Shenzhen - Exploration of the Utilization of Underground Space Resource in the Period of Transition to Market Economy

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ABSTRACT

This paper introduces the course and experience of Shenzhen’s utilization of underground space, and elaborates the systematic reform made by government during the transitional period from planned economy to market economy. Several issues are taken into account: the division of spatial property, land approval, management model and so on which are related to the underground space planning and the relevant public policy. Based on several cases, the paper suggests that at present, the utilization of underground space in China is still at early stage, and we should make full use of the role of a strong government due to the state-dominant background of land ownership. Further, current rapid railway development provides good opportunity to achieve the goal of “intensive use of land resources and sustainable urban development”, which is based on detailed study of legislation, planning, and other relevant issues.

1. INTRODUCTION

China plans to accelerate its railway development with a total length of more than 1,500 kilometers in the next five-year. It will bring great opportunities for the major cities’ utilization and development of underground space. Shenzhen is China’s reform and opening-up pilot city, which has been rapidly developed from a small border town to a mega-city with the GDP of 492.6 billion RMB and the population of 827 million (equals to per capita GDP $7300 US Dollars) in 26 years. It is mainly attributed to the geographical advantages as “located in the Pearl River Delta and close to Hong Kong” and the rapid market-led economic development under the State's preferential policies. Currently, the opportunity caused by railway construction might be possible to release Shenzhen from the development pressure of land and transport due to the city’s rapid development in the past 25 years. In this way, using underground space utilization might bring new space for urban renewal and sustainable development.

2. THE PROCESS OF UTILIZATION OF UNDERGROUND SPACE

The course of underground space utilization in Shenzhen shows the process how government and market understood the value of space, and rail transit development is one important issue of underground space utilization. Shenzhen’s underground space utilization began in the middle of 1980s, from the underground equipment space to underground garage, but with not so many development cases. In 1995, Shenzhen was evaluated as a national class air defense city, and the underground space has been developed gradually. The development has experienced the following main stages: Around 2000, accompanying with mercerization of metro project-I construction and land auction, underground commercial facilities began to be built. The hinterland of 13 sites was accompanied by underground space development with the construction floor areas of more than 500,000 square meters,
of which government and enterprises both shared the half investment. At the same time, the government tried to list for underground space assignment. A series of plans for metro project-II including comprehensive design of hinterland of the metro stations were made, based on the review of underground space utilization attributed to the Project-I metro lines.

<table>
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<th>Before 1980 (Early Special Economic Zone): no concept of underground space;</th>
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<td>In 1980s: Began to appear underground equipment space, 70% early high buildings were built without basement;</td>
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<td>In 1995: Shenzhen was evaluated as a national class air defense city</td>
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<td>1998-2000: Establishment of Shenzhen Civil Air Defense Comprehensive Planning began to use underground space for both war and peace time;</td>
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<td>2002-2005: Subway project I was opened to traffic, several sites hinterland carried out underground space development with construction.</td>
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<td>After 2005: Accompanying with subway project II fully carried on, market enthusiasm is rising. The government launched a series of planning studies and the underground space has been elevated to expand the field of urban space.</td>
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3. THE NEED FOR SUPPORTING POLICY TO REALIZE THE EFFICIENCY OF PLANNING

From the very beginning of its birth, the utilization of underground space in Shenzhen was closely related to the urban development and urban growth. The utilization of underground space has increased the capacity of urban space, and saved some ground space for public from intensive urban development. However, there is still a large gap between China and the developed country in terms of the whole system of underground development, including the relevant development theory, legal supporting system, technical guidance and ordinance, engineering technique, and so forth. The ‘Planning of Utilization of Shenzhen’s Underground Space Resource (2006 – 2020)’ has undertaken quantitative and qualitative evaluation of the underground space resource in Shenzhen.

As a country with long history of planned economy, China inevitably faces the institutional limitation with the emerging of market-led economy. Due to the fast urban development ahead of the proposed plans, the development plans have to be revised continuously in order to catch up with the most recent development. Therefore on the one hand the government is under massive pressure of administration caused by its ambition to ‘control’ everything. On the other hand it arbitrarily restricts the market development driven by the demand. Hence we cannot take it for granted that planning can solve all the problems. More over, to develop a healthy relationship between planning and market is in need of the adjustment of the management institution and should target at the establishment of effective public policy in accordance with the market principles. In this regard, the experience from Montreal for its rent discount policy and that from Hong Kong for its flexible communicative and evaluative model of policy making are both useful for reference.

Montreal has built the underground city throughout the central area for forty years. According to the experience of Montreal, it is almost impossible to make a final target for the development of
underground system, not even to predict all the projects with development potential. In this way, all development projects could only be permitted subject to passing the strict evaluation, which should include: the estimation of population along underground corridor and the study of their daily trip behavior; the relationship of the owners of the land and buildings in terms of ownership, physical linkages, structure, and so on; the demand of public service and the potential of commercial development; and the impacts to the street life and existing underground space which caused by the new underground projects.

However in China, the government enjoys high level power of intervention because the land is owned by state. Therefore planning still plays significant role in development. The following case of Luohu indicates the importance of systematic planning prior to the development. It also suggests that some big or important projects are in great need of government intervention during the whole development process, while the other normal ones should mainly depend on the control and guide by policy and ordinance.

**Case: The Integrated Redevelopment of Luohu Custom Port Area (Government-Led, Unitary Planning and Development)**

Luohu custom port area is the transportation hub linking Shenzhen, Hong Kong, and inland area and also with function as an internal transit of city. Before the redevelopment there was only a platform of two floods to serve the function of distribution and for interchanging and this area was once regarded as the worst place with serious traffic problems. The construction of metro has brought opportunity here for the improvement of environment and renewal of transportation model. The redevelopment has got full use of the underground space to solve the complicated traffic conflicts, with increasing the number of floors from two to six and accordingly guiding the passengers to interchange on the underground floors in order to reduce the surface traffic. In the case of Luohu, to deal with the complicated ownerships, the planning authority has intervened actively to facilitate the development and to encourage the cooperation of different stakeholders. Without this it will not be so successful for the redevelopment. We can learn from the case for three successful reasons. (1) planning prior to the development; (2) get full use of and catch up with the metro construction for the improvement of above- and underground space; (3) active intervention of the government and its guide and control.

4. LEGISLATION: THE KEY OF POLICY MAKING

The key of policy making is legislation and the emphasis is the establishment of underground space clearly. Although Shenzhen has the economic power and market demand on massive subsurface development, while taking into consideration of the irreversibility of underground development, the government should study for pragmatic, prudent and normative strategy before the implementation of relevant laws and regulations, and the technical development should be improved.

In 2000, the government drafted “Regulations concerning underground space use of Shenzhen City” (Bill). Targeting at the problems and difficulties in present underground space use, it made the breakthroughs mainly from the following aspects. First, it defined the state underground space ownership clearly to ensure that public interests are not been infringed and occupied the initiative on legal principle. Secondly, by defining the underground space right to establish the subject areas on underground space use, it expand the traditional concept of land-were so that the potential space rights disputes is based on the law; Third, by setting the underground space servitude and public priority, it establish the main responsibilities and obligations of the underground space subject especially embodying the equitable maximization principle in the treatment of neighboring relationship. The regulations on “underground space right” embody in defining suzerain area by three-dimensional coordinate system to replace the traditional two coordinates. Further, the government is planning to gradually establish a set of regulations involving underground space planning, approval, development and the management of use fields. Access to underground space property rights and land value collection will eventually move toward to vendue. At present, some underground commercial facilities
levy equivalent to one-third of the ground floor premium. Some garage space and equipment is exempt from the premium to encourage building the facilities. And in 2004, it was the first attempt by way of listing underground space open to sell.

5. THE FUTURE DEVELOPMENT STRATEGY

The use of underground space in Shenzhen city has just started. It is still in stage of practice exploration and case accumulation, facing challenges and opportunities. The intensification of land use patterns brings new vitality for the development of underground space. However, the absence of multiple management and related laws, policies, norms, underground space research and information management platform cause that the building above and below ground simultaneously lack the indispensable basis. Therefore, in the legislative and planning management the government still needs to accumulate experience. Based on the analysis of existing problems, Shenzhen needs make great effort from the following aspects in future:

First, the multi-pilot, resource protection
Shenzhen's rapid development cause ground land to be used quickly. But underground space resources have a tremendous waste and the development of underground space is at a relatively disorderly state. How to develop the underground space, we still lack the scientific knowledge. It also caused surrounding underground space development obstacles. So we should carry the main pilot, accumulate experience, and focus on the underground space protection uses at this stage.

Second, making the laws and plans
Policies and regulations are the basic security measures to guide and standardize the use of underground space. Shenzhen also has not been announced specific policies against underground space development and utilization. Due to various reasons, “Regulations concerning underground space use for Shenzhen City” has not been formally promulgated Thus, the supporting laws and regulations about the civil rights of underground space legislation, legal of trade management, financing, taxation, MTR lines tied up development system are inadequate. It leads that the relationships of civil legal rights and obligations was not clear. Public users of underground space development are not possible to obtain the corresponding Usufruct (WIPO), which will trigger a series of problems.

Third, strengthening the forecast, controlling space
From the planning system, underground space plan was disagree with ground planning system, existing the “two tier paper” of over ground and under ground, especially lacking the statutory plan-level planning. Varies of underground space development systems (such as municipal pipeline systems, underground transport system, air defense system engineering, etc.), lack in the integration in space and function.

Fourth, establishing subject, unified management
There is still a lack of specialized organizations to manage and supervise the development of underground space. Relative to the ground planning and management, the planning and management on underground space is still in its early stages. Due to a lack of technical planning guidelines and a higher level planning, approving management more depend on the discretion. Reflecting on the years of practice, Governments and enterprises gradually come to a rational and mature in “the operation of the market” and “planning control” game. From the legislation, planning, investment, financing, technical research etc., government has made many attempts. On the market taking part in the development of underground space, the government makes the behavior of the pilot and guide strategy to encourage unified planning, overall development and Comprehensive Utilization. However, as the fast pace of development and insufficient relevant technical preparation, the use of underground space utilization and scale field also very limited relative to enthusiasm for market development and construction demand. Comparing to the use of underground space in some more mature countries, regardless of the planning concept, laws and regulations or technical standards we still have obvious gaps. City managers must fully recognize the importance of protection to underground space and urgency of rational use to underground space.
Note:
1 Metro first phase includes line 1 and line 4, the total length of which is 21.6 kilometers. There are 20 stations along the lines and it cost 11.5 billion RMB.

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