

**For information  
4 June 2009**

**Legislative Council Panel on Transport  
Subcommittee on Matters Relating to Railways**

**West Island Line  
Ventilation Shafts**

**Purpose**

This paper briefs Members on the background information of the ventilation shafts under the West Island Line.

**Ventilation Shafts**

2. Ventilation shafts are required to provide air circulation in underground railway areas used by the public. Railways are non-polluting. The air coming from railway ventilation shafts does not contain any undesirable emissions as would be the case for ventilation of road tunnels. The air emitted from railway ventilation shafts is the same quality as the air taken into the ventilation shafts and also the same quality as the air used by passengers within the public areas of the stations and tunnels.

3. Railway ventilation must be configured to serve 3 separate areas:

- a) tunnels between stations,
- b) tunnels at the stations, and
- c) the public areas of stations.

4. These are kept separate because they need to operate independently, depending on the mode of operation. For example during normal operation, air circulation within the tunnels between stations is achieved by the piston effect of trains moving through the tunnels, pushing air ahead and out through the ventilation shafts. Trains which are stopped at the

stations no longer generate this piston effect and therefore air circulation within the tunnel sections at the stations must be achieved by means of mechanical extract using air ducts and fans located directly above the trains. The public areas of stations are air conditioned and air circulation is provided for separately to ensure that air-conditioned air is not mixed with non air-conditioned air.

5. Generally the above 3 types of ventilation must be provided at each end of each station, thus leading to a requirement for up to 6 ventilation shafts per station. It is often possible to group the ventilation shafts together at one or more common locations and in the case of University and Sai Ying Pun stations, 3 locations rather than 6 are provided for at each station. For each of the 3 ventilation types, ventilation openings of approximately 15 to 50 sq m are required, depending on the length and configuration of the connections to the station, the selection of the equipment by the contractors, the requirement to minimize noise and the need to address visual impacts, all of which are subject to agreement by the regulatory authorities, notably FSD and E&MSD. For University and Sai Ying Pun stations the combined area of ventilation shafts required for each station is between 100 and 150 sq m.

6. The Hill Road ventilation shaft for University station is currently designed to accommodate all 3 types of ventilation, i.e. intermediate tunnels between stations, tunnels at the station and the station public areas. The combined area based on the current design is approximately 70 sq m. The MTRCL strives to address public concerns wherever possible and is continuing to see what can be done to minimize the size of the Hill Road ventilation shaft. One possibility being explored is to relocate some of the above ventilation categories to other ventilation shafts which are already proposed at other locations for University station. This may result in a reduction of up to 40% in the required ventilation openings at Hill Road. However this cannot be confirmed until the relevant contractors are appointed and have been able to confirm that they can provide the equipment capable of

achieving the required performance levels in terms of air velocities, noise and operational flexibility. Despite these difficulties MTRCL confirms that the possibility of reducing the size of the Hill Road ventilation shaft is being actively explored.

7. Similarly the ventilation shaft at the Bonham Road entrance at Sai Ying Pun station is designed to accommodate all 3 types of ventilation. In this case no alternative locations have been identified which can accommodate the requirements without causing other detrimental effects, such as permanent loss of open space, additional costs and greater disruption during construction. This was explained in the previous response dated 27 May 2009 to the concerns raised in the Subcommittee on Matters Relating to Railways meeting on 31 March 2009.

8. In conclusion, the MTRCL recognises the public concerns over the locations of ventilation shafts, however as explained in this summary, ventilation of underground railway areas is essential, and it is non-polluting. The MTRCL will continue to explore opportunities for reducing the size of the Hill Road ventilation shaft to address resident's concerns.

9. Members are invited to note the contents of this paper.

**Transport and Housing Bureau  
June 2009**