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# Research on Problems and Countermeasures in the Construction of "Integrated Pipe Gallery" Project

Cong Sun

School of Civil Engineering, North China University of Technology, Hebei Tangshan 063000, China.

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## Abstract

An important indicator of urban infrastructure management is the underground integrated pipe gallery. Many urban problems can be alleviated through integrated corridors, and many obstacles and speed-limiting integrated corridors are being developed. At present, the preconditions for the construction of the corridors by laws and regulations, the support of technical regulations and the support of the government are necessary conditions to establish a system of technical standards and principles, with a view to promoting the long-term healthy development of the integrated management corridor.

## Keywords

Integrated pipe gallery; Government policy; Planning management.

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## 1. Introduction

Due to the acceleration of economic urbanization, the demand for various pipelines is gradually increasing, which will cause problems such as road zippers, which will seriously affect the city's traffic and people's lives. At present, the integrated pipe gallery with centralized laying and unified management is a good solution to this problem. However, due to the insufficiency of technology and related laws and regulations, there are many problems.

## 2. Overview of the city's integrated pipe gallery

### 2.1 Integrated pipe gallery concept

The integrated pipe gallery is the abbreviation of the underground city pipeline integrated corridor. That is, municipal public utilities for unified planning, design and construction of pipelines for urban underground laying, and various engineering pipelines such as electric power, communication, and gas are important lifelines for the infrastructure of urban operation.

### 2.2 The construction status of the integrated pipe gallery in China

The comprehensive pipe gallery was researched late in China. In 1994, a multi-functional integrated pipe gallery with a length of about 11km was built in Pudong New Area. Most of the halls are constructed of reinforced concrete, and the integrated system includes fire protection, drainage power supply, monitoring and information collection and processing systems[1]. In recent years, China has carried out promotion and exploration of integrated pipe corridors, and the requirements for municipal infrastructure construction have been continuously improved. Most cities have begun to build integrated pipe corridor projects. Beijing, Shenzhen, etc. have also built pipe corridors with a total length of 17km and 6km, and have made certain progress.

### **3. At present, there are mainly problems in the construction management of integrated pipe corridors in China.**

#### **3.1 Imperfect laws and regulations**

The construction and management of the integrated pipe gallery should be carried out by legislation. The establishment and improvement of laws and regulations related to the construction of integrated pipe corridors is the prerequisite for the construction of large-scale urban integrated pipe corridors[2]. Underground resources are valuable and non-renewable. Therefore, if there are no supporting laws and regulations in the process of building a corridor, and the provisions on property rights, financing methods, and profit-making methods are clearly defined, these precious underground resources will be caused. Serious damage.

In China, for the construction of related urban integrated corridors, most of the administrative departments occupy the main position. Although they are also relatively important forces, they are less powerful than legal means. Therefore, in the case of imperfect laws, the degree will be greatly reduced, and it is difficult to achieve the desired results.

#### **3.2 Technical specifications and management are not perfect**

First of all, the national standards only have the conditions for setting integrated pipe corridors and cable tunnel laying requirements in the “Code for Comprehensive Planning of Urban Engineering Pipelines” and “Technical Regulations for Urban Power Cable Line Design”. There are no other design technical specifications and standards. Secondly, China does not clarify the main body of investment[3]. The source of funds for each unit in the process of building a management corridor is based on self-financing, and each region conducts specific analysis according to the specific requirements of each region. Moreover, the construction of the integrated pipe gallery should be carried out in parallel with the road so as not to affect the construction of the underground works. Finally, according to the nature of the construction cost of the integrated pipe gallery, the construction of the civil works should be completed in one time and should not be constructed in phases. If there is no special organization for communication during management and coordination, it will greatly affect the maintenance and other issues.

#### **3.3 Planning is not comprehensive**

At present, China cannot use the underground space scientifically on the basis of the existing ones, and the layout is also quite imperfect. There is no specific connection between the industries, and there are problems such as more prominent uselessness. Less underground space is not scientifically planned, and there is no uniform arrangement for rail transit, resulting in insufficient space capacity. The most important thing is that there is no basis for the planning of the integrated urban corridors, which increases the waste of space and affects the sustainable development of the city.

#### **3.4 The charging mechanism is not perfect**

According to the proportional allocation model of the charging mechanism, China allocates operating costs in proportion to the space occupied by the integrated pipe corridor. At present, due to the imperfection of the mechanism, only a few pipe-laying units in China have carried out the fee charging standard according to their own circumstances. However, the country does not have a unified cost-sharing mechanism, which will result in a lack of certain basis and no conviction in the specific apportionment. According to the current preliminary situation, many investors are waiting to see the state, and there is no really certain idea. On the other hand, because most of the operated corridors are unsuccessful, there are few successful experiences that can be borrowed. The charging of the corridor is one of the necessary conditions for the smooth operation of the corridor. Therefore, the formulation of the charging mechanism of the corridor is imminent, and we must fully learn from the domestic In addition to the successful experience, we have developed a charging mechanism that is consistent with our own region[4].

### **3.5 Imperfect Management Team Building**

(1) Improving team cohesion: We should set up a reasonable organizational structure of the engineering department, adjust the situation of the comprehensive pipeline gallery construction project, and set the same goal to make the team work more effective through the consistency of the goals.

(2) Improve team coordination ability: Project team members need to clearly understand their roles and responsibilities, and self-restraint through responsibility. The project team should communicate effectively, through direct or indirect communication, fully absorb the opinions of others and improve their working ability.

(3) Enhance the team's combat effectiveness: Make a study plan for project engineering specialty, fully consider the different professional conditions of the existing construction site of the comprehensive pipeline Gallery[5], formulate the study of electrical, automatic control, ventilation, drainage, fire protection and other specialties to enhance the team's professionalism, and then improve the project's own management system.

## **4. Solutions to Comprehensive Pipe Gallery**

### **4.1 Support of laws and regulations**

According to many examples of pipe corridor engineering, only perfecting laws and regulations is the most powerful guarantee for construction projects. If we want to unify the management of the construction of the comprehensive pipeline gallery, we must continue to support the relevant laws. In view of the need for larger investment subjects in the construction of pipeline galleries, many competent units can not coordinate, thus affecting the development of the construction of pipeline galleries. Firstly, the management of space resources should be strengthened according to the specific conditions of the region, so as to enact relevant laws. Secondly, the management of pipelines should be strengthened and reasonable laying methods should be worked out. Finally, for other aspects, such as cost-bearing and business model, a series of laws and regulations are needed to support the management.

### **4.2 Technical specification support**

At present, there is no uniform standard for the technical and normative requirements of the comprehensive pipe gallery. There is no uniform standard for scheme design, construction, project acceptance and so on, which will greatly reduce the quality of the project. Therefore, it can be explored in completed projects, and more reasonable norms and standards can be stipulated[6]. The comprehensive pipeline gallery is a practical project, so the requirements for the technical specifications of the pipeline gallery are very strict, and the durability and waterproof performance are extremely strict. In 2015, although China promulgated the technical specifications for the construction of comprehensive pipeline galleries, there were no detailed provisions, so it is urgent to formulate technical specifications with wider scope, stronger practicability and operability.

### **4.3 Improving the Planning and Design of Comprehensive Pipe Gallery**

At present, many aspects of comprehensive corridor construction planning need to be improved. For example, the low utilization of resources will lead to waste of resources and the phenomenon of re-exploitation and utilization of resources, and many other problems need to be improved. First of all, in the planning and construction of new and old urban areas, we should focus on the transformation according to the characteristics of each urban area. In the construction of the new urban area, it should be carried out according to the development plan of the new urban area. In the construction of comprehensive corridors in old urban areas, detailed planning and statistics should be carried out according to the narrow and densely populated streets in old urban areas to complete the detailed design of the area. Therefore, the construction of the comprehensive corridor should be coordinated

with all aspects to avoid conflicts and contradictions, to avoid the impact of the planning and design of the comprehensive corridor, and should not be blindly transformed.

#### **4.4 Perfecting the charging mechanism**

At present, there is no standard regulation on the cost of comprehensive piping Gallery in our country. Investment and construction costs and operation and management costs are the main contents of the comprehensive pipeline costs. At present, most of the comprehensive pipelines that have been charged in our country adopt the direct buried cost method and space proportion method to allocate the cost[7]. There are many drawbacks in the charging standard. The daily charging can only maintain the normal operation of the pipeline gallery, but it can not recover the cost of construction. If our country extensively promotes the construction of pipeline gallery, we need to solve urgently and take into account the interests of all sides, and need to formulate a reasonable charging mechanism scientifically to give full play to the comprehensive benefits of pipeline gallery.

### **5. Conclusion**

At present, the relevant laws and regulations are not established, and the technical specifications are not perfect, which is the main reason why the construction of comprehensive corridors in China has been stagnant. Secondly, the management should be strengthened constantly, and the advanced team concept should be absorbed constantly in the project practice. At the same time, new project management concepts and methods from abroad should be used for reference, and their own management team concept should be formed initially, service quality should be improved and innovation activities should be promoted. Therefore, the construction of comprehensive corridor in China will be greatly improved Promote.

### **References**

- [1] Wang Shiqian. Discussion on the common trench of pipeline construction in Tianjin [J], Shanghai Municipal Engineering, 2000(4): 36-37.
- [2] Xu Bingzhang. Main problems and countermeasures in the construction of municipal common ditch [J], China Municipal Engineering, 2009 (4): 72-74.
- [3] Sun Yunzhang. Research on Decision Support in the Construction of Urban Underground Pipeline Integrated Pipe Gallery Project [J]. Urban Road and Flood Control, 2014(2): 157-159.
- [4] Zhang Chen. Discussion on the Mode of Investment and Financing in the Construction of Underground Comprehensive Pipe Gallery Project [J] . 2015 (3): 72-74.
- [5] Ding Huifeng. Research on the main problems and countermeasures in the construction of municipal comprehensive pipe corridor [J] . Shanxi Architecture, 2016(34): 242-244.
- [6] Ning Yong, Zhao Shiqiang. Research on the Status Quo, Problems and Countermeasures of Urban Comprehensive Pipe Gallery Development at Home and Abroad [J]. Value Engineering, 2018 (03): 103-105.
- [7] Wang Jun, Pan Liang, Chen Guang, LI Ming, Wen Xiuchun. Analysis of the Difficulties and Countermeasures of Urban Underground Integrated Pipe Gallery Construction [J]. Value Engineering, 2016(07): 15-18.