Investigating Noise Pollution on University Campus: Toronto Metropolitan University

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INTRODUCTION

Urbanization has increased noise pollution, which is a growing concern due to its potential negative impact on human health and well-being. The World Health Organization (WHO) reports that excessive noise levels can lead to stress, sleep disturbances, and problems(1). Moreover, noise irritation can cause emotions such as anger, disappointment, dissatisfaction, anxiety, and depression. In addition, noise pollution can interfere with communication and concentration, leading to reduced productivity and performance.

Our primary screening phase of the project aimed to investigate the sound levels around Toronto Metropolitan University(TMU) and identify the source of noise in the campus environment. The future focus of this study will be on the classrooms and offices exposed to high noise levels. We used a Sound Level Meter (SLM) to measure sound levels at three different times of the day, morning, afternoon, and evening, to capture the variability of noise levels throughout the day. TMU is located in downtown Toronto, which is known for its busy and loud environment.

METHODS

To investigate the sound levels around TMU campus, we used a SoundTrack® LxT Sound Level Meter to collect noise samples. The Sound Level Meter was calibrated and set to record readings in dB mode, which is the standard measurement of noise pollution. Three different time points were selected during weekdays for the study: morning (9-10 am), afternoon (12-1 pm), and evening (7-8 pm).Before and after each sampling session, the Sound Level Meter was calibrated to ensure data accuracy. The calibration involved verifying the instrument's accuracy against a standard reference sound level meter. This step ensured that the measurements were reliable and valid. The noise data collected from the Sound Level Meter were then entered into an Excel spreadsheet for further analysis (figure 1). We color-coded the data to create a noise map that visualized the noise levels across the campus.

Figure 1. Noise samples recorded in dB are entered into a spreadsheet
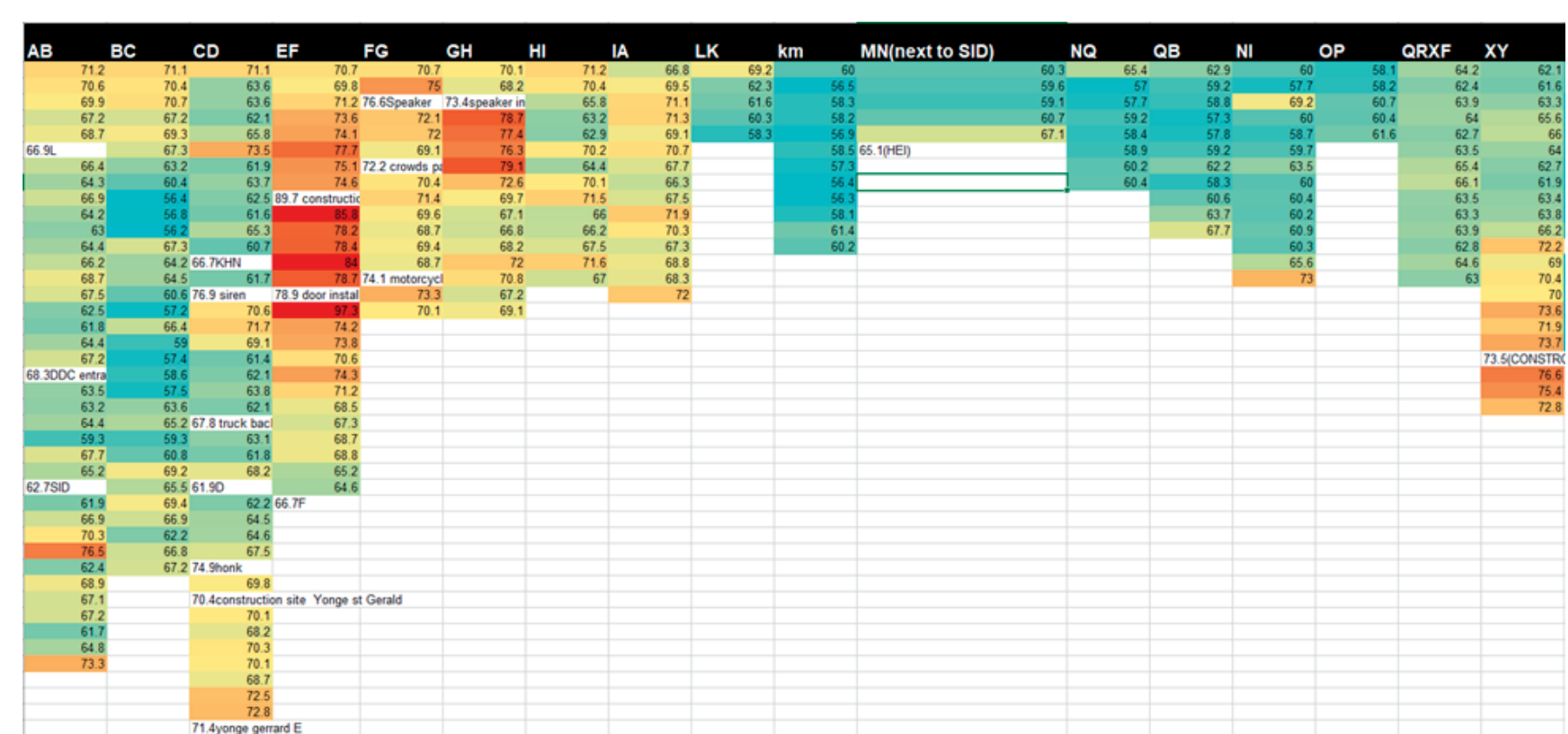

Figure 2. High noise level areas such as construction and shops with outdoor speakers

RESULTS

Our study found that noise pollution levels on the TMU campus vary depending on the time of day. During the morning, noise levels on campus did not exceed 75 decibels, except at the intersection of Yonge and Dundas street. Evenings were the quietest, except for areas with entertainments and heavy traffic. Afternoons had the highest noise levels, reaching up to 85 dB in some areas. Several factors contributed to high noise pollution level in the afternoon, including traffic, speakers from surrounding shops, construction noise, and human noise from high-density crowds (figure 2). The color-coded noise map clearly illustrates the locations with the highest noise levels (figure 3).These findings indicate the need for interventions to reduce noise levels and improve the quality of life on campus. Addressing noise pollution on campus could help to improve students' mental health and quality of life, as excessive noise can cause stress, anxiety, and other negative emotions(2).

Figure 3. color coded noise maps showing noise level at different time of the day on campus
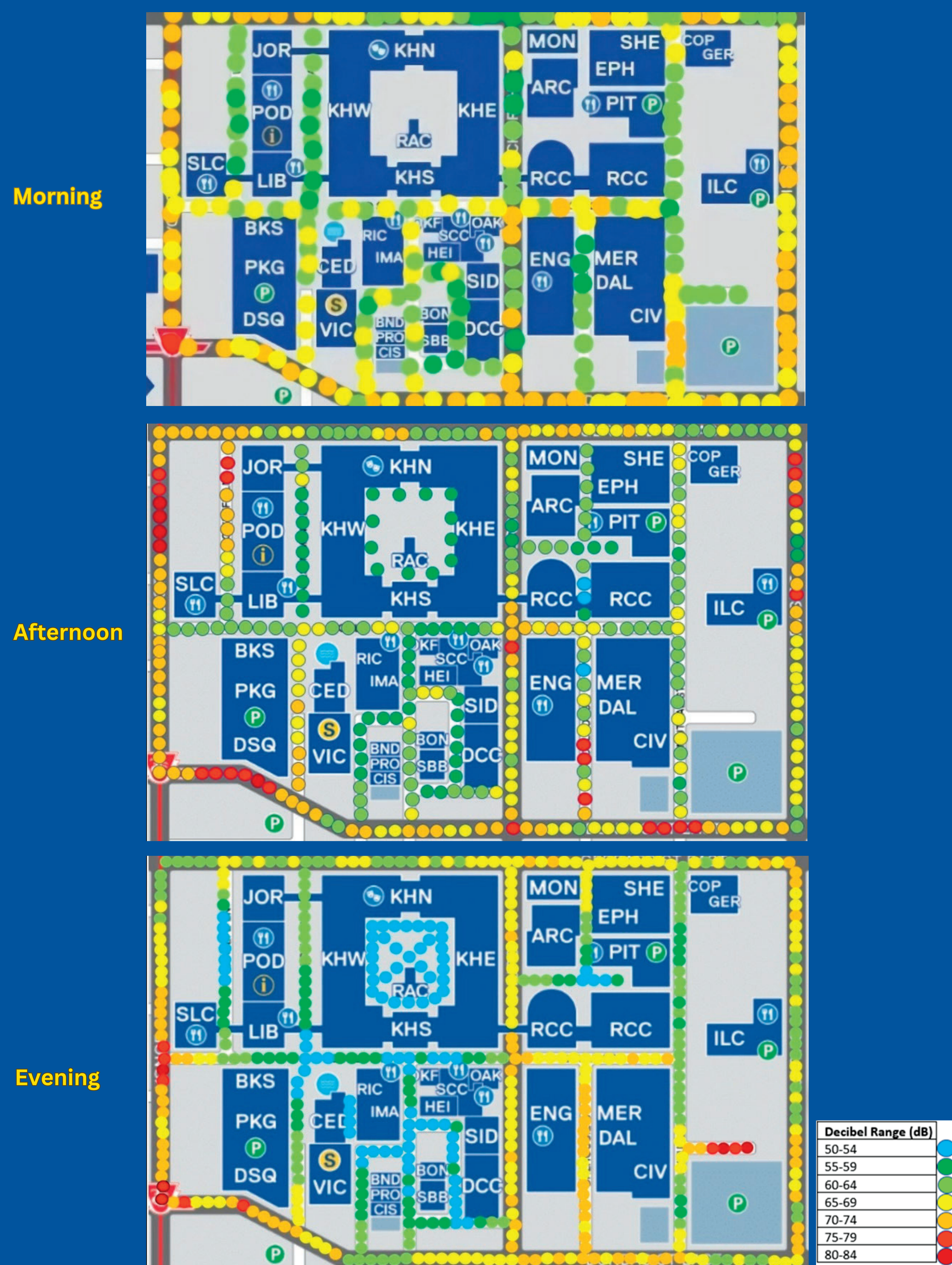
CONCLUSION

Our study has shed light on the severity of noise pollution on the TMU campus, particularly during the afternoon when construction projects and shops with outdoor speakers contribute to noise levels that can exceed the "acceptable noise level" defined by the Government of Ontario(3). Our findings have identified busy roads, intersections, outdoor speakers at shops, and crowded areas as the primary sources of noise pollution. These results underscore the potential negative impact of excessive noise on students' mental health, academic performance, and quality of life.

The implications of our study are not limited to the TMU campus. Our findings can guide policymakers and decision-makers in developing effective noise pollution management strategies for university campuses and urban areas more broadly. Additionally, our study has highlighted the importance of controlling traffic and incorporating green spaces in developing the new TMU campus in Brampton(4,5). These measures can significantly reduce noise pollution and improve the overall campus environment, contributing to the academic success and well-being of TMU students. By prioritizing noise pollution reduction and promoting a healthy campus environment, we can create a more conducive environment for learning and thriving.

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