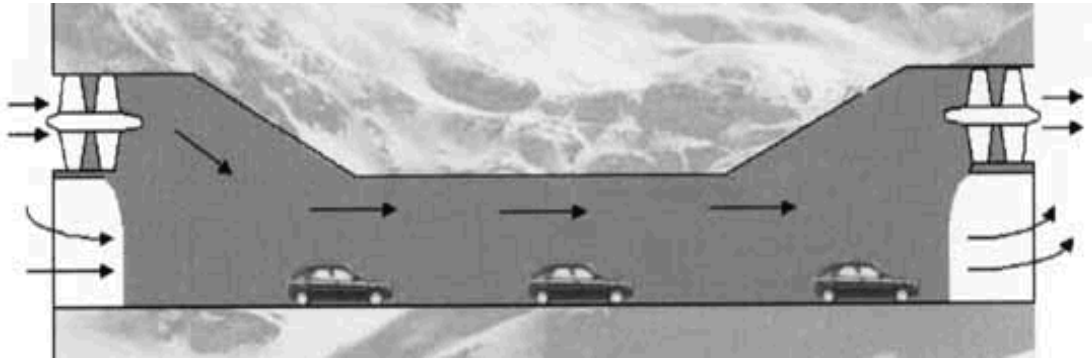
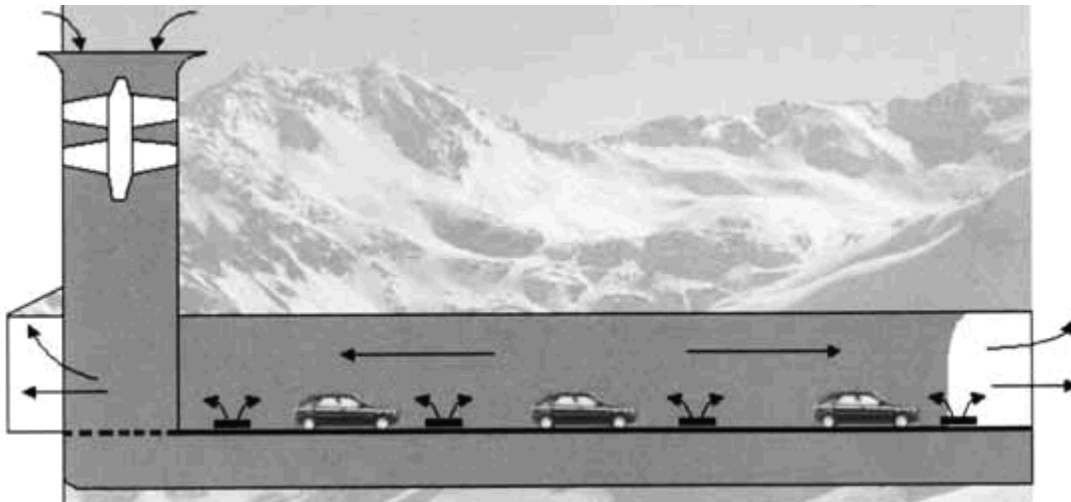


TUNNEL VENTILATION

NEXT TO YOUR HOUSE, HOSPITAL, OR SCHOOL?



Few short tunnels can rely on the piston-effect of moving vehicles and wind to force pollutants out into the air without treatment. Most tunnels add fans to push and/or pull air and exhaust through tunnels in the direction of vehicular movement.



Some ventilation systems add special intake fans to distribute airflows – but with general discharge out each portal.

Wan Chai Portal _

Cross Harbour Tunnel Ventilation,
Hong Kong Island, China _



Short stacks need small, short tunnels and lots of open space.

Citylink Exhaust Tower, Melbourne, Australia _

Lincoln Tunnel, New York _

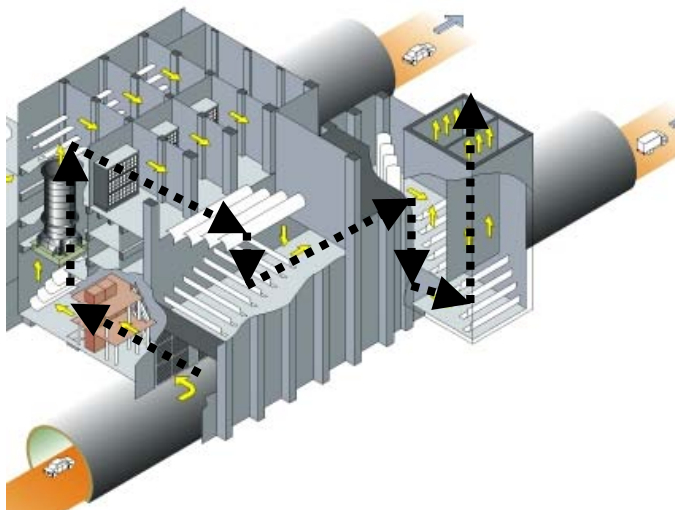


**Some ventilation systems use inflow and exhaust stacks.
Ventilation structures can be very large and high.**



**_ Clem Jones Tunnel
Ventilation, Outlet 2
Brisbane, Australia**

**Any stack needs large
emergency smoke
fans for exhaust.
Smoke Test,
Branisko Tunnel,
Slovakia _**



Air cleaning systems are used in tunnels for removing emission contaminants but they do not clean ALL polluting elements. Some long tunnels in other parts of the world use Electrostatic Precipitators (ESPs) or NOx “Scrubbers” to reduce pollutants (PM2.5-10, NOx). However, they use tremendous power, take significant space and require treatment of wash solution contaminants.