

Appendix C14.5

Operational Results without Cross-border Link

1.1 Operational Results

1.1.1 Section 1

The number of receptors with noise levels greater than 60 dB L_{den} within the study area for both the Do-Minimum and Do-Something opening year and design year scenarios for Section 1 is presented in Table C14.5-1. It is observed, based on the modelling results, that the Proposed Development results in an overall positive impact with a decrease in the number of receptors with predicted noise levels greater than 60 dB L_{den}.

Table C14.5-1: Predicted Traffic Noise Levels Greater than 60 dB L_{den} – Section 1

Receptor Description	Opening Year (2032)		Design Year (2047)	
	Do-Minimum	Do-Something	Do-Minimum	Do-Something
All Property Types	799	592	841	629
Residential (incl Farms)	618	434	654	464
Educational and Childcare Facilities	4	3	4	3
Hotels and Accommodation	9	9	9	9
Activities of Religious Organisations	3	3	4	3
Healthcare Facilities	7	5	7	5
Residential Care	0	0	0	0

Table C14.5-2 presents the predicted noise levels for the Do-Minimum and Do-Something opening year (2032) and design year (2047) for the Proposed Development and compares the calculated results against the three conditions for noise mitigation as outlined in TII (2004) and TII (2014).

Table C14.5-2: Predicted Traffic Noise Levels – Section 1

Receptor ID*	Description	Predicted Noise Levels Opening Year (2032)		Condition for Noise Mitigation Satisfied?			Mitigation Required?	Predicted Noise Levels Design Year (2047)		TII Condition for Noise Mitigation Satisfied?			Mitigation Required?
		Do-Minimum	Do-Something	(a)	(b)	(c)		Do-Minimum	Do-Something	(a)	(b)	(c)	
27272332	Residential	52	61	Yes	Yes	Yes	Yes	53	62	Yes	Yes	Yes	Yes
27272335	Residential	49	60	No	Yes	Yes	No	49	61	Yes	Yes	Yes	Yes
27272336	Residential	49	60	No	Yes	Yes	No	49	61	Yes	Yes	Yes	Yes
27272337	Residential	47	60	No	Yes	Yes	No	47	61	Yes	Yes	Yes	Yes
27272338	Residential	48	61	Yes	Yes	Yes	Yes	49	62	Yes	Yes	Yes	Yes
27272339	Residential	46	60	No	Yes	Yes	No	46	61	Yes	Yes	Yes	Yes
27297671	Residential	58	62	Yes	Yes	Yes	Yes	58	63	Yes	Yes	Yes	Yes
27297671a	Residential	64	60	No	No	No	No	65	61	Yes	No	No	No
27358138	Residential	39	64	Yes	Yes	Yes	Yes	39	65	Yes	Yes	Yes	Yes
35445888	Residential	48	63	Yes	Yes	Yes	Yes	49	63	Yes	Yes	Yes	Yes
37676924	Residential	45	61	Yes	Yes	Yes	Yes	46	62	Yes	Yes	Yes	Yes
80490721	Residential	47	60	No	Yes	Yes	No	48	61	Yes	Yes	Yes	Yes
80490721a	Residential	59	63	Yes	Yes	Yes	Yes	59	64	Yes	Yes	Yes	Yes
80490723	Residential	68	66	Yes	No	No	No	69	66	Yes	No	No	No
80490723a	Residential	58	61	Yes	Yes	Yes	Yes	59	62	Yes	Yes	Yes	Yes
80491373	Residential / Commercial	53	62	Yes	Yes	Yes	Yes	54	63	Yes	Yes	Yes	Yes
80491488	Residential	44	60	No	Yes	Yes	No	45	61	Yes	Yes	Yes	Yes
80506471	Residential / Commercial	62	63	Yes	Yes	Yes	Yes	62	64	Yes	Yes	Yes	Yes

* **Note:** For some receptors several locations around the building have been modelled given their proximity to both existing roads and the proposed development and these locations have been denoted with letters 'a', 'b' etc. depending on the number of locations around the building.

1.1.2 Section 2

The results presented in Section 14.6.4.2 in Chapter 14 Noise & Vibration remain valid for Section 2 of the Proposed Development as there is a negligible change in traffic volumes in Section 2 of the Proposed Development with and without the cross-border link.

1.1.3 Section 3

The number of receptors with noise levels greater than 60 dB L_{den} within the study area for both the Do-Minimum and Do-Something opening year and design year scenarios for Section 3 is presented in Table C14.5-3. It is observed that the Proposed Development results in an overall positive impact with a decrease in the number of receptors with predicted noise levels greater than 60 dB L_{den}.

Table C14.5-3: Predicted Traffic Noise Levels Greater than 60 dB L_{den} – Section 3

Receptor Description	Opening Year (2032)		Design Year (2047)	
	Do-Minimum	Do-Something	Do-Minimum	Do-Something
All Property Types	380	299	419	312
Residential (incl. Farms)	339	264	371	273
Educational and Childcare Facilities	4	3	5	3
Hotels and Accommodation	0	0	0	0
Activities of Religious Organisations	2	1	2	1
Healthcare Facilities	4	4	4	4
Residential Care	0	0	0	0

Table C14.5-4 presents the predicted noise levels for the Do-Minimum and Do-Something opening year (2032) and design year (2047) for the Proposed Development and compares the calculated results against the three conditions for noise mitigation as outlined in TII (2004) and TII (2014).

Table C14.5-4: Predicted Traffic Noise Levels – Section 3

Receptor ID*	Description	Predicted Noise Levels Opening Year (2032)		Condition for Noise Mitigation Satisfied?			Mitigation Required?	Predicted Noise Levels Design Year (2047)		TII Condition for Noise Mitigation Satisfied?			Mitigation Required?
		Do-Minimum	Do-Something	(a)	(b)	(c)		Do-Minimum	Do-Something	(a)	(b)	(c)	
36724783	Residential	51	55	No	Yes	Yes	No	52	57	No	Yes	Yes	No
36724783a	Residential	52	55	No	Yes	Yes	No	53	56	No	Yes	Yes	No
36839482	Residential	57	63	Yes	Yes	No	No	57	63	Yes	Yes	No	No
36839482a	Residential	55	61	Yes	Yes	Yes	Yes	56	61	Yes	Yes	No	No
37055928	Residential	53	56	No	Yes	Yes	No	54	58	No	Yes	Yes	No
38466720	Residential	61	66	Yes	Yes	Yes	Yes	62	67	Yes	Yes	Yes	Yes
38466720a	Residential	61	64	Yes	Yes	Yes	Yes	62	65	Yes	Yes	Yes	Yes
80492710	Residential	49	57	No	Yes	Yes	No	50	59	No	Yes	Yes	No
80492710a	Residential	62	56	No	No	No	No	63	58	No	No	No	No
80492712	Residential	62	58	No	No	No	No	63	59	No	No	No	No
80492712a	Residential	61	62	Yes	Yes	No	No	62	63	Yes	Yes	Yes	Yes
80492712b	Residential	51	60	No	Yes	Yes	No	52	62	Yes	Yes	Yes	Yes
80492715	Residential	62	64	Yes	Yes	Yes	Yes	63	65	Yes	Yes	Yes	Yes
80493104	Residential	50	55	No	Yes	Yes	No	51	56	No	Yes	Yes	No
80523886	Residential	58	64	Yes	Yes	No	No	58	64	Yes	Yes	No	No
80523886a	Residential	57	62	Yes	Yes	No	No	58	62	Yes	Yes	No	No
80524306	Residential	50	60	No	Yes	Yes	No	51	61	Yes	Yes	Yes	Yes
80524306a	Residential	57	60	No	Yes	Yes	No	58	61	Yes	Yes	Yes	Yes
80985572	Residential	62	64	Yes	Yes	Yes	Yes	63	65	Yes	Yes	Yes	Yes

* **Note:** For some receptors several locations around the building have been modelled given their proximity to both existing roads and the proposed development and these locations have been denoted with letters 'a', 'b' etc. depending on the number of locations around the building.

1.1.4 Entire Development

The number of receptors with noise levels greater than 60 dB L_{den} within the study area for both the Do-Minimum and Do-Something opening year and design year scenarios for the Proposed Development is presented in Table C14.5-5. It is observed, based on the modelling results, that the Proposed Development results in an overall positive impact with a decrease in the number of receptors with predicted noise levels greater than 60 dB L_{den}.

Table C14.5-5: Predicted Traffic Noise Levels Greater than 60 dB L_{den} – Entire Development

Receptor Description	Opening Year (2032)		Design Year (2047)	
	Do-Minimum	Do-Something	Do-Minimum	Do-Something
All Property Types	1516	1210	1626	1285
Residential (incl. Farms)	1218	933	1313	995
Educational and Childcare Facilities	12	9	13	9
Hotels and Accommodation	9	9	9	9
Activities of Religious Organisations	5	4	6	5
Healthcare Facilities	16	15	16	15
Residential Care	1	1	1	1

1.2 Mitigation Measures

The noise mitigation measures presented in Section 14.7.2 of Chapter 14: Noise & Vibration account for traffic volumes with and without a cross-border link with the A5 WTC (the N14/N15 to A5 Link) that will join with a proposed Trunk Road T3 and the proposed A5 WTC in Northern Ireland. Further detail on the noise mitigation measures can be found in Section 14.7.2 of Chapter 14.

1.3 Residual Effects

A total of 4,585 properties were considered during the noise modelling carried out as part of this EIAR. The majority of NSLs will either have reduced noise levels or be in line with the TII design goal. However, a limited number of properties will experience a residual noise effect as a result of the Proposed Development, despite the application of a structured approach through the consideration of various mitigation measures.

The residual impacts for each section are presented in two formats, (a) The Environmental Noise Directive (END) noise mapping bands and (b) Assessment of Change.

1.3.1 Section 1

The residual impacts for Section 1 are examined under both the END noise mapping noise level bands and the Assessment of Change.

Section 1 - END Noise Mapping

A summary of the Do-Minimum and the Do-Something with mitigation outcomes in the opening year and the design year are outlined in Table C14.5-6. Three properties that would otherwise be subject to road traffic noise levels in excess of 75 dB are mitigated in the Do-Something design year scenario. As can be seen from the table, the number of properties predicted to be within the 70 - 74 dB L_{den} and 75+ dB L_{den} bands for the design year have reduced substantially. For all bands between 60 dB and 75+ dB, the Proposed Development (Do-Something) has a lower number of properties in the band than the Do-Minimum option. The number of receptors in the <55 dB band also increases in the Do-Something with mitigation scenario when compared to the Do-Minimum scenario. This presents a clear downward trend in noise exposure for the properties assessed in the EIAR. The aggregate residual effect under the END Noise Mapping criteria is positive.

Table C14.5-6: Opening and Design Year L_{den} Noise Level Bands – Section 1

Noise Level Range (dB)	Opening Year 2032		Design Year 2047	
	Do-Minimum	Do-Something with Mitigation	Do-Minimum	Do-Something with Mitigation
<55	1222	1325	1154	1261
55 – 59	242	328	261	360
60 – 64	251	233	268	246
65 – 69	336	236	322	231
70 - 74	97	26	140	50
75+	0	0	3	0

Section 1 – Assessment of Change

A summary of the Do-Minimum and the Do-Something with mitigation L_{den} outcomes with respect to the changes in noise levels in the opening year and design year are outlined below in Table C14.5-7 and Table C14.5-8.

For the opening year, the Proposed Development results in decreased NSL numbers in the low, medium and high impact rating bands, meaning the Proposed Development results in a higher number of NSLs experiencing positive effects. There is, however, a larger number of NSLs experiencing a negligible increase in noise levels than those experiencing a negligible decrease in noise levels.

For the design year, the Proposed Development results in decreased NSL numbers in the low, medium and high impact rating bands, meaning the Proposed Development results in a higher number of NSLs experiencing positive effects. However, there is a larger number of NSLs with a negligible change in noise levels. The aggregate residual effects under the Assessment of Change criteria is positive.

In summary, the Proposed Development will result in a positive aggregate residual effect under the END Noise Mapping and the Assessment of Change. This will result in beneficial environmental and health effects on the general population in the study area.

Table C14.5-7: Change in Opening Year L_{den} Noise Levels – Section 1

Change in Noise Level (dB)	DMRB Magnitude	EPA Magnitude of Impact	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care	
Decrease in Noise Level	5.0+	Major	High	378	332	1	4	0	1	0
	3.0 – 4.9	Moderate	Medium	490	368	3	3	4	3	0
	1.0 – 2.9	Minor	Low	710	643	5	3	2	4	0
	0.1 – 0.9	Negligible	Negligible	96	90	0	0	0	1	0
No Change	<i>No Change</i>	<i>No Change</i>	16	14	0	1	0	0	0	0
Increase in Noise Level	0.1 – 0.9	Negligible	Negligible	208	204	1	0	0	0	0
	1.0 – 2.9	Minor	Low	157	149	0	0	0	0	0
	3.0 – 4.9	Moderate	Medium	81	80	0	1	0	0	0
	5.0+	Major	High	241	230	0	0	0	1	0

Table C14.5-8: Change in Design Year L_{den} Noise Levels – Section 1

Change in Noise Level (dB)	DMRB Magnitude	EPA Magnitude of Impact	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care	
Decrease in Noise Level	10.0+	Major	High	478	380	2	6	0	2	0
	5.0 – 9.9	Moderate	Medium	445	373	3	2	5	2	0
	3.0 – 4.9	Minor	Low	659	595	4	2	1	4	0
	0.1 – 2.9	Negligible	Negligible	109	101	0	1	0	1	0
No Change	<i>No Change</i>	<i>No Change</i>	14	13	0	0	0	0	0	0
Increase in Noise Level	0.1 – 2.9	Negligible	Negligible	197	193	1	0	0	0	0
	3.0 – 4.9	Minor	Low	158	150	0	0	0	0	0
	5.0 – 9.9	Moderate	Medium	75	74	0	1	0	0	0
	10.0+	Major	High	242	231	0	0	0	1	0

1.3.2 Section 2

The residual impact presented in Section 14.8.2 in Chapter 14: Noise & Vibration remain valid for Section 2 of the Proposed Development as there is a negligible change in traffic volumes in Section 2 of the Proposed Development with and without the cross-border link.

1.3.3 Section 3

The residual impacts for Section 3 are examined under both the END noise mapping noise level bands and the Assessment of Change.

Section 3 - END Noise Mapping

A summary of the Do-Minimum and the Do-Something with mitigation outcomes in the opening year and the design year are outlined in Table C14.5-9. The number of properties predicted to be within the 70 – 74 dB L_{den} band for the opening year and design year have reduced substantially. For all bands between 60 dB and 70 - 74 dB the Do-Something with mitigation scenario has a lower number of properties in the band than the Do-Minimum option. The number of NSLs in the 55 – 59 dB and <55 dB bands also increases in the Do-Something with mitigation option when compared to the Do-Minimum scenario. This presents a clear downward trend in noise exposure for the properties assessed in the EIAR. The aggregate residual impact under the END Noise Mapping criteria is positive.

Table C14.5-9: Opening and Design Year L_{den} Noise Level Bands – Section 3

Noise Level Range (dB)	Opening Year 2032		Design Year 2047	
	Do-Minimum	Do-Something with Mitigation	Do-Minimum	Do-Something with Mitigation
<55	605	658	561	616
55 – 59	211	243	223	280
60 – 64	223	185	217	159
65 – 69	129	95	157	118
70 - 74	27	14	37	22
75+	0	0	0	0

Section 3 – Assessment of Change

A summary of the Do-Minimum and the Do-Something with mitigation L_{den} outcomes with respect to the change in noise levels in the opening year and design year are outlined below in Table C14.5-10 and Table C14.5-11.

For the opening and design years, the Proposed Development results in decreased NSL numbers in all impact rating bands, meaning the Proposed Development results in a higher number of NSLs experiencing positive effects. The aggregate residual effect under the Assessment of Change criteria is positive.

In summary, the Proposed Development will result in a positive aggregate residual effect under the END Noise Mapping and the Assessment of Change. This will result in beneficial environmental and health effects on the general population in the study area.

Table C14.5-10: Change in Opening Year L_{den} Noise Levels – Section 3

Change in Noise Level (dB)	DMRB Magnitude	EPA Magnitude of Impact	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care	
Decrease in Noise Level	5.0+	Major	High	75	65	1	0	2	0	0
	3.0 – 4.9	Moderate	Medium	60	57	1	0	0	0	0
	1.0 – 2.9	Minor	Low	193	179	1	0	1	0	0
	0.1 – 0.9	Negligible	Negligible	408	376	1	0	0	3	0
No Change		<i>No Change</i>	<i>No Change</i>	89	68	2	0	1	0	0
Increase in Noise Level	0.1 – 0.9	Negligible	Negligible	296	270	0	0	0	2	0
	1.0 – 2.9	Minor	Low	125	122	0	1	0	0	0
	3.0 – 4.9	Moderate	Medium	27	25	0	0	0	0	0
	5.0+	Major	High	19	17	0	0	0	0	0

Table C14.5-11: Change in Design Year L_{den} Noise Levels – Section 3

Change in Noise Level (dB)	DMRB Magnitude	EPA Magnitude of Impact	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care	
Decrease in Noise Level	10.0+	Major	High	103	93	1	0	1	0	0
	5.0 – 9.9	Moderate	Medium	68	64	1	0	1	0	0
	3.0 – 4.9	Minor	Low	176	161	1	0	1	0	0
	0.1 – 2.9	Negligible	Negligible	494	437	3	0	1	5	0
No Change		<i>No Change</i>	<i>No Change</i>	73	59	0	0	0	0	0
Increase in Noise Level	0.1 – 2.9	Negligible	Negligible	207	200	0	0	0	0	0
	3.0 – 4.9	Minor	Low	121	119	0	1	0	0	0
	5.0 – 9.9	Moderate	Medium	30	29	0	0	0	0	0
	10.0+	Major	High	20	17	0	0	0	0	0

1.3.4 Entire Development

The residual impacts for Entire Development are examined under both the END noise mapping noise level bands and Assessment of Change.

Entire Development – END Noise Mapping

A summary of the Do-Minimum and the Do-Something with mitigation outcomes in the opening year and the design year are outlined in Table C14.5-12. Three properties that would otherwise be subject to road traffic noise levels in excess of 75 dB are mitigated in the Do-Something Design Year scenario. The number of properties predicted to be within the 70 - 74 dB L_{den} band for the opening year and design year have reduced substantially. For all bands between 60 dB and 75+ dB the Do-Something with mitigation scenario has a lower number of properties in the band than the Do-Minimum option. The number of NSLs in the 55 – 59 dB and <55 dB bands also increases in the Do-Something with mitigation option when compared to the Do-Minimum scenario. This presents a clear downward trend in noise exposure for the properties assessed in the EIAR. The aggregate residual impact under the END Noise Mapping criteria is positive.

Table C14.5-12: Opening and Design Year L_{den} Noise Level Bands – Entire Development

Noise Level Range (dB)	Opening Year 2032		Design Year 2047	
	Do-Minimum	Do-Something with Mitigation	Do-Minimum	Do-Something with Mitigation
<55	2116	2279	1989	2145
55 – 59	650	783	673	866
60 – 64	627	568	621	555
65 – 69	592	445	640	475
70 - 74	143	53	202	87
75+	0	0	3	0

Entire Development – Assessment of Change

A summary of the Do-Minimum and the Do-Something with mitigation L_{den} outcomes for the Entire Development with respect to the change in noise levels in the opening year and design year are outlined in Table C14.5-13 and Table C14.5-14.

For the opening and design years, the Proposed Development results in decreased NSL numbers in all impact rating bands, meaning the Proposed Development results in a higher number of NSLs experiencing positive effects (see Table C14.5-13 and Table C14.5-14). The aggregate residual effect under the Assessment of Change criteria is positive.

In summary, the proposed development will result in a positive aggregate residual effect under the END Noise Mapping and the Assessment of Change criteria. Therefore, the Proposed Development as a whole is judged to have a **significant positive** significance of effect for RTN within the study area. This will result in beneficial environmental and health effects on the general population in the study area.

Table C14.5-13: Change in Opening Year L_{den} Noise Levels – Entire Development

Change in Noise Level (dB)	DMRB Magnitude	EPA Magnitude of Impact	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care	
Decrease in Noise Level	5.0+	Major	High	494	433	3	4	2	1	0
	3.0 – 4.9	Moderate	Medium	567	441	4	3	4	3	0
	1.0 – 2.9	Minor	Low	1070	972	7	3	3	5	1
	0.1 – 0.9	Negligible	Negligible	794	707	2	0	0	7	0
No Change	<i>No Change</i>	<i>No Change</i>	136	108	2	1	1	1	1	0
Increase in Noise Level	0.1 – 0.9	Negligible	Negligible	646	592	2	0	1	2	0
	1.0 – 2.9	Minor	Low	420	384	1	1	0	0	0
	3.0 – 4.9	Moderate	Medium	166	152	0	1	0	1	0
	5.0+	Major	High	292	270	0	0	0	3	0

Table C14.5-14 Change in Design Year L_{den} Noise Levels – Entire Development

Change in Noise Level (dB)	DMRB Magnitude	EPA Magnitude of Impact	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care	
Decrease in Noise Level	10.0+	Major	High	623	510	4	6	1	2	0
	5.0 – 9.9	Moderate	Medium	534	457	4	2	6	2	0
	3.0 – 4.9	Minor	Low	1047	945	6	2	2	5	1
	0.1 – 2.9	Negligible	Negligible	851	744	4	1	1	6	0
No Change	<i>No Change</i>	<i>No Change</i>	123	102	0	0	0	1	0	
Increase in Noise Level	0.1 – 2.9	Negligible	Negligible	552	515	3	0	1	3	0
	3.0 – 4.9	Minor	Low	397	367	0	1	0	0	0
	5.0 – 9.9	Moderate	Medium	161	145	0	1	0	1	0
	10.0+	Major	High	297	274	0	0	0	3	0

Table C14.5-15: Balance of Opening Year Impacts – Entire Development – Positive numbers indicate more beneficial than adverse impacts

Change in Noise Level (dB)	No. beneficial impacts <u>less</u> No. of adverse impacts						
	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care
5.0+	202	163	3	4	2	-2	0
3.0 – 4.9	401	289	4	2	4	2	0
1.0 – 2.9	650	588	6	2	3	5	1
0.1 – 0.9	148	115	0	0	-1	5	0
% NSLs beneficially impacted	64%	63%	76%	77%	82%	70%	100%
% NSLs adversely impacted	33%	34%	14%	15%	9%	26%	0%

Table C14.5-16: Balance of Design Year Impacts – Entire Development – Positive numbers indicate more beneficial than adverse impacts

Change in Noise Level (dB)	No. beneficial impacts <u>less</u> No. of adverse impacts						
	All Receptors	Residential (incl Farms)	Educational and Childcare Facilities	Hotels and Accommodation	Activities of Religious Organisations	Healthcare Facilities	Residential Care
5.0+	326	236	4	6	1	-1	0
3.0 – 4.9	373	312	4	1	6	1	0
1.0 – 2.9	650	578	6	1	2	5	1
0.1 – 0.9	299	229	1	1	0	3	0
% NSLs beneficially impacted	67%	65%	86%	85%	91%	65%	100%
% NSLs adversely impacted	31%	32%	14%	15%	9%	30%	0%