

LONDON ASSEMBLY

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Zack Polanski AM

Chair of the Environment Committee 2021-23

Andy Lord
Commissioner, Transport for London
(Sent by email)

11 May 2023

Dear Andy,

I am writing to you as Chair of the London Assembly Environment Committee regarding the impacts of excessive tube noise on Londoners. This is an area the Committee have been exploring as part of our investigation into light and noise in London, which involved two meetings in which the following people gave evidence:

20 October 2022

- Lucy Hayward-Speight (Transport Strategy and Policy Manager, Transport for London)
- Sam Longman (Head of Sustainability and Corporate Environment, Transport for London)
- Neil Smith (Campaigner, Tube Noise)
- Duncan Weir (Head of Track, Transport for London)
- Professor Charlotte Clark (Population Health Research Institute, St George's University)

7 February 2023

- Rick Norman (Head of Noise Strategy, Heathrow Airport)
- Becky Coffin (Director of Communities and Sustainability, Heathrow Airport)

Following this investigation, we have set out recommendations to TfL below. These are designed to address the following:

- 1) Greater data transparency
- 2) Improved communication with Londoners
- 3) Investing in track improvements

Environmental noise has been recognised by the World Health Organization (WHO) as the second largest environmental health risk in Western Europe, behind air quality. Prolonged exposure to environmental noise has been shown to have harmful effects on mental and physical health, including impaired cognitive development in children, tinnitus, sleep disturbance, and even heart disease.¹ Tube Noise has been a persistent issue in London with serious consequences for residents. 1,341 tube noise complaints were made between January 2020 and August 2022.² These numbers include both in-carriage complaints made about sound levels inside the trains and residential complaints from nearby properties.³

There is a difference between in-carriage and in-dwelling noise in both duration and frequency. In-carriage noise can be louder over a shorter period but in-dwelling is repeated every few minutes throughout the day and all night long on Fridays and Saturdays when the Night Tube is running.

Independent research assessing sound pressure levels on moving London Underground carriages between 2006-2019, published in The Laryngoscope journal, found that *“passengers were routinely and consistently subjected to sound pressure levels exceeding 80 dBA, with levels sometimes reaching over 100 dBA”*.⁴ Placing these numbers into context, Transport for London’s (TfL’s) own submissions to the Environment Committee categorise 80 – 100 decibels as ‘hazardous’, with 80-90 decibels comparative to the noise levels of a busy restaurant, and 90-100 decibels similar to that of power tools.⁵ A decibel range of over 100 decibels however is designated as ‘highly hazardous’, with readings comparative to chain saws, rivet hammers and even an aircraft taking off.⁶

Despite there being no legal limit on the noise a tube can emit, TfL is obligated to minimise the disturbance caused, whilst undertaking their statutory duties.⁷

¹ World Health Organisation, [Environmental Noise Guidelines for the European Region](#), 2018.

² MQ2022/2800, [Noise complaints about all Underground lines including the Elizabeth line | London City Hall, 15 September 2022](#)

³ MQ2022/2800, [Noise complaints about all Underground lines including the Elizabeth line | London City Hall, 15 September 2022](#)

⁴ [Noise Exposure on the London Underground, an Observational Study over a Decade - PubMed \(nih.gov\), 7 February 2020](#)

⁵ Duncan Weir to Zack Polanski, Commitment Response Letter, 9 December 2022

⁶ Correspondence from Duncan Weir to the Environment Committee, 9 December 2022

⁷ [Tube noise \[1\] | London City Hall](#)

As well as in-carriage noise, many people living near tube lines are also seriously affected by tube noise. Neil Smith, a tube noise campaigner who lives near the Victoria line in Islington, explained the negative impact caused “by 72 trains per hour (36 in each direction) i.e., more than one a minute”, stating:

“Some residents were registering close to +/-60 decibels, equivalent to a vacuum cleaner in the room with you.”⁸

Duncan Weir, then Head of Track for London Underground, attended the Environment Committee’s meeting on 20 October 2022. He gave evidence on how TfL are attempting to reduce tube noise, including how this is informed by the complaints process.⁹

The Committee recognise the work that TfL have been undertaking in this area. The following recommendations are based on evidence from the meeting and written correspondence afterwards, as well as a private briefing with Assembly Members on 9 March 2023.

1. Greater data transparency

Recommendation 1: TfL should provide more detailed and transparent disclosure of tube noise data to Londoners on its website, through quarterly reports. This data should cover separate total complaints for carriage noise and residential noise, as well as noise monitoring measurements across TfL’s network.

TfL’s official noise measurements are currently not publicly available across its tube network.

The issue of data transparency from TfL and the actions that would be taken was raised by Neil Smith in the Committee meeting in October 2022:

“One of the things that is very, very frustrating is the lack of sharing of data with us. We have our experience, we have our apps, which measure the decibels and things, but TfL has a lot of data and is very reluctant to share it with us. We have conversations - and I do not want to overly criticise TfL because they have done a fantastic job since April 2020 - but the conversation goes along the lines of, “We have data that shows... therefore we conclude that...” I am being oversimplistic here. We residents, on the other side, and my group is over 100 homes in our area, are saying, “Yes, but we are experiencing it, we know what happens when you stop grinding and when you change the model of rails that you put in the Tube”.¹⁰

He concluded that the lack of “meaningful data” means residents “have to rely on our own ability to measure the noise and vibration.”¹¹

⁸ Correspondence from Neil Smith to the Greater London Authority, 16 October 2022

⁹ [\(Public Pack\) Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](#)

¹⁰ [\(Public Pack\) Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](#)

¹¹ Email from Neil Smith to Transport Committee staff, 16 October 2022

There are several examples of independent in-carriage monitoring of noise levels, including a 2019 map by the noise management company EAVE,¹² and decibel level measurements submitted in TfL's online Tech Forum for open data submissions that were collected using a computer-based sound meter in 2019.¹³ These indicate that it is technically feasible to routinely monitor noise levels and make the data available to Londoners.

Currently, TfL send updates on some aspects of tube noise and vibration to Assembly Members on a six-monthly basis. These updates have included information on:

- New complaints
- The trend of complaints over a six-month timeframe
- A heat map of new complaints across London Residential noise measurement reports issued
- Complaints by London borough
- Rail grinding updates¹⁴

The heat map displays the concentration of open noise complaints along the Tube network,¹⁵ and is included as an Annex to this letter.¹⁶

These updates do not include noise monitoring measurement data across its network. The data also provided groups complaints about carriage noise and residential noise together.

The Committee therefore requests more detailed and transparent disclosure of tube noise data to Londoners on its website, through quarterly reports. This data should include all the information currently received by the Committee on a six-monthly basis, as well as noise monitoring measurements across TfL's network. Complaints data should separate carriage and residential noise complaints.

2. Improved communication with Londoners

Recommendation 2: TfL should continue to improve its complaints process on its reporting page to enable clear categorisation of data collected. It should also disclose the number of complaints resolved and user satisfaction levels with how complaints are dealt with on a quarterly basis.

TfL states that its current stakeholder engagement channels on tube noise are:

- TfL's Noise and Vibration Steering Group
- Six-monthly updates to the London Assembly
- Meetings with residents and elected representatives
- Mayor's Questions
- TfL's Contact Centre

¹² See Appendix, Figure 1

¹³ [Transport for London services - measured train noise levels Zones 1&2 - Open Data - TfL Tech Forum](#) See Appendix Figure 2

¹⁴ TfL, Residential tube noise and vibration update: May-October 2021

¹⁵ Correspondence from Duncan Weir to the Environment Committee, 9 December 2022

¹⁶ See Appendix, Figure 3

- TfL's Government Relations Team¹⁷

TfL stated in correspondence on 12 August 2022 to Assembly Members that:

*"We continue to investigate every noise complaint we receive thoroughly and promptly, and all interventions are made following a full investigation. We therefore ask residents to get in touch with the TfL Contact Centre with any complaints, as this helps us to identify any noise 'hotspots.' Please continue to encourage your constituents to do so should they contact you with any noise-related concerns by calling 0343 222 1234 or visiting <https://tfl.gov.uk/help-and-contact/contact-us-about-tube-and-rail>. We will respond to any noise complaints within 14 days and key sites are reviewed monthly by senior management"*¹⁸

However, the user interface for the online complaints process is problematic, as outlined in the October 2022 Environment Committee by Neil Smith:

*"What it says when you go on is, "Do you want to enter your noise and vibration complaint?" It says, "What is your problem?" You say, "Noise and vibration". Then lower down it says, "When did you travel?" Now, I did not travel. I am sitting in my home. [...] Instead of saying, first of all, "Are you a staff member? Are you someone who is travelling or are you a resident?" Then you click on that and then you enter your complaint. That would help everybody, the people trying to complain and TfL, because then the data collection would be instant and immediate and categorised very clearly and simply. I have been asking for that for, as I say, six years. There has been a slight change, but that categorisation would be so helpful to the individuals and to TfL."*¹⁹

Duncan Weir recognised this idea as a sensible suggestion and stated he would raise it in the next steering group.²⁰ He subsequently updated the Committee on progress:

"This year, we have added a section to our main Help & Contacts page on our website titled 'Tube, Rail, Overground, DLR, Trams, stations – Noise and vibration', which makes it easier for both customers and residents to report noise and vibration concerns. We have also edited the reporting page to prompt website users to report the date and time of not only travel but Tube noise occurrences, making it clearer that Tube noise issues affecting residents as well as passengers can be reported. Residents or passengers who contact us online are sent a further form to fill out with more information.

While this may seem like a long process to some, including residents who experience multiple occurrences of Tube noise, it is essential in helping us to gather as much

¹⁷ [Tube Noise Presentation \(tfl.gov.uk\), 6 December 2022, slide 13](#)

¹⁸ Andy Lord, Correspondence to London Assembly, 12 August 2022

¹⁹ [\(Public Pack\)Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](#)

²⁰ [\(Public Pack\)Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](#)

*information as possible so we can monitor noise levels and respond to complaints adequately, as well as identify specific noise hotspots. As set out above, however, we do not rely on complaints to continue to monitor those areas of known concerns. If noise is reported at a property, an engineer will contact the resident about taking measurements”.*²¹

Within TfL’s tube noise presentation to its Board on 6 December 2022, an infographic was displayed showing the internal structure of the complaints handling process, which is included in the Annex of this letter.²² It includes two separate complaints logging entities, whether an intervention can be made, and the pathway towards hotspots being reviewed by the Noise & Vibration Steering Group.²³

However, for the purposes of accessibility, a further form sent to residents or passengers who complain on TfL’s website may dissuade Londoners from reporting due to additional time expenditure and process. We welcome that the online form has been updated to explicitly allow for people to report dates and instances of noise “occurrences” as well as travel. However, the stated changes to the online complaints reporting page do not account for the issue of data categorisation identified in the Committee Meeting. The Committee therefore recommends that TfL simplifies the reporting process further by including options for residents and individual travellers on the reporting page itself. TfL should also disclose on a quarterly basis the number of complaints resolved and user satisfaction levels with how complaints are dealt with, and monitor this alongside numbers of complaints reported.

3. Investing in track improvements

Recommendation 3: TfL should communicate the status of its new solutions to mitigate both residential and in-carriage tube noise, including current trials, to all Londoners. This should be in the form of easily accessible summaries, published on its website every three months.

The Committee recognises the constructive work of TfL in communicating with residents when mitigating excessive tube noise, despite the complex challenges involved. In the past five years TfL have spent approximately £7-10 million a year on rail grinding, including carrying out over 30,000m of rail grinding to lower noise levels for residents, customers and train operators.²⁴ This aims to reduce corrugation (rail roughness), which is the primary cause of noise.²⁵

TfL’s presentation on 9 March 2023 to Assembly Members showed that the use of Pandrol Vanguard,²⁶ a track fastening product introduced ahead of the opening of the night tube, reduced residential noise but increased in-tunnel noise by trapping energy and causing faster corrugation. Instead, alternative approaches have been trialled, including the use of

²¹ Correspondence from Duncan Weir to the Environment Committee, 9 December 2022

²² See Appendix, Figure 4

²³ [Tube Noise Presentation \(tfl.gov.uk\), 6 December 2022](#), slide 12

²⁴ [Tube Noise Presentation \(tfl.gov.uk\), 6 December 2022](#), slide 9

²⁵ [Tube Noise Presentation \(tfl.gov.uk\), 6 December 2022](#), slide 5

²⁶ Pandrol Vanguard is a “rail fastening system with very low vertical dynamic stiffness that leads to high levels of vibration isolation”, see [V13935 Vanguard-Quick-Facts-Datasheet V2.pdf \(pandrol.com\)](#)

an alternative product – Delkor.²⁷ TfL’s analysis shows that deep tube reconditioning to replace Pandrol Vanguard with Delkor is an effective solution, but very expensive.²⁸

Other approaches include trialling speed variations on the Northern line and on-train lubrication on the Jubilee line extension to minimise screeching noise.²⁹ As there have been spikes in complaints on these two lines from May to August 2022,³⁰ it is important that developments on these solutions are clearly communicated to Londoners.

Recommendation 4: TfL should provide an update to the Assembly on the status of all deep tube reconditioning sites listed for the financial year 2022/23, and a new list of sites planned for 2023/24.

In correspondence to the Committee on 9 December 2022, Duncan Weir said that 36 sites were designated as having started or due to start deep tube reconditioning in the financial year 2022/23.³¹ This work covered areas along the Bakerloo, Central, District, Piccadilly, Jubilee, Northern and Victoria lines. This involves significant financial expenditure - as each metre of deep tube reconditioning costs an estimated £6,500-£8,000.³²

One example of a deep tube reconditioning site that was raised during the Committee meeting is a section of the Victoria line between Highbury & Islington and Kings Cross - requiring significant expenditure of £29 million to undertake this work.³³ Duncan Weir stated he did not have the financial resources to finance this at the time.³⁴ However, he did commit to having a full evaluation on whether this work would go ahead and be completed within six months, but noted that this was “an arbitrary number.”³⁵ When responding to the Committee’s request for information on this matter, Duncan Weir said:

“We are committed to providing the Assembly with twice-yearly written updates on our work to tackle Tube noise across the network. I note this specific request and will ensure an update is provided to the Environment Committee on this specific matter.”³⁶

²⁷ Delkor is an “alternative rail fastening”, which TfL hopes “will replicate the benefits of PV (Pandrol Vanguard) in terms of residential noise, while reducing in-carriage noise for staff and customers” see [FOI request detail - Transport for London \(tfl.gov.uk\)](#)

²⁸ [Tube Noise Presentation \(tfl.gov.uk\)](#), slide 9

²⁹ [Tube Noise Presentation \(tfl.gov.uk\)](#), slide 11

³⁰ MQ2022/2800, [Noise complaints about all Underground lines including the Elizabeth line | London City Hall, 15 September 2022](#)

³¹ Correspondence from Duncan Weir to the Environment Committee, 9 December 2022

³² MQ 2021/2326, [Deep Tube Reconditioning | London City Hall](#), 24 June 2021

³³ MQ2021/2326, [Deep Tube Reconditioning | London City Hall](#), 24 June 2021

³⁴ [\(Public Pack\)Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](#)

³⁵ [\(Public Pack\)Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](#)

³⁶ Correspondence from Duncan Weir to the Environment Committee, 9 December 2022

The Committee is yet to receive this information. But TfL's March 2023 Investment programme report provided a progress update on reconditioning works across the network:

*"We completed 416 meters of deep Tube reconditioning works, bringing the deep Tube total delivered to date to 907 metres against a required scorecard run rate of 750 metres."*³⁷

The Committee recommends that TfL updates the Assembly on the status of deep tube reconditioning of all 36 sites as soon as is practicable.

Recommendation 5: TfL should clarify the allocation of its track renewal expenditure for deep tube reconditioning and rail grinding for the 2023/24 financial year. It should also draw upon its financial resources to give reasonable priority to tube noise concerns. This should be actioned in the context of the funding deal reached with the government in August 2022, and the increased overall amount received by TfL in the 2023 Greater London Authority (GLA) Budget. In response to this letter, TfL should set out how many sites have received deep Tube reconditioning work in 2022-23.

On January 2022, you highlighted the effects of the pandemic and funding uncertainty on TfL's ability to tackle tube noise, noting that *"long-term and expensive interventions – remain limited"* and that *"A lack of certainty over future investment risks further limiting the works we are able to undertake and may lead to the prioritisation of a small range of safety-critical works only."*³⁸ Since then, the long-term funding deal agreed with the Government³⁹ and TfL's new 2023/23 Budget of £11.2 billion have provided more certainty to the organisation.⁴⁰

Duncan Weir explained that there is direct responsibility for tube noise by the Head of Track at TfL, and associated capital works:

*"My capital expenditure budget has reduced, but it is layered for noise and vibration. I used to run the maintenance division for track. Now I run all elements of track, and that happened last year. Therefore I look after the end-to-end life cycle of tracks, all capital work and maintenance. Within my maintenance budget there was a specific provision for £2 million a year for spot interventions on the infrastructure. It has been a journey for noise, for myself as well as the organisation, therefore because I now control all elements of track I now determine which capital works we can undertake."*⁴¹

³⁷ TfL, [Investment programme report Q2 2022-23 \(tfl.gov.uk\)](https://www.tfl.gov.uk/modes/transport/tube/investment-programme-report-q2-2022-23), 1 March 2023

³⁸ Andy Lord, Correspondence to London Assembly, 11 January 2022

³⁹ TfL, [TfL Statement – Update on Government funding settlement](https://www.tfl.gov.uk/modes/transport/tube/tfl-statement-update-on-government-funding-settlement), 30 August 2022

⁴⁰ Mayor of London, <https://www.london.gov.uk/media/100391/download?attachment>, March 2023

⁴¹ [Public Pack\)Minutes - Appendix 1 - Transcript Minutes Supplement for Environment Committee, 20/10/2022 10:00 \(london.gov.uk\)](https://www.london.gov.uk/press-releases/mayor/public-pack-minutes-appendix-1-transcript-minutes-supplement-for-environment-committee-20102022)

In this context, we note that according to TfL documents, its 2022/23 forecast as of September 2021 for Deep Tube Renewal (DTR) was 4,754 metres, which was down by 341 metres compared to its projection in July 2019.⁴² These are the most recent projections that have been publicly disclosed on London Underground track renewal by TfL's Programmes and Investment Committee. There is no further breakdown within these figures for what allocation is apportioned to deep tube reconditioning, rail grinding or other track related solutions to mitigate tube noise.

The Committee recognises the complex challenges affecting TfL's ability to deal with tube noise, in particular the financial impacts of the pandemic, operational restrictions such as having only two rail grinding machines and the unique design of the tube underground system.⁴³ However, the Committee recommends that TfL clarifies the allocation of its track renewal expenditure for deep tube reconditioning and rail grinding for future financial years, and draws upon its financial resources to prioritise tube noise concerns, as TfL is now in a phase of greater stability.

The Committee would welcome a response by XXX. Please address your response to Richard Clarke, Senior Policy Adviser, at Richard.Clarke@london.gov.uk.

Yours sincerely,

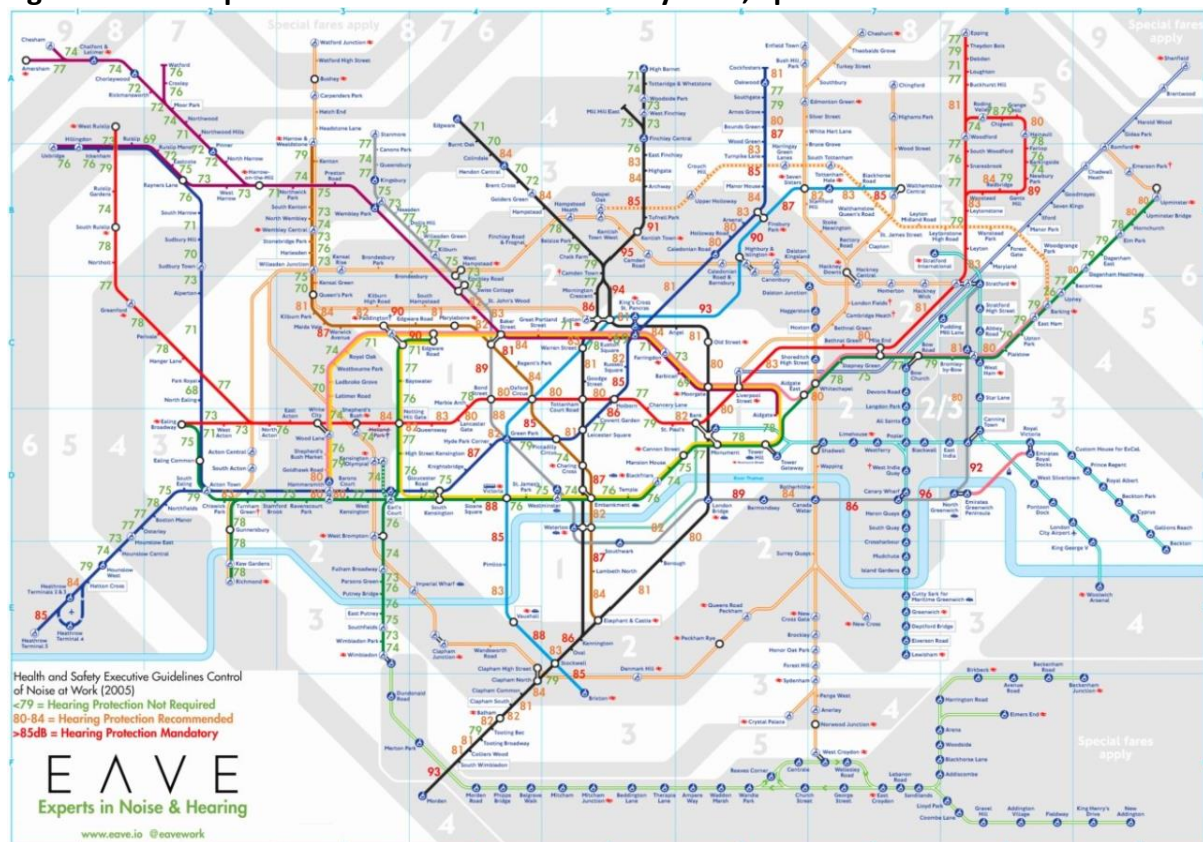
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⁴² TfL, [pic-20211013-Item11-Part1-lu-track.pdf \(tfl.gov.uk\)](#), 13 October 2021

⁴³ [Tube Noise Presentation \(tfl.gov.uk\)](#), 6 December 2022, slide 8

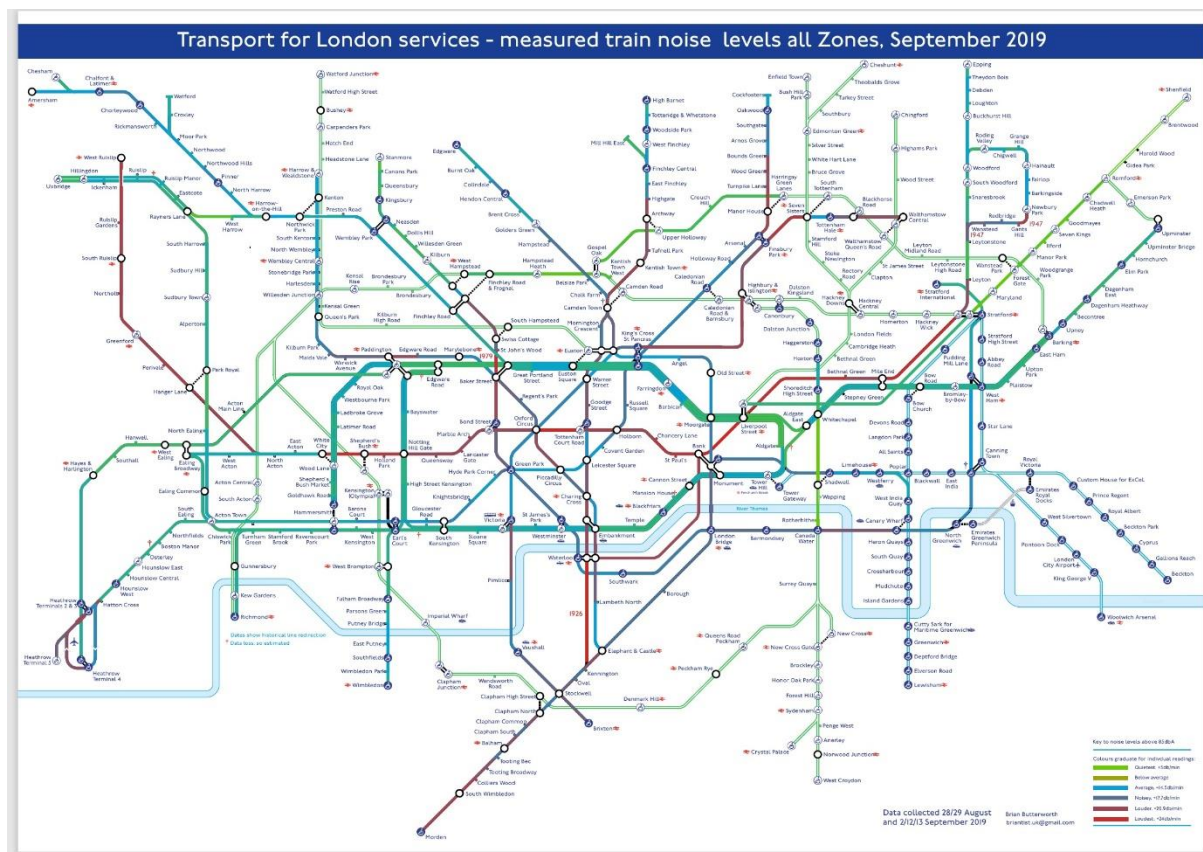
Appendix

Figure 1: Tube Map based on decibel levels recorded by EAVE, April 2019⁴⁴



⁴⁴ [London Underground noise levels revealed — EAVE](#)

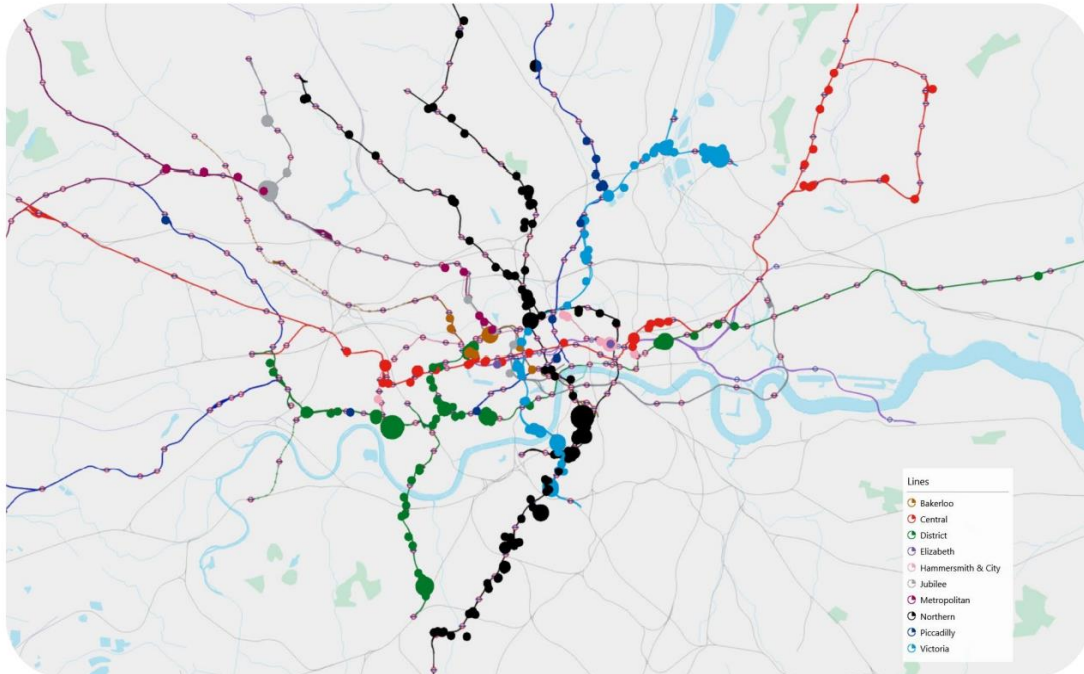
Figure 2: Tube Map based on decibel levels submitted on TFL's Tech Forum, September 2019⁴⁵



⁴⁵ [Transport for London services - measured train noise levels Zones 1&2 - Open Data - TfL Tech Forum](#)

Figure 3: Heat map of open tube noise complaints submitted by TfL, December 2019⁴⁶

Tube Noise Hotspots



Map shows areas of complaints across London, by Tube line. Bigger dots indicate larger numbers of complaints.

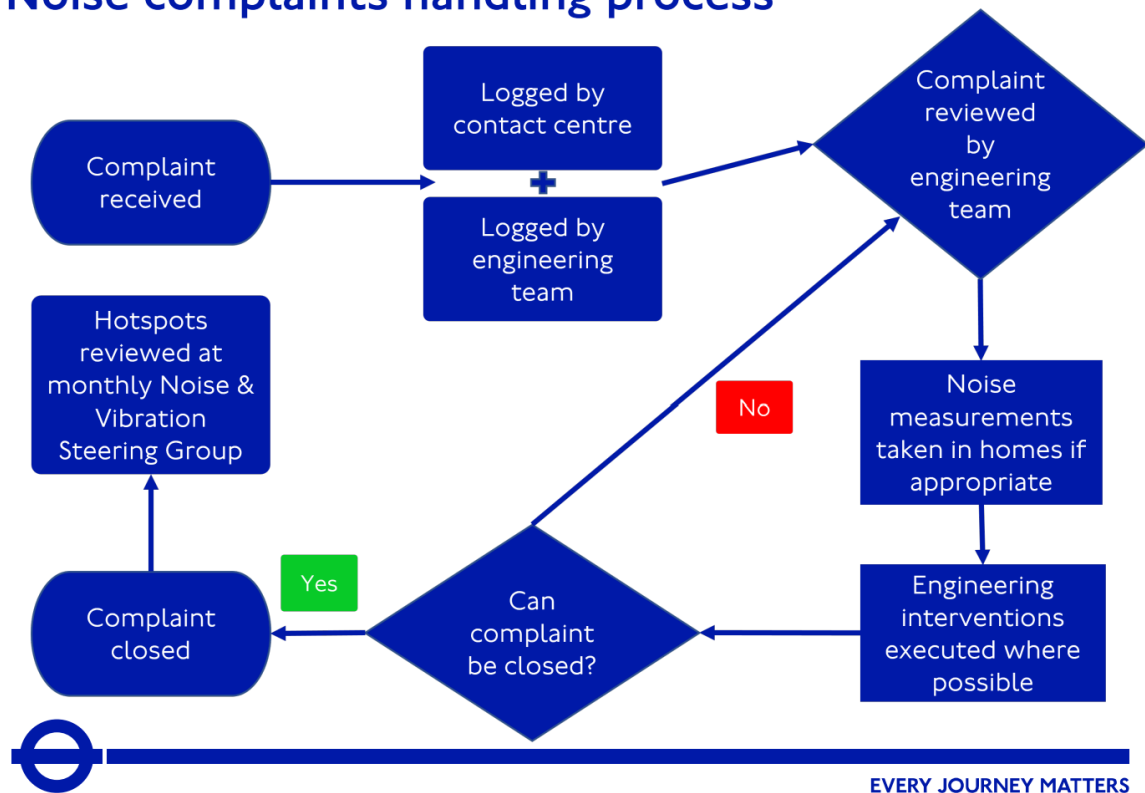


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⁴⁶ [Tube Noise Presentation \(tfl.gov.uk\)](https://tfl.gov.uk), 6 December 2022, slide 7

Figure 4: Infographic of TfL's noise complaints handling process⁴⁷

Noise complaints handling process



⁴⁷ [Tube Noise Presentation \(tfl.gov.uk\)](#), 6 December 2022, slide 11