

Midland Metro Extensions – Noise and Vibration Policy

February 2014

1. Mission Statement

In promoting and delivering Midland Metro Extensions Centro is committed to contributing towards sustainable development through considering environmental, social, ethical and community factors in addition to economic and engineering viability. Part of this commitment is to adopt and continually reflect best practice in controlling noise and vibration impacts.

2. Introduction

Through its experience of operating Line 1 of the Midland Metro, Centro has gained an understanding of the noise and vibration that is generated by the tramway system. Centro will use this experience in planning and operating extensions to the system so as to minimise disturbance from noise and vibration.

This Noise and Vibration Policy addresses the design and operation of future extensions to the Midland Metro system. Impacts during construction processes will be covered in the relevant project Code of Construction Practice.

3. Standards and Guidelines

Centro commits to adopting:-

The guiding principles set out in Planning Policy Guidance Note 24, Planning and Noise (PPG24);

The Noise Insulation (Railways and other Guided Transport Systems) Regulations 1996 (as amended); and

Other Best Practice guidance, as appropriate.

Centro will adopt appropriate noise and vibration emission standards in the procurement of new Metro vehicles.

4. Noise Insulation Regulations

Noise insulation is mandatory for residential properties in accordance with the Noise Insulation Regulations at the qualifying facade levels:

Centro will strive to remain below these levels, which are as follows:

68dB L_{Aeq} Daytime Hours 06:00 – 00:00 hours

63dB L_{Aeq} Night time Hours 00:00 – 06:00 hours.

A further qualifying free-field target level of 82dB $L_{Amax, slow}$, up to a maximum of 6 times per hour at night (00:00 – 06:00) will apply for the purposes of avoiding sleep disturbance, where at-source mitigation measures are not practicable.

For insulation to be offered, tram noise must be proved to exceed the relevant noise level by at least 1dB(A).

5. Noise Mitigation At Source

There are no statutory requirements for the mitigation of noise levels below the Noise Insulation Regulations standards. However, consideration will be given to developing mitigation measures at lower noise levels where significant impacts are predicted and where it is reasonable and appropriate to do so. To this end, whilst PPG24 is not explicitly intended for assessing the impact of new noise sources on existing buildings, it is adopted here as a reasonable basis for specifying threshold levels for mitigation. Mitigation will be considered for noise sensitive receivers including all types of dwellings, schools, libraries, hospitals and places of worship.

The threshold above which noise mitigation will be considered is taken as the free-field noise levels at the top of the Noise Exposure Category A from PPG24. These levels are:

55dB L_{Aeq} Day-time Hours 06:00 – 00:00 hours

45dB L_{Aeq} Night-time Hours 00:00 – 06:00 hours

In line with current guidance, 3dB (A) is taken as the limit to the human perception of any change in environmental noise.

Where tram noise is measured to be above these thresholds (i.e. by at least 3 dB(A)), mitigation measures to reduce the adverse impact of noise intrusion shall be implemented according to the extent to which the pre-

existing ambient (L_{Aeq}) noise levels are increased, under the following criteria:

Increase of less than 3dB(A)	No mitigation required
Increase of more than 5dB(A)	Mitigation considered on a case by case basis, with increasing priority for greater noise increase

Mitigation measures shall be implemented using “Best Practicable Means”, i.e. measures shall be reasonably practicable, having regard to local conditions and circumstances, to the current state of technical knowledge and to the financial implications, in so far as compatible with safe working practice and any duty imposed by law. For example, mitigation will usually take the form of technically proven measures, such as trackside noise bunds, noise barriers and track treatments, with due regard to local considerations such as potential conflicts with road traffic, concerns of track safety, driver sightlines, visual impact, security and construction and maintenance considerations. In each case, the measures shall be commensurate with the noise impact and at reasonable cost.

Buildings used for particularly sensitive activities, such as public musical performances, may need special attention. These will be considered on a case-by-case basis, with any necessary mitigation measures developed using Best Practicable Means

6. Vibration

Where significant impacts are predicted, and where it is reasonable and appropriate to do so, vibration mitigations will be considered for vibration sensitive receivers, including all types of dwellings, schools, libraries, hospitals and places of worship. Trackforms will be designed using Best Practicable Means to keep within the guideline levels of Vibration Dose Value (VDV) given in BS 6472-1, 2008 below which the probability of adverse comment is low:

Threshold levels will be:

Day-time	06:00 – 00:00	$0.4\text{m/s}^{1.75}$; and
Night- time	00:00 – 06:00	$0.2\text{m/s}^{1.75}$

Buildings housing particularly sensitive equipment, such as research and medical facilities, may need special attention. These will be considered on

a case-by-case basis, with any necessary mitigation measures developed using Best Practicable Means

7. Ground –Borne Noise

Ground – borne noise may result when tram generated vibration propagates through the ground into a building, causing structural elements to radiate noise. To minimise the impact of ground-borne noise, Best Practicable Means shall be employed to keep within the following guideline levels:

Building Type	Ground-borne Noise Target Level dB LA_{max, slow}
Dwellings, schools, hospitals	40
Places of worship, courts, libraries, lecture theatres	35
TV & Recording Studios	30
Theatres, Concert Halls	25

8. Monitoring and Maintenance

Centro is committed to maintaining the tram system, and in particular the wheel and rail surfaces, so as to minimise noise and vibration at sensitive receptors. For each extension an appropriate noise and vibration monitoring scheme will be agreed with the relevant Local Authorities. The results will be used to inform wheel and track maintenance programmes in order to ensure unnecessary increases in noise or vibration are avoided.

Centro will give due notice to Local Authorities and affected residents of any plans to carry out potentially noisy maintenance activities such as rail grinding.

9. Turn- backs and Crossovers at Sensitive Locations

Where it is planned to install turn-back and crossover facilities alongside a location that is sensitive to noise and vibration, Centro will

undertake to plan into the design the provision of lift-over crossings, which are proven in their ability to reduce both noise and vibration at such locations.