

June 6, 2013

Dear Councilors,

On June 18, 2013 the Council submitted questions to be considered in the Draft Environmental Impact Statement (FEIS) for the F-35. On May 31, 2013 the FEIS was issued. Our Resolution appears on page E-1358 and responses start on page E-1365.

Below I have excerpted the questions we asked in the Resolution and paired them with the "canned" EIS response (meaning the answer is to questions pooled into categories, not our question directly). I have included how they reframe the questions in their response.

The DEIS itself can be found at this link www.acclanning.org

I hope you find this helpful, though I think you will agree, this is not easy to read.

Sincerely,

Joan Shannon
City Council President

EIS Responses to Burlington Resolution Re: F-35 Basing

Questions from Council Resolution:

- **With increased noise zones 65-85 dB DNL, will buyers be able to receive federally guaranteed loans (FHA and VA) financing?**
- **What kind of "special approvals" will be necessary in order to receive federally guaranteed loans?**
- **What additional disclosures will sellers within the 65 DNL contour need to sign in order to sell their homes?**

Response to all 3 questions:

Question as framed by EIS:

Potential sellers of homes in areas above 65 dB DNL will have to disclose to prospective buyers and lessees that the properties have been designated as "not suitable for residential use." Potential buyers of these properties will not qualify for federally-guaranteed loans, program assistance, subsidies, or housing insurance.

Answer:

As noted in Response LU-1, the land use compatibility guidelines by FICUN are used to determine potential noise impacts on land use. The Air Force does not have the authority to change community land uses or to deem properties as "not suitable for residential use." HUD, FHA, and VA mortgage policies generally prohibit guaranteeing mortgage loans for new homes located within noise zones of 75 dB DNL or greater or within clear zones. These same mortgage policies make availability of federally guaranteed mortgage loans discretionary for new homes located within noise zones of 65 to 75 dB DNL. The term "new home" includes new construction, existing homes that are less than one year old, and existing homes that have been substantially remodeled. HUD, FHA, or VA mortgage policies may also impose conditions on mortgage loan guarantees (such as written acknowledgement of noise conditions) for existing homes located in the 75 dB DNL or greater noise zone or within clear zones.

Questions from Council Resolution:

- **Will any residents be in an “Accident Potential Zone”?**

Reframed Question:

The DEIS does not provide clear information/lacks credibility on CZ, APZ, and AICUZ. Will these areas change after the F-35A beddown?

Answer:

The CZs, APZs, and RPZs are based on set guidelines depending on factors such as runway length and typical aircraft types. The areas covered by the CZs, APZs, and RPZs are not expected to change as a result of basing operational F-35As. Detailed information on the Clear Zones, Accident Potential Zones, and Runway Protection Zones are provided in Section 3.5 of Chapter 3 as well as each base-specific Section 3.4 of the EIS. The Air Installation Compatible Use Zones (AICUZ) is discussed in Section 3.5 and Section 3.11 of Chapter 3 in the EIS.

3.5 Safety

3.5.1 Definition of Resource

The Air Force practices Operational Risk Management as outlined in AFI 90-901 *Operational Risk Management* (Air Force 2000). Requirements outlined in these documents provide for a process to maintain readiness in peacetime and achieve success in combat while safeguarding people and resources. The safety analysis contained in the following sections addresses issues related to the health and well-being of both military personnel and civilians living on or in the vicinity of Burlington AGS, Hill AFB, Jacksonville AGS, McEntire JNGB, Mountain Home AFB, and Shaw AFB, and their associated training airspace. Specifically, this section provides information on hazards associated with aviation safety (APZs or Runway Protection Zones [RPZs], aircraft mishaps, and Bird/Wildlife-Aircraft Strike Hazard [BASH]). The primary safety concern with regard to military training flights is the potential for aircraft mishaps (i.e., crashes) to occur, which could be caused by mid-air collisions with other aircraft or objects, weather difficulties, mechanical failures, pilot error, or BASH. In the training airspace, potential flare debris from F-35A operations represents a topic worthy of discussion, although the possible impacts are negligible at most.

APZs are established at military airfields to delineate recommended surrounding land uses for the protection of people and property on the ground. APZs define the areas in the vicinity of a military airfield that would have the highest potential to be affected if an aircraft mishap were to occur. AICUZ guidelines identify three types of APZs for airfields based on aircraft mishap patterns: the Clear Zone, APZ I, and APZ II (Figure 3-2). The standard Clear Zone is a trapezoidal area that extends 3,000 feet from the end of a runway and has the highest probability of being impacted by a mishap. APZ I, which typically extends 5,000 feet from the end of the Clear Zone, has a lower mishap probability; and APZ II, which typically extends 7,000 feet from the end of APZ I, has the lowest mishap probability of the three zones (Air Force 1999). If needed to reflect different departure and arrival patterns, both the shape and size of APZs can be modified. These APZs apply to the military airfields at Hill AFB, McEntire JNGB, Mountain Home AFB, and Shaw AFB.

See Figure 3-2. Accident Potential Zones

Source: Air Force 1999.

Similar to APZs but used at civilian airports, RPZs are trapezoidal zones extending outward from the ends of active runways at commercial airports and delineate those areas recognized as having the greatest risk of aircraft mishaps, most of which occur during take-off or landing. Development restrictions within RPZs are intended to discourage incompatible land use activities from being established in these areas. The RPZ dimension for a particular runway end is a function of the type of aircraft and minimum approach visibility associated with that runway end. For most commercial airports (e.g., Burlington IAP and Jacksonville IAP) with large aircraft, the departure RPZ begins 200 feet from the end of the runway and continues out to 1,700 feet, with a width beginning at 500 feet and expanding as the distance from the runway increases to 1,010 feet wide (FAA 2009). The approach RPZ begins 200 feet before the runway threshold and extends out 1,700 feet in a reverse of the departure RPZ (Figure 3-3) (FAA 2009).

See Figure 3-3. Runway Protection Zones

Source: FAA 2009.

Aircraft mishaps are classified as A, B, C, or D (Table 3-4). Class A mishaps are the most severe with total property damage of \$2 million or more or a fatality and/or permanent total disability. Comparison of Class A mishap rates for various aircraft types, as calculated per 100,000 flying hours, provide the basis for evaluating risks among different aircraft and levels of operations. Each base-specific safety section analyzes existing and projected Class A mishap potentials based on flying hours and aircraft types.

Source: DoD 2011.

BASH and the dangers it presents form another safety concern for aircraft operations. BASH constitutes a safety concern because of the potential for damage to aircraft or injury to aircrews or local populations if an aircraft crash should occur in a populated area. Aircraft can encounter birds at nearly all altitudes up to 30,000 feet MSL; however, most birds fly close to the ground. According to the Air injury or illness not otherwise classified as A, B, or C

Resource Definition and Methodology

Force Safety Center (AFSC) BASH statistics, more than 50 percent of bird/wildlife strikes occur below 400 feet, and 90 percent occur at less than 2,000 feet AGL (AFSC 2007). Of these strikes, approximately 67 percent occur in the airfield environment (AFSC 2007). Waterfowl present the greatest BASH potential due to their congregational flight patterns and because, when migrating, they can be encountered at altitudes up to 20,000 feet AGL. Raptors also present a substantial hazard due to their size and soaring flight patterns. In general, the threat of bird/wildlife-aircraft strikes increases during March and April and from August through November due to migratory activities. The Air Force BASH program was established to minimize the risk for collisions of birds/wildlife and aircraft and the

subsequent loss of life and property. In accordance with AFI 91-202, *U.S. Air Force Mishap Prevention Program* (Air Force 1998), requires each flying unit in the Air Force (including the AFRC and ANG) to develop a BASH plan to reduce hazardous bird/wildlife activity relative to airport flight operations. The intent of each plan is to reduce BASH issues at airfields by creating an integrated hazard abatement program through awareness, avoidance, monitoring, and actively controlling bird and animal population movements. Some of the procedures outlined in the plan include monitoring the airfield for bird and other wildlife activity, issuing bird hazard warnings, initiating bird/wildlife avoidance procedures when potentially hazardous bird/wildlife activities are reported, and submitting BASH reports for all incidents.

Section 2.1.2 includes a detailed discussion of potential risks from flare debris falling to the ground under authorized training airspace. These risks are assessed for each alternative, and expressed in terms of estimated probabilities of debris striking a person.

3.5.2 Analysis Methodology

Development and basing of the F-35A includes a robust safety clearance program conducted by test pilots in multiple phases at the Lockheed Martin aircraft test facility and several developmental test bases. Modeling, simulation, and ground tests reduce the uncertainties of flight testing, and the flight-test program includes more than 30 aircraft dedicated to ensuring flight safety and reducing risks associated with new technologies. The F-35A will meet all DoD and FAA flight clearance standards prior to production. In addition, there is a post-production safety approval process and a DoD acceptance process required by the Air Force. At publication of this EIS, there have not been enough flight hours to accurately depict the specific safety record for this new aircraft. Therefore, the analysis used similar fighter aircraft safety records. Mishaps analysis was based on that fighter aircraft to draw operational history. For APZs/RPZs and BASH, a comparative safety analysis was performed using the existing conditions and calculating the expected changes as a result of implementing the proposed action. This evaluation also considered whether new construction could be an obstruction to air navigation but no obstruction issues were identified.

The assessment of safety examines how the no-action alternative and proposed action would affect safety at each alternative airfield location and within the associated training airspace. Since no modifications or additions are proposed for the current airspace structure, the impact analysis focuses on changes in airspace use that would result from the addition or loss of annual airfield and airspace operations with the arrival of the F-35A and departure of F-16 or F-15 aircraft. Impacts on air traffic safety were assessed with respect to the potential for disruption of air traffic pattern and systems, and changes in existing levels of air traffic safety. Factors used to assess the impacts on air traffic included an alternative's potential to result in: increased numbers of flights such that they could not be accommodated within established operational procedures and flight patterns; need for an airspace modification; or increased air traffic that might increase collision potential between military and non-participating civilian

operations.

Probabilities of flare debris striking a person on the ground under training airspace authorized for flare use considered the number of flares dispensed annually, the area under the airspace (square miles), population densities, and average time outdoors where strikes could occur. These estimates accounted for different airspace configurations, restrictions on flare use, and number of flares dispensed at the six alternative locations.

Public safety impacts are considered relative to whether the general public is endangered as a result of proposed Air Force activities. For each training activity or group of similar activities, an estimate of risk to the general public was formulated, based on Air Force safety procedures. Existing AFI and regulations provide operational and safety procedures for all normal Air Force aerial events. Several factors were considered in evaluating the effects of Air Force proposed activities on public safety. These factors include proximity to the public, access control, scheduling, public notification of events, frequency of events, duration of events, safety procedures, operational control of training events, and safety history.

Land Use Compatibility Guidelines

In June 1980, an *ad hoc* FICUN published guidelines (FICUN 1980) relating DNL to compatible land uses. This committee was composed of representatives from DoD, Transportation, and Housing and Urban Development; USEPA; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for noise analyses.

Following the lead of the committee, the DoD and FAA adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. Air Force guidelines are reprinted in Table C-4 (Appendix C), along with the explanatory notes included in the regulation. These guidelines are not mandatory (note the footnote "*" in the table), rather they are recommendations to provide the best means for determining noise impact for communities adjacent to bases. For commercial airports, the FAA has adopted similar guidelines (as set forth in the Federal Aviation Regulations [FAR] Part 150) and these are presented in Table C-5 (Appendix C). Again, these are recommendations only; it is up to the city/county zoning and planning entities to determine what land uses are compatible and how they will deal with incompatibilities (e.g., what type of development is allowed, instituting residential buyouts, or whether noise attenuation efforts will be done in residential units).

These land use compatibility guidelines provide a gauge for assessing impacts around busy airfields like those considered for beddown of the F-35A. Other than residential lands and schools, hospitals, and churches, other types of land uses are compatible with noise levels of 65 to 70 dB DNL. As noise levels increase, fewer land use remain compatible. In general, residential land uses normally are not compatible with outdoor DNL values above 65 dB, and the extent of residential land

area and populations exposed to DNL of 65 dB and higher provide the best means for assessing the noise impacts of the proposed action. For effects on schools, churches, and hospitals, refer to Section 3.3, Noise.

Areas under the airspace include federal, state, and local government lands as well as private lands. Sensitive land use areas, such as Wilderness Areas, Wildlife Refuges, State and National Parks, are of particular interest in this analysis. Federal and state geo-databases were used to identify land ownership, management, and special use areas in the vicinity of airspace. Federal lands are administered by agencies, including the BLM, the USFS, the USFWS, and the NPS. This analysis used geographic information systems to calculate the location and acreage of each land management area located under the airspace. Management areas, special use areas, and their respective acreages are reported in both tabular and map formats. Recreational activities were considered within the context of special use areas and were not analyzed specifically. Noise compatibility analysis of special use areas would include all activities within the areas, including recreation.

3.11.2 Analysis Methodology

After describing the existing conditions, the analysis examines the extent to which the beddown alternatives would be consistent with state, regional, and local conservation and development plans and zoning regulations. Changes in land use from new construction are analyzed to determine compatibility with existing and planned uses. In addition, the analysis assesses changes in aircraft noise levels around the bases and in the airspace as a result of the proposed action and alternatives. When compared to baseline conditions, land use plans, and land use regulations, the magnitude of the change represents the level of impacts. Compatibility standards such as those established by the U.S. Department of Housing and Urban Development and AICUZ program provide the means to evaluate impacts.

Changes to ownership or status commonly represent the types of impacts evaluated for lands underlying training airspace. Since no portion of the proposed action would alter the structure, size, or operation of DoD range lands, and acquisition of new non-DoD lands would not be required, alteration of ownership would not pose an issue. Similarly, the proposed action would not generate changes to the status or use of underlying lands, or plans and policies implemented for their management. Therefore, the only source of potential effects to land use would result from changes to noise from overflights that could be perceived as incompatible with current uses, particularly recreation and wilderness aesthetics. Lacking a quantitative or regulatory standard for such impacts, this analysis considers the degree of change and overall noise levels in defining potential impacts to underlying uses and activities.

Assessment of land use compatibility considered the overall level of subsonic and supersonic noise, as well as the degree of change. Noise is reported as the amount of perceptible change in noise levels; the frequency of overflights, especially those at lower altitudes; perceived sensitivities of land uses; and where appropriate, the change in numbers of sonic booms.

Council Resolution Question:

- **Will there be any risk of hearing impairment for adults, children and infants due to F-35 training? On what do you base your answer?**

Reframed Question: Noise from F-35 will cause hearing damage.

Answer:

Each base-specific Section 3.2.1.2 discusses the potential for hearing loss under each alternative scenario (for example, see Section BR3.2.1.2). The methodology used to estimate the risk of potential hearing loss is described in Chapter 3, Section 3.3.3. Department of Defense policy states that populations exposed to noise levels at or greater than 80 dB DNL have the greatest risk of potential hearing loss (see Appendix C, Section C2.5 for more details).

C2.5.1 Hearing Loss and Aircraft Noise

The 1982 USEPA Guidelines report specifically addresses the criteria and procedures for assessing the noise-induced hearing loss in terms of the Noise-Induced Permanent Threshold Shift (NIPTS), a quantity that defines the permanent change in hearing level, or threshold, caused by exposure to noise (USEPA 1982). This effect is also described as Potential Hearing Loss (PHL). Numerically, the NIPTS is the change in threshold averaged over the frequencies 0.5, 1, 2, and 4 kHz that can be expected from daily exposure to noise over a normal working lifetime of 40 years, with the exposure beginning at an age of 20 years. A grand average of the NIPTS over time (40 years) and hearing sensitivity (10 to 90 percentiles of the exposed population) is termed the Average NIPTS, or Ave NIPTS for short. The Average Noise Induced Permanent Threshold Shift (Ave. NIPTS) that can be expected for noise exposure as measured by the DNL metric is given in Table C-7.

For example, for a noise exposure of 80 dB DNL, the expected lifetime average value of NIPTS is 2.5 dB, or 6.0 dB for the 10th percentile. Characterizing the noise exposure in terms of DNL will usually overestimate the assessment of hearing loss risk as DNL includes a 10 dB weighting factor for aircraft operations occurring between 10 p.m. and 7 a.m. If, however, flight operations between the hours of 10 p.m. and 7 a.m. account for 5 percent or less of the total 24-hour operations, the overestimation is on the order of 1.5 dB.

From a civilian airport perspective, the scientific community has concluded that there is little likelihood that the resulting noise exposure from aircraft noise could result in either a temporary or permanent hearing loss. Studies on community hearing loss from exposure to aircraft flyovers near airports showed that there is no danger, under normal circumstances, of hearing loss due to aircraft noise (Newman and Beattie 1985). The USEPA criterion ($Leq_{24} = 70$ dBA) can be exceeded in some areas located near airports, but that is only the case outdoors. Inside a building, where people are more likely to spend most of their time, the average noise level will be much less than 70 dBA (Eldred and von Gierke 1993). Eldred and von Gierke also report that "several studies in the U.S., Japan, and the U.K. have confirmed the

predictions that the possibility for permanent hearing loss in communities, even under the most intense commercial take-off and landing patterns, is remote.” At military airbases, as individual aircraft noise levels are increasing with the introduction of new aircraft, a 2009 DoD policy directive requires that hearing loss risk be estimated for the at risk population, defined as the population exposed to DNL greater than or equal to 80 dB and higher (DoD 2009). Specifically, DoD components are directed to “*use the 80 Day-Night A-Weighted (DNL) noise contour to identify populations at the most risk of potential hearing loss.*” This does not preclude populations outside the 80 DNL contour, i.e., at lower exposure levels, from being at some degree of risk of hearing loss. However, the analysis should be restricted to populations within this contour area, including residents of on-base housing. The exposure of workers inside the base boundary area should be considered occupational and evaluated using the appropriate DoD component regulations for occupational noise exposure.

With regard to military airspace activity, studies have shown conflicting results. A 1995 laboratory study measured changes in human hearing from noise representative of low-flying aircraft on MTRs (Nixon *et al.* 1993). The potential effects of aircraft flying along MTRs is of particular concern because of maximum overflight noise levels can exceed 115 dB, with rapid increases in noise levels exceeding 30 dB per second. In this study, participants were first subjected to four overflight noise exposures at A-C-24 weighted levels of 115 dB to 130 dB. Fifty percent of the subjects showed no change in hearing levels, 25 percent had a temporary 5 dB *increase* in sensitivity (the people could hear a 5 dB wider range of sound than before exposure), and 25 percent had a temporary 5 dB decrease in sensitivity (the people could hear a 5 dB narrower range of sound than before exposure). In the next phase, participants were subjected to a single overflight at a maximum level of 130 dB for eight successive exposures, separated by 90 seconds or until a temporary shift in hearing was observed. The temporary hearing threshold shifts showed an increase in sensitivity of up to 10 dB.

In another study of 115 test subjects between 18 and 50 years old in 1999, temporary threshold shifts were measured after laboratory exposure to military low-altitude flight noise (Ising *et al.* 1999). According to the authors, the results indicate that repeated exposure to military low-altitude flight noise with L_{max} greater than 114 dB, especially if the noise level increases rapidly, may have the potential to cause noise induced hearing loss in humans.

Aviation and typical community noise levels near airports are not comparable to the occupational or recreational noise exposures associated with hearing loss. Studies of aircraft noise levels associated with civilian airport activity have not definitively correlated permanent hearing impairment with aircraft activity. It is unlikely that airport neighbors will remain outside their homes 24 hours per day, so there is little likelihood of hearing loss below an average sound level of 75 dB DNL. Near military airbases, average noise levels above 75 dB may occur, and while new DoD policy dictates that NIPTS be evaluated, no research results to date have definitively related permanent hearing impairment to aviation noise.

Question from Council Resolution:

- **Will the Air Guard continue to exist and support services at the Burlington International Airport if the F-35s are not based at the Burlington International Airport and the F-16s have exceeded their utility?**

Reframed Question: Would the beddown of the F-35A at Burlington International Airport change the mission of the 158 FW? If the F-35A does not beddown at Burlington, would this result in the closing of Burlington AGS?

Answer:

The beddown of the F-35A at Burlington AGS would represent a continuation of the 158 FW's current mission as described in Section BR1.0. Section 2.2.5 in Chapter 2 of the EIS defines the No-Action Alternative which for this EIS reflects the status quo where no F-35A operational basing would occur at any of the bases. At each location, including Burlington AGS, there are ongoing and currently planned activities that have been approved by the Air Force/Air National Guard and supported by existing NEPA documentation and as such are considered as part of the No-Action Alternative. Therefore, if there is no F-35A operational beddown at Burlington AGS the current mission would continue.

Question from Council Resolution:

- **Will the Air Guard continue to exist and support services at the Burlington International Airport if the F-35s are not based at the Burlington International Airport and the F-16s have exceeded their utility?**

Reframed Question:

Would the beddown of the F-35A at Burlington International Airport change the mission of the 158 FW? If the F-35A does not beddown at Burlington, would this result in the closing of Burlington AGS?

Answer:

Would the beddown of the F-35A at Burlington International Airport change the mission of the 158 FW? If the F-35A does not beddown at Burlington, would this result in the closing of Burlington AGS?

Council Resolution request:

AND, BE IT FURTHER RESOLVED that the City of Burlington requests that the Air Force bring an F-35 to the Burlington International Airport as soon as possible, so that residents can experience the actual noise level, rather than trying to infer how a loud a particular decibel increase will be experientially.

Reframed question:

The Air Force should bring several F-35A aircraft and fly some sorties so that residents can judge the noise for themselves.

Answer:

There is not a sufficient number of F-35A aircraft available or enough trained pilots to provide a demonstration of the F-35A aircraft. F-35A noise level measurements used in this EIS are the most accurate data available for the aircraft. Flight profiles expected to be used by the F-35A were derived by repeated flight simulator tests, and were applied to local flying conditions at the beddown installation. Individual overflight noise levels are compared in the Base and Airspace Noise Environmental consequences sections for each base. Field checks have been conducted which indicated good agreement between levels predicted by NOISEMAP and actual noise levels.