



Hong Kong Underground Space Development and Its Enlightenment for the Mainland

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Abstract

First, introduce the background of Hong Kong's underground development and utilization, then, illustrate the ways on planning and utilizing underground space to meet the increasing demand in transit, commercial and pedestrian activities on the one hand, and the accommodation of environmentally-unfriendly public utilities on the other, specifically focusing on such aspects as cavern development, mass transit railway, tunnels, underground pedestrian walkways, shopping malls, new urban structure, special-purpose underground facilities (refuse transfer station, sewage treatment plant, explosives magazines). Also, highlight the planning issues and challenges faced in crowded and compact urban environment, including, e.g., adverse effect on environment, construction constraints, interference to existing underground facilities, limitations on construction methods, search for a consensus or compromise, planning and construction procedures, geotechnical engineer's risk. Finally, sum up some points of enlightenment for the mainland to develop and utilize underground space as per Hong Kong experiences, namely, developing rock cavern with reference to Hong Kong experience; achieving sustainable development by initiating planning first; enhancing integrated development by making two good drawings; building combined utility gallery to satisfy development demands; the last but not the least, applying state-of-the-art technology to guide the planning and development.

Keywords: Underground space; development; planning; utilization; enlightenment

1 Introduction

Hong Kong is one of the most densely populated cities in the world, with over 7.23 million inhabitants crowding into an area of slightly over 1104 km², of which 40% is reserved as protected green areas known as "country parks". To date, the built up area is only about 280 km², which yields a density of 25,357 persons per built up km²[1].

The city core is located on both sides of Victoria Harbour (Figure 1). The crowded environment is a result of the intensive land use planning strategies adopted since the colonial era. The successful implementation of a Transit Oriented

Development (TOD) in Hong Kong is in fact a consequence of environmental restriction and constraint of an artificially created dense habitat.

Land use control, together with narrow streets and a strict policy on vehicle control, discourages private car use. More than 91% of the 11 million daily non-walking commuting trips rely on a wide range and extensive network of public transport options. Mass transit is the backbone of the public transport system, which is supported with a range of public transport services - bus, minibus, light rails, trams, ferries, taxis and speedwalks or passenger conveyors. The advanced underground space development in the city is partly a result of