



LINLITHGOW LOCAL AREA COMMITTEE

NEWTON VILLAGE – TEMPORARY TRAFFIC MANAGEMENT TRIAL

REPORT BY HEAD OF OPERATIONAL SERVICES

A. PURPOSE OF REPORT

The purpose of this report is to provide the Local Area Committee with an evaluation of the trial traffic management scheme on the A904 through Newton village which was undertaken in June 2022.

B. RECOMMENDATION

It is recommended that the Local Area Committee note the contents of this report and agrees that the trial showed no discernible traffic benefits and is it therefore not proposed to install any permanent traffic management features on the A904 through Newton village at this time.

C. SUMMARY OF IMPLICATIONS

I	Council Values	Focusing on our customers' needs; being honest, open and accountable and working in partnership.
II	Policy and Legal (including Strategic Environmental Assessment, Equality Issues, Health or Risk Assessment)	Not applicable.
III	Implications for Scheme of Delegations to Officers	Not applicable
IV	Impact on performance and performance Indicators	Not applicable
V	Relevance to Single Outcome Agreement	Not applicable
VI	Resources - (Financial, Staffing and Property)	None.
VII	Consideration at PDSP	None.

D. TERMS OF REPORT

D.1 Background

On 24 August 2021, the Linlithgow Local Area Committee noted a report in relation to the ongoing traffic concerns raised by Newton Community Council. As part of this report it was agreed that officers would work with the Community Council to bring forward plans to assist in addressing the traffic concerns through the village. On the 1 March 2022 a further report was agreed by the Local Area Committee which supported the promotion of a temporary trial traffic management scheme to determine if any suitable traffic management could address the communities' concerns.

The trial traffic management scheme was subsequently put in place for six weeks between 30 May 2022 and 10 July 2022. This report concludes the findings from that trial.

D.2 Trial traffic management scheme

The A904 route which runs through Newton would not be suitable for the installation of vertical traffic calming features and therefore a scheme layout using horizontal traffic calming features was agreed. This trial traffic management scheme was in the form of a priority traffic build out at each end of the village. The approved trial traffic management scheme that was installed is shown in Appendix 1. The signage that was used to complement the trial traffic management scheme is shown in Appendix 2.

Independent traffic surveys were carried out in the village before the scheme was introduced between 23 and 29 May 2022 and during the trial period between 23 and 29 June 2022. The locations of the survey points are detailed in Appendix 3.

The volume and speed data that was collected is provided in Appendix 4 which also shows comparisons of the data before and during the trial. From this information that was gathered there was no considerable change to the volume of traffic through the village and the percentage of heavy goods vehicles (HGV) has also remained similar before and during the trial.

Traffic speeds did show a reduction particularly over sites 3, 4 and 5, however this is due to the queuing and congestion that was caused by the trial traffic calming features that were installed for the trial.

The existing traffic signals are designed to revert to red in the absence of vehicle demands with a delay to a green signal on approach to try and help slow down speeding vehicles. Temporary trials were carried out in relation to altering the existing traffic signal phasing and whilst minor alterations could be developed, indications were that any changes to timing and phasing would cause significant and unacceptable traffic congestion through the village.

Monitoring of queue lengths during the trial showed that in a westbound direction there were queues which took approximately 30 minutes to get through the village. In an eastbound direction the queues were shorter and took approximately 15 minutes to get through. Such congestion was not considered acceptable for any proposed permanent measures.

Additional comments were received by the Community Council. The details of these comments are provided in Appendix 5.

Throughout the trial a number of enquiries and complaints were received by the Council. A summary of these enquiries and complaints is provided in Appendix 6.

D.3 Trunk road data and communication

Data has been collected from the two sites on the M9 motorway network, at Junction 1A, for the same period as the traffic count data collected on the A904 before and during the trial. The permanent data collection site locations are shown in Appendix 7.

		Site NTCO1271	Site NTCO1274
May 2022	Total Vehicles	6466	7496
	Total HGV's	2237	2256
June 2022	Total Vehicles	6804	9443
	Total HGV's	2422	2730

Summary of data collected

From this information it can be seen that there has been an apparent increase in both total number of vehicles and the number of HGV's, however given that the number of vehicles and HGV's remain virtually the same on the A904 it is unlikely that these increases are due to traffic diverting from the A904. This can be determined by the comparison of the volume data shown in Appendix 4. It is likely that due to the commencement of the summer holiday period and additional traffic/road maintenance on the road network could be the reason for these increases from May to June.

It was agreed that prior to commencement of the traffic management trial officers would discuss these proposals with the trunk road operator to determine if existing motorway variable message signs could be considered to encourage vehicles to remain on the M9 and M90 and not using the A904. This was considered but was not carried out as should the trial traffic management scheme be made permanent, these signs would not be used to re-direct traffic. Approved Transport Scotland motorway messaging remained visible throughout the trial period.

D.4 Traffic Noise Survey and Air Quality

An environmental noise impact assessment was commissioned as part of the trial to measure and predict baseline road traffic noise along Main Street in Newton. A copy of the full independent report is provided In Appendix 8.

Due to the detailed information collected in this report, officers are reviewing the information and will provide an update at a future Linlithgow Local Area Committee.

Unfortunately the air quality monitoring station in Newton village was out of commission during the trial period and the whole data monitoring station has since been replaced, therefore there is no data available as part of this trail.

D.5 Community Council update

A meeting was held with the Community Council on the 21 October 2022 to discuss the outcome of the trial traffic management scheme. It was accepted that the trial traffic management scheme made no difference to the volume or types of vehicles travelling through the village, however traffic speeds were reduced.

The Community Council raised concerns with regard to the operation of the existing traffic signals in the centre of the village and subsequently discussions took place with officers. The existing operation of the signals were discussed in detail and further options will be forwarded to the Community Council for consideration in due course.

E. CONCLUSION

The aim of the trial traffic management scheme between 30 May 2022 and 10 July 2022 was to determine if the number of vehicles, particularly heavy goods vehicles, was reduced should the appropriate traffic management be installed on the A904 through Newton village.

The traffic data in Appendix 4 shows that the volume of traffic and percentage of HGV traffic has remained similar before and during the trial. Although speeds show a reduction in three sites, this was due to the queueing and congestion caused by the traffic management scheme.

Overall, it is concluded that the trial was unsuccessful in its main aims and it is therefore not proposed to make this scheme permanent, however further investigation will be carried out with regard to the noise information collected and a report will be brought back to the Local Area Committee with the findings.

F. BACKGROUND REFERENCES

Linlithgow Local Area committee report 24 August 2021 at:

<https://coins.westlothian.gov.uk/coins/viewDoc.asp?c=e%97%9Di%90m%80%88>

Appendices/Attachments:

Appendix 1 – Temporary traffic management proposals

Appendix 2 – Traffic Management Scheme Signage

Appendix 3 – Locations of Traffic Survey Sites

Appendix 4 – Traffic Data Comparison before and during trial.

Appendix 5 – Feedback from Community Council

Appendix 6 – Summary of enquiries and complaints.

Appendix 7 – Locations of M9 traffic data collection sites

Appendix 8 – Noise Survey Report

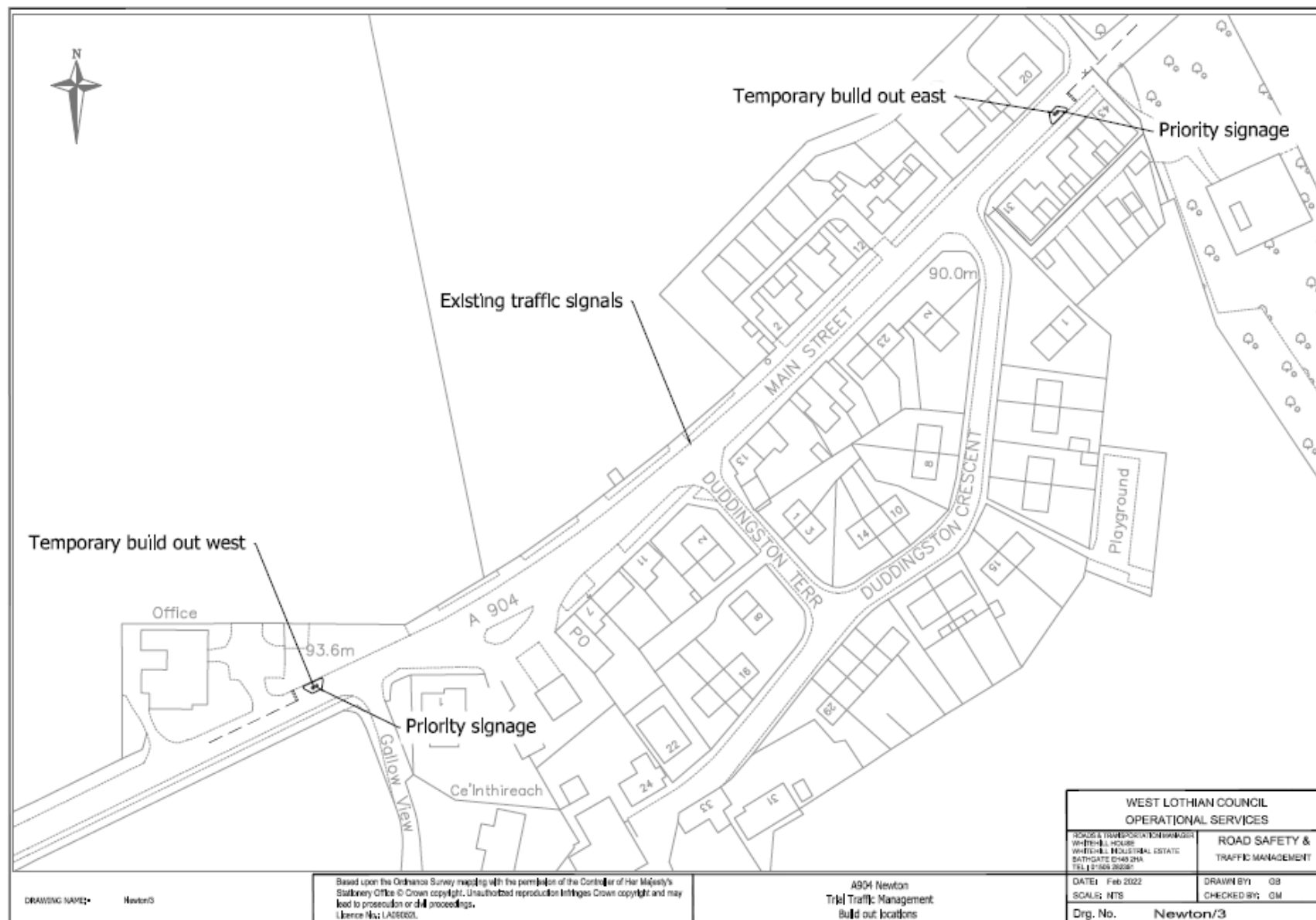
Contact Person: Gordon Brown, Roads and Transportation Manager, Operational Services.

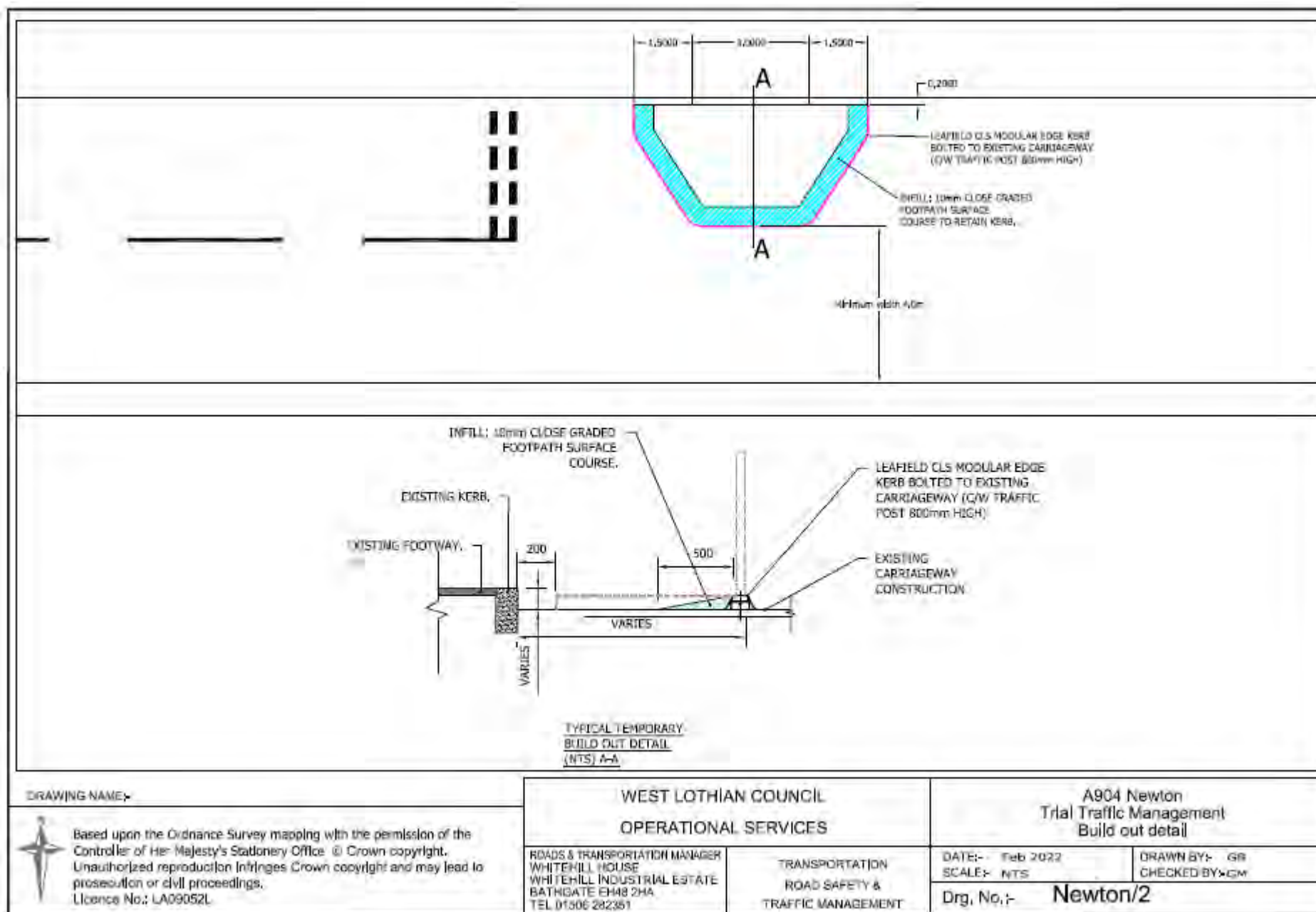
Email: Gordon.Brown@westlothian.gov.uk

Jim Jack, Head of Operational Services

Date: 1 November 2022

APPENDIX 1 – TEMPORARY TRAFFIC MANAGEMENT PROPOSALS





APPENDIX 2 -TRAFFIC MANAGEMENT SCHEME SIGNAGE

 Priority over oncoming vehicles	 Give way to oncoming vehicles	A 904 Newton experimental traffic management scheme from X June to Y July 2022. Use M9 M90 motorway A 904 Newton experimental traffic management scheme from X June to Y July 2022. Expect delays	A 904 Newton Experimental traffic management Expect delays	A 904 Newton Experimental traffic management Consider alternative route
Proposed priority signage to be installed at each of the two temporary build outs.		Examples of temporary information signs that will be erected.		

DRAWING NAME:-  Based upon the Ordnance Survey mapping with the permission of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorized reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Licence No.: LA090521.	WEST LoTHIAN COUNCIL OPERATIONAL SERVICES ROADS & TRANSPORTATION MANAGER WHITEHILL HOUSE WHITEHILL INDUSTRIAL ESTATE BATHGATE EH48 2HA TEL 01506 282351 TRANSPORTATION ROAD SAFETY & TRAFFIC MANAGEMENT	A904 Newton Trial Traffic Management Proposed temporary signage <table border="1"> <tr> <td>DATE:- February 2022</td> <td>DRAWN BY:- GB</td> </tr> <tr> <td>SCALE:- NTS</td> <td>CHECKED BY:- GJM</td> </tr> <tr> <td colspan="2">Org. No.:- Newton/1</td> </tr> </table>	DATE:- February 2022	DRAWN BY:- GB	SCALE:- NTS	CHECKED BY:- GJM	Org. No.:- Newton/1	
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APPENDIX 3 – LOCATIONS OF TRAFFIC SURVEY SITES

Speed survey locations on the A904 through Newton working east to west.

Location Reference	Description
1 (18A)	A904 east of Newton at the 300 yards countdown sign
2 (19A)	A904 at Newton boundary and 30/50mph gateway signage
3 (19B)	A904 after the boundary signs at the steading next to lighting column GU212.
4 (20A)	A904 before high friction surfacing approaching the traffic signals
5 (21A)	A904 at bus stop – tubes through the word BUS to reduce bus wheels stopping on the tubes
6 (22A)	A904 at the 30/40mph speed limit change
7 (23A)	A904 at the lighting column GU191

APPENDIX 4 – TRAFFIC DATA

The data contained in this table is a comparison between the before trial data (23-29 May 2022) and the data collected during the trial (23-29 June 2022). There were 7 sites where data was collected and these locations are detailed in the previous Appendix 3 with their site reference detailed (18A) etc.

There are two sets of data provided for each site, the total 7 day traffic data and the total data broken down to the time period between 7pm and 7am.

	23 – 29 May 2022					23 -29 June 2022			
Site	Average Traffic Flow	Mean Speed (mph)	85%ile Speed (mph)	% HGV		Average Traffic Flow	Mean Speed	85%ile Speed	% HGV
1 (18A)	93105	40.0	45.5	16.04		92820	40.0	45.5	15.97
(7pm-7am)	2120	43.3	49.4	15.68		2148	43.3	49.4	15.38
2 (19A)	93105	32.5	38.9	15.46		93207	32.5	38.9	15.56
(7pm-7am)	2126	36.2	43.5	14.32		2157	36.1	43.3	14.51
3 (19B)	92526	28.5	35.2	17.23		92676	16.8	21.7	17.34
(7pm-7am)	2139	32.8	40.4	16.48		2177	18.7	23.9	16.40
4 (20A)	94440	28.5	35.1	13.47		94731	17.3	22.3	13.42
(7pm-7am)	2161	32.7	40.2	11.33		2209	19.5	24.8	11.58
5 (21A)	95628	24.0	29.7	10.66		95550	14.8	19.4	10.63
(7pm-7am)	2218	26.9	33.1	10.05		2244	16.3	21.3	9.53
6 (22A)	92084	31.4	37.7	17.27		91980	31.4	37.6	17.27
(7pm-7am)	2078	35.3	43.0	16.47		2094	35.2	42.9	16.93
7 (23A)	96016	39.2	46.1	14.22		95726	39.1	46.1	14.38
(7pm-7am)	2207	43.5	50.9	12.10		2272	43.4	50.5	12.46

APPENDIX 5 – ADDITIONAL FEEDBACK PROVIDED BY THE COMMUNITY COUNCIL

These additional comments below were provided during the trial by the Community Council which they received additionally from the residents and the public.

When you buy a 3 or 4 bedroomed house in Main Street, Newton, chances are there are likely to be more than just a couple living in the house. A young married couple looking for such a house can purchase one in Main Street for less than a similar home away from a busy road. Then perhaps children come along and parents become worried about how the traffic may affect their family, so it would be fair to say that these people did not have the foresight to see what they were getting into and then start complaining. Some members of Newton Community Council seem to me to be in such a position.
I have been living in Main Street Newton since 2006, just before I moved in, Main Street had been resurfaced and traffic, which was much lighter than now passed through without creating too much noise. Over the years the road has been opened up for repairs and installation of various streetlights, water mains repairs and the laying of new electrical cables. Some of the reinstatements of the road surface have been of a poor standard and more patching has been done especially in the vicinity of drain and valve covers. The result is that there is now much undulation, pot holes and cracking in all directions, resulting in much banging from vehicle suspensions and structure, especially tipper trucks, articulated trucks and petrol tankers.
The east end of Main Street is perhaps the worst affected in the village.
Newton Community Council do not produce much in the way of minutes which during my time on the Comm Council were posted on the village notice board. I only learned that The Community Council had been lobbying for mitigation a week or two before the public meeting and only then through word of mouth. I attended that meeting and was allowed 10 minutes to say a few words against having a build out installed directly opposite my house. It seemed to me that the C.C. already made their minds up that it was going to happen no matter how many dissenting voices were heard that evening, and, there were more than just me. The council chairman assured us all that this mitigation was not set in stone and options were still up for discussion. It came to pass that within a few weeks the build outs were installed.
So, it was now set in stone that instead of 5 to 6 thousand vehicles a day passing my house on the north side of Main Street I was going to have 10 to 12 thousand with all the associated noise, pollution, vibration, sounding of horns etc.
I contacted someone from W.L.C. roads maintenance it may have been [REDACTED] and explained what was going to happen and made a plea to have some repairs done with a view to reducing bumping and banging. Sure enough a spray on tar with grey stone chips was applied to the road surface at the east end of Main Street just prior to the installation of the build out which did make a difference for a while but not enough to prevent plaster board joint splitting in my master bedroom due to additional vibration. Due to the warm weather and the doubling of traffic on the north side of Main Street the temporary repair has not lasted well and I am back to much banging and vibration.
The Community Council sent out questionnaires at the conclusion of the mitigation trial with, in my opinion, loaded questions on how well or otherwise the trial period went. It will be interesting to see how people who are living within the community council area but can be around a half mile away from Main Street, and perhaps don't use Main Street much can have a meaningful opinion.
I can safely tell you that at least 5 households living within 60 metres of the east most build out were not content with the mitigations.
At least two of the community council members live at No's 37 and 39 Main Street with their main doors adjacent to the east build out. Since the build out removed 5 to 6 thousand vehicles a day away from their frontage and consequently would have reduced the banging and vibration affecting their homes you won't find it a surprise that they are 100 per cent in favour of the trial and will no doubt say that traffic was reduced.

The only problem with their figures is that they asked villagers to comment on a period of time when the schools were on holiday and my research has shown that during school holidays, traffic is reduced by 12 to 15 percent anyway.

APPENDIX 6 – SUMMARY OF ENQUIRIES AND COMPLAINTS

Enquiry	Number	%
General enquiry	19	61%
Stage One Complaint	10	32%
Stage Two Complaint	2	7%
Total	31	100%

Throughout the duration of the trial members of the public raised complaints and enquiries. As shown in the above table there was a total of 31 with 10 of them going through the council's complaint procedure as Stage One complaints. From the 10 Stage One complaints two were escalated to Stage Two of the council's complaint procedure which were investigated and formally responded to within the required timescales.

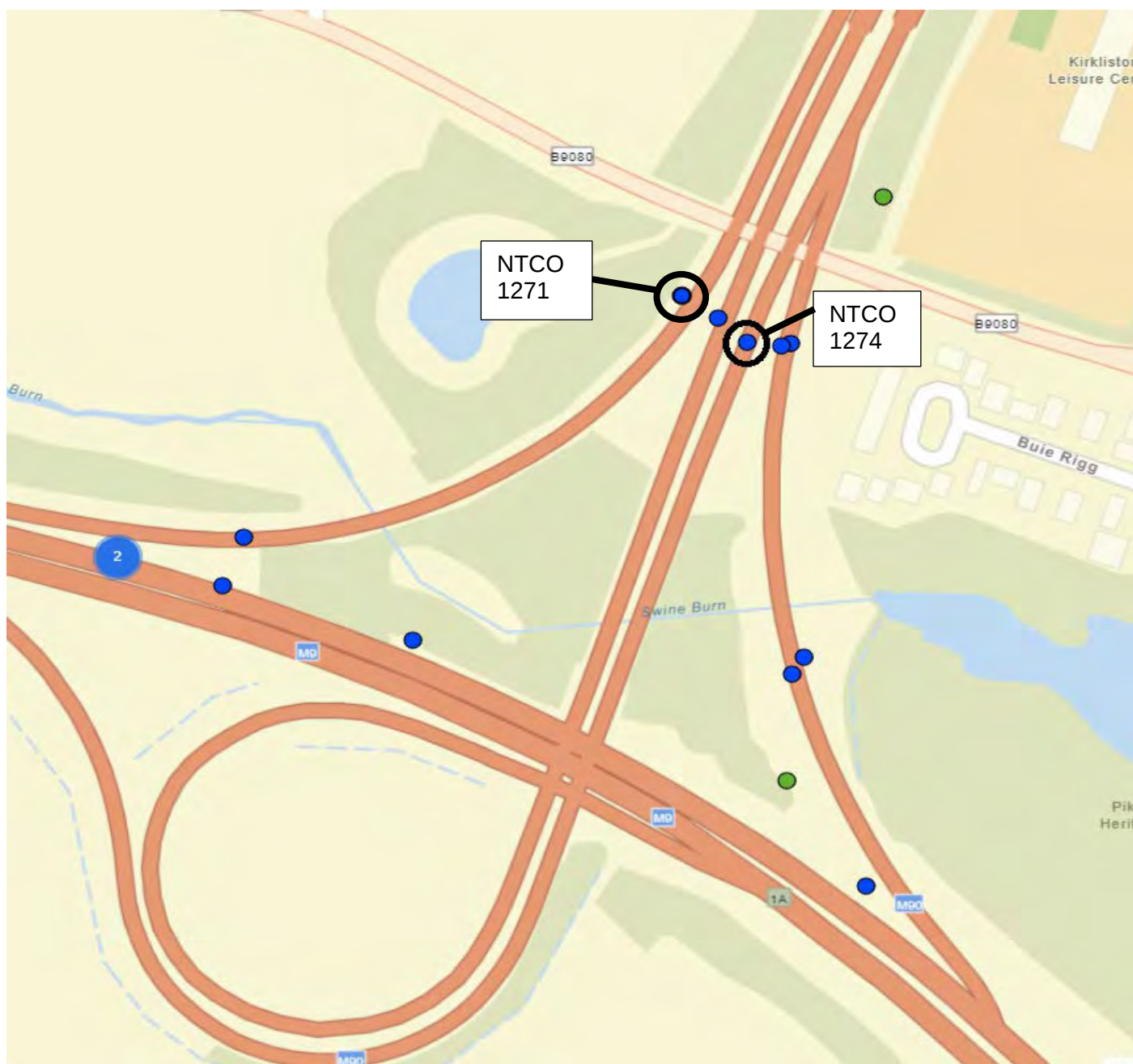
The majority of the enquires raised the similar issues. Mainly that the trial scheme was causing unnecessary congestion and increased travel times. Another common issue that was highlighted in the enquiries was the impact that the additional congestion was having on air pollution through the village as vehicles would be idling whilst waiting in the queues for long periods of time.

It was also stated numerous times that the build outs were impacting road safety, as frustrated motorists would ignore the give way signs resulting in near misses as they passed the build outs. Whilst issues of this nature are caused by inconsiderate driving behaviour, there were no formal reports received of any road traffic accidents during the trial period.

Based on the correspondence received, a recurring theme was that the public had a negative view of the trial and did not support it.

APPENDIX 7 – LOCATIONS OF M9 TRAFFIC DATA COLLECTION SITES

The two sites shown below are permanent traffic data collection sites that are installed on the M9 motorway at junction 1A. This data is collected and managed by BEAR Scotland and the data has been collected from sites NTCO1271 and NTCO1274.



APPENDIX 8 - NOISE SURVEY REPORT

Paul Pacitti
Newton Community Council

By email

Dear Paul

Environmental Noise Impact Assessment Main Street Newton

I refer to your instruction to conduct an environmental noise impact assessment to measure and predict baseline road traffic noise along Main Street Newton. The dwellings along this road (A904) are typically one or two storey, some of which are very close to the carriageway. Your Community Council is seeking an objective assessment to quantify how noise from road traffic on the A904 affects the local environment. I understand that the noise surveys conducted by Airshed and our appointed sub-contractor (for the ATC survey) followed the introduction of the recent traffic calming measures. This letter report presents the results from these surveys and seeks to provide an objective assessment of the likely benefits from the traffic calming measures in terms of noise.

Airshed conducted noise measurements at three locations along the road within Newton village between 26th May and 2nd June 2022. The locations of these sites are shown in Figure 1 attached. Baseline Sites 1 and 2 were selected in consultation with the local community, where sound level meters could be left unattended for a seven-day period. A 3-hour long attended survey was conducted at Baseline Site 3. Wind speed, wind direction and rainfall were recorded throughout this survey period to identify periods where ambient noise may have been significantly affected. The seven-day ambient noise levels for Sites 1 and 2 are plotted in Charts 1 and 2 respectively. The ambient noise from the three-hour survey at Baseline Site 3 is plotted in Chart 3. The meteorological data for the seven-day survey is plotted in Chart 4. This indicates that the wind speed did not exceed 5m/s at the measurement location at any time. Any short periods of rainfall do not appear to have affected the ambient noise levels. The relationship between wind speed and ambient noise at Sites 1 and 2 is plotted in Charts 5 and 6. This indicates that there is no significant relationship between ambient noise and wind speed, which is consistent with an acoustic environment where noise is dominated by transport. Further details of the baseline survey are presented in Appendix 1. The results for the surveys are summarised in Table 1 below.

Table 1 – Summary of Baseline Survey Data									
Site	26-May-22	27-May-22	28-May-22	29-May-22	30-May-22	31-May-22	01-Jun-22	02-Jun-22	Time Period
day	fri	sat	sun	mon	tue	wed	thu	fri	day
1	64	65	63	64	64	64	66	58	daytime
2	67	67	66	66	67	67	67	61	
3	-	-	-	-	-	-	70	-	
1	50	60	58	57	60	59	60	59	night-time
2	53	62	60	60	62	61	62	61	

N.B. units = dB LAeq T (where day = 07:00 – 23:00 and night = 23:00 – 07:00)

A seven-day automatic traffic counter (ATC) was installed on the A904 to the south of Duddingston Crescent to overlap with the baseline noise survey. The results from the seven-day ATC survey are presented in Appendix 2. The location of the ATC is also shown in Figure 1. These data have been summarised in Table 2 at the end of the text. The recorded mean speed is slightly higher on the north-bound traffic (27 mph) compared to the south-bound (22 mph). The pattern of diurnal traffic flows is plotted in Charts 7 – 9. These show a pronounced peak in traffic flows in the early weekday mornings with a wider spread over the PM peak. 92% of all traffic occurs during the daytime period (07:00 – 23:00). The average %HGV is ~12%. These data have been used to help predict noise across the study area and to compare measured and predicted noise levels.

Noise Criteria

The World Health Organisation (WHO) has published Environmental Noise Guidelines to protect human health from road traffic noise, where the principal concern is the effects on sleep disturbance at night. This recommends that night-time noise from road traffic should not exceed 45 dB $L_{night, outside}$, averaged over a period of 1 year, where night is usually defined as being between 23:00 and 07:00 hours.¹

The $L_{night, outside}$ criterion used by WHO is based on the index adopted by the European Noise Directive.² The $L_{night, outside}$ is an annual exposure limit and calculation of exposure should take account of the duration of the project and the prevailing meteorological conditions. Previous WHO Guidance recommended that noise inside bedrooms should not exceed 30 dBA for continuous noise and 45 dB LA_{max} for single sound events, which forms the basis of the internal levels recommended in Table 4 of BS 8233. The WHO 1999 Guidance also recommended that noise levels in outdoor living areas (e.g. gardens) should not exceed 55 dB $LA_{eq, 07:00 - 23:00}$.³ The WHO criteria relevant to this assessment are summarised in Table 3 below.

Environment	Critical Health Effect	Sound Level dBA $LA_{eq, T}$	Time (hours)
Outdoor living areas	Annoyance	50 - 55	16
Outside dwellings (long term average road traffic)	Sleep disturbance	45	8
Outside dwellings (long term average railway traffic)	Sleep disturbance	44	8
Inside dwellings	Speech intelligibility	35	16
Bedrooms	Sleep disturbance	30	8

PAN 1/2011 Planning and Noise⁵ provides advice to planning authorities in Scotland on how they must seek to minimise the adverse impact of noise arising from new

¹ WHO 2018. Environmental Noise Guidelines for the European Region

² Official Journal of the European Communities 25th June 2002. DIRECTIVE 2002/49/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 June 2002 relating to the assessment and management of environmental noise. Annex 1 of the Directive defines the method by which L_{night} should be calculated. The night-time noise indicator L_{night} is the incident A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year; in which: the night is eight hours, a year is a relevant year as regards the emission of sound and an average year as regards the meteorological circumstances and where the incident sound is considered, which means that no account is taken of the sound that is reflected at the façade of the dwelling under consideration.

³ World Health Organisation, Geneva 1999. Guidelines for Community Noise.

⁴ <http://www.who.int/mediacentre/factsheets/fs258/en/>

⁵ Scottish Government 2011. Planning Advice Note 1/2011 Planning and Noise

development. Although not directly applicable to this project, the Technical Advice Note⁶ (TAN) for PAN 1/2011 provides a simple framework where the significance of any change in noise from road traffic can be assessed where a change in predicted noise of <1 dB is considered to be of negligible significance in the Scottish Government Planning and Noise TAN. The Technical Advice Note (TAN) suggests a framework to allow the magnitude of the change to be considered based on the predicted change in ambient noise level. This is set out in Table 4 below.

Table 4 – Magnitude of Noise Impacts	
Magnitude	Change in Noise Level dB LA _{eq T} (After – Before)
Major	>5
Moderate	3 – 4.9
Minor	1 – 2.9
Negligible	0.1 – 0.9
No Change	0

Noise Predictions

The surveys reported above provide robust measurements of road traffic noise at the three survey locations. A noise prediction model has been used to help extend the study area and to evaluate the likely benefits from mitigation measures, e.g. slowing down road traffic. The traffic calming measures recently introduced were in place prior to the Airshed noise surveys. The noise prediction model may be used to determine what reduction in noise level these measures may have achieved in the village.

Noise from road traffic has been predicted across the study area in accordance with the method set out in CRTN as implemented by SoundPlan 8.2. CRTN LA_{10 18 hour} predictions have been converted to LA_{eq 16 hour} in accordance with the Transport Research Laboratory (TRL) method adopted for noise mapping in the UK⁷ where LA_{eq 16 hour} = 0.94 * LA_{10 18 hour} + 0.77 dB. Noise contours have been predicted using a 5m resolution grid at a height of 1.5m above ground level. Noise levels have also been predicted at fixed receptor locations as shown in Figure 2.

CRTN includes methods for the calculation of road traffic noise levels in most situations, taking into account factors such as distance between the road and receptor, road configuration, ground cover, screening, angle of view, reflection from facades, and traffic flow, speed and composition. The method is suitable for calculating noise levels from free-flowing traffic at properties more than 4m from the carriageway, defined as the nearside kerb.

The model layout was constructed using the OS map base at 1:10,000 scale and a site walkover. Dimensions were obtained using a GIS interface. Variations in local ground height were taken into account based on OS Landform Terrain 5 data. An example model layout is shown in Figure 3.

The measured and predicted noise levels at the baseline survey locations are presented in Tables 5.1 and 5.2 below. The predicted and measured daytime road traffic noise levels at Baseline Site 3 are in good agreement. The predictions at Baseline Sites 1 and 2 are pessimistic and over-predict by 2 – 4 dB.

⁶ Scottish Government 2011. Technical Advice Note. Assessment of Noise

⁷ Abbot PG & Nelson PM. Converting the UK traffic noise index LA_{10 18 hour} to EU noise indicators for noise mapping TRL PR/SE/45/02 EPG 1/2/37

Table 5.1 – Scenario 1 - Noise Model Predictions from Road Traffic Noise (day)		
Source	Measured Level dB LAeq (daytime weekday)	Predicted Level dB LAeq 07:00 – 23:00
Baseline Site 1	65	69
Baseline Site 2	67	69
Baseline Site 3	70	70

N.B. Units = dB LAeq 07:00 – 23:00

The measured and predicted noise levels at the baseline survey locations appear to provide better agreement for night-time exposure.

Table 5.2 – Scenario 1 - Noise Model Predictions from Road Traffic Noise (night)		
Source	Measured Level dB LAeq (night-time weekday)	Predicted Level dB LAeq 07:00 – 23:00
Baseline Site 1	59	61
Baseline Site 2	61	61

N.B. Units = dB LAeq 23:00 – 07:00

Four Scenarios have been predicted to allow the likely benefit of traffic calming to be assessed in terms of ambient noise levels:

- Scenario 1 – predicts the noise from road traffic based on the measured traffic flows and mean traffic speed. This Scenario only considers predictions at the baseline survey sites (as shown in Figure 1) as discussed above;
- Scenario 2 – predicts the noise from road traffic based on the measured traffic flows and mean traffic speed, at a number of representative noise-sensitive receptors in Newton (as shown in Figure 2);
- Scenario 3 – predicts the noise from road traffic based on the measured traffic flows, but assumes a mean traffic speed of 30mph (48 kph). This Scenario is intended to represent conditions prior to traffic calming, assuming all vehicles complied with the previous posted speed limit; and.
- Scenario 4 – predicts the noise from road traffic based on the measured traffic flows, but assumes a mean traffic speed of 20mph (32kph). This Scenario is intended to represent conditions with the traffic -calming measures in place and assumes all vehicles comply with the new posted speed limit.

The detailed results from the noise prediction exercise are presented in Appendix 3. The noise contours for Scenarios 2 – 4 are plotted in Figures 4.1 – 4.3 respectively. The results for the predictions at the fixed receptor locations as shown in Figure 2 for Scenarios 3 – 4 are summarised in Table 6.1. (daytime) and Table 6.2 (night-time). This indicates that the best-case (comparing Scenario 3 with Scenario 4) would achieve a reduction of ~ 1dB at some receptors. This is considered to be a negligible reduction in terms of the Scottish Government's TAN assessment framework as described in Table 4 above. The results from this assessment indicate that reducing the vehicle speeds in Newton is likely to be of Negligible significance in terms of noise impacts as defined in Table 4 above.

Kind regards



Steve Fraser BSc MPhil CEnv MIOA MCIWM

Tables

No	Link	24 hour	Daytime		Night		factors				hours	
			LDV	HGV	LDV	HGV	day	night	LDV	HGV	daytime	night-time
1	ATC counter Newton Village	13680	694	92	123	16	0.918	0.082	0.883	0.117	16	8

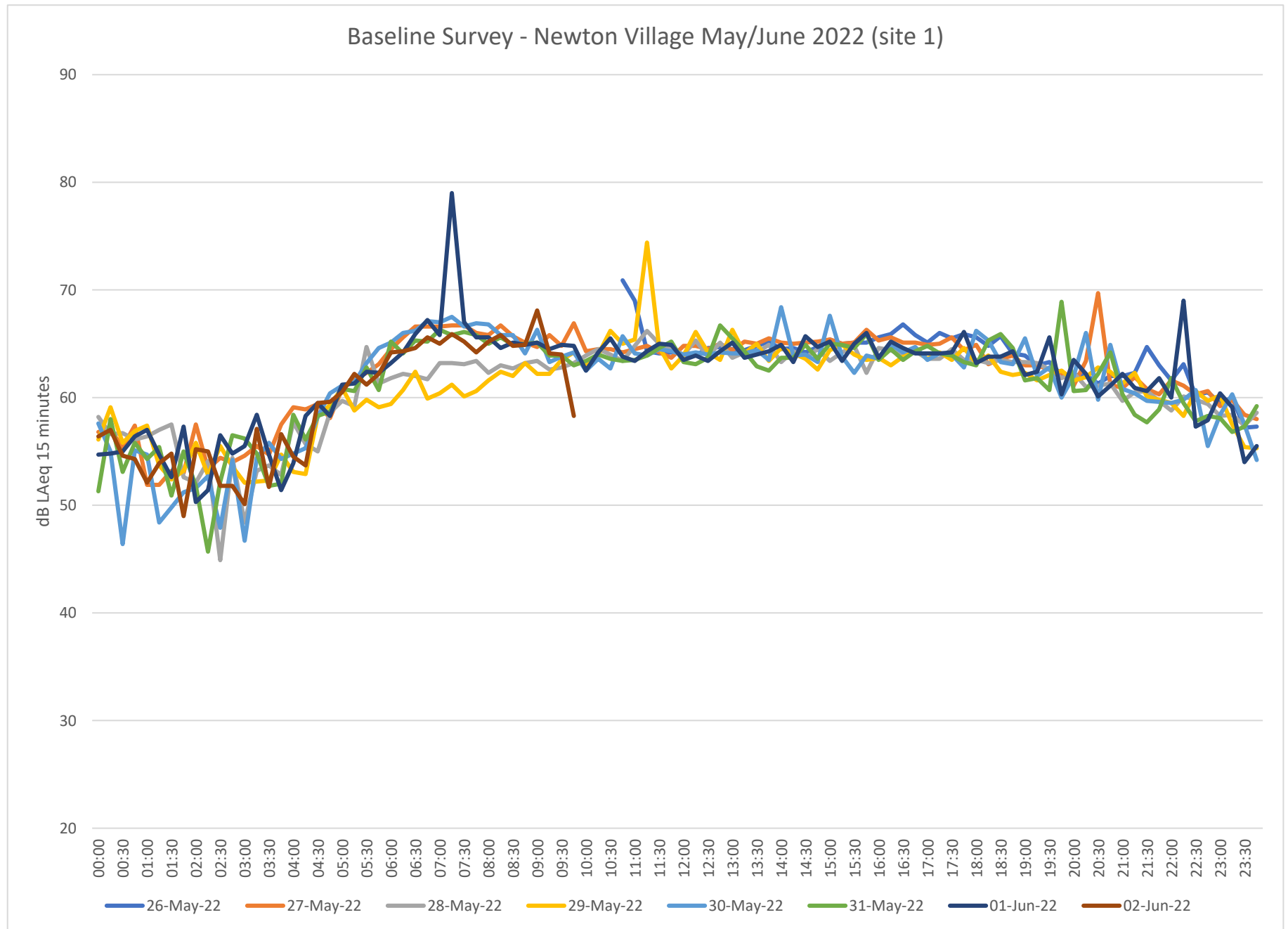
No	Location	FI	Dir	X	Y m	Z m	Scenario 2	Scenario 3	Scenario 4	best case	Significance
1	2 Duddingston Terrace	GF	NW	309188	677651	93.2	67	68	67	-1	Negligible
2	2 Gallow View	GF	NW	309122	677549	94.8	55	55	54	-1	Negligible
		F 1				97.3	57	58	57	-1	Negligible
3	6-12 Main Street	GF	SE	309220	677712	92.4	73	74	73	-1	Negligible
		F 1				94.9	73	74	73	-1	Negligible
4	9 Main Street - Newton Snack	GF	NW	309161	677635	94.3	70	70	70	0	No change
		F 1				96.8	70	71	70	-1	Negligible
5	11 Main Street	GF	NW	309172	677646	93.8	71	71	71	0	No change
6	14-16 Main Street	GF	SE	309252	677743	91.6	73	73	73	0	No change
7	17-19 Main Street	GF	NW	309223	677695	92.6	73	74	73	-1	Negligible
		F 1				95.1	73	73	73	0	No change
8	18 Main Street	GF	SE	309270	677762	90.5	70	70	70	0	No change
		F 1				93.0	73	73	73	0	No change
9	23 Main Street	GF	NW	309239	677706	92.7	70	71	70	-1	Negligible
		F 1				95.2	71	72	71	-1	Negligible
10	35 Main Street	GF	NW	309291	677760	90.1	73	73	73	0	No change
		F 1				92.6	73	73	73	0	No change
11	Duddingston Crescent	GF	NW	309291	677711	92.0	58	58	58	0	No change
		F 1				94.5	60	60	60	0	No change
12	Gallow View	GF	W	309129	677564	94.7	55	56	55	-1	Negligible
		F 1				97.2	58	58	58	0	No change
13	Main Street	GF	NW	309253	677715	92.3	68	69	68	-1	Negligible
		F 1				94.8	70	71	70	-1	Negligible
14	Main Street	GF	SE	309236	677728	92.2	74	74	74	0	No change
		F 1				94.7	73	74	73	-1	Negligible
15	Main Street	GF	SE	309278	677770	90.1	70	70	70	0	No change
16	Main Street	GF	SE	309286	677778	89.7	70	70	70	0	No change
		F 1				92.2	73	73	73	0	No change
17	Main Street	GF	N	309118	677608	95.2	68	68	68	0	No change
		F 1				97.7	69	70	69	-1	Negligible
18	The Pheasant	GF	NW	309206	677678	92.4	73	73	73	0	No change
		F 1				94.4	73	73	73	0	No change

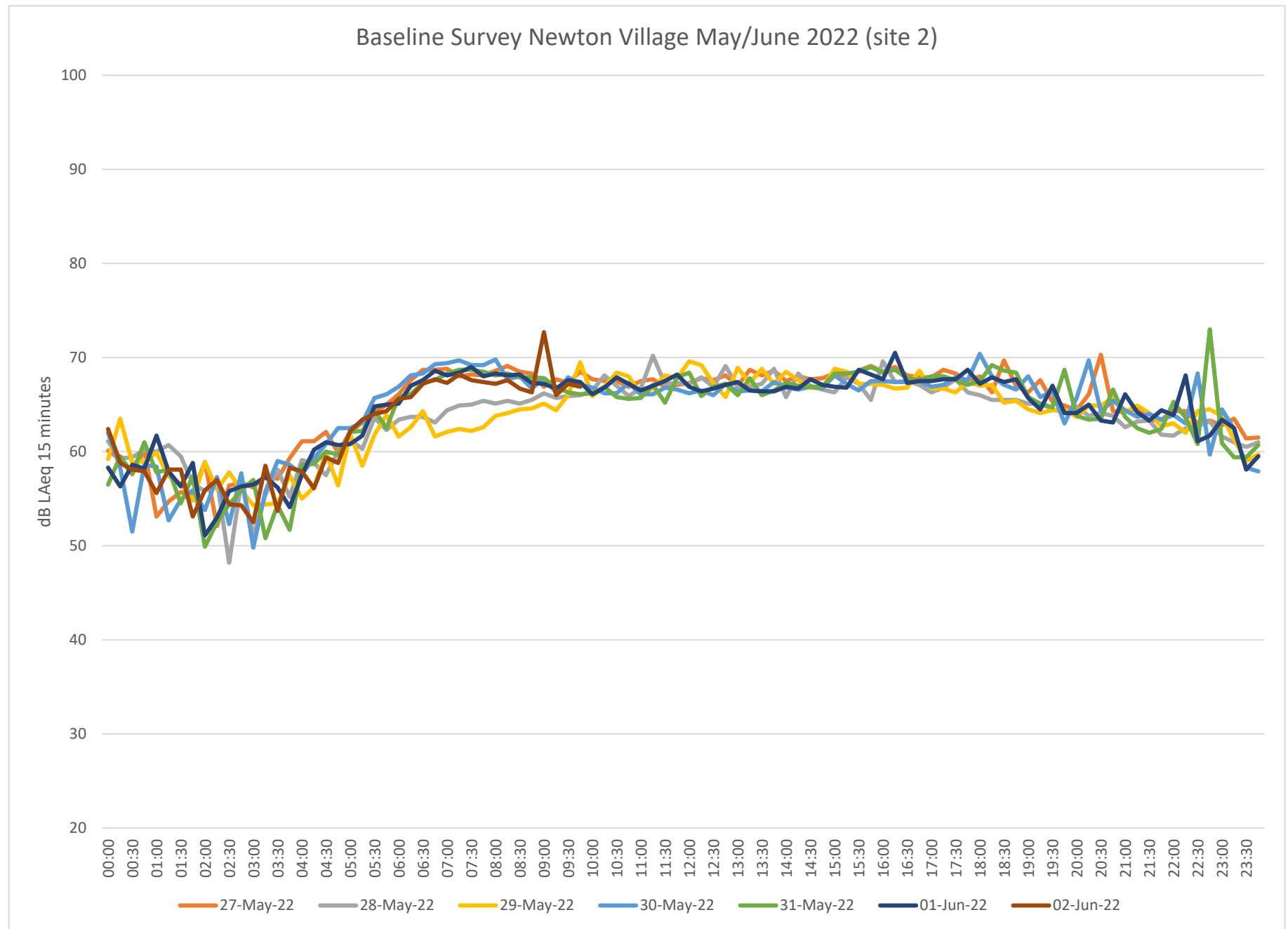
units = dB LAeq daytime

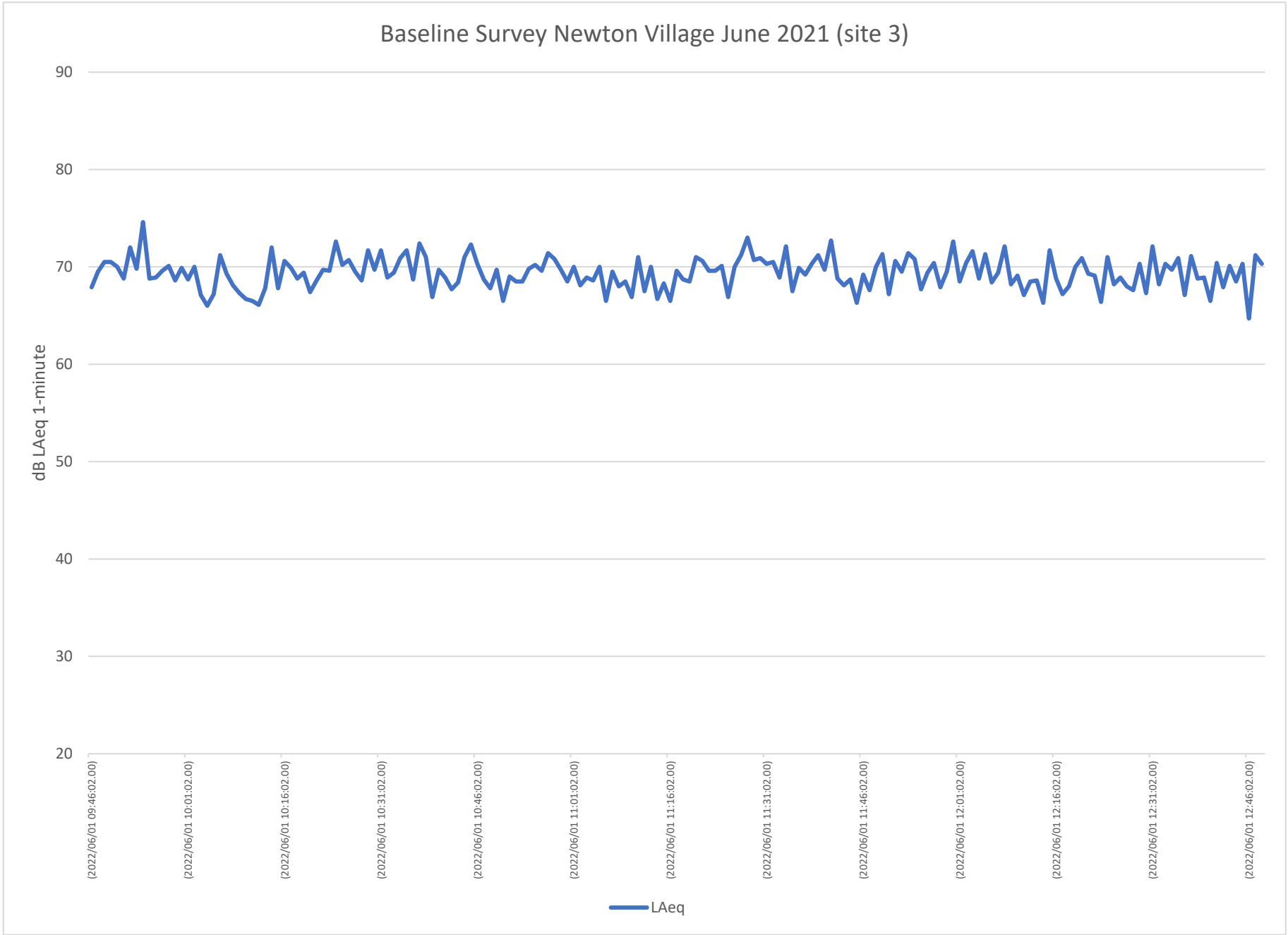
No	Location	FI	Dir	X	Y m	Z m	Scenario 2	Scenario 3	Scenario 4	best case	Significance
1	2 Duddingston Terrace	GF	NW	309188	677651	93.2	60	61	60	-1	Negligible
2	2 Gallow View	GF	NW	309122	677549	94.8	47	48	47	-1	Negligible
		F 1				97.3	50	50	50	0	No change
3	6-12 Main Street	GF	SE	309220	677712	92.4	65	65	65	0	No change
		F 1				94.9	65	65	65	0	No change
4	9 Main Street - Newton Snack	GF	NW	309161	677635	94.3	62	62	62	0	No change
		F 1				96.8	62	63	62	-1	Negligible
5	11 Main Street	GF	NW	309172	677646	93.8	63	63	63	0	No change
6	14-16 Main Street	GF	SE	309252	677743	91.6	64	65	64	-1	Negligible
7	17-19 Main Street	GF	NW	309223	677695	92.6	65	65	65	0	No change
		F 1				95.1	65	65	65	0	No change
8	18 Main Street	GF	SE	309270	677762	90.5	62	62	62	0	No change
		F 1				93.0	64	64	64	0	No change
9	23 Main Street	GF	NW	309239	677706	92.7	63	63	63	0	No change
		F 1				95.2	63	64	63	-1	Negligible
10	35 Main Street	GF	NW	309291	677760	90.1	64	65	65	0	No change
		F 1				92.6	65	65	65	0	No change
11	Duddingston Crescent	GF	NW	309291	677711	92.0	54	54	54	0	No change
		F 1				94.5	55	56	55	-1	Negligible
12	Gallow View	GF	W	309129	677564	94.7	52	53	52	-1	Negligible
		F 1				97.2	54	54	54	0	No change
13	Main Street	GF	NW	309253	677715	92.3	61	61	61	0	No change
		F 1				94.8	62	63	62	-1	Negligible
14	Main Street	GF	SE	309236	677728	92.2	65	65	65	0	No change
		F 1				94.7	65	65	65	0	No change
15	Main Street	GF	SE	309278	677770	90.1	62	62	62	0	No change
16	Main Street	GF	SE	309286	677778	89.7	62	62	62	0	No change
		F 1				92.2	64	65	65	0	No change
17	Main Street	GF	N	309118	677608	95.2	61	61	61	0	No change
		F 1				97.7	62	62	62	0	No change
18	The Pheasant	GF	NW	309206	677678	92.4	64	65	64	-1	Negligible
		F 1				94.4	64	65	64	-1	Negligible

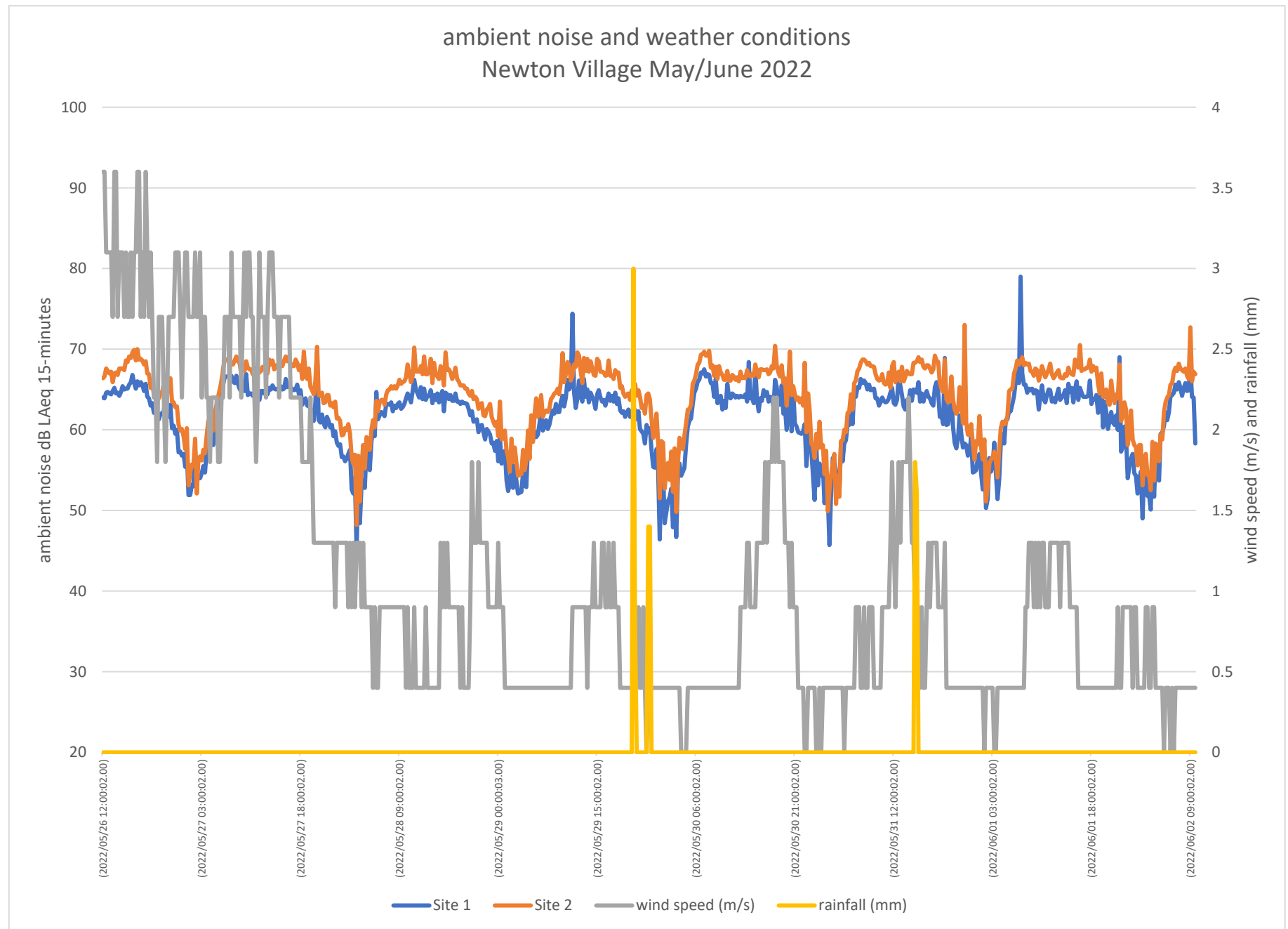
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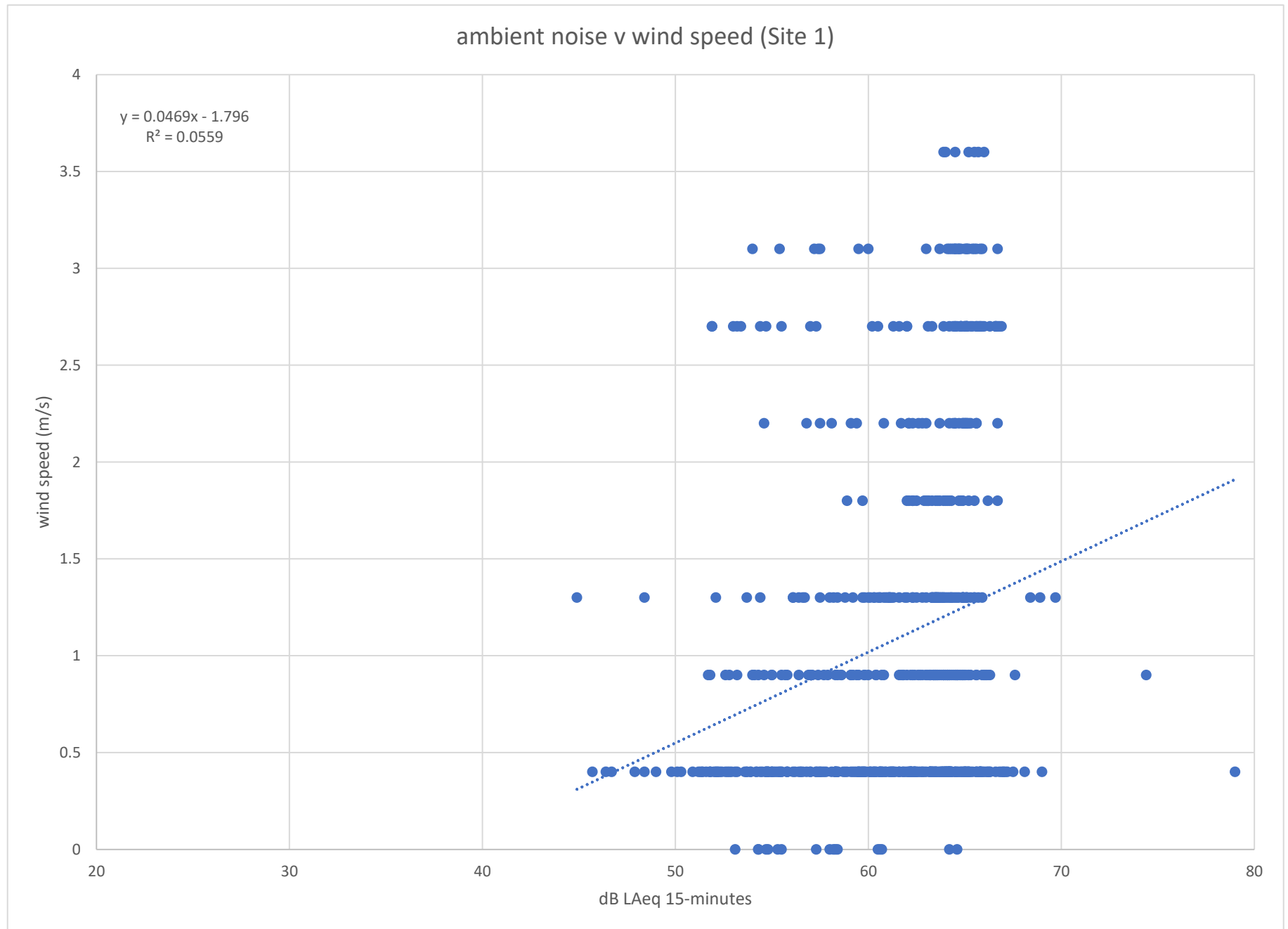
Charts

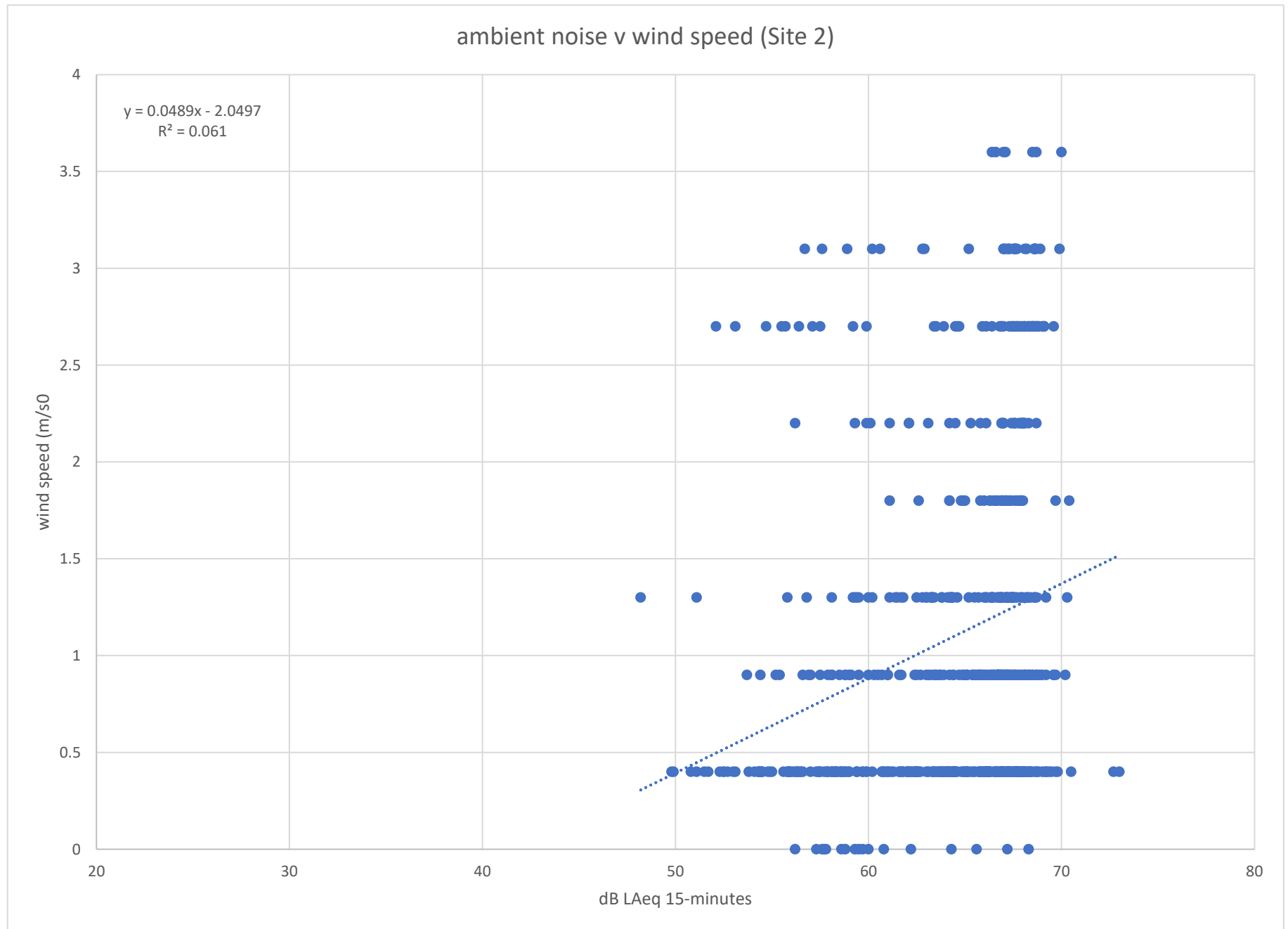


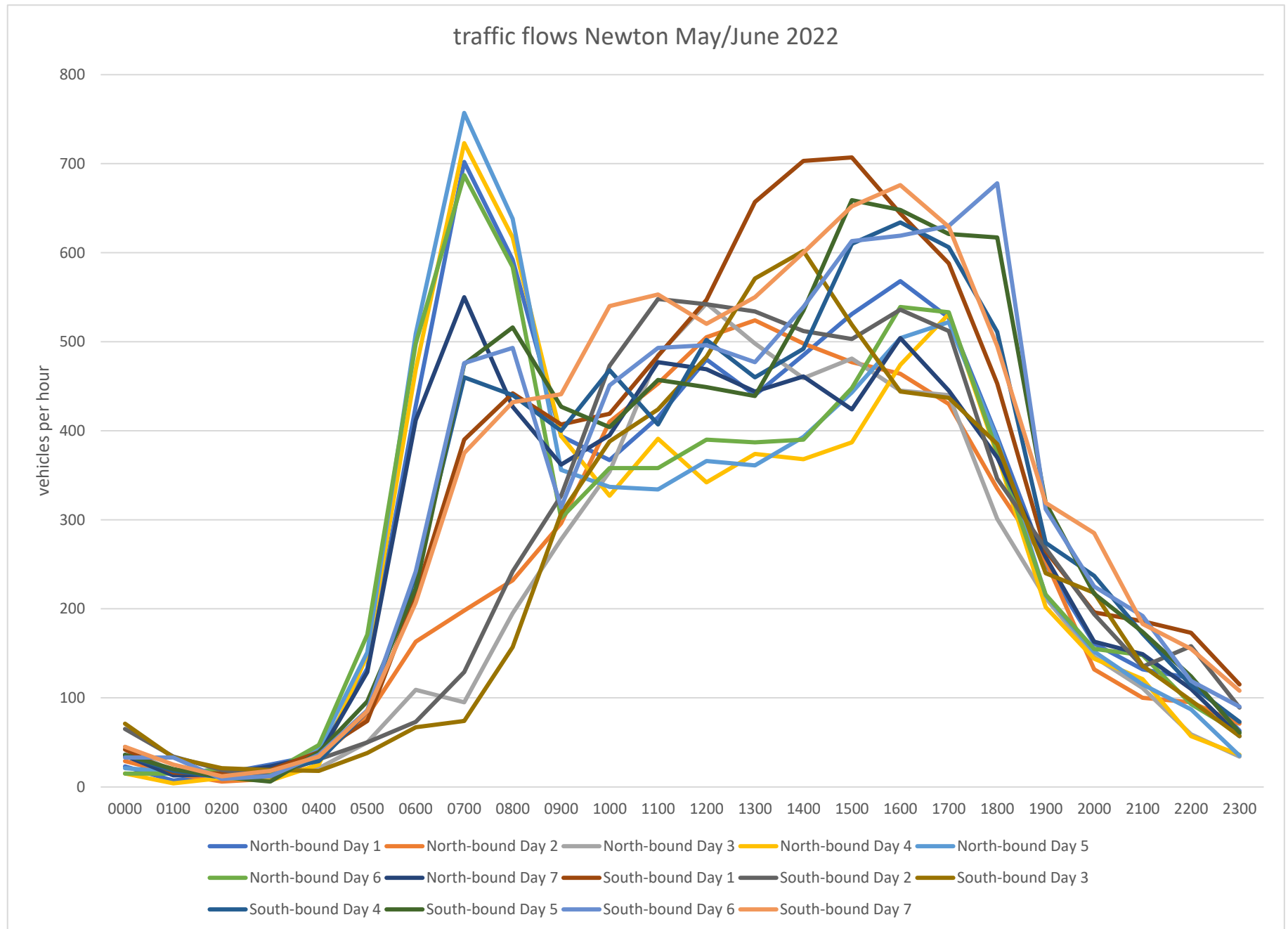


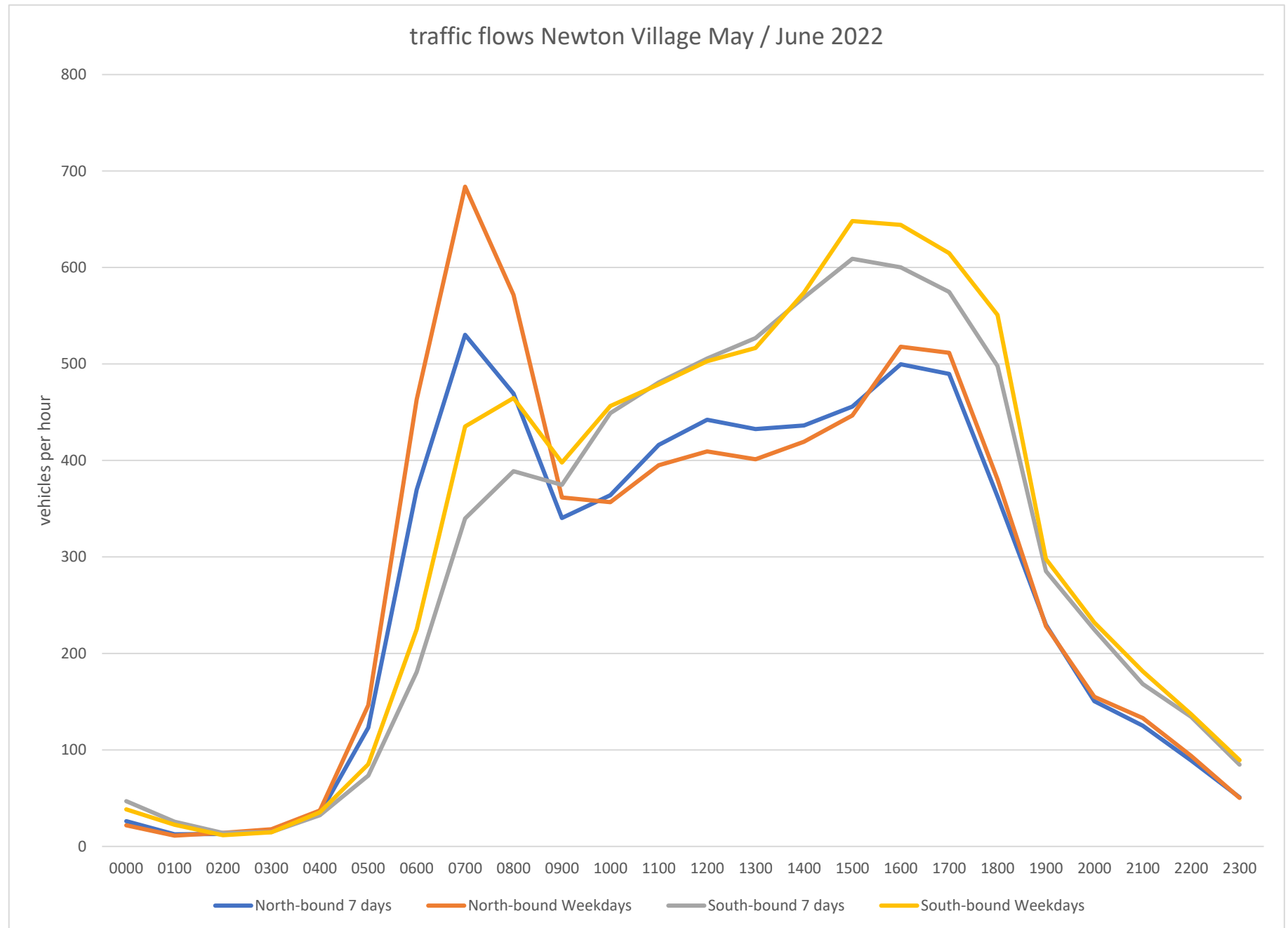


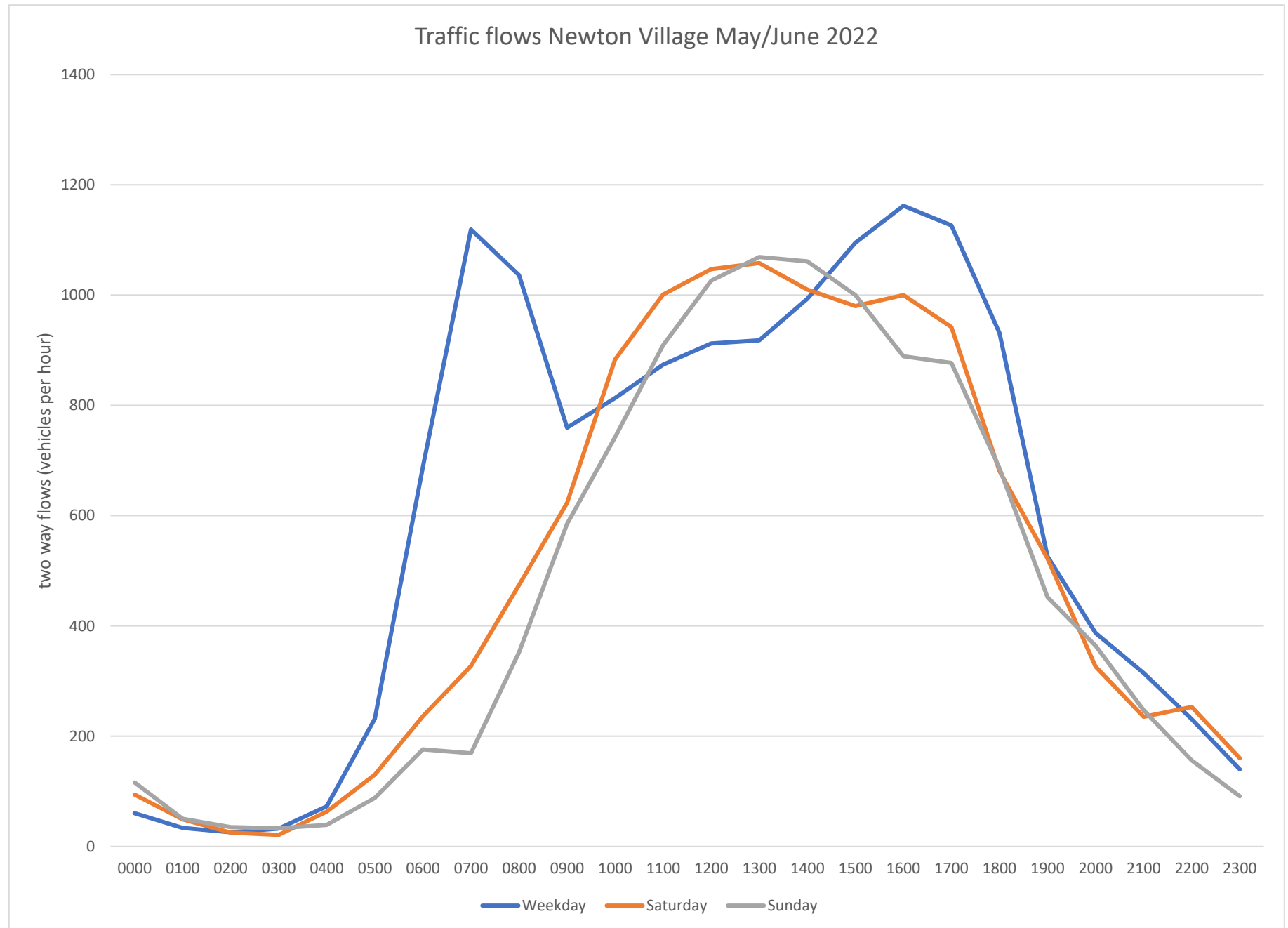








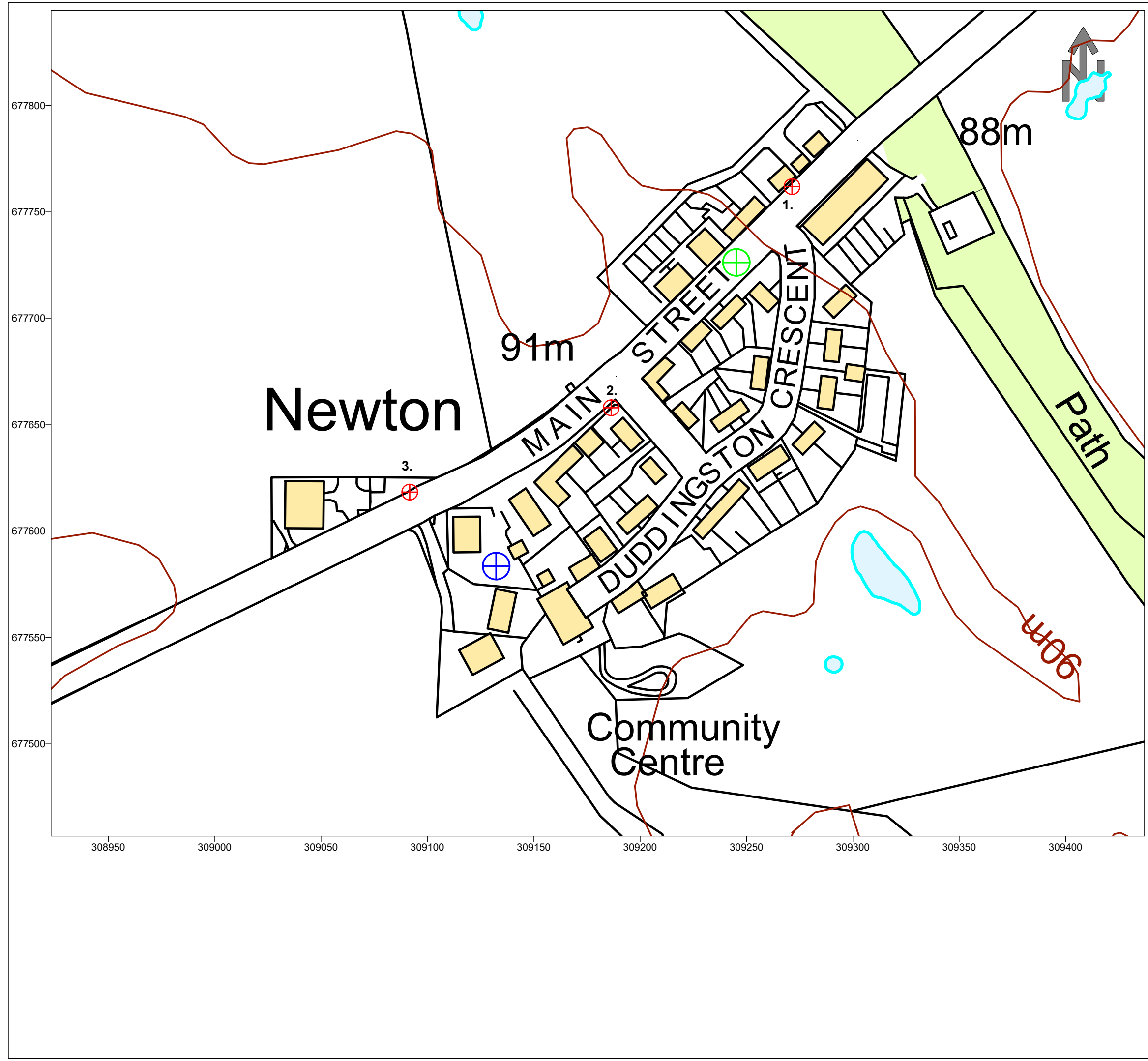




Figures

Figure 1 - Survey Locations

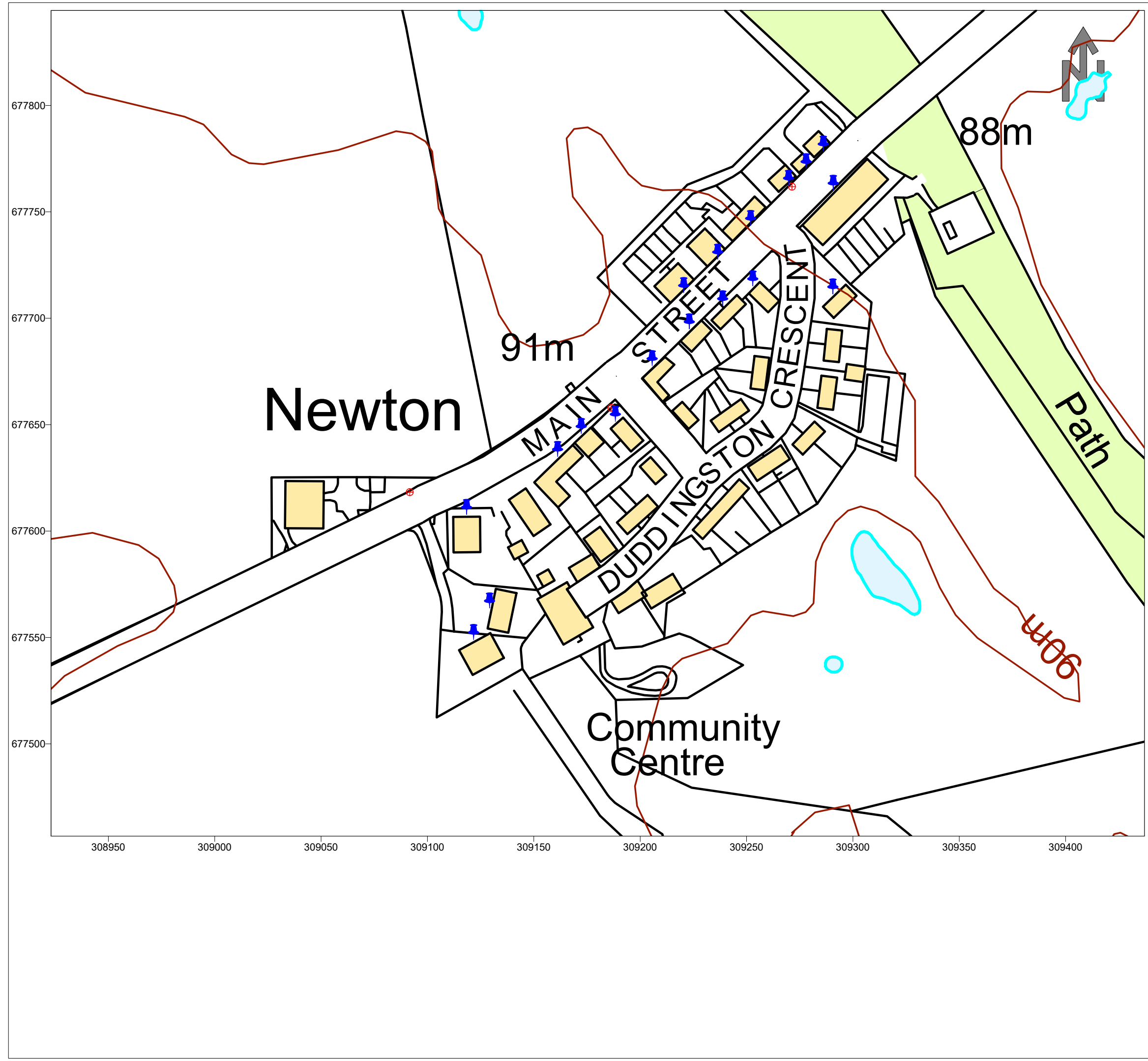
-  baseline noise survey
-  weather station
-  ATC



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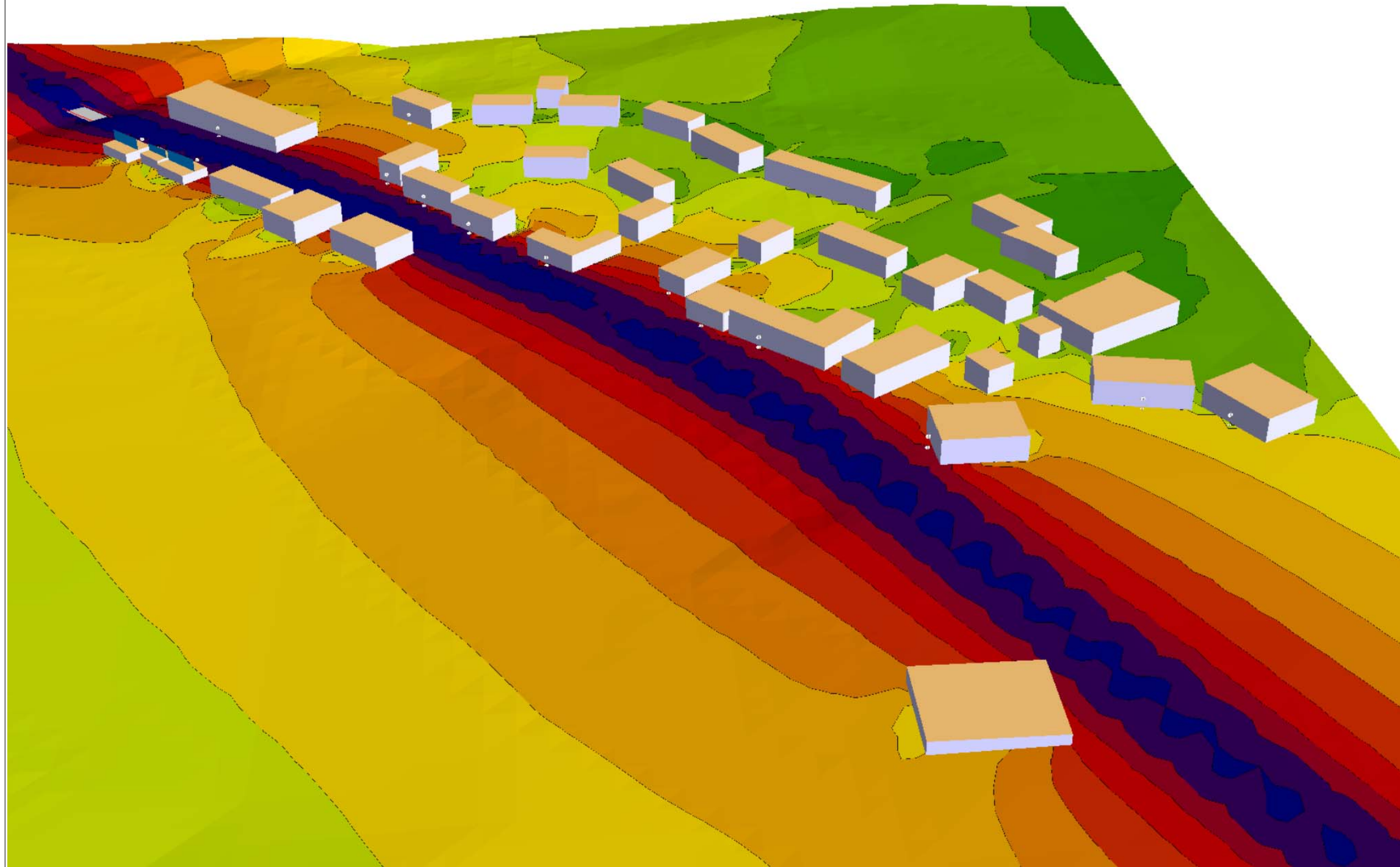
Figure 2 - Receptors

-  baseline noise survey
-  noise-sensitive receptor considered in prediction model



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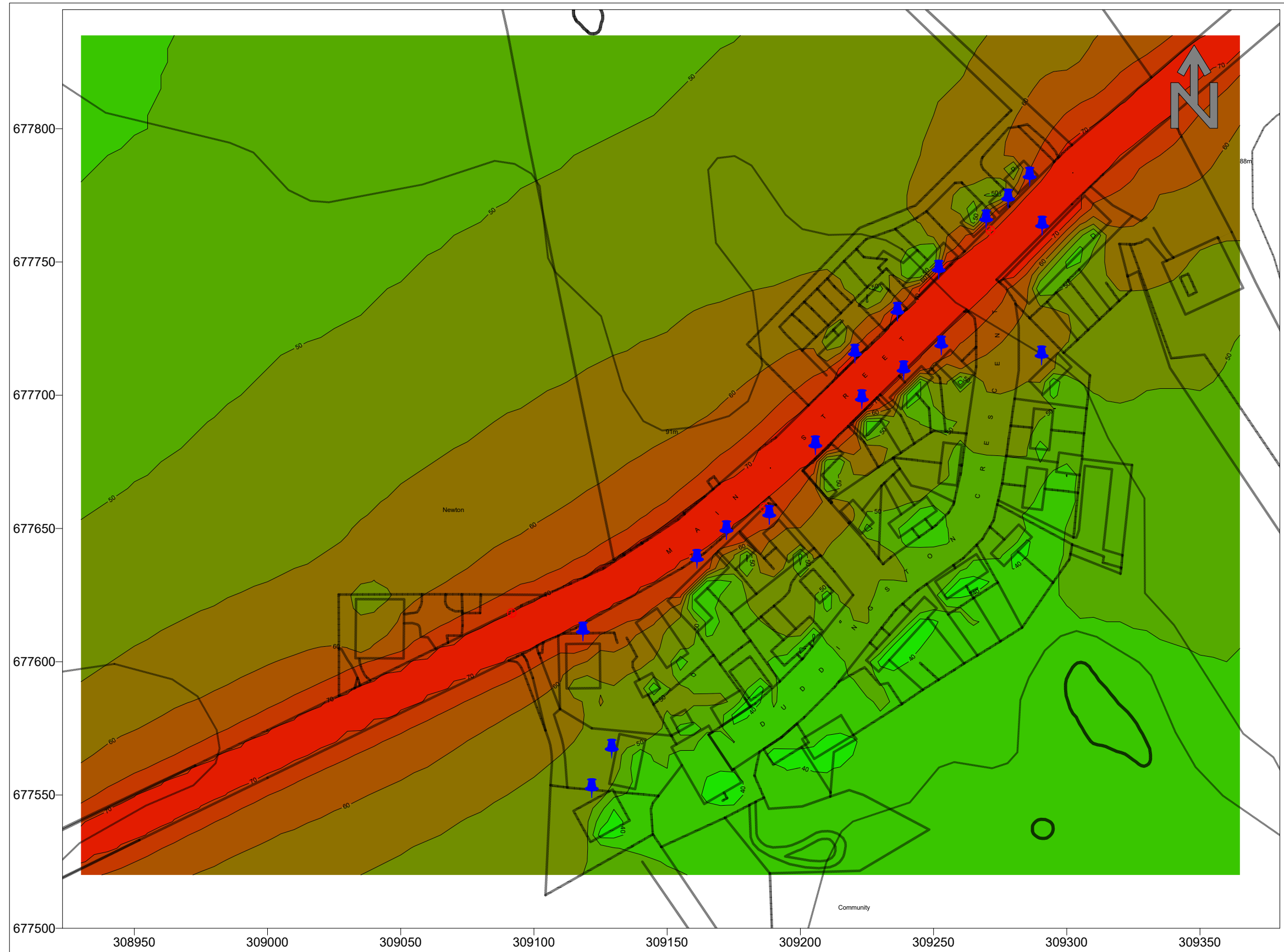
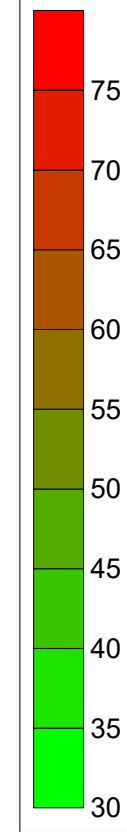
Figure 3 - Model Layout



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Figure 4.1 - Scenario 2

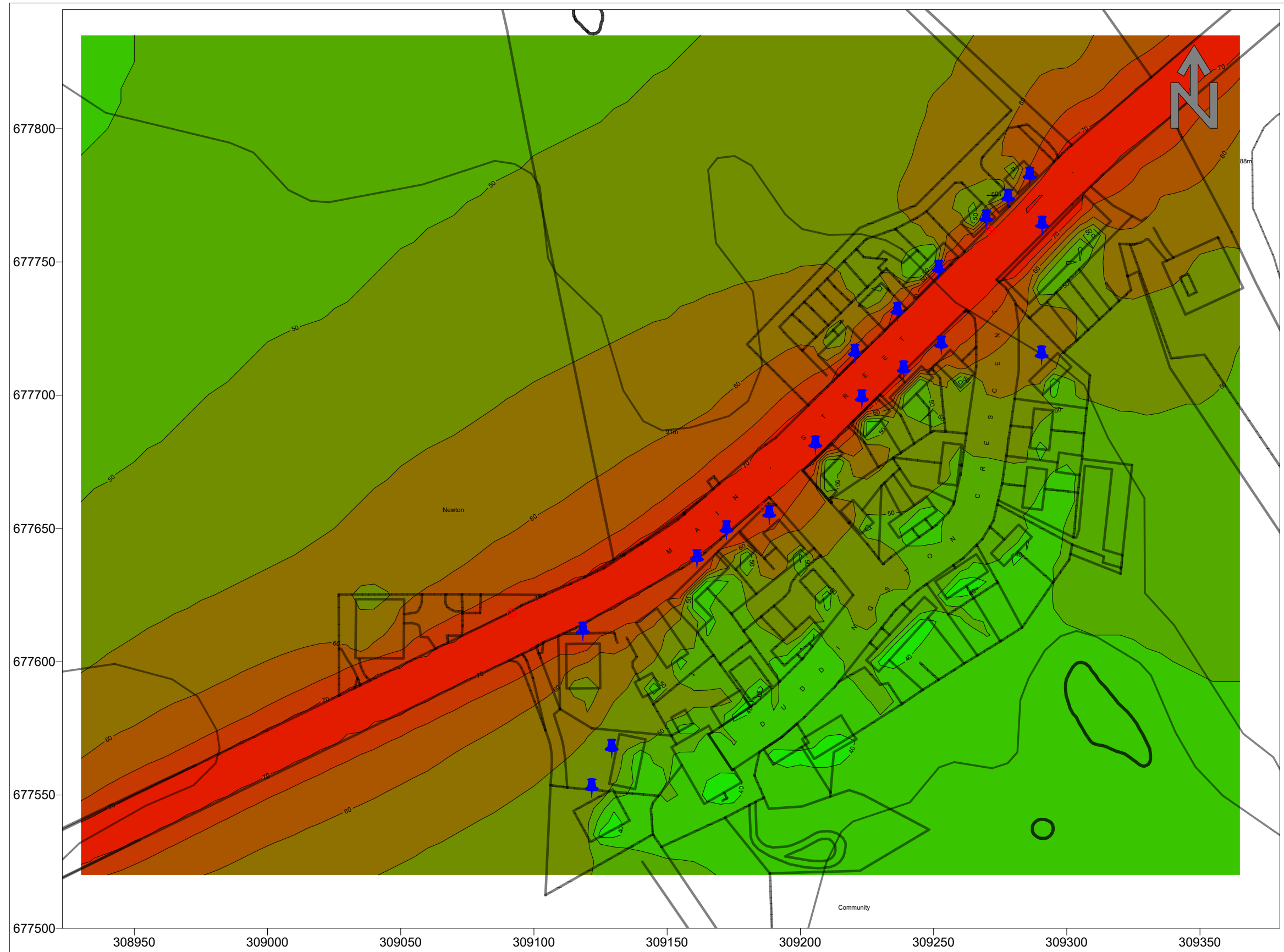
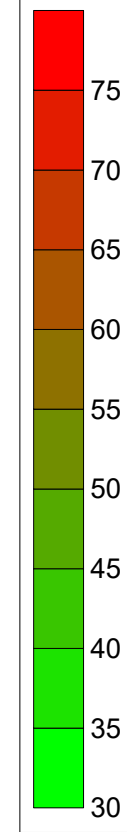
Prediction Model
Soundplan 8.2
Road Traffic
Model includes existing buildings
Prediction CRTN
Topography based on OS data
Prediction grid 5m
contours dB LA_{eq} 07:00 - 23:00
1.5m above ground level
units = dB LA_{eq} daytime



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Figure 4.2 - Scenario 3

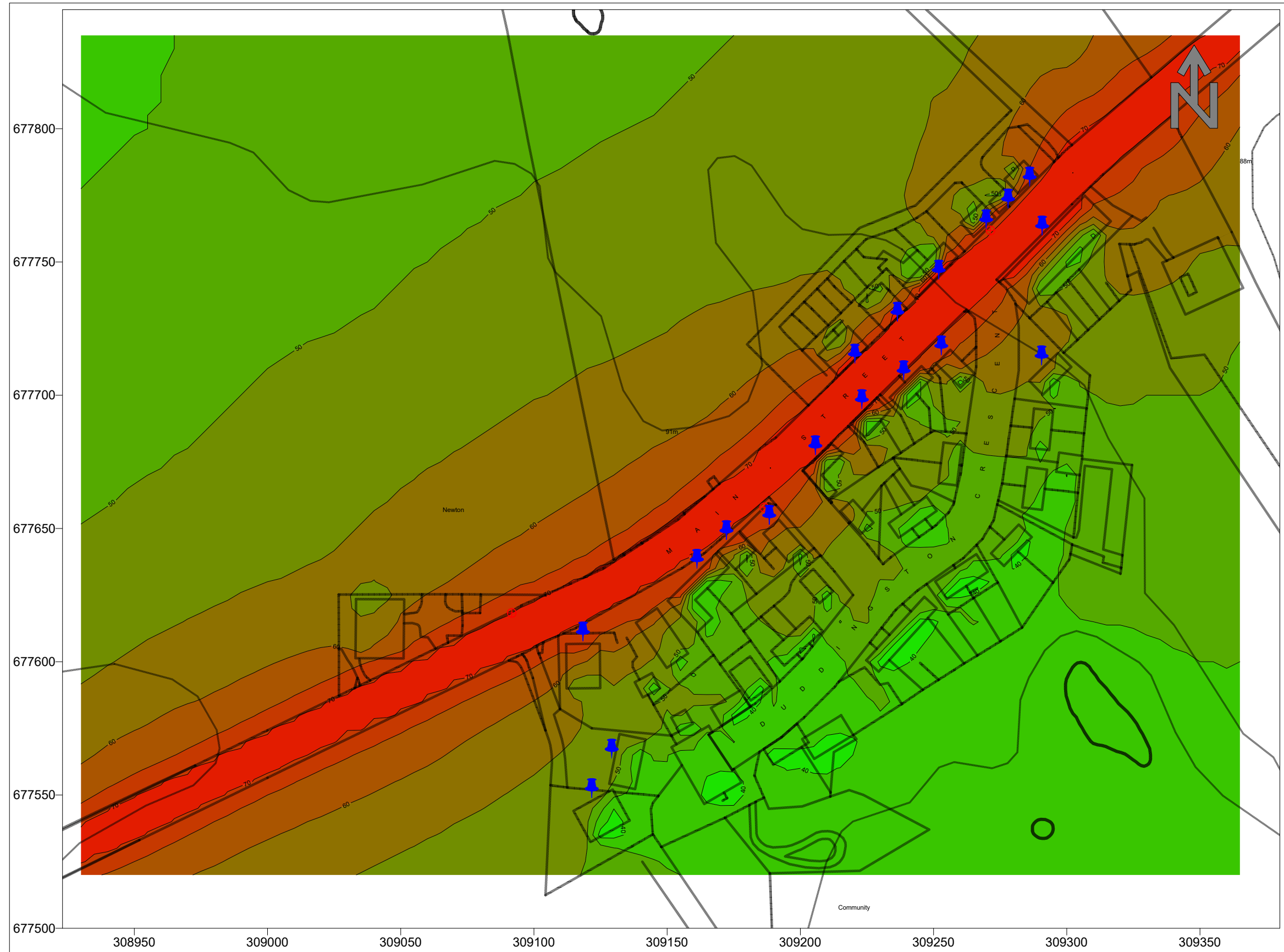
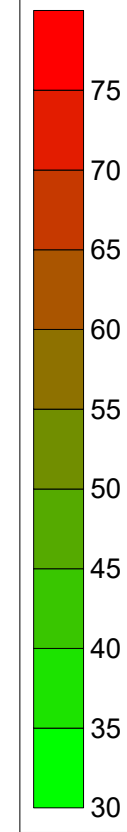
Prediction Model
Soundplan 8.2
Road Traffic
Model includes existing buildings
Prediction CRTN
Topography based on OS data
Prediction grid 5m
contours dB LA_{eq} 07:00 - 23:00
1.5m above ground level
units = dB LA_{eq} daytime



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Figure 4.3 - Scenario 4

Prediction Model
Soundplan 8.2
Road Traffic
Model includes existing buildings
Prediction CRTN
Topography based on OS data
Prediction grid 5m
contours dB LA_{eq} 07:00 - 23:00
1.5m above ground level
units = dB LA_{eq} daytime

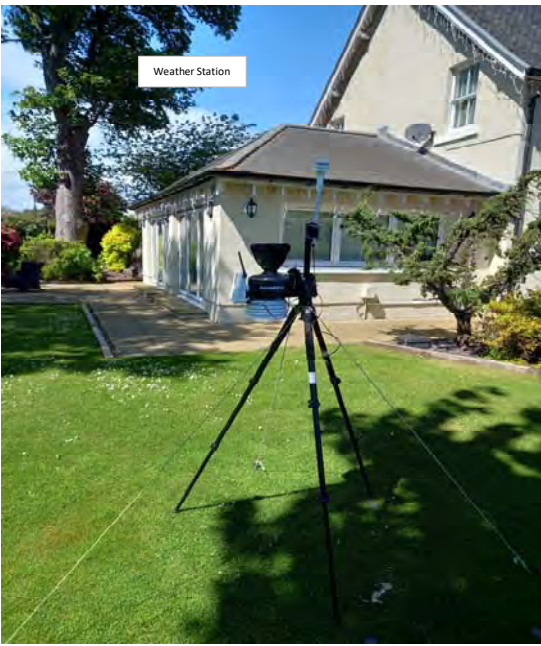
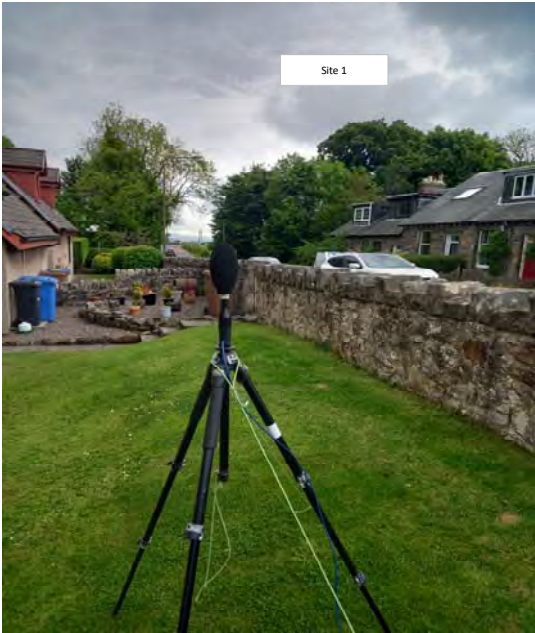


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Appendix 1 – Baseline Survey

Noise Survey

Project Number:	AS 0910	Project Name:	Newton
Log Book Number:	115		
Site No:	1	Start Date / Time:	Thursday 26th May 2022; 11:00
Location :	18, Main Street	End Date / Time:	Thursday 2nd June 2022; 09:30
Norsonic Nor-140 Sound Level Meter 6		Serial No.	1406914
Norsonic Nor-1251 Acoustic Calibrator B		Serial No.	34961
Norsonic Nor-1225 Microphone		Serial No.	212990
Norsonic Nor-1217 Outdoor Protection Kit		Serial No.	12175403
Calibration Factor 113.8		Calibration End:	113.8
Site No:	2	Start Date / Time:	Thursday 26th May 2022; 11:00
Location :	2, Duddingston Terrace	End Date / Time:	Thursday 2nd June 2022; 09:30
Norsonic Nor-140 Sound Level Meter 5		Serial No.	1406913
Norsonic Nor-1251 Acoustic Calibrator B		Serial No.	34961
Norsonic Nor-1225 Microphone		Serial No.	208201
Norsonic Nor-1217 Outdoor Protection Kit		Serial No.	12175402
Calibration Factor 113.8		Calibration End:	113.8
Site No:	3	Start Date / Time:	Wednesday 1st June 2022; 10:00
Location :	Gallows View	End Time:	13:00
Norsonic Nor-140 Sound Level Meter 7		Serial No.	1405074
Norsonic Nor-1251 Acoustic Calibrator B		Serial No.	34961
Gras 40AF Microphone		Serial No.	114655
Norsonic Nor-1217 Outdoor Protection Kit		Serial No.	12175404
Calibration Factor 113.8		Calibration End:	113.8
Weather Station		Start Date / Time:	Thursday 26th May 2022; 12:00
1590-PK-020	Built in Temperature Gauge and Barometer		
Weathermaster	Rain Gauge and Anemometer attachments		



Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, GB-CM6 1HD
 Phone 01371 871030

**Certificate of Calibration and Conformance**Certificate number: **U39703**Test Object: **Sound Calibrator**Producer: **Norsonic AS.**Type: **1251**Serial number: **34961**Customer: **The Airshed Ltd**

Address: **5 Lauder Place, East Linton,
 East Lothian. EH40 3DB.**

Contact Person: **Hilary Fraser**Order No: **AS 21-22**

Measurement Results	Level dB	Level Stability dB	Frequency Hz	Distortion %
Measurement 1	114.00	0.06	1000.54	<0.3
Measurement 2	114.00	0.06	1000.55	<0.3
Measurement 3	114.00	0.06	1000.55	<0.3
Result (Average):	114.00	0.06	1000.55	<0.3
Expanded Uncertainty:	0.1	0.02	1	0.1
Degree of Freedom:	>100	>100	>100	>100
Coverage Factor:	2	2	2	2

The stated level is relative to 20µPa. The level is traceable to National Standards. The stated level is valid at reference conditions. The following correction factors have been applied during the measurement

Pressure: 0.0005 dB/kPa Temperature: 0.003 dB/°C Humidity: 0 dB/%RH Load volume: 0.0003 dB/mm³

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.054 ±0.046	22.1 ±0.2	35.5 ±1.0

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\2021\NOR1251_34961_M2.nmf

Preconditioning

The equipment was preconditioned for more than 4 hours in the specified calibration environment.

Method

Calibration has been performed as set out in the current version of CA Technical procedure TP01

Calibration Dates:

Received date:	30/11/2021	Reviewed date:	10/12/2021
Calibration date:	10/12/2021	Issued date:	10/12/2021

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan B.Eng(Hons), M.Sc*

Reviewed by: *Darren Batten*

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Certificate of Calibration and Conformance

Continuation of Certificate number: U39703

Reference Microphone: WSM5 - B&K4192-2496459

Measurements

The calibrator has been tested as described in the following annexes to BS EN IEC60942:2003 Sound Calibrators; B3.4 for sound pressure level, B3.5 for frequency, B3.6 for total distortion and A4.4 for short term stability of the pressure level.

Instruments and Program

A complete list of instruments, hardware and software that have been used for this calibration is available from the calibration laboratory

Comments

Level adjusted from 114.21dB.

Statement of Conformance and Calibration

As public evidence was available*, from a testing organisation responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in annex A of BS EN IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of that BS EN IEC 60942:2003.

*This evidence is held on file at the calibration laboratory.

Notes:

The sound pressure level generated by the calibrator in its ½ inch configuration was measured five times and averaged by a WS2P working standard microphone for class 1 or 2 devices or a LS2P reference microphone for class 0 or LS devices as specified in the International Standard BS EN 61094-4. The results of three replications and the mean of the measurements obtained are given in the measurement results table of this certificate. The frequency and distortion were measured in a similar manner. The figures in BOLD are the final results; a small correction factor may need to be added to the sound pressure level quoted here if the device is used to calibrate a sound level meter that is fitted with a free field response microphone. See manufacturer's handbooks for full details of this and other corrections that may be applicable.

Observations:

Decision Rule:

The decision rules have been applied in accordance with the procedure as described in BS EN 60942:2003

This certificate relates only to the items tested above.

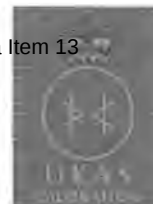
** End of Certificate **

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
www.campbell-associates.co.uk
Phone 01371 871030 Facsimile 01371879106



CALIBRATION



0789

Certificate of Calibration and Conformance

Certificate number: U37646

Test object: Sound Level Meter, BS EN IEC 61672-1:2013 Class 1 (Precision)
Producer : Norsonic
Type : 140
Serial No.: 1406913
Customer: The Airshed Ltd
Address: 5 Lauder Place
East Linton
EH40 3DB
Contact Person: Hilary Fraser

Method :

Calibration has been performed as set out in CA Technical Procedures TP01 & 02 as appropriate. These are based on the procedures for periodic verification of sound level meters as set out in BS EN IEC 61672-3:2013. Results and conformance statement are overleaf and detailed results are in the attached Test Report.

Tested

	Producer:	Type:	Serial No:	Certificate number
Microphone	Norsonic	1225	208201	37645
Calibrator*	Norsonic	1251	34961	U37644
Preamplifier	Norsonic	1209A	21061	Included

Additional items that also have been submitted for verification

Wind shield -
Attenuator -
Extension cable -

These items have been taken into account wherever appropriate.

Instruction manual: Im140_1Ed8R0En Firmware version: v4.0.1430 The test object is a single channel instrument.

Conditions	Pressure	Temperature	Humidity
Reference conditions:	101.325 kPa	23.0 °C	50 %RH
Measurement conditions:	102.68 ±0.05 kPa	23.3 ±0.3 °C	37.6 ±0.7 %RH

Date received for calibration: 24/03/2021
Date of calibration: 14/04/2021
Date of issue: 14/04/2021
Engineer


Markus Cross

Supervisor


Darren Batten Tech IOA

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.
*The sound calibrator was complete with the coupler specified in the instruction manual for the sound calibrator and the sound level meter as appropriate for the coupling of the microphone provided to the specified sound calibrator.

Certificate of Calibration and Conformance

UKAS Laboratory Number 0789

Certificate number: U37646

Conformance

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to BS EN IEC 61672-1:2013 and similarly that the associated sound calibrator conforms to BS EN IEC 60942.

Statement of conformance

The sound level meter submitted for testing has successfully completed the periodic tests of BS EN IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available¹, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with BS EN IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in BS EN IEC 61672-1:2013, and that the sound level meter submitted for testing conforms to the class 1 specifications of BS EN IEC 61672-1:2013.

¹ This evidence is held on file at the calibration laboratory

Summary of Measurement Results

Indication at the calibration check frequency - IEC 61672-3 Ed.2 Clause 10	Passed
Self-generated noise - IEC 61672-3 Ed.2.0 Clause 11.2	Passed
Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.2.0 Clause 12	Passed
Electrical signal tests of frequency weightings - IEC 61672-3 Ed.2.0 Clause 13	Passed
Frequency weightings: A Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency weightings: C Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency weightings: Z Network - IEC 61672-3 Ed.2.0 Clause 13.3	Passed
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.2.0 Clause 14	Passed
Level linearity on the reference level range - IEC 61672-3 Ed.2.0 Clause 16	Passed
Toneburst response - IEC 61672-3 Ed.2.0 Clause 18	Passed
Peak C sound level - IEC 61672-3 Ed.2.0 Clause 19	Passed
Overload indication - IEC 61672-3 Ed.2.0 Clause 20	Passed
High level stability test - IEC 61672-3 Ed.2.0 Clause 21	Passed
Long term stability test - IEC 61672-3 Ed.2.0 Clause 15	Passed

Comment

Correct level with associated calibrator is 113.9dB(A).

Observations

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements. Details of the uncertainty for each measurement are available from the Calibration Laboratory upon request. Details of the sources of corrections and their associated uncertainties that relate to this verification are contained within the test report accompanying this certificate.

Calibration Report

Certificate No.:37645

Manufacturer: Norsonic
Type: 1225
Serial no: 208201

Customer: The Airshed Ltd
Address: 5 Lauder Place
 East Linton
 EH40 3DB
Contact Person: Hilary Fraser

Measurement Results:

	Sensitivity: (dB re 1V/Pa)	Capacitance: (pF)
1:	-25.72	22.4
2:	-25.67	22.4
3:	-25.66	22.4
Result (Average):	-25.69	22.4
Expanded Uncertainty:	0.13	1.00
Degree of Freedom:	28	>100
Coverage Factor:	2.13	2.00

The following correction factors have been applied during the measurement:
 Pressure:-0.001 dB/kPa Temperature:-0.005 dB/°C Relative humidity:0.000 dB/%RH

Reference Calibrator: WSC2 - GRAS42AA-18277 Volume correction: 0.000 dB
 Records:K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\2021\NOR1225_208201_M1.nmf
 Measurement procedure: TP05

All results quoted are directly traceable to National Physical Laboratory, London

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which for a normal distribution corresponds to coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA publication EA-4/02.

Comment:

Environmental conditions:

Pressure: 102.499 $\pm$ 0.043 kPa Temperature: 22.7 $\pm$ 0.1 °C Relative humidity: 35.7 $\pm$ 0.8 %RH

Date of calibration: 13/04/2021

Date of issue: 13/04/2021

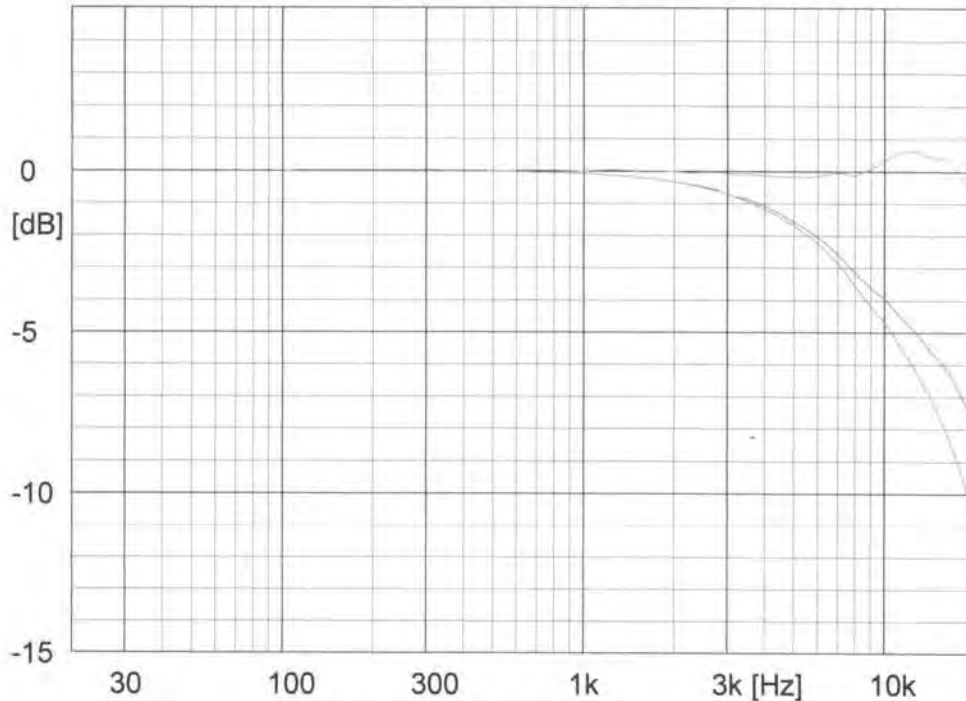
Supervisor : Darren Batten TechIOA
 Engineer :



Markus Cross
 Software version: 6.0h


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Microphone Calibration Certificate

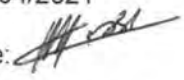


Norsonic Agenda Item 13

Type: 1225

Serial no: 208201

Sensitivity: 51.97 mV/Pa
-25.69 $\pm$ 0.13 dB re. 1 V/Pa
Capacitance: 22.4 $\pm$ 1.0 pF
Date: 13/04/2021

Signature: 

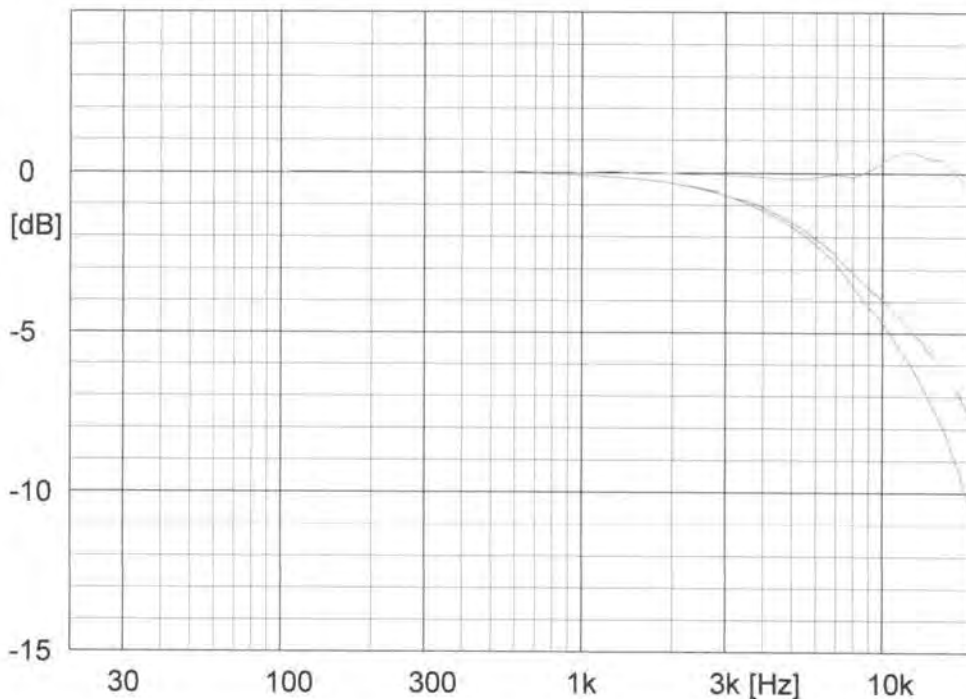
Measurement conditions:
Polarisation voltage: 200.0 V
Pressure: 102.50 $\pm$ 0.04 kPa
Temperature: 22.7 $\pm$ 0.1 $^{\circ}$ C
Relative humidity: 35.7 $\pm$ 0.8 %RH
Results are normalized to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

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Microphone Calibration Certificate

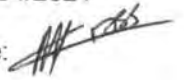


Norsonic

Type: 1225

Serial no: 208201

Sensitivity: 51.97 mV/Pa
-25.69 $\pm$ 0.13 dB re. 1 V/Pa
Capacitance: 22.4 $\pm$ 1.0 pF
Date: 13/04/2021

Signature: 

Measurement conditions:
Polarisation voltage: 200.0 V
Pressure: 102.50 $\pm$ 0.04 kPa
Temperature: 22.7 $\pm$ 0.1 $^{\circ}$ C
Relative humidity: 35.7 $\pm$ 0.8 %RH
Results are normalized to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

Campbell Associates

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Comment:

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, GB-CM6 1HD
 Phone 01371 871030

**Certificate of Calibration**Certificate number: **U39705**Test Object: **Sound Level Meter, BS EN IEC 61672-1:2013 Class 1**

Producer: **Norsonic AS.**
 Type: **140**
 Serial number: **1406914**
 Customer: **The Airshed Ltd**
 Address: **5 Lauder Place, East Linton,
 East Lothian, EH40 3DB.**
 Contact Person: **Hilary Fraser**
 Order No: **AS 21-22**

Introduction:

Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

Tested:	Producer	Type	Serial No	Certificate No
Microphone	Norsonic	1225	212990	39704
Calibrator*	Norsonic	1251	34961	U39703
Preamplifier	Norsonic	1209	21121	Included

* The calibrator was complete with any required coupler for the microphone specified.

Additional items that have also been submitted for verification:

Wind shield Norsonic Nor1451 (ø 60mm)

Attenuator -

Extension cable Norsonic Nor1410A/2M

These items have been taken into account wherever appropriate.

Instruction Manual: Im140_1Ed8R0En Firmware Version: v4.0.1282 The test object is a single channel instrument.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.13 ±0.03	21.88 ±0.6	35.78 ±0.7

Calibration Dates:

Received date:	30/11/2021	Reviewed date:	10/12/2021
Calibration date:	10/12/2021	Issued date:	10/12/2021

Technicians: (Electronic certificate)

Calibrated by: **Palaniivel Marappan B.Eng (Hons), M.Sc**

Reviewed by: **Darren Batten**

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Certificate of Calibration

Continuation of Certificate number: **U39705**

The statements of conformance and observation notes detailed in this certificate are made with reference to the following standards in respect of the calibration of the test object.

Manufactured:	BS EN IEC 61672-1:2013
Periodic Tests:	BS EN IEC 61672-3:2013
Pattern Evaluation:	Not Applicable

Conformance:

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to the listed standard and similarly that the associated sound calibrator conforms to the BS EN IEC 60942 standard.

Measurement Summary:

Indication at the calibration check frequency - IEC 61672-3 Ed.2.0 #10	Passed
Self-generated noise - IEC 61672-3 Ed.2.0 #11.2	Passed
Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.2.0 #12	Passed
Electrical signal tests of frequency weightings - IEC 61672-3 Ed.2.0 #13	Passed
Frequency weightings: A Network - IEC 61672-3 Ed.2.0 #13.3	Passed
Frequency weightings: C Network - IEC 61672-3 Ed.2.0 #13.3	Passed
Frequency weightings: Z Network - IEC 61672-3 Ed.2.0 #13.3	Passed
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.2.0 #14	Passed
Level linearity on the reference level range - IEC 61672-3 Ed.2.0 #16	Passed
Toneburst response - IEC 61672-3 Ed.2.0 #18	Passed
Peak C sound level - IEC 61672-3 Ed.2.0 #19	Passed
Overload indication - IEC 61672-3 Ed.2.0 #20	Passed
High level stability test - IEC 61672-3 Ed.2.0 #21	Passed
Long term stability test - IEC 61672-3 Ed.2.0 #15	Passed

Comments

Correct level with associated calibrator is 113.8dB(A). Case reflections have been excluded as tests were made with a microphone extension cable.

Statement of Conformance

The sound level meter submitted for testing has successfully completed the periodic tests for the environmental conditions under which the tests were performed. However, no general statement of conclusion can be made about conformance of the sound level meter to the full requirements of the manufactured standard because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in the manufacturer's standard and because the periodic tests completed cover only a limited subset of the specifications in the relevant standard

Observations

Decision Rule

The decision rules will be applied in accordance with the procedure as described in BS EN 61672-3:2013.

This certificate relates only to the items tested above.

**** End of Certificate ****

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, GB-CM6 1HD
 Phone 01371 871030

**Certificate of Calibration**Certificate number: **39704**Test Object: **Measurement Microphone**Producer: **Norsonic AS.**Type: **1225**Serial number: **212990**Customer: **The Airshed Ltd**

Address: **5 Lauder Place, East Linton,
 East Lothian. EH40 3DB.**

Contact Person: **Hilary Fraser**Order No: **AS 21-22**

Measurement Results	Sensitivity (dB re 1V/Pa)	Sensitivity (mV/Pa)	Capacitance (pF)
Measurement 1	-25.43	53.52	23.85
Measurement 2	-25.43	53.52	23.87
Measurement 3	-25.43	53.50	23.86
Result (Average):	-25.43	53.51	23.86
Expanded Uncertainty:	0.10		1.00
Degree of Freedom:	>100		>100
Coverage Factor:	2		2

The stated sensitivity is the pressure sensitivity at 250Hz, S_{250} , and is valid at reference conditions. The following correction factors have been applied during the measurement:

Pressure:uncertainty dB/kPa Temperature:-0.005 dB/°C Humidity:0 dB/%RH

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.079 ± 0.047	22.0 ± 0.2	35.6 ± 0.8

The calibration test report shown on the next page gives details of the response at other frequencies relative to this 250 Hz reference sensitivity. Results ≥100 Hz are obtained using an electrostatic actuator as described in BS EN 61094-6 and those below 100 Hz are obtained in a reference pressure chamber. Detailed results are available from the calibration laboratory upon request.

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of $k=2$, providing a coverage probability of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level.

Calibration Dates:

Received date:	30/11/2021	Reviewed date:	10/12/2021
Calibration date:	10/12/2021	Issued date:	10/12/2021

Technicians: (Electronic certificate)Calibrated by: **Palanivel Marappan BEng(Hons), MSc**Reviewed by: **Darren Batten**

This certificate is issued in accordance with the CA Quality Management system. It provides traceability of measurement to recognized national standards, and to the units of measurement realized at the National Physical Laboratory or other recognized national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Certificate of Calibration

Continuation of Certificate number: **39704**

Reference Calibrator: WSC2 - GRAS42AA-18277

Measurement Record: K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\NOR1225_212990_M1.nmf

Preconditioning

The equipment was preconditioned for more than 12 hours at the specified calibration temperature and humidity.

Instruments and Program

A complete list of instruments, hardware and software that have been used for this calibration is available from the calibration laboratory

Traceability

The measured values for sound pressure, frequency, voltage, capacitance, temperature, humidity and ambient pressure are traceable to an accredited national physical laboratory.

Observations

The differences between the two results at 100 Hz are within normal limits bearing in mind the different test methods and are taken into account in arriving at the uncertainties of measurement.

Method of Calibration

The open circuit sensitivity of the microphone has been determined at 250 Hz against a reference laboratory standard measurement microphone by insert voltage techniques using a laboratory standard sound calibrator as a transfer standard. The electrostatic actuator frequency response was then obtained for frequencies above 100 Hz as described in BS EN IEC 61094-6. In addition, where requested the optional free field frequency response over the range 2 – 100 Hz has been obtained using a pressure chamber; in this case the reference frequency is 100 Hz. All of these results and their associated uncertainties are detailed in the table on page 3 of this certificate. See the observations field below for details of any discrepancies between the 100 Hz results obtained via the electrostatic actuator and pressure chamber.

The overall uncertainty at any frequency $\sigma_{\text{Combined},Fn}$ may be obtained by combining the uncertainty of the open circuit sensitivity σ_{S250} with the uncertainty of the actuator / or LF pressure response at any other frequency $\sigma_{\text{Act},Fn}$ where Fn is the uncertainty at the frequency of interest using the relationship:

$$\sigma_{\text{Combined},Fn} = 2\sqrt{(\sigma_{S250}^2 + \sigma_{\text{Act},Fn}^2)}$$

Appendix to this certificate

Where data is available from the microphone manufacturer to correct the actuator / pressure frequency response to obtain the random incidence and / or free field response it is shown in the appendix to this certificate. The uncertainty information relating to these corrections is the responsibility of the microphone manufacturer and when it is available the total uncertainty for the corrected frequency response at each point may then be obtained by including the correction uncertainty in the root-sum-square formula given above. These responses are outside the UKAS accredited scope, but are provided for information.

Observations

Certificate of Calibration

Continuation of Certificate number: 39704

Numerical Results for Relative Frequency Response

Actuator Results					
Freq	Actuator	Uncert.	Freq	Actuator	Uncert.
Hz	dB re 250 Hz	dB	Hz	dB re 250 Hz	dB
100.0	0.02	0.21	5,010.70	-2.19	0.24
112.2	0.02	0.21	5,622.00	-2.57	0.24
125.9	0.01	0.21	6,307.90	-2.98	0.24
141.3	0.01	0.21	7,077.50	-3.44	0.24
158.5	0.01	0.21	7,940.90	-3.92	0.24
177.9	0.00	0.21	8,909.70	-4.62	0.48
199.6	-0.01	0.21	9,996.70	-5.36	0.48
223.9	-0.01	0.21	11,216	-6.33	0.48
251.2	Ref	0.21	12,585	-6.82	0.48
281.9	-0.03	0.21	14,120	-7.33	0.48
316.3	-0.04	0.21	15,843	-7.81	0.48
354.9	-0.04	0.21	17,775	-8.76	0.70
398.2	-0.06	0.21	19,944	-9.86	0.70
446.7	-0.06	0.21	22377		0.90
501.2	-0.07	0.21	25107		0.90
562.4	-0.08	0.21	28170		0.90
631.0	-0.10	0.21	31607		0.90
708.0	-0.11	0.21	35463		0.90
794.4	-0.13	0.21	39790		0.90
891.3	-0.14	0.21	44644		0.90
1000.0	-0.16	0.21	50091		0.90
1122.0	-0.18	0.21	56202		1.20
1258.9	-0.21	0.21	63058		1.20
1412.5	-0.26	0.21	70752		1.20
1584.8	-0.32	0.21	79383		1.20
1778.1	-0.43	0.21	89068		1.20
1995.1	-0.51	0.21	99934		1.20
2238.5	-0.62	0.21	112126		-
2511.6	-0.74	0.21	125806		-
2818.0	-0.90	0.21	141154		-
3161.8	-1.09	0.21	158375		-
3547.5	-1.31	0.21	177696		-
3980.3	-1.56	0.21	199375		-
4465.9	-1.86	0.24	-		-

Low Frequency		
Freq	dB re	Uncert.
Hz	100 Hz	dB
2.0		0.7
2.2		0.7
2.5		0.7
2.8		0.7
3.2		0.7
3.6		0.7
4.0		0.7
4.5		0.7
5.0		0.7
5.6		0.7
6.3		0.7
7.1		0.7
8.0		0.7
8.9		0.7
10.0		0.7
11.2		0.7
12.6		0.7
14.1		0.7
15.9		0.7
17.8		0.7
20.0		0.7
22.4		0.7
25.1		0.7
28.2		0.7
31.6		0.7
35.5		0.7
39.8		0.7
44.7		0.7
50.1		0.7
56.3		0.7
63.1		0.7
70.8		0.7
79.5		0.7
89.2		0.7
100.0	Ref	0.7

Certificate of Calibration

Continuation of Certificate number: 39704

Appendix to certificate (not accredited). Random and Free Field Corrected Data

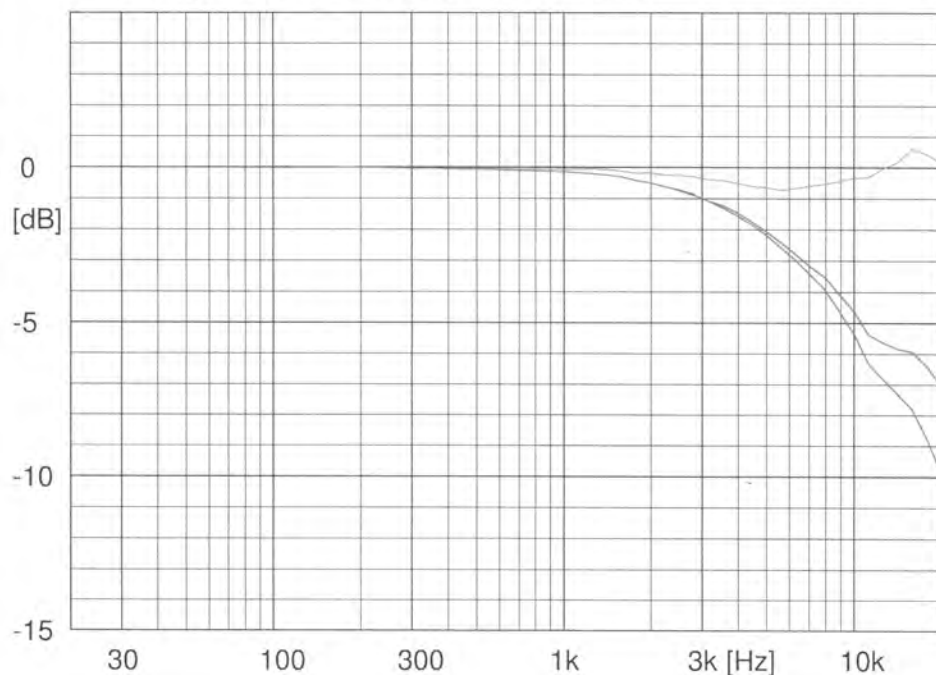
Corrected results, dB re 250 Hz					
Freq Hz	Random incidence corrected	Free field corrected	Freq Hz	Random incidence corrected	Free field corrected
100	0.02	0.02	5,010.70	-2.08	-0.66
112.2	0.02	0.02	5,622.00	-2.40	-0.72
125.9	0.01	0.01	6,307.90	-2.78	-0.67
141.3	0.01	0.01	7,077.50	-3.18	-0.60
158.5	0.01	0.01	7,940.90	-3.52	-0.53
177.9	0.00	0.00	8,909.70	-4.08	-0.45
199.6	-0.01	-0.01	9,996.70	-4.63	-0.35
223.9	-0.01	-0.01	11,216	-5.39	-0.34
251.2	-0.02	-0.02	12,585	-5.64	-0.04
281.9	-0.03	-0.03	14,120	-5.85	0.15
316.3	-0.04	-0.04	15,843	-5.94	0.59
354.9	-0.04	-0.04	17,775	-6.41	0.41
398.2	-0.06	-0.05	19,944	-7.01	0.15
446.7	-0.06	-0.05	22,377		
501.2	-0.07	-0.06	25,107		
562.4	-0.08	-0.06	28,170		
631	-0.10	-0.06	31,607		
708	-0.11	-0.07	35,463		
794.4	-0.13	-0.08	39,790		
891.3	-0.14	-0.08	44,644		
1,000.00	-0.16	-0.09	50,091		
1,122.00	-0.18	-0.07	56,202		
1,258.90	-0.21	-0.05	63,058		
1,412.50	-0.26	-0.09	70,752		
1,584.80	-0.32	-0.14	79,383		
1,778.10	-0.43	-0.19	89,068		
1,995.10	-0.51	-0.19	99,934		
2,238.50	-0.62	-0.26	112,126		
2,511.60	-0.72	-0.26	125,806		
2,818.00	-0.86	-0.30	141,154		
3,161.80	-1.09	-0.41	158,375		
3,547.50	-1.23	-0.44	177,696		
3,980.30	-1.46	-0.51	199,375		
4,465.90	-1.76	-0.61	-		

The corrections used to produce these random and free field responses are published by the manufacturer and they are responsible for the accuracy of the data and for the associated uncertainties to be applied. Campbell Associates Limited use their best endeavours to ensure the accuracy of this data but are not responsible for any errors, omissions or for ensuring that the data is of the current issue.

If the actuator response was not measured for any frequency, then the corresponding cell in the above table will be blank; similarly, if correction data is not available from the manufacturer the cell will also be blank. Correction data for frequencies below 100 Hz are not required

** End of Table Section **

Microphone Calibration Certificate



Norsonic
Type: 1225

Serial no: 212990

Sensitivity: 53.51 mV/Pa
 -25.43 ± 0.10 dB re. 1 V/Pa
 Capacitance: 23.9 ± 1.0 pF
 Date: 10/12/2021

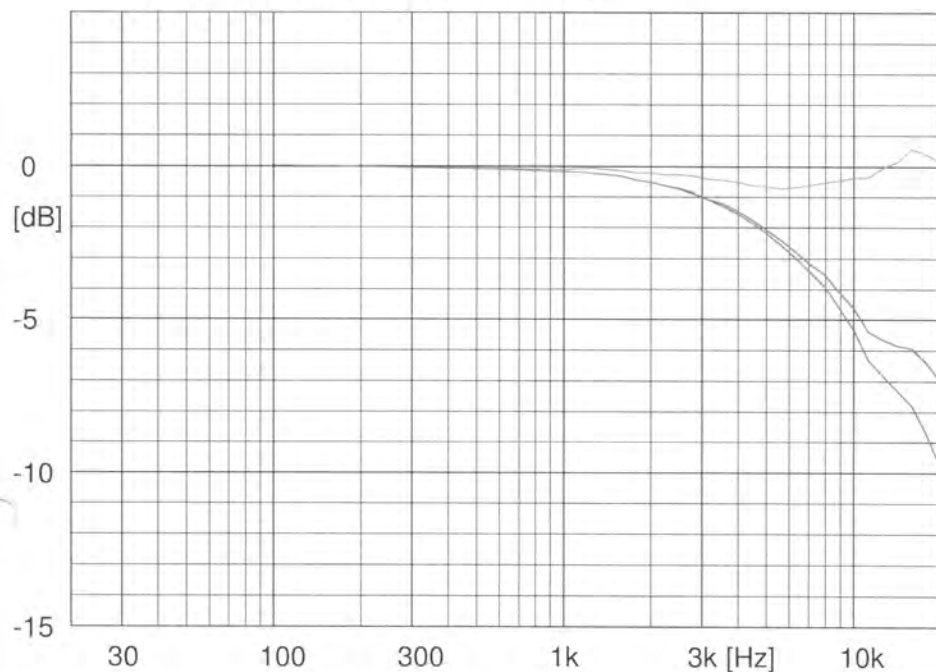
Signature:

Measurement conditions:
 Polarisation voltage: 200.0 V
 Pressure: 99.08 ± 0.05 kPa
 Temperature: 22.0 ± 0.2 °C
 Relative humidity: 35.6 ± 0.8 %RH
 Results are normalized to the reference conditions.

Free field response
 Diffuse field response
 Pressure (Actuator) response

Campbell Associates
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Microphone Calibration Certificate



Norsonic
Type: 1225

Serial no: 212990

Sensitivity: 53.51 mV/Pa
 -25.43 ± 0.10 dB re. 1 V/Pa
 Capacitance: 23.9 ± 1.0 pF
 Date: 10/12/2021

Signature:

Measurement conditions:
 Polarisation voltage: 200.0 V
 Pressure: 99.08 ± 0.05 kPa
 Temperature: 22.0 ± 0.2 °C
 Relative humidity: 35.6 ± 0.8 %RH
 Results are normalized to the reference conditions.

Free field response
 Diffuse field response
 Pressure (Actuator) response

Campbell Associates
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Comment:

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, GB-CM6 1HD
 Phone 01371 871030

**Certificate of Calibration and Conformance**Certificate number: **U38655**Test Object: **Sound Level Meter, BS EN IEC 61672-1:2003 Class 1**

Producer: **Norsonic**
 Type: **140**
 Serial number: **1405074**
 Customer: **The Airshed Ltd**
 Address: **5 Lauder Place, East Linton,
 East Lothian. EH40 3DB.**
 Contact Person: **Hilary Fraser**
 Order No: **AS 21-08**

Introduction:

Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

Tested:	Producer	Type	Serial No	Certificate No
Microphone	GRAS	40AF	114655	38654
Calibrator*	Norsonic	1251	31060	U37894
Preamplifier	Norsonic	1209	21254	included

* The calibrator was complete with any required coupler for the microphone specified.

Additional items that have also been submitted for verification:

Wind shield	-	-
Attenuator	-	-
Extension cable	-	-

These items have been taken into account wherever appropriate.

Instruction Manual: Im140_1Ed8R0En. Firmware Version: v2.1.670. The test object is a single channel instrument.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.28 +/-0.03	22.73 +/-0.1	39.00 +/-1.2

Calibration Dates:

Received date:	27/07/2021	Reviewed date:	06/08/2021
Calibration date:	06/08/2021	Issued date:	06/08/2021

Technicians: (Electronic certificate)Calibrated by: *Palanivel Marappan B.Eng (Hons), M.Sc*Reviewed by: *Darren Batten*

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Certificate of Calibration and Conformance

Continuation of Certificate number: U38655

The statements of conformance and observation notes detailed in this certificate are made with reference to the following standards in respect of the calibration of the test object.

Manufactured:	BS EN IEC 61672-1:2003
Periodics Tests:	BS EN IEC 61672-3:2006
Pattern Evaluation:	BS EN IEC 61672-2:2003

Conformance:

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to the listed standard and similarly that the associated sound calibrator conforms to the BS EN IEC 60942 standard.

Measurement Summery:

Indication at the calibration check frequency - IEC61672-3 Ed.1 #9	Passed
Self-generated noise - IEC 61672-3 Ed.1 #10.2	Passed
Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.1 #11	Passed
Electrical signal tests of frequency weightings - IEC 61672-3 Ed.1 #12	Passed
Frequency weightings: A Network - IEC 61672-3 Ed.1 #12.3	Passed
Frequency weightings: C Network - IEC 61672-3 Ed.1 #12.3	Passed
Frequency weightings: Z Network - IEC 61672-3 Ed.1 #12.3	Passed
Frequency and time weightings at 1 kHz IEC 61672-3 Ed.1 #13	Passed
Level linearity on the reference level range - IEC 61672-3 Ed.1 #14	Passed
Toneburst response - IEC 61672-3 Ed.1 #16	Passed
Peak C sound level - IEC 61672-3 Ed.1 #17	Passed
Overload indication - IEC 61672-3 Ed.1 #18	Passed

Comments

Correct level with associated calibrator is 114.0dB(A).

Statement of Conformance

The sound level meter submitted has successfully completed the periodic tests of the standard listed for the environmental conditions under which the tests were performed. As public evidence(1) was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with the manufactured standard to demonstrate that the model of sound level meter fully conformed to the requirements of the said standard, the sound level meter submitted for testing conforms to the relevant class of the said standard.

(1 - evidence is held on file at the calibration laboratory)

Observations

Decision Rule

The decision rules will be applied in accordance with the procedure as described in BS EN 61672-3:2006.

This certificate relates only to the items tested above.

**** End of Certificate ****

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, GB-CM6 1HD
 Phone 01371 871030

**Certificate of Calibration**Certificate number: **38654**Test Object: **Measurement Microphone**Producer: **GRAS**Type: **40AF**Serial number: **114655**Customer: **The Airshed Ltd**

Address: **5 Lauder Place, East Linton,
 East Lothian. EH40 3DB.**

Contact Person: **Hilary Fraser**Order No: **AS 21-08**

Measurement Results	Sensitivity (dB re 1V/Pa)	Sensitivity (mV/Pa)	Capacitance (pF)
Measurement 1	-26.57	46.94	22.56
Measurement 2	-26.56	46.99	22.63
Measurement 3	-26.56	47.01	22.67
Result (Average):	-26.56	46.98	22.62
Expanded Uncertainty:	0.10		1.01
Degree of Freedom:	>100		>100
Coverage Factor:	2		2

The stated sensitivity is the pressure sensitivity at 250Hz, S_{250} , and is valid at reference conditions. The following correction factors have been applied during the measurement:

Pressure: -0.011 dB/kPa Temperature: -0.01 dB/°C Humidity: -0.001 dB/%RH

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	99.257 ± 0.043	22.8 ± 0.1	39.1 ± 0.8

The calibration test report shown on the next page gives details of the response at other frequencies relative to this 250 Hz reference sensitivity. Results ≥100 Hz are obtained using an electrostatic actuator as described in BS EN 61094-6 and those below 100 Hz are obtained in a reference pressure chamber. Detailed results are available from the calibration laboratory upon request.

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of $k=2$, providing a coverage probability of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level.

Calibration Dates:

Received date: 27/07/2021 Reviewed date: 06/08/2021
 Calibration date: 06/08/2021 Issued date: 06/08/2021

Technicians: (Electronic certificate)Calibrated by: *Palanivel Marappan BEng (Hons), MSc*Reviewed by: *Darren Batten*

This certificate is issued in accordance with the CA Quality Management system. It provides traceability of measurement to recognized national standards, and to the units of measurement realized at the National Physical Laboratory or other recognized national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Certificate of Calibration

Continuation of Certificate number: 38654

Reference Calibrator: WSC1 - Nor1253-24269

Measurement Record: K:\C A\Calibration\Nor-1504\Nor-1017 MicCal\GRAS40AF_114655_M1.nmf

Preconditioning

The equipment was preconditioned for more than 12 hours at the specified calibration temperature and humidity.

Instruments and Program

A complete list of instruments, hardware and software that have been used for this calibration is available from the calibration laboratory

Traceability

The measured values for sound pressure, frequency, voltage, capacitance, temperature, humidity and ambient pressure are traceable to an accredited national physical laboratory.

Observations

The differences between the two results at 100 Hz are within normal limits bearing in mind the different test methods and are taken into account in arriving at the uncertainties of measurement.

Method of Calibration

The open circuit sensitivity of the microphone has been determined at 250 Hz against a reference laboratory standard measurement microphone by insert voltage techniques using a laboratory standard sound calibrator as a transfer standard. The electrostatic actuator frequency response was then obtained for frequencies above 100 Hz as described in BS EN IEC 61094-6. In addition, where requested the optional free field frequency response over the range 2 – 100 Hz has been obtained using a pressure chamber; in this case the reference frequency is 100 Hz. All of these results and their associated uncertainties are detailed in the table on page 3 of this certificate. See the observations field below for details of any discrepancies between the 100 Hz results obtained via the electrostatic actuator and pressure chamber.

The overall uncertainty at any frequency $\sigma_{\text{Combined},Fn}$ may be obtained by combining the uncertainty of the open circuit sensitivity σ_{S250} with the uncertainty of the actuator / or LF pressure response at any other frequency $\sigma_{\text{Act},Fn}$ where Fn is the uncertainty at the frequency of interest using the relationship:

$$\sigma_{\text{Combined},Fn} = 2\sqrt{(\sigma_{S250}^2 + \sigma_{\text{Act},Fn}^2)}$$

Appendix to this certificate

Where data is available from the microphone manufacturer to correct the actuator / pressure frequency response to obtain the random incidence and / or free field response it is shown in the appendix to this certificate. The uncertainty information relating to these corrections is the responsibility of the microphone manufacturer and when it is available the total uncertainty for the corrected frequency response at each point may then be obtained by including the correction uncertainty in the root-sum-square formula given above. These responses are outside the UKAS accredited scope, but are provided for information.

Observations

Appendix 2 – ATC Survey Data (Raw)

A904 Newton

27 May 2022

Time [--]	Total	Speed Categories																				Classes			Mean Speed	85th %ile
		0-5 mph	5-10 mph	10-15 mph	15-20 mph	20-25 mph	25-30 mph	30-35 mph	35-40 mph	40-45 mph	45-50 mph	50-55 mph	55-60 mph	60-65 mph	65-70 mph	70-75 mph	75-80 mph	80-85 mph	85-90 mph	90-95 mph	95-100 mph	Cls 1 Light	Cls 2 Medium	Cls 3 Heavy		
0000	23	0	0	0	0	1	10	9	2	0	1	0	0	0	0	0	0	0	0	0	0	20	3	0	30.8	34.5
0100	7	0	0	0	0	0	3	1	2	0	1	0	0	0	0	0	0	0	0	0	0	4	3	0	33.2	-
0200	15	0	0	0	2	3	2	4	3	0	0	1	0	0	0	0	0	0	0	0	0	9	1	5	30.2	37.8
0300	25	0	0	0	1	2	3	7	6	1	4	1	0	0	0	0	0	0	0	0	0	19	4	2	35	45.4
0400	36	0	0	0	0	5	4	9	11	4	2	1	0	0	0	0	0	0	0	0	0	26	4	6	34.2	40.6
0500	133	0	0	0	0	14	21	47	27	18	5	1	0	0	0	0	0	0	0	0	0	118	11	4	33.9	40.8
0600	428	0	0	0	4	36	130	157	75	21	3	0	2	0	0	0	0	0	0	0	0	338	81	9	31.6	36.6
0700	702	0	0	0	29	150	292	173	42	14	1	0	1	0	0	0	0	0	0	0	0	547	144	11	28.3	33.4
0800	592	0	0	0	26	156	245	127	36	2	0	0	0	0	0	0	0	0	0	0	0	486	96	10	27.6	32.3
0900	394	0	0	2	11	113	148	86	30	4	0	0	0	0	0	0	0	0	0	0	0	313	73	8	27.7	32.9
1000	367	0	0	0	21	98	152	78	12	5	0	1	0	0	0	0	0	0	0	0	0	315	47	5	27.3	31.4
1100	415	0	0	3	32	133	153	73	19	2	0	0	0	0	0	0	0	0	0	0	0	368	40	7	26.4	31.5
1200	480	0	0	6	33	143	193	86	17	2	0	0	0	0	0	0	0	0	0	0	0	414	60	6	26.4	31.4
1300	440	0	0	0	12	135	190	81	18	4	0	0	0	0	0	0	0	0	0	0	0	394	45	1	27	31.2
1400	485	0	0	0	15	139	234	81	12	3	1	0	0	0	0	0	0	0	0	0	0	428	50	7	27	31
1500	531	0	1	4	14	163	201	130	17	1	0	0	0	0	0	0	0	0	0	0	0	470	55	6	27.1	32.1
1600	568	0	0	9	31	157	228	112	26	4	1	0	0	0	0	0	0	0	0	0	0	502	57	9	26.8	31.9
1700	527	0	0	2	22	95	197	167	42	1	1	0	0	0	0	0	0	0	0	0	0	489	36	2	28.6	33.2
1800	393	0	0	3	12	97	151	98	32	0	0	0	0	0	0	0	0	0	0	0	0	360	30	3	27.9	33.3
1900	250	0	1	2	14	41	84	72	28	8	0	0	0	0	0	0	0	0	0	0	0	228	22	0	28.9	34.7
2000	161	0	0	0	7	38	48	46	16	1	5	0	0	0	0	0	0	0	0	0	0	138	19	4	28.9	34.9
2100	132	0	0	2	6	25	43	36	15	3	2	0	0	0	0	0	0	0	0	0	0	123	6	3	28.9	35
2200	122	0	0	0	8	28	32	35	17	1	1	0	0	0	0	0	0	0	0	0	0	114	7	1	28.6	35.1
2300	63	0	0	0	2	14	18	12	12	4	0	1	0	0	0	0	0	0	0	0	0	60	3	0	30.5	37.7
07-19	5894	0	1	29	258	1579	2384	1292	303	42	4	1	1	0	0	0	0	0	0	0	0	5086	733	75	27.4	32.2
06-22	6865	0	2	33	289	1719	2689	1603	437	75	14	1	3	0	0	0	0	0	0	0	0	5913	861	91	27.7	32.8
06-00	7050	0	2	33	299	1761	2739	1650	466	80	15	2	3	0	0	0	0	0	0	0	0	6087	871	92	27.8	32.9
00-00	7289	0	2	33	302	1786	2782	1727	517	103	28	6	3	0	0	0	0	0	0	0	0	6283	897	109	28	33.2

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Time [--	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	29	0	0	0	0	2	6	12	5	4	0	0	0	0	0	0	0	0	0	0	27	1	1	32.8	39.5	
0100	15	0	0	0	0	0	1	8	3	1	0	2	0	0	0	0	0	0	0	0	12	0	3	36.4	47.1	
0200	6	0	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	4	1	1	34.2	-	
0300	9	0	0	0	0	0	2	2	2	0	2	1	0	0	0	0	0	0	0	0	6	3	0	37.5	-	
0400	32	0	0	0	0	4	5	3	8	8	3	1	0	0	0	0	0	0	0	0	28	3	1	35.6	41.3	
0500	80	0	0	0	0	11	20	17	20	9	2	1	0	0	0	0	0	0	0	0	64	11	5	33	40	
0600	163	0	0	0	3	14	33	42	49	15	7	0	0	0	0	0	0	0	0	0	124	34	5	33.3	39.5	
0700	198	0	0	0	0	14	45	52	53	29	3	2	0	0	0	0	0	0	0	0	146	49	3	33.8	40.5	
0800	232	0	0	0	7	34	82	68	35	4	2	0	0	0	0	0	0	0	0	0	204	26	2	30	35.5	
0900	296	0	1	0	18	72	102	77	20	4	1	1	0	0	0	0	0	0	0	0	255	34	7	28	33.2	
1000	410	0	0	1	15	147	141	88	16	2	0	0	0	0	0	0	0	0	0	0	371	38	1	26.9	31.8	
1100	453	0	0	3	13	135	200	87	13	2	0	0	0	0	0	0	0	0	0	0	418	34	1	27	31.5	
1200	505	0	0	0	45	154	186	99	18	3	0	0	0	0	0	0	0	0	0	0	473	30	2	26.6	31.3	
1300	524	0	0	0	18	214	219	50	22	1	0	0	0	0	0	0	0	0	0	0	504	18	2	26	29.6	

Airshed

Northbound

1400	498	0	0	1	23	159	223	79	11	2	0	0	0	0	0	0	0	0	0	0	0	0	477	19	2	26.3	30.7
1500	477	0	1	6	31	161	183	82	12	1	0	0	0	0	0	0	0	0	0	0	0	0	453	19	5	26.1	30.9
1600	464	0	0	3	32	151	190	72	15	0	0	0	1	0	0	0	0	0	0	0	0	0	440	20	4	26.3	30.8
1700	430	0	0	10	34	128	159	77	17	3	1	1	0	0	0	0	0	0	0	0	0	0	407	21	2	26.4	31.5
1800	335	0	0	0	9	86	138	72	24	6	0	0	0	0	0	0	0	0	0	0	0	0	310	24	1	28.1	33.4
1900	254	0	0	2	4	40	105	81	18	4	0	0	0	0	0	0	0	0	0	0	0	0	244	9	1	29	33.6
2000	132	0	0	0	8	32	38	36	12	4	1	1	0	0	0	0	0	0	0	0	0	0	122	8	2	28.7	34.9
2100	100	0	0	0	2	8	37	35	12	6	0	0	0	0	0	0	0	0	0	0	0	0	93	7	0	30.6	36.2
2200	95	0	0	0	6	18	32	28	10	0	0	1	0	0	0	0	0	0	0	0	0	0	93	2	0	28.9	34.3
2300	71	0	0	0	0	19	29	13	7	2	0	1	0	0	0	0	0	0	0	0	0	0	65	6	0	28.8	34.3
07-19	4822	0	2	24	245	1455	1868	903	256	57	7	4	1	0	0	0	0	0	0	0	0	0	4458	332	32	27.1	32
06-22	5471	0	2	26	262	1549	2081	1097	347	86	15	5	1	0	0	0	0	0	0	0	0	0	5041	390	40	27.5	32.7
06-00	5637	0	2	26	268	1586	2142	1138	364	88	15	7	1	0	0	0	0	0	0	0	0	0	5199	398	40	27.5	32.8
00-00	5808	0	2	26	268	1603	2176	1184	404	110	22	12	1	0	0	0	0	0	0	0	0	0	5340	417	51	27.7	33

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Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	45	0	0	0	0	8	13	10	10	3	0	0	1	0	0	0	0	0	0	0	0	40	3	2	31.1	37.1
0100	17	0	0	0	1	3	0	3	8	2	0	0	0	0	0	0	0	0	0	0	0	16	1	0	33.7	40
0200	14	0	0	0	0	2	5	1	2	2	1	1	0	0	0	0	0	0	0	0	0	12	0	2	33.4	45.1
0300	14	0	0	0	0	1	6	4	2	1	0	0	0	0	0	0	0	0	0	0	0	11	3	0	35.3	41.2
0400	21	0	0	0	1	5	1	3	7	4	0	0	0	0	0	0	0	0	0	0	0	16	3	2	32.7	43.2
0500	50	0	0	0	0	4	8	14	11	7	4	2	0	0	0	0	0	0	0	0	0	45	2	3	35.3	44.2
0600	109	0	0	0	3	13	17	25	30	12	5	3	0	0	1	0	0	0	0	0	0	100	7	2	34.2	41.9
0700	95	0	0	0	1	9	15	35	27	6	1	1	0	0	0	0	0	0	0	0	0	81	14	0	33.2	38.5
0800	195	0	0	0	13	15	43	70	38	12	2	1	1	0	0	0	0	0	0	0	0	175	17	3	31.5	36.9
0900	278	0	0	1	13	57	108	80	16	3	0	0	0	0	0	0	0	0	0	0	0	260	14	4	28.1	33.1
1000	354	0	0	3	5	100	149	70	24	3	0	0	0	0	0	0	0	0	0	0	0	328	23	3	27.7	32.3
1100	485	0	0	1	11	147	201	111	13	1	0	0	0	0	0	0	0	0	0	0	0	457	27	1	27.2	31.4
1200	543	0	0	2	35	134	261	99	12	0	0	0	0	0	0	0	0	0	0	0	0	512	26	5	26.6	30.8
1300	498	0	0	1	25	149	219	84	18	2	0	0	0	0	0	0	0	0	0	0	0	462	30	6	26.6	31.1
1400	459	0	0	1	19	159	200	72	7	1	0	0	0	0	0	0	0	0	0	0	0	433	21	5	26.4	30.6
1500	481	0	0	0	25	154	222	76	3	0	1	0	0	0	0	0	0	0	0	0	0	450	28	3	26.2	30.3
1600	445	0	0	0	32	137	183	84	7	1	1	0	0	0	0	0	0	0	0	0	0	409	22	14	26.3	30.9
1700	440	0	0	0	9	86	220	107	16	2	0	0	0	0	0	0	0	0	0	0	0	415	23	2	28	32
1800	301	0	0	1	15	76	113	69	26	1	0	0	0	0	0	0	0	0	0	0	0	270	28	3	27.6	32.8
1900	212	0	0	0	3	37	88	62	16	3	3	0	0	0	0	0	0	0	0	0	0	195	15	2	29.2	33.7
2000	146	0	0	0	0	22	58	47	15	3	1	0	0	0	0	0	0	0	0	0	0	133	9	4	30	34.8
2100	111	0	0	0	2	13	34	34	19	8	1	0	0	0	0	0	0	0	0	0	0	107	4	0	31.1	37.5
2200	59	0	0	0	2	13	10	20	11	2	1	0	0	0	0	0	0	0	0	0	0	55	2	2	30.2	36.1
2300	34	0	0	0	0	7	5	15	3	1	3	0	0	0	0	0	0	0	0	0	0	32	1	1	31.5	36.9
07-19	4574	0	0	10	203	1223	1934	957	207	32	5	2	1	0	0	0	0	0	0	0	0	4252	273	49	27.3	31.9
06-22	5152	0	0	10	211	1308	2131	1125	287	58	15	5	1	0	1	0	0	0	0	0	0	4787	308	57	27.7	32.3
06-00	5245	0	0	10	213	1328	2146	1160	301	61	19	5	1	0	1	0	0	0	0	0	0	4874	311	60	27.7	32.4
00-00	5406	0	0	10	215	1350	2174	1197	343	81	25	8	2	0	1	0	0	0	0	0	0	5014	323	69	27.9	32.8

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Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	15	0	0	0	0	1	4	2	2	4	2	0	0	0	0	0	0	0	0	0	0	14	1	0	35.8	45.3
0100	4	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	34.1	-
0200	10	0	0	0	1	3	1	3	0	2	0	0	0	0	0	0	0	0	0	0	0	7	1	2	30.5	-

Airshed

Northbound

0300	7	0	0	0	0	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	2	29.9	-
0400	25	0	0	0	0	1	7	4	5	5	2	0	0	0	0	0	0	0	0	0	0	0	18	3	4	33.9	41.5
0500	148	0	0	1	0	15	28	62	29	11	2	0	0	0	0	0	0	0	0	0	0	0	123	20	5	32	36.9
0600	469	0	0	0	6	70	162	162	57	10	1	1	0	0	0	0	0	0	0	0	0	0	376	78	15	30	35
0700	723	0	0	4	14	154	285	203	56	7	0	0	0	0	0	0	0	0	0	0	0	0	595	118	10	28.4	33.6
0800	617	0	1	6	76	191	231	95	14	3	0	0	0	0	0	0	0	0	0	0	0	0	521	86	10	25.6	30.5
0900	394	0	0	2	70	122	116	75	8	1	0	0	0	0	0	0	0	0	0	0	0	0	318	71	5	25.2	31.2
1000	327	0	4	16	73	111	89	26	7	0	1	0	0	0	0	0	0	0	0	0	0	0	265	54	8	23.3	29
1100	391	0	0	8	32	131	153	61	6	0	0	0	0	0	0	0	0	0	0	0	0	0	335	49	7	25.7	30.8
1200	342	0	0	2	16	92	150	70	12	0	0	0	0	0	0	0	0	0	0	0	0	0	293	43	6	27	31.6
1300	374	0	0	4	24	114	167	58	7	0	0	0	0	0	0	0	0	0	0	0	0	0	320	46	8	26.1	30.3
1400	368	0	0	6	40	210	82	26	3	0	0	1	0	0	0	0	0	0	0	0	0	0	305	56	7	23.9	27.3
1500	387	0	1	11	42	119	178	32	4	0	0	0	0	0	0	0	0	0	0	0	0	0	330	56	1	24.9	29
1600	474	0	0	13	37	144	196	70	14	0	0	0	0	0	0	0	0	0	0	0	0	0	416	50	8	25.8	30.4
1700	531	0	0	3	42	199	227	56	3	0	0	0	0	0	1	0	0	0	0	0	0	0	471	55	5	25.4	29.2
1800	373	0	1	3	9	91	183	67	18	1	0	0	0	0	0	0	0	0	0	0	0	0	343	22	8	27.3	32
1900	202	0	0	2	7	52	78	44	14	4	1	0	0	0	0	0	0	0	0	0	0	0	183	16	3	27.7	32.9
2000	144	0	0	4	10	29	43	42	13	2	1	0	0	0	0	0	0	0	0	0	0	0	131	8	5	28	33.7
2100	121	0	0	0	3	25	49	34	9	1	0	0	0	0	0	0	0	0	0	0	0	0	110	9	2	28.3	33.1
2200	57	0	0	0	2	9	18	17	7	3	0	1	0	0	0	0	0	0	0	0	0	0	53	0	4	30.1	36.8
2300	36	0	0	0	0	4	13	12	4	3	0	0	0	0	0	0	0	0	0	0	0	0	33	2	1	30.6	37.5
07-19	5301	0	7	78	475	1678	2057	839	152	12	1	1	0	1	0	0	0	0	0	0	0	0	4512	706	83	25.9	30.8
06-22	6237	0	7	84	501	1854	2389	1121	245	29	4	2	0	1	0	0	0	0	0	0	0	0	5312	817	108	26.3	31.4
06-00	6330	0	7	84	503	1867	2420	1150	256	35	4	3	0	1	0	0	0	0	0	0	0	0	5398	819	113	26.4	31.5
00-00	6539	0	7	85	505	1888	2463	1225	295	57	10	3	0	1	0	0	0	0	0	0	0	0	5569	844	126	26.6	31.8

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Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	21	0	0	0	4	1	10	2	2	1	0	1	0	0	0	0	0	0	0	0	0	15	2	4	29.4	38.9
0100	17	0	0	0	1	4	4	5	3	0	0	0	0	0	0	0	0	0	0	0	0	14	2	1	29.2	36.4
0200	11	0	0	0	0	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	6	27.5	35.1
0300	18	0	0	0	0	1	9	8	0	0	0	0	0	0	0	0	0	0	0	0	0	12	2	4	29.8	33.6
0400	43	0	0	0	0	5	17	13	6	1	1	0	0	0	0	0	0	0	0	0	0	31	9	3	30.9	37.1
0500	151	0	0	0	6	20	45	61	17	2	0	0	0	0	0	0	0	0	0	0	0	134	10	7	29.9	34.3
0600	509	0	2	2	23	86	195	157	39	5	0	0	0	0	0	0	0	0	0	0	0	411	86	12	28.5	33.4
0700	757	0	0	6	43	193	375	118	21	0	1	0	0	0	0	0	0	0	0	0	0	625	120	12	26.7	30.6
0800	638	0	0	9	51	226	272	73	6	1	0	0	0	0	0	0	0	0	0	0	0	542	85	11	25.4	29.6
0900	356	0	2	14	27	109	130	59	11	2	1	0	0	0	0	0	1	0	0	0	0	277	70	9	25.8	31.1
1000	337	0	0	0	29	111	135	55	6	1	0	0	0	0	0	0	0	0	0	0	0	271	59	7	26.1	30.6
1100	334	0	5	23	67	135	79	23	2	0	0	0	0	0	0	0	0	0	0	0	0	275	54	5	22.5	27.2
1200	366	0	0	1	34	153	140	32	6	0	0	0	0	0	0	0	0	0	0	0	0	316	47	3	25	29
1300	361	0	0	5	27	132	162	32	3	0	0	0	0	0	0	0	0	0	0	0	0	295	60	6	25.2	29.3
1400	393	0	0	12	31	131	177	40	2	0	0	0	0	0	0	0	0	0	0	0	0	345	43	5	25	29.2
1500	443	0	0	6	41	166	176	49	5	0	0	0	0	0	0	0	0	0	0	0	0	385	49	9	25	29.3
1600	504	0	0	3	16	174	234	71	4	1	0	0	0	0	0	0	1	0	0	0	0	458	41	5	26.2	30.1
1700	522	0	4	15	32	145	237	78	10	1	0	0	0	0	0	0	0	0	0	0	0	475	41	6	26	30.4
1800	390	0	0	1	34	95	182	64	11	3	0	0	0	0	0	0	0	0	0	0	0	361	28	1	26.7	31.2
1900	215	0	0	0	8	51	93	52	8	2	1	0	0	0	0	0	0	0	0	0	0	202	13	0	27.8	32.4
2000	152	0	0	1	2	33	51	47	9	9	0	0	0	0	0	0	0	0	0	0	0	138	7	7	29.4	34.5
2100	115	0	0	1	12	39	36	20	5	2	0	0	0	0	0	0	0	0	0	0	0	106	8	1	26.3	31.6
2200	87	0	0	1	5	19	35	18	7	1	0	0	0	1	0	0	0	0	0	0	0	81	5	1	28	33.3
2300	35	0	0	0	0	4	12	11	6	0	2	0	0	0	0	0	0	0	0	0	0	32	0	3	30.9	36.8
07-19	5401	0	11	95	432	1770	2299	694	87	9	2	0	0	0	0	0	2	0	0	0	0	4625	697	79	25.6	30
06-22	6392	0	13	99	477	1979	2674	970	148	27	3	0	0	0	0	0	2	0	0	0	0	5482	811	99	26	30.5
06-00	6514	0	13	100	482	2002	2721	999	161	28	5	0	0	1	0	0	2	0	0	0	0	5595	816	103	26	30.6

Airshed

Northbound

00-00	6775	0	13	100	493	2038	2809	1090	190	32	6	1	0	1	0	0	2	0	0	0	0	5805	842	128	26.2	30.9
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01 June 2022

Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	15	0	0	0	0	2	4	7	1	1	0	0	0	0	0	0	0	0	0	0	0	12	1	2	30.3	35.2
0100	15	0	0	0	0	0	3	12	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	1	31.1	33.1
0200	20	0	0	0	1	3	4	9	3	0	0	0	0	0	0	0	0	0	0	0	0	12	4	4	29.9	35.9
0300	16	0	0	0	0	2	8	4	1	1	0	0	0	0	0	0	0	0	0	0	0	5	4	7	29.4	33.9
0400	47	0	0	0	1	16	9	11	6	4	0	0	0	0	0	0	0	0	0	0	0	32	6	9	29.1	36.1
0500	171	0	0	0	9	28	44	68	17	4	1	0	0	0	0	0	0	0	0	0	0	141	19	11	29.6	34.7
0600	498	0	0	1	26	117	161	161	28	4	0	0	0	0	0	0	0	0	0	0	0	416	71	11	28.1	33.3
0700	687	0	1	5	33	203	284	132	24	5	0	0	0	0	0	0	0	0	0	0	0	566	112	9	26.9	31.4
0800	584	0	0	3	38	160	295	77	8	2	1	0	0	0	0	0	0	0	0	0	0	486	92	6	26.3	30.1
0900	302	0	0	4	27	102	130	37	2	0	0	0	0	0	0	0	0	0	0	0	0	246	52	4	25.4	29.9
1000	358	0	1	3	35	141	142	33	1	0	0	0	0	0	0	0	0	2	0	0	0	295	60	3	25.1	29
1100	358	0	2	3	24	110	173	40	5	1	0	0	0	0	0	0	0	0	0	0	0	295	58	5	25.6	29.6
1200	390	0	2	4	21	145	160	53	5	0	0	0	0	0	0	0	0	0	0	0	0	343	45	2	25.6	29.9
1300	387	0	0	2	23	137	173	41	10	0	1	0	0	0	0	0	0	0	0	0	0	322	61	4	25.9	29.6
1400	390	0	1	3	37	146	165	33	5	0	0	0	0	0	0	0	0	0	0	0	0	328	56	6	25.2	29.2
1500	448	0	5	7	47	164	150	64	11	0	0	0	0	0	0	0	0	0	0	0	0	386	54	8	25.1	30.3
1600	539	0	1	3	40	173	233	80	9	0	0	0	0	0	0	0	0	0	0	0	0	493	44	2	26	30.3
1700	533	0	4	7	22	146	265	77	11	0	0	1	0	0	0	0	0	0	0	0	0	495	38	0	26.3	30.2
1800	376	0	1	3	31	106	168	60	7	0	0	0	0	0	0	0	0	0	0	0	0	344	28	4	26.1	30.4
1900	216	0	0	0	11	56	99	40	7	0	0	0	0	3	0	0	0	0	0	0	0	198	17	1	27.4	31.7
2000	155	0	0	1	11	28	60	34	20	1	0	0	0	0	0	0	0	0	0	0	0	141	10	4	28.2	34
2100	148	0	0	1	4	25	56	43	17	2	0	0	0	0	0	0	0	0	0	0	0	137	8	3	29.3	34.7
2200	93	0	0	0	0	15	42	20	12	4	0	0	0	0	0	0	0	0	0	0	0	87	3	3	29.5	35.6
2300	60	0	0	0	4	9	15	24	7	1	0	0	0	0	0	0	0	0	0	0	0	56	2	2	29.3	34.9
07-19	5352	0	18	47	378	1733	2338	727	98	8	2	1	0	0	0	0	0	2	0	0	0	4599	700	53	25.9	30.1
06-22	6369	0	18	50	430	1959	2714	1005	170	15	2	1	0	3	0	0	0	2	0	0	0	5491	806	72	26.3	30.8
06-00	6522	0	18	50	434	1983	2771	1049	189	20	2	1	0	3	0	0	0	2	0	0	0	5634	811	77	26.3	30.8
00-00	6806	0	18	50	445	2034	2843	1160	217	30	3	1	0	3	0	0	0	2	0	0	0	5850	845	111	26.5	31.1

02 June 2022

Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	35	0	0	0	1	8	10	13	2	0	0	1	0	0	0	0	0	0	0	0	0	30	1	4	29.5	33.8
0100	13	0	0	0	0	2	2	4	3	2	0	0	0	0	0	0	0	0	0	0	0	8	3	2	32.1	40.2
0200	14	0	0	0	1	1	4	7	1	0	0	0	0	0	0	0	0	0	0	0	0	6	3	5	29.3	32.2
0300	23	0	0	0	1	8	7	6	1	0	0	0	0	0	0	0	0	0	0	0	0	17	3	3	27.8	34
0400	35	0	0	0	1	4	11	14	5	0	0	0	0	0	0	0	0	0	0	0	0	28	5	2	30.1	35.5
0500	129	0	0	0	10	21	26	42	20	9	0	1	0	0	0	0	0	0	0	0	0	107	12	10	30.5	37.4
0600	412	0	0	0	8	40	159	155	42	7	1	0	0	0	0	0	0	0	0	0	0	348	55	9	30.1	34.4
0700	550	0	3	2	18	96	229	167	32	2	1	0	0	0	0	0	0	0	0	0	0	451	88	11	28.2	32.8
0800	427	0	0	5	20	103	201	79	18	1	0	0	0	0	0	0	0	0	0	0	0	342	74	11	27	31.3
0900	362	0	0	3	28	120	142	61	7	1	0	0	0	0	0	0	0	0	0	0	0	300	59	3	26.1	30.9
1000	395	0	0	5	23	150	144	63	10	0	0	0	0	0	0	0	0	0	0	0	0	337	50	8	26	30.6
1100	477	0	2	13	67	213	151	28	3	0	0	0	0	0	0	0	0	0	0	0	0	416	56	5	23.7	28.1
1200	469	0	0	2	37	174	207	46	3	0	0	0	0	0	0	0	0	0	0	0	0	415	48	6	25.2	29.2
1300	444	0	0	5	41	144	200	50	4	0	0	0	0	0	0	0	0	0	0	0	0	381	56	7	25.3	29.3
1400	461	0	2	7	34	145	214	50	8	1	0	0	0	0	0	0	0	0	0	0	0	415	44	2	25.6	29.8
1500	424	0	0	3	42	147	187	40	5	0	0	0	0	0	0	0	0	0	0	0	0	377	40	7	25.3	29.2

Airshed

Northbound

1600	504	0	1	7	47	138	236	67	7	1	0	0	0	0	0	0	0	0	0	0	0	455	47	2	25.7	30
1700	445	0	1	8	21	161	185	68	1	0	0	0	0	0	0	0	0	0	0	0	397	45	3	25.7	30.1	
1800	370	0	0	1	10	78	169	101	11	0	0	0	0	0	0	0	0	0	0	0	341	26	3	27.7	31.4	
1900	258	0	0	0	7	55	107	76	8	5	0	0	0	0	0	0	0	0	0	0	240	17	1	28.3	32.7	
2000	163	0	0	0	8	33	59	49	12	2	0	0	0	0	0	0	0	0	0	0	153	9	1	28.5	33.7	
2100	149	0	0	0	4	19	65	48	13	0	0	0	0	0	0	0	0	0	0	0	132	16	1	29.2	34	
2200	110	0	0	1	4	23	47	29	5	1	0	0	0	0	0	0	0	0	0	0	102	8	0	28	33.1	
2300	57	0	0	0	2	16	19	15	5	0	0	0	0	0	0	0	0	0	0	0	50	6	1	28.2	33.9	
07-19	5328	0	9	61	388	1669	2265	820	109	6	1	0	0	0	0	0	0	0	0	0	4627	633	68	26	30.4	
06-22	6310	0	9	61	415	1816	2655	1148	184	20	2	0	0	0	0	0	0	0	0	0	5500	730	80	26.5	31.1	
06-00	6477	0	9	62	421	1855	2721	1192	194	21	2	0	0	0	0	0	0	0	0	0	5652	744	81	26.5	31.2	
00-00	6726	0	9	62	435	1899	2781	1278	226	32	2	2	0	0	0	0	0	0	0	0	5848	771	107	26.7	31.4	

A904 Newton

27 May 2022

Time [--]	Total	Speed Categories																			Classes			Mean Speed	85th %ile	
		0-5 mph	5-10 mph	10-15 mph	15-20 mph	20-25 mph	25-30 mph	30-35 mph	35-40 mph	40-45 mph	45-50 mph	50-55 mph	55-60 mph	60-65 mph	65-70 mph	70-75 mph	75-80 mph	80-85 mph	85-90 mph	90-95 mph	95-100 mph	Cls 1 Light	Cls 2 Medium			Cls 3 Heavy
0000	42	0	0	1	4	9	19	6	2	0	1	0	0	0	0	0	0	0	0	0	0	38	3	1	26.6	31.8
0100	16	0	0	0	4	5	2	4	1	0	0	0	0	0	0	0	0	0	0	0	0	12	3	1	25	33.7
0200	15	0	0	0	2	5	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	13	1	1	25.8	33.9
0300	19	0	0	0	2	1	12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	16	2	1	27.3	31.9
0400	39	0	0	0	0	9	8	17	5	0	0	0	0	0	0	0	0	0	0	0	0	24	12	3	29.7	34.8
0500	74	0	0	0	0	19	27	15	10	3	0	0	0	0	0	0	0	0	0	0	0	62	11	1	29.2	35.7
0600	216	0	0	0	13	57	85	46	12	3	0	0	0	0	0	0	0	0	0	0	0	187	28	1	27.4	32.1
0700	390	0	3	4	63	153	112	48	7	0	0	0	0	0	0	0	0	0	0	0	0	338	47	5	24.5	29.8
0800	442	0	5	16	92	230	84	14	1	0	0	0	0	0	0	0	0	0	0	0	0	391	45	6	22.3	26.6
0900	407	0	7	25	104	189	66	12	4	0	0	0	0	0	0	0	0	0	0	0	0	333	69	5	21.8	25.9
1000	419	0	1	9	149	198	53	7	0	2	0	0	0	0	0	0	0	0	0	0	0	365	49	5	21.3	25.1
1100	484	0	0	15	174	218	69	7	1	0	0	0	0	0	0	0	0	0	0	0	0	424	50	10	21.2	25.3
1200	547	0	8	27	163	263	70	15	1	0	0	0	0	0	0	0	0	0	0	0	0	464	72	11	21.3	25.2
1300	657	0	5	35	182	280	133	20	1	1	0	0	0	0	0	0	0	0	0	0	0	566	82	9	21.8	26.2
1400	703	0	2	36	255	293	107	8	2	0	0	0	0	0	0	0	0	0	0	0	0	599	95	9	21.1	25.3
1500	707	0	12	43	161	303	147	38	3	0	0	0	0	0	0	0	0	0	0	0	0	617	81	9	22.1	27.4
1600	644	0	6	32	169	253	136	41	7	0	0	0	0	0	0	0	0	0	0	0	0	575	62	7	22.4	27.5
1700	588	0	3	11	171	251	115	35	2	0	0	0	0	0	0	0	0	0	0	0	0	549	34	5	22.5	27.7
1800	453	0	1	4	102	202	114	27	3	0	0	0	0	0	0	0	0	0	0	0	0	418	34	1	23.2	28.1
1900	265	0	2	7	31	106	83	29	5	2	0	0	0	0	0	0	0	0	0	0	0	245	18	2	24.7	30
2000	196	0	5	4	36	56	71	19	4	1	0	0	0	0	0	0	0	0	0	0	0	184	11	1	24.2	29.6
2100	186	0	0	5	39	67	57	16	2	0	0	0	0	0	0	0	0	0	0	0	0	175	11	0	23.6	28.3
2200	173	0	0	1	32	82	40	18	0	0	0	0	0	0	0	0	0	0	0	0	0	162	6	5	23.6	28.5
2300	115	0	0	0	23	53	29	8	2	0	0	0	0	0	0	0	0	0	0	0	0	112	3	0	23.9	28.7
07-19	6441	0	53	257	1785	2833	1206	272	32	3	0	0	0	0	0	0	0	0	0	0	0	5639	720	82	22.1	26.6
06-22	7304	0	60	273	1904	3119	1502	382	55	9	0	0	0	0	0	0	0	0	0	0	0	6430	788	86	22.4	27.2
06-00	7592	0	60	274	1959	3254	1571	408	57	9	0	0	0	0	0	0	0	0	0	0	0	6704	797	91	22.5	27.3
00-00	7797	0	60	275	1971	3302	1644	455	77	12	1	0	0	0	0	0	0	0	0	0	0	6869	829	99	22.6	27.4

28 May 2022

Time [--]	Total	Vbins																			Classes			Mean	Vpp 85
		0 5	5 10	10 15	15 20	20 25	25 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	75 80	80 85	85 90	90 95	95 100	Cls 1	Cls 2	Cls 3	
0000	65	0	0	0	14	19	23	6	2	1	0	0	0	0	0	0	0	0	0	0	62	2	1	25.2	30
0100	34	0	0	0	1	12	14	5	1	1	0	0	0	0	0	0	0	0	0	0	30	1	3	26.8	30.7
0200	19	0	0	0	2	8	4	4	0	1	0	0	0	0	0	0	0	0	0	0	18	0	1	26.2	33.4
0300	12	0	0	0	2	5	4	0	0	1	0	0	0	0	0	0	0	0	0	0	11	0	1	24.9	28
0400	31	0	0	0	0	9	13	4	2	3	0	0	0	0	0	0	0	0	0	0	22	9	0	28.7	36.1
0500	50	0	0	1	1	16	14	9	6	1	2	0	0	0	0	0	0	0	0	0	41	7	2	28.1	36.2
0600	73	0	0	0	9	20	14	18	8	3	1	0	0	0	0	0	0	0	0	0	60	13	0	28.1	35.2
0700	129	0	0	3	13	35	44	27	6	1	0	0	0	0	0	0	0	0	0	0	109	17	3	26.6	32
0800	242	0	0	0	56	111	57	17	1	0	0	0	0	0	0	0	0	0	0	0	216	20	6	23.4	27.5
0900	327	0	1	5	77	165	66	10	2	0	0	0	0	1	0	0	0	0	0	0	292	34	1	22.6	26.8
1000	473	0	0	11	158	232	60	12	0	0	0	0	0	0	0	0	0	0	0	0	443	29	1	21.5	25.1
1100	548	0	5	17	168	274	67	15	2	0	0	0	0	0	0	0	0	0	0	0	506	37	5	21.5	25.1
1200	542	0	0	17	172	244	101	8	0	0	0	0	0	0	0	0	0	0	0	0	499	38	5	21.7	26.1
1300	534	0	3	20	157	251	90	11	2	0	0	0	0	0	0	0	0	0	0	0	498	35	1	21.7	25.5

Airshed

Southbound

1400	512	0	2	36	148	217	90	18	1	0	0	0	0	0	0	0	0	0	0	0	0	489	21	2	21.6	26.3
1500	503	0	4	24	179	209	75	9	3	0	0	0	0	0	0	0	0	0	0	0	0	476	26	1	21.2	25.3
1600	536	0	0	11	132	240	110	31	12	0	0	0	0	0	0	0	0	0	0	0	0	509	26	1	23	28
1700	512	0	1	24	139	198	122	26	2	0	0	0	0	0	0	0	0	0	0	0	0	484	27	1	22.4	27.4
1800	346	0	1	7	49	149	105	24	9	1	1	0	0	0	0	0	0	0	0	0	0	322	22	2	24.2	29.2
1900	268	0	0	9	69	105	57	21	6	1	0	0	0	0	0	0	0	0	0	0	0	255	12	1	23.3	28.7
2000	194	0	0	1	37	63	63	18	8	4	0	0	0	0	0	0	0	0	0	0	0	183	11	0	25.2	30.6
2100	135	0	0	1	15	56	42	17	4	0	0	0	0	0	0	0	0	0	0	0	0	123	10	2	25.1	30.4
2200	158	0	0	2	37	81	30	6	1	1	0	0	0	0	0	0	0	0	0	0	0	148	6	4	22.6	26.5
2300	89	0	0	0	20	32	20	11	5	0	0	1	0	0	0	0	0	0	0	0	0	85	3	1	24.8	30.6
07-19	5204	0	17	175	1448	2325	987	208	40	2	1	0	0	1	0	0	0	0	0	0	0	4843	332	29	22.2	26.6
06-22	5874	0	17	186	1578	2569	1163	282	66	10	2	0	0	1	0	0	0	0	0	0	0	5464	378	32	22.5	27.1
06-00	6121	0	17	188	1635	2682	1213	299	72	11	2	1	0	1	0	0	0	0	0	0	0	5697	387	37	22.6	27.1
00-00	6332	0	17	189	1655	2751	1285	327	83	19	4	1	0	1	0	0	0	0	0	0	0	5881	406	45	22.7	27.3

29 May 2022

Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	71	0	0	0	12	30	17	8	3	1	0	0	0	0	0	0	0	0	0	0	0	68	3	0	24.9	30.4
0100	33	0	0	0	2	5	9	5	1	2	0	0	0	0	0	0	0	0	0	0	0	31	2	0	25.8	31.5
0200	21	0	0	0	4	6	3	6	1	0	0	1	0	0	0	0	0	0	0	0	0	18	2	1	27.4	33.5
0300	19	0	0	0	3	7	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	17	2	0	24.6	28.5
0400	18	0	0	0	2	6	4	4	1	0	0	1	0	0	0	0	0	0	0	0	0	12	4	2	27.6	34.6
0500	38	0	0	0	2	4	11	10	7	4	0	0	0	0	0	0	0	0	0	0	0	34	4	0	31.1	37.5
0600	67	0	1	0	4	14	25	12	7	3	1	0	0	0	0	0	0	0	0	0	0	63	3	1	28.6	35.9
0700	74	0	0	0	5	31	22	10	4	1	1	0	0	0	0	0	0	0	0	0	0	68	4	2	26.6	32.9
0800	157	0	0	2	28	68	40	16	3	0	0	0	0	0	0	0	0	0	0	0	0	138	18	1	23.8	29.3
0900	307	0	0	9	84	143	52	17	2	0	0	0	0	0	0	0	0	0	0	0	0	290	15	2	22.5	27.1
1000	388	0	0	10	106	188	68	16	0	0	0	0	0	0	0	0	0	0	0	0	0	370	18	0	22.2	26.6
1100	424	0	1	5	102	222	75	18	1	0	0	0	0	0	0	0	0	0	0	0	0	403	19	2	22.4	26.4
1200	483	0	0	7	119	254	90	11	2	0	0	0	0	0	0	0	0	0	0	0	0	458	19	6	22.4	25.8
1300	571	0	1	24	173	273	84	14	2	0	0	0	0	0	0	0	0	0	0	0	0	542	23	6	21.6	25.3
1400	602	0	2	36	204	286	69	5	0	0	0	0	0	0	0	0	0	0	0	0	0	572	27	3	20.8	24.4
1500	519	0	0	20	148	214	117	17	3	0	0	0	0	0	0	0	0	0	0	0	0	487	31	1	22.3	26.7
1600	444	0	3	14	110	211	81	22	3	0	0	0	0	0	0	0	0	0	0	0	0	421	20	3	22.3	26.7
1700	437	0	1	6	107	217	83	20	3	0	0	0	0	0	0	0	0	0	0	0	0	411	20	6	22.6	26.9
1800	385	0	0	17	67	182	99	16	4	0	0	0	0	0	0	0	0	0	0	0	0	366	18	1	22.9	27
1900	240	0	0	6	30	96	74	25	7	2	0	0	0	0	0	0	0	0	0	0	0	228	10	2	24.8	29.6
2000	218	0	0	4	38	95	51	24	6	0	0	0	0	0	0	0	0	0	0	0	0	209	9	0	24.1	29.6
2100	136	0	0	0	23	53	41	16	3	0	0	0	0	0	0	0	0	0	0	0	0	128	7	1	24.8	29.6
2200	97	0	0	0	9	42	37	8	1	0	0	0	0	0	0	0	0	0	0	0	0	88	4	5	25	29.8
2300	57	0	0	0	10	23	18	5	1	0	0	0	0	0	0	0	0	0	0	0	0	54	2	1	24.4	29
07-19	4791	0	8	150	1253	2289	880	182	27	1	1	0	0	0	0	0	0	0	0	0	0	4526	232	33	22.2	26.3
06-22	5452	0	9	160	1348	2547	1071	259	50	6	2	0	0	0	0	0	0	0	0	0	0	5154	261	37	22.6	27
06-00	5606	0	9	160	1367	2612	1126	272	52	6	2	0	0	0	0	0	0	0	0	0	0	5296	267	43	22.6	27.1
00-00	5806	0	9	162	1395	2674	1178	306	65	13	3	1	0	0	0	0	0	0	0	0	0	5476	284	46	22.8	27.3

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Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	36	0	0	0	6	17	8	3	2	0	0	0	0	0	0	0	0	0	0	0	0	33	2	1	24.3	30.9
0100	18	0	0	0	0	6	8	3	1	0	0	0	0	0	0	0	0	0	0	0	0	15	3	0	27.2	31.3
0200	11	0	0	0	2	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	26.3	31.2

Airshed

Southbound

0300	18	0	0	1	1	6	5	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	16	2	0	26.5	35.1
0400	29	0	0	0	4	5	3	11	5	1	0	0	0	0	0	0	0	0	0	0	0	0	15	14	0	29.2	35.7
0500	85	0	0	1	13	18	22	16	9	3	2	1	0	0	0	0	0	0	0	0	0	0	76	8	1	27.8	36.1
0600	237	0	0	1	13	75	100	30	18	0	0	0	0	0	0	0	0	0	0	0	0	0	211	25	1	26.7	32.2
0700	460	0	0	20	70	201	130	34	4	1	0	0	0	0	0	0	0	0	0	0	0	0	407	47	6	23.6	28.5
0800	440	0	0	14	107	179	103	32	5	0	0	0	0	0	0	0	0	0	0	0	0	0	392	44	4	23	27.8
0900	400	0	6	76	187	100	29	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	324	66	10	18.5	23
1000	468	0	10	70	242	124	19	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	387	73	8	18.4	22.3
1100	407	0	30	40	139	153	32	12	0	0	0	0	0	0	0	0	1	0	0	0	0	0	332	69	6	19.5	24.4
1200	502	0	3	32	198	221	43	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	420	74	8	20.4	24.2
1300	460	0	3	22	162	208	52	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	389	64	7	21	24.8
1400	492	0	1	48	213	201	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	417	67	8	19.6	22.9
1500	610	0	2	39	274	244	44	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	533	73	4	20.1	23.7
1600	634	0	2	59	237	269	59	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	550	76	8	20.2	24.1
1700	606	0	0	31	216	288	64	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	534	64	8	21	24.6
1800	511	0	7	30	123	245	88	17	1	0	0	0	0	0	0	0	0	0	0	0	0	0	468	36	7	21.6	25.7
1900	274	0	1	9	55	115	80	12	1	0	1	0	0	0	0	0	0	0	0	0	0	0	251	20	3	23.2	27.8
2000	237	0	0	5	46	117	57	11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	223	13	1	23	27.5
2100	172	0	0	0	30	77	49	15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	162	9	1	24	28.9
2200	114	0	0	0	22	54	30	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	104	6	4	23.5	28
2300	73	0	0	0	5	39	14	12	2	1	0	0	0	0	0	0	0	0	0	0	0	0	69	2	2	25.1	30.8
07-19	5990	0	64	481	2168	2433	692	135	14	1	0	0	0	0	1	0	1	0	0	0	0	0	5153	753	84	20.6	24.8
06-22	6910	0	65	496	2312	2817	978	203	35	1	1	0	0	1	0	1	0	0	0	0	0	0	6000	820	90	21.1	25.6
06-00	7097	0	65	496	2339	2910	1022	221	39	2	1	0	0	1	0	1	0	0	0	0	0	0	6173	828	96	21.1	25.7
00-00	7294	0	65	498	2365	2965	1071	259	59	6	3	1	0	1	0	1	0	0	0	0	0	0	6339	857	98	21.3	25.9

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Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	36	0	0	1	9	9	9	8	0	0	0	0	0	0	0	0	0	0	0	0	0	31	2	3	24.4	31.3
0100	20	0	0	0	4	5	6	3	1	1	0	0	0	0	0	0	0	0	0	0	0	13	4	3	25.8	33.1
0200	11	0	0	0	2	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	10	1	0	26.8	34.8
0300	6	0	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	25.6	-
0400	39	0	0	0	2	16	14	6	1	0	0	0	0	0	0	0	0	0	0	0	0	27	11	1	25.9	30.1
0500	96	0	0	1	16	41	27	9	2	0	0	0	0	0	0	0	0	0	0	0	0	81	13	2	24.2	28.7
0600	223	0	0	6	37	103	58	16	3	0	0	0	0	0	0	0	0	0	0	0	0	186	34	3	23.7	28.2
0700	475	0	0	16	138	241	75	5	0	0	0	0	0	0	0	0	0	0	0	0	0	427	45	3	21.7	25.3
0800	516	0	6	39	181	220	62	7	0	0	1	0	0	0	0	0	0	0	0	0	0	456	57	3	20.8	24.8
0900	427	0	2	18	193	176	29	7	0	0	1	0	0	0	0	0	1	0	0	0	0	350	73	4	20.3	23.5
1000	404	0	0	23	191	151	33	3	3	0	0	0	0	0	0	0	0	0	0	0	0	329	69	6	20.1	23.8
1100	457	0	4	27	228	162	35	1	0	0	0	0	0	0	0	0	0	0	0	0	0	373	73	11	19.9	23.6
1200	449	0	6	39	215	163	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	374	70	5	19.4	22.8
1300	439	0	0	15	181	195	43	4	1	0	0	0	0	0	0	0	0	0	0	0	0	369	62	8	20.7	24.4
1400	535	0	7	32	239	202	54	1	0	0	0	0	0	0	0	0	0	0	0	0	0	452	74	9	20	23.8
1500	659	0	9	75	251	277	40	5	1	1	0	0	0	0	0	0	0	0	0	0	0	556	93	10	19.8	23.7
1600	648	0	4	34	227	311	62	7	0	1	0	0	0	0	0	0	2	0	0	0	0	567	75	6	20.9	24.5
1700	621	0	4	46	220	287	58	3	2	0	1	0	0	0	0	0	0	0	0	0	0	564	52	5	20.4	24.3
1800	617	0	0	20	209	283	98	7	0	0	0	0	0	0	0	0	0	0	0	0	0	563	45	9	21.4	25.3
1900	319	0	0	7	97	142	64	7	2	0	0	0	0	0	0	0	0	0	0	0	0	286	28	5	22.1	26.2
2000	217	0	0	4	44	118	36	12	1	1	0	1	0	0	0	0	0	0	0	0	0	202	14	1	22.9	26.4
2100	174	0	0	2	44	84	41	3	0	0	0	0	0	0	0	0	0	0	0	0	0	161	13	0	22.4	26.6
2200	124	0	0	2	27	55	30	8	1	1	0	0	0	0	0	0	0	0	0	0	0	117	4	3	23.5	27.8
2300	61	0	0	1	7	22	20	9	1	1	0	0	0	0	0	0	0	0	0	0	0	55	4	2	25.4	31.2
07-19	6247	0	42	384	2473	2668	614	51	7	2	3	0	0	0	0	0	3	0	0	0	0	5380	788	79	20.5	24.3
06-22	7180	0	42	403	2695	3115	813	89	13	3	3	1	0	0	0	0	3	0	0	0	0	6215	877	88	20.8	24.6
06-00	7365	0	42	406	2729	3192	863	106	15	5	3	1	0	0	0	0	3	0	0	0	0	6387	885	93	20.8	24.7

00-00	7573	0	42	408	2763	3268	924	135	20	6	3	1	0	0	0	0	3	0	0	0	0	6553	917	103	21	24.9
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01 June 2022

Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	33	0	0	0	5	18	6	2	2	0	0	0	0	0	0	0	0	0	0	0	0	26	4	3	24.1	28
0100	33	0	0	0	2	14	11	2	3	0	1	0	0	0	0	0	0	0	0	0	0	25	3	5	26.6	31.3
0200	9	0	0	0	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	22.8	-
0300	12	0	0	0	0	7	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	0	25.4	29.9
0400	36	0	0	0	4	11	10	11	0	0	0	0	0	0	0	0	0	0	0	0	0	24	10	2	26.9	32.6
0500	86	0	0	0	15	29	30	11	1	0	0	0	0	0	0	0	0	0	0	0	0	70	13	3	24.7	29.2
0600	242	0	0	3	44	120	51	18	4	2	0	0	0	0	0	0	0	0	0	0	0	212	28	2	23.7	28.6
0700	476	0	2	21	145	223	76	9	0	0	0	0	0	0	0	0	0	0	0	0	0	425	45	6	21.4	25.4
0800	493	0	1	21	155	254	54	8	0	0	0	0	0	0	0	0	0	0	0	0	0	430	54	9	21.3	24.6
0900	314	0	0	18	132	134	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	269	42	3	20.4	23.9
1000	451	0	6	61	230	126	24	1	0	0	0	0	0	0	0	0	0	3	0	0	0	386	59	6	19	22.6
1100	493	0	2	35	214	205	31	6	0	0	0	0	0	0	0	0	0	0	0	0	0	417	67	9	20	23.6
1200	496	0	2	49	204	209	27	3	1	1	0	0	0	0	0	0	0	0	0	0	0	433	55	8	19.6	22.9
1300	477	0	0	14	183	211	61	8	0	0	0	0	0	0	0	0	0	0	0	0	0	411	60	6	21.2	24.9
1400	539	0	6	67	243	192	25	6	0	0	0	0	0	0	0	0	0	0	0	0	0	459	69	11	19.1	22.9
1500	613	0	8	61	216	280	45	3	0	0	0	0	0	0	0	0	0	0	0	0	0	515	89	9	19.9	23.5
1600	619	0	3	65	233	235	77	4	1	1	0	0	0	0	0	0	0	0	0	0	0	550	61	8	20.4	24.8
1700	630	0	10	37	180	293	99	9	2	0	0	0	0	0	0	0	0	0	0	0	0	558	65	7	21.2	25.4
1800	678	0	5	29	200	337	100	6	0	0	0	1	0	0	0	0	0	0	0	0	0	621	52	5	21.3	25.2
1900	312	0	0	13	68	157	53	18	1	0	0	0	0	2	0	0	0	0	0	0	0	291	18	3	22.7	26.4
2000	225	0	0	4	44	103	62	9	3	0	0	0	0	0	0	0	0	0	0	0	0	212	12	1	23.3	27.6
2100	192	0	0	8	35	85	48	12	4	0	0	0	0	0	0	0	0	0	0	0	0	180	11	1	23.4	28.4
2200	119	0	0	0	31	50	28	7	2	1	0	0	0	0	0	0	0	0	0	0	0	115	4	0	23.5	28.5
2300	90	0	0	0	12	38	28	11	1	0	0	0	0	0	0	0	0	0	0	0	0	86	3	1	25	29.9
07-19	6279	0	45	478	2335	2699	649	63	4	2	0	1	0	0	0	0	0	3	0	0	0	5474	718	87	20.4	24.3
06-22	7250	0	45	506	2526	3164	863	120	16	4	0	1	0	2	0	0	0	3	0	0	0	6369	787	94	20.8	24.8
06-00	7459	0	45	506	2569	3252	919	138	19	5	0	1	0	2	0	0	0	3	0	0	0	6570	794	95	20.9	24.9
00-00	7668	0	45	506	2597	3336	982	165	25	5	1	1	0	2	0	0	0	3	0	0	0	6734	826	108	21	25.1

02 June 2022

Time [--]	Total	Vbin 0 5	Vbin 5 10	Vbin 10 15	Vbin 15 20	Vbin 20 25	Vbin 25 30	Vbin 30 35	Vbin 35 40	Vbin 40 45	Vbin 45 50	Vbin 50 55	Vbin 55 60	Vbin 60 65	Vbin 65 70	Vbin 70 75	Vbin 75 80	Vbin 80 85	Vbin 85 90	Vbin 90 95	Vbin 95 100	Cls 1	Cls 2	Cls 3	Mean	Vpp 85
0000	45	0	0	0	8	14	13	8	2	0	0	0	0	0	0	0	0	0	0	0	0	43	1	1	25.7	31.1
0100	25	0	0	0	4	7	9	2	2	1	0	0	0	0	0	0	0	0	0	0	0	22	3	0	26.4	32.5
0200	12	0	0	0	1	2	3	3	2	1	0	0	0	0	0	0	0	0	0	0	0	11	1	0	29.6	37.5
0300	18	0	0	0	0	2	12	4	0	0	0	0	0	0	0	0	0	0	0	0	0	13	4	1	28.1	30.8
0400	34	0	0	0	0	9	16	7	2	0	0	0	0	0	0	0	0	0	0	0	0	24	10	0	27.8	33.7
0500	85	0	0	0	8	31	30	10	5	1	0	0	0	0	0	0	0	0	0	0	0	69	15	1	26.2	31.9
0600	207	0	0	2	34	92	53	21	4	1	0	0	0	0	0	0	0	0	0	0	0	179	23	5	24.3	29.6
0700	375	0	3	12	99	178	67	8	7	1	0	0	0	0	0	0	0	0	0	0	0	318	55	2	22.2	26.3
0800	432	0	4	22	143	196	57	9	1	0	0	0	0	0	0	0	0	0	0	0	0	377	51	4	21.1	25.1
0900	441	0	4	32	144	198	55	7	1	0	0	0	0	0	0	0	0	0	0	0	0	371	62	8	20.7	24.9
1000	540	0	0	49	228	221	40	2	0	0	0	0	0	0	0	0	0	0	0	0	0	476	57	7	19.9	23.3
1100	553	0	4	49	286	193	20	1	0	0	0	0	0	0	0	0	0	0	0	0	0	481	64	8	19.2	22.5
1200	520	0	1	52	246	195	25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	461	54	5	19.3	22.8
1300	550	0	1	76	249	199	21	4	0	0	0	0	0	0	0	0	0	0	0	0	0	467	71	12	19	22.5
1400	600	0	4	68	230	252	41	5	0	0	0	0	0	0	0	0	0	0	0	0	0	511	78	11	19.7	23.3
1500	652	0	3	36	274	276	54	7	2	0	0	0	0	0	0	0	0	0	0	0	0	566	74	12	20.4	24

Airshed

Southbound

1600	676	0	8	57	289	269	47	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	612	61	3	19.7	23.4
1700	629	0	1	44	199	313	65	7	0	0	0	0	0	0	0	0	0	0	0	0	0	569	54	6	20.8	24.3	
1800	495	0	1	25	126	243	94	4	2	0	0	0	0	0	0	0	0	0	0	0	0	474	20	1	21.8	25.6	
1900	319	0	2	10	75	152	64	13	2	1	0	0	0	0	0	0	0	0	0	0	0	297	21	1	22.6	27.2	
2000	285	0	0	11	85	105	67	15	2	0	0	0	0	0	0	0	0	0	0	0	0	268	17	0	22.5	27.6	
2100	183	0	0	4	32	96	36	12	2	1	0	0	0	0	0	0	0	0	0	0	0	176	5	2	23	26.8	
2200	155	0	0	6	44	69	28	7	1	0	0	0	0	0	0	0	0	0	0	0	0	145	6	4	22	26.2	
2300	108	0	0	3	23	54	21	4	2	1	0	0	0	0	0	0	0	0	0	0	0	102	5	1	23	27.2	
07-19	6463	0	34	522	2513	2733	586	61	13	1	0	0	0	0	0	0	0	0	0	0	0	5683	701	79	20.2	24	
06-22	7457	0	36	549	2739	3178	806	122	23	4	0	0	0	0	0	0	0	0	0	0	0	6603	767	87	20.6	24.6	
06-00	7720	0	36	558	2806	3301	855	133	26	5	0	0	0	0	0	0	0	0	0	0	0	6850	778	92	20.7	24.7	
00-00	7939	0	36	558	2827	3366	938	167	39	8	0	0	0	0	0	0	0	0	0	0	0	7032	812	95	20.8	24.9	

Appendix 3 – Noise Model Outputs

Newton Village Run info Scenario 1 - Baseline

Project description

Project title: Newton Village
 Project No.: AS 0910
 Project engineer: Jack Fraser
 Customer:

Description:

Run description

Calculation type: Single Point Sound
 Title: Scenario 1 - Baseline
 Group
 Run file: RunFile.runx
 Result number: 2
 Local calculation (ThreadCount=12)
 Calculation start: 22/06/2022 12:37:32
 Calculation end: 22/06/2022 12:37:34
 Calculation time: 00:00:388 [m:s:ms]
 No. of points: 3
 No. of calculated points: 3
 Kernel version: SoundPLAN 8.2 (07/10/2020) - 32 bit

Run parameters

Reflection order: 3
 Maximum reflection distance to receiver 200 m
 Maximum reflection distance to source 50 m
 Search radius 5000 m
 Weighting: dB(A)
 Allowed tolerance (per individual source): 0.100 dB
 Create ground effect areas from road surfaces: No

Standards:

Road: CoRTN: 1988
 Driving on right side
 Emission according to: CoRTN
 Reflection order limited to: 1
 Road gradient smoothed with smooth length of: 15 m
 Disable low flow correction: No
 Method for L10 to Leq conversion: TRL formula
 Side diffraction: disabled
 Attenuation
 Foliage: No attenuation
 Built-up area: No attenuation
 Industrial site: No attenuation

Assessment: PPG24 (day/night)
 Reflection of "own" facade is suppressed

The Airshed

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Newton Village

Run info

Scenario 1 - Baseline

Geometry data

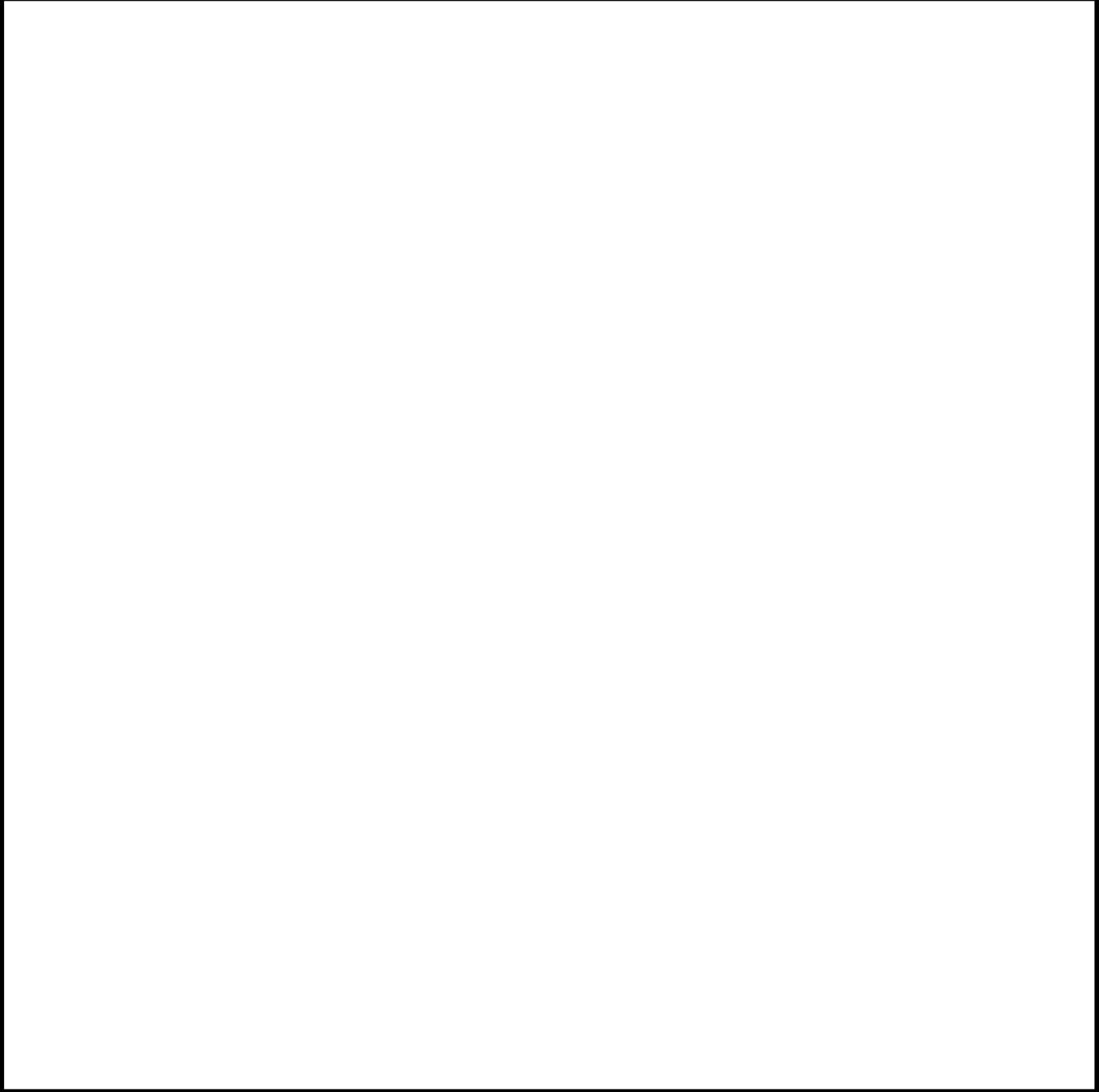
Scenario 1 - baseline.sit	22/06/2022 12:34:28	
- contains:		
baseline receptors.geo	22/06/2022 12:31:38	
DXF_15010_Building_Outline.geo		22/06/2022 12:24:28
DXF_15700_General_Road_Casing.geo		22/06/2022 11:07:42
environment.geo	22/06/2022 11:38:00	
Geo-File1.geo	22/06/2022 12:31:38	
ground conditions.geo	22/06/2022 11:42:36	
Roads S1-S2 - baseline 39kph.geo		22/06/2022 12:31:38
RDGM0001.dgm	22/06/2022 11:02:20	

The Airshed

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Newton Village
Assessed receiver levels
Scenario 1 - Baseline

Receiver	Fl	Dir	X m	Y m	Z m	LrD dB(A)	LrN dB(A)	
Site 1	GF		309271	677762	90.5	69	61	
Site 2	GF		309186	677658	93.2	69	61	
Site 3	GF		309092	677618	95.0	70	62	



	The Airshed	1
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Newton Village

Assessed receiver levels

Scenario 2 - Receptors 39kph

2

RNo	Receiver	FI	Dir	X	Y	Z	LrD	LrN
				m	m	m	dB(A)	dB(A)
1	2 Duddingston Terrace	GF	NW	309188	677651	93.2	67	60
2	2 Gallow View	GF	NW	309122	677549	94.8	55	47
		F 1				97.3	57	50
3	6-12 Main Street	GF	SE	309220	677712	92.4	73	65
		F 1				94.9	73	65
4	9 Main Street - Newton Snack	GF	NW	309161	677635	94.3	70	62
		F 1				96.8	70	62
5	11 Main Street	GF	NW	309172	677646	93.8	71	63
6	14-16 Main Street	GF	SE	309252	677743	91.6	73	64
7	17-19 Main Street	GF	NW	309223	677695	92.6	73	65
		F 1				95.1	73	65
8	18 Main Street	GF	SE	309270	677762	90.5	70	62
		F 1				93.0	73	64
9	23 Main Street	GF	NW	309239	677706	92.7	70	63
		F 1				95.2	71	63
10	35 Main Street	GF	NW	309291	677760	90.1	73	64
		F 1				92.6	73	65
11	Duddingston Crescent	GF	NW	309291	677711	92.0	58	54
		F 1				94.5	60	55
12	Gallow View	GF	W	309129	677564	94.7	55	52
		F 1				97.2	58	54
13	Main Street	GF	NW	309253	677715	92.3	68	61
		F 1				94.8	70	62
14	Main Street	GF	SE	309236	677728	92.2	74	65
		F 1				94.7	73	65
15	Main Street	GF	SE	309278	677770	90.1	70	62
16	Main Street	GF	SE	309286	677778	89.7	70	62
		F 1				92.2	73	64
17	Main Street	GF	N	309118	677608	95.2	68	61
		F 1				97.7	69	62
18	The Pheasant	GF	NW	309206	677678	92.4	73	64
		F 1				94.4	73	64

	The Airshed	1
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Newton Village

Assessed receiver levels

Scenario 3 - Receptors 48kph

2

RNo	Receiver	FI	Dir	X	Y	Z	LrD	LrN
				m	m	m	dB(A)	dB(A)
1	2 Duddingston Terrace	GF	NW	309188	677651	93.2	68	61
2	2 Gallow View	GF	NW	309122	677549	94.8	55	48
2	2 Gallow View	F 1	NW	309122	677549	97.3	58	50
3	6-12 Main Street	GF	SE	309220	677712	92.4	74	65
3	6-12 Main Street	F 1	SE	309220	677712	94.9	74	65
4	9 Main Street - Newton Snack	GF	NW	309161	677635	94.3	70	62
4	9 Main Street - Newton Snack	F 1	NW	309161	677635	96.8	71	63
5	11 Main Street	GF	NW	309172	677646	93.8	71	63
6	14-16 Main Street	GF	SE	309252	677743	91.6	73	65
7	17-19 Main Street	GF	NW	309223	677695	92.6	74	65
7	17-19 Main Street	F 1	NW	309223	677695	95.1	73	65
8	18 Main Street	GF	SE	309270	677762	90.5	70	62
8	18 Main Street	F 1	SE	309270	677762	93.0	73	64
9	23 Main Street	GF	NW	309239	677706	92.7	71	63
9	23 Main Street	F 1	NW	309239	677706	95.2	72	64
10	35 Main Street	GF	NW	309291	677760	90.1	73	65
10	35 Main Street	F 1	NW	309291	677760	92.6	73	65
11	Duddingston Crescent	GF	NW	309291	677711	92.0	58	54
11	Duddingston Crescent	F 1	NW	309291	677711	94.5	60	56
12	Gallow View	GF	W	309129	677564	94.7	56	53
12	Gallow View	F 1	W	309129	677564	97.2	58	54
13	Main Street	GF	NW	309253	677715	92.3	69	61
13	Main Street	F 1	NW	309253	677715	94.8	71	63
14	Main Street	GF	SE	309236	677728	92.2	74	65
14	Main Street	F 1	SE	309236	677728	94.7	74	65
15	Main Street	GF	SE	309278	677770	90.1	70	62
16	Main Street	GF	SE	309286	677778	89.7	70	62
16	Main Street	F 1	SE	309286	677778	92.2	73	65
17	Main Street	GF	N	309118	677608	95.2	68	61
17	Main Street	F 1	N	309118	677608	97.7	70	62
18	The Pheasant	GF	NW	309206	677678	92.4	73	65
18	The Pheasant	F 1	NW	309206	677678	94.4	73	65

The Airshed

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Newton Village

Assessed receiver levels

Scenario 4 - Receptors 32kph

2

RNo	Receiver	FI	Dir	X	Y	Z	LrD	LrN
				m	m	m	dB(A)	dB(A)
1	2 Duddingston Terrace	GF	NW	309188	677651	93.2	67	60
2	2 Gallow View	GF	NW	309122	677549	94.8	54	47
		F 1				97.3	57	50
3	6-12 Main Street	GF	SE	309220	677712	92.4	73	65
		F 1				94.9	73	65
4	9 Main Street - Newton Snack	GF	NW	309161	677635	94.3	70	62
		F 1				96.8	70	62
5	11 Main Street	GF	NW	309172	677646	93.8	71	63
6	14-16 Main Street	GF	SE	309252	677743	91.6	73	64
7	17-19 Main Street	GF	NW	309223	677695	92.6	73	65
		F 1				95.1	73	65
8	18 Main Street	GF	SE	309270	677762	90.5	70	62
		F 1				93.0	73	64
9	23 Main Street	GF	NW	309239	677706	92.7	70	63
		F 1				95.2	71	63
10	35 Main Street	GF	NW	309291	677760	90.1	73	65
		F 1				92.6	73	65
11	Duddingston Crescent	GF	NW	309291	677711	92.0	58	54
		F 1				94.5	60	55
12	Gallow View	GF	W	309129	677564	94.7	55	52
		F 1				97.2	58	54
13	Main Street	GF	NW	309253	677715	92.3	68	61
		F 1				94.8	70	62
14	Main Street	GF	SE	309236	677728	92.2	74	65
		F 1				94.7	73	65
15	Main Street	GF	SE	309278	677770	90.1	70	62
16	Main Street	GF	SE	309286	677778	89.7	70	62
		F 1				92.2	73	65
17	Main Street	GF	N	309118	677608	95.2	68	61
		F 1				97.7	69	62
18	The Pheasant	GF	NW	309206	677678	92.4	73	64
		F 1				94.4	73	64

	The Airshed	1
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