

Briefing Paper: Noise Concerns from Westchester County Airport

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Prepared by: Intermunicipal Airport Master Plan Task Force

Introduction

Westchester County Airport (HPN) is a vibrant and busy public facility. Along with the benefits it provides the community, the airport also generates negative impacts which are most closely felt by the surrounding communities and are the appropriate subject of public monitoring, concern and input.

One of the impacts disproportionately affecting the surrounding communities is noise pollution generated by airport activities. As operations at the airport have rebounded since the pandemic, residents in nearby areas have reported higher levels of disturbance from aircraft noise, especially during early morning and late-night hours and from disruptive low flying helicopters. This briefing paper aims to provide an overview of the noise issues of community concern, historical context for these concerns, to propose possible solutions to address these concerns and to provide a foundation for further dialogue and decision-making among all stakeholders.

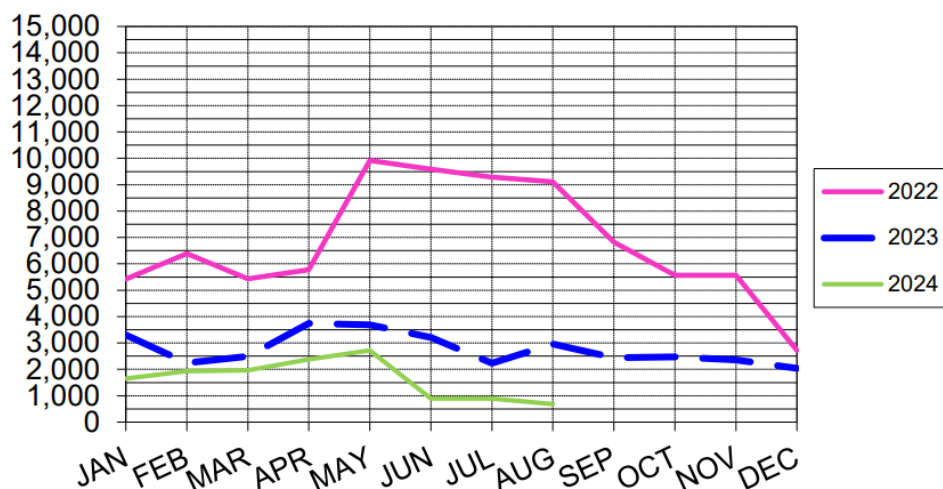
In response to these and other concerns, local municipalities have formed an Intermunicipal Airport Master Plan Task Force. The Task Force is a collection of volunteers representing each of the municipalities most impacted by the daily operation at HPN. The Task Force hopes these noise issues will be considered and addressed where possible in the Master Plan. The Task Force is comprised of volunteer, non-professional part-time members and the data and conclusions cited in this report are to be reviewed with airport professionals and staff.

Background

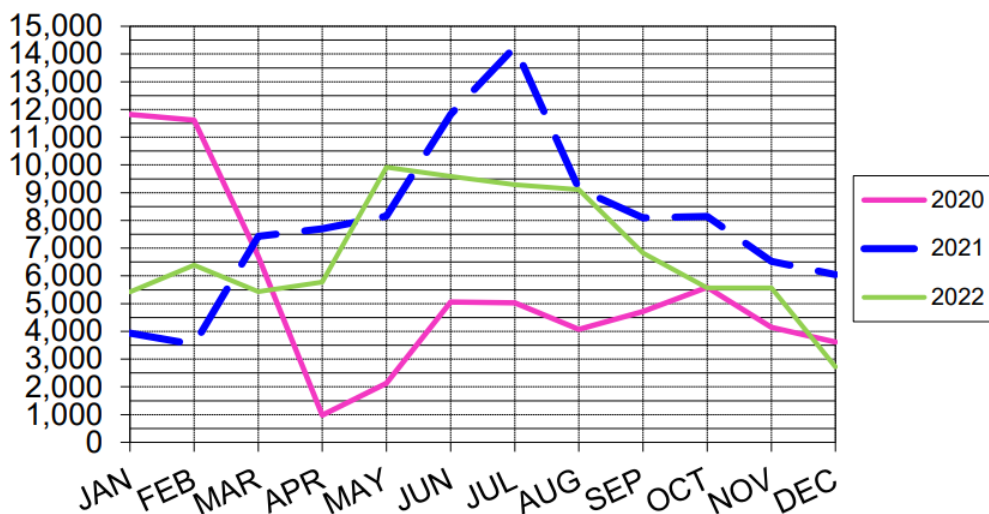
Located in the Village of Rye Brook and Towns of Harrison and North Castle, New York, HPN is located in primarily a residential area. Initially developed as home to the Air National Guard during World War II, HPN has evolved into a facility serving commercial air carriers-such as Jet Blue, Delta and American Airlines, fixed base and transient operators-such as NetJets, Signature and Million Air, and corporate users-such as JPMorgan/Chase and Pepsico. Commercial air traffic passing through the terminal comprise only about 15% of all aircraft operations at the airport, resulting in governing bodies having limited authority over the vast majority of aircraft operations which do not pass through the terminal.

Local residents, particularly those communities along the final approaches leading to the airport, such as Port Chester, Rye Brook, North Castle, and Greenwich CT, consistently raise concerns about the noise generated from aircraft operations and its impact on health and quality of life. The level of noise complaints over many years indicates that many residents find the current levels of noise to be disruptive to their daily lives.

WESTCHESTER COUNTY AIRPORT NOISE COMPLAINTS



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Studies have linked prolonged exposure to high noise levels to health risks such as stress, hypertension, and sleep disturbances. Vulnerable populations, including children, the

elderly, and individuals with preexisting health conditions, may be disproportionately affected.

Aircraft noise is not only a disturbance to humans but can also impact local wildlife habitats. Noise-sensitive species in surrounding areas, including those in the nearby protected lands, may experience stress or be displaced.

Discussion of Key Issues

1. Flight Frequency/Passenger Volume:

- Flight frequency fluctuates and generally follows a pattern that coincides with larger macro conditions. The total number of aircraft operations (i.e., takeoffs and landings) peaked in 1987 at 232,422, consistently declined until the Great Recession of 2008-2009, reaching lows of 154,128 and 150,102¹, respectively in those years, climbed to 161,146 in 2017², until dipping again in the COVID year of 2020 to a level of 100,354³.
- Since COVID, aircraft operations have rebounded to more historically average levels of 159,781 in 2022 and 158,764 in 2023⁴. As of the writing of this paper, reported aircraft operations at HPN total 148,641 through November 30, 2024⁵, suggesting 2024 will be consistent with historical norms.
- Flight frequency, however, doesn't tell the full story. While flight frequency has been variable, the number of passengers travelling through the terminal at HPN (i.e., on commercial aircraft) has consistently increased. This data leads to the conclusion that significantly larger planes are utilizing the airport, transporting more passengers and one would expect that these larger aircraft generate more noise⁶. The table below shows the lack of correlation between the

¹ See Westchester County Airport Master Plan Update, December 2017

² See Westchester County Airport Monitor for December 2017.

³ See Westchester County Airport Monitor for December 2022.

⁴ See Westchester County Airport Monitor for December 2023.

⁵ See Westchester County Airport Monitor for November 2024.

⁶ Certain reports suggest that larger but more modern planes do not necessarily generate more noise. The 2002 Noise Study prepared for the County by TAMS Consultants, Inc, and Harris Miller Miller & Hanson Inc., indicates that the conversion from Stage 2 aircraft to quieter Stage 3 aircraft mandated by the FAA at the end of 1999 has had only a minimal effect on aircraft noise during landing but been reported to be more effective on takeoffs. Yet this net benefit was expected to be only in the order of one decibel. It is worth investigating if further advances in technology have yielded potential additional benefits and can be implemented. In

number of aircraft operations and passenger volume at HPN for several years⁷.

Year	Aircraft Operations (commercial and private)	Passengers Utilizing Main Terminal ⁸
2024 ⁹	148,641	2,091,962
2023	158,764	2,231,608
2022	159,781	1,732,589
2021	142,336	1,033,483
2020	100,354	445,779
2017	161,146	1,357,067
2016	147,516	1,352,953
2012	161,109	1,800,000 ¹⁰

- Compare, for example, the years 2022 and 2023 above. The number of aircraft operations were virtually identical in each year-159,781 (for 2022) vs. 158,764 (for 2023). Yet the number of passengers passing through the terminal in 2023 was almost 30% higher (2,231,608 vs. 1,732,589) yielding an average of approximately 14 passengers per operation for 2023 vs. 11 passengers per operation for 2022. This pattern appears to be repeating itself in 2024 and appears to be the result of the commercial airlines utilizing larger aircraft carrying greater numbers of passengers in and out of HPN which will be discussed further below.
- The ratio of commercial airline operations to private aircraft operations is relatively stable for each of 2022 and 2023 and were within 10% of each other¹¹ thereby supporting the conclusion that the increase in passenger counts is not due to an increase in commercial air traffic but rather due to the larger jets the commercial airlines are flying into HPN. The table below illustrates the stable ratio of commercial airline

addition, this Noise Study was conducted in 2002 and an updated noise study, if not already performed, is overdue.

⁷ This information is generally derived from the year-end Westchester County Airport Monitors for the corresponding years, with the exception of the data for the year 2012 which is derived from the 2017 Airport Master Plan.

⁸ The airport does not have reliable figures on the number of passengers not utilizing the main terminal so these passenger counts reflect only passengers utilizing the main terminal.

⁹ Through November 30, 2024

¹⁰ This figure is estimated based on the 939,341 enplanements reported in the 2017 Master Plan Update.

¹¹ See Westchester County Airport Monitor Reports for December 2022 and December 2023.

operations to corporate operations at HPN going back almost ten (10) years with commercial airline operations ranging between approximately 14% (excluding the COVID years of 2020 and 2021) and 17.5% on a historical basis.

Year	Total Operations	Corporate Operations ¹² / % of total	Airline Operations/ % of total
2024 ¹³	148,641	81,397/54.8%	24,483/16.5%
2023	158,764	85,209/53.7%	27,636/17.4%
2022	159,781	92,765/58.8%	25,295/15.8%
2021	142,336	89,346/62.8%	13,626/9.6%
2020	100,354	55,244/55.0%	7,817/7.8%
2018	151,368	83,460/55.1%	22,137/14.6%
2017	161,146	92,734/57.6%	22,268/13.8%
2016	147,516	89,117/60.0%	23,129/15.7%

- When you consider that commercial aircraft operations are only a fraction of total operations at HPN and passenger counts reflect just passengers utilizing the main terminal, you can see how dramatically passenger counts on the commercial airlines have increased. The table below indicates they reflect a 25% increase in average passenger counts per commercial airline operation from 2022-2024.

Year	Commercial Aircraft Operations Utilizing Main Terminal	Passengers Utilizing Main Terminal	Passengers per Operation
2024 ¹⁴	24,483	2,091,962	85.45
2023	27,636	2,231,608	80.75
2022	25,295	1,732,589	68.50

- The County should examine and quantify the usage of larger aircraft at HPN and seek to correlate noise complaints received with the type of aircraft associated with the corresponding complaint. The noise profiles of these aircraft should be examined relative to the smaller aircraft previously in use in order to enable an informed analysis to be made of the trade-off in total noise generated between having fewer flights with

¹² These figures are combined for based and transient corporate aircraft and are also taken from County Airport Monitor Reports.

¹³ Through November 30, 2024

¹⁴ Through November 30, 2024

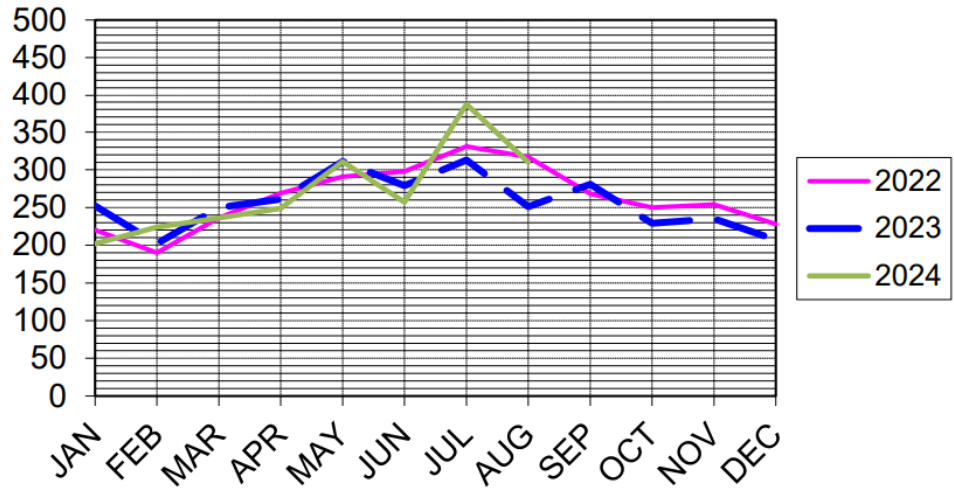
larger planes each carrying more passengers vs. having more flight operations with smaller planes each carrying fewer passengers.

- The Terminal Use Agreement (TUA) in effect at HPN is effective in limiting the number of aircraft and passengers that use the terminal and similarly limits noise pollution. It is important that the TUA remain in effect to continue to limit noise pollution.

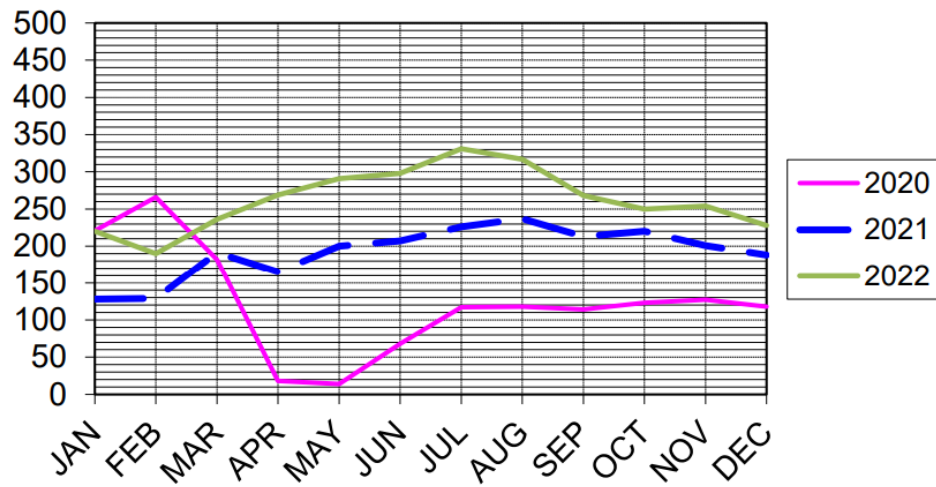
2. Existing Noise Abatement Procedures-The Airport has several noise abatement procedures in place and they include the Voluntary Restraint from Flying Program (VRFF), High Range Noise Event (HRNE) Program, Intersection Takeoff Prohibition, Maintenance Runup Restriction, Reverse Thrust Usage limitation, and Advance Authorization Program. These programs are important contributors to limiting noise and it is important they remain in effect. We will discuss only a few of them here.

- VRFF-This is a voluntary curfew in effect from midnight to 6:30 AM. Compliance with this curfew, as its name suggests, is voluntary with violators suffering mostly just a lack of the positive recognition bestowed on those with good compliance records and perhaps poor public relations but no meaningful sanctions. There are several regularly scheduled commercial aircraft which operate within the hours proscribed by this curfew. Private aircraft operators not using the terminal do not appear to be subject to any meaningful repercussions for violating the curfew. The County should consider what tools may be at its disposal, whether through leases in effect at the airport or otherwise, to enforce compliance with the curfew.
- In 2024, VRFF night operations are reaching a multi-year high and the charts below indicate the upward trend in VRFF operations over several years.

VRFF NIGHT OPERATIONS - 12 AM to 6:30 AM



VRFF NIGHT OPERATIONS - 12 AM to 6:30 AM



The County's Airport Monitor Reports indicate that corporate aircraft operations during the curfew (for transient and based corporate aircraft combined) comprise the majority (and in some years the vast majority) of these operations (with only one year reported falling slightly below 50% of these operations). The table below, derived from the County's Airport Monitors, illustrates the breakdown of

VRFF operations between corporate users and the commercial airlines for recent years for which this data was available¹⁵.

Year	Transient Corporate Aircraft	Based Corporate Aircraft	Total Corporate Aircraft	Commercial Aircraft
2024 ¹⁶	39.6%	12.7%	52.3%	39.6%
2023	38.2%	9.6%	47.8%	44.2%
2022	40.4%	10.0%	50.4%	39.7%
2021	59.1%	15.5%	74.6%	16.1%
2019 ¹⁷	46.2%	7.5%	53.7%	38.8%
2018	52.4%	7.1%	59.5%	32.7%
2017	59.7%	7.1%	66.8%	31.7%
2016	54.1%	7.8%	61.9%	33.1%

While the above shows the majority of VRFF operations are conducted by corporate users, it also shows that VRFF operations by the commercial airlines are increasing.

Another phenomenon is also evident here. When you consider that commercial aircraft operations only comprise approximately 15% of all operations at HPN, you can see that the number of operations the commercial airlines are conducting during the curfew represents a much larger percentage of their total operations. Consider the year 2023, which is the most recent complete year for which data is available. In 2023, the commercial airlines conducted a total of 1,358 VRFF operations out of a total of 27,636 operations. This translates to the commercial airlines conducting 4.9% of their total operations airlines during the curfew. This pattern is relatively stable with the commercial airlines routinely conducting approximately 5% of their total operations during the curfew.

Year	Commercial Airlines VRFF Operations	Commercial Airlines Total Operations	Percentage of VRFF to Total Operations
2023	1,358	27,636	4.9%
2022	1,251	25,295	5.0%
2018	1,071	22,137	4.8%

¹⁵ No data was available for 2020.

¹⁶ Through November 30, 2024

¹⁷ Data for 2019 was only reported on the County's Airport Monitor through November 20, 2019. As mentioned above, no data was reported for 2020.

2017	1,132	22,268	5.1%
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By comparison, the 1,470 VRFF operations conducted by corporate users (transient and based combined) in 2023, represented only 1.7% of their 85,209 total operations. This pattern held true in 2022 as well with the corporate users again conducting 1.7% of their total operations within the curfew (with 1,606 VRFF operations out of a total of 92,765 operations). In other words, when looked at relative to each user's own operations, the commercial airlines are violating the curfew at a rate almost three times the rate of corporate users¹⁸.

- Helicopter Operations- Helicopter usage during the curfew shows dramatic variations from year to year as illustrated in the table below¹⁹.

Year	Helicopter Usage during VRFF ²⁰	% of Total VRFF Operations
2017	132	3.7%
2021	92	4.0%
2022	136	4.3%
2023	91	3.0%
2024 ²¹	98	3.4%

Helicopter operations during the curfew appear to consistently range between 3.0% and 4.3% of total VRFF operations²². While these percentages pale compared to their commercial and private aviation counterparts, when you consider that a helicopter generates between 79-87 dB of noise at altitudes between 500-1000 feet, even these relatively infrequent violations of the curfew severely disrupt the quality of life for the surrounding residents and steps should be taken to curtail these disturbances. Transient helicopter usage during the VRFF in particular (as distinguished from HPN based helicopters), appears to vary greatly-ranging from 59 in 2023 to 107 in 2022²³. An effort should be made to understand the reasons behind the large swing in transient helicopter operations during the curfew.

¹⁸ See Westchester County Airport Monitor Report for December 2023 and December 2018.

¹⁹ See Westchester County Airport Monitor Reports for December 2018, December 2023 and November 2024.

²⁰ These are combined figures for transient and based helicopters.

²¹ Through November 30, 2024

²² See Westchester County Airport Monitor Reports for December 2018, December 2023 and November 2024.

²³ Again, based on the Airport Monitor Reports referenced above.

In addition, given advances in electrically powered helicopters and their reduced noise profile²⁴, HPN must make certain it has the infrastructure to support eVTOL (electric vertical takeoff and landing) usage to mitigate the noise impacts of helicopters at HPN both during and outside the hours of the curfew.

- Advance Authorization Program- A 120,000 lbs. gross takeoff weight restriction is in place at HPN. An operator must call the airport in advance and request permission to land if this restriction (120,000-180,000 lbs.) is to be exceeded and aircraft exceeding 180,000 lbs. are not allowed to operate at HPN. Given advances in technology, it is also worth considering whether this weight criterion is still the most effective barometer to measure noise impacts or if other or additional criteria should be considered.

3. Noise Monitoring

- The County places noise monitors at several locations surrounding the airport. Consistent with accepted practices, these monitors measure average noise levels. While prolonged exposure to elevated noise levels is a concern and needs to be addressed, it is also rapid increases in noise levels that have deleterious effects on stress, anxiety, sleep and health. The limited duration of increased noise levels caused by intermittent air traffic results in only nominal increases in average noise levels and do not accurately reflect all of the impacts on health, stress, anxiety or sleep disturbance.
- The 2017 Master Plan indicates a jet flying overhead at an altitude of 900 feet produces sound at a level of 100 dB, somewhere between the noise level of a rock band 15 feet away or the inside of a New York Subway train²⁵. Neighborhoods in the areas surrounding the airport are regularly subjected to noise from aircraft at altitudes of less than 900 feet. Yet, with the exception of increases in total noise levels measured by the noise monitors located either directly beneath the final approach to runways 16 or 11 (Monitor #1 and 17) or in the direct path of or immediately adjacent to runway 34 (Monitors # 2R, 6 and 14), the remaining monitors generally do not reveal an increase of more than a dB or two in average

²⁴ These noise levels are estimated to be below 65dB at a distance of 330 feet during takeoff and landing according to Joby Aviation.

²⁵ See Sec. 2.1.4.11.1.1.

noise levels between general community noise levels and total noise levels when adding in air traffic.

- Other municipalities, such as New York City, measure noise disturbances relative to increases in ambient sound levels caused by various activities, with variations on the amount of permissible increases at different times of day. The County should consider a methodology that similarly measures increases in ambient sound levels on an episodic basis, rather than on an average basis, and consider maximum levels of increases in ambient noise levels on that basis.

4. Property Values; New Development

- Noise pollution correlates to reduced property values in the areas most affected, as potential buyers may be deterred by airport noise.
- Municipalities, facing their own separate pressures, continue to approve new developments either directly within the flight path or within areas susceptible to noise pollution from air traffic and within areas previously not considered suitable for residential development. As of the 2017 Master Plan Update, the estimated population within the Average Daily Noise Level (DNL) 65 dB contour was 33²⁶. The County should evaluate how this population has grown in light of the developments completed and anticipated since then.
- While the County has previously sought to discourage municipalities from approving residential developments in these areas, new and additional education and alternatives are needed to prevent additional residents from being impacted by noise pollution resulting from airport activities.

5. Flight Path Adjustments:

- The airspace around HPN is regulated by the Federal Aviation Administration (FAA) and not controlled by the County. With several airports in close proximity to HPN, including JFK, LaGuardia, Newark, Stewart and Teterboro, the airspace around HPN is very tight and does not leave a lot of flexibility to adjust flight paths.

²⁶ See Sec. 2.1.4.11.5 of 2017 Master Plan.

- To the extent helicopter usage is discretionary, flight paths over Greenwich and Port Chester to the Long Island Sound and along the shoreline of Rye and Mamaroneck is also disturbing. Encouraging these flights at higher altitudes and through routes more in the middle of the Sound would help mitigate these impacts.
- To the extent total noise levels to be experienced by all residents can be reduced, the County should consider ways to collaborate with the FAA to seek to reduce total noise levels over residential areas. The County should not however, seek to re-distribute or re-allocate noise impacts from one community to another as existing residents have made deliberate decisions on where to locate their homes based on existing patterns.

Recommendations

1. Community Engagement and Feedback Mechanisms:
 - Conduct more frequent public hearings and forums to gather community feedback on noise issues, enhance community involvement in the decision-making process and foster a collaborative approach.
 - Timely update noise reports.
 - Educate public on how to access noise reports and report noise complaints.
2. Noise Mitigation
 - Compare noise profiles of larger aircraft to smaller aircraft.
 - Correlate noise complaints with corresponding aircraft.
 - Consider trade-off between larger aircraft carrying more passengers on fewer flights and smaller aircraft carrying fewer passengers on more frequent flights.
 - To the extent helicopter usage is discretionary, encourage helicopter routes over surrounding waterways at greater altitudes.
 - Provide eVTOL infrastructure.
3. Development Considerations
 - Require and/or offer sound mitigation solutions for homes in high-noise areas.
 - Require disclosures in new projects in areas affected by airport noise.

- Educate and provide incentives for local municipalities to limit development in areas severely affected by airport noise.

4. VRFF

- Identify meaningful remedies for violation of VRFF curfews.
- Encourage operators (both commercial and private) to reduce usage within VRFF curfews.
- Identify reasons for fluctuations in transient helicopter usage during VRFF curfews.

5. Noise Monitoring and Reporting:

- Expand noise monitoring efforts and provide regular reports that are accessible and easy to digest and understand.
- Measure sudden increases in noise on an episodic basis, in addition to monitoring average noise levels.
- Set benchmarks and goals to track noise reduction efforts over time.

6. FAA Collaboration:

- Seek to identify potentially feasible flight path adjustments that reduce total noise levels but do not re-distribute noise impacts between communities.

7. Long-Term Policy Considerations:

- Maintain long-standing policy against operational expansion to avoid escalation of noise levels, passenger usage and overnight operations.
- Maintain TUA in effect to limit passenger levels.
- Conduct impact assessment on proposed operational changes to anticipate and mitigate noise impacts.

Short-Term Actionable Recommendations. Of the numerous recommendations set forth above, we would consider the following the most actionable in the short term.

- Correlate noise complaints to type of aircraft and consider trade-off between larger aircraft carrying more passengers on fewer flights and smaller aircraft carrying fewer passengers on more frequent flights.

- Require and/or incentivize sound mitigation solutions for homes in high-noise areas.
- Identify meaningful remedies for violation of VRFF curfews.
- Measure sudden increases in noise on an episodic basis, in addition to monitoring average noise levels.
- Maintain TUA in effect to limit passenger levels.

Conclusion

The noise concerns stemming from Westchester County Airport are significant and require a multifaceted approach involving airport management, the FAA, local government, and community stakeholders. By enhancing monitoring, fostering community involvement, and exploring feasible operational adjustments, the airport can work towards reducing noise impacts and improving the quality of life for residents in surrounding areas.