

## **Appendix F**

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### **Land Use Mitigation Alternatives**

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## Appendix F Land Use Mitigation Alternatives

The following appendix presents the range of the land use mitigation alternatives that were considered in this Part 150 Noise Compatibility Study (Part 150 Study) to mitigate noise impacts of aircraft operations at the Duluth International Airport (DLH or Airport). The proposed measures were evaluated for the anticipated benefits and costs associated with its implementation. Each recommended measure was reviewed with the membership of the Planning Advisory Committee (PAC). Local planning professionals from the surrounding communities were invited to meet with the project team to discuss the types of measures that were evaluated and recommended. Copies of all of the materials that were sent are located in **Appendix G, Public Involvement**.

Those alternatives that are recommended for inclusion in the DLH 2021 Noise Compatibility Program (NCP) are included in **Chapter Four, Noise Compatibility Program**.

### F.1 Potential Land Use Controls

Land use controls fall into two categories, preventative and remedial. Preventive land use management techniques seek to prevent the introduction of additional noise-sensitive land uses within existing and future airport noise contours. Remedial measures are intended to convert existing, non-compatible uses to compatible uses. These potential measures are discussed in **Appendix D, Land Use Methodology** and summarized below:

#### Preventative

- Compatible Use Zoning
- Subdivision Regulations
- Building Codes
- Capital Improvement Programs
- Growth Risk Assessment
- Fair Disclosure Policies

#### Remedial

- Sound Insulation
- Land Acquisition
- Purchase Guarantee
- Aviation Easements

The following pages provide a description of each land use alternative evaluated, along with an assessment of the benefits, drawbacks, and a recommendation.

## F.2 Land Use Mitigation Alternatives

This section provides a summary of the analysis of the previously recommended mitigation measures that were included in 1997 NCP and potential new mitigation alternatives that were evaluated as part of this DLH 2021 NCP Update.

### F.2.1 Previously Recommended Mitigation Measures

This section provides a review of the previously recommended mitigation measures that were included in the 1997 NCP. Provided for each measure is a description, the current status, and the recommendation for this DLH 2021 NCP Update.

#### Measure M-1

Description: A voluntary land acquisition/relocation program should be implemented within the 75 DNL, with emphasis placed upon parcels which are currently undeveloped. The implementation of this measure could result in the relocation of 395 residents who would benefit from such a program.

Status: Not implemented

Recommendation: Recommended to be continued with modification

#### Measure M-2

Description: All those involved in the public information process felt that a strong proactive position should be taken to prevent future non-compatible land use around DLH. It was also unanimously felt that the proper forum for such an effort is the current multi-jurisdictional Airport Zoning Board. This committee will probably require additional technical assistance as they begin to develop a comprehensive compatible land use plan or Airport Noise Overlay Zone. In all probability, a mix of multiple zoning and land use controls should be adopted based upon specific circumstances in the various noise impacted areas.

Status: Not Implemented

Recommendation: Recommended to be continued with modification

### F.2.2 Screening of Potential Mitigation Alternatives

This section summarizes the qualitative screening analysis of modified or potential new noise mitigation measures. **Table F-1, *Mitigation Alternatives Screening Analysis Summary*** presents a summary of the mitigation alternatives screening. The "Evaluation and Recommendation" column provides a brief synopsis of the issues and findings associated with each mitigation alternative and notes whether the mitigation alternative was recommended for further analysis. The mitigation alternatives are presented as either remedial or preventative. Those mitigation alternatives that were determined to warrant further analysis are discussed in greater detail in **Section F.2.3**.

**Table F-1 Mitigation Alternatives Screening Analysis Summary**

DESCRIPTION	BENEFITS	DRAWBACKS	EVALUATION AND RECOMMENDATION
<b>REMEDIAL</b>			
Offer Residential Sound Insulation Program for Single- and Multi-Family Homes within the 65+ DNL Noise Contour and in the Block Rounding Area Outside of the 65 DNL Noise Contour	Would reduce interior noise levels for the homes impacted within the 65 DNL contour and in the block rounding area outside of the 65 DNL noise contour.	Final eligibility for each property would have to be determined. Final cost would still have to be determined based on participation rates and local costs to implement.	This measure has the ability to provide benefits to the homes impacted by the 65+ DNL noise contour and in the block rounding area outside the 65 DNL noise contour. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Offer Land Acquisition Program for Single-Family Homes within 70+ DNL Noise Contour	Has the potential to convert owner-occupied residential housing units into compatible uses. Acquired properties could potentially be utilized in future airport development.	Total costs are uncertain pending completion of the feasibility study to determine who is interested in participating.	This measure has the ability to convert impacted properties to compatible uses. Single-family homes could be offered either sound insulation or land acquisition. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Offer Land Acquisition Program to Mobile Homes within NMPA #1	Has the potential to convert owner-occupied residential housing units into compatible uses. Acquired properties could potentially be utilized in future airport development.	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating. Major issues that complicate this would be interests of owners of mobile homes and the interests of the owner of the mobile home park who likely owns the rights to the land.	This measure has the ability to convert impacted properties to compatible uses. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Offer Avigation Easements to Owner-Occupied Single- and Multi-Family Homes within NMPA#1 if Acquisition and/or Sound Insulation is Declined	Has the potential to convert owner-occupied residential housing units into compatible uses. Properties would remain as taxable land.	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating. Major issues include that all properties would be offered sound insulation and would have to be eligible. Some properties would be offered acquisition. Only owners declining either measure would be offered avigation easement.	This measure has the ability to convert impacted properties to compatible uses. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Offer Avigation Easement to owner-occupied Mobile Home within NMPA #1 if Acquisition is Declined	Has the potential to convert owner-occupied residential housing units into compatible uses. Properties would remain as taxable land.	The total costs are uncertain pending completion of the feasibility study to determine of the property owner is interested in participating. Major issue is that the property would be offered acquisition. Only if the owner declined acquisition would they be offered avigation easement.	This measure has the ability to convert impacted properties to compatible uses. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Offer Avigation Easements to Owner-Occupied Mobile Homes within NMPA #2.	Has the potential to convert owner-occupied residential housing units into compatible uses. Properties would remain as taxable land.	Total costs are uncertain pending completion of the feasibility study to determine who is interested in participating. AIP funding would not be approved for mitigation of mobile homes outside the 65+ DNL.	This measure has the ability to convert impacted properties to compatible uses. Therefore, this alternative is <b>NOT RECOMMENDED</b> for inclusion in the NCP.

DESCRIPTION	BENEFITS	DRAWBACKS	EVALUATION AND RECOMMENDATION
<b>PREVENTATIVE</b>			
Rezone Parcels within 65+ DNL.	This measure would prevent future development and non-compatible land uses within the 65+ DNL.	Occupied properties would still be non-compatible if they are not sound insulated.	This measure has the ability to prevent future non-compatible land uses within the 65 DNL noise contour. Few undeveloped properties exist within the 65 DNL noise contour. Therefore, this alternative, is <b>NOT RECOMMENDED</b> to be included in the NCP.
Develop an Airport Land Use Management District (ALUMD).	This alternative would develop a fixed boundary within which land use controls will be recommended. The boundary would be based on the 2026 NEM/NCP noise contour, and other geographical and jurisdictional boundaries. The ALUMD boundaries are outside of the current 60 DNL noise contours and are set to eliminate changing boundaries caused by changing noise contours.	Would be up to local jurisdictions within the ALUMD to apply different land use controls as appropriate.	This measure has the ability to establish a fixed boundary within which consistent land use compatibility planning can be conducted. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP. Measure A-2 from the 1997 NCP outlined this previous recommendation.
Adopt Updated Subdivision Regulations.	This alternative would set new standards for new subdivisions. During the review of the plats by public entities, the site plans would be reviewed to ensure the design minimizes noise impacts. This could include the use of more open public space or by decreasing the density of development within a subdivision.	Developers of new subdivisions within the ALUMD may find the property not as profitable due to the decreased density of residences or the increase of public space.	This measure will require potential developers of new subdivisions within the ALUMD to reduce potential exposure to aircraft noise by decreasing density or increasing public space. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Adopt Improved Building Codes.	This alternative would update existing building codes to ensure that new residential construction meets current FAA criteria for sound insulation.	This alternative would likely increase the overall cost of residential construction within the ALUMD.	This measure will require potential builders of an increased level of construction to reduce noise within residential structures within the ALUMD. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.
Develop a Voluntary Fair Disclosure Program.	Will disclose through regulations on the seller or their representatives at the time of sale that an existing property or plats of buildable lots in a new subdivision could be subjected to aircraft noise. Potential buyers will be made aware before they purchase the property that it is in an area that has the probability of receiving noise from aircraft.	Will need to seek cooperation from the local Lake Superior Area Realtors and the Duluth Board of Realtors to participate.	This measure will notify potential buyers that they may be subjected to aircraft noise within the ALUMD. Therefore, this alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

Source: Landrum &amp; Brown, 2021.

### F.2.3 Analysis of Potential Mitigation Alternatives

The qualitative analysis described below identified six (6) remedial measures and four (4) preventative measures as recommended for continued evaluation. The measures are analyzed in greater detail in the following pages.

The following information is provided for each alternative:

- **Title:** includes a brief descriptive title of the measure.
- **Background and Intent:** includes the intent of the measure as a means to mitigate noise impacts, and the background and setting to which the measure relates where applicable.
- **Benefits:** includes a statement of how the measure would provide land use compatibility benefits.
- **Drawbacks:** identifies any potential negative consequences of implementing the measure
- **Cost to Implement:** identifies the potential cost to implement each measure
- **Findings and Recommendations:** provides a recommendation as to whether or not to carry forward the alternative for further analysis and consideration.

In some cases, alternatives had drawbacks that made that alternative unfeasible or they did not provide measurable benefits and therefore no further consideration was warranted. Those alternatives that showed potential benefits were continued for further analysis, including further discussion with parties responsible for implementation (FAA, DAA, airport users) and presented to the public for input and comment. Alternatives that are recommended for inclusion in this NCP are included in **Chapter 4, Noise Compatibility Program**.

**Noise Compatibility Program - Mitigation Alternative M-A**

<b>TITLE:</b>	Offer Residential Sound Insulation Program for Single-Family Homes within the 65+ DNL Noise Contour
<b>BACKGROUND AND INTENT:</b>	Approximately 47 single- and multi-family residential units located inside the 65+ DNL of the Future (2026) Baseline condition would be eligible for sound insulation. In addition, 17 additional single-family units are located in a proposed block rounding area outside of the 65 DNL noise contour. If approved, a total of 64 residential units could potentially be eligible for sound insulation. All homes that participate in the sound insulation program would be required to confer an aviation easement to the DAA in exchange for the improvements.
<b>BENEFITS:</b>	This measure has the potential to convert owner-occupied residential housing units into compatible uses.  AIP, if awarded, may be available to offset costs.
<b>DRAWBACKS:</b>	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating and also pending testing to determine final eligibility.
<b>COST TO IMPLEMENT:</b>	Noise attenuation costs for a particular unit may vary extensively depending upon the size, age, condition and construction of the overall building and each individual unit. No extensive work has been done at this point to assess these factors or to develop actual detailed costs. Total cost would depend upon all of these factors and the number of units that choose to participate. In addition, costs are also based on the level of effort provided by the airport staff. Costs to implement included hard costs which is the actual construction at the property and soft costs which can include program management, architectural and engineering support, acoustical testing, construction oversight, community outreach, development of legal documents, grant applications, etc.  After a preliminary review of the housing types and size, a recommended budget of \$50,000 per home is proposed for construction which is similar to other programs in northern climates and similar housing stock. Soft costs can vary from 20% to 30% per property, depending on airport involvement. We recommend budgeting 25% or \$12,500 per property for a total of \$62,500 per property. If all 64 units in the Future (2026) Baseline condition within the 65+ DNL, and in the block rounding area outside the 65 DNL were included in the program, the estimated cost for implementation would be approximately \$4,000,000. This would be considered a maximum cost as it is likely that not all 64 units would participate. Out of the 64 units, seven (7) units are located within the 70+ DNL noise contour and may be eligible for acquisition as a first choice. Some units may just choose not to participate. Other units would not meet the interior eligibility requirement, and others still are likely not to meet the build date criteria.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

## Noise Compatibility Program - Mitigation Alternative M-B (formerly M-1)

<b>TITLE:</b>	Offer Land Acquisition Program for Single-Family Homes within 70+ DNL Noise Contour
<b>BACKGROUND AND INTENT:</b>	Approximately seven (7) single-family homes inside the 70+ DNL of the Future (2026) Baseline condition would be eligible for acquisition. These homes are also included in the 47 homes that may be eligible for sound insulation.
<b>BENEFITS:</b>	This measure has the potential to convert owner-occupied residential housing units into compatible uses. Acquired properties could potentially be utilized in future airport development. Property owners could be offered a choice of sound insulation or land acquisition.  AIP, if awarded, may be available to offset costs.
<b>DRAWBACKS:</b>	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating.
<b>COST TO IMPLEMENT:</b>	Total cost would depend on the number of units that choose to participate and the fair market value (FMV) for each property, among other expenses.  For the 7 single-family homes, it is estimated that $\frac{2}{3}$ are owner-occupied and $\frac{1}{3}$ are tenant-occupied. Total costs for all 7 properties is estimated to be \$2,450,000 or around \$350,000 per property. Total costs would include the FMV for each property, relocation expenses, moving expense, remediation and/or demolition expenses, legal expenses, and program management expenses.  If the 7 single-family homes would decline to be acquired, they would still be able to participate in the sound insulation program (Measure M-A) at a cost of \$62,500 per property or \$437,500, subject to all eligibility requirements. Note that these costs are already included in Mitigation Alternative M-A above.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

**Noise Compatibility Program - Mitigation Alternative M-C**

<b>TITLE:</b>	Offer Land Acquisition Program for Mobile Homes within the 65+ DNL Noise Contour
<b>BACKGROUND AND INTENT:</b>	Approximately 103 mobile homes inside the 65+ DNL of the Future (2026) Baseline condition would be eligible for acquisition. It should be noted that 102 mobile homes are in a mobile home park and one (1) additional property located within the 65 DNL.
<b>BENEFITS:</b>	This measure has the potential to convert owner-occupied residential housing units into compatible uses. Acquired properties could potentially utilized in future airport development.  AIP, if awarded, may be available to offset costs.
<b>DRAWBACKS:</b>	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating.
<b>COST TO IMPLEMENT:</b>	Total cost would depend on the number of units that choose to participate and the fair market value (FMV) for each property, among other expenses.  For the 103 mobile homes, the costs are slightly more complicated as the assumption is that the land is owned by the mobile home park and the mobile homes are mostly owner-occupied. For the 103 mobile homes the total costs are estimated at around \$11,568,000 and would include the FMV for each property, relocation expenses, moving expense, remediation and/or demolition expenses, legal expenses, and program management expenses. In addition, it includes the estimated buy-out of the mobile home park, include FMV for the property and lose of rental income over the years, legal expenses, and program management expenses.  Overall, land acquisition costs for mobile home park and one (1) additional mobile home would be \$11,568,000 depending upon the level of participation.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

## Noise Compatibility Program - Mitigation Alternative M-D

<b>TITLE:</b>	Offer Avigation Easements to owner-occupied single-family homes within NMPA #1 if acquisition (within 70 DNL noise contour only) and/or sound insulation is declined.
<b>BACKGROUND AND INTENT:</b>	This measure will offer a cash payment in exchange for the avigation easement in case owners decline acquisition and/or sound insulation. The avigation easement would be placed on the property and would be attached to the deed for all future owners. It ultimately deems the property compatible land use.
<b>BENEFITS:</b>	This measure has the potential to convert owner-occupied residential housing units into to compatible uses.  AIP, if awarded, may be available to offset costs.
<b>DRAWBACKS:</b>	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating.
<b>COST TO IMPLEMENT:</b>	Total costs would be dependent on the number of units that choose to participate and the Fair Market Value (FMV) for each unit, among other expenses.  The cost of the avigation easement is set based on a percentage of the FMV for each unit. The easement almost always does not exceed \$3,000 per unit.  For the single- and multi-family homes the avigation easement cost is estimated at \$141,000. However, that cost is based on all 47 residential units participating as they would have to decline sound insulation or acquisition (acquisition for homes within 70+ DNL only).
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

**NOISE COMPATIBILITY PROGRAM MEASURE: M-E**

<b>TITLE:</b>	Offer Avigation Easements to one (1) mobile home, along Lavaque Bypass Rd., within NMPA #1 if acquisition is declined.
<b>BACKGROUND AND INTENT:</b>	This measure will offer a cash payment in exchange for the avigation easement in case owners decline acquisition. The avigation easement would be placed on the property and would be attached to the deed for all future owners. It ultimately deems the property compatible land use.
<b>BENEFITS:</b>	This measure has the potential to convert one (1) single mobile home property into compatible use.
<b>DRAWBACKS:</b>	The total costs are uncertain pending completion of the feasibility study to determine who is interested in participating.
<b>COST TO IMPLEMENT:</b>	Total costs would be dependent if the unit chose to participate and the Fair Market Value (FMV) for each unit, among other expenses.  The cost of the avigation easement is set based on a percentage of the FMV for each unit. The easement almost always does not exceed \$3,000 per unit.  For the single mobile home, the avigation easement cost is estimated at no more than \$3,000. However, that cost is based on the mobile home declining acquisition.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

## Noise Compatibility Program - Mitigation Alternative M-F

<b>TITLE:</b>	Develop an Airport Land Use Management District (ALUMD).
<b>BACKGROUND AND INTENT:</b>	<p>This measure sets a fixed boundary within which land use controls will be recommended. These controls will include the adoption of updated subdivision regulations, adoption of improved building codes, and the development of a fair disclosure program. These measures are discussed in M-G thru M-I below.</p> <p>The ALUMD boundary is fixed and outside of the 60 DNL noise contours so annual changes in the contours would not require a reestablishment of the ALUMD boundary. While this gives the airport some say in the development outside of its boundaries, it ultimately decreases the amount of future noise issues that might arise.</p> <p>All four of the jurisdictions within the ALUMD will have to be contacted such that the ALUMD can be incorporated into their planning documents.</p>
<b>BENEFITS:</b>	This alternative would develop a fixed boundary within which certain land use controls will be recommended. Since the proposed boundary is outside of the current 60 DNL noise contours, the measure is meant to develop a boundary within which future residences will be more aware of local noise issues.
<b>DRAWBACKS:</b>	Would be up to local jurisdictions within the ALUMD to apply different land use controls as appropriate.
<b>COST TO IMPLEMENT:</b>	It is expected that there will be minimal cost of up to \$50,000 associated with this measure. The Duluth-Superior Metropolitan Interstate Council (DSMIC) could be contracted to develop the final boundaries and then coordinate with the local jurisdictions for incorporation into local planning documents.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

**Noise Compatibility Program - Mitigation Alternative M-G**

<b>TITLE:</b>	Adopt Updated Subdivision Regulations.
<b>BACKGROUND AND INTENT:</b>	During the review of the plats for new subdivisions by public entities, the site plans would be reviewed to ensure the design minimizes noise impacts. This could include the use of more open public space or by decreasing the density of development within a subdivision. The intent is to minimize the density of residences that could be subjected to aircraft noise and to minimize noise complaints against the airport.
<b>BENEFITS:</b>	During the review of the plats for new subdivisions by public entities, the site plans would be reviewed to ensure the design minimizes noise impacts. This could include the use of more open public space or by decreasing the density of development within a subdivision and preventing and or reducing noncompatible landuse within the 65+ DNL noise contour and beyond.
<b>DRAWBACKS:</b>	Developers of new subdivisions within the ALUMD may find the property not as profitable due to the decreased density of residences or the increase of public space.
<b>COST TO IMPLEMENT:</b>	It is expected that there will be minimal cost of up to \$50,000 associated with this measure. The Duluth-Superior Metropolitan Interstate Council (DSMIC) could be contracted to develop the updated subdivision regulations and then coordinate with the local jurisdictions for incorporation into local planning documents.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

## Noise Compatibility Program - Mitigation Alternative M-H

<b>TITLE:</b>	Adopt Improved Building Codes.
<b>BACKGROUND AND INTENT:</b>	This alternative would update existing building codes to ensure that new residential construction meets current FAA criteria for sound insulation.
<b>BENEFITS:</b>	This alternative would ensure that any new residential construction would meet current FAA criteria for sound insulation. Better windows, doors, insulation would be added to construction to minimize building interior noise levels from aircraft operations. By meeting the interior noise level standards the home would be considered compatible.
<b>DRAWBACKS:</b>	This measure would likely increase the overall cost of residential construction within the ALUMD.
<b>COST TO IMPLEMENT:</b>	It is expected that there will be minimal cost of up to \$50,000 associated with this measure. The Duluth-Superior Metropolitan Interstate Council (DSMIC) could be contracted to review and update the local building codes and then coordinate with the local jurisdictions for incorporation into local planning documents.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.

**Noise Compatibility Program - Mitigation Alternative M-I**

<b>TITLE:</b>	Develop a Voluntary Fair Disclosure Program.
<b>BACKGROUND AND INTENT:</b>	Will disclose through voluntary regulations on the seller or their representatives at the time of sale that an existing property or plats of buildable lots in a new subdivision could be subjected to aircraft noise.
<b>BENEFITS:</b>	Potential buyers will be notified before they purchase that their property has the potential to be exposed to aircraft noise.
<b>DRAWBACKS:</b>	This measure will need to seek the cooperation from the local Lake Superior Area Realtors and the Duluth Board of Realtors to participate. Local realtors may not actively support as it could reduce potential property sales close to the airport.
<b>COST TO IMPLEMENT:</b>	It is expected that there will be minimal cost of up to \$50,000 associated with this measure. The Duluth Board of realtors and the Lake Superior Area Realtors would need to work together, likely in association with the Duluth-Superior Metropolitan Interstate Council (DSMIC) to develop the final language for the disclosure program. All jurisdictions would then incorporate into local planning documents.
<b>FINDINGS AND RECOMMENDATIONS:</b>	This alternative is <b>RECOMMENDED</b> for inclusion in the NCP.