300 Manchester Road, Auburn

Planning Proposal Acoustic Assessment

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

DOCUMENT CONTROL REGISTER

Project Number	20171264.1
Project Name	300 Manchester Road, Auburn
Document Title	Planning Proposal Acoustic Assessment
Document Reference	20171264.1/2811A/R1/BW
Issue Type	Email
Attention To	M Projects

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	11/09/2017	20171264.1/1109A/R0/BW	BW		BW
1	28/11/2017	20171264.1/1109A/R1/BW	BW		BW

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1 INTRODUCTION

This report presents our assessment of acoustic impact associated with the proposed mixed use development located at 300 Manchester Road, Auburn.

In this report we have:

- Conducted an external noise impact assessment (primarily rail and surrounding land uses) and recommended acoustic treatments to ensure that a reasonable level of amenity is achieved for future occupants. Traffic and rail noise at the site have been measured and assessed in accordance with Council requirements and the NSW Department of Planning SEPP Infrastructure 2007 and the Australian Standard AS2107:2000.

- Conducted a rail vibration impact assessment and if necessary provide recommendations regarding vibration isolation. The assessment has been done in accordance with NSW Department of Planning Development Near Rail Corridors and Busy Roads – Interim Guideline.

- Carried out background noise monitoring to determine noise emission goals for future use of the development to meet council and NSW EPA acoustic requirements.

The assessment is based on the drawings and project description provided to this office from PAYCE.

2 SITE DESCRIPTION

The proposed plan includes a site with multi story mixed use development located on the land at 300 Manchester Road, Auburn. The site is bounded by Manchester Road to the south of the site with existing industrial use on the land to the west and a railway siding to the north of the site.

Train noise from the rail corridor is the primary noise sources affecting the proposed development. The rail corridor is also the primary vibration source affecting the development. Figure 1 shows the site, monitor and measurements locations are detailed in Figure 2.

The proposed development and site plan are detailed in the following figures.

Figure 1: Proposed development

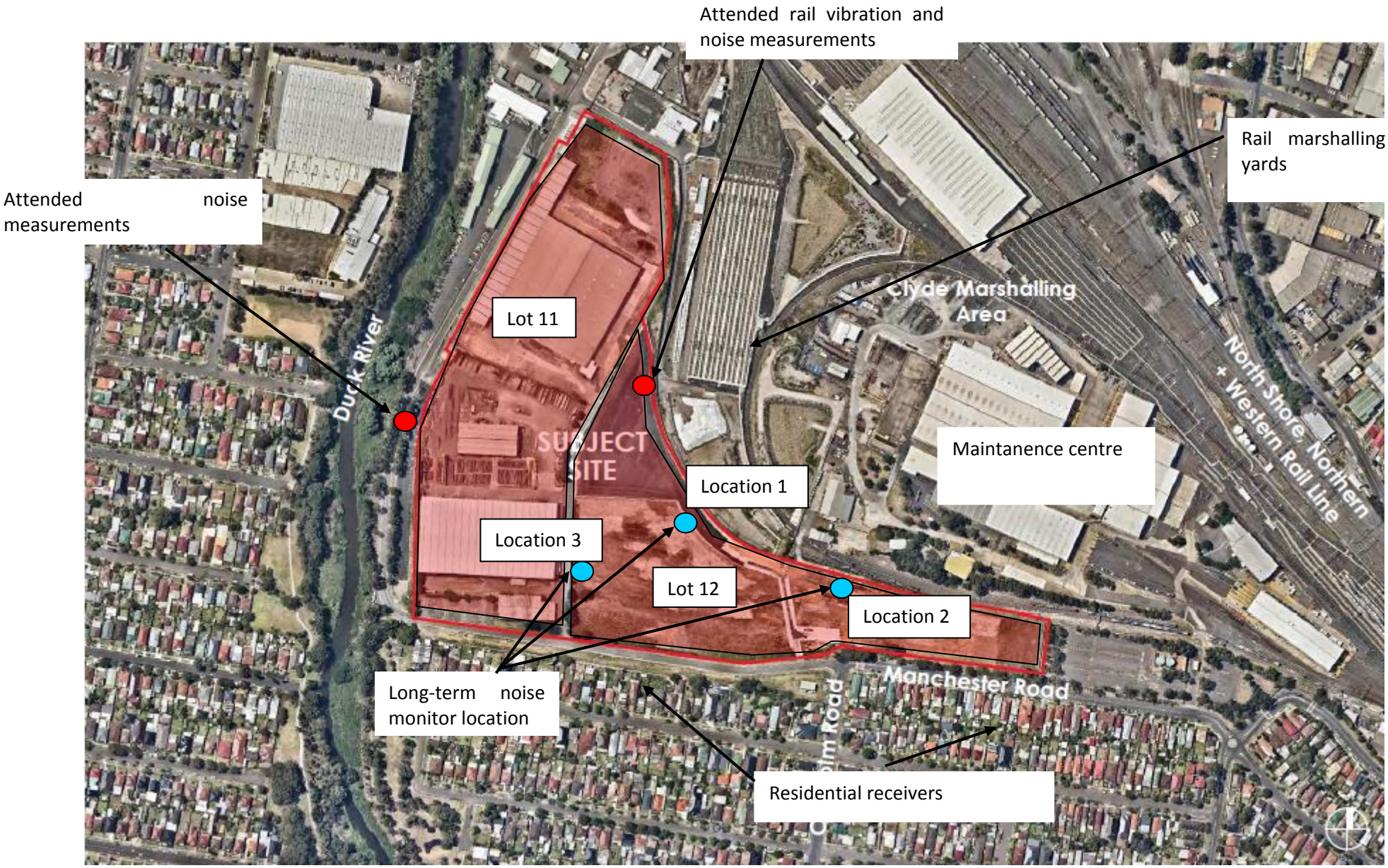


Figure 2: Site Map and Measurement Locations

3 NOISE INTRUSION ASSESSMENT

3.1 NOISE DESCRIPTORS

Traffic noise constantly varies in level, due to fluctuations in traffic speed, vehicle types, road conditions and traffic densities. Accordingly, it is not possible to accurately determine prevailing traffic noise conditions by measuring a single, instantaneous noise level. To accurately determine the effects of traffic noise a 15-20 minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters. These parameters are used to measure how much annoyance would be caused by a particular noise source.

In the case of environmental noise three principle measurement parameters are used, namely L_{10}, L_{90} and L_{eq}.

The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced at the source.

Conversely, the L_{90} level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L_{90} parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

The L_{eq} parameter 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 traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of traffic noise.

Current practice favours the L_{eq} parameter as a means of measuring traffic noise, whereas the L_{10} parameter has been used in the past and is still incorporated in some codes. For the reasons outlined above, the L_{90} parameter is not used to assess traffic noise intrusion.

LA_{max} refers to the maximum noise level occurring during a measurement period, and is used when assessing sleep disturbance impacts.

3.2 PROJECT ACOUSTIC OBJECTIVES

The following documents are used to determine the external noise intrusion assessment criteria for this project:

- NSW SEPP Infrastructure (2007)
- The NSW Environmental Protection Authority Environmental Criteria for Road Traffic Noise (Sleep Disturbance Guidelines).

3.2.1 NSW SEPP Infrastructure (2007)

The NSW Department of Planning's policy, Development Near Rail Corridors And Busy Roads – Interim Guideline, sets out internal noise level criteria adapted from the State Environmental Planning Policy (Infrastructure) 2007 (the 'Infrastructure SEPP') for developments with the potential to be impacted by traffic or rail noise and vibration.

For rail noise and vibration, the following controls apply:

"87 Impact of rail noise or vibration on non-rail development

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

(a) a building for residential use,

(b) a place of public worship,

(c) a hospital,

(d) an educational establishment or child care centre.

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

(3) If the development is for the purposes of a building for residential use, 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 exceed:

(a) in any bedroom in the building – 35 dB(A) at any time between 10.00 pm and 7.00 am,

(b) anywhere else in the building (other than a garage, kitchen, bathroom or hallway) – 40 dB(A) at any time."

3.2.2 Sleep Disturbance (Peak Noise) Events

An assessment of sleep disturbance is not mandatory in the SEPP controls. However, given that the proximity of the project site to the rail siding yards and for Lot 12 with the industrial site on Lot 11, an assessment of sleep disturbance will also be presented.

In addition to the SEPP criteria noise levels (the L_{eq} noise levels) referred to above, an assessment will be conducted of sleep disturbance as a result of rail noise. This sleep disturbance assessment is necessitated as a result of the night time use of the siding yards and the industrial noise sources.

Potential sleep disturbance to residents as a result of late night train movements will be assessed using the methodology set out in the EPA Environmental Criteria for Road Traffic Noise appendix B, table B3. This table is used to determine the number of awakenings that are likely to occur during the night time period (between 10pm and 7am) as a result of vehicle noise intrusion. For the purpose of this assessment, acoustic controls will be determined such that there will be less than one sleep disturbance per night as a result of external noise intrusion. In our opinion, a maximum of one awakening per night is considered acceptable, as, on average, a sleeper will have one awakening during the night as result of some disturbance other than external noise.

3.2.3 Project Criteria

The subject site is affected by rail and traffic noise thus both of the noise criteria listed above will be applied. The governing project criteria are presented in Table 3.

Table 1 – Internal Noise Level Criteria

LOCATION	PERIOD	CRITERIA	
		Average Noise Levels	Sleep Disturbance/Peak Noise Events
Bedrooms	Night (10pm – 7am)	35 dB(A) $L_{eq(9hour)}$	50-55 dB(A)L_1
Living Areas	All day (24 hrs)	40 dB(A) $L_{eq(24hour)}$	N/A

The recommended treatments in this report include those required to ensure that internal noise levels within the future residential apartments comply with both the average noise levels and Sleep Disturbance events detailed in the table above.

3.3 EXTERNAL NOISE MEASUREMENTS

A site survey was carried out. It was observed that the main environmental noises impact onto the site are generated by transportation noise and industrial noise sources surrounding the site, as detailed in Figures 1 and 2 above. 3 long term unattended noise monitor locations and 2 attended noise measurement locations were used in this assessment.

Additional attended noise level measurements have been conducted at the site on the 7th September, 2107 to confirm previously conducted noise levels recorded at the site remain accurate.

Based on the additional testing conducted in September 2017 all previously conducted attended and unattended noise survey data remains suitable for the assessment of noise impacts at the site and detailed in this report.

3.3.1 Measurement Position

The unattended noise monitoring was conducted at the locations detailed in Figure 2 above.

3.3.2 Time of Measurement

The unattended noise measurement was conducted between the 24th October and 9th November, 2014. The results of noise logging is detailed in Appendix 1.

Noise logging has been conducted over a continuous 2 week period and included all operations within the marshalling yards. The operation of the yards during this period are assumed to include normal marshalling activities, including those identified in the Auburn Stabling Project Review of Environmental Factors report. The recorded maximum L_1 noise levels during the entire periods have been used in the assessment of noise impact of the proposed site to ensure there is a suitable acoustic amenity for future residence.

3.3.3 Measurement Equipment

Equipment used consisted of an Acoustic Research Laboratories Pty Ltd noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Noise logger data is provided in Appendix 1.

3.3.4 Measured Noise Levels

The measured noise levels for day/night periods are presented below.

Table 2 – Measured Existing Environmental Noise Levels

Location	Period	Noise Level
Location 1	Day(7.00am – 10.00pm)	61 dB(A) L_{eq} (15hr)
	Night(10.00pm – 7.00am)	47 dB(A) L_{eq} (9hr)
		59 dB(A) L_1
Location 2	Day(7.00am – 10.00pm)	55 dB(A) L_{eq} (15hr)
	Night(10.00pm – 7.00am)	53 dB(A) L_{eq} (9hr)
		59 dB(A) L_1
Location 3	Day(7.00am – 10.00pm)	54 dB(A) L_{eq} (15hr)
	Night(10.00pm – 7.00am)	47 dB(A) L_{eq} (9hr)
		54 dB(A) L_1

3.4 EVALUATION OF NOISE INTRUSION AND RECOMMENDATIONS

A preliminary assessment of the resulting internal noise levels within the future residential tenancies has been undertaken. Internal noise will primarily be as a result of noise transfer through the windows and doors and roof, as these are relatively light building elements that offer less resistance to the transmission of sound.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the measured level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Calculations were performed taking into account the orientation of windows, barrier effects (where applicable), the total area of glazing, facade transmission loss and the likely room sound absorption characteristics.

3.4.1 Glazing Constructions

The indicative glazing assemblies for the future residential tenancies are indicated in Tables below. The glazing includes that required to Lot 12 to ensure compliance with the relevant criteria noise levels from the Lot 11 industrial sources in the event the building is tenanted with operations remaining in operation.

The glazing thicknesses recommended are those needed to satisfy acoustic requirements and do not take into account other requirements such as structural, safety or other considerations. These additional considerations may require the glazing thickness to be increased beyond the acoustic requirement. Details of specified glazing will be confirmed at the CC stage of the project.

Table 3 – Glazing Requirements (Lot 12)

Space	Façade	Glazing Thickness	Acoustic Seals
Bedrooms	Northern	6.38mm laminated	Yes
	Southern	6mm float	Yes
	Eastern	6mm float	Yes
	Western	6.38mm laminated	Yes
Living Areas	Northern	6.38mm laminated	Yes
	Southern	6mm float	Yes
	Eastern	6mm float	Yes
	Western	6.38mm laminated	Yes

Table 4 – Glazing Requirements (Lot 11)

Space	Façade	Glazing Thickness	Acoustic Seals
Bedrooms	Northern	6.38mm laminated	Yes
	Southern	6mm float	Yes
	Eastern	6mm float	Yes
	Western	6mm float	Yes
Living Areas	Northern	6.38mm laminated	Yes
	Southern	6mm float	Yes
	Eastern	6mm float	Yes
	Western	6mm float	Yes

In addition to complying with the minimum scheduled glazing thickness, the STC/R_w rating of the glazing fitted into operable frames and fixed into the building opening should not be lower than the values listed in the Table 6 below.

Where nominated, this will require the use of acoustic seals equal to Schlegel Q-lon series *(acoustic bulb seal)* around the full perimeter of operable frames. The frame will need to be sealed into the building opening using a flexible 100% polyurethane sealant equal to Selly's Pro Series FIreblock. Note that mohair seals and/or mohair/plastic fin combination seals in windows and doors are **not** acceptable where acoustic seals are required.

It is recommended that only window systems have test results indicating compliance with the required ratings obtained in a certified laboratory be used where windows with acoustic seals have been recommended.

Table 5 – Minimum STC/R_w of Glazing Requirements

Glazing Assembly	Acoustic Seals	Minimum STC/R_w of Installed Window
6mm float	Yes	29
6.38mm laminated	Yes	31

4 RAILWAY VIBRATION ASSESSMENT

Train induced ground borne vibration that is transmitted through the subsoil. These vibrations can be perceptible close to railways, as tactile vibrations and as structure borne noise.

4.1 PROJECT VIBRATION OBJECTIVES

4.1.1 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 OEH *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 represents 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 10. For this project the aim will be for a low probability of adverse comment.

Table 6 - 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

4.1.2 Structure Borne Noise

The Department of Planning 'Development Near rail Corridors and Busy Road – Interim Guideline' only requires structure borne noise assessment to be conducted where buildings or adjacent lands are over railway tunnels. Section 3.6.2 of the standard states the following:

"Where building are constructed over or adjacent to land over tunnels, ground-born noise may be present without the normal masking effects of air born noise. In such cases, residential buildings should be designed so that the 95th percentile of train pass-bys complies with a ground-born LAmax noise limit of 40 dB(A)(daytime and 35 dB(A) (nigh time)measured using the "slow" response time setting on a sound level meter.

As a general guide, ground borne noise may be an issue in habitable rooms which are shielded from airborne noise from the railway. Examples are rooms that are not facing the railway, and where cuttings or noise barriers block the line of sight between the receiver room and the rail line. In addition, some structures such as suspended slabs can lend to vibration amplification."

In this case, the proposed development is not located over or adjacent to a railway tunnel, from the vibration testing conducted on site we found that the predicted structure borne noise are compliant and the results are presented in Section 4.2.2.

4.2 RAIL VIBRATION MEASUREMENTS

4.2.1 Vibration Dose Values

Rail noise measurements were conducted in line with the future proposed north-western façade, which is the potentially worst affected façade as detailed in Figure 1 of this report above.

Attended train vibration measurements were conducted on 11th November 2014. A Svan 912A Vibration Analyser was used for the vibration measurements. The analyser was fitted with a Dytran triaxial accelerometer.

The measured vibration levels, duration of train passby and the number of 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 7 - Vibration Dose Values

Time Period	Calculated VDV $m/s^{1.75}$	Criteria VDV $m/s^{1.75}$	Complies
Day (7am – 10pm)	0.02	0.2 to 0.4	Yes
Night (10pm -7am)	0.01	0.13	Yes

Based on the result of this assessment vibration isolation is required for the future buildings on the site to comply with the relevant tactile or structure bone noise critiera.

4.3 LAND USE DISCUSSION

The proposed urban form of the project includes a location which can be suitably acoustically treated to ensure the amenity of future residence.

The proposed acoustic treatments and mitigations as detailed within this report will ensure compliance with the relevant acoustic criteria as well as ensuring a suitable amenity for residence within the development.

Similar residential development have been successfully constructed and occupied by residential users which are located within close proximity to transport infrastructure using the design criteria and approach proposed for the 300 Manchester Road development. Similar such developments include:

1. The Discovery Point Residential precinct with residential building directly adjacent the Eastern Suburbs and Illawarra Railway Line and Airport line.

2. Residential developments at a number of locations within the Turramurra and Hornsby areas located between the Pacific Highway and Northern Suburbs Railway Line.

3. Enmore Road Residential development located between the min Western Railway Line and Enmore Road which is a high traffic volume roadway.

4. Chatswood Central Development located directly above the main Northern Railway Line.

Based on the location of the project and the proposed acoustic treatments as detailed in this report the proposed 300 Manchester Road site is acoustically acceptable for the proposed residential use without impeding on the existing operations of the rail marshalling yards.

5 EXTERNAL NOISE EMISSION ASSESSMENT

The main noise emitted from the project site will be proposed plant servicing the future buildings. Detailed mechanical equipment selection and layouts are not available at this stage. The external noise emission criteria are set up in this section of the report to ensure that the acoustic amenity of nearby residents is not adversely affected.

The nearest potentially affected residential receivers are:

- Existing residential premises to the south of the site on Manchester Road.
- Future residential dwellings within the proposed development.

5.1 BACKGROUND NOISE MONITORING

The unattended noise monitors used in the environmental assessment detailed in the section above have been used for background noise survey of existing conditions. The measured Rating background Noise Levels are presented in Table below.

Table 8 – Measured Rating Background Noise Levels

Location	Period/Time	Rating Background Noise Level dB(A) L_{90}
Location 1	Day (7am-6pm)	43
	Evening(6pm-10pm)	38
	Night(10pm-7am)	31
Location 2	Day (7am-6pm)	40
	Evening(6pm-10pm)	36
	Night(10pm-7am)	35
Location 3	Day (7am-6pm)	40
	Evening(6pm-10pm)	35
	Night(10pm-7am)	31

5.2 EXTERNAL NOISE EMISSION CRITERIA

In the absence of any specific controls from Location Council, the following documents were used to determine the project criteria for noise emissions:

- NSW EPA Industrial Noise Policy
- Protection of the Environmental Operation Act Regulation

5.2.1 NSW EPA Industrial Noise Policy

The EPA Industrial Noise Policy, has two criteria which need to be satisfied namely Intrusiveness and Amenity.

The EPA Industrial Noise Policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface. Under the policy the nearest residence would be assessed against the suburban criteria.

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

5.2.1.1 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 5.1. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

5.2.1.2 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 Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface. This site is categorised by the residential receivers as suburban.

For the purposes of this condition:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays;
- Evening is defined as the period from 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

Table 9 – INP Amenity Noise Levels

Type of Receiver	**Time of day**	**Recommended Noise Level dB(A)$L_{eq(period)}$**	
		Recommended	Maximum
Residential - Suburban	Day	55	60
	Evening	45	50
	Night	40	45

5.2.1.3 Sleep Arousal

To minimise the potential for sleep arousal the $L_{1\ (1\ minute)}$ noise level of any specific noise source does not exceed the background noise level *(L_{90})* by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am.

The L_1 noise level is the level exceeded for 1 per cent of the time and approximates the typical maximum noise level from a particular source. Where the typical repeatable existing L_1 levels exceed the above requirement then the existing L_1 levels form the basis for, sleep disturbance criteria.

5.2.2 Protection of the Environmental Operation Act Regulation

Protection of the Environmental Operations regulation limits the noise levels associated within the operation of domestic air conditioning criteria during night time periods which is presented below:

Protection of the Environmental Operations (Noise Control) Regulation 2000-Sect 52

52 Air Conditioners

(1) A person must not cause or permit an air conditioner to be used on residential premises in such a manner that it emits noise that can be heard within a habitable room in any other residential premises (regardless of weather any door or window to that room is open):

(a) before 8 am or after 10 pm on any Saturday, Sunday or public holiday, or
(b) before 7 am or after 10 pm on any other day.

5.3 NOISE EMISSION OBJECTIVES

Based on the requirements stated in the sections above, Table 10 provides a summary of the assessment criteria applicable to the future residential development at the project site. The assessment criteria are also based on the ambient noise monitoring conducted at the site.

Table 10 – Environmental Noise Emission Criteria (Existing Residence to the South of the Site)

Time Period	Assessment Background Noise Level dB(A)L_{90}	Amenity Criteria dB(A) L_{eq}	Intrusiveness Criteria Background + 5 dB(A) $L_{eq(15min)}$	EPA Criteria for Residential Condensers	OEH Criteria for Sleep Disturbance dB (A)$L_{1(1minute)}$
Day	40	55	**45**	N/A	N/A
Evening	36	45	**41**	N/A	N/A
Night	35	40	**40**	**Inaudible within neighbouring premises**	**50**

Table 11 – Environmental Noise Emission Criteria (Future Residence within the Development)

Time Period	Assessment Background Noise Level dB(A)L_{90}	Amenity Criteria dB(A) L_{eq}	Intrusiveness Criteria Background + 5 dB(A) $L_{eq(15min)}$	EPA Criteria for Residential Condensers	OEH Criteria for Sleep Disturbance dB (A)$L_{1(1minute)}$
Day	40	55	**45**	N/A	N/A
Evening	35	45	**40**	N/A	N/A
Night	31	40	**36**	**Inaudible within neighbouring premises**	**46**

At this early stage of the project equipment items and their respective locations have not been determined, thus, detailed review of all external mechanical plant should be undertaken at construction certificate stage (once plant selections and locations are finalised). Acoustic treatments should be determined in order to control plant noise emissions to the criteria levels set out in Table 10 and 11 of this report.

6 CONCLUSION

This report provides the results of an Environmental Noise and Rail Vibration study for the proposed 300 Manchester Road mixed use development.

Noise and vibration at the site have been measured and assessed in conjunction with noise goals based in accordance with the requirements of the local council and relevant statutory/regulatory authorities. We concluded the following:

- Provided acoustic treatments in Section 3.4 of this report are adopted, the internal train and traffic noise levels shall fully comply with the requirements of the NSW Department of Planning SEPP Infrastructure 2007 and Australian Standard 2107-2000.
- No vibration isolation is required based on the requirements of NSW Department of Planning Development Near Rail Corridors and Busy Roads – Interim Guideline.
- Plant noise emission criteria have been setup in Section 5 of this report while detailed plant noise control shall be determined at CC stage.
- The site is acoustically acceptable for a residential development in this location and would not impede with the operations of the adjacent rail marshalling yards.

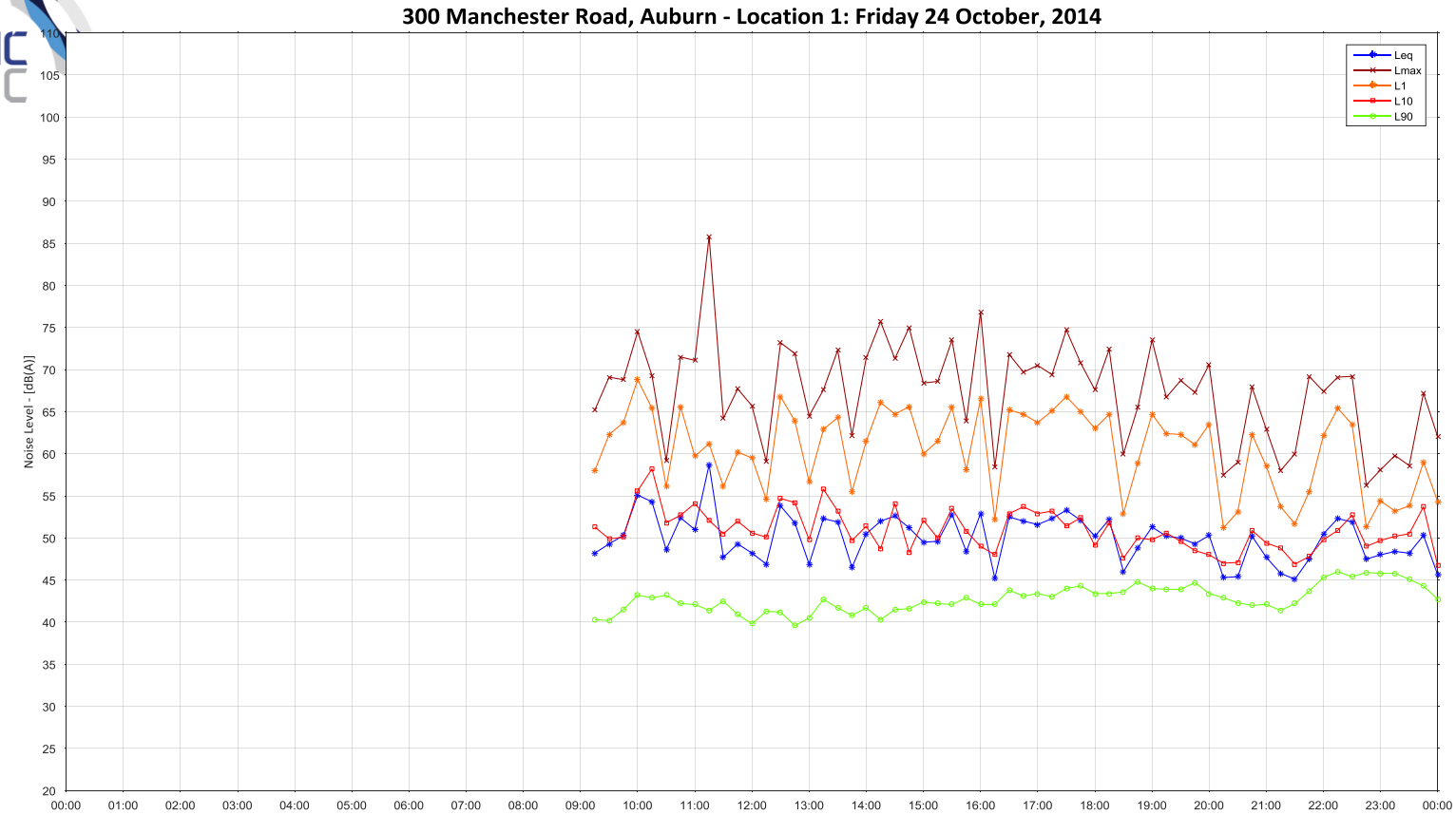
We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

B.G.White.

Acoustic Logic Consultancy Pty Ltd
Ben White

APPENDIX 1: NOISE LOGGING DATA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Lmax
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L10
L90
110
105
100
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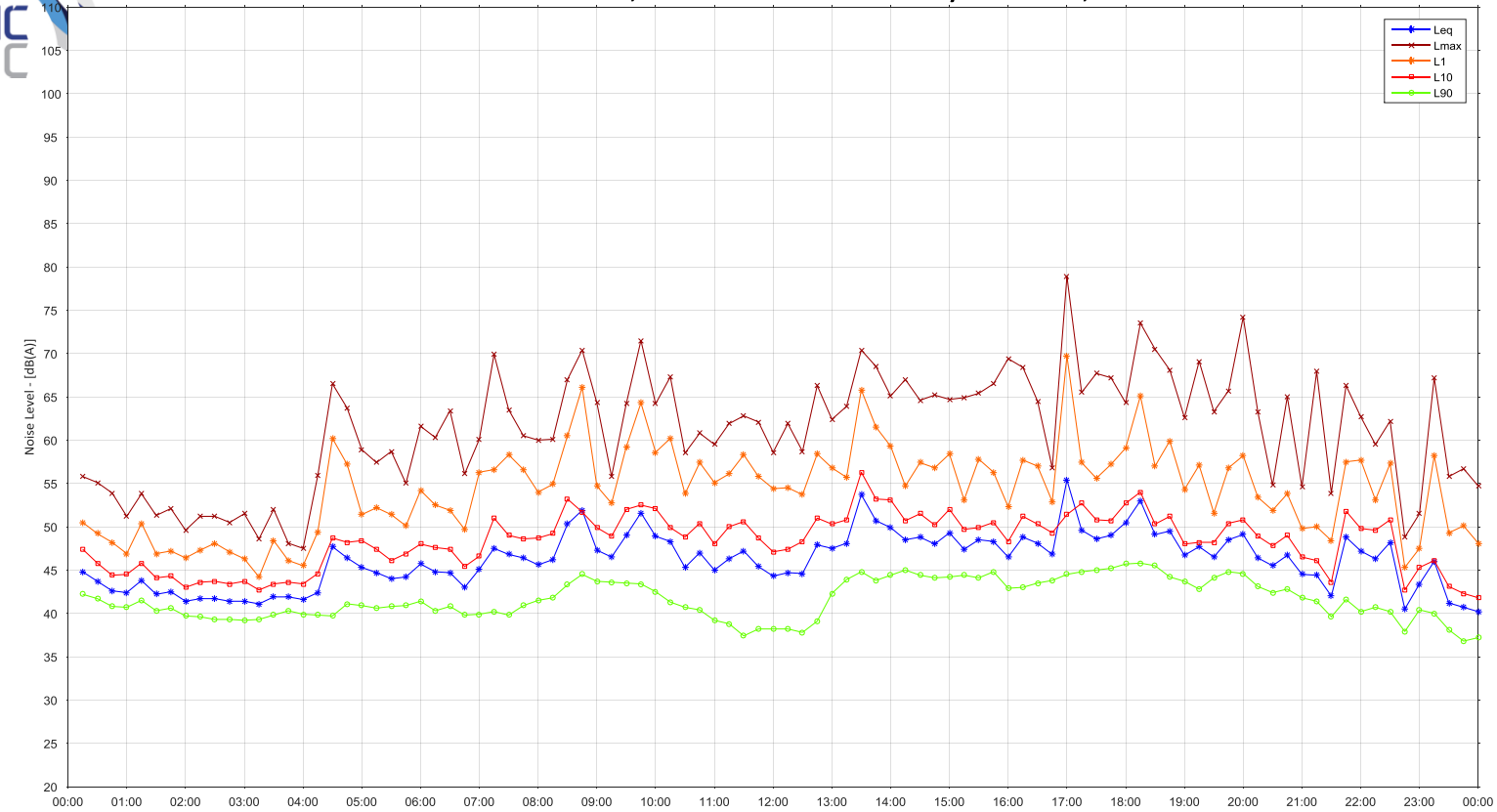
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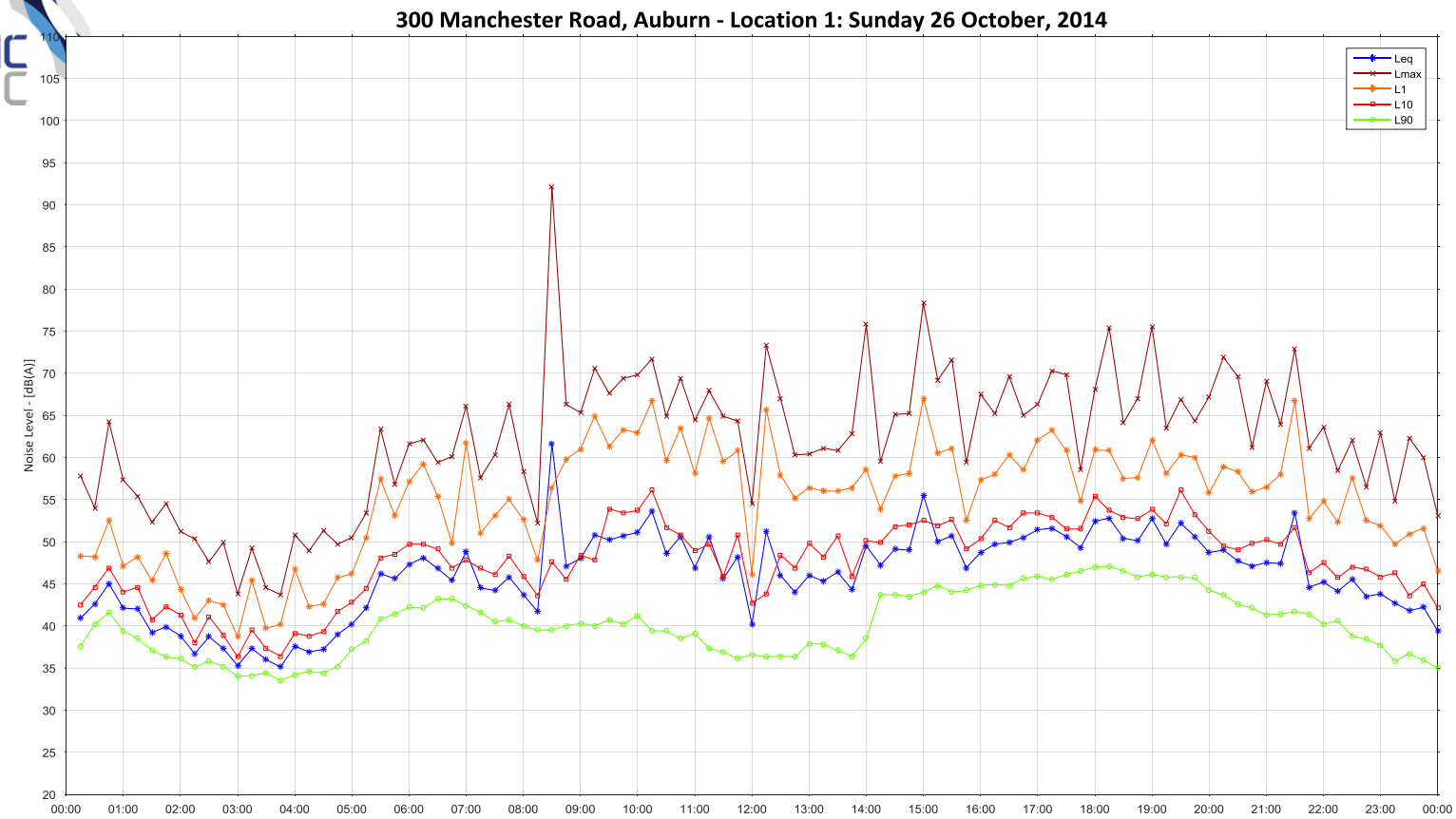
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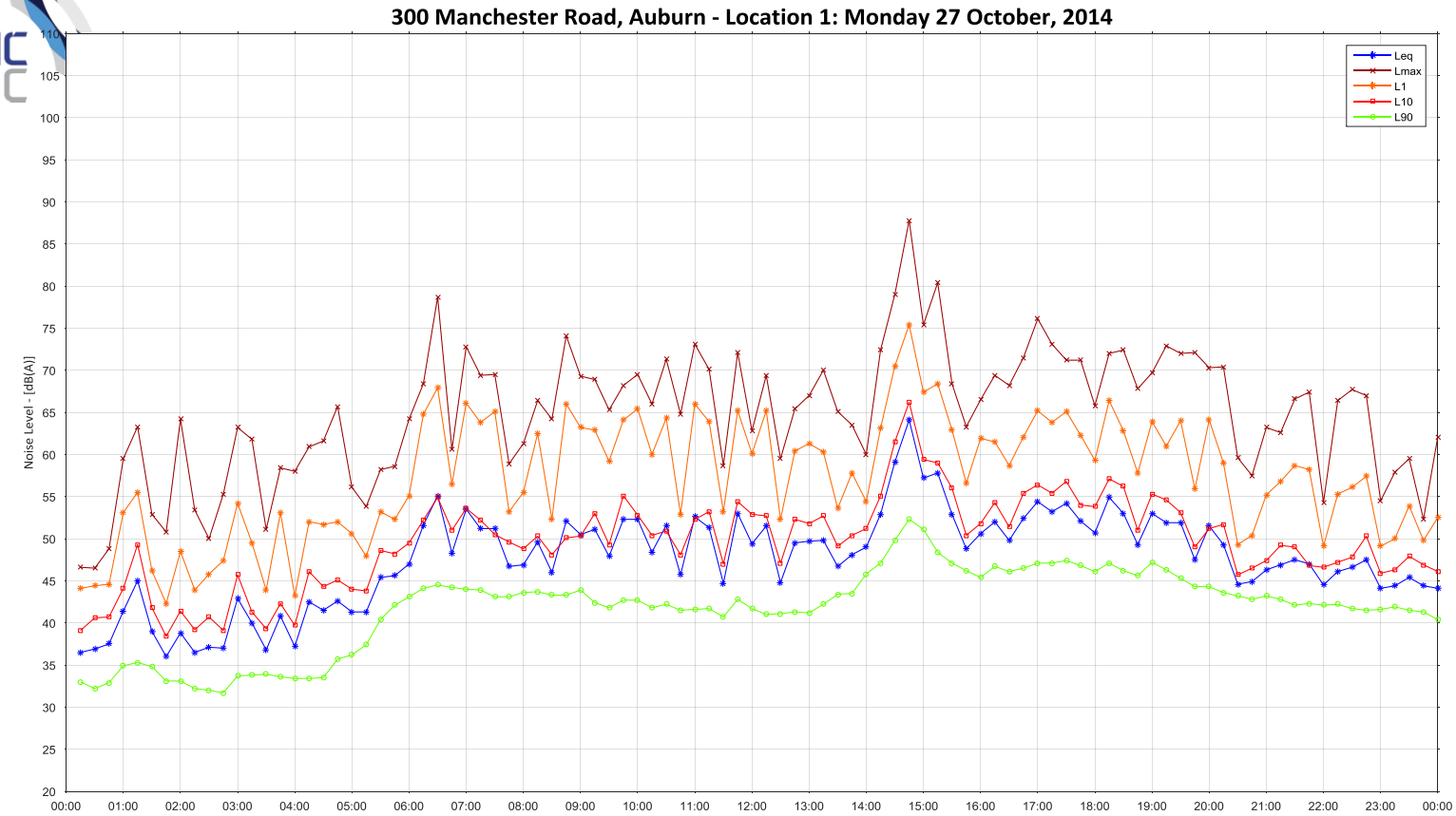
300 Manchester Road, Auburn - Location 1: Monday 27 October, 2014
Noise Level - [dB(A)]
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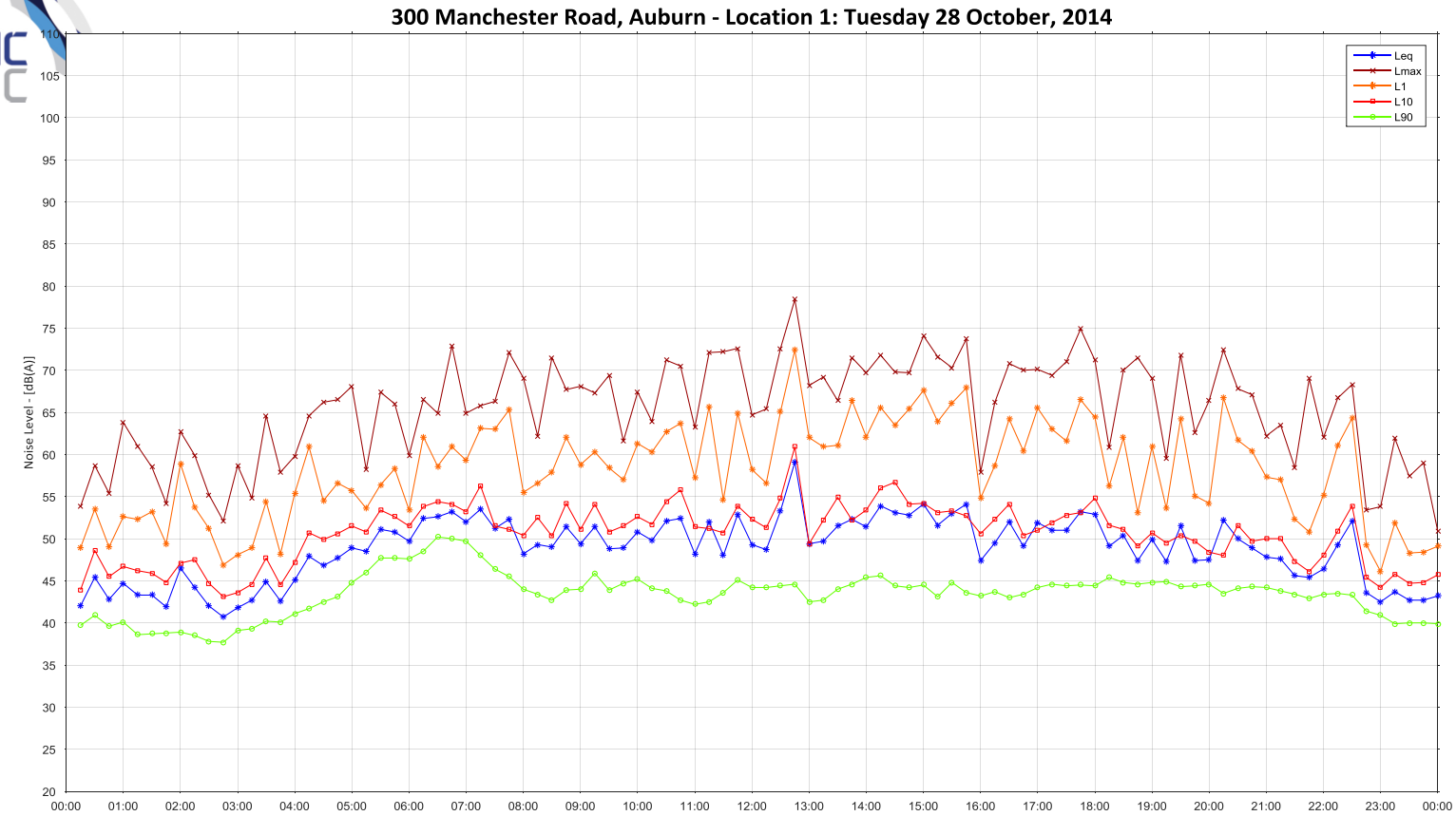
300 Manchester Road, Auburn - Location 1: Tuesday 28 October, 2014
Noise Level - [dB(A)]
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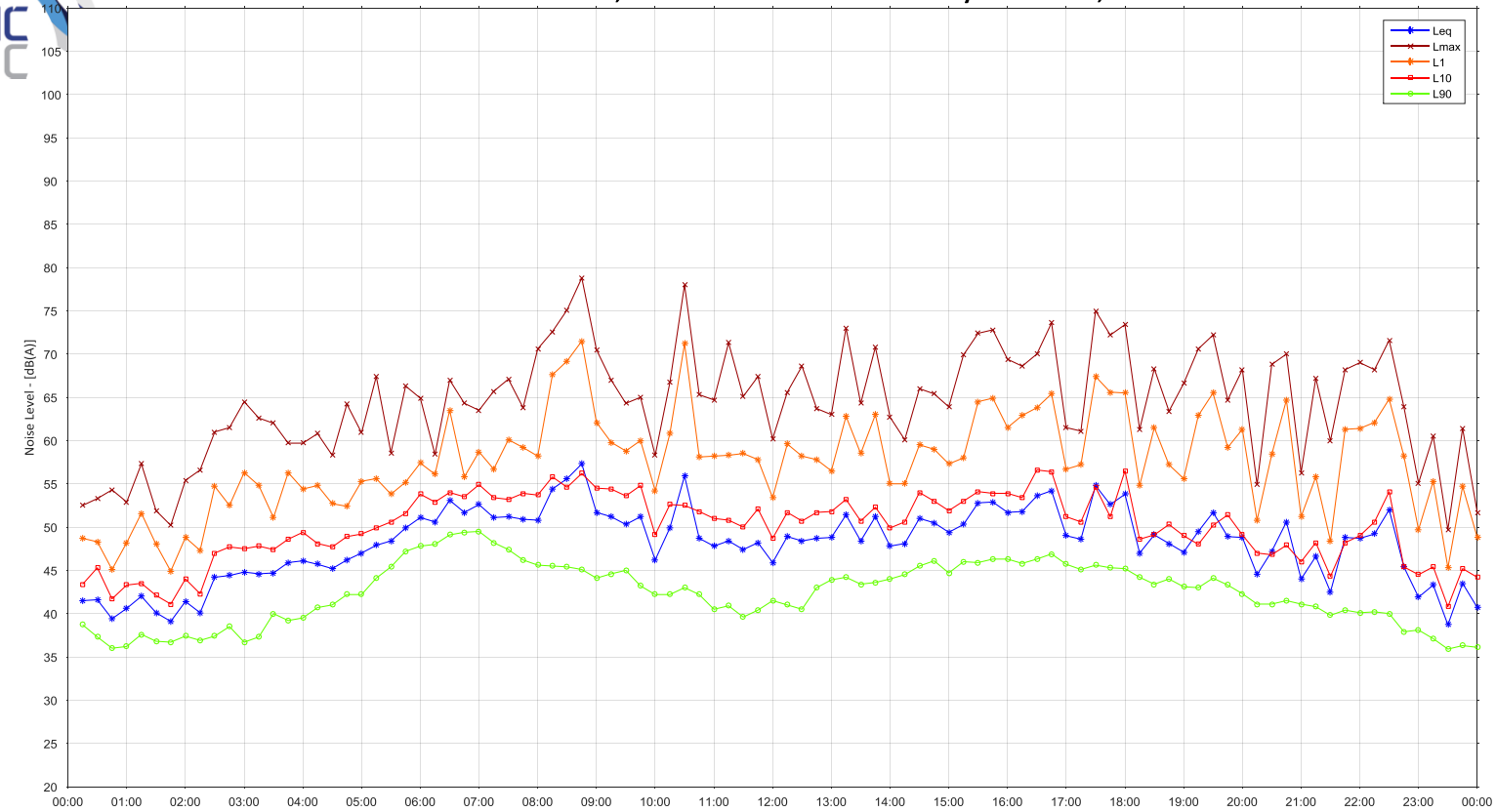
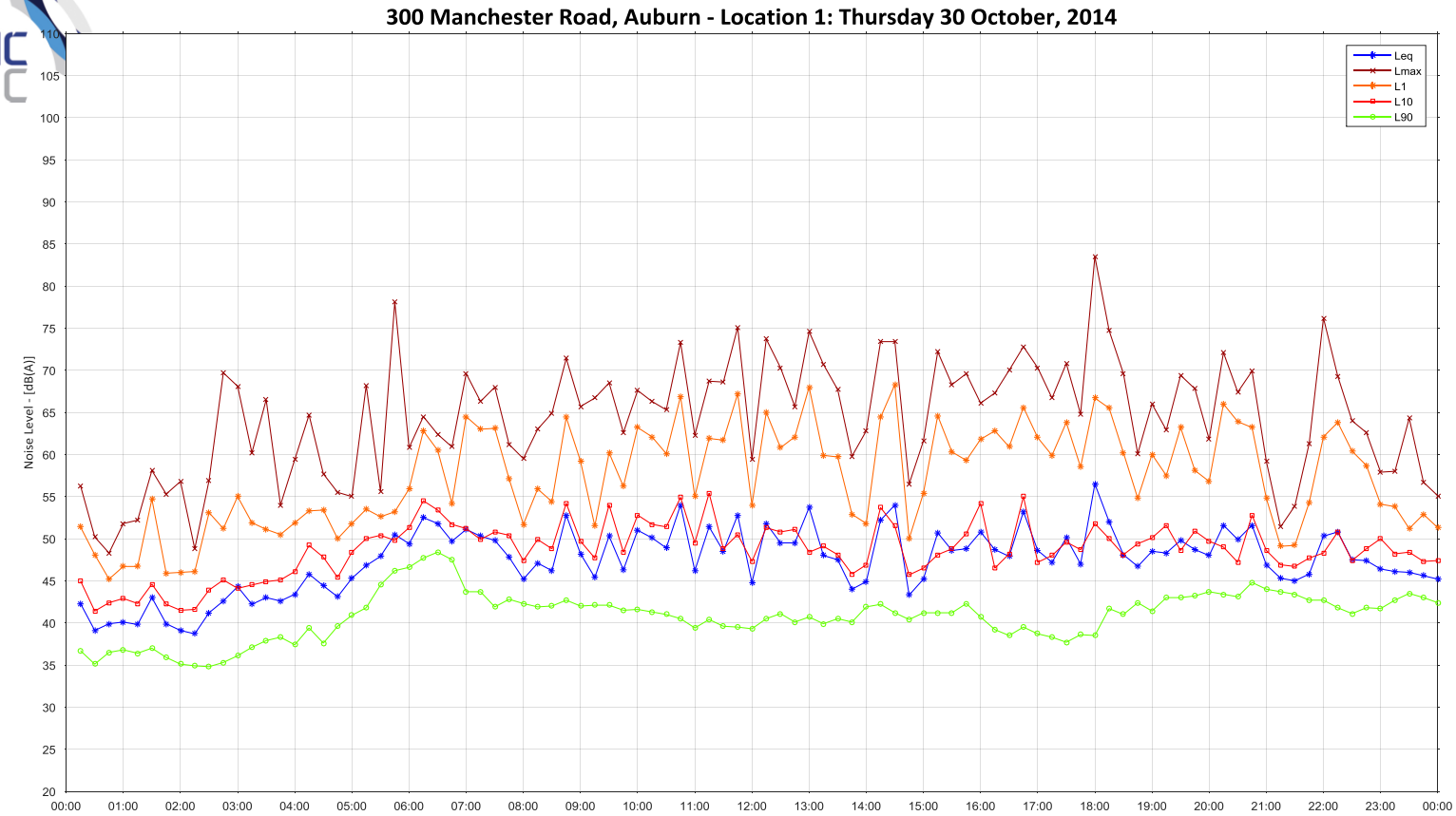
300 Manchester Road, Auburn - Location 1: Wednesday 29 October, 2014




300 Manchester Road, Auburn - Location 1: Thursday 30 October, 2014
Noise Level - [dB(A)]
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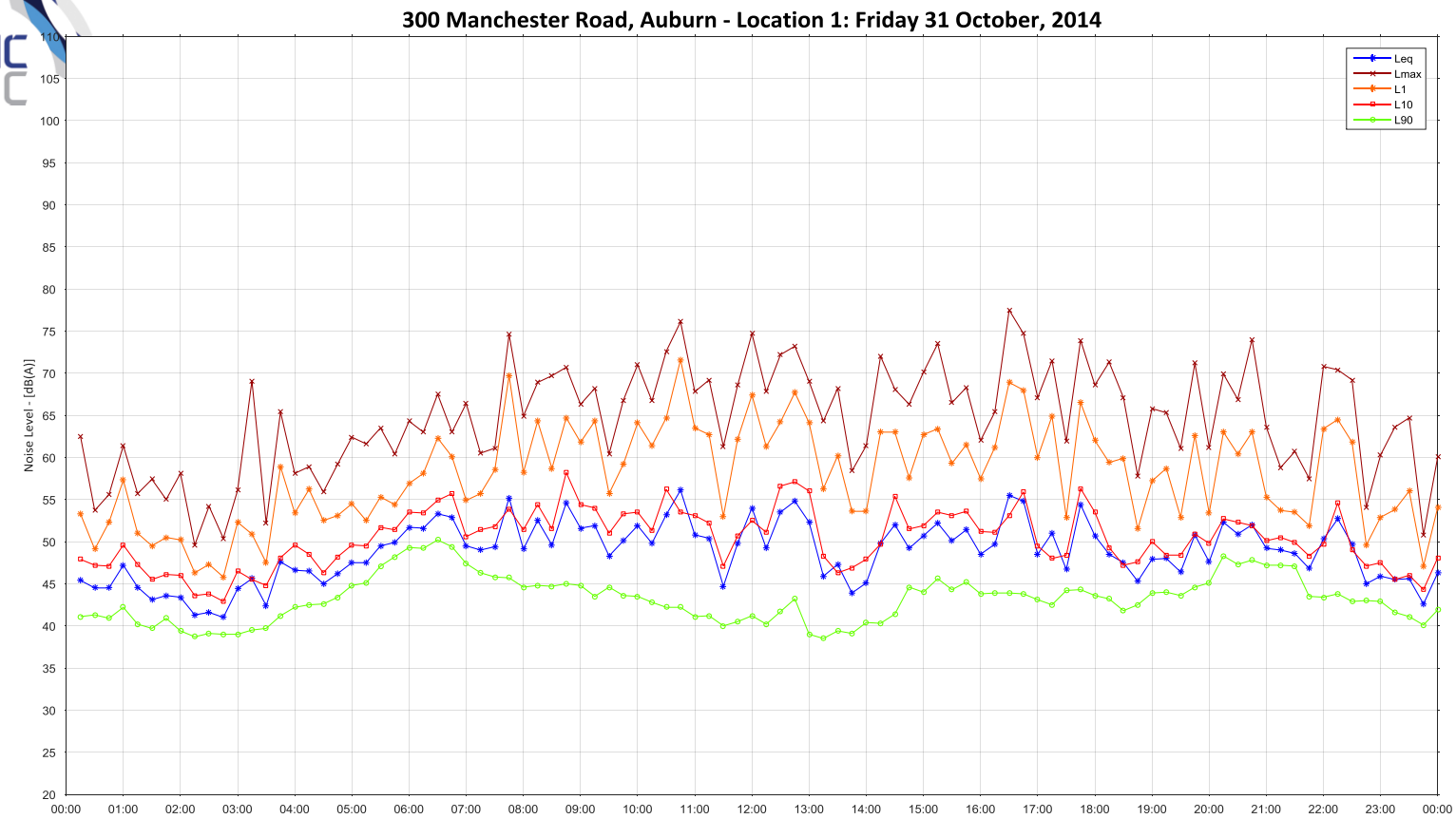
300 Manchester Road, Auburn - Location 1: Friday 31 October, 2014
Noise Level - [dB(A)]
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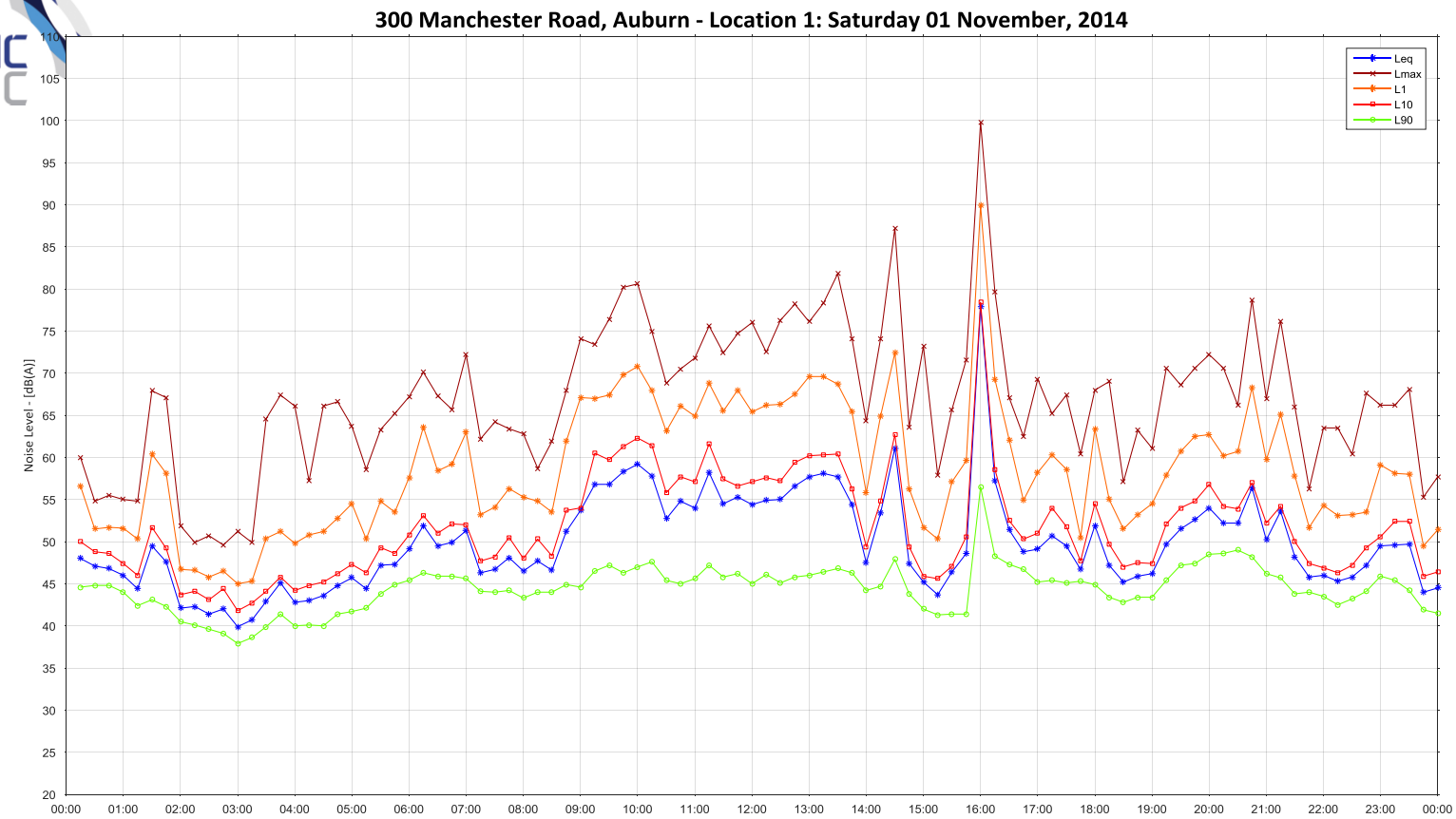
300 Manchester Road, Auburn - Location 1: Saturday 01 November, 2014
Noise Level - [dB(A)]
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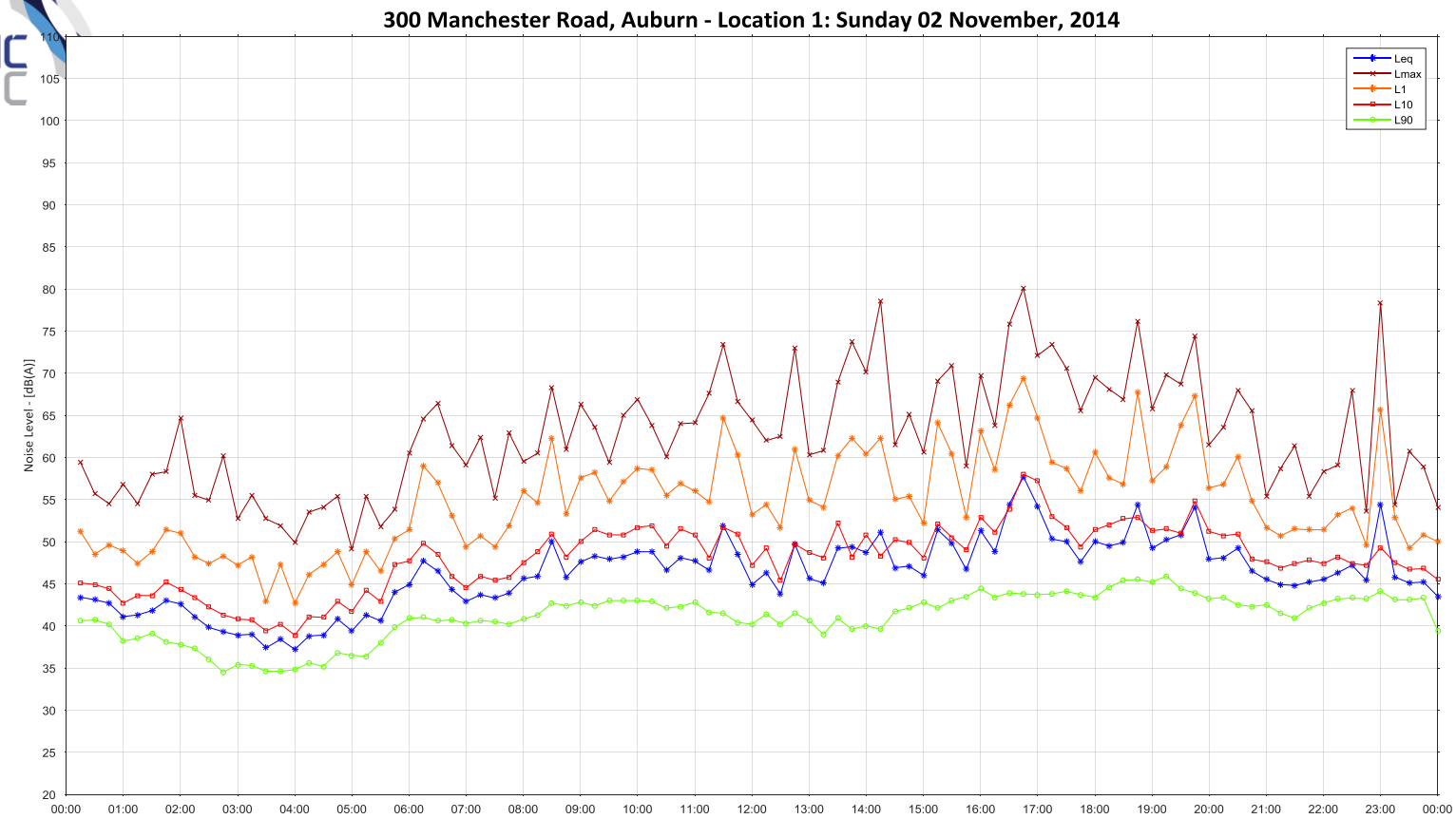
300 Manchester Road, Auburn - Location 1: Sunday 02 November, 2014
Noise Level - [dB(A)]
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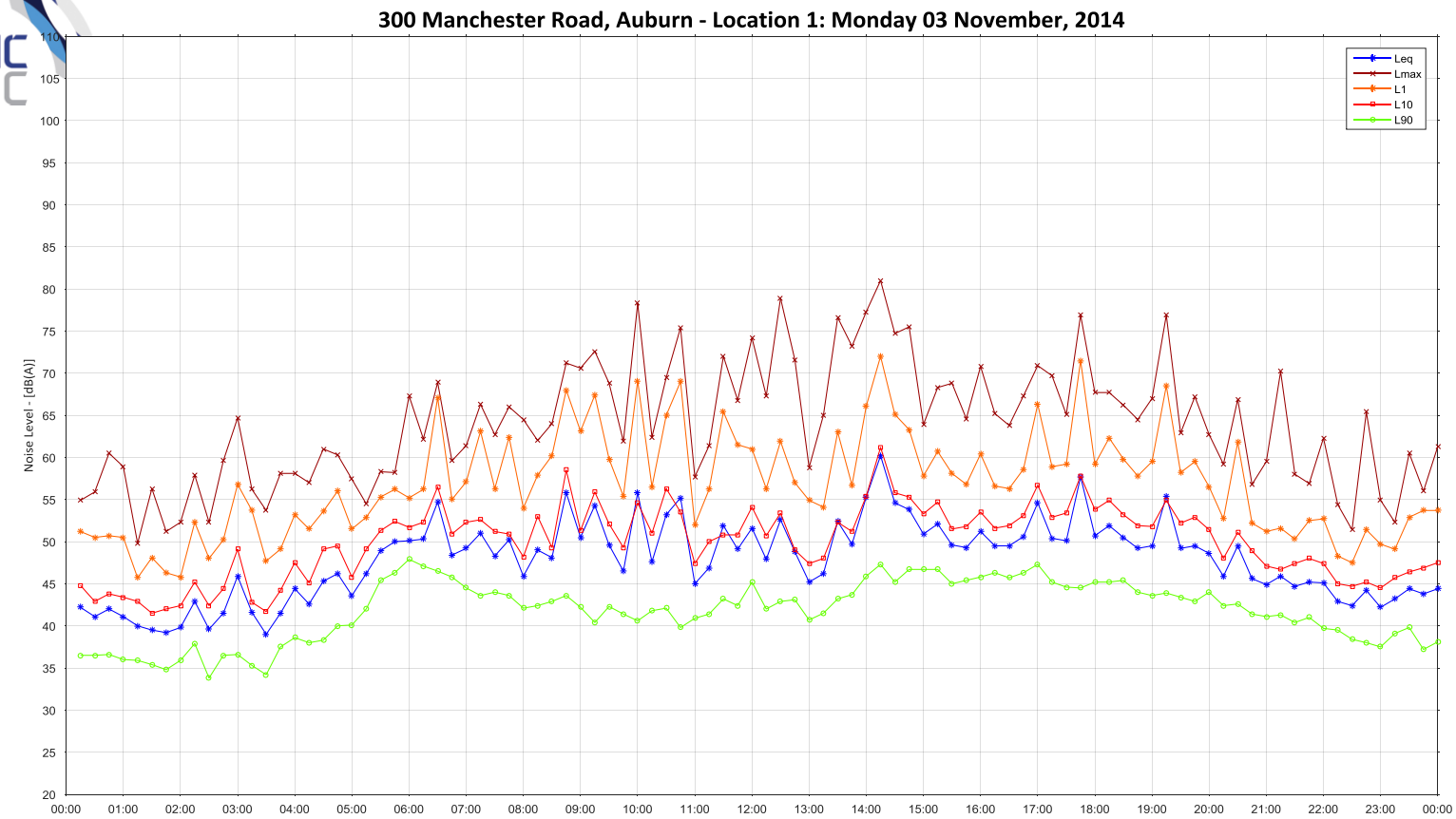
300 Manchester Road, Auburn - Location 1: Monday 03 November, 2014
Noise Level - [dB(A)]
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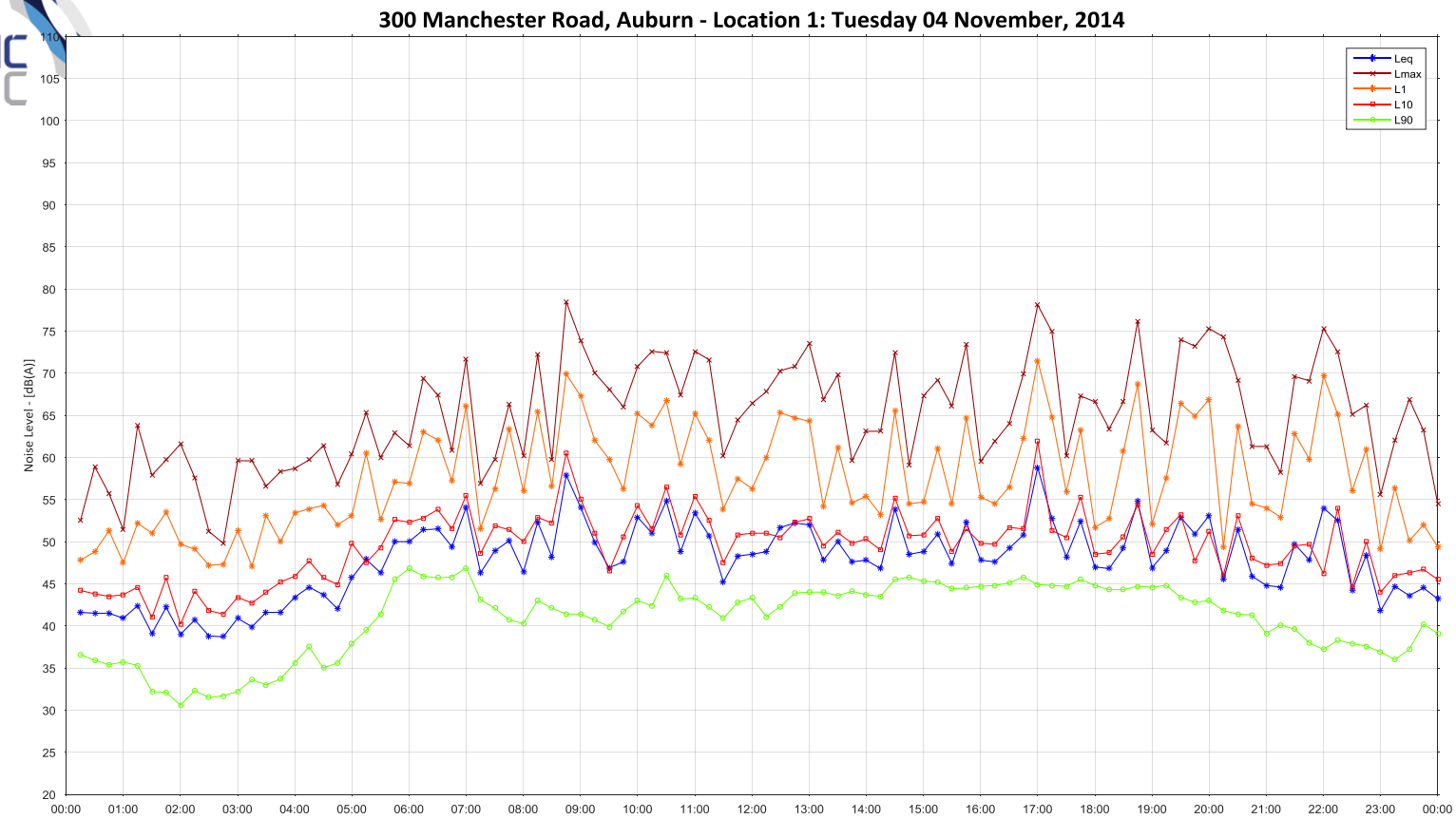
300 Manchester Road, Auburn - Location 1: Tuesday 04 November, 2014
Noise Level - [dB(A)]
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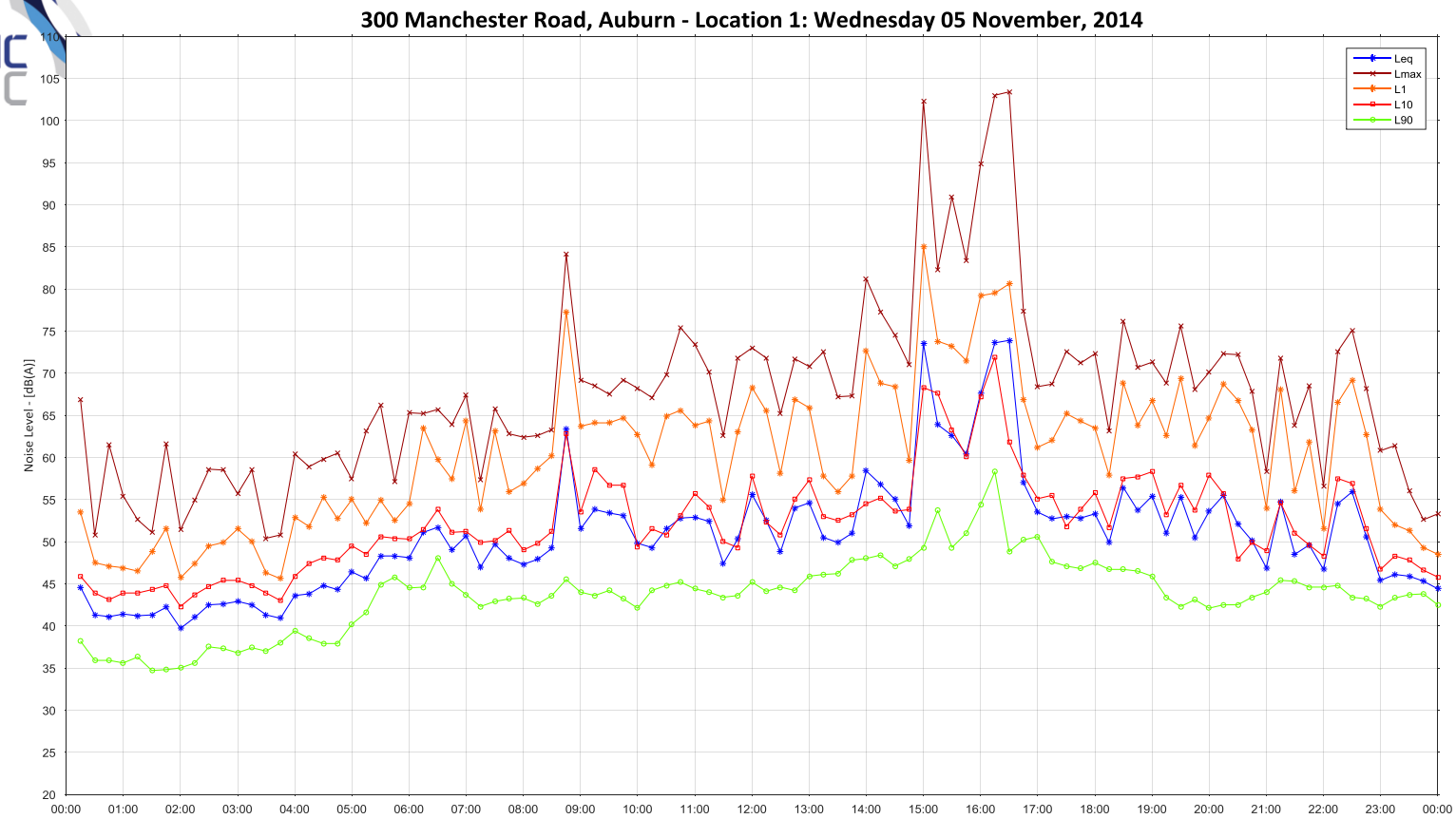
300 Manchester Road, Auburn - Location 1: Wednesday 05 November, 2014
Noise Level - [dB(A)]
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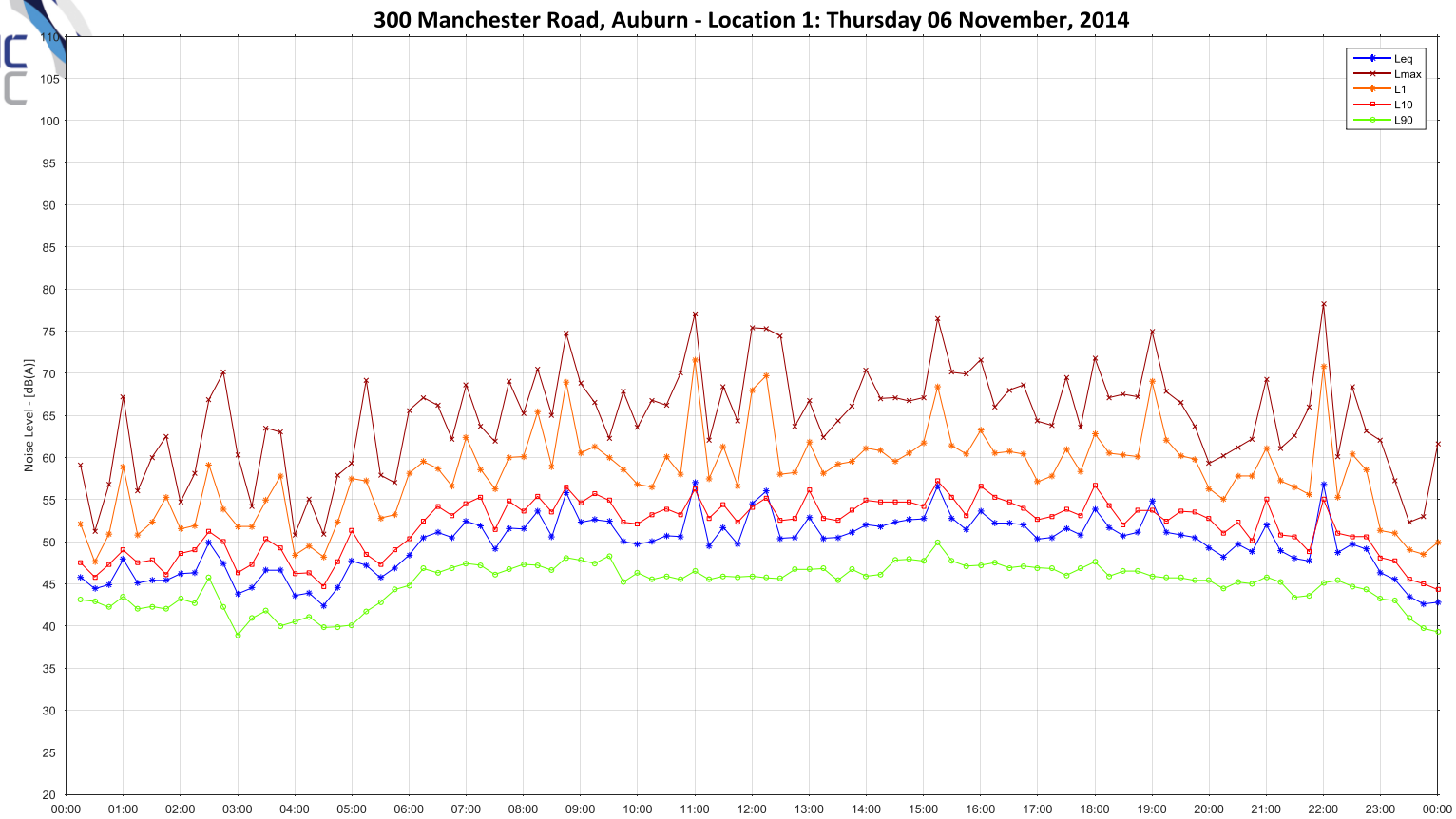
300 Manchester Road, Auburn - Location 1: Thursday 06 November, 2014
Noise Level - [dB(A)]
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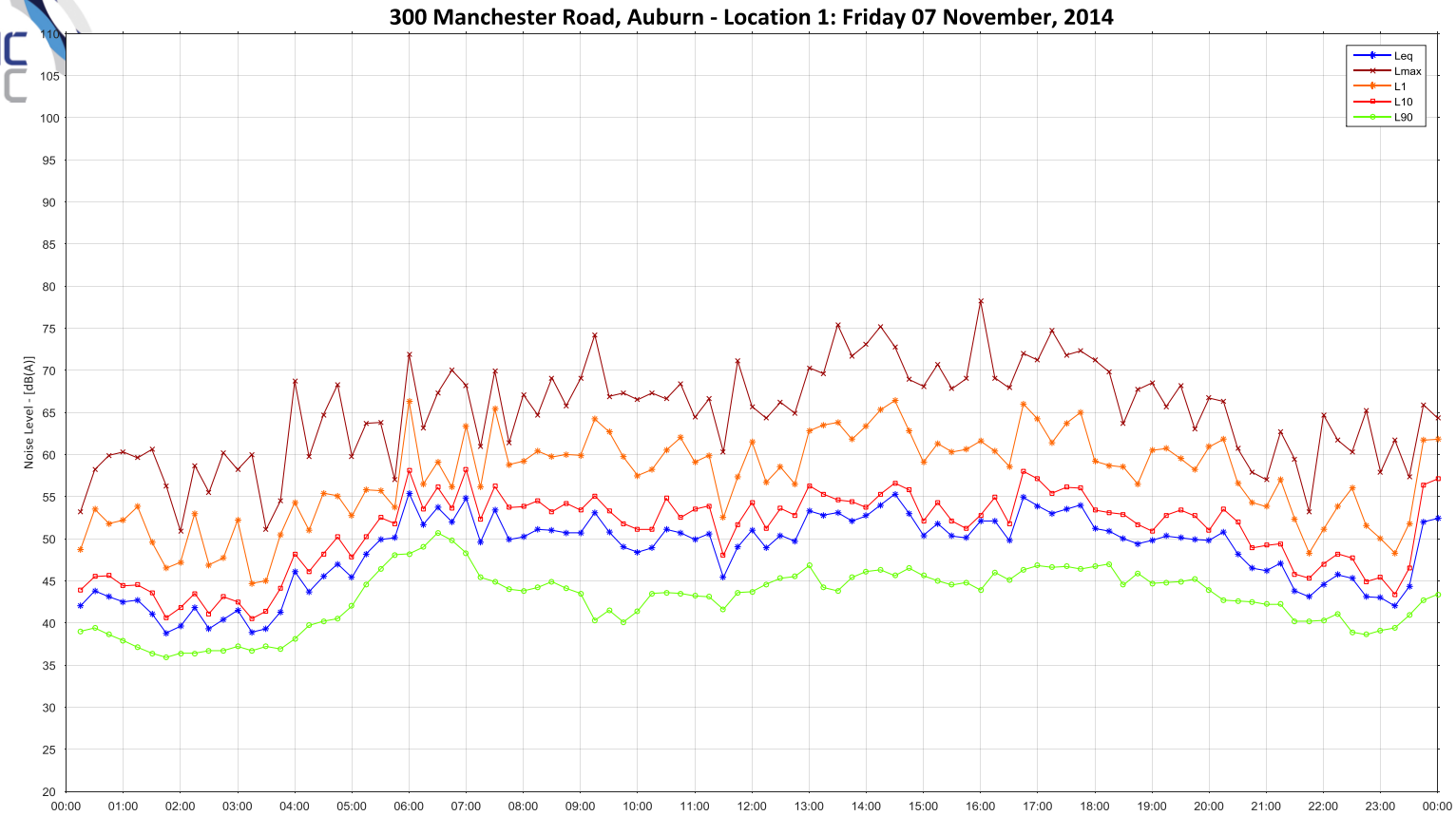
300 Manchester Road, Auburn - Location 1: Friday 07 November, 2014
Noise Level - [dB(A)]
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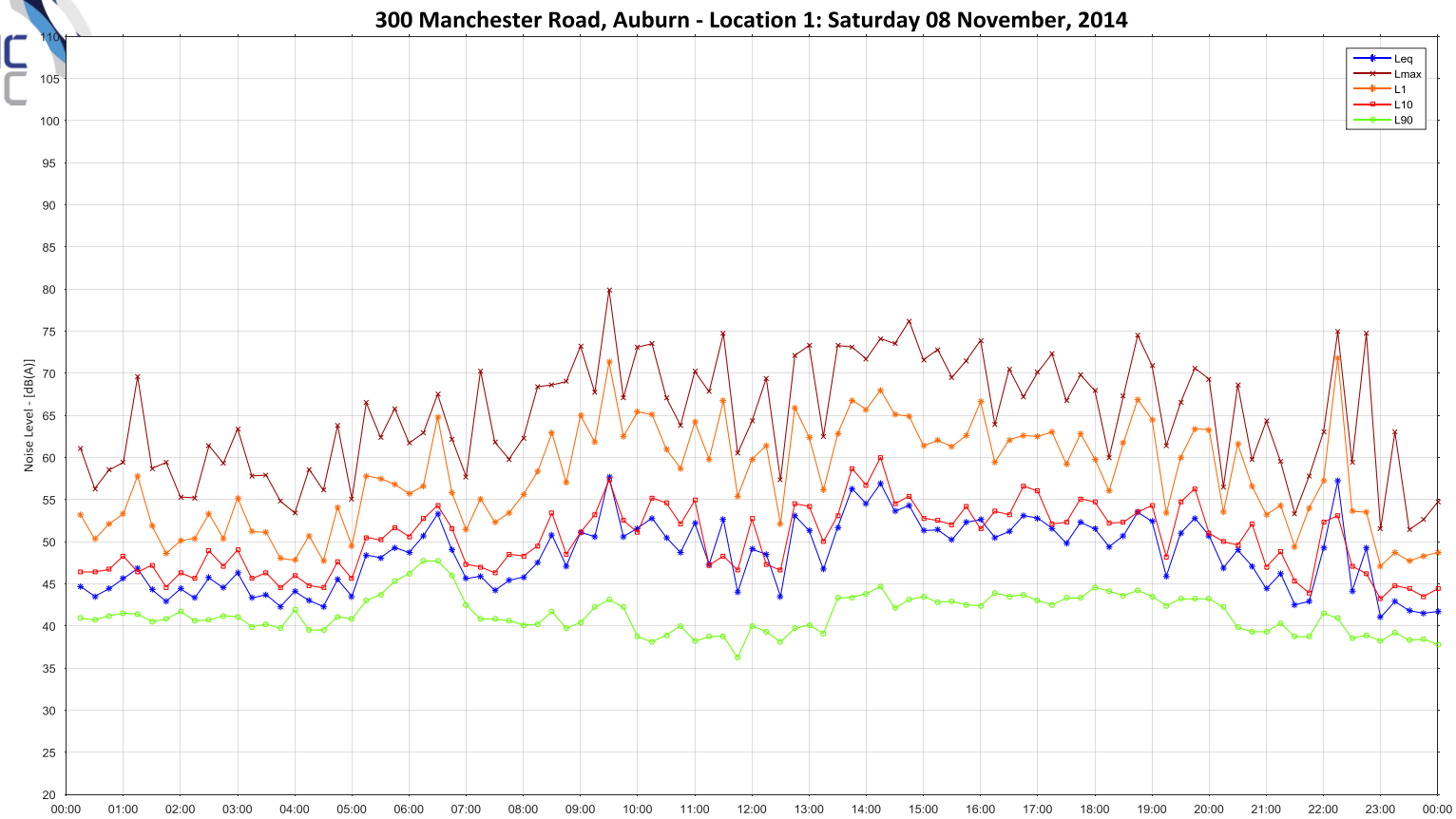
300 Manchester Road, Auburn - Location 1: Saturday 08 November, 2014
Noise Level - [dB(A)]
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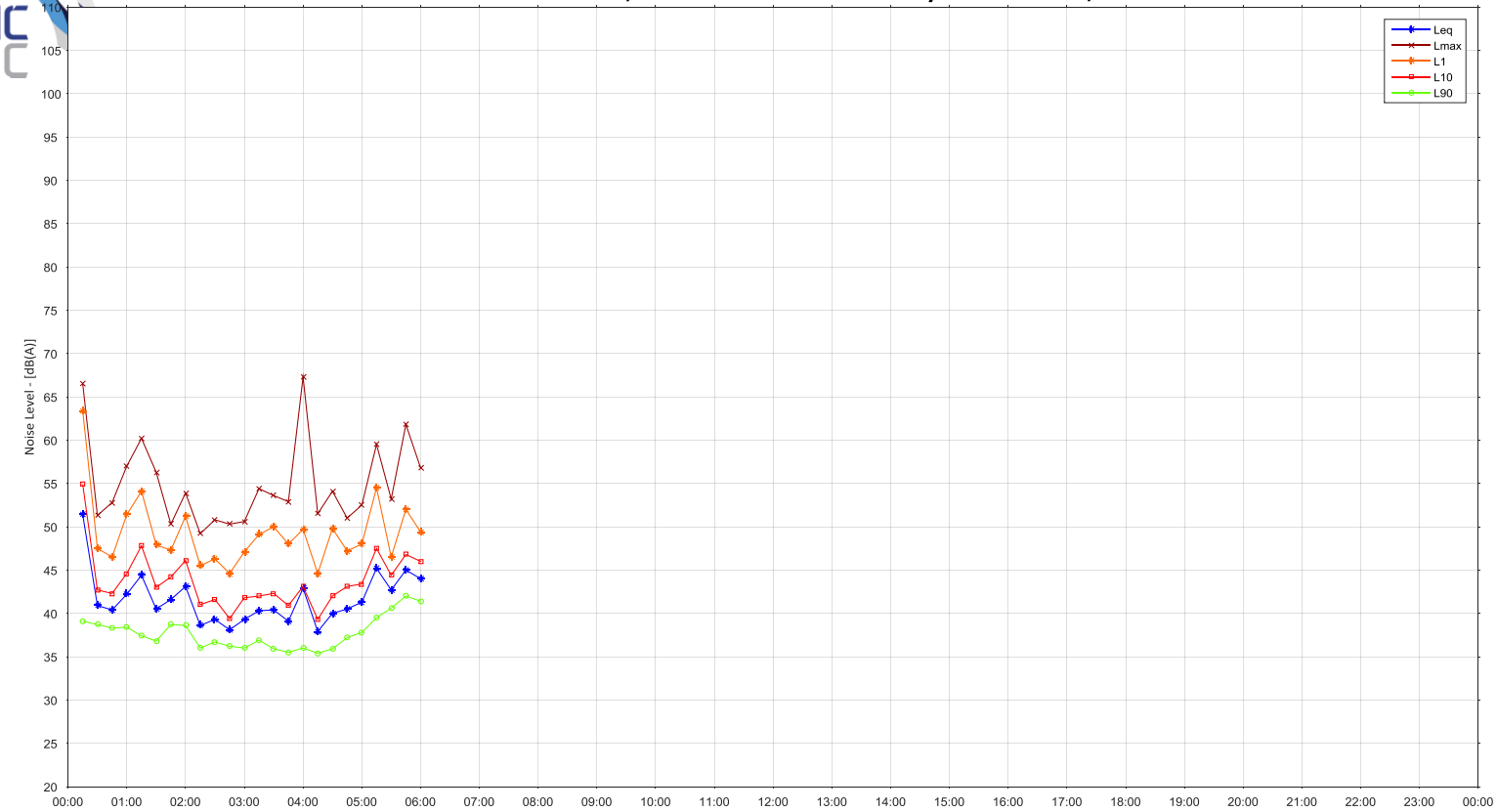
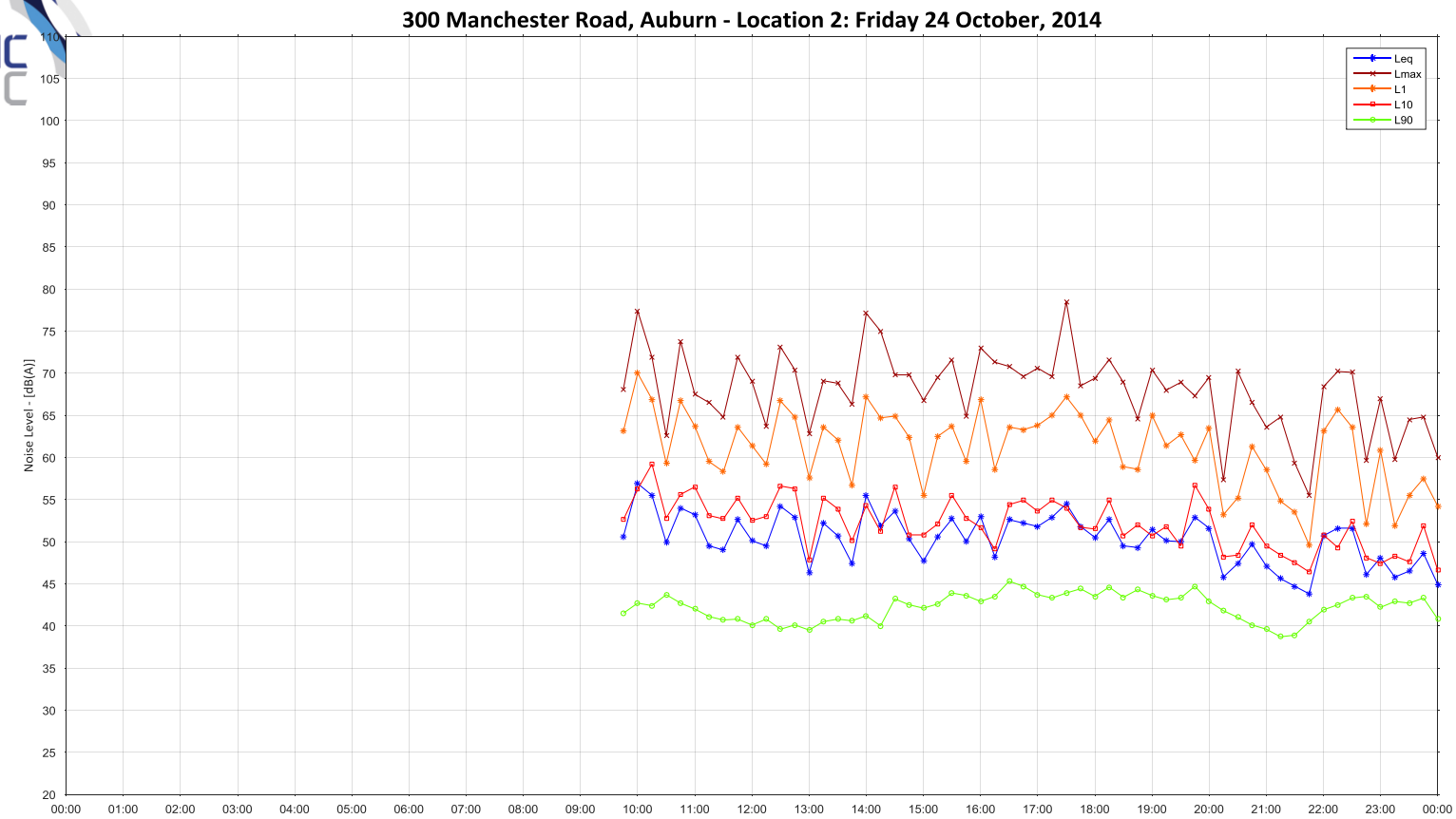
300 Manchester Road, Auburn - Location 1: Sunday 09 November, 2014




300 Manchester Road, Auburn - Location 2: Friday 24 October, 2014
Noise Level - [dB(A)]
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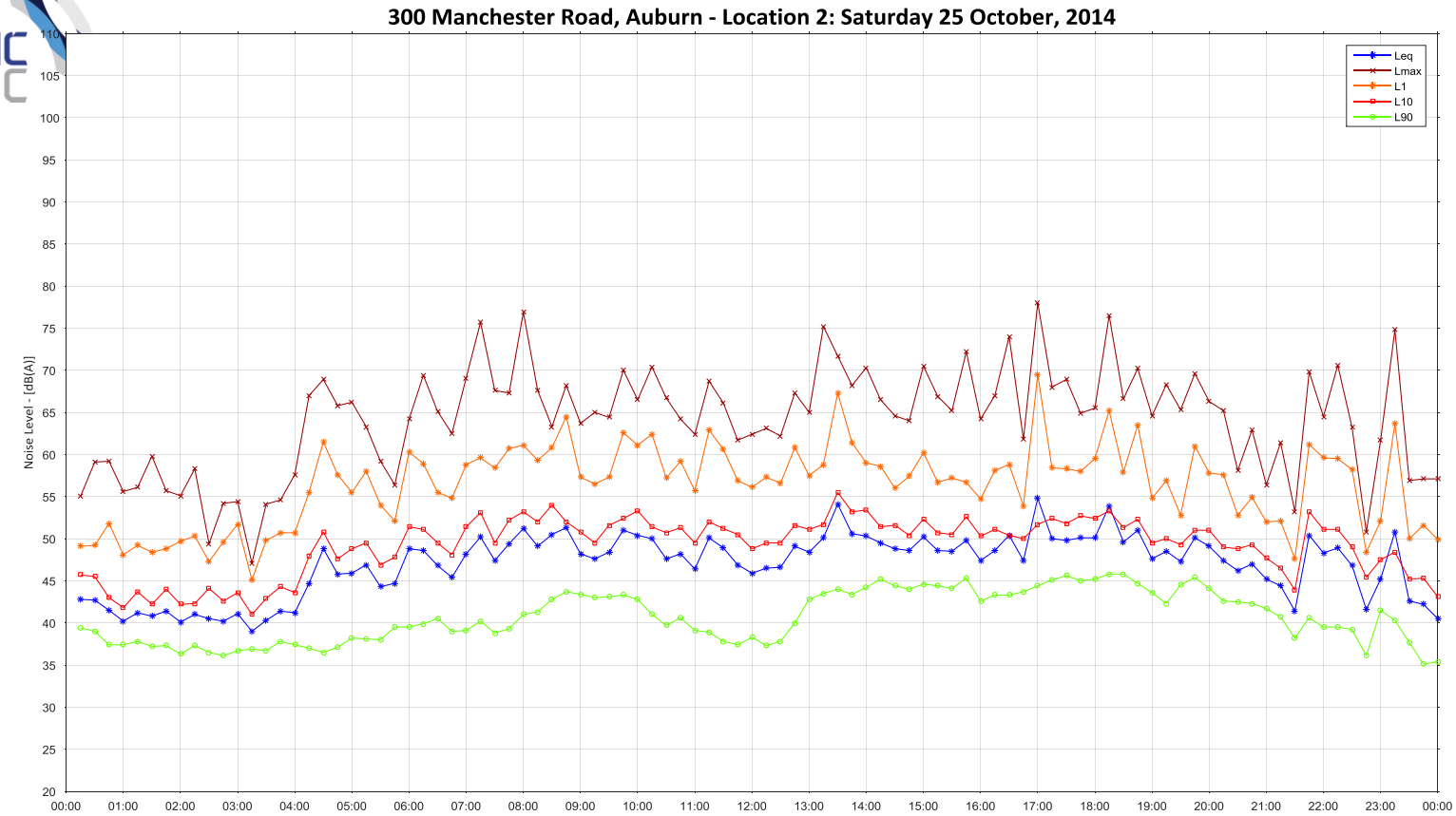
300 Manchester Road, Auburn - Location 2: Saturday 25 October, 2014
Noise Level - [dB(A)]
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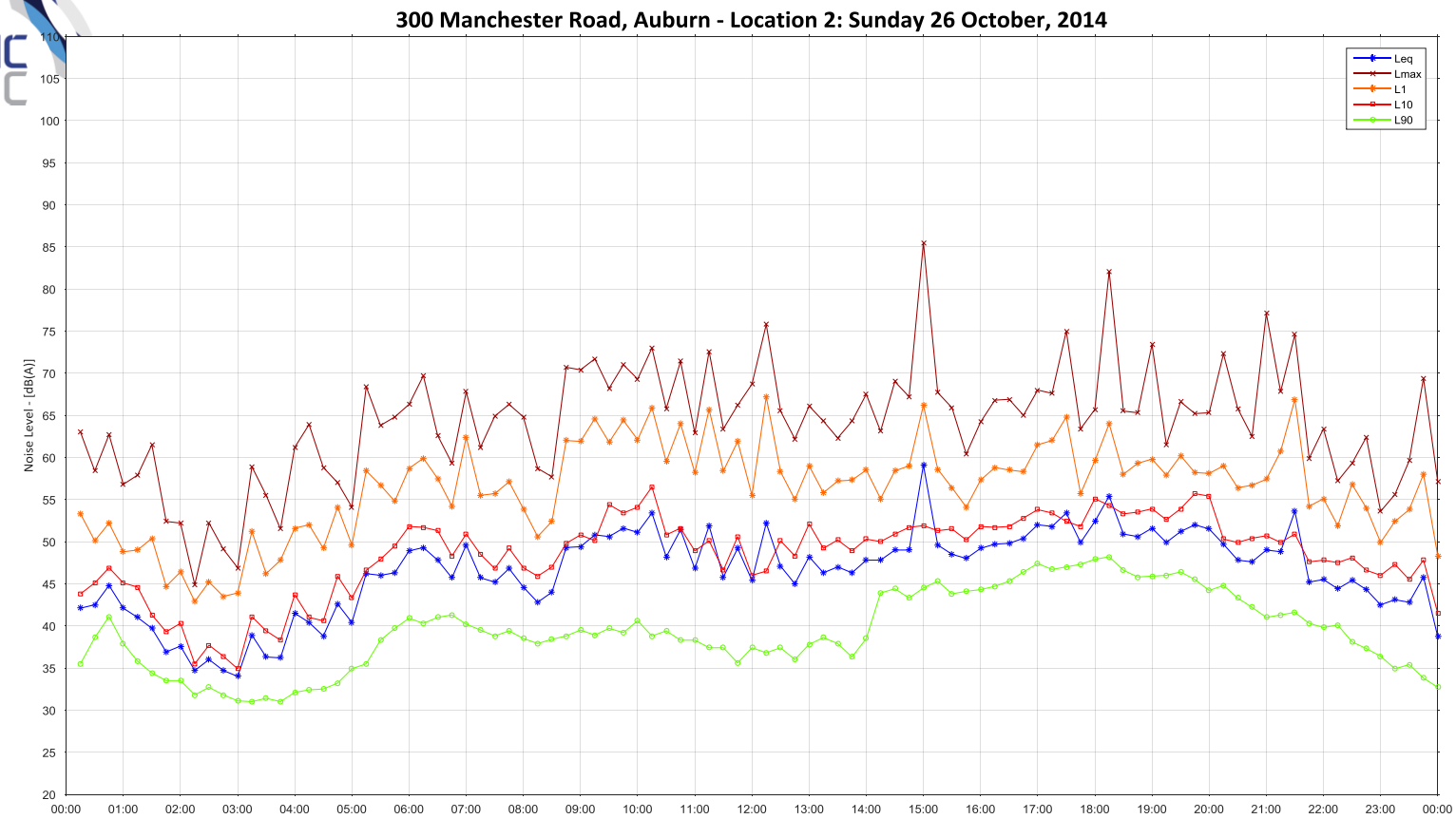
300 Manchester Road, Auburn - Location 2: Sunday 26 October, 2014
Noise Level - [dB(A)]
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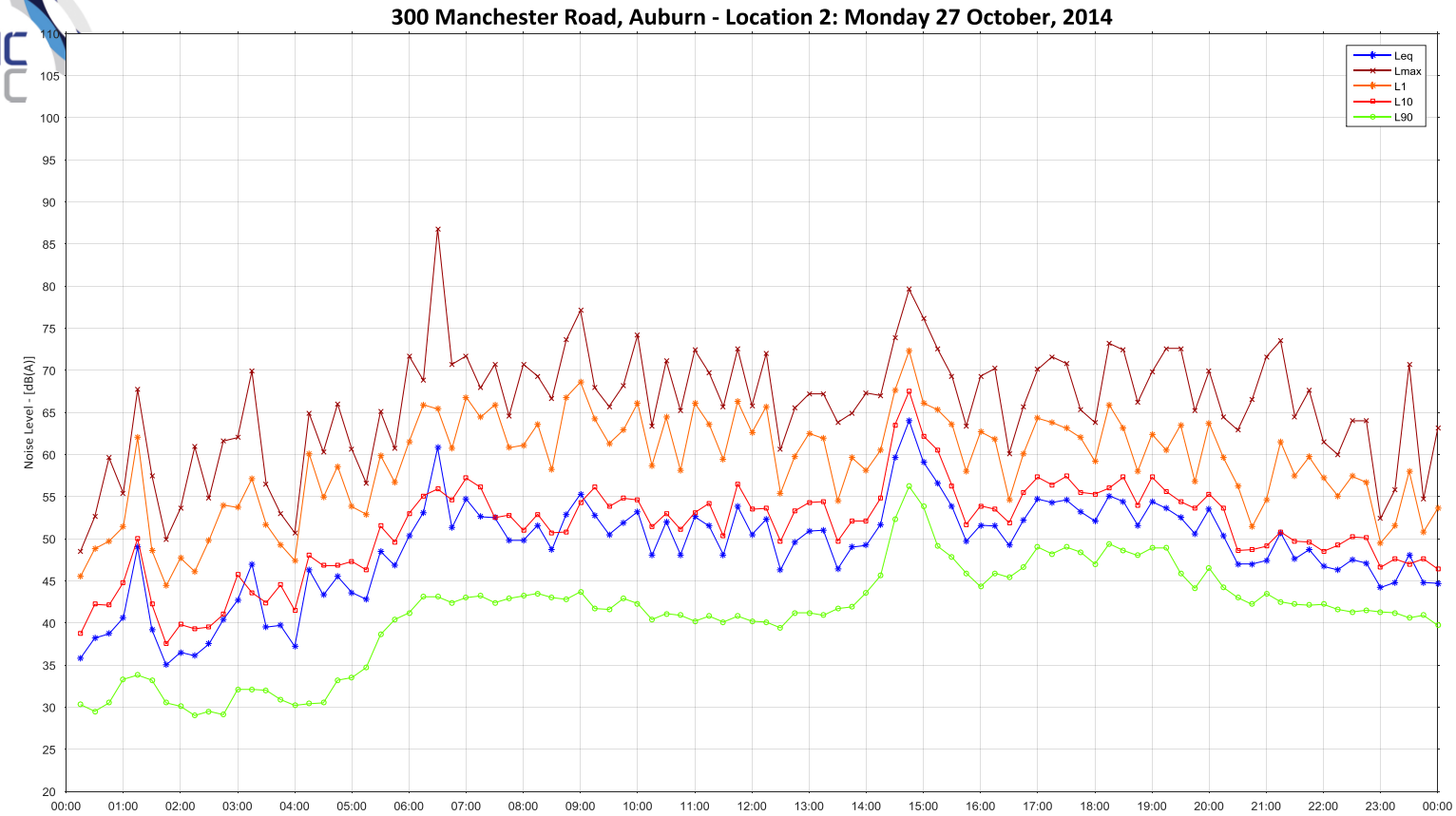
300 Manchester Road, Auburn - Location 2: Monday 27 October, 2014
Noise Level - [dB(A)]
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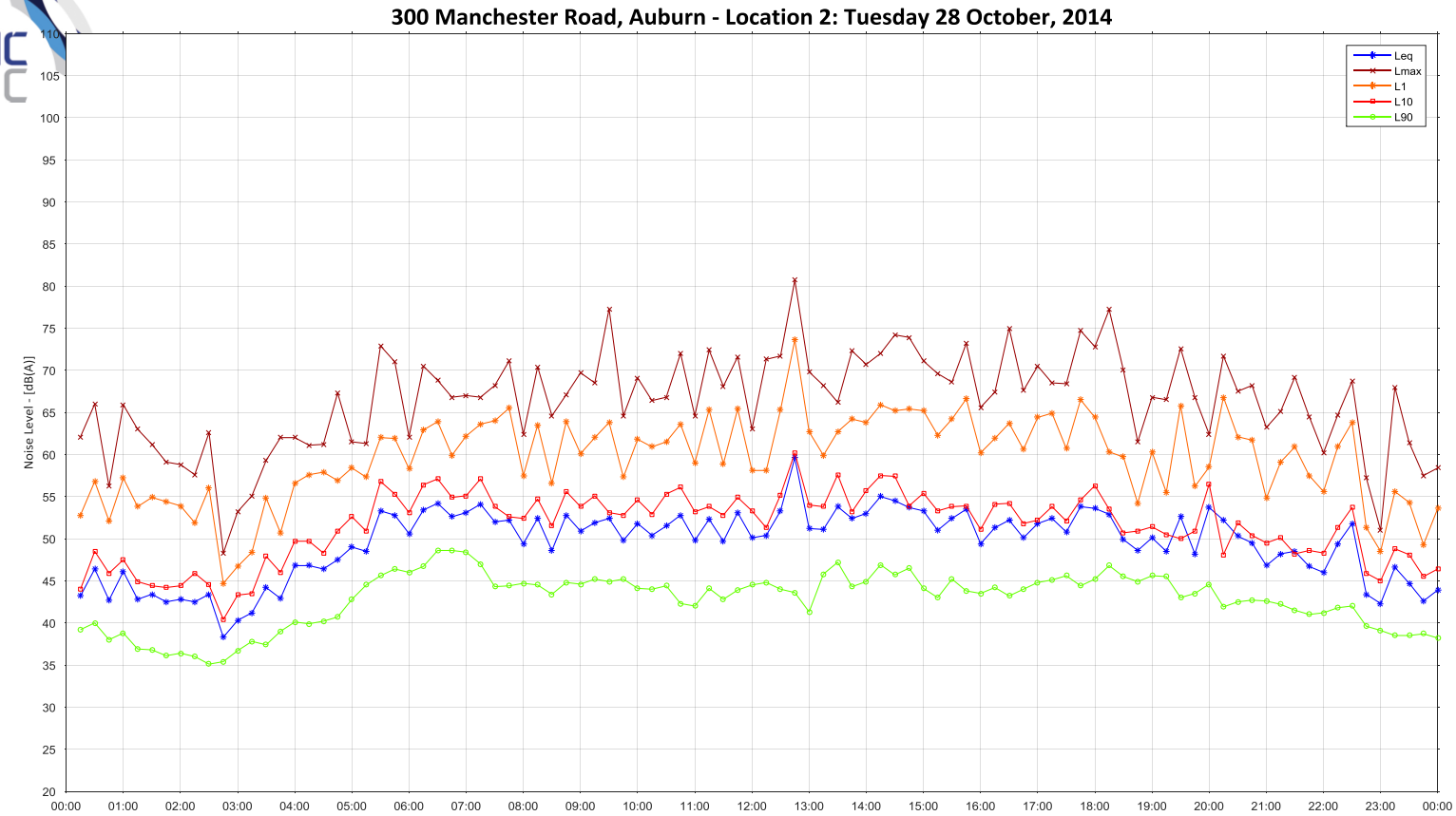
300 Manchester Road, Auburn - Location 2: Tuesday 28 October, 2014
Noise Level - [dB(A)]
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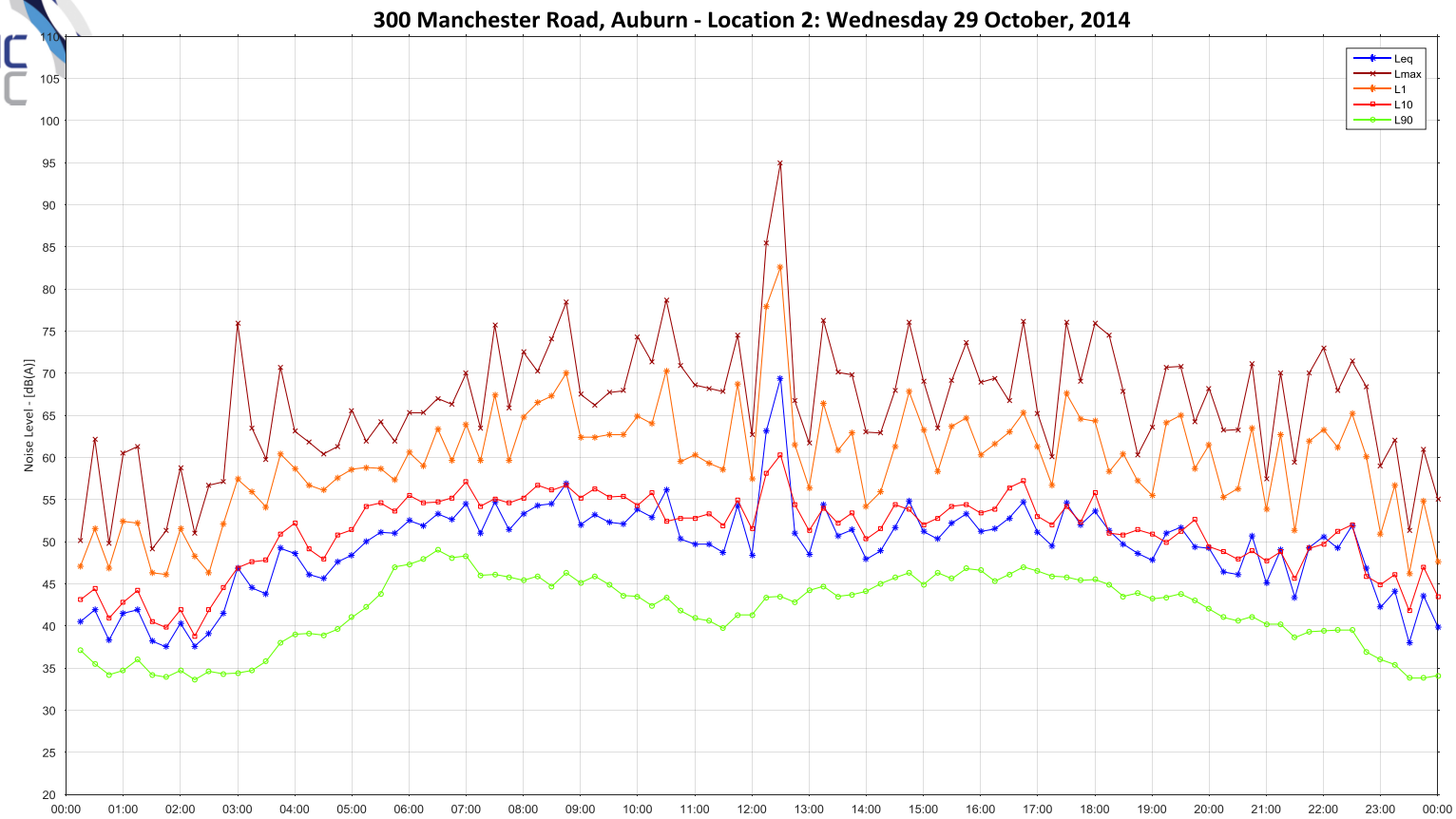
300 Manchester Road, Auburn - Location 2: Wednesday 29 October, 2014
Noise Level - [dB(A)]
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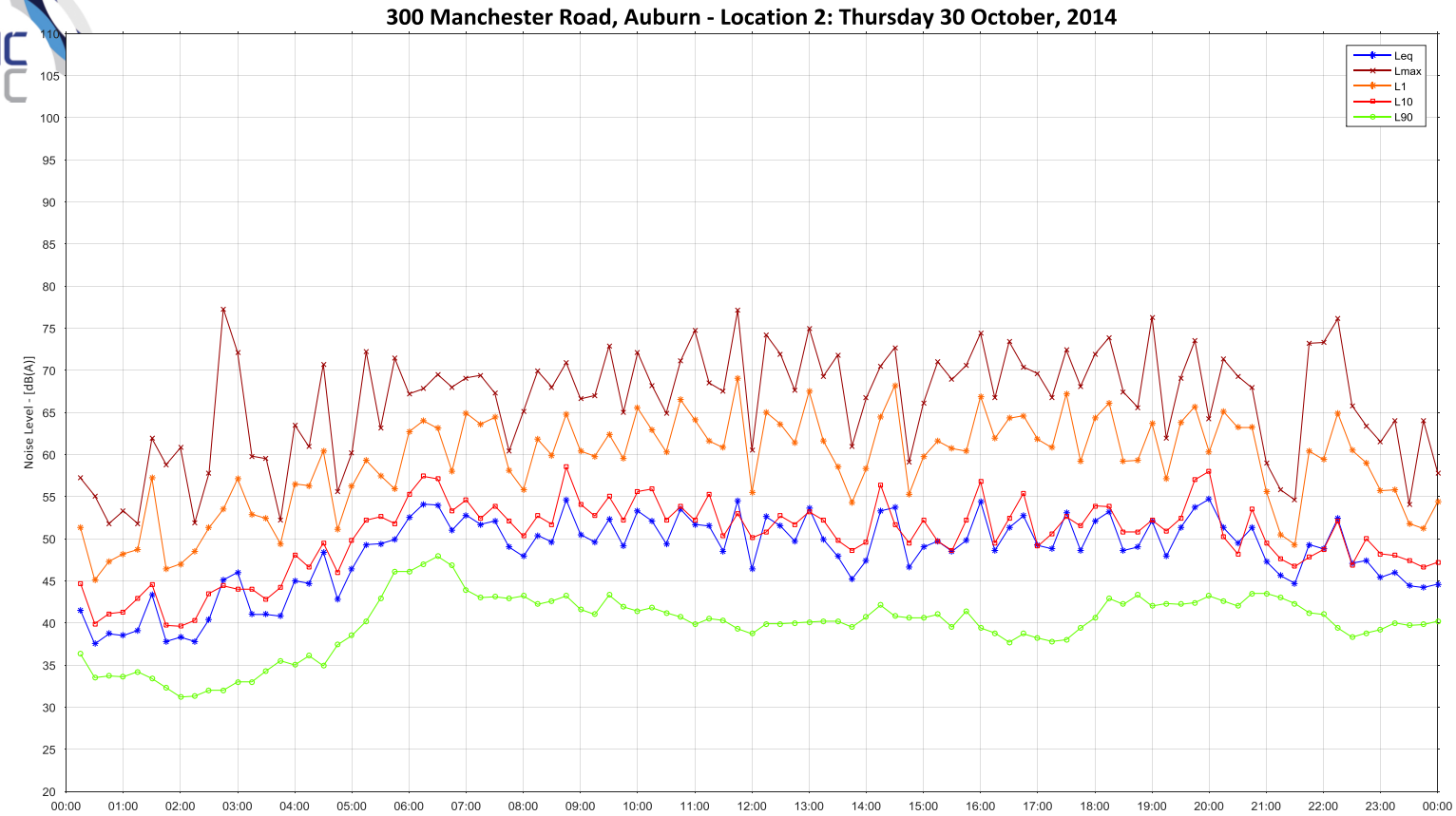
300 Manchester Road, Auburn - Location 2: Thursday 30 October, 2014
Noise Level - [dB(A)]
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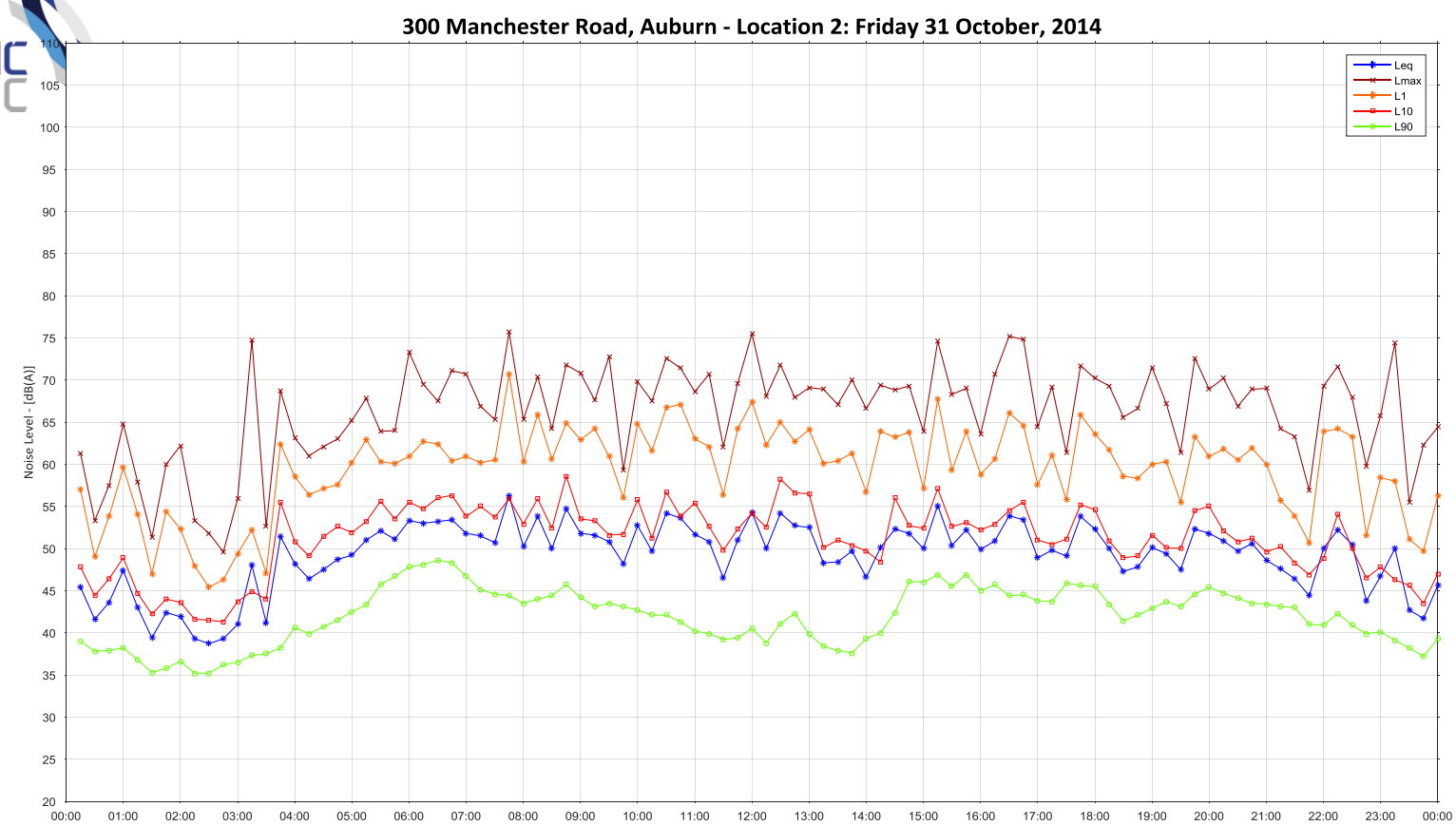
300 Manchester Road, Auburn - Location 2: Friday 31 October, 2014
Noise Level - [dB(A)]
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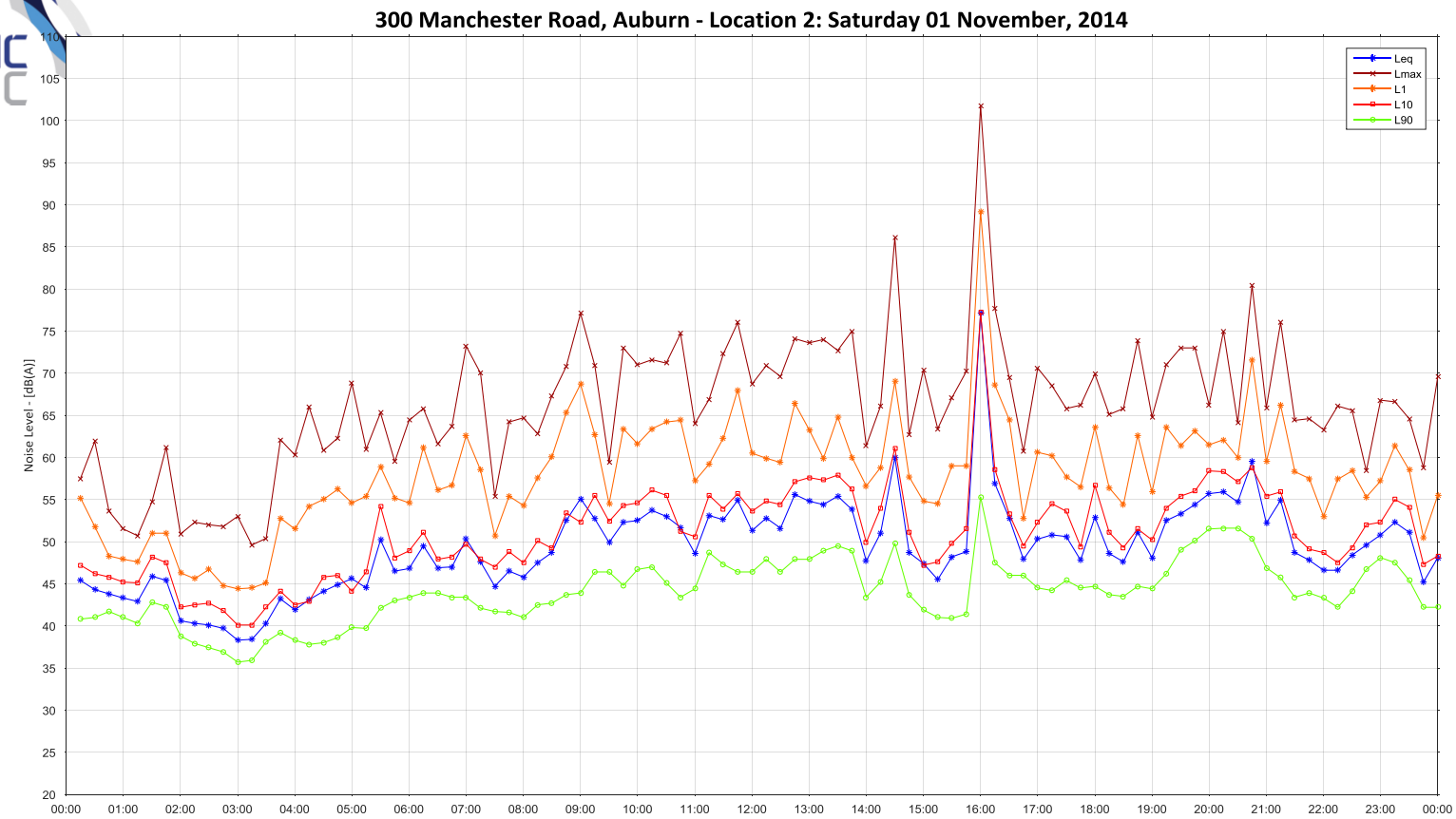
300 Manchester Road, Auburn - Location 2: Saturday 01 November, 2014
Noise Level - [dB(A)]
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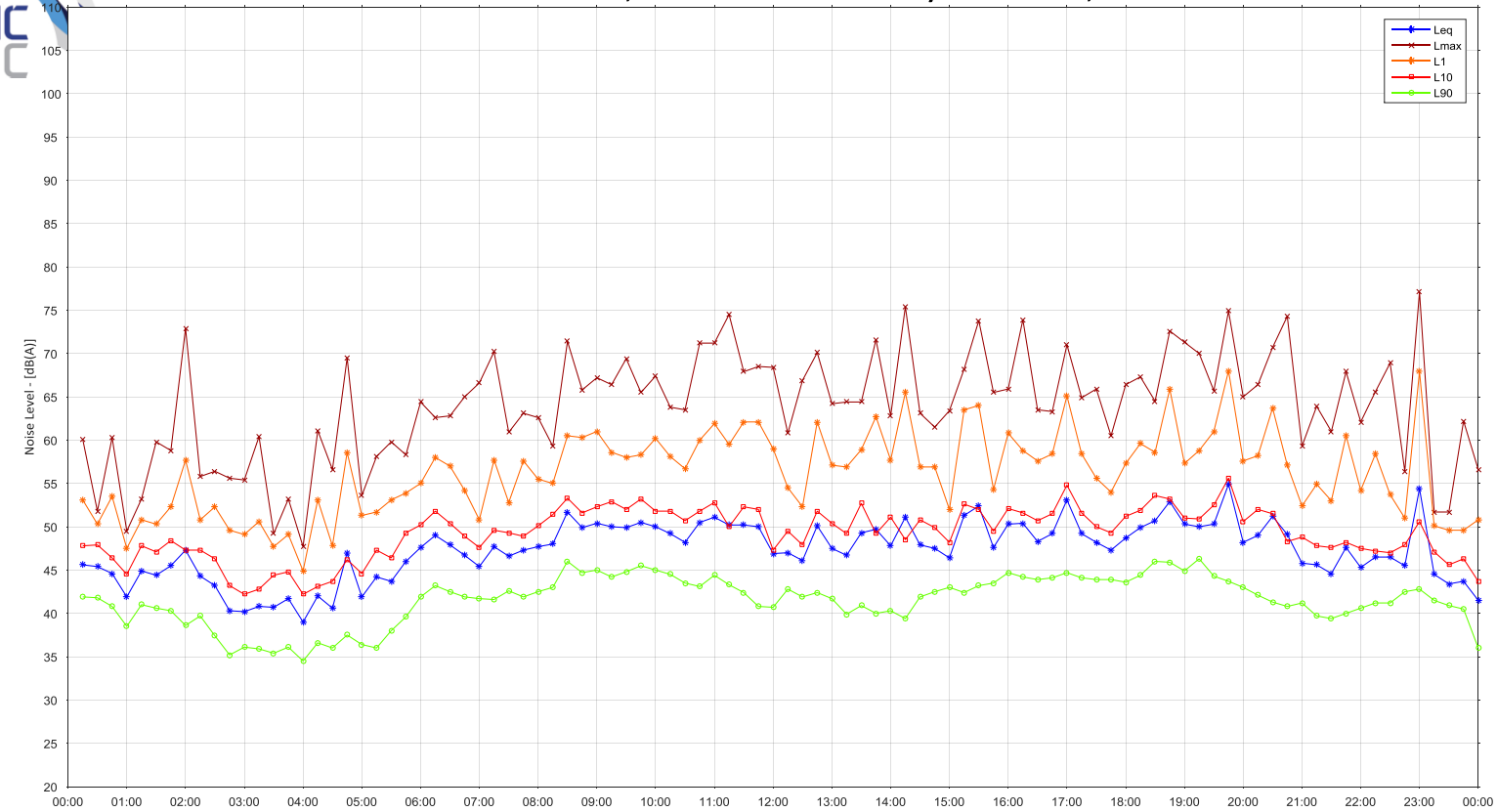
300 Manchester Road, Auburn - Location 2: Sunday 02 November, 2014
Noise Level - [dB(A)]
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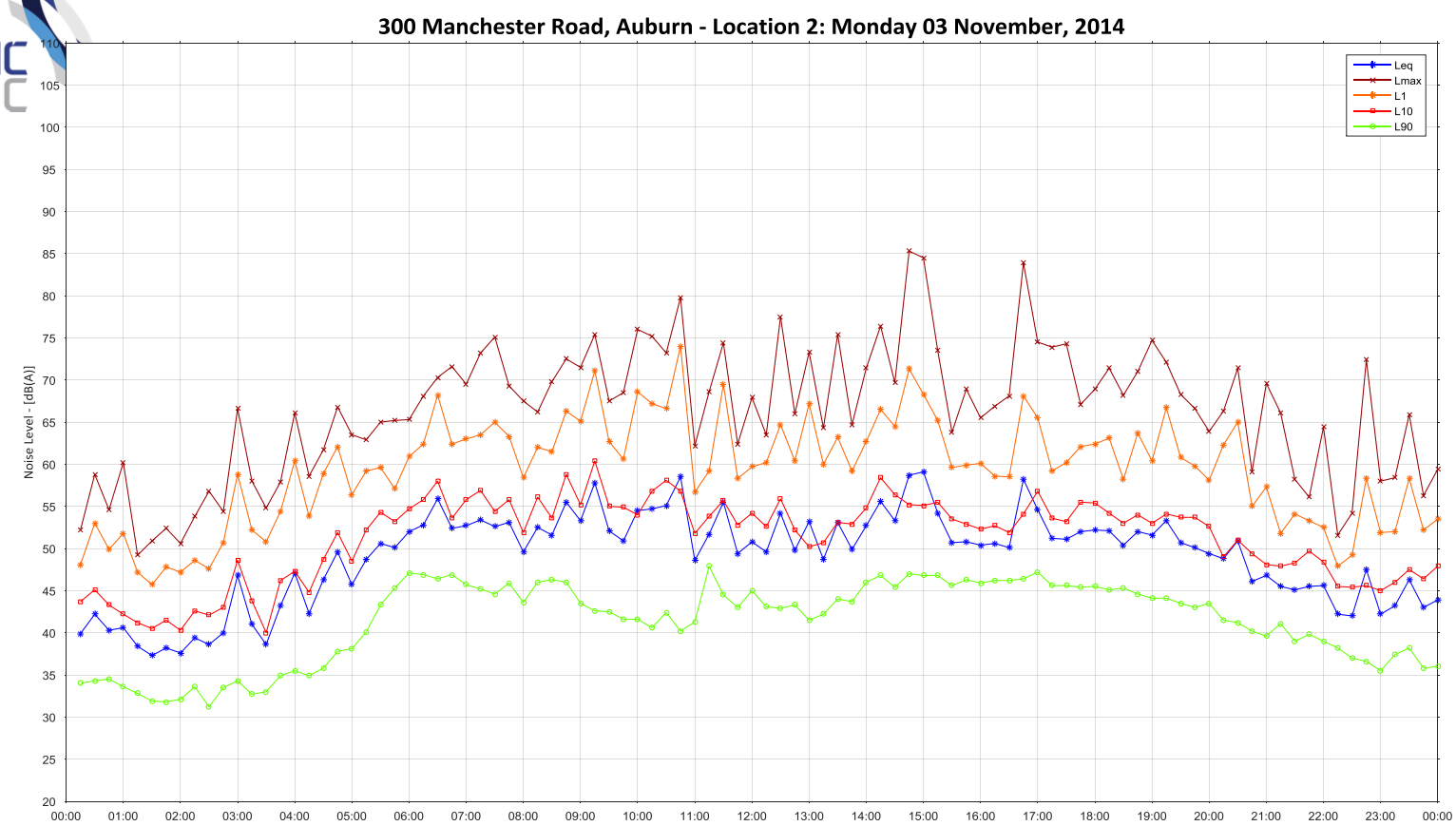
300 Manchester Road, Auburn - Location 2: Monday 03 November, 2014
Noise Level - [dB(A)]
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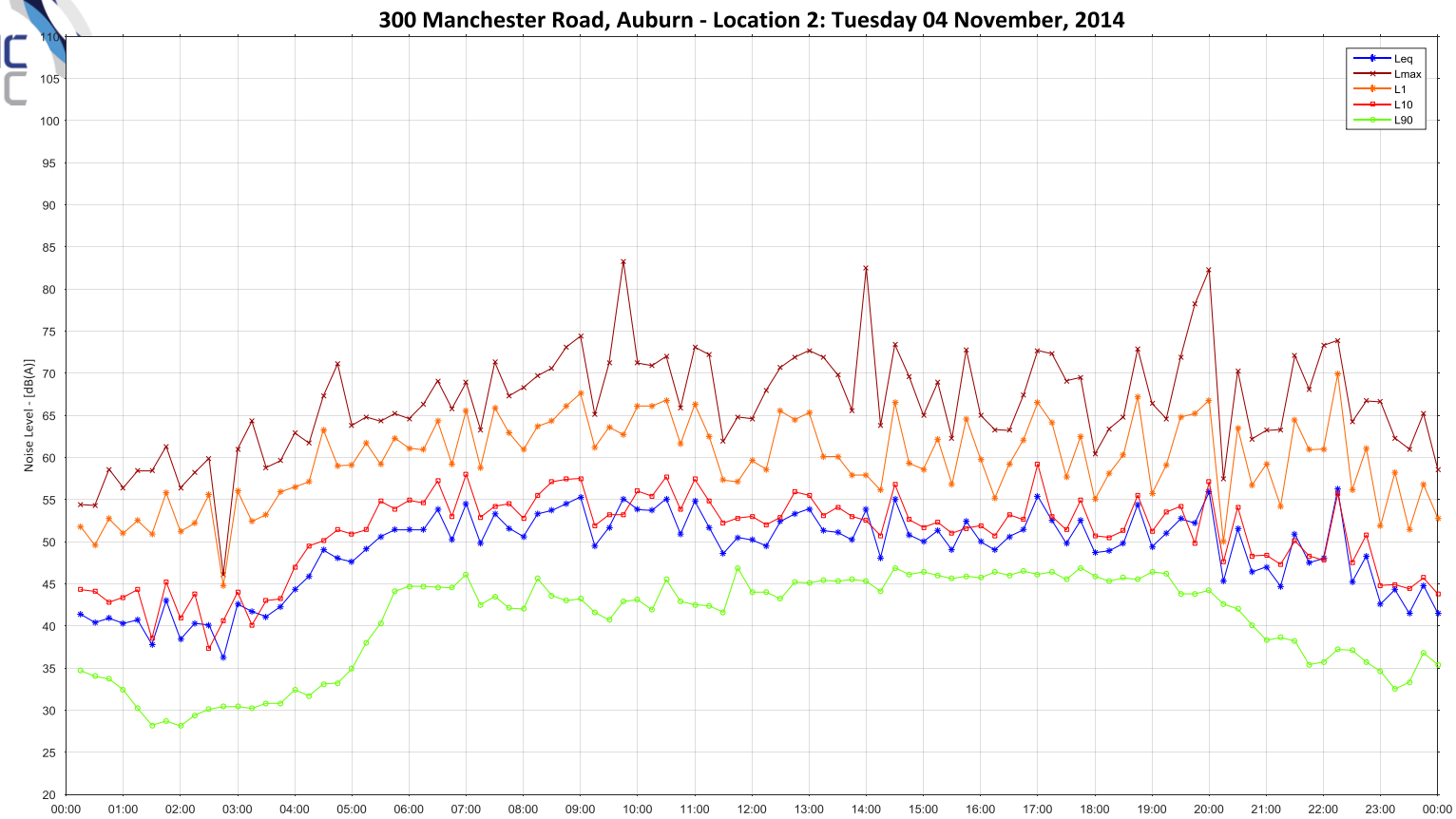
300 Manchester Road, Auburn - Location 2: Tuesday 04 November, 2014
Noise Level - [dB(A)]
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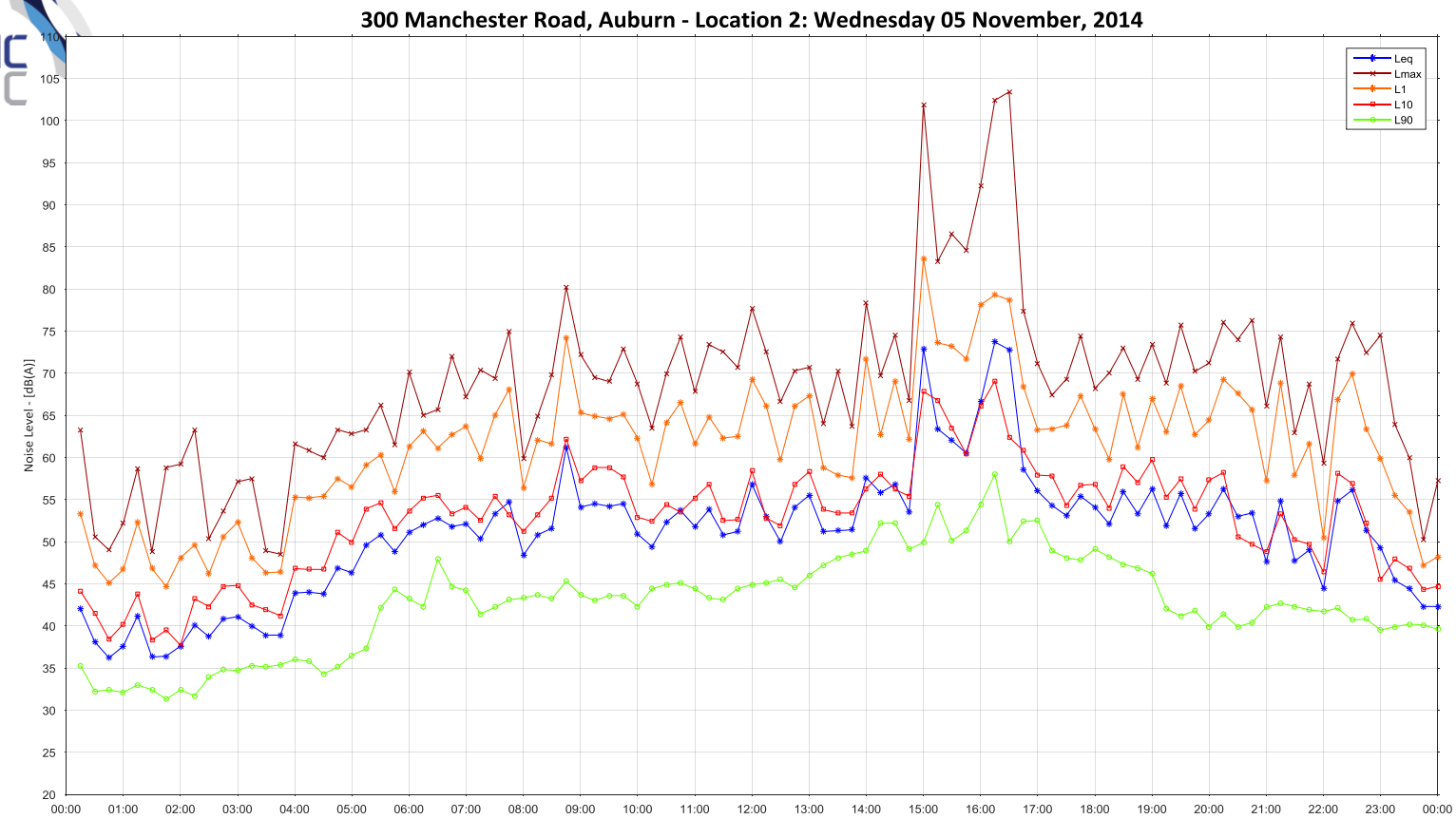
300 Manchester Road, Auburn - Location 2: Wednesday 05 November, 2014
Noise Level - [dB(A)]
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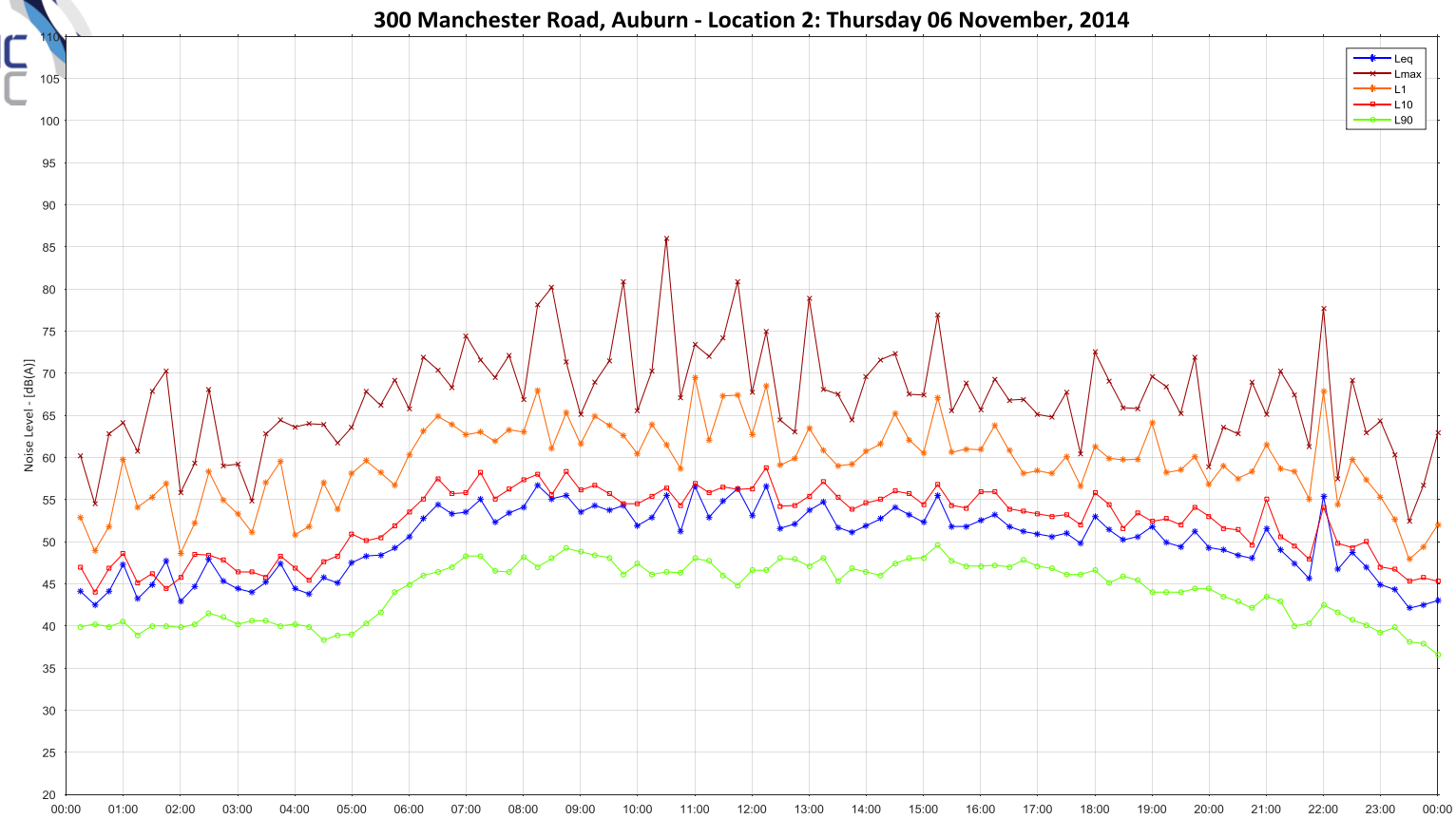
300 Manchester Road, Auburn - Location 2: Thursday 06 November, 2014
Noise Level - [dB(A)]
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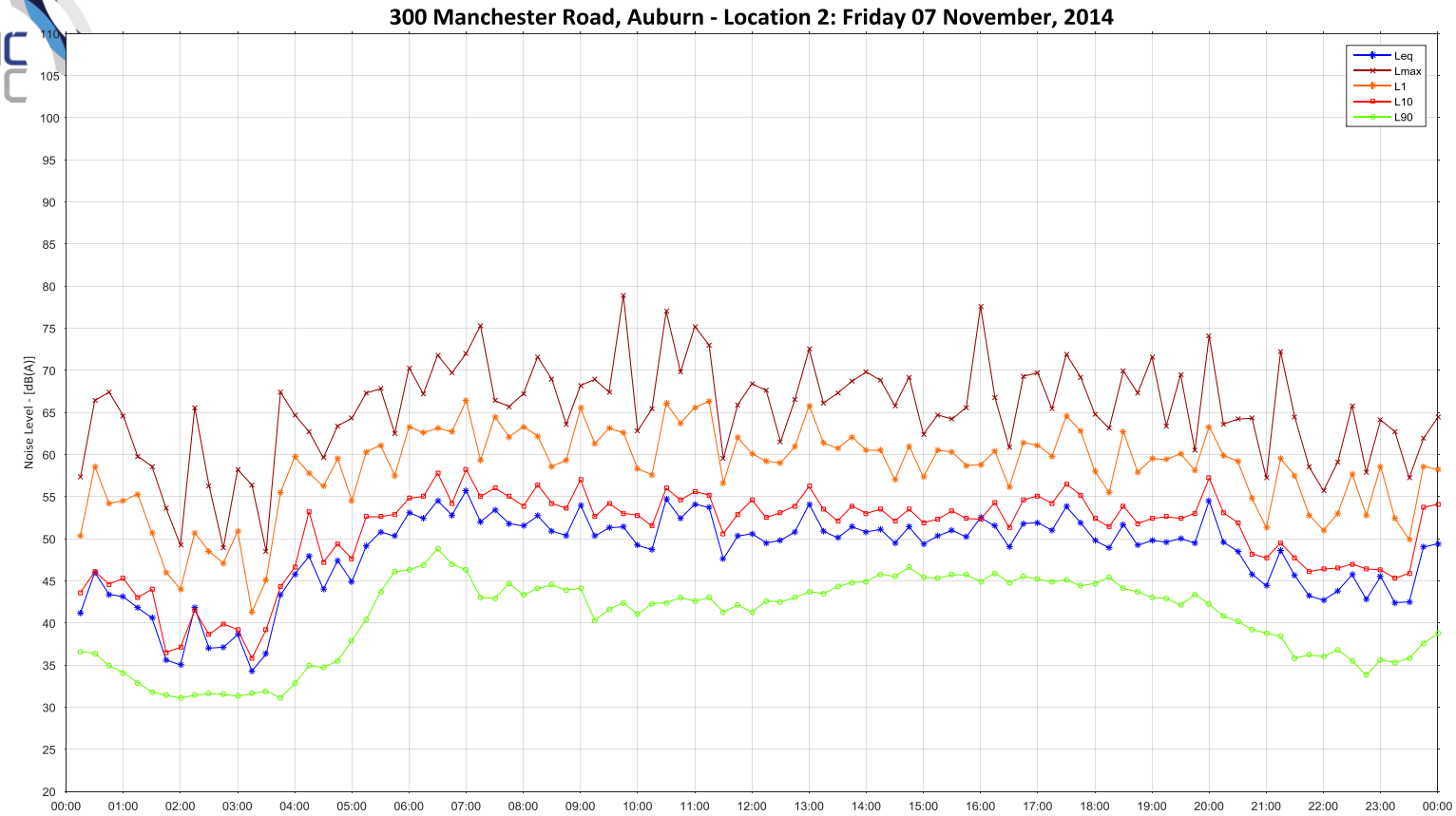
300 Manchester Road, Auburn - Location 2: Friday 07 November, 2014
Noise Level - [dB(A)]
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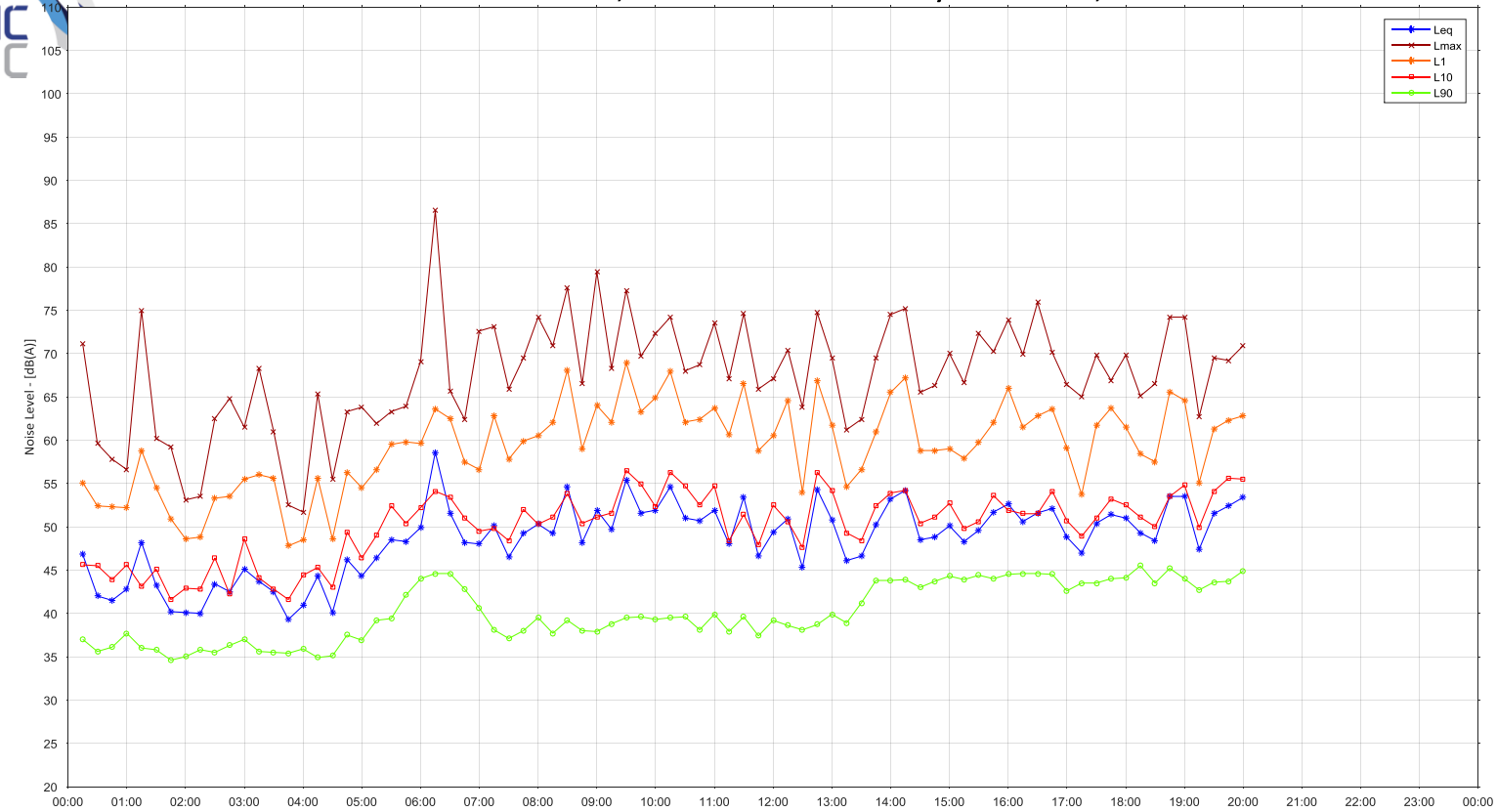
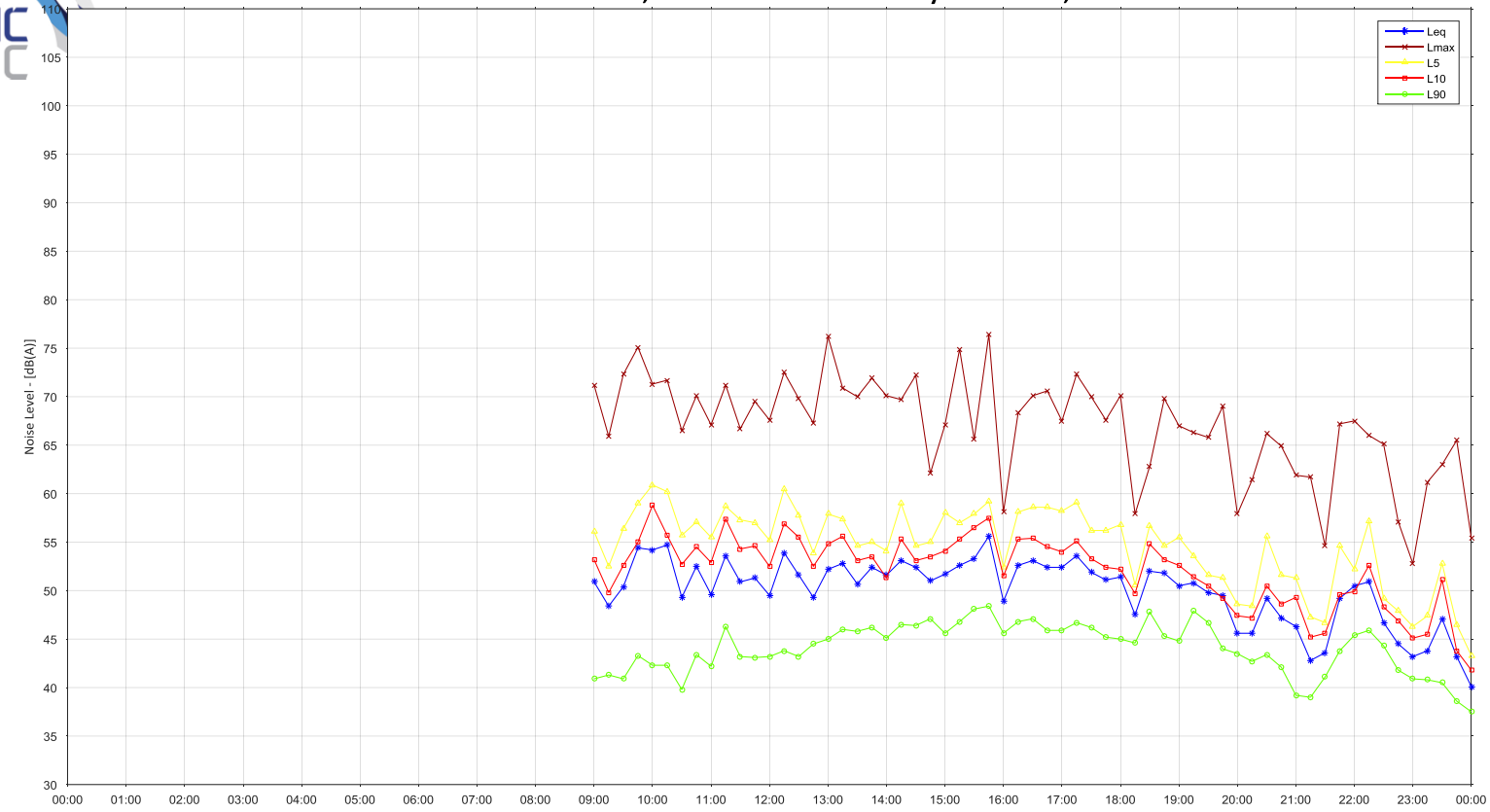
300 Manchester Road, Auburn - Location 2: Saturday 08 November, 2014




300 Manchester Road, Auburn - Location 3: Friday 24 October, 2014
Noise Level - [dB(A)]
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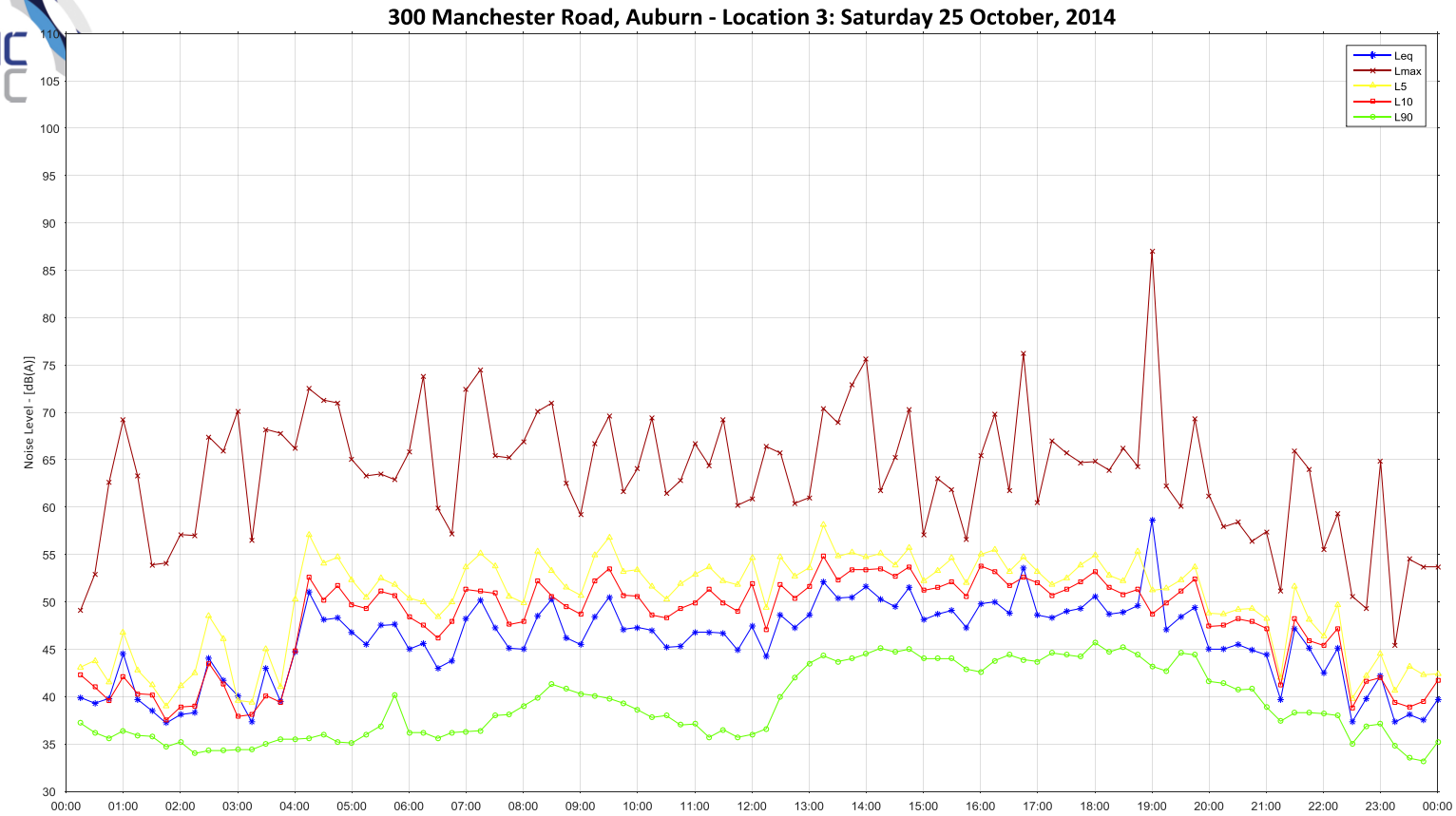
300 Manchester Road, Auburn - Location 3: Saturday 25 October, 2014
Noise Level - [dB(A)]
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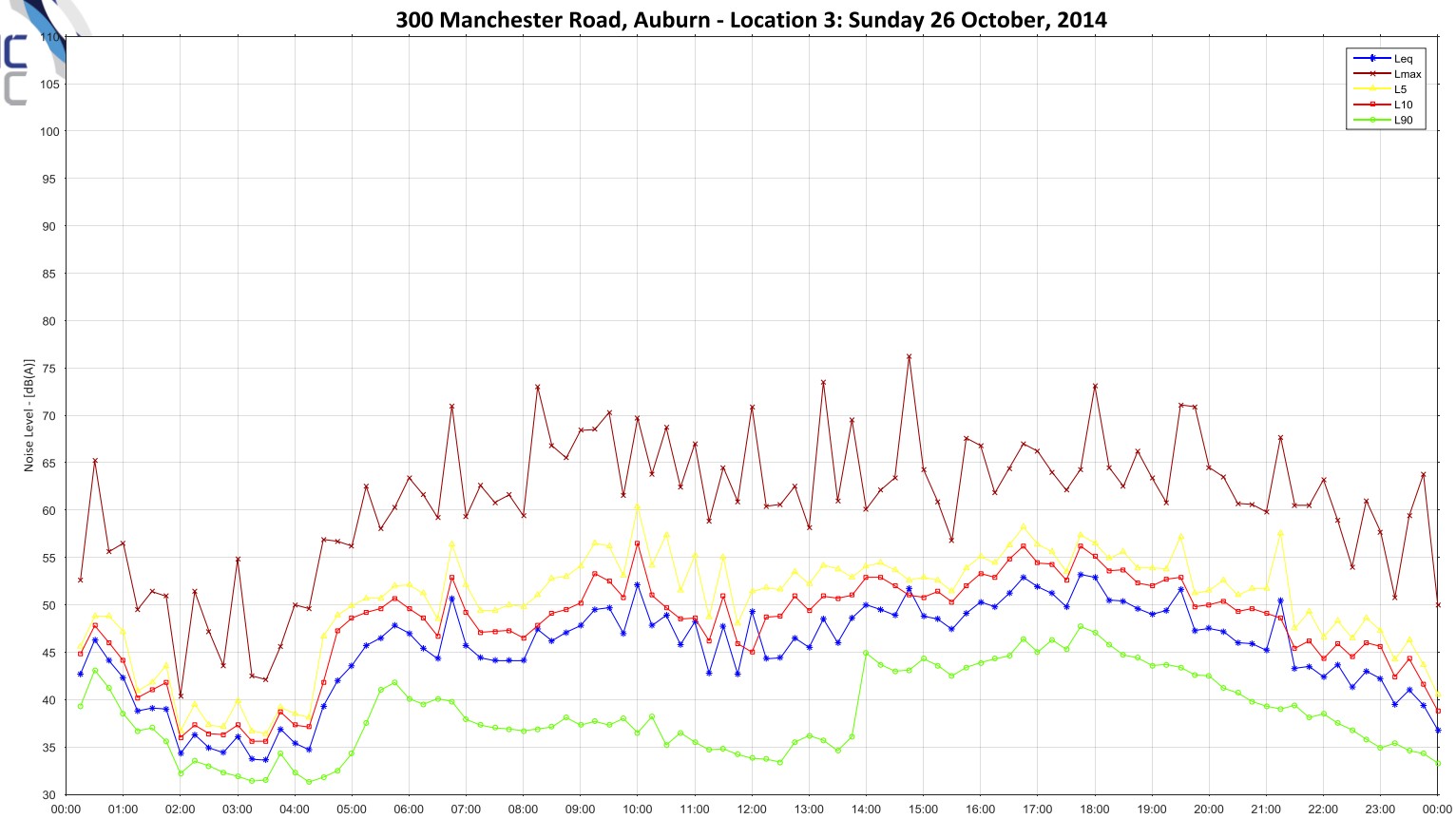
300 Manchester Road, Auburn - Location 3: Sunday 26 October, 2014
Noise Level - [dB(A)]
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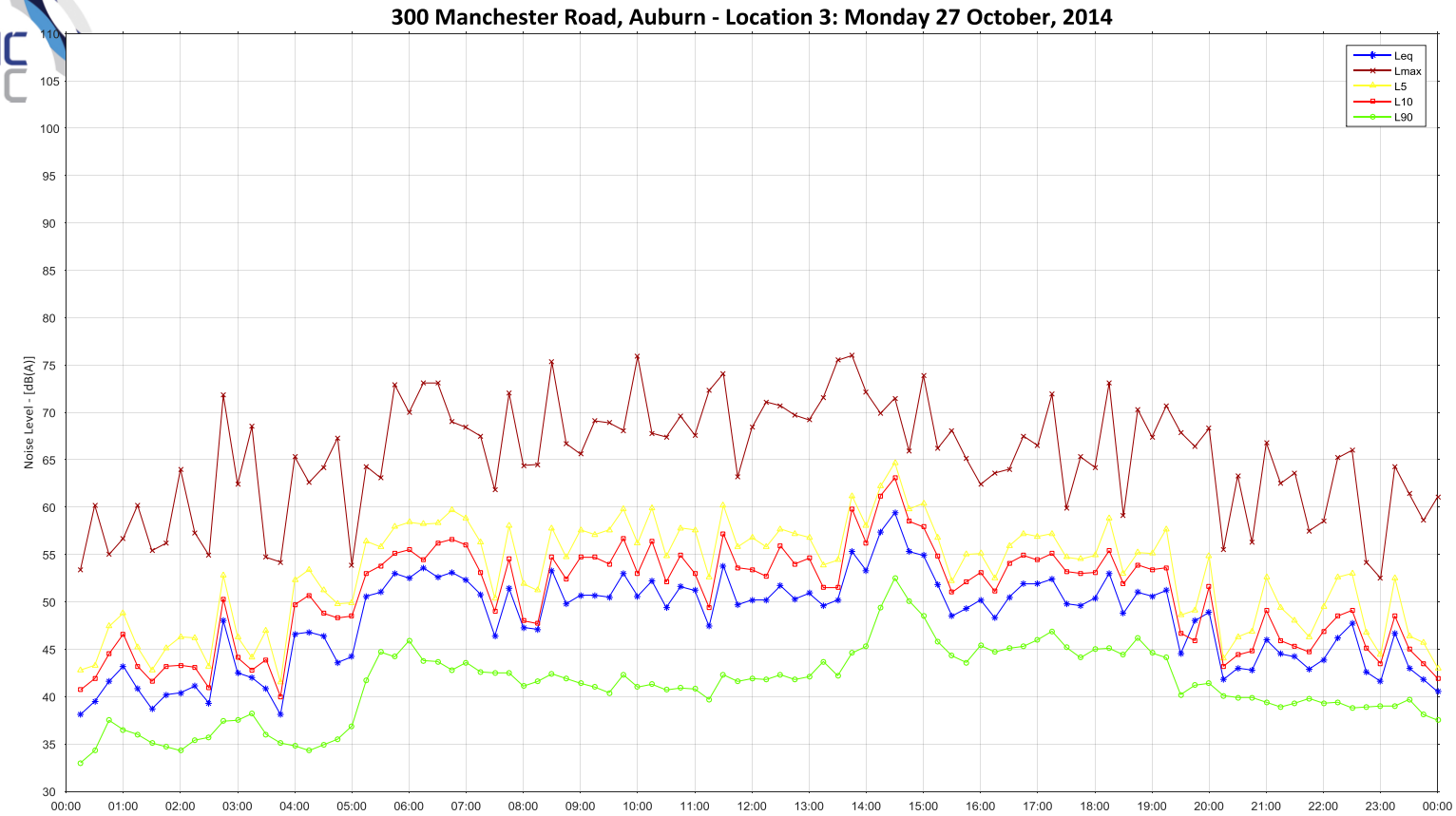
300 Manchester Road, Auburn - Location 3: Monday 27 October, 2014
Noise Level - [dB(A)]
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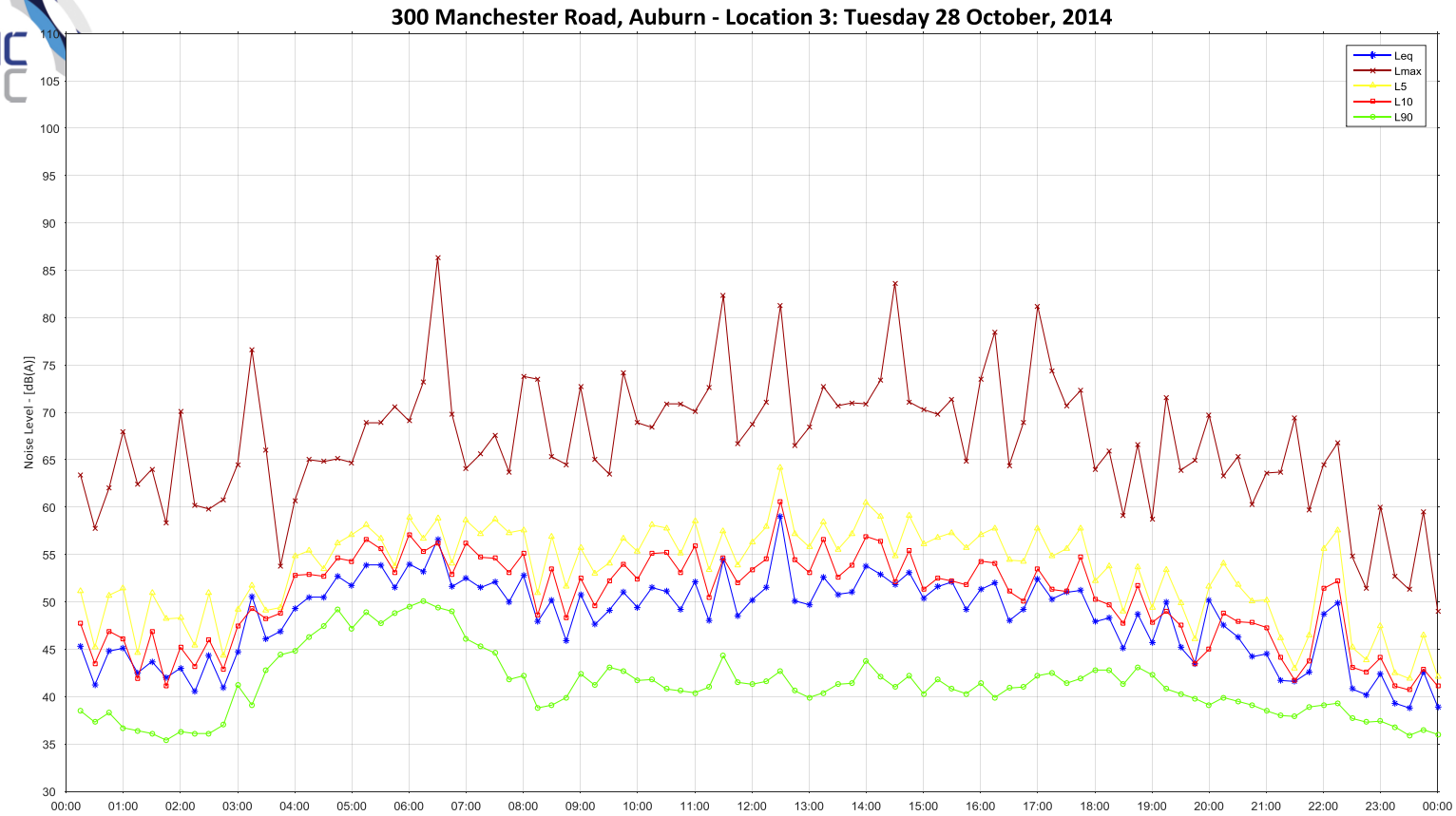
300 Manchester Road, Auburn - Location 3: Tuesday 28 October, 2014
Noise Level - [dB(A)]
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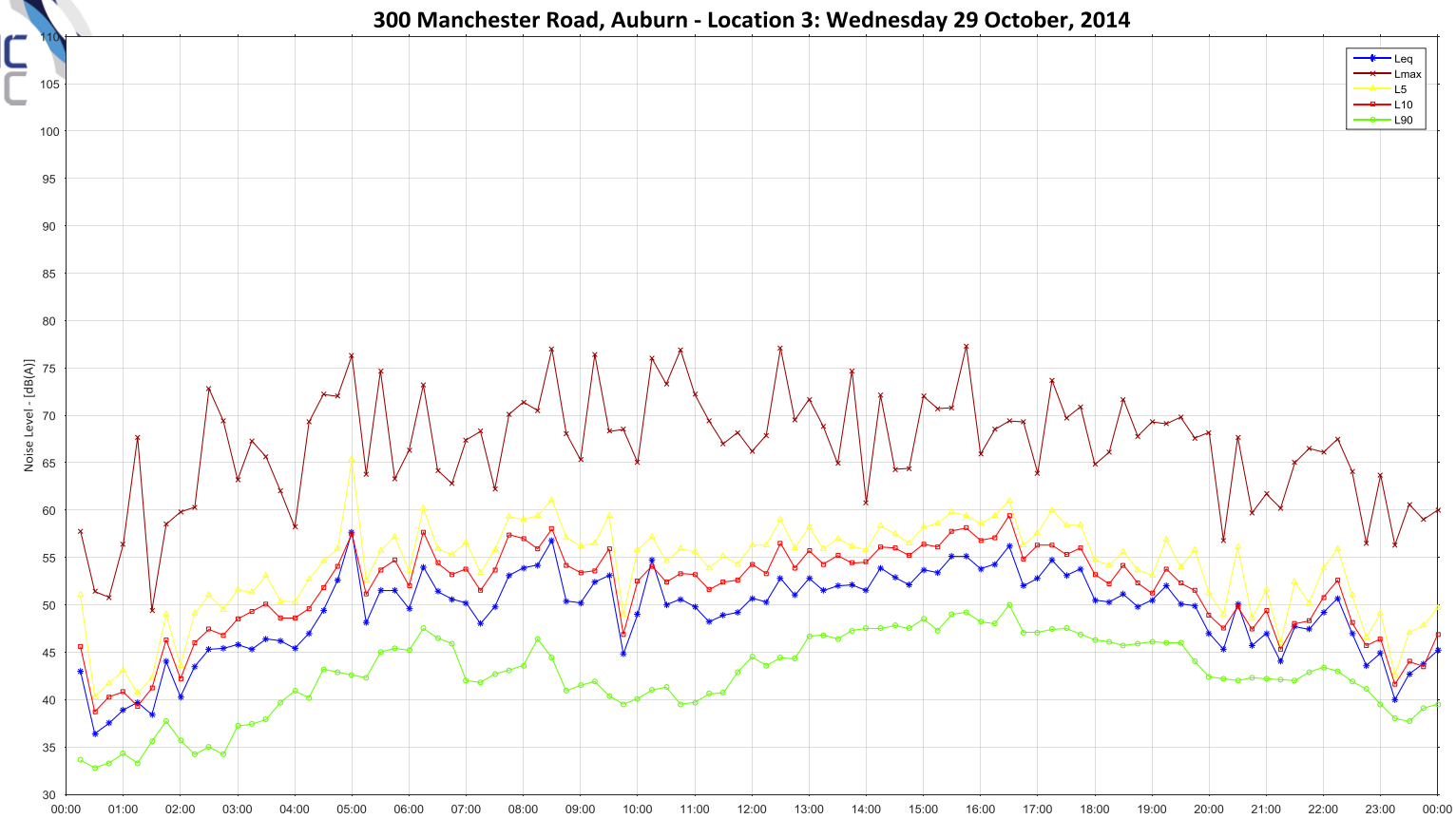
300 Manchester Road, Auburn - Location 3: Wednesday 29 October, 2014
Noise Level - [dB(A)]
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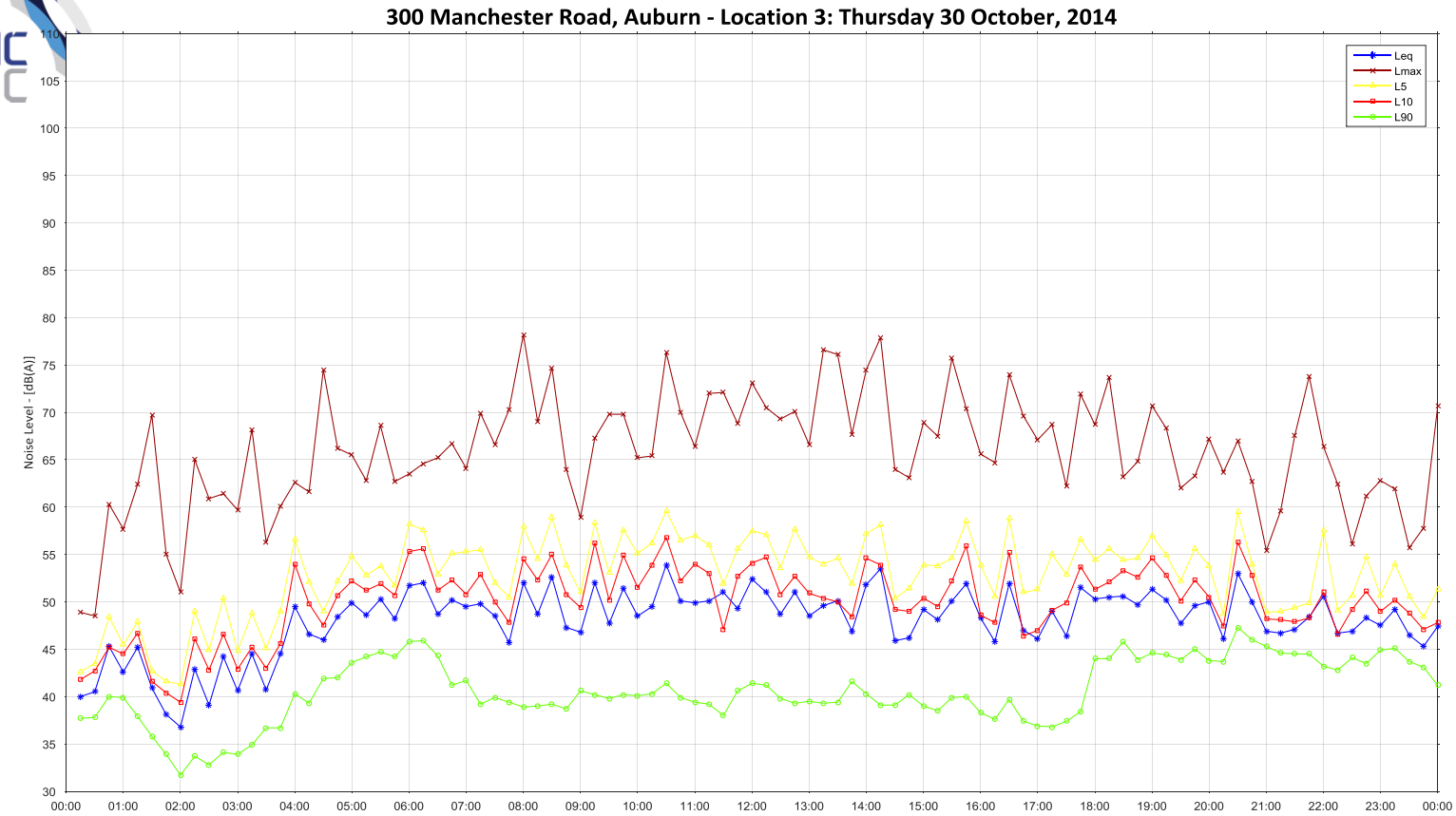
300 Manchester Road, Auburn - Location 3: Thursday 30 October, 2014
Noise Level - [dB(A)]
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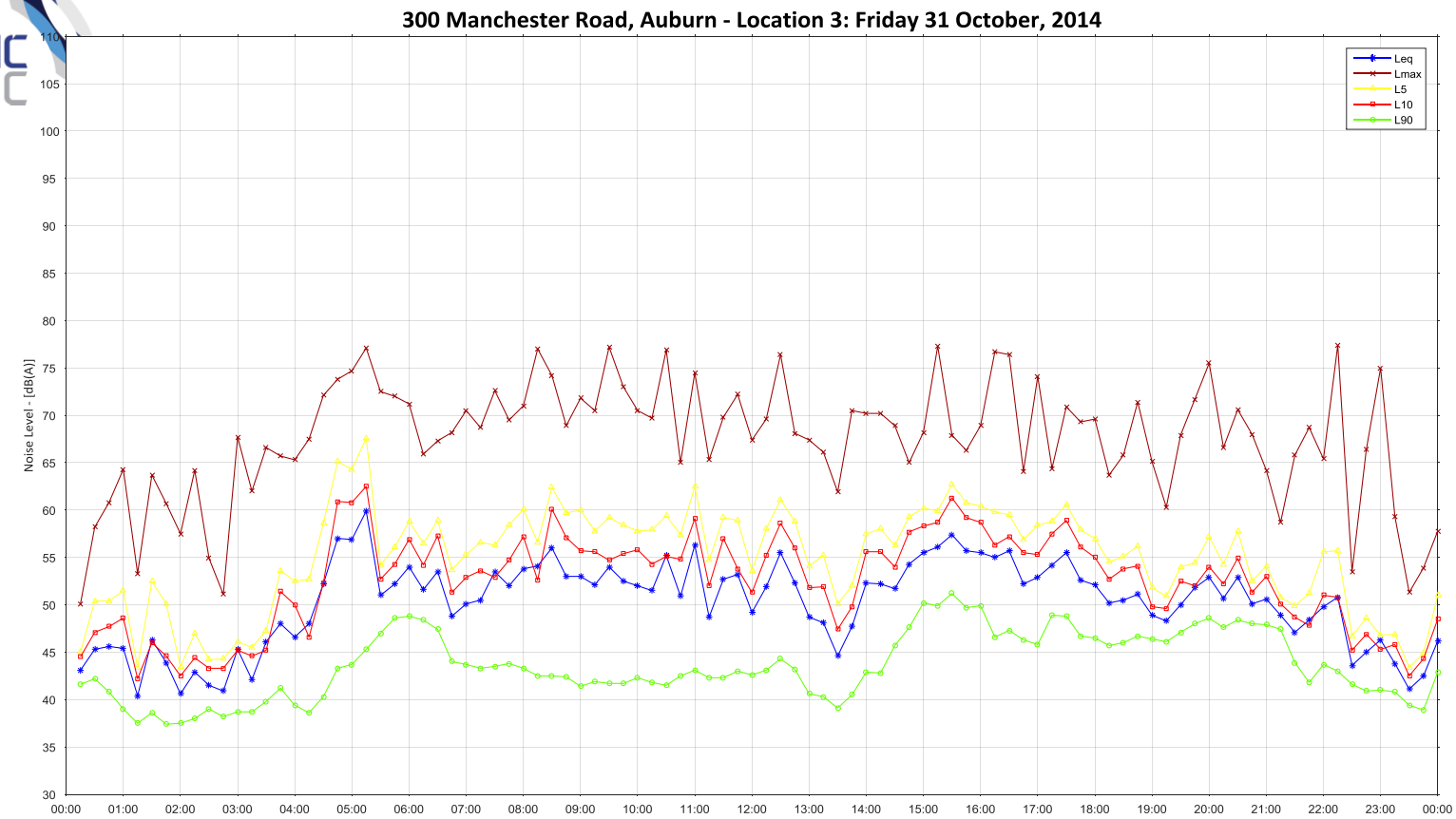
300 Manchester Road, Auburn - Location 3: Friday 31 October, 2014
Noise Level - [dB(A)]
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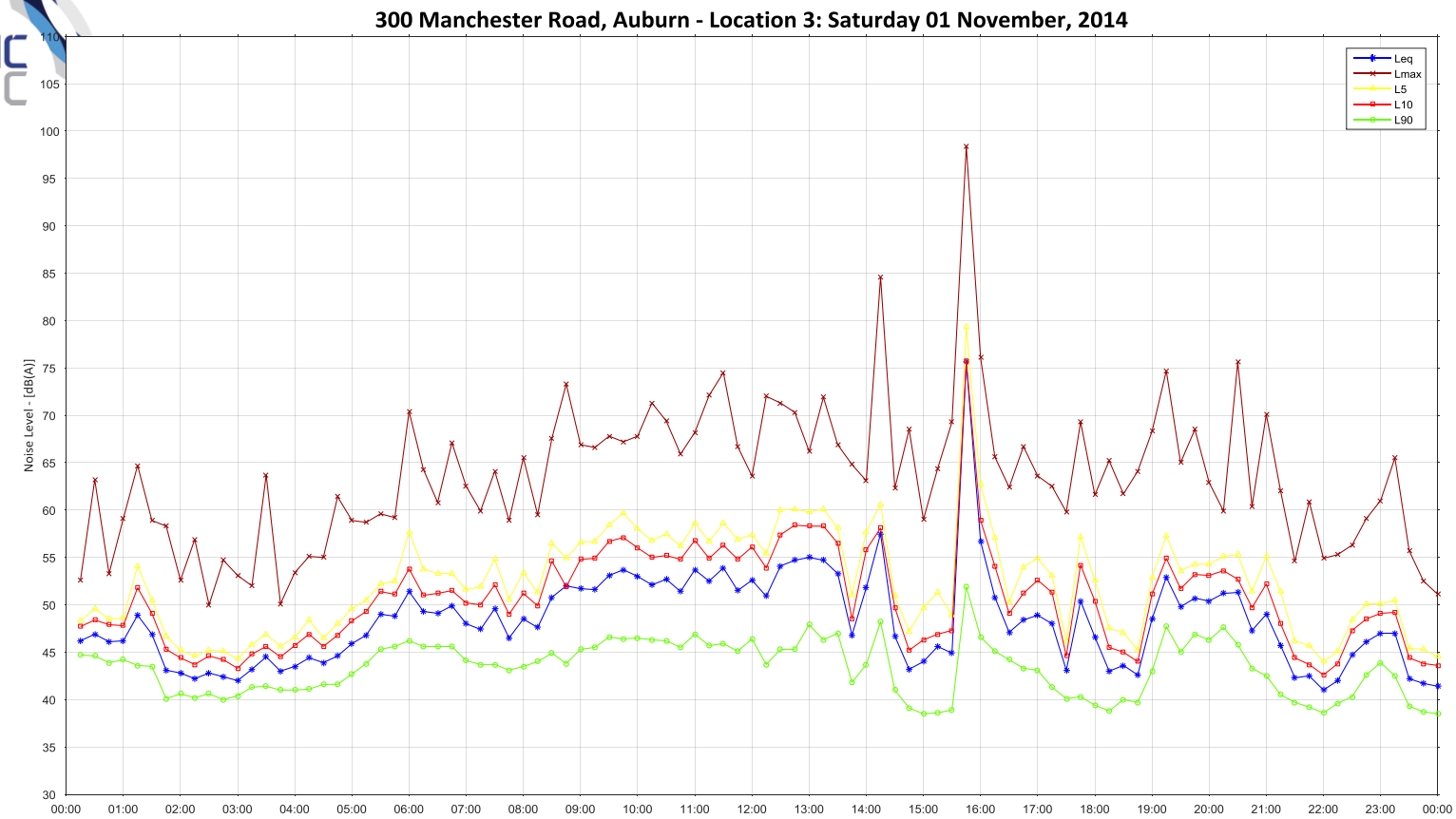
300 Manchester Road, Auburn - Location 3: Saturday 01 November, 2014
Noise Level - [dB(A)]
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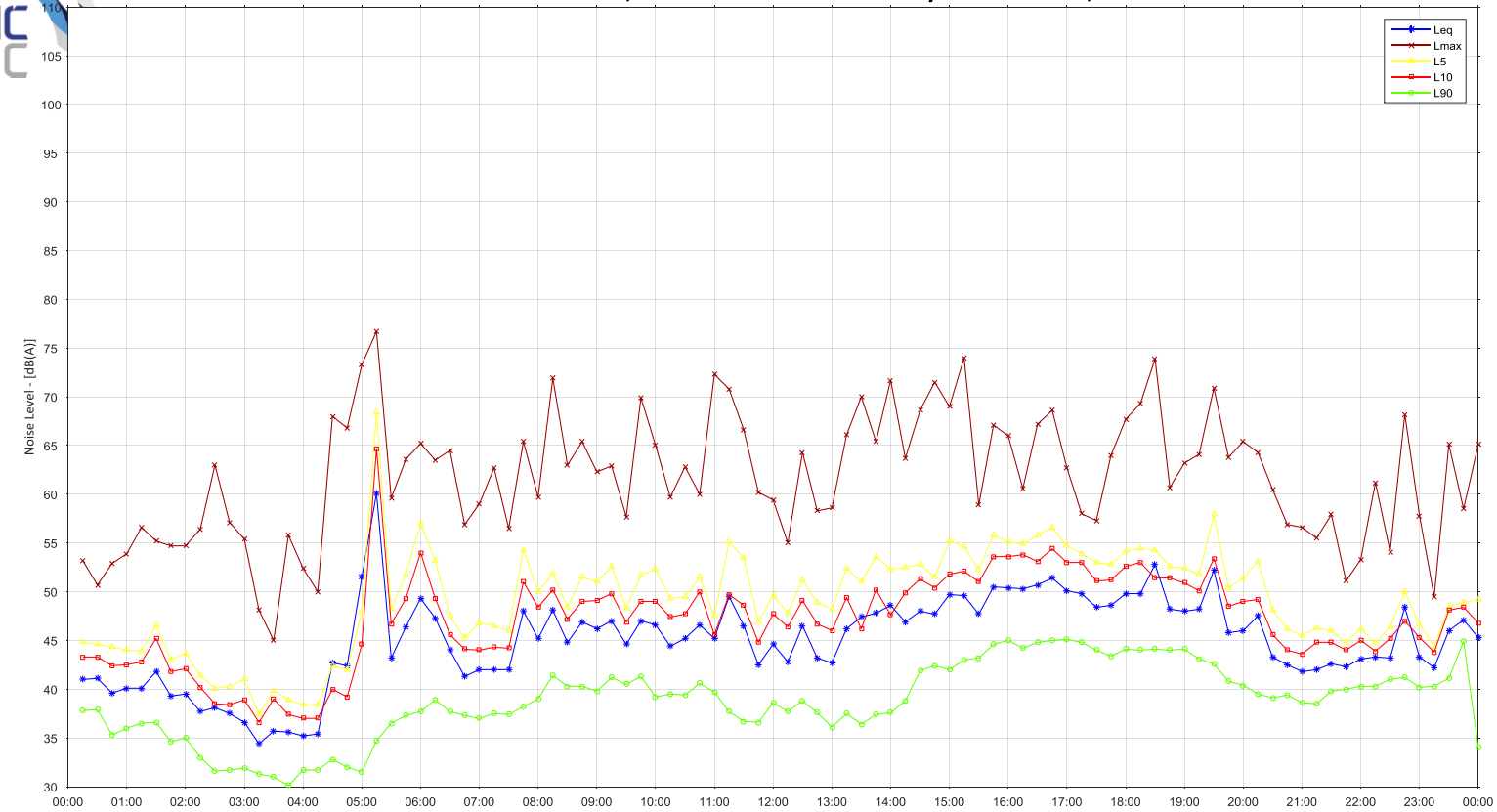
300 Manchester Road, Auburn - Location 3: Sunday 02 November, 2014
Noise Level - [dB(A)]
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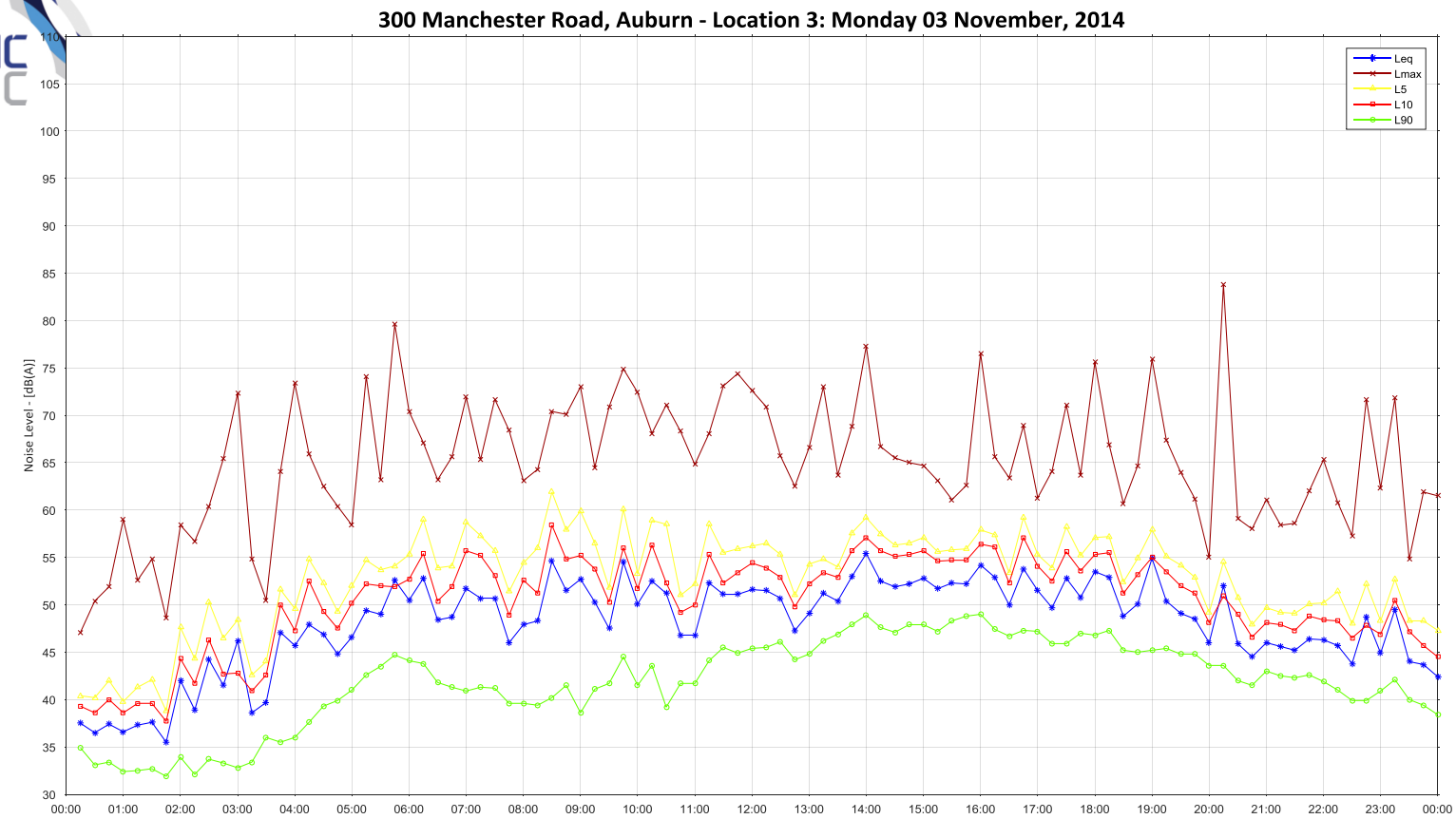
300 Manchester Road, Auburn - Location 3: Monday 03 November, 2014
Noise Level - [dB(A)]
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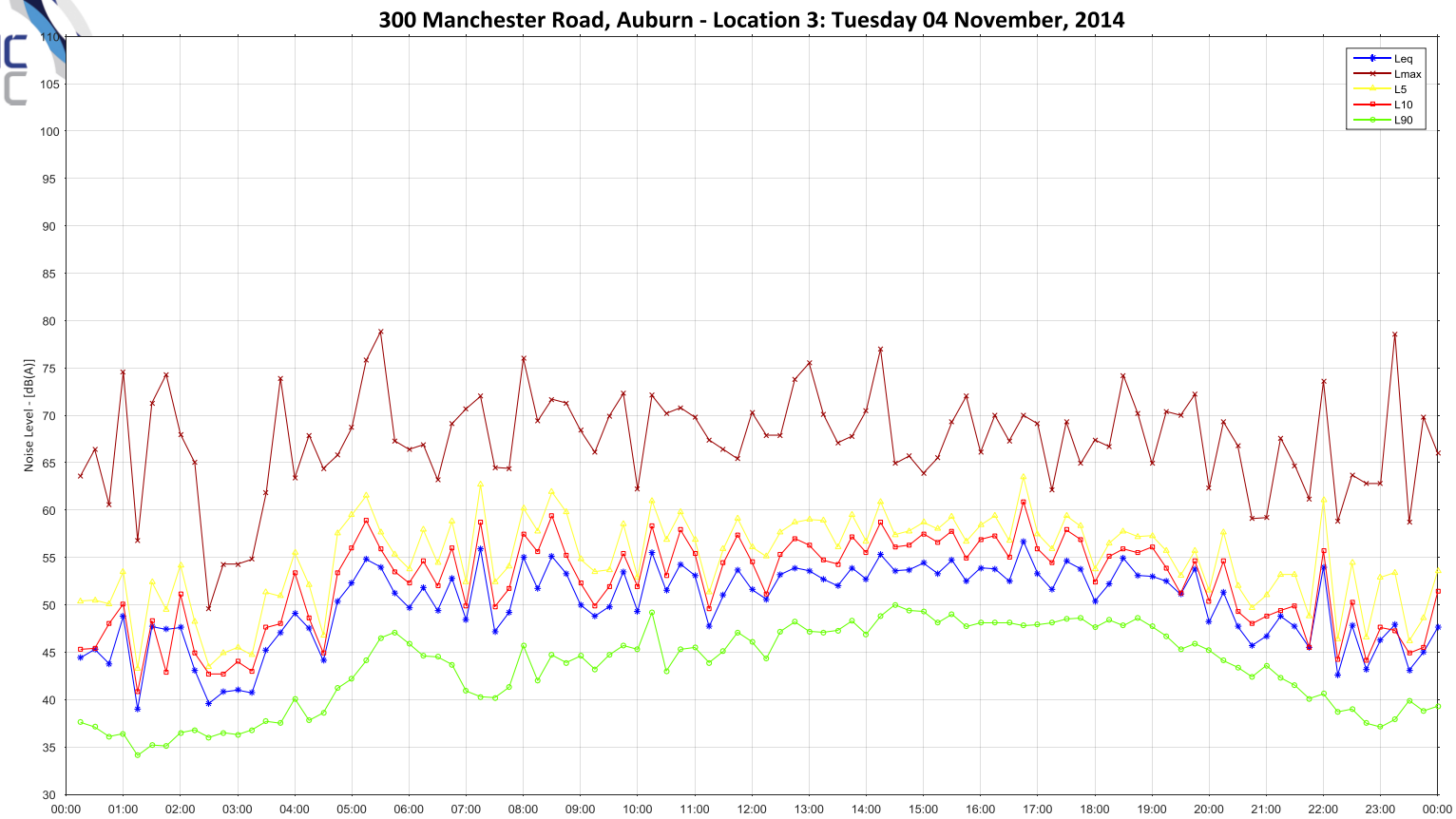
300 Manchester Road, Auburn - Location 3: Tuesday 04 November, 2014
Noise Level - [dB(A)]
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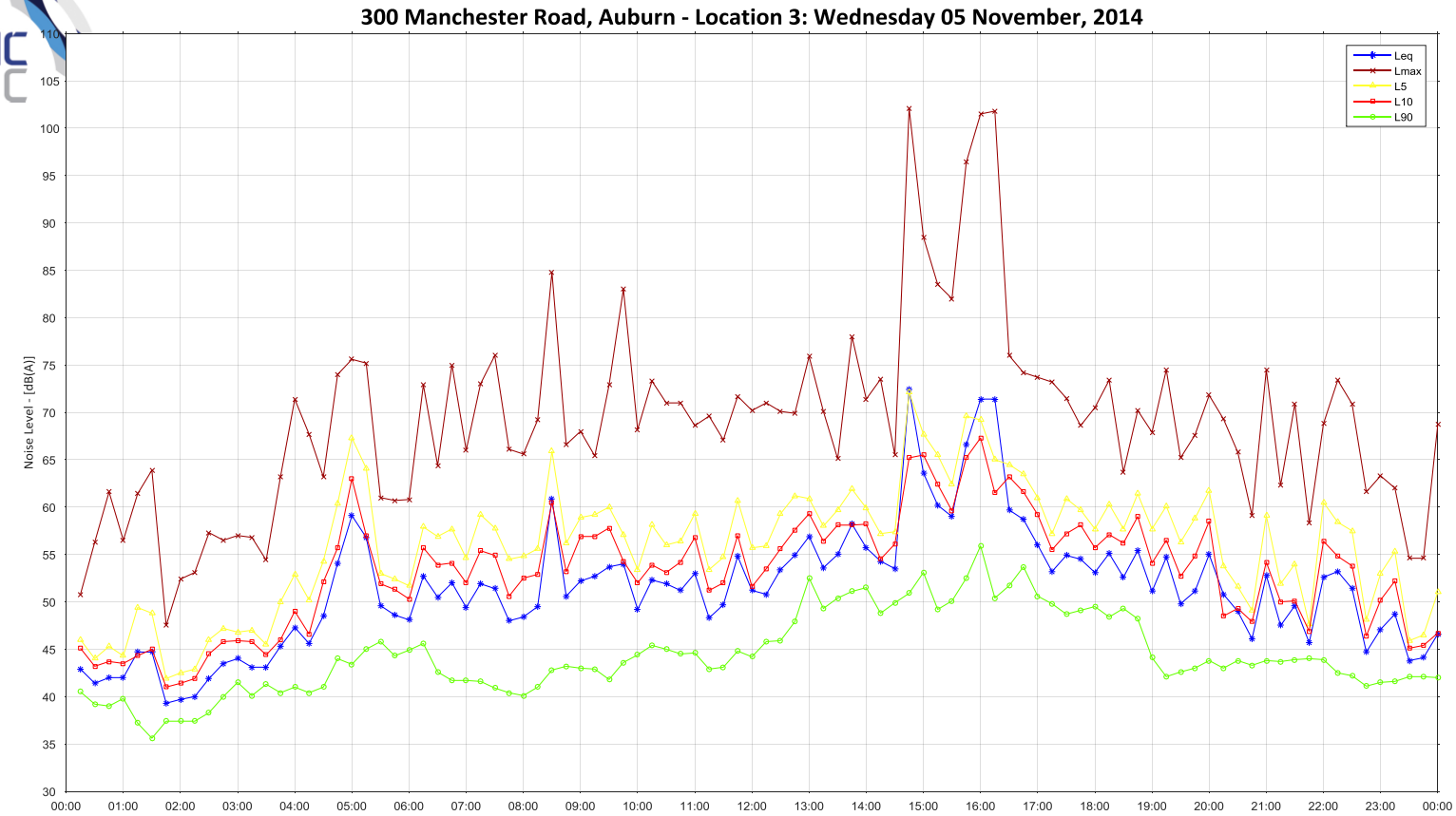
300 Manchester Road, Auburn - Location 3: Wednesday 05 November, 2014
Noise Level - [dB(A)]
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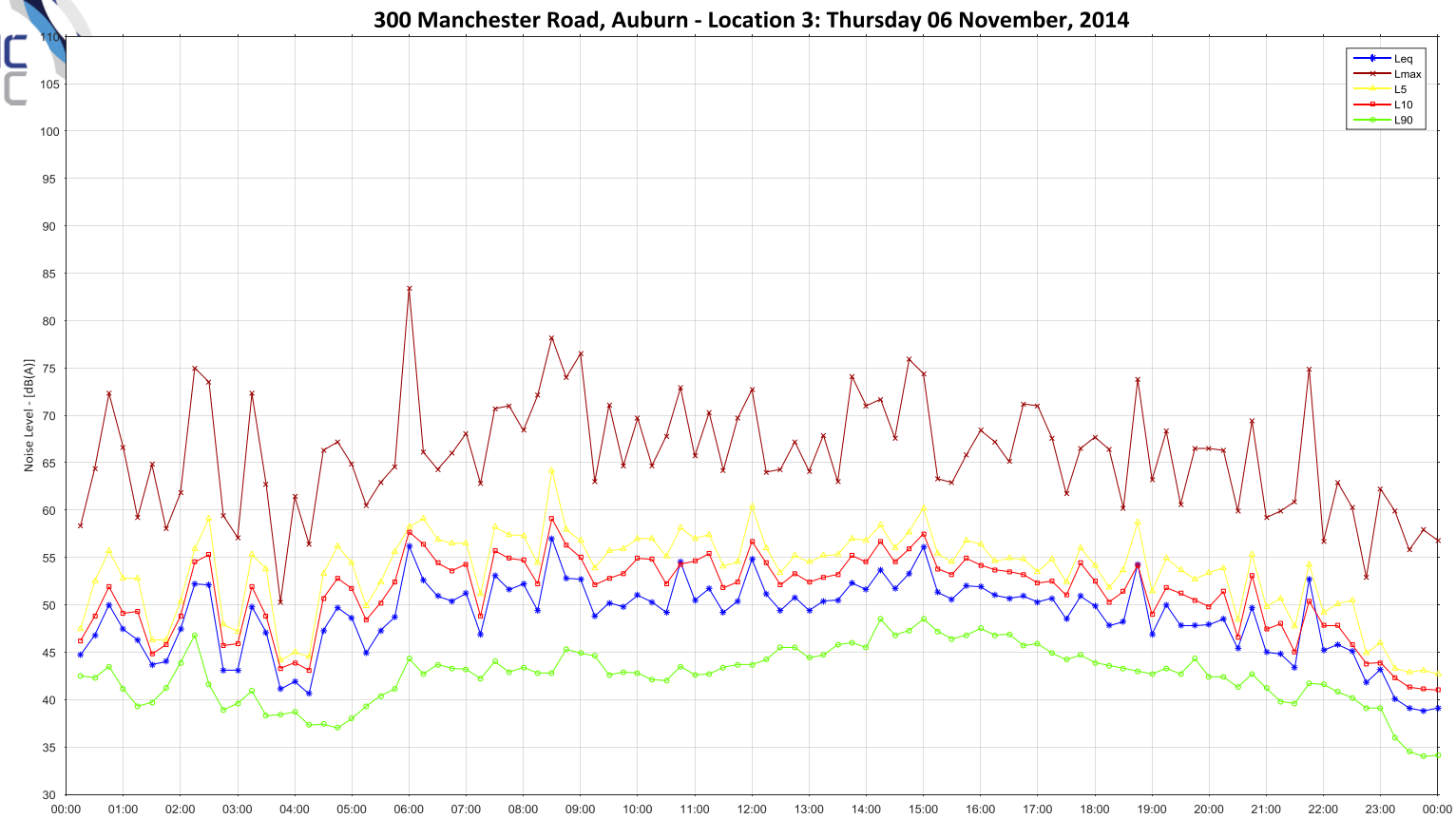
300 Manchester Road, Auburn - Location 3: Thursday 06 November, 2014
Noise Level - [dB(A)]
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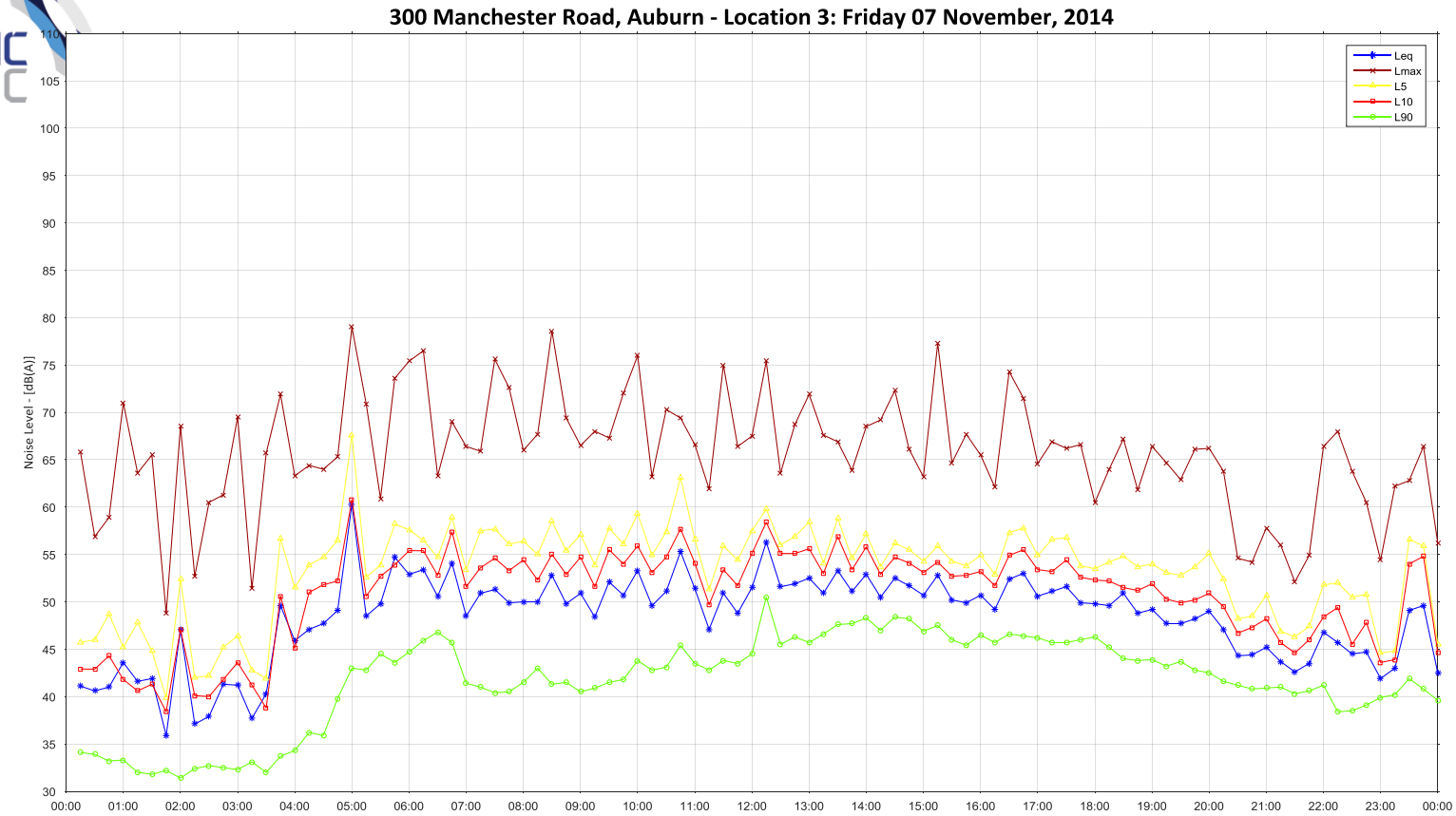
300 Manchester Road, Auburn - Location 3: Friday 07 November, 2014
Noise Level - [dB(A)]
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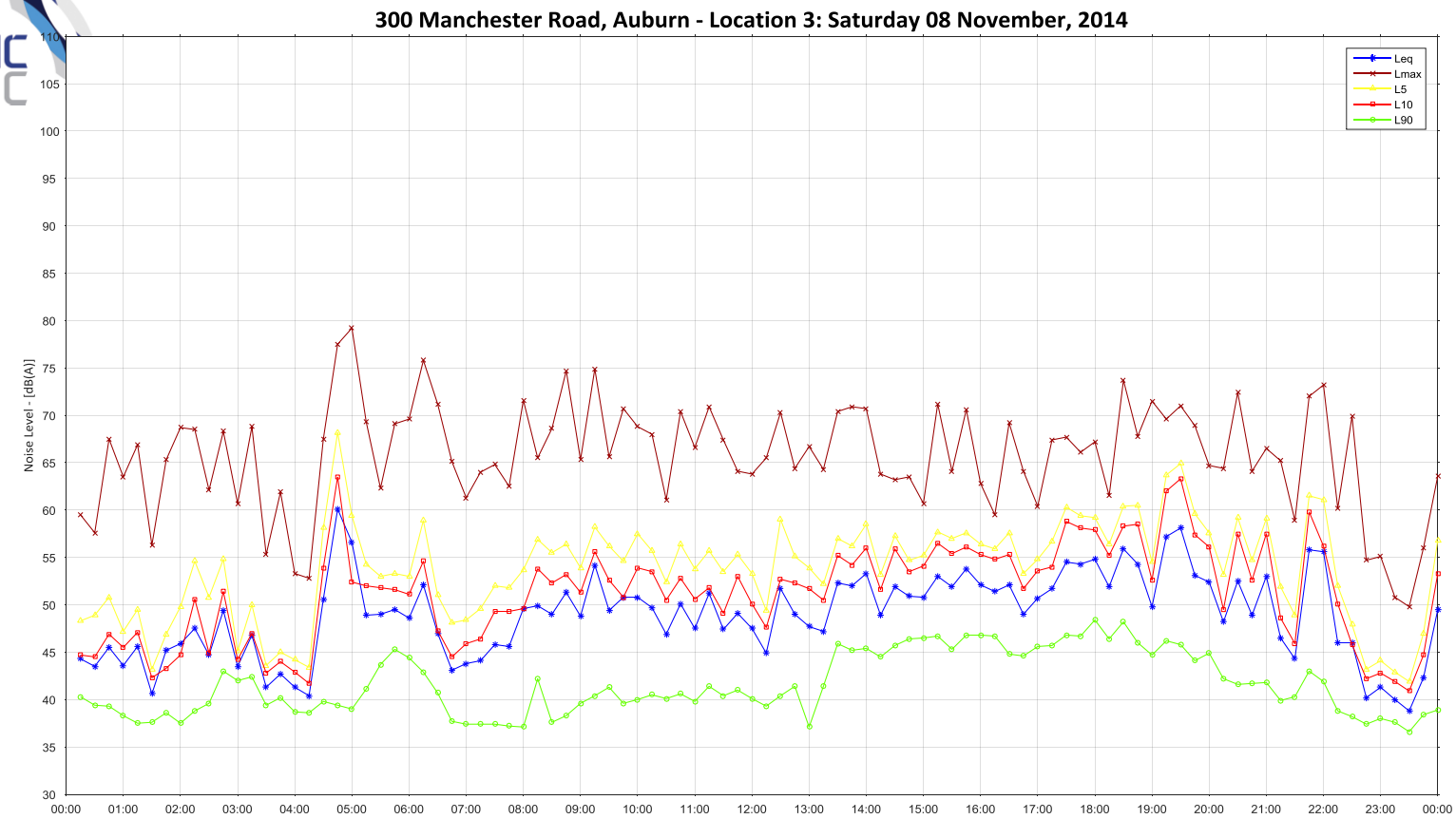
300 Manchester Road, Auburn - Location 3: Saturday 08 November, 2014
Noise Level - [dB(A)]
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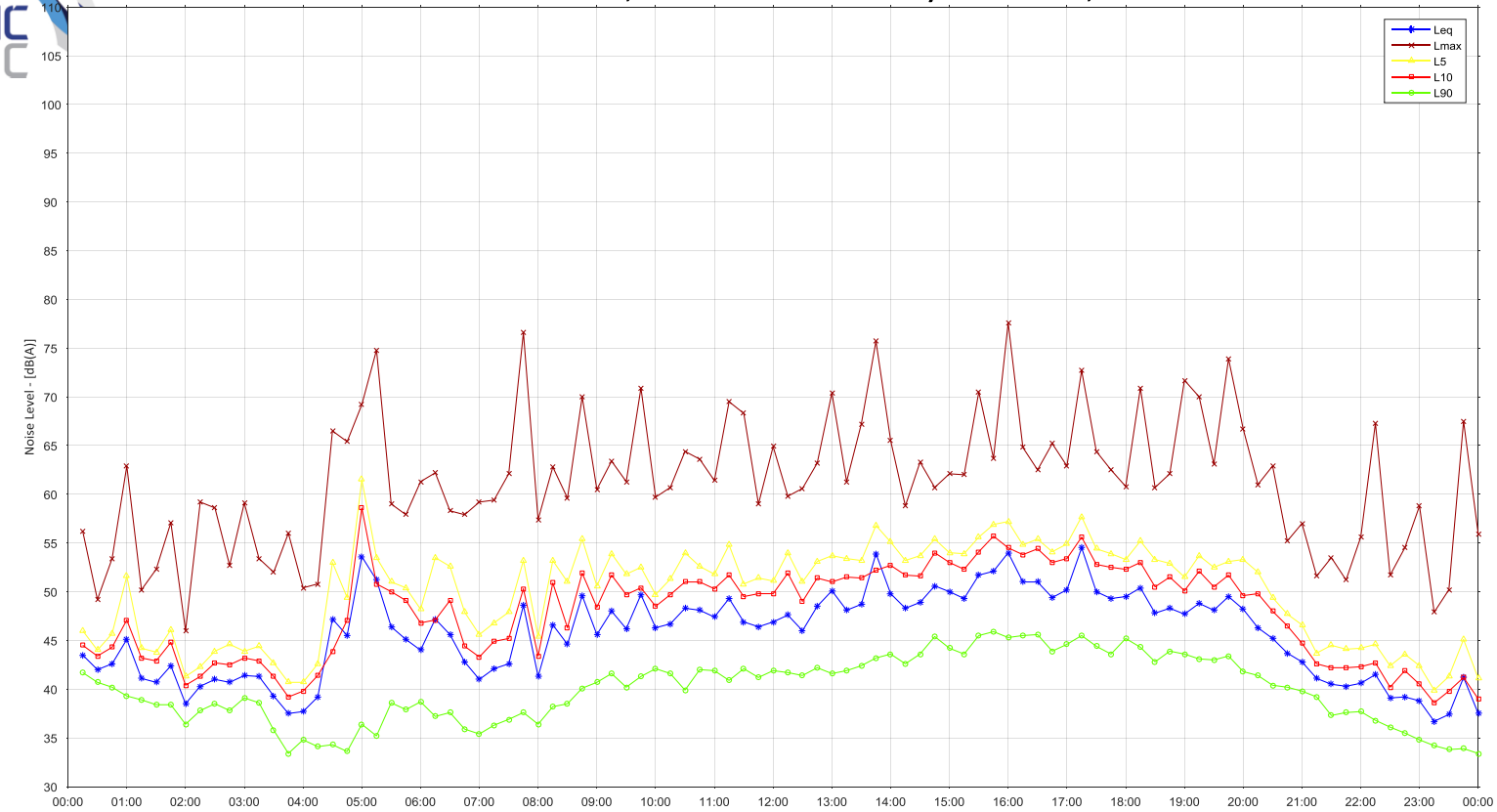
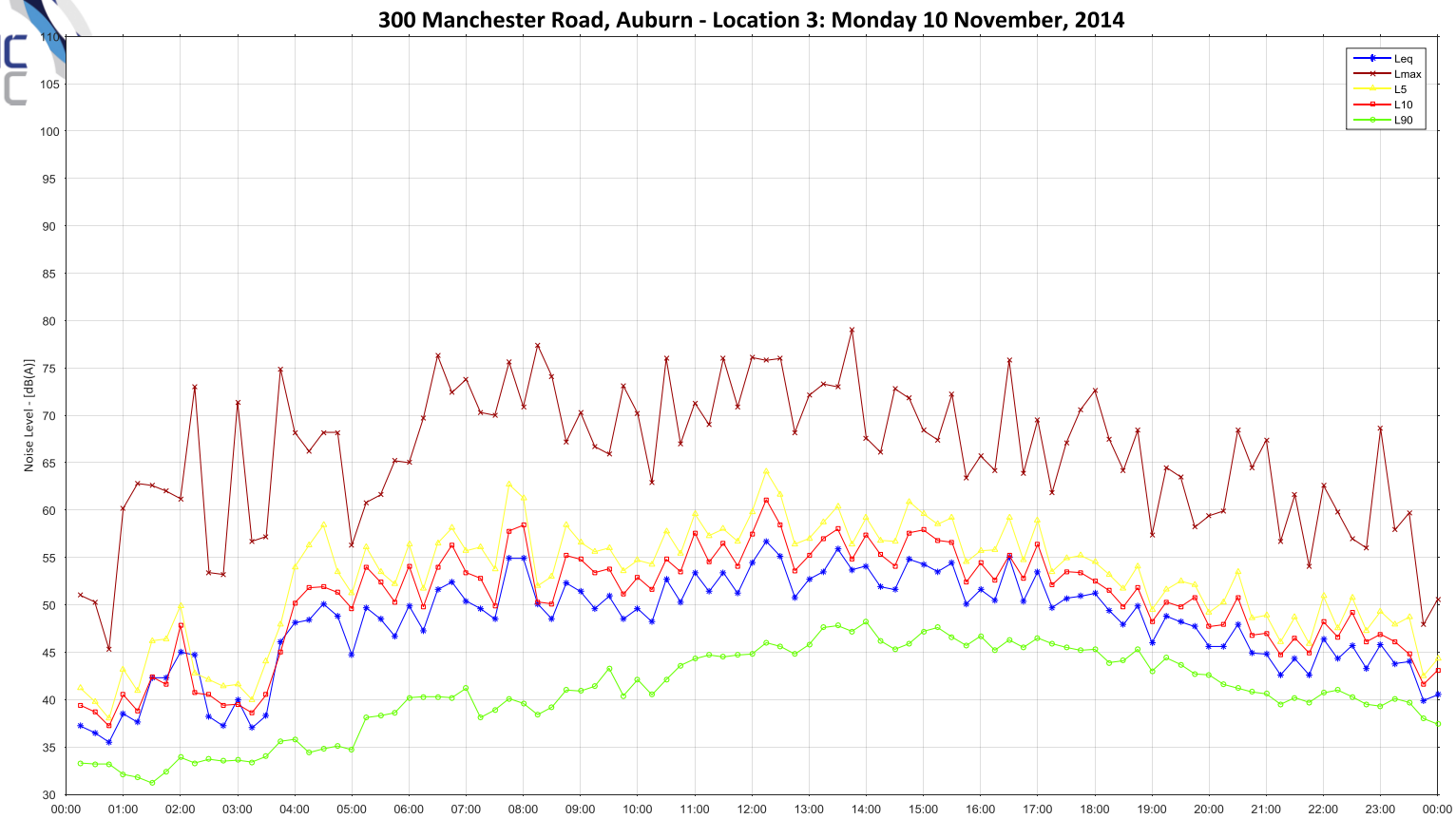
300 Manchester Road, Auburn - Location 3: Sunday 09 November, 2014




300 Manchester Road, Auburn - Location 3: Monday 10 November, 2014
Noise Level - [dB(A)]
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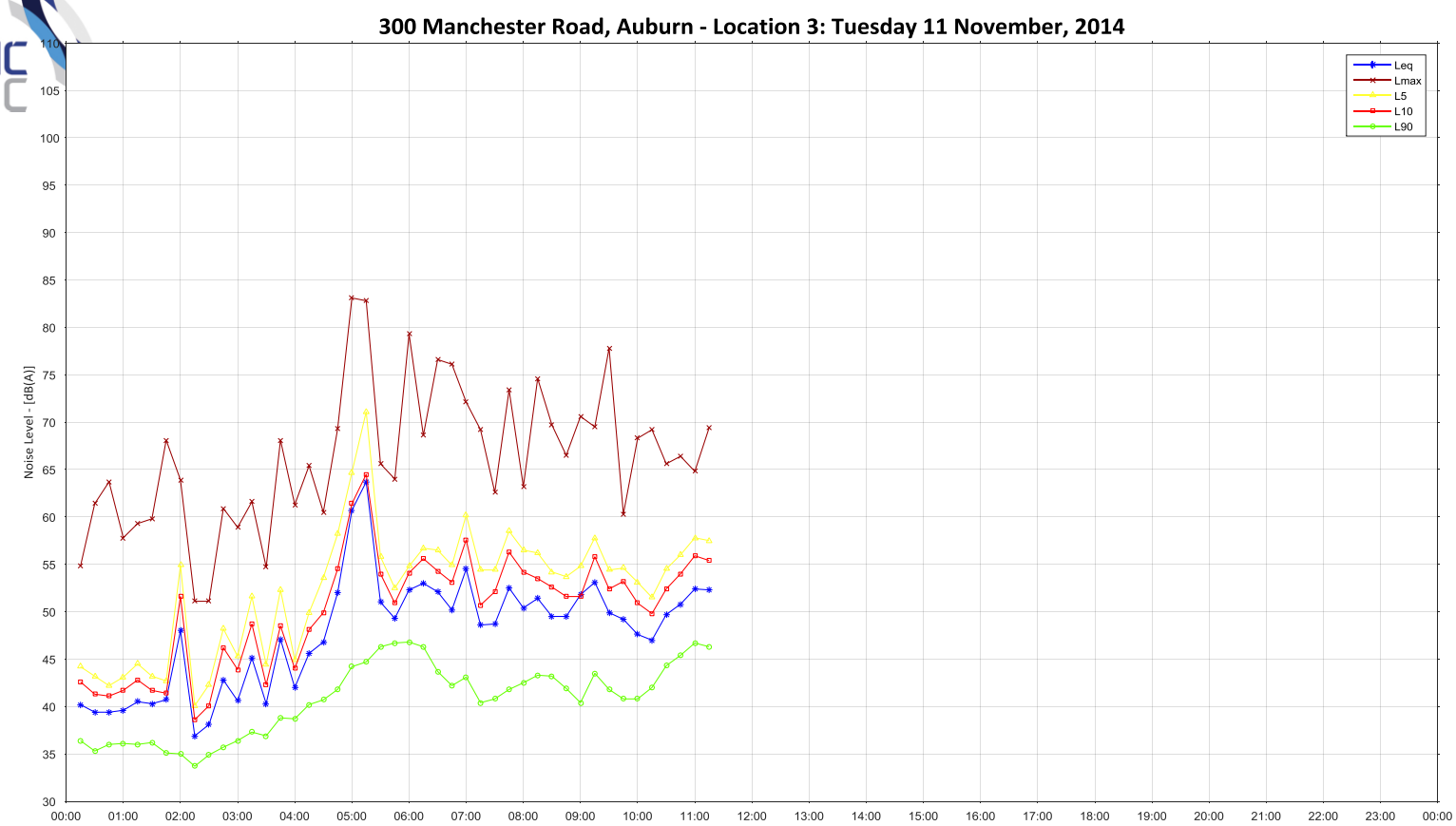
300 Manchester Road, Auburn - Location 3: Tuesday 11 November, 2014
Noise Level - [dB(A)]
Leq
Lmax
L5
L10
L90
110
105
100
95
90
85
80
75
70
65
60
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