

---

# Research on Cost Control in Highway Engineering Project Management

Fuchun Zheng, Haijun Zhao

Power Construction Corporation of China

---

## Abstract

Cost control is one of the three major kinds of control in the engineering project construction and relates to the success and final profits of the construction project. The scale and number of the highway construction has been showed a growing trend in China, but there have always been problems like insufficient supply of project funds, continuously growing construction cost in the process of the highway engineering project construction in China. These problems have brought lots of adverse effects to China's highway project construction and seriously restricted the development of highway construction in China. Highway engineering project construction management, therefore, must strengthen cost management and control optimization, effectively reduce the unnecessary cost consumption in highway engineering project construction, eliminate the unreasonable parts, save construction costs and improve construction efficiency and economic benefits, which are current matters to be done urgently.

## Keywords

Highway Project, Engineering Project Management, Cost Control,

---

## 1. Concept of Cost Control and Implementing Principles

With the constant advancement of urban modernization process, the project construction has become an integral and indispensable part of the social development. How to effectively manage the project has become the important guarantee for smooth implementation of projects. Project cost control is one of the project management methods. It refers to the certain calculation, control and supervision of various expenses needed in the project construction through the use of certain management means and techniques. The implementation of cost control not only can reduce the waste of money, but also fully improve the enterprise's operation efficiency. To seize the preemptive opportunities in the fierce market competitions, highway engineering construction enterprises must provide high-quality, low-price and fast-track projects to the masses as far as possible. Therefore, the implementation of cost control becomes extremely important. The implementation of the highway engineering project management must be adhering to the principles of sustainable development and resource conservation and save construction costs to the maximum extent on the basis of guaranteeing the quality and safety of the project so as to improve the efficiency of the construction enterprise management when creating maximum profits for construction enterprises.

Cost control refers to conducting certain calculation, control and supervision of various expenses needed in the project construction through the use of certain management means and techniques to control all expenses of the project within cost standards formulated in advance and ensure the realization of cost budget targets. Introduction of cost control into the highway engineering project management usually refers to carrying out certain guidance, supervision and restriction on resource consumption and expenses in construction of the highway project to rectify in time cost deviations appearing in production and ensure the expenses of highway project construction to be controlled

within the cost planning. The implementation of cost control in highway engineering project management not only can respond to the call of a conservation-minded society, minimize construction cost and improve the construction enterprise's economic benefits, but also bring high-quality and low-cost construction to society.

## **2. Problems Existing in the Cost Control of Highway Engineering Project Management**

In China, construction management and construction technological level of highway enterprises have made great progress during the transition from planned economy system and market economy system. However, due to the low levels of highway project's cost management and control, the economic benefits of Chinese highway enterprises are difficult to achieve larger ascension. There are several following major problems existing in the highway project's cost management and control in China:

### **2.1 Lack of Cost Competition Awareness**

Under the planned economy system, China's highway construction projects were assigned by the state and enterprises only needed to guarantee the construction quality without bearing the risks of project cost and economic profits. There was no competition between highway enterprises, so both corporate leaders and employees did not set up competition consciousness. However, after entering the market economy system, enterprises are faced with fierce competitions both in the survival and development. To survive and keep footholds in the fierce competitive market environment, they must make in-depth investigations of the market environment to know clearly about competitive advantages of enterprises in the same industry and establish a strong sense of competition. Project construction enterprises' competitive advantages are mainly embodied in cost management and control. The cost of an engineering project affects the enterprise's future survival and development to a great extent. In the highway engineering project construction enterprises, managers in the department of construction management are the core of enterprise cost management and control. The working efficiency of managers in the management department can influence a lot the enterprise's ultimate economic benefits. Therefore, the cultivation of cost competition awareness must be strengthened for the management personnel. However, the actual development situation is that both leaders and the general staff have no awareness of cost competition in highway engineering project construction enterprises which fail to have thorough enough understanding of the market environment or lack adequate awareness of the highway construction market development direction and development trend. In addition, they neither know competitors' advantages in cost management and control nor have clear knowledge of building materials and the development of human resources market. They do not give careful considerations to the selection of suppliers and construction teams in the long run.

### **2.2 Poor Performance of Cost Management and Control**

Highway engineering project's construction cost management and control is an organized and planned economic management activity and needs corresponding systems to support. Only perfect and scientific management systems of regulations and rules are specified scientific and truly implemented in each practical operating level, the full roles of cost management and control system can be truly played.

At present most of Chinese highway engineering project construction enterprises have established the corresponding cost management and control systems, but there are various problems existing in concrete rules and regulations and in the practical process. Although some construction enterprises have formulated relatively perfect cost management and control systems, they still have plenty of loopholes in terms of detailed operating systems. Cost management and control systems established by some highway engineering project construction enterprises fail to be closely connected with their internal staff performance appraisal systems and the reward and punishment strength can not excite employees' working enthusiasm; some department enterprises have formed detailed and rigorous cost

management and control regulation systems, but these rules and regulations have not been really implemented in practice and employees who participate in the project do not obey rules and regulations of the cost management and control. Therefore, cost management rules and regulation formulated only exist in name only in the project construction and enterprise development. There are two reasons for these problems: first, the whole highway engineering project construction unit does not pay attention to cost management and control and formulates rules and regulations just in order to cope with the inspection of superior leaders. The construction unit has not yet formed the strong concept of cost management and control. Second, when making cost management and control rules and regulations, the construction unit neither conducts market investigations nor has correct understanding of itself. It just follows the trend, which makes rules and regulations formulated eventually are not feasible or operable and become “chicken ribs” in the highway engineering project management.

### **2.3 Lack of Holistic View and Integral Consciousness**

Influenced by traditional management concept, at present the vast majority of Chinese highway engineering project construction enterprises only conducts cost management activities in the construction stage and the enterprise cost management and control lacks holistic view and integral consciousness. Under this situation, head of the project cost management cannot make careful and rigorous planning and responsibility allocation of the cost, which also indirectly leads to poor cooperation between construction units and failures of mutual progress and mutual benefit. Some construction units even just consider local cost control related to their own interests without considering the total cost at all for the pursuit of their own economic benefits. Every stage and every part of highway engineering project construction can have certain effects on the whole, but most of the highway engineering project managers would be extremely easily blind to this point and only pursue the cost control in some stage or part when considering the cost management and control, which, however, finally increases the overall cost. Project cost runs throughout the whole process of highway engineering construction project and there is cost consumption in each stage, but many enterprises fail to realize this. Highway engineering construction enterprises' project cost management and control are only limited to construction and acceptance stages, which makes that they can not carry out effective cost management and control in other stages.

## **3. Enhance Cost Control Countermeasures of Highway Engineering Project Management**

### **3.1 Update Ideas of Cost Management and Control**

Under the background of market economy, to survive in the fiercely competitive market environment, highway engineering project construction enterprises must update the cost management concept, establish people foremost and economic benefit-targeted and science and technology-driven strategic cost management and control concept. Strategic cost management combines strategic management and cost management control. The difference of strategic cost management is that it attaches great importance to the important status of enterprise cost management and control in the market competition and enhances the core competitiveness of the enterprise by improving the cost management and control. Core contents of highway engineering construction project's strategic cost management include strategic positioning, value chain analysis and cost motivation analysis. The most brilliant and effective management is the management of people. “People foremost” the most scientific way for modern enterprises to conduct management activities. By establishing the cost consciousness, an enterprise can organize employees well and mobilize employees to participate in the enterprise cost management and control activities, which can give full play to the staff's sense of belonging. By setting a series of fair reward and punishment measures, the enterprise can mobilize staff to form the consciousness of cost control and creativity, stimulate their work enthusiasms and effectively ensure the enterprise can get more economic benefits. Perfect management can truly play an effective role

with all staff's active cooperation. Therefore, the construction of cost management and control system of the highway engineering construction should be guided by "people foremost", give full play to human being's leading factor and set up the "people foremost" cost management and control concept. An enterprise's ultimate objective is to obtain more economic benefits and social benefits, and cost control is also implemented to gain more benefits. Hence, the highway engineering project construction enterprises need to change the concept of effectiveness. Under the market economy system, effectiveness management concept is the combination of input and output. Cost management and control is the core content for the highway engineering project construction enterprise which therefore must establish a strong concept of cost effectiveness, combine the project cost management, project profit and corporate profitability to constantly improve the enterprise's construction quality and market competitiveness and win. Another critical factor to improve the highway engineering project construction enterprise's competitiveness is innovation of science and technology. Cost management and control should also follow the innovation science and technology. Highway engineering project construction enterprise should regard science and technology as the driving force, closely combine cost management control with construction, optimize construction programs, improve the construction technology and establish systematic scientific and reasonable systems of modern management and construction. In addition, enterprises should attach great importance to the allocation of resources, take advantage of modern technology to integrate production factors together organically and build a science & technology-driven modern cost management and control system.

### **3.2 Establish Scientific and Perfect Cost Management Guarantee System**

Constructing an efficient, perfect, scientific and rational organization and management agency is the important foundation to ensure the smooth highway engineering project construction activities and an effective way for a highway engineering project construction enterprise to improve the cost control management effect. In the organization management structural system, each post's scope of duties, responsibilities and obligations are marked clearly and cooperation between various organizations and members should be done well to ensure the well-regulated construction of highway engineering project and practical fulfillment of responsibilities. Second, enterprises also need to create more feasible and operable cost management systems to standardize and guide the process of the highway engineering project. When making cost control and management system, the enterprise must conduct sufficient market surveys and investigations, proceed from the reality and build more operable systems conforming to requirements of the enterprise and local market environment. The objectives of cost control and management system should respect the reality with simple and definite contents. Moreover, cost management and control work should be conducted under clear and explicit system regulations.

### **3.3 Choose the Most Appropriate Cost Control Approach**

Whether the cost control and management approach selected is scientific and reliable and accords with the enterprise's actual situation directly relate the quality of the enterprise's cost control management. In terms of highway project construction enterprises, project activity is the primary core of project construction. The enterprise should make cost control management by reducing the waste of resources and consumption quantity. In the practical construction and application of cost control management, the highway engineering project is carefully divided into a number of specific operational items, directly makes accurate allocation of indirect cost and auxiliary resources in accordance with the requirements of all operational elements and conducts cost budget management. Compared with traditional cost accounting approaches, the operation cost control management method has the advantage that it can makes strategic management of the whole process of cost control management and introduces the concept of cost driver into the cost control management, which can effectively improve the accuracy of analysis of highway engineering project cost composition. Target cost control management is relatively commonly used in highway engineering project cost control management methods of a, target cost control management is one of the more commonly used approaches for the

cost control management system of highway engineering project. The target cost control management approach can be divided into five sections: 1. establish the cost target stages, make accurate budget of costs that construction may bear according to the size of the highway engineering project and the actual situation of the enterprise's construction strength and formulate feasible cost control management plans; 2. decompose cost target stages, decompose the cost targets according to responsibilities of different departments after the overall cost target has been determined and then various departments construct the cost target system based on their own organizational structures and make detailed decomposition and planning of project cost types and using time. 3. Control stage: implement whole process control management for the highway engineering project costs and adopt various cost control means to make cost control management in accordance with the scientific, reasonable and operable construction schemes formulated by the enterprise. 4. Actual cost accounting stage: account all costs produced actually in the highway project and offer experience reference for the next stage's project construction cost control management. 5. Cost driver analysis stage: make a detailed comparative analysis of actual cost accounting results and the target cost, find specific links in which there are problems and causes for the problems, take effective measures in time and offer experience reference for the next stage's project construction cost control management.

Highway engineering project cost control management runs throughout the whole highway engineering project. Therefore, enterprises need to strengthen the whole process cost control management to enhance the effectiveness of the highway engineering project cost management.

#### 4. Conclusion

Highway engineering project cost control management relates to the construction quality and construction efficiency of the highway engineering project and economic benefits that an enterprise finally obtains. At present, there are such problems as backward management style and lack of competition awareness in the highway engineering project cost control management in China. Therefore, the highway project construction enterprises must renew the management concept in time, construct scientific and perfect cost control management organizational system, choose proper cost control management approaches, constantly perfect the highway engineering project cost control management system, improve the quality and efficiency of management, and enhance their economic benefits.

#### References

- [1] Yang Jing. Cost Control Problems in Highway Engineering Construction Management [J]. Urbanism and Architecture, 2016, 02.
- [2]Zhang Jiangbin. Cost Management of Expressway Engineering Construction Project [J]. Tranpo World (Architectural Maintenance and Machinery), 2016, 03.
- [3]Xie Caili. Research on Highway Project Construction Site Cost Control Thinking [J]. Sichuan Building Materials, 2010, 01.
- [4]Yang Xuantang and Luochungui. Problems Existing in Highway Engineering Construction Project Cost Management [J]. Science & Technology Information, 2010, 18.
- [5]Li Jianqing and Hu Yuling. Analysis of Cost Management of Expressway Subgrade Construction Project [J]. Architectural Knowledge, 2013, 04.
- [6]Shao Baofeng. Research on Strengthening Highway Engineering Cost Management [J]. China Venture Capital, 2013(11): 39.