

67-75 Lords Road, Leichhardt

Noise & Vibration Impact Assessment

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1 INTRODUCTION

This report presents an acoustic assessment of potential noise impacts associated with the proposed mixed-use residential development to be at 67-75 Lords Road, Leichhardt.

The following will be addressed in this report:

- External noise intrusion assessment (primarily from rail and aircraft noise, as well as Lords Road to the south of the site).
- Vibration impacts from light rail adjacent to site.
- Noise impacts from the adjacent Lambert Park Sportsfield.
- Noise emissions from mechanical plant servicing the development (in principle).

This report has been based on the Planning Proposal Report prepared by FPDplanning (February 5, 2025) and the Urban Design Report prepared by SJB Architecture (issue V8), dated 21st November 2023.

2 SITE DESCRIPTION

The planning proposal would facilitate the redevelopment of the site for up to 21,667sqm of floor space (2.4:1 FSR across 9,028sqm of land at 67 -73 Lords Road) for residential development delivering around 210 new dwellings in addition to the potential for non-residential uses at ground level. A minimum of 5% of residential floor space would be provided as affordable housing in perpetuity through a Community Housing Provider.

The proposed development is located at 67-75 Lords Road, Leichhardt and comprises of four mixed use residential buildings in addition to both public and private open space.

The predominant noise sources impacting the site are summarised as follows:

- Noise from Aircraft pass-bys
- Rail noise from the L1 Sydney light rail-line along the western boundary of the site
- Vehicle noise from surrounding roads, including Lords Road to the south.
- Noise associated with the use of the APIA Leichhardt Football Club playing field (Lambert Park) that borders the north boundary of the proposed development.

The nearest affected noise sensitive receivers near the site include the following:

- **Receiver R1** -- residential dwellings to the east along 2-28 Davies Street;
- **Receiver R2** - residential dwellings located across Lords Road to the south of the site at 17-27 Kegworth Street.
- **Receiver R3** – Active recreational area to the north at Lambert Park Sportsfield

Figure 1 below presents a site map, measurement locations and receiver locations.

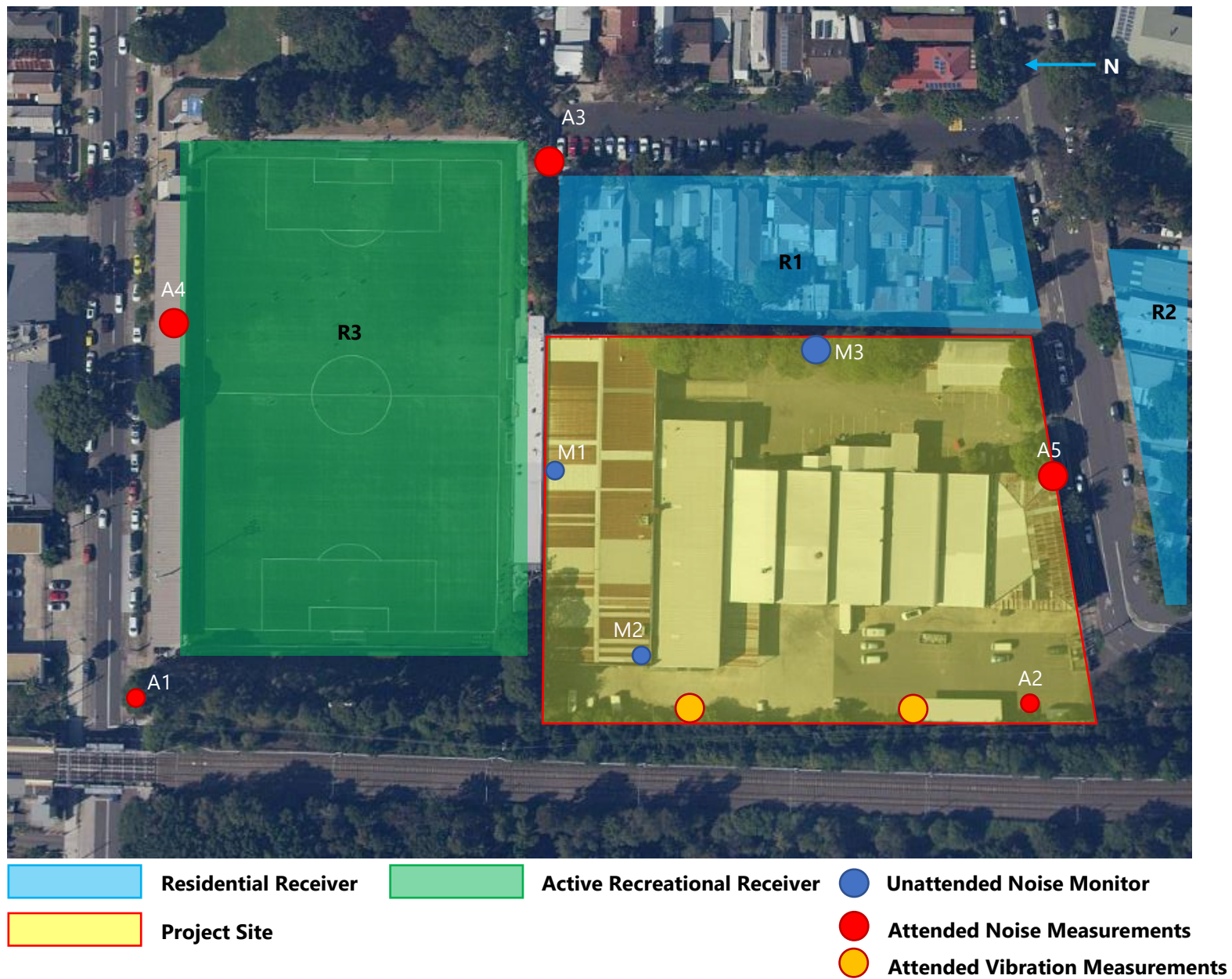


Figure 1 – Site Map, Measurement Locations and Surrounding Receivers (Source: SixMaps NSW)

3 EXISTING ACOUSTIC ENVIRONMENT

Unattended noise monitoring and supplementary attended measurements were conducted on site by Acoustic Logic to establish the existing ambient noise levels which will be used as basis for this assessment.

3.1 NOISE DESCRIPTORS

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15 minute measurement interval is typically utilised. Noise levels are monitored continuously during this period, and then statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters obtained from the data are:

L_{eq} - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. **L_{eq}** is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of time-varying noise sources (such as traffic noise).

L₉₀ – This is commonly used as a measure of the background noise level as it represents the noise level heard in the typical, quiet periods during the measurement interval. The **L₉₀** parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the **L₉₀** level.

L₁₀ is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event, and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

L₁ is sometimes used in place of **L_{max}** to represent a typical noise level from a number of high level, short term noise events.

3.2 MEASUREMENT EQUIPMENT

Attended noise measurements were conducted using a Norsonic 140 sound level analyser, set to A-weighted fast response. The sound level analyser was calibrated before and after the measurements, no significant drift was noted.

Monitoring was conducted using Acoustic Research Laboratories (ARL) NGARA and Rion NL-42 noise loggers. The monitoring was continuous, with statistical noise levels recorded at 15-minute intervals throughout the monitoring period. Measurements were taken on "A" frequency weighting and fast time response.

All monitoring equipment used retains current calibration - either manufacturers' calibration or NATA certified calibration. The monitors were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

Unattended noise monitoring data is presented in Appendix A.

3.3 MEASUREMENT LOCATIONS & PERIOD

M1 – One Unattended noise monitor was installed along the northern boundary of the existing two-storey warehouse, as shown in Figure1. The monitor was located close to the edge of the roof with the microphone extended above the parapet. Line of sight to the field was partially obstructed. Monitoring at this location was undertaken on two occasions, the first being from Monday 6th June 2022 – Tuesday 14th June 2022, and the second being from Monday 4th July 2025 – 14th July 2025. On the second occasion, the monitor was also setup to record audio files to assist with identification of noise sources during the period.

M2 – One Unattended noise monitor was installed along the western boundary of the existing two-storey warehouse, as shown in Figure1. The monitor had a full view of the adjacent light rail. This monitor has been used to determine period average levels of noise from the light rail adjacent to the site. Monitoring at this location was undertaken from Monday 6th June 2022 – Wednesday 15th June 2022 (Location M2).

As detailed in Appendix D of the DNRCBR, long term monitoring of rail operations is the preferable method of assessment, as all movements throughout the daytime and night time periods are captured and form part of the period noise levels. Where attended measurements are solely relied up (typically in situations where long term monitoring is not available or appropriate), a minimum of 20 pass-bys is recommended. In this case, significantly more than 20 pass-bys were measured over the monitoring period by the long term monitor.

M3 – One unattended noise monitor was installed along the eastern boundary of the site, adjacent to residential receivers closest to site. The monitoring was undertaken to establish the background noise levels representative of surrounding residents. The location was chosen as it is screened from adjacent transportation sources of noise, and provides a conservative basis to establish noise emission requirements for the site. Monitoring at this location was undertaken from Monday 4th July 2025 – 23rd July 2025.

A1 and A2 - Attended measurements were conducted at the location of the nearest noise sources (adjacent to Lambert Park Sportsfield and light-rail) to determine the spectral characteristics of noise sources impacting the site. The location of all on-site measurements is shown in figure 1. Attended noise measurements were taken on Tuesday 28th June 2022 between 11:00am and 12:00pm.

A3 & A4 – Attended measurements were undertaken during a competitive football match between APIA Leichardt FC First Grade Female and Sydney United SFC First Grade Female on Sunday 13th of July 2025. Measurements were taken within the grandstand area of Lambert Park, as well as at the closest accessible external boundary with line of sight to the ground. Measurements were undertaken to establish typical noise levels from competitive fixtures at the ground. Measurements were undertaken between the hours of 3pm and 8pm.

A5 – Attended traffic noise measurements undertaken along Lords Road on 23rd July 2025.

3.4 MEASUREMENT RESULTS

3.4.1 Unattended Noise Measurements

Results from unattended measurements are presented in the following tables.

Factsheets A & B of the NSW EPA *Noise Policy for Industry* (NPI) provide procedures for noise monitoring to determine background noise levels, including the exclusion of data which may be weather affected. The policy recommends that data be excluded from the assessment period where rainfall occurs in a sample period, or the wind speed exceeds 5 metres per second. In the event a significant portion of data is excluded from a particular assessment period the ABL for that period should be excluded.

Rating background noise levels have been established from the methodology outlined in the NPI. Average period L_{eq} noise levels have been calculated in line with the procedures detailed in the Road Noise Policy. Weather affected data has been excluded from the calculation of noise levels, the results of which are presented below.

Table 1 –Long Term Environmental Noise Level Summary

Location	Date	Time of Day	Measured Rating Background Noise Level dB(A) $L_{90}(\text{period})$	Measured Ambient Noise Level
M1	06.06.2022 – 15.06.2022	Day (7am – 6pm)	49	57 dB(A) $L_{eq}(15 \text{ hour})$
		Evening (6pm – 10pm)	46	
		Night (10pm – 7am)	40	52 dB(A) $L_{eq}(9 \text{ hour})$
	04.07.2025 – 14.07.2025	Day (7am – 6pm)	48	59 dB(A) $L_{eq}(15 \text{ hour})$
		Evening (6pm – 10pm)	47	
		Night (10pm – 7am)	40	52 dB(A) $L_{eq}(9 \text{ hour})$
M2	06.06.2022 – 15.06.2022	Day (7am – 6pm)	47	57 dB(A) $L_{eq}(15 \text{ hour})$
		Evening (6pm – 10pm)	46	
		Night (10pm – 7am)	39	52 dB(A) $L_{eq}(9 \text{ hour})$
M3	04.07.2025 – 23.07.2025	Day (7am – 6pm)	41	58 dB(A) $L_{eq}(15 \text{ hour})$
		Evening (6pm – 10pm)	43	
		Night (10pm – 7am)	38	51 dB(A) $L_{eq}(9 \text{ hour})$

3.4.2 Lambert Park Noise Levels

To quantify the levels of noise which may be generated by Lambert Park during operation, an unattended noise monitoring was located on the rooftop of the existing warehouse to continuously monitor noise levels during the period of Monday 4th July 2025 – 14th July 2025. In addition, a series of attended measurements were undertaken during competitive matches of the APIA Leichardt women's teams on Sunday 13th July 2025, including a first grade match, between the hours of 4pm and 8pm.

Review of information of fixtures scheduled for Lambert Park during the monitoring showed games scheduled for Saturday 5th July, Sunday 6th July, Saturday 12th July & Sunday 13th July. In addition, monitoring was undertaken during the school holiday period where the ground may be in use for holiday activities. No publicly available information was found for school holiday activities, however these were identified based on review of the audio files. Similarly, training activities at the field would be captured over the period.

Attended measurements within the grandstand and at the southern boundary of the site during competitive matches allowed the quantification of noise contribution from the field and grandstand elements of Lambert Park. An estimate of spectators at the ground was approximately 300. Attended measurements were undertaken over the course of the afternoon and evening. A summary of the representative measured noise levels is presented in Table 3, i.e. those which were not affected by significant external sources of noise such as aircraft, pedestrians or vehicles within the laneway.

Based on review of the measurements the following periods were identified for field use:

- Saturday 5th of July 2025 – Junior competitive football matches between 8am and 6pm
- Sunday 6th of July 2025 – Junior competitive football matches between 8am and 6pm
- Monday 7th July & Tuesday 8th July 2025 – Holiday camps or similar from approximately 7.30am, with field use continuing until approximately 9pm for training.
- Saturday 12th of July 2025 - Junior competitive football matches between 8am and 6pm
- Sunday 13th of July 2025 – Women's competitive youth and senior football matches between 8am and 8pm

Based on review of the audio files and noise levels, audible noise from Lambert Park generally consisted of coaching instruction (primarily for junior games and holiday camps), vocal noise from players, whistles, ball impacts, and cheering from spectators. APIA Leichardt has indicated that the field may be in use from 7am to 9pm daily, with some games extending to 10pm – the above identified schedules is consistent with this.

Contributing to the noise levels were also surrounding vehicle traffic, with maximum noise levels measured generally being from the light rail passbys and aircraft overflight.

A summary of the measured noise levels are presented below, with the summarised loudest 1 hour period during each day.

Table 2 – Summarised Noise Levels (Long Term Monitor)– Lambert Park

Date	Measured Noise Level	Type of Use
Saturday 5 July 2025 (10am – 11am)	63 $L_{eq}(1 \text{ hour})$	Competitive Fixtures
Sunday 6 July 2025 (10am – 11am)	63 $L_{eq}(1 \text{ hour})$	Competitive Fixtures
Monday 7 July 2025 (9.15am – 10.15am)	61 $L_{eq}(1 \text{ hour})$	Holiday Activities / Training
Tuesday 8 July 2025 (10.15am – 11.15am)	64 $L_{eq}(1 \text{ hour})$	Holiday Activities / Training
Wednesday 9 July 2025 (9.30am – 10.30am / 10.30am – 11.30am)	62 $L_{eq}(1 \text{ hour})$	No Significant Use Noted
Thursday 10 July 2025 (10.30am – 11.30am)	63 $L_{eq}(1 \text{ hour})$	No Significant Use Noted
Friday 11 July 2025 (10.30am – 11.30am)	63 $L_{eq}(1 \text{ hour})$	No Significant Use Noted
Saturday 12 July 2025 (5pm – 6pm)	59 $L_{eq}(1 \text{ hour})$	Competitive Fixtures
Sunday 13 July 2025 (10am – 11am)	62 $L_{eq}(1 \text{ hour})$	Competitive Fixtures

Table 3 – Summarised Noise Levels (Short Term Attended)– Lambert Park

Date	Location & Time	Measured Noise Level (Attended)	Measured Noise Level (Logger)	Description of Noise
Sunday 13 July 2025	A3 Southern Boundary 4.30pm	63 dB(A) $L_{eq}(15\text{min})$	60 $L_{eq}(15\text{min})$	Crowd cheering, player vocals and referee whistle, multiple goals scored for home team.
	A4 Northern Grandstand 5.30pm	72 dB(A) $L_{eq}(15\text{min})$	57 $L_{eq}(15\text{min})$	Within grandstand, crowd noise including cheering, general field play including goal scored.
	A3 Southern Boundary 6pm	61 dB(A) $L_{eq}(15\text{min})$	58 dB(A) $L_{eq}(15\text{min})$	Crowd cheering, player vocals and referee whistle.

3.4.3 Summary of Noise Measurements

3.4.3.1 Lambert Park

Based on the measurements undertaken at various locations surrounding the site and at various times, the following can be summarised:

- Noise levels at the northern and western boundaries of the site are comparable both in terms of background and ambient noise levels.
- Measured levels at the same location (M1) between similar periods in 2022 and 2025 show consistency in both background and ambient levels – there have been no significant change in the environmental noise levels during this time.
- Measured levels at the eastern boundary (adjacent existing residents) have generally lower background noise levels, being screened from surrounding sources of transport noise (other than aircraft).

With respect to measurements of current operational noise from Lambert Park, there was a correlation between the attended measurement positions (with direct line of sight to the field) and the elevated monitoring position (with partially screened view). The difference was in the order of 3dB(A).

It was observed that the primary contribution to the overall noise level was from use of the field (i.e. player vocals, whistles etc.). Whilst contribution was noted from the crowd, this was of significantly shorter duration and so did not increase the overall noise level significantly. In this respect, the measured noise levels from Lambert Park to the proposed development are relatively insensitive to variations from crowd noise for typical use.

Across the monitoring period there was little variation in the measured noise levels at the monitoring location between when the field was in use, and when it was unoccupied. This shows that whilst there is audible contribution from the use of the field, other surrounding sources of noise are at a similar level or slightly louder – use of the field does not appear to contribute to higher measured noise levels at the proposed development.

3.4.3.2 Light Rail Operations

Long term unattended noise monitoring was undertaken to determine the noise levels from the adjacent light rail line. This was supplemented by attended measurements to determine the noise spectra generated by the operation to enable detailed assessment of noise intrusion.

4 NOISE INTRUSION ASSESSMENT

The predominant noise sources impacting the site are as follows:

- Noise from Aircraft pass-bys
- Rail noise from the L1 Sydney light rail-line along the western boundary of the site
- Vehicle noise from surrounding roads, including Lords Road to the south.
- Noise associated with the use of Lambert Park field that borders the north boundary of the proposed development.

4.1 INTERNAL NOISE CRITERIA

The following documents were used to determine the project criteria for noise intrusion into the development:

- Inner West Council (Leichhardt Council) Development Control Plan (DCP) 2013
- State Environmental Planning Policy (Transport and Infrastructure) 2021
- NSW Department of Planning – *“Development near Rail Corridors and Busy Roads –Interim Guideline”*.
- AS2021:2015 – *“Aircraft Noise Intrusion – Building Siting and Construction”*
- AS2107 – 2016 Acoustics – *“Recommended design sound level and reverberation times for building interiors”*

The standards and the application of the criteria is presented in the following sections.

4.1.1 Inner West Council (Leichhardt Council) DCP 2013

Section C3.12 – Acoustic Privacy, contained in the Inner West Council (Leichhardt Council) DCP 2013 has the following controls regarding external noise impacts on residential development.

C3.12 ACOUSTIC PRIVACY

- C2 Buildings that are exposed to high levels of external noise are designed and constructed in accordance with AS3671 – *Acoustics – Road Traffic Noise Intrusion*, AS2107:2016 – *Recommended Design Sound Levels and Reverberation Times for Building Interiors*, and AS2021-2015 – *Acoustics – Aircraft Noise Intrusion – Building siting and construction*.

4.1.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

As the development is located adjacent to a rail-line the provisions of the State Environmental Planning Policy (SEPP) Transport & Infrastructure 2021, applies at this site. This policy states the following:

“2.100 Impact of rail noise or vibration on non-rail development

(1) This section applies to development for any of the following purposes that is on land in or adjacent to a rail corridor and that the consent authority considers is likely to be adversely affected by rail noise or vibration—

- (a) residential accommodation,*
- (b) a place of public worship,*
- (c) a hospital,*
- (d) an educational establishment or centre-based child care facility.*

(2) Before determining a development application for development to which this section applies, the consent authority must take into consideration any guidelines that are issued by the Secretary for the purposes of this section and published in the Gazette.

(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—

- (a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10.00 pm and 7.00 am,*
- (b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.”*

4.1.3 Development Near Rail Corridors and Busy Roads – Interim Guideline

This guideline provides both general and specific advice for the planning and assessment of noise sensitive development impacted by roads and railways, and in particular those uses required to be addressed under the T&I SEPP. The assessment criteria broadly mirror those in the T&I SEPP, noting that the DNRCBR recommends adoption of the $L_{eq(period)}$ noise descriptors for airborne noise impacts to residential development.

Whilst the adjacent roadways are not directly covered by the T&I SEPP, given the presence of the light rail line west of site, the same internal noise criteria will be utilised for the assessment of road traffic noise. The below table summarises the criteria from these sources.

Table 4 – DNRCBR Airborne Noise Level Requirement

Space /Activity Type	Internal Noise Level Requirement	Time of Day
Bedrooms	35 dB(A) $L_{eq(9 \text{ hour})}$	Night Time (10pm – 7am)
Living Areas	40 dB(A) $L_{eq(15 \text{ hour})}$	Daytime (7am – 10pm)

The DNRCBR also provides general design guidance and principles which can be adopted to mitigate noise from external sources to residential apartments. Some of these principles relate to the orientation, siting and layout of buildings whilst others relate to the effective mitigation of incident sources of noise on the façade (i.e. acoustic design of the façade).

With respect to these we note that the current planning proposal does not include detail as to the internal layout of apartments, and is primarily for the approval of building envelopes. Design of internal layouts would be considered as part of future stages. With respect to building siting and orientation, we note that whilst there are discreet sources of noise adjacent to site (light rail, roadways and Lambert Park), the site is also exposed to aircraft noise which effects all areas of the development to a similar extent. Given this, alterations to the siting of the buildings is unlikely to provide significant changes or improvements to the overall noise exposure of specific façades.

With respect to façade mitigation balconies (both open and enclosed) are suggested as effective ways to mitigate noise transfer to internal areas of the development. These elements are able to be incorporated into the overall design of the building, and are expected to form part of the strategy for noise mitigation to future apartments. Specifically, enclosed balconies/wintergardens are intended to be strategically adopted for areas of the development which would benefit from their use, for example those which face the light rail line or Lambert Park. This strategy is described in Figure 3.16 of the DNRCBR, reproduced below.

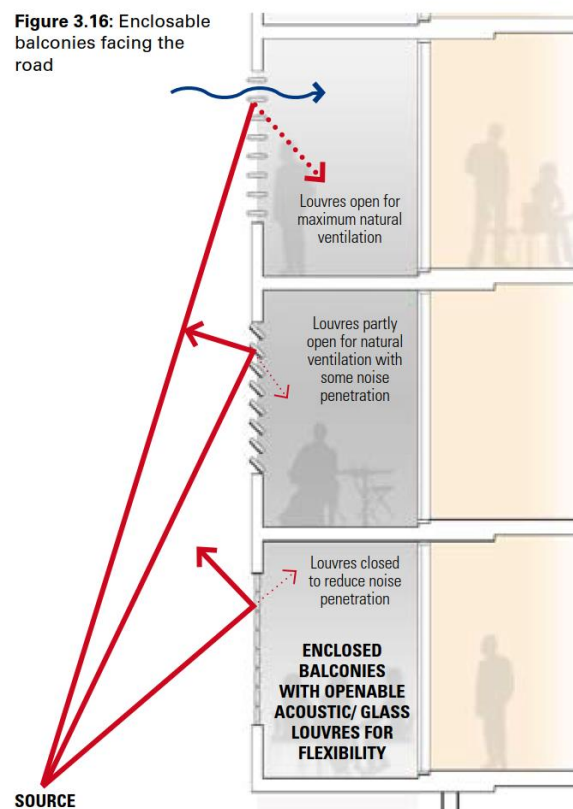


Figure 3 – Noise Mitigation Strategy Including Enclosable Balconies/Wintergardens (DNRCBR)

4.1.4 NSW Apartment Design Guide

This document provides additional design guidance for multi-unit residential apartment developments. These include residential flat buildings, shop top housing and the residential component of fixed use developments.

Although the ADG is applied as a guide, the Housing SEPP refers to some parts of the ADG that must be applied when assessing development applications. Section 4J of the ADG provides guidelines for acoustically constrained sites near transportation noise sources and other environments such as industrial areas, substations, sports stadiums, etc. It also requires that all Housing SEPP development adjacent to rail corridors and busy roads must have regard to DNRCBR.

There are two sections of the ADG which relate to acoustics – 4H (which relates to general acoustic privacy) and 4J (which relates to acoustic privacy in constrained sites affected by external noise sources). With respect to noise mitigation, many of the design considerations are similar (or reproduced from) to the DNRCBR. For example, in scenarios where external noise sources are to be mitigated through the design of the building the following guidance is proposed in Part 4H:

- Double or acoustic glazing
- Acoustic seals
- Use of materials with low noise penetration properties
- Continuous walls to ground level courtyards where they

Section 4J provides similar guidance as detailed in the DNRCBR (including the use of balconies and enclosed balconies to mitigate noise transmission).

Specifically with reference to the potential noise mitigation solutions, the following is suggested:

- Limiting the number and size of openings facing noise sources
- Providing seals to prevent noise transfer through gaps
- Using double or acoustic glazing, acoustic louvres or enclosed balconies(wintergardens)
- Using materials with mass and/or sound insulation or absorption properties e.g. solid balcony balustrades, external screens and soffits.

As noted in Section 4.1.3, the use of enclosed balconies/wintergardens are proposed to be implemented where appropriate within the future design, in order to assist in the mitigation of external noise sources to apartments. For these scenarios, the ADG notes *balconies designed as acoustically sealed wintergardens can improve liveability of the balcony and adjoining habitable rooms...*

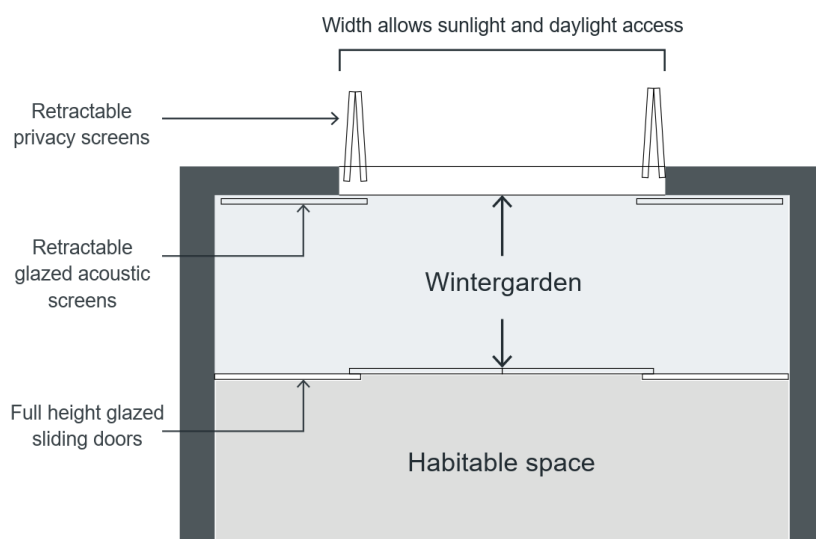


Figure 4 – Wintergarden Design Considerations (ADG Figure 4J.5)

4.1.5 AS2021:2015 – Aircraft Noise Intrusion – Building Siting and Construction

The acceptability of Aircraft Noise exposure is assessed using Australian Standard AS2021:2015 '*Acoustics– Aircraft noise intrusion–Building siting and construction*'.

The standard sets criteria for allowable levels of aircraft noise exposure depending on the proposed land use for the site being assessed.

The acceptability of a site in terms of aircraft noise exposure is assessed using the Australian Noise Exposure Forecast System (ANEF). Three basic parameters influence perception of aircraft noise: the frequency of aircraft movements overhead, the noise level and duration of individual aircraft movements, and the time of the day in which they occur. ANEF was developed to provide a rating system that reflects actual human response to these factors so that the noise exposure of a particular location can be readily assessed.

The project site is located close to the ANEF 20 contour, based on the Sydney Airport 2039 ANEF contour map. Therefore, the proposed site must be assessed to ensure that internal noise levels are limited to those recommended in AS2021.

AS2021:2015 stipulates the internal noise levels listed in the table below for residential buildings. These levels will be used to assess aircraft noise intrusion into the residential levels of the development.

Table 5 – Aircraft Noise Levels Inside Residential & Commercial Buildings

Space /Activity Type	Recommended Design Sound Level dB(A) L_{max}
Sleeping areas, dedicated lounges	50dB(A) L_{max}
Other habitable spaces	55dB(A) L_{max}
Bathrooms, toilets, laundries	60dB(A) L_{max}
Shops, Supermarkets and Showrooms	75dB(A) L_{max}

4.1.6 Australian Standard AS2107:2016 “Recommended design sound levels and reverberation times for building interiors”

Australian Standard 2107:2016 – “*Recommended Design Sound Levels and Reverberation Times for Building Interiors*” provides guidance on acceptable internal noise levels from steady state and quasi-steady state sources. Whilst we note that this guideline excludes noise from crowds or sporting events from its scope of assessment, in the absence of other relevant guidelines it provides a reasonable basis on which to determine acceptable internal noise levels for residential use. On this basis, AS2107 will be used to establish the internal noise levels for the residential areas of the development for noise impacts from the playing field, in addition to the non-habitable areas of the development and the ground floor commercial tenancies.

We note that the current operation of Lambert Park does not include use of the fields during the night time period (10pm – 7am), and so specific assessment against this criteria would not be applicable for typical use. Notwithstanding, a criteria for bedrooms has been provided, in the event that hours of use for the field are varied in the future such that it includes operation during these periods.

Table 6 – Recommended Design Sound Levels for Residential & Commercial Spaces

Space /Activity Type	Recommended Maximum Design Sound Level dB(A)_{Leq}
Sleeping Areas	35 to 40
Living Areas	40 to 45
Apartment Common Areas (e.g. foyer, lift lobby etc.)	50
Small Retail Stores	Less than 50

4.1.7 Summarised Noise Intrusion Requirements

A summary of the relevant noise intrusion requirements is presented in the table below.

Table 7 – Summarised Internal Noise Level Requirement

Noise Source	Space /Activity Type	Internal Noise Level Requirement	Time of Day
Aircraft AS2021	Bedrooms	50 dB(A) L_{max}	Any Time
	Living Areas	55 dB(A) L_{max}	
	Bathrooms, toilets, laundries	60 dB(A) L_{max}	
Light Rail T & I SEPP 2021	Bedrooms	35 dB(A) $L_{eq}(9 \text{ hour})$	Night Time (10pm – 7am)
Road Traffic Noise	Living Areas	40 dB(A) $L_{eq}(15 \text{ hour})$	Daytime (7am – 10pm)
Lambert Park AS2107	Bedrooms	35-40 dB(A) $L_{eq}(1 \text{ hour})$	Night Time (10pm – 7am)
	Living Areas	40-45 dB(A) $L_{eq}(1 \text{ hour})$	Daytime (7am – 10pm)
All	Apartment Common Areas (e.g. foyer, lift lobby etc.)	50 $L_{eq}(1 \text{ hour})$	When in Use
	Small Retail Stores	50 $L_{eq}(1 \text{ hour})$	

4.2 EXTERNAL NOISE LEVELS IMPACTING THE SITE

Noise sources which may impact the proposed development are summarised in the following sections, based on the measured noise levels at site and determined with reference to AS2021 (for aircraft noise).

Noise levels below represent the calculated noise level at the most affected façade to the noise source, inclusive of a façade correction. We note that the actual noise level from each individual source will vary across the project site (other than for aircraft), however the below summary provides a summary of the maximum noise levels at façade elevations.

4.2.1 AIRCRAFT NOISE ASSESSMENT

Aircraft noise levels at the site were determined using AS2021-2015. The Standard gives aircraft noise levels for aircraft landing and taking off for locations near airports. The location of the runways was obtained from the Sydney Airport ANEF 2039.

Based on the distance from the site to the runways, the flight path, and the site elevation, AS2021 predicts that the loudest typical aircraft movement will be from an A380 aircraft departing on the Main Runway. The noise level at the site as indicated by the standard is 79dB(A). This noise level will be used to predict the resultant internal noise levels.

Review of the unattended noise monitoring data on site indicate that there are instances where the measured maximum noise levels on site exceed 79dB(A), and as such it is possible that there are some flights which generate higher external noise levels than identified by the standard. As part of future design development for the project it is recommended that consideration be given to the potential for these flights, which should consider both the level and frequency of aircraft pass-bys above 79dB(A).

4.2.2 Light Rail Noise

Façade noise levels due to light rail operations have been predicted from the attended and long-term monitoring results. Monitoring results at location M2 established the daytime and night time noise levels generated by the existing light rail (as presented in Table 2). Corrections have been made to adjust the noise level incident on the closest façade of the planning proposal (refer Figure 2).

The calculated noise levels to the most affected façade (west) are 61dB(A) $L_{eq,15hr}$ and 56dB(A) $L_{eq,9hr}$.

4.2.3 Traffic/Road Noise

Attended measurements along Lords Road were undertaken during peak hour (8am – 10am) on the 23rd of July 2025 to determine the existing level of noise generated by vehicle movements along the road. Measurements were undertaken at the site boundary, with a level of 56 dB(A) $L_{eq(15min)}$ being the highest level recorded over the period.

Traffic noise from surrounding roadways has been considered in the assessment of noise intrusion, however in the context of other sources of noise does not provide a significant contribution.

4.2.4 Lambert Park Sports Field

Based on measured noise levels of field use and spectators, most exposed levels of the development directly facing the ground (north) are anticipated to experience approximately 60 dB(A) $L_{eq(1\text{ hour})}$ from the use of the sports field. Noise levels have been calculated based on the measured maximum $L_{eq(1\text{ hour})}$ noise level at the logger position and corrected to the northern façade at a 6m setback.

4.3 COMPLYING CONSTRUCTIONS

Internal noise levels will primarily be a result of noise transfer through the windows and doors as these are relatively light building elements that offer less resistance to the transmission of sound. Noise transfer through any masonry elements will not be significant and need not be considered further. **All constructions will need to be reviewed and assessed at a later stage prior to construction.**

4.3.1 Glazed Windows

A preliminary review of noise intrusion from all external noise sources has revealed that compliance with acoustic guidelines is achievable with mostly single glazed windows with acoustic seals. Exact glazing thicknesses and acoustic treatments are to be determined after window sizing and room layouts are finalised in the detailed design phase of the project. All recommendations are based on noise levels measured on site. Noise levels have been adjusted based on distances from any major noise source, any barrier effects from objects in the direct path of the sound source and the orientation of the building façade with respect to the sound source.

Recommendations have been provided for both single glazed and enclosed balcony/wintergarden scenarios to assist with the design development.

Table 4.4 – Typical Glazing Construction Recommendations – Residential Areas

Facade	Room	Glazing requirements
Any	Bedrooms	Option 1: Single layer of heavy-weight laminated glazing with acoustic seals (R_w 35-37)
	Living Rooms	Option 2: Wintergarden balconies with single layer of medium-weight (R_w 31) laminated glazing to "internal" windows and single layer medium weight glazing to external façade (R_w 29).
	Common Areas / Corridors	Light to medium weight single glazed windows with acoustic seals (R_w 29-31)

Table 4.5 – Typical Glazing Construction Recommendations – Commercial Areas

Façade	Room	Glazing requirements
Any	Open Offices	Light to medium weight single glazed windows with acoustic seals (R_w 29-31)
	Showrooms	
	Private Offices	Medium to heavy weight single glazed windows with acoustic seals (R_w 29-31)

The glazing thicknesses recommended are those needed to satisfy acoustic requirements and do not consider other requirements such as structural, safety, thermal control or reflectivity.

4.3.2 External Walls and Roof/Ceiling Construction

Noise intrusion through the concrete/masonry elements will be acoustically acceptable without further acoustic treatment.

Where any light-weight wall or roof/ceiling systems are proposed, these are to be reviewed prior to construction by a suitable qualified acoustic consultant. Indicatively, a light weight system with a minimum rating of R_w 50 would be sufficient to control external noise intrusion.

4.4 EXTERNAL NOISE LEVELS AT THE BUILDING FAÇADE & VENTILATION REQUIREMENTS

With respect to natural ventilation of the occupied living spaces of the development, the Australian Standard AS 2021 – 2015 "Aircraft Noise Intrusion – Building Siting and Construction" states that:

"Buildings on sites determined to be 'conditionally acceptable' under clause 2.2 should be designed such that the Aircraft Noise Reductions (ANR) values determined under clause 3.2.2 are achieved for all internal spaces. In general, this will require that external windows and doors be kept closed, since if these are opened for ventilation purposes the aircraft noise reduction of the building envelope will be significantly reduced. If it is necessary to close windows and doors to comply with this standard, building ventilation should be in accordance with the National Construction Code on the assumption that windows and doors are not openable. Mechanical ventilation or air-conditioning systems complying with AS1668.2 should be installed."

With windows (or doors) open, the allowable internal noise goals specified in AS 2021 – 2015 "Aircraft Noise Intrusion – Building Siting and Construction" will not be achieved and therefore ventilation systems complying with the standard are required for all habitable rooms in dwellings.

Furthermore, the NSW Department of Planning document "Development near Busy Roads and Rail Corridors - Interim Guideline" states the following with respect to natural ventilation of buildings adjacent to rail corridors and busy roads:

"If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."

With windows open, the allowable internal noise goal is therefore permitted to be 10dB(A) higher than when the windows are closed (i.e. the allowable noise intrusion level in bedrooms becomes 45dB(A), and 50dB(A) in living rooms).

Light rail noise levels within the dwellings and natural ventilation has been considered with reference to the NSW Department of Planning guideline. An assessment of noise intrusion from Lambert Park has also been conducted in a similar manner.

Façade noise levels due to light rail operations have been predicted from the long-term monitoring results. The most affected façade would experience noise levels of 61dB(A) $L_{eq,15hr}$ and 56dB(A) $L_{eq,9hr}$. Therefore, without any other measures the corresponding internal "windows open" (to 5% of the floor area) noise levels will be approximately 51 dB(A) and 46 dB(A). Noise levels in the most affected location would marginally exceed the windows open goal by 1 dB(A) in living areas and sleeping areas during the daytime and night time periods respectively.

Similarly, based on the external noise levels generated by use of Lambert Park, with windows open (open area of window equal to 5% of floor space of habitable room), the internal noise levels from the loudest typical noise levels is approximately 50dB(A) within living areas, which meets the 50dB(A) noise goal. As the park does not operate in the night-time period (10pm-7am), a consideration of noise levels in sleeping areas is not required.

It is proposed to incorporate wintergardens to the dwellings. The wintergardens would act as a noise buffer to internal habitable areas. Whilst not a mandatory requirement, if the noise to wintergarden areas were to be considered, the external noise level from use of Lambert Park at the edge is expected to be 60dB(A) $L_{eq(1 \text{ hour})}$. Where windows are retained open to the wintergarden area, a further reduction of 5-10dB(A) would be expected (depending on the extent/type of opening and room characteristics of the wintergarden), resulting in a level of 50-55 dB(A) $L_{eq(1 \text{ hour})}$ within the space.

Whilst not strictly applicable to noise from sports or community uses, various planning guidelines provide recommended noise levels for external recreation spaces. For example, the NSW EPA Road Noise Policy recommends a level of 55-60dB(A) $L_{eq(period)}$ for passive and active external recreation spaces respectively. The Noise Policy for Industry recommends amenity levels of 50-55 dB(A) $L_{eq(period)}$ for the same uses. Expected noise levels within the wintergarden (with windows open) is consistent with these ranges.

Contextually, the noise environment surrounding the site is diverse, and contains a range of noise sources (as detailed in the preceding sections of this report). Without use of the sporting field, a similar level of noise is present in the area (from aircraft, road traffic, light rail, and general ambient noise) as from the use of Lambert Park. The results in Table 2 demonstrate this through on days where no significant use of the field were observed, however equivalent or higher levels of noise were measured over the course of the day, as compared to periods with active use for competitive fixtures.

We also note that future residents would have the opportunity to retain open wintergardens to achieve higher levels of ventilation, or closed to achieve lower levels of noise. Whilst detailed selection of façade materials has not been completed, predicted noise levels within most exposed wintergarden areas would be 40 dB(A) or less. This is consistent with the recommended internal noise levels for habitable spaces such as living & dining rooms.

5 NOISE EMISSION ASSESSMENT

Noise emissions from the site should be assessed to ensure that the amenity of nearby land users are not adversely affected. An assessment of traffic noise generation and mechanical plant (in principle) has been undertaken with reference to EPA guidelines.

5.1 NOISE EMISSION CRITERIA

Noise emissions from the site are to comply with the provisions of the Council DCP, NSW EPA *Noise Policy for Industry* (for mechanical plant) and the *Road Noise Policy* (RNP).

All noise emission criteria applicable at the site is presented in the following sections.

5.1.1 Inner West Council (Leichhardt Council) DCP 2013

Section C3.12 – Acoustic Privacy, contained in the Inner West Council (Leichhardt Council) DCP 2013 has the following controls regarding noise emissions from new development.

C3.12 ACOUSTIC PRIVACY

- C6 Electrical, mechanical or hydraulic plant achieves a maximum noise level of 5dB(A) above background sound levels at the boundary of the site.

5.1.2 NSW EPA Noise Policy for Industry (NPfI) 2017

The EPA NPfI has two criteria which both are required to be satisfied, namely intrusiveness and amenity. The NPfI sets out acceptable noise levels for various localities. The policy indicates four categories to assess the appropriate noise level at a site. They are rural, suburban, urban and urban/industrial interface. Under the policy the nearest residential receivers would be assessed against the urban criteria.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

5.1.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality. Background noise levels adopted are presented in Section 3.4.1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 8 - NPI Intrusiveness Criteria

Receiver	Time of day	Background Noise Level dB(A) L_{90}	Intrusiveness Criteria Background +5dB(A)
Residential	Day	41	46
	Evening	43	46*
	Night	38	43

* As the evening background noise level is higher than the daytime period, the daytime period has been used to determine the intrusive level.

5.1.2.2 Project Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The EPA's NPFI sets out acceptable noise levels for various localities. The recommended noise amenity area is based upon the measured background noise levels at the sensitive receiver. Based on the measured background noise levels detailed in Section 3.4, the Noise Policy for Industry suggests the adoption of the 'urban' categorisation.

The NPFI requires project amenity noise levels to be calculated in the following manner:

$$L_{Aeq,15min} = \text{Recommended Amenity Noise Level} - 5 \text{ dB(A)} + 3 \text{ dB(A)}$$

The amenity levels appropriate for the receivers surrounding the site are presented in Table 9.

Table 9 - NPFI Project Amenity Noise Levels

Type of Receiver	Time of day	Recommended Noise Level dB(A) $L_{eq}(\text{period})$	Project Amenity Noise Level dB(A) $L_{eq}(15 \text{ minute})$
Residential – urban	Day	60	58
	Evening	50	48
	Night	45	43
Active Recreational Area	When in use	55	53

The NSW EPA Noise Policy for Industry (2017) defines:

- Day as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sundays and Public Holidays.
- Evening as the period from 6 pm to 10 pm.
- Night as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sundays and Public Holidays.

5.1.2.3 Sleep Arousal Criteria

The Noise Policy for Industry recommends the following noise limits to mitigate sleeping disturbance:

Where the subject development / premises night -time noise levels at a residential location exceed:

- $L_{eq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{Fmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

a detailed maximum noise level even assessment should be undertaken.

Table 10 - Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A) L_{90}	Emergence Level
Residential Receivers Night (10pm – 7am)	38 dB(A) L_{90}	43 dB(A) $L_{eq, 15min}$; 53 dB(A) L_{Fmax}

5.2 NSW EPA ROAD NOISE POLICY

For land use developments with the potential to create additional traffic on public streets the development should comply with the EPA *Road Noise Policy*. Noise levels generated by traffic should not exceed the noise levels set out in the table below when measured at a nearby property.

Table 11 – Criteria for Traffic Noise Generated by New Developments – Residential Receivers

Road Type	Time of day	Permissible Noise Generation
Local Roads	Day (7am to 10pm)	55 dB(A) $L_{eq}(1hr)$
	Night (10pm to 7am)	50 dB(A) $L_{eq}(1hr)$

However, if existing noise levels exceed those in the table above, Section 3.4 of the Road Noise Policy is applicable, which requires noise impacts to be reduced through feasible and reasonable measures. However, in determining what is feasible/reasonable, the Policy notes that an increase of less than 2dB(A) is a minor impact and would be barely perceptible.

In this case, the measured traffic noise level along Lords Road is 56 dB(A) L_{eq} , which is above the permissible noise generation – i.e. the existing level of traffic noise already exceeds the guidance in the Road Noise Policy. In these cases, traffic generation is considered acceptable where additional vehicles on public roads does not increase the level by more than 2dB(A), or a level of 58 dB(A) $L_{eq}(1 \text{ hour})$.

5.3 SUMMARISED NOISE EMISSION CRITERIA

Applicable noise emission project trigger levels are bolded in the table below.

Table 12 – Summarised Noise Emission Criteria for Surrounding Receivers

Receiver	Time Period	Assessment Background Noise Level dB(A) L_{90}	Project Amenity Criteria dB(A) L_{eq}	Inner West Council (Leichhardt) DCP 2013 & Intrusiveness Criteria (BG +5 dB(A) $L_{eq}(15min)$)	NPI Maximum Noise Level Assessment
Residential	Day	41	58	46	-
	Evening	43	48	46*	-
	Night	38	43	43	43 dB(A) $L_{eq, 15min}$ 53 dB(A) L_{Fmax}
Active Recreational Area	When in use	-	53	-	-

Table 13 – Criteria for Traffic Noise Generation

Road Type	Time of day	Permissible Noise Generation
Local Roads	Day (7am to 10pm)	≤ 58 dB(A) $L_{eq}(1hr)$

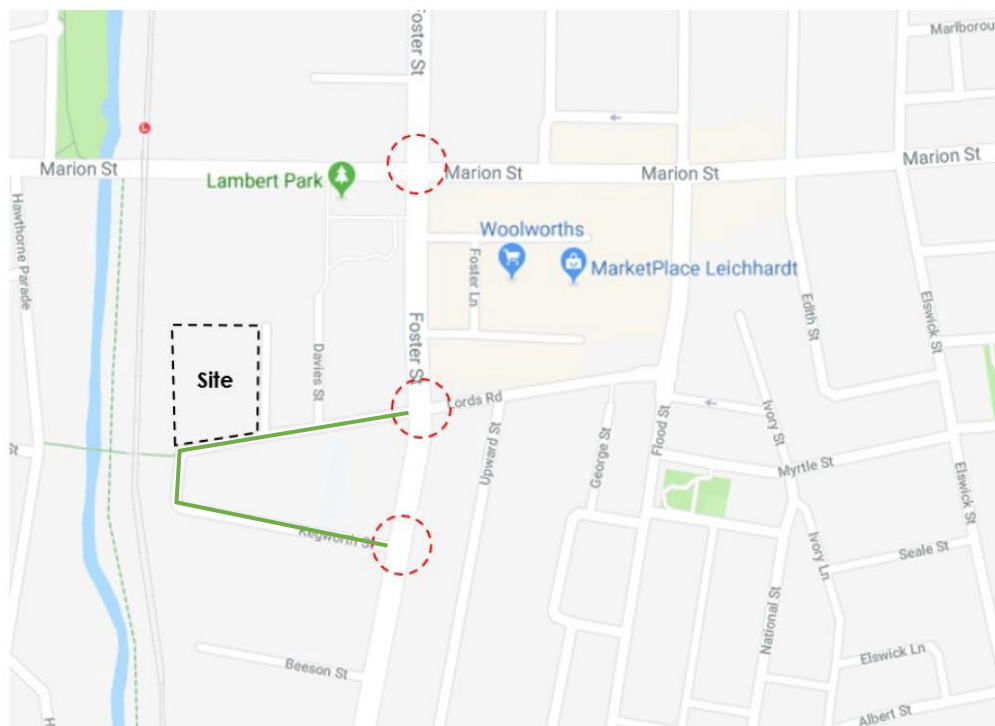
5.4 TRAFFIC NOISE GENERATION

A Traffic and Parking Impact Assessment (T&PIA) has been prepared by The Transport Planning Partnership as part of the planning proposal (ref: 18145, dated 18 January 2024). This report details peak hour traffic volumes as well as the expected level of vehicle movements associated with the development.

Section 2.5 of the T&PIA details traffic volumes based on vehicle counts at key intersections surrounding the site. Given the surrounding road network, access to the site is from either from either Lords Road or Kegworth Street and connecting east (highlighted below).

The two key intersections to consider with respect to traffic generation are then Lords Road/Forster Street and Kegworth Street/Tebbutt Street, figure reproduced below.

Figure 2.8: Key Nominated Intersections



A summary of existing peak hour volumes at these intersections are presented in the table below. For simplicity, the below numbers represent all vehicles movements which travel along Lords Road (adjacent site) and Kegworth Street, but only vehicles in the north/south direction for the primary roads of Forster Street / Tebbutt Street.

Table 14 – Existing Peak Hour Traffic Volumes

Street / Direction	Time of Day	Number of Vehicles
Lords Road / Kegworth Street Loop	AM Peak	134
	PM Peak	320
Forster Street / Tebbutt Street (North / South)	AM Peak	1440
	PM Peak	1646

Section 5.2 of the T&PIA details the estimated traffic generation from the planning proposal, reproduced below.

Table 5.2: Net Proposed Development Traffic Estimates

Scenario	AM Peak (7am-8am)	PM Peak (5pm-6pm)
2018 Existing Site Traffic Generation	30 vph	110 vph
Proposed Development Traffic	68 vph	53 vph
Net Development Traffic	38 vph	-58 vph

N.B. The AM and PM Peaks have been assessed against the road network peak times based on 2018 traffic surveys. The site's existing AM peak occurs outside of the network peak hours.

The above shows that the impact during the PM peak period would be an overall reduction in traffic volume on surrounding roadways, which would not generate additional traffic noise.

For the AM peak an increase of 38 vehicles over the peak hour is expected from the current usage. This increase is not significant with respect to noise generation, and in the context of the existing volume of traffic through the access ways to the site, any increase would be less than 1 dB(A) and acceptable with the Road Noise Policy.

5.5 MECHANICAL PLANT

Detailed plant selection has not been undertaken at this stage, as mechanical design and plant specifications have not been determined. Detailed acoustic review should be undertaken prior to construction to determine acoustic treatments to control noise emissions to satisfactory levels.

Satisfactory levels will generally be achievable through appropriate plant selection and location and, if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures, for example:

- Where air conditioning condenser units are located on the roofs of buildings within the development, screening could be implemented if required to reduce noise levels to surrounding residents.
- General ventilation fans can be located within acoustically treated plant rooms to contain noise.
- Where external fan locations are required, the location and selection of these fans can be chosen to minimise noise emissions.
- Where additional acoustic treatment is required, this can generally be readily implemented to the plant design to comply with specified noise levels.

Cumulative assessment of plant noise is recommended when conducting the acoustic design of plant items. Compliance with NSW *Noise Policy for Industry* (2017) criteria as set out in Section 5.2 will be achievable, provided that detailed acoustic review of plant items is undertaken once plant is selected, and standard acoustic treatments (such as in-duct attenuation, barriers, appropriate location of plant items etc) are adopted.

6 RAIL INDUCED VIBRATION

Trains induce ground borne vibration that is transmitted through the subsoil. This vibration can be perceptible close to railways.

6.1 ASSESSMENT CRITERIA

This section presents the applicable assessment criteria for ground borne noise and tactile vibration.

6.1.1 Ground Borne Noise

Development located adjacent to railway lines must be assessed in accordance with Clause 2.100 of the SEPP (Transport & Infrastructure) 2021. It is noted that the requirements of this standard are achieved when assessed in accordance with the NSW Department of Planning *Development Near Rail Corridors and Busy Roads – Interim Guideline (2008)*. The section relevant to ground borne noise is as follows:

Where buildings are constructed over or adjacent to land over tunnels, ground borne noise may be present without the normal masking effect of airborne noise. In such cases, residential buildings should be designed so that the 95th percentile of train pass-bys complies with a ground borne L_{Amax} noise limit of 40dBA (daytime) or 35dBA (night-time) measured using the “slow” response time setting on a sound level meter.

Table 15 - Internal Railway Noise Level Criteria for Ground Borne Noise

LOCATION	TIME OF DAY	Internal Ground Borne Noise Criteria dB(A) L_{max} (SLOW)
Living and sleeping areas	Day (7am-10pm)	40
	Night (10pm-7am)	35

6.1.2 Tactile Vibration

Human comfort is normally assessed with reference to the British Standard BS 7385 Part 2 1993 or Australian Standard AS 2670.2 1990.

The Interim Guideline references the DECCW *Assessing Vibration- A technical guideline* which recommends that habitable rooms should comply with the criteria therein which is in line with the requirements of British Standard BS 6472:1992 "Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)".

British Standard BS 6472:1992 "Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)" is recommended by the RIC's and SRA's Interim Guidelines for Councils "Consideration of rail noise and vibration in the planning process" as this standard includes guidance for the assessment of human response to building vibration including intermittent vibrations such as that caused by trains.

Human response to vibration has been shown to be biased at particular frequencies, which are related to the orientation of the person. This standard provides curves of equal annoyance for various orientations. These curves are applied as correction filters such that an overall weighted acceleration level is obtained. As the orientation of the resident is unknown or varying the weighting filter used is based on the combined base curve as given in ISO 2631 & Australian Standard 2670 "Evaluation of Human Exposure to Vibration and Shock in Buildings (1 to 80Hz)" which represent the worst case of the X, Y and Z axes. Filtered measurements are made in all three co-ordinate axes and the highest value axis used.

This standard assesses the annoyance of intermittent vibration by using the Vibration Dose Value (VDV). Alternatively the VDV may be estimated by the eVDV which is derived by a simpler calculation using an empirical factor. The VDV or eVDV is calculated for the two periods of the day being the "Daytime" (6am-10pm) and "Night time" (10pm-6am). The overall value is then compared to the levels in Table 9. For this project the aim will be for a low probability of adverse comment.

Table 16 - Vibration Dose Values (m/s^{1.75}) above which various degrees of adverse comment may be expected in residential buildings

Place	Low Probability of adverse comment	Adverse comment possible	Adverse comment probable
Residential buildings 16hr day (Daytime)	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8hr night (Night time)	0.13	0.26	0.51

6.2 VIBRATION MEASUREMENTS

Rail vibration measurements were conducted at two locations along the western boundary of the site, being the closest point to the light rail corridor. Attended train vibration measurements were conducted on 4th of July 2025. A Svan 958 AE Vibration Analyser was used for the vibration measurements. The analyser was fitted with a Dytran triaxial accelerometer.

6.2.1 Tactile Vibration

The measured vibration levels, duration of train pass-by and the number of light rail movements per hour were used to determine the overall vibration dose (VDV) at the proposed development for both daytime and night time periods. The results are presented the table below.

Table 17 - Vibration Dose Values

Time Period	Calculated VDV m/s^{1.75}	Criteria VDV m/s^{1.75}	Complies
Day (7am – 10pm)	0.07	0.2 to 0.4	Yes
Night (10pm -7am)	0.04	0.13	Yes

The Vibration Dose Values were found to be less than the “low probability of adverse comment” criteria (the most stringent criteria) for the subject site. Once building locations and setbacks have been confirmed, further vibration measurements the specific building location can confirm the above assessment.

6.2.2 Structure Borne Noise Measurements

Internal noise levels within future residential units as a result of structure borne noise have been calculated for a number of light rail passbys. Noise levels have been determined based on-site measurements of light rail induced vibration and calculation of the amount of structure borne noise which may be radiated to the future building. Refer to Table below for predicted internal noise levels at the closest locations of the development.

Table 18 – Predicted Structure Borne Vibration Levels

Location	Time of Day	Predicted Internal Ground Borne Noise dB(A)L_{max(Slow)}	Criteria dB(A)L_{max(Slow)}	Complies
Apartments along western portion of site (closest to rail line)	Day (7am-10pm)	< 30	40	Yes
	Night (10pm-7am)	< 30	35	Yes

The results above indicate that no further acoustic treatment is required to mitigate vibration from light rail to the site. Once building locations and setbacks have been confirmed, further vibration measurements the specific building location can confirm the above assessment.

7 SUMMARY OF ASSESSMENT

A summary of the mitigation measures and recommendations from this report are summarised below:

- The northern façade of the buildings should be set back a minimum of 6m from the boundary.
- Use of wintergardens is recommended to control noise intrusion from a range of sources to internal habitable areas, and provide additional benefit to external private open space.
- Future design considerations for apartment layouts and building design should consider:
 - Orientation, siting and layout of buildings
 - Careful development and design of internal layouts.
 - Limiting the number and size of openings facing noise sources
- Preliminary recommendations have been provided for façade constructions to control noise intrusion to internal areas – this is to be further developed as part of the detailed design of the project.
- Once building siting, setbacks and layouts have been finalised, noise and vibration measurements for adjacent sources of noise are to be confirmed to determine impacts to the site, particularly to residential uses.
- Noise emissions from the site, particularly with respect to mechanical plant, is to be assessed as part of the future design.
- It is recommended that an appropriate notation (for example a restriction as to user) be placed on the title of all future residential dwellings on the site acknowledging the noise associated with the use of Lambert Park as a sports field / recreation facility.

8 CONCLUSION

This report presents our acoustic assessment for the proposed mixed-use residential development located at 67-75 Lords Road, Leichhardt. The report has been updated to reflect comments made in submissions in relation to the following matters:

- Noise impacts & vibration impacts from the adjacent light rail and Lambert Park.
- Background noise levels/emission goals for adjacent residents.

In relation the above, further noise and vibration monitoring has been undertaken on site to quantify the existing levels of environmental noise. Specifically, additional measurements have been taken of operational noise from use of the sports field and potential vibration impacts from the light rail.

Based on these additional measurements and assessment, it can be concluded that noise impacts from surrounding sources of noise can be effectively mitigated through the building design to meet relevant internal noise requirements from all sources of noise (aircraft, light rail, road traffic and sports noise). Initial recommendations have been provided to assist with further design development in relation to acoustic requirements for the façade to achieve these levels. Noise emission requirements to surrounding residents have been updated to reflect the additional background noise measurements completed at a conservatively selected residential boundary.

The assessment has been undertaken with regard to the following:

- External noise impacts to the development from aircraft, light rail, roadways and Lambert Park.
- Potential vibration impacts from the adjacent light rail line.
- Noise emission requirements to surrounding land uses, including residential properties.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,



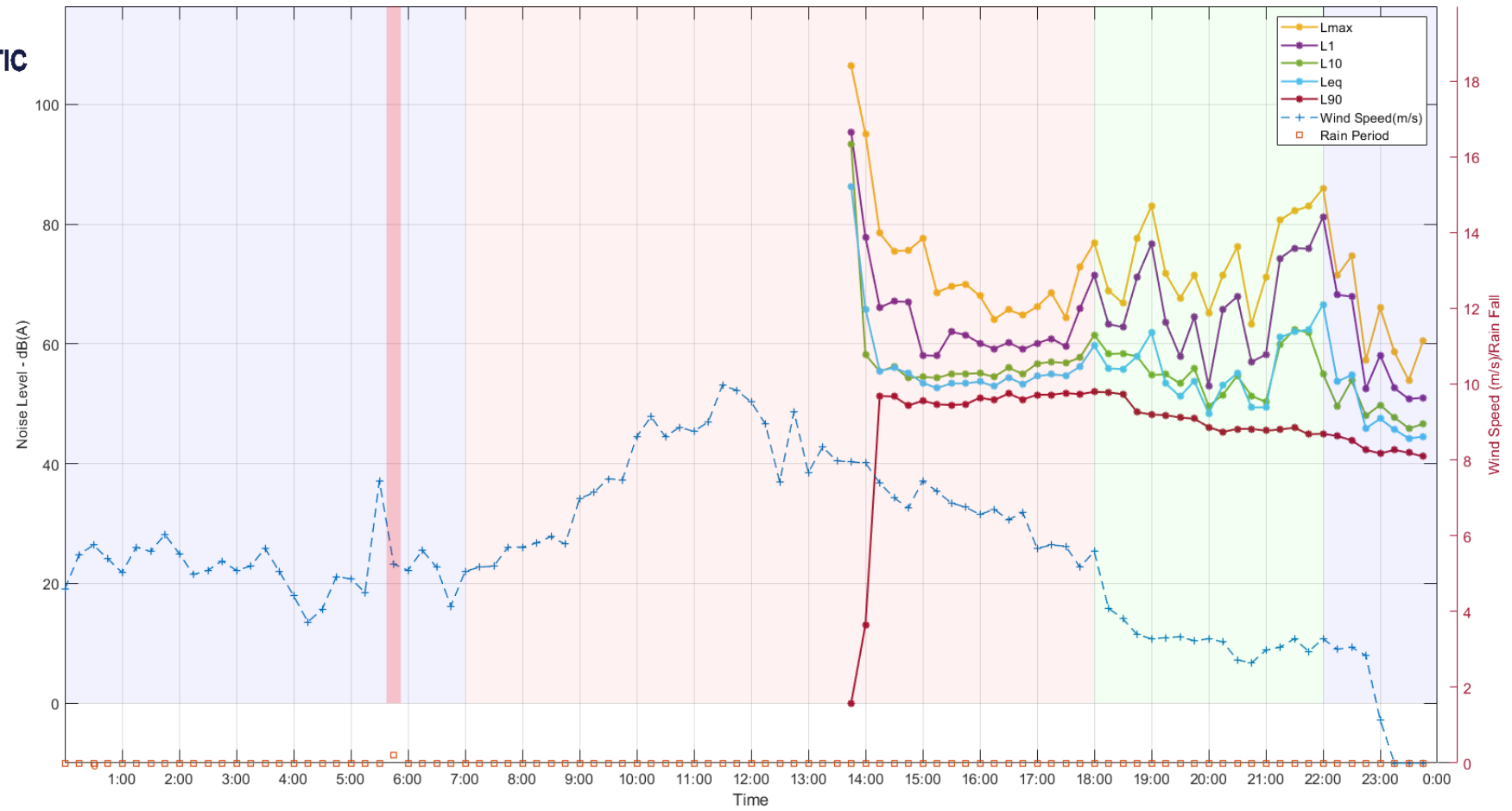
Acoustic Logic Pty Ltd
Alex Washer

APPENDIX A – UNATTENDED NOISE MONITORING DATA

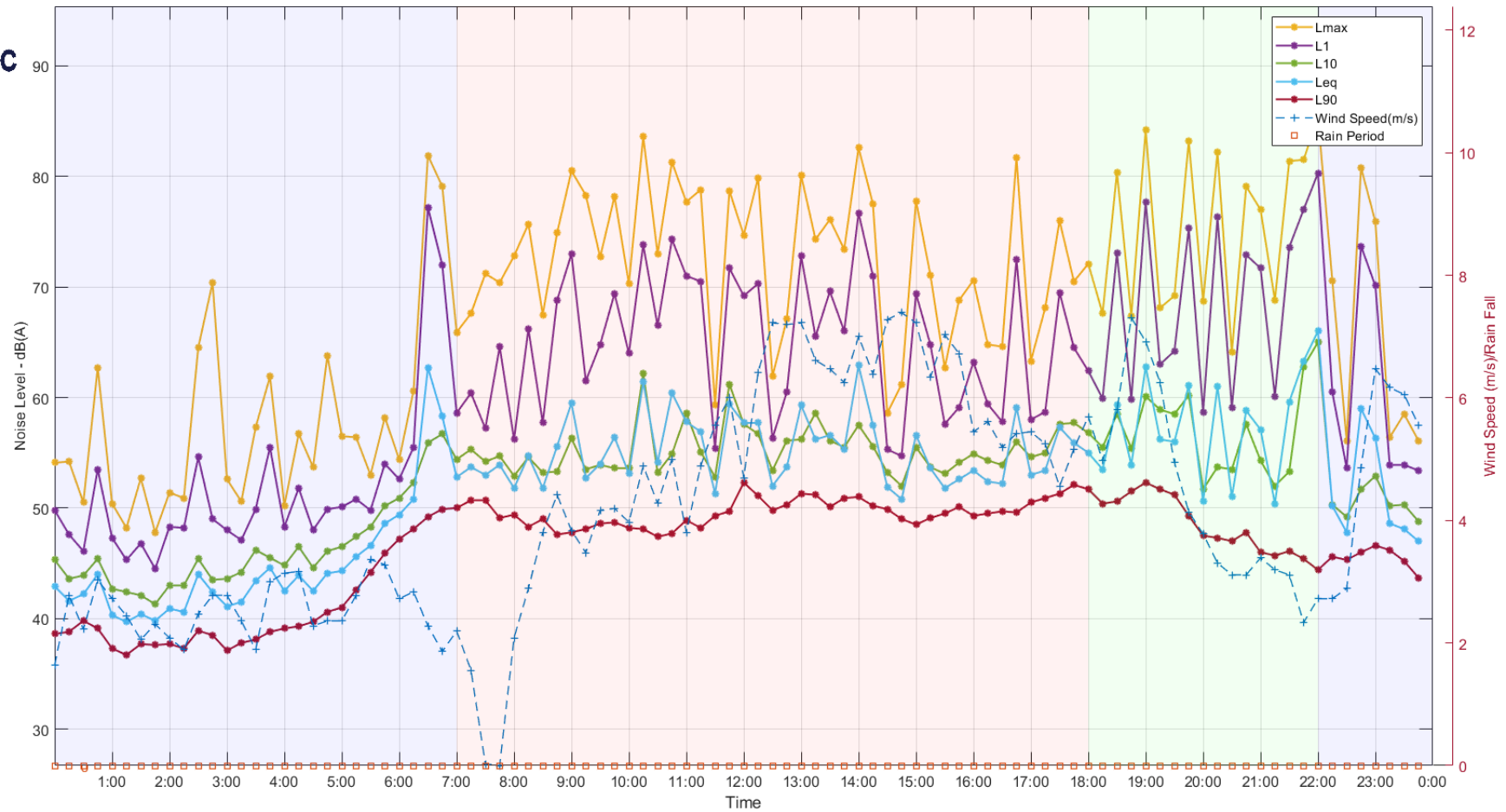
POSITION M1 – WESTERN BOUNDARY ADJACENT LAMBERT PARK (2022)



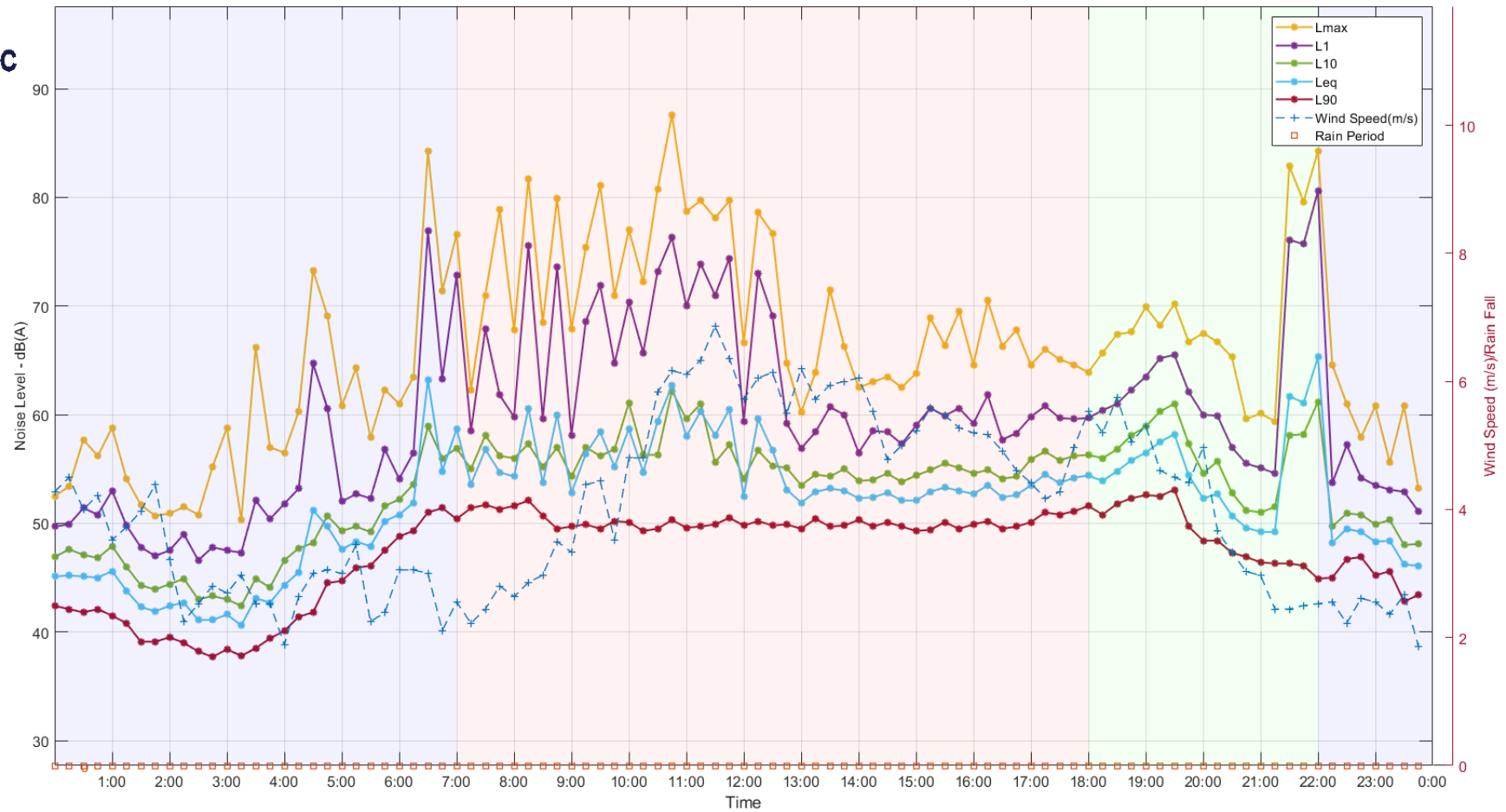
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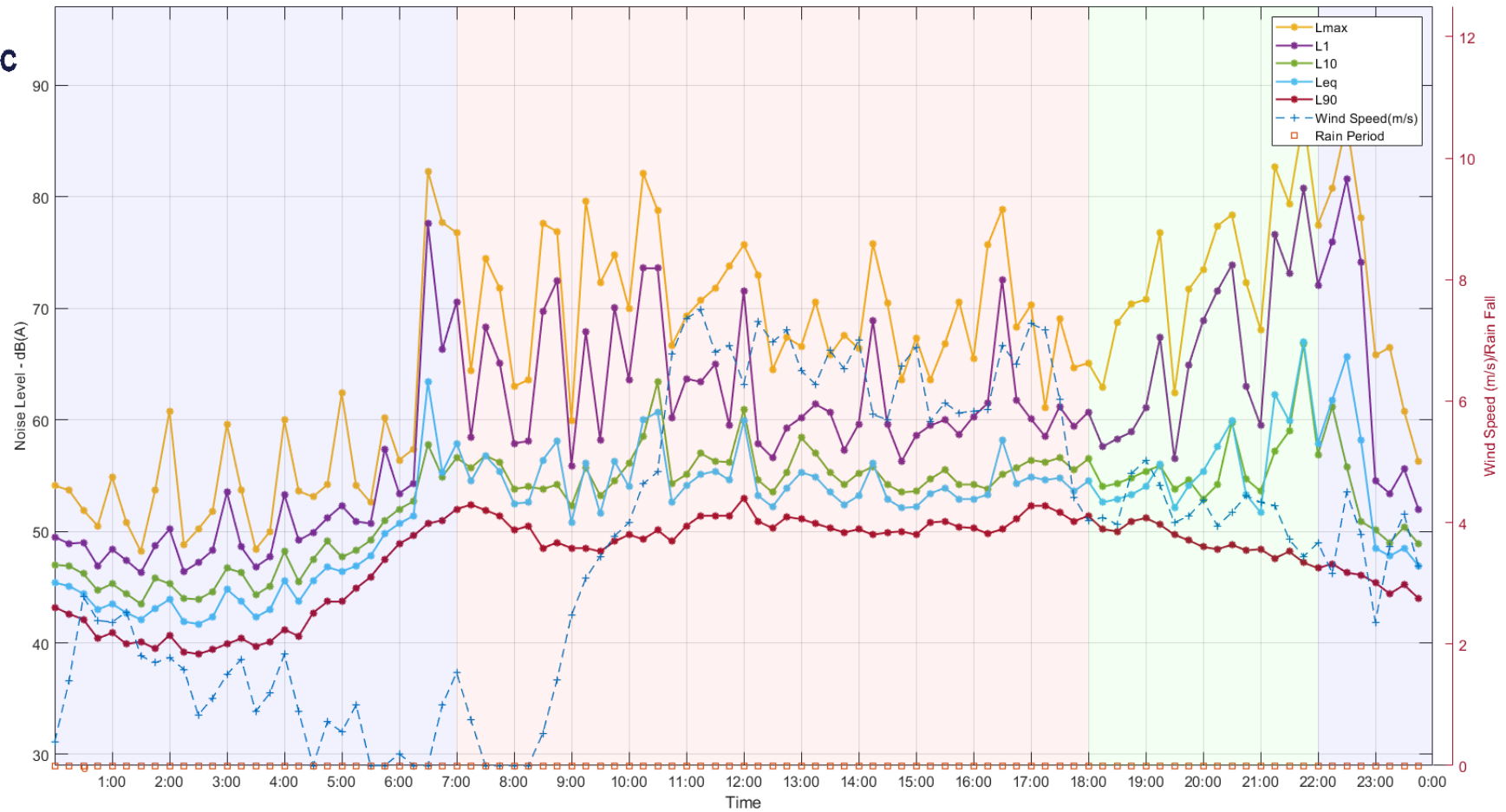
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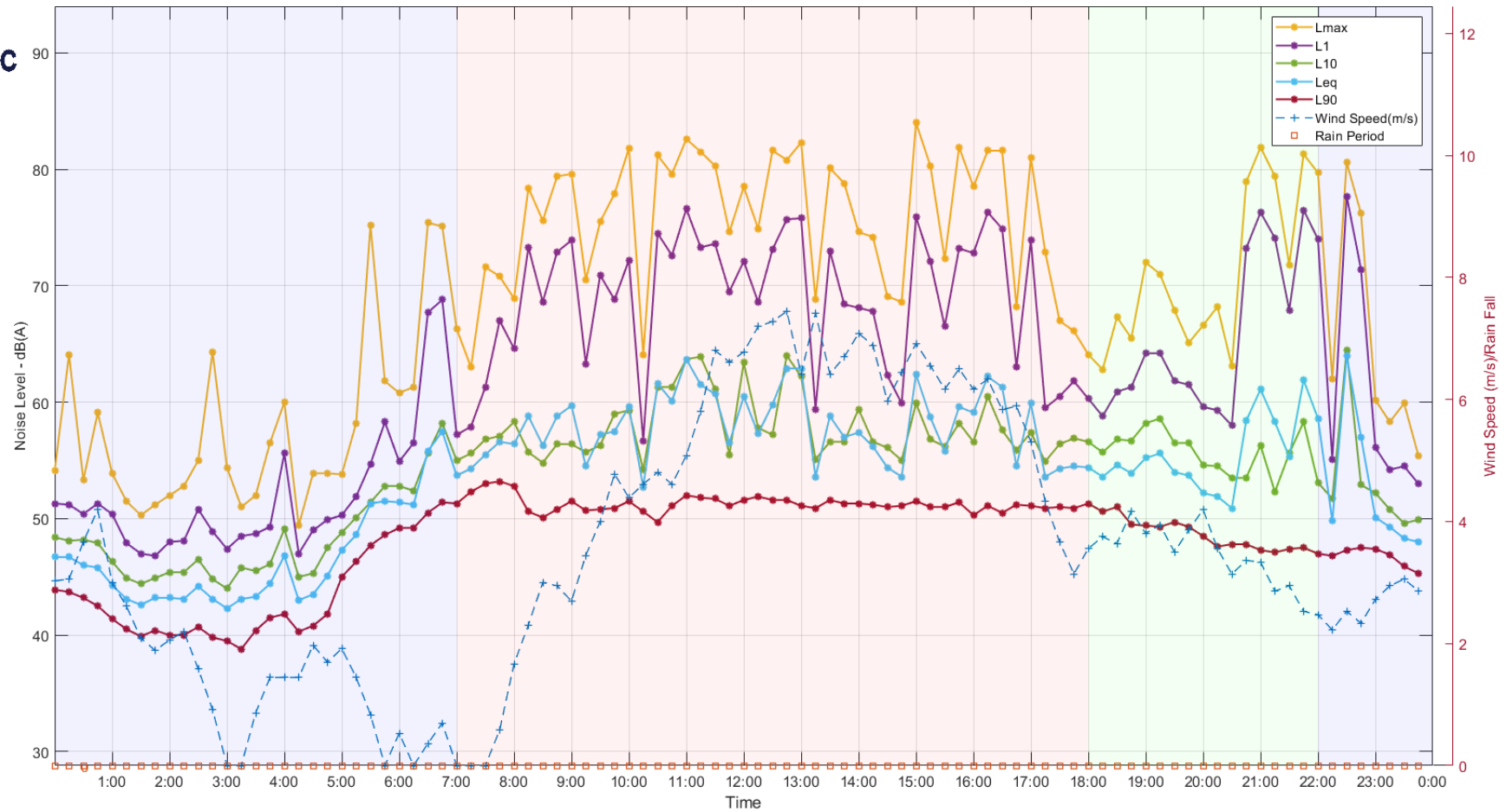
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8/06/2022



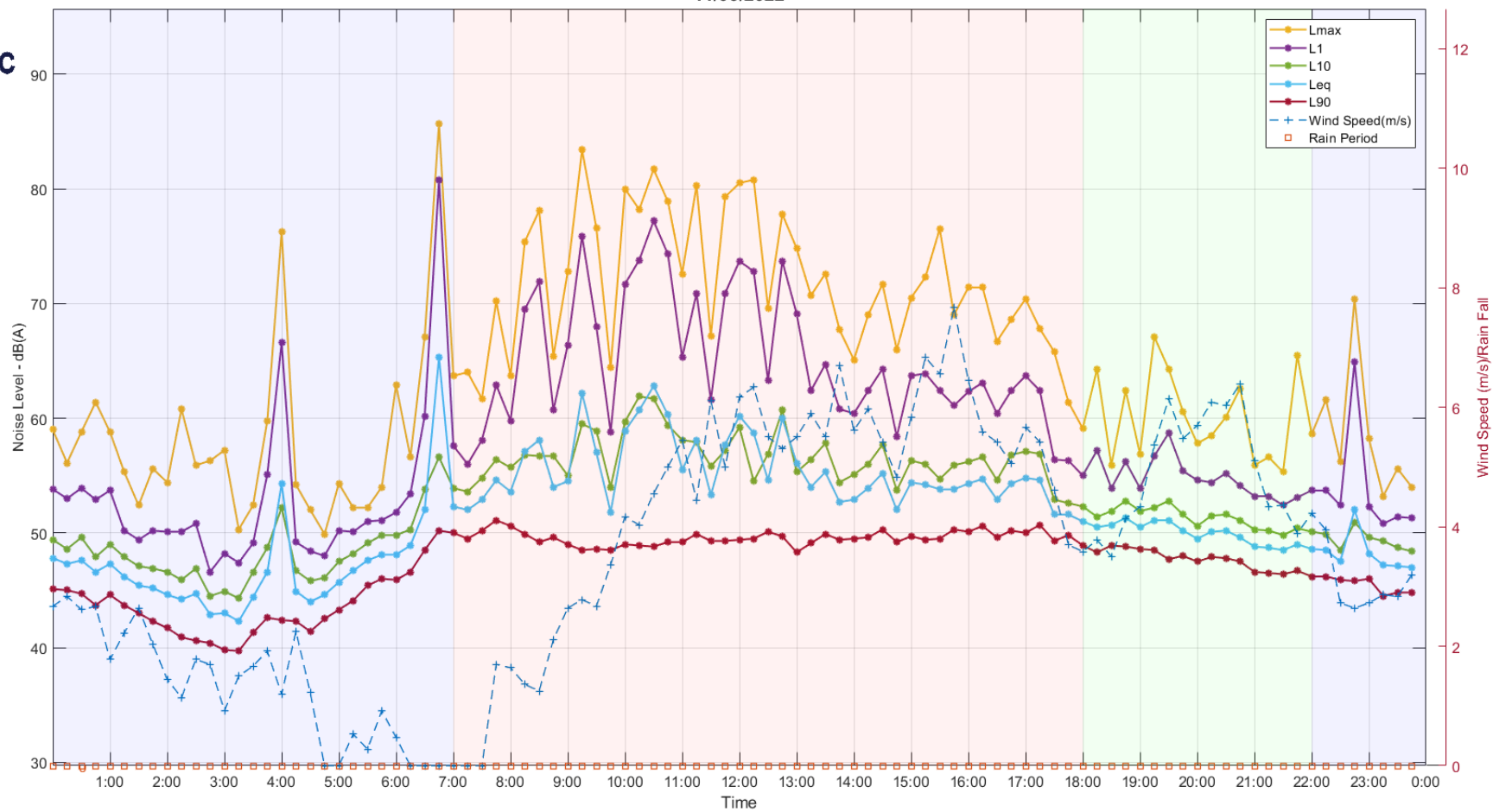
67-75 Lords Road, Leichhardt, Field
9/06/2022



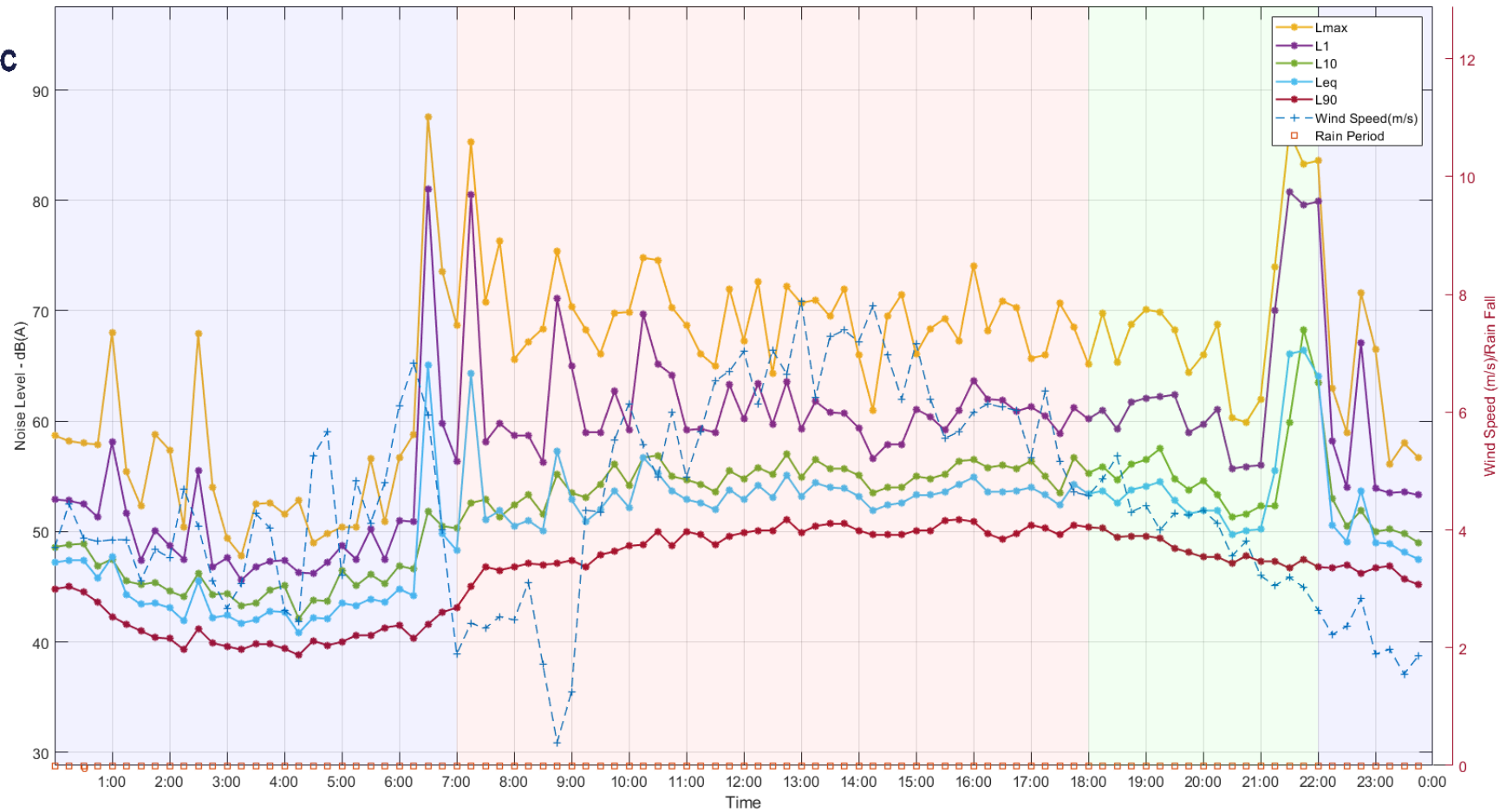
67-75 Lords Road, Leichhardt, Field
10/06/2022



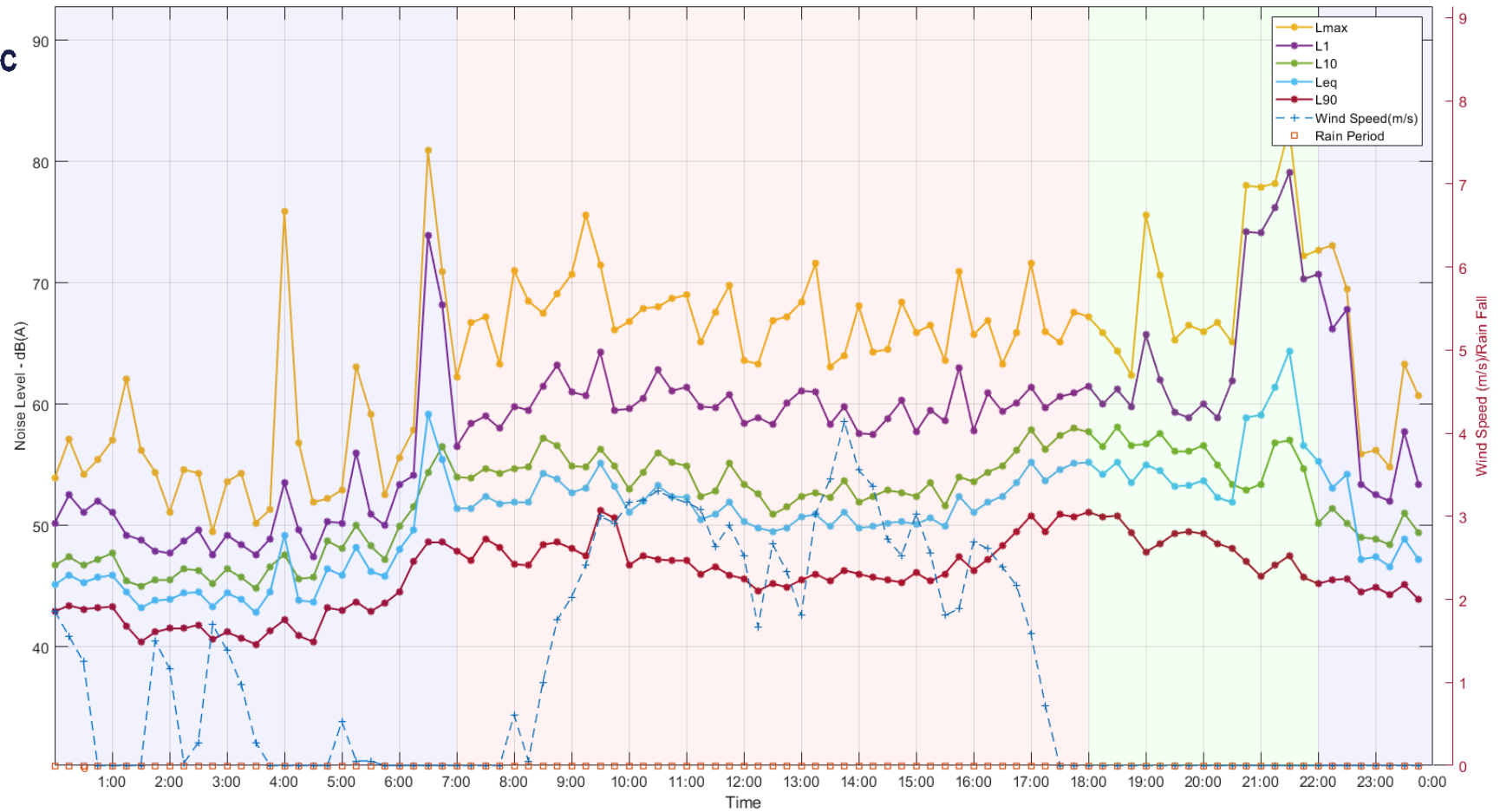
67-75 Lords Road, Leichhardt, Field
11/06/2022



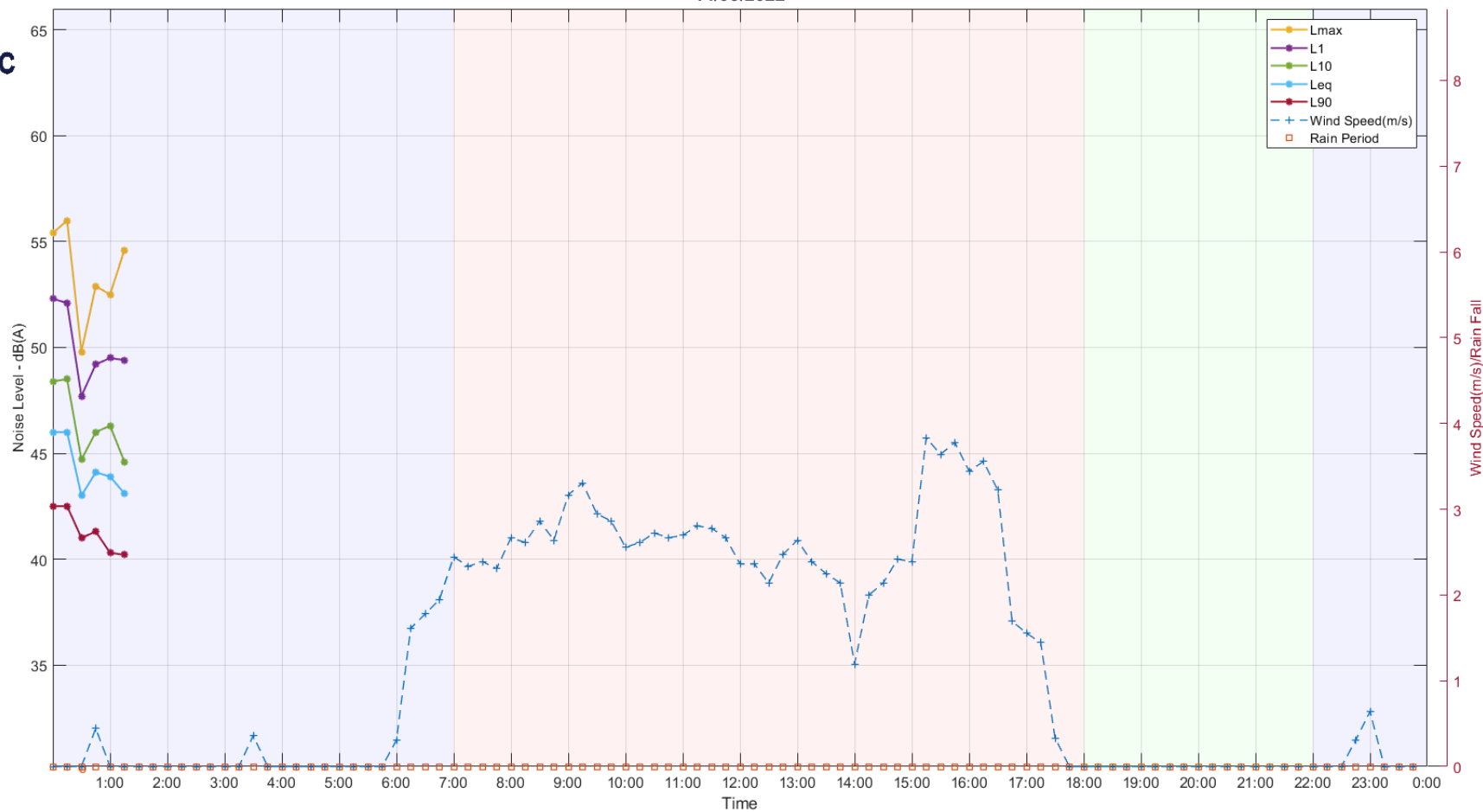
67-75 Lords Road, Leichhardt, Field
12/06/2022



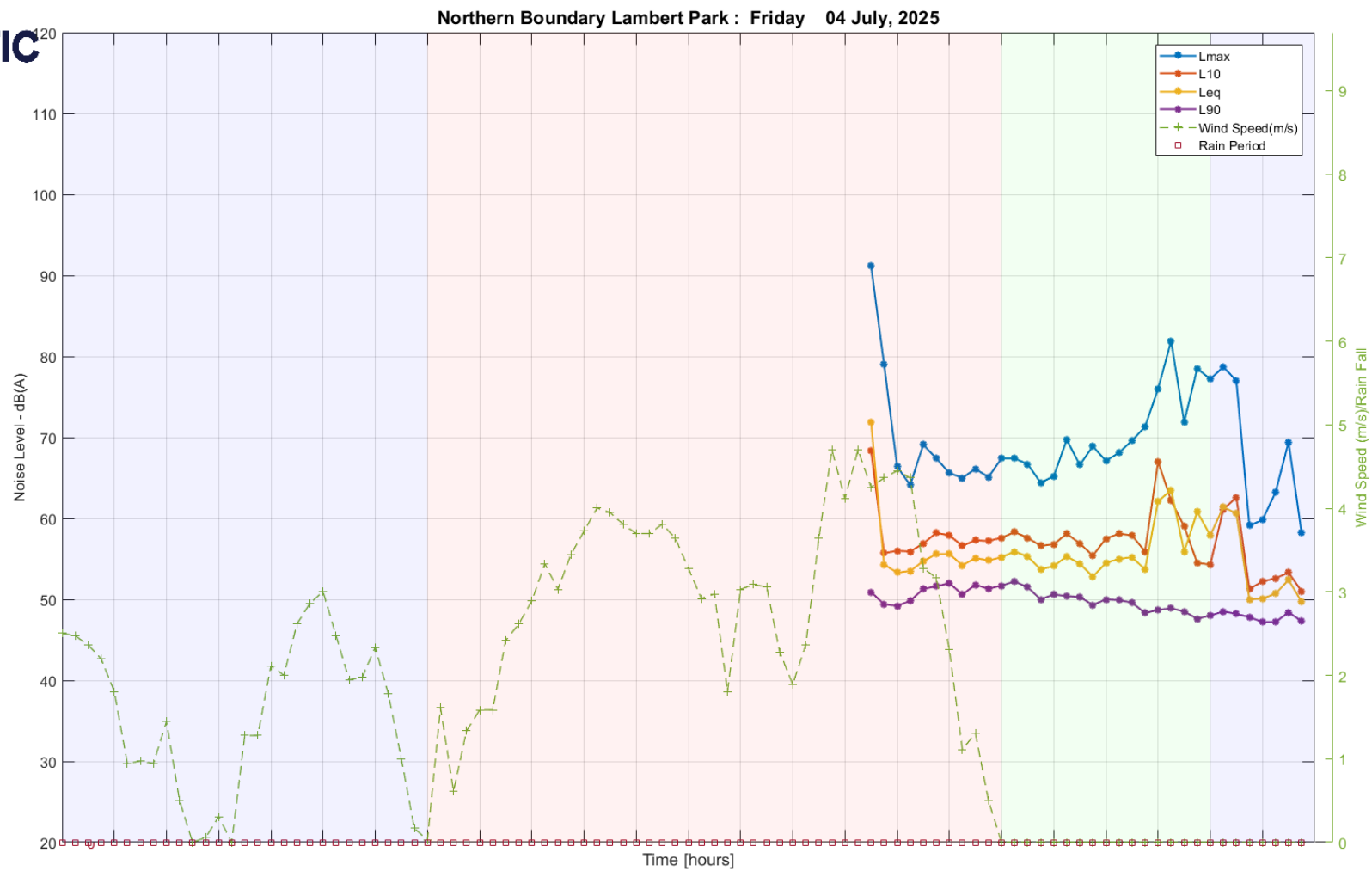
67-75 Lords Road, Leichhardt, Field
13/06/2022

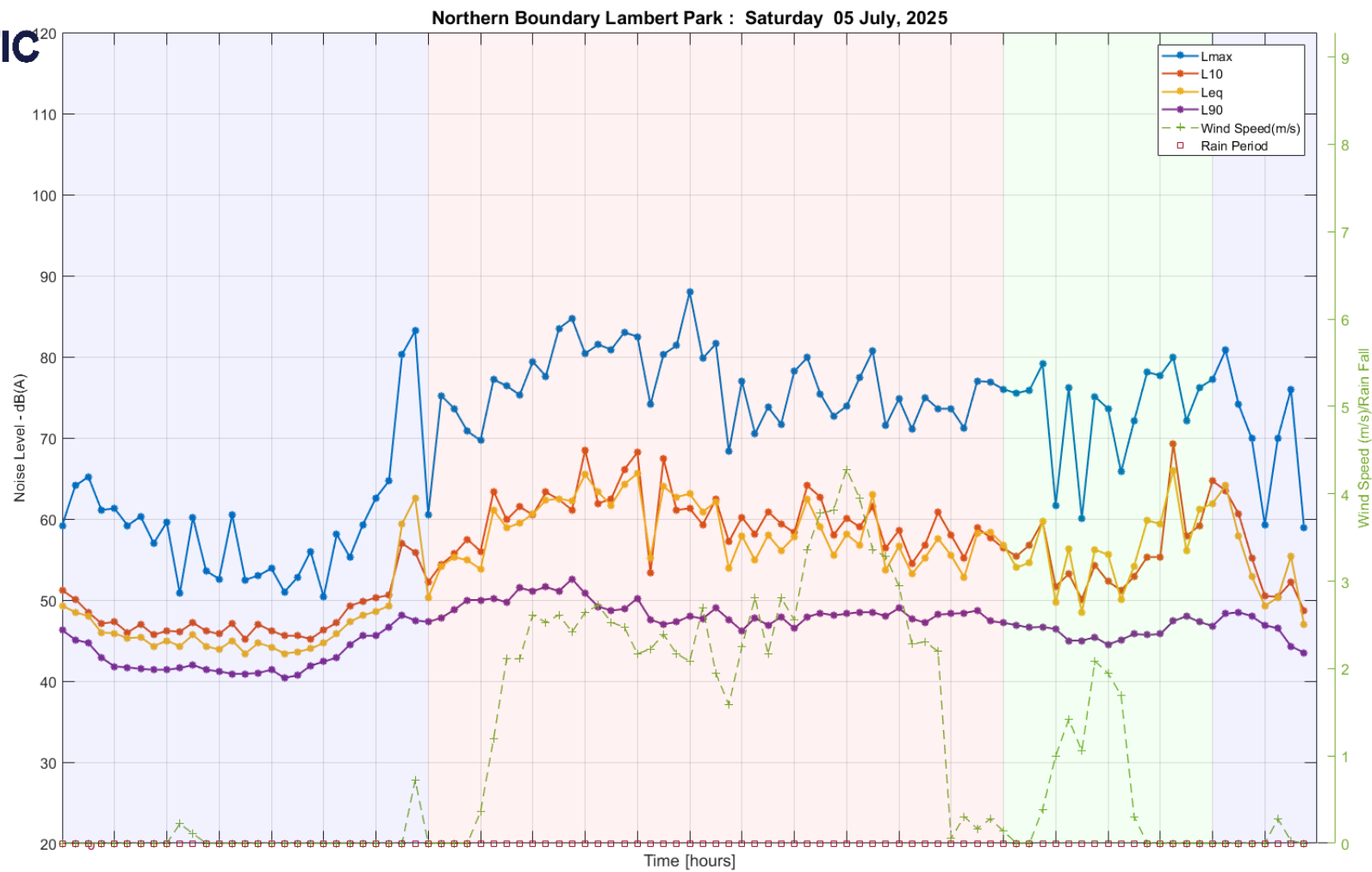


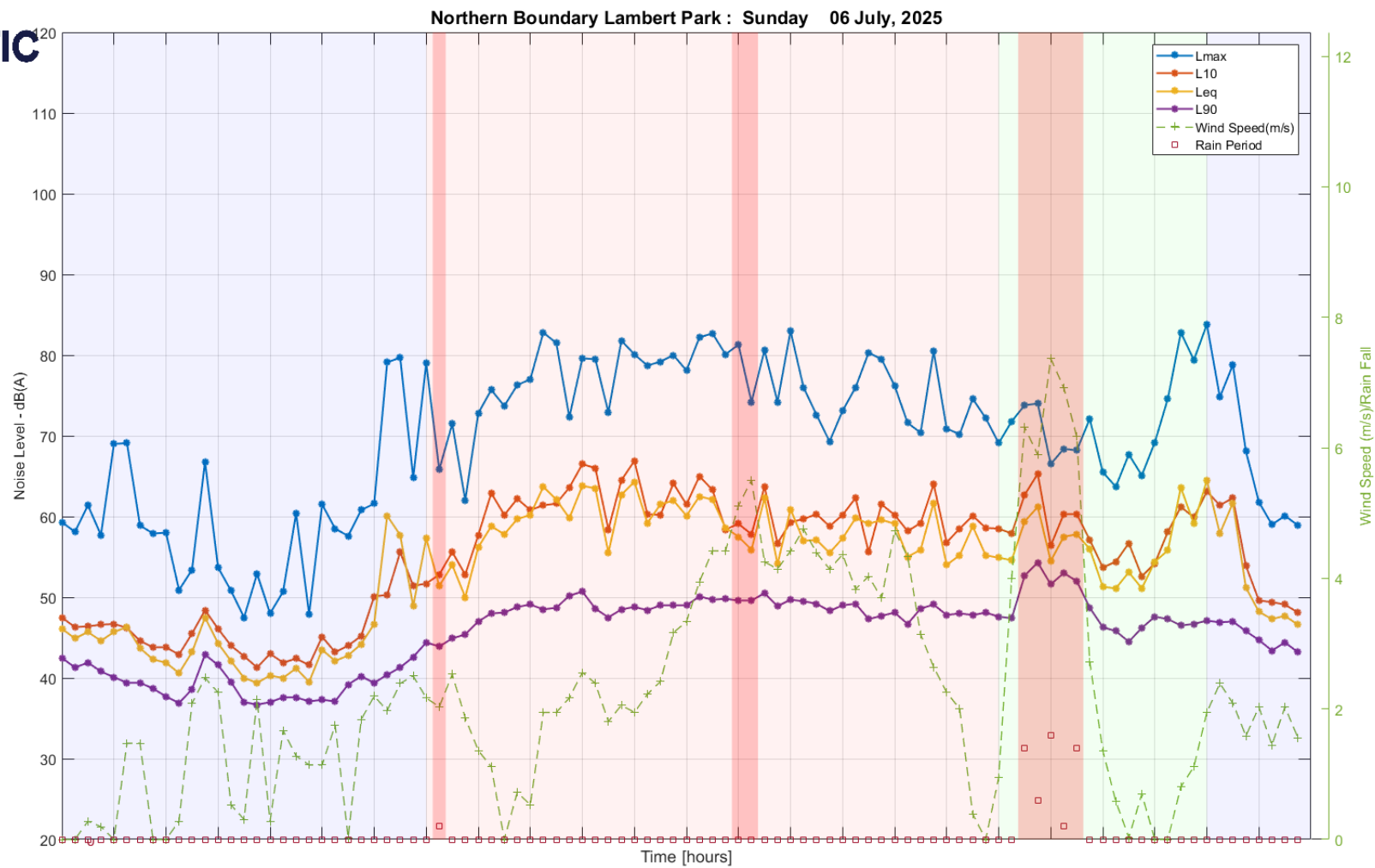
67-75 Lords Road, Leichhardt, Field
14/06/2022

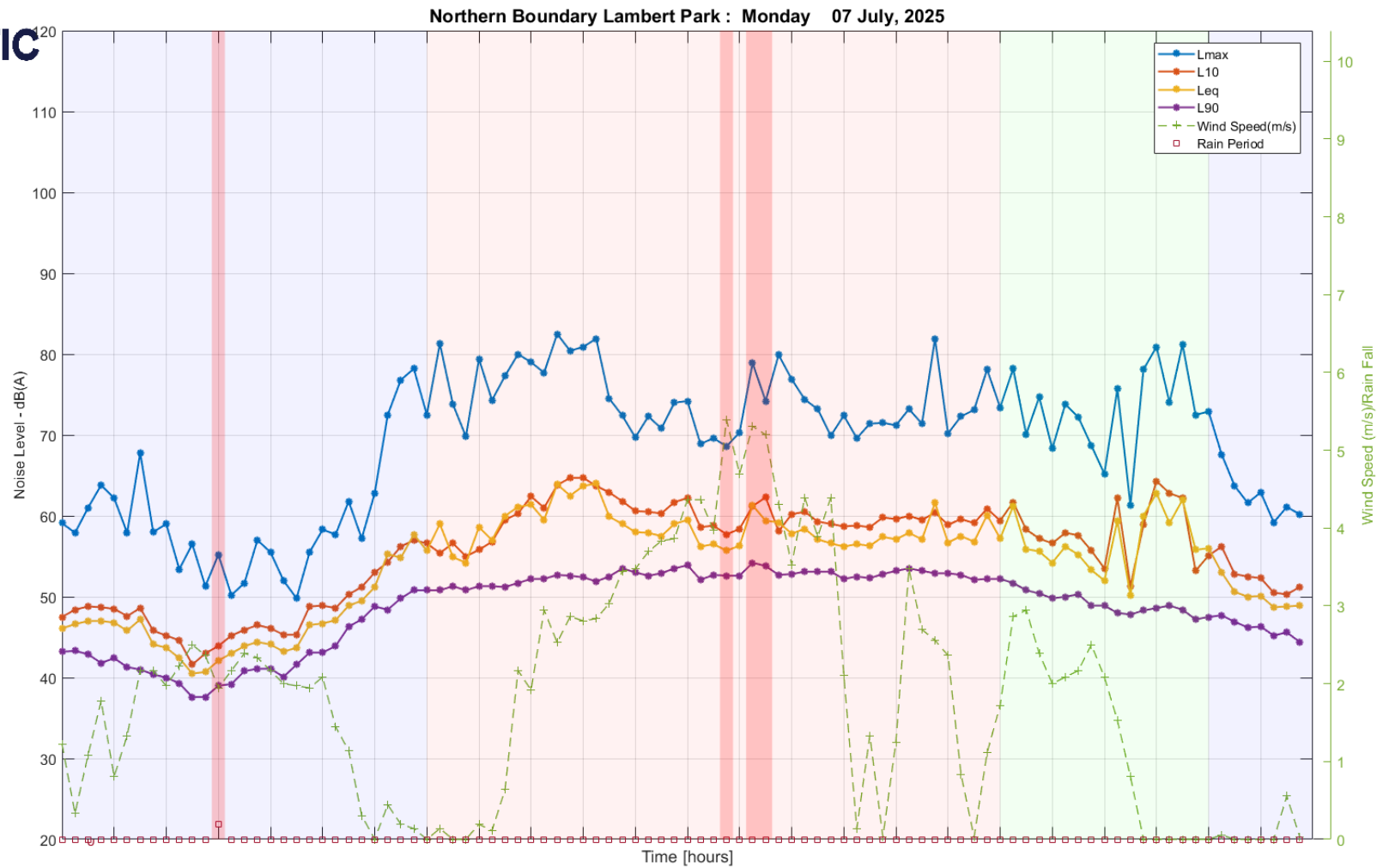


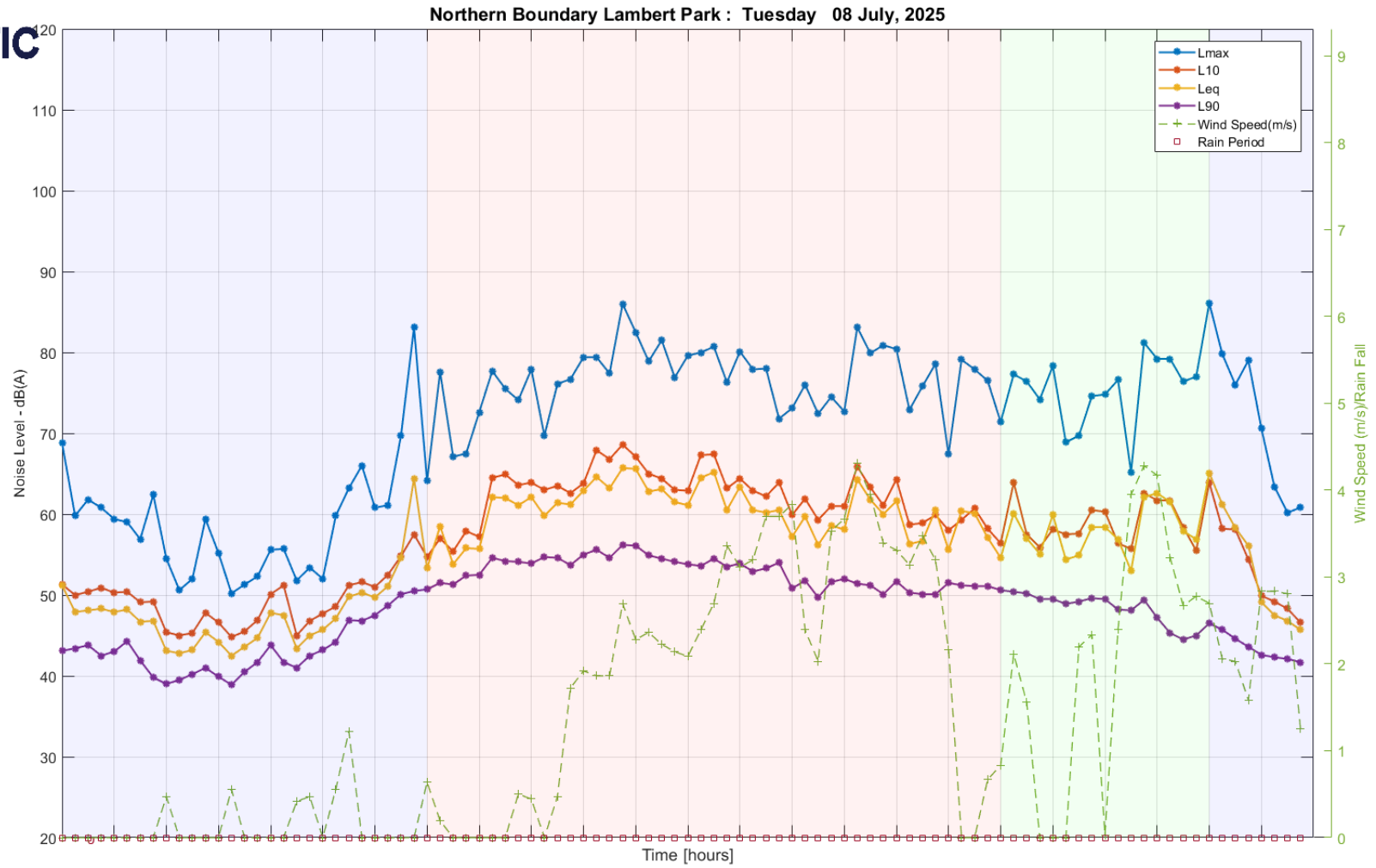
POSITION M1 – WESTERN BOUNDARY ADJACENT LAMBERT PARK (2025)

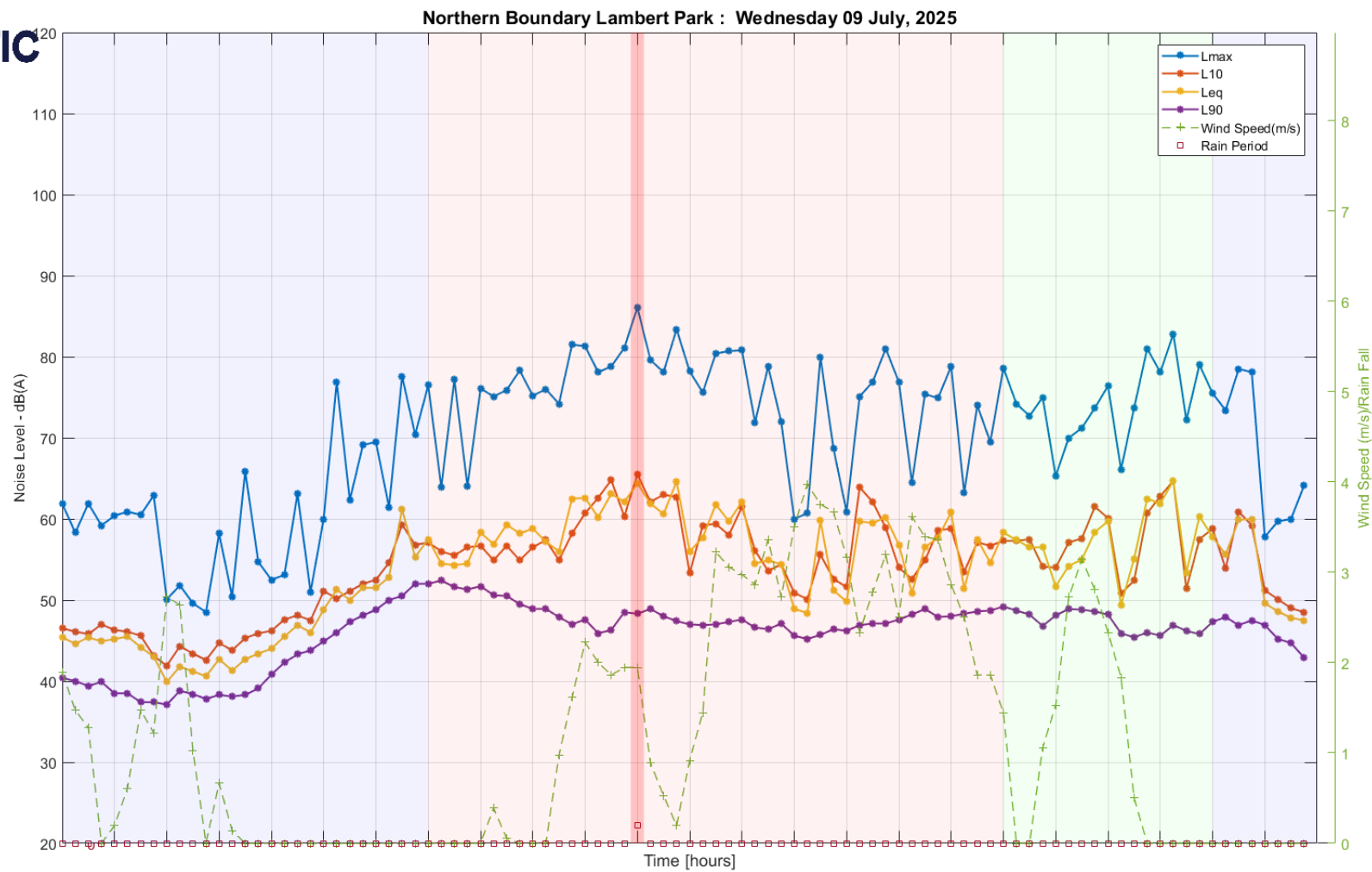


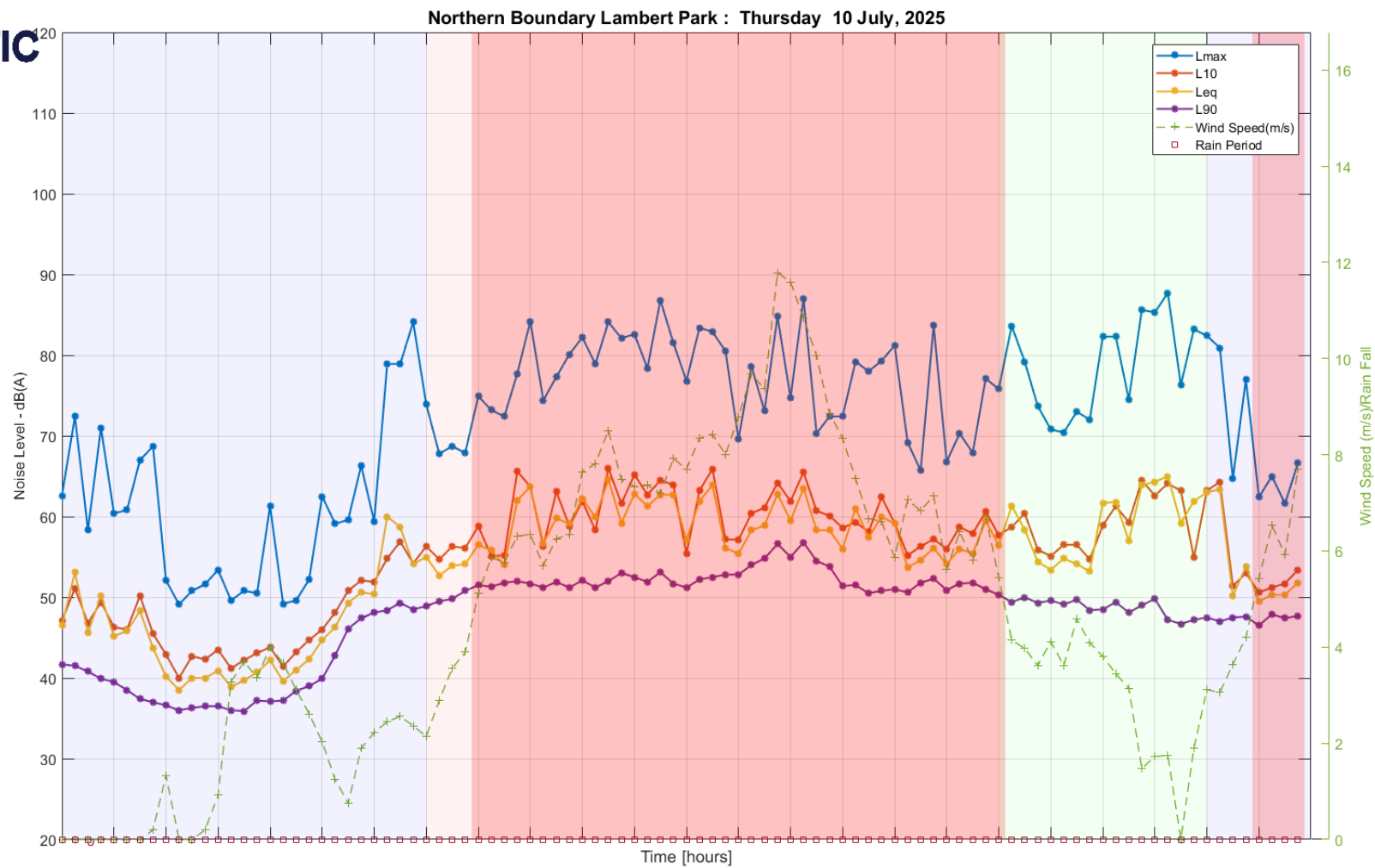


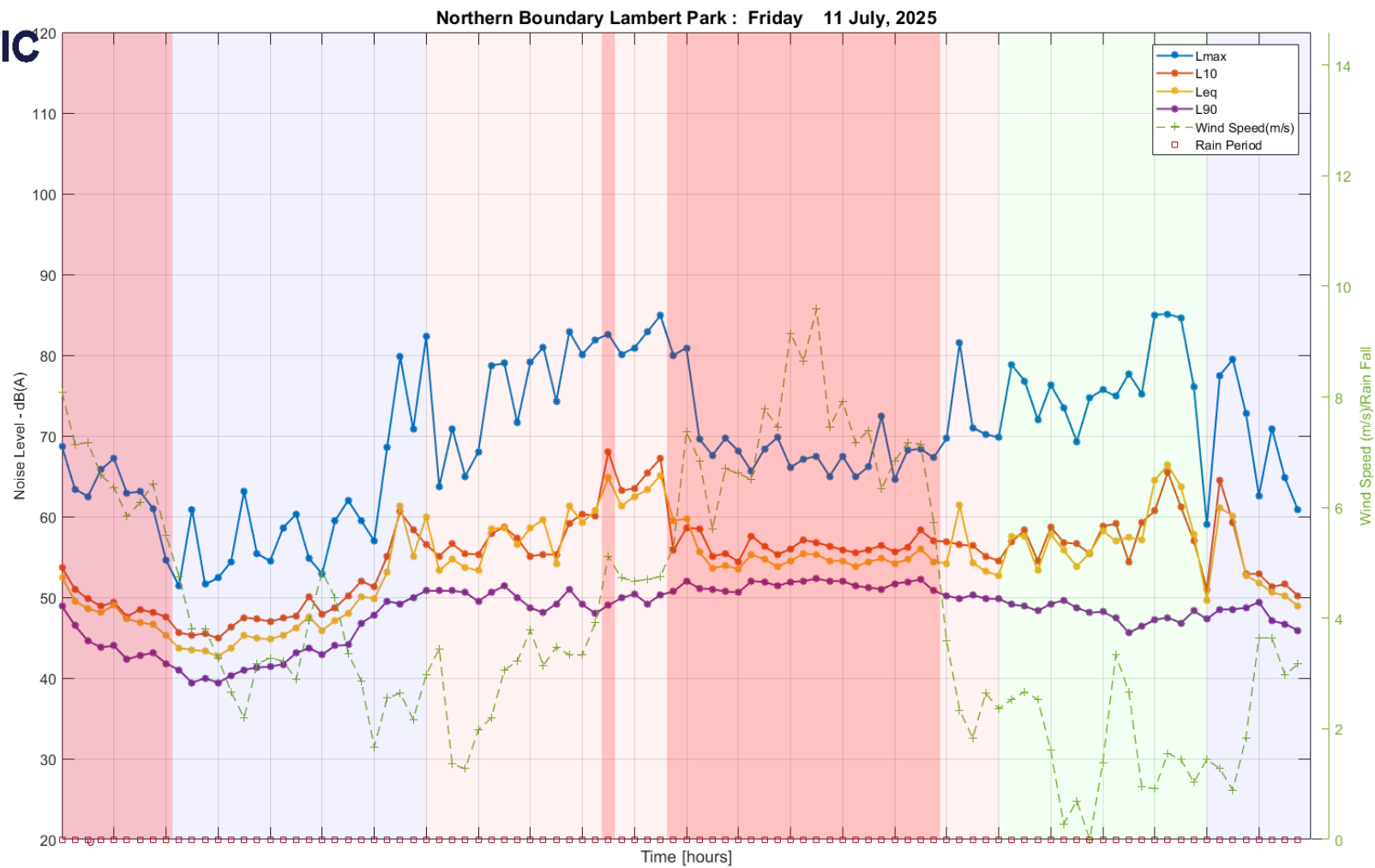


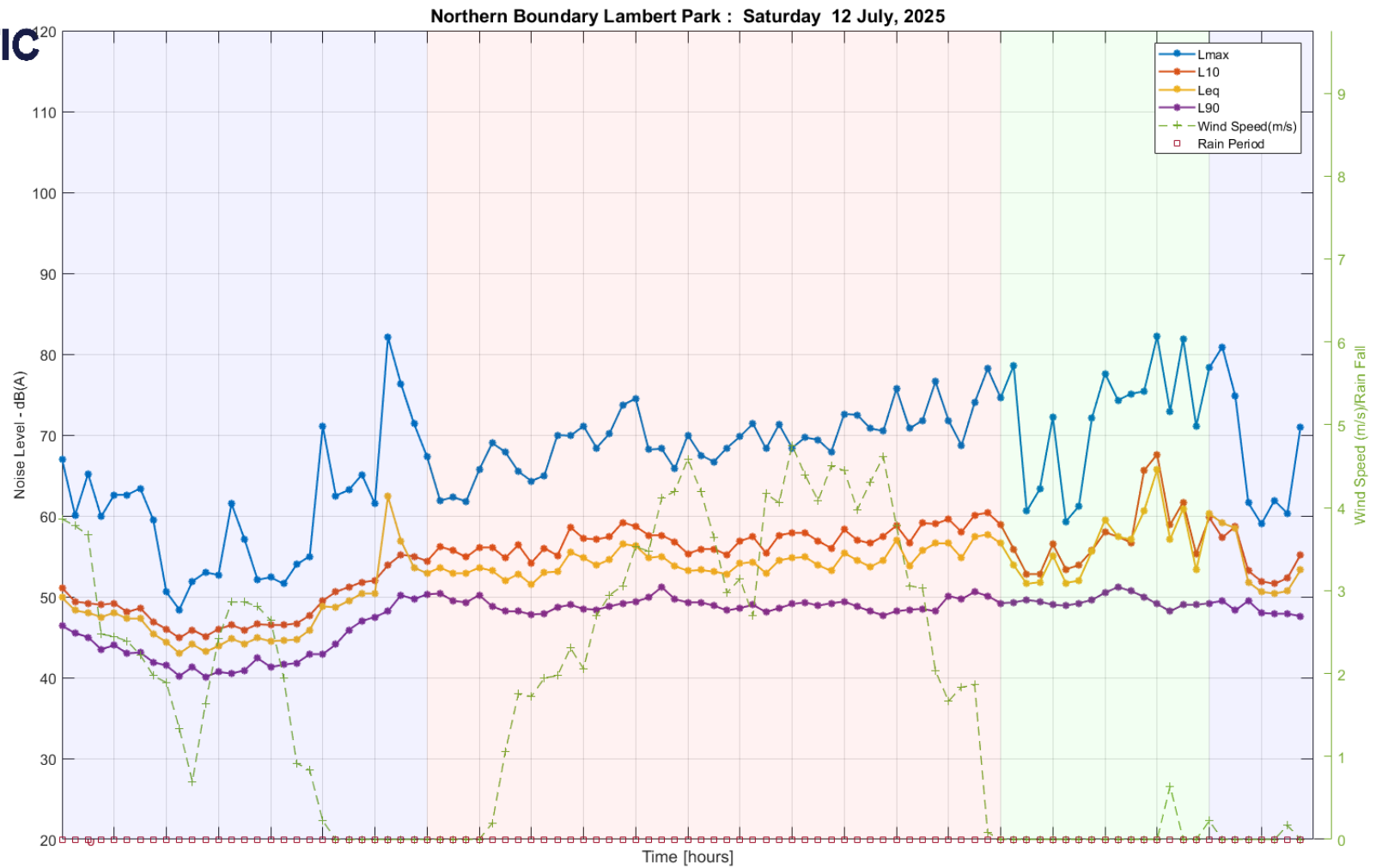


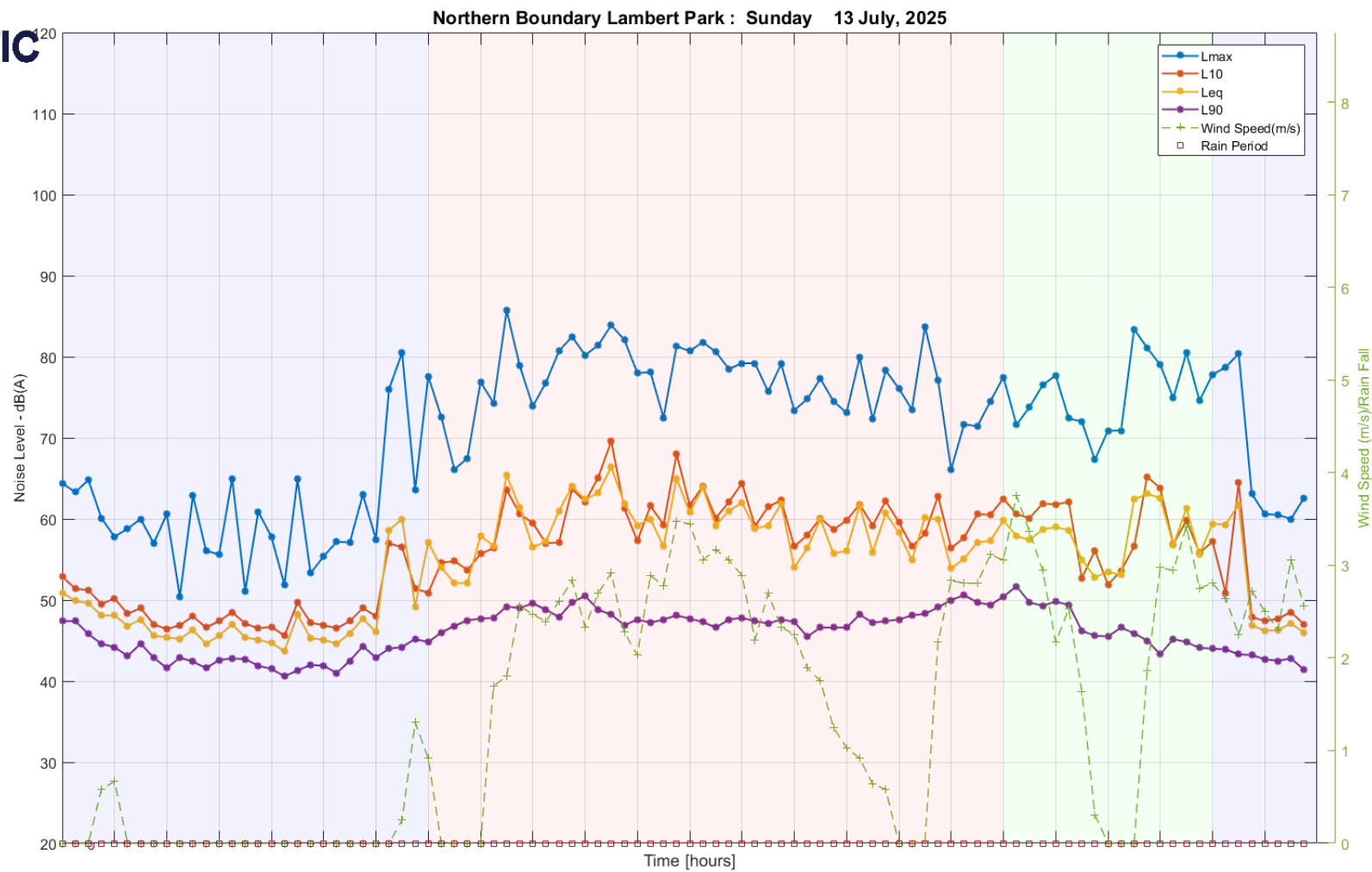


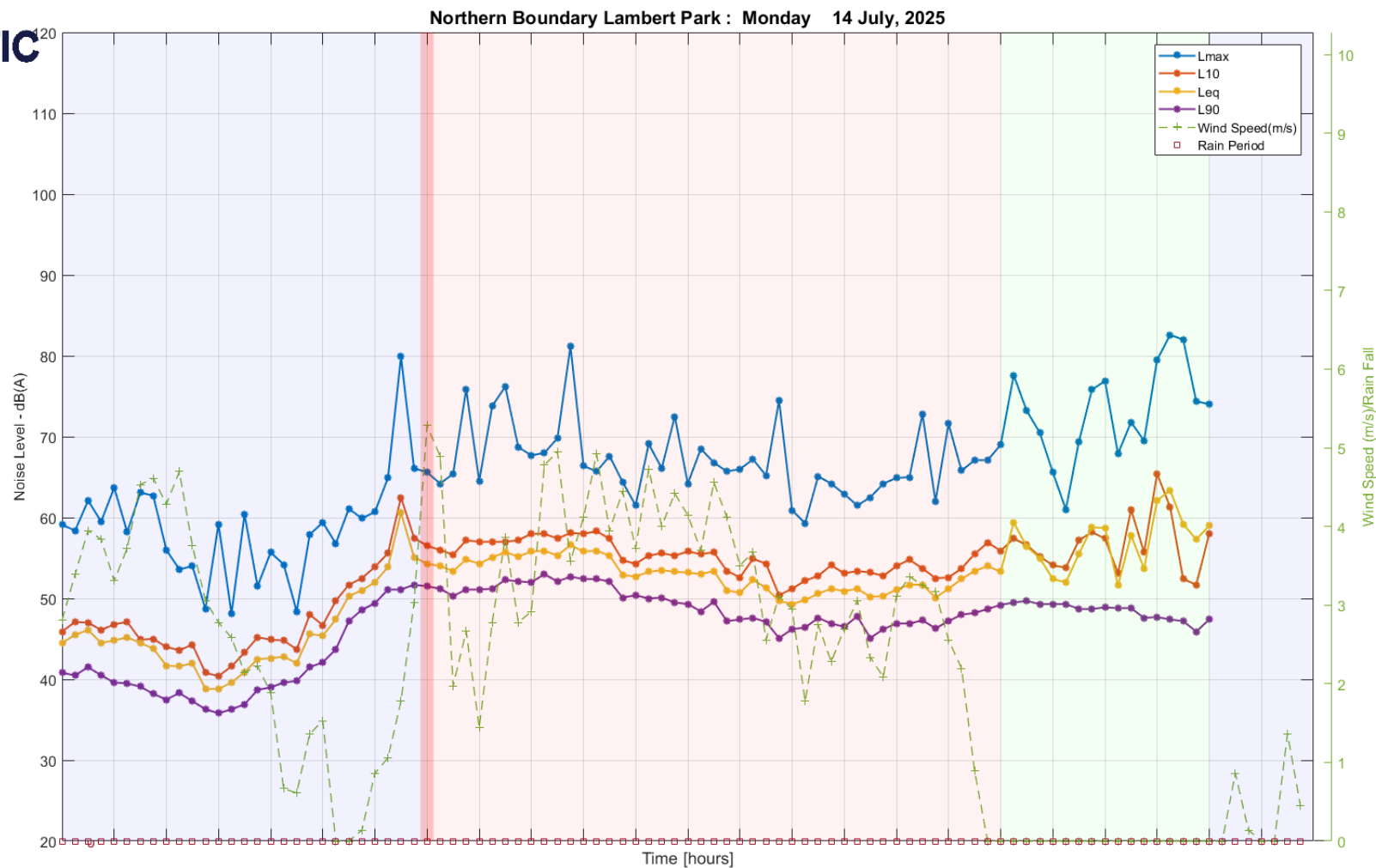








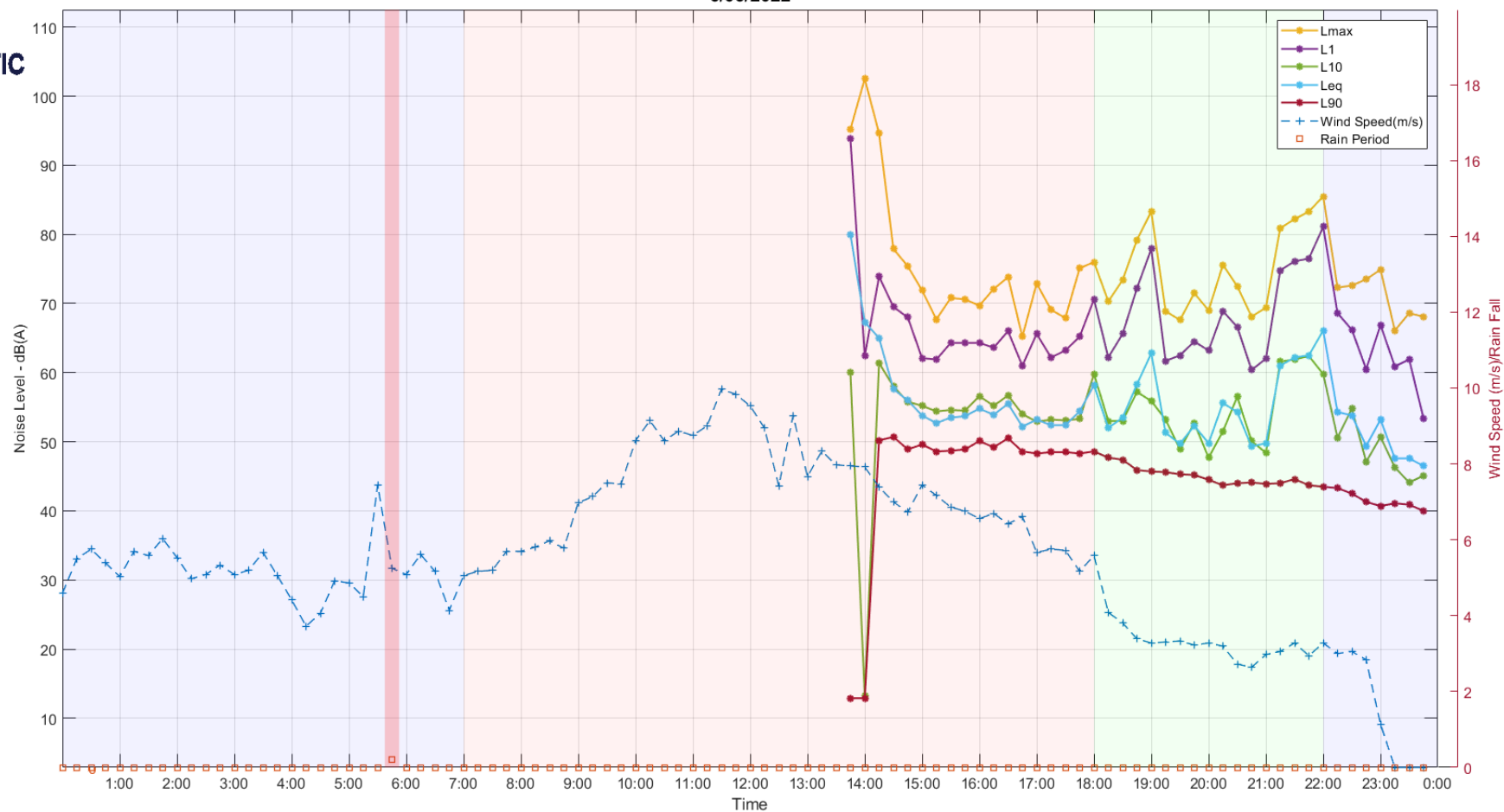




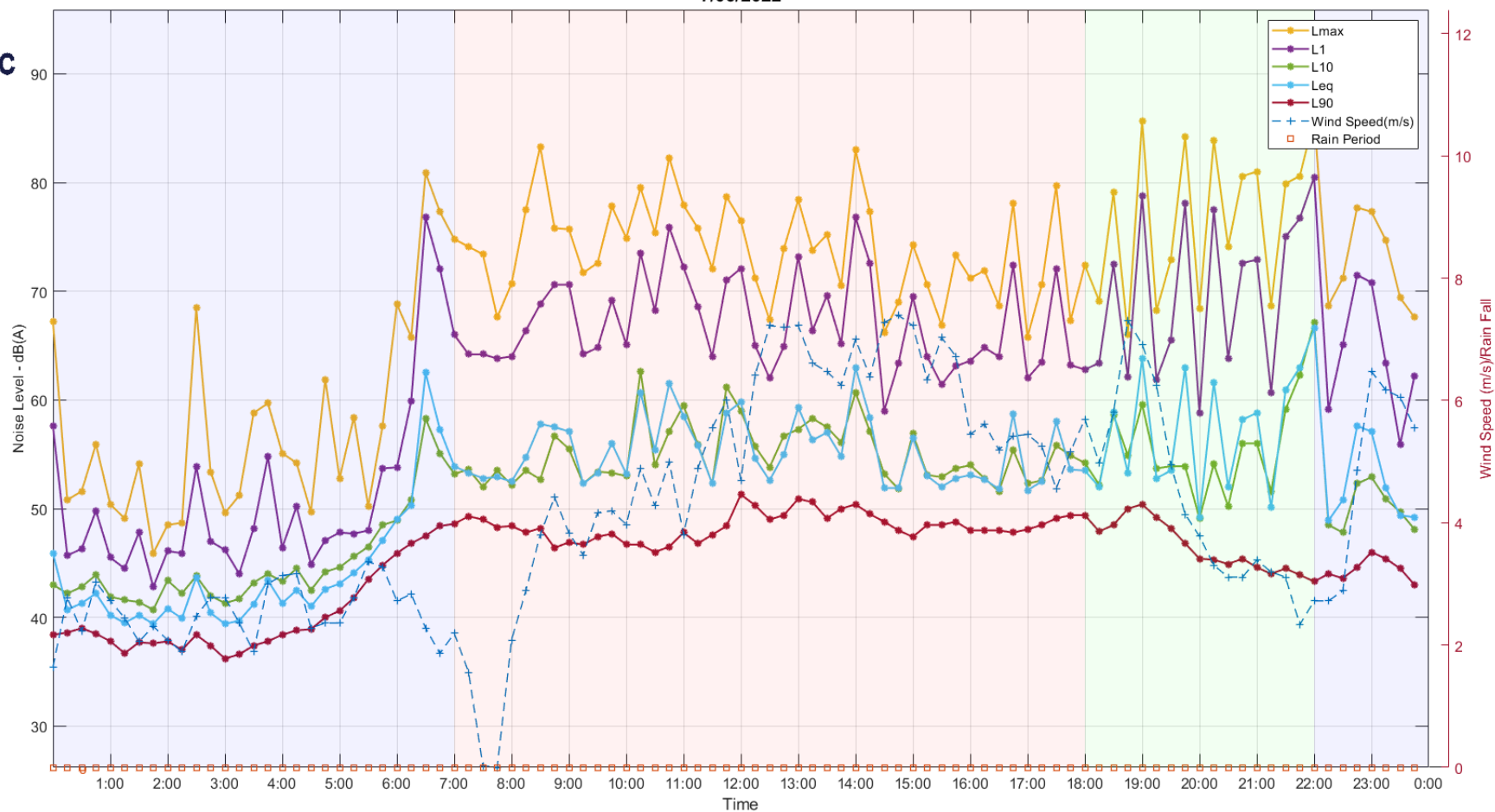
Wind Speed is corrected using factor 1.00 based on logger location

POSITION M2 – WESTERN BOUNDARY ADJACENT LIGHT RAIL (2022)

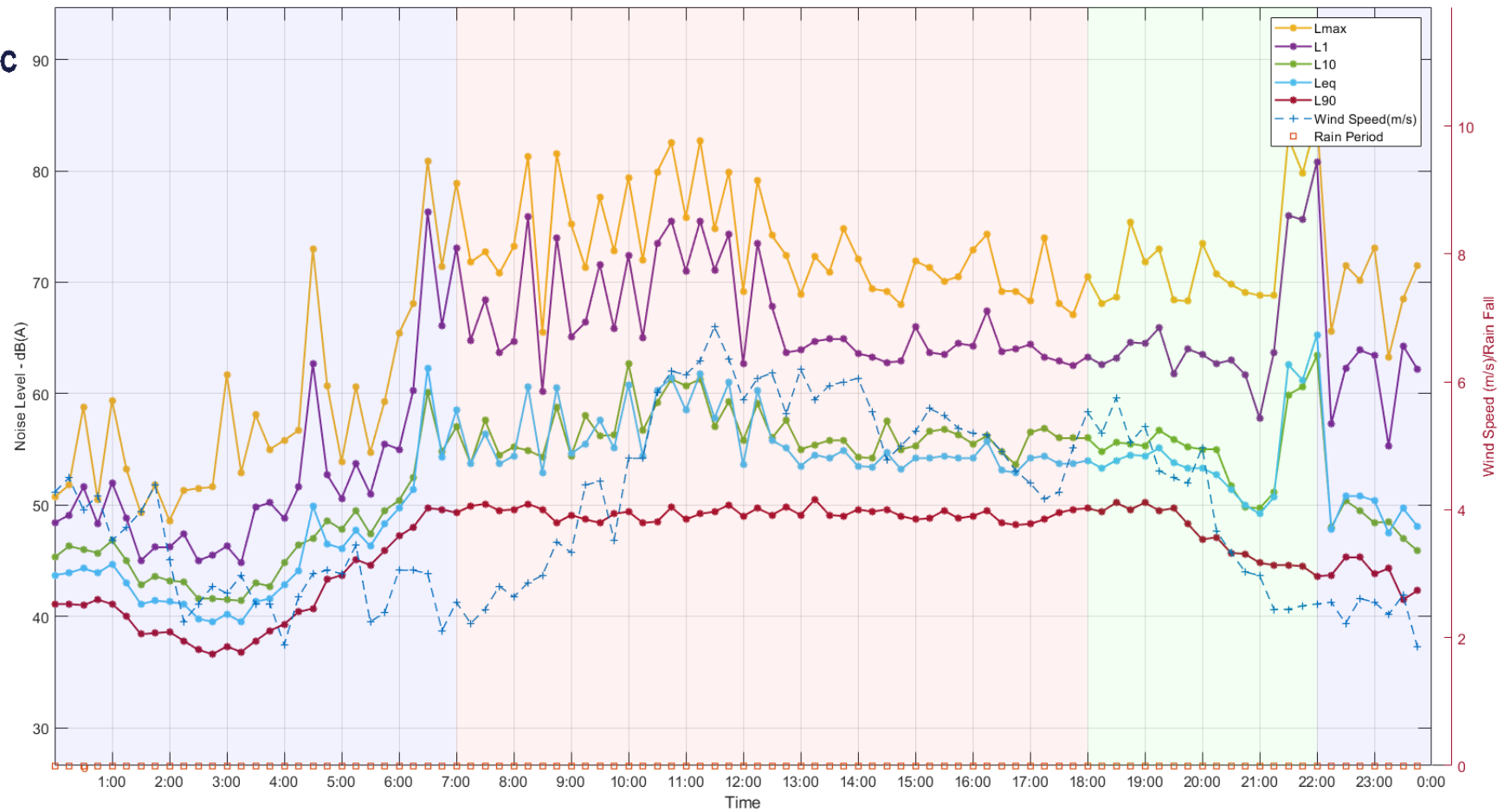
**67-75 Lords Road, Leichhardt, LightRail
6/06/2022**



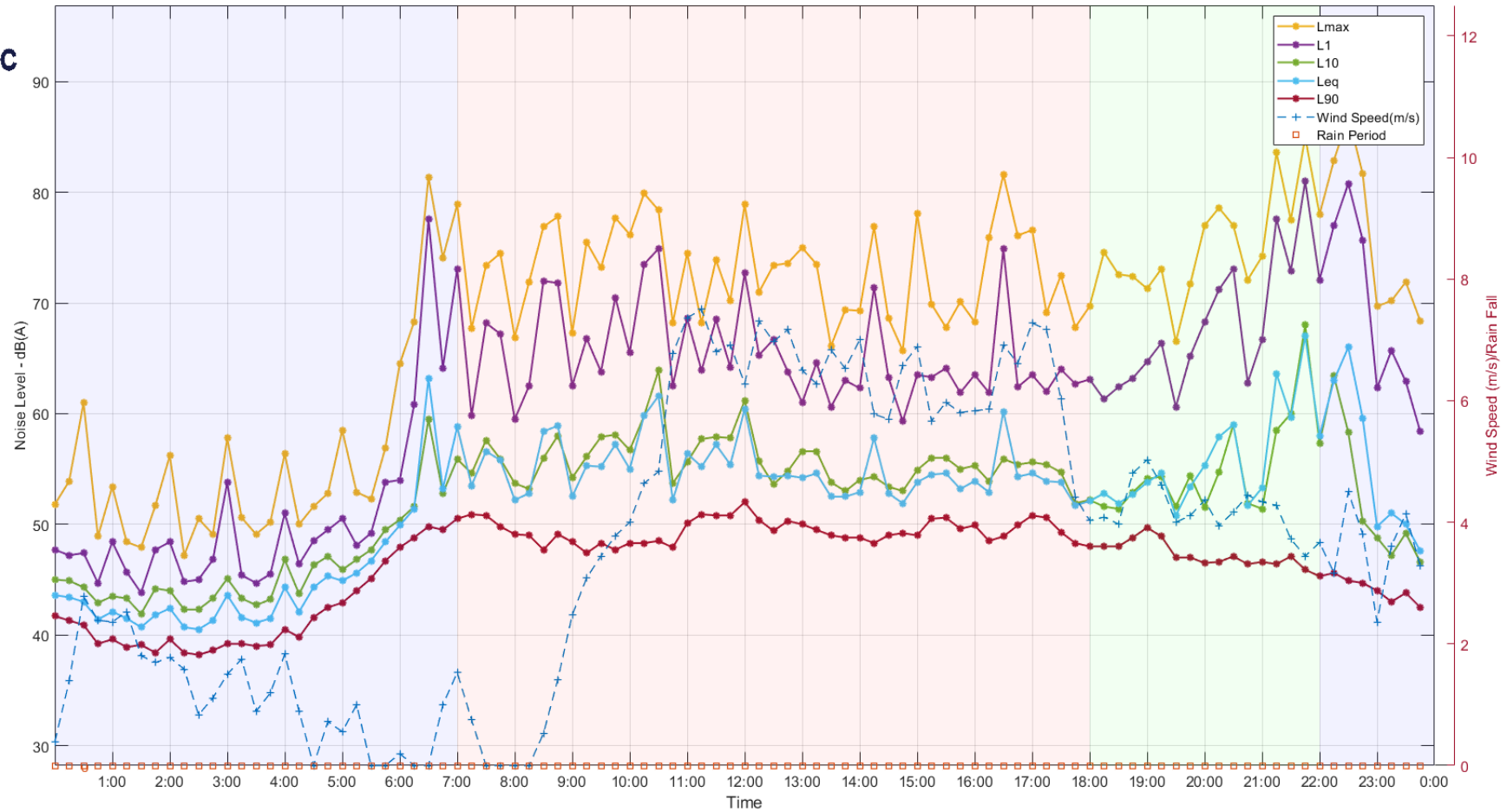
67-75 Lords Road, Leichhardt, LightRail
7/06/2022



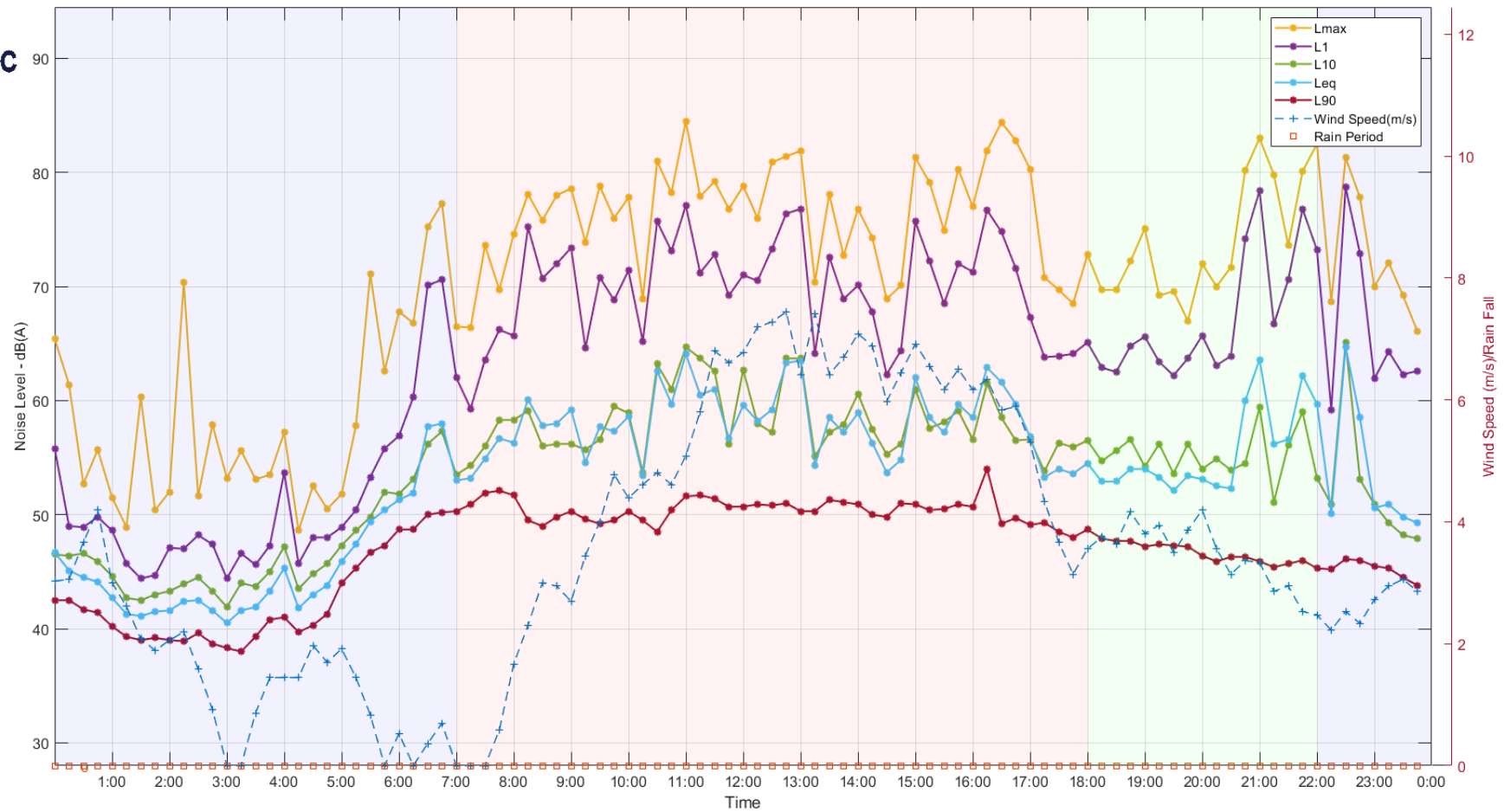
**67-75 Lords Road, Leichhardt, LightRail
8/06/2022**



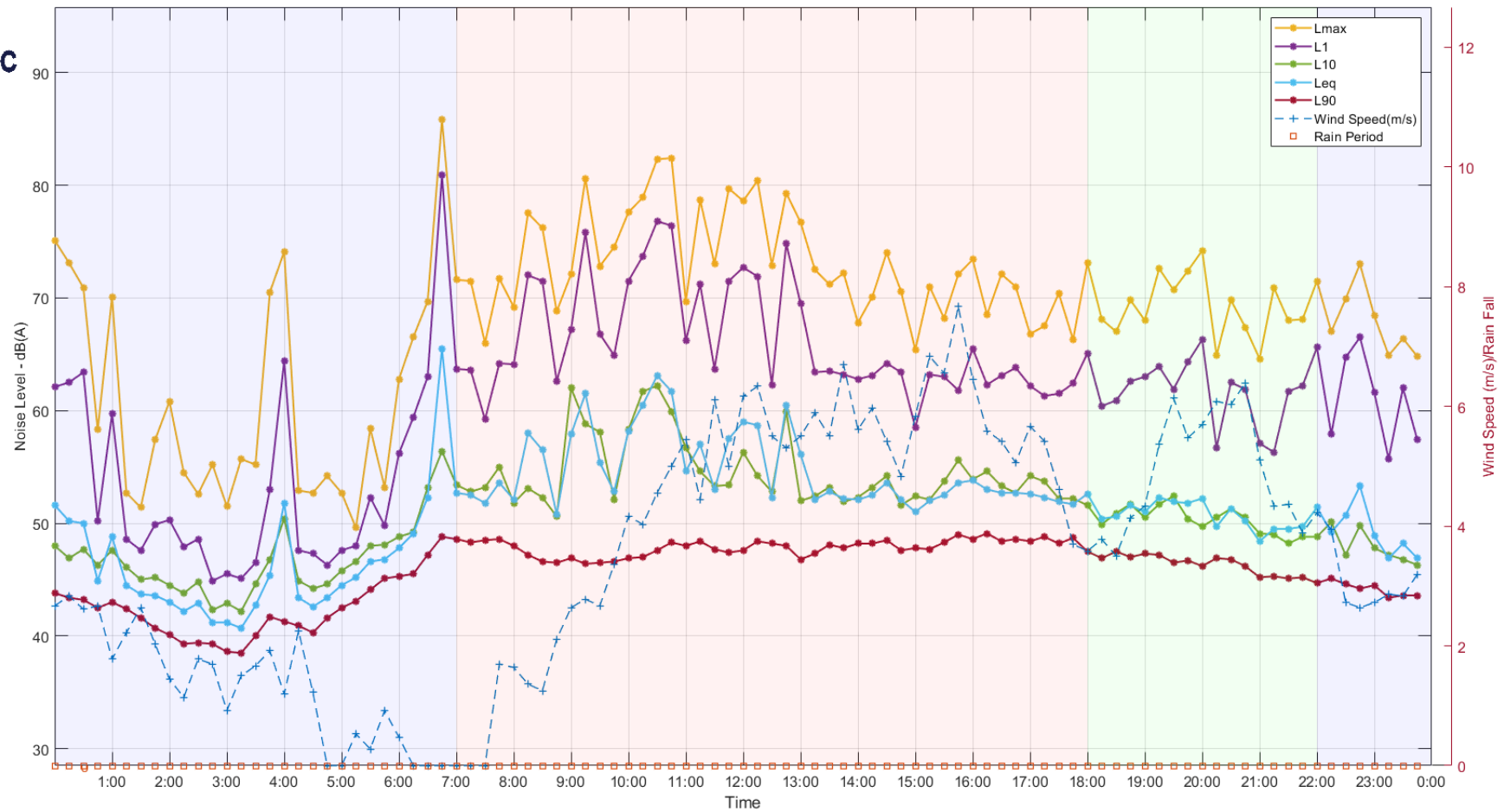
**67-75 Lords Road, Leichhardt, LightRail
9/06/2022**



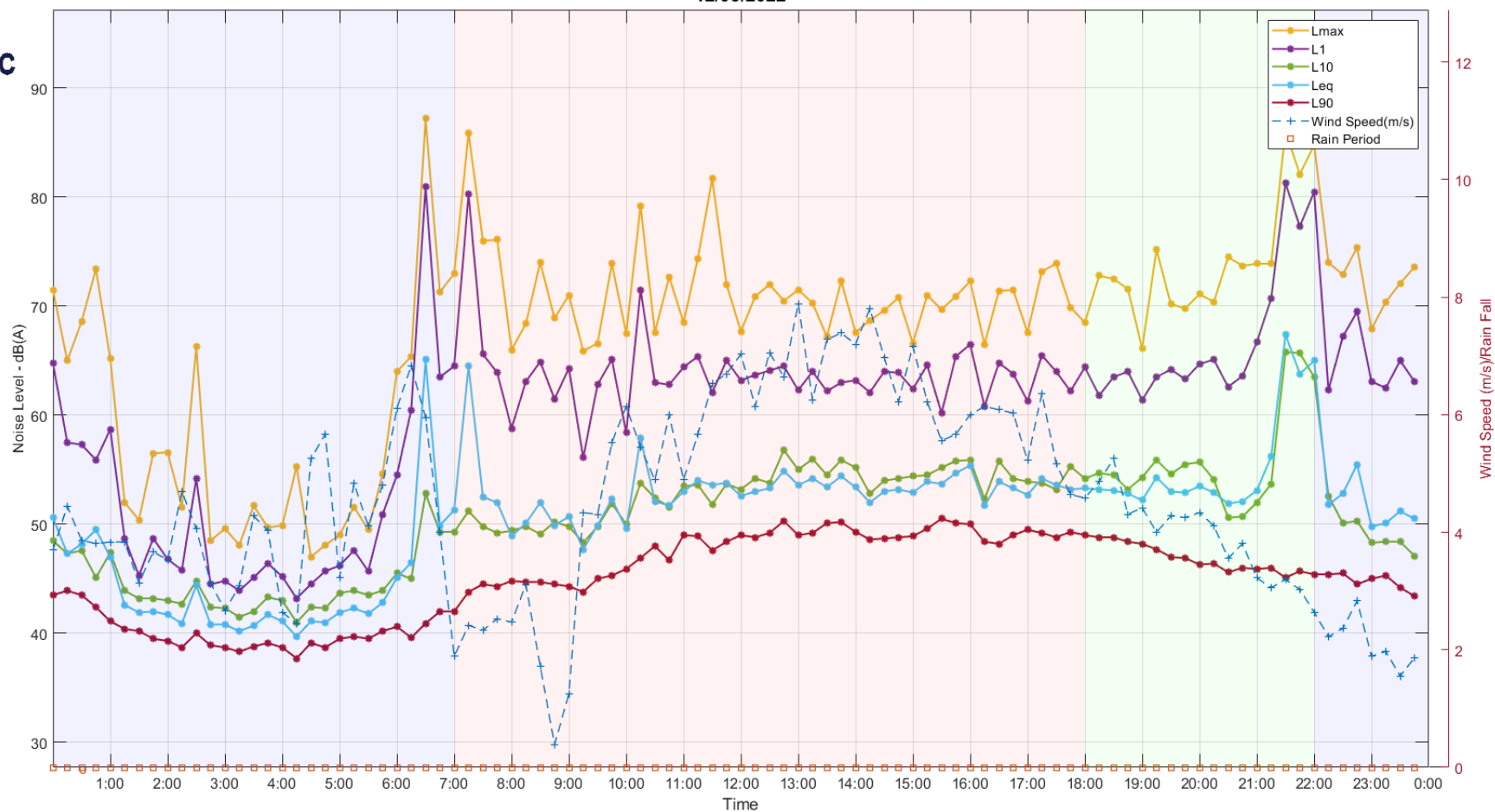
**67-75 Lords Road, Leichhardt, LightRail
10/06/2022**



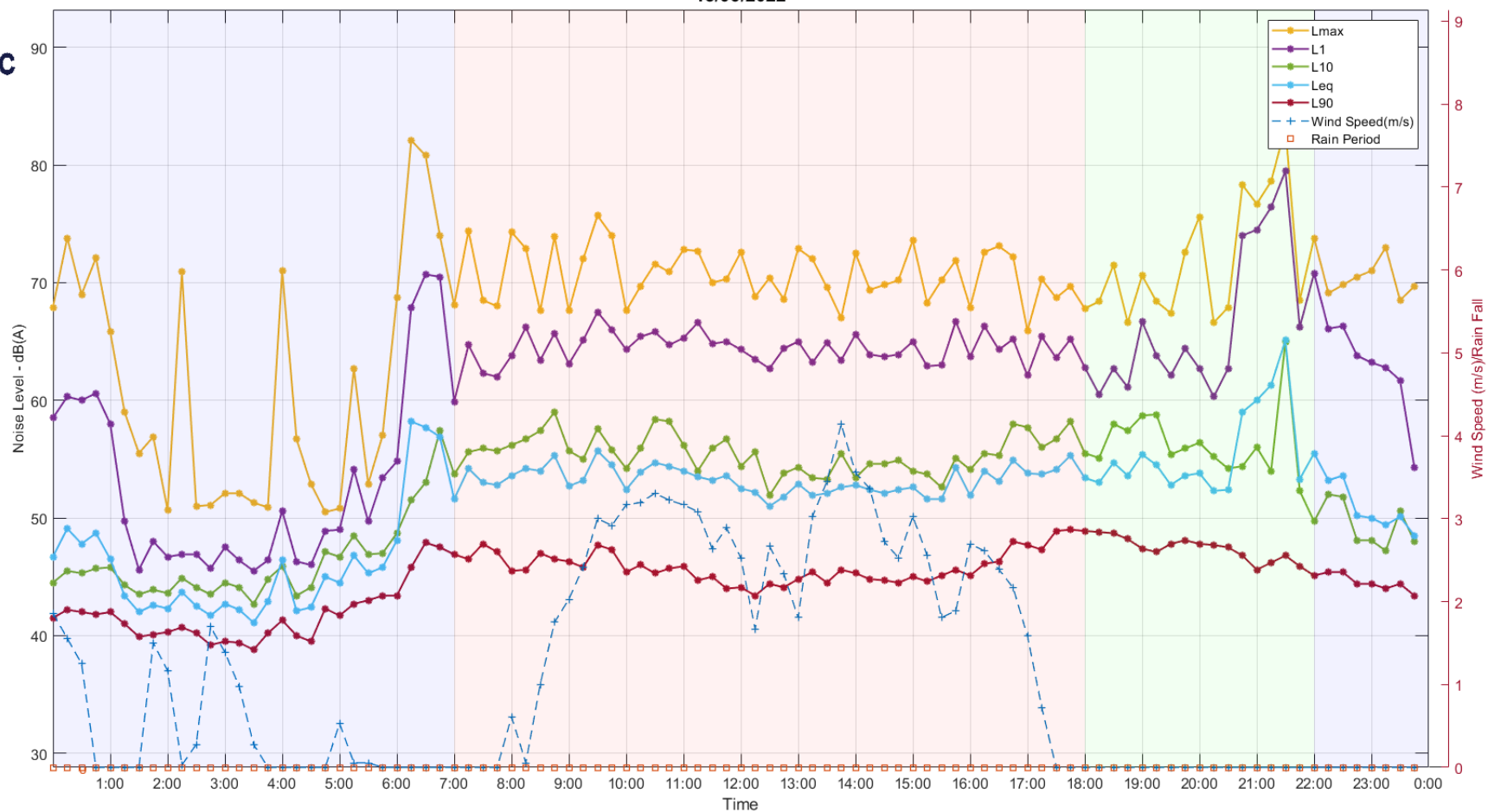
67-75 Lords Road, Leichhardt, LightRail
11/06/2022



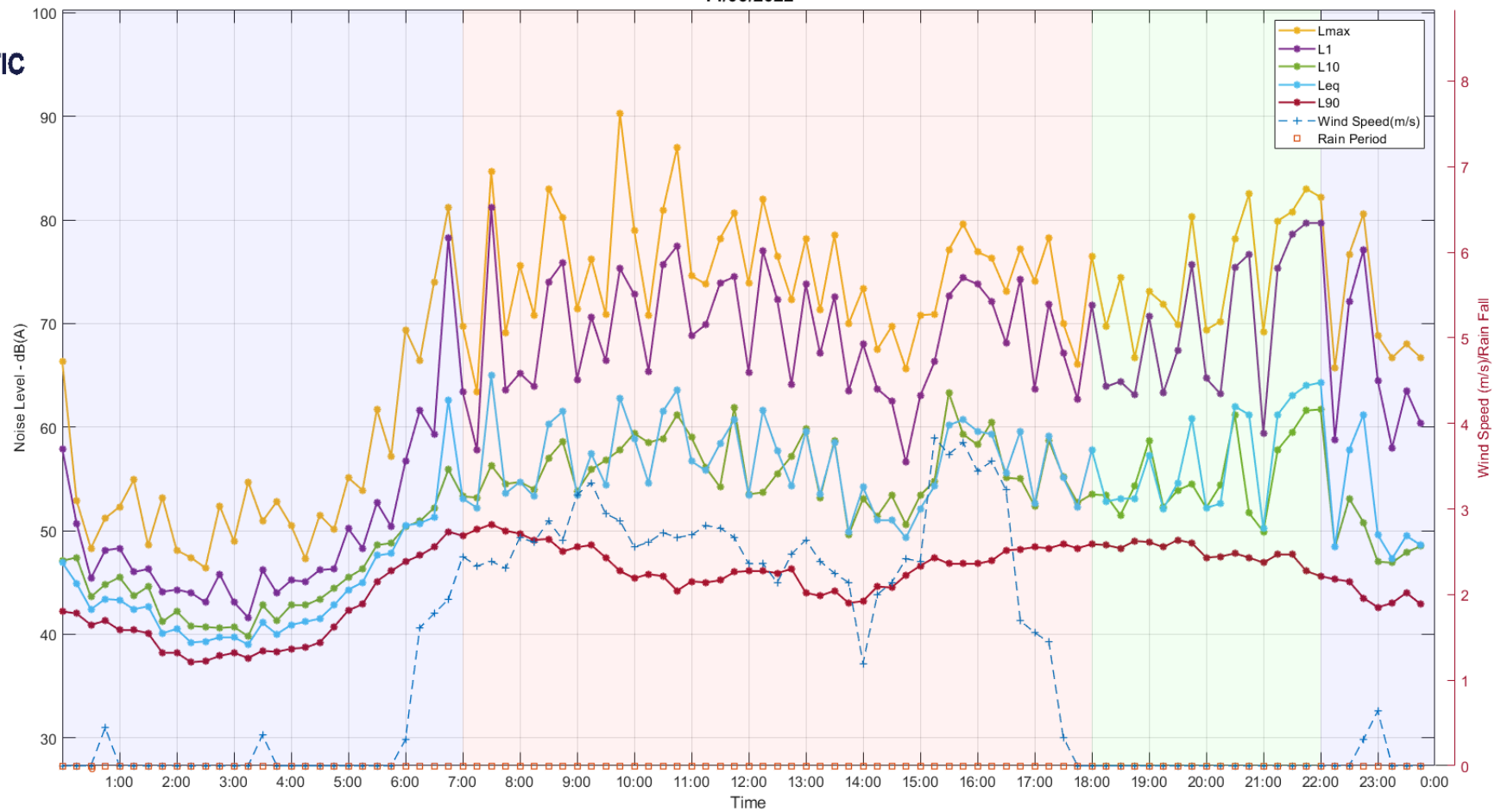
67-75 Lords Road, Leichhardt, LightRail
12/06/2022



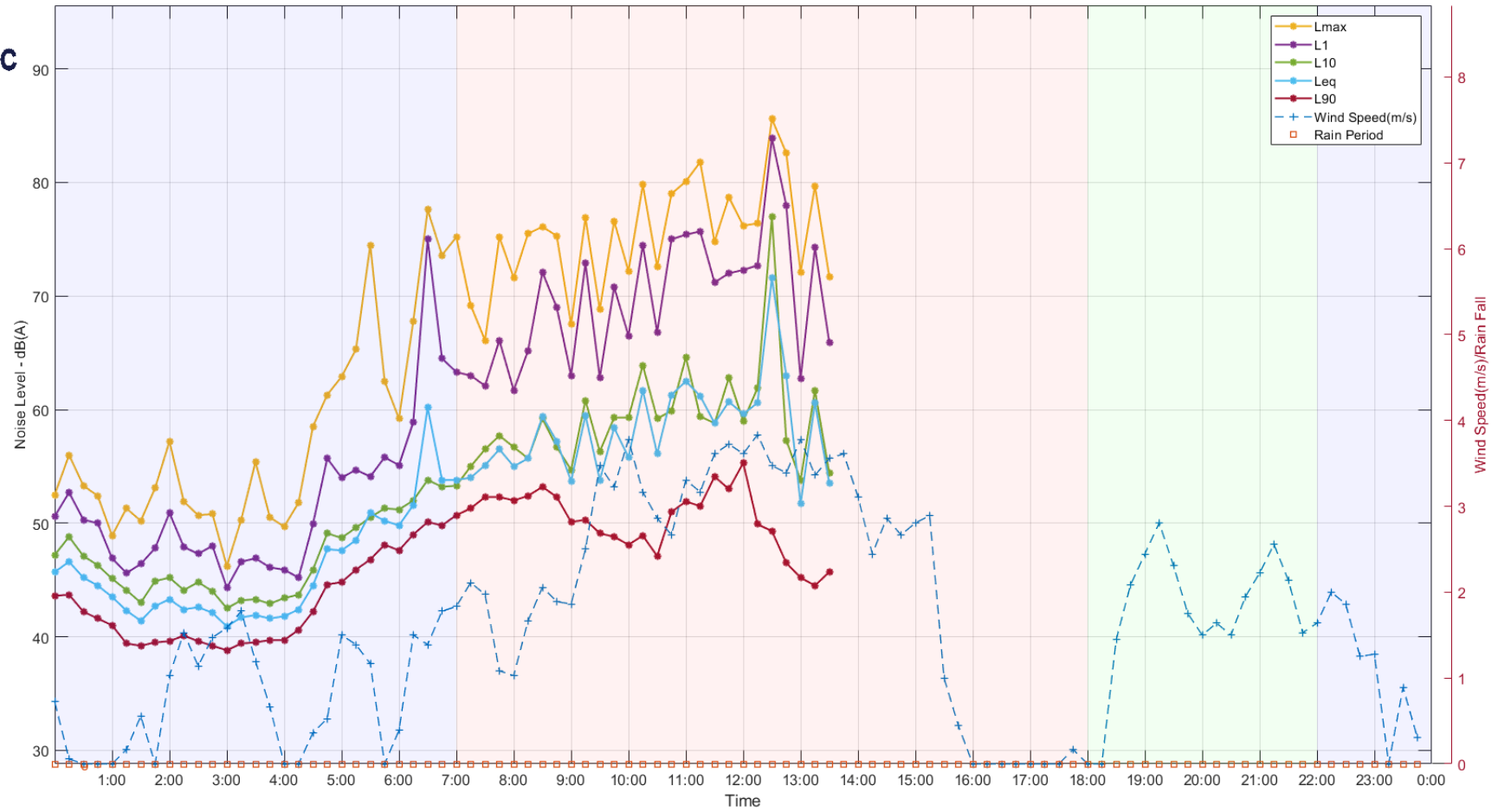
67-75 Lords Road, Leichhardt, LightRail
13/06/2022



67-75 Lords Road, Leichhardt, LightRail
14/06/2022

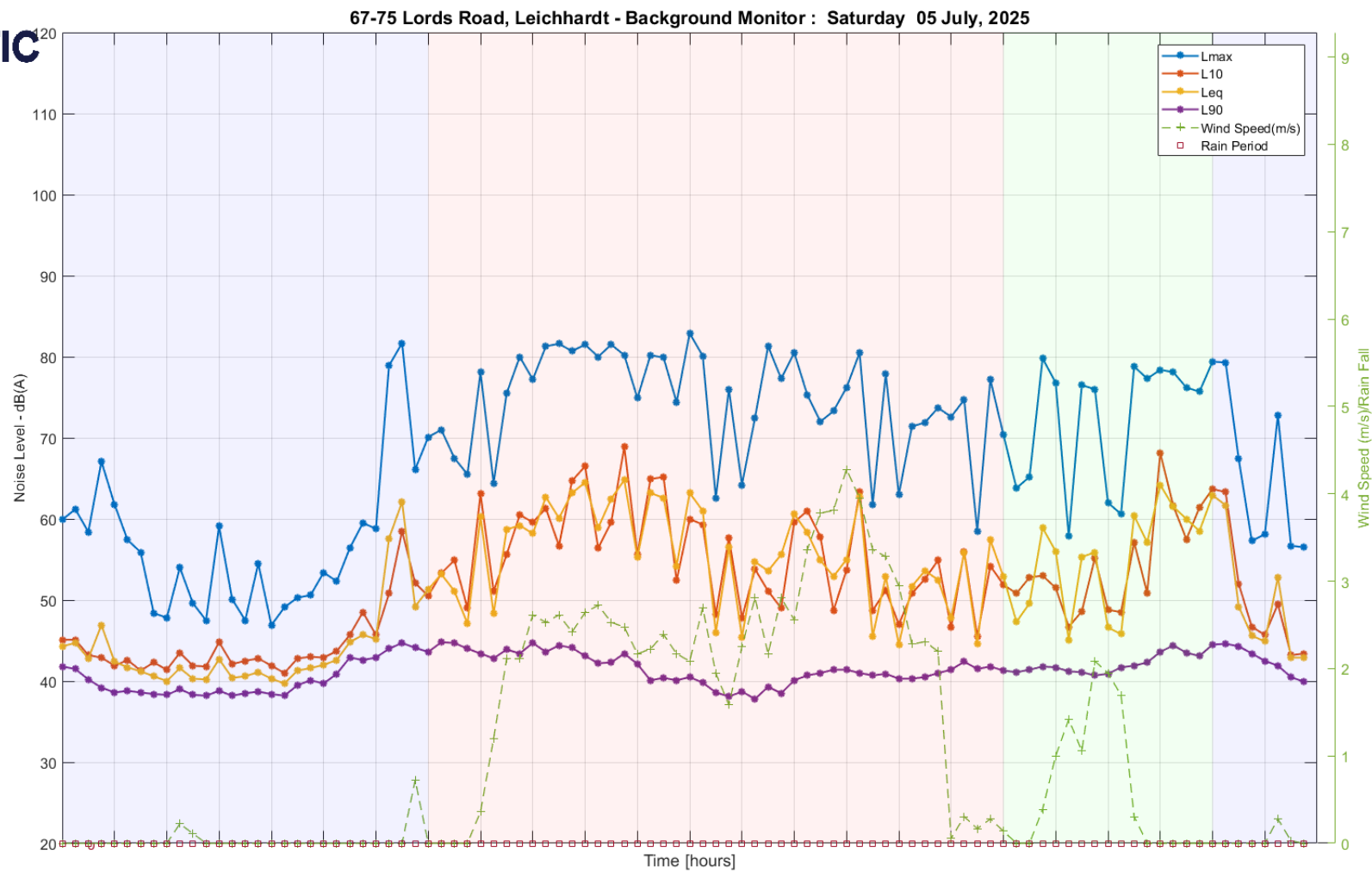


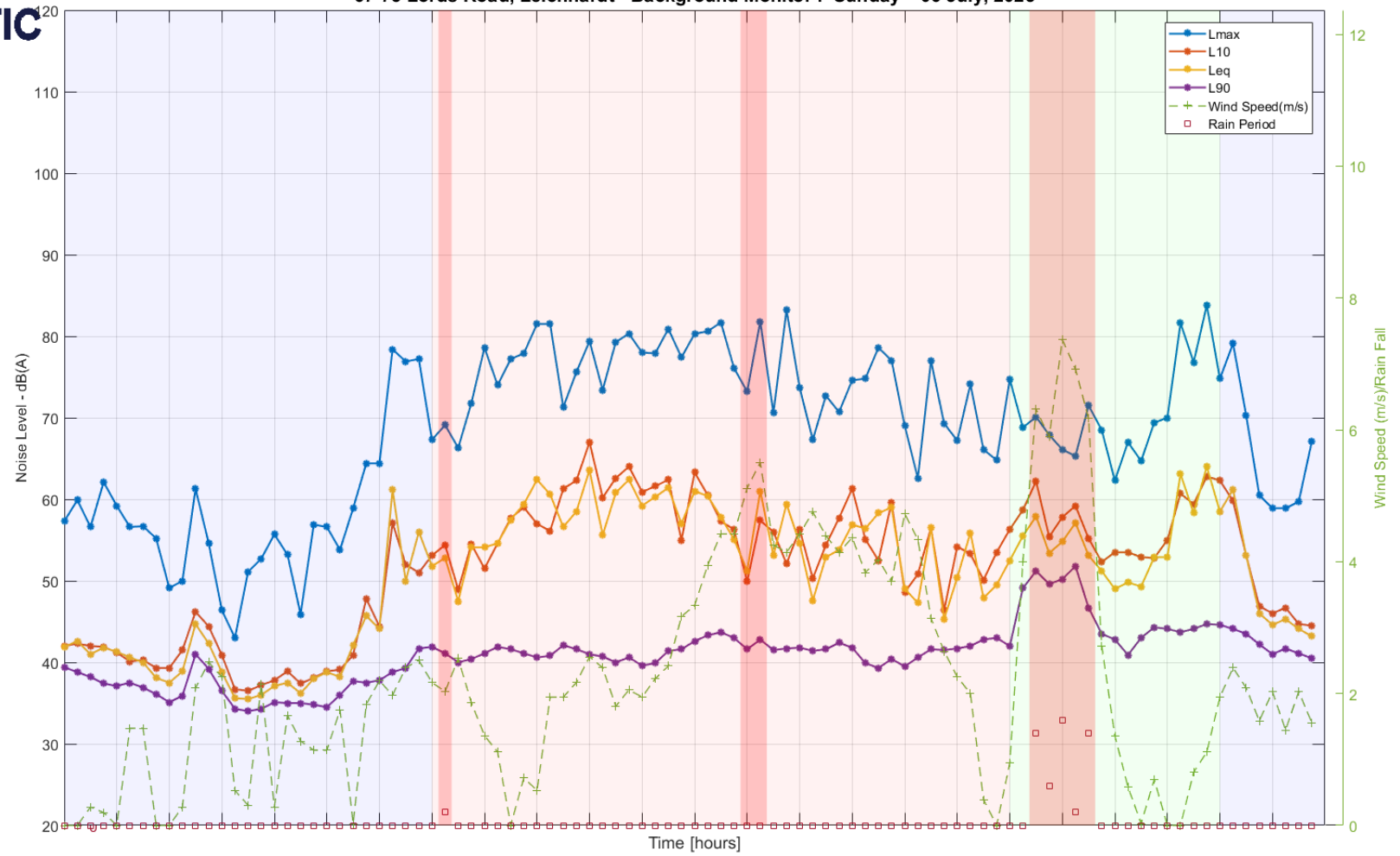
67-75 Lords Road, Leichhardt, LightRail
15/06/2022

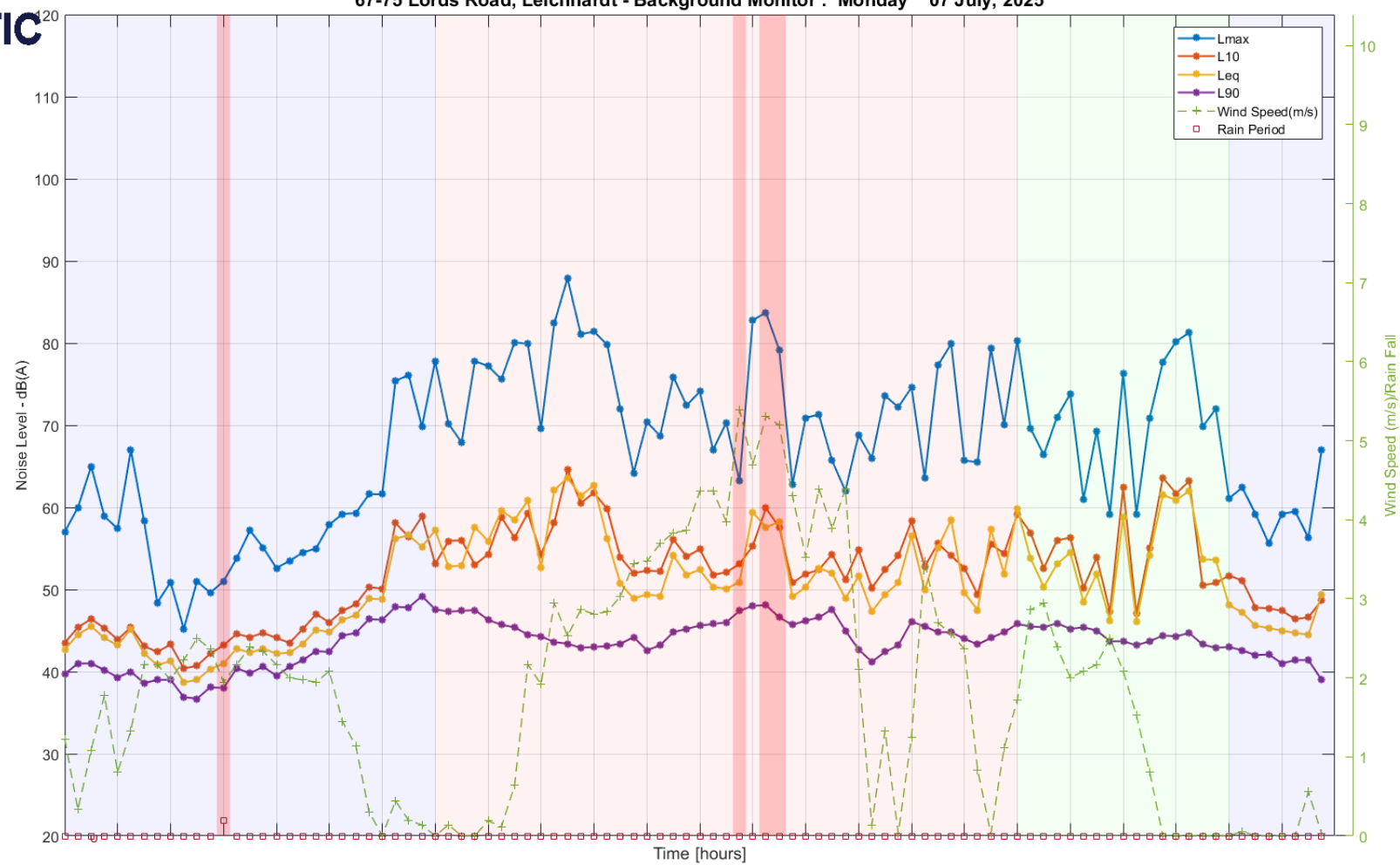


POSITION M3 – EASTERN BOUNDARY ADJACENT RESIDENTS (2025)



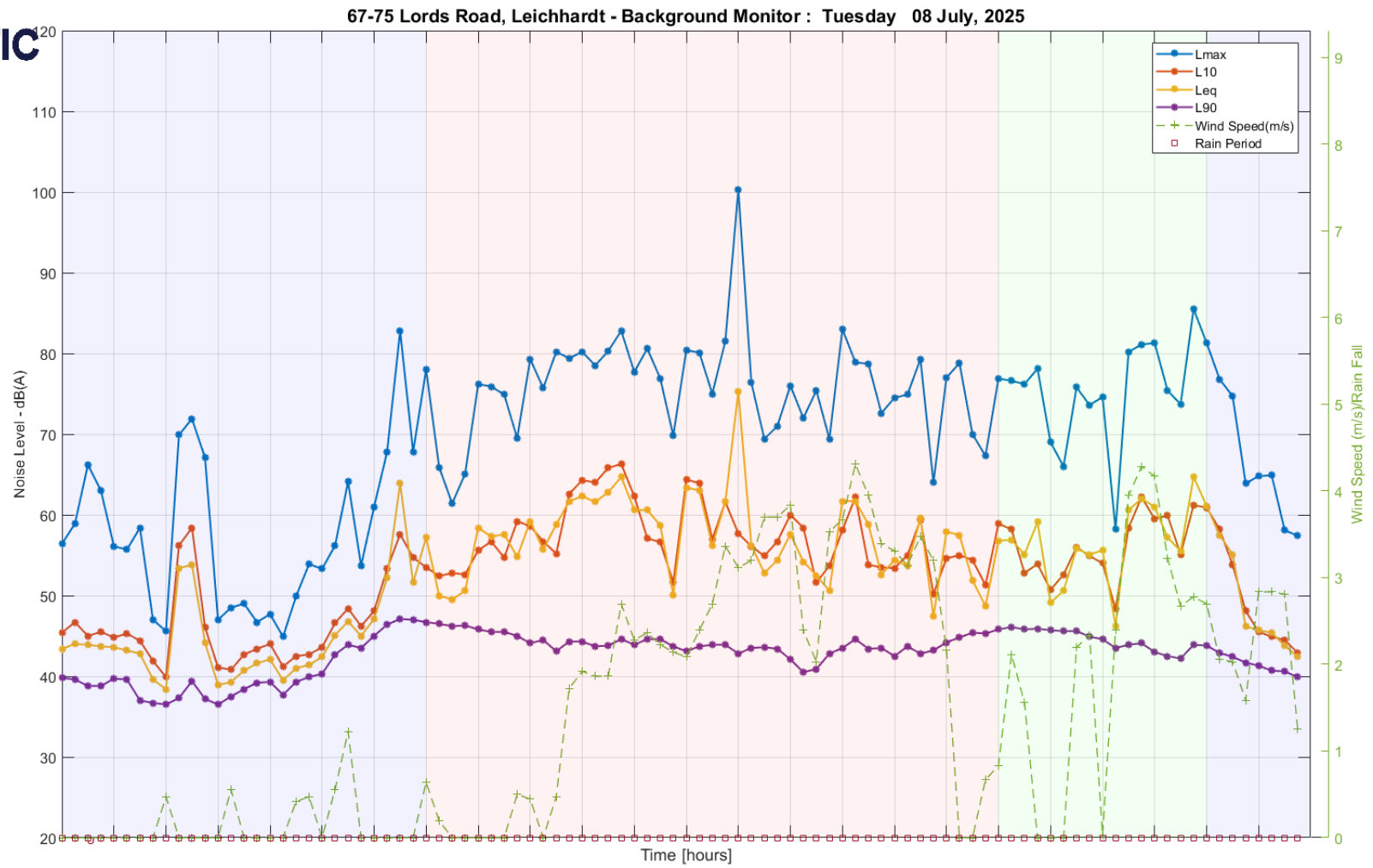


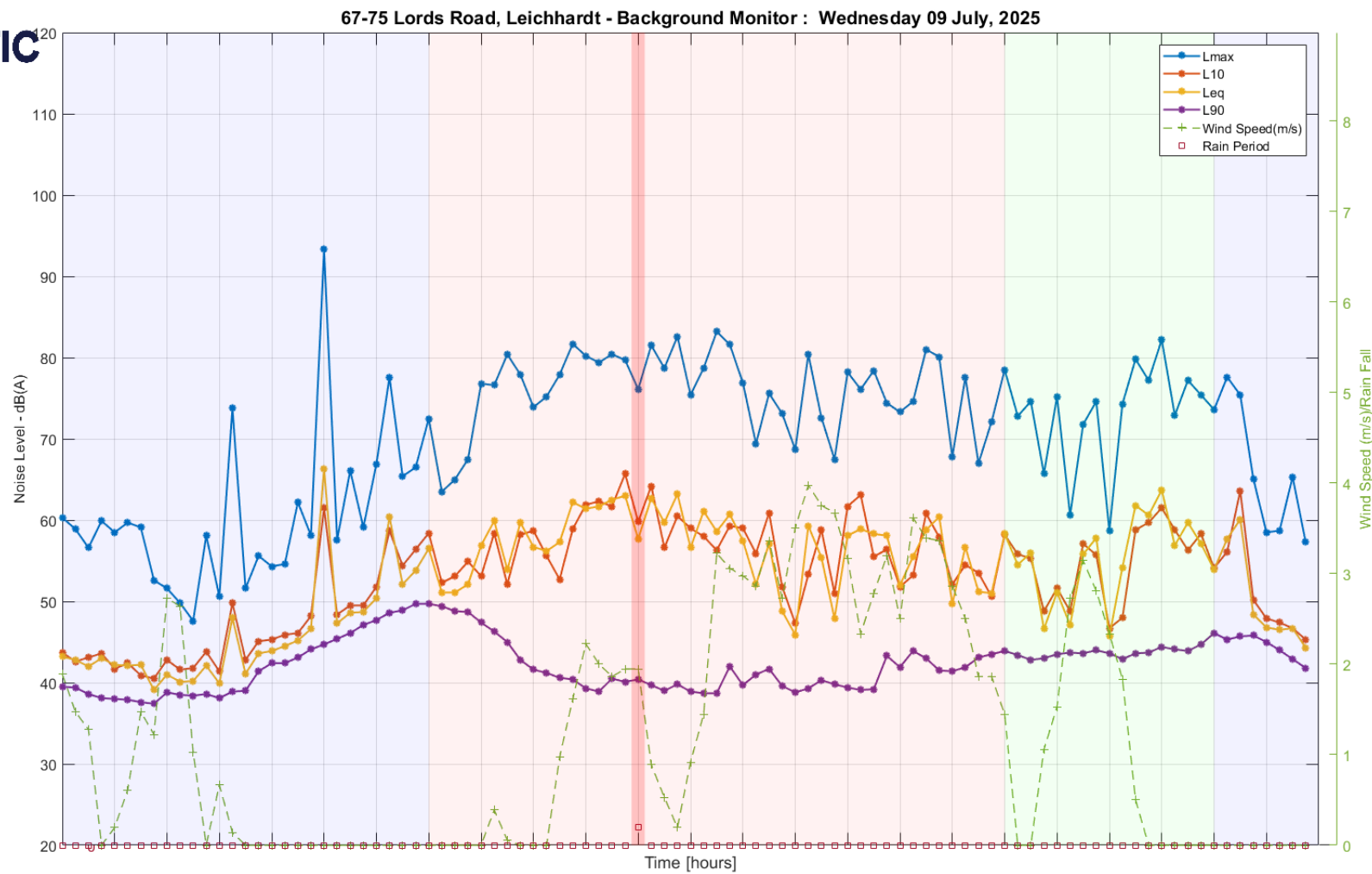


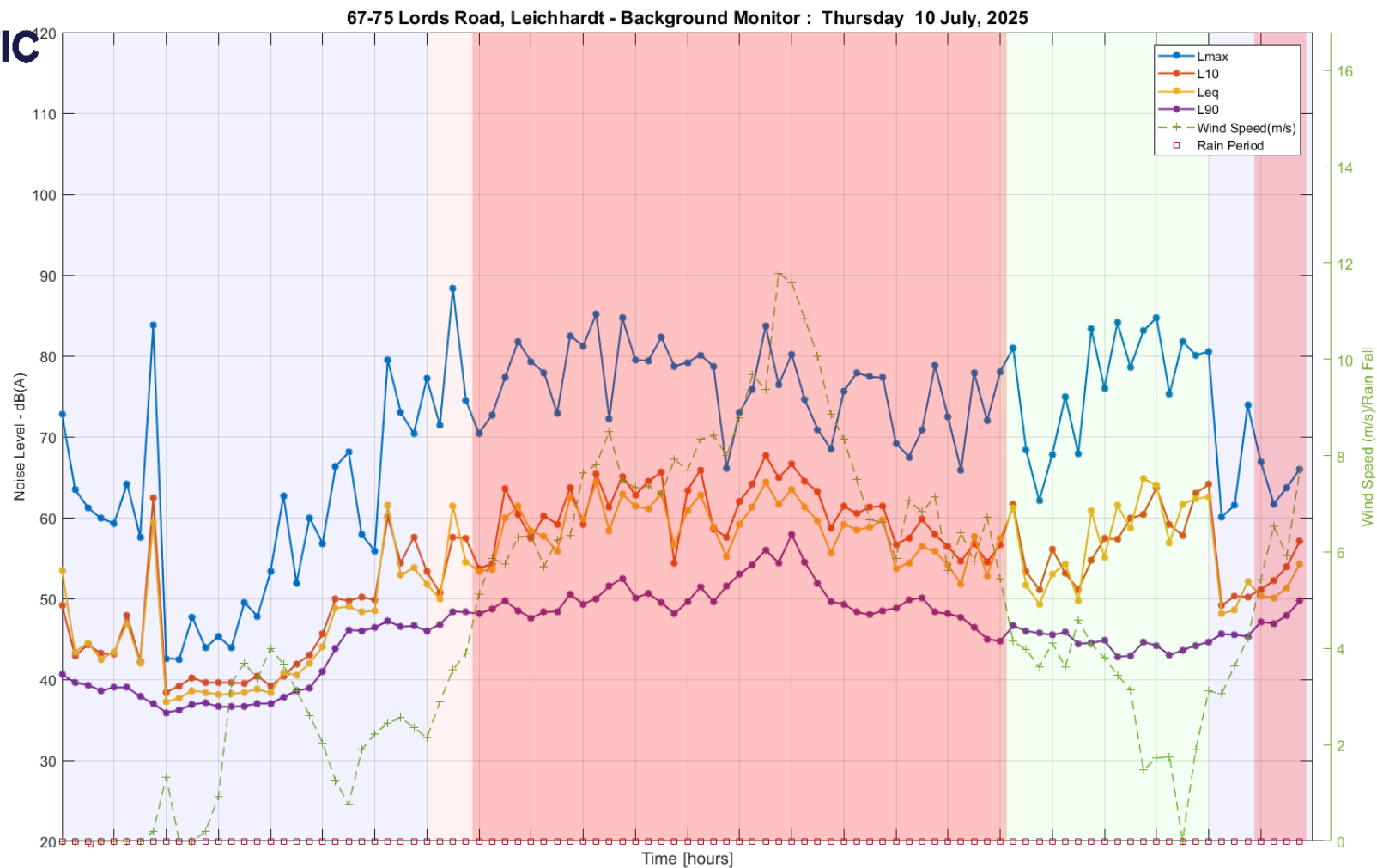


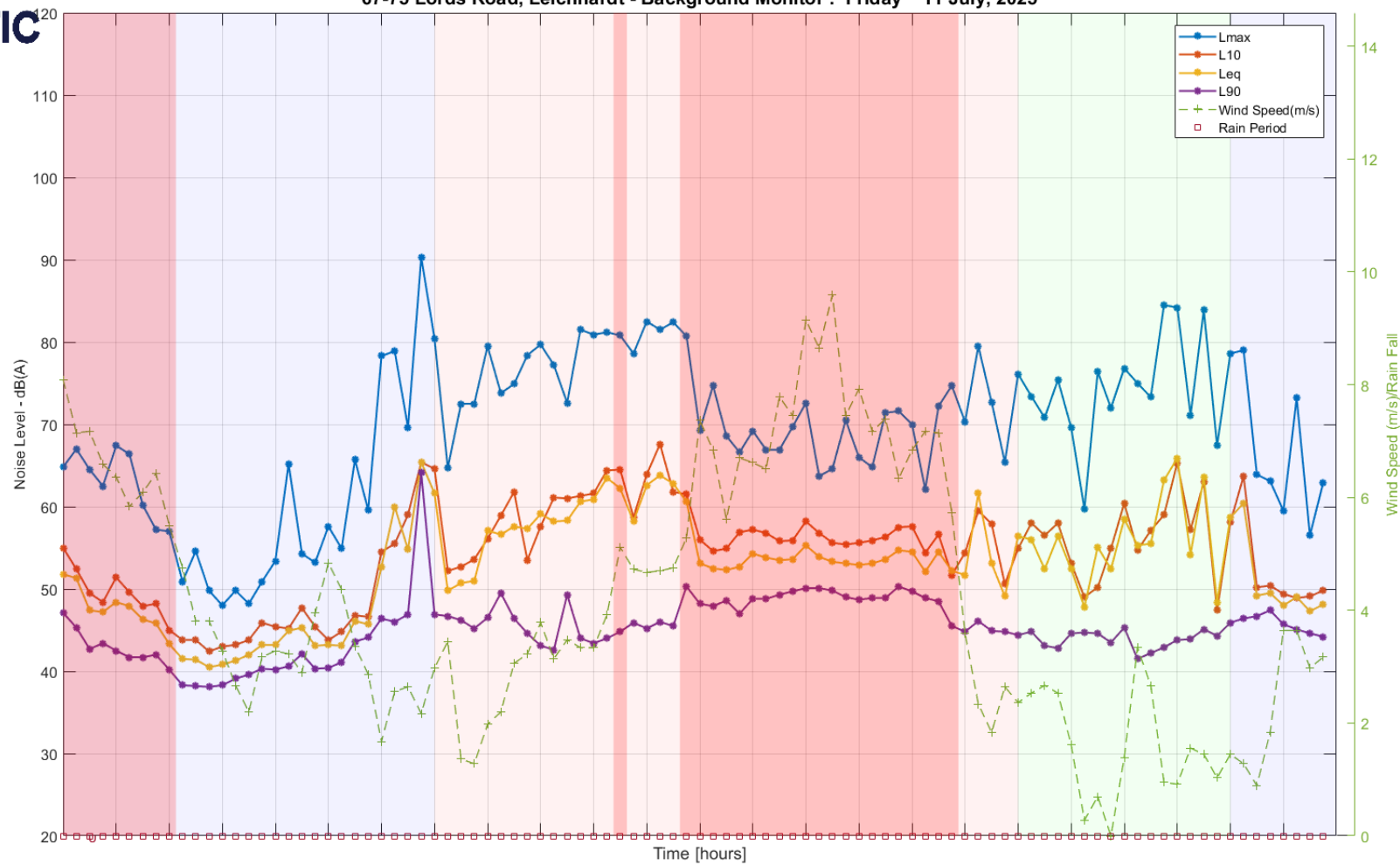


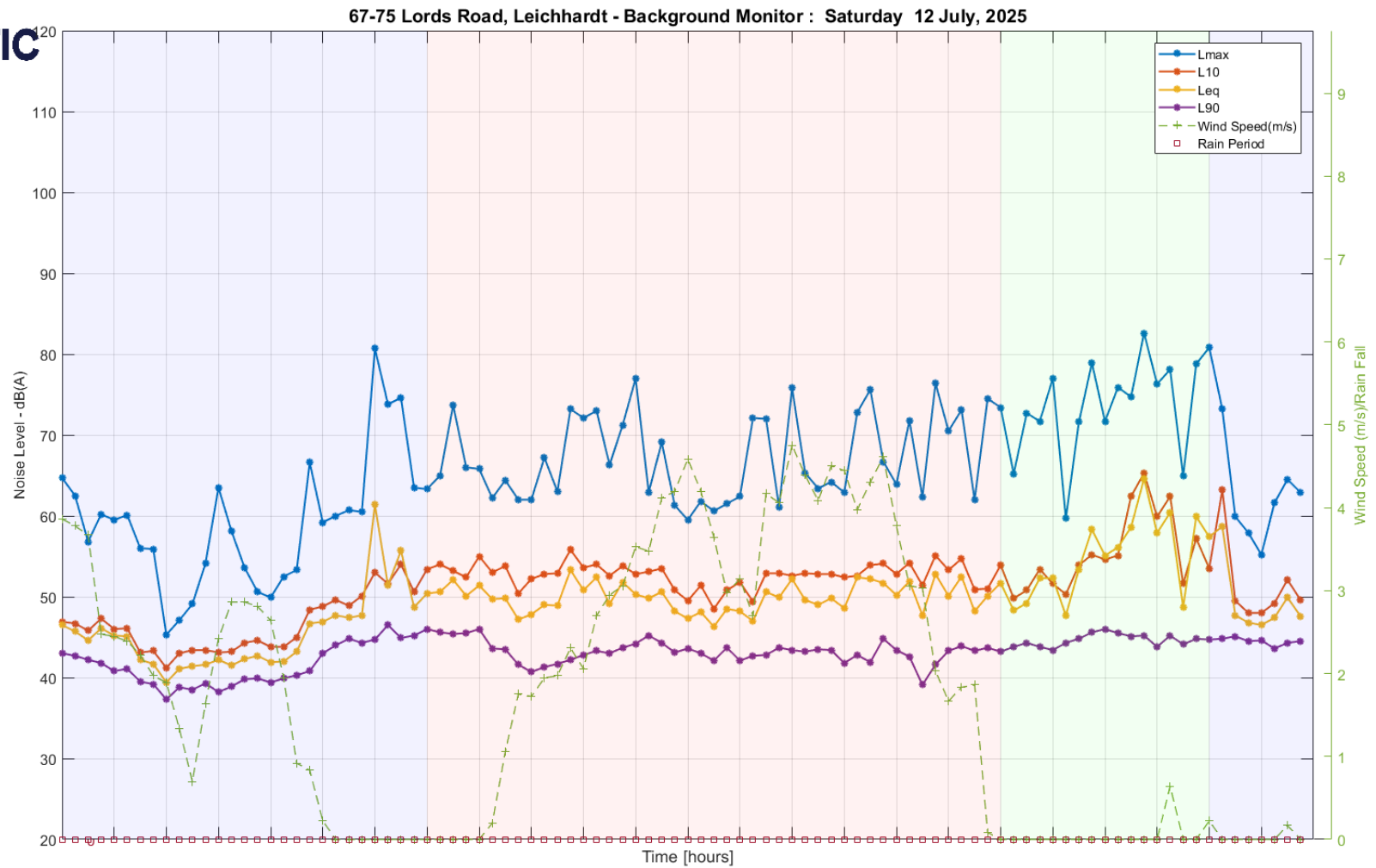
ACOUSTIC
LOGIC

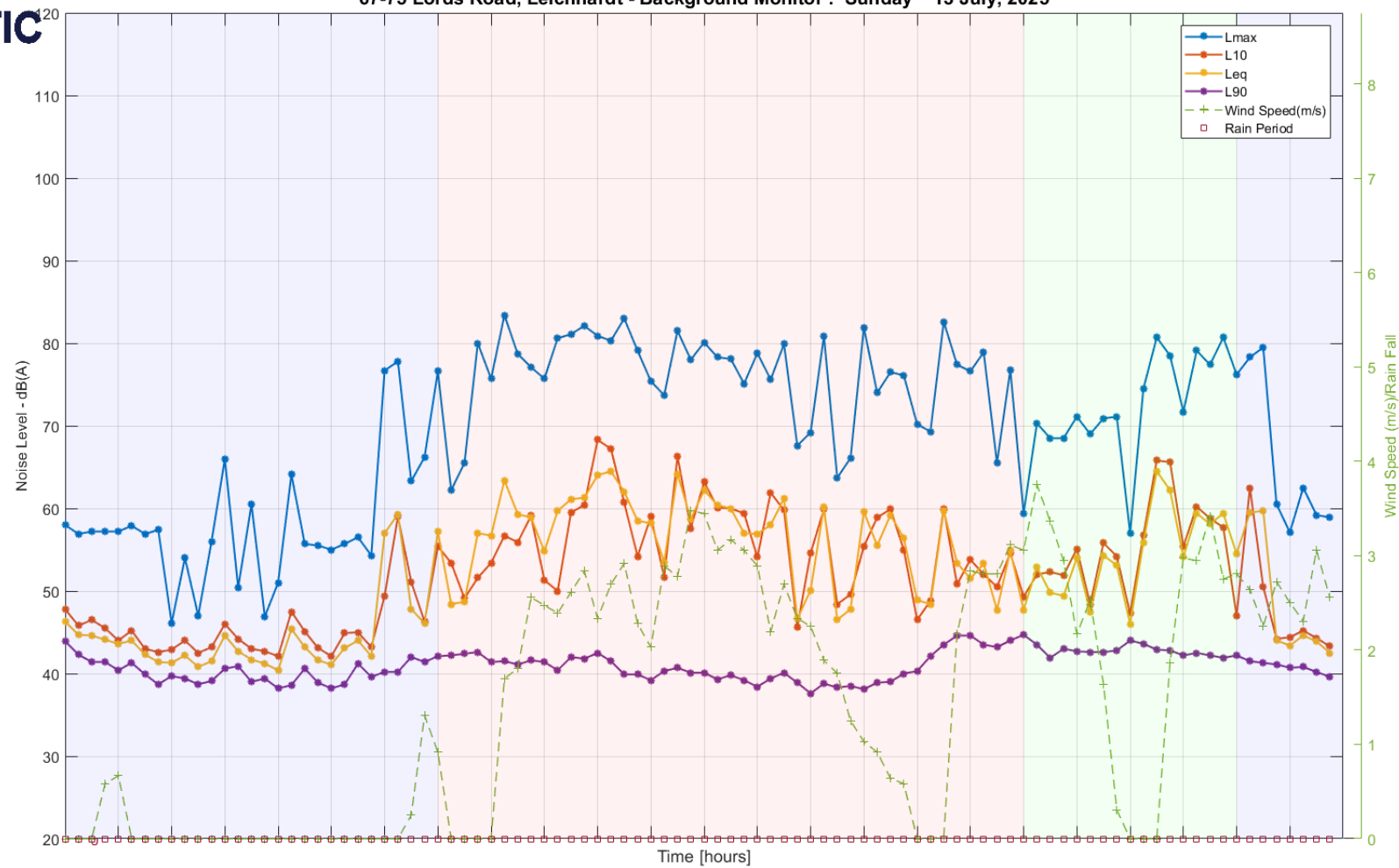


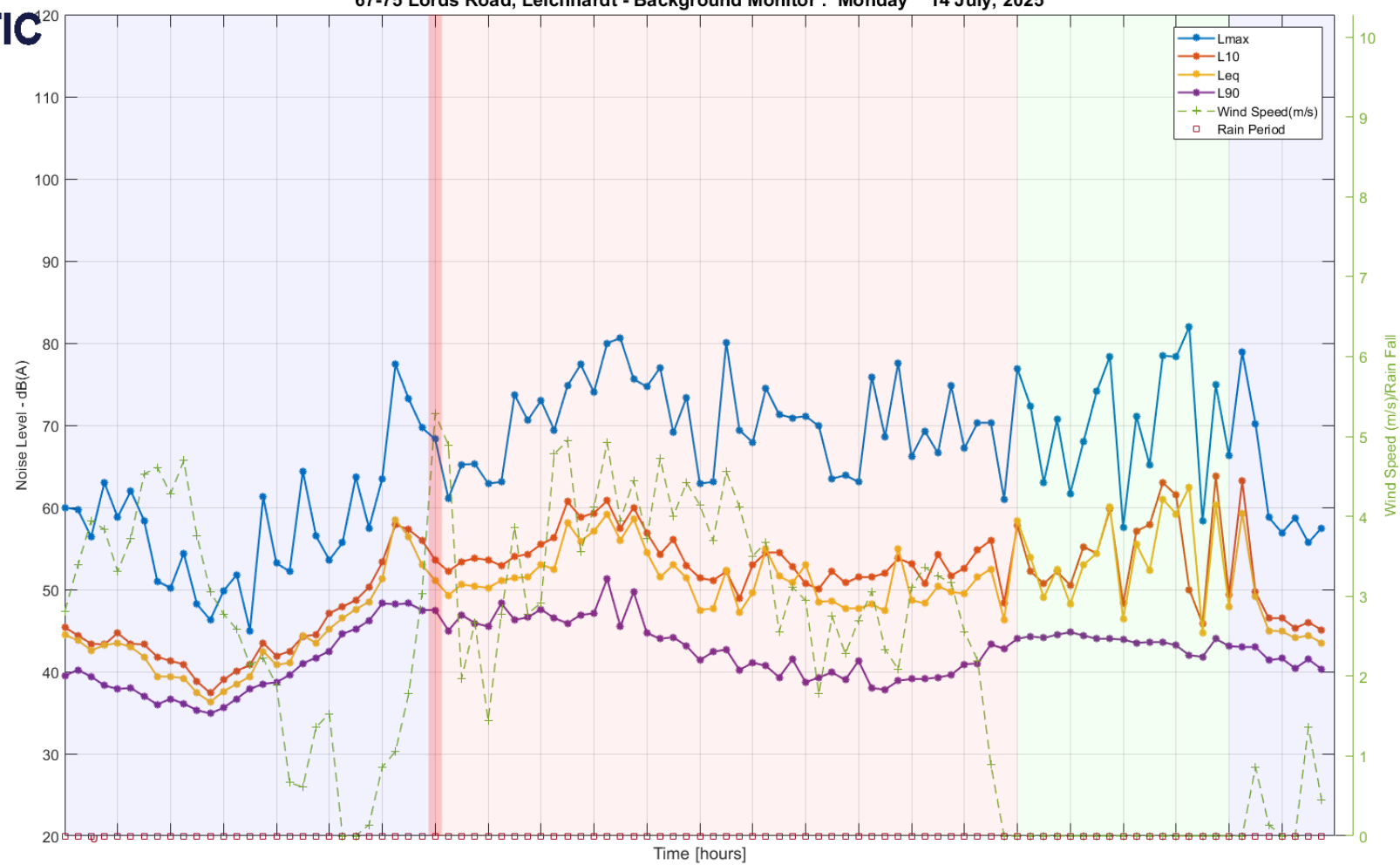


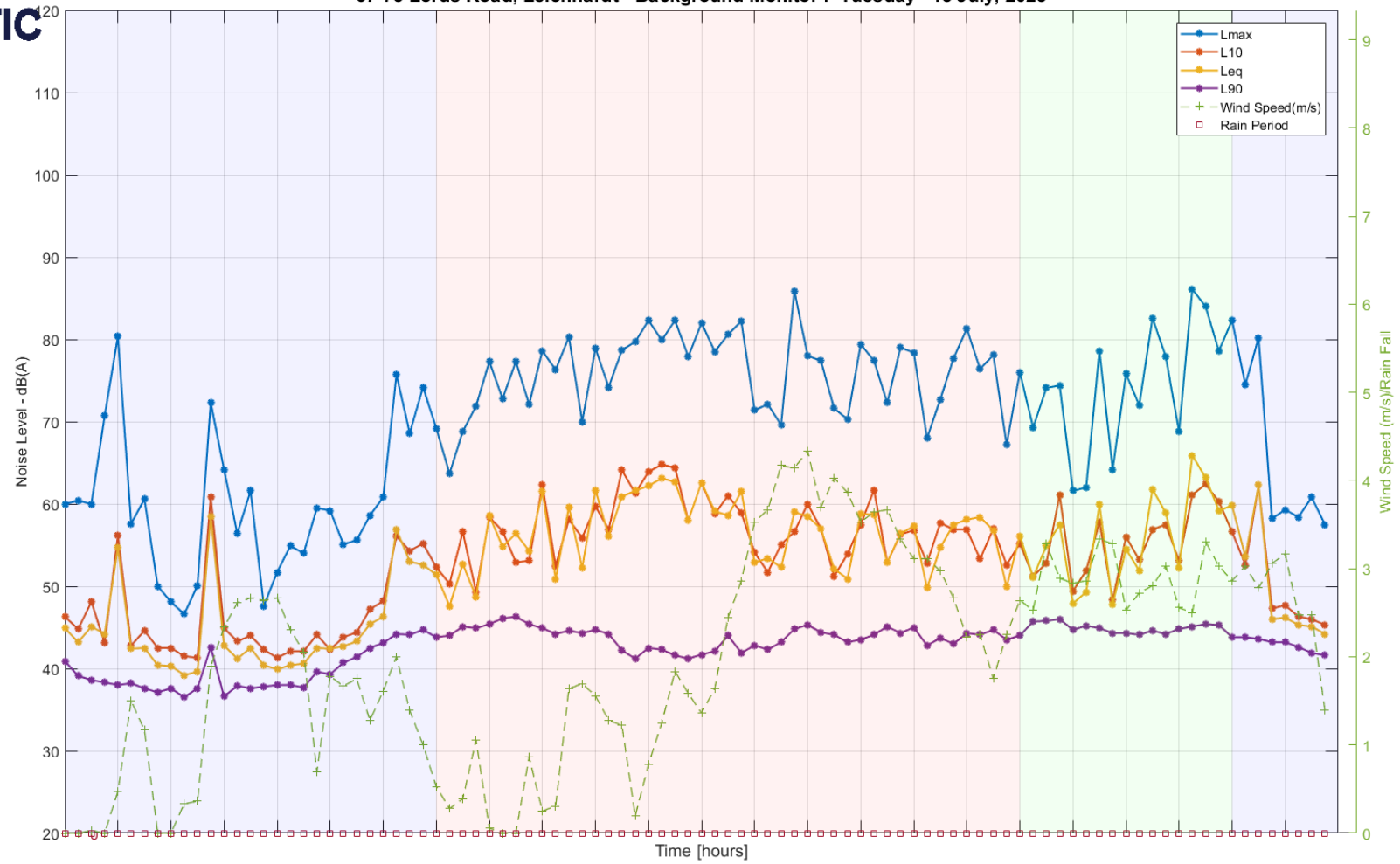


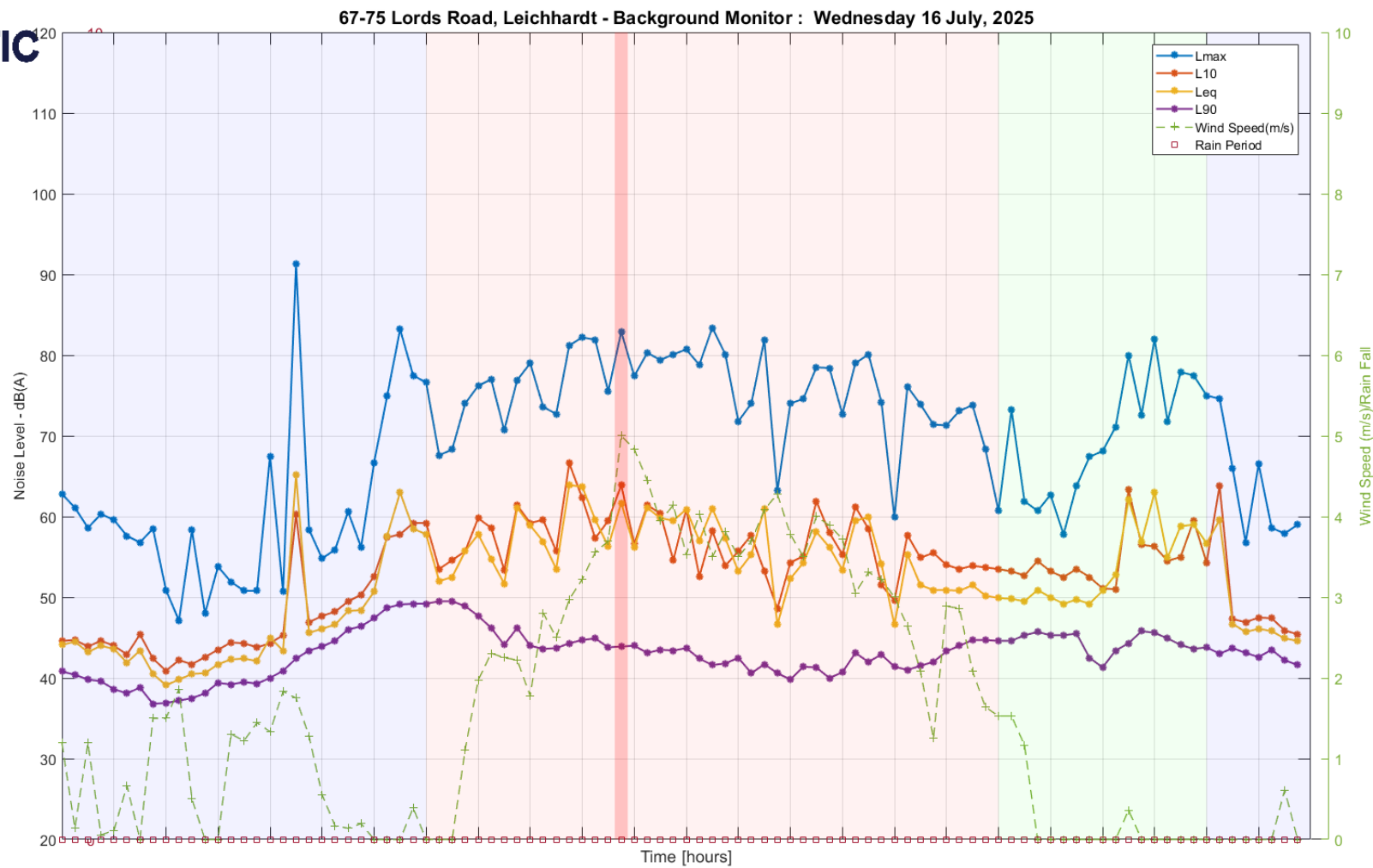


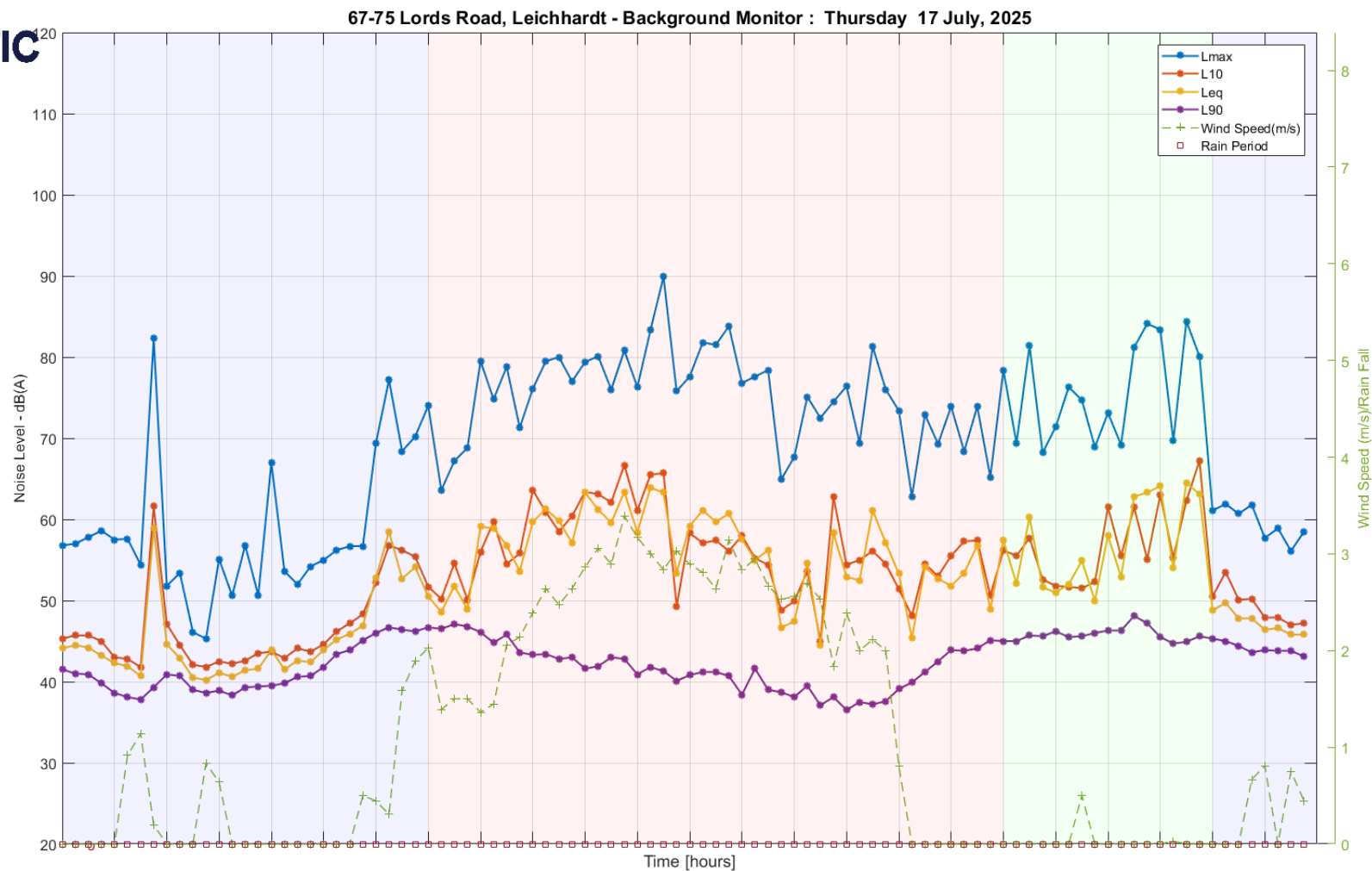


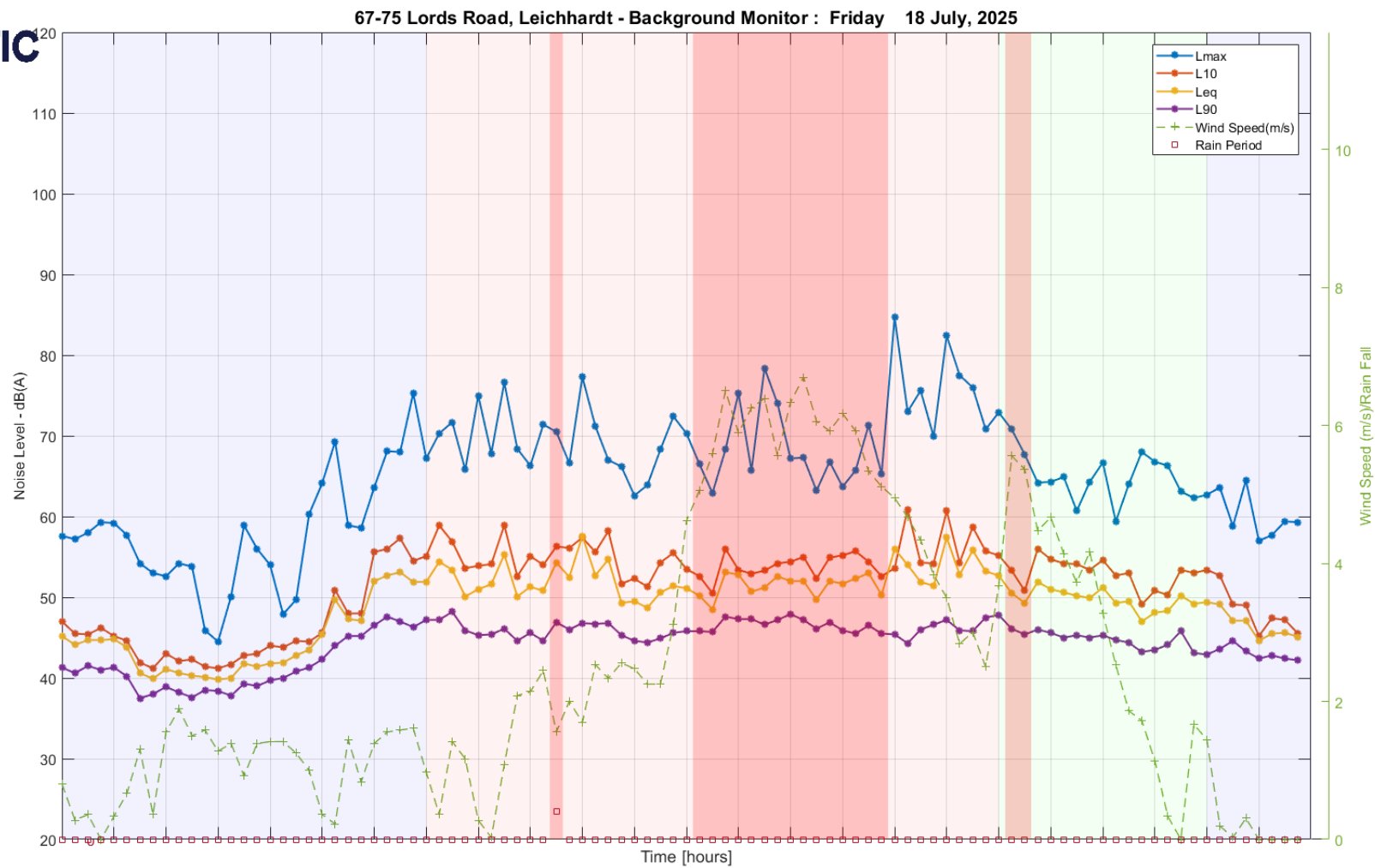


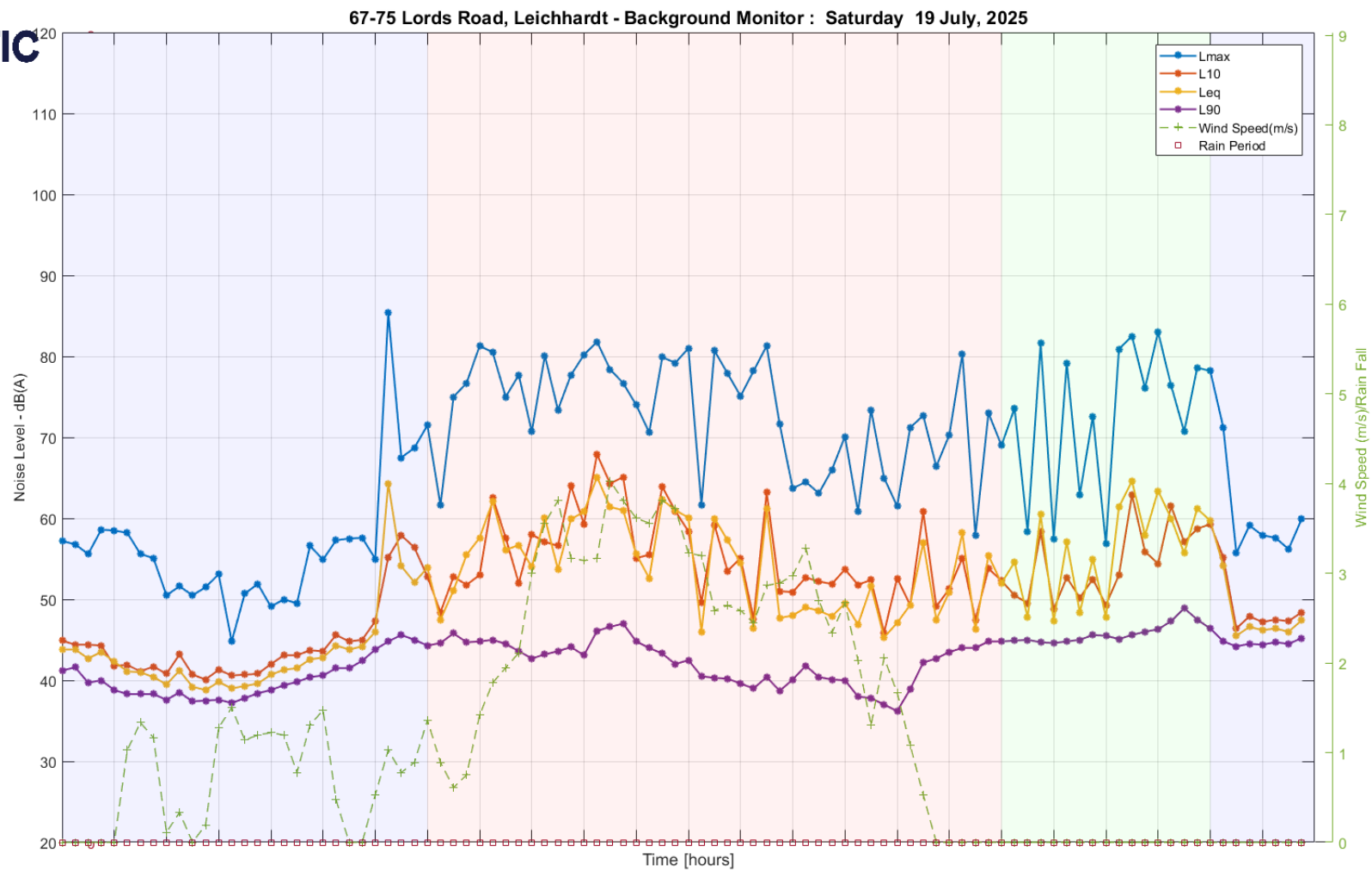


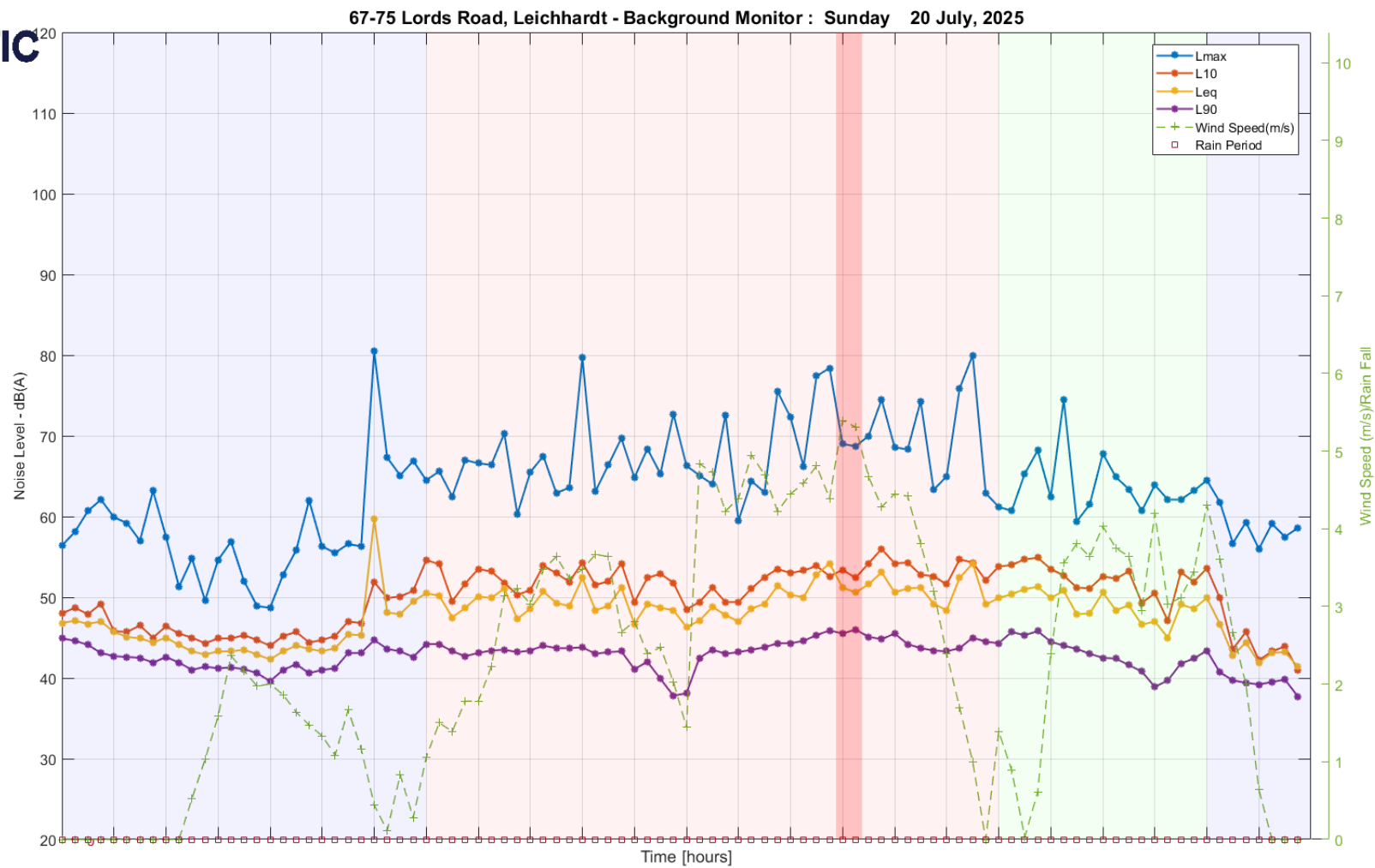


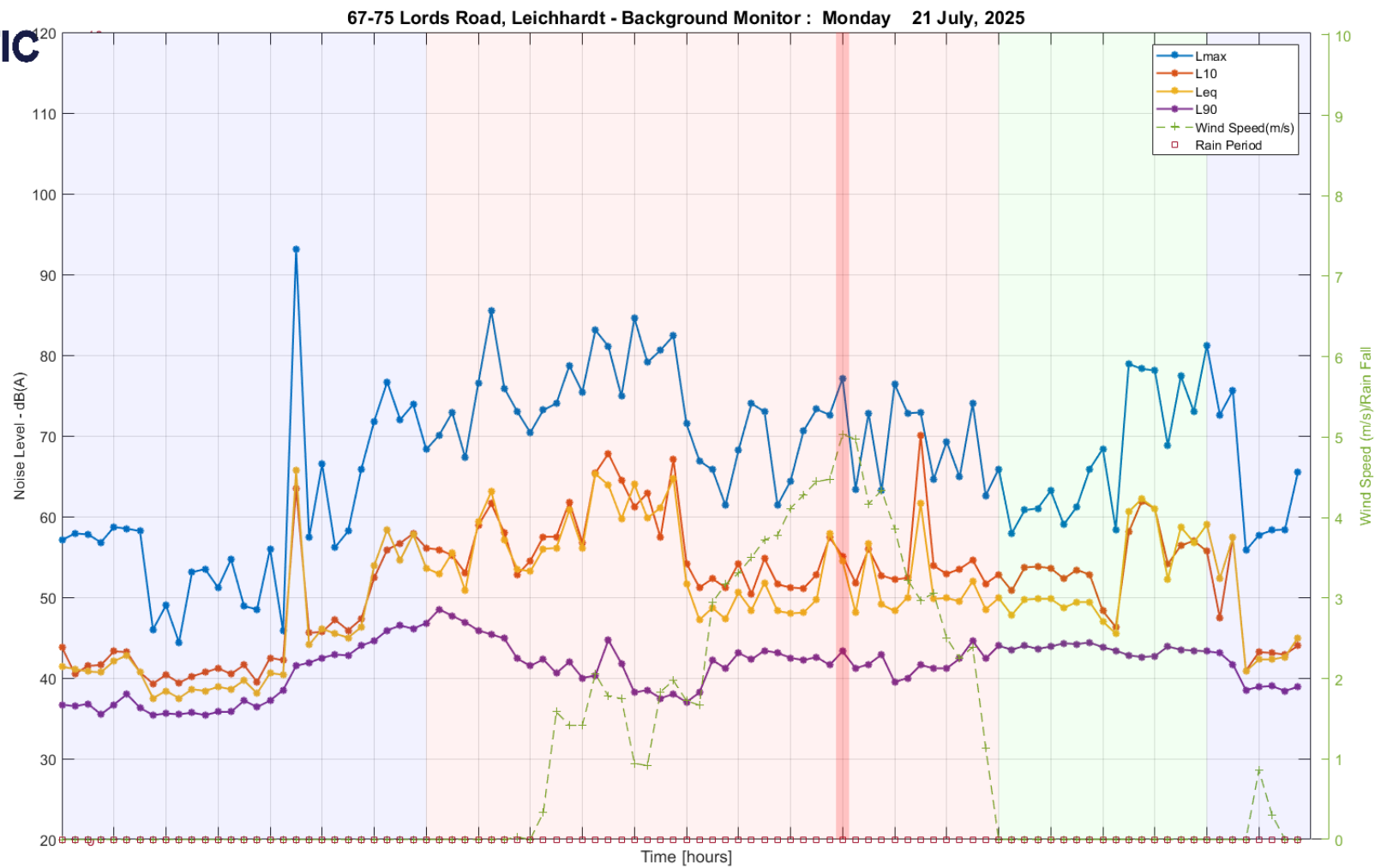


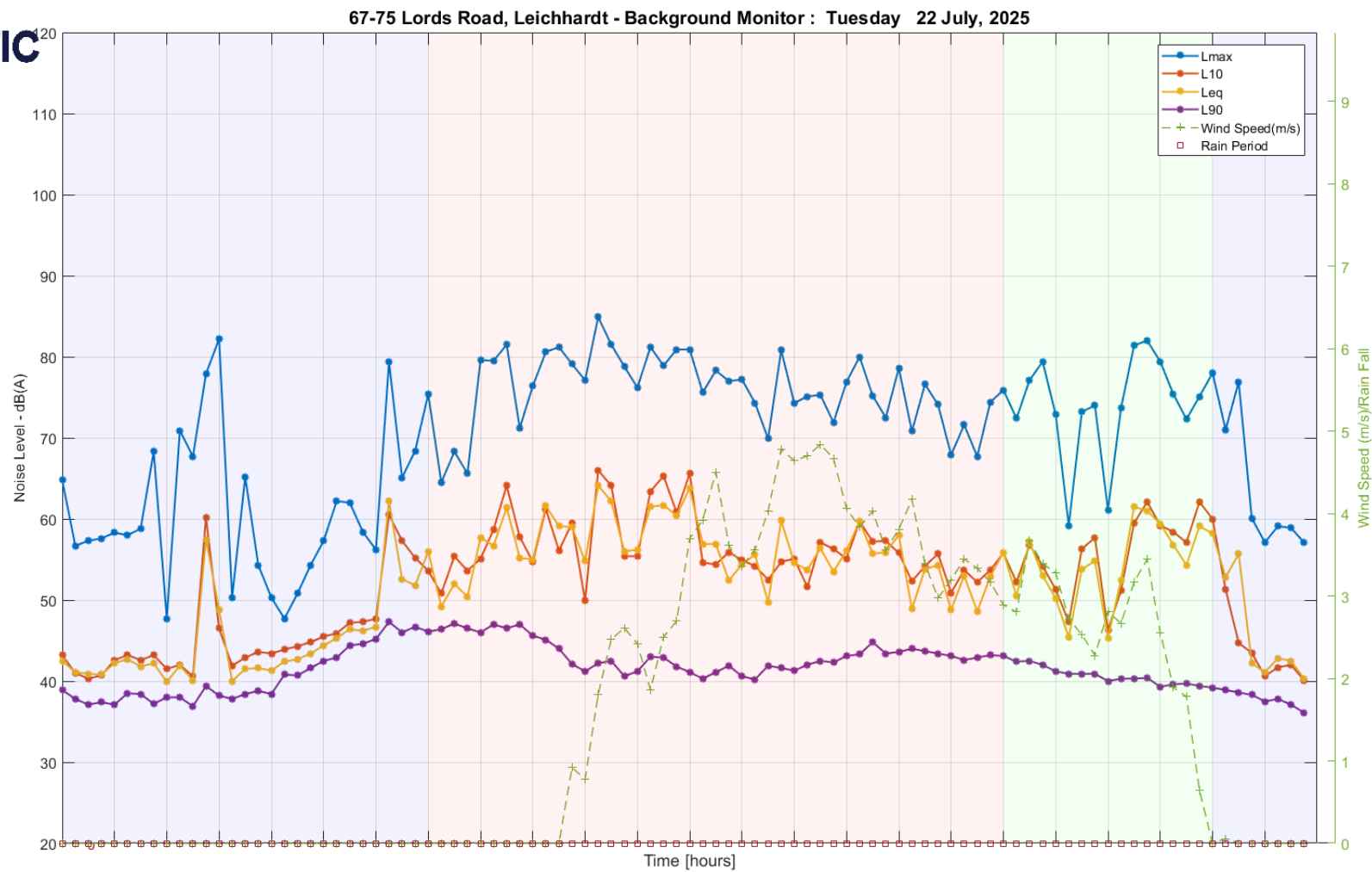


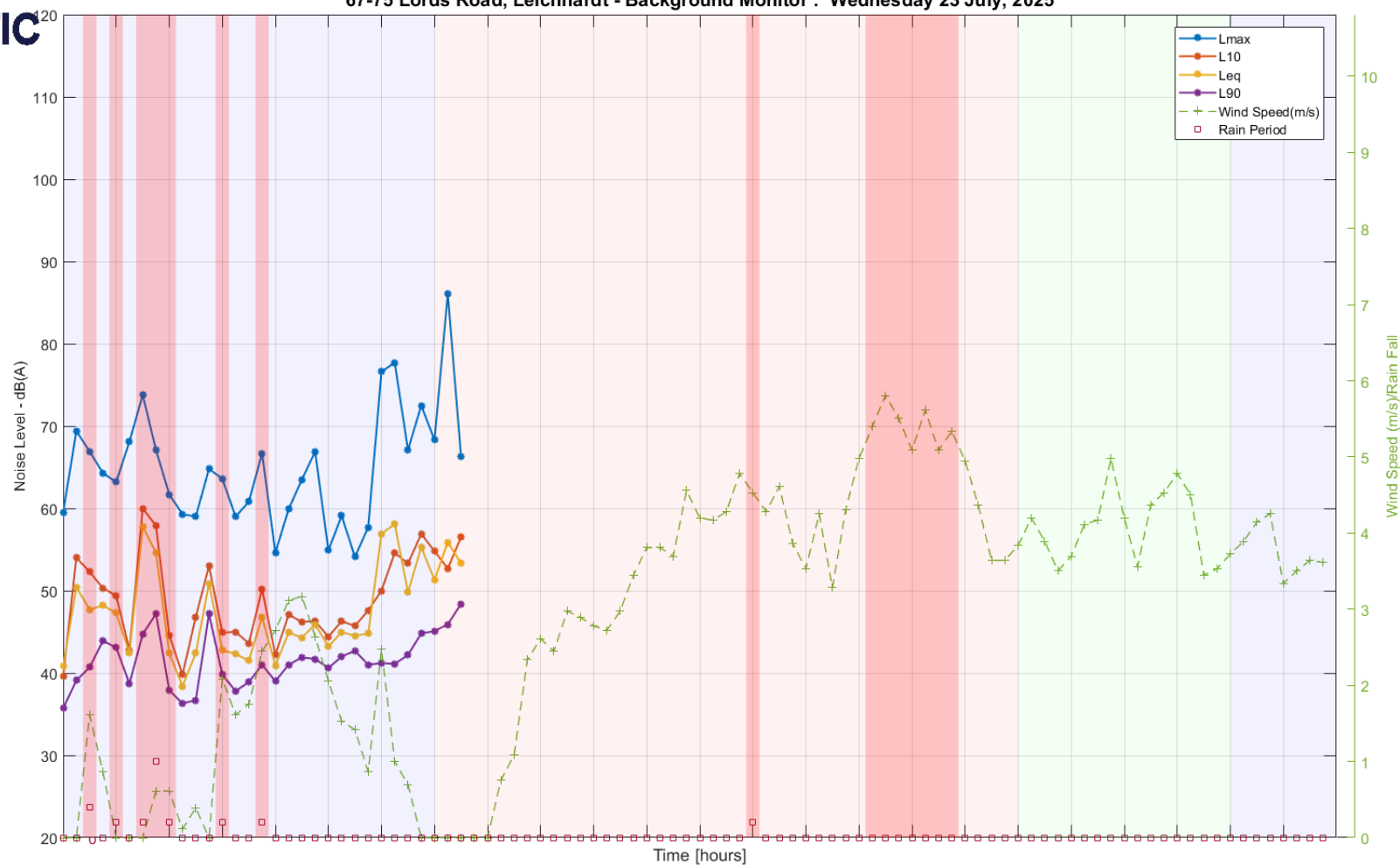












Wind Speed is corrected using factor 1.00 based on logger location