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Editorial

The effect of transportation vibration on the urban acoustic environment

Urban transportation networks represent an interesting modal transfer since they significantly alleviate traffic congestion and pollution. However, especially road and rail networks are subject to some drawbacks, particularly problems related to noise and vibration. Considerable efforts have been made to reduce the generated vibrations, improving the inhabitants' comfort as well as the protection of buildings. However, ground-borne noise and vibration is still considered as a major factor affecting the urban environment and local soundscape.

This Virtual Special Issue of the international journal "Science of the Total Environment" (STOTEN) is dedicated to environmental problem induced by urban transport in the field of ground-borne and airborne Noise and vibration. Combined with past special issues (Kassomenos et al., 2014, 2016), this Issue offers the recent state-of-the-art research works in the environmental ground-borne and vibration noise related to transportation networks.

For this issue, six papers have been selected, after and rigorous peer-review. Song and Li (2018) proposed an efficient combined acoustic and dynamic model to predict the noise emitted by light rapid transit concrete bridges and suggested some mitigation measures such as noise barrier and sound absorbing panel. Vogiatzis et al. (2018) developed an innovative large-scale measurement monitoring system along the Athens Metro Line 3 (Greece) during the extension phase in order to verify that sensitive receptors are prevented from possible damage face to high vibration and ground borne noise emissions. Zhang et al. (2018) studied the structural acoustic radiation of box girder bridge and revealed the effective characteristic and mechanism of radiation thanks to vibro-acoustic methods. Ngamkhanong and Kaewunruen (2018) showed that specific railway equipments (overhead line equipments) are sensitive to ground-borne vibration and resonance phenomena could occur, amplifying the effects of a ground vibration about tenfold. Ainalis et al. (2018) presented a new method for evaluating the peak particle velocity and the dominant frequencies related to ground vibrations, including road and rail sources. Ducarne et al. (2018) developed an original method working in two steps, able to predict with accuracy the ground vibrations of a truck driving over a speed hump.

The papers accepted in this Virtual Special Issue cover a limited number of problems and mitigation solutions. However, they strongly contribute to draw to this subject the attention it deserves taking into account the implications on railway vehicle to environmental noise and vibration. They involve a wide range of papers dedicated to various form of by light rapid transit vehicles (tram, metro, subway, …), trucks and associated lines construction.

We hope that this Virtual Special Issue will be interesting for researchers and engineers working in the field of traffic-induced noise and vibration. We are convinced that this issue illustrates the broad variety of environmental problems found for road and rail transport systems.

Finally, we thank all the authors and reviewers for their great contributions and valuable efforts to this issue.

References

Ainalis, D., Ducarne, L., Kaufmann, O., Tshibangu, J.-P., Verlinden, O., Kouroussis, G., 2018. Improved analysis of ground vibrations produced by man-made sources. Sci. Total Environ. 616–617, 517–530. https://doi.org/10.1016/j.scitotenv.2017.10.291 (ISSN 0048-9697).

Ducarne, L., Ainalis, D., Kouroussis, G., 2018. Assessing the ground vibrations produced by a heavy vehicle traversing a traffic obstacle. Sci. Total Environ. 612, 1568–1576. https://doi.org/10.1016/j.scitotenv.2017.08.226 (ISSN 0048-9697).

Kassomenos, P., Vogiatzis, K., Bento Coelho, J.L., 2014. Critical issues on environmental noise: editorial. Sci. Total Environ. 482–483, 399. https://doi.org/10.1016/j.scitotenv.2014.02.108 (ISSN 0048-9697).

Kassomenos, P., Vogiatzis, K., Kouroussis, G., 2016. Special issue on impact on the urban environment and the quality of life from the construction and operation of LRT (light rapid transit) systems. Sci. Total Environ. 568, 1275. https://doi.org/10.1016/j.scitotenv.2016.06.246 (ISSN 0048-9697).

Ngamkhanong, C., Kaewunruen, S., 2018. The effect of ground borne vibrations from high speed train on overhead line equipment (OHLE) structure considering soil-structure interaction. Sci. Total Environ. 627, 934–941. https://doi.org/10.1016/j.scitotenv.2018.01.298 (ISSN 0048-9697).

Song, X., Li, Q., 2018. Numerical and experimental study on noise reduction of concrete LRT bridges. Sci. Total Environ. 643, 208–224. https://doi.org/10.1016/j.scitotenv.2018.06.179 (ISSN 0048-9697).

Vogiatzis, K., Zafiropoulou, V., Mouzakis, H., 2018. Monitoring and assessing the effects from Metro networks construction on the urban acoustic environment: the Athens Metro Line 3 Extension. Sci. Total Environ. 639, 1360–1380. https://doi.org/10.1016/j.scitotenv.2018.05.143 (ISSN 0048-9697).

Zhang, X., Zhai, W., Chen, Z., Yang, J., 2018. Characteristic and mechanism of structural acoustic radiation for box girder bridge in urban rail transit. Sci. Total Environ. 627, 1303–1314. https://doi.org/10.1016/j.scitotenv.2018.01.297 (ISSN 0048-9697).

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