An tÚdarás Inniúil um Thorann Aerárthaí

Aircraft Noise Competent Authority

Regulatory Decision Report Appendix J



Report

ANCA Framework 2024

Information to Support Cost Effectiveness Analysis of Noise Insulation Scheme Options

For Fingal County Council – Airport Noise Competent Authority

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1 Introduction

This report has been prepared by Noise Consultants Ltd (NCL) and Cambridge Economic Policy Associates (CEPA LLP), and outlines the relevant information used to estimate the likely cost-effectiveness of options for an expanded noise insulation scheme at Dublin Airport as proposed by ANCA.

In accordance with the Aircraft Noise Regulation and the Act of 2019, the likely cost-effectiveness of identified noise mitigation measures and operating restrictions (if any) must be thoroughly evaluated.

The report is structured as follows:

- Section 2 provides examples of the potential reduction are likely to be achieved through the noise insulation interventions included in the identified noise insulation scheme.
- Section 3 provides a sense check of the proposed contribution for the identified noise insulation scheme to evaluate whether it is sufficient to cover typical sound insulation interventions.
- Section 4 provides the details of the calculations carried out to estimate the potential costs for noise insulation interventions.
- Section 5 provides a breakdown of the estimated number of eligible dwellings for the 2027, 2031 and 2034 forecast with Development scenarios considered in the cost-effectiveness analysis.
- Section 6 provides the details of the assessment of the potential costs of the schemes, depending on the level of contribution offered by each option.
- Section 7 provides details of the assessment carried out to measure the likely effectiveness of each scheme option in terms of reduction of annoyance and sleep disturbance.
- Section 8 provides details of the likely cost-effectiveness analysis, considering in combinations the potential costs and the likely effectiveness of each scheme option.

2 Potential Reduction of the Noise Insulation Interventions in Indoor Noise Levels

The Applicant has previously assumed that the installation of noise insulation will lead to at least a 5 dB reduction for affected dwellings[1]. This level of reduction is targeted by the Applicant's existing noise insulation schemes[2].

- Interventions of the proposed noise insulation scheme include:
- installation of acoustic double-glazed window units,
- installation of acoustic vents and
- attic insulation.

These measures can be expected to provide a level of reduction between 5dB to 10 dB.

The following calculations estimate the potential reduction in noise that may be achieved by upgrading window units from standard thermal double glazing with non-acoustic ventilators, to a mid-specification thermal double glazing with an acoustic ventilator. Calculations have been carried out to quantify the reductions in habitable rooms such as bedrooms and living rooms.

All calculations have been prepared in accordance with British Standard BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.

[1] Dublin Airport Grant Scheme Responses to RFI Nos. 92, 93, 130, 136 and 137," RFI 93, TFT on behalf of daa
[2] https://www.dublinairport.com/corporate/environmental-social-governance/noise/mitigation-schemes/residential-noise-insulation-schemes

2.1 Bedrooms

Table 2-1 provides a breakdown of the calculations of the indoor level for a 3m x 4m bedroom[3] with standard thermal double glazing (32 R_w) with non-acoustic ventilators (31 $D_{n,e,w}$), hence before any intervention included in the noise insulation scheme.

Table 2-1 - Baseline facade construction details for an example bedroom

Calculation steps	Frequency, Hz								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	TOTAL, dB(A)
External Noise Level									
Example External Noise Levels (L_{eq} dB)	63	60	53	56	62	52	39	25	**63**
Façade Construction Details									
Vent Type: **Standard trickle vent**	20	23	26	29	30	33	33	35	-
Glazing Type: **6:12:6 mm non-acoustic glazing**	14	20	19	29	38	36	45	48	-
External Wall Type: **100mm Solid breeze of clinker blocks, plastered (12mm both sides)**	20	27	33	40	50	57	56	59	-
Roof Type: **Standard cold roof pitched, tiled roof with 100mm mineral wool above 12.5mm plasterboard ceiling. BS 8233 example)**	25	28	34	40	45	49	49	52	-
Resulting Internal Noise Level									
Internal Noise Level (Leq dB)	52	44	36	32	36	23	9	-6	**38**

[3] A reverberation time of 0.5 seconds is assumed across every octave band.

Table 2-2 shows an example where the standard thermal double glazing with non-acoustic ventilators have been updated with an improved acoustically performing double glazing (33 R_w) and trickle ventilations (35 $D_{n,e,w}$), achieving 5 dB reduction.

Table 2-2 - Improved facade construction for 5 dB internal noise reduction in a bedroom

Calculation steps	Frequency, Hz								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	TOTAL, dB(A)
Noise data									
Example External Noise Levels (L_{eq} dB)	63	60	53	56	62	52	39	25	63
Façade Construction Details									
Vent Type: Hit and miss trickle vent (from Draft Part E)	29	34	39	34	41	31	28	24	-
Glazing Type: 8:12:4 mm non-acoustic glazing	20	26	22	28	38	41	42	45	-
External Wall Type: 100mm Solid breeze of clinker blocks, plastered (12mm both sides)	20	27	33	40	50	57	56	59	-
Roof Type: Standard cold roof pitched, tiled roof with 100mm mineral wool above 12.5mm plasterboard ceiling. BS 8233 example)	25	28	34	40	45	49	49	52	-
Resulting Internal Noise Level									
Internal Noise Level (Leq dB)	48	40	32	30	28	25	14	5	**33**
Reduction compared to scenario with no insulation	-4	-4	-4	-2	-8	2	5	11	**-5**

Following, in Table 2-3, is another example where the standard thermal double glazing with non-acoustic ventilators have been updated with an acoustic double glazing (45 R_w) and trickle ventilations (47 $D_{n,e,w}$), achieving 10 dB reduction.

Table 2-3 - Facade construction details to provide 10 dB reduction in internal noise level in a bedroom

Calculation steps	Frequency, Hz								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	TOTAL, dB(A)
Noise data									
Example External Noise Levels (L_{eq} dB)	63	60	53	56	62	52	39	25	63
Façade Construction Details									
Vent Type: Willan A101 dB Ventilator with TVAG4 Canopy	26	28	38	45	52	52	51	52	-
Glazing Type: Secondary glazing, non acoustic single outer panel 6:100:4 mm	20	26	34	44	56	53	52	55	-
External Wall Type: 100mm Solid breeze of clinker blocks, plastered (12mm both sides)	20	27	33	40	50	57	56	59	-
Roof Type: Standard cold roof pitched, tiled roof with 100mm mineral wool above 12.5mm plasterboard ceiling. BS 8233 example)	25	28	34	40	45	49	49	52	-
Resulting Internal Noise Level									
Internal Noise Level (Leq dB)	48	41	27	22	22	9	-4	-19	**29**
Reduction compared to scenario with no insulation	-4	-3	-9	-10	-14	-14	-13	-13	**-9**

2.2 Living room

Provided in Table 2-4 is the breakdown of the calculations of the indoor level for a 5m x 6m living room4 with standard thermal double glazing (32 R_w) with non-acoustic ventilators (31 $D_{n,e,w}$), hence before any intervention included in the noise insulation scheme.

Table 2-4 -Baseline living room facade construction

Calculation steps	Frequency, Hz								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	TOTAL, dB(A)
Noise data									
Example External Noise Levels (Leq dB)	63	60	53	56	62	52	39	25	63
Façade Construction Details									
Vent Type: Standard trickle vent	20	23	26	29	30	33	33	35	-
Glazing Type: 6:12:6 mm non-acoustic glazing	14	20	19	29	38	36	45	48	-
External Wall Type: 100mm Solid breeze of clinker blocks, plastered (12mm both sides)	20	27	33	40	50	57	56	59	-
Roof Type: Standard cold roof pitched, tiled roof with 100mm mineral wool above 12.5mm plasterboard ceiling. BS 8233 example)	25	28	34	40	45	49	49	52	-
Resulting Internal Noise Level									
Internal Noise Level (Leq dB)	49	41	33	28	32	20	5	-10	**34**

[4] A reverberation time of 0.5 seconds is assumed across every octave band.

Table 2-5 shows an example where the standard thermal double glazing with non-acoustic ventilators have been updated with a more acoustically performing double glazing (37 R_w) and trickle ventilations (35 $D_{n,e,w}$), achieving 5 dB reduction.

Table 2-5 - Improved facade construction for 5 dB internal noise reduction in a living room

Calculation steps	Frequency, Hz								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	TOTAL, dB(A)
Noise data									
Example External Noise Levels (Leq dB)	63	60	53	56	62	52	39	25	63
Façade Construction Details									
Vent Type: **Hit and miss trickle vent (from Draft Part E)**	29	34	39	34	41	31	28	24	-
Glazing Type: **10:12:6 mm non-acoustic glazing**	20	26	27	34	40	38	46	49	**-**
External Wall Type: **100mm Solid breeze of clinker blocks, plastered (12mm both sides)**	20	27	33	40	50	57	56	59	-
Roof Type: **Standard cold roof pitched, tiled roof with 100mm mineral wool above 12.5mm plasterboard ceiling. BS 8233 example)**	25	28	34	40	45	49	49	52	-
Resulting Internal Noise Level									
Internal Noise Level (Leq dB)	45	37	26	24	24	21	10	1	**29**
Reduction compared to scenario with no insulation	-4	-4	-7	-4	-8	1	5	11	**-5**

Table 2-6 shows an example where the standard thermal double glazing with non-acoustic ventilators have been updated with a more acoustically performing double glazing (49 R_w) and trickle ventilations (47 $D_{n,e,w}$), achieving 9dB reduction.

Table 2-6 - Facade construction details for a living room to provide a 9 dB reduction of internal noise level

Calculation steps	Frequency, Hz								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	TOTAL, dB(A)
Noise data									
Example External Noise Levels (L_{eq} dB)	63	60	53	56	62	52	39	25	63
Façade Construction Details									
Vent Type: Willan A101 dB Ventilator with TVAG4 Canopy	26	28	38	45	52	52	51	52	-
Glazing Type: Secondary glazing, non acoustic single outer panel 10:200:6 mm	29	35	46	46	46	56	65	68	-
External Wall Type: 100mm Solid breeze of clinker blocks, plastered (12mm both sides)	20	27	33	40	50	57	56	59	-
Roof Type: Standard cold roof pitched, tiled roof with 100mm mineral wool above 12.5mm plasterboard ceiling. BS 8233 example)	25	28	34	40	45	49	49	52	-
Resulting Internal Noise Level									
Internal Noise Level (Leq dB)	44	37	23	19	20	5	-8	-24	**25**
Reduction compared to scenario with no insulation	-5	-4	-10	-9	-12	-115	-13	-14	**-9**

3 Bottom-Up Estimates of Noise Insulation Costs in Dublin

Cambridge Economic Policy Associates (CEPA LLP) has carried out a bottom-up cost estimation for noise insulation measures for residential properties in the Greater Dublin Area, in support of the evaluation of the proposed noise mitigation measures for Dublin Airport in relation to the Application. A summary of this analysis is appended to this report.

The work serves as a "sense check" for the full/majority funding contribution for the identified noise insulation scheme, specifically whether a €40,000 per property limit is sufficient to cover typical sound insulation interventions. The analysis draws on desk research, material costs, and labour estimates to establish a baseline for single-family houses.

References used for the bottom-up estimate also include details for different dwelling configurations that have been used in the Cost Effectiveness Analysis of the proposed noise insulation scheme options.

4 Estimate of the Costs for Noise Insulation Interventions

An assessment of possible costs of the interventions for different residential configurations has been carried out using the assumptions extrapolated from the note Bottom-Up Estimates of Noise Insulation Costs in Dublin produced by CEPA (Section 3 of this Appendix) and summarised in Table 4-1.

The assessment considers the possible costs associated with the following noise insulation measures:

- installation of window units,
- installation of acoustic vents and
- attic insulation.

Table 4-1: Assumptions used in the assessment of the costs of the noise insulation interventions of different dwelling configurations (Livingroom (L) and Bedrooms (B))

Base	Windows		Attic insulation, in €	Acoustic vent		Labour	
	Quantity	€ per window		Quantity	€ per vent	Number of days	€ per person per day
1L + 1B	4	570 to 2,280	1,025 to 1,450	1 to 3	76	1 to 3	179.40
1L + 2B	6		1,450 to 1,700	3 to 5		2 to 4	
1L + 3B	8		1,700 to 2,500	5 to 7		3 to 5	
1L + 4B	10		2,050 to 2,550	7 to 9		4 to 6	
1L + 5B	12		2,550 to 3,550	9 to 11		5 to 7	
1L + 6B	14		3,550 to 4,550	11 to 13		6 to 8	

The following tables summarise the assessment of possible costs of the interventions for different residential configurations, based on the assumptions outlined in Table 4-2. Values are reported from the lower to higher range of costs of interventions.

Table 4-2: Lower range of costs of interventions

Property configuration	Window Insulation, €	Attic Insulation, €	Acoustic Vent, €	Labour (assuming 4 persons), €	20% uplift, €	Total, €
1L + 1B	2,280	1,025	76	718	820	4,918
1L + 2B	3,420	1,450	228	1,435	1,307	7,840
1L + 3B	4,560	1,700	380	2,153	1,759	10,551
1L + 4B	5,700	2,050	532	2,870	2,230	13,383
1L + 5B	6,840	2,550	684	3,588	2,732	16,394
1L + 6B	7,980	3,550	836	4,306	3,334	20,006

Table 4-3: Base range of costs of intervention

Property configuration	Window Insulation, €	Attic Insulation, €	Acoustic Vent, €	Labour (assuming 4 people), €	20% uplift, €	Total, €
1L + 1B	5,700	1,025	152	1,435	1,662	9,975
1L + 2B	8,550	1,450	304	2,153	2,491	14,948
1L + 3B	11,400	1,700	456	2,870	3,285	19,712
1L + 4B	14,250	2,050	608	3,588	4,099	24,595
1L + 5B	17,100	2,550	760	4,306	4,943	29,659
1L + 6B	19,950	3,550	912	5,023	5,887	35,322

Table 4-4: Higher range of cost of intervention

Property configuration	Window Insulation, €	Attic Insulation, €	Acoustic Vent, €	Labour (assuming 4 people), €	20% uplift, €	Total, €
1L + 1B	9,120	1,450	228	2,153	2,590	15,541
1L + 2B	13,680	1,700	380	2,870	3,726	22,356
1L + 3B	18,240	2,050	532	3,588	4,882	29,292
1L + 4B	22,800	2,550	684	4,306	6,068	36,408
1L + 5B	27,360	3,550	836	5,023	7,354	44,123
1L + 6B	31,920	4,550	988	5,741	8,640	51,839

5 Estimate of the potential eligible dwellings

The estimated number of eligible dwellings under each of the proposed scheme options drawn on the analysis and modelling of the 2027, 2031 and 2034 forecast with Development scenarios provided by the Applicant in support of the Application.

Table 5-1 presents, for each noise band from 55 dB L_{den}, the number of dwellings and associated population outside the RNIS eligibility contours, based on the 2019 GeoDirectory dataset.

Table 5-1 - Total count of households and associated population within noise bands from 55 dB L_{den}.

Scenario	55 dB – 60 dB		60 dB – 65 dB		>65 dB	
	Dwellings	Population	Dwellings	Population	Dwellings	Population
2027 NRPP Scenario	5,274	14,350	527	1,404	0	0
2027 NRRA Scenario	5,474	14,273	1,332	3,321	1	0
2031 NRRA Scenario	4,398	11,453	1,165	2,886	0	0
2034 NRPP Scenario	3,275	8347	3,28	978	0	0
2027 Supplemental Scenario	5,474	14,273	1,332	3,321	1	0
2031 Supplemental Scenario	4,439	11,550	1,197	2,971	0	0

For the same dwellings reported in Table 5-1, Table 5-2 reports the correspondent L_{night} levels in 5 dB bands.

Table 5-2 – Corresponding L_{night} level for dwellings (DW) and associated population (POP) within L_{den} contours and outside the RNIS eligibility contours

L_{den} Eligibility Level	55dB – 60dB										60 dB – 65 dB										>65 dB									
Corresponding L_{night} Exposure	<40 dB		40dB – 45dB		45dB – 50dB		50dB – 55dB		>55dB		<40 dB		40dB – 45dB		45dB – 50dB		50dB – 55dB		>55dB		<40 dB		40dB – 45dB		45dB – 50dB		50dB – 55dB		>55dB	
	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP	DW	POP
2027 NRPP Scenario	409	1,163	21	57	3,432	9,102	1,412	4,027	0	0	2	6	3	8	0	0	518	1,381	4	9	0	0	0	0	0	0	0	0	0	0
2027 NRRA Scenario	0	0	4,175	10,855	1,299	3,418	0	0	0	0	0	0	0	0	1,044	2,453	288	868	0	0	0	0	0	0	0	0	0	0	1	3
2031 NRRA Scenario	0	0	0	0	3,311	8,634	1,087	2,819	0	0	0	0	0	0	0	0	889	2,051	276	835	0	0	0	0	0	0	0	0	0	0
2034 NRPP Scenario	199	545	175	431	2,500	6,500	401	871	0	0	1	3	0	0	22	55	305	920	0	0	0	0	0	0	0	0	0	0	0	0
2027 Supplemental Scenario	0	0	4,175	10,855	1,299	3,418	0	0	0	0	0	0	0	0	1,044	2,453	288	868	0	0	0	0	0	0	0	0	0	0	1	3
2031 Supplemental Scenario	0	0	0	0	3,261	8,477	1,178	3,072	0	0	0	0	0	0	0	0	914	2,117	283	854	0	0	0	0	0	0	0	0	0	0

Table 5-3 presents the estimated number of eligible dwellings5 for each scheme option outside the RNIS eligibility contours by the type of funding offered under each scheme option. For context, an estimate of the number of dwellings that would be eligible for noise insulation under each option that may also be eligible for noise insulation under RSIGS is also indicated.

Table 5-3: Estimated Number of Dwellings Potentially Eligible for Noise Insulation for Each Option

Type of funding	2027 NRPP Scenario				2027 NRRA Scenario				2031 NRRA Scenario				2034 NRPP Scenario				2027 Supplemental Scenario				2031 Supplemental Scenario			
	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4
Full/majority funding	527	0	0	527	924	0	0	924	792	0	0	792	328	0	0	328	924	0	0	924	818	0	0	818
Inside RSIGS eligible for higher contribution under proposed scheme					409	1	1	409	373	0	0	373					409	1	1	408	379	0	0	379
Partial funding	5,274	527	5,801	0	5,422	924	6,346	0	4,308	792	5,100	0	3,275	328	3,603	0	5,422	924	6,346	0	4,355	818	5,173	0
Inside RSIGS eligible for lower contribution under proposed scheme					52	408	460	0	88	373	461	0					52	408	460	0	82	379	461	0
Inside RSIGS eligible for no contribution under proposed scheme					(0)	(52)	(0)	(52)	(0)	(88)	(0)	(88)					(0)	(52)	(0)	(52)	(0)	(82)	(0)	(82)
Total eligible under proposed scheme	**5,801**	**527**	**5,801**	**527**	**6,807**	**1,333**	**6,807**	**1,333**	**5,561**	**1,165**	**5,561**	**1,165**	**3,603**	**328**	**3,603**	**328**	**6,807**	**1,333**	**6,807**	**1,333**	**5,634**	**1,197**	**5,634**	**1,197**

[5] dwellings constructed and/or consented prior to 9th December 2019

6 Assessment of the potential costs associated with the scheme options

For the purposes of assessing the potential costs associated with each scheme option, a €40,000 grant has been assumed as a financial offer for the majority/full funding contribution for insulation of habitable rooms.

For the partially funding contributions, ANCA has adopted the level of contribution offered as part of Gatwick Airport Northern Runway Project DCO Noise Insulation and Compensation Scheme based on recent benchmarks. These contributions could provide for insulation in a limited number of habitable rooms.

All monetary values have been corrected for inflation and currency exchange, where appropriate and presented in 2025 prices.

Table 6-1: Funding Assumptions by Scheme Option

Eligibility Criteria, L_{den}	55dB - 60dB	60dB - 65dB	> 65dB
Option 1	Partial funding up to €5,600	Majority/Full funding up to €40,000	
Option 2		Partial funding up to €8,100	Majority/Full funding up to €40,000
Option 3	Partial funding up to €5,600	Partial funding Up to €8,100	Majority/Full funding up to €40,000
Option 4		Majority/Full funding up to €40,000	

Based on the financial contributions assumed for the four options, the total costs associated to each option to insulate all eligible dwellings have been estimated and are presented in Table 6-2 for both the 2027, 2031 and 2034 forecast years. Costs are calculated on the basis of a full uptake of the scheme options.

For context,

Table 6-3 present the incremental costs needed to raise the RSIGS contribution from €30,000 to €40,000 are also shown, along with the additional costs required to match the RSIGS financial offer for those dwellings receiving either lower or no financial contribution under the proposed scheme.

Table 6-2: Assessment of the potential costs of the proposed scheme options

Eligibility Noise Band, L_{den}	55dB – 60dB		60dB – 65dB		>65 dB		TOTAL
Number of Eligible Dwellings	Outside RSIGS	Inside the RSIGS	Outside RSIGS	Inside the RSIGS	Outside RSIGS	Inside the RSIGS	
2027 NRPP Scenario	5,274		527		0		5,801
2027 NRRA Scenario	5,422	52	924	408	0	1	6,807
2031 NRRA Scenario	4,308	88	792	373	0	0	5,561
2034 NRPP Scenario	3,275		328		0		3,603
2027 Supplemental Scenario	5,422	52	924	408	0	1	6,807
2031 Supplemental Scenario	4,355	82	818	379	0	0	5,634
Option 1 Funding	**€5,600**	**€5,600**	**€40,000**	**€40,000**	**€40,000**	**€40,000**	**TOTAL**
2027 NRPP Scenario	29,534,400	-	21,080,000	-	-	-	€50,614,400
2027 NRRA Scenario	30,363,200	291,200	36,960,000	16,320,000	-	40,000	€83,974,400
2031 NRRA Scenario	24,124,800	492,800	31,680,000	14,920,000	-	-	€71,217,600
2034 NRPP Scenario	18,340,000	-	13,120,000	-	-	-	€31,460,000
2027 Supplemental Scenario	30,363,200	291,200	36,960,000	16,320,000	-	40,000	€83,974,400
2031 Supplemental Scenario	24,388,000	459,200	32,720,000	15,160,000	-	-	€72,727,200
Option 2 Funding	-	-	**€8,100**	**€8,100**	**€40,000**	**€40,000**	**TOTAL**
2027 NRPP Scenario			€4,268,700		-		€4,268,700
2027 NRRA Scenario			€7,484,400	€3,304,800	-	€40,000	€10,829,200
2031 NRRA Scenario			€6,415,200	€3,021,300	-	-	€9,436,500
2034 NRPP Scenario			€2,656,800		-		€2,656,800
2027 Supplemental Scenario			€7,484,400	€3,304,800	-	€40,000	€10,829,200
2031 Supplemental Scenario			€6,625,800	€3,069,900	-	-	€9,695,700
Option 3 Funding	**€5,600**	**€5,600**	**€8,100**	**€8,100**	**€40,000**	**€40,000**	**TOTAL**
2027 NRPP Scenario	€29,534,400		€4,268,700		-		€33,803,100
2027 NRRA Scenario	€30,363,200	€291,200	€7,484,400	€3,304,800	-	€40,000	€41,483,600
2031 NRRA Scenario	€24,124,800	€492,800	€6,415,200	€3,021,300	-	-	€34,054,100
2034 NRPP Scenario	€18,340,000		€2,656,800		-		€20,996,800
2027 Supplemental Scenario	€30,363,200	€291,200	€7,484,400	€3,304,800	-	€40,000	€41,483,600
2031 Supplemental Scenario	€24,388,000	€459,200	€6,625,800	€3,069,900	-	-	€34,542,900
Option 4 Funding	-	-	**€40,000**	**€40,000**	**€40,000**	**€40,000**	**TOTAL**
2027 NRPP Scenario			€21,080,000		-		€21,080,000
2027 NRRA Scenario			€36,960,000	€16,320,000	-	€40,000	€53,320,000
2031 NRRA Scenario			€31,680,000	€14,920,000	-	-	€46,600,000
2034 NRPP Scenario			€13,120,000		-		€13,120,000
2027 Supplemental Scenario			€36,960,000	€16,320,000	-	€40,000	€53,320,000
2031 Supplemental Scenario			€32,720,000	€15,160,000	-	-	€47,880,000

Table 6-3: Incremental costs of the proposed scheme options respect RSIGS

Noise Band, Lden	55 dB – 60 dB	60 dB – 65 dB	> 65 dB
Number of Eligible Dwellings	Inside the RSIGS	Inside the RSIGS	Inside the RSIGS
2027 NRPP Scenario			
2027 NRRA Scenario	52	408	1
2031 NRRA Scenario	88	373	
2034 NRPP Scenario			
2027 Supplemental Scenario	52	408	1
2031 Supplemental Scenario	82	379	
RSIGS Contribution	€30,000	€30,000	€30,000
2027 NRPP Scenario			
2027 NRRA Scenario	€1,560,000	€12,240,000	€30,000
2031 NRRA Scenario	€2,640,000	€11,190,000	-
2034 NRPP Scenario			
2027 Supplemental Scenario	€1,560,000	€12,240,000	€30,000
2031 Supplemental Scenario	€2,460,000	€11,370,000	-
Option 1 Incremental Cost	Cost to increase offer to 30k for lower or no contribution (outside scheme budget)	Cost to increase offer from 30k to 40k (included in scheme budget)	
2027 NRPP Scenario			
2027 NRRA Scenario	€1,268,800	€4,080,000	€10,000
2031 NRRA Scenario	€2,147,200	€3,730,000	-
2034 NRPP Scenario			
2027 Supplemental Scenario	€1,268,800	€4,080,000	€10,000
2031 Supplemental Scenario	€2,000,800	€3,790,000	-
Option 2 Incremental Cost	Cost to increase offer to 30k for lower or no contribution (outside scheme budget)		Cost to increase offer from 30k to 40k (included in scheme budget)
2027 NRPP Scenario			
2027 NRRA Scenario	€1,560,000	€8,935,200	€10,000
2031 NRRA Scenario	€2,640,000	€8,168,700	-
2034 NRPP Scenario			
2027 Supplemental Scenario	€1,560,000	€8,935,200	€10,000
2031 Supplemental Scenario	€2,460,000	€8,300,100	-
Option 3 Incremental Cost	Cost to increase offer to 30k for lower or no contribution (outside scheme budget)		Cost to increase offer from 30k to 40k (included in scheme budget)
2027 NRPP Scenario			
2027 NRRA Scenario	€1,268,800	€8,935,200	€10,000
2031 NRRA Scenario	€2,147,200	€8,168,700	-
2034 NRPP Scenario			
2027 Supplemental Scenario	€1,268,800	€8,935,200	€10,000
2031 Supplemental Scenario	€2,000,800	€8,300,100	-
Option 4 Incremental Cost	Cost to increase offer to 30k for lower or no contribution (outside scheme budget)	Cost to increase offer from 30k to 40k (included in scheme budget)	
2027 NRPP Scenario			
2027 NRRA Scenario	€1,560,000	€4,080,000	€10,000
2031 NRRA Scenario	€2,640,000	€3,730,000	-
2034 NRPP Scenario			
2027 Supplemental Scenario	€1,560,000	€4,080,000	€10,000
2031 Supplemental Scenario	€2,460,000	€3,790,000	-

7 Assessment of likely effectiveness of the scheme options

An assessment of the effectiveness of the insulation scheme options in reducing the effects of high annoyance and high sleep disturbances has been carried drawing on the estimated number of eligible dwellings outside the RNIS eligibility contours and the associated population calculated from the Applicant's modelling of the 2027, 2031 and 2034 forecast with Development scenarios in support of the Application (Table 5-1 and Table 5-2)

For each noise band, the number of people highly annoyed and highly sleep disturbed has been calculated at the central value of each noise band (for instance at 57.5 dB for the 55–60 dB noise band)[6] excluding any reduction that can be achieved through the insulation.

To take into account of the potentially effectiveness of insulation on reducing annoyance and sleep disturbance, it has been necessary to apply a correction to the outdoor exposure levels in each noise exposure band having regard to the potential performance of the insulation measures.

The proposed insulation scheme options aim to provide a reduction of 5 dB in indoor levels with reductions of potentially 10 dB also possible. Partial funding introduces uncertainty regarding which and how many rooms can be insulated and whether the targeted 5 dB reduction can be achieved in full. To reflect these differences in the level of contributions, two different corrections to the external levels have been assumed in the assessment of the harmful effects:

- a correction between 2 dB and 5 dB to both L_{den} and L_{night} exposure levels for population within dwelling eligible for partial funding contributions reflecting that not all habitable rooms may be insulated due to the partial contribution,
- a correction between 5 dB and 10 dB reductions to both L_{den} and L_{night} exposure levels for population within dwelling eligible to majority/full funding contributions reflecting that all or a majority of habitable rooms are likely to be insulated.

These reduction ranges have been applied to quantify the potential reduction in annoyance and sleep disturbance using the exposure response functions attached to Directive 2020/367.

Furthermore, the effectiveness of the insulation is also affected by the level of uptake of the schemes. Insulation programmes that offer only partial funding are less likely to attract homeowners as homeowners would be required to contribute towards the costs of insulation whereas majority/fully funded schemes are more likely to be taken up. Uptake rates of noise insulation schemes vary significantly, and beyond available funding, uptake can also be influenced by the factors such as:

- scheme advertising and accessibility and ease of applications to the scheme;
- socio-demographics; and
- the nature of the housing stock in the scheme eligibility boundaries.

In 2023, Luton Airport carried out a market study of insulation schemes as part of their planning application to expand from 19mppa to 32mppa. This study highlighted that uptake rates for a scheme running for around 30 years had been on average 50-60%. The study also highlighted that for schemes where insulation had been offered to bedrooms only, up-take rates were as low as 15% rising to up to 80% for schemes providing majority funding for a full package of measures.

In 2015, research was published for a noise insulation pilot scheme trial at a major UK airport. This paper[7] reported up-take rates of between 6 and 10% for the financial contribution scheme with rates of 40% for the full cost scheme.

In 2024, Heathrow Airport reported uptake rates of around 70% associated with their full cost pilot noise insulation scheme.

To reflect the above, the analysis presented in this section has assumed the following:

- an expected level of participation between 20% and 40% for dwellings eligible to partial contribution; and
- an expected level of participation of 70 to 90% for dwellings eligible to full/majority contribution.

Based on the assumptions outlined in the paragraphs, Table 7-1 and

Scheme Uptake	2027 NRPP Scenario		2027 NRRA Scenario		2031 NRRA Scenario		2034 NRPP Scenario		2027 Supplemental Scenario		2031 Supplemental Scenario	
	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB
Total Pop. in eligible dwellings per Lden band	14,349	1,404	14,273	3,321	11,453	2,886	8,347	978	14,273	3,321	11,549	2,971
Number of people Highly Annoyed assuming 2dB reduction achieved by the scheme												
0%	4,360	558	4,336	1,320	3,480	1,147	2,536	389	4,336	1,320	3,509	1,181
20%[a]	4,255	547	4,232	1,295	3,396	1,125	2,475	381	4,232	1,295	3,425	1,158
40%[a]	4,150	537	4,128	1,270	3,312	1,103	2,414	374	4,128	1,270	3,341	1,136
Number of people Highly Annoyed assuming 5dB reduction achieved by the scheme												
0%	4,360	558	4,336	1,320	3,480	1,147	2,536	389	4,336	1,320	3,509	1,181
20%[a]	4,101	532	4,079	1,258	3,273	1,093	2,386	370	4,079	1,258	3,301	1,125
40%[a]	3,843	505	3,822	1,196	3,067	1,039	2,235	352	3,822	1,196	3,093	1,070
70%[b]	3,455	466	3,436	1,102	2,757	958	2,010	325	3,436	1,102	2,781	986
90%[b]	3,196	440	3,179	1,040	2,551	904	1,859	306	3,179	1,040	2,573	930
Number of people Highly Annoyed assuming 10dB reduction achieved by the scheme												
0%		558		1,320		1,147		389		1,320		1,181
70%[b]		377		893		776		263		893		799
90%[b]		326		771		670		227		771		690
									Effectiveness: % Reduction in High Sleep Disturbance for population in eligible dwellings			
Uptake	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Option 1	4%	15%	6%	19%	6%	19%	4%	16%	6%	19%	6%	4%
Option 2	0%	1%	0%	2%	0%	2%	0%	1%	0%	2%	0%	0%
Option 3	2%	12%	2%	11%	2%	11%	2%	12%	2%	11%	2%	2%
Option 4	2%	5%	4%	10%	4%	10%	2%	6%	4%	10%	4%	2%

a – for partial funding
b – for full/majority funding

[7] https://andersonacoustics.co.uk/wp-content/uploads/2023/12/The-role-of-noise-insulation-schemes-in-airport-noise-management-The-22nd-International-Congress-on-Sound-and-Vibration-Italy-2015.pdf?utm_source=chatgpt.com

Table 7-2 present the results of the effectiveness analysis carried out for each scheme option.

Table 7-1: Reduction in High Annoyance for population in eligible dwellings

Scheme Uptake	2027 NRPP Scenario		2027 NRRA Scenario		2031 NRRA Scenario		2034 NRPP Scenario		2027 Supplemental Scenario		2031 Supplemental Scenario	
	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB
Total Pop. in eligible dwellings per L_{den} band	14,349	1,404	14,273	3,321	11,453	2,886	8,347	978	14,273	3,321	11,549	2,971
Number of people Highly Annoyed assuming 2dB reduction achieved by the scheme												
0%	4,360	558	4,336	1,320	3,480	1,147	2,536	389	4,336	1,320	3,509	1,181
20%[a]	4,255	547	4,232	1,295	3,396	1,125	2,475	381	4,232	1,295	3,425	1,158
40%[a]	4,150	537	4,128	1,270	3,312	1,103	2,414	374	4,128	1,270	3,341	1,136
Number of people Highly Annoyed assuming 5dB reduction achieved by the scheme												
0%	4,360	558	4,336	1,320	3,480	1,147	2,536	389	4,336	1,320	3,509	1,181
20%[a]	4,101	532	4,079	1,258	3,273	1,093	2,386	370	4,079	1,258	3,301	1,125
40%[a]	3,843	505	3,822	1,196	3,067	1,039	2,235	352	3,822	1,196	3,093	1,070
70%[b]	3,455	466	3,436	1,102	2,757	958	2,010	325	3,436	1,102	2,781	986
90%[b]	3,196	440	3,179	1,040	2,551	904	1,859	306	3,179	1,040	2,573	930
Number of people Highly Annoyed assuming 10dB reduction achieved by the scheme												
0%		558		1,320		1,147		389		1,320		1,181
70%[b]		377		893		776		263		893		799
90%[b]		326		771		670		227		771		690
									Effectiveness: % Reduction in High Sleep Disturbance for population in eligible dwellings			
Uptake	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Option 1	4%	15%	6%	19%	6%	19%	4%	16%	6%	19%	6%	4%
Option 2	0%	1%	0%	2%	0%	2%	0%	1%	0%	2%	0%	0%
Option 3	2%	12%	2%	11%	2%	11%	2%	12%	2%	11%	2%	2%
Option 4	2%	5%	4%	10%	4%	10%	2%	6%	4%	10%	4%	2%

a – for partial funding
b – for full/majority funding

Table 7-2: Reduction in High Sleep Disturbance for population in eligible dwellings

Scheme Uptake	2027 NRPP Scenario		2027 NRRA Scenario		2031 NRRA Scenario		2034 NRPP Scenario		2027 Supplemental Scenario		2031 Supplemental Scenario	
	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB	55-60 dB	60-65 dB
Total Pop. in eligible dwellings per L_{den} band	14,349	1,404	14,273	3,321	11,453	2,886	8,347	978	14,273	3,321	11,549	2,971
Number of people Highly Sleep Disturbed assuming 2dB reduction achieved by the scheme												
0%	2,427	307	1,953	604	2,075	686	1,342	212	1,953	604	2,104	706
20%[a]	2,377	301	1,911	592	2,032	673	1,313	207	1,911	592	2,061	693
40%[a]	2,327	295	1,868	579	1,989	660	1,285	203	1,868	579	2,017	679
Number of people Highly Sleep Disturbed assuming 5dB reduction achieved by the scheme												
0%	2,427	307	1,953	604	2,075	686	1,342	212	1,953	604	2,104	706
20%[a]	2,308	293	1,649	575	1,974	655	1,268	202	1,649	575	2,002	674
40%[a]	2,189	278	1,345	546	1,873	624	1,193	192	1,345	546	1,900	642
70%[b]	2,011	256	889	501	1,722	576	1,082	177	889	501	1,746	593
90%[b]	1,893	242	586	472	1,621	545	1,008	167	586	472	1,644	561
Number of people Highly Sleep Disturbed assuming 10dB reduction achieved by the scheme												
0%		307		604		686		212		604		706
70%[b]		216		258		487		145		258		501
90%[b]		190		160		429		126		160		442
									Effectiveness: % Reduction in High Sleep Disturbance for population in eligible dwellings			
Uptake	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**
Option 1	4%	13%	6%	41%	6%	17%	4%	15%	6%	41%	6%	17%
Option 2	0%	1%	0%	2%	0%	2%	0%	1%	0%	2%	0%	2%
Option 3	2%	10%	2%	26%	2%	10%	2%	11%	2%	26%	2%	10%
Option 4	2%	4%	4%	17%	4%	9%	2%	6%	4%	17%	4%	9%

a – for partial funding
b – for full/majority funding

8 Assessment of Likely Cost-Effectiveness of the scheme options

The identification of the most cost-effective options among those ones identified is carried out by calculating the cost per % reduction in High Annoyance and High Sleep Disturbance using the total budget associated with the scheme options and the results in terms of effectiveness.

Table 8-1 and Table 8-2 present the results for each option of the cost-effectiveness assessment carried out across the forecast scenarios.

Table 8-1: Scheme option cost-effectiveness (€ per % reduction in High Annoyance)

Scenario	2027 NRPP Scenario		2027 NRRA Scenario		2031 NRRA Scenario		2034 NRPP Scenario		2027 Supplemental Scenario		2031 Supplemental Scenario	
Scheme option costs, €												
Option 1	€50,614,400		€83,974,400		€71,217,600		€31,460,000		€83,974,400		€72,727,200	
Option 2	€4,268,700		€10,797,300		€9,436,500		€2,656,800		€10,797,300		€9,695,700	
Option 3	€33,803,100		€41,451,700		€34,054,100		€20,996,800		€41,451,700		€34,542,900	
Option 4	€21,080,000		€53,320,000		€46,600,000		€13,120,000		€53,320,000		€47,880,000	
Scheme option effectiveness (Reduction in High Annoyance)												
Uptake	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**
Option 1	15%	4%	19%	6%	19%	6%	16%	4%	19%	6%	19%	6%
Option 2	1%	0%	2%	0%	2%	0%	1%	0%	2%	0%	2%	0%
Option 3	12%	2%	11%	2%	11%	2%	12%	2%	11%	2%	11%	2%
Option 4	5%	2%	10%	4%	10%	4%	6%	2%	10%	4%	10%	4%
Scheme option cost-effectiveness (€ per % reduction in High Annoyance)												
Uptake	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**
Option 1	3,322,082 €/%	12,652,971 €/%	4,466,182 €/%	14,757,278 €/%	3,702,394 €/%	12,079,581 €/%	1,989,379 €/%	7,360,403 €/%	4,466,182 €/%	14,757,278 €/%	3,758,438 €/%	12,222,825 €/%
Option 2	3,990,152 €/%	19,723,377 €/%	4,907,684 €/%	24,258,752 €/%	4,037,195 €/%	19,955,909 €/%	2,120,255 €/%	10,480,448 €/%	4,907,684 €/%	24,258,752 €/%	4,084,501 €/%	20,189,747 €/%
Option 3	2,918,106 €/%	14,418,278 €/%	€3,670,817 €/%	18,138,248 €/%	3,025,205 €/%	14,948,235 €/%	1,820,012 €/%	8,992,694 €/%	3,670,817 €/%	18,138,248 €/%	3,071,190 €/%	15,175,480 €/%
Option 4	4,464,551 €/%	11,259,688 €/%	5,491,171€/%	13,848,845 €/%	4,517,187 €/%	11,392,436 €/%	2,372,337	5,983,082 €/%	5,491,171€/%	13,848,845 €/%	4,570,118 €/%	11,525,930 €/%

Table 8-2: Scheme option cost-effectiveness (€ per % reduction in High Sleep Disturbance)

Scenario	2027 NRPP Scenario		2027 NRRA Scenario		2031 NRRA Scenario		2034 Scenario 4		2027 Supplemental Scenario		2031 Supplemental Scenario	
Scheme option costs, €												
Option 1	€50,614,400		€83,974,400		€71,217,600		€31,460,000		€83,974,400		€72,727,200	
Option 2	€4,268,700		€10,797,300		€9,436,500		€2,656,800		€10,797,300		€9,695,700	
Option 3	€33,803,100		€41,451,700		€34,054,100		€20,996,800		€41,451,700		€34,542,900	
Option 4	€21,080,000		€53,320,000		€46,600,000		€13,120,000		€53,320,000		€47,880,000	
Scheme option effectiveness (Reduction in High Sleep Disturbance)												
Uptake	High	Low	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**
Option 1	13%	4%	41%	6%	17%	6%	15%	4%	41%	6%	17%	6%
Option 2	1%	0%	2%	0%	2%	0%	1%	0%	2%	0%	2%	0%
Option 3	10%	2%	26%	2%	10%	2%	11%	2%	26%	2%	10%	2%
Option 4	4%	2%	17%	4%	9%	4%	6%	2%	17%	4%	9%	4%
Scheme option cost-effectiveness (€ per % reduction in High Sleep Disturbance)												
Uptake	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**	**High**	**Low**
Option 1	3,896,452 €/%	13,684,907 €/%	2,040,257 €/%	14,791,939 €/%	4,285,724 €/%	12,851,386 €/%	2,091,788 €/%	7,757,202 €/%	2,040,257 €/%	14,791,939 €/%	4,358,728 €/%	13,038,294 €/%
Option 2	4,011,047 €/%	19,162,022 €/%	4,699,046 €/%	22,016,903 €/%	4,148,737 €/%	19,669,977 €/%	2,075,306 €/%	9,805,362 €/%	4,699,046 €/%	22,016,903 €/%	4,215,789 €/%	19,987,527 €/%
Option 3	3,466,497 €/%	16,417,941 €/%	1,590,445 €/%	19,312,552 €/%	3,551,861 €/%	16,685,732 €/%	1,941,401 €/%	10,064,637 €/%	1,590,445 €/%	19,312,552 €/%	3,606,558 €/%	16,946,819 €/%
Option 4	4,899,212 €/%	11,318,651 €/%	3,065,503 €/%	13,260,095 €/%	5,008,452 €/%	11,707,195 €/%	2,383,426 €/%	5,856,243 €/%	3,065,503 €/%	13,260,095 €/%	5,089,573 €/%	11,896,406 €/%

A1 CEPA Note on Bottom-Up Estimate of Noise Insulation Costs in Dublin

NOTE: BOTTOM-UP ESTIMATES OF NOISE INSULATION COSTS IN DUBLIN

Author: CEPA LLP

Date Prepared: 23rd March 2026

This note presents estimates of the cost of insulating homes in the Greater Dublin Area. These were originally developed in 2025 to support future cost-effectiveness of airport noise mitigation measures (including noise insulation schemes), and to allow for a sense check of any noise insulation costs produced by Dublin Airport. These estimates are now being used to sense check whether a proposed cap of €40,000 per property is likely to be sufficient to cover the full cost of a typical noise insulation package.

We developed these estimates on a bottom-up basis, drawing on a range of publicly available and online sources, and assumptions which are discussed in further detail below. The veracity and reliability of these sources vary – where we have doubts as to the robustness of the figures, we have estimated plausible ranges. Given these estimates were developed as an interim output for a future cost-effectiveness analysis, they have not undergone the full range of quality assurance checks that would typically be accompanied by the use of such figures, though we have undertaken a sense check around their overall plausibility.

To do this, we have cross checked our range to top-down estimates of the level of funding at two other airports: London Heathrow and London Gatwick. Under Heathrow's Residential Insulation Scheme (RIS), an upper limit of £35,130[1] (approximately €40,500) of support is offered to cover 100% of eligible noise insulation costs[2]. While this exceeds the upper bound of our estimated range in Table 1, this likely reflects differences in costs arising from dwellings being within Greater London. In contrast, London's Gatwick Airport (which is outside Greater London) offers funding up to £26,000 (approximately €30,000) of noise insulation works as part of its Noise Insulation Scheme[3]. This is in line with our calculated range in Table 1.

1.1. SUMMARY OF NOISE INSULATION COSTS

In Table 1 below, we present the estimated cost of a typical noise insulation scheme, for a single-family house in Dublin. This involves double glazing of windows in the living room and bedrooms, insulation of attics (if any), and the installation of acoustic vents. We also include a notional 20% uplift in order to account for any miscellaneous costs that are not captured in our itemised breakdown. The range of noise insulation interventions included in our estimate are in line with measures typically offered by airport noise insulation schemes in Europe; they exclude interventions such as wall and floor insulation, that we and our technical partners, Noise Consultants, consider atypical.

We note that the actual level of support offered by the airport could differ based on the level of noise deemed acceptable for each room. For example, some rooms without a window could be exposed to a lower level of noise, and the airport might not insulate the room further with acoustic vents. As such, these estimates are expected to further vary based on individual characteristics of the dwelling.

Table 1: Estimate of costs to insulate a typical single-family house in Dublin

Noise insulation intervention	Cost (€, 2025)	Range (€, 2025)
Window insulation	11,400	3,400 – 22,800

[1] Heathrow's scheme offers full noise insulation up to an indexed cap of £34,000. This value is adjusted for inflation annually.

[2] A Quieter Neighbour: Heathrow's Noise Action Plan 2024-2028. Published October 2024. *Available online here.*

[3] Gatwick Airport Northern Runway Project Environmental Statement. Appendix 14.9.10: Noise Insulation Scheme. Published May 2024. *Available online here.*

Noise insulation intervention	Cost (€, 2025)	Range (€, 2025)
Attic insulation	2,500	1,500 – 3,500
Acoustic vents	500	500 – 600
Labour costs	2,900	2,200 – 3,600
Contingency uplift (applied as a 20% uplift on all costs)	3,500	1,500 – 6,100
Total	**20,800**	**9,100 – 36,600**

Source: CEPA analysis
Note: Values rounded to the nearest hundreds of euros

1.2. Assumptions

To estimate the costs of noise insulating a typical single-family house in Dublin, we take a relatively simple bottom-up approach of estimating material costs multiplied by quantities required and adding on labour costs. The estimate is based on desk top research.

Table 2 below presents the quantities we have assumed for our estimates and provides commentary on how we have derived them.

Table 2: Assumed parameters of a typical single-family house in Dublin, and days involved in installation

Item	Units	Low value	Base value	High value	Source/ remarks
Windows	no.	6	8	10	We assume that the average house is a 3-bedroom house based on information here. We assume that only windows in the bedrooms and living room will be replaced based on typical noise insulation schemes. We assume that there are 2 windows per room on average. Our low and high values reflect a +/- 2 range.
Attic insulation	Per attic	1	1	1	More information can be found in Table 3 which presents the unit costs we have assumed in producing our estimates and provides commentary on our sources.
Acoustic vents	no.	5	6	7	We assume this range from an estimate of number of habitable rooms in a typical house in Dublin.
Labour	days	12	16	20	One day estimated for Attic insulation based on information here.[2] Our start point is 2 days estimated for windows and vents based on information here.[3] We assume that 4 people will be required for the entire job. We have also included another day of works in our base case (and two in the high case) to account for any unplanned increase in works.

Sources: 1) Central Statistics Office, Ireland: Census of Population 2022 Profile 2 - Housing in Ireland. Available online here. 2) Instant Eco Homes Ireland. Available online here. 3) Cherwell United Kingdom. Available online here.

Table 3 presents the unit costs we have assumed in producing our estimates and provides commentary on our sources.

Table 3: Estimated costs of items and labour involved in noise insulation

Item	Units	Low value	Base value	High value	Source/ remarks
Window insulation	€/ window	570	1,425	2,280	We assume that double glazing is required for maximum noise reduction. We also assume the average of the of the range of costs for the base value presented here.[1]
Attic insulation	€/per attic	1,450	2,500	3,500	Estimates on costs to insulate an attic by number of bedrooms can be found here.[2] We use the full range presented as a range. This range can be narrowed depending on the number of bedrooms.
Acoustic vents	€/ vent	76	76	76	We have used the values provided here.[3]
Labour	€/ day	179.40	179.40	179.40	We use Q2 2025 estimates for average hourly earnings in the construction sector found here.[4] We assume workers work 6 hours a day.

Sources: 1) Horizon Windows and Doors Ireland. Available online here. 2) BuildTech Ireland. Available online here. 3) Lougview Solutions Ireland. Available online here. 4) Central Statistics Office, Ireland: Earnings and Labour Costs Q1 2025 (Final) Q2 2025 (Preliminary Estimates) . Available online here. (Table 2 Row F).

These estimates are intended to provide an indicative guide only and should not be interpreted as precise estimates. Actual costs may vary depending on a range of factors such as:

- The size and layout of the property, including the number and dimensions of windows and the extent of roof space requiring treatment.
- The age and construction type of the property, which may affect the complexity of installation or require preparatory works.
- The specific noise levels experienced at each property, which may determine whether enhanced glazing specifications (e.g. triple glazing) are required beyond the standard assumed here.
- The ability of Dublin Airport to benefit from economies of scale by procuring and delivering noise insulation as a coordinated programme of works.
- Advertised prices not including additional costs which could be required in order for successful installation of noise mitigation measures.
- Prevailing labour and materials costs at the time of delivery, which may differ from the 2025 estimates used here.
- Site-specific access constraints or listed building considerations that could increase installation costs.

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