NFTA

Buffalo Niagara International Airport

Noise Exposure Map Update

April 2011

Draft

McFarland Johnson

49 Court Street, Metrocenter | Binghamton, NY 13901

Table of Contents

1.0 Introduction ... 1
1.1 Airport Description ... 1
1.2 FAR Part 150 and Land Use Compatibility at BNIA ... 1
1.3 Methodology ... 3
2.0 Existing Conditions ... 5
2.1 Fleet Mix ... 6
2.2 Substitute Aircraft ... 8
2.3 Daytime vs. Nighttime Operations ... 8
2.4 Runway End Utilization ... 9
2.5 Flight Tracks ... 10
2.6 Touch and Go Operations ... 13
2.7 Takeoff Profiles & Stage Lengths ... 13
2.8 2008 Noise Exposure Map Results ... 14
3.0 Future Conditions ... 19
3.1 Enplanement Forecasts ... 19
3.2 Operations Forecasts ... 20
3.3 Other Operational Characteristics ... 23
3.4 Projected 2013 Noise Exposure Map Output ... 23
3.5 Changes to Airport Noise Overlay Zoning Districts ... 28
4.0 Conclusion ... 31

List of Tables

1. Operations by Aircraft Group - 2008 ... 5
2. 2008 Actual Aircraft Fleet Mix and Operations ... 6
3. Substitute Aircraft ... 8
4. Daytime Runway Utilization - 2008 ... 10
5. Nighttime Runway Utilization - 2008 ... 10
6. Stage Length ... 13
7. Typical Outdoor Day-Night Noise Levels ... 14
8. Difference Between Noise Contours ... 16
9. Enplanement Forecasts – 2009 – 2013 ... 20
10. Airline Operations Forecast ... 21

11. Operations by Aircraft Group – 2013 21

12. 2013 Projected Aircraft Fleet Mix and Operations 22

13. Difference Between Noise Contours 26

14. Sound Insulation Improvements (Designed or Constructed) 26

15. Compatible uses in airport noise overlay districts 29

List of Figures

1. Location Map 2

2. Land Use Map 4

3. Approach Tracks 11

4. Departure Tracks 12

5. Actual (2008) Noise Exposure Map 15

6. Actual (2008) Noise Exposure Map with Land Use 17

7. Projected (2008) vs. Actual (2008) Noise Exposure Map 18

8. Future (2013) Noise Exposure Map 24

9. Future (2013) Noise Exposure Map & Affected Land Uses 25

10. Noise Exposure Map Comparison 27

11. Proposed Noise Overlay Zoning Districts 30

Appendices

Appendix A Agency Correspondence

Appendix B Land Use Compatibility With Yearly Day-Night Average Sound Levels

Appendix C Detailed Scenario Run Input Reports

1.0 Introduction

The purpose of this analysis is to prepare updated Noise Exposure Maps (NEMs) for the Buffalo Niagara International Airport (BNIA). This update of the NEMs for BNIA includes the creation of NEMs for existing (2008) and future (2013) operations at the Airport. Land use has also been considered for parcels that are located within close proximity of BNIA.

BNIA is a public use airport located in Cheektowaga, New York. This noise study update was completed using FAA's Integrated Noise Model (INM) Version 7.0b. Data to create the updated NEMs was obtained from the Niagara Frontier Transportation Authority (NFTA) and airport management. Additional information was obtained from the Federal Aviation Administration's (FAA) New York Airports District Office (NYADO), the Fixed Base Operator (FBO), Prior Aviation, Mercy Flight, and the Buffalo Air Traffic Control Tower (ATCT). In addition, records including FAA Terminal Area Forecasts (TAF), ATCT monthly operation counts, the 2003 Federal Aviation Regulation (FAR) Part 150 Study, and airline schedules were utilized to fully understand the fleet mix and operations schedule at BNIA. The NEMs for BNIA have been prepared in accordance with FAA guidelines per 14 CFR 150, *Airport Noise Compatibility Planning.*

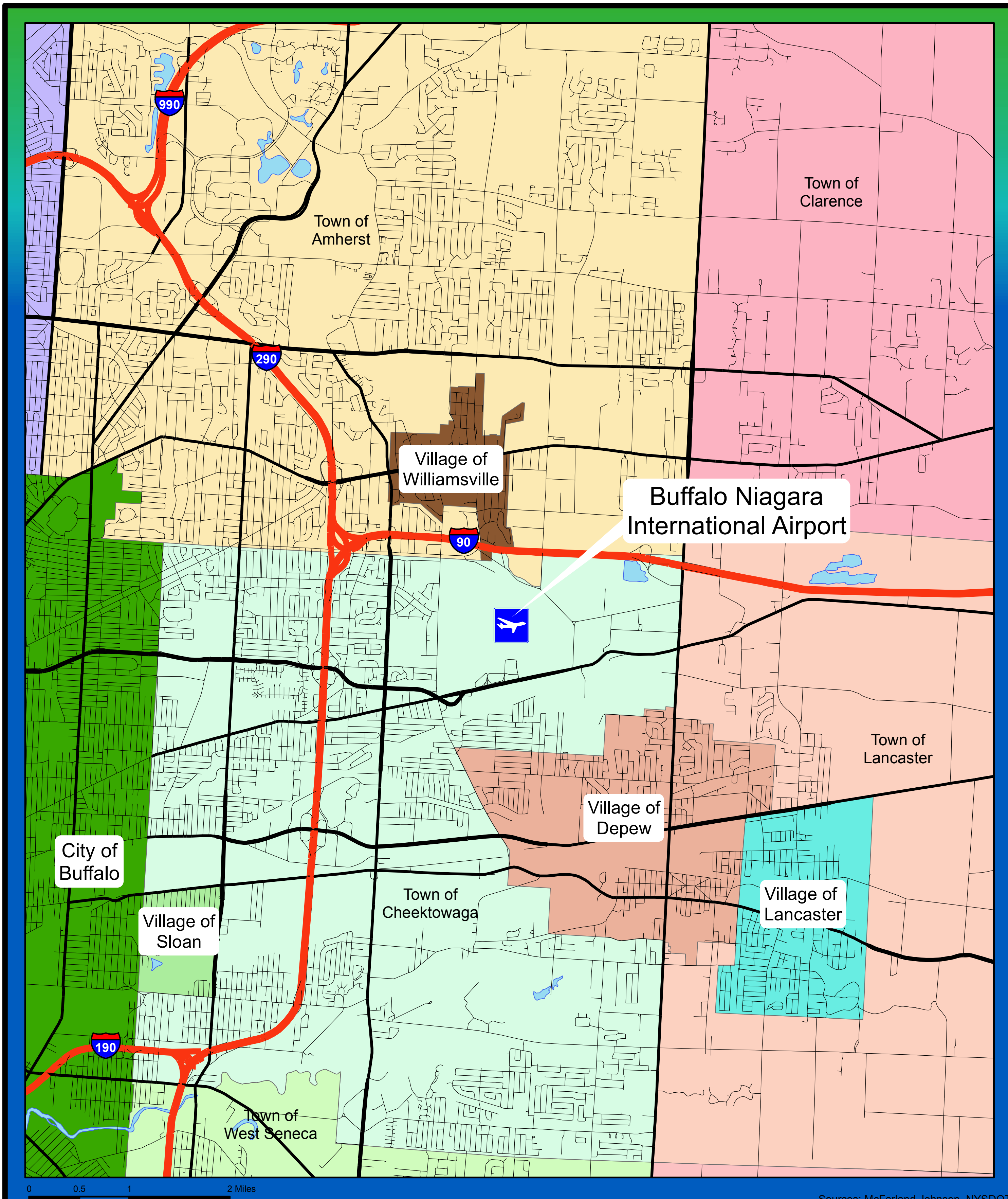
1.1 Airport Description

BNIA is located approximately five miles northeast of the City of Buffalo. Major highways in the vicinity of the airport include Interstate 90 (the New York State Thruway) adjacent to the Runway 23 end, as well as Interstate 290 and State Route 33 (Kensington Expressway). The Airport is located approximately five miles north of the Buffalo Airfield, six miles west of the Buffalo-Lancaster Regional Airport, and 15 miles southeast of the Niagara Falls International Airport. The area surrounding BNIA is displayed in **Figure 1**. BNIA is categorized in the National Plan of Integrated Airport Systems (NPIAS) as a Commercial Service-Medium Hub airport as a result of the number of annual enplanements.

BNIA contains two runways. Runway 5-23 is oriented in a southwest to northeast direction and measures 8,827' in length and 150' in width. Runway 14-32 is oriented in an east southeast to west northwest direction and measures 7,161' in length by 150' in width. The passenger terminal at the airport is located south of the runway intersection, while the cargo apron and associated uses are located to the west of the intersection. The Airport, and the ATCT, is open for operations 24 hours daily.

1.2 FAR Part 150 and Land Use Compatibility at BNIA

FAR Part 150 is a federal program that airports can voluntarily participate in to study land use compatibility with neighboring parcels and noise impacts caused by the



NOISE EXPOSURE MAP UPDATE

LOCATION MAP

Legend

- Interstate Highway
- Major Road
- Local Road

N
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FIGURE
1

NFTA
Niagara Frontier Transportation Authority
Serving Buffalo Niagara

BUFFALO NIAGARA INTERNATIONAL AIRPORT

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Date: APRIL 2011

K:\NFTAT-1734501 BNIA Noise\-3 Draw\GIS\Final\Location Fig 1.mxd

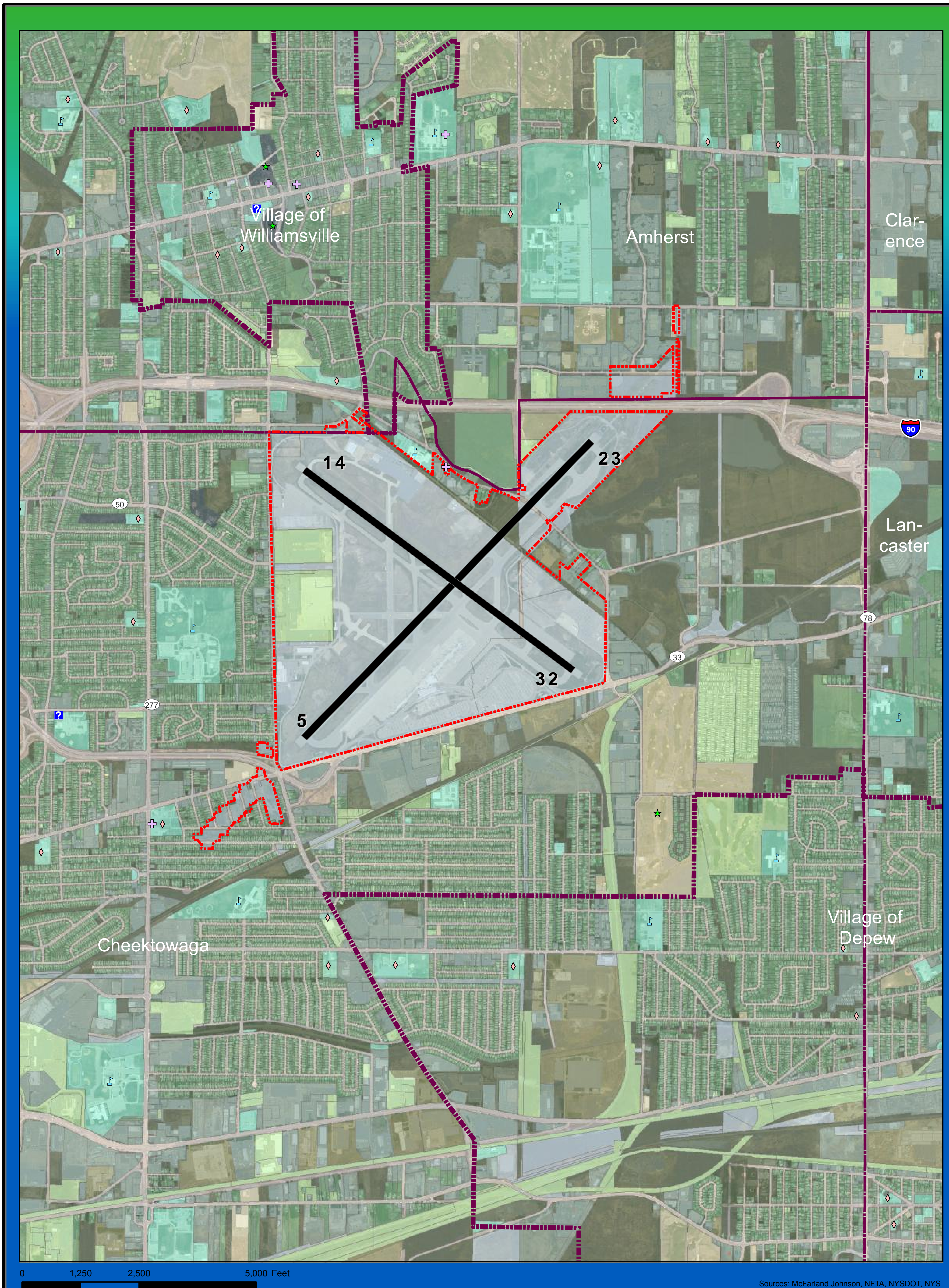
Airport. The results of a Part 150 study typically include the development of NEMs and a Noise Compatibility Program (NCP). A result of the 2003 Part 150 Study established the BNIA Noise Compatibility Program, formally known as QuieterHome Buffalo. QuieterHome Buffalo provides sound and noise insulation for residential properties as part of the NCP. Land uses surrounding BNIA are depicted in **Figure 2**. Since 2003, sound attenuation has been achieved through the construction of noise mitigation at residential households off the ends of Runway 5-23, southwest and northeast of the Airport. In addition, the construction of noise mitigation has occurred at the Maryvale Primary School, off the Runway 5 end.

1.3 Methodology

The FAA's Office of Environment and Energy (OEE) developed the INM for evaluating aircraft noise impacts in the vicinity of airports. The most recent version of INM is Version 7.0b, which was released in September 2009 and is utilized in this study. INM is designed to estimate noise impacts for the existing environment, long-term conditions, or proposed airport changes. The model can assess alterations in noise impacts resulting from changes in aircraft operations or fleet mix, or new development such as runway extensions or alterations in flight tracks. An airport's physical and operational characteristics are entered into INM and noise contours and detailed noise reports are produced. The physical characteristics that are entered into INM include runway configuration, runway end points, and airport elevation. Operational characteristics include the airport fleet mix, the number of arrival, departure, and touch-and-go operations for each type of aircraft, and runway usage.

Once data is entered into the INM, cumulative aircraft noise at ground levels are calculated and expressed in decibels (dB) using the yearly average day-night sound level (DNL). Decibels are measured in A-weighted units, which approximate the range of human hearing. Through the use of DNL, INM uses an average noise level to determine noise impacts and is designed to estimate long-term conditions.

Operations entered into the INM model are divided into daytime or nighttime operations. Nighttime operations are defined in FAR Part 150 as occurring between the hours of 10:00pm and 6:59am. Operations that occur during the defined nighttime hours are penalized an additional 10 dB due to the increased annoyance of operations during these hours on nearby residents.



NOISE EXPOSURE MAP UPDATE

LAND USE MAP

Legend

Landmarks
- Church
- Historic Register
- Library
- Park
- School

Tax Parcel Land Use
- Agricultural
- Residential
- Vacant Land
- Commercial
- Recreation & Entertainment
- Community Services
- Industrial
- Public Services
- Parks & Conservation Areas
- Other
- Municipal Boundaries
- Airport Property

N W E S

NFTA Niagara Frontier Transportation Authority Serving Buffalo Niagara

BUFFALO NIAGARA INTERNATIONAL AIRPORT

FIGURE

2

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Date: APRIL 2011

K:\NFTA\T-1734501 BNIA Noise\-3 Draw\GIS\Final\Land Use - Fig 2.mxd

2.0 Existing Conditions

To determine existing conditions at BNIA, a full calendar year of data was utilized. The most recent calendar year available at the start of this study was 2008. Data for existing conditions at the Airport was obtained from a variety of sources. NFTA provided a monthly commercial air carrier schedule which included operating days, time of departure or arrival, destination or origin airport, and aircraft type. Monthly data for commercial air carrier arrivals and departures was combined and a daily average was determined by dividing the total number of annual operations by 366, as 2008 was a leap year and included an extra day of operations. Operations data for cargo aircraft were also obtained by NFTA through interviews with the cargo operators at the Airport. Cargo operations at BNIA were completed by UPS, FedEx, DHL, and Business Air (AirNow) in 2008. Military operations were determined based on operations counts received by the ATCT. In addition, fleet mix was also provided by the ATCT.

General aviation operations at BNIA were determined based on NFTA interviews with Prior Aviation as well as ATCT counts. As a result, it was determined that 35% of the general aviation operations at BNIA were completed by single-engine aircraft, 45% of the operations were completed by business jets, and 20% were completed by twin-engine aircraft. In addition, operations completed utilizing the newly constructed helipad at BNIA have also been analyzed in this study. The number of helipad operations was determined based on data provided by Mercy Flight, the primary user and operator of the helipad.

The noise analysis considered 136,979 operations in 2008. The number of annual operations utilized in this study was based on the total number of operations by month for the 2008 calendar year. **Table 1** provides a breakdown of daily and annual operations at BNIA by aircraft grouping.

TABLE 1: OPERATIONS BY AIRCRAFT GROUP - 2008

AIRCRAFT GROUP	AVERAGE DAILY OPERATIONS	TOTAL ANNUAL OPERATIONS	PERCENT OF TOTAL ANNUAL OPERATIONS
Commercial Passenger	213	77,984	57%
Commercial Cargo	15	5,319	4%
General Aviation – Jet	61	22,443	16%
General Aviation – Non Jet	81	29,751	22%
Military	4	1,482	1%
Total	374	136,979	100%

Source: Niagara Frontier Transportation Authority, FAA Air Traffic Control Tower, Prior Aviation, Mercy Flight, McFarland Johnson Analysis

2.1 Fleet Mix

To further define operations at BNIA, fleet mix was utilized to categorize operations. Fleet mix was determined utilizing several variables. Fleet mix for operations completed by commercial passenger and cargo operators was determined based on flight schedules provided by the airlines to the Airport. Fleet mix for operations completed by military and general aviation operators at BNIA were determined based on conversations with Airport staff, Prior Aviation, the ATCT, as well as data obtained through a sample of operations from FlightAware. FlightAware is a publicly accessible website providing information regarding flights operating under Instrument Flight Rules arriving or departing from an airport. Several variables are available on FlightAware, including aircraft operator, aircraft type, and the time of takeoff or landing. Similar to the previously completed Part 150 study, GASEPF, a generic single-engine aircraft, was utilized to model the various single-engine aircraft that utilize BNIA. The Beechcraft King Air 200 and the Piper PA-31 were utilized for twin-engine aircraft, and business jets were portrayed utilizing the Cessna Citation II, Lear 35, and the Raytheon Hawker 400. In most instances, yearly data was provided and an average number of daily operations was determined and utilized in the INM model. **Table 2** shows the average number of daily operations for each aircraft type utilized in the INM model, as well as the total number of annual operations and the percent of the total operations at BNIA for each aircraft type.

TABLE 2: 2008 ACTUAL AIRCRAFT FLEET MIX AND OPERATIONS

AIRCRAFT TYPE	INM CATEGORY	ANNUAL OPERATIONS	AVERAGE DEPARTURE OPERATIONS		AVERAGE APPROACH OPERATIONS		PERCENT OF FLEET
			DAY	NIGHT	DAY	NIGHT	
COMMERCIAL SERVICE							
AIRBUS A319	A319-131	3,724	3.087431	2.019125	3.707650	1.360656	2.72%
AIRBUS A320	A320-211	7,003	8.469944	1.049179	6.959016	2.655737	5.11%
AIRBUS A321	A321-232	296	0	0.404372	0	0.404372	0.22%
BOEING 717	717200	3,043	3.500000	0.655737	3.551912	0.606557	2.22%
BOEING 737-300	737300	7,139	8.797813	0.975409	8.098360	1.633879	5.21%
BOEING 737-400	737400	208	0.284153	0	0.284153	0	0.15%
BOEING 737-500	737500	1,640	1.792349	0.418033	1.959016	0.311475	1.20%
BOEING 737-700	737700	8,884	10.166666	1.852458	9.355191	2.898907	6.49%
BOEING 737-800	737800	311	0.407104	0.021858	0.407104	0.013661	0.23%
BOEING 757	757PW	619	0.844262	0	0.846994	0	0.45%
CANADAIR REGIONAL JET	CL601	8,532	10.644809	1.617486	9.931694	1.117486	6.23%
CANADAIR REGIONAL JET 700	CRJ9-LR	1,805	2.401639	0.133880	1.836065	0.560109	1.32%
CANADAIR REGIONAL JET 900	CRJ9-LR	2,759	3.05	0.78	2.767760	0.937158	2.01%

AIRCRAFT TYPE	INM CATEGORY	ANNUAL OPERATIONS	AVERAGE DEPARTURE OPERATIONS		AVERAGE APPROACH OPERATIONS		PERCENT OF FLEET
			DAY	NIGHT	DAY	NIGHT	
MCDONNELL DOUGLAS DC9-50	DC950	1,919	2.232240	0.420765	2.210383	0.379781	1.40%
BOMBARDIER DASH 8-100	DHC8	5,591	7.308743	0.34153	7.448087	0.177596	4.08%
BOMBARDIER DASH 8-200	DHC8	544	0.734973	0	0.751366	0	0.40%
BOMBARDIER DASH 8-300	DHC830	228	0.256831	0.054644	0.251366	0.060109	0.17%
BOMBARDIER DASH 8-400	DHC830	914	1.084699	0.166666	1.092896	0.153005	0.67%
EMBRAER 135	EMB145	44	0.060109	0.000000	0.060109	0.000000	0.03%
EMBRAER 145	EMB145	12,937	13.874310	3.562841	15.303278	2.606557	9.44%
EMBRAER 170	GV	2,269	2.546448	0.524590	2.606557	0.521857	1.66%
EMBRAER 190	GV	3,750	5.117486	0.000000	4.090164	1.038251	2.74%
MCDONNELL DOUGLAS MD-88	MD83	2,278	2.103825	1.000000	2.327869	0.792350	1.66%
SAAB 340	SF340	1,547	1.387978	0.715847	2.122951	0	1.13%
CATEGORY TOTAL		***77,984***	***90.155724***	***16.715841***	***87.969941***	***18.229503***	***56.93%***
CARGO							
AIRBUS A300	A300-622R	512	0	0.7	0	0.7	0.37%
AIRBUS A310	A310-304	525	0.733333	0	0	0.7	0.38%
BOEING 727-200	727EM2	732	1	0	0	1	0.53%
BOEING 757-200	757PW	805	0	1.1	0	1.1	0.59%
BOEING 767-300	767300	24	0	0.033000	0	0.033000	0.02%
CESSNA 208	GASEPF	525	0.716667	0	0.716667	0	0.38%
EMBRAER 110	EMB110	2,196	3	0	3	0	1.60%
CATEGORY TOTAL		***5,319***	***5.45***	***1.833***	***3.716667***	***3.533***	***3.88%***
GENERAL AVIATION							
SINGLE ENGINE	GASEPV	17,093	22.183538	1.167555	22.183538	1.167555	12.48
BEECHCRAFT SUPER KING AIR 200	BEC200	5,644	7.324863	0.385519	7.324863	0.385519	4.12%
PIPER PA-31 NAVAJO	PA31	4,128	5.357377	0.281967	5.357377	0.281967	3.01%
CESSNA CITATION II	CNA500	8,174	10.608333	0.558333	10.608333	0.558333	5.97%
LEAR 35	LEAR35	12,262	15.913798	0.837568	15.913798	0.837568	8.95%
RAYTHEON HAWKER 400	BEC400	2,063	2.677391	0.140915	2.677391	0.140915	1.51%
EUROCOPTER 130	EC130	2,830	1.93306	1.93306	1.93306	1.93306	2.07%
CATEGORY TOTAL		***52,194***	***65.998361***	***5.304917***	***66.029266***	***5.304917***	***38.1%***
MILITARY							
C130	C130	1,482	2.024999	0	2.024999	0	1.08%
CATEGORY TOTAL		***1,482***	***2.024999***	***0***	***2.024999***	***0***	***1.08%***
TOTAL		***136.979***	***163.6291***	***23.8536***	***159.7409***	***27.06742***	***100%***

2.2 Substitute Aircraft

Several substitute aircraft were necessary in this study due to their omission from the INM database. Most of the substitute aircraft necessary in this study were included as part of the INM 7.0b database. However, two aircraft, the Bombardier Dash 8-200 (Q200) and the Bombardier Dash 8-400 (Q400) were excluded from the INM database and did not have a recommended substitute aircraft provided. Based on guidance provided by the FAA OEE, the Bombardier Dash 8-100 was utilized as a substitute aircraft for the Q200, and the Bombardier Dash 8-300 was utilized as a substitute aircraft for the Q400. **Table 3** lists all aircraft that required the use of a substitute aircraft within the INM model. Correspondence with the FAA OEE is located within **Appendix A**.

TABLE 3: SUBSTITUTE AIRCRAFT

Aircraft Code	Aircraft Type	INM Substitution
Substitutions Recommended by INM		
BEC200	Beechcraft Super King Air 200	DHC6
BEC400	Raytheon Hawker 400	MU3001
CLREGJ	Canadair Regional Jet	CL601
CRJ701	Canadair CRJ701	CRJ9-LR
EMB110	Embraer Bandeirante 110	DHC6
EMB135	Embraer EMB-135	EMB145
EMB140	Embraer EMB-140	EMB145
EMB170	Embraer EMB-170	GV
EMB190	Embraer EMB-190	GV
MD88	McDonnell-Douglas MD88	MD83
CNA208	Cessna 208 Caravan I	GASEPF
Substitutions Not Available in INM		
Q200	Bombardier Dash 8-200 (Q200)	DHC8
Q400	Bombardier Dash 8-400 (Q400)	DHC830

Source: Integrated Noise Model, Version 7.0b, FAA Office of Environment & Energy

2.3 Daytime vs. Nighttime Operations

As part of the determination of the number of daily operations at the Airport, it is important to differentiate between daytime operations and nighttime operations. As noted previously, nighttime operations are those that occur after 10:00pm and before 6:59am daily. Daytime operations occur from 7:00am until 9:59pm. In order to count as a nighttime operation, the aircraft must takeoff or land during these hours. Night operations, as shown in Table 2, were determined based on airline schedules and communications with Prior Aviation. According to Prior Aviation, five percent of general aviation operations at BNIA occurred during nighttime hours, while the remaining 95% occurred during daytime hours. Mercy Flight, which operates the helipad at BNIA, indicated that their operations occur when they are needed based upon regional emergency response needs. Therefore, it was estimated that 50% of the operations occur at night, and 50% occur during the day. The differentiation between daytime and nighttime operations for commercial passenger and cargo operations was determined based on the arrival and departure times provided by the airlines to BNIA. According to this data, approximately 84% of the commercial passenger operations at BNIA occurred during daytime hours, with the remaining 16% occurring during nighttime hours. For cargo operations, approximately 67% of the operations occurred during daytime hours, while the reaming 33% occurred overnight. According to the ATCT, 100% of the military operations at the Airport were during daytime hours.

2.4 Runway End Utilization

BNIA currently has two runways in operation. At 8,827 feet in length, Runway 5-23 is the primary runway at the Airport. Runway 5 is orientated in a southwest to northeast pattern, with the Runway 13 end adjacent to Interstate 90 (New York State Thruway) and the Runway 5 end near Cayuga Road, Genesee Street, and the Kensington Parkway. Runway 14-32 is the crosswind runway at BNIA. Runway 14-32 is 7,161 feet in length and is orientated in a northwest to southeast direction. The Runway 14 end is adjacent to Wehrle Road and Cayuga Street while the Runway 32 end is adjacent to Holtz Road and Genesee Street. Both runways are 150 in width and are served by a full parallel taxiway. The passenger terminal is located south of the runway intersection, while the general aviation and cargo facilities are located to the west. The helipad is located to the east of the runway intersection.

As part of this study, runway utilization was determined. The number, and type, of aircraft utilizing each runway is important in modeling the noise created by operations at BNIA. Information provided by NFTA, the ATCT, and the 2003 FAR Part 150 study were used and runway end utilization rates were determined. The rates utilized for 2008 operations were similar to those rates predicted in the 2003 study. However, a small increase of operations by commercial passenger and cargo aircraft on Runway 14-32 was incorporated, as a result of the recent runway extension. It was noted that some airlines prefer to use Runway 14-32 when weather conditions permit due to the location of the terminal in relation to the runway to shorten taxi times and reduce fuel consumption. This increase in commercial passenger aircraft operations on Runway 14-32 was considered in this study, with eight percent of daily commercial passenger and cargo aircraft operations utilizing the runway. Runway end utilization rates, by aircraft type, can be found in **Tables 4 and 5**.

TABLE 4: DAYTIME RUNWAY UTILIZATION – 2008								
AIRCRAFT GROUP	PERCENTAGE ARRIVALS (BY RUNWAY)				PERCENTAGE DEPARTURES (BY RUNWAY)			
	5	23	14	32	5	23	14	32
Commercial Passenger	28	68	2	2	28	68	2	2
Commercial Cargo	28	68	2	2	28	68	2	2
General Aviation – Jet	20	55	20	5	25	45	25	5
General Aviation – Non Jet	18	29	12	41	15	31	44	10
Military	25	75	0	0	25	75	0	0
Average	**24**	**59**	**7**	**10**	**24**	**57**	**15**	**4**

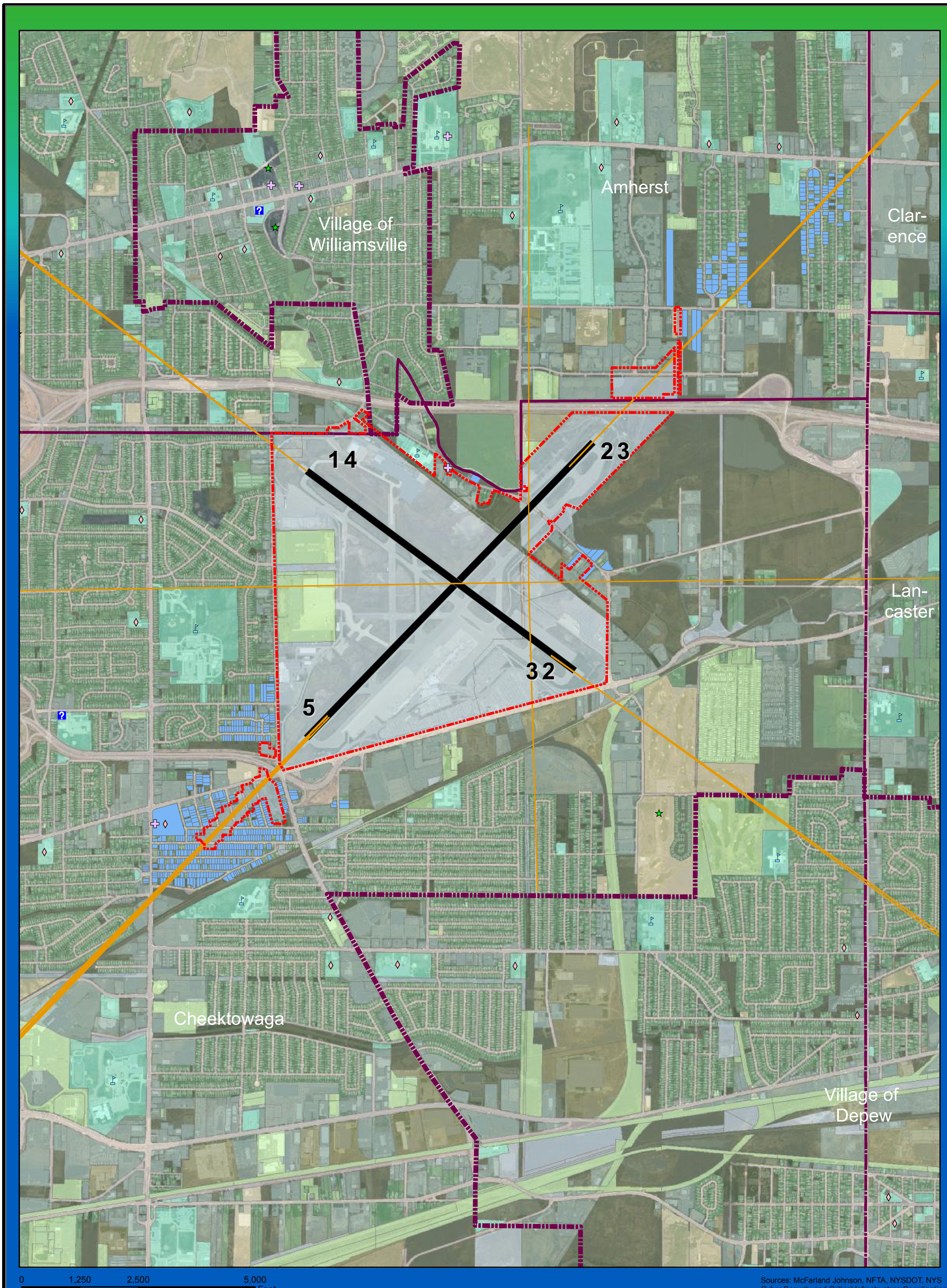
Source: 2003 BNIA Part 150 Update, Air Traffic Control Tower, McFarland Johnson Analysis

TABLE 5: NIGHTTIME RUNWAY UTILIZATION – 2008								
AIRCRAFT GROUP	PERCENTAGE ARRIVALS (BY RUNWAY)				PERCENTAGE DEPARTURES (BY RUNWAY)			
	5	23	14	32	5	23	14	32
Commercial Passenger	28	68	2	2	28	68	2	2
Commercial Cargo	28	68	2	2	28	68	2	2
General Aviation – Jet	20	55	20	5	25	45	25	5
General Aviation – Non Jet	15	18	5	62	15	18	60	7
Military	25	75	0	0	25	75	0	0
Average	**23**	**57**	**6**	**14**	**24**	**55**	**18**	**3**

Source: 2003 BNIA Part 150 Update, Air Traffic Control Tower, McFarland Johnson Analysis

2.5 Flight Tracks

After determining the percentage of aircraft that are utilizing each runway, specific flight tracks for aircraft departing and arriving at the Airport must be considered. Based on conversations with the ATCT and NFTA, as well as data utilized in the 2003 FAR Part 150 study, similar flight tracks were utilized. This includes six approach tracks to Runway 5, each with eight sub-tracks, and ten departure tracks, also with eight sub-tracks. Runway 14 has three approach tracks and six departure tracks, while Runway 23 has six approach tracks and twelve departure tracks. All tracks off Runways 14 and 23 have eight sub-tracks. For Runway 32, there are three approach tracks, and five departure tracks. All of the approach tracks, and four of the departure tracks, each have eight sub-tracks. The remaining departure track is a straight-out track. The ATCT at BNIA confirmed that the 2003 tracks still apply. According to departure procedures, all turbojet aircraft are requested to maintain a straight heading to 3,000 feet. **Figures 3 and 4** display the flight tracks that were utilized in this study.



NOISE EXPOSURE MAP UPDATE

APPROACH TRACKS

Legend

Landmarks
- Church
- Historic Register
- Library
- Park
- School
- Airport Property Line
- Approach Flight Tracks
- Municipal Boundaries

Tax Parcel Land Use
- Agricultural
- Residential
- Vacant Land
- Commercial
- Recreation & Entertainment
- Community Services
- Industrial
- Public Services
- Parks & Conservation Areas
- Other
- Residential (Participating in Sound Mitigation)

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FIGURE
3

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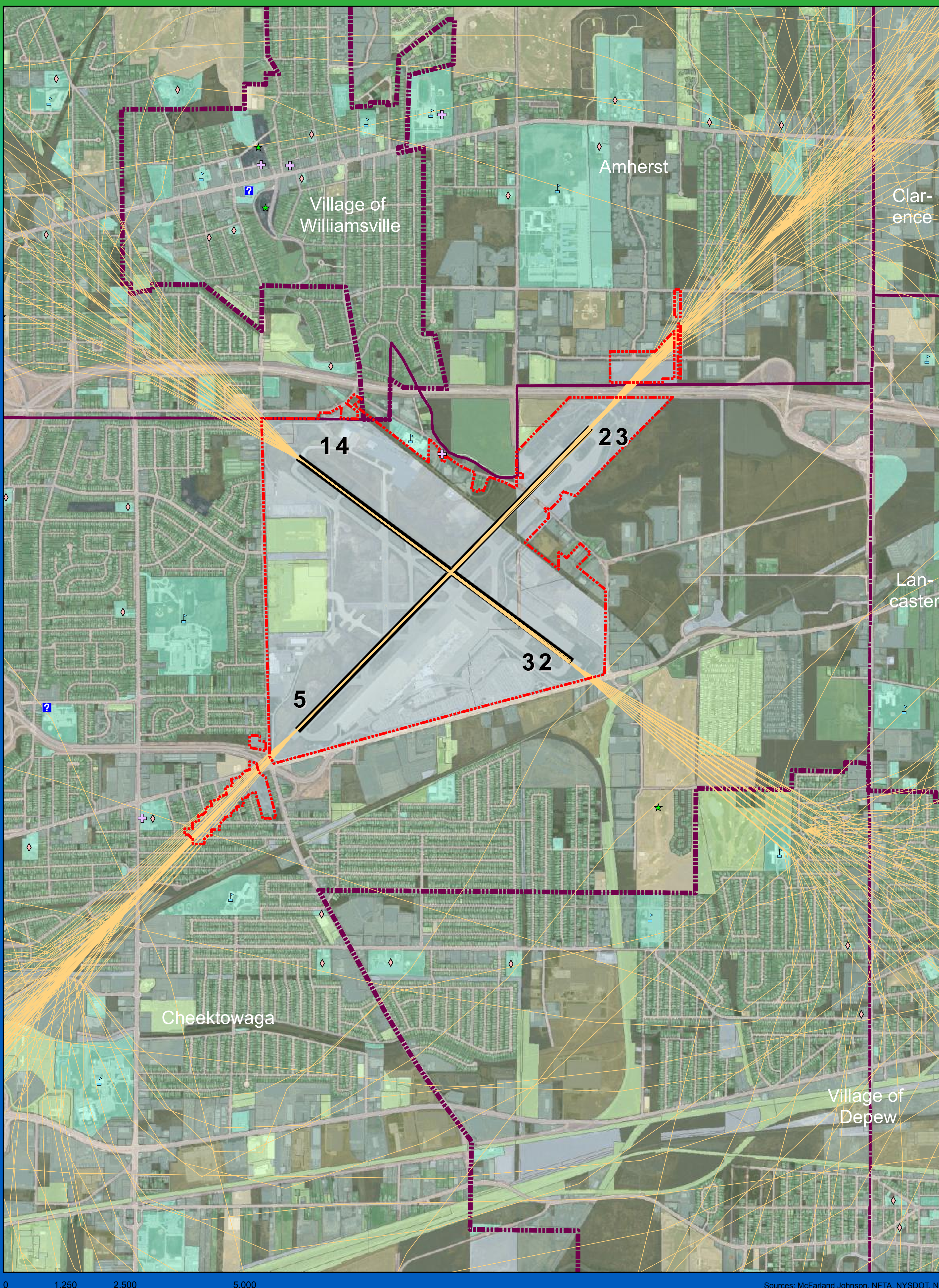
K:\NFTA\11-1734501 BNIA Noise\-3 Draw\GIS\Final\Tracks - Fig 3.mxd



Sources: McFarland Johnson, NFTA, NYSDOT, NYS Cyber Security and Critical Infrastructure Coordination

NOISE EXPOSURE MAP UPDATE

DEPARTURE TRACKS

Legend

Landmarks	Tax Parcel Land Use
Church	Agricultural
Historic Register	Residential
Library	Vacant Land
Park	Commercial
School	Recreation & Entertainment
Airport Property Line	Community Services
Departure Flight Tracks	Industrial
Municipal Boundaries	Public Services
	Parks & Conservation Areas
	Other

N W E S

NFTA Niagara Frontier Transportation Authority Serving Buffalo Niagara

BUFFALO NIAGARA INTERNATIONAL AIRPORT

FIGURE 4

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2.6 Touch and Go Operations

According to the ATCT, touch and go operations at BNIA are extremely rare due to the high traffic volume at the Airport. Flight training operations originating from the Airport typically will complete these operations at other nearby airports including Dunkirk and Niagara Falls. Therefore, no touch and go operations were considered as part of this NEM Update.

2.7 Takeoff Profiles & Stage Lengths

This study utilized the standard takeoff profiles and aircraft specifications provided in the INM 7.0b database. With the exception of the substitutions of the Bombardier Dash 8-300 for the Bombardier Dash 8-400 and the Bombardier Dash 8-100 for the Bombardier Dash 8-200, there have been no modifications to aircraft types within this study. No evidence has been provided that indicates a need to differentiate from the takeoff profiles and aircraft specifications in the INM 7.0b database, which has content that adheres to FAA standards. One important difference between departure operations at the Airport is aircraft weight. Aircraft that are traveling longer distances will require an increased amount of fuel in order to reach the destination airport. An increased amount of fuel will subsequently increase the amount of weight on the aircraft and will cause a different climb rate at takeoff. This change in climb rate can also increase noise produced by the aircraft. Aircraft departures are therefore categorized by the distance between Buffalo and the destination airport. This is known as stage length. Stage length categories, and examples of their destinations from Buffalo, can be found in **Table 6**.

TABLE 6: STAGE LENGTH

STAGE LENGTH	DISTANCE OF DESTINATION AIRPORT FROM BUFFALO	EXAMPLES FROM BUFFALO
1	0 – 500 nautical miles	Chicago, Boston, Washington D.C., New York City
2	501 – 1,000 nautical miles	Charlotte, Atlanta, Minneapolis, Memphis
3	1,001 – 1,500 nautical miles	Orlando, Tampa, Fort Myers, Dallas, Fort Lauderdale
4	1,501 – 2,500 nautical miles	Phoenix, Las Vegas, Los Angeles
5	2,501 – 3,500 nautical miles	Dublin, Anchorage, London
6	3,501 – 4,500 nautical miles	Rome, Honolulu, Moscow
7	4,500 nautical miles and beyond	Tokyo, Buenos Aires, Sydney

Source: Great Circle Mapper (http://www.gcmap.com)

While the largest group of aircraft leaving BNIA is bound for destinations within Stage Length 1, there are several daily departures to destinations within other stage length groupings. Destinations for scheduled passenger and cargo operations within Stage Length 1 include New York City (Newark Liberty, LaGuardia, and John F. Kennedy), Chicago (O'Hare and Midway), Detroit, Philadelphia, Louisville, Cleveland, Cincinnati, Washington (Dulles and Reagan National), and Baltimore. Operations within Stage Length 2 occurred to destinations including Charlotte, Atlanta, Minneapolis and Memphis. Scheduled operations categorized within Stage Length 3 departed BNIA for Orlando, Fort Myers, Tampa, and Fort Lauderdale. Two destinations from BNIA, Phoenix and Las Vegas, are categorized within Stage Length 4. There were no scheduled departures from BNIA in 2008 to a destination greater than 2,000 miles from the Airport.

2.8 2008 Noise Exposure Map Results

Noise contours for the 65, 70, and 75 dB DNL were developed for actual operations in 2008. The resulting contours were plotted on aerial images of the area surrounding BNIA and can be found in **Figure 5**. The FAA considers the 65 dB DNL contour to be the threshold of impact for noise sensitive areas. In order to help put the DNL into perspective; **Table 7** shows various DNL levels and their equivalence.

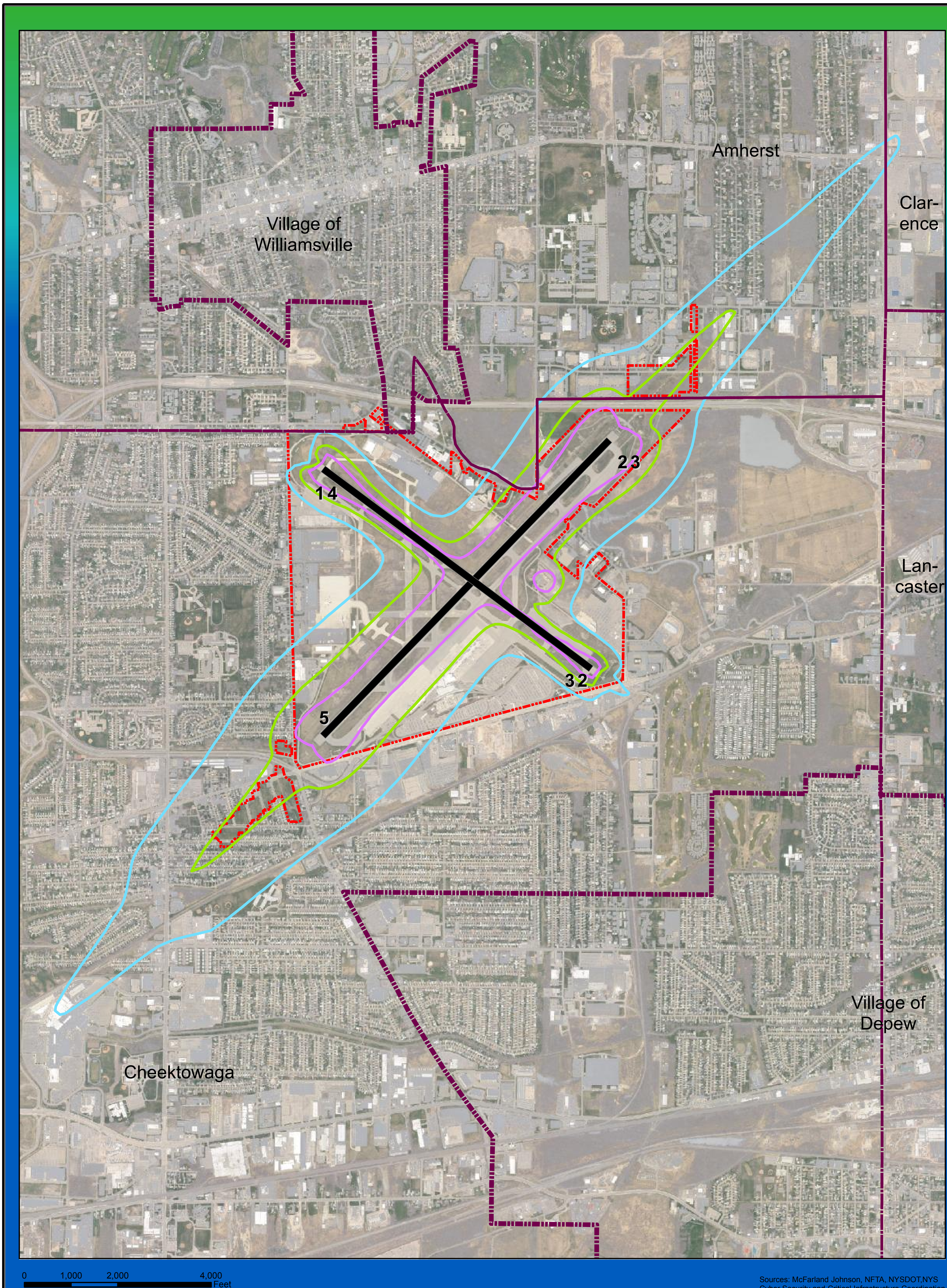
TABLE 7: TYPICAL OUTDOOR DAY-NIGHT NOISE LEVELS

DNL IN DECIBELS	LOCATION
50 dB	Residential area in a small town or quiet suburban area
55 dB	Suburban residential area
60 dB	Urban residential area
65 dB	Noisy urban residential area
70 dB	Very noisy urban residential area
80 dB	City noise (downtown of a major metropolitan area)
85 dB	3^{rd} floor apartment in a major city next to a freeway

Source: "Noise Fundamentals Training Document, Highway Noise Fundamentals", USDOT FHWA

According to FAR Part 150, levels of compatibility based on aircraft noise vary based on land use. Noise generated by aircraft can have a negative impact on certain land uses. Residential homes and public use facilities such as churches, schools, and parks are considered to be noise sensitive. Industrial and agricultural activities are typically compatible with noise generated by airports. **Appendix B** provides a list of land use categories and their compatibility within various decibel-level ranges.

As shown, the 65 db DNL contours are longest off the Runway 5-23 ends, which account for the largest number of operations at the Airport, particularly commercial passenger and cargo jet operations. Land use in these areas varies, but includes some residential



NOISE EXPOSURE MAP UPDATE

ACTUAL (2008) NOISE EXPOSURE MAP

Legend

- Property Line
- Municipal Boundaries

Day-Night Level Contours

- 65 dB DNL
- 70 dB DNL
- 75 dB DNL

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FIGURE 5

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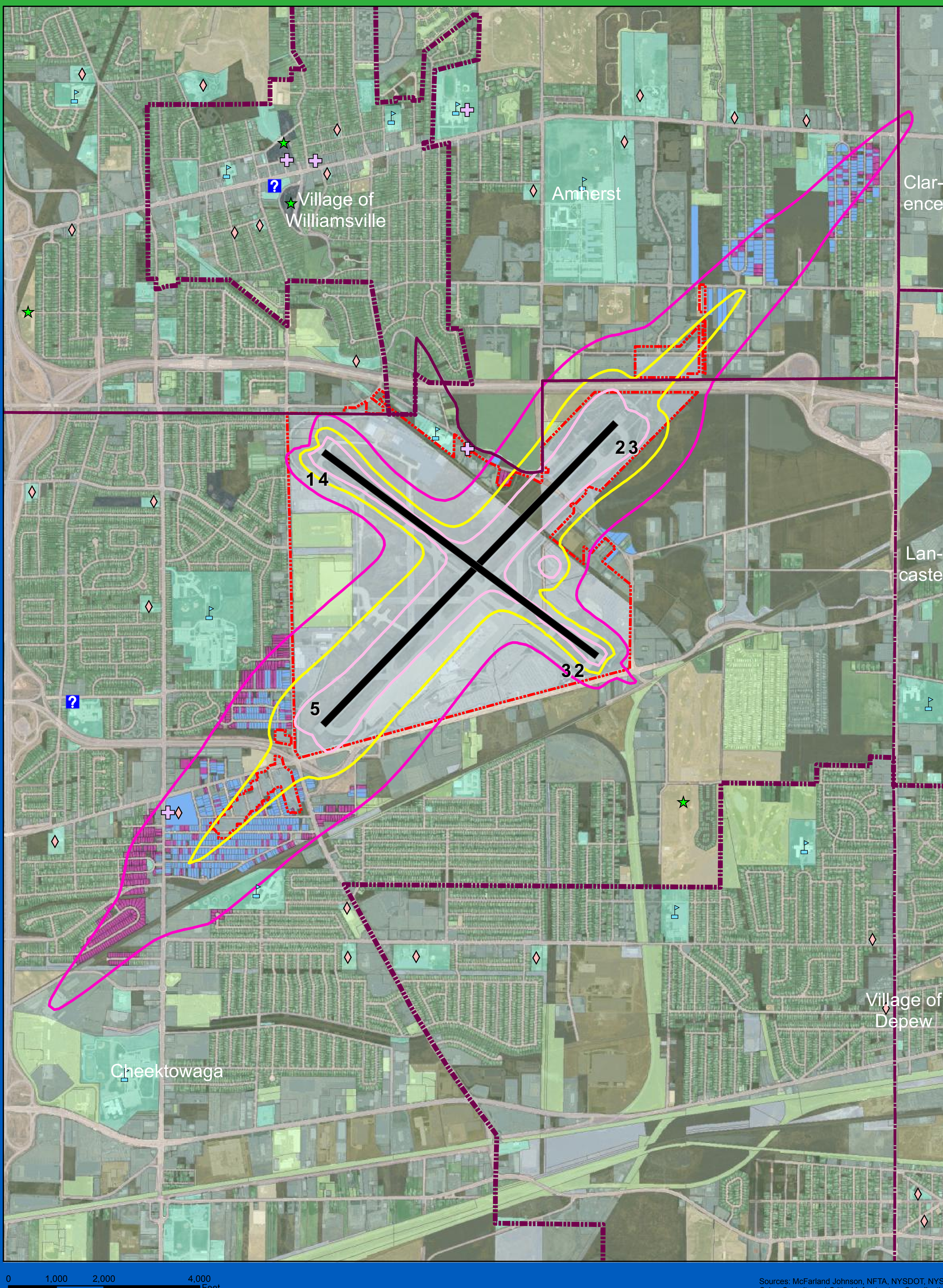
households and schools. Commercial and industrial uses can be found close to each runway end and towards the outer markers of the 65 db DNL contours. There are no incompatible land uses off Runway 14-32. The contour off the Runway 14 end remains mainly on-airport, while the 65 db DNL contour off the Runway 32 end affects commercial and industrial uses only. **Figure 6** displays the noise contours in comparison to compatible, and incompatible, land uses within the vicinity of BNIA.

The actual 65 db DNL noise contour for operations in 2008, as shown in **Figure 7**, has shrunk from the noise contour projected in the Part 150 study. The change in area is detailed in **Table 8**. This decrease in size is a result of a decrease in the number of total annual operations at the Airport, including those completed by commercial passenger and cargo jet aircraft. According to the FAR Part 150 study, 446 daily operations were projected to occur at the Airport. However, actual 2008 data indicates that only 374 daily operations occurred on an average day; a 16.1% decrease. Operations by commercial passenger aircraft were 10% below projections, and operations by commercial cargo aircraft were 55% below the projections.

TABLE 8: DIFFERENCE BETWEEN NOISE CONTOURS

NOISE CONTOUR (DNL)	TOTAL AREA (2008 ACTUAL)	TOTAL AREA (2008 PROJECTED)	CHANGE IN AREA
65 to 70 dB	881 ac.	1,050 ac.	-169 ac.
70 to 75 dB	361 ac.	387 ac.	-26 ac.
Greater than 75 dB	266 ac.	457 ac.	-191 ac.
Total	1,508 ac.	1,894 ac.	-386 ac.

In addition, there have been several changes in fleet that were not projected in the 2003 FAR Part 150 study, including an increase in commercial passenger operations by the Bombardier Dash 8 family of turboprop aircraft, as well as the Saab 340 turboprops. The FAR Part 150 study assumed that all commercial passenger operations at BNIA would be completed by jet-powered aircraft. The decrease in cargo operations at BNIA is significant, as many of these operations were projected to occur during nighttime hours and therefore would receive a ten decibel penalty. Cargo operations were projected to utilize aircraft types that were typically the loudest utilizing BNIA, including a significantly greater number of operations by the Boeing 727, Airbus A300, Airbus A310, and the McDonnell Douglas DC-9. The 2003 Part 150 Study included military operations at BNIA from the KC-135, which were based at the nearby Niagara Falls International Airport. However, the 2005 Base Closure and Realignment Report recommended the relocation of the KC-135 aircraft from Niagara Falls to Little Rock, Arkansas. With this relocation, operations of the KC-135 at BNIA ceased. Detailed scenario run input reports for the actual 2008 NEM can be found in **Appendix C**.



NOISE EXPOSURE MAP UPDATE

ACTUAL (2008) NOISE EXPOSURE MAP WITH LAND USE

Legend

Landmarks
- Church
- Historic Register
- Library
- Park
- School
- Property Line
- Municipal Boundaries

Day-Night Level Contours
- 65 dB DNL
- 70 dB DNL
- 75 dB DNL

Tax Parcel Land Use
- Agricultural
- Residential
- Vacant Land
- Commercial
- Recreation & Entertainment
- Community Services
- Industrial
- Public Services
- Parks & Conservation Areas
- Other
- Residential (Within 65 dB DNL)
- Residential (Participating in Sound Mitigation)

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FIGURE
6

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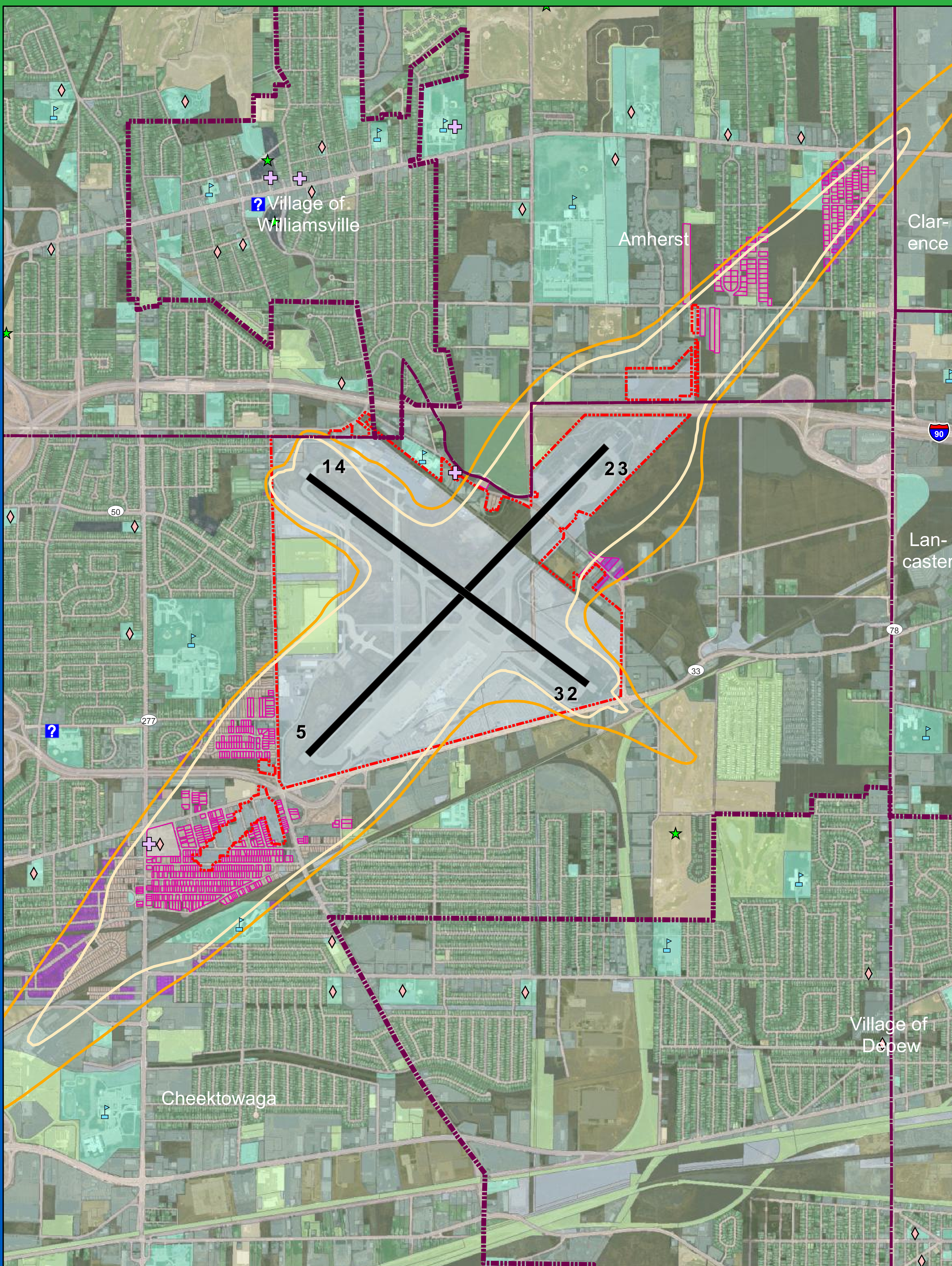
K:\NFTA\T-1734501 BNIA Noise\-3 Draw\GIS\Final\Existing Contour and Land Use - Fig 6.mxd



0 1,000 2,000 4,000 Feet

Sources: McFarland Johnson, NFTA, NYSDOT, NYS Cyber Security and Critical Infrastructure Coordination

NOISE EXPOSURE MAP UPDATE

PROJECTED (2008) VS. ACTUAL (2008) NOISE EXPOSURE MAP

Legend

Landmarks
- Church
- Historic Register
- Library
- Park
- School
- Municipal Boundaries
- Property Line

Day-Night Level Contours
- Actual 65 dB DNL
- Projected 65 dB DNL

Tax Parcel Land Use
- Agricultural
- Residential
- Vacant Land
- Commercial
- Recreation & Entertainment
- Community Services
- Industrial
- Public Services
- Parks & Conservation Areas
- Other
- Residential (Within 65 dB DNL)
- Residential (Removed from 65 dB DNL)
- Residential (Participating in Sound Mitigation)

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FIGURE 7

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K:\NFTA\T-1734501 BNIA Noise\-3 Draw\GIS\Final\Noise Contour Difference - Fig 7.mxd

3.0 Future Conditions

In addition to the creation of a NEM for operations that occurred at BNIA in 2008, a future NEM has also been created as part of this study. The future NEM is based on projected operations at the Airport in 2013. Operations forecasts were determined based on analyses of data provided by the FAA's TAF, the ATCT, BNIA, as well as projected changes in aircraft fleet based on current aircraft orders by carriers currently serving BNIA. Forecasting methodologies can be found in the following sections.

3.1 Enplanement Forecasts

BNIA records of monthly passenger enplanements were the basis of the enplanement forecasts. These statistics reveal strong growth from 2002 through 2008, with the exception of 2003 when the enplanements declined by 1.61% from the previous year. For the 6-year period, the average year over year growth rate was 4.95%. The last full year prior to the recent economic downturn showed a 5.36% growth in enplanements from the previous year

The current economic downturn has affected this growth in enplanements. The Airport saw excellent month over month growth rates through the summer of 2008, but the rate of growth began to decline in September, went below zero in October, and was down almost 10% in January of 2009 compared to January of the previous year. Growth rates continued to be negative through the summer of 2009, with the first seven months of 2009 recording 5.48% fewer enplanements than during the same seven months of 2008 when growth was relatively strong. Even though the remaining five months of 2009 are expected to show a return to positive month over month growth rates, in part because they are being compared to the 2008 growth rates when the economic downturn was at its worst, the 2009 enplanement figures are expected to show a decline from those of 2008.

Reliable short term forecasts of economic conditions are not available, but as of September 2009 there seems to be a consensus that conditions are expected to not worsen significantly and begin to show gradual improvement in 2010. The NFTA forecasts have acknowledged that the 2009 enplanements will be below the 2008 level by an estimated 3.49%. A positive year over year growth rate is forecast for 2010, when enplanements are forecast to approach 2008 levels, and increases will continue through the end of the forecast period with annual rates between 4.26% and 4.5%. This rate of growth is below the 6-year historical average rate of 4.95%. The selection of this growth rate is in part based on the fact that the BNIA service area includes a large population in southern Ontario, Canada, where the economic downturn has been less severe.

The TAF was also reviewed in the forecasting process. Because the BNIA data is collected based on calendar year, while the TAF is based on Federal Fiscal Years (FFY), the current forecast data was adjusted to the FFY for comparison purposes. The most recent enplanement data available to the TAF is from 2007, and the current downturn in enplanements is not reflected in the TAF for 2008 and 2009. As a result the TAF shows positive enplanement growth in 2009, while the BNIA forecast acknowledges a decline. The TAF has used an annual growth rate for the years 2010 – 2013 that is from 1.1% to 7.5% below the actual rate of enplanement growth over the last five years, so their forecast rate of growth is below that that in the BNIA forecast. For these reasons, the BNIA forecast for 2009 is approximately 6% below the TAF, but by 2013 the two forecasts differ by only 0.11% due to the difference in the rate of growth. By the end of the forecast period the TAF differs from the BNIA (FFY) forecast by only 3,509 enplanements. The forecast summary is presented in **Table 9**.

TABLE 9: ENPLANEMENT FORECASTS - 2009 – 2013

CALENDAR YEAR (CY)	CY ENPLANEMENTS	CY % GROWTH RATE	FEDERAL FISCAL YEAR (FFY) ENPLANEMENTS	TAF ENPLANEMENTS	% ABOVE OR BELOW TAF
2008	2,762,401	3.55%	2,777,559	2,758,428	0.69%
2009	2,666,022	-3.49%	2,660,440	2,831,866	-6.05%
2010	2,759,515	3.51%	2,734,203	2,878,429	-5.01%
2011	2,877,121	4.26%	2,847,136	2,952,228	-3.56%
2012	3,006,592	4.50%	2,975,257	3,027,947	-1.74%
2013	3,141,889	4.50%	3,109,144	3,105,635	0.11%

Source: FAA Terminal Area Forecast; Niagara Frontier Transportation Authority; McFarland Johnson Analysis

3.2 Operations Forecasts

Utilizing data for existing operations at the Airport, as well as the forecasts for enplanements, operations forecasts were determined. According to airline operations records, approximately 3,668,532 seats were available on commercial passenger aircraft in 2008. With 2,762,401 enplanements, this represents an average aircraft capacity of approximately 75.3%. The enplanements forecast presented above includes a nearly 14% increase in passenger enplanements between 2008 and 2013. Based upon these figures, the total number of enplaned passengers, as well as available seats, was determined. Therefore, it was estimated that approximately 4,074,716 seats would be available for departing flights at BNIA. **Table 10** provides a comparison of the airline operations. As a result of increasing enplanements, as well as increasing load factors, the total number of departures by commercial passenger aircraft is estimated to increase by 10.52% for most aircraft types, or for a total of approximately ten additional departures daily at the Airport and a total of 85,939 total airline operations annually. In addition, the load factor would also increase to 77.1%. While the fleet mix at BNIA is projected to remain relatively similar to the fleet mix in 2008, operations completed by the Embraer 135 were removed, with seats previously available now found on Embraer 145 aircraft. The remainder of the fleet mix for commercial passenger aircraft at BNIA is expected to remain stable through 2013.

TABLE 10: AIRLINE OPERATIONS FORECAST				
CALENDAR YEAR	CY ENPLANEMENTS	CY AIRLINE OPERATIONS	CY AVAILABLE SEATS	CY LOAD FACTOR
2008	2,762,401	77,670	3,668,246	75.3%
2013	3,141,889	85,939	4,074,716	77.1%

Source: Niagara Frontier Transportation Authority; McFarland Johnson Analysis

With the departure of DHL from BNIA in early 2009, the two daily operations utilizing the Boeing 727 were eliminated from the 2013 operations forecast. In addition, current operations by UPS, FedEx, and Business Air, are expected to remain steady through 2013. The fleet mix utilized by these air cargo carriers is also expected to remain unchanged. Military operations, currently completed by the C130, are also expected to remain unchanged. General aviation operations, consisting of operations by single and multi-engine aircraft, as well as a business jets and helicopters, are expected to increase at a similar rate to the TAF, or 10.4%. As a result of these projections, total operations at BNIA are projected to increase over 2008 figures by 9.4%, to a total of 149,900 annual operations. Operations projections for 2013 can be found in **Table 11**.

TABLE 11: OPERATIONS BY AIRCRAFT GROUP - 2013			
AIRCRAFT GROUP	AVERAGE DAILY OPERATIONS	TOTAL ANNUAL OPERATIONS	PERCENT OF TOTAL ANNUAL OPERATIONS
Commercial Passenger	235	85,939	57%
Commercial Cargo	13	4,857	3%
General Aviation – Jet	68	24,777	17%
General Aviation – Non Jet	90	32,845	22%
Military	4	1,482	1%
Total	411	149,900	100%

Source: McFarland Johnson Analysis

As a result of an increase in operations, the number of average daily operations for most fleet types at BNIA will also increase. **Table 12** provides information about the number of daily approach and departure operations at BNIA, by aircraft type.

TABLE 12: 2013 PROJECTED AIRCRAFT FLEET MIX AND OPERATIONS							
AIRCRAFT TYPE	INM CATEGORY	ANNUAL OPERATIONS	AVERAGE DEPARTURE OPERATIONS		AVERAGE APPROACH OPERATIONS		PERCENT OF FLEET
			DAY	NIGHT	DAY	NIGHT	
PASSANGER SERVICE							
AIRBUS A319	A319-131	4,105	3.412229	2.231537	4.097695	1.503797	2.74%
AIRBUS A320	A320-211	7,719	9.360982	1.159553	7.691104	2.935121	5.15%
AIRBUS A321	A321-232	326	0.000000	0.446912	0.000000	0.446912	0.22%
BOEING 717	717200	3,354	3.868200	0.724721	3.925573	0.670367	2.24%
BOEING 737-300	737300	7,868	9.723343	1.078022	8.950307	1.805763	5.25%
BOEING 737-400	737400	229	0.314046	0.000000	0.314046	0.000000	0.15%
BOEING 737-500	737500	1,808	1.980904	0.462010	2.165104	0.344242	1.21%
BOEING 737-700	737700	9,792	11.236199	2.047336	10.339357	3.203872	6.53%
BOEING 737-800	737800	343	0.449931	0.024157	0.449931	0.015098	0.23%
BOEING 757	757PW	681	0.933078	0.000000	0.933078	0.000000	0.45%
CANADAIR REGIONAL JET	CL601	9,404	11.764643	1.787646	10.976508	1.235046	6.27%
CANADAIR REGIONAL JET 700	CRJ9-LR	1,989	2.654291	0.147964	2.029219	0.619032	1.33%
CANADAIR REGIONAL JET 900	CRJ9-LR	3,041	3.372973	0.863626	3.058928	1.035747	2.03%
MCDONNELL DOUGLAS DC9-50	DC950	2,115	2.467072	0.465029	2.442915	0.419734	1.41%
BOMBARDIER DASH 8-100	DHC8	6,205	8.145896	0.377459	8.280187	0.196278	4.14%
BOMBARDIER DASH 8-200	DHC8	557	0.744019	0.000000	0.781848	0.000000	0.37%
BOMBARDIER DASH 8-300	DHC830	251	0.283850	0.060393	0.277810	0.066432	0.17%
BOMBARDIER DASH 8-400	DHC830	1,007	1.198809	0.184199	1.207869	0.169101	0.67%
EMBRAER 145	EMB145	14,295	15.372735	3.947628	16.956032	2.888065	9.54%
EMBRAER 170	GV	2,501	2.814334	0.579777	2.880767	0.576756	1.67%
EMBRAER 190	GV	4,133	5.655846	0.000000	4.520449	1.147475	2.76%
MCDONNELL DOUGLAS MD-88	MD83	2,511	2.325147	1.105200	2.572761	0.875705	1.68%
SAAB 340	SF340	1,705	1.533993	0.791154	2.346285	0.000000	1.14%
CATEGORY TOTAL		***85,939***	***99.612520***	***18.484323***	***97.197773***	***20.154543***	***57.33%***
CARGO							
AIRBUS A300	A300-622R	511	0.000000	0.700000	0.000000	0.700000	0.34%
AIRBUS A310	A310-304	523	0.733333	0.000000	0.000000	0.700000	0.35%
BOEING 757-200	757PW	803	0.000000	1.100000	0.000000	1.100000	0.54%

AIRCRAFT TYPE	INM CATEGORY	ANNUAL OPERATIONS	AVERAGE DEPARTURE OPERATIONS		AVERAGE APPROACH OPERATIONS		PERCENT OF FLEET
			DAY	NIGHT	DAY	NIGHT	
BOEING 767-300	767300	24	0.000000	0.033000	0.000000	0.033000	0.02%
CESSNA 208	GASEPF	578	0.791200	0.000000	0.791200	0.000000	0.39%
EMBRAER 110	EMB110	2,418	3.312000	0.000000	3.312000	0.000000	1.61%
CATEGORY TOTAL		***4,857***	***4.836533***	***1.833000***	***4.103200***	***2.533000***	***3.24%***
GENERAL AVIATION							
SINGLE ENGINE	GASEPV	18,941	24.649628	1.297349	24.649628	1.297349	12.64%
BEECH SUPER KING AIR 200	BEC200	6,255	8.139741	0.428407	8.139741	0.428407	4.17%
PIPER PA-31 NAVAJO	PA31	4,574	5.952727	0.313301	5.952727	0.313301	3.05%
CESSNA CITATION II	CNA500	9,058	11.788423	0.620443	11.788423	0.620443	6.04%
LEAR 35	LEAR35	13,588	17.682634	0.930665	17.682634	0.930665	9.06%
RAYTHEON HAWKER 400	BEC400	2,287	2.975754	0.156619	2.975754	0.156619	1.53%
EUROCOPTER 130	EC130	2,919	1.999277	1.999277	1.999277	1.999277	1.95%
CATEGORY TOTAL		***57,622***	***73.188185***	***5.746062***	***73.188185***	***5.746062***	***38.44%***
MILITARY							
C130	C130	1,482	2.024999	0.000000	2.024999	0.000000	0.99%
CATEGORY TOTAL		***1,482***	***2.024999***	**0.000000**	***2.024999***	**0.000000**	***0.99%***
TOTAL		***149,900***	***179.662871***	***26.063385***	***176.514157***	***28.433605***	***100%***

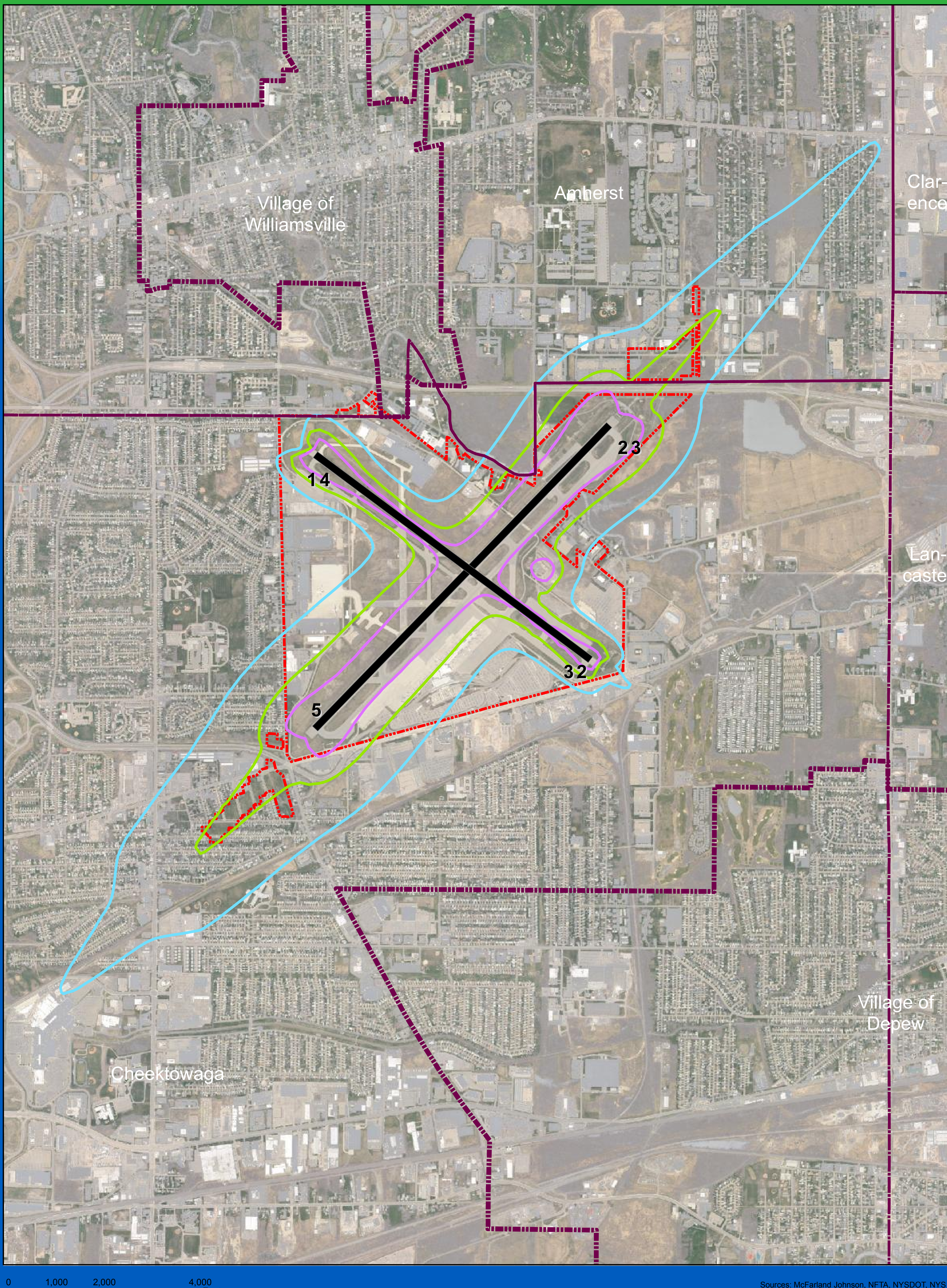
3.3 Other Operations Characteristics

It is expected that runway utilization, flight tracks, and takeoff profiles and stage lengths will remain unchanged from 2008 for the 2013 NEM. There is no evidence, or planned construction to the airside facilities at the Airport, that would have a significant impact on the runways utilized and the destinations available from BNIA. Therefore, the variables utilized in the 2008 NEM will also be utilized for the 2013 NEM.

3.4 Projected 2013 Noise Exposure Map Output

Using data as described in this section, projected noise contours were calculated for 2013. The 65, 70, and 75 dB DNL contours were plotted on aerial images of the area surrounding BNIA and can be found in **Figure 8**. As shown, the 2013 noise contour has decreased in size off the Runway 5-23 ends. This is mainly a result of the decrease in operations by the Boeing 727-200 at the Airport as a result of the loss of service by DHL. **Figure 9** provides details regarding land use within the projected 2013 NEM.

The area of the 65 dB DNL contour was increased by approximately 17 acres from the actual 2008 NEM. The area of the Projected 2013 NEM is in **Table 13**. Approximately 1,143 households are included within the 65 dB DNL contour, considered



Sources: McFarland Johnson, NFTA, NYSDOT, NYS Cyber Security and Critical Infrastructure Coordination

NOISE EXPOSURE MAP UPDATE

FUTURE (2013) NOISE EXPOSURE MAP

Legend

- Property Line
- Municipal Boundaries

Day-Night Level Contours

- 65 dB DNL
- 70 dB DNL
- 75 dB DNL

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FIGURE 8

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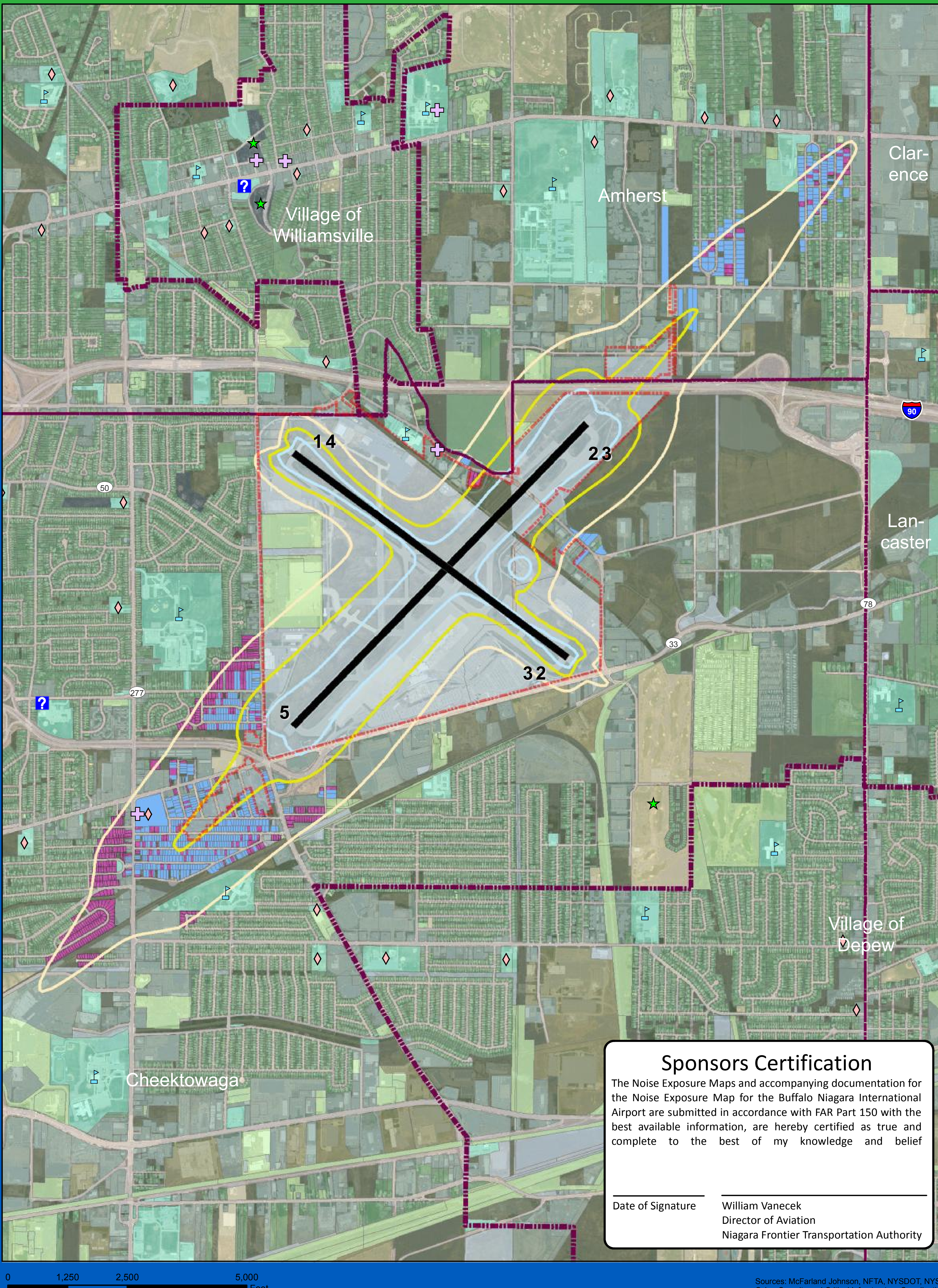
K:\NFTA\T-1734501 BNIA Noise\-3 Draw\GIS\Final\Future Countour - Fig 8.mxd



Sponsors Certification

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Map for the Buffalo Niagara International Airport are submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief

Date of Signature

William Vanecek
Director of Aviation
Niagara Frontier Transportation Authority

NOISE EXPOSURE MAP UPDATE

FUTURE (2013) NOISE EXPOSURE MAP & AFFECTED LAND USES

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FIGURE
9

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K:\NFTA\1-17345.01 BNIA Noise\-3 Draw\GIS\Future\Future Contour and Land Use - Fig 9.mxd to be the threshold of significance by the FAA. **Figure 10** displays the difference between the 2008 NEM projected as part of the 2003 Part 150 Study, the actual 2008 NEM, and the projected 2013 NEM. Of the 1,143 households within the 65 dB DNL contour, 474 have had sound insulation improvements constructed, and an additional 148 have signed agreements for the design of these improvements. This leaves 521 households that have not undergone improvements through the QuieterHome Buffalo program. However, approximately 209 households previously eligible for sound insulation improvements will fall outside of the 65 db DNL threshold. **Table 14** provides a detailed analysis of the on-going Noise Compatibility Program and impacts on the project for future sound insulation improvements as a result of this NEM Update. In addition, 35 households that are no longer within the 65 dB DNL contour, as well as an apartment building and the Maryvale Primary School, have constructed sound insulation improvements, or have the design of those improvements ongoing. The Chapel of the Our Lady Help of Christians is located within the 65 db DNL contour and, as a structure registered on the National Register of Historic Places, is a non-compatible land use. Detailed scenario run input reports for the projected 2013 NEM can be found in **Appendix C**.

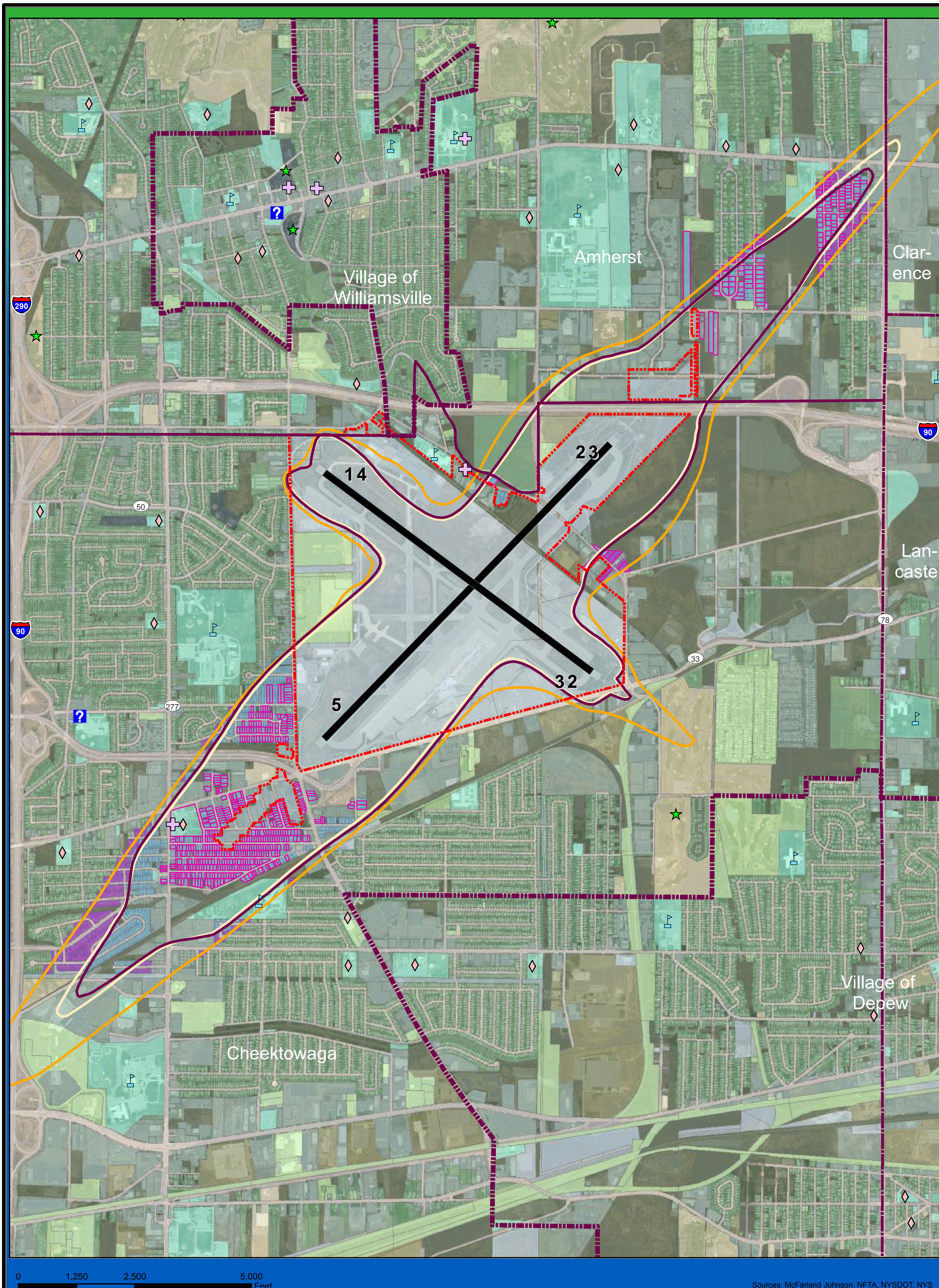
TABLE 13: DIFFERENCE BETWEEN NOISE CONTOURS

NOISE CONTOUR (DNL)	TOTAL AREA (2008 ACTUAL)	TOTAL AREA (2013 PROJECTED)	POPULATION (2013 PROJECTED)
65 to 70 dB	881 ac.	888 ac.	7 ac.
70 to 75 dB	361 ac.	360 ac.	-1 ac.
Greater than 75 dB	266 ac.	277 ac.	11 ac.
Total	1,508 ac.	1,525 ac.	17 ac.

TABLE 14: SOUND INSULATION IMPROVEMENTS (DESIGNED OR CONSTRUCTED)

NOISE CONTOUR (DNL)	NON-COMPATIBLE PARCELS WITH IMPROVEMENTS	HOUSEHOLDS WITH IMPROVEMENTS	NON-COMPATIBLE PARCELS WITHOUT IMPROVEMENTS (2003 PART 150)	HOUSEHOLDS WITHOUT IMPROVEMENTS (2003 PART 150)	NON-COMPATIBLE PARCELS WITHOUT IMPROVEMENTS (2008 NEM UPDATE)	HOUSEHOLDS WITHOUT IMPROVEMENTS (2008 NEM UPDATE)
65 to 70 dB	394	424	624	700	414	495
70 to 75 dB	176	197	27	28	25	26
Greater than 75 dB	1	1	2*	2*	0	0
Total	571	622	653	730	439	521

* The two parcels, which were previously residential, were acquired by NFTA & C&S Engineers as part of the QuieterHome Buffalo program.



NOISE EXPOSURE MAP UPDATE

NOISE EXPOSURE MAP COMPARISON

Legend

Landmarks
- Church
- Historic Register
- Library
- Park
- School
- Municipal Boundaries
- Property Line

Day-Night Level Contours
- Actual (2008) 65 dB DNL
- Projected (2008) 65 dB DNL
- Projected (2013) 65 dB DNL

Tax Parcel Land Use
- Agricultural
- Residential
- Vacant Land
- Commercial
- Recreation & Entertainment
- Community Services
- Industrial
- Public Services
- Parks & Conservation Areas
- Other
- Residential (Within 65 dB DNL)
- Residential (Removed from 65 dB DNL)
- Residential (Participating in Sound Mitigation)

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FIGURE 10

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Also relevant is the location of the nearby Maryvale Middle School and Maryvale High School, both located on Maryvale Drive in Cheektowaga. The schools, with Day-Night Levels of 60.4 and 60.8 dB, remain outside of the 65 dB DNL threshold. However, NFTA has indicated that the schools may be interested in noise mitigation due to the adverse affects of aircraft noise on the education environment. According to FAR Part 150, the threshold of significance for a school is 65 dB DNL. However, Appendix A, Part B, Section 101(d) of the document indicates that "For the purpose of compliance with this part, all land uses are considered to be compatible with noise levels less than 65 dB DNL. Local needs or values may dictate further delineation based on local requirements or determinations."

3.5 Changes to Airport Noise Overlay Zoning Districts

The 2003 Part 150 Study recommended the creation of Airport Noise Overlay Zoning Districts in the Towns of Amherst, Cheektowaga, and Clarence to manage development within noise sensitive areas, or those with a Day-Night Level greater than 65 dB. The zones were divided into three categories with the largest designated as "Zone 1" which included parcels with a DNL between 65 and 70. "Zone 2" included parcels with a DNL between 70 and 75. The final zone, and the smallest in terms of area, was "Zone 3" which included parcels with a DNL greater than 75. Compatible land uses within each zone can be found in **Table 15**.

The Projected 2013 NEM includes 369 fewer acres within the 65 dB DNL and higher noise contours than the Projected 2008 NEM included as part of the 2003 Part 150 Study. Further, the DNL 65 dB noise contour no longer extends into the Town of Clarence. As of February 2010, the Towns of Cheektowaga and Amherst had yet to enact Airport Noise Overlay Zoning Districts as part of their Town Zoning Ordinances. According to a review of recently completed plans and studies that may affect the Town of Amherst, completed as part of an on-going Five-Year Comprehensive Plan Review, it was recommended that the Town consider enacting the Airport Noise Overlay Zoning Districts recommended in the 2003 Part 150 Study[1]. It is recommended that the Towns of Amherst and Cheektowaga enact Airport Noise Overlay Zoning Districts as part of their zoning regulations that will correspond to the Projected 2013 NEM. Airport Noise Overlay Zoning Districts should correspond to the same categories recommended in the 2003 Part 150 Study, and follow the same guidelines available in Table 14 below. The proposed overlay district should not include parcels currently owned by NFTA for uses associated with BNIA. The proposed Airport Noise Overlay Zoning Districts are shown in **Figure 11**.

[1] Town of Amherst Five-Year Comprehensive Plan Review, Review of Plans & Regulatory Amendments, Pages 48-50.

TABLE 15: COMPATIBLE USES IN AIRPORT NOISE OVERLAY DISTRICTS			
LAND USE	ZONE 1 (DNL 65 – 70 DB)	ZONE 2 (DNL 70 – 75 DB)	ZONE 3 (DNL 75 – 80 DB)
Residential			
Residential	Incompatible[1]	Incompatible[1]	Incompatible
Mobile Homes	Incompatible	Incompatible	Incompatible
Transient Lodging	Incompatible[1]	Incompatible[1]	Incompatible
Public Use			
Schools/Libraries	Incompatible[1]	Incompatible[1]	Incompatible
Hospitals/Nursing Homes	Compatible[2]	Compatible[3]	Incompatible
Churches/Theatres/ Auditoriums	Compatible[2]	Compatible[3]	Incompatible
Governmental Services	Compatible	Compatible[2]	Compatible[3]
Commercial			
Office Buildings	Compatible	Compatible[2]	Compatible[3]
Wholesale & Retail (Building Materials, Hardware)	Compatible	Compatible[2]	Compatible[3]
General Retail	Compatible	Compatible[2]	Compatible[3]
Utilities	Compatible	Compatible[2]	Compatible[3]
Communications	Compatible	Compatible[2]	Compatible[3]
Manufacturing			
Manufacturing (General)	Compatible	Incompatible[2]	Incompatible[3]
Photographic & Optical	Compatible	Incompatible[2]	Incompatible[3]
Agriculture (Excluding Livestock)	Compatible[4]	Compatible[4]	Compatible[5]
Livestock Farming	Compatible[4]	Compatible[4]	Incompatible
Mining	Compatible	Compatible	Compatible
Recreational & Open Space			
Outdoor Sports Facilities	Compatible[6]	Compatible[6]	Incompatible
Amphitheatres	Incompatible	Incompatible	Incompatible
Nature Exhibits & Zoos	Incompatible	Incompatible	Incompatible
Parks/Playgrounds	Compatible	Compatible	Incompatible
Golf Course/Stables	Compatible	Compatible[2]	Compatible[3]
Permanent Vacant/Open Space	Compatible	Compatible	Compatible

Source: 14 CFR 150, Airport Noise Compatibility Planning; 2003 Part 150 Study; McFarland Johnson Analysis

[1] When necessary, residential uses in Noise Zones 1 and 2 are permitted, however noise level reduction measures of at least 25 dB (in Noise Zone 1) to 30 dB (in Noise Zone 2) are required.

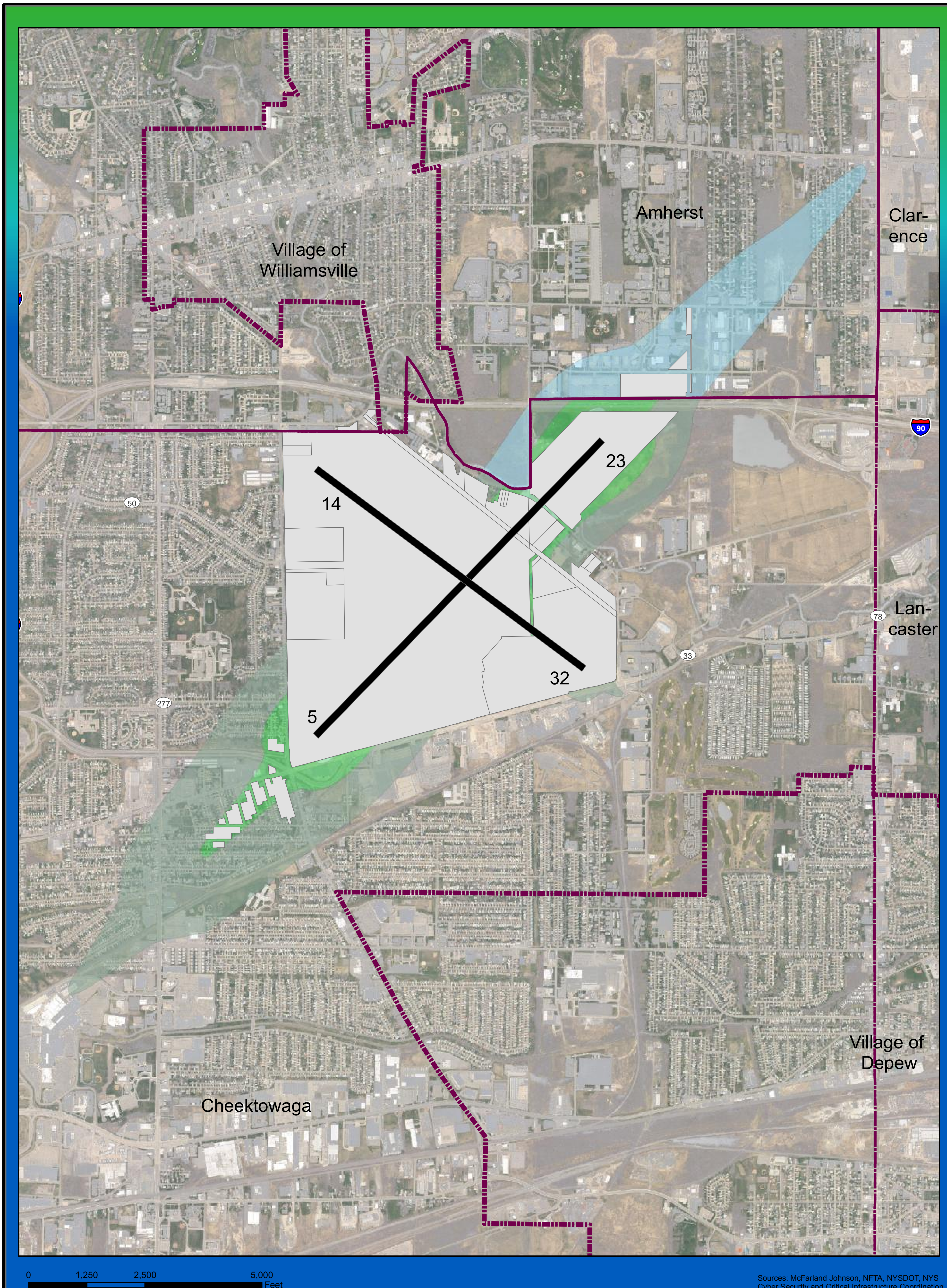
[2] Noise Level Reduction of at least 25 dB are necessary for portions of buildings available for public use including office areas and learning spaces

[3] Noise Level Reduction of at least 30 dB are necessary for portions of buildings available for public use including office areas and learning spaces

[4] Restrictions on residential structures are required to follow those in Note 1.

[5] Residential structures are incompatible.

[6] Sound reinforcement systems are recommended



NOISE EXPOSURE MAP UPDATE

PROPOSED NOISE OVERLAY ZONING DISTRICTS

Legend

Town of Cheektowaga Overlay
- Zone 1 (65-70 dB)
- Zone 2 (70-75 dB)
- Zone 3 (75+ dB)

Town of Amherst Overlay
- Zone 1 (65-70 dB)
- Zone 2 (70-75 dB)
- Zone 3 (75+ dB)

- Municipal Boundaries
- Runway
- Airport-Owned Property

N W E S

NFTA
Niagara Frontier Transportation Authority
Serving Buffalo Niagara

BUFFALO NIAGARA INTERNATIONAL AIRPORT

FIGURE
11

McFarland Johnson

Date: APRIL 2011

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4.0 Conclusion

As a result of a improved modeling technology, a changing fleet mix, and actual operations below the number projected in the 2003 Part 150 Study, the area included in the Actual 2008 NEM and the Projected 2013 NEM is less than the Projected 2008 NEM included in that study. The Projected 2013 NEM includes 369 fewer acres of land that experience Day-Night Levels of greater than 65 dB. The combination of a decreased rate of growth in operations and a decreased number of operations by aircraft including the KC-135 and the Boeing 727 is considered a main factor behind the decrease in the area of the NEMs completed as part of this update. The decrease in this area will remove several hundred households from the DNL 65 dB threshold of significance for airport related noise that were included within the 2003 Part 150 Study. Further, this decrease in area will also affect the proposed Airport Noise Overlay Districts proposed in the 2003 Part 150 Study, as the districts will decrease in area to accommodate the changing operations and fleet mix at the Airport. It is recommended that NFTA reevaluate the NEMs periodically to ensure they reflect projected operations, fleet mix, and to account for changes in airport layout.

APPENDIX A

AGENCY CORRESPONDENCE

McFarland Johnson

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PO Box 1980
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Fax: 607-723-4979
Web: www.mjinc.com

September 29, 2009

Sukhbir Gill
New York Airports District Office
Federal Aviation Administration
600 Old Country Road
Garden City, NY 11530

RE: Buffalo Niagara International Airport
Noise Exposure Map Update
Approval of INM Substitutions

Ms Gill:

McFarland Johnson Inc. has been retained by the Niagara Frontier Transportation Authority to update the Noise Exposure Map (NEM) for the Buffalo Niagara International Airport (BNIA). The original NEM map was created as part of a Part 150 Study in 2003, which featured a NEM for existing conditions as well as projected conditions in 2008. As part of this update, McFarland Johnson will be creating an existing NEM utilizing 2008 operations data at BNIA, as well as an NEM for 2013 utilizing enplanement and operations projections.

As part of this study, McFarland Johnson is utilizing data for commercial passenger air carriers at BNIA. In 2008, Continental Airlines partner Colgan Air conducted operations at BNIA utilizing the Bombardier Dash 8-400 (Q400). The Q400 is not in the Integrated Noise Model (INM) 7.0a database, and therefore a substitute aircraft is necessary. In addition, Continental Airlines partner CommutAir conducted operations utilizing the Bombardier Dash 8-200 (Q200), also not included in the INM database. McFarland Johnson has concluded that the BAe ATP should be utilized as a substitute aircraft for the Q400. According to FAA Advisory Circular (AC) 36-1H, *Noise Levels for U.S. Certificated and Foreign Aircraft*, the effective perceived noise levels (EPNdB) for the BAe ATP and the Q400 are within three dB at takeoff, approach, and sideline noise levels. McFarland Johnson has also concluded that the Q200 has similar engine thrust levels as the Bombardier Dash 8-100 (DHC8), an aircraft which utilized BNIA regularly in 2008 and therefore has been chosen as the substitute aircraft.

Please let us know if you have any comments or questions regarding the proposed substitutions.

Sincerely,

ZAS

Zachary Staff
Junior Planner

cc: Mark Clark, Niagara Frontier Transportation Authority

U.S. Department
of Transportation
Federal Aviation Administration

Office of Environment and Energy

800 Independence Ave., S.W.
Washington, D.C. 20591

January 12, 2010

Maria Stanco
Federal Aviation Administration
Eastern Region Airports Division, AEA-610

Dear Ms. Stanco,

The Office of Environment and Energy (AEE) has reviewed the proposed Integrated Noise Model (INM) aircraft substitutions for the Noise Exposure Map (NEM) Update at Buffalo Niagara International Airport (BNIA).

McFarland Johnson, Inc. has been retained by the Niagara Frontier Transportation Authority to update the NEM for BNIA and has proposed substitutions for two aircraft types that currently do not have standard substitutions in the INM aircraft database. The proposed substitutions and the corresponding AEE recommendations are summarized in the table below.

Aircraft	McFarland Johnson Proposed Substitution	AEE Recommendation
Bombardier Dash 8-402(Q400)	BAEATP	DHC830
Bombardier Dash 8-201(Q200)	DHC8	Concur

AEE concurs with using the INM type DHC8 as the aircraft substitution for the Bombardier Dash 8-201 (Q200). However, AEE recommends the INM type DHC830 for modeling the Bombardier Dash 8-402 (Q400) rather than the BAEATP proposed by McFarland Johnson. The BAEATP is not currently modeled in the INM aircraft database. INM currently uses the HS748A as a substitute for the BAEATP; however the HS748A is a poor substitute for both the BAEATP and the Q400. The HS748A is a Stage 2 aircraft with takeoff and sideline certification levels more than 10 dB above the BAEATP and Q400 aircraft certification levels. AEE analysis of the Q400 indicates that the DHC830 would be a more reasonable substitute for the Q400 than the HS748A.

Please understand that this approval is limited to this particular NEM update for BNIA. Any additional projects or non-standard INM input at BNIA or any other site will require separate approval.

Sincerely,

Raquel Girvin, Ph.D.
Manager
AEE/Noise Division

cc: Vicki Catlett

APPENDIX B

LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS
(OBTAINED FROM 14 CFR 150, APPENDIX A, TABLE 1)

Land Use Compatibility* With Yearly Day-Night Average Sound Levels

Land use	Yearly day-night average sound level (L_{dn}) in decibels					
	Below 65	65–70	70–75	75–80	80–85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

*The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Key to Table 1

SLUCM=Standard Land Use Coding Manual.

Y (Yes)=Land Use and related structures compatible without restrictions.

N (No)=Land Use and related structures are not compatible and should be prohibited.

NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes for Table 1

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

Appendix C

Detailed Scenario Run Input Reports
(Provided on Enclosed CD)