

# **FRAPORT TAV ANTALYA AIRPORT**



## **VOLUNTARY NOISE INSULATION PROGRAM**

**VOLUNTARY NOISE INSULATION PROGRAM**

**INDEX**

1. PURPOSE .....4

2. SCOPE .....5

3. ABBREVIATIONS DEFINITIONS .....6

4. RELATED DOCUMENTS .....6

5. ROLES AND RESPONSIBILITIES .....7

6. VNIP IMPLEMENTATION .....8

6.1 Program Structure .....8

6.1.1 Noise Mapping .....10

6.1.2 Identification of Affected Areas .....10

6.1.3 Eligibility Criteria .....13

6.2 Program Phases .....16

6.3 Communication and Participation .....18

6.4 Application Process .....22

6.5 Implementation Process .....26

6.5.1 Site Assessment and Acoustic Calculations .....26

6.5.2 Planning of Insulation Applications .....27

6.6 Cost and Financing .....28

6.6.1 Program Budget Framework .....28

6.6.2 Payment and Cost Coverage .....29

6.7 Risk Management .....29

6.8 Frequently Ask Questions (FAQ) .....30

**TABLE LIST**

**Table 1:** Roles and Responsibilities .....7  
**Table 2:** Public Educational Facilities List with Lday >60 dBA (2025) ..... 12  
**Table 3:** Healthcare Facilities List with Lday >60 dBA (2025) ..... 13  
**Table 4:** VNIP Eligibility Matrix for FTA..... 15  
**Table 5:** Stakeholder Engagement .....20  
**Table 6:** List of Requested Documentation for Residential Properties .....23  
**Table 7:** List of Requested Documentation for Educational/Healthcare Facilities.....25  
**Table 8:** Voluntary Noise Insulation Program Risk Register .....29

**FIGURE LIST**

**Figure 1:** The Noise Map of AYT at night (ref. Noise Measurement Report), prepared by the Frekans Acoustic, 2024 ..... 11  
**Figure 2:** The locations of 9 public schools, the Lday exceeds 60 dBA. .... 13  
**Figure 3:** Noise monitoring screen accessible from the web page .....20  
**Figure 4:** A Community Notification Box Mounted on The Wall Of One of The Mukhtars' Office.....21  
**Figure 5:** Application Process Flowchart ..... 22  
**Figure 6:** Facade Insulation Calculation Model.....27  
**Figure 7:** Visual representation of noise reduction through window replacement. Image credit: Wood Street Windows.....28

## 1. PURPOSE

Antalya Airport (AYT) is situated within the Antalya province in southern Türkiye. The airport comprises both international and domestic terminals equipped with runways suitable for accommodating a wide range of aircraft types. Through Phase I construction efforts, the airport's capacity is projected to increase by up to 50%. Currently servicing commercial flights with two runways, AYT has undergone significant expansions of its apron areas and the construction of new taxiways to efficiently handle additional flight traffic. Operating with two commercial runways.

As part of the funding for the expansion initiatives, FTA commissioned a comprehensive Noise Assessment to evaluate the potential impacts stemming from the airport's expansion and the anticipated increase in flight activity. The findings of the noise assessment report revealed that neighboring communities could potentially experience disturbances due to increased noise levels. These findings were substantiated by noise maps that were modelled to provide a detailed understanding of the projected noise dispersion patterns. The Assessment Report findings suggested the development of a Noise Management Plan (NMP) and the initiation of a VNIP to mitigate these potential noise disturbances.

The measures to be taken to mitigate noise at source are communicated through the Noise Management Plan to the relevant authority (DHMI) for their input and contribution.

This Voluntary Noise Insulation Program (VNIP) has been prepared within the scope of the Antalya Airport Expansion Project as the participation of residents, educational or healthcare facilities in the Program is entirely voluntary. The VNIP was developed as a core mitigation measure identified in the Environmental and Social Impact Assessment (ESIA) conducted for the expansion project, which assessed potential impacts on local communities. Through this program, FTA demonstrates its voluntary commitment to proactively address community concerns related to environmental noise. This approach reflects FTA's intent to promote a responsible, transparent, and inclusive project development framework in alignment with international environmental and social performance standards. The Project proposes the expansion of Antalya Airport in a multi-phase program of works in order to facilitate future increased passenger traffic and aircraft movements.

FTA has been awarded the tender of AYT operation for 25 years between 2027 and 2051. The Joint Venture will ensure to increase the capacity of AYT and obtain a new concession for operation.

Financing for Phase I of these planned works is provided by The European Bank for Reconstruction and Development (the "EBRD"), International Financial Corporation ("IFC") and Asian Infrastructure Investment Bank (AIIB), jointly "the Lenders".

The current passenger terminals and associated facilities are operated by Fraport TAV Antalya Terminal İşletmeciliği A.Ş (FTA 1, Terminal Operator), as the Project Sponsor, under a concession until December 31, 2026. The part of FTA which is focused on terminal operations is referred to as "FTA1".

Another part of FTA is organizationally separate from FTA1 and is responsible for the financing and construction works for FTA – this organization is referred to as FTA2. Following the completion of ongoing construction works of the expansion of Terminal 2 (T2) and Domestic Terminal by FTA2 in the beginning of 2025, the terminals will be operated by FTA1 until the end of 2026. After January

**VOLUNTARY NOISE INSULATION PROGRAM**

1, 2027, FTA1 and FTA2 will merge and operate the terminals.

This VNIP aims to mitigate the impact of noise levels exceeding 60 dBA generated by airport operations on surrounding residential areas. This initiative, undertaken on a voluntary basis, seeks to balance the airport's growth and operational needs with the well-being of the environment and the local population. The program is designed to enhance the welfare of local communities and promote effective collaboration with stakeholders. This program is based on technical studies of environmental noise and refers to internationally recognized standards and guidelines, including those of the World Bank Group, the International Finance Corporation (IFC), the World Health Organization (WHO), the International Civil Aviation Organization (ICAO) and the EU Balanced Approach Directive. The main objective of the program is to address aircraft noise affecting people living in buildings, exposed to ambient noise levels exceeding 60 dBA at nighttime and educational and healthcare facilities exposed to ambient noise levels exceeding 60 dBA at daytime, with the aim of reducing noise exposure to surrounding communities. Key components of the program include the implementation of window replacements of buildings identified as experiencing night-time noise exceedance and educational and healthcare facilities experiencing daytime noise exceedance, based on the noise map developed by the appointed noise consultant.

## 2. SCOPE

The FTA's Project Management Office (PMO)(FTA2) appoints and supervises an Engineering, Procurement and Construction (EPC) Contractor to deliver these construction works on behalf of the airport owner, The Turkish General Directorate of State Airports Authority ("DHMI" - Devlet Hava Meydanları İşletmesi Genel Müdürlüğü). Once the Project has been completed, FTA2 will merge with FTA1 and retain responsibility for the management of passenger-focused assets. Any aspects that are not controlled by FTA during the operational phase will be handed over to DHMI as part of their operational obligations.

The FTA VNIP has been established to address the impact of aircraft-related noise on surrounding residential areas and mitigate its effects within the jurisdiction. These areas have been identified based on data from noise modelling studies and monitoring stations, and the impact zone includes residential areas around the airport runways. The program is designed to identify and prioritize the most affected residential, educational and healthcare facilities, taking into account the degree of vulnerability. For impact areas exposed to night-time and daytime noise levels above 60 dBA due to airport activities, insulation measures—replacing windows—will be implemented to reduce indoor noise levels and alleviate the impact. Furthermore, the program provides a voluntary application system, telephone lines, and web-based platforms to facilitate public and stakeholder participation, with the goal of responding directly to community needs in collaboration with neighborhood mukhtars.

This VNIP aims to reduce both night-time noise impact on surrounding buildings and the daytime noise impact on educational and health care facilities, which are located within the identified noise impact zones that exceed 60 dBA.

The VNIP will apply to buildings constructed before the start date of the Antalya Airport expansion project on January 5, 2022. Households eligible to benefit from the VNIP, which will be implemented over a period of 15 years, have been identified through the established Eligibility Matrix, with all relevant details outlined in the corresponding document.

## **VOLUNTARY NOISE INSULATION PROGRAM**

To ensure a fair and effective program, FTA has adopted a systematic approach for prioritization of houses to be insulated. This involves considering various factors, such as noise impact, high-impact areas, vulnerable groups, existing insulation, adherence to legal and technical criteria, and cost effectiveness (the allocated budget will mitigate the noise disturbance for a percentage of the impacted households until 2041).

### **3. ABBREVIATIONS DEFINITIONS**

<b>ATM:</b>	Air Traffic Movement
<b>AYT:</b>	IATA - Antalya International Airport
<b>DHMI:</b>	General Directorate of State Airports Authority (Airport Operator)
<b>FTA 1:</b>	Fraport TAV Antalya Terminal İşletmeciliği A. Ş. (Terminal Operator)
<b>FTA 2:</b>	Fraport TAV Antalya Yatırım Yapım İşletme A. Ş. (Borrower)
<b>NLR:</b>	Noise Level Reduction
<b>NPD:</b>	Noise-Power-Distance
<b>SEL:</b>	Sound Exposure Level (dBA)
<b>VNIP:</b>	Voluntary Noise Insulation Program

<b>Decibel (dB):</b>	Unit of level - measurement on a logarithmic scale of ratio Levels in dB relate the magnitude of a sound or noise to that of another
<b>Lday:</b>	For the 07:00-19:00 time period, energy average of the A-weighted long-term sound level
<b>Levening:</b>	For the 19:00-23:00 time period, energy average of the A-weighted long-term sound level
<b>Lnight:</b>	For the 23:00-07:00 time period, energy average of the A-weighted long-term sound level
<b>Sensitive Receptors:</b>	Healthcare Facilities (Health care institutions providing inpatient services, hospitals, Child, disabled and geriatric care facilities, family health centres), educational facilities (Schools, Nurseries, Student residences) and residential

### **4. RELATED DOCUMENTS**

#### **Internal**

- Noise Management Plan (Issue Date: June 2025, Rev. No: 0)
- Grievance Mechanism Procedure
- Stakeholder Engagement Procedure
- Audit Procedure

#### **External**

- Antalya Airport Noise Map Report, General Directorate of State Airports Authority, 2020
- Antalya Metropolitan Municipality Strategic Noise Action Plan, 2019

**VOLUNTARY NOISE INSULATION PROGRAM**

- Antalya Noise Action Plan Report, Antalya Metropolitan Municipality, 2019
- Compendium of WHO and other UN guidance on health and environment, 2022, Chapter 11
- ECAC (European Civil Aviation Conference) Doc. 29 Vol. 1 Appendix C, European countries have their own methodologies and assessment strategies in terms of aircraft noise. (ECAC Doc. 29) Federal Aviation Administration (FAA), AC 150/5000-9B - Guidelines for Sound Insulation of Structures Exposed to Aircraft Noise, 2022
- ICAO (International Civil Aviation Organization) Annex 16, 8th Edition, 2017
- IFC (International Finance Corporation) EHS Guidelines for airports, 2007
- ISO 16283 Acoustics - Field measurement of sound insulation in buildings and of building elements
- Regulation on the Protection of Buildings Against Noise, 30082, dated 31 May 2017
- Noise Measurements: ISO 1996-2:2017: Description, measurement, and assessment of environmental noise

**5. ROLES AND RESPONSIBILITIES**

The Environmental Specialist, Community Liaison Officer (CLO) and FTA’s Noise Committee will be jointly responsible for tracking and documenting the entire application and implementation process. During the pilot phase, a digital tracking system will be developed in collaboration with FTA’s IT Department. This secure database system will enable applicants to check their eligibility status and allow monitoring of all applications. All grievances, updates, and documentation will be logged in this system and used for internal audits and reporting.

Roles and responsibilities of the Noise Committee established within FTA are defined in Noise Management Plan. Please see NMP Roles and Responsibilities section.

**Table 1: Roles and Responsibilities**

Main Roles	Definitions	Responsible
Project Coordination	<ul style="list-style-type: none"> <li>• Coordination and overall oversight of the noise management plan.</li> <li>• Facilitating communication among departments and stakeholders.</li> <li>• Monitoring the plan’s progress and ensuring alignment with objectives.</li> </ul>	Environmental Specialist
Noise Monitoring	<ul style="list-style-type: none"> <li>• Installation and maintenance of noise monitoring stations.</li> <li>• Collecting, analyzing, and reporting noise data.</li> <li>• Reviewing noise maps annually.</li> <li>• Conducting noise modeling studies and preparing technical reports.</li> <li>• Providing technical guidance on noise mitigation measures.</li> </ul>	Noise Consultant
Technical Management VNIP Implementation	<ul style="list-style-type: none"> <li>• Ensure that monitoring station maintenance and measurement results are carried out in accordance with the consultancy contract and legislation.</li> <li>• Coordinating the implementation of the VNIP and planning the budget</li> </ul>	Energy Systems Manager

**VOLUNTARY NOISE INSULATION PROGRAM**

	<ul style="list-style-type: none"> <li>Monitoring of mitigation measures and compliance</li> <li>Supporting the assessment of housing conditions and refurbishment needs.</li> <li>Preparation of Technical terms and conditions and execution of the contract process</li> <li>Determination of technical requirements for insulation</li> <li>Collaboration with local service providers for construction activities.</li> <li>Site visits to monitor and report on construction progress.</li> </ul>	
Legal Management	<ul style="list-style-type: none"> <li>Regulatory compliance support</li> </ul>	Attorney
Community Relations Management Collaborations	<ul style="list-style-type: none"> <li>Gathering and addressing feedback from local residents.</li> <li>Acting as a bridge between terminal management and the community.</li> <li>Organizing regular meetings with mukhtars, municipalities and Provincial Directorate of Family and Social Policies.</li> <li>Conducting public awareness campaigns and establishing communication platforms (e.g., websites, hotlines).</li> </ul>	Community Liaison Officer Corporate Communications Asst. Manager Noise Consultant
Collaborations	<ul style="list-style-type: none"> <li>Organizing meetings with DHMI and airlines.</li> </ul>	Operation Manager Energy Systems Manager Noise Consultant
Community Feedback Monitoring	<ul style="list-style-type: none"> <li>Monitoring feedback related with noise nuisance.</li> <li>Coordination and implementation of grievance mechanism.</li> </ul>	Quality Specialist Community Liaison Officer
Financial Management	<ul style="list-style-type: none"> <li>Planning and allocating budgets for noise management initiatives.</li> <li>Providing financial support for noise insulation programs and technical investments.</li> </ul>	Finance Manager
Procurement	<ul style="list-style-type: none"> <li>Coordinating the procurement of equipment and materials.</li> <li>Ensuring transparent and efficient procurement processes.</li> <li>Collaborating with local vendors and service providers.</li> </ul> Preparation of terms and conditions and execution of the contract process	Procurement Chief

Besides this committee, FTA commissioned Frekans, a noise consulting company, to conduct Noise Monitoring including installation and maintenance of noise monitoring stations, collecting, analyzing, and reporting noise data, updating noise maps annually, conducting noise modelling studies and preparing technical reports, providing technical guidance on noise mitigation measures.

**6. VNIP IMPLEMENTATION**

**6.1 Program Structure**

The VNIP, envisioned to span a duration of 15 years, will be executed in four phases, as detailed in the subsequent section 6.2. At its core, the Program Structure encompasses a series of strategic initiatives. These include the establishment of a dedicated team, rigorous data collection and validation processes, identification of eligible buildings, community outreach efforts, development of the insulation program, and post-construction evaluations. Each facet of the Program Structure plays a crucial role in the systematic implementation and successful execution of the noise

**VOLUNTARY NOISE INSULATION PROGRAM**

insulation initiatives aimed at mitigating aircraft noise impacts on affected communities. Furthermore, the cost effectiveness of the program will be meticulously monitored throughout its duration, with a primary focus on ensuring the optimal allocation of resources.

A general outlook on the program structure is given below:

**1. Announcement of the Program:** Different channels will be used to announce the program to the most affected households / facilities within the relevant noise contours:

- Publication on FTA's official website (<https://www.antalya-airport.aero/expansion-project/noise>)
- Informational brochures and posters distributed through Mukhtars' offices
- Community meetings coordinated through Mukhtars facilitated by the Community Liaison Officer (CLO)
- Direct phone calls or home visits for households with disabled members
- Hotline (+90 242 315 1601) and e-mail ([izolasyon@antalya-airport.aero](mailto:izolasyon@antalya-airport.aero)) for inquiries and application support

Health care facilities and educational facilities will be informed about the program both through the official authorities to which they are affiliated and through face-to-face meetings.

**2. Application to Program:** As a second step, the voluntary program collects applications for households/facilities. The details of the Application Process and requirements are provided in the Community Outreach-Application Process section below.

All personal data collected under the VNIP—including contact details, property information, and supporting documentation—will be processed in accordance with Türkiye's Personal Data Protection Law (KVKK) and international data privacy standards. FTA has a Data Management Policy that outlines procedures for data collection, access, storage, retention, and disposal. Access to personal data is strictly limited to authorized personnel involved in the application and implementation processes.

**3. Pre-Evaluation According to Technical Findings and Legal Documentation:** This step in the program is based on the Eligibility Criteria (given below) to assess the property's potential in participating in the program. Applications should be able to provide some legal documentation and should be located in the Eligibility Zone.

Properties eligible for noise insulation include residential buildings (flats, houses), educational institutions (public schools), and healthcare facilities (e.g., family health centers, hospitals, geriatric care centers) located within noise contours exceeding 60 dBA for the applicable time period (Lnight for residences, Lday for facilities).

The eligibility and phasing criteria have been designed with transparency and consistency. In cases where a noise contour intersects only part of a street or neighborhood, eligibility will be determined at the building level. This ensures that inclusion is based strictly on noise exposure, not arbitrary geographic or social boundaries. Moreover, households or facilities not currently eligible but located near the contour edges may be reevaluated if updated noise maps demonstrate changes in

**VOLUNTARY NOISE INSULATION PROGRAM**

exposure levels. These updates are planned on a year cycle, and applicants may reapply based on revised data.

**4. Site Assessment:** After the technical evaluation, if an application meets the necessary criteria, technical specialists will conduct an on-site visit to assess the suitability of the buildings or windows for noise insulation. In addition to the technical team's input, consultation with the project's acoustical consultant is crucial for the final decision. Depending on the requirements, field measurements or observations may be carried out to determine the acoustical consultant's final recommendation.

**5. Budget Organization and Procurement:** Once the decision to insulate the property is made, the budget for that specific application will be determined and the insulation material will be selected and procured. The cost effectiveness will be strictly monitored throughout the program, and the availability of the funds will be evaluated regularly.

**6. Insulating the Property:** A schedule is set based on the property owner's and contractor's availability and the windows of the property will be insulated.

**7. Post Construction Assessment:** After the window replacement of the program participants is completed, the technical team will carry out on-site inspections for the provisional acceptance of the work. Simultaneous noise measurements will be conducted both indoors and outdoors in pilot buildings and during phases over a suitable sample of the properties insulated. The difference between the outdoor and indoor measurement results will be compared with the results of the Facade Insulation Calculation Model. A validation of the model against the actual implementation will be performed. In this context, a validation report was prepared using ISO 12354-3 and ISO 3744 standards.

### 6.1.1 Noise Mapping

Noise contours, i.e. grid noise maps, have been generated with data from Flight radar 24 database. Day and night noise exposure to population and buildings are analyzed.

In alignment with the NMP, AYT has strategically installed seven noise measurement stations at predetermined locations to conduct continuous monitoring of noise levels attributed to air traffic. These stations have been diligently collecting noise data, capturing day, night, and average noise levels, as well as identifying instances where noise limits are exceeded. These data received from the stations are anticipated to support in evaluating the eligibility criteria for the VNIP and facilitating the renewal process of both the NMP and the corresponding Noise Maps.

Noise maps are verified annually. Furthermore, these noise maps and the areas affected will be revised every five years.

For more details on this section, please refer to the NMP (<https://www.antalya-airport.aero/expansion-project/noise>).

### 6.1.2 Identification of Affected Areas

The plan focuses on the related noise contours during nighttime ( $L_{night} > 60 \text{ dBA}$ ) for residential buildings, and during daytime ( $L_{day} > 60 \text{ dBA}$ ) for educational and healthcare facilities. It specifically addresses areas where noise levels exceed 60 dBA ( $L_{day}$  and  $L_{night}$ ), based on data from noise modeling studies and monitoring stations.

**VOLUNTARY NOISE INSULATION PROGRAM**

Apart from the noise limits defined in RENC (Regulation on Control of Environmental Noise) and international guidelines, a night-time noise quality concept of sleep disturbance is also defined in “Environmental noise guidelines for the European Region” by WHO, 2018.

WHO has set guidelines on noise levels to prevent sleep disturbances. According to WHO’s 1999 Community Noise Guidelines, the recommended indoor noise level is 30 dBA at night-time.

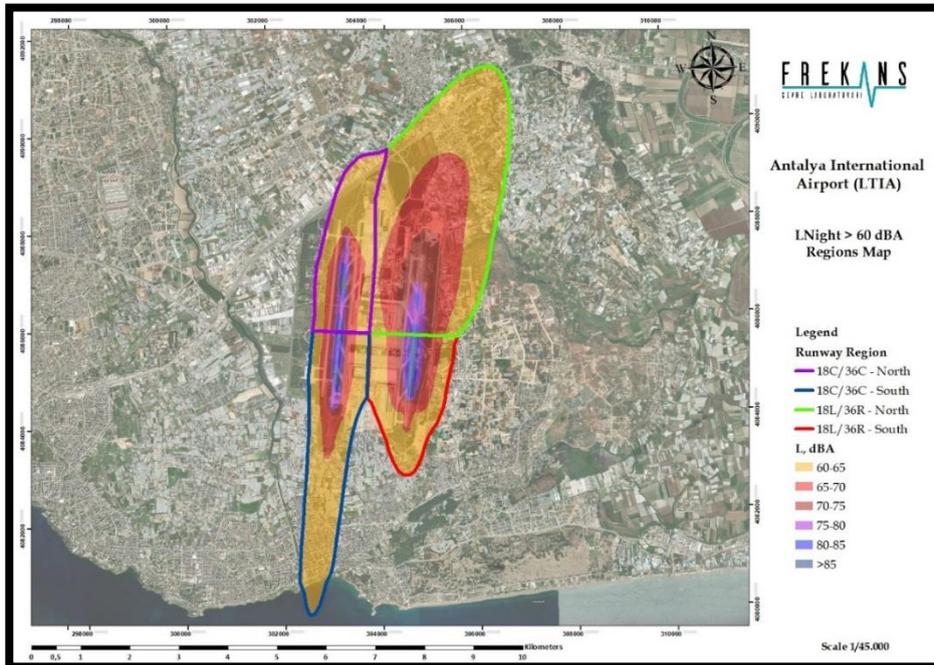
WHO 2018 states that, the differences between indoor and outdoor levels are usually estimated at around 10 dBA for open, 15 dBA for tilted or half-open and about 25 dBA for closed windows.

The aim of the program is to improve indoor noise levels in sleeping rooms to support undisturbed sleep, ideally below 30 dBA at night.

Insulated windows are expected to reduce outdoor noise by approximately 25–30 dB, which means buildings exposed to 60 dBA (L<sub>night</sub>) can achieve significantly improved indoor conditions.

This aligns with WHO guidelines, which recognize health risks beginning at 40 dBA outdoors.

Actual noise reduction may vary depending on building type, installation quality, and window use. Therefore, 60 dBA L<sub>night</sub> has been set as the threshold for eligibility to ensure meaningful benefit.



**Figure 1:**The Noise Map of AYT at night (ref. Noise Measurement Report), prepared by the Frekans Acoustic, 2024

A high-resolution version of the noise contour map in Figure 1 and all other maps are available on the FTA website at <https://webapp.frekanscevre.com/flight-map/ayt>. This map allows interested parties to visually assess whether their property lies within the program's eligibility zones.

High-resolution versions of the maps are also provided in the Technical Appendix of the NMP.

**VOLUNTARY NOISE INSULATION PROGRAM**

Regarding the noise contours identified through noise modelling results, Application Steps and Evaluation Criteria - including eligibility based on noise exposure levels, prioritization of vulnerable groups, and the documentation needed - are detailed in Section 6.1.3 and for more details on this section, please refer to the NMP.

The Noise Management Plan (NMP) defines eligibility thresholds for the VNIP based on both daytime and nighttime noise exposure, depending on building type.

For residential buildings, the program applies a nighttime threshold of  $L_{night} > 60$  dBA, while for educational and healthcare facilities, a daytime threshold of  $L_{day} > 60$  dBA is used.

This distinction reflects the different sensitivity of these building types to noise during their primary hours of use and ensures targeted protection of vulnerable groups.

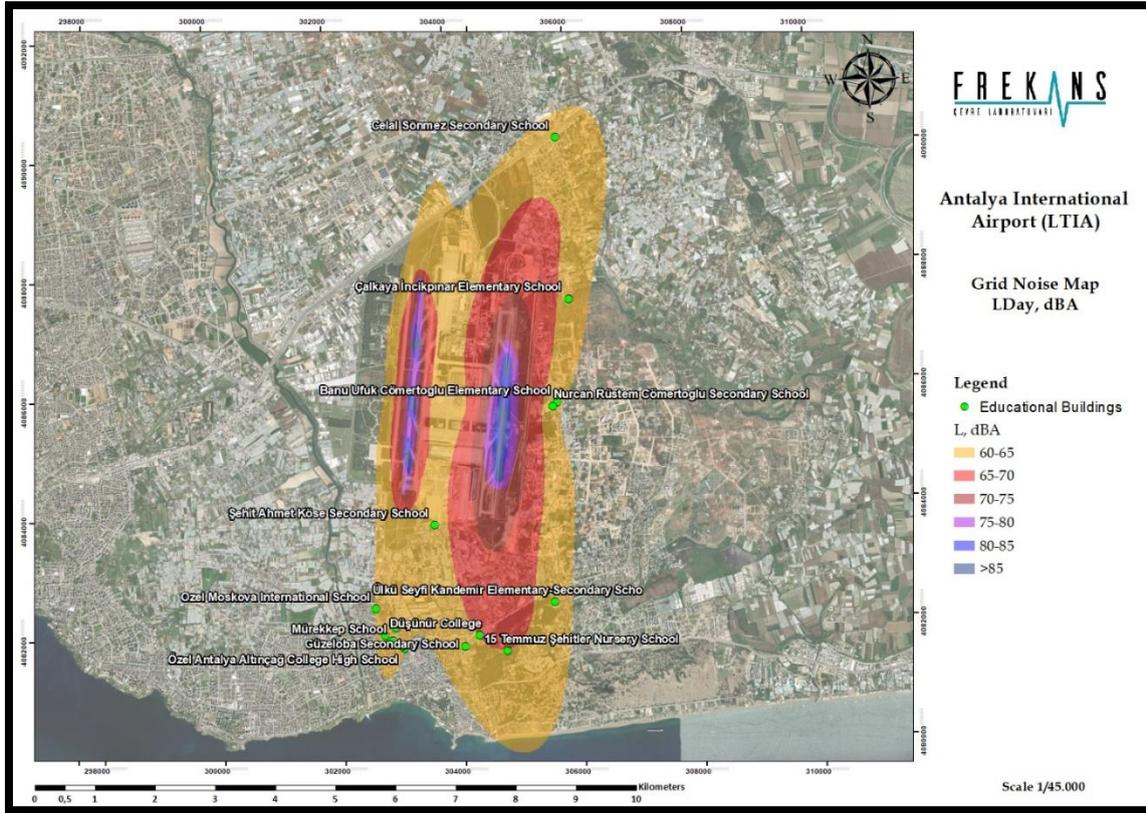
Since educational activities take place during the daytime, these buildings have been identified using the  $L_{day}$  grid noise map. The analysis results of noise exposure for educational buildings are presented in Table 2.

**Table 2:**Public Educational Facilities List with  $L_{day} > 60$  dBA (2025)

Public Educational Facilities with $L_{day} > 65$ dBA			
1	15 Temmuz Şehitler Nursery School	2	Çalkaya İncikpınar Elementary School
Public Educational Facilities with $L_{day} > 60$ dBA			
3	Güzeloba Elementary- Secondary School	4	Şehit Ahmet Köse Secondary School
5	Ülkü Seyfi Kandemir Elementary-Secondary School	6	Güzeloba Nursery School
7	Banu Ufuk Cömertoğlu Elementary School	8	Nurcan Rüstem Cömertoğlu Secondary School
9	Celal Sönmez Secondary School		

\*Although the VNIP covers 60 dBA zone, areas exposed to 65 dBA or higher are considered the most impacted and will be prioritized during the early phases of implementation. This approach ensures that the program begins with communities facing the highest levels of noise exposure.

The figure below illustrates the locations of 9 public schools situated in areas where the  $L_{day}$  (daytime equivalent continuous noise level) exceeds 60 dBA.



**Figure 2:** The locations of 9 public schools, the  $L_{day}$  exceeds 60 dBA.

There are 4 healthcare facilities expected to be located within the related noise contours that exceed 60 dBA during daytime hours shown on Table 3.

**Table 3:** Healthcare Facilities List with  $L_{day} > 60$  dBA (2025)

Healthcare Facilities with $L_{day} > 60$ dBA			
1	Güzelyurt Şehit Komando Er Mustafa GÖKTÜRK Family Health Center	2	Antalya Aksu Altıntaş Family Health Center
3	No. 22 Guzelbag Family Health Center	4	Kumsal Family Health Center

### 6.1.3 Eligibility Criteria

The VNIP's eligibility criteria is structured on technical and legal eligibility requirements.

**Legal Eligibility:** The buildings constructed after the enforcement date (31.05.2018) of the Regulation on Protection of Buildings against Noise, namely new buildings are required to ensure a specific acoustic quality at the façade of the building. As a result, these new buildings, which are expected to have an adequate level of insulation according to the legislation, will not be prioritized under the VNIP.

Therefore, the Construction Permit (required to determine the year of construction of the building and can be provided by the municipalities) of the buildings located in the noise contour, supported with the Title Deed (requested to ensure whether the applicant is a tenant or a landlord, if the applicant is a tenant the consent of the landlord should be required) and proof of residence

**VOLUNTARY NOISE INSULATION PROGRAM**

(occupancy evidence such as utility bills, address registration etc.), will establish the legal foundation of the eligibility assessment. This will ensure that buildings with full legal status will be eligible. In the absence of a title deed or proof of residence a statement will be obtained from the head of the relevant neighborhood (Mukhtar) to confirm the applicant household's residency or ownership of the property.

In addition, only the following types of property will be accepted into the program:

- The building should be a flat/house (single family, multifamily residences)
- Educational Facilities (will be given priority in the program)
- Healthcare Facilities (will be given priority in the program)

**Technical Eligibility:** On-site sample Noise Assessments conducted by Acoustical Engineer/expert will help in creating a model to assessing outdoor noise in residential areas for technical evaluation, and houses with night-time environmental noise greater than 60 dBA and educational and healthcare facilities with daytime environmental noise greater than 60 dBA will be considered for the program.

3 of the households exposed to  $L_{night} > 65$  dBA noise and 3 of the households exposed to  $L_{night} > 60$  dBA noise on the map will be selected as pilot implementation areas. Households will be selected as a sample from different types of buildings suitable for Antalya conditions. The implementation results to be achieved in these households will be used to determine the window types to be used in the insulation program. In addition, the insulation values obtained from this phase will provide information for the technical evaluation stages of the program. A pre and post-installation testing regime will be put in place for these pilot buildings using accepted international standards such as ISO 16283.

Household noise measurements will only be carried out in pilot implementations. The model will be verified with the measured values before and after insulation. The model will be made usable in the field with the data to be obtained after the pilot implementations. The eligibility assessment of the applications will be continued using this model. The eligibility criteria of FTA VNIP are given below:

**VOLUNTARY NOISE INSULATION PROGRAM**

**Table 4:VNIP Eligibility Matrix for FTA**

Criteria		Eligibility	Prioritization Status	Entitlement	Conditions/Notes
<b>Building Properties</b>		Buildings constructed after 05.01.2022, Commercial buildings, are not eligible	-	-	As Antalya Airport expansion project start date is 05.01.2022, the buildings constructed after this date are not covered in the scope of this VNIP.
<b>Night-time Noise Level (dBA) (Lnight)</b>	60 dBA and above	Residential / flats are eligible	1- Flats located in the 65 dBA (Lnight) impact zone	Sleeping room window insulation (*sleeping room window insulation if necessary)	<p>External noise level measurements to be taken during night-time (23:00-07:00)</p> <p>Proof of land market cost is referenced regarding announced figures via related municipality's website, for the previous year of the application date, based on address/street</p> <p>Documentation or information on disability or vulnerability will be requested to aid in prioritization (Disabled ID card obtained from the Provincial Directorate of Family and Social Policies and issued to persons with 40% or more disability)</p> <p>The buildings constructed after the enforcement date (31.05.2018) of the Regulation on Protection of Buildings against Noise, are required to ensure a specific acoustic quality at the façade of the building. As a result, these new buildings, which are expected to have an adequate level of insulation according to the legislation, will not be prioritized under the VNIP.</p>
			2- The land market cost below the average land market cost of the houses located in the exposure area		
			3- Households with disabled member(s)		
			4- Buildings constructed before 31.05.2018		
<b>Day-time Noise Level (dBA) (Lday)</b>	60 dBA and above	<p>- **Educational facilities (Public schools),</p> <p>Healthcare facilities (health care institutions providing inpatient services, hospitals, child, disabled and geriatric care facilities, family health centres) are eligible</p>	1- Facilities located in the 65 dBA (Lday) impact zone	Insulation of windows (except internally crowded areas, such as canteens)	External noise level measurements to be taken during daytime (07:00-19:00)
			2- Buildings constructed before 31.05.2018		

\* Sleeping rooms may include rooms where family members other than parents (e.g. elderly, children) sleep, or rooms such as living rooms used as sleeping areas by extended families (confirmed through Mukhtar, who registers household families).

\*\* The list of eligible educational and health care facilities is given in Section 6.

**VOLUNTARY NOISE INSULATION PROGRAM**

This matrix ensures that the most affected and vulnerable populations are prioritized for noise mitigation while adhering to the fairness criteria.

## 6.2 Program Phases

The phased implementation of the VNIP is based on various aspects such as social, technical and strategic considerations.

Stakeholder and community communication and engagement are crucial factors in this process. As noise insulation efforts directly impact local residents and other stakeholders, it is expected that phased implementation will be an effective approach to facilitate adaptation and acceptance. By structuring the process into phases, community feedback mechanisms can function more effectively, and adjustments and improvements can be made based on early-phase experiences. This will ensure that future phases better aligned with community expectations and needs.

One of the key reasons for this approach is the need to prioritize areas most affected by noise. The first phase will focus on identifying and addressing the most affected locations, ensuring that mitigation efforts begin. This approach will not only help to reduce the negative impact on the community immediately but will also allow for broader implementation in subsequent phases.

From a technical perspective, the evolution of materials and methods used in such insulation programs must also be considered. After the completion of the initial phase, data collected will be analyzed to assess the effectiveness of the measures, allowing for the adoption of more advanced solutions in later phases. Thus, enhancing operational efficiency while minimizing potential disruptions is targeted.

Furthermore, in order to ensure the efficient and timely implementation of this long-term program, the management of resources (monitoring, labor, cost, infrastructure, planning, ...) planned for noise insulation plays a critical role in the sustainable, efficient and timely implementation of the program. In addition, the phased structure of the program will provide flexibility to adapt to potential funding opportunities, legislative changes and developments in noise insulation technologies.

In summary, structuring noise insulation program into distinct phases ensure community engagement, enhance technical feasibility, and secure financial sustainability, ultimately leading to a more effective and well-managed implementation.

This voluntary noise insulation program covers a 15-year implementation period and consists of four phases:

- **Pilot Phase (July-Sep 2025)**

**Focus:**

3 households exposed to night-time ( $L_{night}$ ) noise levels exceeding 65 dBA 3 households exposed to night-time ( $L_{night}$ ) noise levels exceeding 60 dBA, as indicated on the noise map, will be selected as pilot implementation areas.

Finalisation of brochures, flyers, prior to the launch of full program communications, incorporating any necessary improvements based on observations and feedback gathered

Engagement with Mukhtars and related state authorities, to inform and raise awareness.

**Key Activities:**

**VOLUNTARY NOISE INSULATION PROGRAM**

Households will be chosen as representative samples from different building types that are suitable for Antalya's conditions.

During the pilot phase noise measurements will be taken before and after to assess the impact of the insulation.

Results obtained from these pilot implementations will determine the types of windows to be used in the insulation program.

The insulation performance measured during this phase will contribute to the technical evaluation stages of the program.

Collected data will refine the model to improve the insulation program's effectiveness.

**Outcome:**

The model will be validated, using measured noise levels before and after insulation (NLR), and the data will be used to assess future implementations.

- **Phase 1 (Sep 2025-2029)**

**Focus:**

- 1- Educational and healthcare facilities in 65 dBA (Lday)
- 2- Households, in which building is constructed before 31.05.2018, in 65 dBA (Lnight)

**Key Activities:**

The educational and healthcare facilities and households with disabled will be prioritized.

Applications for remaining households will be evaluated and planned for implementation in future phases.

- **Phase 2 (2030-2034)**

**Focus:**

- 1- Educational and healthcare facilities in 60 dBA (Lday)
- 2- Households, in which building is constructed after 31.05.2018, in 65 dBA (Lnight)

**Key Activities:**

This phase expands to include households based on eligibility criteria.

Applications for remaining households will be evaluated and planned for implementation in future phases.

- **Phase 3 (2035-2040)**

**Focus:**

Households exposed to night-time noise levels in the range of 60-65 dBA (Lnight)

**Key Activities:**

**VOLUNTARY NOISE INSULATION PROGRAM**

The program will continue to focus on these households, following the same criteria for eligibility.

FTA has allocated a specific amount of resources (including but not limited to cost, labor, monitoring, etc.) for the implementation of the VNIP, planned to span 15 years. As a result, only a certain portion of the households within the related noise contour will be able to benefit from this insulation support. FTA reserves the right to determine and allocate these planned resources based on the program's priorities, available capacity, and operational requirements noting that the basic target is to use all the allocated resources during the planned 15 years.

### 6.3 Communication and Participation

The NMP and VNIP will be officially announced through various channels, such as publication on FTA's website, announcements through Mukhtars' offices, transmission to the related authorities such as Provincial Directorate of Family and Social Policies, Provincial Directorate of National Education, Municipalities, DHMI, etc... and direct communication facilitated by Community Liaison Officer (CLO). Additionally, the program website and hotline will remain active and responsive for community to inquire about eligibility status.

Community Liaison Officer (CLO) will serve as the main point of contact for community throughout the VNIP process. The responsibilities include communicating eligibility decisions determined by Environmental Specialist, assisting with application submissions, coordinating and booking on-site noise surveys when needed with the Environmental Specialist, and providing updates on timelines and outcomes. CLO is also tasked with facilitating communication between applicants and the Environmental Specialist, technical teams, ensuring applicants are informed at each stage, and helping address any concerns or grievances through the established feedback mechanisms. CLO will maintain a visible presence in the affected neighborhoods and act as the bridge between the community, Environmental Specialist and the Noise Committee.

Noise monitoring station measurements and noise maps are accessible through FTA's official website. This application provides the public, authorities, and relevant stakeholders with real-time data on noise levels around the airport, helping to keep track of environmental noise dynamics. The monitoring system will continue to operate, ensuring that noise measurements are consistently updated and available for review. This ongoing effort will contribute to maintaining a transparent communication channel with the public, while also enabling the relevant authorities to take timely action when necessary. The stakeholder engagement thus outlines strategies to effectively engage all stakeholders to ensure their concerns, needs and feedback are incorporated into the noise management strategies. Therefore, the main objectives of the stakeholder engagement can be summarized as follow:

- Build and bolster transparent communication with stakeholders,
- Build lasting relationships and trust and collaboration between the Airport and local communities,
- Ensure all affected communities are well-informed about the project,
- Ensure smooth implementation of the project activities.

#### Key Stakeholders

The key stakeholder groups of the Noise Management Plan can be summarized as follow:

**VOLUNTARY NOISE INSULATION PROGRAM**

**Internal Stakeholders**

- Project sponsors,
- Contractors and subcontractors.

**External Stakeholders**

**Government and Regulatory Authorities**

- DHMI,
- Provincial Directorate of Family and Social Policies, Provincial Directorate of National Education,
- Provincial Directorate of Health,
- Municipalities (Metropolitan, Muratpaşa, Aksu, Kepez)

**Community Stakeholders**

- Educational and healthcare facility managers (that remain within the project-impact area, which are detailed in Area of Influence section)
- Mukhtarships of the affected communities,
- Residents of project-affected communities, namely:
  - Güzelbağ, Güzeloba, Ermenek – within the boundaries of the Muratpaşa Municipality,
  - Altıntaş, Güzelyurt, Hacıaliler, Pınarlı, Cihadiye, Soğucaksu – within the boundaries of the Aksu Municipality,
  - Altınova Sinan – within the boundaries of the Kepez Municipality,

**Engagement Activities**

The start of the Project in each neighborhood will vary in parallel with the number of neighborhoods and buildings included in the Noise Management Plan. Priority will be given to the most affected neighborhoods and buildings and stakeholder engagement efforts will concentrate in these areas. The key engagement activities that are included within the scope of the Noise Management Plan are listed below:

• **Print Materials and Digital Communication**

CLO, in coordination with the Environmental Specialist and Corporate Communications Department, are responsible for preparing and disseminating clear and accessible communication materials. These materials include brochures, flyers, posters, FAQs, and web content tailored to explain the program's objectives, eligibility criteria, application steps, and expected outcomes.

- Distribute brochures that introduce the project to the affected communities through mukhtars' offices, health clinics and government and regulatory authority representatives.
- A website through which information sharing about the project and application forms are presented.

• **Consultations and Collaborations**

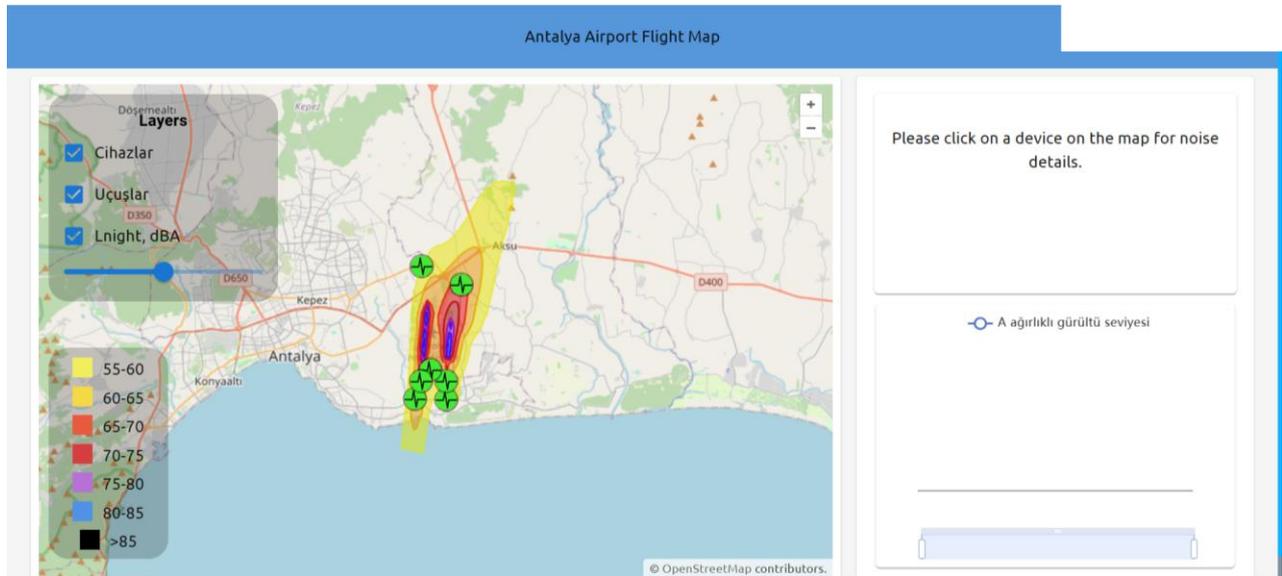
- Periodic meetings with the mukhtars of the project affected neighborhoods for information sharing and update about the progress of the project activities.

**VOLUNTARY NOISE INSULATION PROGRAM**

- Periodic meetings with schools that are located within the project-affected neighborhoods.

**Table 5: Stakeholder Engagement**

Stakeholder Group	Subjects	Consultation Method
DHMI	<ul style="list-style-type: none"> <li>• Information sharing and updates about the project activities</li> </ul>	<ul style="list-style-type: none"> <li>• Official Letters</li> <li>• Face to face meetings</li> </ul>
Mukhtars	<ul style="list-style-type: none"> <li>• Dissemination of information about the Project activities</li> <li>• Consultations about the Project stages</li> <li>• Informing about the application process</li> </ul>	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Phone calls</li> <li>• Brochure</li> <li>• Website</li> </ul>
Residentials	<ul style="list-style-type: none"> <li>• Consultations about the Project stages</li> <li>• Informing about the application process</li> <li>• Assisting for applications</li> </ul>	<ul style="list-style-type: none"> <li>• Website</li> <li>• Announcement through Mukhtars</li> </ul>
Educational and Healthcare Facilities	<ul style="list-style-type: none"> <li>• Consultations about the Project stages</li> <li>• Informing about the application process</li> <li>• Assisting for applications</li> </ul>	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Phone calls</li> <li>• Brochure</li> <li>• Website</li> </ul>
Related Governmental Bodies (e.g. to reach-out disabled residentials,...)	<ul style="list-style-type: none"> <li>• Information sharing and update about project activities</li> </ul>	<ul style="list-style-type: none"> <li>• Face to face meetings</li> <li>• Phone calls</li> <li>• Brochure</li> <li>• Website</li> </ul>



**Figure 3: Noise monitoring screen accessible from the web page**

Meetings will be conducted with the Mukhtars of the noise-affected settlements before any public announcements regarding NMP. These meetings will provide information about the purpose, scope

**VOLUNTARY NOISE INSULATION PROGRAM**

and target groups of the NMP and VNIP, and will serve as a direct communication channel, and Mukhtars will continue to act as intermediaries between FTA and the public, helping to address the needs and concerns of the local community.

Hosting meetings with Provincial Directorate of Family and Social Policies, information sessions with Mukhtars' explaining the program's objectives, benefits, eligibility criteria, and how to apply.

As Mukhtars are the most powerful entities that are aware of the socio-economic and cultural conditions of the neighborhoods. FTA will co-operate with them to have their guidance for reaching out to eligible community and announcement of the program.

Phone hotlines have been established and will continue to be maintained. The number and availability of the hotline are being well advertised, especially in regions expected to be most vulnerable to environmental noise from the airport.

Moreover, any kind of possible grievances can be conveyed through Community Liaison Officer (CLO). All complaints from noise-affected communities, are collected in the Community Grievance Database.

The Community Outreach will be stemmed from the existing community feedback mechanism of the airport, which is already founded on strong connections to the neighboring communities via continuous engagements. This mechanism of the airport is already disclosed on Antalya Airport's website (<https://www.antalya-airport.aero/community-feedback>) and notification boxes are located in the neighboring Community Headman( *Mukhtars*) offices.

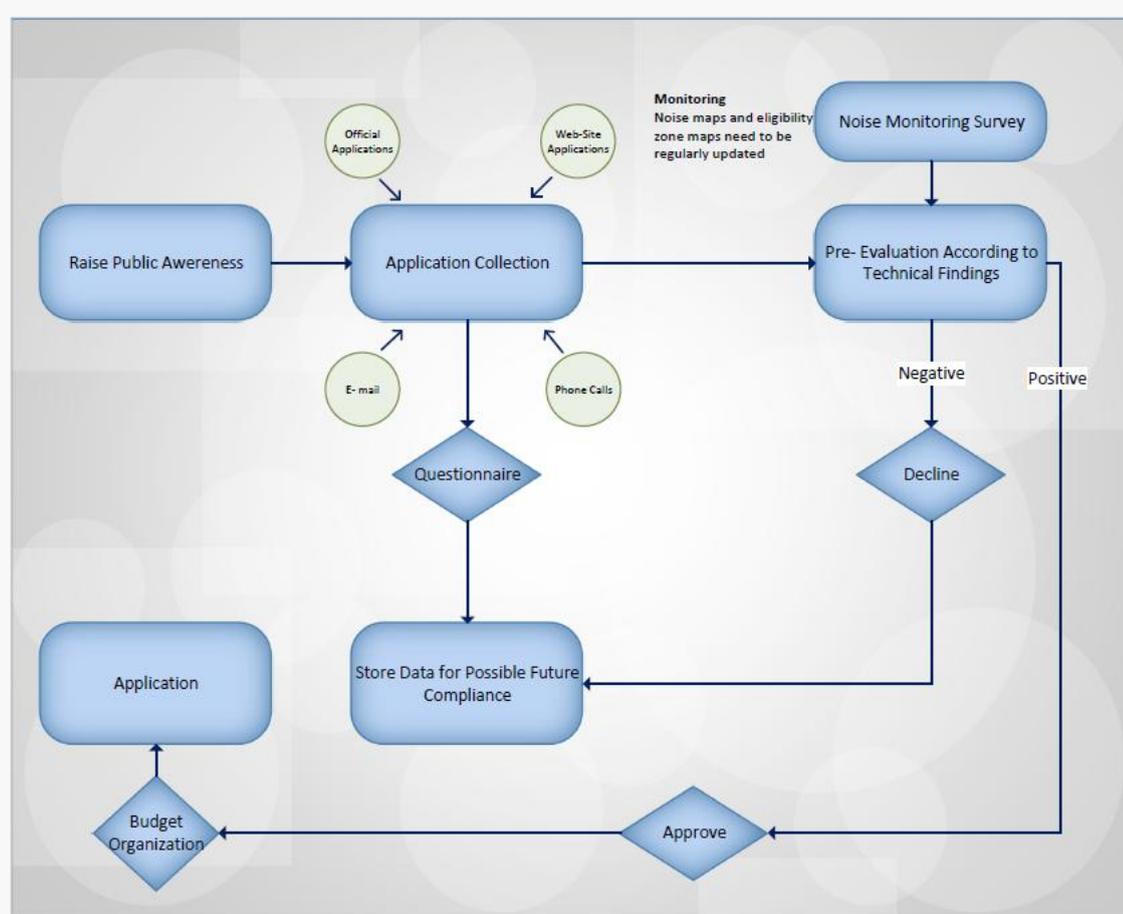
Multiple channels to distribute information will be used, including printed materials such as flyers, brochures, QR codes and posters will be displayed in Mukhtars' offices.



**Figure 4:** A Community Notification Box Mounted on The Wall Of One of The Mukhtars' Office

### 6.4. Application Process

The flow chart summarizing the details of the application process is given in Figure 5.



**Figure 5:** Application Process Flowchart

#### 6.4.1 Application Steps and Evaluation Criteria

The application mechanism is designed to ensure a seamless process, which is straightforward, simple, and transparent for all applicants. Various channels of communication have been established to ensure that applications can be easily submitted by anyone. For example, applications can be made through the website, by email or telephone, through forms available at the Mukhtars' offices, or with the assistance and guidance of the CLO.

Information on the application process, including deadlines and required documentation, specific guidelines or eligibility criteria for the program, can be provided through any of these different channels.

The required documents for application of the Voluntary Noise Insulation Program are listed below.

- Complete and accurate application form providing contact details.
- Proof of residency, such as a utility bill or official documentation.

**VOLUNTARY NOISE INSULATION PROGRAM**

- Documentation of legal ownership or tenancy of the property (such as lease agreements).
- Technical documentation for any housing extensions or additional structures presents on the property (if any).
- Information on the current level of noise insulation in the house, (if available, if not FTA’s technical team will determine during the pre-construction assessment).
  - Examining the construction status of the existing building in terms of noise insulation
  - Determining the building materials used
- Additional supporting documents that demonstrate the sensitivity to noise of a household member, such as medical records or complaints about noise disturbances (if the applicant wishes to share them these documents will be used for prioritization).

**Residential Properties Applications**

**Table 6:** List of Requested Documentation for Residential Properties

Requested Documentation	Use and Purpose
Complete and accurate application form providing contact details	should provide all requested details and contact information
Title deed*	*Documentation of legal ownership or tenancy of the property, proof of residence (such as utility bills, address registration etc)  requested to ensure whether the applicant is a tenant or a landlord, if the applicant is a tenant the consent of the landlord should be required
Architectural plans and specifications, including any extensions and modifications (if available)	Technical assessment
Number of windows, façade type, roof type and any other factors that may impact on acoustical test results (if available)	Technical assessment
Construction Permit/Legal document as proof of building age	Legal Assessment

\*In the absence of a title deed or proof of residency a statement will be obtained from the head of the relevant neighborhood (Mukhtar) to confirm the applicant household's residency or ownership of the property.

Tenants could also apply for this scheme; however, the insulation program will only start after the tenant informs the homeowner and obtains his/her consent and approval.

**Step 1:** The Process starts with the application collection. Although the applications can be collected via e-mail, phone calls or through the web-site grievance system (as shown in Figure 5), the complainant is always directed at the Application Form that is available on the airport’s website. This is to manage the potentially heavy load of grievance collected and ensure not a single complainant is overlooked. All grievances will be filed and closed out by the existing grievance mechanism. For those who are unable to use the online system, application forms are available from the Mukhtars' offices. Applications are collected by the CLO.

**VOLUNTARY NOISE INSULATION PROGRAM**

**Step 2:** The filled application form, accompanied by the supporting documents provided above in Table 6 are submitted through application system by the specified deadline (30 days). It is the applicant's responsibility to ensure that all documents are legible and properly organized. The applicant receives confirmation of receipt from the program administration and the applicant is then requested to await confirmation and further instructions. If needed, additional information and/or documentation may be requested.

Regardless of the outcome, the applicant is informed of their application and the results of the application's initial assessment.

**Step 3-a:** The applications might be rejected for various reasons such as not being in a relevant socio-economic situation, the construction date of the building is not covered, ... will be filed and in cases where the reason for rejection is that the application is not located within the related noise contour, will be given priority should the revisions in the Noise Map be favorable for the applicant. In this case, the applicant is requested to submit any changes in information/documentation occurred since their initial application. It is of applicant's responsibility to inform the Program Representatives should their contact details are changed.

**Step 3-b:** Applications that are eligible to receive insulation support are requested to cooperate with the Program Representatives to organize a pre-construction assessment. A Permit to Conduct Pre-construction Assessment is signed between the applicants. The applicant is requested to provide access to the property for on-site assessments and inspections as required and respond promptly to any requests for additional information or clarification. Applicants are informed of their application status throughout the process to perform a transparent communication.

**Step 4:** The Assessment Report/Checklist of the pre-construction assessment (Number of windows, façade type, roof type and any other factors that may impact acoustical test results) which will be prepared by Technical Department, determines application's program participation and may/should consist of:

- The photographs of the exterior and interior of the property for visual reference
- A sketch of the floorplan, highlighting the location of the sleeping room(s)
- The Calculation of the potential NLR values
- The technical expert view on the application's potential participation in the program

**Step 5-a:** In case of technical non-compliance (with the window insulation during the Pre-Construction assessment, the application will be rejected and recorded. The applicant will be informed. Examples for non-compliances are as follows.

- Insufficient bearing wall of the window for the window load (mudbrick wall etc.)
- Even if window insulation is made during the evaluation of the house, the external walls and technical requirements of the house are insufficient, and noise insulation cannot be provided with window replacement.
- If the windows are very new or already meets insulation requirements

**Step 5-b:** For the applications that are accepted into the program, the applicant will be informed, and they will be requested to review and sign an Insulation Program Contract. The Contract will include information on the type of insulation that will be installed, as well as terms and conditions, expected duration and outcome and will be prepared and reviewed by FTA's Legal Department. The applicant may contact CLO(s) for any of their questions and requests regarding the contract details. Application process is complete once the resident signs the contract.

**VOLUNTARY NOISE INSULATION PROGRAM**

**Educational/Healthcare Facilities**

The Application Procedure for the Educational/Healthcare Facilities slightly differ from the residential property applications. Depending on the status of the facility (either a government building or a private property) the application procedure will slightly differ.

Regardless of the ownership status of the facility (government owned or private property), the list of documents that are required are presented below but may not be limited to:

**Table 7:** List of Requested Documentation for Educational/Healthcare Facilities

Requested Documentation	Use and Purpose
Complete and accurate application form providing facility key contact person details	should provide all requested key contact person details and contact information
The approval letter of the related state authority	Documentation of legal ownership or tenancy of the property, evidence of habitation
architectural plans and specifications, including any extensions and modifications (if available)	Technical assessment
Permit letter from the owner of the facility( for tenant facilities)	Legal Assessment
Construction Permit/Legal document as a proof of building age	Legal Assessment

**Step 1:** As defined in section 6.3, Community and Participation, FTA will reach out to educational and healthcare facilities, and the relevant government authorities to which these institutions are affiliated (such as the Provincial Directorate of National Education, Provincial Directorate of Health, etc.) to promote the project."

**Step 2:** The filled Application Form, accompanied by the supporting documents provided above in Table 7 are submitted through online application system by the specified deadline. It is the applicant’s responsibility to ensure that all documents are legible and properly organized. The applicant receives a confirmation of receipt from the program administration and the applicant is then requested to await confirmation and further instructions. If needed, additional information and/or documentation may be requested.

Regardless of the outcome, the applicant is informed of their application and the results of the application’s initial assessment.

**Step 3-a:** The applications that are rejected are filed and are given priority should the revisions in the Noise Map be favorable for the applicant. In this case, the applicant is requested to submit any changes in information/documentation occurred since their initial application. It is of applicant’s responsibility to inform the Program Representatives should their contact details are changed.

**Step 3-b:** Applications that are eligible to receive insulation support are requested to cooperate with the Program Representatives to organize a pre-construction assessment. A Permit to Conduct Pre-construction Assessment is signed between the applicants. The applicant is requested to provide access to the property for on-site assessments and inspections as required and respond promptly to any requests for additional information or clarification. Applicant is informed of their application status throughout the process to perform a transparent communication.

**VOLUNTARY NOISE INSULATION PROGRAM**

**Step 4:** The Assessment Report/Checklist of the pre-construction assessment (Number of windows, façade type, roof type and any other factors that may impact acoustical test results) which will be prepared by Technical Department, determines application's program participation and may/should consist of:

- The photographs of the exterior and interior of the facility for visual reference
- A sketch of the floorplans
- The Calculation of the potential NLR values
- The technical expert view on the application's potential participation in the program

**Step 5:** For the applications that are accepted into the program, the applicant will be informed, and they will be requested to review and sign an Insulation Program Contract. The Contract will include information on the type of insulation that will be installed, as well as terms and conditions, expected duration and outcome and will be prepared and reviewed by FTA's Legal Department. The applicant may contact CLO(s) for any of their questions and requests regarding the contract details.

**Step 6:** Step 6 is the last step at the Application Process, given that all steps have resulted in favour of the Applicant, and signals that the implementation may begin.

## 6.5. Implementation Process

Excluding the pilot phase, the implementation of the program carries out in total 3 phases: 1st phase for years between 2025-2029, 2nd phase between 2030-2034 and final phase for the remaining 5 years until 2040.

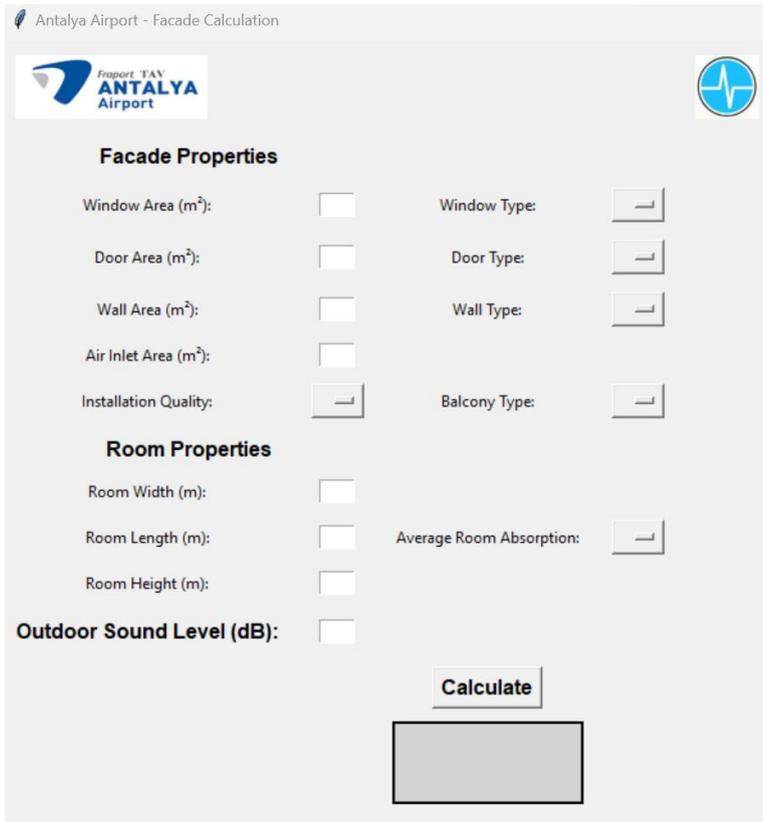
The 1<sup>st</sup> phase implementation starts by end of Q3 2025, with remaining phases to be initiated every five years until end of project. The experiences and lesson learn of the phases will be incorporated into the implementation of the remaining phases, with an emphasis on the successful management of the previous phase.

Based on the findings of the Close Out Initial Status Report, the Voluntary Noise Insulation Program will be reviewed and revised if necessary for all the remaining phases.

### 6.5.1 Site Assessment and Acoustic Calculations

The Acoustic consultant developed an Acoustic Calculation Model, outlining the current status of the building and Noise Level Reduction calculations. These calculations are carried out on this model with the information provided during the application evaluation phase. The findings, along with the feedback received during application process as well as the Acoustic Consultant's professional input on the property's condition (façade-window conditions) will be used to make the final decision on whether include a property in the program or not. A validation of the model against the actual implementation will be performed. In this context, a validation report was prepared using ISO 12354-3 and ISO 3744 standards.

Following the pilot phase, the validated Acoustic Calculation Model will be the primary tool for assessing insulation effectiveness in subsequent phases. Routine household noise measurements will not be required unless specific concerns arise. This approach respects the privacy of households and ensures practical implementation at scale.



**Figure 6:** Facade Insulation Calculation Model

### 6.5.2 Planning of Insulation Applications

The noise insulation will be limited to window replacements of the properties.

During the initial assessment of the houses, the quality of the existing window glass and its thickness will be evaluated. The key criteria will be the Sound Reduction Index (R) value of the window, which measures the window's ability to reduce noise pollution and is measured in decibels. It is important to note that this should not be mistaken for the *R Value* of the window, which measures the thermal resistance and insulating properties of windows. Potential windows with high decibels of Sound Reduction Index will be evaluated and selected based on the needs of each applicant, providing a tailor-based approach to raise program success and increase efficient use of budget.

The insulation works will be supervised by the Noise Committee's technical team members.

Responsibility for the procurement and appointment of contractors lies with the technical department through a transparent and competitive procurement process. A pre-approved qualified contractor(s) will be identified on the basis of technical capacity, experience in noise insulation and compliance with health, safety and environmental standards. The appointed contractor(s) will be required to comply with Turkish labour law and IFC/EBRD's basic labour standards such as non-discrimination, fair wages, etc. Beneficiaries will not find contractors themselves. The insulation works will be managed by FTA's technical team to ensure compliance with programme standards and timelines.



**Figure 7:** Visual representation of noise reduction through window replacement. Image credit: Wood Street Windows

## 6.6. Cost and Financing

### 6.6.1 Program Budget Framework

The overall budget covering all insulation-related expenses of the program is capped (administrative and continued monitoring costs excluded from this budget cap are also planned) for a total of 15 years. It is expected that this period starts by end of 2025, and program will last until 2040.

#### Key Considerations:

1. **Detailed Cost Estimates per Household:** The cost per household will depend on the number of windows requiring insulation. The final cost will vary based on the size of the windows to be insulated.
2. **Budget Constraints:** FTA has allocated a dedicated, multi-year budget to support VNIP through 2040. While the program doesn't require equal distribution of the budget every year, the allocation will be based on demand, prioritizing the most affected households and facilities.

In cases where insulation budgets are not fully spent in a given year, the unused portion will be rolled over to the following year allowing continuous progress and optimized use of the budget allocation.

The program aims to insulate approximately 150 windows per year, adjusting as needed based on field realities.

3. **Impact of Price Increases Until 2040:** Price increases, especially for materials and labor, may impact the cost of the insulation program over the 15-year period. However, by

**VOLUNTARY NOISE INSULATION PROGRAM**

distributing the budget flexibly rather than equally across all years, the program can adjust to these price fluctuations. The rationale for this approach is to ensure that resources are used efficiently while addressing the most pressing needs first.

4. **Budget Allocation Strategy:** The allocation of the planned budget will be based on the demand for insulation support in each phase, rather than an equal distribution across all years. This flexible approach ensures that the program adapts to the needs of households and facilities that are most affected by noise, using the funds where they are most needed at any given time.
5. **Reevaluation of Planning/Timeline:** To address potential budget overruns and risks, the program’s planning and timeline will be continuously reevaluated. Adjustments will be made based on the risk matrix to minimize the impact of any unforeseen cost increases. The goal is to ensure that the allocated budget is fully utilized to benefit the most impacted households and facilities throughout the program’s duration.

The primary objective is to ensure that the entire allocated-planned budget is used effectively over the program’s course, with a focus on helping the most affected households and facilities. The budget breakdown and specifics will be periodically reviewed and adjusted as necessary, based on program needs and cost-effectiveness.

While FTA funding has been secured for the program until 2040, unexpected costs could arise. FTA will manage these through careful budgeting and financial oversight, and adjustments will be made as necessary.

**6.6.2 Payment and Cost Coverage**

All payments for noise insulation works under the VNIP will be managed and paid directly by FTA to the appointed contractors. Beneficiaries will not make any payments for the insulation works. No grants or direct cash transfers will be issued to beneficiaries. Instead, once eligibility is confirmed and the insulation agreement is signed, the costs of approved works will be covered entirely by the program budget of FTA.

**6.7. Risk Management**

The risk analysis for the Voluntary Noise Insulation Program is as follows.

**Table 8:** Voluntary Noise Insulation Program Risk Register

Risk	Likelihood	Impact	Mitigation Measures
<b>Environmental Variations (Noise Fluctuations)</b>	Medium	High	Regular updates to the Noise Contour Maps. Enhanced monitoring to capture changes in noise levels, and adjustment of insulation efforts accordingly.
<b>Technological Challenges (New Noise Insulation Techniques)</b>	Low	Medium	Stay up to date with advancements in noise insulation technology. Collaborate with experts to ensure the most effective solutions are used, and conduct pilot tests for new technologies before widespread implementation.

**VOLUNTARY NOISE INSULATION PROGRAM**

<b>Budget Overruns/Unexpected Costs</b>	Medium	High	Careful budgeting with contingency plans. Regular financial monitoring and review to track expenditures and reallocate funds if necessary.
<b>Community Perception Changes</b>	Medium	Medium	Ongoing community engagement initiatives. Regular communication through updates and town hall meetings to address concerns, expectations, and any changes to the program.
<b>Delay in Insulation Works (Logistics or Material Supply Issues)</b>	Low	High	Develop strategic partnerships with reliable suppliers. Create backup plans for material procurement and pre-order supplies to mitigate delays.
<b>Rejection of Contract or Participation by Applicants</b>	Low	Medium	Clear communication of the benefits of program participation. Provide personalized assistance to address applicants' concerns and encourage contract signings.
<b>Deficiencies in Initial Insulation Works</b>	Medium	High	Conduct thorough pre-construction assessments to avoid poor installations. After installation, perform quality assurance check and provide quick remedial actions if necessary.
<b>Legal Challenges (Disputes over Property Ownership, etc.)</b>	Low	Medium	Ensure all legal documents are properly reviewed and verified before beginning the insulation process. Maintain open communication with legal advisors and applicants to resolve any ownership or permit-related issues promptly.

**6.8. Frequently Ask Questions (FAQ)**

Those who are affected by environmental noise and who want to apply to benefit from the voluntary noise insulation program could find answers to their questions with the help of FAQ which will be published on the website.