

NY State Development
Planning Board

November 1968

BUREAU OF TECHNICAL SERVICES
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ENVIRONMENTAL PROTECTION ADMINISTRATION
DEPARTMENT OF AIR RESOURCES
NEW YORK CITY

AN ESTIMATE OF VEHICULAR AIR POLLUTION
POTENTIAL AT THE PROPOSED LOWER
MANHATTAN EXPRESSWAY IN
NEW YORK CITY

Environmental Research Center
RECEIVED
JAN 1976
MUNICIPAL BUILDING
NEW YORK CITY

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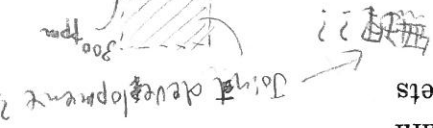
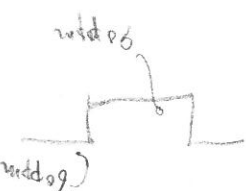
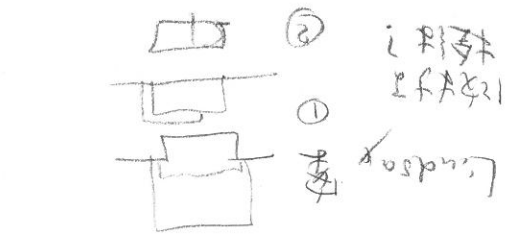
ABSTRACT

An estimate of the air pollution potential that will be created by different configurations of the proposed Lower Manhattan Expressway has been made by the Department of Air Resources. Available data from the Department and other sources were used in making the estimates. It is important to note that the analysis contains significant uncertainties because lack of certain data resulted in the necessity for considerable extrapolation in the estimations. Problems were also introduced as a result of uncertainties about the precision of measurements and lack of information about the location of some of the sensors in respect to traffic.

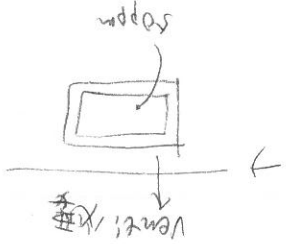
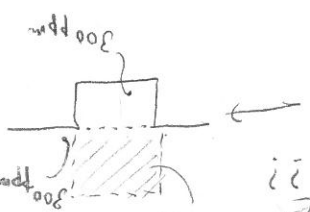
The original proposal, according to the Traffic Department study, estimated a peak hour demand for the Lower Manhattan Expressway of 14,200 vehicles. Calculations indicate that use of the depressed highway open trench configuration, during peak hour traffic of 15,000 vehicles, will result in concentrations of 90 ppm at breathing level within the trench and 60 ppm at breathing level on surface streets in the vicinity.

For a partly covered highway, 15,000 vehicles per hour would produce a uniform concentration of about 300 ppm throughout the trench and at surface level, if its ventilation characteristics are similar to those of the George Washington Bridge approach.

For a tunnel configuration, ventilation rates such as those routinely used in the Lincoln Tunnel, that is, forty to fifty air changes per hour, would produce an average peak



Joint development?



2019 日 環境省 人の健康
CO → 連続8時間1.25(1.25)以下 20 ppm以下
連続24時間 10 ppm以下

The pollutants of major interest are nitrogen oxides, particulates, hydrocarbons and carbon monoxide which represent the primary components of automobile exhaust. Of these pollutants carbon monoxide lends itself best to routine measurement and analysis. There is a dearth, however, of information relating the quantity of pollutants discharged from various types of automobiles and the distribution of such pollutants in space for either of the configurations mentioned.

The greatest amount of recorded data relates to the Holland and Lincoln Tunnels but this is not readily accessible in quantity or form to permit detailed analysis by this Department.

The data used in this study included more than one year's air quality information from the Department of Air Resources 45th Street site, four months from its Park Avenue site, one month from the Port of New York Authority site at the George Washington Bridge approach and three days from its Lincoln Tunnel site. Traffic data in each case consisted of one or two weeks observations. Observed traffic volumes and carbon monoxide concentrations were compared with ventilation rates where applicable and used to form the basis of projected concentrations on the Expressway. The source of vehicular emissions information was the paper by Rose, Smith et al.¹ based on tests of 20 U.S.-made vehicles. Although emissions factors were observed to change considerably with vehicle velocity, it was important to point out that the scatter of the original data was such that the use of a mean mass emission rate for all speeds would seem quite adequate. Carbon monoxide in vehicle exhaust varies between 2% and 10% with an average of 4% by volume.

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Grand central
5th Ave