PARKING IN CHINESE CITIES—

BARRIERS TO PRICING POLICIES

Alainna Thomas, Global Metropolitan Studies Initiative, University of California at Berkeley, alliet@berkeley.edu

ABSTRACT

China has undergone an unprecedented rate of motorization. It has now surpassed the United States to become the largest auto market in 2010. As a result, cities across China are undergoing profound urban transformations, as elevated expressway and wide arterials are built to meet motorists' demands (Cao 2008). The car has ingratiated itself in Chinese society; municipal governments are facing increased congestion that is costing them millions in lost revenue. Parking supply management, particularly pricing, could help shift auto dependence to more sustainable alternative modes and reduce congestion (Shoup 2005). This paper addresses the barriers to using parking to reduce auto use in Chinese cities. Barriers identified include: (1) lack of parking supply (2) weak regulations and intergovernmental conflicts (3) and weak enforcement. All three are interlinked and must be addressed to make full use of parking as a transportation demand management tool.

Keywords: China, parking, pricing barriers,

INTRODUCTION

Strong parking supply management is an important element to running an efficient and sustainable transportation system (Chinese Academy of Engineering 2003; Littman 2006). It is an integrated system that takes into account supply, location, pricing, and enforcement (Kuzmyak 2003). Parking cannot be used to its fullest for controlling travel behaviour without having strong enforcement and strong parking guidelines. Strong parking guidelines are worthless unless they are enforced and are in sync with what is happening on the ground. And neither works if the parking supply is insufficient to meet the basic needs of a city. Parking is critical to Chinese cities as a tool for more sustainable cities to reduce the number of vehicle trips as well as reducing congestion. As it is a regulatory tool that is already a part

of Chinese society, pricing policies may be more politically acceptable than other policies, such as congestion pricing (Chen 2008; Wang 2010).

Recent motorist travel behavioural studies in China have shown that once behind the driver's seat, it is difficult to get drivers out. In a study conducted in Nanjing, over fifty percent of drivers surveyed stated that they lived near a direct bus line to work, yet continued to drive to work (He 2005). Proximity to public transit was not enough to get them out of their cars. In another study on over 36 cities in China, driving habits of car owners demonstrated a heavy reliance on auto use (Wan 2008). Once they bought a car it became an integral part of their daily lives. Restrictions on vehicle purchases or registration help to lower the overall number of personal cars, but not usage. For example, in Hong Kong, in a study motorists found that drivers surveyed drove their cars every chance they could; they had high vehicle kilometres travelled(Cullinane 2003).

Because driving in China is now an integral part of everyday life, municipal governments have the opportunity to utilize parking to reduce auto dependence, reduce vehicle kilometres travelled (vkt), and thus, reduce carbon emissions. Unlike the United States, which has oversupplied parking, with the right planning and strategy, China can provide an adequate amount of parking and use market mechanisms to use these spaces efficiently. This paper looks at the barriers to utilizing pricing to shift travel behaviour. There are three major barriers: (1) lack of parking supply (2) weak regulations and intergovernmental conflicts (3) and weak enforcement. All three are interlinked and must be addressed to make full use of pricing policies as a tool for transportation demand management.

Parking Supply Issues

A fundamental problem and the biggest barrier for China is a lack of public parking. This has been a key problem for many municipal governments in China as they undergo rapid motorization. A recent article in Renmin Ribao reported that Shanghai's public parking infrastructure could only accommodate two percent of its cars, Nanjing 6.7 percent of its cars and Hangzhou had a ratio of 2.58 cars per public parking space. Alarmingly, many large and mid-sized cities reportedly lacking parking spaces up to 60 percent (Tong 2005). According to parking estimates done in the 2004 Jinan Comprehensive Transportation Report, the city could lack up to one million parking spots by 2020.

Multiple Parking Demands

Parking supply problems are twofold. First, there is a general lack of parking spaces throughout Chinese cities. Despite the rapid pace of construction in China, rising car consumption continuously outpaces it. The overall growth in the car population far exceeds parking infrastructure, particularly public parking. While the overall number of vehicles increased 11% on average from 2001-2008 (Guan 2009), private cars increased by 14% annually on average. Parking standards have not kept up with demand and are outdated (Chen 2006).

Older infrastructure lacks parking. City centres and traditional residential developments were built during the bicycle era; only a minimal amount of parking spaces are available in these areas. Taking Jinan as an example, a 15-story building provincial court building along one of its main arterials only had a surface lot of roughly 40 spaces available. The open space, such as courtyards, in government buildings, commercial buildings, and residential buildings has now been turned into surface parking lots. In addition, some of the commercial buildings may have had sufficient parking at one time, but their used the parking spaces for other types of land use, such as for storage. Thus, old infrastructure, restricted access to available parking, and rapid motorization combine to provide municipal governments with a complex planning problem. Yet, a significant portion of this demand is coming from government cars, both municipal as well as provincial agencies. This also impacts enforcement as oftentimes government cars are exempt.

Second, the parking spaces that are supplied are not necessarily used as efficiently as they could be. For example, public parking spaces that are available often do not have time limits. Thus, a space in a high demand area may be taken for most of the day. This is also tied to enforcement and fee collection issues, which are discussed in more detail in the section following.

Intergovernmental conflicts

Issues surrounding pricing and general parking policies are divided amongst several municipal agencies. For example, if time limits were implemented, enforcement is required. This falls under the Public Security Bureau's traffic police. The pricing is handled by another department; yet the agencies themselves may not be sure who has final authority. These types of issues arise whether this is public parking or private parking. In conversations with planners, in one city, a private agency oversaw a segment of on-street parking. Conflicts arose between different agencies as to who was responsible for enforcing the parking fees (the private company or the traffic police) and who was responsible for maintaining the on-street spaces (the public works department or the private company). For example, in Wenzhou, when a company proceeded to do on-street metered parking, various bureaus, including the Standards and Regulation Bureau, told them that each of these offices manages on-street parking. In the end, they had no idea which bureau was responsible (Tong 2005).

Planned but not built

Other reasons for under supply include changes to master plans. Even if master plans include parking, it is not a guaranteed that the parking will be built. The city may use those parcels for other types of land development (Tong 2005). The payoff for parking is difficult to see as quickly as a land development deal where the profits are almost immediate. Real estate development has been a driving force of urbanization; transportation infrastructure is not perceived as profitable, despite adding value to a city (Yang 2007; Yang 2007).

Financing and public parking

Public parking faces several hurdles to get built. Financing is difficult to secure as the return on investment will take several years (Guan 2009). This is connected to current pricing, which does not reflect supply and demand. According to Guan (2009), despite efforts by the Beijing municipal government to encourage the parking market, knowledge and the level of marketization of parking remains low. Intergovernmental conflicts as described above make it a risky investment for investors as it is unclear what government bureau will take charge of the project or has the necessary authority to allow them to provide parking. If the bureaus are at odds, this sends a signal to investors that they may lose out on their investment if problems occur as responsibilities may be passed from one organization to the next.

Parking policies

The parking requirements in Chinese cities are quite basic (Chen 2006; Guo 2007; Li 2007). They are not necessarily related to where the building is sited nor are they dynamic enough to be adjusted for growing demand. For example, in Jinan's parking guidelines, the parking spaces for hotels are based on the rating of the hotel (e.g. one star versus three star) not if it is located in the downtown area or in the financial district area.

In the city of Kunming, Li and Sun (2007) found that parking policies could not address the issue of supply and demand because they are too simple and only consider the location of parking. They are not written to address transportation demand.

Interestingly, they recommended linking public transit to parking to offer motorists an alternative. Kunming has the largest bus corridor public transit system and has been able to improve speeds and public transit use because of this type of system. If parking is going to be restricted, there has to be a comparable alternative. In addition, because Kunming has closed corridors on some its bus routes, buses can still move while cars are stuck in traffic, providing a compelling image for motorists to choose another mode of transportation.

The overall analysis of practitioners is that stronger laws and guidelines and better enforcement will solve China's parking issues (Chinese Academy of Engineering 2003; Guo 2007; Li 2007; Wen 2008). Yet, all the agencies involved would have to be in agreement over the role of parking. However, a stronger planning framework, which requires collaboration between government agencies involved focused on an agreed goal, is missing. This requires increased flexibility more local assessment and coordination.

Parking Enforcement

Policies alone cannot solve China's parking problem. These policies have to be backed by enforcement. Even if Chinese cities were able to adequately supply parking spaces, they would still face an enforcement issue. China cannot provide parking at the same level of the United States, nor is this desirable. With that in mind, enforcement becomes even more

critical to improving China's transportation system. Any parking policy hinges on its enforcement; this is a key to ensuring access to spaces and efficient use of available spaces.

This is also a major point of contention in China because of government conflicts over the goals of each bureau. As mentioned before, the regulation of parking in China is the nexus of multi-agency conflicts as it requires one agency to build it, another to set the rate, and yet another to enforce parking policy. They may not be in agreement with each other and enforcement suffers.

In addition, at both off-street and on-street parking lots, parking attendants collect fees. In informal interviews with parking attendants in three Chinese cities, parking fees are often negotiated, especially if the driver has been there for over two hours. In one city, a private agency oversees some public parking, but expects the city to maintain the street the parking is on. The traffic police will not enforce ticketing because they are not guaranteed a percentage of the fees collected and feel that the private company should be responsible.

Pricing also has to be consistent. In some cities, the on-street parking is cheaper than underground parking. Similar problems have happened in the US and have resulted in more traffic as drivers cruise looking for cheaper parking (Shoup 2006).

Recommendations

Taking into consideration the abovementioned barriers to parking pricing, in the following section are recommendations to addressing these barriers. These recommendations are only a starting point and more research is needed to look at possible best practices that will work within China cities[1].

Linking Parking and Public Transit

While many have identified (and rightly so) that parking is a major issue in Chinese cities because it is under supplied, this also brings an opportunity to ensure that parking is not overbuilt. Tied to parking is mass transit as they are both part of a city's transportation system. If parking is going to be used as a lever for transportation demand management; an alternative for trips has to be high quality mass transit. This means that access to the station needs to be safe. The actual journey on the bus, subway, light rail, needs to be comfortable and safe, not overcrowded. Public transit also needs to be reliable. Real improvements in mass transit need to be implemented. In a study on parking and travel behaviour in the United States, there was a strong link between cities with good public transit systems and parking management systems. Parking was utilized to support public transit (Mildner 1996).

1 Most of these recommendations focus on best practices in the United States. In future iterations of this paper, international best practice examples will be included.

Diversify parking supply

The parking supply needs to be adequate and dynamic. The types of parking provided in Chinese cities need to include both long and short term parking to get the most efficient use of land (Kuzmyak 2003). Parking with time and price differentials prevents the abuse of these spaces and is another way of control travel behaviour. The issues attached to public parking are related to the types of parking available in cities. If higher demand areas had more limited parking spaces, then public parking facilities that offer longer term parking, such as an hour or more, would be filling a demand. As it stands now, most parking available in China is does not have a time limit.

Financing Public Parking

National policies need to be in place to support these structures as part of the overall effort to support the automobile industry. While it is difficult to finance public parking, the city governments should continue to pursue providing public parking. Having enough spaces in the central business districts provides greater access to local businesses and helps to increase revenue. By allowing for greater FAR (floor area ratio), parking structures could be more profitable (Li and Sun 2007). Build-operate and transfer (BOT) models in which the government puts up money to build and then transfers management to private sector are one way to provide increased parking (Guan 2009).

New Parking Framework

In the longer term, a new parking management framework is needed for understanding parking's relationship to the city. Government agencies need to work together collectively to consider the goals of the city. With each new development or redevelopment, they need to consider who will be using the area and ways to increase public transit use in order to support more sustainable urban development.

The US Environmental Protection Agency (2006) provided guidelines and identified best practices to support better parking policies in US cities. They outlined six elements that have to be considered for better parking:

1. Development type and size
2. Development density and design
3. Demographics
4. Availability of transportation choices
5. Surrounding land use mix
6. Off-site parking

Taking these into consideration, the municipal government agencies that oversee parking must work together to address these issues as multiple agencies are impacted by and have influence over parking. Responsible bureaus need to be working together and a clear delineation of power and responsibilities defined to ensure better coordination as well as the

possibility of more investment. National parking standards should serve as guidelines; local cities should focus on creating unique parking policies that address their local needs and goals and adjust these guidelines and implement maximum parking requirements once adequate parking supply is reached to avoid the oversupply of parking.

Improving standards through studies

Parking studies need to be conducted in cities to understand current parking behaviours and issues. Each city has its own unique parking characteristics. In addition, the type of land uses and their proximity will also impact use. In a study conducted in Jinan, many of the on-street parking spaces were used by employees nearby (Thomas 2006). They lacked parking because their offices were located in an older building. Some cities in the United States rely on yearly parking analysis to adjust fees and types of parking in order to get more efficient use of parking spaces, encouraging faster turn over as well as to influence travel behaviour (Kuzmyak 2003).

If cities conducted parking surveys that included sampling workers in high-density areas, this could provide insight into actual demand for parking structures in this city as well as the need to push for incentives such as transit passes/checks for employees. In satellite cities across China, which are being built from the ground up, minimum-parking requirements impact their urban form, which has been experienced in the US (Shoup and Manville, 2005). Thus, parking studies would be useful for monitoring use and establishing policies that would reduce car dependence.

Linking Parking and employee parking

One of the perks for employees is free parking. In cities such as Chicago, Los Angeles, New York and regions such as the Bay Area in California, businesses provide their employees with transit subsidies for taking alternative forms of transportation, such as public transit, walking, or biking. These types of incentives could be used in conjunction with other policies to reduce auto dependence and parking demand (Shoup 1995).

Carsharing for government fleets

Government employees should be encouraged to use public transit or to car share. While private cars are increasing at a significant rate, the majority of cars registered in major cities are government cars. Shifting to carsharing will parking demand, reduce trips, improve congestion and reduce pollution. The City of Berkeley replaced its government car fleet with car share vehicles. They saved $250,000 in the first three years of the program (Mtc 2007). A majority of the cars in major cities are government cars. By utilizing carsharing, even for smaller units of government, would reduce demand for parking as well as traffic congestion.

Conclusion

Parking priced right could offer municipal governments another tool to address congestion and put their cities on a more sustainable development path. However, as outlined above, several barriers exist that thwart governments from using this powerful tool: low parking supply, weak policy, and weak enforcement. All three are linked- without an adequate supply, pricing cannot be used to its fullest as a lever. Still an adequate supply does not guarantee spaces will be used efficiently and profitably unless strong enforcement and strong parking guidelines are in place. Strong parking guidelines are worthless unless they are enforced and are in sync with what is happening on the ground. At the crux of the parking issue are intergovernmental conflicts that must be addressed so that pricing, enforcement, and supply issues are ameliorated. A new policy framework that requires increased collaboration and cooperation amongst municipal planning agencies are needed. Once these issues are addressed, Chinese municipal governments can move forward and implement a full array of policies that link pricing not only to location but also to time of day.

BIBLIOGRAPHY

Cao, Xiao-shu, Da-peng Wang, and Kuang-hui Li (2008). "Private Cars and Development of Urban Form and Structure (in Chinese)." Modern Urban Research **7**: 78—81.

Chen, Hongfeng, Pu Xiao, Xiangzhao Feng and Fen Li (2008). "Public Attitudes Towards Policy Instruments for Congestion Mitigation in Shanghai." Chinese Journal of Population, Resources and Environment **6**(3): 40-47.

Chen, Jun, Wang Wei, and He Baohong (2006). "Research on Classification for Urban Parking Lots of Public Buildings (in Chinese)." Planners **22**(10): 87-90.

Chinese Academy of Engineering, National Research Council of the National Academies (2003). Personal Cars and China. Washington, D.C., National Academies Press.

Cullinane, Sharon and Kevin Cullinane (2003). "Car dependence in a public transport dominated city: evidence from Hong Kong." Transportation Research Part D: 129-138.

Guan, Hong-zhi, Yan Hai, Wang Zhao-rang, and Yang Yuliang (2009). "Analysis and Suggestions on Parking Industrialization Policies: A case study of Beijing " Urban Transport of China **7**(2).

Guo, Li, Jin Wen and Tan Ying-jia (2007). "Study on Parking Problems in Small and Mid-sized Cities." Communications Standardization (交通标准化）**8**: 73-76.

He, Baohong, Jun Chen, and Wei Wang (2005). "Survey and Analysis of Trip Characteristics of private cars with Nanjing as an example
(城市小汽车出行特性调查及分分析—以南京为列）." Urban Planning Forum
(城市规划学刊）**4**(158): 83-87.

Kuzmyak, J. Richard, Rachel Weinberger, Richard H. Pratt and Herbert S. Levinson (2003). Parking Management and Supply, Chapter 18, Transit Cooperative Research Program.

Li, Shan-shan and Jinyi Sun (2007). "Countermeasures against the urban parking in Kunming " Technology and Economy in Areas of Communications **6**(44): 84-89.

Littman, Todd (2006). Parking Management: Strategies, Evaluation and Planning, Victoria Transport Policy Institute.

Mildner, Gerard, James G. Strathman, and Martha J. Bianco (1996). Travel and Parking Behavior in the United States. Discussion Paper 96-7. Portland, Portland State University.

MTC (2007). Reforming Parking Policies to Support Smart Growth Toolbox/Handbook: Parking Best Practices and Strategies for Supporting Transit Oriented Development in the San Francisco Bay Area

Shoup, Donald (1995). "An opportunity to reduce minimum parking requirements." Journal of the American Planning Association **61**(1): 14-28.

Shoup, Donald (2005). The High Cost of Free Parking.

Shoup, Donald C. (2006). "Cruising for parking." Transport Policy **12**: 479-486.

Thomas, Alainna and Elizabeth Deakin (2006). "Land Use Challenges to Implementing Transit-Oriented Development in China: Case Study of Jinan, Shandong Province." Transportation Research Record(2077): 80-86.

Tong, Zongli (editor) (2005). Two main bottlenecks to developing China's parking industry (in Chinese). Renmin Ribao Online.

Wan, Xia, Jun Chen and Wei Wang (2008). "Correlation of private car and city economy " City Planning Review **33**(1): 74-79.

Wang, Rui (2010). "Shaping urban transport policies in China: Will copying foreign policies work?" Transport Policy **17**(3): 147-152.

Wen, Zhi Gang (2008). "Countermeasures Study on Parking in Chinese Cities." Journal of Shan Xi Police Academy **16**(2): 65-68.

Yang, Jiawen (2007). Land Development control under motorization pressure: Will China have transit-friendly urban forms? Fourth Urban Research Symposium 2007 "Urban Land Use and Land Markets". Washington, D.C.

Yang, Jiawen, Changchun Feng, adn Guangzhong Cao (2007). "Land and Transportation Development in China: Economic Analysis of Government Behavior." Transportation Research Record(2038): 78-83.