



Historical Analysis of Urban Public Transportation Development in Modern Tianjin (1902-1949)

Yili Zhao*, Lin Feng**, Yanchen Sun***, Kun Song****

* PhD, Tianjin University, 974046546@qq.com

** Lecture, Tianjin University, 41941932@qq.com

*** PhD, Tianjin University, SunYanchen8910@gmail.com

**** Professor, Tianjin University, 344255920@qq.com

Tianjin was the earliest city opening urban public transport lines in China. Urban public transportation had profound impacts on urban construction and on the formation of urban structure in Tianjin from 1902 to 1949. Based on the background of urban development, this paper firstly divides the evolution process of public transportation represented by tramways and buses into three periods from the perspectives of the distribution, quantity and operation status of public transportation lines. It then analyses the strong influence of public transportation on urban roads construction from the view of the increased municipal income, road widening, improvement of pavement quality, and bridges construction and maintenance. Finally, by using qualitative and quantitative analysis and superposing the related statistical data with the historical map, it analyses the relationship among public transportation line density, land value partition and basic urban structure, and certifies they were highly relative. In conclusion, the paper argues that Tianjin urban public transport network was based on trams and supplemented by buses, and not only planning ideas but also advanced municipal technologies from the West like public transportation system were also indispensable supports in the process of urban modernization in Chinese modern treaty ports.

Key words: Urban Public Transportation, Modern Tianjin, Tram, Roads Construction, Urban Structure

Introduction

The transformation of Chinese modern treaty ports was closely related to western planning ideas of the time. Western advanced technologies, including public transportation, also had profound impacts on urban construction. Tramcar and bus, as novel means of transportation, were introduced into China's metropolises including Tianjin successively in the early 20th century, which greatly promoted urban modernization. Tianjin was the first city opening urban public transport lines in China (Table 1). As the biggest treaty port in North China, Tianjin stepped into modern orbit with the establishment, planning and construction of concessions. To meet the expanding need on urban modernization and seek potential benefits from business, European merchants introduced tram to Tianjin. The paper explores the introduction, development and influence of public transportation represented by trams and buses in modern Tianjin (1902-1949).

First, it divides the development process of public transportation into three periods from the perspectives of the distribution, quantity and operation status of public transportation lines. The 1st period (1902-1924) started with the establishment of "Compagnie de Tramways et d'Eclairage de Tientsin" (CTDT) mainly invested by Belgian consortium (Oriental International Corporation, Overseas Bank, Second Railway Corporation, China Railway and Tram Corporation, etc.) in 1902¹. The opening of bus line set up by Chinese merchants in 1925 implied the beginning of the 2nd period (1925-1936)². And the 3rd period (1937-1949) came with Japanese takeover of tram and bus companies³. It argues that tramlines formed the basic skeleton of urban public transport network and bus lines supplemented it. Second, the article shows how public transportation promoted the development of urban road system from its contribution to municipal income, roads widening, transformation of pavement material. The foremost round of road widening in concessions was induced by the planning of tram lines and the paving of asphalt pavement also started from the road along tram route. Third, by using quantitative and qualitative analysis and superposing the related statistical data with the historical map, the paper analyses the relationship among public transportation line density, land value partition and urban spatial structure. It could be found that public transport lines greatly promoted the formation of land value partition and shift of urban centre, and the influence of trams was much deeper than that of buses.

In conclusion, the paper argues that not only planning ideas but also advanced municipal technologies from western countries like public transportation system were also indispensable supports in the process of urban modernization in Chinese modern treaty ports. The description and accurate quantitative analysis of Tianjin urban public transport demonstrates the strong influence of public transportation systems on urban construction.



City	TIAN JIN	NANJING	SHEN YANG	SHANG HAI	GUANG ZHOU	DA LIAN	HA' ERBIN	BEI JING
Transport	Tram	Short-distance Train	Carriage Railway	Tram	Tram	Tram	Bus	Tram
Start Year	1906	1907	1907	1908	1908	1909	1917	1924

Table 1: *The Start Year of Urban Public Transport Lines of Different City.*

Sources: compiled by the author based on “The First Opening of the Tram,” *Ta Kung Pao*(大公报), February 17, 1906; *Nanjing Chronicles Compilation Commission, Nanjing Chronicles* (Nanjing: Nanjing Chronicles Press, 1995), 288; Huangjin Sun, “Urban Development and Social Change of Shenyang In Modern Times” (Phd Diss., Northeast Normal University, 2012), 96; Song Zhang, “Historical Analysis on Public Transportation Development in Shanghai Concession,” *City Planning Review* 38, no. 1 (January 2014): 50; Dong Zou, “On Guangzhou’s Urban Planning and Construction in the Nationalist Era of China, 1911-1949” (Phd Diss., South China University, 2012), 222; Li Liu, “The Correlation between Traffic and Urban Development in Northeast Region of China from 1860 to 1931” (Phd Diss., Jilin University, 2012), 45; Zhong Zhang, “The early modernization study of Ha’erbin municipal(1898-1931)” (Phd Diss., Jilin University, 2011), 162; Zhihong Li, “On the Development of Buses in Beijing in the Nationalist Era of China” (Master Diss., Capital Normal University, 2008), 11;

The Initial Period of Public Transportation in Tianjin (1902-1924)

Tianjin was opened as a treaty port with the signing of the *Beijing Treaty*, and nine concessions were set up by western authorities successively in Tianjin. The establishment, planning and construction of concessions led to the outward expansion of urban area, the substantial increase in the quantity and length of roads, and the continuous growth of population. By 1900, the downtown area expanded by 4km², nearly equal to half of the city area in 1860, the number of roads added by 54, equal to that built during the 450 years from Ming Dynasty to 1860, the length of roads increased by 115km (measured by CAD drawings drawn by author’s team), equal to three-quarters of the city area in 1860, and the population rose more than 300,000, all of which made traditional transportation methods no longer met the needs of citizens and inspired the emerging and flourish of public transport in Tianjin⁴.

In the end of the 20th century, European and Japanese merchants tried to introduce short-distance steam railway and carriage railway into Tianjin, but both failed⁵. After seven of the members of the Eight-Nation Alliance established the Provisional Government that first used modern urban management and construction concept to manage Chinese areas (the areas governed by Chinese authorities) in 1900, European and Japanese competed to apply for the franchise of tram. “The Tramway and Electric Lightning Company” operated by Belgian Shichang Foreign Firm acquired the franchise in 1901, and then CTDI was founded one year later and inherited the business of the original company, which implied the prelude of modern public transport was officially opened⁶.

CTDI began to renegotiate with the Qing Government after the Government represented by Shikai Yuan (袁世凯) took over Tianjin in 1902, and reacquired 50-year franchise of trams and designed tramrails in Chinese areas with the signing of *Agreement for the Electric Tramways and Lighting of Tientsin* (ATLT) in 1904⁷. CTDI signed agreements with the authorities of Austria-Hungary, Italian and Russian concessions in 1905, of the French concession in 1906, and of the Japanese concession in 1907, to acquire the franchise of trams and specify tramlines in the concessions.⁸ The first tramline, “White Line”, which started from Beidaguan (北大关) and circled around the Old City (老城厢) in a clockwise direction after reaching Beiman (北门), was opened to traffic in 1906 (Figure 1)⁹. Subsequently, “Red Line”, “Blue Line”, “Yellow Line”, and “Green Line” were opened successively¹⁰.



Figure 1: *The first tram line-white line in Tianjin began in 1906.*



By 1921, there had been five tram lines (17.6km long) in Tianjin, covering the periphery of the Old City, the Japanese, French, Austria-Hungary, Italian, and part of the Russian Concessions, with four passing through the Old City and three of them passing through the French Concession, initially forming the basic structure of public transportation centering on the Old City and the French Concession (Figure 2).

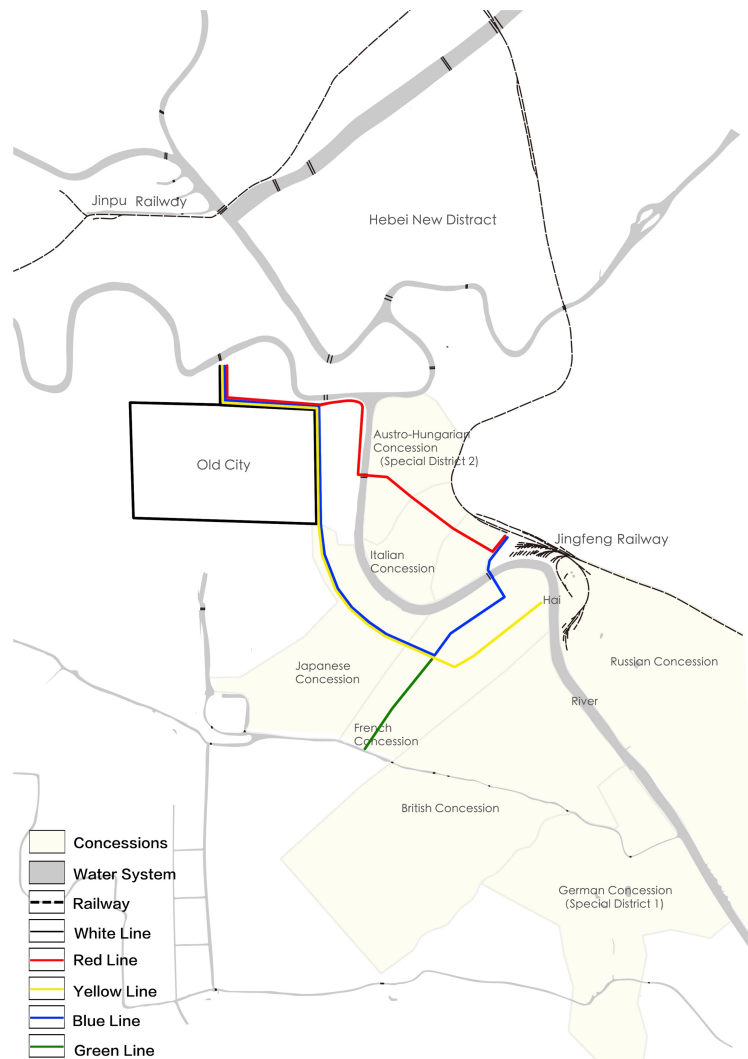


Figure 2: The distribution of tram lines in Tianjin in 1921: “White Line” (5.16km) was from Beidaguan (北大关) to Beimen (北门); “Red Line” (3.541km) was from Beidaguan to the Jintang Bridge (金汤桥), and then to East Railway Station (东站); “Yellow Line” (4.156km) was from Beidaguan to Tianjin Custom (天津海关); “Blue Line” (5.135km) was from Beidaguan to the Old Longtou Bridge (老龙头桥), and then to the East Railway Station; “Green Line” (0.969km) was from the French Church to Quanyechang. The first tram line was opened in 1906, all of the middle three lines were opened in 1908 and the last one was opened in 1921.

The Rapid Development Period of Public Transportation in Tianjin (1925-1936)

After 1925, Tianjin entered the era with two means of transportation – tramcar and bus. According to the “ATLT”, “The local authorities may buy back the whole plant after 20 years from the running of the electric tramways”. Chinese began to formally collect funds to recover CTDT from 1922 and negotiate with CTDT in 1927¹¹. Japanese growing influence on North China (华北) also made CTDT be afraid of investing in the construction of new rails (The “Flower Line” opened in 1927 was on old rails). Therefore, the most noticeable development of trams during this period (1925-1936) was the large-scale rail renovation, which began in 1927¹². The use of the new material of the track, cadmium-nickel, led to a considerable reduction in the tramcars damage rate and energy consumption, which demonstrated that tramway, as a novel kind of advanced municipal facility and technology, became more mature¹³.

The continuous expansion of the downtown and the growth of employment population made tram lines no longer meet citizen’s demand on public transportation. In the spring of 1925, the first bus line from the Old Longtou



Bridge to Dazhigu (大直沽) was opened to traffic by Tongxing Motor Company (同兴汽车公司), which was established by Chinese merchants Shutang Li and Renpu Liu, and then the second line was opened in 1929¹⁴. Afterwards, Passenger Bus Company (公共客座汽车公司), Urban Bus Company (市营公共汽车公司) and Yunlong Bus Company (云龙公共汽车公司) were founded successively¹⁵. The most influential company was Passenger Bus Company, established by Japanese businessmen, which operated three bus lines strengthening the connection between the French Concession and the British Concession.

By 1936, urban public transportation network had extended to the entire downtown area with six tram and bus lines each¹⁶. There were up to seven lines in the French Concession, which marked the formation of the urban public transportation network system centering on the French Concession. Two points can be seen from Figure 3: three of the bus lines start from tram stops and three intersect with tramlines, which implied bus lines were the extension of tramlines; and the trend of bus routes diverging from the city center to the surrounding area along the river was highly consistent with that of urban expansion, which proved that the development of bus line network was closely related to urban expansion.

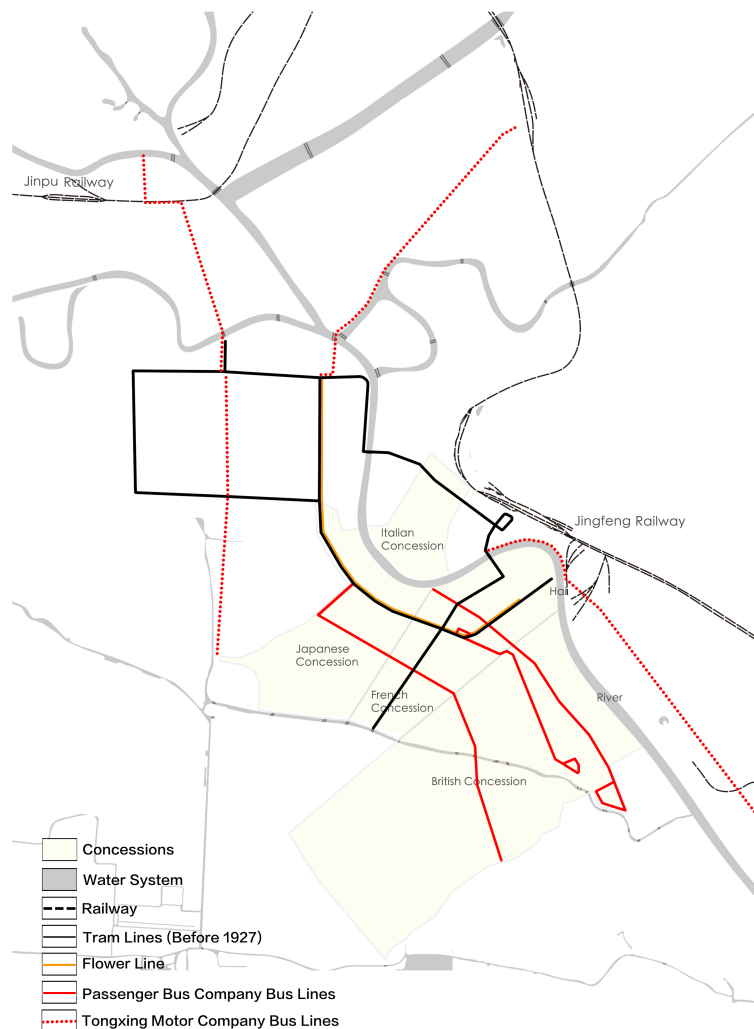


Figure 3: Distribution of public transportation lines in Tianjin in 1936: Bus lines of Tongxing Company from left to right are from Dahong Bridge (大红桥) to Haiguang Temple (海光寺), from the Northeast Corner (东北角) to the North Railway Station, and from the Old Longtou Bridge to Dazhigu; Bus lines of Passenger Bus Company from left to right are from Zhongyuan Corporation (中原公司) to Taoyuan (陶园), from National Hotel (国民饭店) to Dayingmen (大营门), and from Majiakou (马家口) to Dayingmen.

The Stagnation Period of Modern Public Transportation in Tianjin (1937-1949)

After occupying Tianjin in 1937, Japanese troops gradually took over CTDT and all bus companies. Tianjin tram business had no longer developed since Belgian businessmen lost its operation rights of tramways. By Japan's surrender (1945), almost all trams paralyzed¹⁷. Tianjin Public Bureau Tram and Bus Temporary Management



Office(天津市公用局电、汽车临时管理处) took over tram business in 1945. The Office established “Purple Line” in 1947, but tram business was still in depression and the Office suffered serious losses.¹⁸

In order to implement unified management of bus business, Japanese authorities bought all bus companies, established the Tianjin Bus Branch of the North China Automobile Company and planned 13 lines in 1938¹⁹. However, it was recorded there had been only 11 bus lines in operation at its maximum, which quickly reduced to 3 lines in 1944 due to lack of fuel and fittings, concessions blockade and serious losses, etc.²⁰ After Public Bureau Tram and Bus Temporary Management Office took over bus business, the bus operation was also poor. There were 5 lines being normally operated in May 1946²¹. Bus routes were once increased to 14 in March 1948, but most routes were quickly stopped due to gasoline deficiency and vehicles aging. On July 9 of the same year, only 5 routes were barely maintained, and 7 at its maximum after that²².

During this period, the number of public transportation lines was highly volatile for the turbulent political situation. Although occasionally increased, the duration of most lines was very short. Therefore, Tianjin urban public transport development had been almost stagnant during this period. The bus routes planned by Japanese in 1938 shows all the 13 bus lines started from tram stops (East Station Stop, Zhongyuan Corporation Stop, and French Church Stop) to urban edge areas, which proved the feature that bus lines planning was based on tramlines had become more prominent (Figure 5).

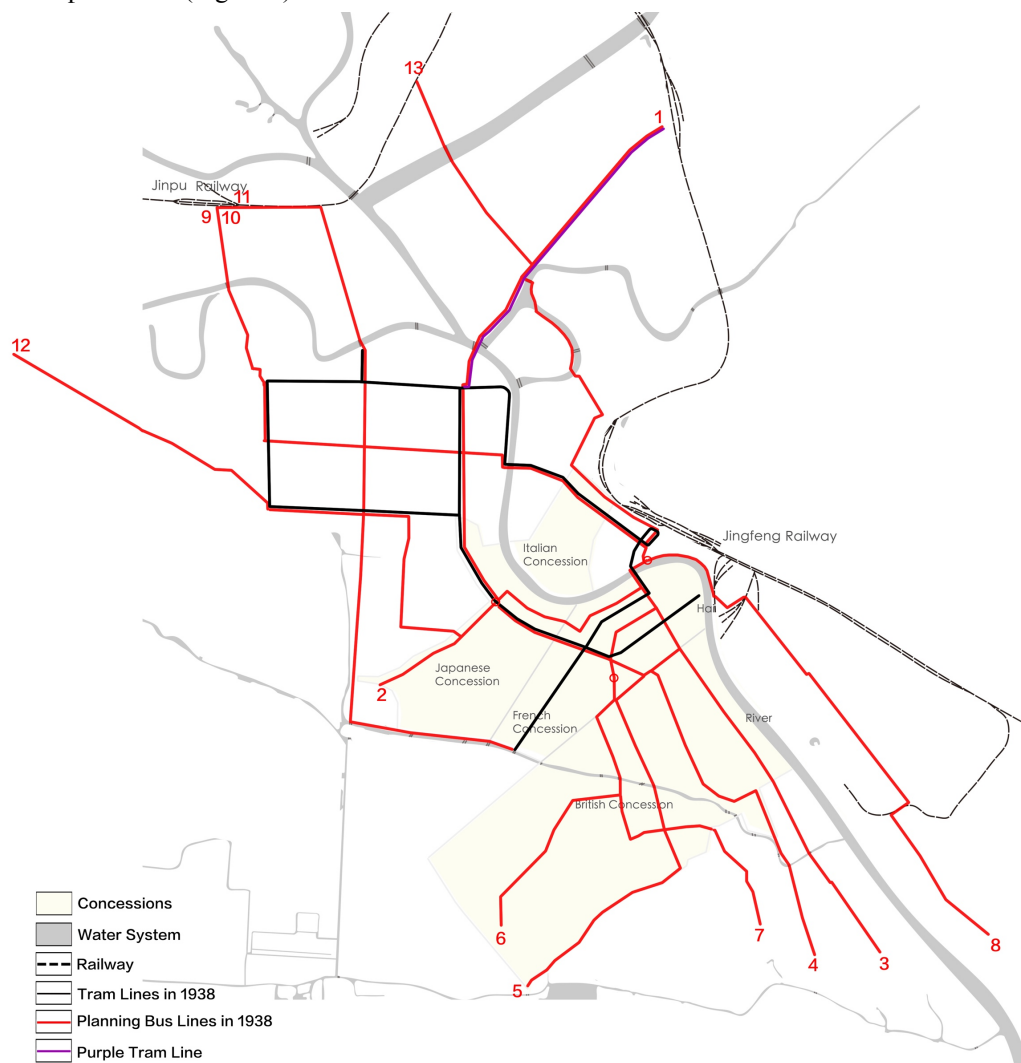


Figure 4: The distribution of tram lines in Tianjin in 1947 and the Planning Bus Lines in 1938: “Purple Line” (3.541km) was from the Northeast Corner to the North Railway Station(北站); Bus Line 1 was from the East Railway Station to the North Railway Station; Line 2 was from the East Railway Station to Haiguang Temple Street (海光寺街); Line 3 was from the East Railway Station to Xiaoliuzhuang (小刘庄); Line 4 was from Zhongyuan Corporation to Tonghuali (同华里); Line 5 was from the East Railway Station to Machangli (马场里); Line 6 was from the East Railway Station to Xiaosunzhuang (小孙庄); Line 7 was from Zhongyuan Corporation to Family Li Garden (李家花园); Line 8 was from the East Railway Station to Malu Street (马路街); Line 9 was from the East Railway Station to the West Railway Station; Line 10 was from Zhongyuan Corporation to the West Railway Station;



Line 11 was the same as above; Line 12 was from the French Church to the Hebei Third Prison (河北第三监狱); Line 13 was from the East Railway Station to Xiaoguozaung (小郭庄).

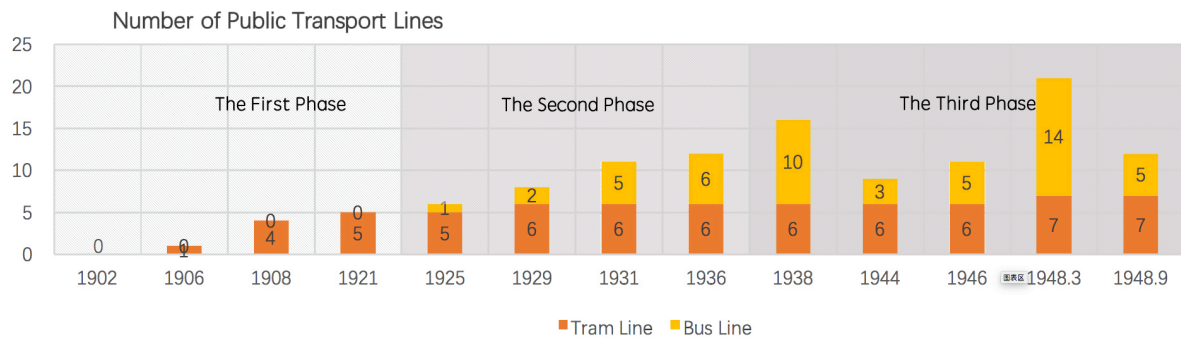


Figure 5: Quantity of public transportation lines at all phases (1902-1949): at the 1st phase there were only trams in Tianjin; at the 2nd phase bus was introduced. The number of lines continued to grow at both phases, but at the 3rd phase the number was up and down, which implied the development of public transportation was unstable.

Public Transport and Municipal Income

CTDT had paid tram tax to the Chinese and concession authorities since the tram started running. According to ATLT, “The company shall pay every year to the Local Authorities a sum equal to three and a half percent (3.5%) of the gross earnings of the undertaking before payment of working expenses, salaries or any other disbursements whatsoever”²³. Also, the concession authorities sent personnel to audit the gross earnings of CTDT every year in order to acquire the tax. It was reported that the “passing fee” paid by CTDT to the French Concession was as high as CNY 170,000 per year²⁴. Similarly, the authorities also charged the bus companies for route operation rights and taxes. For example, Passenger Bus Company paid taxes, CNY 15 every three months, to the French Concession Municipal Council in 1930²⁵. Similar to other taxes, most of tram and bus taxes were used for the maintenance and construction of roads, bridges, sewers and other public facilities.

Public Transport Development and Urban Roads Construction

The impact of public transportation on urban construction was far more than taxes. New types of vehicles had different requirements on roads because of their difference in operation method, speed and size²⁶. Therefore, the development of public transportation propelled the implementation of roads widening and improvement.

The foremost round of road widening in modern Tianjin was induced by the planning of tram lines. As the headmost roads equipped with tram in the French Concession, the original planned width of Rue du Chaylard (now Heping Road 和平路) and Rue Paron Gros (now Binjiang Road 滨江道) (the section between Rue du Chaylard and Quai Auguste Boppe) was insufficient for the implementation of the tram program. For laying rails, the French Municipal Council ordered the owners of the roadside buildings to demolish and transform the buildings to widen the roads to 16 meters in width in 1906²⁷. Rue de France (now Jiefang North Road 解放北路) and Rue de L'Amirauté (now Chifeng Road 赤峰道) were widened due to the laying of tram rails almost at the same time, but other roads without tramway laying plan had not been widened until much later. The Tianjin Map in 1912 showed that roads equipped with tram were obviously wider than others in all concessions (Figure 6). The passage of trams had also promoted the implementation of roads widening in Chinese area. The Chinese authority believed that the reason why the number of accidents increased significantly after trams were opened was the varying road width, which led to the decision of “widening the besieged roads appropriately” in 1924²⁸. Therefore, the operation of trams promoted roads widening in both the Chinese area and the Concessions.

The construction of the asphalt road started from the Italian concession, Da Ma Road along the “Red Line” in 1914, followed by Rue de France and Rue de L'Amirauté both in the French concession in 1916 and Asahi Streets (now Heping Road) in the Japanese Concession in 1919 all along tramways²⁹. The initial paving of asphalt pavement was too slow to be only paved on the roads along tramways, but the obvious advantages of asphalt pavement of low degree of wear and cost of repairs prompted Frenchmen to introduce asphalt mixing road construction technology after 1920s, which had greatly speeded up the construction of asphalt roads and further stimulated the refurbishment of other roads in the French Concession and other concessions³⁰. The construction of asphalt roads in the Chinese areas started from the East Road, where the density of public transport lines was the highest³¹. In addition, electric lights were installed leadingly on roads equipped with tram³². Therefore, the construction of trams promoted the modernization of pavement and road facilities.



Furthermore, the operation of trams was closely related to the construction and maintenance of bridges. As “Blue Line” was planned to pass through Old Longtong Bridge, CTDI took on the daily operation and maintenance costs of the bridge in exchange for its right of way and management. To lay tram tracks, Jintang Bridge was converted to a steel-beam iron bridge by CTDI, Tianjin Custom, and the Austrian Concession and the Italian Concession³³.



Figure 6: Tianjin Central District Road Network in 1912

Public Transport and Land Value Partition

The density of public transport network was closely related to land value partition. In the early 20th century, when tramlines in the French Concession was just opened to traffic, the highest price of land in the British concession was approximately 1.75 times that of the French Concession. But the highest price of land in the British Concession and the French Concession was almost the same in 1938 when tramlines had been opened for 30 years. Table 2 shows the density of public transport line in the French Concession increased much more greatly than that in the British Concession during the 30 years: the density in the French Concession was five times more than that in the British Concession by 1938. Therefore, the growth of public transport line density had positive impacts on land price. Figure 7 shows a gradually decreasing trend of urban land value from the French and British concessions to the periphery in 1938: the land price of the areas around Rue du Chaylard, Rue Paron Gros, Rue de France and Rue de L'Amirauté in the French concession, Asahi Street in the Japanese Concession, and Taku Road (now Dagu North Road 大沽北路) and Recreation Road (now Xinhua Road 新华路) in the British Concession was the highest, followed by Nanshi Area and East Railway Station Area. According to statistical calculations, the density of public transport network was 9.2km/km² in areas, where average land price was over 1,200 yuan/acre, while the density was only 0.6149km/km² in areas where average land price was below 200 yuan/acre. It is visible that public transport network density was highly consistent with land price--the higher the density of public transport lines, the higher the land price was.

Table 3 and Figure 7 also show that the land price of areas equipped with tramlines was quite high. In contrast, the land price of areas along bus lines but without tramline (except British Concession) was relatively lower, which was led to by the differences in the introduction time, passenger flow and line stability between them: tramway was introduced at the early stage of urban development and all lines had high stability and large passenger flow under the unified operation of CTDI; differently, bus lines were opened to traffic when the urban form was almost formed and had poor stability because several bus companies were operated independently and competed intensely before Japanese occupation.



		Early 20th Century	1938
British Concession	Public Transport Line Density	0 km/km ² (in 1908)	1.07 km/km ²
	The Highest price of Land	7000 Liang/Acre	1904.28 Yuan/Acre
French concession	Public Transport Line Density	1.66 km/km ² (in 1908)	5.49 km/km ²
	The Highest price of Land	4000 Liang/Acre	2057.15 Yuan/Acre

Table 2: *Public Transport Line Density and The Highest price of Land Comparison Between the British Concession and the French Concession: Public Transportation Line Density = The Length of the Road Center Line with Public Transport / Area (Unit: km/km²).*

Source of Land Value: *Tianjin Real Estate Administration, Tianjin Real Estate Chronicles, (Tianjin: Tianjin Academy of Social Sciences Press, 1999) , 523-556.*

Land price (Yuan/Acre)	Public Transportation Line Density (km/km ²)	Tram Line Destiny (km/km ²)	Bus Line Destiny (km/km ²)
>1200	9.25	4.71	4.54
1000-1200	6.41	4.61	1.80
800-1000	5.32	3.37	1.95
600-800	1.87	0.56	1.31
400-600	1.86	0.56	1.30
200-400	1.32	0.31	1.01
0-200	0.61	0	0.61

Table 3: *Relationship Between Land Value and Public Transportation Line Density in 1938.*

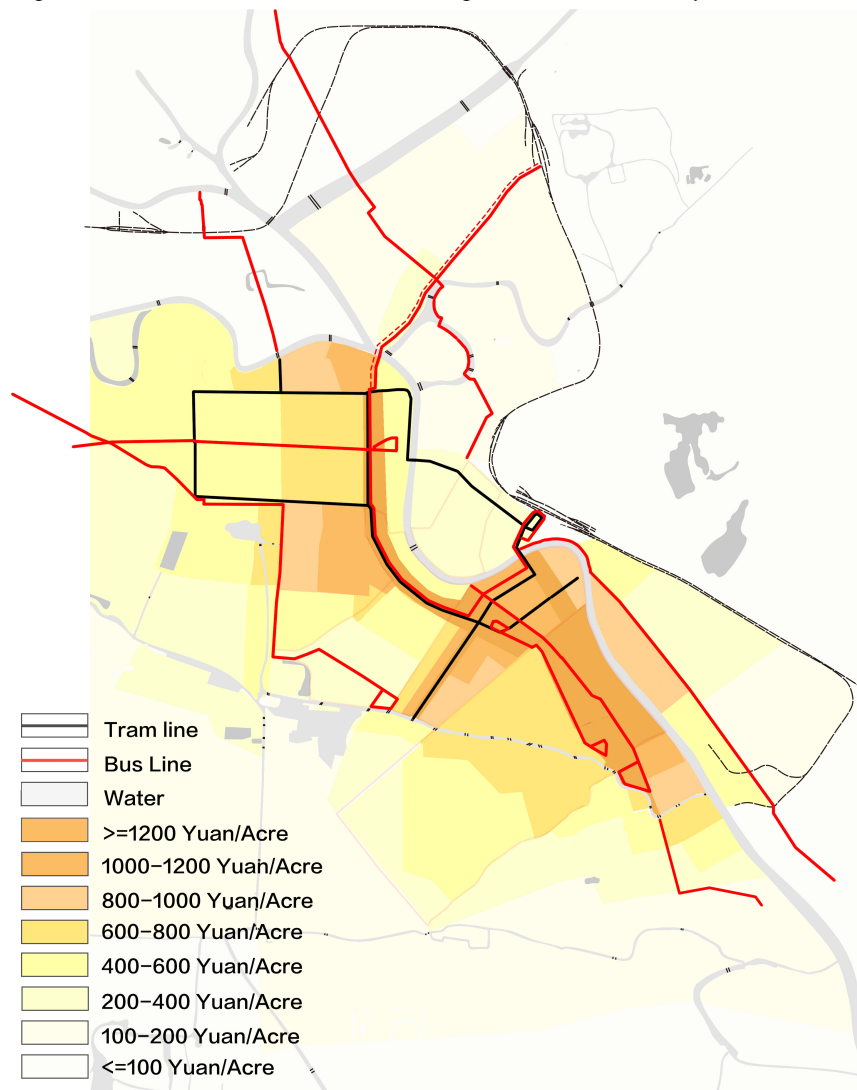


Figure 7: *Relationship Between Land Value and Public Transportation Line Density in 1938.*

Source of Land Value Partition: *Tianjin Real Estate Administration, Tianjin Real Estate Chronicles, (Tianjin: Tianjin Academy of Social Sciences Press, 1999), 556.*



Public Transport and Urban Structure Evolution

The development of urban public transport had changed urban spatial structure. “The development of Tianjin was initially revolved around the old city, followed along the river, railways and then tramways from the emergence of electrical business”³⁴. Both urban population and business had tendency to flow and develop along tram routes after trams were opened. The fastest-growing piece along the tram line was the area along Asahi Street and Rue du Chaylard to Lizhan (梨棧) area equipped with the “Yellow Line”, “Blue Line”, “Flower Line” and “Green Line”³⁵. Geographically located in the center of the city, together with the intention of Japanese and French concession authorities to develop economy by taking advantages of tram lines to propel population mobility, this area became a new commercial center with 4 major shopping malls, Tianxiang (天祥), Taikang (泰康) and QuanYe (劝业) in Lizhan area and Zhongyuan Corporation in Asahi Street in the late 1920s³⁶. Statistically, there were nearly 60 theatres, restaurants and ballrooms coexisting surrounding Quanye. Rue de France also boomed and became a pivotal financial street with banks, money shops, credit companies, insurance companies, security companies and pawn companies, nearly 300, according to the statistics pre-1949³⁷. The transfer of commercial and financial centers propelled the French Concession to gradually replace the Old City and become the new economic center of Tianjin.

The soaring of land prices in the downtown area caused some residents who had to work here during daytime to move out due to their inability to afford high rents, but the development of public transport provided convenience for the daily movement of out-migrant residents. For example, as a direct link between the Old City and the concessions, Nanshi (南市) area was surrounded by many tram and bus lines, attracting a large number of real estate developers and citizens, which thus led to the development and construction of Nanshi Area and further resulted in the formation of commercial streets and residential areas here in the 1920s and 1930s³⁸.

From the above analysis, it could be found that public transportation line was highly related to land value partition and urban functional division: advanced municipal facilities represented by public transport could promote urban development, construction and economic prosperity. At that time, CTDI had recognized this view from the development process of Western cities to mediate with government to increase tram lines. Since 1911, CTDI submitted plan for the construction of tramline from the northeast corner to the West Station to Zhili Foreign Affairs Bureau (直隶交涉公署) repeatedly by using modern urban construction ideas to clarify the benefits of the line, “If convenient transportation lines could be established from the area around West Railway Station where is not well-built now to the Old City, buildings will be built one after another, which is true for foreign metropolises ... People working in the Old City or its surrounding areas could live in the good and new places, which is good for health, and also avoids row upon row of buildings in limited place. Tramlines in metropolises throughout the world were all from the distant to the downtown, so the remote areas developed for its low land and housing prices and the business of downtown boomed because residents could work in downtown during daytime and go home in the evening, which could bring about the increase of shop number and the growth of land and housing prices”³⁹. Although new line was not built due to the opposition of local businessmen, the case proved that people at that time had the idea of using the action of improving municipal facilities to promote land and housing prices, thereby facilitate urban construction and economic development⁴⁰.



Figure 8: *Bustling Lizhan Street and Tramways*

Conclusion

The outward expansion of downtown area and roads, the sharp growth of population, and the increasing production and living needs of modern metropolis stimulated the introduction and boom of urban public transport. Both



tramcars and buses were introduced to Tianjin when existing facilities could not satisfy the demands of urban development. Moreover, taking tramlines as the basic skeleton coupled with bus lines as the tool of network expansion, Tianjin formed a unique set of urban public transport network based on trams and supplemented by buses.

On the other hand, while meeting the needs of urban development, advanced municipal facilities and technologies from the West, represented by urban public transport, reacted to the city with promoting the modernization of urban social-spatial morphology and creating a nice public environment for citizens. The rapid development of the urban public transportation not only improved the municipal revenues of the authorities, but also promoted the modernization of the infrastructures and propelled the transformation of urban spatial structure. The advancing influence of modern Tianjin urban public transport development on the construction of roads and bridges and the form of urban resource development taking tramlines as the axis proved it absolutely. Public transport was the indispensable technical support in the process of modern Tianjin urban transformation and modernization. It can be said that it was precisely because of the convenient public transportation lines that Tianjin modern urban space was formed so quickly.

Acknowledgements

The author would like to thank Haifeng Shi, whose advices have contributed to improving this paper.

Disclosure Statement

No potential conflict of interest was reported by the author.

Funding

The author would like to acknowledge support from the National Natural Science Foundation of China [grant number 51578365 and 51608356] in carrying out this work.

Endnotes

¹ State Archives of Belgium, [Archives D'entreprises Bedrijfsarchieven: Compagnie de Tramways et D'eclairage de Tientsin S.A.2].

² Tianjin Chronicles Compilation Commission, *Tianjin Concession Chronicles* (Tianjin: Tianjin Academy of Social Sciences Press, 1996), 320.

³ "Evolution of Urban Public Transport," in *Tianjin -- The Rise of a City*, ed. Zhongguo ren min zheng zhi xie shang hui yi. Tianjin Shi wei yuan hui. Wen shi zi liao yan jiu wei yuan hui (中国人民政治协商会议天津市委员会文史资料研究委员会) (Tianjin: Tianjin People's Press, 1990), 264-207.

⁴ Hong Qiao, *Tianjin Urban Construction Chronicles*, (Beijing: Science and technology of China press, 1994), 84.

Yanlin Gao, *Tianjin Population Research* (Tianjin: Tianjin People's Press, 2002), 90.

Jingneng Li, Qiang Wang and Ziqiang He, *Chinese Population, Tianjin Vol.* (Beijing: China Financial and Economic Press, 1987), 48.

⁵ Haiyan Liu, "Tram, Public Transportation and Modern Tianjin Urban Development," *Shilin*, no.2 (June 2006): 20.

⁶ Shousong Wang, Kelu Hao, and Peili Wang, *The Record of the Eight-Power Allied Forces: Minutes of the Provisional Government Sessions of Tientsin* (Tianjin: Tianjin Academy of Social Sciences Press, 2004), 8.

⁷ The Viceroy Shikai Yuan grants to Company the monopoly for the building and working of tramways and electric lighting in Tientsin, within a circle having a radius of six li measured from the Drum Tower (鼓楼) in the center of the walled city, for a term of fifty years, see Tianjin Municipal Archive, [401206800-J0001-3-003329].

⁸ National Archives of Japan, [B10074726200 (May 24, 1907)].

State Archives of Belgium, [Archives D'entreprises Bedrijfsarchieven: Compagnie de Tramways et D'eclairage de Tientsin S.A.271].

State Archives of Belgium, [Archives D'entreprises Bedrijfsarchieven: Compagnie de Tramways et D'eclairage de Tientsin S.A.269].

⁹ "The First Opening of the Tram," *Ta Kung Pao*(大公报), February 17, 1906.

¹⁰ See note 2 above.

¹¹ "Prepare to Recover Compagnie de Tramways & D'eclairage de Tientsin," *Social Welfare* (天津益世报), January 1, 1921.

"Start to Negotiate to Take back the Tram," *Social Welfare* (天津益世报), May 28, 1927.

¹² The whole tracks were renovated from 1927 to 1936, exclude track between the French Church and Quanyechang, and track between the Northeast and Jiantang Bridge, see State Archives of Belgium, [Archives D'entreprises Bedrijfsarchieven: Compagnie de Tramways et D'eclairage de Tientsin S.A.448].

¹³ State Archives of Belgium, [Archives D'entreprises Bedrijfsarchieven: Compagnie de Tramways et D'eclairage de Tientsin S.A.438].

¹⁴ See note 2 above.

¹⁵ "Today in History," Tianjin Municipal Archive, accessed December 3, 2010, <http://www.tjdag.gov.cn/tjdag/jgsl/lssdjt/5955179/index.html>.

"Buses of Passenger Bus Company are opened to traffic," *Ta Kung Pao*(大公报), January 21, 1930.

"Notice of Passenger Bus Company," *Ta Kung Pao*(大公报), March 4, 1931.

¹⁶ Bus line from the Northeast to the North Railway Station established by Urban Bus Company was bought by Tongxing Motor Company, and bus line from National Hotel to Xiaoliuzhuang established by Yunlong Bus Company was bought by Passenger Bus Company in 1935, see note 2 and 3.

¹⁷ Ibid.

¹⁸ Tianjin Municipal Archive, [401206800-J0002-3-002938-009].



- ¹⁹ Tianjin Municipal Archive, [401206800-J0001-3-000690-010].
- ²⁰ Line 1 was from the North Railway Station to the East Railway Station, Line 4 was from Zhongyuan Corporation to Xiaoliuzhuang, and Line 8 was from Zhongyuan Corporation to Xiaosunzhuang, see Tianjin Municipal Archive, [401206800-J0001-3-007088-012].
- ²¹ Line 1 was from the Northeast Corner to the North Railway Station, Line 3 was from Zhangzizhong Road (张自忠路) to Fenghua Road (奉化道), Line 4 was from the National Hotel to Xiaoliuzhuang, Line 7 was from Zhongyuan Corporation to Qiandezhuang (谦德庄), and Line 8 was from International Bridge to Xiaoliuzhuang, see Tianjin Municipal Archive, [401206800-J0002-2-000833-015].
- ²² Line 3 (from the Victory Bridge to the East Door), Line 4 (from National Hotel to Xiaoliuzhuang), Line 6 (from Beidaguan to Dahong Bridge), Line 10 (from the Southeast to Qiandezhuang), and Line 12 (from the Northwest to the Worldbuilding), see “Gas shortage in the city,” *Ta Kung Pao*(大公报), July 9, 1948.
- “All Buses Were Resumed to Traffic,” *Ta Kung Pao*(大公报), July 17, 1948.
- ²³ Tianjin Municipal Archive, [401206800-J0001-3-003329].
- ²⁴ Yuanyuan Gao, “Research on the Surge of Increasing Tram Fare in Tianjin in 1932” (Master diss., Central China Normal University, 2012), 12.
- ²⁵ See note 2 above.
- ²⁶ Ji Yang, “Introduction of Asphalt Road,” *Ta Kung Pao* (大公报), June 23, 1947.
- ²⁷ Tian Li, “Study on the History of Urban Development of the French Concession in Tianjin (1861-1943)” (PhD diss., Tianjin University, 2015), 42.
- ²⁸ “Local News: Renovate the Street and Lay the Tramway,” *Social Welfare* (天津益世报), January 1, 1924.
- ²⁹ O. D. Rasmussen, *Tianjin Concession History* (Illustrated), trans. Yifan Xu, Diyi Zhao (Tianjin: Tianjin People’s Press, 2009), 307.
- ³⁰ See note 27 above.
- ³¹ “Secretary Xue for Public Works Talks about Road Construction,” *Ta Kung Pao* (大公报), November 23, 1929.
- ³² Chinese Stationed Army Commander, *Tianjin Chronicles: Tianjin's Overview of the Early 20th Century*, trans. Hou Zhenlong (Tianjin: Tianjin Chronicles Compilation Commission, 1989), 23.
- ³³ Tianjin Hedong CPPCC Cultural, Sports, Literature and History Committee, and Tianjin Hedong CPPCC Cultural, Sports, Literature and History Committee, *The Old Longtou Bridge - The Railway Station of the Earliest Treaty Port in China* (Tianjin: Tianjin Ancient Books Press, 2016), 83.
- Yuyang Shan, “Research of Bridge Construction with Urban Development in Tianjin Early-modern” (Master diss., Tianjin University, 2017), 23.
- ³⁴ Aichen Wu, *International Five Issues in North China* (Shanghai: Commercial Press, 1929), 33.
- ³⁵ Lizhan Area was the area around Quanyechang, see Ruwei Tan, “Tianjin Old Placename – Lizhan,” Sina, April 7, 2007, http://blog.sina.com.cn/s/blog_4b6668a101008uh9.html
- ³⁶ Gaofeng Zhang, “Changes around Quanyechang,” in *Tianjin Literature and History Information Collection* (no.16), ed. Zhongguo ren min zheng zhi xie shang hui yi. Tianjin Shi wei yuan hui. Wen shi zi liao yan jiu wei yuan hui (Tianjin: Tianjin People’s Press, 1981), 264-85.
- ³⁷ The Geographic Society of China, *Beautiful Tianjin* (Beijing: Beijing Blue Sky Press, 2014), 126.
- ³⁸ Yanchen Sun, Wechat message to author, December 12, 2017.
- ³⁹ Tianjin Municipal Archive, [401206800-J0128-2-002193-019].
- “Tram Company Expansion Plan,” *Social Welfare* (天津益世报), September 5, 1921.
- Tianjin Municipal Archive, [401206800-J0002-3-002938-009].
- ⁴⁰ “Expansion of Trams Has Been Stopped,” *Social Welfare* (天津益世报), January 17, 1918

Bibliography

- “All Buses Were Resumed to Traffic.” *Ta Kung Pao*(大公报), July 17, 1948.
- “Buses of Passenger Bus Company are opened to traffic.” *Ta Kung Pao*(大公报), January 21, 1930.
- Chinese Stationed Army Commander, *Tianjin Chronicles: Tianjin's Overview of the Early 20th Century*. Translated by Hou Zhenlong, Tianjin: Tianjin Chronicles Compilation Commission, 1989.
- “Expansion of Trams Has Been Stopped.” *Social Welfare* (天津益世报), January 17, 1918
- Gao, Yanlin. *Tianjin Population Research*. Tianjin: Tianjin People’s Press, 2002.
- Gao, Yuanyuan, “Research on the Surge of Increasing Tram Fare in Tianjin in 1932” Master diss., Central China Normal University, 2012.
- “Gas shortage in the city.” *Ta Kung Pao*(大公报), July 9, 1948.
- Li, Jingneng, Qiang Wang and Ziqiang He. *Chinese Population, Tianjin Vol.* Beijing: China Financial and Economic Press, 1987.
- Li, Zhihong, “On the Development of Buses in Beijing in the Nationalist Era of China” Master Diss., Capital Normal University, 2008.
- Liu, Haiyan. “Tram, Public Transportation and Modern Tianjin Urban Development,” *Shilin*, no.2 (June 2006): 20-25.
- Liu, Li, “The Correlation between Traffic and Urban Development in Northeast Region of China from 1860 to 1931” Phd Diss., Jilin University, 2012.
- Li, Tian, “Study on the History of Urban Development of the French Concession in Tianjin (1861-1943)” PhD diss., Tianjin University, 2015.
- “Local News: Renovate the Street and Lay the Tramway.” *Social Welfare* (天津益世报), January 1, 1924.
- Nanjing Chronicles Compilation Commission, *Nanjing Chronicles*. Nanjing: Nanjing Chronicles Press, 1995.
- “Notice of Passenger Bus Company.” *Ta Kung Pao*(大公报), March 4, 1931.
- O. D. Rasmussen, *Tianjin Concession History* (Illustrated). Translated by Yifan Xu, Diyi Zhao. Tianjin: Tianjin People’s Press, 2009.



- “Prepare to Recover Compagnie de Tramways & D’eclairage de Tientsin.” *Social Welfare* (天津益世报), January 1, 1921.
- Qiao, Hong. *Tianjin Urban Construction Chronicles*. Beijing: Science and technology of China press, 1994.
- Shan, Yuyang, “Research of Bridge Construction with Urban Development in Tianjin Early-modern” Master diss., Tianjin University, 2017.
- “Secretary Xue for Public Works Talks about Road Construction.” *Ta Kung Pao* (大公报), November 23, 1929.
- “Start to Negotiate to Take back the Tram.” *Social Welfare* (天津益世报), May 28, 1927.
- Sun, Huangjin, “Urban Development and Social Change of Shenyang In Modern Times” Phd Diss., Northeast Normal University, 2012.
- Tan, Ruwei, “Tianjin Old Placename – Lizhan.” Sina Blog, April 7, 2007, http://blog.sina.com.cn/s/blog_4b6668a101008uh9.html
- “The First Opening of the Tram.” *Ta Kung Pao*(大公报), February 17, 1906.
- The Geographic Society of China, *Beautiful Tianjin*. Beijing: Beijing Blue Sky Press, 2014.
- Tianjin Academy of Social Sciences. *History of Tianjin*. Tianjin: Tianjin People’s Press, 1987.
- Tianjin Concession Chronicles Compilation Commission. *Tianjin Concession Chronicles*. Tianjin: Tianjin Academy of Social Sciences Press, 1996.
- “Tianjin-20040618.jpg.”, Wikimedia Commons, September 25, 2013, <https://commons.wikimedia.org/wiki/File:Tianjin-20040618.jpg>.
- Tianjin Happy Tumbler, “Old Photo.” Sina Weibo, April 7, 2007, <https://m.weibo.cn/status/4092359849090754>.
- Tianjin Hedong CPPCC Cultural, Sports, Literature and History Committee, Tianjin Hedong CPPCC Cultural, Sports, Literature and History Committee, *The Old Longtou Bridge - The Railway Station of the Earliest Treaty Port in China*. Tianjin: Tianjin Ancient Books Press, 2016.
- “Tram Company Expansion Plan.” *Social Welfare* (天津益世报), September 5, 1921.
- Yang, Ji, “Introduction of Asphalt Road.” *Ta Kung Pao* (大公报), June 23, 1947.
- Wang, Ruiyang, *The Modern Traffic in Modern China*. Beijing: People's Literature Publishing Press, 2006.
- Wang, Shousong, Kelu Hao and Peili Wang, *The Record of the Eight-Power Allied Forces: Minutes of the Provisional Government Sessions of Tientsin*. Tianjin: Tianjin Academy of Social Sciences Press, 2004.
- Wu, Aichen, *International Five Issues in North China*. Shanghai: Commercial Press, 1929.
- Zhang, Gaofeng, “Changes around Quanyechang,” in *Tianjin Literature and History Information Collection* (no.16), edited by Zhongguo ren min zheng zhi xie shang hui yi. Tianjin Shi wei yuan hui. Wen shi zi liao yan jiu wei yuan hui, 264-85. Tianjin: Tianjin People’s Press, 1981.
- Zhang, Song. “Historical Analysis on Public Transportation Development in Shanghai Concession.” *City Planning Review* 38, no. 1 (January 2014): 50–56.
- Zhang, Zhong, “The Early Modernization Study Of Ha’erbin Municipal(1898-1931)” Phd Diss., Jilin University, 2011.
- Zhu, Jianbin, “Evolution of Urban Public Transport,” in *Tianjin -- The Rise of a City*, edited by Zhongguo ren min zheng zhi xie shang hui yi. Tianjin Shi wei yuan hui. Wen shi zi liao yan jiu wei yuan hui, 264-207. Tianjin: Tianjin People’s Press, 1990.
- Zou, Dong, “On Guangzhou’s Urban Planning and Construction in the Nationalist Era of China, 1911-1949” Phd Diss., South China University, 2012.

Image sources

- Figure 1: Wikimedia Commons, Tianjin-20040618.jpg, <https://commons.wikimedia.org/wiki/File:Tianjin-20040618.jpg> (Accessed September 25, 2013.)
- Figure 2: Diagrams by authors based on State Archives of Belgium [Archives D’entreprises Bedrijfsarchieven: Compagnie de Tramways et D’eclairage de Tientsin S.A.365].
- Figure 3: Diagrams by authors based on State Archives of Belgium [Archives D’entreprises Bedrijfsarchieven: Compagnie de Tramways et D’eclairage de Tientsin S.A.365] and *Tianjin Concession Chronicles*.
- Figure 4: Diagrams by authors based on State Archives of Belgium [Archives D’entreprises Bedrijfsarchieven: Compagnie de Tramways et D’eclairage de Tientsin S.A.365], Tianjin Municipal Archives [401206800-J0001-3-000690-010] and [401206800-J0002-3-002938-009].
- Figure 5: Diagrams by authors based on *Tianjin Concession Chronicles*.
- Figure 6: Diagrams by authors based on Map of Tianjin. *Map of Tianjin*, (Beijing: Chung-Tang Litho Works, 1912).
- Figure 7: Diagrams by authors based on *Tianjin Real Estate Record* and State Archives of Belgium [Archives D’entreprises Bedrijfsarchieven: Compagnie de Tramways et D’eclairage de Tientsin S.A.365].
- Figure 8: Weibo, <https://m.weibo.cn/1986884193/4092359849090754>.