5 2014 AND 2019 NOISE EXPOSURE MAPS WITH EXISTING NOISE COMPATIBILITY PROGRAM

The fundamental noise elements of an Noise Exposure Map are DNL contours for existing and forecast conditions (2014 and 2019 in this update), presented over base maps depicting the airport layout, local land use control jurisdictions, major land use categories, discrete noise-sensitive "receptors," and other information required by Part 150.

Since this submission includes an update to the CAK Noise Compatibility Program, it also includes two sets of Noise Exposure Map graphics:

- Pursuant to Part 150 §150.21, Section 5.1 presents 2014 and 2019 Noise Exposure Maps with no change in the existing Noise Compatibility Program; i.e., based on the operational assumptions summarized in Section 4.
- Pursuant to Part 150 §150.23, Section 10.6 presents 2014 and 2019 Noise Exposure Maps assuming implementation of the revised Noise Compatibility Program, which Section 10 presents.

Section 5.1 presents the Noise Exposure Map graphics with the existing Noise Compatibility Program. Section 5.2 presents the associated land use compatibility statistics. Section 5.3 compares the modeled DNL for 2014 and 2019 to the measured DNL at the six monitoring locations visited in the noise measurement program. Section 5.4 compares the 65 dB DNL contours for the 2014 Noise Exposure Map with the existing Noise Compatibility Program to the forecast contours from the prior Part 150 and from a 2004 environmental assessment (EA) related to the extension of Runway 5/23.

5.1 2014 and 2019 Noise Exposure Map Graphics with Existing Noise Compatibility Program

Figure 36 presents the existing conditions Noise Exposure Map for 2014 operations with the existing Noise Compatibility Program. Figure 37 presents the five-year forecast conditions Noise Exposure Map for 2019 operations with the existing Noise Compatibility Program. *These are the official Noise Exposure Maps that the Authority is submitting under Part 150 for appropriate FAA review and determination of compliance, pursuant to §150.21(c), pending FAA decision making regarding the revisions to the Noise Compatibility Program, which Section 10 presents.*

These two figures contain all graphical elements that Part 150 requires be depicted on Noise Exposure Maps, with the exception of flight tracks, which Part 150 permits airports to submit in supplemental graphics.[27] Section 4.7.1 presents and discusses those supplemental graphics.

As noted in item IV.D of the checklist, Part 150 requires that Noise Exposure Maps depict the 65, 70, and 75 DNL noise contours. For informational purposes only, the figures also include the 60 DNL noise contour, using a dashed line.

5.2 Land Use Compatibility within 2014 and 2019 Noise Exposure Maps with Existing Noise Compatibility Program

As discussed in Section 2.4, CAK and local land use control jurisdictions have adopted Part 150 land use compatibility guidelines. Table 3 presents those guidelines. As stated in the table, FAA

[27] As noted in item IV.E of the Noise Exposure Map checklist, presented in Table 1 of this document.

considers all land uses compatible outside of 65 dB DNL. As shown in Figures 36 and 37, the 65 dB DNL contours for both 2014 and 2019 only extend off airport property in two very limited areas:

- Immediately east of the Runway 19 landing threshold the contour extends over a parcel zoned for "manufacturing and production." A recreational vehicle sales and distribution business is currently developing the parcel. This is a compatible land use. The parcel is in Green Township.
- The southwestern tip of the 65 dB DNL contour under the approach to Runway 5 touches a parcel zoned for "manufacturing and production." A sand and gravel operation currently uses the parcel as a maintenance facility. This is a compatible land use. In addition, as shown on the figure, the Authority has an avigation easement over the parcel. This parcel is in Jackson Township.

The contours and land use data clearly illustrate that within the 65 dB DNL Noise Exposure Map contours for either 2014 or 2019:[28]

- There are no residents.
- There is no noncompatible land use.
- There are no noise sensitive public buildings or other discrete "sensitive receptors" (e.g., schools, health care places of worship, facilities, or properties on or eligible for inclusion on the National Register for Historic Preservation).

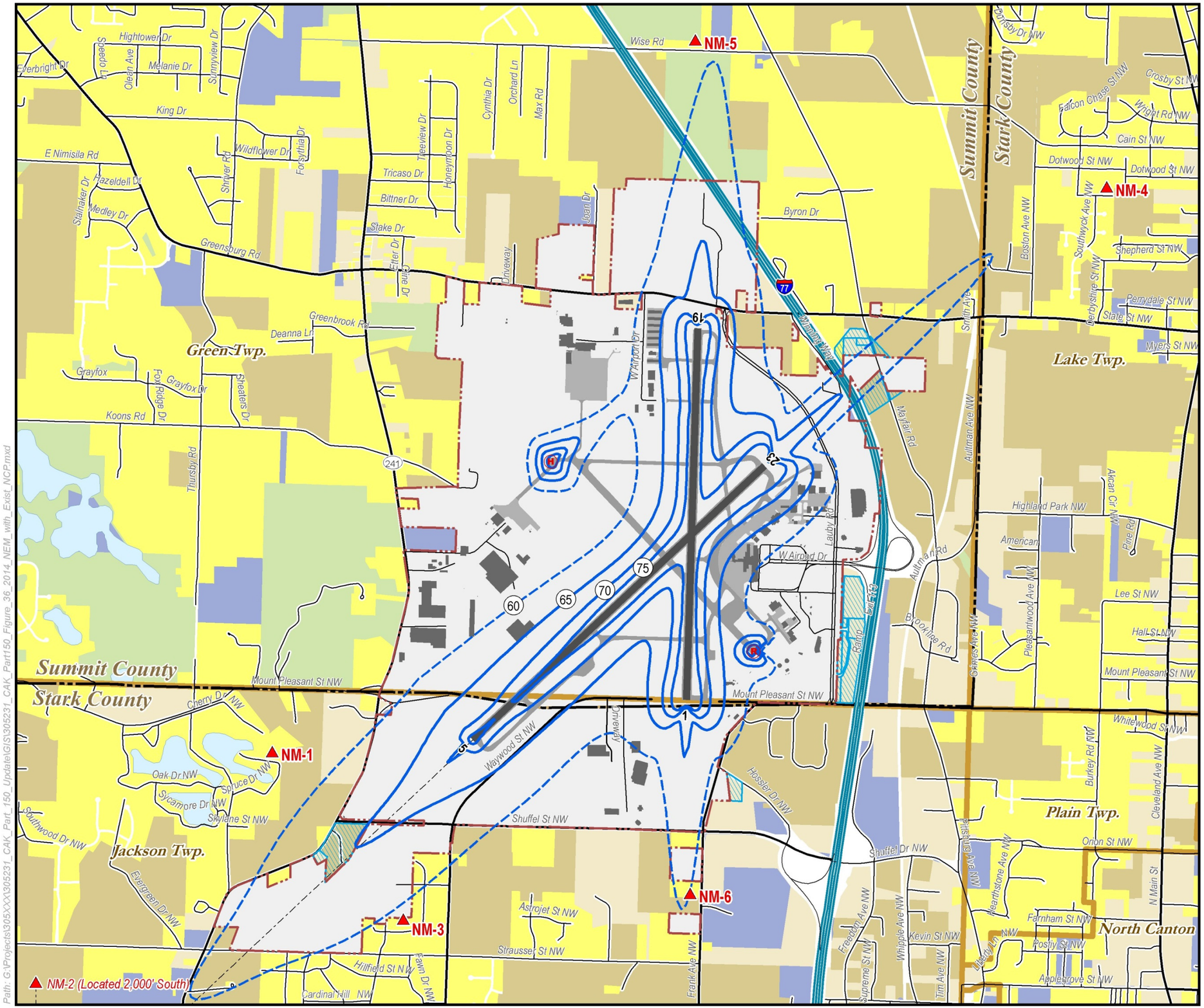
In summary, within the official Noise Exposure Map contours for either 2014 or 2019 there are no noncompatible land uses, noise-sensitive buildings, residents, or other properties that Part 150 requires be identified for compatibility purposes

The Advisory Committee requested that the Noise Exposure Map figures depict the 60 dB DNL contours, *for informational purposes only*. Those contours extend off airport property over residential land uses. *Also for informational purposes only,* Table 14 presents the numbers of residents and dwelling units within the 60 to 65 dB DNL contour interval for 2014 and 2019, broken down by runway end. The Part 150 Advisory Committee requested this information for consideration in the noise abatement analyses discussed in Section 7.

Table 14 Residential Land Use within 2014 and 2019 60 to 65 dB DNL Contour Interval by Runway End
Source: HMMH, 2014

Year	Metric	North – off Runway 19 approach / Runway 1 departure end	Northeast – off Runway 23 approach / Runway 5 departure end	South – off Runway 1 approach / Runway 19 departure end	Southwest – off Runway 5 approach / Runway 23 departure end	TOTAL
2014	Residents	0	2	4	56	62
	Dwelling Units	0	1	2	24	27
2019	Residents	0	3	4	31	38
	Dwelling Units	0	1	2	15	18

[28] Part 150 §A150.101(e) requires that the Noise Exposure Maps depict these categories of noncompatible or noise sensitive land uses within the 65, 70, and 75 DNL contours.



AKRON-CANTON AIRPORT

Figure 36
2014 Noise Exposure Map with Existing Noise Compatibility Program
14 CFR Part 150 Update

- 2014 DNL Contour (65-75 dB)
- 2014 DNL Contour (60 dB, for informational purposes only)
- Airport Property Boundary
- Avigation Easement
- Airport Runway
- NM-# Portable Noise Monitoring Sites
- (H) OANG Helipad
- (R) Designated Runup Location
- County Boundary
- Township Boundary

Land Use (Actual use, or zoned use where undeveloped.)

- Residential Use
- Public Use
- Commercial Use
- Manufacturing and Production
- Recreational and Open Space

- Interstate Highways
- Primary Roads
- Local Roads
- Water Bodies

Notes:
Part 150 Sec. A150.101, Table 1 presents FAA land use compatibility guidelines as a function of yearly DNL. Under those guidelines, all land uses are considered compatible with noise exposure outside 65 DNL.

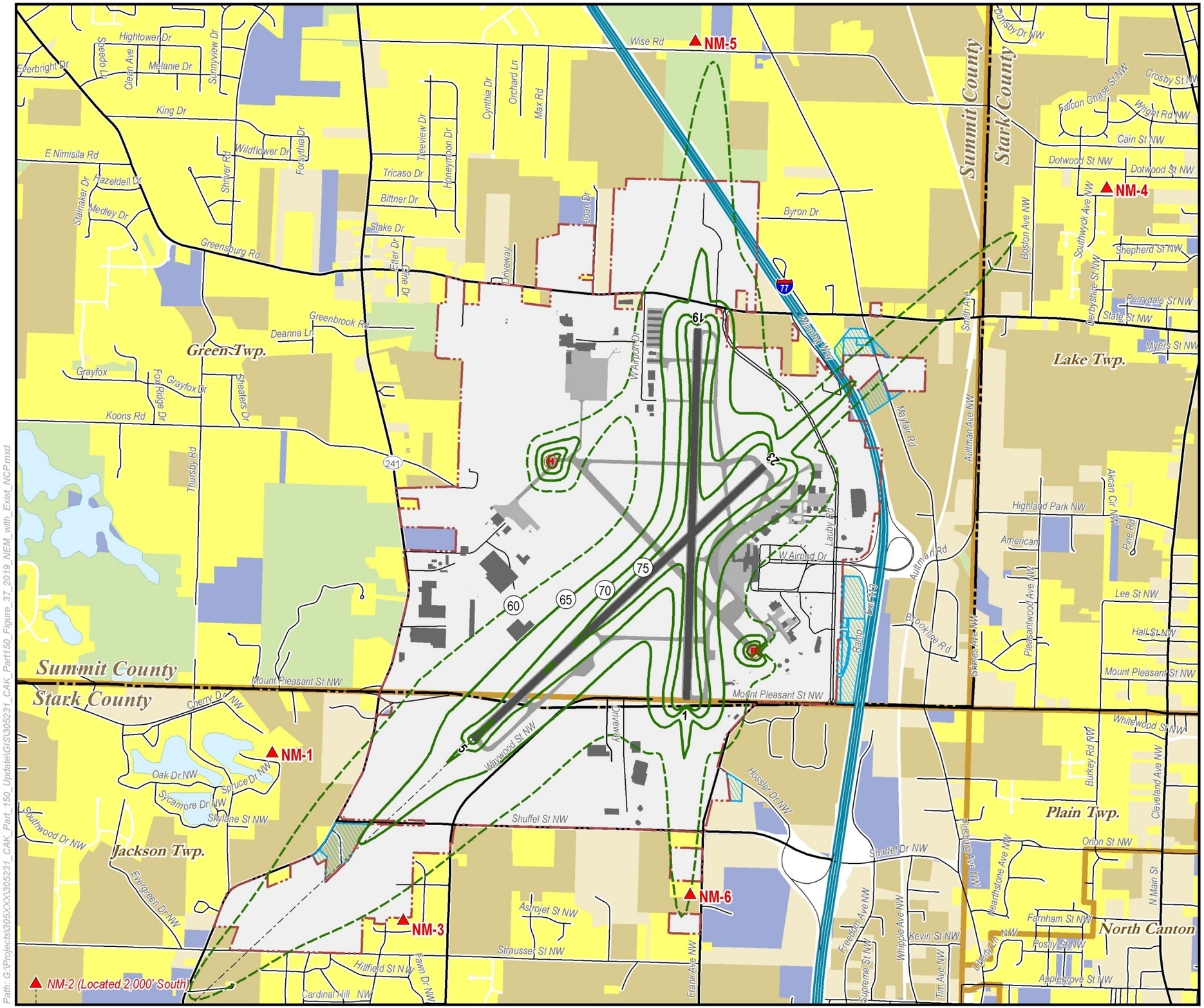
Portable Noise Monitoring Site NM-2 (Not Shown) is located southwest 11,327' along runway 5 extended centerline, offset northwest 1,031'

North

0 2,000 4,000 Feet

HARRIS MILLER MILLER & HANSON INC.

Page intentionally left blank.



AKRON-CANTON AIRPORT

Figure 37
2019 Noise Exposure Map with Existing Noise Compatibility Program
14 CFR Part 150 Update

- 2019 DNL Contour (65-75 dB)
- 2019 DNL Contour (60 dB, for informational purposes only)
- Airport Property Boundary
- Avigation Easement
- Airport Runway
- NM-# Portable Noise Monitoring Sites
- (H) OANG Helipad
- (R) Designated Runup Location
- County Boundary
- Township Boundary

Land Use (Actual use, or zoned use where undeveloped.)

- Residential Use
- Public Use
- Commercial Use
- Manufacturing and Production
- Recreational and Open Space

- Interstate Highways
- Primary Roads
- Local Roads
- Water Bodies

Notes:
Part 150 Sec. A150.101, Table 1 presents FAA land use compatibility guidelines as a function of yearly DNL. Under those guidelines, all land uses are considered compatible with noise exposure outside 65 DNL.

Portable Noise Monitoring Site NM-2 (Not Shown) is located southwest 11,327' along runway 5 extended centerline, offset northwest 1,031'

North

0 2,000 4,000 Feet

HARRIS MILLER MILLER & HANSON INC.

Page intentionally left blank.

5.3 Comparison of Measured and Modeled Noise Exposure

Table 15 presents the modeled DNL for annual average day activity in 2014 and 2019 at the six monitoring locations visited during the June 2013 portable noise measurement program, compared to overall measured DNL at those sites.[29] The table also identifies the numbers of hours of measurements conducted at each location, to assist in placing the measured and modeled values in perspective, and reports the difference between the 2014 measured and modeled results. The Noise Exposure Maps depict the measurement locations.

Table 15 Comparison of 2014 and 2019 Modeled DNL to Measurements at Six Portable Monitoring Sites
Source: HMMH, June 2013 (Measured) and January 2014 (Modeled)

Site	Overall DNL Measured at Site	Hours of Measurements at Site	Annual Average Day Modeled DNL		2014 Difference (Measured Minus Modeled)
			2014	2019	
1	57	159	56	56	1 dB
2	52	66	56	56	-4 dB
3	54	141	59	59	-5 dB
4	54	74	55	56	-1 dB
5	64	26	59	59	5 dB
6	59	27	60	60	-1 dB

The measured and modeled results agree very well within expected and commonly observed tolerances, particularly taking into consideration factors such as:

- Measurement durations were relatively short compared to the annual period of the modeled estimates.
- The modeling was for forecast annual 2014 and 2019 operations, not the operations that occurred during the specific measurement periods at each site.
- The measurements do not reflect annual-average-day runway use, fleet mix, and other operating conditions.
- To the extent feasible, measurements were conducted at each site on days when the runway(s) that most affect the site were in use.
- The measurements include non-aircraft noise exposure.
- Both the measurements and noise model involve some inherent technical accuracy tolerances.[30]

Specific site-by-site comparisons are summarized below.

[29] Section 3 presents the full discussion of the measurement program and results.

[30] The measurements were conducted using noise monitors that meet American National Standards Institute (ANSI) S1.4-1983 standards for Type I "precision" sound level meters (SLMs), which must meet a ± 1.5 dB end-to-end accuracy tolerance requirement. These monitors exceed the Part 150 requirement for the use of Type 2 "survey" SLMs, for which the end-to-end accuracy tolerance is ± 2.3 dB. However, even the higher accuracy monitors used in the measurements may contribute as much as 1.5 dB to the differences between measured and modeled results. The FAA does not provide an official statement of the accuracy of the Integrated Noise Model, which it requires airports to use in preparing noise contours. However, long-term studies show that when it is applied carefully, DNL estimates generally differ from measurements by two decibels or less.

Site 1: 95 Spruce Dr. NW

The excellent (one-decibel) agreement between the measured DNL (57 dB) and that modeled for 2014 (56 dB) can be attributed to a number of factors, principally including: (1) the site had the longest measurement duration, (2) measurements included periods of activity on Runway 1, 5, and 23, providing a diverse range of aircraft exposure, and (3) operations on Runways 5 and 23, which have the most effect at the site, occurred on five of the six days of measurement (with the most important Runway 23 operations on all or part of four days). It is not surprising that the measured level is slightly higher than the modeled level, given that: (1) the site was deliberately visited during a period when Runway 23 operations were expected, (2) it rained for some time during the measurements, and (3) the measurements included at least a modest amount of non-aircraft noise.

Site 2: 7601 Pine Ridge St. NW

The measured DNL at Site 2 (52 dB) is approximately four decibels below the 2014 modeled level (56 dB). This is a reasonable difference, particularly given that the measured DNL reflects only the operations that occurred during the two-plus day site visit, whereas the modeled DNL reflects annual average day conditions. Runway 23 departures and Runway 5 arrivals are the primary operations affecting the site. While the former activity occurred during slightly more than two days of measurements, the only other activity was approximately a half day of Runway 1 operations, which have a negligible effect at the site. It is not surprising that the modeled exposure is higher, in particular because the modeling reflects the effect of Runway 5 arrivals directly over the site, which did not occur during the measurements.

Site 3: 6167 Redford Rd. NW

The measured DNL at this site (54 dB) is approximately five decibels below the 2014 modeled level (59 dB), While the measurement duration was the second longest after Site 1, the runway use during the measurements differed from the annual average; that was likely a major factor contributing to the difference. For example, Runway 5 operations occurred for less than one day over the six days of measurements. These operations are important at this site because it is close to the Runway 5 landing threshold, where landings are low and concentrated. Normal day-to-day variation in flight track geometry, aircraft fleet mix, and the day-night split of operations were likely contributing factors as well.

Site 4: 3527 Northgate St. NW

The measured DNL at this site (54 dB) is one decibel less than the 2014 modeled level (55 dB). Three factors likely contributed to this excellent level of agreement. First, the measurements covered a relatively long three-day period. Second, operations occurring during the session included use of Runways 1, 5, and 23. Third, the measurement session included approximately two full days of Runway 23 arrivals and one full day of Runway 5 departures, which are the first and second most important activity types affecting the site.

Site 5: 2475 Wise Rd. NW

The measured DNL at this site (64 dB) is five decibels more than the modeled level (59 dB). The major factor leading to this difference is the fact that the monitor was deliberately installed at the site starting on a day when Runway 1 was the primary runway in use, since Runway 1 departures pass close to or directly over the site. Operations shifted to primarily Runway 23 on the second day of monitoring. Contours prepared for a hypothetical day when all operations are on Runway 1 result in an estimated DNL of approximately 63 dB, essentially identical to the 64 dB DNL measured at the

site. Page K-76 of Appendix K (the 19th page of the PowerPoint presentation for the fourth Advisory Committee meeting) presents these contours.[31]

As discussed Section 3.4.7, an MD-88 departure on Runway 1 during the hour starting at 5 p.m. on June 3 resulted in the highest aircraft noise level measured at any site during the measurements. That single operation was loud enough that it would have created an overall DNL on the day of measurements of approximately 56 dB, even if it had been the only aircraft noise on the entire day. A Runway 1 departure in that unusually noisy aircraft type occurs than once every eight days in the 2014 forecast. That 2019 forecast does not include any operations in that aircraft type.

Given the effects of the unusual operation, runway use, and non-aircraft sources, the difference between measured and modeled levels are reasonable. The short measurement duration at this site supports means that its primary value is for the information on single event and hourly levels, rather than cumulative exposure.

Site 6: 7979 Frank Ave., NW

The measured DNL (59 dB) at this site agrees well with the level modeled for 2014 (60 dB). However, given the relatively short measurement duration at this site (27 hours) this agreement should not be given a high degree of significance.

5.4 Comparison of 65 dB DNL Contours for 2014 NEM with Existing NCP to Forecast Cases from Prior Part 150 and 2004 EA

In response to an Advisory Committee request, Figure 38 compares 65 dB DNL contours for four cases: (1) the 2014 Noise Exposure Map with the existing Noise Compatibility Program, (2) the 1999 five-year forecast case from the 1997 Part 150, and (3) and (4) the 2015 no-action and proposed-action alternatives from a 2004 environmental assessment for extension of Runway 5/23.[32] The figure presents only the 65 dB DNL contours to reduce clutter and because this is the outermost contour that is common to all four cases.

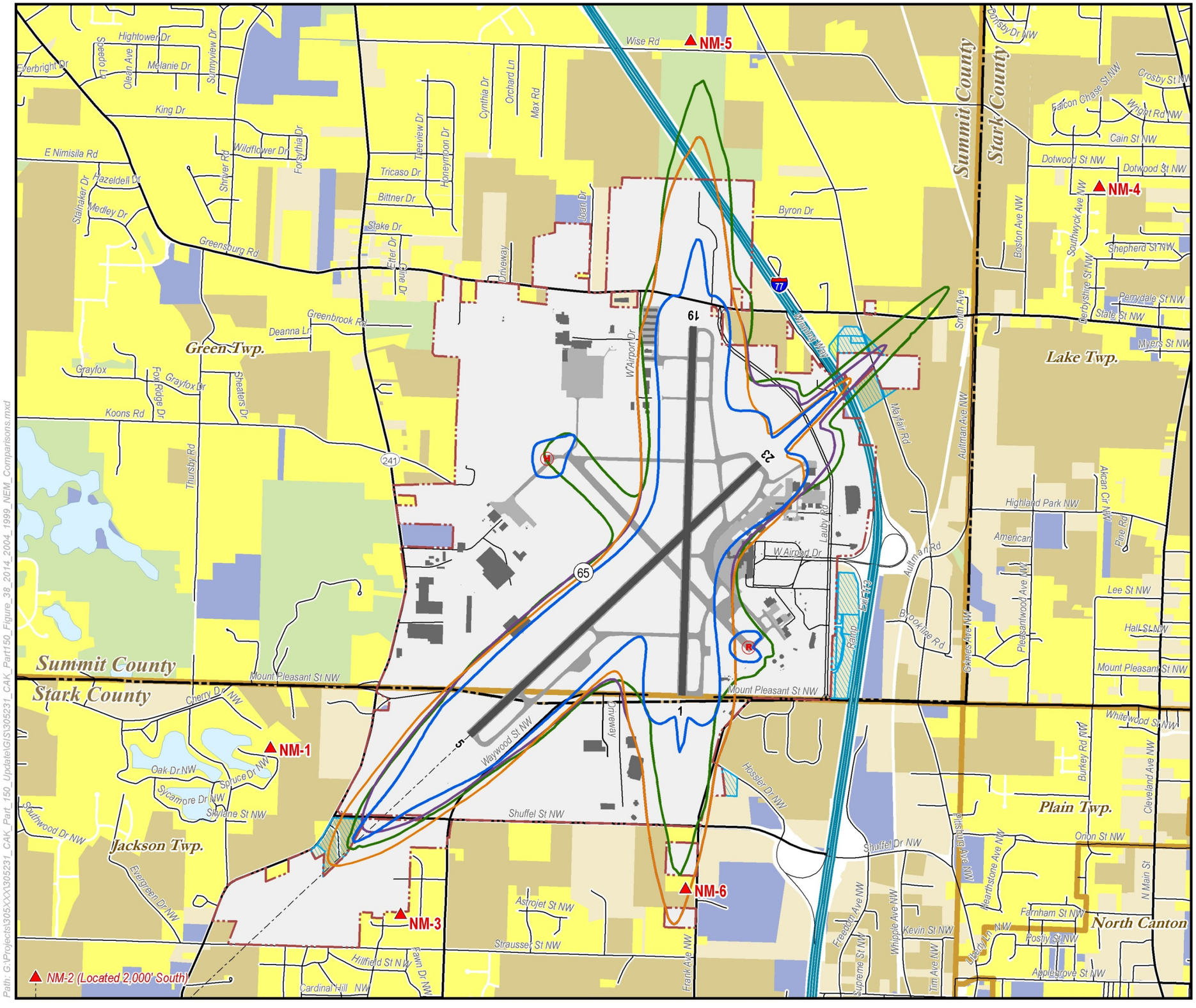
The differences in the contours result from several factors. The most important factors are differences in the modeling inputs associated with airport layout and operations; e.g., the runway configuration, level and mix of aircraft activity, runway use, flight track geometry and use, etc. The 2014 existing conditions contour includes the effect of OANG helicopter operations on the west side of the airport and maintenance runup activity on the east, which do not appear to have ben modeled in the other studies, at least to the current study's level of precision.

There also are technical factors affecting the contour comparisons. The current study reflects the most extensive use of actual radar data to develop these modeling inputs. It also reflects the use of the most up-to-date version of the INM and its most extensive database.

[31] That presentation responded to a previous Advisory Committee request for contours representing hypothetical days in which all operations were on each of the four runways.

[32] The EA contours are the most recently prepared prior to this study.

Page intentionally left blank.



Path: G:\Projects\305XXX\305231_CAK_Part_150_Update\GIS\305231_CAK_Part150_Figure_38_2014_2004_1999_NEM_Comparisons.mxd

AKRON-CANTON AIRPORT

Figure 38
Comparison of 65 dB DNL Contours for 2014 NEM with Existing NCP to Forecast Cases from Prior Part 150 and 2004 EA
14 CFR Part 150 Update

- 2014 DNL Contour (65 dB)
- 2004 Proposed Action DNL Contour (65 dB)
- 2004 No Action DNL Contour (65 dB)
- 1999 DNL Contour (65 dB)
- Airport Property Boundary
- Avigation Easement
- Airport Runway
- NM-# Portable Noise Monitoring Sites
- OANG Helipad
- Designated Runup Location
- County Boundary
- Township Boundary

Land Use (Actual use, or zoned use where undeveloped.)

- Residential Use
- Public Use
- Commercial Use
- Manufacturing and Production
- Recreational and Open Space
- Interstate Highways
- Primary Roads
- Local Roads
- Water Bodies

Notes:
Part 150 Sec. A150.101, Table 1 presents FAA land use compatibility guidelines as a function of yearly DNL. Under those guidelines, all land uses are considered compatible with noise exposure outside 65 DNL.

Portable Noise Monitoring Site NM-2 (Not Shown) is located southwest 11,327' along runway 5 extended centerline, offset northwest 1,031'

North

0 2,000 4,000 Feet

HARRIS MILLER MILLER & HANSON INC.

Page intentionally left blank.