



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Jack Reed  
Chairman  
Committee on Armed Services  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

Section 1724(c) of the National Defense Authorization Act for FY 2020 (Public Law 116-92), requested that the Secretary of Defense, in coordination with the Joint Chiefs of Staff, conduct a review and assessment of military helicopter noise in the National Capital Region (NCR).

The enclosed report includes an analysis of the causes and effects of military helicopter noise on communities; A description of the policies and procedures used to mitigate helicopter noise; A description of the processes in place for collecting, analyzing, and managing helicopter noise complaints in the NCR and the following recommendations to mitigate those effects: Work with the Federal Aviation Administration (FAA) to examine the feasibility of adjusting helicopter flight altitudes within the confines of flight safety and practicable action; Work with FAA and local airport authorities to identify noise complaint trends and make adjustments as necessary in the flying units within the limits of mission and safety; Obtain flight track data to ensure compliance with local flight procedures and helicopter routes and take corrective action, as needed, with the flying units within limits of mission and safety; and Ensure that good practices such as “fly neighborly” are being reinforced.

The Department of Defense understands the concerns of Congress and its constituents, and will continue to work closely with local military helicopter operators, military installations, and the FAA on this challenging issue.

I am sending an identical letter to the President of the Senate, the Speaker of the House, the transportation committees, and the other congressional defense committees.

Sincerely,

*Stacy A. Cummings*  
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CUMMINGS.STACY.A.10405  
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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
(Acquisition)  
Performing the Duties of Under Secretary of  
Defense for Acquisition and Sustainment

Enclosure:  
As stated

cc:  
The Honorable James M. Inhofe  
Ranking Member



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Adam Smith  
Chairman  
Committee on Armed Services  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

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Sincerely,

*Stacy A. Cummings*  
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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
(Acquisition)  
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Defense for Acquisition and Sustainment

Enclosure:  
As stated

cc:  
The Honorable Mike D. Rogers  
Ranking Member



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Patrick J. Leahy  
Chairman  
Committee on Appropriations  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

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Sincerely,

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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
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Defense for Acquisition and Sustainment

Enclosure:  
As stated

cc:  
The Honorable Richard C. Shelby  
Vice Chairman



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Rosa L. DeLauro  
Chair  
Committee on Appropriations  
U.S. House of Representatives  
Washington, DC 20515

Dear Madam Chair:

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Sincerely,

*Stacy A. Cummings*  
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CUMMINGS.STACY.A.10405  
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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
(Acquisition)  
Performing the Duties of Under Secretary of  
Defense for Acquisition and Sustainment

Enclosure:  
As stated

cc:  
The Honorable Kay Granger  
Ranking Member



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Maria Cantwell  
Chairwoman  
Committee on Commerce, Science, and Transportation  
United States Senate  
Washington, DC 20510

Dear Madam Chairwoman:

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I am sending an identical letter to the President of the Senate, the Speaker of the House, the other transportation committee, and the congressional defense committees.

Sincerely,

Digitally signed by  
CUMMINGS.STACY.A.1040  
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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
(Acquisition)  
Performing the Duties of Under Secretary of  
Defense for Acquisition and Sustainment

Enclosure:  
As stated

cc:  
The Honorable Roger F. Wicker  
Ranking Member



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Peter A. DeFazio  
Chairman  
Committee on Transportation and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:


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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
(Acquisition)  
Performing the Duties of Under Secretary of  
Defense for Acquisition and Sustainment

Enclosure:  
As stated

cc:  
The Honorable Sam Graves  
Ranking Member



OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Kamala D. Harris  
President of the Senate  
United States Senate  
Washington, DC 20510

Dear Madam President:

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I am sending an identical letter to the Speaker of the House, the transportation committees, and the congressional defense committees.

Sincerely,

*Stacy A. Cummings*  
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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
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Defense for Acquisition and Sustainment

Enclosure:  
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3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

ACQUISITION  
AND SUSTAINMENT

The Honorable Nancy Pelosi  
Speaker of the House  
U.S. House of Representatives  
Washington, DC 20515

Dear Madam Speaker:

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Stacy A. Cummings  
Principal Deputy Assistant Secretary of Defense  
(Acquisition)  
Performing the Duties of Under Secretary of  
Defense for Acquisition and Sustainment

Enclosure:  
As stated



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# **DEPARTMENT OF DEFENSE REPORT: Review and Assessment of Mitigation of Military Helicopter Noise**

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**As requested in the National Defense Authorization Act for FY 2020 (Section 1724)**

## **OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND SUSTAINMENT**

The estimated cost of this report or study for the Department of Defense is approximately \$21,000 for the 2021 Fiscal Year. This includes \$10,000 in expenses and \$11,000 in DoD labor.

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# **1. Introduction**

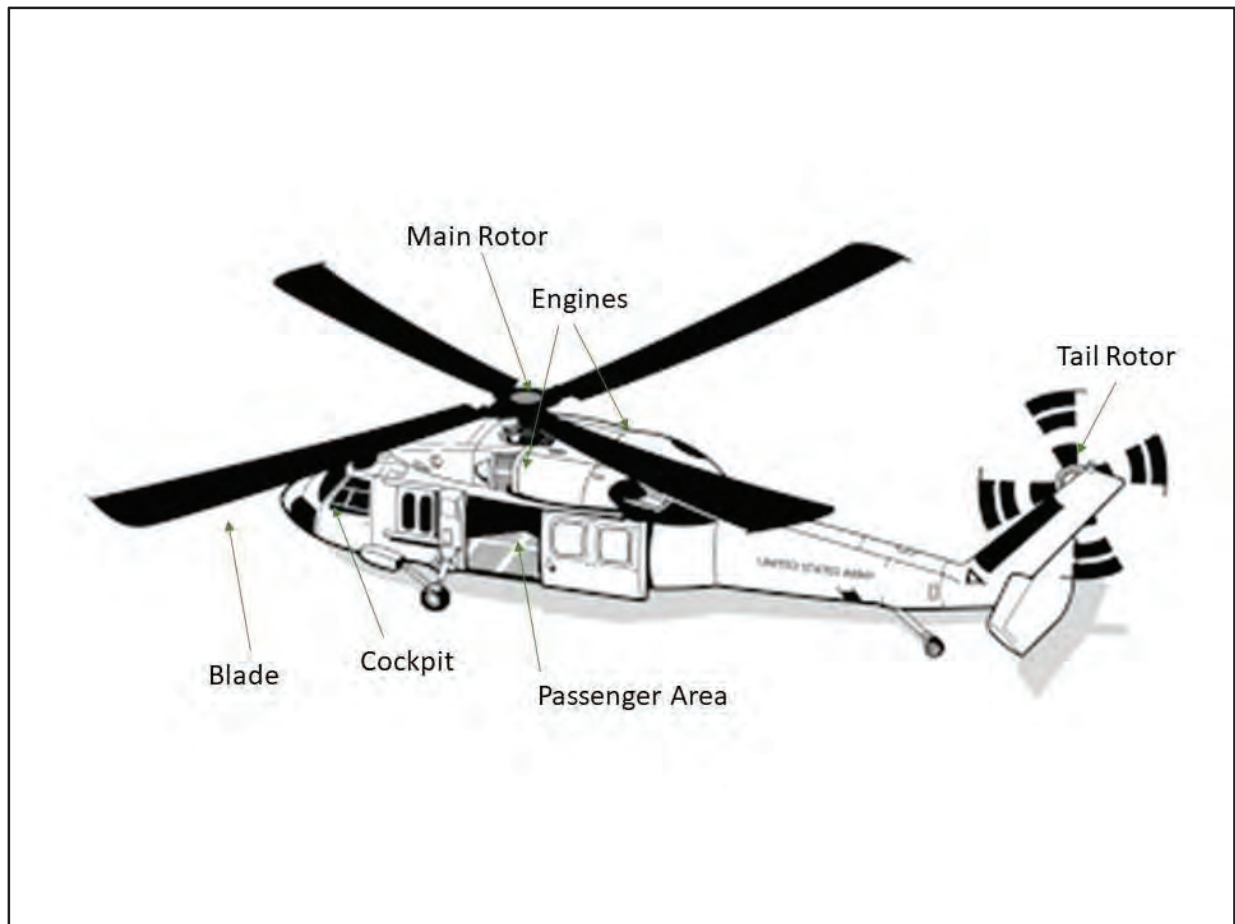
In response to Section 1724 of Public Law 116-92, the National Defense Authorization Act (NDAA) FY 2020, the Department of Defense (DoD) is submitting this report on the Department's review and assessment of military helicopter noise in the National Capital Region (NCR). This report captures and summarizes:

- 1) The Department's review and study of the causes and effects of military helicopter noise on communities and individuals in the NCR;
- 2) Recommendations to mitigate the effects of military helicopter noise on individuals, structures, and property values in the NCR;
- 3) The extent to which the Department has processes in place for collecting, analyzing, and managing military helicopter noise complaints from the general public across the NCR;
- 4) A description of the policies and procedures currently being used by the Army, Air Force, and Marine Corps in the NCR to mitigate the impact of helicopter noise; and
- 5) A description of the means to track compliance with these internal practices to ensure compliance.

Section 1724 of the NDAA for FY 2020 defined the NCR as including the District of Columbia; Montgomery and Prince George's Counties in the State of Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties and the City of Alexandria in the Commonwealth of Virginia; and all cities and other units of government within the geographic areas of such District, Counties, and City.

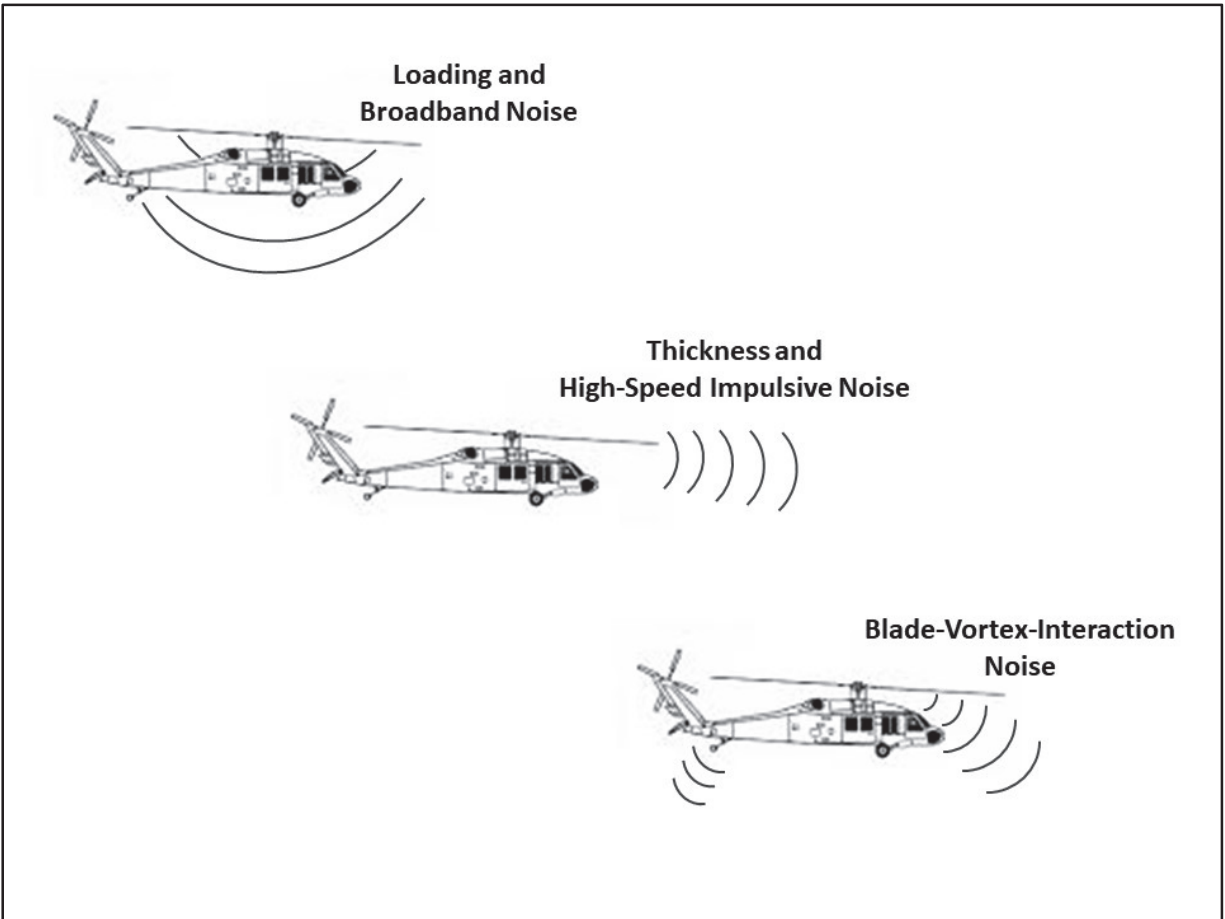
## **2. Understanding Causes and Effects of Helicopter Noise**

The external sound of a helicopter is generated from multiple acoustical sources from the aircraft: the main rotor, the tail rotor or anti-torque system, the engines, and the drive systems (Figure 1). For turbine-powered helicopters, the main rotor and tail rotor dominate the acoustical signature. Mechanical noise from the engine and transmission gearing is often considered secondary and tends to be significant only when the helicopter is in close proximity or passing directly overhead (Helicopter Association International (HAI) 2007). Other factors can affect the volume and type of noise detected including the design of the helicopter—specifically, the number of rotors, rotor design, engine type, size, and weight. In most cases, heavier aircraft will produce more noise.



**Figure 1: Basic Helicopter Components**

The complexity of helicopter noise also depends upon flight conditions. Rotor noise consists of the rotor rotational noise; thickness noise, or the displacement of air (volume displacement); and loading noise, or forces acting on the air that flows around the blade, caused by lift and drag. Additional low-frequency noise phenomena are caused by aerodynamic shocks on the blade surface. As seen in figure 2 below, these low-frequency noises include high-speed impulsive (HSI) noise and blade vortex interaction (BVI) noise (Yin 2000).



**Figure 2: Main Rotor Noise Directivity**

HSI noise is produced during fast, forward flight, when the leading edge of the advancing rotor blade becomes supersonic and compression shock occurs. These compression shocks generate an impulsive-like sound signal directed to the front of the aircraft. BVI, or more commonly referred to as “blade slap,” noise is the result of an interaction where the blade tip vortices produced by one rotor blade are encountered by the other rotor blades. Blade slap for a small or light helicopter primarily occurs during partial power descents and in sharp or high rate turns. For a medium to large or heavy helicopter, blade slap can occur in low-speed level flight; during partial power descents, such as a landing approach; and in sharp or high rate turns (HAI 2007). Acoustic directivity of blade slap is concentrated in the flight direction forward and opposite to the flight direction downwards at an angle of about  $45^\circ$  to  $60^\circ$  to the plane of the rotor.

There are three types of anti-torque systems used in helicopters, and each has unique acoustical characteristics. The conventional open tail rotor generates a fluctuating low-pitched whine or drone. Alternatively, the ducted tail rotor/fan produces a high-pitched, sometimes fluctuating, shrill sound. Last, the blown air, directional vane system (e.g., the “no tail rotor” or NOTAR system) generates a broadband, compressed air hissing noise. The noise of both the open tail rotor and the ducted tail rotor/fan increases with airspeed and in high-rate climbs and turns.

Interaction between the main rotor and either type of anti-torque system often exacerbates the anti-torque system's sound output (HAI 2007).

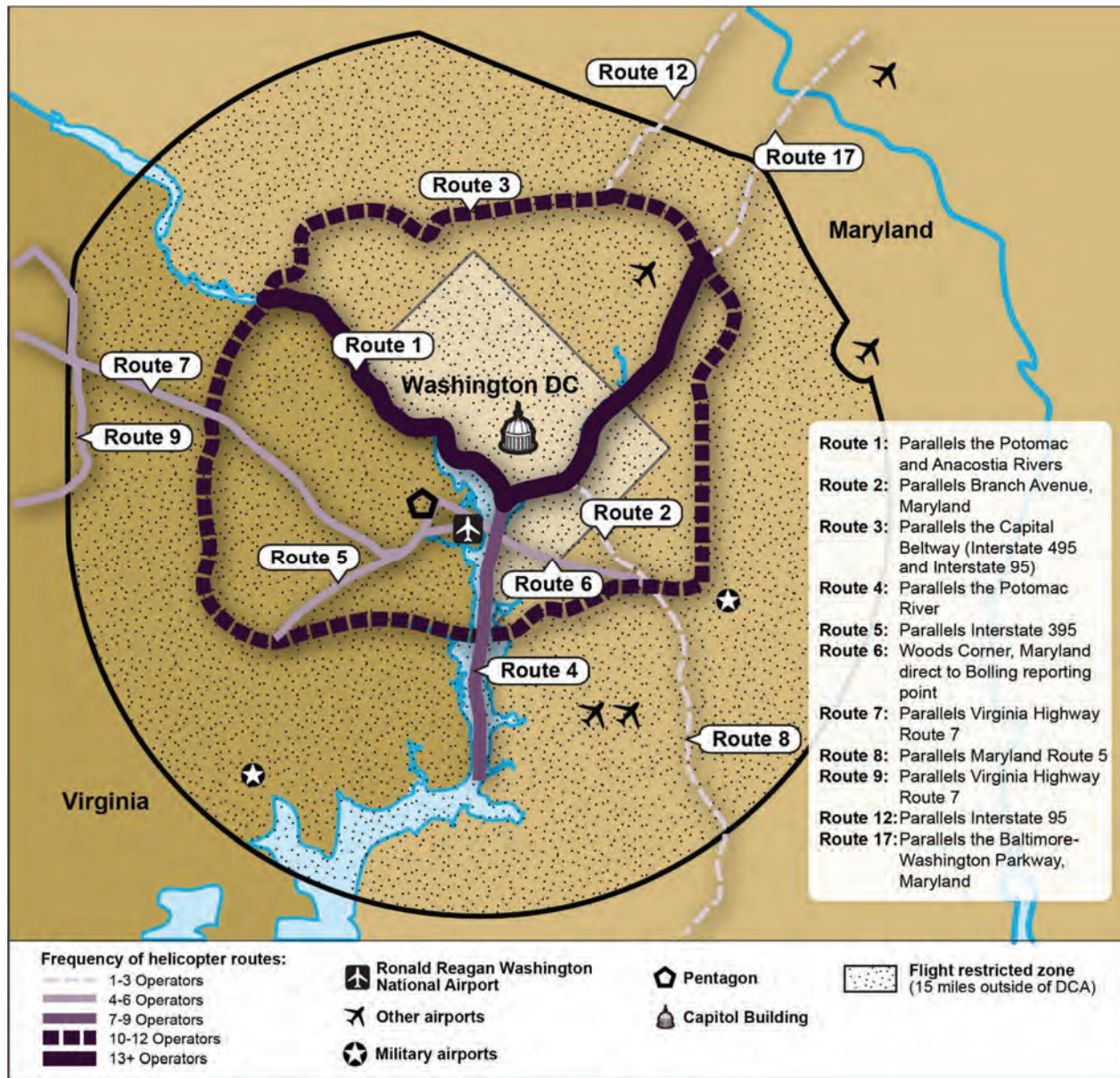
When heard over communities, these different noises commonly elicit strong reactions. Reactions to helicopter noise have been studied for decades; however, these reactions are generally not as well understood as community reactions to fixed-wing aircraft noise. In 2017, the National Academy of Sciences conducted a research report, Report 181, through the Airport Cooperative Research Program (ACRP) assessing available data and information on community annoyance toward non-military helicopter noise. Through an extensive literature review, this report found that conclusions on annoyance and the general perception of helicopter noise vary greatly from study to study. Most studies, however, agreed that helicopter noise is much more variable and complex than the noise generated by a fixed-wing aircraft. Helicopter noise emissions vary not only with flight conditions, orientation with respect to flight path, and speed, but also with the manner of operation. The spatial distribution of helicopter noise is also more complex than that of a fixed-wing aircraft due to source directivity and operational flexibility. HSI and BVI, for example, concentrate noise emission in different directions during different flying conditions. Additionally, non-acoustic factors including attitudinal differences such as fear of crashes, concern over the mission of the helicopter, and sense of necessity (e.g., medevac or police search) as measured on a community-wide basis have been shown to have significant effects on the public's sentiments toward helicopter noise (ACRP 2017).

### **3. Effects of Military Helicopter Noise on Communities and Individuals**

The Army is the predominant operator of military helicopters in the NCR and can therefore be used as a case study to illustrate noise effects on the community. Army helicopters originate from the Davison Army Airfield (DAAF) located on Fort Belvoir, Virginia. DAAF is home to the Army's 12th Aviation Battalion, which is the primary operator at the airfield, along with the District of Columbia Army National Guard and the Night Vision and Electronic Sensors Directorate. There are various aircraft stationed at DAAF including UH-60 Blackhawk and UH-72 Lakota helicopters, which are used for missions such as consequence management readiness, defense support for civil authorities, homeland security operations, air medical operations, and transportation.

Once an aircraft is beyond the local DAAF airspace, helicopters transition to training areas south of the NCR, to the Pentagon helipad, or through the NCR to points north of the District of Columbia. The air traffic control (ATC) tower at Ronald Reagan Washington National Airport controls helicopters operating within the Baltimore-Washington airspace. Aircraft operating in the NCR are subject to extensive monitoring and are limited in their routing choices (Figure 3). The Federal Aviation Administration (FAA) has made maximum use of routes over the Potomac and Anacostia Rivers, and over major roads such as Interstate 95 (I-95), Interstate 395 (I-395), and Interstate 495, to restrict helicopters from flying over populated areas. These routes provide for the safe and expeditious flow of helicopters through the airspace by mandating both maximum altitudes and flight path (U.S. Army 2018).





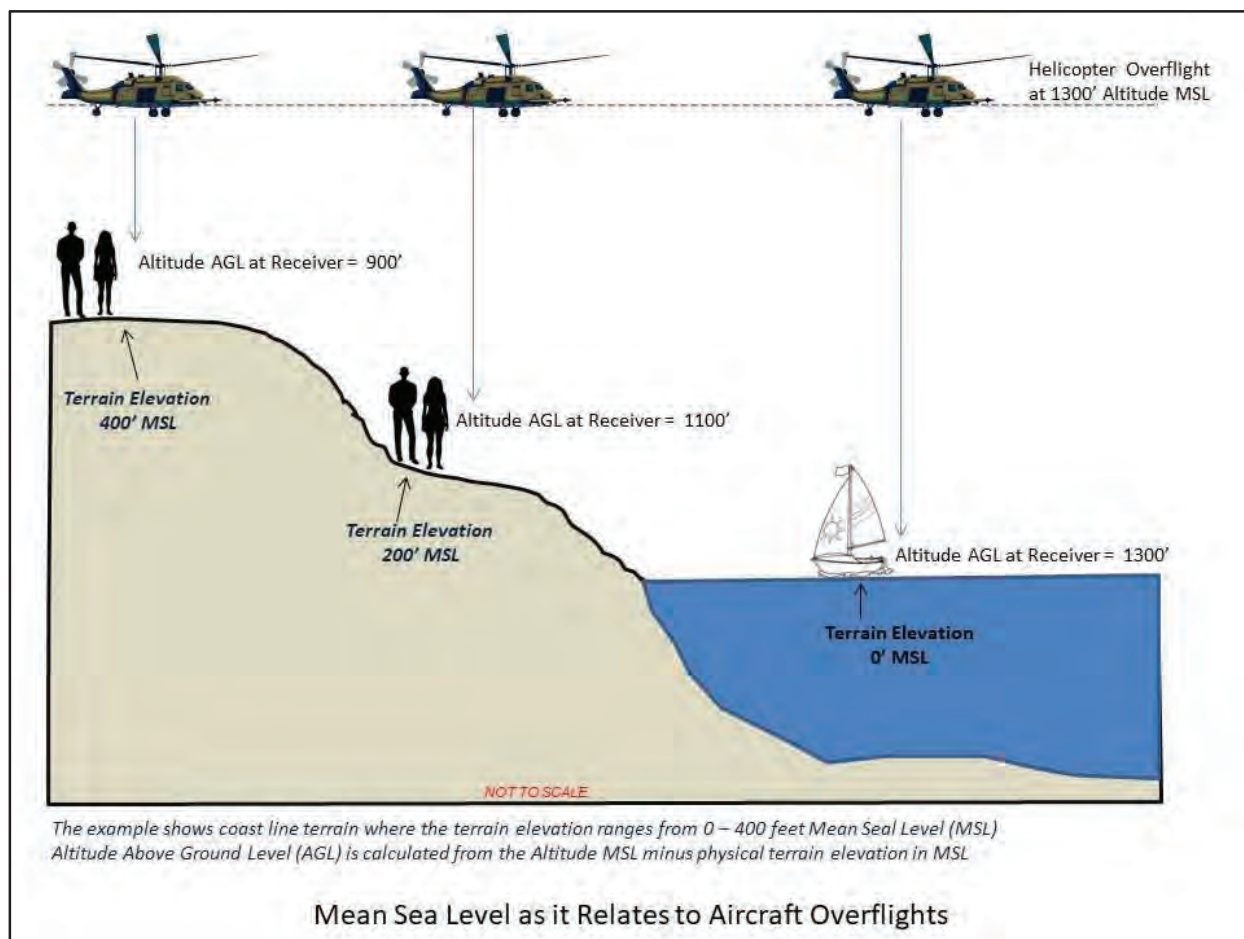
Sources: GAO analysis of Federal Aviation Administration and helicopter operator information; MapInfo (map). | GAO-21-200

**Figure 3: Selected National Capital Region Area Airspace Restrictions and Helicopter Route Structure (Source: Government Accountability Office (GAO 21-200))**

Due to the abundance of large fixed-wing commercial passenger jets operating in the same airspace, FAA assigns all helicopters in the NCR the lower airspace, which is the surface up to as high as 1,300 feet mean sea level (MSL). Altitude restrictions are based on relative height above sea level, not above ground level (AGL). This distinction is particularly important to note when discussing noise impacts, as the actual distance between the aircraft and the receiver on the ground may be different than the distance between the aircraft and MSL. Based on this principle, the extent to which operations can be changed to mitigate perceived noise impacts depends on a combination of geography and safety limits. For example, the varying topography,



elevation, and surface changes within the NCR routes mandate various altitude restrictions even within the same flight track. Figure 4 illustrates the difference between AGL and MSL altitudes as it relates to helicopter overflight.



**Figure 4: Mean Sea Level Versus Above Ground Level Related to Aircraft Overflights**

The lowest altitudes occur in FAA Route 4, over the Potomac River, where the maximum allowable flight altitude is 200 feet MSL. Route 3, which parallels the Capital Beltway, has maximum allowable altitudes ranging from 300 feet MSL at the Wilson Bridge, to 1,000 feet MSL on the east side, to 1,300 feet MSL on the north, west, and south sides. Terrain elevation in these areas generally ranges from 200 to 400 feet MSL.

Communities in the NCR are exposed to varying levels of helicopter noise, with the volume of the noise experienced depending on proximity to the airfield's daily operations. In accordance with DoD Instruction 4715.13, *DoD Operational Noise Program*, aircraft noise at U.S. Army airfields, heliports, and helipads is assessed with the day-night average sound level (DNL) metric, specifically the A-weighted day-night average sound level (ADNL) metric. DNL is a noise metric that describes the average noise level over the course of a 24-hour period. A-weighting means that the sound being described is within the range of sound frequencies detectable by the human ear. A 10-decibel (dB) adjustment is applied to operations that happen

during nighttime hours, 10:00 p.m. through 7:00 a.m., because noise tends to be more intrusive at night than during the day. This adjustment is referred to as “time-weighting.” Because ADNL is an average, it is very useful in expressing cumulative long-term noise exposure. However, it may not always be the best noise metric when describing the intrusiveness of a singular loud aircraft event, such as the noise an individual will experience from a helicopter flying overhead. Supplemental noise metrics, such as Maximum Sound Levels, are used to describe how loud a singular event actually is.

The noise from a helicopter overflight, as noted above, is a combination of various mechanical effects of the aircraft flying toward, above, and then away from the individual (sound returns to background level). The maximum level is the highest A-weighted sound level that occurs during the aircraft overflight. Table 1 represents maximum A-weighted sound exposure levels during a flyover at constant speed with the source directly overhead of the receiver.

**Table 1: Maximum A-Weighted Sound Levels for Rotary-Wing Aircraft<sup>1</sup>**

Altitude Above Ground Level (Feet)	Maximum Level, dBA				
	UH-60/VH-60 <sup>2</sup> 70 KIAS	UH-72 <sup>2</sup> ^123 KIAS	UH-1 <sup>3</sup> ^80 KIAS	UH-3/VH-3 <sup>3</sup> 70 KIAS	MV-22 <sup>2</sup> ^67 KIAS
200	86	87	91	91	98
500	77	78	83	83	89
800	73	74	78	78	84
1,000	71	72	76	76	82
1,200	69	70	75	74	80
1,500	67	68	73	72	78
2,000	64	65	70	69	75
2,500	61	62	68	66	72

<sup>1</sup> During flyover at constant airspeed

<sup>2</sup> Obtained via the Rotorcraft Noise Model Program (Wyle 2013)

<sup>3</sup> Obtained via SelCalc Program (U.S. Air Force 2005)

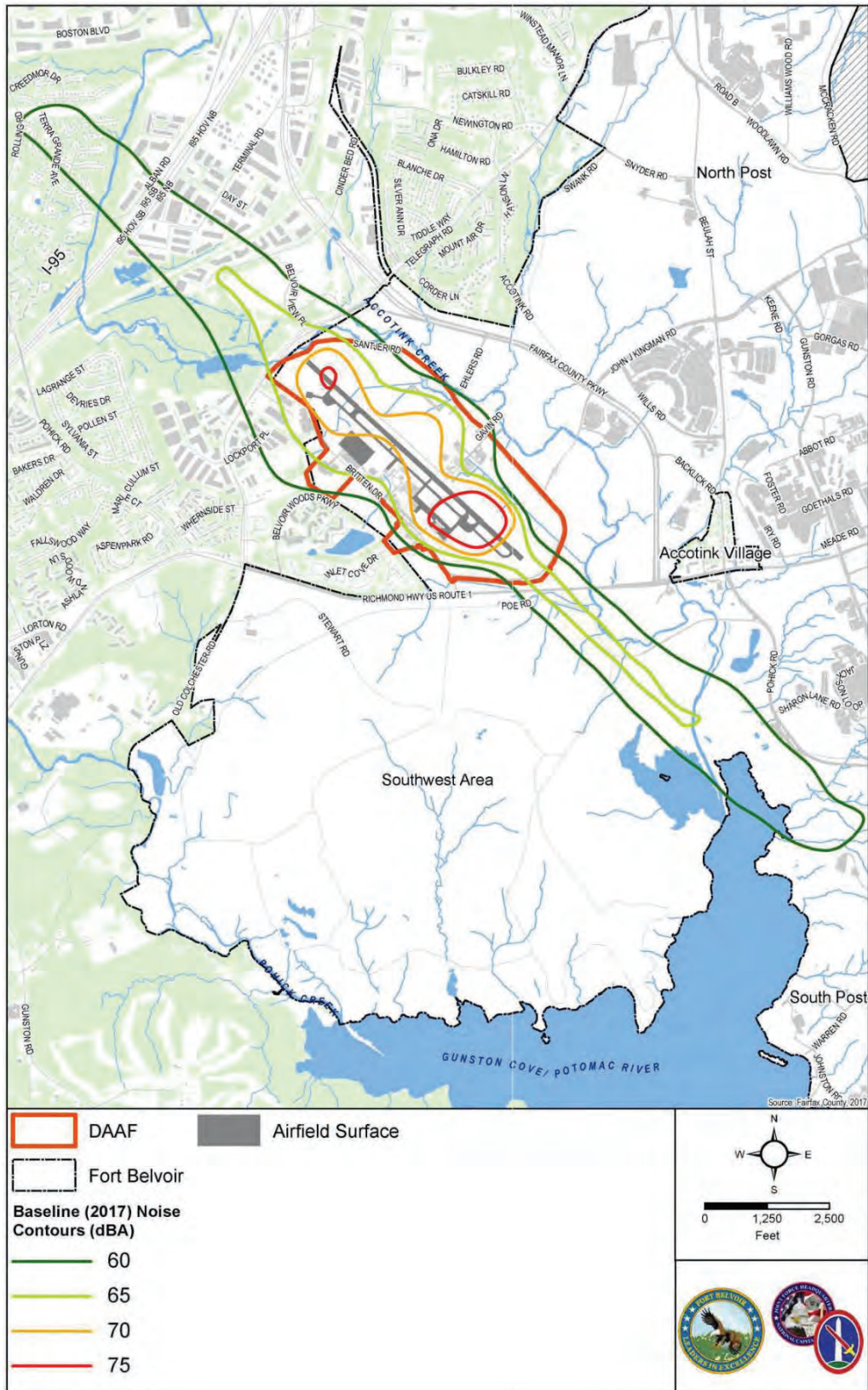
^ Only knots indicated air speed (KIAS) available in single track mode

Direct measurements of sound levels are often impractical, expensive, and inconclusive due in part to other noise sources that interfere with measurements. Therefore, within DoD, the primary means of assessing environmental or operational noise is through computer simulation models. Simulated aircraft noise contours take into account the number of flights, ground run-up operations, types of aircraft, power settings, flight tracks used, and whether the flights occur during the day or night. Annual traffic count totals are used to produce ADNL noise contours, which represent cumulative noise exposure within a given community. Noise contours are depicted as lines on a map, similar to a topographic map, and represent specific sound levels. The noise contours in Figure 5 depict the cumulative noise exposure of 60 dBA DNL and greater around DAAF.

The Army translates community noise exposure into Noise Zones. Army Regulation 200-1 guidelines state that for land use planning purposes, noise-sensitive land uses range from acceptable to not compatible within the Noise Zones (Department of the Army 2007). Table 2 lists the noise limits and land use planning guidelines from Army Regulation (AR) 200-1 specific to aviation noise.

**Table 2: Army Aviation Noise Zones and Land Use**

Noise Zone	Noise Limit ADNL (dB)	Noise-Sensitive Land Use
LUPZ	60 – 65	The Land Use Planning Zone (LUPZ) is a subdivision or upper limit of Zone I. The LUPZ represents an area starting at the lower limit of Zone II and extends outward to a distance significant enough to allow for a 5-dB reduction in sound level for aircraft noise. Within this area, noise-sensitive land uses are generally acceptable. LUPZ is delineated to inform local government planning organizations as they make zoning decisions.
Zone I	< 65	Noise-sensitive land uses are acceptable within Zone I. Zone I is not delineated on contour maps; rather, it is the entire area outside of Zone II.
Zone II	65 – 75	Although local conditions such as availability of developable land or cost may require noise-sensitive land uses in Zone II, this type of land use is generally not compatible and is strongly discouraged on the installation and in surrounding communities.
Zone III	> 75	Noise-sensitive land uses are not recommended (incompatible).



**Figure 5: Baseline DAAF Noise Contours (Source: Draft Environmental Impact Statement, Davison Army Airfield Area Development Plan, June 2020)**



Because ADNL is calculated using average daily operations and an assessment period of 365 days, it takes a considerable number of helicopter flights to generate Noise Zones reaching 65 dB ADNL. This is particularly true if the majority of operations are daytime activity and are therefore lacking time weighting. ADNL is calculated from the A-weighted sound exposure level (ASEL). SEL is a commonly used measure of cumulative noise exposure for an individual noise event, such as an aircraft flyover. SEL compresses the sound energy from the entire duration of the event into one second.

The ASEL of a UH-60, which is the Army's most common and loudest helicopter in the NCR, at 1,000 feet AGL is 82.7 A-weighted decibels (dBA). If there is only one flight per day, the ADNL can be calculated by using Equation 1, where  $L_{dn}$  is the day-night average sound level or ADNL;  $L_{AE}$  is the A-weighted sound exposure level or ASEL;  $N_{day}$  is the number of aircraft passes between 7:00 a.m. and 10:00 p.m.;  $N_{night}$  is the number of aircraft passes between 10:00 p.m. and 7:00 a.m.; and 49.4 dB is the normalization constant which represents 10 times the logarithm of the 86,400 seconds in a 24-hour day. Therefore, for one UH-60 flyover at 1,000 feet and 82.7 dB ASEL, the ADNL would be 33.3 dB ADNL. In other words, one flight per day represents a relatively low level of noise experienced by residents over a 24-hour period.

$$L_{dn} = L_{AE} + 10 \cdot \log_{10} (N_{day} + 10 \cdot N_{night}) - 49.4 \text{ dB} \quad (\text{Equation 1})$$

Based on this equation, the ADNL increases approximately 3 dB for every doubling of flight operations. Therefore, it would take approximately 256 UH-60 flights at 200 feet AGL occurring over one location within a 24-hour period to achieve a 66.3 dB ADNL, the level at which operations would begin to be incompatible with noise-sensitive land uses. Although this calculation is simple, it does convey useful information about the number of overflights necessary in a single FAA NCR flight route to reach a 65 dB ADNL from Army activity alone. Table 3 provides examples of the ADNL for a UH-60 at various altitudes AGL. The values in Table 3 represent sound levels for a receiver located directly below the aircraft. Noise levels will be lower for receivers located farther from the aircraft.

**Table 3: ADNL Noise Levels Calculation at Varying Altitudes**

NUMBER OF UH-60 FLIGHTS IN 24-HOUR PERIOD	dB ADNL		
	200' AGL	500' AGL	1,000' AGL
1	42	37	33
2	45	40	36
4	48	43	39
8	51	46	42
16	54	49	45
32	57	52	48
64	60	55	51
128	63	58	54
256	66	61	57

DAAF personnel reported 13,272 departure and arrival operations, not including closed pattern work (take-off and landing practice) at the airfield, in Calendar Year (CY) 2020 with over 98 percent occurring during acoustical daytime hours—7:00 a.m. to 10:00 p.m. This is the highest yearly total in the past four years. Army aircraft use the appropriate route to reach their destination; thus, daily operations are spread among the different FAA routes. However, even applying the CY 2020 total to a singular route and assuming only daytime operations would yield roughly 73 daily flights (Equation 2). As shown in Table 3, at the lowest point in Route 4 (200' AGL), 73 daily flights would not generate a 65 dB ADNL.

$$(13,272 \text{ flights} \times 2 \text{ route passes for each flight}) / 365 \text{ days per year} = \text{flights per day (Equation 2)}$$

A more realistic scenario to describe noise impacts would be to assume eight daytime flights over Route 5 along I-395 in Arlington and an average altitude of 500 AGL. This would yield 46 dB ADNL. Therefore, the flights occurring are generating noise at a level for which residential and other noise sensitive land use is considered acceptable based on Army, DoD, and Federal land use compatibility recommendations.

The number of helicopter operations reported by the Marine Corps and Air Force airfields in proximity to the NCR were substantially less than the 13,272 operations reported by the Army. The Marine Corps and the Department of the Air Force had a combined 8,591 departure and arrival operations in CY 2020 for a total of 21,863 operations across all three Services. The Marine Corps reported 5,345 total V-22, H-60, H-3, and VH-92 departure and arrival operations from Marine Corps Base (MCB) Quantico, Virginia. The Department of the Air Force reported 3,246 total UH-1N departure and arrival operations from Joint Base Andrews, Maryland, in CY 2020, with an estimated 85 percent of flights taking place during acoustical daytime hours.

It is important to note that the 21,863 operations reported by Army, Marine Corps, and Air Force airfields in CY 2020 do not directly translate to 21,863 flights within the NCR. For example, flights departing from MCB Quantico may support activities taking place at the training range or locations south of the airfield and would therefore not transit the NCR. Additionally, flights from DAAF include other military installations and ranges to the south, such as Fort A.P. Hill. Included in the 21,863 operations are 834 operations, or four percent, using the Pentagon helipad. Of these 834 operations, 745 were departures and returns from DAAF (12th Aviation Battalion) to the Pentagon helipad and back. To land at the Pentagon helipad, one of two routes must be used—Route 1, to the north, which parallels the Potomac and Anacostia Rivers, and Route 5, to the south, which parallels I-395. Assuming an equal distribution of total flights on these two routes, this would equal an average of four flights per day, per route. Operations at the Pentagon helipad end each day at 6:00 p.m.; therefore, there are no night flights, acoustically speaking, at the Pentagon helipad.

Government Accountability Office (GAO) Report GAO-21-200 counted 11,011 military helicopter flights within the NCR in 2019, including Department of Homeland Security flights, which is substantially lower than the 21,863 flights reported in CY 2020 by the Army, Marine Corps, and Air Force. However, it is important to note that GAO used available flight track data

from FAA and limited its data collection to flights within 30 miles of Ronald Reagan Washington National Airport, which differs from the prescribed scope of this report.

As previously mentioned, Section 1724 of the NDAA for FY 2020 defines the NCR as including the District of Columbia; Montgomery and Prince George’s Counties in the State of Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties and the City of Alexandria in the Commonwealth of Virginia; and all cities and other units of government within the geographic areas of such District, Counties, and City. The 21,863 flights discussed in this report represent all documented flight plans collected from each military installation within the NCR as defined by Section 1724, including helicopter operations with destinations outside of the NCR such as other military training ranges and installations. Not all of the 21,863 flights discussed in this report were conducted within the immediate area of the District of Columbia. The number of flights excluded all pattern work or “touch-and-go” activities that are confined to the airfield.

## **4. Policies and Procedures to Mitigate the Impact of Helicopter Noise**

ADNL is the preferred metric for describing aircraft noise; developing noise contours and noise zones for land use planning; and assessing operational noise impacts on the community. However, DoD acknowledges, as substantiated by noise research literature, surveys, and community reaction, that individual perceptions of noise vary significantly. While from a planning and acoustics effects perspective it would take a large number of flights to produce operations incompatible with residential activities, single events of helicopter flights can cause concern and annoyance among residents. Therefore, it is DoD policy and procedure to mitigate noise impacts to the maximum extent practical while ensuring that national security missions are carried out safely.

DoD Instruction 4715.13, *DoD Operational Noise Program*, is DoD’s overarching policy to minimize effects of military noise on the environment while maintaining military readiness. This policy also informs DoD on how to best integrate noise management principles into installation, operational range, and operating area plans and programs. DoD uses the following policies and procedures within the NCR to minimize the effects of helicopter noise on communities:

- Each of the military operators in the NCR and across the country implements “fly neighborly” and “fly friendly” practices. The fly friendly routes determined by FAA in the NCR encourage flights over highways where traffic noise is already elevated, and no residential or other noise sensitive land uses exist. This approach puts more lateral distance between the helicopter and the residents. Similarly, flights along the Potomac River put more lateral distance between people and the helicopter (Figures 3 and 4).
- All aircrews fly the highest allowable published altitudes on helicopter routes unless an emergency, weather, or ATC directs a lower altitude.
- All aircrews are prohibited from conducting flights off the published helicopter routes unless unique mission requirements, emergencies, weather, or ATC require deviation.



- Helicopter use of the Pentagon helipad is limited to only DoD-directed exercises and three- and four-star executive travel and their civilian equivalents.
- Military District of Washington policy limits training hours to Monday through Saturday, 8:00 a.m. to 10:00 p.m., and Sunday, 12:00 p.m. to 10:00 p.m. During daylight savings, the hours are extended until 11:00 p.m., Monday through Friday.
- To reduce traffic in the Newington and Fort Belvoir area, operational units established a traffic pattern on the southwest side of the DAAF. Units are required to split helicopter traffic between the original northeast pattern and the new southwest pattern to reduce overflight of Newington.
- DAAF published Notices to Airmen (NOTAMS) directing rotary-wing traffic to continue along the direction of the centerline of the runway until reaching I-95 and achieve traffic pattern altitude prior to turning downwind over populated areas or transitioning to the FAA helicopter routes. All aircrews using DAAF are required to read and comply with these published NOTAMS.
- Helicopter landing zones are surveyed every six months. The surveys include instructions explaining noise abatement requirements with either specific flight path or ground track recommendations.
- Aircrews operating out of Joint Base Andrews are also provided with immediate and semi-annual noise-reduction updates through Flight Crew Information Files and Flight Crew Bulletins.

These updates include:

- a. Amplifying information for DAAF noise sensitive areas;
- b. Guidance on the use of airspace between Manassas Airport and Dulles International Airport;
- c. Guidance regarding flight restrictions at the airfield in College Park, Maryland; and
- d. Avoidance of noise-sensitive housing areas in the vicinity of landing zones on government property at remote sites near Davidsonville and College Park, Maryland and Paris, Virginia.

## **5. Processes for Collecting, Analyzing, and Managing Military Helicopter Noise Complaints**

Aircraft noise complaints most often manifest as a local installation- or Service-specific issue. Individual installations often accept complaints through their local public affairs offices, established complaint hotlines, or websites. DoD and the Office of the Secretary of Defense do not collect or respond to noise complaints because each Military Department maintains its own

policies and guidance on noise, and each military installation has unique, installation-specific noise challenges. As with other areas of the United States, the same concept applies to military installations within the NCR, where individual Military Services and installations have their own reporting mechanisms (Table 4).

### **5.1. Army**

Complaints related to Army helicopter operations are addressed by the Fort Belvoir Public Affairs office, which can be contacted by email. The Fort Belvoir Public Affairs website states that “initial complaints should be referred to the FAA Complaint Portal to assist in determining the source of the complaint and, if applicable, referral to the appropriate military entity.”

### **5.2. Marine Corps**

Complaints associated with Marine Corps helicopter operations are taken by the public affairs office at MCB Quantico. MCB Quantico provides a web form where individuals can file complaints or comments on noise from Marine Corps operations (Appendix A). MCB Quantico also provides posted noise advisories on the installation website to alert the public on days where local, high noise activity can be expected. The installation also provides the public with a phone number to contact the installation Community Relations Office.

### **5.3. Departments of the Navy and Air Force**

The Departments of the Navy and Air Force manage helicopter complaints through the public affairs offices located at Joint Base Andrews and Joint Base Anacostia-Bolling. Joint Base Andrews collects complaints through a complaint form, phone calls, and email. Submitted complaints are then processed using a detailed checklist to ensure that each complaint is appropriately routed and addressed. If the complainant would like to discuss their concern with a more senior authority, they are given the contact information for the 316th Wing’s Inspector General’s (IG) office. The IG is then notified of the complaint and the potential follow-up. The complaint form and detailed follow-up checklist can be found at Appendix A. Complaints received by Joint Base Anacostia-Bolling are collected by the installation public affairs office via an online web form or by email.

**Table 4: NCR Military Service and Installation Noise Complaint Reporting Channels**

<b>Military Service</b>	<b>Installation</b>	<b>Complaint Mechanism</b>
Army	Fort Belvoir/Davison Army Airfield	<a href="mailto:usarmy.belvoir.imcom-atlantic.mbx.public-affairs-office@mail.mil">usarmy.belvoir.imcom-atlantic.mbx.public-affairs-office@mail.mil</a>
Marine Corps	Marine Corps Base Quantico	<a href="https://www.quantico.marines.mil/Info/Noise-Advisories/Noise-Comment/">https://www.quantico.marines.mil/Info/Noise-Advisories/Noise-Comment/</a> <a href="https://www.quantico.marines.mil/Info/Noise-Advisories/">https://www.quantico.marines.mil/Info/Noise-Advisories/</a> Community Relations Office: (703) 784-3699
Departments of the Navy and the Air Force	Joint Base Andrews	<a href="https://www.jba.af.mil/Contact-Us/Public-Affairs-Command-Information/">https://www.jba.af.mil/Contact-Us/Public-Affairs-Command-Information/</a> <a href="https://www.jba.af.mil/Portals/38/documents/Complaint%20Form/AF%20FORM%2039%20-%20Complaint.doc?ver=2018-09-19-151544-577">https://www.jba.af.mil/Portals/38/documents/Complaint%20Form/AF%20FORM%2039%20-%20Complaint.doc?ver=2018-09-19-151544-577</a> <a href="mailto:316wg.pa.communityengagement@us.af.mil">316wg.pa.communityengagement@us.af.mil</a> Public Affairs: (240) 612-4430 Public Affairs (Navy): 240-857-2552/0981
	Joint Base Anacostia-Bolling	<a href="https://www.jbab.jb.mil/Contact-Us/">https://www.jbab.jb.mil/Contact-Us/</a> <a href="mailto:af.jbab.publicaffairs@us.af.mil">af.jbab.publicaffairs@us.af.mil</a>

In addition to these procedures, and in accordance with Section 1087 of the FY 2021 NDAA (Public Law 116-283), DoD formally established a process for collecting helicopter noise complaint data from the Metropolitan Washington Airport Authority (MWAA) noise complaint website. From the data reported between January 2018 and March 2021, only a small number of complaints, 210 out of 5,785, or 3.6 percent, were directly attributed to military helicopters. A total of four complaints identified hospital transport or law enforcement helicopters. The rest of the complaints, 5,571, or 96.3 percent, remain unattributed. This is unsurprising given how difficult it is to identify the type of helicopter flying overhead, according to GAO Report GAO-21-200. Moreover, military helicopters account for less than 40 percent of the helicopter operations in the NCR according to the same GAO report. Other operators such as local law enforcement, federal law enforcement, news, and medical transport must regularly deviate from the FAA routes to perform their missions or duties, often hovering or circling to film events, collect patients, or pursue criminals. These activities are more likely to generate annoyance than transiting military aircraft.

Because the MWAA complaint database does not and cannot distinguish between military and other helicopter operators, DoD believes the best approach for addressing and tracking noise complaints is for those complaints to be submitted to the local installations in accordance with the procedures described above. This approach allows for DoD to determine and attribute which department is the source of an individual noise complaint. Providing complaints directly to the

local installations will allow for an assessment of flight operations and will help determine, if necessary, the need for new operating procedures over certain areas. Note that any changes would have to include an assessment of the effect on the mission and whether a change would affect a different community previously unaffected.

## **6. Compliance with Processes and Policies**

As previously stated, the ATC tower at Ronald Reagan Washington National Airport controls helicopters operating within the Baltimore-Washington airspace. Aircraft operating in the NCR are subject to extensive monitoring and are limited in their routing and altitude choices by FAA. Monitoring compliance with the route following and altitude of all helicopter operations is the responsibility of ATC.

DoD does not currently have the means or resources to continuously track and monitor the real-time location and altitude of individual military helicopter operations to determine compliance with current policies and processes. Moreover, there are a variety of security and other concerns associated with using FAA radar data to determine compliance. The Military Departments rely on the professionalism of their pilots and the duty of the air traffic controllers to ensure military helicopter operations in the NCR are conducted safely, in a neighborly manner, and in accordance with local flight procedures. However, in response to Section 1087 of the FY 2021 NDAA (Public Law 116-283), the Department has begun working with FAA to develop a process for determining trends to ensure fly friendly procedures are adhered to without affecting national security and safety requirements. DoD plans to use available, historical data to investigate the extent to which military helicopters deviate from the published FAA routes. However, DoD does not have the manpower or resources to continuously request, review, and monitor historical helicopter operations for compliance.

## **7. Recommendations to Mitigate the Effects of Military Helicopter Noise**

The airspace within the NCR is one of the busiest and most restrictive in the United States. The military helicopters that operate within the NCR are sharing airspace with three major commercial airports and are required to follow the helicopter routes and altitude restrictions established and enforced by FAA to ensure safe and efficient passage throughout that shared airspace while minimizing noise impacts on the general public. This process of minimizing noise impacts by using established noise abatement routes is one of the approaches to helicopter noise mitigation noted in the 2017 ACRP study, and DoD believes that this is the most effective way to manage noise in the NCR given that there are over 50 helicopter operators in the area (GAO Report GAO-21-200).

The ability to modify already heavily restricted military helicopter operations in the NCR while continuing to meet mission requirements is significantly limited. As reported by GAO and FAA in GAO Report GAO-21-200, existing minimum and maximum altitudes for helicopters are set to maintain safe separation for helicopters between commercial passenger airplanes and ground

structures. Based on GAO interviews with helicopter operators, the report also noted that an increase in maximum or minimum altitude could reduce safety for all aircraft operating in this airspace. The majority of helicopter operators interviewed by GAO (13 of 18) stated that establishing quiet or restricted zones would negatively affect their mission, with some operators requiring access to the entire airspace or specific areas to complete their missions.

With these important caveats in mind, DoD has agreed to pursue the following recommendations in an effort to help further mitigate concerns of the general public:

1. DoD will engage in discussions with FAA on the possibility of increasing altitudes of helicopter routes within the confines of flight safety and practicable action. Safety of flight and de-confliction of commercial fixed-wing air traffic and helicopters will always take priority over noise issues. However, it may be possible to raise the altitude of helicopter routes or segments of routes in a way that will reduce community noise exposure and not interfere with fixed-wing air traffic. The importance of safety of flight is discussed in the ACRP study, which references the limits of such an approach in the equally congested Los Angeles airspace.
2. DoD will continue working with the MWAA and FAA on receiving, tracking, and analyzing helicopter noise complaints in the NCR to identify potential trends, problem areas, and, if necessary, determine what if any adjustments can be taken by the Army Aviation Brigade, 1st Helicopter Squadron, and Marine Corps Helicopter Squadron 1 (HMX-1) within the limits of mission and safety requirements.
3. DoD will work with FAA to obtain flight track data trends that will provide insight into overall compliance with local flight procedures and helicopter routes, and address any potential corrective actions, as needed, to be taken by Army Aviation Brigade, 1st Helicopter Squadron, and Marine Corps HMX-1 within the limits of mission and safety requirements.
4. DoD will work closely with Army Aviation Brigade, 1st Helicopter Squadron, and Marine Corps HMX-1 to ensure “fly neighborly” and “fly friendly” procedures are being reinforced. DoD will investigate the use of “fly neighborly” resources and training programs offered by FAA and HAI.

## **Appendix A – Noise Complaint Forms and Materials**

## NOISE COMMENT



### OFFICIAL U.S. MARINE CORPS WEBSITE

Crossroads of the Marine Corps

Date/Time  
  \*

Name  
    \*

Address  
  
 \*

Phone

Email

How Long Have You Lived There

Any Damage?  
☐

Comment

Skip to main content (Press Enter).

<https://www.quantico.marines.mil/Info/Noise-Advisories/Noise-Comment/>

1/2



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## 316th Wing Public Affairs Noise Complaints Checklist



Actions to close complaints:	Completed	Date
1- Acknowledge complaint <ul style="list-style-type: none"> <li>a. PA receives complaint via phone, email or website link "Noise Complaints/Citizens Concerns Form" on JBA web page</li> <li>b. PA records complaint on AF IMT 39, Response to Query (see Attachment 1)</li> </ul>		
2- Log complaint by month/date/year in Noise Complaints Folder on PA drive (O:\PA\0011WGPA\COMMUNITY RELATIONS ENGAGEMENTS\Noise Complaints)		
3- Contact complainant to let them know that we have received their query and will begin coordinating with appropriate aerial units for response.  *If they are a JBA aerial asset, notify the proper unit POC for resolution		
4- Ask complainant if there are any damages. If the complainant claims damages, immediately contact JA at: (240) 612- 5787 (Claims Office)  *Let the complainant know that JBA legal will contact them directly to begin claims process. It is the responsibility of the complainant to prove damages were caused by JBA aircraft.		
5- Ask complainant if you may call them back. Make sure to ask for a good time to call or whether they prefer an e-mail correspondence.  *Let the complainant know that you will respond back within 3 days or less		
6- Contact unit involved for response: <b>(NOTE: DETAILED CONTACT INFORMATION WAS REMOVED FOR THIS REPORT)</b>  <b>1HS/DO</b>  <b>89 AW Airfield Ops</b>  <b>89 AW/PA</b>  <b>113 WG/PA</b>		

<b>459 ARW/PA</b>  <b>175 FW/PA (Reserves A-10 Unit)</b>  <b>AFDW/PA</b>  <b>JFHQ-NCR/MDW PA</b>  <b>Air Traffic &amp; Airspace Manager</b>  <b>Office of Governmental &amp; Public Affairs</b> <b>U.S. Coast Guard Headquarters</b>  <b>FAA Eastern Region Public Affairs</b>  <b>Aviation Safety</b> <b>Aviation Safety</b>  *See PA folder for other possible orgs: *Other Possible Orgs: FAA, Other Military Bases, and Prince George's County Etc.		
<b>Once response received:</b>		
1- Craft message for complainant (see Attachment 2 for example). Message reviewed and coordinated with aircraft unit believed to be involved with the complaint		
2- Contact complainant with response		
3- Document date and time of response and method		
4- Ensure complainant has PA contact information:  Phone: (240) 612-4428 Email: <a href="mailto:316wg.pa.communityengagement@us.af.mil">316wg.pa.communityengagement@us.af.mil</a>		
5- Document all actions to close complaint.		
6- Provide 316 WG/IG contact information if complainant wishes to seek higher authority to discuss noise complaint (e.g. complainant has mentioned they will be contacting their congressman for resolution).  *Let the IG know that their info has been provided to the complainant and they may be contacted on the next step in the complaint process		
7- <a href="#">Air Installation Compatibility Use Zone</a>		

## Attachment 1

<b>RESPONSE TO QUERY</b> <small>(THIS FORM IS SUBJECT TO THE PRIVACY ACT OF 1974)</small>					
<small><b>AUTHORITY:</b> 5 USC 301, 10 USC 8012 and 8034 and EO 9397.</small> <small><b>PRINCIPAL PURPOSE:</b> To provide response to the public or news media inquiries.</small> <small><b>ROUTINE USE:</b> This form will not be used to record or serve as a source for personal data about any individual unless the person is informed and agrees that the information may be used in providing response to the public or news media inquiry.</small> <small><b>DISCLOSURE IS VOLUNTARY:</b> The SSN when used will be used for positive identification of the individual. It will not be used for any other purpose.</small>					
QUERY INFORMATION					
RECEIVED		RESPONSE ACTION OFFICER		SUSPENSE DATE	
DATE	TIME	N/A			
RECEIVED FROM					
Name: _____ Phone Number: _____ Email: _____					
<b>DESCRIPTION OF QUERY</b> Provide Information as Applicable  Nature of Complaint: Noise ___ Low-Flying ___ Dropped Object ___ Other (Specify): _____ Aircraft Description: _____ Date/Time of Disturbance: _____ Location: _____ Flight Direction: _____ Weather: _____ Damage: _____ Additional Information: _____					
<b>RESPONSE</b> N/A					
SOURCE OF RESPONSE		COORDINATION			
PHONE NO.	OFFICE SYMBOL	OFFICE SYMBOL	NAME	PHONE NO.	DATE
N/A	N/A				
NAME OF SOURCE					
N/A					
DATE	TIME				
<b>REMARKS</b> N/A					

AF IMT 39, 19790101, V2

## Attachment 2

**1. PA STATEMENT (If applicable):** Your house is our designated low-level training area which makes it more likely to be flown over. We are required to be proficient in low-level flying so that we are able to safely operate the aircraft. Hopefully we did not cause any damage to your property our crews will attempt to limit our noise signature. Joint Base Andrews strives to be a good neighbor by maintaining good community relations with surrounding communities.

Thank you for your patience and understanding while our Airmen strive to train and support our Department of Defense mission - know that your safety and our safety are paramount to our missions.

**2. PA Statement (If applicable)**

Thank you for your recent note about helicopter noise over your neighborhood. The Air Force has operated helicopters in the National Capital Region since the 1950s and has operated continuously out of Joint Base Andrews since 1971. In addition, multiple federal, state, and private organizations operate rotary wing assets in the National Capital Region. Unfortunately, we are unable to determine which agency was operating near your residence on the date provided. We ensure that our aircrew fly in accordance with FAA, Air Force, and local regulations during all phases of flight to ensure they minimize noise, and more importantly, do not create a hazard to persons or property. We also seek to strike a balance between providing national security and flying friendly through a series of local policies and agreements. We appreciate how disruptive helicopter operations can be and will continue to strive to balance national security with peace and quiet.

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## Appendix C – Abbreviations

<b><u>Abbreviation</u></b>	<b><u>Definition</u></b>
AR	Army Regulation
ASEL	A-weighted sound exposure level
ATC	air traffic control
BVI	blade vortex interaction
CY	calendar year
DAAF	Davison Army Airfield
D.C.	District of Columbia
DNL	day-night average sound level
DoD	Department of Defense
FAA	Federal Aviation Administration
FY	fiscal year
GAO	Government Accountability Office
HAI	Helicopter Association International
HSI	high-speed impulsive
IG	Inspector General
KIAS	knots indicated air speed
LUPZ	Land Use Planning Zone
MCB	Marine Corps Base
MSL	mean sea level
MWAA	Metropolitan Washington Airport Authority
NCR	National Capital Region
NDAA	National Defense Authorization Act
NOTAM	notice to airmen
SEL	sound exposure level
U.S.	United States