

Statistics Related to Pollution, Noise, and Vibrations

I was reviewing the King Edward Avenue Renewal document at the Ottawa Public Library today. They in fact did an assessment of the noise, pollution and vibrations on the street. I've attached a few of the pages from out of the document.

It appears that the sound levels were between 57 dBA & 72 dBA. There was no effort in the report to compare this with noise standards, but I checked: According to the City of Ottawa website, "The desirable outdoor noise level in a noise sensitive area is 55 dBA." (City of Ottawa, Ottawa 20/20, Environmental Strategy)

Four different kinds of readings were taken all along the avenue for four pollutants: CO, HC, NOx, and PM. Each of these is described in the document. It appears that only the NOx and PM (nitrous oxides and particulate matter) were over their limits for safety. Peak values were 150% for NOx and 200% for PM of the acceptable levels. The highest concentrations for all pollutants were at King Edward & Rideau, and KE & Murray.

Vibrations were determined to be insignificant in this particular report after being measured.

**King Edward Avenue
Environmental Assessment Study
Existing Conditions**

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EXECUTIVE SUMMARY

This document establishes the existing environmental conditions for noise, air quality and ground vibrations produced by vehicle traffic along the King Edward Avenue corridor. The roadways covered in this study include the segment of King Edward Avenue spanning from Laurier Avenue to the MacDonald-Cartier Bridge, as well as the ramps connecting King Edward Avenue with Sussex Drive. This report addresses the effects of existing vehicle traffic and road configuration on noise, air quality, and ground-borne vibrations in the vicinity of neighboring buildings. Noise and air quality results are compared to established guidelines from the former Region of Ottawa-Carleton (ROC) and the Ministry of the Environment of Ontario (MOE). The effects of vibrations are evaluated against criteria for human perception and structural damage.

Our assessments indicate the following information about existing environmental effects created by vehicle traffic along King Edward Avenue:

- A) Overall the noise levels range between 57 dBA and 72 dBA over the area represented by 24 receptors used in the study. The largest noise levels occur near the Rideau Street intersection as well as along the segment of King Edward Avenue from Murray Street to Bolton Street. High traffic volumes and proximity of residences to the roadway are responsible for the high levels. The quietest areas are found among the open spaces at the north end of the corridor, followed by the southern end of the corridor near Laurier Avenue.
- B) The variability of wind speed and direction mitigate the maximum pollutant concentrations calculated to occur along the King Edward Avenue corridor. The pollutant levels that are predicted to exist most of the time fall below the MOE recommended standards. However, NO_x and PM (particulate matter) levels are predicted to approach, and occasionally exceed, the one-hour Ambient Air Quality Criteria (AAQC) stipulated by the MOE for infrequent



According to the MOE's Ambient Air Quality Criteria (AAQC), the recommended allowable levels for these pollutants are indicated as follows:

	AAQC (mg/m ³)		Background (mg/m ³)
Carbon Monoxide, CO	36.2 (1 Hr)	15.7 (24 Hr)	0.46
Total Hydrocarbons As Hexane	35.0 (½ Hr)	12.0 (24 Hr)	0.003
Nitrous Oxides, NO _x	0.40 (1Hr)	0.20 (24 Hr)	0.026
Suspended Particulates	0.10 (½ Hr)	0.12 (24 Hr)	0.009

Results indicate that the area around Rideau Street, represented by receptors 6 through 8, as well as the segment from Murray Street to Bolton Street, represented by receptors 14-19, experience the worst pollution levels. The largest one-hour concentration of pollutants is found to occur at receptor 7, located on the east side of King Edward Avenue between Murray Street and St. Patrick Street. At this site the peak one-hour concentrations of CO, HC, NO_x and PM are 7.25 mg/m³, 0.75 mg/m³, 0.72 mg/m³ and 0.22 mg/m³ respectively. While the peak values for CO and HC are below the AAQC criteria, the peak values for NO_x and PM are 150% and 200% of the acceptable levels. Maximum concentrations are highest at signalized intersections including King Edward Avenue and Rideau Street (receptors 6, 7 and 8) as well as King Edward Avenue and Murray Street (receptor 14) due in large part to the idling emissions and queue lengths of traffic. The worst conditions will occur during rush hour periods when vehicle emissions are trapped by adverse temperature and buoyancy inversion in the atmosphere.

Combining these maximum pollution levels with the Ottawa wind statistics generates the predicted pollution levels summarized in Table 5 that are expected to exist much of the time. These results are significantly below the allowable limits for CO, HC and NO_x, even after adding in the average background levels. For instance, the maximum statistical one-hour level of pollutants are predicted to be CO = 2.43 mg/m³ (1.97 + 0.46), HC = 0.17 mg/m³ (0.17 + 0.003), and NO_x = 0.23 mg/m³ (0.20 + 0.026), which fall below their representative criteria. However, the PM concentrations are predicted to reach the MOE criterion of 0.1 mg/m³ at receptor 7 when the background levels are

