

The application of "Railway + Property" combined with "PPP" mode in Qingdao Metro Line 8

Jia Zhao^{1, a}, Jianbo Wang^{1, b} and Yinghao Qin^{2, c}

¹School of management, Qingdao University of Technology, Qingdao 266520, China;

²The Third Construction Co.LTD of China Construction Third Engineering Bureau, Guangzhou 510275, China.

^azhjia820@163.com, ^bwangjianbo2008@126.com, ^c118008459@qq.com

Keywords: metro; property; public-private partnerships; financing and investment.

Abstract. The metro has the advantages of large capacity, velocity on time, safe and convenient, environmental protecting and energy saving. However, the government leading investment pattern has been unable to meet the needs of the expansion under the circumstances that metro had entered a rapid development period, it becomes a new way to solve this problem to explore the market financing mode. In-depth analysis of the metro financing and investment mode of capital structure, operating mechanism and financing characteristics of the government, government and enterprise joint ventures, PPP mode and "Railway + Property", this article proposes "Railway + Property" combined with PPP mode of financing and investment program based on the actual situation and development characteristics of Qingdao Metro Line 8 in order deal with the synergy between development of metro construction and property development and meet the financing needs at the same time, and elaborates the momentum basis of combination, operation principle, and announcements in the end.

Introduction

The metro is an important part of modern urban public transport system and shows significant advantages in reasonable utilization of resources, reducing environmental pollution, alleviating traffic pressure, improving travel convenience and so on when compared to the traditional public transport. The metro has become an indispensable choice of stimulating domestic demand to develop the economy and optimize the space, however, the metro construction is faced with high cost of investment, long construction cycle, capital recovery difficult and so on, what's more, the metro generally has the problem of operating losses. The situation in which the government invested a lot of money to make up for the loss of the metro will not exist with the construction of other infrastructure gradually into the right track, and the land revenue decreased. Therefore, it becomes the fundamental way to solve the problem of financing and operational issues of metro to optimize the planning structure of the land along, to adjust the development mode of land resources, to promote the integration of metro construction and urban planning and to introduce social capital comprehensively.

Typical metro investment and financing mode

Wholly government-owned. It refers that almost all money for the construction of metro derives from the government the financial allocation, bank or other financial institutions and the issuance of loans and bonds, etc. For example, the Beijing municipal government is solely responsible for the money spent on the construction and operation of the Beijing metro line 1 and line 2.

This investment and financing model is very common in the early stage of the construction of the metro. Although structure of this model is simple, of high financing efficiency and convenient operation, but the government finance which is supported by the land grant can't satisfy the fund for the rapid development of the metro, and commercialization degree of the fare policy implemented by government is low, which has caused serious losses of the metro operation.

Government-enterprise joint venture. It mainly refers that mutual cooperation between the government and the social enterprises is based on bidding and negotiation, the former gives the right to the latter, who are responsible for financing the construction and operation of metro and recover the right to the former in accordance with the contract after a certain period of time, for example, Shenzhen Metro Line 4.

This model is under the leadership of the government, who will give social enterprises a certain subsidy generally, such as common construction compensation and operating period of loss compensation, in order to attract social capital to participate in the construction of metro[1], which can reduce the financial pressure to a certain extent, improve the operating efficiency and to ensure that the government's final possession of the metro, but the government subsidies reduces the social enterprise's initiative in construction technology and innovation in operation mode for metro, which makes the profits of the social enterprises in the infrastructure no longer returned to infrastructure. In another way, it's a difficult for the government to solve the operating loss the problem and to ensure the sustainable management of the subway.

PPP model. Public-Private Partnerships, cooperation between government and social capital, is a new type of financing model, which refers that the government establishes a long-term cooperative relationship with social capital in the way of franchising, purchase of services, equity cooperation and so on for the sake of enhancing the supply of public goods and services and improving the efficiency of supply. Such as Beijing Metro Line 4, the construction of the metro is divided into two parts, public welfare and profitability, the government investment public part and the social enterprise investment profitability.

PPP model is also considered as a more generalized government-enterprise joint venture, but the two bear big differences:

Different emphasis. Traditional focuses on government and establishes the cooperation on the basis of the special permission of the infrastructure while the PPP model is more emphasis on market mechanisms and extensive privatization approach, and chooses the best investors, constructors and operators through a series of measures such as tender in the various stages of the project in order to reduce the cost[2].

Different cooperation. The relationship of government and social enterprise in the traditional government-enterprise joint venture is vertical, government is responsible for the project design, project establishment, bidding, whereas social capital participates passively only in the phase of bidding, which may greatly prolongs the time of the project preparatory work. However, government and social enterprise is kind of cooperation in the PPP model, both sides set up the project company jointly and involve in each stage of the project, the social is responsible for the company's day-to-day management and decision-making while the government is only entitled to the decision of the major issues. Only in this way can economic benefit and social benefit be effectively separated and the efficiency of the operation of the project can be ensured.

Different risk management. It seems that the both sides share the risk in the traditional government-enterprise joint venture, but in fact, the government is in active status while social enterprise is relatively weak and many risks are inadvertently transferred to the social enterprise especially the construction of operating risk and risk. However, the PPP mode emphasis more on the benefit sharing and risk sharing, the principle of which is allocating risk to the best to bear.

"Railway + Property" Model. It is that the government will be right in the construction of subway project, operation rights and subway surrounding land development rights granted to the metro project company, Metro project company is responsible for the integration of the planning and construction of the property and the construction of the metro[3]. The most successful use of this "land feed on land" financing mode is the Hong Kong metro.

It can be found that most of the metro operation is losing money, only one of the few metro operation can achieve break even, however, the operation mode of the Hong Kong metro can achieve sustained profitable state [1], which is benefited from the comprehensive development of "Railway +

Property" investment and financing mode. The advantages of this kind financing model can be summarized as follows:

Integrated development of Metro and Property. It can make full use of land resources, reduce the urban planning of the disharmony and improve urban comfort, and can as well internalize the spillover benefits of metro development through the development of the benefits of the property along the metro, which can achieve the mutual transformation of land value-added benefits and property appreciation benefit.

More market-oriented overall pattern. It is a development orientation of market model that the railway lines according to the mode of population density planning gradually changed for the planning of the subway line to guide the population aggregation degree of the model and a market-oriented financing means which can make full use of lending market resources and financing tool for diversification to reduce the risk of financing.

Administrative independence. The government will provide the guarantee for the Metro company through administrative means, but not too much interference, the two sides have maintained a business interaction and a game state management independently.

Although "Railway + Property" financing mode has a strong advantage in profit, but if you want to use it also need to meet the three key external conditions in order to the successful application[4]. First, whether land policy can guarantee enterprise contract at a specific price within a certain range of metro surrounding property development rights or not; the second, whether economic policy can guarantee property development profits enough to make up for the cost of metro operation or not; the third, whether the degree of marketization can guarantee the synchronous construction and coordination of the subway and property or not.

It can be informed from the comparison of the above four kinds of typical metro financing patterns that investment and financing is mostly led by the government because of the specific national conditions. But with the profound changes undergone in market and more mature resource regulating mechanism, the government can adopt a more market-oriented means of financing, appropriately in order to prompt the financing efficiency and make the infrastructure construction effect more apparent.

Qingdao metro line 8

Project background. With the successful approval of National West Coast District, as well as the rapid advance of Shandong International Airport, the Qinglian Railway and Jiqing high-speed rail and other infrastructure projects, Qingdao proposed a new urban strategy- one ring and four lines, a ring tri-cities three nets, interconnection between networks four lines- which divided Qingdao rail transit system into the urban rail lines and rail express, in order to emphasize the rail transit network of global co-ordination, three city linkage, shaft commenced, ecological interval, group development strategy support. Qingdao Metro Line 8 belongs to the "a ring tri-cities three nets" the planning and is a new line which serves to solve the traffic problem of Jiaodong International Airport and Jiqing high-speed rail and the central city, connects the east coast city along with the M7, M8 and M10. The length of main line is approximately 60.9 kilometers, which begins from railway Jiaozhou north station and ends May 4th Square in Shinan District [5].

Scheme design of investment and financing. Qingdao Metro Line 8 is a new project and has a greater innovation space to choose when compared to other investment and financing model of the stock of the project. Therefore in the view of the situation, the author puts forward the "Railway + Property" with PPP model combining investment and financing plan, in which both are used together to the construction of Qingdao Subway Line 8.

The detailed design of "Railway + Property" combined with PPP.

Momentum of combination. Experience summary. It can be found through the analysis of capital structure, operation mechanism and characteristics of financing of the existing metro typical

investment and financing mode that the operation mode of Hong Kong MTR is more productive in terms of profitability, however, mainland and Hong Kong in is indeed different in three shortcomings [4], that is whether land policy can guarantee enterprise contract at a specific price within a certain range of metro surrounding property development rights or not, whether economic policy can guarantee property development profits enough to make up for the cost of metro operation or not, and whether the degree of marketization can guarantee the synchronous construction and coordination of the subway and property or not. For example, the government orders that the ownership of commercial, tourism, entertainment, industrial and commercial residential buildings, such as various operating land and the competing requirements of industrial land must be to the tender auction listing transferring, that is undoubtedly increased the difficulty of obtaining land development rights along the metro of metro company and will reduce space of the profitability greatly. Furthermore, the existing development mode makes the property along the metro plots too scattered, making the whole subway and the property difficult in synchronized planning. But PPP mode actually exists problems in profit, such as the Beijing Metro Line 4, it implement low fare system in the initial operation, ticket price is 2 yuan per person, that means essentially the government has taken regulatory policy to ensure quasi public goods attribute of the metro. That narrowed the profit space of PPP in a certain extent, and thus metro company can't use the only fare revenue of the operating period to make up for the huge operating costs, as a result, the operating period is always in a state of loss [3]. Therefore, when combining the "Railway + Property" with the PPP mode, both of which can be complementary advantages and disadvantages.

Policy support. 50 PPP projects including the Qingdao Metro Line 8 was launched by Qingdao municipal government publicly, and the total investment is about 276 billion 500 million yuan. Qingdao municipal government also recommended the establishment of a 30 billion yuan PPP development fund to attract all kinds of financial institutions to discuss investment cooperation. Qingdao City issued local regulations, " Plan on the encourage and guide social capital to participate in investment in infrastructure and other areas of the project implementation", in which points out that the new metro lines can adopt PPP mode, BOT, "Railway + Property" comprehensive development, etc and encourages to break the decentralized operation mode which take the project as a unit and then implement large-scale operations. What's more, when it involves the integration of the construction of the project, land can be provided in the means of sell, lease, bidding auction listing sold, in view of the specific circumstances of the agreement. All of these policies above have promoted the combination.

Operation principle of the combination. The specific process of combination is as follows, the mode of operation is shown in figure 1.

Qingdao municipal government packages the rights of metro and the property of along the metro, and chooses the social enterprise with strong capital, strong financing ability and rich experience in the metro construction and real estate development, such as Rail CSCEC, CSCEC, Greenland and etc, to form a project company with the client company of land ownership management based on the shareholders' agreement. The project company assesses the land premium under the authority of the government, and obtain land use rights directly when the latter will get shares with the invest of the land price.

Qingdao municipal government and the client company signs a capital investment agreement, the latter is responsible for holding land ownership and management and pays the government a certain return, which can be used as subsidies for the project company or for the loss of non-profit-making public infrastructure. The government also need sign a concession agreement with the project company and can play a regulatory and regulatory role but does not involve the internal management of project company even they develop the overall development plan jointly.

Project company operates independently and signs a contract involving project value for money evaluation, performance review, loans, bonds, guarantee, insurance and other activities with consulting firms, financial institutions, insurance companies, guarantee companies and others.

Project company is responsible for the construction of Qingdao Metro Line 8 and the development of the property along the line and the later operation and management. It develops the property, such as station comprehensive service area, residential area and CBD, gets investment profit and returns certain income to make up the demand for construction funds and operating losses, which can enhance the commercial value of the property along the line through the effective continuous operation of the metro.

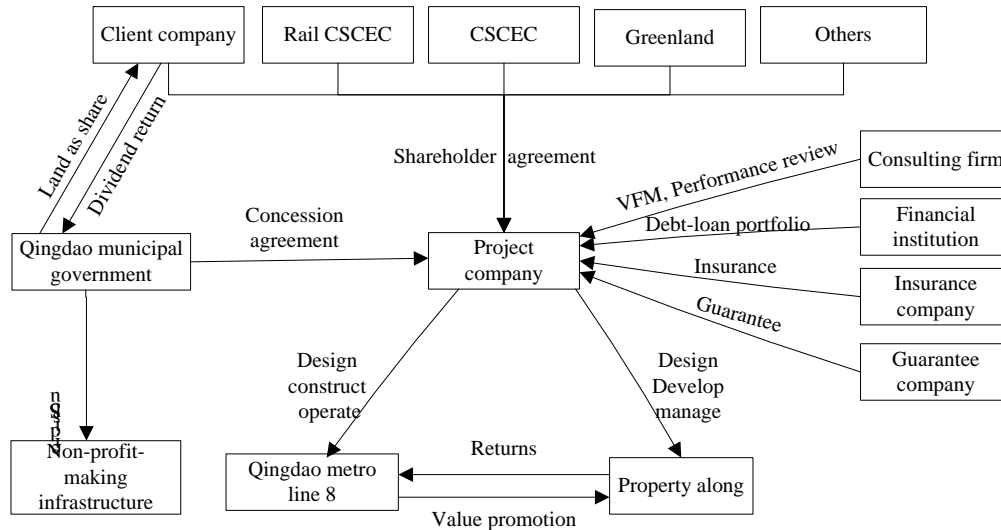


Fig. 1 "Railway + Property" combined with PPP mode

Announcement of the combination. Using land use right as shares can bypass the regulation that land use right must be bidding, auction and listing, which not only can make the project success of the company to obtain the land development rights, can be an effective solution to profit allocation and risk sharing problems in the government and social enterprise cooperation [6, 7], at the same time can make government enjoy the comprehensive development of land value increment when maximizing land resources, which is undoubtedly a gospel for the government under the revenue crunch of land. But in this way, the high social participation degree making operation of the whole project much more complex and the risk higher, hence it should develop the management system with appropriate distribution of income and dividends of the return according to the ratio of equity the parties holding, and establish the risk management system.

It can avoid government holding the project company directly, reduce the government's administrative intervention of the project company, guarantee the project company independent operation and self-financing in the market, force the project company to adjust and optimize the structure, control costs and focus on perfect company comprehensive risk management actively in order to improve its profitability when the government transfers land ownership the client company. The government can choose the local city construction investment company or the SASAC or professional equity management company he parties recognized if the degree of marketization is high enough to be responsible for equity management. In addition, the government and the client company shall sign the corresponding option agreement about equity management, dividend return, management cost and so on. What's more, the government should also assure the client company independent operation to avoid damage to the equity system of the project company.

The cooperative development of the property and the metro has formed a land development mode based on the urban public transport using the commercial principle of diversified business development. In the operation process, the government should sign a particular concession agreement with project company and show support for comprehensive development mode to avoid social capital losing investment confidence due to the lag and uncertainty of property development along, and declare that the project company should be in accordance with the market operation and subsidies is available unless profit is not up to the specific proportion, which is 15% in Hong Kong for instant.

The cooperation of multi social enterprises can meet the demand of the huge investment needs of urban development, improve the efficiency of the operation of the market, develop mixed ownership

economy and promote the self configuration of market resources. Thus, municipal government should be carefully in the choice of social enterprises, for example, choose social enterprises with higher qualification through consultation or competitive negotiation applied in Shandong Weifang high-speed rail PPP projects and establish a reasonable evaluation system to filter out the unqualified enterprises.

Project company operates with market mechanism, which can drive infrastructure construction to evolve from "government investment and financing" to "market investment and financing". The Notice on the Strengthening the Construction of Urban Rail Transit Planning Management of the National Development and Reform Commission points out that project capital ratio should be not less than 40% and the government capital accounted for urban public finance budget revenue ratio should be less than 5% current year, which makes the legitimacy of land shares faced with the challenge. Therefore, the municipal government should make corresponding adjustments and amendments in the law and examination and approval, or obtain recognition from superior government so as to protect the interests of all parties and reduce legal disputes.

Summary

The subway is the core of the new generation of urban comprehensive transportation system and plays an important role in optimizing the urban spatial structure and enhancing the comprehensive carrying capacity of the city in the process of urbanization. Hence, the combinative application of "Railway + Property" combined with PPP mode in metro construction is the internal mechanism of market operation and the infinite self adjusting ability of free markets, which can satisfy the urban transport and land resources unified planning, demand of the development of the system, the healthy development of economy and society.

Acknowledgments

1. Foundation: Natural Science Foundation of Shandong Province (ZR2011GL021)
2. Corresponding author: E-mail address: zhjia820@163.com (Jia Zhao)

References

- [1] Z. Hong, L. Yong, S.X. Dong, Experiences of investment/financing on Metro in seven world cities, *Urban Mass Transit*. (2007)6-10.
- [2] Y.M. Xu, Present situation and suggestions of China's Metro investment and financing, *Urban Rapid Rail Transit*. 23(2010) 28-31.
- [3] S. Chen, Analysis on subway financing and investment mode innovation — contrast analysis on Beijing subway and Hong Kong metro, *Chinese Academy of Social Sciences.*, China, 2012, pp. 18-20.
- [4] Z.Q. Tang, Y.W. Zheng, Strategic research of the preparatory work based on “subway + property” mode, *Urban Mass Transit*, 5(2013)33-36.
- [5] Information on <http://qd-metro.com>
- [6] S.H. Ma, D. Wu, S.Q. Wang, Design of investment and financing scheme for a high speed railway station, *Project Management Technology*, 10 (2012)18-20.
- [7] J.H. Wang, S.L. He, Legal analysis on the practice of Hong -Kong mode “subway + property” concession, *Urban Rapid Rail Transit*, 20 (2007)25-28.