

Analysis of Barrier-Free Facilities Construction in China from an Economic Perspective

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Abstract. Social equity and well-being of vulnerable groups rely on barrier-free facilities, which is one of the primary indicators of inclusive development. Nevertheless, the vulnerable groups have systematic problems in their construction in China such as a lack of supply, low efficiency, and poor maintenance. The paper will examine these dilemmas in the theoretical framework of the public goods. The barrier-free facilities are quasi-public goods with high positive externalities, which cause market failure and lack of incentives to privately engage in those goods. Further, existing models dominated by the government have gradual responsibilities and disarranged incentives. The research shows the essence of supply and governance failures through the analysis of cases like "zombie blind path" and elevator installation in old communities. The research suggests a partnership of governance ecosystem based on government leadership, market incentives, and social participation. The framework has an objective of internalizing externalities and maximizing resource allocation, which provides a sustainable way towards high-quality barrier-free environments.

Keywords: Barrier-Free facilities, public goods, externality, social well-being

1. Introduction

The Chinese population has changed significantly in the recent decades. As the aging population increases at pace and the importance of promoting social equity becomes clearer, the necessity to have accessible environments is growing quickly. Recent census data indicate that the aged population of China has already exceeded 190 million people, and the number of people with disabilities has already exceeded 38 million. To these large vulnerable populations, barrier-free facilities are not just a convenience but rather a necessity that supports the fundamental rights of these populations to travel, live, and start contributing to society.

The level of urban modernization and social civilization can be seen in barrier-free facilities, such as wheelchair ramps, tactile paves, accessible elevators, and information accessibility devices. As a result, Chinese government has come with a series of policies and regulations to facilitate the building of such environments with the most remarkable being the "Barrier-Free Environment Construction Law of the People's Republic of China." The law is a big step towards institutionalization of a barrier-free construction where the emphasis is not on voluntary application but on the compulsory use of the law.

Nevertheless, despite the strong policy framework, implementation is fraught with many challenges. The lack of supply, unreasonable plans, low utilization efficiency, and bad maintenance are still common in most cities. There is also a discrepancy between the theoretical aim of statutory participation involving people with disabilities and the realities of life in daily life because facilities are often described as having poor usability, discontinuity, and lack of maintenance [1]. The problems show that the legal system is present, while the financial and operational mechanisms to maintain these establishments are not yet established.

The existing research on the design of barrier-free facilities construction has provided impressive outcomes and has addressed different aspects such as technical standards to the end user. The analysis of the facility accessibility, the demand analysis of users and the effectiveness of policies has been largely considered by foreign scholars. To illustrate, Elorduy et al. took a user-centered approach to the question of the availability of public transport to physically challenged people in Burgos, Spain, and offered specific improvement strategies depending on the user-feedback [2]. Andersson Järnberg et al. also examined the readiness to pay an increase in the level of traffic safety, citing the significance of the determination of the latent value of public goods [3].

The Chinese domestic research is generally geared towards policy analysis, summaries of practical problems and introduction of foreign experience. He and Wei have created a performance assessment model of accessible passage facilities within residential communities, with the considerations of the demands in respect to the types of slopes [4]. The research papers are a source of good technical advice and status evaluation.

Nevertheless, there is a knowledge gap in literature as to the economic mechanisms which support such outcomes. Most of the literature available does not provide a detailed discussion of the economic characteristics of barrier-free facilities as such [5]. The lack of research that combines both the public goods and externality theories to examine why, despite the government mandate, the market failure and the government failure are present in this industry is dire. Countermeasures that are currently in place tend to concentrate on technical or management changes but not the systematic incentive structures. The paper bridges the research gap by developing a theoretical framework to make a detailed discussion of the dilemmas and solutions of the barrier-free facilities construction in China.

Aiming at discussing the central issues in the barrier-free facilities construction in China, the study employs economic theories, namely, the public goods theory and the externalities theory as a tool for case analysis. This study can enhance the applicability of public goods theory and externality theory to research on the tensions between disabled populations and urban infrastructure development. Furthermore, it can provide guidance for the government in optimizing the construction of urban accessibility facilities, exploring collaborative governance models involving multiple stakeholders and promoting the expression of social inclusivity.

2. Theoretical basis

2.1. Public goods theory

The theory of public goods gives us the initial figure in realizing why the private market does not offer sufficient barrier-free facilities. Based on traditional economic concepts, true public goods are non-excludable with no rivalry in consumption and no rivalry in benefits [6]. Non-rivalry implies that the consumption of a good by one individual does not decrease the availability of that good to other individuals, whereas non-excludability implies that it is not possible or prohibitively costly to exclude anybody who would like to use the good.

The barrier-free facilities usually have the attributes of quasi-public goods. They are highly non-excludible; the example of a wheelchair ramp located in the street can be used for all people: people with disabilities, the aged, parents with their strollers, or even delivery workers. The technical aspect makes it impossible to charge individual users and leave certain people out of the benefits. This contributes to the free-rider problem, as people will be able to receive the facility without paying for it [7]. The fact that the revenue of the user can hardly be captured by the private companies does not provide them with motivation to provide these goods and, therefore, the government must intervene.

Moreover, there is low competition among these facilities in a normal condition. The facilities, however, may be converted into congestible public goods. As an illustration, available elevators or toilets can be subject to dispute at busiest times. This quality establishes that their supply cannot fully be dependent on the market mechanisms [8]. The government should take the most dominant role to make sure that it is available, but the quasi-user nature also means that market forces can be implemented by adopting certain institutional designs to enhance efficiency [9].

2.2. Externality theory

Externality theory is the reason why there is differentiation between the social costs and private costs. Externality is a type of economic activity that has an impact on third parties not directly in the transaction but is not reported in the price of the market. Barrier-free facilities produce a lot of positive externalities. The availability of quality environments that are accessible will not only support mobility of people with disability, but also decongest the family caregivers in the economy, freeing labor [10]. The environments increase social justice, consumption among the vulnerable and enhance the image of the city. Nevertheless, these social amenities at large are not easily translatable into individual gains of the construction firms or property developers. This results in the fact that the social marginal benefit is greater than the private marginal one, which causes a lack of willingness to invest on the part of market entities.

A shortage of barrier-free facilities creates negative externalities. When facilities are damaged, the negative externalities on people with disabilities will be converted into social costs. It makes it more reliant on government support and guardians, worsens social non-participation, and diminishes the productivity of the working population [11]. The question of policy that is at the heart of all this is the ability to internalize such externalities, to make providers compensated for the benefits that they give in positive ways and negative ones in negative ways.

Based on the above theories, the paper employs a three-tier framework, analyzing market failure at the root level, examining government incentive misalignment at the mechanism level, and revealing multi-party collaboration barriers at the performance level, to systematically explain the systemic limitations in accessibility construction.

3. Barrier-free facilities construction in China: core dilemmas in the theoretical perspective

3.1. Supply dilemma

The main traits of the supply dilemma include inadequate aggregate amount and high structural imbalances, which is a direct consequence of the attributes of public goods. Since the market does not have the incentive to provide these goods in a voluntary manner, the government is left with practically all the responsibilities [12]. Nonetheless, the fiscal capacity of the government is not much and results in a resource allocation shortage of projects like accessible facilities, which do not yield clear financial returns.

One of the best illustrations of such quandary is the gradual introduction of elevators in the old residential areas. Although elevators are mandatory in newly constructed infrastructure, old communities in which a significant percentage of the elderly population reside are behind. Moreover, the introduction of elevators into the old buildings is associated with the complicated property rights and negotiations with neighbors. This is not solved by the market due to the prohibitively high transaction costs of negotiating compensation between neighbors and the lack of profit mechanism of a third-party company that would participate in the market without a substantial government subsidy. This leads to an enduring supply gap when there is a high demand.

3.2. Efficiency dilemma

The efficiency dilemma takes the form of wastefulness and low utilization levels all because of a basic failure to internalize externalities and lack of connection between policy outputs and user demands. When it is an administrative edict that the project is going to be built as opposed to market signals of demand, efficiency is likely to be impaired.

Scientific planning is missing to compromise construction efficiency. Structures are commonly constructed to conform to a quota and not to resolve a particular mobility issue. The site selection is sometimes irrational, and the designs are not usually based on real-life application by the vulnerable groups. Inefficiency in usage is also decreased because of ineffective maintenance. Since the positive externality of a well-maintained facility (social inclusion) is not revenue generating to the property manager, there is no economic incentive for repairing a broken ramp or a failing blind path.

An example of the efficiency dilemma is the phenomenon of zombie blind paths. Tactile paving to the sightless is very common in most cities of China, but in most cases, it is virtually useless. These trails are often planned irrationally, and they will bend around electric pikes, straight towards the wall, or drop suddenly in the open ditch [1]. Moreover, they are frequently covered with communal bicycles, parked vehicles or street traders. This is the result of both designing inability and management failure, in which the negative externality of using the path (danger to the blind) is not penalized and the positive externality of clearing the path is not compensated. The net effect is that resources are used to construct the paths, and it still fails to bring the desired social good, which is safe passage by the visually impaired, and therefore is a waste of money.

3.3. Governance dilemma

The governance dilemma is typified by a change of responsibility and failure of multiple stakeholders to work together. The governance dilemma is based on the fragmented responsibilities as reported in the theoretical framework. The process of managing barrier-free facilities is composed of a large network of government departments which include complex divisions who may have overlapped roles with vague powers. Unless there are institutional or legal requirements that can centrally constrain them, departments are reluctant to participate in construction without social incentives.

Take an example of building of a simple barrier-free ramp. The planning and construction standards of it may be handled by the Housing and Urban-Rural Development Bureau. The Urban Management Bureau, however, is charged with managing the sidewalk that it is attached to after construction and may install stone piers in front of the ramp, crippling wheelchairs actually. In case one of the users complains, the Construction Bureau states that it was constructed in the right way, and the Urban Management Bureau states that it is controlling traffic safety [13]. This failure of coordination results in a failure of governance in which there is no targeting of goals in the

departments, and the facility turns out to be useless. This is a typical example of the governance dilemma in the provision of public goods with the effect known as the silo effect.

4. The solutions of barrier-free facilities construction in China according to theoretical perspective

4.1. Optimize the supply system

To resolve the supply dilemma, the government should enhance its dominant role at the same time social participation is directed. Given the aspect of a public good of these facilities, the government cannot leave the market to take over responsibility. The government needs to put more funds into it, namely, in the areas of weak links revealed during the analysis, including rural locations and the outdated residential communities. This guarantees a universal supply which naturally is not heeded by the market.

Nevertheless, government funding should not be the only one. Market forces are exploited through policy instruments. The internalization of the positive externalities should be done by the government using financial subsidies, reduction of taxes, and by the government acquiring the services. As an illustration, where a developer constructs extra-standard barrier-free facilities that are beneficial to the greater community, one is to be given tax credits or bonuses in terms of floor area ratio. This gets their own interest and in line.

Moreover, it is important to investigate the market-oriented operation models. This sector can be altered to the Public-Private Partnership (PPP) model. As an example, business organizations can be given commercial rights in their operation (advertisement space or vending machines) in exchange for a barricade free elevator or bathroom. This adds a source of revenue which would also be a motivation towards quality maintenance, addressing the issue of government being a source of everything.

4.2. Enhance the incentive mechanisms

To solve the efficiency dilemma, the distorted incentive systems need to be repaired. It is hoped to make it profitable to have entities construct and operate high-quality facilities- at least reputationally valuable. Thus, entailing a three-pronged strategy; policy incentives, reputational incentives, and benefit sharing.

Aiming at providing policy Incentives, the government ought to offer actual policy dividends. To the businesses that are leading in construction without barriers, the government can either provide priority project approval, credit provision, or even direct monetary incentives. This directly adds to the side of the equation of the private benefit.

Besides, this is a time when Corporate Social Responsibility (CSR) is becoming a more treasured asset and reputation is part of it. The evaluation system must be made strong with buildings and companies rated on their friendliness in the form of barriers. High ratings are to be brought into the limelight by the press, which provides the enterprises with a social license to conduct business and boosts the brand image [14]. This transforms the social positive externality which is intangible to a tangible brand asset.

From the aspect of benefit sharing, a benefit compensation mechanism is required to counter the negative externality problem in such a scenario as elevator installation. Any positive value accrued to residents on the upper floor should be partly passed to the residents on the lower floor to make up for the loss. This can be provided by the government by establishing such standardized

compensation rules or even paying the compensation of the loss of the lower levels as a subsidy and hence decrease the cost of the transactions of negotiation (in the logic of the Coase aspect) and the project can be implemented [14].

4.3. Construct a collaborative governance ecosystem

To address the governance dilemma, the paradigm shift must be done between fragmented management and collaborative ecosystem. This incorporates different but collaborative positions of the government, the market and society. Government as Leader and Leader: The government can no longer be a builder but a platform builder [15]. It is supposed to introduce a high-tier coordination system which will create a connection between various departments (construction, civil affairs, urban management). Its essential tasks include the development of coherent plans, establishing obligatory standards and exact implementation of laws to punish the negative externalities (such as the prevention of blind paths).

The market as an Efficient Operator: The market ought to take advantage of its efficiency advantage to take part in facility building and functioning. The above-mentioned incentive mechanisms will allow the professional service providers to be hired to run facilities so that they are not merely constructed but maintained [16].

Society as Bridge and Supervisor: Social organizations and society should have a significant role in lowering information asymmetry [5]. The federation and NGOs of disabled persons should become the middle ground, gathering the actual needs of users and back them to planners to prevent zombie facilities. It should introduce a system of public supervision - a barrier-free map is an application where individuals can report damaged facilities [2]. This gives community the power to check the quality and usage of what is being constructed, and it creates feedback to the people in which the facilities are supposed to benefit.

5. Conclusion

The paper has developed a logical framework of the study of the dilemma of constructing barrier-free facilities in China using the public goods theory and externality theory. The study determines that the main rats of the existing dilemmas such as inadequate supply, low efficiency, and disjointed governance are not only technical and financial problems. Rather, they reflect structural malfunctions brought about by the economic characteristics of such facilities, the market failure of being a public good and the absence of incentives because of the uninternalized positive externalities.

According to the study, on the supply side, the single government-led model cannot be effective to address a wide variety of needs, whereas the market is lacking, as there are no mechanisms of generating profits. The lack of relation between policy output and user needs on the efficiency side results in the wastage of resources, which is illustrated by zombie blind paths. At the governance level, there is a lack of accountability at the departmental level.

To overcome such problems, this paper suggests a complete paradigm change of administration-led construction to incentive-compatible governance. The way out is a multi-dimensional solution: to reinstate the dominant role of the government in lawmaking and fundamental investment; to innovate market policies to internalize social benefits by subsidies and other PPP models; and to strengthen the social organizations to break the information gap. Through creating a cooperation environment in which the government leads, market works, and society oversees, China can turn its

environment free of barriers into the environment of substantive effectiveness, and indeed, inclusive development to everyone.

References

- [1] Zhang, S., Liu, Y. and Chen, Q. (2025) Improving equity through barrier-free transportation: Challenges and policy recommendations for transport barrier-free environment development in China. *Frontiers in Public Health*, 12, 1463824.
- [2] Elorduy, J.L., Pino, Y. and Gento, Á.M. (2025) Assessing public transport accessibility for people with physical disabilities in Burgos, Spain: a user-centered approach to inclusive urban mobility. *PLoS ONE*, 20(4), 1-22.
- [3] Andersson Järnberg, L., Andrén, D., Hultkrantz, L., Rutström, E.E. and Vimefall, E. (2025) Willingness to pay for private and public traffic safety improvements: the importance of the underlying good. *Applied Economics*, 57(42), 6636-6649.
- [4] He, B., & Wei, D. (2024). Human Factor Performance Evaluation Model for Barrier-Free Access Facilities in Residential Communities Based on Demand Priority Levels of Four Typical Ramps. *Sustainability*, 16(16), 7035.
- [5] Wu, Y., Feng, J. and Liu, H. (2025) Public awareness of accessible environments and its influencing factors in underdeveloped regions of China. *Urban Science*, 5(4), 92.
- [6] Samuelson, P.A. (1954) The pure theory of public expenditure. *The Review of Economics and Statistics*, 36(4), 387-389.
- [7] Johnson, M.K. and Lee, S. (2022) Digital free riding: How modern technology challenges the classic free-rider problem. *Journal of Public Policy & Marketing*, 41(3), 223-240.
- [8] Abe, T. and Funaki, Y. (2021) The projective core of symmetric games with externalities. *International Journal of Game Theory*, 50(1), 167-183.
- [9] Nicoletti, L., Sirenko, M. and Verma, T. (2023) Disadvantaged communities have lower access to urban infrastructure. *Environment and Planning B: Urban Analytics and City Science*, 50(3), 831-849.
- [10] Carson, B.B. (2022) Individuals and Externalities in Economic Epidemiology: A Tension and Synthesis. *Journal of Private Enterprise*, 37(3), 1-24.
- [11] Sangha, S., Anderson, J.K. and Burn, A.-M. (2023) A Qualitative Study Investigating the Experiences of Young Adults Caring for a Sibling with Disability within Immigrant Families in the UK: "Challenges Are Just the Constant." *Journal of Intellectual & Developmental Disability*, 48(4), 421-431.
- [12] Liu, X., Chen, X. and Gao, C. (2019) The Status Quo, Challenges, and Policy Recommendation of Transport Barrier-Free Environment Development in China. In *CICTP 2019*, 5351-5363.
- [13] Qu, X., Yang, Y., Liu, Z., Jin, S. and Weng, J. (2014) Potential crash risks of expressway on-ramps and off-ramps: a case study in Beijing, China. *Safety Science*, 70, 58-62.
- [14] Wang, Q., Tan, Z., De, G., Pu, L. and Wu, J. (2019) Research on promotion incentive policy and mechanism simulation model of energy storage technology. *Energy Science & Engineering*, 7(6), 3147-3159.
- [15] Miao, S. and Tan, H. (2025) The construction of collaborative governance mechanisms for green space in megacities: Evidence from China. *SAGE Open*, 15(1), 21582440251328921.
- [16] Zhang, W., Huang, K., Feng, X. and Zhang, Y. (2017) Market maker competition and price efficiency: Evidence from China. *Economic Modelling*, 66, 121-131.