

Chemicals present in automobile traffic tunnels and the possible community health hazards: A review of the literature

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Abstract Dozens of volatile and semivolatile organic compounds can be detected in vehicle exhaust, along with numerous metals and oxides of sulfur, nitrogen, and carbon. While the adverse effects of these chemicals have been extensively studied surrounding open roadways, the hazards to local residents and commuters resulting from the presence of tunnel emission chemicals are less well known. Commuters and workers within tunnels are also exposed to tunnel atmospheres, and the risks have only been evaluated to a limited extent. Approximately 50 studies conducted at more than 35 different international traffic tunnels were reviewed in order to characterize the potential health impact on individuals residing near these tunnels. One objective of this article is to identify those chemicals that deserve further study in order to understand the hazards to humans who work in these tunnels, as well as the risks to those in the surrounding community. The second objective is to present the available information regarding the hazards to those living near these tunnels. The published information, for the most part, indicates that the concentration of most toxicants detected in communities exposed to tunnel emissions are below those concentrations that are generally considered to pose either a significant acute or chronic health hazard. However, there have been no comprehensive studies that have evaluated the concentration of all of the relevant toxicants on a real-time basis or using repetitive time-weighted average sampling. Based on our analysis of the existing information appearing in peer-reviewed literature and government reports, additional information on the variation of concentrations of various chemicals over time near the tunnel exits would be helpful. Optimally, these would be better if evaluated in conjunction with traffic magnitude and vehicle type. It would also be useful to further characterize acute exposures to commuters or tunnel workers during times of heavy volume or slow-moving traffic due to accidents within the tunnel structure, when tunnel pollutant levels would be expected to be substantially elevated. A recent review by the Australia's National Health and Medical Research Council also discusses tunnel and air quality in detail (2008). Nearly 300 references are cited.

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