ENVIRONMENTAL PROTECTION DEPARTMENT
PRACTICE NOTE FOR PROFESSIONAL PERSONS

Control of Air Pollution in Semi-Confined Public Transport Interchanges

Introduction

This Practice Note sets out the air quality guidelines for public transport interchanges (PTI) at semi-confined locations, and outlines major considerations for designing and operating a PTI to meet these guidelines.

2. A PTI is a public place where public transport such as buses, taxis, mini-buses or coaches pass or terminate, and passengers queue for public transport. In Hong Kong, many PTIs are located under the podiums of residential or commercial complexes, and surrounded by structural columns or walls. Air pollutants will accumulate to high concentrations inside these PTIs if the mechanical ventilation there is not sufficient.

3. The professional persons can help by ensuring proper design, operation and maintenance of mechanical ventilation systems in semi-confined PTIs, to prevent an air pollution problem from arising.

Air Quality Guidelines

4. Carbon monoxide, nitrogen dioxide and sulphur dioxide are the major air pollutants of concern inside semi-confined PTIs. At excessive concentrations, carbon monoxide may block the absorption of oxygen by the blood and cause impairment of coordination and deleterious effects, especially to pregnant women and those with heart illnesses. Nitrogen dioxide may affect the lungs and cause breathing difficulties and respiratory irritation. Sulphur dioxide may reduce respiratory function and aggravate existing respiratory disease.

Table 1: Air Quality Guidelines

Air Pollutant	Maximum Concentration* Not to Be Exceeded	
	1-Hour Average ($\mu g/m^3$)	5-Minute Average ($\mu g/m^3$)
Carbon monoxide	30,000	115,000
Sulphur dioxide	800	1,000
Nitrogen dioxide	300	1,800

* Expressed at the reference condition of 25°C and 101.325kPa (one atmosphere)

5. To protect public health, the air quality at passenger waiting areas inside a semi-confined PTI should meet both the 1-hour and 5-minute average air quality guidelines as given in Table 1. At other places where passengers stay for not more than a few minutes, the air quality should at least meet the 5-minute average air quality guidelines.

Design Considerations

6. Semi-confined PTIs should be designed such that the air quality guidelines set out in paragraph 5. above are met under all conditions. Factors to be considered are listed below :

Location and Background Air Quality

(a) A semi-confined PTI should be located in an area with access to good background air. The background air quality should be estimated from the most relevant full year monitoring results of the Environmental Protection Department, and by taking the 95-percentile of the pollutant concentration data.

The Layout

(b) To help minimize the accumulation of air pollutants, the layout of a PTI should avoid as far as possible solid walls or other barriers which inhibit natural air flow, and should have the vehicle entrances and exits strategically located so as to enhance air movements across the PTI. The layout should help minimize the accumulation of air pollutants.

The Ventilation System

(c) A PTI ventilation system should consist of fresh air supply units and exhaust air units, with the amount of fresh air supply greater than that of the exhaust air. In some circumstances, it may be necessary to provide air purifying units to clean the air supply.

(d) The fresh air inlets should be so located that they can capture fresh air of a quality which is comparable to the ambient background level. They should be away from any major air pollution sources such as busy roads or polluted air outlets.

(e) The exhaust air outlets should be located away from nearby residents or other receptors to avoid causing an air pollutant nuisance. If necessary, control equipment such as filters or scrubbing units should be used to minimize the pollution caused to the surroundings.

(f) Inside the PTI, the fresh air delivery outlets should be positioned at a low level to discharge fresh air towards the passengers, whereas the extraction openings should be located at a high level. The fresh air outlet and the extraction openings should be placed as far away from each other as possible, and should be configured to avoid air short circulation.

The Emissions

(g) The quantities of carbon monoxide, sulphur dioxide or nitrogen dioxide emissions from the vehicles should be estimated from considering :

(i) the types and models of the vehicles using the PTI; and
(ii) the usage pattern of the vehicles, including speed, frequency, idling time and routing.

If the information on the nitrogen dioxide to nitrogen oxide ratio for a particular type of motor vehicle is not available, it should be taken as 20%.

Operation

7. The operator of a PTI should draw up and implement a set of operation procedures, which should include the following :

(a) Inspection and Maintenance

The inspection and maintenance of the ventilation system at regular intervals, to ensure proper operation of the ventilation system and minimize breakdown time.

(b) Provision of Adequate Ventilation

A proper fan operation schedule which should be reviewed once every three months, or a pollution level interlocked fan operation system, to ensure that there is always sufficient ventilation.

(c) Air Quality Monitoring

Monitoring of the air quality inside the PTI from time to time to check the adequacy of the fan operation schedule or the interlocked fan operation system.

(d) Idling Emissions

Instruction to all drivers using the PTI to switch off the vehicle engines while waiting.

Enquires

8. Please contact the Air Services Group of the Environmental Protection Department (Telephone: 2594 6211, Facsimile: 2827 8040) for enquiries on controlling air pollution in semi-confined PTI.

(M.J. Stokoe)
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Addendum to the ProPECC Practice Note PN 1/98 (valid from 1 January 2023)

1. The following amendments are made to this practice note:

Original	Amendments
Paragraph 8 "Please contact the Air Service Group of the Environmental Protection Department (Telephone: 2594 6211, Facsimile: 2827 8040) for enquires on controlling air pollution in semi-confined PTI." Contact address was: Environment Protection Department 28/F Southorn Centre 130 Hennessary Road Wan Chai	"Enquiries on the Practice Note can be made to the Air Science and Modelling Group of the Environmental Protection Department (Telephone: 2594 6421, Facsimile: 2827 8040, email: enquiry@epd.gov.hk)." Contact address is: Air Science and Modelling Group Environmental Protection Department 33/F, Revenue Tower 5 Gloucester Road Wan Chai, Hong Kong

2. This Practice Note PN 1/98 applies to PTIs with design (including the layout and ventilation system) already finalised before 30 Dec 2022 only. For PTIs under planning/design stage on or after 30 Dec 2022 and built thereafter, the ProPECC PN 1/22 shall apply.