

# Research on the Reform Path of Public Products Supply based on PPP Mode

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## Abstract

**This article summarizes the mode and characteristics of PPP application in China, and analyzes the development status of PPP in China based on two large-scale PPP cases in Wenzhou, and proposes the advantages and disadvantages of PPP under the current system. Comparing the experience of PPP operation in the United Kingdom, France, the United States, Canada, and Japan, it proposes the optimization path of PPP in the tide of China's supply-side reform: improve the supporting laws, regulations and management system; cultivate supporting markets and PPP professionals; information disclosure, introduce Third-party supervision agencies.**

## Keywords

**PPP; Public Products Supply; Public Service Supply.**

## 1. Research Background

The supply of public products is the anchor of economic and social development, and it is also an important part of building a service-oriented government and urban construction and development. Schultz, the famous American economist, said that "any system is a response to the needs that already exist in real life". With the continuous improvement of economic development, the scale of investment in public product projects has become increasingly large, and the supply mechanism that mainly relies on government budget input has been far from meeting the demand of urban development. PPP (Public-Private Partnership) is a project financing method that introduces social capital into government projects through franchising, equity cooperation, government purchase services, etc.. PPP not only expands investment entities and financing channels, but also establishes mechanisms of mutual benefit sharing and risk sharing. The application of PPP in public product supply can improve the capacity of co-construction, strengthen market-oriented operation, and change the status quo of low efficiency of public service projects.

## 2. Literature Review

### 2.1. Global Theoretical Basis

In the field of public products supply, Mankiw [1] believes that the market can automatically adjust and replace some government's behaviors, but when the market fails and externalities appear, especially negative externalities, the government should issue policies or instructions in order to regulate behaviors, address market failures and provide incentives for individuals. But Ronald H. Coase[2] believes that objects like lighthouses could be built, operated, financed and owned by individuals, and the government's role was limited to legally determine the property rights of lighthouses. E.S.Savas[3] believes that the privatization of public services supply can help improve competitiveness and efficiency, meanwhile it can reduce the cost. It is unreasonable that public services must be provided by government. He highly recommends that promote the privatization of public services supply, it is the best way to get rid of the inefficiency of government public services, difficulties in raising funds, and insufficient funds.

Chasey et al. [4] compare the cost and the delivery time of 12 PPP programs, 36 Design-Bid-Build (DBB) and 47 Design-Build (DB) projects in California, Texas, Virginia, and Canada, carried out a comparative conclusion that the cost premium rate of those project which constructed and operated through PPP financing was lower than that of traditional ways (DBB and DB), and the delivery time of PPP project was earlier as well. John Forrer and James Edwin Kee [5] believe that PPP should focus on establishing a lasting partnership between the public and private sectors, the government and the private sector should share risks through negotiation instead of the government taking most of the risks, and at the same time ensure that the private sector has the right to participate in public goods and services supply and be a decision-maker.

## 2.2. Research Status in China

Li Hongjia and Shen Yaping [6] believe that the supply-side reform of public service can learn from the public value management paradigm, there are three paths to ameliorate: dredging and broadening the expression channels of public service demand, attract multiple participants in public service program to improving the cooperative supply mechanism, and strengthening the legal guarantee of public service supply. Han Dan[7] propose that the development of the PPP mode requires the cooperation between the spirit of social contract and perfect laws and regulations. In the experience of the operation of public library PPP projects in China, there are some problems: on the one hand, if the project needs the government grant funds to the enterprise, the government and the enterprises lack equal communication, and rent-seeking and breach of contract often occur. On the other hand, when the government does not grant funds to enterprises, the long-term and stability of the PPP mode is difficult to guarantee. Zhong Jieci and You Min[8] believe that the steady implementation of the PPP financing mode needs to follow the principle of "government-led, win-win cooperation, and risk control". Zhang Xiaoling, Sun Guoshuai, etc. [9] put forward that the problems of PPP mode are not only financial, policy and legal factors, but also conflicts caused by the diversification of stakeholders, lack of a sound audit system, and low participation of private capital. Positive measures should be taken to deal with these problems. Ge Xinqi and Yang Yanfeng[10] propose the optimal path for the implementation of the PPP mode in the construction of municipal highway: in the division of property rights, the public products which generated by the project should allocate according to the local ownership, and the property rights of facilities within the scope of the land which allocated by the government for free should belong to the private sector. In terms of return on investment, the goal can be achieved by the government by buying public products. It is necessary to allocate risks and establish a reasonable appraisal system. Pang De and Liu Kun[11] compare the PPP financing mode in China and Canada then point out that China's PPP development is still faced with problems such as imperfect supervision system, lack of project funding sources, access restrictions. The development of PPP should be improved by optimizing the structure design and payment mode of PPP projects, strengthening professional management, and encouraging the participation of private funds.

It can be seen that in terms of channel selection, PPP financing can facilitate the cooperation between social capital and the government in the supply of public products, and play a role in reducing costs and improving efficiency. However, there are still some practical problems to be solved in the specific operation and implementation. This article compare domestic and foreign PPP projects, summarize experience, and discuss measures to improve the efficiency of PPP financing.

## 3. Main Mode of PPP and its Characteristics

According to the types of infrastructure projects, it can be divided into two categories: economic infrastructure and social infrastructure. Economic infrastructure includes

transportation, energy communication, garbage disposal, etc. Social infrastructure includes education, medical care, security, housing construction, etc. There are also great differences in the application of PPP mode in different stages of the project and in different regions. Through analyzing domestic cases and combined with the PPP classification standard proposed by Lin Jun [12], it can be seen that PPP mode mainly includes the following three types in China: outsourcing, franchise and privatization. [Table 1](#) shows the characteristics of three modes.

**Table 1.** China's PPP financing mode and its characteristics

Type		Operating mechanism	Operation time	Ownership	Risk allocation
Outsourcing	O&M	Delegating the operation and maintenance responsibilities of public assets to the project company.	Within 8 years	Government	Greater government risk, less investor risk
	MC	Authorize the operation, maintenance and user service responsibilities of public assets to the project company.	Within 3 years		
Franchise	BOT	The project company is responsible for financing, construction and operation, etc., realizes returns through fees, and transfers assets and rights to the government after the expiration.	20-30 years	Government	Shared risk
	TOT	The project company operates and maintains public facilities by purchasing or leasing, and the assets are transferred to the government after the expiration.	20-30 years	Partial ownership by the government	More risks for investors during the operation period
Privatization	Private	The project company purchases the ownership of the asset, the construction project is subject to the government supervision, and the public welfare terms of the service are specified in the contract.	Long-range	The government has no ownership	More risks for investors
	Partially private	The project company owns public service assets through shareholding.	Long-range	Partial ownership by the government	Greater risk for both government and investors

## 4. PPP Development Status and Typical Cases

### 4.1. PPP Development Status in China

In recent years, with the rapid development of China's economy and the continuous advancement of urbanization, PPP mode has been applied to infrastructure projects such as public goods or public services. According to the data released by the National Development and Reform Commission[13], from January to December 2021, there were 403 new PPP projects in various regions. In terms of different regions, there are many new projects in Jiangxi, Shanxi and Guizhou. In terms of different industries, the number of new urban infrastructure

projects is the largest, reaching 149. The rest ranked by the number of projects are: agriculture, forestry and water conservancy, social undertakings, transportation, environmental protection and other industries in order of the number of projects. According to the participation of private enterprises in the signed projects announced by the national PPP project information monitoring service platform[14], 844 private enterprises won the bid, and private enterprises participated in 917 projects through shareholding. In terms of regions, the top five PPP projects are Shandong, Anhui, Jiangsu, Henan and Guangdong; the top five total investment were Jiangsu, Shandong, Anhui, Yunnan and Guangxi. It can be seen that the PPP mode plays an important role in the infrastructure construction in various regions of China, and private enterprises participate more in the way of holding shares.

#### 4.2. The PPP Project Case of Local Government Public Service Supply

This article selects the experience of two large-scale PPP projects in Wenzhou, and the characteristics are summarized in Table 2.

**Table 2.** PPP projects in Wenzhou

	Light Railway S1 line	High-speed Railway New Town
PPP mode	TOT	DBFOT+ government pays
Total project funds	19.957 billion	19.988 billion
Project funding	Individual investor equity, combined with trust financing, insurance financing, financial leasing and "perpetual bond" issuance, with government document plus credit guarantee;	The enterprise and the government jointly establish a project company. During the cooperation period, the project company is responsible for design, investment and financing, construction, operation and maintenance, etc.;
Project Time	30 years	15 years
Project return	6% rate of return on personal equity, renewable and redeemable at 1-year maturity;	The project company recovers costs through user fees and gap subsidies from government, and obtains a reasonable return on investment and operation;
Project Risks and Responsibilities	In the first 3 years, the project company does not bear the passenger revenue risk, meanwhile the cost risk is shared;	During the operation of the project, the government assumes all direct payment responsibility;
After the expiration of the project	The operation right of the project company will automatically expire, and the project equipment needs to be handed over to the agency designated by the Wenzhou Government for free;	The project company shall hand over project facilities (all facilities which are necessary for the normal operation: equipment, land use rights, various information systems, maintenance manuals, etc.) to the HSR Office or its designated agency for free in accordance with the agreement;

Combining domestic and Wenzhou practical project experience, advantages of PPP are mainly reflected in the following aspects: improve economic efficiency and time efficiency. PPP financing can increase the financial stability of the public sector, increase investment in public product supply. And to a certain extent, it can also reduce the risks of the private sector, stabilize its cash flow, promote its development, stimulate local industries, and increase employment opportunities. It is definitely that using the PPP mode to supply public goods has many benefits, but there are still some shortcomings in the specific operation process of the PPP mode: high financing costs, insufficiency of project funds, lack of flexibility, resulting in

monopoly and so on. Therefore, it is necessary to learn from the experience of successful PPP projects at home and abroad to explore the optimization path of the PPP mode.

## 5. International Experience of PPP Mode of Public Goods Supply

At present, the development of PPP in the world has gradually matured. The United Kingdom and France are the most successful leaders in the development of PPP. In addition, other countries such as Canada, the United States, Japan and other countries and regions have also used PPP to finance public goods supply projects. Various countries and regions have promulgated PPP-related laws and regulations in order to explore PPP mode suitable for their own national conditions and ensure the efficient operation and development of PPP projects. According to the statistics of the World Bank, 66 PPP-related professional organizations have been established in various countries and regions around the world. For example, the National Council for PPP and Federal High Way Administration (FHWA)、PPP Canada in Canada、PFI Promotion Office in Japan、European PPP Expertise Centre (EPEC), etc. By comparing and summarizing the successful experience of foreign PPP projects, it is found that the leaders of PPP project investment are mainly financial institutions in the region. In terms of the source of funds, in addition to bank loans, some also come from pension and social security funds. In terms of project implementation goals, some public reconstruction projects are aimed at improving service levels and efficiency. The PPP operation characteristics of foreign public goods or services are summarized as follows:

### 5.1. PPP in the United Kingdom

The United Kingdom is the first country in the world to implement PPP. In 1972, the Hung Hom Tunnel was the first project constructed by the British government through BOT. In the early 1990s, the British government proposed the PFI (Private Finance Initiative), which refers to the purchase of services by the government. The development of PFI in the UK was very successful, but it also exposed some problems, so the British Treasury later issued the "A New Approach to Public Private Partnerships"(PF2 policy), which made improvements in the following areas: risk negotiation and sharing, increased flexibility in contract terms, standardized payment mechanisms and agreements with shareholder, simplify the process of contract signing. In terms of supervision, the UK has established IPA to be responsible for the planning and supervision of PPP. Governments at all levels have also established specialized agencies responsible for planning and cooperation of public-private partnership. In addition, the UK has set up "Partnerships UK" (PUK) to provide the government with a fee-based consultancy service on PPP projects.

### 5.2. PPP in France

Although PPP started relatively late in France, the French government has made a series of improvements to the PPP mode. In 2004, France began to implement the Contract of Partnership (CP), formulated relevant laws and revised it in 2008 and 2009. After that, the PPP mode was rapidly promoted and applied in the construction of public service projects in the fields of medical care, transportation, education, and social security in France. The interpretation of "CP" is: the duration of project is 10 years to 35 years and above, and public-private cooperation is established with DBFOM. The current PPP mechanism in France is based on franchising and government purchases of services. The franchise system is the most common mode for building and managing public services and infrastructure in France. Government holding shares of SPV companies in most project. The French government has also set up a series of safeguard measures to ensure the normal operation of PPP, including mature laws and regulations, tax incentives, financial subsidies, supervision agencies, PPP fund support,

encouragement of project asset securitization, professional project team and consulting service organization.

### **5.3. PPP in Japan**

Japan draws on the PFI concept from the United Kingdom and adopts the PFI mode. The private sector and social capital are active participants in public products supply project in Japan. The government does not participate in the project construction and operation, but purchases the right to use public products or public services in the final stage. The Japanese government has promulgated a series of relevant laws and regulations in order to promote the PFI mode. In 1997, the Japanese government promulgated the Law of PFI, which clarified the project evaluation procedures, promotion processes, value evaluation, risk sharing, and information disclosure, etc.. In addition, there are some PPP professional organizations in Japan, such as PPP Association, PFI Association, PFI Promotion Committee, etc. These institutions have played an active role in promoting the development of PPP.

### **5.4. PPP in the United States**

In the 1990s, the United States began to promote the PPP mode, which accelerated the efficiency of the supply of public goods in various states in the United States. After the subprime mortgage crisis, the US government promulgated the "American Recovery and Reinvestment Act of 2009" in 2009 to encourage the private sector participate in infrastructure construction. In 2014, the Obama administration proposed an investment proposal to build the United States in order to accelerate the development of PPP in the United States. The PPP management agencies in the United States include the National Council for Public-Private Partnerships (NCPMP), the Mayors Business Council, and the Federal Highway Administration. The PPP financing funds are derived from private activity bonds, charitable funds, the Transportation Infrastructure Finance and Innovation Act (TIFIA), Water Infrastructure Finance and Innovation Act (WIFIA), etc. Based on the U.S. federal system, all states have the freedom to legislate, so the U.S. government provides guidance with the "American Recovery and Reinvestment Act of 2009" for all states, and each state formulates and implements the corresponding regulations and management clauses according to their own specific conditions. In terms of project supervision, the United States implements a mode of independent supervision between the federal government and the states. "Freedom of Information Act" ensures that the public can obtain PPP information through public channels. In addition, the Third-party objection and litigation mechanism implemented in the United States can also play a supervisory role.

### **5.5. PPP in Canada**

The development of PPP in Canada began in the early 1990s. So far, Canada has established one of the most efficient and stable PPP markets in the world. The success of PPP in Canada is mainly due to its excellent management system, diversified funding channels and reasonable incentive mechanism. In terms of participants, in the PPP system of the Canadian federal and provincial governments, there are no strict restrictions on the participation of state-owned enterprises in the PPP. And they implement a return mechanism based on the government payment mode and pay-for-performance as the core. In terms of funding sources, the Canadian PPP does not rely on bank debt financing. Funds come from pension funds, project bonds, and support funds (such as the establishment of "PPP Fund" in 2007/the establishment of "Building Canada Fund" in 2013). In terms of management institutions, Canada has established "PPP Canada" and "Canadian Council for Public-Private Partnerships" (CCPPP), as well as six provincial PPP professional institutions, forming a joint governance system with mutual coordination and clear division of responsibilities among multiple departments.

## 6. The Optimal Path of PPP Mode

Comparing the status quo of PPP development in China, local (Wenzhou) cases with foreign cases, the operating experience of PPP mode in other countries has a certain enlightening effect on domestic PPP development.

In conclusion, this article puts forward some suggestions on optimizing the public goods supply mechanism based on the PPP mode.

### 6.1. Improve the Supporting Laws and Regulations, Management System

Judging from the experience of operating PPPs in various countries in the world, perfect laws, regulations and systems are the basis for ensuring the operation of PPP projects. The central government should formulate regulations and make top-level design, and then fully mobilize the enthusiasm of local governments to implement them. The law applicable to PPP projects should clearly define the scope of PPP operation, government authority, participants, management procedures, regulatory agencies, information disclosure, financial subsidy mechanism, etc., and at the same time enhance the flexibility of the terms which negotiated by both parties during the life cycle of PPP projects, such as Risk sharing and reward return mechanism, etc. Different countries have different legal systems and national conditions, and China's PPP related laws, guidelines and management regulations are also in the process of exploration and development. It is inevitable that there will be conflicts between policies and existing laws and regulations. According to the development situation, it is necessary to repair regulations and adjust policies.

In terms of management system, China's PPP management agencies are the National Development and Reform Commission and the Ministry of Finance. In 2014, the Ministry of Finance also established "China public private partnerships center", but compared with the actual operation of PPP projects, it can be found that many of the PPP project guidance agencies in China are construction enterprises. Referring to the successful experience of Canada, there should be a clear division of responsibilities and coordination among various departments to form a six-integrated management system of the Development and Reform Commission, the Ministry of Finance, the public product supply department, the infrastructure construction department, the Third-party regulatory department and professional consulting agencies.

### 6.2. Broaden Funding Sources

China PPP project financing channels mainly rely on policy funds and commercial bank loans. With the rapid development of the capital market, direct financing is playing an increasingly important role. To expand channels, it can refer to Canada's experience and try to guide social security funds to participate in projects, issue project bonds, trust investment fund, etc., actively play the role of special support fund- "China PPP fund" in "guiding, standardizing and increasing credit" in the PPP industry. From the perspective of funding sources, the most PPP projects in China are urban infrastructure construction, and the project usually has a relatively long operation cycle. Learning from the experience of the Wenzhou S1 line case, it should encourage the private sector and private investment to join, intensify publicity and education, lower the threshold, provide long-term, stable and attractive returns, achieve win-win cooperation.

### 6.3. Cultivate PPP Supporting Market and PPP Professionals

The mature PPP market and professional consulting team are the guarantee of the success of the project. Drawing on the experience of the UK and France, the UK has set up some professional PPP service organizations, and most of the PPP business in France is contracted by its three large domestic contractors. The development of the PPP mode in China also requires a mature market supporting mechanism, professional project contractors (partners),

a reasonable competition mechanism, open bidding procedures, consulting service teams, etc., and professional service teams including legal advisors, engineering construction consultants, professional technical consultants, business operation consultants, etc.. At the initial stage of the project, the government must choose suitable partners and service teams. The partners should not only consider the company's professional background, technical capabilities and strength to undertake the project, but also take into account the social responsibility and management structure. The consulting service team should not be limited to local enterprises, but can also cooperate with international consulting companies with rich experience.

In addition, the cultivation of talents is also crucial to the development of PPP. The government should encourage the establishment of a multi-disciplinary professional talent training system in PPP, such as encouraging PPP professional training and PPP research.

#### **6.4. Information Disclosure and Introduction of Third-party Supervision Agencies**

At present, the national PPP project information monitoring service platform is responsible for the collection and publication of PPP big data. However, there are just basic information of PPP projects public on the national PPP project information monitoring service platform, the detailed project progress information are not exposed on the platform. The public lacks a platform to participate in supervision, and lacks service quality evaluation and feedback channels as well. It is suggested that the national PPP project information monitoring service platform can disclose relevant laws, regulations and policies, details of demonstration cases of successful PPP operations, project structure design and progress information, and consider establishing public feedback channels.

China's current PPP supervision system is supervised by the National Development and Reform Commission and the Ministry of Finance. However, government departments have many functions, and government departments are not specialized market institutions, and different departments will inevitably deviate and conflict in PPP operation and management mode. Different departments will inevitably have deviations and conflicts in PPP operation and management methods. Referring to the experience of the United Kingdom, an independent project implementation supervision agency can be introduced. The supervision responsibilities of a Third-party agency for PPP projects include qualification review of the private sector which will participate in the project, agreements, operation management, mid-term evaluation, acceptance and delivery, etc. Third-party organizations should formulate specific performance indicators and assessment standards at different stages of project implementation, regularly provide supervision reports to the government, and publish project information.

Transparent information and Third-party supervision mechanisms are beneficial to attracting public investment, as well as the operation and development of PPP projects.

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