Thesis Title Transportation Noise Assessment from the Second Stage Expressway

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ABSTRACT

The first step in this research was to determine the refermence energy mean emission level for each class of vehicle that uses the highway. Speed and peak pass-by noise level generated by 4 classes of vechicle data were measureed at a distance of 15 metres from the centerline of the traffic lane on Bhuttamontol Sai2, Bhuttamontol Sai5 , and Wang noi roads. From this study an equation of speed for each class of vehicle and energy mean emission noise level were derived as follows :

$$\overline{Loe}_4 = 44.5554.S^{0.1196}$$

$$\overline{Loe}_6 = 50.0726.S^{0.1113}$$

$$\overline{Loe}_{10} = 49.5222.S^{0.1232}$$

$$\overline{Loe}_{>10} = 0.1732.S + 72.0104$$

(where $\overline{Loe}_4$, $\overline{Loe}_6$, $\overline{Loe}_{10}$ and $\overline{Loe}_{>10}$ are the reference energy mean emission levels in decibel from each class of vehicle that have 4 wheels ,6 wheels ,10 wheels and more than 10 wheels respectively and S is the speed of the vehicle ; km/hr).

Using the reference energy mean emission noise level from this study,the mathematic model of Federal Highway Administration was adapted to predict traffic noise from the 2nd stage expreesway along Klong Prapa(the existing noise levels in this area were 73.6-77.3 dBA).

It was projected that traffic noise from the expressway would be between 65.84-73.03 dBA with no noise barrier and 61.28-65.40 dBA with a noise barrier (that less than existing noise level by about 10 dBA).

The difference between outdoor and indoor noise from this study was significant. In the case of opened windows the average difference was between 1.58-5.82 dBA and for closed windows was between 5.35-10.26 dBA.