%	1.2%	4.1%	0.0%	3.5%	21.5%	Propeller	0.0%	5.3%	0.0%	0.0%	90.7%	0.0%	1.8%	2.2%
RJ/BJ	18	3.2%	3.7%	55.5%	7.4%	1.8%	1.0%	7.4%	20.0%	RJ/BJ	0.0%	2.1%	1.9%	0.0%	93.5%	0.0%	1.9%	0.6%

■ - Indicates revised runway use as compared to Future (2011) Baseline

Source: Landrum and Brown, 2006

**Table F-2**  
**ALTERNATIVE NA-A ARRIVAL RUNWAY UTILIZATION**  
**Cincinnati/Northern Kentucky International Airport**

Future (2011) Baseline – Arrival Runway Use										Alternative NA-A – Arrival Runway Use								
Daytime (7:00 a.m. - 11:00 p.m.)*										Daytime (7:00 a.m. - 10:00 p.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	25	0.1%	0.0%	43.2%	36.6%	0.1%	0.0%	10.0%	10.0%	Heavy Cargo	0.1%	0.0%	43.2%	36.6%	0.1%	0.0%	10.0%	10.0%
Jet	139	0.1%	35.9%	27.9%	16.0%	0.1%	10.5%	1.8%	7.7%	Jet	0.1%	35.9%	27.9%	16.0%	0.1%	10.5%	1.8%	7.7%
Jet Cargo	1	0.1%	16.0%	51.9%	11.9%	0.1%	0.0%	10.0%	10.0%	Jet Cargo	0.1%	16.0%	51.9%	11.9%	0.1%	0.0%	10.0%	10.0%
Propeller	28	0.1%	39.9%	23.9%	16.0%	0.1%	10.5%	1.8%	7.7%	Propeller	0.1%	39.9%	23.9%	16.0%	0.1%	10.5%	1.8%	7.7%
RJ/BJ	576	0.1%	39.9%	23.9%	16.0%	0.1%	10.5%	1.8%	7.7%	RJ/BJ	0.1%	39.9%	23.9%	16.0%	0.1%	10.5%	1.8%	7.7%
Night - Period 1 (11:00 p.m. - 12:00 a.m.)										Night - Period 1 (11:00 p.m. - 12:00 a.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	1	0.1%	0.0%	24.2%	44.2%	0.8%	0.0%	11.3%	19.4%	Heavy Cargo	1.8%	0.0%	2.0%	6.0%	0.1%	0.0%	18.6%	71.5%
Jet	0	0.2%	0.0%	28.0%	39.5%	6.0%	0.0%	15.2%	11.1%	Jet	1.8%	0.0%	2.0%	6.0%	0.1%	0.0%	18.6%	71.5%
Jet Cargo	0	0.1%	0.0%	22.2%	28.9%	5.0%	0.0%	16.5%	27.3%	Jet Cargo	1.8%	0.0%	2.0%	6.0%	0.1%	0.0%	18.6%	71.5%
Propeller	2	0.1%	1.0%	11.0%	47.5%	5.6%	0.5%	9.4%	24.9%	Propeller	0.1%	0.1%	11.5%	47.5%	5.6%	0.5%	9.8%	24.9%
RJ/BJ	5	0.1%	1.0%	24.2%	40.6%	4.4%	0.5%	17.0%	12.2%	RJ/BJ	0.1%	0.1%	24.2%	40.6%	5.3%	0.5%	17.0%	12.2%
Night - Period 2 (12:00 a.m. - 3:00 a.m.)										Night - Period 2 (12:00 a.m. - 3:00 a.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	10	58.1%	0.0%	1.1%	19.4%	6.0%	0.0%	9.7%	5.7%	Heavy Cargo	70.0%	0.0%	1.0%	8.0%	1.0%	0.0%	5.0%	15.0%
Jet	0	58.0%	0.1%	1.0%	19.4%	6.0%	0.1%	9.7%	5.7%	Jet	70.0%	0.0%	1.0%	8.0%	1.0%	0.0%	5.0%	15.0%
Jet Cargo	15	58.1%	0.0%	1.1%	19.4%	6.0%	0.0%	9.7%	5.7%	Jet Cargo	70.0%	0.0%	1.0%	8.0%	1.0%	0.0%	5.0%	15.0%
Propeller	10	0.2%	0.1%	29.0%	33.4%	8.5%	0.1%	16.6%	12.1%	Propeller	0.2%	0.1%	29.0%	33.4%	8.5%	0.1%	16.6%	12.1%
RJ/BJ	1	0.2%	0.1%	29.0%	33.4%	8.5%	0.1%	16.6%	12.1%	RJ/BJ	0.2%	0.1%	29.0%	33.4%	8.5%	0.1%	16.6%	12.1%
Night - Period 3 (3:00 a.m. - 7:00 a.m.)										Night - Period 3 (3:00 a.m. - 7:00 a.m.)								
Runway	Ops	9	18L	18C	18R	27	36L	36C	36R	Runway	9	18L	18C	18R	27	36L	36C	36R
Heavy Cargo	1	0.1%	0.0%	4.0%	8.0%	0.9%	0.0%	15.5%	71.5%	Heavy Cargo	0.1%	0.0%	4.0%	8.0%	0.9%	0.0%	15.5%	71.5%
Jet	1	0.1%	1.0%	3.5%	7.5%	0.9%	0.5%	15.5%	71.0%	Jet	0.1%	1.0%	3.5%	7.5%	0.9%	0.5%	15.5%	71.0%
Jet Cargo	0	0.1%	0.0%	4.0%	8.0%	0.9%	0.0%	15.5%	71.5%	Jet Cargo	0.1%	0.0%	4.0%	8.0%	0.9%	0.0%	15.5%	71.5%
Propeller	3	0.1%	1.0%	10.0%	1.9%	0.9%	0.5%	13.8%	71.8%	Propeller	0.1%	1.0%	10.0%	1.9%	0.9%	0.5%	13.8%	71.8%
RJ/BJ	11	0.1%	1.0%	10.0%	1.9%	0.9%	0.5%	13.8%	71.8%	RJ/BJ	0.1%	1.0%	10.0%	1.9%	0.9%	0.5%	13.8%	71.8%

■ - Indicates revised runway use as compared to Future (2011) Baseline

Source: Landrum and Brown, 2006

**INSERT EXHIBIT F-1 Alternative NA-A Noise Exposure Contour**

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**Table F-3  
 COMPARISON OF IMPACTS FUTURE (2011) BASELINE VERSUS  
 ALTERNATIVE NA-A  
 Cincinnati/Northern Kentucky International Airport**

<b>Future (2011) Baseline Noise Incompatibility</b>				
	<b>65-70 DNL</b>	<b>70-75 DNL</b>	<b>75+ DNL</b>	<b>65+ DNL</b>
<b>Housing Units</b>				
Previously Mitigated	121	7	0	128
Newly Impacted	2	0	0	2
<b>Total</b>	<b>123</b>	<b>7</b>	<b>0</b>	<b>130</b>
<b>Population</b>				
Previously Mitigated	339	23	0	362
Newly Impacted	5	0	0	5
<b>Total</b>	<b>344</b>	<b>23</b>	<b>0</b>	<b>367</b>
<b>Area (Square Miles)</b>				
<b>Total</b>	<b>6.11</b>	<b>2.55</b>	<b>2.40</b>	<b>11.06</b>

<b>Alternative NA-A Noise Incompatibility</b>				
	<b>65-70 DNL</b>	<b>70-75 DNL</b>	<b>75+ DNL</b>	<b>65+ DNL</b>
<b>HOUSING UNITS</b>				
Previously Mitigated	109	7	0	116
Newly Impacted	0	0	0	0
<b>Total</b>	<b>109</b>	<b>7</b>	<b>0</b>	<b>116</b>
<b>POPULATION</b>				
Previously Mitigated	305	23	0	328
Newly Impacted	0	0	0	0
<b>Total</b>	<b>305</b>	<b>23</b>	<b>0</b>	<b>328</b>
<b>AREA (SQUARE MILES)</b>				
<b>Total</b>	<b>6.67</b>	<b>2.62</b>	<b>2.51</b>	<b>11.8</b>

No noise-sensitive facilities (schools, churches, libraries, nursing homes) would be located in the 65 DNL noise contour in this alternative.

Source: Landrum and Brown, 2006

**ALTERNATIVE NA-C:**

Assign heavy (>255,000 lbs) aircraft departures to Runway 27 during the nighttime hours (10:00 p.m. to 7:00 a.m.).

**CATEGORY:**

Nighttime Runway Utilization

**DESCRIPTION:**

The intent of Alternative NA-C is for Air Traffic Control Tower (ATCT) to assign heavy aircraft (aircraft with a gross weight over 255,000 pounds) to use Runway 27 for nighttime departures. Heavy aircraft, such as the Boeing DC-8, 747, and 767 aircraft, which currently operate at CVG, are often the loudest aircraft in the fleet mix.

Currently, Runway 27 is the longest departure runway and, as such, is generally the preferred departure runway for heavy aircraft. Additionally, Runway 27 is the primary departure runway as indicated by the current nighttime runway utilization program. There are occasions when operational necessity (wind/weather conditions, snow removal, periods of high delay, construction, or maintenance work) may warrant the use of multiple departure runways during the nighttime hours. The intent of this alternative is that during times when an additional departure runway is needed, the ATCT would assign all heavy aircraft to use Runway 27. If implemented, this alternative would result in quieter aircraft, including regional jet and passenger jet aircraft, being assigned to the second departure runway.

**BENEFITS:**

By focusing the loudest aircraft of the fleet to maintain the use of Runway 27 during times when a second departure runway is needed, the impact of nighttime overflights to the north and the south of the airport would be reduced, which is consistent with the Kenton County Airport Board's nighttime runway use goals.

**DRAWBACKS:**

This alternative would require additional coordination between the ATCT and the airlines. The coordination of aircraft destinations once aircraft have departed could result in delay. As air traffic increases, this alternative could increase delay and therefore may need to be revised.

**EXPECTED COSTS:**

Nominal costs for modifying the ATCT Tower Order.

**EVALUATION METHOD:**

Integrated Noise Model modeling

**RESULTS:**

The noise contour for Alternative NA-C **decreases** in total size by 0.03 square miles in comparison to the Future (2011) Baseline Noise Contour. Alternative NA-C **does not cause a change in** housing impacts in the 65 DNL. Between the 60–65 DNL noise contour, housing units would **decrease** from 2,270 homes in the Future (2011) Baseline Noise Contour to 2,257 homes with the implementation of Alternative NA-C.

**RECOMMENDATION:**

Recommended for inclusion in the Noise Compatibility Program.

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**Table F-4  
 ALTERNATIVE NA-C DEPARTURE RUNWAY UTILIZATION  
 Cincinnati/Northern Kentucky International Airport**

Future (2011) Baseline – Departure Runway Use										Alternative NA-C – Departure Runway Use								
Daytime (7:00 a.m. - 11:00 p.m.)										Daytime (7:00 a.m. - 10:00 p.m.)								
Runway	Ops	9	18R	18C	18R	27	36L	36C	36R	Runway	9	17	18L	18R	27	35	36L	36R
Heavy Cargo	26	0.1%	0.0%	22.5%	9.5%	52.8%	0.0%	2.7%	12.4%	Heavy Cargo	0.1%	0.0%	22.5%	9.5%	52.8%	0.0%	2.7%	12.4%
Jet	139	0.1%	0.5%	19.1%	25.2%	35.2%	0.5%	13.4%	6.0%	Jet	0.1%	0.5%	19.1%	25.2%	35.2%	0.5%	13.4%	6.0%
Jet Cargo	2	0.1%	0.1%	22.6%	23.1%	34.0%	0.1%	14.0%	6.0%	Jet Cargo	0.1%	0.1%	22.6%	23.1%	34.0%	0.1%	14.0%	6.0%
Propeller	27	0.1%	0.5%	21.1%	28.2%	30.2%	0.5%	13.4%	6.0%	Propeller	0.1%	0.5%	21.1%	28.2%	30.2%	0.5%	13.4%	6.0%
RJ/BJ	546	0.1%	0.5%	21.1%	28.2%	30.2%	0.5%	13.4%	6.0%	RJ/BJ	0.1%	0.5%	21.1%	28.2%	30.2%	0.5%	13.4%	6.0%
Night - Period 1 (11:00 p.m. - 12:00 a.m.)										Night - Period 1 (11:00 p.m. - 12:00 a.m.)								
Runway	Ops	9	18R	18C	18R	27	36L	36C	36R	Runway	9	17	18L	18R	27	35	36L	36R
Heavy Cargo	0	0.1%	0.0%	5.4%	5.4%	81.9%	0.0%	1.8%	5.4%	Heavy Cargo*	0.1%	0.0%	5.4%	5.4%	83.3%	0.0%	1.8%	4.0%
Jet	0	0.1%	0.0%	5.4%	2.0%	85.0%	0.0%	2.5%	5.0%	Jet	0.1%	0.0%	5.4%	2.0%	85.0%	0.0%	2.5%	5.0%
Jet Cargo	0	0.1%	0.0%	0.1%	18.2%	81.4%	0.0%	0.1%	0.1%	Jet Cargo	0.1%	0.0%	0.1%	18.2%	81.4%	0.0%	0.1%	0.1%
Propeller	0	0.1%	0.0%	13.8%	1.0%	79.2%	0.0%	1.0%	4.9%	Propeller	0.1%	0.0%	13.8%	1.0%	79.2%	0.0%	1.0%	4.9%
RJ/BJ	29	0.1%	0.0%	5.4%	2.2%	88.1%	0.0%	1.6%	2.6%	RJ/BJ	0.1%	0.0%	5.4%	2.2%	88.1%	0.0%	1.6%	2.6%
Night - Period 2 (12:00 a.m. - 3:00 a.m.)										Night - Period 2 (12:00 a.m. - 3:00 a.m.)								
Runway	Ops	9	18R	18C	18R	27	36L	36C	36R	Runway	9	17	18L	18R	27	35	36L	36R
Heavy Cargo	0	0.1%	0.0%	1.0%	7.9%	60.0%	0.0%	30.0%	1.0%	Heavy Cargo*	0.1%	0.0%	1.0%	7.9%	85.0%	0.0%	5.0%	1.0%
Jet	0	0.1%	0.0%	1.0%	7.9%	60.0%	0.0%	30.0%	1.0%	Jet	0.1%	0.0%	1.0%	7.9%	60.0%	0.0%	30.0%	1.0%
Jet Cargo	0	0.1%	0.0%	1.0%	7.9%	60.0%	0.0%	30.0%	1.0%	Jet Cargo	0.1%	0.0%	1.0%	7.9%	60.0%	0.0%	30.0%	1.0%
Propeller	4	0.1%	0.0%	16.0%	8.0%	60.0%	0.0%	6.9%	9.0%	Propeller	0.1%	0.0%	16.0%	8.0%	60.0%	0.0%	6.9%	9.0%
RJ/BJ	0	0.1%	0.0%	16.0%	8.0%	60.0%	0.0%	6.9%	9.0%	RJ/BJ	0.1%	0.0%	16.0%	8.0%	60.0%	0.0%	6.9%	9.0%
Night - Period 3 (3:00 a.m. - 7:00 a.m.)										Night - Period 3 (3:00 a.m. - 7:00 a.m.)								
Runway	Ops	9	18R	18C	18R	27	36L	36C	36R	Runway	9	17	18L	18R	27	35	36L	36R
Heavy Cargo	11	0.1%	0.0%	1.2%	4.8%	84.8%	0.0%	9.0%	0.1%	Heavy Cargo*	0.1%	0.0%	1.2%	4.8%	89.8%	0.0%	4.0%	0.1%
Jet	1	0.1%	0.0%	1.2%	0.9%	83.4%	0.0%	5.8%	8.7%	Jet	0.1%	0.0%	1.2%	0.9%	83.4%	0.0%	5.8%	8.7%
Jet Cargo	14	0.1%	0.0%	0.7%	1.3%	91.5%	0.0%	6.3%	0.1%	Jet Cargo	0.1%	0.0%	0.7%	1.3%	91.5%	0.0%	6.3%	0.1%
Propeller	12	0.1%	0.0%	1.2%	0.9%	83.4%	0.0%	5.8%	8.7%	Propeller	0.1%	0.0%	1.2%	0.9%	83.4%	0.0%	5.8%	8.7%
RJ/BJ	18	0.1%	0.0%	1.2%	0.9%	83.4%	0.0%	5.8%	8.7%	RJ/BJ	0.1%	0.0%	1.2%	0.9%	83.4%	0.0%	5.8%	8.7%

■ - Indicates revised runway use as compared to Future (2011) Baseline; \* Includes Boeing 767, 747-200, DC-8 aircraft.

Source: Landrum and Brown, 2006

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**Insert Exhibit F-3 Alternative NA-C Noise Exposure Contour**

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**Table F-5  
 COMPARISON OF IMPACTS FUTURE (2011) BASELINE VERSUS  
 ALTERNATIVE NA-C  
 Cincinnati/Northern Kentucky International Airport**

<b>Future (2011) Baseline Noise Incompatibility</b>				
	<b>65-70 DNL</b>	<b>70-75 DNL</b>	<b>75+ DNL</b>	<b>65+ DNL</b>
<b>Housing Units</b>				
Previously Mitigated	121	7	0	128
Newly Impacted	2	0	0	2
<b>Total</b>	<b>123</b>	<b>7</b>	<b>0</b>	<b>130</b>
<b>Population</b>				
Previously Mitigated	339	23	0	362
Newly Impacted	5	0	0	5
<b>Total</b>	<b>344</b>	<b>23</b>	<b>0</b>	<b>367</b>
<b>Area (Square Miles)</b>				
<b>Total</b>	<b>6.11</b>	<b>2.55</b>	<b>2.40</b>	<b>11.06</b>

<b>Alternative NA-C Noise Incompatibility</b>				
	<b>65-70 DNL</b>	<b>70-75 DNL</b>	<b>75+ DNL</b>	<b>65+ DNL</b>
<b>Housing Units</b>				
Previously Mitigated	119	7	0	126
Newly Impacted	1	0	0	1
<b>Total</b>	<b>120</b>	<b>7</b>	<b>0</b>	<b>127</b>
<b>Population</b>				
Previously Mitigated	334	23	3	357
Newly Impacted	3	0	0	3
<b>Total</b>	<b>337</b>	<b>23</b>	<b>3</b>	<b>360</b>
<b>Area (Square Miles)</b>				
<b>Total</b>	<b>6.11</b>	<b>2.55</b>	<b>2.49</b>	<b>11.15</b>

No noise-sensitive facilities (schools, churches, libraries, nursing homes) would be located in the 65 DNL noise contour in this alternative.

Source: Landrum and Brown, 2006

**ALTERNATIVE: NA-F**

Turbojet aircraft departing Runway 36R during the nighttime hours (10:00 p.m. to 7:00 a.m.) turn left to 330-degree heading to follow the Ohio River corridor.

**CATEGORY:**

Other Nighttime - Flight Path Location

**DESCRIPTION:**

The intent of this alternative is to direct nighttime departures to use the Ohio River corridor by turning to an approximate 330-degree heading following take-off. The existing nighttime departure procedure for Runway 36C directs aircraft to turn left and overfly the Ohio River corridor. This alternative would create a similar procedure for Runway 36R. The procedure would be used in conjunction with the existing nighttime runway use program or a revised nighttime runway use program when additional departure capacity is required on multiple runways.

The Ohio River corridor turn off of Runway 36R was tested as part of the Federal Aviation Administration (FAA) Air Traffic Control Tower (ATCT) operational tests conducted in 2004. During the construction of the Runway 27 extension, Runway 36R, in conjunction with the left turn over the Ohio River, was used heavily for nighttime cargo departures. It is anticipated that under Baseline or Alternative NA-A and NA-B conditions, the level of use of Runway 36R at night would be far less than what occurred during the testing period in the summer of 2004.

**BENEFITS:**

Alternative NA-F, when used in conjunction with Alternative NA-A, would move nighttime departures from Runway 36C to Runway 36R during certain operational conditions and turn the departing aircraft from Runway 36R northwest to intersect the existing river corridor departure track. As compared to the existing turn over the Ohio River corridor from Runway 36C, this alternative would allow aircraft to overfly the same corridor but at an increased altitude, which would reduce the noise exposure along the corridor. In addition, the first section of the turn from Runway 36R to the northwest would be over airport property before reaching residential areas.

**DRAWBACKS:**

This alternative would increase departure overflights along the new Alternative NA-F departure corridor just outside the airport property line and prior to intersecting with the existing Runway 36C departure corridor.

**EXPECTED COSTS:**

This procedure would need to be further developed and evaluated by the FAA prior to implementation. Nominal costs for modifying the ATCT Tower Order. Alternative NA-F would require environmental review prior to implementation.

**EVALUATION METHOD:**

INM modeling

**RESULTS:**

The noise contour for Alternative NA-F **increases** in total size by 0.06 square miles in comparison to the Future (2011) Baseline Noise Contour. Alternative NA-F **does not cause a change in** housing impacts in the 65 Day-Night Average Sound Level (DNL). Between the 60–65 DNL noise contour, housing impacts would **increase** from 2,270 in the Future (2011) Baseline noise contour to 2,318 homes with Alternative NA-F by itself. However Alternative NA-F would only be implemented in conjunction with Alternative NA-A, which would reduce the number of housing units between the 60-65 DNL from 2,270 homes in the Future (2011) Baseline Noise Contour to 2,215 homes.

**RECOMMENDATION:**

Recommended for inclusion in the Noise Compatibility Program in conjunction with Alternative NA-A.

**Table F-6**  
**COMPARISON OF IMPACTS FUTURE (2011) BASELINE VERSUS**  
**ALTERNATIVE NA-F**  
**Cincinnati/Northern Kentucky International Airport**

<b>Future (2011) Baseline Noise Incompatibility</b>				
	<b>65-70 DNL</b>	<b>70-75 DNL</b>	<b>75+ DNL</b>	<b>65+ DNL</b>
<b>Housing Units</b>				
Previously Mitigated	121	7	0	128
Newly Impacted	2	0	0	2
<b>Total</b>	<b>123</b>	<b>7</b>	<b>0</b>	<b>130</b>
<b>Population</b>				
Previously Mitigated	339	23	0	362
Newly Impacted	5	0	0	5
<b>Total</b>	<b>344</b>	<b>23</b>	<b>0</b>	<b>367</b>
<b>Area (Square Miles)</b>				
<b>Total</b>	<b>6.11</b>	<b>2.55</b>	<b>2.40</b>	<b>11.06</b>

<b>Alternative NA-F Noise Incompatibility</b>				
	<b>65-70 DNL</b>	<b>70-75 DNL</b>	<b>75+ DNL</b>	<b>65+ DNL</b>
<b>Housing Units</b>				
Previously Mitigated	121	7	0	128
Newly Impacted	2	0	0	2
<b>Total</b>	<b>123</b>	<b>7</b>	<b>0</b>	<b>130</b>
<b>Population</b>				
Previously Mitigated	339	23	0	362
Newly Impacted	5	0	0	5
<b>Total</b>	<b>344</b>	<b>23</b>	<b>0</b>	<b>367</b>
<b>Area (Square Miles)</b>				
<b>Total</b>	<b>6.46</b>	<b>2.60</b>	<b>2.51</b>	<b>11.57</b>

No noise-sensitive facilities (schools, churches, libraries, nursing homes) would be located in the 65 DNL noise contour in this alternative.

Source: Landrum and Brown, 2006



# Alternative NA-F Noise Exposure Contour

## LEGEND

- Alternative NA-F 65+ DNL Noise Exposure Contour
- Future (2011) Baseline 65 DNL Noise Exposure Contour
- Church
- School
- Nursing Home
- Hospital
- Library

- Runway Centerlines
- Airport Property
- Park
- Jurisdictional Boundary
- County Boundary
- State Line

### Generalized Existing Land Use Hamilton, Boone, Kenton Counties

- Single-Family
- Multi-Family/Mobile Home Park
- Commercial/Industrial
- Institutional
- Agricultural/Open Space
- Transportation



Landrum & Brown

12/13/06  
 Prepared by Landrum & Brown  
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 Contour-na-f revised.dxf

EXHIBIT F-3

