

Can Transferable Development Rights be Applied in the Chinese  
Context?

—— A Comparative Study between China and the United States

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**Abstract:** Transferable development right (TDR) is an innovative land management tool created under zoning system in the United States and widely applied in the preservation of historical buildings and natural resources. Chinese scholars have introduced it and conducted extensive research, advocating for the establishment of a trading market for land development rights. However, there are significant misunderstandings that need clarification. Firstly, In China's property rights system, "development rights" is implicitly included within the "land use rights" specified in the Civil Code. Secondly, China's quotas-trading between governments differs from the TDR system in the United States, where land development rights are traded among private landowners. Additionally, the transfer of floor area ratio (FAR) between land users does not hold practical significance in the Chinese context.

**Keywords:** TDR, FAR, land use control, property rights

### 1. Introduction

Development rights transfer (referred to as TDR) is an innovative land use management tool created under the zoning system in the United States. New York pioneered this mechanism as part of an effort to preserve historic landmarks in the face of a long postwar building boom that increasingly threatened their viability<sup>Erreur ! Source du renvoi introuvable.</sup>. The "landmark transfers" provision, which allowed unused development rights on designated landmarks to be transferred to adjacent plots, was added to zoning resolution in 1968. This mechanism provided economic relief to owners of landmarked properties, thereby furthering the purpose of the landmark preservation law and provided the city a measure of legal protection from a takings challenge<sup>Erreur ! Source du renvoi introuvable.</sup>.

The case of Penn Central Transportation Co. v. New York City was a milestone in the legalization of TDR. In 1960s, although the Grand Central Terminal, owned by Penn Central Transportation Company had been designated as a landmark by Landmarks Preservation Commission, Penn Central still entered into a renewable 50-year lease and sublease agreement with UGP Properties, Inc. UGP was to build office towers above the terminal; however, the commission denied the application on the ground of landmark preservation. Penn Central and UGP sued the city council, claiming that LPC's decision constituted a government "taking" of its property no less than if the government had condemned a plot of Penn Central's land<sup>Erreur ! Source du renvoi introuvable.</sup>. The case wended its way to the US Supreme Court. In 1978, the Court upheld the Landmarks Preservation Law, and gave the TDR concept some legitimacy by adding that if a taking had occurred, the TDRs "undoubtedly mitigate whatever financial burdens the law has imposed on appellants, and, for that reason, are to be taken into account in considering the impact of the regulation"<sup>[1]</sup>.

In the United States, a majority of TDR programs are used either for environmental protection or farmland preservation. In addition, there are a few programs that use TDRs to protect rural character, to preserve historic sites, and to implement urban design and revitalization goals<sup>[1]</sup>.

Chinese scholars have been attempting to introduce TDR to address issues such as urban-rural disparities, unfair distribution of land value increment, inadequate consideration of farmers' rights, and insufficient motivation for urban renewal in the Chinese context. The main focuses are as follows:

One type of TDR is referred to as land-use quotas-based TDR. Specifically, Researchers propose endowing rural areas with development rights in the form of quotas and transferring them to urban areas. This enables rural areas to obtain monetary compensation through quotas transactions, which will benefit farmland and environmental preservation goals. While this approach bears similarities to the American practice, the dual urban-rural land system and land quota system in China make its essence different from that of the United States.

Another type of TDR is referred to as floor area ratio(FAR)-based TDR. Relevant research suggests that in the case of urban renewal or historic preservation, permitting unused development rights to be transferred to other plots in the form of FAR can attract market entities to preserve historic buildings. This approach may seem similar to New York's landmark preservation, yet its essence differs significantly.

Based on the aforementioned background, this study conducts a comparative analysis of two sets of cases to examine the inherent differences in TDR under different land ownership systems in China and the United States. Through this research, a deeper understanding of the applicability of the TDR mechanism in China can be achieved.

Meanwhile, China's experiences to promote land resource protection to be presented in this paper, which will be of great significance to other countries.

## **2. Comparative cases: The Practices of TDR in China and the United States**

### **2.1 Land Management Systems in China and the United States**

#### **2.1.1 Chinese Land Management System**

The Chinese government has implemented a dual urban-rural land ownership system, whereby urban land is state-owned, while land in rural and suburban areas is collectively owned. The Land Administration Law of the People's Republic of China stipulates that ownership of all state-owned land is exercised by the State Council on behalf of the state. Acting as agents of the central government, local governments are specifically responsible for land utilization and protection, and they are delegated the authority, in the interest of the public, to expropriate or requisition collectively owned land.

Since the start of reform and opening up in 1978, China's economy has developed rapidly, with a significant influx of foreign capital. This is partly attributed to local governments' strategy of attracting businesses at the expense of land resources. However, several issues have arisen, such as land use inefficiency, significant loss of arable land, and inadequacy in protecting farmers' rights during land requisition. During the 1986-1996 period, China's arable land decreased at an alarming rate of 280,000 hectares per year<sup>[2]</sup>. To curb this trend and strengthen land management, the central government issued an important document in 1997 titled "Notice on Further Strengthening Land Management and Effectively Protecting Arable Land", which directly led to the revision of the "Land Administration Law".

The "Land Administration Law" promulgated in 1998 reaffirmed that "treasuring and reasonably utilizing land, and effectively protecting arable land, are the basic national policies of our country". It proposed to establish a stringent land use control system, thereby strengthening the central government's authority over land use and protection. It introduced a mechanism—balancing the occupation and reclamation of arable land—to achieve the goal of maintaining the quantity of arable land. Under this system, construction land quotas are distributed hierarchically by higher-level governments through the land use master plan and the annual land use plan. The Master Plan sets long-term regulations on both the quantity and spatial distribution of agricultural land in a locality that is allowed to be converted construction land, while the Annual Land Use Plan breaks down these long-term objectives for each year<sup>[3]</sup>. Overall, the Chinese government adopted a "dual management" approach to protect arable land and promote efficiency in land utilization. At the same time, a land

inspection system was established to ensure the regulations made in the plan are executed properly.

In 2004, the central government proposed "the increase in urban construction land should be linked to the decrease in rural construction land." It clarified the corresponding implementation plan: several rural construction land parcels intended for reclamation as arable land (i.e., demolished parcels) and parcels intended for urban construction (i.e., newly built parcels) together constitute a "new construction and demolition project area" (hereinafter referred to as the project area). By combining construction and demolition, along with arable land reclamation, the goal is for the total amount of construction land in the project area not to increase and for that of arable land not to decrease. In other words, aiming to transfer the development rights of rural areas to urban districts by eliminating the development rights of rural areas, this sets the institutional background and basic form of TDR in China.

### **2.1.2 American Land Management System**

The land ownership in the United States, where most of the land is privately owned, differs from that in China. According to statistics, sixty percent (1.4 billion acres) of the 2.3 billion acres of land surface is privately owned, 29 percent is owned by the Federal Government, 9 percent by state and local governments, and 2 percent is in Indian reservations<sup>[4]</sup>. The state-owned land is managed by U.S. Department of the Interior in the form of national parks, national wildlife refuges and the like, While privately owned lands are regulated by the local government through covenants, zoning and other legal devices<sup>[5]</sup>.

In 1916, New York City adopted the nation's first comprehensive zoning, Building Zone Resolution, to regulate private property rights for the benefit of public health, safety, comfort, convenience and general welfare. The Resolution divided the five boroughs into three different kinds of use districts, five different height districts, and five different area districts<sup>[6]</sup>. In 1922, the Department of Commerce issued the Standard State Zoning Enabling Act, a model law, delegating local governments to enact zoning law through the authority of state police powers.

The conventional zoning (also referred to as Euclid zoning due to village of Euclid v. Ambler Realty Company) divides the municipalities into several districts to separate incompatible uses<sup>[6]</sup>. In recent decades, many innovative tools have been created by local governments to fulfill certain goals. Nevertheless, the zoning law sets restrictions on property owners' development rights. However, within the ownership system, the development rights by law belong to individuals, and the TDR trading typically occurs between rights holders, usually in a market environment.

## **2.2 Land-use quotas-based TDR: Practices of Zhejiang Province in China**

### **Comparing with that of Boulder County in the United States**

#### **2.2.1 The Practice of TDRs in Zhejiang Province, China**

Situated in the Yangtze River Delta, Zhejiang has been one of the most economically dynamic provinces since the economic reforms<sup>[3]</sup>, which has led to significant challenges for its land resources. Based on statistics, from 1995 to 2009, Zhejiang's GDP increased from 355.755 billion yuan to 2,299.035 billion yuan, and the per capita GDP nearly quintupled. Zhejiang Province adopted the approach of attracting investment with low-priced land like many other cities in China. As a result, rapid economic development led to a dramatic expansion of construction land, encroaching significantly on arable land. Statistics also showed that its arable land decreased by 138,700 hectares, and per capita arable land dropped from 0.048 hectares to 0.037 hectares during the period from 1997 to 2009, while construction land increased by 405,800 hectares compared to 1997.

The Land Use Master Plan for Zhejiang Province (1997-2010) was approved by the State Council in 1999 and stipulated that 66,667ha of agricultural land could be converted for construction purposes<sup>[3]</sup>. To meet the central government's request for "the amount of arable land cultivated equals that of depleted" Zhejiang had to reclaim an equivalent quantity of arable land that was to be converted to construction land.

In terms of the distribution of construction land quotas, Zhejiang provincial government allocated them nearly proportionally to cities based on their GDP performance<sup>[3]</sup>. This was a relatively fair approach, as each municipality has a desire for more quotas. However, cities or counties with strong development potential tended to have a shortage of construction land quotas, while economically backward areas had more than they needed.

To tackle this dilemma, the provincial government initiated a mechanism allowing for the transfer of construction land and farmland quotas between urban and rural areas as well as between regions, which many scholars also referred to as China's TDR.

the TDRs between urban and rural areas can be achieved through "land consolidation," which entails cultivating abandoned parcels into arable land, and "rural construction land reclamation," which involves demolishing rural residential or industrial buildings and converting the land into arable land. In the case of land consolidation, municipalities would be rewarded with construction land quotas equivalent to as much as 72 percent of the newly cultivated arable land. By employing the latter type of TDR, local governments could acquire an equal amount of additional construction land quotas if a certain amount of non-agricultural land within their

jurisdictions was reclaimed as farmland<sup>[3]</sup>.

Additionally, TDRs across localities could be realized through a two-step process. Firstly, municipalities with less demand for construction could sell their unused quotas, which were typically earned through "rural construction land reclamation" or "land consolidation," to cities or counties in need of extra quotas. However, in terms of trade-in areas, locating these purchased quotas would inevitably encroach upon prime farmland, as 85 percent of arable land had been designated as prime farmland in the Land Use Master Plan. Therefore, the prime farmland preservation accountability needed to be transferred to other municipalities capable of bearing extra burdens.

Let's assume there are one developed city, City A, and one underdeveloped city, City B in Zhejiang Province (Fig. 1). Both City A and City B will be distributed with construction land quotas through the Land Use Master Plan (LUMP) and Annual Land Use Plan (ALUP). However, due to strong development momentum, City A requires more construction land quotas. Construction land quotas obtained through land consolidation and rural construction land reclamation within its jurisdiction are intended to facilitate urban expansion. In addition, in cases where additional quotas are needed for further economic development, City A can purchase them from City B, typically acquired through similar means. Meanwhile, to locate these quotas and maintain the amount of prime farmland, City A can make a payment to City B for assuming this accountability on its behalf.

In this process, City A fully realizes its economic potential through sufficient development land, while City B, lacking development opportunities, finds that the marginal benefits from land development are lower than those from quota trading. Therefore, City B is eager to generate revenues by selling quotas. As for Zhejiang Province, it fulfills the development and protection responsibilities imposed by the central government. This can be described as a win-win transaction for all parties involved.

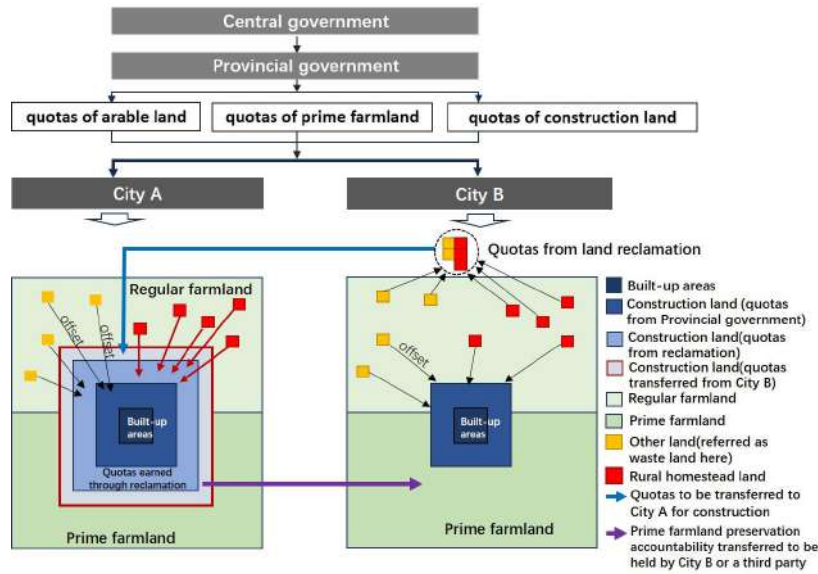


Fig. 1 The ideal type of TDRs between rural and urban areas and between localities

However, this innovative instrument, which had breached central government regulations, raised several concerns. It was reported that some local governments rushed to convert fish ponds, riverbanks, and hilltops into prime farmland to meet quotas, prioritizing quantity over quality<sup>[3]</sup>. Additionally, local governments could undermine farmers' benefits by forcibly relocating them to cities. Consequently, the central government halted further implementation of Zhejiang's practices in 2004.



Fig. 2 Intergovernmental TDR between 1999 and 2008 in Zhejiang Province  
Source: reference [4]

### 2.2.2 The Practice of TDRs in Boulder County, America

Boulder County, Colorado, spans 1,946 square kilometers and has a population of approximately 330,000 people as of 2022. Boulder, the most populous municipality in the county, is the county seat (Fig. 3).



Fig. 3 Location and layout of the Boulder County  
Source: google

The study by Nelson, A. C., Pruetz, R., & Woodruff, D. (2013) showed how the TDR program was operated in Boulder County. In 1981, Boulder County adopted a clustering technique known as a non-urban planned unit development (referred to as NUPUD), granting a density bonus in case that 75 percent of the parcel are permanently preserved. The base density could be doubled, from one unit per 35 acres to two units per 35 acres. This clustering technique significantly contributed to resources

preservation and growth management.

In 1989, the county upgraded this mechanism to allow the density bonus to be transferred to a noncontiguous parcel, which was referred to as non-contiguous non-urban planned unit development (referred to as NCNUPUD). The NCNUPUD includes two or more noncontiguous parcels, between which development rights can be transferred. In this situation, receiving sites can achieve up to three times the density permitted under the NUPUD process. For example, one unit allowed to be developed on a 35-acre site by right, two units through NUPUD, and six units with NCNUPUD<sup>[7]</sup>.

The NCNUPUD could be utilized within the jurisdiction of Boulder County, as well as being employed between Boulder County and a city in case that an intergovernmental agreement (IGA) had been reached. For example, in 1996, Boulder County and the city of Longmont entered into a TDR IGA. The Planning Area of Longmont, which was outside its city limits and intended for future development, was designated as receiving sites (Fig. 4). When property owners chose to preserve sending sites, the conservation easements were granted to Boulder County and the city jointly. If all the owners in the sending areas were willing to sell their development rights, a greenbelt, with valuable agricultural and environmental resources, was going to be created<sup>[7]</sup>.

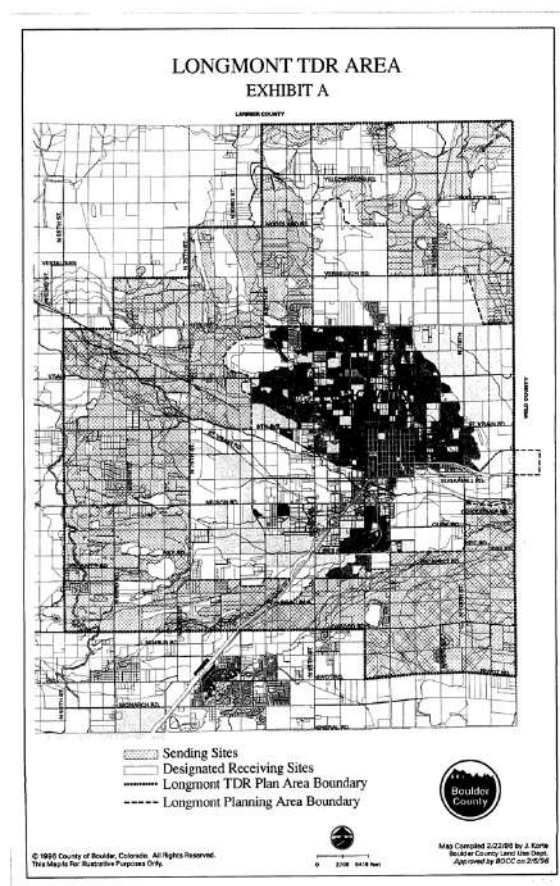


Fig. 4 Longmont TDR area

Source: <https://assets.bouldercounty.gov>

## 2.3 FAR-based TDR: A Case of Shenzhen in China Comparing with that of New

### York City in the United States

#### 2.3.1 A Case of TDRs in Shenzhen, China

Shenzhen, located in Guangdong province, spans a total area of 1,997 square kilometers, comparable to that of Boulder County. However, by the end of 2023, Shenzhen's population had surged to 17.79 million people, with a GDP of 34,606.40 billion yuan. Remarkably, just 35 years ago, Shenzhen was nothing more than a small fishing village. In 1978, the Chinese government decided to implement nationwide

reforms and opening-up policies. The State Council granted Shenzhen the status of an economic special zone, positioning it as a pioneer in China's economic reform. Over the past three decades, Shenzhen has effectively utilized policies, the domestic market, and its proximity to Hong Kong to rapidly evolve into a first-tier city.

Like many other cities in China, Shenzhen's rapid economic development has consumed a significant amount of land. By 2005, the spatial capacity was estimated to be insufficient to support further development, leading to the decision, in 2009, to implement urban renewal to facilitate economic development by demolishing underutilized parcels<sup>[8]</sup>.

Shenzhen has devised an urban renewal plan, through which a few urban renewal units were designated. Each unit typically involves multiple property owners and other stakeholders. Developers are authorized to create the plans, determining land use categories and their intensity. As widely acknowledged, residential and commercial utilization, combined with a higher Floor Area Ratio (FAR), can yield significant revenue for developers. However, this comes at a cost: developers are responsible for demolishing existing structures on behalf of the government, relocating native residents, and transferring a portion of the land, free of charge, to the government for public facilities. Additionally, developers are required to pay for the land use rights (usually below market prices). These expenditures prompt developers to negotiate with the government, seeking higher profits by increasing intensity.

Due to Shenzhen's high population density and significant shortage of infrastructure and public facilities, in the event that additional plots are transferred to the government for public benefit, the floor area on those plots can be transferred to other lots for the developers' benefit (Fig. 5). This approach is somewhat similar to "bonus density" adopted by New York city.

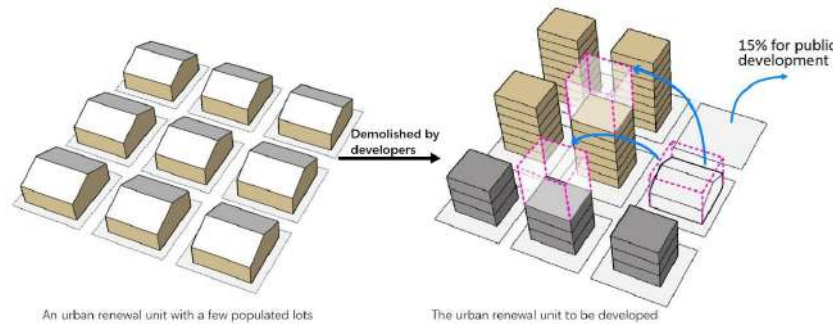


Fig. 5 FAR-based TDRs in an urban renewal unit

The urban renewal unit of Baolong Street, Longgang District, Shenzhen City can serve as an example(Fig.6, Fig.7). According to the plan, the area will be redeveloped

for industrial and residential use. In order to implement this vision, developers need to demolish the buildings on 104.5 hectares of land, among which 38.2 hectares will be transferred to the government for public facilities. Additionally, the developer, on behalf of the government, had to demolish the properties outside the urban renewal unit with an area of 8930 square meters. As an incentive, the development rights on this parcel will be transferred to a certain plot within the renewal unit at a specified ratio.

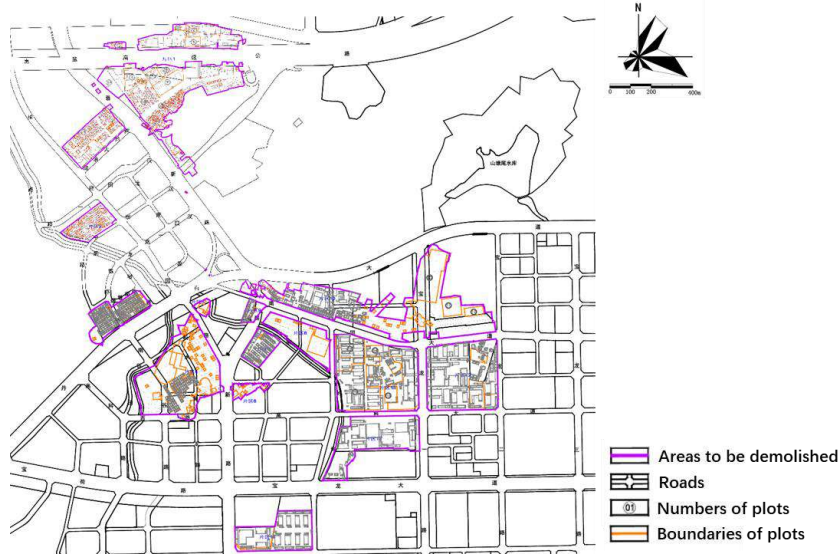


Fig.6 Urban renewal unit of Baolong street, Longgang District, Shenzhen

Source: [www.lg.cn](http://www.lg.cn)

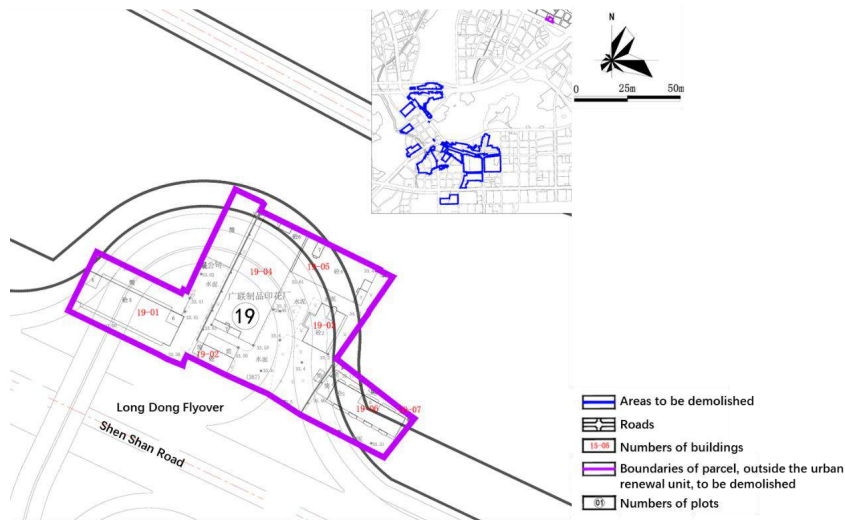


Fig.7 The parcel outside the urban renewal unit of Baolong Street to be demolished

Source: [www.lg.cn](http://www.lg.cn)

### 2.3.2 A Case of TDRs in New York City, America

The case of the Theater Subdistrict can illustrate how the FAR was transferred in New York City(Fig.8). The Theater Subdistrict is part of the Special Midtown District, one of the special purpose districts in New York's zoning resolution. The establishment of this subdistrict aims to protect the entertainment industry of Broadway from being encroached by abutting residential and office development. Many of the theaters in the area were built in the nineteenth century. In the 1970s, some significantly historic buildings were demolished, with only a few theaters designated as landmarks being preserved. By the 1980s, promoted by the "Save the Theaters" movement, New York City founded the Theater Advisory Council, and the area was designated as the Theater Subdistrict. Meanwhile, within the Special Midtown District, a special provision was created allowing property owners of listed theaters to sell their unused development rights, but the scope of the transfers was strictly limited.

In response to pressure imposed by stakeholders and the expansion of Times Square, New York City reformed the TDR rules in 1998. The amendment greatly widened TDR receiving areas by allowing listed theaters to transfer floor area anywhere within the Theater Subdistrict, expanded the Subdistrict to include the 8th Avenue Corridor up to 56th Street, reduced the procedural requirement to streamline the process<sup>Erreur ! Source du renvoi introuvable.</sup>. Through this tool The TDR trading in the Theater Subdistrict has become one of the most active programs in New York City. This initiative has enabled the preservation and of Broadway's entertainment industry and cultural brands.

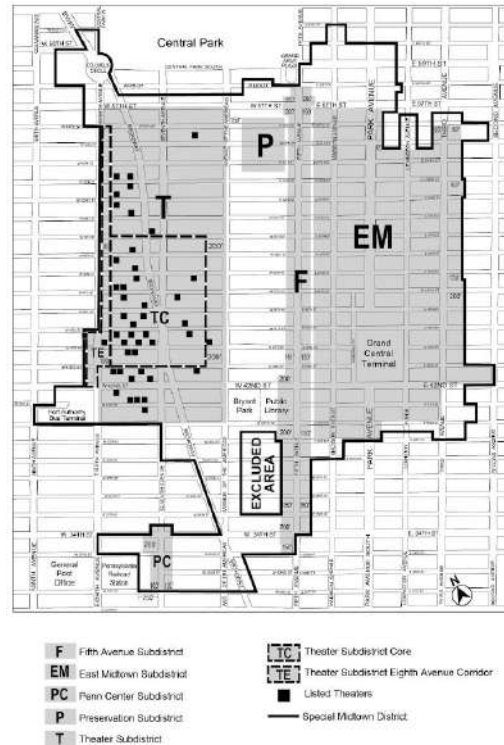


Fig.8 Special midtown district and subdistricts of New York City  
Source: Zoning Resolution of New York City

### 3. The Difference Between TDRs in China and that in America and its

#### Applicability in China

Two sets of comparative cases have been presented above, from which we can conclude that there are significant differences between TDRs in China and those in America.

Firstly, the goals of TDR vary. Through quota trading, Zhejiang Province and municipalities sought to fulfill the central government's objectives of farmland protection, while also addressing the scarcity of construction land quotas in developed municipalities. Conversely, Boulder County utilized TDRs for growth management, aiming to prevent urban sprawl and preserve agricultural and environmental resources. Similarly, regarding Shenzhen and New York City, the former aimed to incentivize developers to undertake governmental responsibilities, such as demolishing dilapidated

buildings and constructing public facilities, resembling more of a density bonus rather than a straightforward FAR transfer. The latter focused on the protection of historic buildings, facilitating the transfer of development rights between preservation sites and development parcels.

Secondly, the entities involved in the transaction are different. In the Zhejiang case, it was the local governments who promoted the transfers, since the quotas of prime farmland and construction land are strictly controlled by the central government. In the Boulder and New York City cases, local governments only establish rules and supervise implementation, while the transfers were still carried out by property owners. In the case of Shenzhen, developers traded with the government for additional floor areas.

The aforementioned distinctions between the two fundamentally lie in the difference in land ownership. In China, land ownership belongs to the government, which not only formulates land use regulations but also eagerly obtains revenue through selling land use rights. In the United States, since land is privately owned, the government intervenes in the amounts of development rights and the transaction process through planning, yet it does not directly engage in TDR trading.

Therefore, in the context of China, it is necessary to reexamine the essence of the TDR mechanism. Quotas-based TDR is one type used merely within a limited scope under the control of the central government, including the transfer of construction land quotas between urban and rural areas and that across regions limitedly. FAR-based TDR is essentially a density bonus, where developers take on public obligations on behalf of the government in exchange for additional floor area.

#### **4. Conclusions**

Given that Chinese scholars are advocating for the adoption of the TDR mechanism from the United States to address issues in China, such as the dual urban-rural land ownership system, government monopoly on land revenue, and lack of protection for farmers' rights, this article raises the question: Can Transferable Development Rights be Applied in the Chinese Context? It first introduces the backgrounds of land management in China and the United States respectively, and then compares the differences and similarities between the two countries' TDR systems from two perspectives: quotas-based TDR and FAR-based TDR, using two sets of case studies—Zhejiang Province and Boulder County, Shenzhen and New York City. The study finds that in both sets of cases, both the goals and the trading entities of TDR are different, which fundamentally stems from the different land systems in the two countries. As a result, the roles of the government differ. In China, with urban land being owned by the government, it has a strong incentive to acquire larger construction quotas to generate more fiscal revenue through TDR, while at the same time passing on accountability that the government fails to hold to developers.

In conclusion, the essence and connotations of TDR in the Chinese context differ significantly from those in the United States, and their implementation should fully consider China's institutional framework. Additionally, this article introduces China's experiences, thereby filling the gap in TDR research within the context of developing countries.

**References:**

- [1] New York City Department of City Planning 2015, A Survey of Transferable Development Rights Mechanisms in New York City, <https://www.nyc.gov/assets/planning/download/pdf/plans-studies/transferable-development-rights/research.pdf>.
- [2] Fulton, W, Mazurek, J, Pruetz, R & Williamson, C 2004, TDRs and other market-based land mechanisms: how they work and their role in shaping metropolitan growth, The Brookings Institution, Washington, DC.
- [3] Ye, H 2020, 'Core Objectives of Land Use Control in China from the Perspective of Legal System Construction over the Past 30-Plus Years', China Land, no. 06, pp. 4-7.
- [4] Wang, H, Tao, R, Wang, L & Su, F 2010, 'Farmland preservation and land development rights trading in Zhejiang, China', Habitat International, vol. 34, no. 4, pp. 454-463.
- [5] United States Department of Agriculture Economic Research Service (n.d.), 'Agricultural Land Ownership' [PDF file], Retrieved from [https://www.ers.usda.gov/webdocs/publications/41964/30285\\_landownership.pdf?v=0](https://www.ers.usda.gov/webdocs/publications/41964/30285_landownership.pdf?v=0).
- [6] Krutilla, JV, Fisher, AC, Hyde, WF & Smith, VK 1983, 'Public versus private ownership: The federal lands case', Journal of Policy Analysis and Management, vol. 2, no. 4, pp. 548-558.
- [7] Serkin, C 2020, 'A case for zoning', Notre Dame Law Review, vol. 96, p. 749.
- [8] Nelson, AC, Pruetz, R & Woodruff, D 2013, The TDR handbook: designing and implementing transfer of development rights programs, Island Press.
- [9] Zou, B 2017, 'Practices, Effects, And Challenges of the Inventory Development Pattern: The Assessments and Extended Thoughts of Urban Renewal Implementation In Shenzhen', Urban Planning, no. 01, pp. 89-94.