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| Committee(s) | Dated: |
| Port Health and Environmental Services | 15 th January 2019 |
| Subject: Measurement and mitigation options for operational rail noise from London Underground affecting the Barbican Estate. | Public |
| Report of: Director of Markets and Consumer Protection | For Information (PHES) |
| Report author: Rachel Pye, Assistant Director, Public Protection. | |

Summary

Operational rail noise from London Underground Limited (LUL) sub-surface Circle, Hammersmith and City and Metropolitan lines running beneath the Barbican Estate, between Barbican and Moorgate Stations continues to affect residents of the Barbican Estate.

The importance of this as a public health issue is recognised and officers commissioned an independent investigation and subsequent report, examining -

- The potential public health impact to residents;
- The acceptability of existing noise / vibration levels experienced;
- The potential impacts of night tube to residents;
- Mitigation options.

The report is presented here and will be used to inform further discussions with LUL as to what mitigation measures may be implemented to gain a reduction in the noise and vibration experienced.

This work meets the key aims of the City's Noise Strategy 2016 to 2026 and the Corporate Plan outcome "People enjoy good health and wellbeing".

Recommendation

The contents be noted and the further actions in paragraphs 15 to 18 be endorsed, subject to any comments by this committee.

Main Report

Background

1. Parts of the Barbican Estate, specifically Brandon Mews, Defoe House and Lambert Jones Mews are affected by noise and vibration generated by London

Underground trains running on the Circle, Hammersmith and City and Metropolitan Lines between Moorgate and Barbican Stations.

2. Vibration created by LUL train services propagates through the ground and surrounding structures and results in the vibration of floors, walls and ceilings, this can be heard as a low frequency 'rumbling' sound.
3. The effects of noise and vibration from the railway were considered when the existing railway was realigned and enclosed in 1965; historical records show that mitigation in the form of separation to the railway and the Barbican structure and the placing of the precast deck on rubber blocks was part of the design.
4. Complaints however, began to emerge in the late 1970's and there is written evidence of complaints and subsequent noise studies dating back to the 1990s in LUL and City archives.
5. More recently residents are reporting an increase in the noise and vibration experienced and a number of previously unaffected properties have raised complaints.
6. City officers have been in discussion with LUL for some time to determine the level and extent of the disturbing noise and vibration, the primary causes and an examination of measures that could be implemented to mitigate it.
7. The Chairmen of Port Health and Environmental Services (PHES) and Planning and Transportation Committee's raised the issue of operational train noise in July 2016, November 2017 and again in July 2018 in letters to Mark Wild, the Managing Director of London Underground. Positive responses were received and LUL have shown a positive attitude to date in resolving the matter.
8. Whilst improvements have been secured by activities such as rail grinding and partial track replacement; and issues with construction noise on the running tunnels and stations have now been resolved, the disturbance from operational rail noise under the Barbican remains caused in part by rail discontinuities, joints and points.
9. To assist the investigation the City appointed independent expert consultancy, Cole Jarman to review the work undertaken to date, carry out independent measurements and present suggestions as to what mitigation measures might be available in order to mitigate the effects of the operational railway on Barbican residents.

Measurement Summary

10. Independent initial measurements have been carried out to determine levels of noise and vibration generated at four properties (1 property in each of Brandon Mews, Defoe House, Lambert Jones Mews and Gilbert House) on the Barbican Estate located above the LUL railway lines. The measurements are broadly in line with those most recently recorded by LUL.
11. Noise level changes, although identifiable, are less obvious than vibration level changes because LUL pass-by noise levels are not significantly higher than the

background noise during parts of the day when people are active. Vibration level changes are more identifiable as very few naturally occurring sources can excite a building structure to the same extent as an underground train.

12. The data acquired over different times of the day show that both noise and vibration generated by LUL train pass-bys exceed the background levels by a greater amount in the very early morning or late evening and are more perceptible, seeming louder and are more disturbing.
13. There are no British Standards for assessing ground-borne noise from trains and in the absence of this, guidance has been drawn from guidelines developed for HS1, assessment criteria for the Crossrail project and the World Health Organisation Night Noise Guidelines for Europe 2009. The measured levels of LUL train pass-by in Brandon Mews, Defoe House and Lambert Jones News exceed the thresholds set out in all three sets of guidelines. The noise thermometer on page 29 of the Cole Jarman report provides some context as to the actual levels of noise experienced.

Mitigation Options

14. Part 2 of the Cole Jarman report details and discusses a number of potential mitigation options summarised below;
 - a. Removal of debris and rerouting of services bridging the space between the running tunnel structure and the Barbican structures.
 - b. Rail and wheel grinding.
 - c. Removal of points, crossings and rail discontinuities such as track joints.
 - d. Track replacement using under ballast mat.

The City of London has some responsibility for option a. The City Surveyor and the Barbican are reviewing the works required to meet this recommendation. Option a on its own is not expected to have a significant effect, but taken together with the other options and implemented carefully across the estate, they would be expected to lead to worthwhile results.

Options b, c and d are options only available to LUL.

Further Actions

15. The recommendations made in the Cole Jarman report have been provided to LUL and will form the basis of further discussion where the City will seek commitments as to potential mitigation measures. A detailed response is expected from LUL by the 11th January. A track walk has been scheduled for City Officers on 31st January 2019 to facilitate and inform these further discussions. LUL have committed to undertaking further measurements in properties previously assessed to better understand quantitatively the reduction in noise levels provided by the new section of track.

16. LUL have committed to a Residents Transport Forum to enable liaison between residents and LUL on matters related to the underground railways including Crossrail. The first forum meeting was held on 29th November 2018.
17. The Barbican Estate are reviewing the mitigating options in option a above outside of the tunnels outlined in the report and the possibility of carrying out a scoping exercise to consider the ownership, feasibility, costing and funding implications of carrying out the works.
18. A further report will be made to this committee in July 2019 updating on the outcomes of paragraphs 15, 16 and 17 above.
19. I propose that, subject to comments received, the above actions are progressed.

Legal Position

20. The City's statutory powers in dealing with nuisance are contained in Part III Environmental Protection Act 1990. Section 80 of the Act provides that where a local authority is satisfied as to the existence of a statutory nuisance it shall serve a notice requiring the abatement of the nuisance. Section 79 of the Act defines matters which can be considered to constitute a statutory nuisance which includes noise. Failure to comply with an abatement notice is a criminal offence.
21. However, Section 122 Railways Act 1993 provides an authority as a defence to actions in nuisance. In particular, it provides that there shall be an authority to use, or to cause or permit any agent or independent contractor of his to use, rolling stock on any track, any land comprised in a network, station or light maintenance depot for or in connection with the provision of network services, station services or light maintenance services. The authority is subject to "qualifying conditions" which are: -
 - i. In relation to the use of any rolling stock on track, that the track is comprised in a network, station or light maintenance depot, and that the operator of that network, station or light maintenance depot is the holder of an appropriate licence or has the benefit of an appropriate licence exemption;
 - ii. In relation to any use of land for or in connection with the provision of network services, station services or light maintenance services, that the operator of the network, station or light maintenance depot in question is the holder of an appropriate licence or has the benefit of an appropriate licence exemption.
22. London Underground/Transport for London meet the two qualifying conditions and therefore benefit from the authority contained within the legislation and therefore can rely upon the defence of statutory authority in respect of any proceedings, whether criminal or civil, in nuisance. Therefore, in the event that the City of London was satisfied that a statutory nuisance existed it would not be able to serve an abatement notice on London Underground/Transport for London due to the statutory authority contained in Section 122 Railways Act 1993.

23. The potential for control through the planning regime has been investigated and the only relevant condition attached to the original outline planning permission (application no. 4997) dated 7th December 1962, is Condition 4 (xi). This requires details to be submitted for approval of *“any railway cuttings properly covered and integrated with the proposed treatment of the adjoining land”*. This is concerned with the landscaping rather than any noise mitigation issues. It is also worth noting that Informative 9 of the same permission states: *“(9) This permission although requiring the railway cuttings to be covered, does not imply any consent from the London Transport Executive for this work to be carried out; it will be necessary therefore for you to obtain any necessary agreement from the Executive and to satisfy them so far as their requirements are concerned.”* The Informative implies that the structure of the covering tunnels/rafts would need to meet LTE’s requirements rather than any planning/City requirements.
24. In summary, as the noise issue is primarily related to track maintenance rather than any physical changes to the tunnel structures that the issue is not one related to development but rather maintenance, there is no planning control that can be exercised.
25. It is relevant to note that works on LUL/TfL’s operational land that is required in connection with the movement of traffic by rail is permitted development outside of planning control (see Class A, Part 8, Schedule 2 of the Town & Country Planning (General Permitted Development) Order 2015).

Financial Implications

26. The consultant costs of the investigation have been funded from underspend in the Port Health and Public Protection Service budgets.
27. The financial implications for the City of London or London Underground of implementing any mitigation measures are not yet known.

Corporate and Strategic Implications

28. The work on noise supports the aims and objectives of the City of London Noise Strategy 2016 to 2026 and the key Corporate Plan outcome: ‘People enjoy good health and wellbeing’.

Conclusion

29. The City Corporation has carried out an investigation to determine the level and extent of the operational rail noise affecting the Barbican Estate.
30. A report on the primary causes and recommendations as to what measures can be implemented to mitigate it has been produced and provided to LUL for their consideration, the City is awaiting their response.
31. Officers continue to meet LUL and lobby for noise and vibration mitigation to be considered and implemented.

Appendix 1

Cole Jarman: Barbican Estate, LUL Noise and Vibration Measurements and Mitigation Report 18/0197/R3

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