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PREFACE: PLANNING IN CHINA

The Chinese city has been in rapid transition for over 25 years, and it shows no sign of slowing down that process of change. The city continues through phase after phase, showing the consequences of changing and expanding economy together with rapidly accommodating institutional response and guidance. Andrew Marshall Hamer wrote in 1993 “the Chinese city is being reinvented.” The reinvention is still going on.

These papers provide a kind of overview of that process and also some interesting indicators of its future. There is a tracking of this uniquely rapid evolution (see Zhou) in urban transportation policy and investment. There is application of the increasingly fine-grained social survey research that exposes the dynamic of revealing social behavior (see Wang, et al.). It took some time for the issue of urban conservation to move in as a feature of contemporary Chinese practice, following recent controversy when redevelopment threatened historic buildings in Beijing. Now the process approaches a broader collaborative stakeholder approach to the problem (see Qian).

There is a good deal of urban transportation in this issue, reasonably because economic adjustments together with rapid urban growth have entailed very high transport investments and dramatic shifts in the locations of travel demand. The impacts of these investments—highways and public transit—on the shape of urban land development have also been dramatic. This is specially affected in the Chinese case by the capability of government to manage the land use side of the land use-transportation interaction, as documented here by Pan and Zhang. And, of course, much of this development is taking place at the turbulent urban fringe, where cities are eating up contiguous agricultural land at a rapid rate, allegedly exploiting the interests of contiguous rural work groups. This is a phenomenon so apparent that it got high profile comment in a recent Economist review article. Abramson and Anderson in this issue attempt to advance solutions to this problem to the level of community enabling.

The span here encompasses a broad and assertive scope of observation, interpretation and expectation for dynamic change in the Chinese city. I recommend it highly for your reading.

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INTRODUCTION FROM THE EDITORS

The Department of Urban Studies and Planning (DUSP) at MIT has paid great attention to the development and planning issues in China ever since China’s economic reforms of the late 1970s. The involvement of DUSP has been extensive, ranging from faculty research projects, joint studios, exchange programs, and joint research labs, to student admissions, training seminars, and workshops. DUSP affiliated scholars, practitioners, and government officials are playing active roles not only in improving our understanding of the complex and large-scale urban development in China, but also in facilitating policy decisions and plan-making in a sustainable and productive way.

The idea of having a special issue of Projections on China planning and development first emerged from the success of the DUSP-sponsored China Planning Network (CPN) annual conferences held at Harvard (2004) and MIT (2005). The large number of participants and the enthusiastic response worldwide to these events made such a journal issue not only feasible but also necessary. Nevertheless, it is impossible for one volume to cover all the important topics affecting development and planning in China. The five selected papers focus on only a few critical issues: conservation, transportation and land use, location choices, and growth at the urban fringe. Four papers are by Chinese scholars or students, and only one paper is by two US scholars. We hope that publication of this issue can help attract more attention to China from domestically-oriented US planning educators, students, and practitioners, and will lead to an increase in high-quality research. If this Volume succeeds in its purpose, it will recall an ancient Chinese saying: throwing a brick while returning a jade.

Zhan Guo, Jinhua Zhao, Ming Guo
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This paper reports on research into the sensitivity and accountability of local planning processes to diverse communities of urban residents and development actors in China’s coastal Fujian Province. Of particular interest is how urban planning can better assist rural villages adjust to the transition to urban communities, as well as how planning can better accommodate migrant populations in the settlements at the city’s expanding periphery (cheng zhong cun, or “villages in the city”). In the summer of 2002, the city of Quanzhou began the process of abolishing an important factor in the creation of cheng zhong cun: the distinction between urban and rural hukou (household registration). The city thus embarked fairly early on a policy reform that has since been nationally embraced, and therefore it represents perhaps a bellwether case for examining the relation between peri-urban planning and this key issue in demographic categorization. Within Quanzhou’s broad policy environment, a comparison of two cheng zhong cun tentatively suggests what a community-enabling approach to peri-urban planning might look like in China.
INTRODUCTION

One of the burning questions in China’s current discourse on urbanization is how to respond to the phenomenon of the cheng zhong cun, or “villages in the city.” 1 As Chinese cities grow, the conversion to urban uses of agricultural land and villages at the cities’ edges – “peri-urbanization” – triggers a profound set of changes in planning, governance, control of economic assets, and access to social goods. These changes expose in extremely raw fashion the contrasts that exist in China between rural and urban society, between mobility of labor and stability of communities, between rich and poor, and between plan and reality (for a broad discussion, see M. Leaf, 1998). The dynamic and complex nature of peri-urbanization especially challenges a planning system such as China’s, which relies heavily on large-scale, state-enabled consolidation of development sites and highly standardized construction in order to accommodate the rapid development of high-density cities. The emergence of cheng zhong cun – residual villages where self-organized, unplanned and substandard development occurs amidst the broader expansion of urban fabric – represents a particularly visible failure of official Chinese planning.

Much of the ensuing criticism in the current debate treats the cheng zhong cun as the symptom of a disease that must be prevented or cured only through more rigorous application of existing comprehensive planning standards (for example A. Yang, 1996), and through removal of barriers to a more freely operating land market (J. Zhu, 2004). Another, less prevalent critique sees the cheng zhong cun as a natural response to a situation in which existing planning standards themselves otherwise would deny affordable housing to migrant workers and income to local villagers. This position calls for a more incremental and enabling approach to upgrade the environments of urbanizing villages, along lines promoted in much of the developing world outside China, in which villagers are encouraged through protection of property rights and other favorable policies to make long-term responsible investments in housing (Hamdi, 1991; Li, 2001; L. Zhang, Zhao, & Tian, 2003).

The following discussion reviews the connections between physical planning approaches to peri-urban development in China, and the policy conditions that have created the cheng zhong cun. Observations of two cheng zhong cun in the city of Quanzhou, Fujian, on China’s southeast coast, underline the variety of development trajectories that different peri-urban villages may take, even in one metropolitan area, depending on the involvement of higher levels government in the development, and the response of the local village government to environmental challenges. The comparison suggests what kinds of alternative policy conditions might provide the basis for an enabling approach to physical planning, and what that approach might look like on the ground, at the city’s edge.

PERI-URBANIZATION AND THE EMERGENCE OF THE CHENG ZHONG CUN AS A PLANNING PROBLEM
According to ideal Chinese planning practice, a freshly urbanized area is subject to a sudden and drastic change in land division, building types and uses, and increased infrastructure investment, according to the city’s master plan and a “comprehensive” project plan. The land loses its status as collective and village-owned, and becomes the direct property of the state, whose agents are the various levels of government – provincial, municipal, district/county, town and township – each acting according to its position in the hierarchy of governance (See chapters 1-6 in Ding & Song, 2005). Development companies commissioned by the government then rebuild the entire village, replacing the farmers’ fields and individual houses with industrial parks, commercial centers and residential estates (see Figure 1). The village governing committee receives a payment in compensation for its loss of agricultural assets, and is reconstituted as all or part of the lowest level of the urban governance hierarchy, a “street/subdistrict” (jie dao) or “community” (she qu), or “residents committee” (ju wei hui), depending on the size of the village. The villagers themselves are given new apartments, off-site if necessary and in consolidated estates, but matching the square footage of their old houses; they also have the opportunity to purchase additional flats, which they may rent to migrant laborers or exurban residents for income to replace their lost farm income. It is assumed that the ex-farmers will find employment either in newly established industries or in the growing service sector.

In reality, the process of urban expansion is usually far less orderly, often less equitable, and also quite different from locality to locality. As Webster (2002) has described, the nested hierarchy that distinguishes China’s formal system of development decision-making from other rapidly urbanizing Asian societies masks an actual situation that is characterized by decentralization and competition between levels of government, so that China’s peri-urbanization in many respects increasingly resembles other East Asian societies’. Among the most serious problems are environmental degradation, in terms both of polluted natural systems and of deteriorating built-environmental conditions (French, 2005; Tang & Chung, 2002); corrupt relations between land developers, village leaders and higher levels of government, who are in a position to pocket income from land transfers without adequately compensating villagers (Rosenthal, 2003; Su & Chan, 2005; Xia & Cheng, 2004); inadequate alternative employment for peasants who are no longer able to farm, and the attendant social problems that particularly affect their children (D. Zhu, 2004); and criminal networks that move among and prey upon the high concentrations of migrant workers from distant provinces who gravitate to the cheap housing and abundant jobs that are especially available on the edges of cities. Municipal master plans (zongti guihua) and urban system plans (chengzhen tixi guihua) from the early 1990s even up to this decade rarely considered the origins and demographic features of the populations that were projected for specific areas (see for example Beijing Municipal Institute of City Planning and Design, 1993; Jiangsu Provincial Institute of Urban-Rural Planning Design, 2001; Quanzhou Municipal Government, 1995).

Among the most striking spatial expressions of this situation are the cheng zhong
cun – villages that maintain much of their original street layout, land division pattern or building types, even as the city expands around them. They combine elements of long-term community stability, as in the preservation of lineage halls, neighborhood temples and ancestral homes, with frenetic short-term investment in private house enlargement and shopfronts, which is driven partly by the income that can be generated from rents and business, and partly by the anticipation of wholesale redevelopment when householders expect to be compensated for the floor area that is demolished. Two factors of supply and demand are responsible above all for this behavior. On the supply side, each village household has a property right to the use of the land on which its private home sits; once village farmland is requisitioned for urban development, this housing plot is often the only asset that villagers have left. On the demand side, is the distinction, through the national hukou (household registration) system, between urban and rural residents and between local (permanent) and migrant/“floating” (temporary) residents. Rural hukou-holders have been largely excluded from urban housing, so villagers’ housing is often the only alternative to factory-provided dormitories. Likewise, the informal economy and the more self-policing environment of the village, as opposed to the urban community, provides a more hospitable shelter to migrants who may not have legal residency anywhere in the city.

Rural-urban migration in the reform era (since 1978, but increasing rapidly particularly in the 1990’s) has resulted in both the empowering of urban-edge villages through an enormous increase in wealth due to rent income, and has also produced glaring gaps in social services, police authority, and infrastructure provision in communities that host migrant groups. Within many cities, local-migrant distinctions seem to show the sharpest social inequalities, particularly when the hukou, or household registration, regime has been used to institutionally reinforce those distinctions. As Kam Wing Chan, Delia Davin, Dorothy Solinger, and Li Zhang have shown, such distinctions are a key determinant in access to employment opportunities, housing, education, and a wide range of social services. Perhaps even more important, they represent a profound cultural rift in Chinese society (Chan & Zhang; Li Zhang, 2001). Nevertheless, as the importance of hukou in daily life continues to fade, and municipalities throughout the country begin to erase the distinction between rural and urban residency, an examination of a situation where this distinction is in an advanced state of obsolescence promises to shed light on the future of peri-urban planning in China.

TWO CHENG ZHONG CUN IN QUANZHOU, FUJIAN – LIBERAL HUKOU POLICY, FLEXIBLE PLANNING IMPLEMENTATION, AND BROADLY DISTRIBUTED DEVELOPMENT POWER

The city of Quanzhou, in Fujian Province, began the process of abolishing the urban-rural residency distinction in the summer of 2002. This was a time when relatively few municipalities were experimenting with hukou policy in this way (Wu, 2002). Quanzhou is part of a region in China where industrialization has occurred primarily on a village-by-village basis, in an extremely dispersed and
decentralized pattern. Yu Zhu calls it “in situ urbanisation” (2000; , 2002). The city is located in a bend of the Jin River about 100 km north of Fujian’s largest city, Xiamen. It is the third largest city in Fujian after Xiamen and Fuzhou, and is the northernmost city of the Min’nan speaking region of Fujian. Quanzhou is the name of the administrative municipality, which incorporates a rural hinterland, some smaller cities and towns as well as Quanzhou city proper. The total area is 10,865 km2 and as of the 2000 census has a population of 7,280,000, of whom approximately 680,000 are migrants from outside of the Quanzhou administrative municipality who have resided in the city for over 6 months. In this paper, when referring to Quanzhou, we mean the city proper and its suburbs, with a population of approximately 800,000 people, of whom about 550,000 live in newly developed districts outside the city’s historic core.

Municipal abolition of the urban-rural distinction, like the pattern of “in situ” urbanization itself, is related to Quanzhou’s unusually private and family-based ownership of industrial assets and land-use rights, often hidden “under the red umbrella” of village collective government (Chen, 1999; Oi, 1999). In Jinjiang, the county-level city just south of Quanzhou city proper, for example, the majority of rural enterprise employment and output value as early as 1984 was either joint-household or individual-owned, whereas in China nationally it was township- or village-run [Chen, Jay Chih-Jou, p. 136]. In 1993, only 6.78 percent of all production in the municipality was state-owned, and 53 percent of retail was private (Quanzhou Municipal Statistics Bureau, 1998). Likewise, in the area of housing and the land it occupies, there has been an equal continuity of private ownership. The Great Leap Forward and the Cultural Revolution saw essentially no collectivization of housing in Quanzhou. According to the 2000 census long-form sample population, a remarkable 34% of urban households in the two districts that comprise the urban core of Quanzhou’s prefectural seat still live in self-built housing. As would be expected, an even higher proportion of town and village households live in self-built housing (2002, pp. 594-595 Tables L598-594a—L598-594c).

All of these features of Quanzhou’s development are based on the city’s strong dependence on Overseas Chinese and Taiwanese kinship ties for investment in both private economic and public social goods; and export-oriented industries that are highly dependent on both migrant labor and overseas marketing networks. Throughout China, local (especially village and town level) governments became involved in enterprise development through the reform era as a way to generate the income needed to fulfill their obligations to residents, as central governments off-loaded services onto lower levels of government but did not allow them to retain a greater share of taxes to pay for these obligations (Oi, 1999). Coupled with the loss of agricultural income after the dissolution of the collectives, many local level governments established money-making collective enterprises. Partly as a result of these conditions, a political landscape of highly autonomous villages and county-level cities has emerged, along with a correspondingly weak administrative center in Quanzhou proper. And all levels of government tend to be weak with respect to private lineage-organized interests. Individualistic, diverse
and un-standardized building activities, and a relatively high standard of housing in particular makes conventional redevelopment a very expensive strategy for infrastructure improvement (D. Abramson, Leaf, & Tan, 2002).

Researching Peri-urban Quanzhou

Because Quanzhou’s conditions of development are so challenging for conventional Chinese planning, the authors collaborated with partners at Tsinghua University and the Chinese Academy of Urban Planning and Design in a series of planning consulting and advocacy projects, academic exercises, and field research hosted by the Quanzhou Municipal Planning Bureau to explore how planning might adapt to meet local challenges (D. Abramson, Leaf, Anderson, & the students of UBC Plan 545B, 2001; D. Abramson, Leaf, & the students of UBC Plan 545B, 2000; D. B. Abramson, 2005; M. L. Leaf et al., 1995). Peri-urbanization became a particular focus during a field studio in 1999, which included a survey of residents and building typologies in the village of Dong Mei, about 1.5 miles east of the historic urban center (see Figure 1) (D. Abramson, Leaf, & the students of UBC Plan 545B, 2000; D. Abramson, Leaf, & Ying, 2002).

 Eleven subsequent visits over the next five years provided the authors with an

**Figure 1.** MAP OF DONG MEI AND HUO JU IN RELATION TO QUANZHOU’S URBAN CORE
Source: Author
opportunity to observe the development and planning of Dong Mei over time, and augment them with observations of other peri-urban villages in Quanzhou. Five villages consolidated to form an urban community at Huo Ju provided a particularly enlightening comparison with Dong Mei. Huo Ju, despite its greater separation from the city center (see Figure 1), became the focus of a far more disruptive imposition of large-scale spatial planning than Dong Mei did, in the form of a town (zhen)-level industrial park. Both Dong Mei and Huo Ju were the main focus of fieldwork carried out by Samantha Anderson in May-July, 2002, and Huo Ju was one site of an action-research planning studio led by Dan Abramson and Michael Leaf in June-July, 2004.4

The 2002 fieldwork included a brief census of all 244 shopfront businesses in the two cheng zhong cun, as well as semi-structured, in-depth interviews with fifty-one self-selected respondents from the census, plus twenty-four other peri-urban residents; five factory owners, managers and industrial park officials; and sixteen government officials at different levels, including a Vice Director of the Municipal Planning Bureau, the Planning Bureau official in charge of village planning, and the village heads/Party Secretaries of Dong Mei, Huo Ju and three other peri-urban villages. The census of shopfronts identified each by business type, and asked the shop-owner or other responsible occupant his/her origin, the business’s duration of operation, business conditions, and invited him/her to comment further, probing for feelings about relations between migrants and locals (see Table 1).

For the 2004 studio in Huo Ju, a multi-disciplinary team of graduate students mapped changes in Huo Ju’s built environment, observed the use of public space, and conducted interviews with local village property owners (17), factory owners and managers (7), migrant workers and business owners (10), and officials from the community and jie dao governments (5). They also conducted a focus group interview with a village temple elders committee, and a survey in the public space in front of two village temples of opinions about potential future environmental changes, for which sixty-six self-selecting migrants and locals filled out questionnaires.

Comparing Dong Mei and Huo Ju

Dong Mei and Huo Ju exhibit similar features in a number of respects, and have followed typical patterns of peri-urban spatial development for southern Fujian. They both began to industrialize in the mid-1980s with private individual or joint-household investment, first filling in the fields in scattered fashion and then in the 1990s in consolidated local industrial parks. Villagers rebuilt their one-story courtyard houses into typically three story block-like houses with modern conveniences, and shopfronts along major streets. Migrants came to work in the factories and rent accommodations and business space in the enlarged houses, and many villagers also opened businesses in the shopfronts (see Figures 2 and 3). Business owners in the two villages responded remarkably similarly to questions
Table 1. SELECTED DONG MEI AND HUO JU STATISTICS AND RESPONSES TO BUSINESS SURVEY

<table>
<thead>
<tr>
<th></th>
<th>Dong Mei</th>
<th></th>
<th>Huo Ju</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permanent</td>
<td>Temporary</td>
<td>Permanent</td>
<td>Temporary</td>
</tr>
<tr>
<td>Population</td>
<td>5,500</td>
<td>5,000</td>
<td>1,700</td>
<td>20,000</td>
</tr>
<tr>
<td>Business Survey</td>
<td># Response</td>
<td>Rate</td>
<td># Response</td>
<td>Rate</td>
</tr>
<tr>
<td></td>
<td>156</td>
<td>100%</td>
<td>88</td>
<td>100%</td>
</tr>
<tr>
<td>Origin of Owner or responsible occupant</td>
<td>107</td>
<td>69%</td>
<td>66</td>
<td>75%</td>
</tr>
<tr>
<td>This village or town</td>
<td>18</td>
<td></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Elsewhere in Quanzhou municipality</td>
<td>45</td>
<td></td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Elsewhere in this linguistic region</td>
<td>9</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Other region of Fujian and elsewhere</td>
<td>35</td>
<td></td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Duration of operation</td>
<td>61</td>
<td>39%</td>
<td>33</td>
<td>38%</td>
</tr>
<tr>
<td>Less than six months</td>
<td>15</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Six months to one year</td>
<td>15</td>
<td></td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>More than one year</td>
<td>31</td>
<td></td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Further Comments</td>
<td>61</td>
<td>39%</td>
<td>58</td>
<td>66%</td>
</tr>
<tr>
<td>including relations (migrants + locals)</td>
<td>17</td>
<td>11%</td>
<td>8</td>
<td>9%</td>
</tr>
<tr>
<td>Good</td>
<td>6</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ok</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bad</td>
<td>7</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Not much contact</td>
<td>2</td>
<td></td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author

about their origin, how long they were in business there, and even their impression of local-migrant relations (though comments on this last topic were too few to be statistically representative; see Table 1).

In October 2001, Dong Mei villagers received urban hukou and in June 2002 the village became an urban community (she qu). Huo Ju followed in 2003. Both communities accommodate a great diversity of building types, residents, and socio-economic activities within a very small area, so that local villagers and migrants coexist among a blend of old and new self-built housing, shops and cottage industry, and developer-built apartments and factories. In Dong Mei, commodity housing estates add relocated inner-city residents to the mix. Finally, both occupy key locations in the spatial structure of the growing city. Both are adjacent to the government headquarters of their respective urban districts. Dong Mei is also adjacent to the city’s new bus terminal and Huo Ju is adjacent to an important intersection leading to the city’s newest bridge across the Jin River.

Important differences between the two cheng zhong cun, however, include the presence of a town/jie dao-developed industrial park in Huo Ju, and a generally higher proportion of land given over to industrial use in Huo Ju than in Dong Mei. Huo Ju’s total area is 2.1 square kilometers, about half of which is industrial park. The proportion of migrants to locals is consequently much higher in Huo
Figure 2. PARTIAL MAP OF DONG MEI LAND USE IN 1999
Source: Author

Figure 3. PARTIAL MAP OF HUO JU LAND USE IN 2004
Source: Author
Ju. Although accurate numbers are difficult to obtain, in interviews in 2002 and 2004 the Huo Ju village/community head stated that there are approximately 1,700 registered villagers, but the number of registered migrants increased from 5,000 in 2002 to 20,000 in 2004, and in both years there were many unregistered migrants as well, so that the total population in 2004 was estimated at 30,000. Approximately half the migrants live in dormitories in the park and the other half (including most migrant families) live in villager-built rental housing.

The population of Dong Mei, on the other hand, in 2004 approximately 5,500 registered permanent residents and 5000 temporarily registered migrants, living on 0.65 square kilometers. Just one year before that, the permanent registered population was 4,179, and the year before that it was 1,300. While the increase was due in part to the addition of new residents of the commodity housing estate (some relocated from the inner city and some moved in from more distant villages to be closer to the city), a certain portion of the increase was due to the permanent settling in Quanzhou of migrants from outside the municipality altogether. The community head/Party Secretary predicted a further growth after 2005 of 10,000 residents as a result of additional commodity housing construction.

Accompanying these differences in population and land use are some critical differences in physical planning. Dong Mei and Huo Ju both are organized around core historical villages whose local god temples and lineage halls remain intact, along with a number of traditional one-story courtyard houses. However, while Huo Ju’s villager-built factories, dormitories and multi-story housing are haphazardly and densely arranged according to informal field parcel subdivisions with little space left for public amenity or protection of waterways, Dong Mei’s self-building activity has been guided by a series of locally developed plans that have ensured siting standards for individual houses and gradually improved the village’s open space and public amenities. Not only has the village lineage hall been preserved; temples have been rebuilt and slightly relocated where necessary to widen streets or create open space. Dong Mei’s public space includes a covered fresh market and market plaza, and a public park with an opera stage. There is also a site laid aside for an elementary school. Huo Ju’s fresh markets, on the other hand, have been built precariously on concrete slabs covering a neglected stream. A year after becoming an urban community, Dong Mei produced its own “human settlement upgrading vision plan” that showed how, through further improvements in streets and public space, the village would still be able to maintain a coexistence of privately-built individual housing and new large-scale housing estates and major urban infrastructure (Figure 4). Planning in Huo Ju, by contrast, has reached a stage of limbo, as higher levels of government wait for an opportunity either to expand the factory zone or begin to implement the municipal master plan, which designates much of the area for higher density commercial and residential uses.

Two Local Land Control Regimes
Differences in the environmental quality and planning activity of Dong Mei and Huo Ju are outcomes of different relationships between the villagers, the community government, and higher levels of government over land control, which in turn depends in part on who can be seen to be best upholding environmental standards. Since the State Council issued the “City Planning Ordinance” in 1984, all municipal and county level governments have been required to develop master plans (Abramson et al, 167). Villages have also been required to submit their own plans to the Quanzhou Municipal Planning Bureau for approval. The Municipal Planning Bureau’s guidelines for village plans include the preservation of all temples; the limiting of self-built homes to three stories; required setbacks; the use of traditional building materials for at least 30% of the construction (usually red brick for the façade); the protection of waterways; and depending on the size of the village must also include schools, hospitals, markets and public space. The goal is to have complete communities to reduce commuting to the inner city by residents either for work or shopping, but at the same time to move industry ever farther from the inner city.

Most villages lack the resources and expertise to develop their own plans, however, and often plagiarize other communities’ plans in order to fulfill their bureaucratic obligations to higher levels of government, but with little consideration for the particularities of their own community. Thus plans are created but are
often ignored. Whether noncompliance is the result of villagers’ intransigence or higher-level administrative lack of interest in enforcement, the result is the same: ultimately when the land is valuable enough, higher-level governments use the noncompliance as an excuse to remove the land from village control and redevelop it on a large scale, thus also removing the chief source of financing for the village-cum-community. In both Dong Mei and Huo Ju, it was villagers who initiated the first industrial development. However, Dong Mei’s leadership moved quickly on its own to consolidate its scattered industries into a small zone, and also to diversify its development by building a commodity housing estate, which accorded with master plan long-term vision of residential use for the area. Twenty-five percent of household compensation for the taking of fields was dedicated to improving public facilities and environment within the village (D. B. Abramson, 2004).

In effect, the Dong Mei leadership used incremental upgrading to forestall the district and municipal governments’ drive to use environmental quality as an excuse to take over the land and redevelop it on their own. In addition to substantial investment in environmental improvements, the Dong Mei Party Secretary has been quite media-savvy, producing videos and attracting television news attention that highlights these improvements and downplays the actual continuity of much of the village’s pre-existing features ([Quanzhou Dongmei Community], c2003; Dong Mei Community Committee, 2004). Huo Ju, by contrast, suffered from the greater initial success of its industries, which attracted the attention of the township-cum-jiedao and district governments to requisition the village land and develop it itself. This left the village-cum-community without adequate resources to manage and improve its remaining land, which was quite small (D. B. Abramson & Shieh, 2004; Anderson, 2002; Y. Yang, Flower, & Xin, 2004).

TOLERANCE TOWARDS THE TRANSIENT? – IMPLICATIONS FOR POLICY RESEARCH

We do not know to what extent the different fates of these two cheng zhong cun depend on the competence of their particular local leaderships, but the point of this story is to show that, though inadvertently and through mere political expedience, the leadership of one of them – Dong Mei – has demonstrated an alternative approach to planning which is currently not acknowledged in standard Chinese practice. Dong Mei’s gradual accommodation in a small area of different populations and activities, and both private and collective forms of land ownership, bears little relation either to the process or product of typical “new” district development. Since Municipal planning authorities have become accustomed to view Dong Mei, Huo Ju and similar villages as utterly “temporary” in every respect, they assume that development need not take their features into account.

Written during the mid-1990s, the Master Plan has adopted the typical “one-size-fits-all” (yi dao qie) approach to peri-urban development (Feng, 2002). Rather than accounting for the variety of ways a village might become incorporated into
the city, the plan treats all new development zones at the urban edge identically, as vacant land to be laid out in a grid and built as either industrial or housing estates, interspersed at great distances with specialized shopping areas, even though the villages may have been their for hundreds and sometimes thousands of years. There is no recognition in the plan of the need for housing of various types, standards and levels of affordability, or of the convenience of mixing uses in close proximity, and in spaces that are flexible enough to change their function quickly if necessary.

Municipal planning authorities, policy-makers, and local academics still insist that cheng zhong cun should be completely redeveloped, by facilitating the consolidation of private villager-owned housing property and finding developers to undertake “turnkey” projects if necessary (Jiang, 2005; Xie, 2004; Zheng, Liu, & Lin, 2004). However, out of respect for strong de facto private household property rights, Quanzhou’s authorities have perforce actually been quite strategic in their pursuit of master planning goals, by preventing construction on future rights-of-way and shutting down the most polluting home-based industries, but otherwise refraining from wholesale demolition and relocation. The experience of Dong Mei might suggest how to undertake gradual upgrading in a more systematic fashion, under conditions of more formalized village rights of self-governance rather than uneasy inter-governmental tension. A policy that enables this would assist villagers in making the transition to urban citizenship.

Underlying the tendency of municipal officials to see peri-urban villages as physically temporary until they have been formally incorporated into the city through complete redevelopment, is the question of the extent to which cities will have to accommodate a “permanently temporary” population or a portion of the population whose composition is always changing. Planning Bureau officials often make the assumption that migrants would come to Quanzhou, work for a few months and then move on, and therefore their needs do not have to be accounted for in planning for the city. This is not an assumption shared by local people in daily contact with migrants: landlords; shopkeepers in areas with large migrant populations; even local village officials.

Many migrants do settle down. One factory has workers from Sichuan and Jiangxi who have been there for twelve years, which basically covers the period of time of migration for factory work to Quanzhou. It was an explicit policy on the part of the factory to pay better than competing factories and provide better housing and food in order to retain workers. The difficulty in retaining skilled workers was a common complaint amongst factory owners and industrial park officials, but few seemed to have made the connection, as this and a minority of other factories had made, between providing better working conditions and lower turnover. Generally, workers tended to jump from one job to the next looking for the best deal. The ideal seemed to be to move up from factory work to running a small business such as a local shop or restaurant. Flexible, gradual upgrading of urbanizing villages – and in particular the accommodation of small businesses that can
be owned by migrants – seems likely to ease the transition of temporary residents to permanent status.

This study also suggests that the kind of close proximity and mutual economic dependence between migrants and locals that is supported in the cheng zhong cun may reduce the prejudice and distrust that often exist between these groups. It is common in China to see cheng zhong cun as a threat to “urban harmony” and the “harmonious society” that is the focus of so much governmental attention at present (see for example Nanfang Dushi Bao [Southern Metropolitan News], 2006). Our interviews revealed a pattern of attitudes, with government officials at the municipal level having the most negative view of migrants and being the most likely to consider their sojourns temporary, and local villagers living in close proximity with migrants having the most positive and realistic views. In between are village committee officials, who blame migrants for crime and pollution, but recognize their economic and cultural contribution. One village committee head exclaimed that, due to the migrants’ presence, “even the old ladies can speak Mandarin now!” Only ten years before this research, in the early 1990’s, it was rare for rural and older people to speak Mandarin. Even urbanites older than teenagers still in school generally spoke Mandarin with very heavy accents. The migrants themselves have varying views of the local population, with a possible pattern that those renting accommodations from locals in owner-occupied houses feeling most intimate (“like family” in the words of one migrant from Jiangxi) and those living in factory dormitories having less interaction.

The ratio of migrants to villagers seemed also to be a factor in the ability of migrants and villagers to coexist peacefully. Though anecdotal, Huo Ju residents reported instances of crime and discrimination that were more severe than any we heard from Dong Mei residents. This seems likely to be related to the overwhelming ratio of migrants to locals in Huo Ju (more than 10:1). These qualitative impressions seem to justify a more rigorous social survey of migrant-local relations in places where migrants are renting accommodations built by locals, and where these groups are accommodated separately. To a certain extent, the less exclusionary relationship in Quanzhou between occupation, place of residence, and place of origin is surely due to the export manufacturing orientation of its economy, as opposed to the development of services for the populations of large cities like Beijing or Shanghai. Nevertheless, there is a spatial flexibility and non-exclusiveness in Quanzhou that correlates with this relationship, which the government of any Chinese city would do well to incorporate in its plans. A major focus of planning in China now should be how to accommodate migrants, knowing that a portion of them will become long-term residents while others will move on.

Finally, in assessing the positions of different Chinese cities in the trend towards eliminating the urban-rural distinction in population policy, and how this might relate to peri-urban planning, Quanzhou’s situation seems to indicate what factors might be compared from city to city. As described above, some characteris-
tics that have played a role in Quanzhou’s position are: the decentralized nature of political and economic organization; experience with private enterprise; the export orientation of manufacturing; the dispersed and local nature of investment channels; a lack of dependence on state-owned enterprises for employment; and local experience with out-migration.

ACKNOWLEDGEMENTS

The authors are indebted especially to Michael Leaf, whose constant guidance inspired and informed this research. An international team of students – William Buckingham, Chia-ling Chen, Andrea Flower, Katherine Idziorek, Laurie Karlinsky, Yen-ju Li, Elizabeth Maly, Eden Mercer, Marc Philpart, Essence Pierce, Leslie Shieh, Jianan Xin, and Yudong Yang – gathered the bulk of information about Huo Ju in 2004. Much information about both Huo Ju and Dong Mei, and Quanzhou in general, was available to us only with the hospitality, interest and cooperation of dozens of residents and local officials in Quanzhou. We are also grateful for the helpful comments of many anonymous referees.

ENDNOTES

1. Discussion is intensifying. An online search of Chinese journal articles with the term “cheng zhong cun” in the title yielded 278 articles, of which one-third were published just in 2005, and only five were published before 2000 (Qinghua Tongfang Guangan Gongs, Zhongguo Xueshu Qikan (guangan ban) Dianzi Zazhi She, & Zhongguo Zhishi Jichu Sheshi Gongcheng, 2001).

2. As has been well documented, China instituted a household registration (hukou) system in 1958 that designated where a person might live and work, enforced through food rationing and state allocation of housing and most other necessities. The government managed to maintain a fairly strict separation between rural and urban populations with this system. With the return to a cash economy after 1978, the hukou system began to break down and millions of rural migrants moved to cities in search of work. Having a rural hukou, however, still limited migrants’ access to what Solinger refers to as the urban goods regime, in particular, education, health care and housing, and forced migrants into unstable and often exploitative working conditions (for a thorough analysis of the complications in the common wisdom of the urban-rural divide in China, see Chan, 1994; for a history of the hukou system, see Cheng & Selden, 1994; and for its impact on migrants in the 1990’s, see Davin, 1999; Solinger, 1999).

3. Between late 1999 through 2004, these activities were supported by a UBC Hampton Fund research grant and a Ford Foundation-supported project to promote “Community-based Urban Environmental Management.” Professor Michael Leaf at UBC’s Centre for Human Settlements was the Principal Investigator for both the Hampton and Ford projects.


5. Not only is the number of actual migrants difficult to obtain; Quanzhou being the origin of the diaspora it is, many of the local villagers who are registered as residents actually live elsewhere. Until the 2000 census microdata are available, this cannot be quantified for an area as small as Huo Ju.
REFERENCES

[Quanzhou Dongmei Community]. (c2003). Cong Kunzhuan dao Chengshi (From Hamlet to City) [MPEG Digital Video]. [Quanzhou].


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RAIL TRANSIT SHAPING URBAN TRAVEL AND LAND USE:
EVIDENCE FROM SHANGHAI, CHINA

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ABSTRACT

There has been a major boom in rail transit development in China in the past ten years. Yet the evidence of rail transit shaping urban travel and land development in Chinese cities has been scarcely studied and reported to the outside world. This paper presents a case study of Shanghai, attempting to answer two questions: 1) How has the introduction of the metro rail influenced Shanghai travelers’ trip making? 2) What role has the rail system played in shaping Shanghai’s land use?

Shanghai’s rail transit effort is an integral part of the municipal government’s comprehensive approach towards transportation enhancement and urban development. The ten year experience from rail investments so far has brought largely encouraging outcomes. First, travelers in Shanghai have exhibited changed trip-making characteristics in response to the introduction of the rail mode. [I made travelers the subject of the previous sentence so that it is consistent with “they” in the following sentence] They make more transit trips, travel more frequently to the downtown, and on average have shorter trip times. The rail mode has attracted a significant portion of its riders from the bus mode, many of whom might have been lost to cars or other personalized modes if there had been no rail. Second, higher development intensity and more capital-intensive land uses occur in more accessible areas near train stations. Rail transit demonstrates a magnetic effect in attracting new or re-development in areas surrounding the system.
INTRODUCTION

The past ten years witnessed a major boom in rail transit development in China. Cities such as Shanghai, Beijing, and Guangzhou have added multiple metro lines to their existing transportation networks, with the current rail systems alone serving over a million passenger trips daily in each of these cities. A dozen additional cities either already have their first rail transit lines in operation or are in advanced stages of preparation for rail transit development.¹

These Chinese cities are building the metro rail transit systems with dual intentions. One is to accommodate the increasing demand for mobility from their citizens. China’s rapid economic development and income growth have led to tremendous increase in travel demand. There are strong indications (and concerns) that China is about to become highly motorized with private vehicles (Kenworthy and Townsand 2002, Sperling 2003). At this critical point, developing mass rapid transit is seen as a sensible strategy to shape the mobility preferences of China’s commuters. Physically and spatially, Chinese cities are also transforming and expanding on a very large scale (Zhang 2000). In time, it is essential to guide city development towards a transit-based, corridor-nodal urban pattern that is believed to be more desirable than car-oriented sprawl [I do not know this terminology—is “car-oriented sprawl” a term or do they mean “sprawl that results from a car-oriented transportation regime?”] (Newman and Kenworthy 1999).

Have the rail transit investments fulfilled their intentions in China? Countries in other parts of the world have asked the same question to justify their own investments in rail transit. In North America, for example, the question has been discussed for several decades (see an early study by Knight and Trygg, 1977). In the Chinese context, however, this question has not been adequately addressed. There are rather voluminous reports on the general topic of rail transit development in China, mostly published in Chinese (e.g., Li and Yan 2002, Liu and Zhang 2004, Pan and Ren 2005). Yet rarely has the evidence of rail transit shaping urban travel and land development in Chinese cities been studied and reported to the outside world. Perhaps the most comprehensive report currently available on China’s rail transit development is the World Bank theme paper presented in 1995 and published in 1997 (Allport 1997). At that time it was premature to report any empirical evidence as most of the systems had only been in operation for about two years. Now, as ten years have elapsed since these rail transit services began operating, we may start filling this knowledge gap. In this paper, we address two questions by examining a case study of Shanghai:

1. How has the introduction of the metro rail influenced residents’ trip making? In many car-oriented U.S. cities, public transportation, including rail, tend to be considered secondary modes of travel. Expectations of rail performance also are rather pessimistic (e.g., Rubin, et. al. 1999). In the Shanghai case study, we
are interested in learning how travelers in Shanghai have accepted the rail as a new mode of travel, and how such acceptance translates into changes in their trip making characteristics in terms of trip purpose, average trip duration, trip frequency, and changes in use of other travel modes.

2. What role has the rail system played in shaping Shanghai’s land use? Existing studies on the impact of rail systems on land use [as the footnote indicates, these studies are worldwide, not Shanghai-specific] have largely focused on the vicinity of transit stations. Yet empirical evidence in Shanghai (and China) remains to be identified with regard to the existence, direction, and degree of rail transit impacts on changes in functional use and development intensity of land. Studying this topic in the Chinese context is particularly interesting and challenging because the land market is still a fairly new concept under an institutional structure under which all urban land is state-owned. Identification of the land use impacts of rail transit will therefore provide evidence for urban land market analysis and land policy making.

This paper presents the study in two major parts. Part 1 draws a big picture of Shanghai. While the main interest here is rail transit, it is important to provide a context in which rail transit runs together with other complementary efforts made by the Shanghai municipal government in responding to pressures on it transportation systems. Part 2 focuses specifically on rail station areas, examining travel characteristics of those living near the stations and land use characteristics in terms of functional composition and development intensity as they relate to the rail transit.

THE BIG PICTURE: SHANGHAI BACKGROUND AND MUNICIPAL EFFORTS IN MOBILITY SUPPLY

Shanghai, the largest city in China, is strategically located on the east coast of China where the Yangtze River enters the Yellow Sea. There are 18 districts and an island county within its current jurisdiction, with a total area of 6,340 square kilometers (km2) (Figure 1). Since China’s economic reform beginning in the late 1970’s, Shanghai has grown tremendously in population, economy, and the built area. At the end of 2003, the Chinese census reported Shanghai’s population at 17.11 million, while the registered population amounted to 13.44 million. The city’s annual growth in gross regional product (GRP) has averaged 10 percent since 1990. In 2004, its total GRP reached 745.03 billion Yuan [on page 11 the authors use RMB, should it also be RMB here?] , which gives a per capita GRP of US $6,700 (based on exchange rate), close to that of Thailand. From 1993 to 2003, the built area in urban Shanghai expanded from 300 km2 to 550 km2 (State Statistical Bureau, 1993-4, 2003).

Shanghai’s rapid expansion in its population and its economic and physical dimensions has led to rapidly rising demand for urban travel. The rising demand is evident from an increased volume of daily traffic, lengthened average commuting distance, and a continuing shift from non-motorized, slower travel modes to
motorized, faster travel modes (Shen 1997). While the absolute level of vehicle ownership remains relatively low in Shanghai, the motorization rate has been at an unprecedented high. For instance, the number of registered vehicles in Shanghai grew from 555,430 in 1995 to 2,015,700 in 2000 (SCCTPI 2003). The rapid pace of change imposes tremendous pressure on the existing transportation
infrastructure, causing severe congestion on roadways and a general decline in urban mobility. This phenomenon is not unique to Shanghai, but is common to all rapidly growing cities in the developing world (Gakenheimer 1996). Yet Shanghai faces particular challenges in providing sufficient mobility for its people because of the city’s extraordinarily high density, particularly in the old urban districts, and decades of lagging investments in transportation infrastructure.

In 1990, before China’s municipal jurisdiction redistricting, Shanghai’s population density was as high as 11,312 persons per square kilometer. Density in the city core (including three districts of Huang’pu, Lu’wan, and Jing’an) was over 60 thousand persons per square kilometer. After redistricting, Shanghai incorporated several rural counties into its municipal boundaries, which brought the municipality-wide raw density down to 3,624 persons per square kilometer in 2000. New development in the fringe areas and re-development in the inner city have helped to reduce density in the city center. Nevertheless, in 2000, the three core districts retained a density of over 40 forty thousand persons per square kilometer (Table 1, Figure 2). On a per unit area basis, such high density translates into high travel demand. Yet transportation supply in Shanghai has been very limited. For example, space for roadways accounts for only 9% of the city’s urbanized area, comparing to 20-25% in most European cities (Shen 1997). Congestion occurs inevitably as a result of imbalance in mobility demand and supply. Before the 1980’s, when nearly 60% of trips were made by the walking mode, congestion in Shanghai affected only a relatively small portion of travelers during the peak hours. Congestion worsened since the late 1980’s when about 70% of all trips were made by bicycles, buses, cars, and other forms of non-walking modes. Because the supply capacity remained rather fixed due to decades of disinvestments in the transportation infrastructure (Wu 1999), even a slight increase in private motorization has had exponential adverse effects on roadway performance. In early 1990’s the peak hour vehicle operating speed was as low as 11.9 kilometers per hour (SCCTPI 1992).

Table 1. POPULATION DENSITY IN SHANGHAI IN 1990 AND 2000

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population</td>
<td>Density</td>
<td>Population</td>
<td>Density</td>
</tr>
<tr>
<td>City Core</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Huang’pu District</td>
<td>938.1</td>
<td>75,592</td>
<td>574.5</td>
<td>46,296</td>
</tr>
<tr>
<td>Lu’wan District</td>
<td>475.8</td>
<td>59,105</td>
<td>328.9</td>
<td>40,859</td>
</tr>
<tr>
<td>Jing’an District</td>
<td>486.6</td>
<td>63,861</td>
<td>305.3</td>
<td>40,069</td>
</tr>
<tr>
<td>New District</td>
<td>7,418.2</td>
<td>2,041</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chong-ming County</td>
<td>2,059.2</td>
<td>852</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shanghai Municipality</td>
<td>13,341.9</td>
<td>11,312</td>
<td>16,407.7</td>
<td>3,624</td>
</tr>
</tbody>
</table>

Note: Units of population: 1,000 persons; units of density: 1,000 persons /sq kilometers. Source: Tongji University, 2004
Figure 2. POPULATION IN CENTRAL SHANGHAI (AREA WITHIN THE OUTER RING ROAD)
Source: Author

In the 1990’s, Shanghai responded in several ways to the long-lasting pressure on its urban transportation system. Major efforts include expansion of roadway capacity, bus reform, vehicle registration and use restrictions, construction of rail transit, and decentralization of urban functions.

Between 1995 and 2004, the Shanghai government invested 125.6 billion Yuan for roadway improvement. Surface roads increased by 120%, reaching a total length of 11,825 kilometers. To improve bus service quality and contain operational subsidies, the government introduced competition into the bus sector by authorizing several independent operating companies. Bus services are now available in Shanghai with higher frequencies, better vehicles (e.g., air-conditioned), larger coverage, and more flexible service plans than before the reform. Shanghai is among few cities in mainland China where the municipal government has adopted a policy to cap annual registration of new cars and trucks. Beginning in 1998, the number of new vehicle registration has been capped at 50,000 annually (Shanghai City Comprehensive Transportation Planning Institute 1998).

Shanghai’s high density offers a unique opportunity for developing mass rapid transit. The government had considered developing rail transit since the 1950’s when a 105-km rail transit line was proposed. However, it was not until the 1980’s when a 176-km rail transit was formally included in the city’s master plan. Its most recent long-range plan of rail transit system is ambitious, covering the entire central Shanghai with a total track length of over 800 km by 2030.
The municipal government places a great emphasis on rail transit and plans to develop a capacity ratio of rail transportation to buses of 6:4 (Lu 2002). Shanghai began construction of its first rail transit line in 1990. On April 10, 1995, Phase One of its Metro Line-1 started operating. As of September 2005, Shanghai has a total of 92.5 kilometers in rail transit lines. In addition, the city operates the world’s first commercial line of maglev train that connects Metro Line-2 to the new PuDong International Airport over a distance of 30 kilometers (Table 2).

For decades, Shanghai has ventured to transform from a super dense, monocentric city to a multi-centric metropolis. In the 1970’s-80’s, Shanghai planned and developed a number of satellite cities in the outskirts of the city. The goal was to guide Shanghai’s expansion towards Ebenezer Howard’s Garden City structure while avoiding the trend of ‘pancake-making’ (which may be interpreted as the Chinese version of sprawl). Relocating industries and their employees was also expected to reduce density in the old city core. Nevertheless, the performance of the satellite cities fell below expectations. Shanghai’s most recent plan continues the effort of developing multiple activity centers (SIUP 2004). According to the plan, there are five levels of hierarchically structured urban centers: City Center or the Central Business District (CBD), City Sub-Centers, City Specialized Centers, District Centers, and Community Centers. The vast majority of these centers are spatially coupled with the existing or planned rail transit stations. It has been highly recommended that Shanghai’s rail transit network function as a major backbone of the city’s spatial plan (Pan and Ren 2005).

Are Shanghai’s efforts realizing their goals? While fully answering this question certainly requires thorough research and analysis, a few aggregate facts may help portray a big picture.

Shanghai’s major investments in expanding its roadway capacity have been dwarfed by the rapid city-wide growth in travel. Congestion still occurs throughout the city, especially in the central area. While congestion may never be eliminated (Downs 2002), the average vehicle operating speed during the peak hours in Shanghai has increased from 11.9 km per hour in 1991 to nearly 20 km per hour.

Table 2. RAIL TRANSIT LINES IN SHANGHAI

<table>
<thead>
<tr>
<th>Line #</th>
<th>Length (kilometers)</th>
<th>Headway (minutes)</th>
<th>Number of Stations</th>
<th>Year Opened</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>32.54</td>
<td>3</td>
<td>25</td>
<td>1995</td>
</tr>
<tr>
<td>2</td>
<td>18.32</td>
<td>3.5</td>
<td>13</td>
<td>2000</td>
</tr>
<tr>
<td>3</td>
<td>23.17</td>
<td>5.5</td>
<td>19</td>
<td>2000</td>
</tr>
<tr>
<td>5</td>
<td>17.2</td>
<td>6.5</td>
<td>11</td>
<td>2003</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>20</td>
<td>2</td>
<td>2002</td>
</tr>
</tbody>
</table>

Source: Tongji University, 2004
recently (SCCTPI 2003).

Shanghai has the largest bus system in China. Bus reform in the 1990’s led to an improvement in services. Nevertheless, much of the effort has been offset by rising travel demand, roadway congestion, and changes in travelers’ mode preferences. Competing for road space with cars and other vehicles, bus services are severely hurt by roadway congestion. The average bus operating speeds (with out-of-vehicle times considered) have not improved much, and on many routes they actually decline in the peak hours. Reliability has also decreased. In addition, rising incomes and industrial relocation have affected people’s preferences towards more personalized modes such as bicycles, motorcycles, and cars, as well as more reliable and faster modes such as rail. As a result, the bus sector has been losing its market share (Shen 1997).

In contrast, rail transit has been well received in Shanghai. In just a ten year period of operation, daily passenger trips served by Shanghai’s metro system increased from 178 thousand in 1995 to 1.6 million in 2005. On a per kilometer basis, this is more than three times the ridership of the Massachusetts Bay Transportation Authority’s rail system in Boston, MA. The metro accounts for 2.5% of the total trips municipality-wide, which is also 13.5% of the total passenger trips served by Shanghai’s public transportation system (taxi excluded). (SCCTPI 2005)

Figure 3. SHANGHAI RAIL TRANSIT SYSTEM AND CITY CENTER/SUB-CENTERS
Source: Author
Such high ridership has generated significant farebox revenue. For example, in 2001, Metro Line-1 recorded a farebox revenue totaling RMB 379 million, while its operating cost was about RMB 230 million. This gives an operating profit of approximately RMB150-180 million (Hu and Fan 2003). Nevertheless, the farebox profits are far from paying off the capital costs of building the system.

Shanghai’s transformation from a mono-centric city to a multi-centric metropolis is still ongoing. Development of the city sub-centers in general has not reached a critical mass to share the service functions of the CBD. Recent experience of Xujiahui City Sub-Center, however, suggests an emerging trend of development. It is also a case demonstrating the role of rail transit in sub-center development.

Xujiahui is one of four planned city sub-centers, part of Shanghai’s effort to reduce the demand pressure on the city core (Figure 3). Located in the southwest quadrant of central Shanghai, Xujiahui has been an attractive location to Shanghai’s citizens for its rich offering of cultural, educational, and commercial service destinations. Starting services in 1995, Metro Line-1 set a station at Xujiahui, connecting the area to the CBD in 5 stops. Local district government, planners and developers took advantage of the rail station and integrated it with station area land development. As a result, a number of commercial and residential projects took place in the area. The most visible is GangHui Plaza with high-rise, multi-function complex directly connected to the rail station lobby.

**Figure 4a. METRO LINE-1 XUJIAHUI STATION AREA WITH 13 ENTRANCE POINTS**

Source: Author
Figure 4b. GANGHUI PLAZA, XUJIAHUI SUB-CENTER OF SHANGHAI

Source: Author

Note: Entrance to Metro Line-1 Xujiayui Station at the lower left corner
TRAVEL AND LAND USE CHARACTERISTICS IN THE STATION AREAS

Analytical Framework and Study Methodology

This part of the study consists of two sections corresponding to the two questions raised earlier, with particular attention paid to the station area.

The first section focuses on the trip-making characteristics of the residents living in the surrounding areas of Shanghai’s metro stations. It is reasonable to assume that the fundamental trip-making motivation of Shanghai travelers is similar to those in other countries. That is, by and large, people make trips not for the sake of traveling itself, but for the purpose of participating in activities (e.g., work, shopping, entertainment) at trip destinations (Mitchell and Rapkin 1954). If there are few or no activity opportunities available at the destination, people will travel less or will not travel at all to the destination. The traveler’s decision of taking specific travel modes and routes from trip origin to destination is the outcome of rational choice, as consumer choice theory suggests (Ben-Akiva & Lerman, 1985; Domencich & McFadden, 1975). If travel costs (in generic terms) decrease for one travel mode relative to other modes, people would be more likely to choose this mode. Rail transit in general offers a better quality of travel than bus, although the out-of-pockets cost (i.e., fares) maybe higher. It is thus expected that the introduction of rail transit will attract ridership from the bus. In the case study of Shanghai, we examine these travel characteristics as they relate to the development of Shanghai’s metro system.

The study was carried out in years 2000, 2002, and 2003. Residents living in the metro station areas were interviewed and asked questions about their trip making. A total of 2,396 individuals were interviewed, with a sample size of 859, 932, and 605 for each year respectively.

The second part of the study focuses on the identification of rail transit impacts on land use in metro station areas in Shanghai. The classical theories of urban economics provide an analytical framework for this part of the study (Alonso 1964, Muth 1969, and Mills 1972). According to those theories, transit development improves accessibility to the land where the system goes. The improved accessibility will be capitalized in the value of the properties near the stations. As a result, development densities would become higher in areas closer to the station than in areas farther away. In addition, the less land-intensive urban uses (e.g., office and commercial) would outbid the more land-intensive uses (e.g., residential and industrial) for being located closer to the station.

In the case study of Shanghai, we examined two basic characteristics of land use in the station area, which is defined as the area within a 500-meter distance from the station.
1. Functional composition: If the accessibility effect of rail transit is capitalized in the local market around the station, one should observe a land use pattern in the station area where more commercial, office, and other capital-intensive uses are located closer to the station, while more industrial, warehouse, residential, and other land-intensive uses are located farther away. To empirically identify the expected land use pattern, we first created two buffer zones around each of the rail stations. One is the inner buffer with a distance of 200 meters from the station. The other is the donut-shaped buffer between 200 and 500 meters from the station. Land use information is then assembled for the buffers and reported in seven land use categories. They are residential, office use, commercial, other public facilities, industrial/warehouse, green space, and transportation. Next, we compare shares of each type of land use between the two buffers. Because the three rail transit lines were constructed and opened for operation in different times, we conducted our analyses separately for each line. For suburban stations, a different set of buffers was used. Instead of looking at land use within the 500-meter area, we studied land uses between the 0-500 meter buffer and the 500-1,000-meter buffer (Figure 5). We chose a larger buffer for the suburban station areas based on the observation that densities in suburban areas are lower than those in the central city and the travelers there tend to rely on bicycles and other feeder modes to access the rail. (Our surveys did not ask specific questions about access modes though.)

Figure 5. 200-, 500-, 1,000-METER BUFFERING ZONES IN CAOXI ROAD STATION AREA

Source: Author
2. Development intensity: Similarly, as the theory suggests, if the accessibility effect of rail transit is capitalized in the local market around the station, we should observe higher development intensity in places closer to the station, and vice versa. Floor Area Ratio (FAR) is used to measure land development intensity, which is calculated as the ratio of gross building area to gross lot size. To understand variations in land development intensity in relation to rail transit, we first calculated the values of FAR for all lots in the 500 meter radius to stations. We then rated each lot as low, medium, or high development intensity, where low, medium, and high intensity are defined as having FAR less than 1.0, between 1.0 and 2.5, and greater than 2.5, respectively. Finally, we compared the proportions of the low, medium, and high intensity lots between the inner and the outer buffer.

Land use data used for this study are part of a database maintained by the Department of Urban Planning at Tongji University. A research team of more than 20 students and faculty members from Tongji started collecting land use data in 2000 for the station areas of Metro Line-1. Researchers from the team visited each station area and recorded land uses of all parcels in the area. After Metro Line-2 and Line-3 opened to the public, the research team conducted another round of site surveys and updated the station area land use database. When conducting the in-depth study of the Park Station and its station area development, we also interviewed officials from the Planning Bureau of Shanghai.

The Influence Of Rail Transit Development On Trip Making Characteristics In Shanghai

Trip Purpose

In year 2000, residents in Shanghai reported 20.4% of their rail trips as being made for work commute (Table 3). The percentage increased steadily in the following years to 36.5% in 2003. On the other hand, rail use for recreational purposes decreased significantly from 30.5% in 2000 to 9.4% in 2003. Such a shift in the purpose of rail travel reflects a use pattern observed in many other countries: rail transit is mostly used for work commute that displays certain spatial and temporal regularities. Non-work activities are relatively less conveniently

<table>
<thead>
<tr>
<th>Year</th>
<th>Work</th>
<th>School</th>
<th>Personal Business</th>
<th>Shopping</th>
<th>Recreation</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>20.4%</td>
<td>6.6%</td>
<td>3.3%</td>
<td>26.8%</td>
<td>30.5%</td>
<td>12.5%</td>
</tr>
<tr>
<td>2002</td>
<td>24.6%</td>
<td>3.8%</td>
<td>4.7%</td>
<td>33.9%</td>
<td>17.4%</td>
<td>15.6%</td>
</tr>
<tr>
<td>2003</td>
<td>36.5%</td>
<td>5.2%</td>
<td>10.9%</td>
<td>28.6%</td>
<td>9.4%</td>
<td>9.4%</td>
</tr>
</tbody>
</table>

Source: Author
served by rail because of the diversity of non-work destinations. In Shanghai, recreational facilities were not well provided around or before 2000 in the newly developed suburban areas. Hence residents tend to rely on the offerings located in the central city where the metro goes through. After 2000, development in the suburban areas took place on a large scale. The availability of service facilities in the newly developed neighborhoods helps the residents to become less reliable on the central city establishments.

It should be noted that the residents or travelers surveyed in 2003 are not necessarily the same as those in 2002 or 2000. Therefore, one cannot conclude from Table 3 that rail transit caused behavioral changes in trip making. It is likely that from 2000 to 2003 some residents moved into the station areas to take advantage of the available services offered by the rail. Changes in trip purposes by rail as shown in Table 3 may be attributable to residents’ self-selection decisions. Availability of rail services offered choice opportunities for households to spatially re-sort themselves and self-select to their desirable locations.

Trip Modes

As expected, the modal split of travel by the station-area residents shifted considerably from bus to metro. Before the metro was opened to passenger services, 63.3% of the residents in the station areas used the bus transit as their main travel means (Table 4). Since then, the bus share has decreased to the current level of 17.4%. In contrast, the rail share reached 52.9%. Much of the 46.9 percentage point loss in bus share can be attributed to competition from rail. Loss of bus share as a result of metro service has been a source of debate in the field. Rail critics often challenge the net mobility benefit brought by the expensive metro system. In addition, rail fare is much higher than bus fare on a per trip basis, raising concerns about the increased financial burden to ordinary travelers and households. Proponents cite rail benefits such as better riding quality, reduced trip time, and greater reliability than bus. Motorists also benefit from rail because of fewer buses competing for road spaces.

Non-metro users (47.1% of the interviewees) cited a variety of reasons for not using the rail mode for travel. 30.9% of them said the fare was too high. 25.7% noted that the metro line was not in the direction of their destinations. This coverage limitation was due to the fact that in year 2000 only Metro Line-1

<table>
<thead>
<tr>
<th>Year</th>
<th>Metro</th>
<th>Bus</th>
<th>Car</th>
<th>Walk</th>
<th>Bicycle</th>
<th>Powered Bicycle</th>
<th>Motor- cycle</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>0</td>
<td>63.3%</td>
<td>2.4%</td>
<td>11.5%</td>
<td>14.5%</td>
<td>4.0%</td>
<td>1.7%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Current</td>
<td>52.9%</td>
<td>17.4%</td>
<td>1.5%</td>
<td>9.4%</td>
<td>14.9%</td>
<td>3.3%</td>
<td>0.4%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

Source: Author
was in service. Over 12.2% chose not to take the metro because of too many or inconvenient transfers. Although all the interviewees lived in the station areas, there were still 8.9% of them who found the distance to the station too far to use the metro. Others cited inconvenience in parking (10.4%) and a few other reasons (11.9%).

Changes in Trip Times and Frequency of Downtown Visits

Figure 6 shows the proportions of interviewees in different ranges of trip times

![Figure 6. DISTRIBUTION OF TRIP TIMES BEFORE AND AFTER RAIL SERVICES](source: Author)

Figure 7. FREQUENCY OF DOWNTOWN VISITS BEFORE AND AFTER RAIL SERVICES

*Source: Author*
before and after the metro services. A general trend observable from the figure is that the mode and mean of the distribution shift towards the left, meaning that overall travel times have decreased after the introduction of the metro system. Specifically, the proportions of trips less than 30 minutes have increased whereas trips longer than 30 minutes have decreased.

Frequency of downtown visits indicates the vitality of the city center. Figure 7 plots the frequency distribution of downtown visits before and after the metro services. It shows a general increase in downtown visits associated with the introduction of the metro, particularly among those frequent visitors. For instance, before the metro service was available, 10% of the interviewees reported that they visited the downtown daily. After the metro service became available, daily downtown visitors grew to 15.6%. Infrequent downtown visitors – those who visited downtown only once or a few times a month – decreased in proportion, becoming relatively more frequent downtown visitors than they were before.

It is important to point out that changes in trip times and frequency of downtown visits reported above may not be entirely attributable to the introduction of the metro system in the city. Since the rail system was being constructed and started its operation, new or redevelopment has taken place in almost every corner of Shanghai. The development changed city-wide land uses, and thus altered the spatial distribution of travel destinations, which in turn led to changes in trip making. Nevertheless, these changes are consistent with the theory and the experience in the Western cities. That is, a radial network of rail transit such as that in Shanghai generally strengthens the role of downtown (Pickrell 1999).

Land Use Characteristics Near Rail Transit Stations In Shanghai

Land Use Composition

Table 5 reports land use compositions in the buffer areas around Shanghai’s metro stations. The following land use characteristics in the station areas are observed from Table 5:

1. The inner buffer contains a smaller share of residential use than the outer buffer. For instance, residential use accounts for 36.6% of the total land in the outer buffer zones along Metro Line-1. In the inner buffer zones of Line-1, the figure is 24.5%. Similar residential land use patterns occur in the station areas along Metro Line-2 and Line-3. Likewise, land for industrial or warehouse uses has smaller shares in the inner buffer than in the outer buffer.

2. In contrast, the inner buffer contains a greater proportion of commercial land use than the outer buffer across all three metro lines. In the inner buffers, the proportions of commercial land use are 24%, 18.1%, and 10.7% along Metro Line-1, Line-2, and Line-3, respectively. The corresponding figures in the outer buffer zones are all smaller. Specifically, they are 16.3%, 15.5%, and 8.9%, respectively. The between-buffer differences indicate a nodal concentration of
The land use pattern with commercial land uses closer to the stations and residential or industrial uses farther away suggests the existence of land market forces that shape land use patterns in the station area along Shanghai’s rail transit lines. A station area is like a mini land market, with the station being the market center. Different land uses bid for being closer to the station. The bidding outcome displays a typical mono-centric land use profile similar to that described in the classic urban economic theory at the city scale.

3. The share of land for transportation uses in the inner buffer is larger than that in the outer buffer. This is due to the presence of train stations and related facilities. Notably, the inner buffer has larger shares of green space than the outer buffer. This seems contradictory to common knowledge, because the inner Shanghai has been known for its high density and lack of open space. An explanation lies in the process of planning and constructing new rail transit stations, as it was mandatory by the national planning and design code to provide a certain level of green space for new development projects.

4. Land for industrial or warehouse uses in the station areas of Line-3 have much larger proportions than those of Line-1 and Line-2. In both the inner and outer buffers of Line-3, industrial or warehouse land uses occupy 8.6-8.7% of station area land. In the station areas of the other two metro lines, the number is about 3% or less. This is mainly because Line-3 was developed along an existing rail track. Along the Line-3 alignment there remains a large amount of industrial sites and warehouses, which offer significant potential for future redevelopment.
Land Development Intensity

Table 6 reports average FAR for the inner- and outer-buffer of the three existing metro lines in China. It shows that the inner buffer has been developed more intensively than the outer buffer around metro stations in Line-1 and Line-2. For example, for Metro Line-1, the average FAR is 2.55, greater than that of Line-2 (2.27). For Line-3, however, the opposite is true: the inner buffer was even less developed than the outer buffer. As mentioned earlier, Line-3 is relatively new and the alignment generally follows an existing rail track. Redevelopment of the station areas has yet to take place.

To examine the land use substitution effect associated with rail transit development, we visually compare land uses between 2000 and 2003 for Xin-Zhuang Station (Figure 8). The two sets of maps clearly show that more commercial and office uses replaced residential uses in areas closer to the station from year 2002 to 2003. In addition, development intensity had also increased during the time period. The average FAR in the Xin-Zhuang Station area grew from 1.26 in 2000 to 1.71 in 2003.

CONCLUSIONS

Shanghai’s rail transit effort is an integrated part of the municipal government’s comprehensive approach towards transportation enhancement and urban development. Its ten year experience has so far led to largely encouraging outcomes from the rail investments. Demonstrated by the city-wide statistics as well as those from the rail transit station areas, trip making characteristics of Shanghai travelers have changed in response to the introduction of the rail mode. They make more transit trips, travel more frequently to the downtown, and on average have shorter trip times. The rail mode has attracted a significant portion of its riders from the bus mode. From the bus perspective, this seems discouraging. Yet Shanghai’s historical data indicate that, if the rail services were not available, much of the lost bus share might have gone to cars or other
Evidence from Shanghai on changes in land use associated with the rail transit shows consistency with what classical urban economic theory suggests: higher development intensity and more capital-intensive land uses occur in more accessible areas near train stations. At least two implications can be drawn from the study findings. First, rail transit in Shanghai demonstrates a magnetic effect in attracting new or re-development to areas where the system goes. While the magnitude of the impacts remains to be quantified, identification of the impacts in Shanghai should set an encouraging example to other cities in China when planners and decision makers in those cities look for options to accommodate rising mobility demand. Second, the private sector is playing an increasingly important role in China’s transportation planning and land use decisions. It indicates the emergence of a land market in a country where all land remains state-owned and planed-economy has dominated urban development for decades. The combination of market forces and government planning will further drive spatial re-sorting of land uses, which leads to more efficient use of limited urban land resources.

Shanghai is not alone in China. Other cities are anticipating a similar strategic role for rail transit to play in serving urban mobility and in shaping the city's personalized modes (Shen 1997, SCCTPI 2005).
transformations. Their experience warrants in-depth study and documentation as well.

ACKNOWLEDGEMENTS

This study is part of an ongoing research jointly supported by the National Science Foundation of China, the Lincoln Institute of Land Policy (Cambridge, MA), and the Center for Sustainable Development at the University of Texas at Austin.

ENDNOTES

1. They are: Nanjing, Shenzhen, Qingdao, Shenyang, Chongqing, Chengdu, Dalian, Changchun, Harbin, Wuhan, Hangzhou and Urumqi.

2. One can easily find several hundreds of studies on the topic worldwide, see an early review by Vessali (1996) and a most recent study on Seoul, Korea by Kim and Zhang (2005).

3. Ideally, study of the influence of rail transit development on travel should be carried out in the entire metropolitan region because the operation and use of the metro are integrated with services and use of other travel modes throughout the region. Due to time and resource constraints, this study focused only on residents and land use around stations.

4. Conventionally a ¼-mile or 400-meter radius has been used to define the station area. This rule-of-thumb assumes an average distance in which people are willing to walk. The behavioral and empirical research supports this assumption is that by Untermann (1984) based mostly on the North American and European experience. This study uses a distance of 500 meters to define the station area based on the common observation that on average pedestrians in China are willing to walk longer than those in North American and European cities.

5. We are conducting a study to quantify rail transit’s impacts on land use in Shanghai using hedonic price modeling. Results of the study will be reported in early 2006.

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SCCTPI (Shanghai Comprehensive City Transportation Planning Institute). 2005, The Third Travel Survey of Shanghai, Shanghai. (in Chinese)


TOWARD A COLLABORATIVE APPROACH TO URBAN CONSERVATION PLANNING IN CHINA: AN ANALYSIS WITH REFERENCE TO QUANZHOU

ZHU QIAN
Texas A&M University, Department of Landscape Architecture + Urban Planning

ABSTRACT

Economic reforms towards a market economy have significantly accelerated urbanization and modernization in urban China. During the mid-1990s urban conservation became a significant issue and pressing concern in most Chinese inner cities. Local authority has played a principal role in conservation practice under China’s administrative and fiscal decentralization process. Together with the devolution of urban planning administration, it makes local governments encounter challenges in conservation implementation. This paper examines current historic district conservation practices in urban China, focusing on the roles of four interest groups – local government, the private sector, the general public, and professionals. It concludes by proposing a collaborative approach to urban conservation among state and non-state actors, facilitated by changes to current legal, institutional, and funding frameworks capable of meeting the challenge of balancing conflicts between the conservation and redevelopment agendas. The case of Quanzhou is examined in detail to show how the municipal government has conducted historic district conservation in the context of market economy conditions, and then to recommend policies that would support and further collaborative historic district conservation.
INTRODUCTION

The incorporation of market forces into the economy and the revival of land and property development have led to tremendous changes in Chinese cities since 1980. The transition of the economy from command to market provides an excellent opportunity to examine the Chinese urban built environment under conditions of profound institutional and administrative change. For the past two decades, the push for urban modernization in China has been translated into the demolition of old buildings, clearance of slums, resettlement of populations from central city areas, and the erection of new buildings, dictated by a concern to maximize the redevelopment potential of scarce inner city land. The urbanization process however has greatly threatened urban heritage, one of the main embodiments and expressions of local identity—an increasingly emphasized ideology under globalization. After the cooling down of the real estate boom and the issuance of much stricter rural land expropriation policies in the mid-1990s, and more importantly the recognition of detrimental impacts on urban heritage associated with redevelopment-dominant urbanization, contentious issues relating to conservation vis-à-vis redevelopment have gained prominence on the urban planning agenda. The term “historic district conservation” (Lishi Jiequ Baohu) has appeared in Chinese conservation contexts to reclaim urban heritage as a means of promoting and solidifying a collective past under the countervailing pressures of modernization and urban renewal. However, the search for consensus in resolving conservation/redevelopment conflicts is complicated by the plurality of interests in historic districts and the uneven impact of state-led conservation programs on different socio-economic classes. Cultural elite conservation activities are increasingly challenged by a wide spectrum of issues that cannot be solved by the state alone. The weaknesses of current elite-led conservation can only be overcome by collaborative action involving multiple stakeholders in historic districts.

This study is an empirical investigation of how a Chinese municipal government has conducted historic district conservation. Its purpose is to understand some of the reasons behind the municipality’s choice of legal, institutional, and funding mechanisms, and ultimately to propose policy recommendations accordingly towards collaborative conservation. Devolution of China’s urban planning administration and the regional diversity of urban heritage have conveniently lead to a decentralization of urban heritage conservation activities to municipal governments. However state-led historic district conservation under the market economy at local levels is restricted by limited local government resources as well as conflicts between state and non-state interests on the path toward urbanization and modernization. A collaborative conservation approach addressing the various interests together with a series of legal, institutional, and funding changes is arguably an effective response to these pressing problems.

The case of Quanzhou is based on an intensive field study during the summer of 2001. The author conducted 22 open-ended interviews with government...
officials, scholars, developers, respected community members, and ordinary property owner/occupants, within the study area. The city is a rapidly developing coastal city as well as a nationally designated heritage city. Because of a slowdown in large-scale redevelopment in the Old City and the current municipal administration’s preservationist attitude towards urban development, Quanzhou provides an unusual opportunity to explore how the state might encourage and facilitate non-state collective action for the sake of historic district conservation. Potential collaborative urban conservation is even more promising given the vitality of the city’s civil society, private sector, and linkages to a global network of overseas Chinese.

HISTORIC DISTRICT CONSERVATION THEORIES IN CHINA

There is a large and rapidly growing literature on the practice of conservation in the developed world (Appleyard, 1979; Ashworth and Tunbridge, 2000; Hubbard, 1993) but comparatively limited theoretical work (Larkham, 1992). For developing countries, there is neither a strong empirical nor theoretical base (Dix, 1990). This imbalance of academic attention fails to reflect the fact that the majority of historic urban centers are situated in developing countries. While conservation policy initiatives have been mentioned from time to time in Chinese literature often with the traditional focus on built environment, detailed theoretical investigations are nevertheless very limited. Those that exist can be categorized under three headings:

Organic Renewal

Wu’s (1999) organic renewal thought is arguably the most influential theory on urban area conservation in Chinese cities. Developed through a series of studies and projects in Beijing since the 1950s, the organic renewal approach recognizes that certain aspects of historic urban structure have lasting value, and seeks to preserve them by adapting them to modern life. Overall it stresses the establishment of a new organic order based on adaptation rather than on complete replacement. The concept owes much to the work of Jane Jacobs following the drastic slum clearance and urban renewal programs implemented in American cities in the middle of the 20th century. The theoretical premise of organic renewal is that the city is a living organism whose parts and tissue undergoes a metabolic process. If solutions could be uniquely tailored for each building quality and historic value type, then a highly complex problem may be broken down into simpler parts, each of which could pursue an appropriate strategy even with limited available funds. The organic renewal theory was originally presented to frame the specific case study of Ju’er Hutong (Chrysanthemum Lane), a traditional housing area in Beijing in late 1980s.

Wu’s theory of organic renewal mainly focuses on physical aspects. His work touches only very briefly on social facets (such as original resident return), economic facets (such as a pilot project jointly funded by the state, work units,
and individuals), and cultural facets of urban conservation. These less discussed aspects indicate weaknesses in the scope of this theoretical approach on urban area conservation.

Small-scale Self-help Rehabilitation

Derived from the theory of organic renewal, small-scale self-help rehabilitation is more an approach to urban historic district conservation than a theory. It was initiated in 1995 based on a pilot project on historic district conservation and rehabilitation in Beijing. The rehabilitation approach attempts to resolve issues concerning historic district use, mainly of housing, through encouraging small-scale socio-economic and construction activities including small-scale housing renovation, maintenance, and restoration. Additionally it involves limited funded government-resident cooperative neighborhood environmental enhancement (Fang, 2000; Zhang, 1996).

Small-scale self-help rehabilitation was widely practiced for hundreds of years until the 1949 Liberation after which strict restraints were put on it. Historically, most residential construction was erected and then rehabilitated by residents themselves according to their own preferences. This was a metabolic process as well as a spontaneous public participation approach to urban conservation. Small-scale self-help is often not permissible under planning regulations, but it exists, mostly with illegal status, and plays an important role in the daily life of ordinary residents. It has been suggested that the municipal government should consider an effective policy to support it both financially and technically. Since the rehabilitation practitioners are users themselves who know their own expectations better than anyone, rehabilitation could generally meet their needs. In addition, the cost of rehabilitation would be less since lots of intermediate links can be skipped in small-scale self-help rehabilitation (Fang, 2000). In this sense, small-scale self-help actually makes a special kind of affordable housing available. The adaptive change within the restrained boundary proposed by small-scale self-help approach makes its negative impact on the surrounding area as little as possible. Hence it realizes the purpose of historic district conservation.

Community Cooperative Renovation

Influenced by the community architecture movement that emerged in the 1960s in Great Britain, housing cooperatives first appeared in 1988 as an initiative for historic district conservation and rehabilitation in Beijing. Housing cooperatives, non-government bodies, were organized either by neighborhood committees or work units (Danwei). One of the principles of housing cooperatives is that the state, work units, and individuals collaboratively finance housing conservation or rehabilitation. Housing cooperatives have changed longstanding attitudes among residents towards housing formed in the planned economy, for which government had always taken full financial responsibility, and have provided opportunities for negotiation and cooperation among residents, developers, architects, and planners.
Based on housing cooperative experiences and small-scale self-help, Fang (2000) proposes a concept of community cooperative conservation and rehabilitation that emphasizes community cooperation and resident self-help. It involves internal community agents, such as community groups and local residents as well as external agents such as local government, developers, and financiers. Community cooperatives emphasize resident participation, equal cooperation (not only among residents, but also local authorities, residents, professionals \(^1\), and external investors), self-help and small and flexible conservation and rehabilitation plans. From an institutional perspective, Fang suggests the establishment of housing cooperative associations, resident self-help and self-managed non-profit grassroots organizations, or joint stock housing companies with investments from residents, housing cooperatives, and external investors.

**HISTORIC DISTRICT CONSERVATION EVOLUTION IN CHINESE CITIES**

Urban historic district conservation in China has evolved through a gradual and incremental process. The process from individual ancient monument preservation, holistic old city conservation to historic district conservation illustrates that urban heritage conservation has been closely tied to the changes of the post-Mao urban development since 1978. The trend in urban construction in the 1980s was to enlarge urban area scale and develop new zones near urban boundaries. Old cities were not the focus of urbanization. Holistic old city conservation seemed realistic at that time. A series of policies on strict control of the agrarian-construction land transition and the new development zone approval were enacted by the state after painful reflection on 1980s urbanization. Municipalities and developers started to focus on old cities as an alternative to a new round of fresh urbanization while the real estate boom, beginning in the early 1990s, exacerbated government focus on large-scale inner city development.

Both the state and local authorities gradually recognized the detrimental effects of large-scale inner city redevelopment upon urban heritage and the unique identities of old city areas. Based on a couple of historic district conservation pilot projects, historic district conservation has been accepted as a more realistic approach, compared with the Famous Historic Cultural Cities conservation \(^2\). However, under the current enthusiasm for local economic development and urbanization, historic district conservation practice has never been easy. Municipal ambition to revitalize local traditional economies and culture is challenged by modern business activities with higher potential profits. The tourism- and culture-led conservation has arguably become the only preferred path to historic district revitalization. Under the slogan of economic development, municipalities are exploring effective ways to reconcile the redevelopment/conservation conflict within inner cities. Limited available funding for historic district conservation and the inefficiency of conventional funding methods have raised further questions under the market economy.
The examination of the mechanisms underpinning current historic district conservation practice calls for incremental reforms to these mechanisms. The most crucial point regarding reform is that collaboration among local government and non-government actors is necessary to shoulder conservation work under the market economy, given that the resources required are far beyond local authority capacities. Moreover, the urban historic district does not have a single owner but many owners, users, and claimants, linked or conflicting through a complex web of relationships. The local administration is the central player as the representative of all interests. As the agency of the state, its role is to break boundaries between the different interests and guide collaboration for urban historic district conservation.

The players in urban conservation are in a variety of roles, from a wide spectrum of disciplines and backgrounds, with conflicting interests, agendas, and accountability structures. As such there has to be a comprehensive legal, institutional, and financial framework which ensures formal links between those different interests to allow all parties to participate in the conservation process. Successful urban historic district conservation will depend on positive attitudes, support and investment from local authorities, private and public initiatives, and professionals. The task of successfully conserving urban historic districts must follow a collaborative model and new ways of thinking and breaking boundaries through the decentralization of urban conservation planning and management, partnerships, and a more active role for communities.

The study of Quanzhou provides an encouraging case regarding how the municipal government has carried out historic district conservation in the context of market economy conditions, including the local government’s changing attitude towards large-scale redevelopment and urban conservation, and a successful experiment in state and non-state collaborative urban conservation. It then assesses the four types of interests (local government, the private sector, the general public, professionals) in a specific study area of the city in order to inform policy recommendations for collaborative historic district conservation.

HISTORIC DISTRICT CONSERVATION PRACTICE IN QUANZHOU

The City Of Quanzhou

Quanzhou is a prefectural-level city located on the north bank of the lower reaches of the Jinjiang River in Fujian Province. The Quanzhou municipality, which administratively includes the surrounding six-county region, has a total area of 10,865 square kilometers and a total population of 6.5 million, among which 850,000 were registered as non-agricultural in 1997 (Abramson et al., 2002). The historic and administrative core is comprised of the Old City district and its adjacent suburbs. Although it is now only a medium-sized urban centre, Quanzhou was historically one of China’s most important windows on the world. Its historical
Figure 1. SKYLINE OF QUANZHOU OLD CITY AND PAGODAS IN KAIYUAN TEMPLE
Source: Quanzhou Municipal Urban and Rural Planning Bureau

Figure 2. SAME AREA IN OLD CITY BEFORE AND AFTER REDEVELOPMENT
Source: Quanzhou Municipal Urban and Rural Planning Bureau
value as a city is so important that the State Council designated it as one of the first 24 Famous Historic and Cultural Cities in 1982 (Figure 1). Established in the Tang Dynasty in 718 A.D., Quanzhou reached its height of prosperity in the Yuan Dynasty during the 13th century, when it became the political and economical centre of Fujian Province and the biggest trade port of China. Quanzhou was well known as the starting point for the “Maritime Silk Road” in the Middle Ages. When its commercial fortunes decreased, Quanzhou became a departure point for people leaving China. The number of overseas Chinese originally from Quanzhou totals about 6 million, and over 8 million Taiwan compatriots have their ancestral homes in Quanzhou (Window on Fujian Tourism, 2002).

In 1979, the Fujian coast was opened up to foreign trade and given more autonomy in national economic development policy. Quanzhou attracts much direct foreign investment, especially from overseas Chinese communities due to its extensive linkages to the compatriot Chinese of Hong Kong, Macao, Taiwan, and other parts of Southeast Asia. Continuous strong ties with relatives abroad influences not only economic development, but also architecture, culture and other aspects of society. Quanzhou was, and is, perhaps one of China’s most “open” and “open-minded” cities (Nilsson and Tan, 2001).

Changing Attitudes Towards Historic District Conservation In Quanzhou

One of the early influential efforts to conserve historic Quanzhou in the post-Mao era was the establishment of the Quanzhou History and Culture Centre in 1983. It raised funds to collect, study, organize, and publish data on Quanzhou’s history and culture, and to protect historical remains as well as maintain ancient buildings (Wang, 1991). The Centre had a fairly wide spectrum in its research and practice including ancient buildings, local music (Nanyin), puppet shows, dramatic arts, and so on. With limited financial support from the local government and overseas Chinese communities, the Centre played a significant role in the renovation and rehabilitation of many of the most important ancient buildings in Quanzhou throughout the 1980s. In the meanwhile, the Old City was well preserved throughout the 1980s because of three tightly inter-linked factors determined by the city’s historic and geographic circumstances: (1) It experienced a relative lack of state investment during the period of the centralized command economy, due to what was seen to be its vulnerable position on the Taiwan Straits; (2) A high degree of private control of property has been maintained in the city; (3) Almost all houses and properties of good quality belong to (or are connected to) overseas Chinese are respected by the local government, in that it almost always tries to avoid offending those overseas connections that have meant so much to the city (Abramson et al., 2002).

The situation in the Old City started to change fundamentally during rapid urbanization after the 1980s. There were two aspirations favorable to urban redevelopment in the Old City. Residents tried to improve their housing conditions through small-scale, but widespread, self-building. The other more destructive
force affecting Quanzhou’s historic core originated with the local government. Because of devolution of fiscal responsibility from the central government, heavy investment in construction accompanied by rapid economic development made large-scale redevelopment initiated by the municipal government possible (Figure 2). Many unique and historically valuable buildings and historic areas were lost in the process of urban renewal although the use of traditional materials, styles, and motifs in new buildings were proudly adopted and appreciated. Large-scale redevelopment also adversely affected residents’ attitudes toward their own residences. Without knowing the fate of their own neighborhoods, many residents deliberately let their houses deteriorate by not performing necessary maintenance and rehabilitation.

The years of the 1990s saw a number of local historic district conservation efforts and changes in opinion and methodology with respect to urban development in the Old City of Quanzhou. In the early 1990s, professors and graduate students from Tsinghua University of China and Canada’s University of British Columbia expressed opposition to large-scale redevelopment and street widening in historic districts when they worked with the Quanzhou Municipal Planning Bureau on the West Street (Xi Jie) project. Xi Jie goes between two of the most significant historic districts of the city– Kaiyuan Temple, a Tang Dynasty building and a national heritage site and Jiu Guanyi neighborhood, one of three conservation neighborhoods in Quanzhou’s master plan. As usual, the intention of the planning bureau was to execute a redevelopment plan to clear all the buildings along the street and then widen Xi Jie. The academic team proposed an alternative for the Xi Jie project as well as a scheme for a general road system in the Old City.

A common belief in Quanzhou at that time was that redevelopment was an inevitable road to modernization. Some considered preservation of one-story housing in the urban core technically impractical or economically unfeasible. Others thought that too much of the city had already been redeveloped to leave room for “preserving the historic core as a whole” (Nilsson and Tan, 2001). At the same time, redevelopment projects had changed the historic urban centre so much that even the local authorities were uncertain about what future large-scale redevelopment would bring and therefore sought alternative development models. Municipal leaders and planning authorities attended a series of international seminars and entertained study visits with scholars from Chinese, French, and Norwegian universities, in addition to working constantly with outside designers from prestigious universities and planning institutes in China who highly appreciated local architectural elements. These experiences gradually shifted municipal leaders and planning authorities towards a preservationist attitude during the second round of revisions to the Xi Jie design proposal in 1996. The original street-widening and clearance style design was abandoned and a conservation-oriented strategy adopted.

At least two strategies indicate the shift of official attitudes toward conservation and development. First, in its master plan for 1995-2020 issued in 1995, the
municipal government for the first time included the concept of tourism city to take advantage of the comparatively well-preserved heritage sites in the city. It has been noted that in this document historic sites are considered tourism resources and an integral part of the Old City. Secondly, Quanzhou’s planners ceased using the term “old (i.e. obsolete) city redevelopment” (Jiucheng Gaizao) and instead spoke of “old (i.e. historic) city preservation and construction” (Gucheng Baohu Jianshe) (Abramson et al., 2002). New planning processes and ideas for the historic districts of Quanzhou adopted small-scale, house-based conservation and rehabilitation that had been introduced to the Old City of Beijing, and were then considered appropriate. This approach to the concern with conservation opened up several opportunities for new historic district conservation strategies. Not only were physical aspects considered, the focus of previous research, but more importantly social aspects of preservation / restoration such as the public’s understanding and appreciation of urban historic district conservation.

COLLABORATIVE CONSERVATION IN CHENG NAN

Cheng Nan: The Study Area

The officially designated Cheng Nan (literally means South City, which is located at the south part of Quanzhou) conservation area is approximately 40 hectares with a population of 8,000 including a 1,200 migrant population (QMUPDI and IAUS, 2000), and is home to 22 heritage sites or relics of varied importance. Since the migrant population has more employment opportunities in newly developed areas such as the eastern city and suburbs, migrants are few in the Cheng Nan area. Therefore, the Cheng Nan area is a retail and residential area largely for local people. This is consistent with the municipality’s intention to protect the Old City, and to develop the eastern part of the city and suburbs. However, the high rate of housing production in these areas not only pushes the urban boundary outward, but also encourages the rapid abandonment of older homes located in inner city areas like Cheng Nan, which damages the traditional small business community’s vitality.

The municipal government’s response to the situation of the Cheng Nan area is a series of conservation and rehabilitation plans. The ultimate goal of the plans is “to re-illustrate the wealth of history and culture, the delicate vernacular architecture and prosperous commercial tradition in the area”, and “to combine preservation and renovation with tertiary and tourism development of the city” (Quanzhou Municipal Urban and Rural Planning Bureau, 2000). As such, the Cheng Nan area is in need of conservation as well as economic revitalization strategies. Localization of urban planning is an important outcome of Quanzhou’s agenda to pursue urban environment upgrading and modernization on the one hand, and simultaneously to initiate an appropriate historic district conservation strategy on the other. Collaboration for conservation is required between various local government agencies as well as between local authorities and non-government actors.
Zhongshan Road Conservation And Renovation Project

Zhongshan Road conservation and renovation project ³ (March 1998 – November 1999) illustrates an effective collaboration among different parties of interests. 70-year old Zhongshan Road is the primary historical and cultural arterial of the Old City. During the project period, the local governments, the public, the private sector, planners, and the developer cooperated closely and set up an effective implementation system so as to ensure the success of the project. The planners cooperated with the local authorities to organize the project, liaised with the property owners and managed relationships between city reform departments (UNESCO, 2002). In addition to setting design guidelines for the project, planners also facilitated communications between the local governments, the public, and the developer. The public had the right to speak, comment on proposals, give feedback to planners and local governments, and supervise project implementation. The developer was under the supervision of the governments, the public, and the planners. Since collaborative conservation was new to Quanzhou Municipality, the decision was made to carry out a test section first, take stock of the experience, and then proceed with development gradually in order to anticipate and pro-actively resolve problems (Figure 3).

The project cost for the renovation of Zhongshan Road was more than 18 million RMB, of which 10.71 million was paid by homeowners, 7.6 million by the local governments (UNESCO, 2002). The concept of “beneficiaries share the cost” was adopted, which meant that property owners had to pay for repairing or rebuilding their houses, while the governments paid an allowance, and the balance was shared between relevant departments. The costs for conservation management, design and plant/building removal were the responsibility of the governments,

![Figure 3. SAME SEGMENT OF ZHONGSHAN ROAD: BEFORE AND AFTER CONSERVATION AND REHABILITATION](Source: Quanzhou Municipal Urban and Rural Planning Bureau)
while the various departments shared the infrastructure costs. The municipal and
district administrations divided the governmental part of the costs at a ratio of one
to one. The success of Zhongshan Road Conservation and Renovation Project has
made the municipal governments understand that collaboration among various
interest groups is an essential step toward striking a balance between them, and
has given the government more confidence in further developing participatory
neighborhood planning processes in the Old City. The Zhongshan Road Project
has a number of policy implications for the proposed collaborative conservation
and rehabilitation of Cheng Nan. It is necessary to examine the various interests
in Cheng Nan before any policy recommendations for the area can be drawn.

Local Government

As a result of a series of changing attitudes towards Quanzhou’s urban built
environment, a preservationist local government has emerged in recent years. To
facilitate ongoing conservation efforts in the Old City and horizontal collaboration
between the relevant local state agencies, the municipal government established
the Quanzhou Famous Historic and Cultural City Conservation and Construction
General Headquarters in 1996. This is an administrative unit which cuts across
agency boundaries between the planning bureau, the cultural relics bureau, the
construction commission, and so on. It provides a communication channel to the
community, but primarily for implementation not decision-making processes.

Self-initiated construction by non-state actors in Cheng Nan has in recent years
come to be accepted by the local authority instead of being condemned and
triggering only stronger restriction. The municipal planning bureau has proposed
guidelines and regulations 4 for use or compliance by individual property owners in
Cheng Nan, rather than an overall plan requiring sweeping property expropriation
and resident relocation. The engagement of professionals experienced in the
sector makes self-help rehabilitation and renovation a tolerant but strictly guided
approach to historic district conservation.

For Cheng Nan as well as the whole of Quanzhou Old City, besides the enforcement
of building guidelines, the other ongoing concern of the local authority is how
to finance conservation and rehabilitation. The official recognition of legal self-
help renovation means property owners (most of who in a survey of Cheng Nan,
indicated that they could afford to renovate or rehabilitate their own properties 5)
have been a major contributor to conservation funding. The other primary sources
of funding adopted by the Cheng Nan branch are loans, government subsidies,
business (especially developers) financial contributions and/or collective work
unit donations, overseas Chinese sponsorship, and so on. In order to use the
funding effectively, the local government has considered the establishment of
an Old City Conservation and Construction Fund, an administrative organization,
which would raise and comprehensively manage funds.

Private Sectors
From interviews with the residents, it has been noted that despite all the complaints about living conditions, most households still prefer to remain in the area whether or not it was renovated, because of its better access to amenities, a strong personal attachment to the neighborhood, and their affordability for regular renovation. One of the common characteristics among houses in Cheng Nan is a considerably high degree of private housing ownership. Interviews in Cheng Nan conclude that to be effective a conservation strategy needs residents’ approval and support, and finally, implementation by residents.

Private business is the typical and dominant type of enterprise in the commercial streets in the Cheng Nan area. Most of the private businesses are small-scale and local customer-oriented with limited registered capital. Food retail, small restaurants, and miscellaneous daily-use goods have comprised the greatest proportion of all business types on the commercial streets (Figure 4). The business situation is unfortunately not encouraging. Property owners switch business types or their leaseholders frequently, trying to maintain or maximize their income from the properties.

General Public And Local Non-governmental Organizations

Neighborhood committees are the most active community organization in the Cheng Nan area. As non-governmental agencies, neighborhood committees nevertheless have the closest relationship with the local government among all the local non-governmental organizations. Official policies influencing grassroots

Figure 4. TRADITIONAL BUSINESSES IN CHENG NAN

Source: Author
constituencies usually require the involvement of neighborhood committees for citizen mobilization, where neighborhood committees play a mediation role between the different community interests, and also provide a communication channel for those interests to the local government. The four neighborhood committees of Cheng Nan not only assist local authorities like the planning bureau in the built environment conservation process around issues such as property ownership clarification, rehabilitation/renovation applications, and supervision and resident relocation, but also foster community economic development (revitalization). Based on the long existing interaction between neighborhood committees and communities, the role of the former in participatory planning process will remain significant. The questions are how to provide a mechanism for their participation in planning particularly in the decision making process in addition to policy implementation, and how to integrate neighborhood committees with other community organizations to best serve as social advocates.

Cheng Nan has an array of traditional non-state community societies, including kinship associations, folk musical associations, temple associations, and associations organized for cooperation with overseas Chinese. Temples are vital spaces of public ritual and one of the focal points for any community or functionally physical community centre in the Fujian province. A great deal of Quanzhou’s preservation work has focused on temples and has been funded through temple associations; similarly neighborhood temple restoration in Cheng Nan is a significant part of conserving the area’s urban landscape. Residents approach temples as a public ritual place for their own welfare, but the by-products of temple-related activities in urban environment, except for temple renovations, are extremely limited.

Commercial associations of business owners/managers (e.g. business improvement associations in urban centers) in North America are often the strongest advocates of improving public space and shop facades in an organized and relatively unified manner. The present situation in Cheng Nan however does not look encouraging since there are almost no trade organizations or business associations. Interviews with shopkeepers in the commercial streets of Cheng Nan suggest they are optimistic about adopting commercial associations as one method for conservation and revitalization. Some of them (around 2/3 of 20 interviewees) would however hesitate to join a commercial association immediately mostly because of uncertainty regarding government attitudes and policies with respect to business associations, including future relationships between such associations and the local authority. The current weak financial capacity for most of the businesses is also a concern although most of the interviewees do not mind paying a modest annual fee on the condition that the local government shows a clear commitment to conservation and revitalization in the Cheng Nan neighborhood.

Professionals
As a medium-size but comparatively wealthy city, Quanzhou has been able to hire renowned professional or academic architecture and planning agencies from elsewhere. The advice of planners from those nationally renowned institutions to influential local leaders has carried more weight in debates over planning policy than similar viewpoints expressed by local factions (Abramson et al., 2002). Cooperation has always existed between those units from outside Quanzhou and local professional agencies.

The latest plan for the Old City (QMUPDI and IAUS, 2000) suggests the municipality establish an exclusive old city conservation expert consultative agency to maintain the compatibility and continuity of conservation work. This long-term institution has been a further step away from the architecture specialist model (hiring one or two senior specialists specifically for the project) used in the rehabilitation of Zhongshan Road. In addition, comments from members of national academic societies in particular have a strong influence on local leaders’ decision making about conservation planning.

CONCLUSION

Supportive local government attitudes are essential to urban development and conservation even in a place like Quanzhou, where the government’s role in society is more limited than in most Chinese cities. The local political economy of the urbanization process is shaped by three intertwined factors—low state investment, strong connections with overseas Chinese communities, and a high proportion of private housing ownership. The current political agenda favored by the local state is preservation, behind which are several forces: (1) The preservation-oriented attitudes to the Old City’s future of some local municipal government leaders, like the current vice mayor as well as local state agencies, such as the municipal planning bureau; (2) International agencies doing research and advocating new approaches to preservation, such as community participatory planning; (3) Advice from scholars and professionals from both inside and outside Quanzhou; (4) Individuals, particularly respected community members associated with neighborhood committees, with an interest in the history of their own neighborhood.

Institutional decentralization in planning practice argues for the development of more inclusive forms of planning, which can actively engage the various relevant interest groups in the normative process of shaping the future of the city (Abramson et al., 2002). There is a need to think carefully about the interaction and collaboration between those varied actors involved in the urban conservation process. A constructive set of measures should include a common forum for interested players but rules and procedures acceptable to them can only be determined after considering the functions and interests of all actors. Presently the municipal planning bureau is working towards that direction and has recognized the importance of the involvement of individual households and non-government organizations that represent and communicate with local residents.
For the local state agencies, inter-departmental collaborative relationships have not had enough emphasis. For instance, besides dialogues with community representatives and non-governmental organizations, the municipal planning bureau should also initiate communications with the local tourism administration given the city’s tourism development strategy in the master plan. Funding for conservation could come from sources linked with tourism, including those businesses that profit from the tourist industry. A financial mechanism is needed to get the tourist industry to contribute to heritage conservation. Local authorities should also adopt other strategies clearly involving stakeholders who benefit from heritage assets. A heritage resource fee charged to developers might be levied on all new building permits. Thus when a new building is finished in newly developed area of the city, the developer would be required to pay this fee as a contribution to the conservation of the Old City. This would serve to connect the Old City with the new.

Since participatory approaches are just being introduced to the city, individuals and groups often need help to determine their own interests. Local government should not confine their understanding of citizen participation only to mobilization and implementation when they propose more participatory initiatives. Besides their financial contributions to historic district conservation, as experienced in the Zhongshan Road project, the private business sectors should also be encouraged to participate more actively in the conservation process, because they are likely to provide economically feasible suggestions for the conservation and revitalization of a commercial and residential district like Cheng Nan. Their unique insight into the local market, business viability, and entrepreneurial ideas is an asset to use in conserving and revitalizing commercial streets. This is particularly important when local authorities pragmatically hope to use the revenue from successful economic revitalization of the commercial streets to subsidize residential neighborhood conservation, as in the Cheng Nan area. Involvement of the private sector might be realized by broadening the current specialist advisory agency to include the interests of more non-state actors.

With respect to non-government organizations, neighborhood committees are the prominent one among others. Their role in conservation would probably be more effective if they could arrange for a position in charge of conservation issues, even a temporary one just during the conservation process. Neighborhood committees need to keep the community better informed and involved with conservation policies. The possibility of establishing commercial associations depends on the financial and organizational capacities of local businesses and the government’s attitude to the associations. The local authority therefore will need to come up with initiatives both for comparatively stagnant businesses and for organizations, fundraising mechanisms, and the regulation of commercial associations. Similar commercial associations in the West may be good models but careful adaptations are definitely needed. Although temple associations play a very limited role in current conservation, these groups should be used to tap into global linkages with
overseas Chinese religious and commercial leaders, which to date have greatly benefited the city’s efforts in urban conservation.

Urban China’s historic district conservation agenda has been a search for an institutional and administrative framework with legislative backing that can reconcile the contradictory goals of rapid urban development and heritage conservation. Weaknesses of the elitist nature of heritage conservation in China have become apparent in practice, especially when historic district conservation means the conservation scope has extended from renowned ancient monuments to everyday neighborhoods of local importance, because the state alone is unable to shoulder the heavy conservation burden in a variety of aspects. Successful historic district conservation practice suggests that local governments need to involve more local interest groups in the form of non-government organizations rather than individuals under comprehensive and mature legal, institutional, and administrative frameworks to ensure citizen participation in conservation decision-making as well as implementation processes. Collaborative conservation calls for careful analysis of each interest group, especially non-state actors and different government agencies, in order to grasp their respective contributions to conservation. Municipal government, the key initiator and only purveyor of urban heritage conservation under the command economy, will need to change its role to one among many active participants under the new market economy where non-state actors are adopting increasing responsibility.

ENDNOTES

1. As in community architecture, professionals such as architects and planners in community co-operative should act as facilitators and educators on top of providing technical expertise.

2. Since the real estate boom in the 1990s, it has been almost impossible to find a comparatively well-preserved historic district in some of the listed Famous Historic Cultural Cities (Ruan and Sun, 2001).

3. As an Award of Merit winner of the UNESCO Asia-Pacific Heritage Awards for Culture Heritage Conservation in 2001, Zhongshan Road Conservation and Renovation Project received very positive reviews from UNESCO. “The initiative of the local government and active support from the private sector, which exemplify collective responsibility for heritage conservation”, (UNESCO, 2002) in particular were highlighted in the judge’s citations.

4. For instance, these guidelines and regulations include that (1) The planning bureau simplifies the procedures for property ownership applications and renovation/maintenance applications, and waives some kinds of related fees; (2) The local government offers to assist financially strapped property owners with façade rehabilitation by helping them obtain loans and governmental subsidies; (3) The local government allows the deferment or (partial) waiver of construction matching fees for property owners with financial difficulties, and provides subsidies to them for the renovation of dilapidated housing.

5. It is helpful to learn how the property owners plan to use various resources to invest in self-help rehabilitation. Among 38 interviewees in the Qing Long Xiang neighborhood of Cheng Nan, 15 believed they could pay for it through personal savings, 7 would resort to help from friends or family locally, 5 would consider help from family overseas, 6 would consider loans, and only 4 would ask for government subsidies (Abramson and Leaf, 2001).
6. The survey in Jubao Street indicates that 76.5 percent of the properties are private owned, and in Wanshou Road the percentage is 66.6%. The actual percentage might be even higher given that 16.9% and 26.3% respectively in the two streets are categorized as “unclear ownership” (Quanzhou Municipal Urban and Rural Planning Bureau, 2000). An unofficial survey in Qing Long Xiang indicates that 44 out of 47 properties are private ones (Abramson and Leaf, 2001).

7. July 2001 data from the Licheng District Industry and Commerce Bureau of Quanzhou indicate that 60 out of the 71 registered businesses and 49 out of the 52 registered businesses in Jubao Street and Wanshao Road respectively are private.

8. The same data source as above indicates that the registered capital average of private businesses in Jubao Street is only 3,665 RMB with a range from 30,000 RMB to 350 RMB, and the average in Wanshou Road is 4,724 RMB with a range from 50,000 RMB to 200 RMB. (1USD = 8.1 RMB)

9. For instance, after hearing recommendations for Cheng Nan from a senior member of the Academic Committee of Famous Historic and Cultural City Planning under the Ministry of Construction, the local authorities have turned their planned focus away from Qing Long Xiang to Jubao Street and Wanshou Road.

10. Leaders of the Quanzhou Municipal Planning Bureau expressed this idea, when the author was in a meeting with them on July 6, 2001.

11. One such kind of adaptation pertains to taxation. Commercial associations in the West usually collect association annual taxes based on the member’s property value to raise funds for the association. This may not be workable because of the absence of property taxation in urban China, but an alternative such as collecting fees based on the linear front along the street as well as the shop area might work.

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RESIDENTIAL DIFFERENTIATION: THE MAPPING OF YOUNG PROFESSIONALS’ LIFESTYLES AND THEIR HOUSING LOCATION CHOICES IN TRANSITIONAL SHANGHAI

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ABSTRACT

The development of Chinese cities has taken off at an incredible pace since China’s transformation towards a socialist-market economy. The economic development has resulted in an unceasing wave of urban reforms that aims to create a market-oriented housing system in many places. Along with the gradual privatization of housing, the proportion of housing consumers in the market has been growing, especially in China’s metropolises, such as Shanghai, Beijing and Guangzhou. The role of individual housing preferences in the formulation of residential spatial differentiation, however, has long been ignored in the literature on Chinese cities due to the still dominant role of the institutional sector. Since residents’ housing preferences are the basis of sustainable and feasible land use planning, it is essential to understand these preferences and their underlying motivations.

This paper explores the interaction between an individual’s lifestyle and his or her choice of housing location, based on a survey of young Shanghai professionals conducted by the author in 2003 and 2005. Factor analysis of the discretionary activity data identified three distinctive lifestyles – urban amenity oriented, career oriented and family life oriented lifestyle. Logistic regression revealed that respondents, motivated by their lifestyles, preferred to select a housing location that minimized commute to corresponding land uses, such as work and/or the major urban amenities center. The current residential spatial pattern takes on a complicated form. For some cases, the geographic location of residents’ homes allowed them to pursue a particular lifestyle, such as making use of urban amenities and facilities nearby. For some cases, the pursuit of a desired lifestyle was possible only through long trips on weekends when the associated urban spaces were far away from respondents’ homes. The respondents’ stated preference for housing location proved to be more closely associated with observed lifestyle.
INTRODUCTION

The rapid development of Chinese cities is attracting growing attention from researchers. It comes with an unceasing wave of urban transformation, in both economic and physical terms. Among all the studies on Chinese cities, housing geography, one of the basic parameters defining urban structure, is becoming a hot topic. Much of the literature on Chinese cities focuses on the role of institutional actors in the housing reform process, such as the changes of related policy (Zhu, 2004; Lee, 2000; W. Wang, 1999), the mechanism of housing allocation (Chen & Gao, 1993), and the role of institutions (F. Wu, 1996), etc. Another group of studies pay attention to the estimation and mapping of residential distribution. Varying models developed on the basis of Western cities are adapted to model the urban population density gradient (F. Wang & Zhou, 1999) or the distribution of property prices (Han, 2004; F. Wu, 2002a). In recent years, more concern has been put on the underlying forces that contribute to residential differentiation. Numerous studies in Western cities have shown that residential configuration is best regarded as a reaction to a set of historical circumstances (Fishman, 1987; Jackson, 1985), which is also found to be the case in Chinese cities. The role of the institutional actors is still revealed to be dominant (Li, 2000; F. Wu, 1996) during the transitional stage towards a market economy. Another strand of theory, which approaches the question of residential differentiation from the housing consumers’ point of view, has not been paid the attention it deserves (D. Wang & Li, 2004). There is little understanding of the motivation behind buyers’ residential location choice. Empirical studies on residential mobility suggest that there will be a growth of mobility in formerly socialist cities since the introduction of housing reforms, like what was observed in Moscow in the early 1990s (Daniell & Struyk, 1997). During the process of housing privatization, the share of housing purchased in the market is increasing. Correspondingly, the role of housing consumers is becoming more and more significant, though at a gradual pace (D. Wang & Li, 2004). A better understanding of what people prefer, and why, is a prerequisite to effective policy-making in urban housing reform and planning in China.

It is recognized, however, that conducting studies on residents’ preferences is very difficult because of the large disparity between expectations and realities in the transitional context of Chinese cities (Li, 2004). One reason is government intervention. Under China’s economy-first policy, land use conversion due to infrastructure construction or the conversion to high-productivity land uses has taken places in many cities (W. Wu, 1999). This has resulted in a large number of passive or involuntary migrants. A survey in Shanghai of people’s relocation mode and their satisfaction with new housing showed that those who moved from the inner city to the outlying areas were usually passive migrants, while most households that moved from outer to inner areas of the city were usually voluntary movers, reporting relatively higher satisfaction (F. Wu, 2004). For these passive migrants, their preferences are not known, let alone taken into account. Their relocation may be due to low housing affordability. During the past several
years, the house price to income ratio ranged from six to seven according to the Goldman’s data (Liang & Ma, 2004). In other words, it requires six to seven years’ income for a median family with three members to purchase a 100-square-meter flat at the median transaction price. It is then anticipated that many voluntary migrants have to make compromises if their preferred housing is beyond their purchasing power.

Studies of Chinese cities now identify varying trends, one indicating suburbanization based on population density gradient pattern, the other signifying inner city booming based on property price mapping. Han (2004) conducted a three-dimensional surface mapping of the distribution of property values in Beijing and found that the most valuable residential locations were in the central city. Wang and Zhou (1999), meanwhile, found that the population density in the central city area declined and that in suburban areas rose—a signal for suburbanization. A similar phenomenon is also reported for Shanghai (F. Wu, 2002a). When trying to make reliable forecasts of housing needs, approaches that merely rely on population density shifts without investigating into housing consumers’ preferences are questionable. A deeper understanding, which considers the phenomenon of intra-urban migration from the individual housing consumer’s perspective, is needed.

Regarding the exploration on housing preference, the literature based on cities in the West witnesses a continuous revision. The “filter” mechanism assumed that during the period of industrialization urban dwellers preferred newly designed housing which was usually constructed on the outer marginal land of the city (Bassett & Short, 1980; Bourne, 1981; Hamnett, 1984). The “bid-rent model,” simulating the trade-off between lot size and access to employment, assumed that the US image of an ideal home was a suburban house with a play yard for the kids, because private space for family members was the overwhelming criterion for evaluation (Alonso, 1964; Muth, 1969). The emergence of gentrification in many large cities prompted a shift in the discourse of the discipline and a rethinking of how to account for people’s preferences (Hamnett, 1984; Ley, 1996). Gentrifiers were labeled “Yuppie” (young urban professional) (Ley, 1996), or later “Yupps” (young urban professional parents) (Karsten, 2003). The young professionals are distinguished by their appreciation of urban amenities, social and cultural facilities (Ley, 1996), and are argued to be a new middle class when Fordist mass production is transferred to a post-Fordist production system (Hamnett, 2003). A growing interest in the exploration of dimensions to classify lifestyle or orientations that influenced housing location preferences may be witnessed in empirical studies. Bootsma’s (1995) study provides positive evidence of the association between a work-oriented lifestyle and city residence. Households appreciating a colorful urban life are found in the inner city of Paris (Brun & Fagnani, 1994). Based on a study of Canadian cities, Bourne argued that the “inner city-suburban contrast must give way to more sophisticated analyses” (Bourne, 1993). The diverse lifestyles “in a modern, affluent, and relatively open society” (Bourne, 1981, p. 135) associated with varying symbolic land use
Wang

deserve more concern.

For Chinese cities which are still at a transitional stage towards a market economy, it is questionable to state that they have changed to post-Fordist societies. The impact of lifestyle choices as an underlying force shaping the residential spatial structure of the city, however, cannot be ignored. Questions to be asked are, for example, whether young professionals are necessarily urban residents, and whether there are any special lifestyles that distinguish urban residents from others. The paper has adopted the notion of a “spatial lifestyle”—a preferred way of living (or lifestyle) through space—as one of the explanatory variables of the respondents’ choice of housing location. The hypothesis is that households evaluate and select housing location according to their lifestyle preferences. A major research question is to identify how and to what extent their orientations towards career, urban amenity, etc. affected their choice of accommodation. The case study of Shanghai is presented in two steps. In step one, factor analysis was employed to capture the variation of leisure activity patterns. In step two, a series of logistic regression estimations were carried out to test the relationship between lifestyle factors and choice of housing location. This is followed by a summary and conclusion.

THE CASE OF YOUNG SHANGHAI PROFESSIONALS

The sample of young professionals was collected through their workplaces, a method that proved to be effective for selecting a population from a specified industry sector. Another consideration was that selecting respondents through their workplace would more likely lead to a greater variety of home location choices, which was preferred for statistical reasons. Five office clusters were selected for the study: (1) the Lujiazui Trade and Financial Zone (LjzTFZ); (2) the traditional urban core of Shanghai, covering Nanjing Road and Huaihai Road; (3) the Caohêjing Economic and Technology Development Zone (ChETZ); (4) Tongji University—one of the universities clusters in the north of Shanghai; (5) the Xujiahui area (Xjh). All five clusters contain companies or institutions in the advanced services industry sectors, especially in the trade and finance, broadcasting, design, IT, and real estate sectors. The other controlling variable was age, as determined by the personal judgments of the on-site interviewers. The sampling process was as follows: Interviewers entered office buildings in the five selected office zones and distributed questionnaires randomly to those who were judged to be between 20 and 34 years old. Based on this sampling process, a number of respondents outside of the target age group were selected, but the young respondents (within the age bracket 20–34) still formed the majority—about 87.4 percent of the entire sample. Another criterion used to further filter the sample was that the respondents should have moved during the last two years or planned to move within the next two years. The last criterion was to ensure that the respondents had been in the housing market or had begun collecting information about housing and possibly also had begun evaluating and comparing housing opportunities (Brown & Moore, 1970).
This focus on young professionals also allowed us to capture the demographic of the majority of new housing consumers in Shanghai. Studies of residential mobility widely accept that marriage is an important trigger for housing relocation for a new family (Li, 2004), and young people represent the majority of the first-time housing buyers. Young professionals also represent a relatively wealthier socio-economic group with greater purchasing power than average, and thus presumably have a greater freedom of choice in the housing market.

A total of 659 valid copies of the questionnaire was collected, covering 0.51 percent of the total 131,687 managerial and professional workers in Shanghai, or 1.3 percent of the professional and managerial workforce within the 20–34 age bracket (total of 50,873 persons) (SPCO, 2002). Figure 1 plots the residential distribution of the 659 respondents, with dots denoting the locations of the respondents’ homes. It was found that their present residences covered most of the residential areas inside the Outer Ring highway—the area usually defined as the Shanghai city area. Different colors for administrative districts signify varying family density (families per sq. km), with the darker color indicating higher density. By comparing the residential distribution patterns of respondents in this study with the average family density of districts, we found the respondents to be relatively evenly scattered. There were respondents living in the most densely populated districts of Jing’an, Luwan and Hongkou, and there was also a number of respondents living in the newly developed fringe areas, such as the Xinzhuang

Figure 1. RESIDENTIAL DISTRIBUTION OF RESPONDENTS

Source: Author
and Changning districts in the southwest and Pudong in the east.

MEASURING LIFESTYLE

Lifestyle was measured by the discretionary activity patterns of the sampled individuals, using indicators summarized from previous “Time Budget” studies. Only discretionary activities are taken into account since they are more motivation-directed and therefore more likely to reflect respondents’ lifestyles. The respondents’ behavior patterns were recorded by the “retrospective method”, using a diary form. “Yesterday” and “last weekend” were specified to help respondents recall their daily patterns (Chapin, 1974), with supplementary questions asked to arrive at a “normal” image of their weekly and monthly behavior patterns.

Three key elements of daily activity patterns were adopted: duration, frequency and purpose of traveling (with a binary option for “single” or “multiple”). Activities were classified by their nature: from recreation, shopping, socialization (friends meeting), working overtime, training, and food shopping to family life. It is acknowledged that travel mode is also a widely employed indicator in the description of activity patterns; however, it was not adopted in this study because owning a private vehicle is still uncommon in Shanghai due to the relatively low income level of Shanghai dwellers and strict control of private vehicle ownership. In 2003, only 12 out of every 1000 persons in Shanghai owned a car (ShaMSB, 2004). According to the data gathered in this study, 17 out of 659 households had private cars, a mere 2.6 percent of all respondents. Deviations in preference expressed for various modes of travel, therefore, were not considered in this paper. As a result, we arrived at a large number of indicators (Table 1). If we take leisure shopping activities as an example, a total of six indicators were developed, including time duration of each shopping trip on a weekday and on the weekend; frequency of main shopping center visits on five weekdays and on each weekend;

<table>
<thead>
<tr>
<th>Activity Category</th>
<th>Places Visited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreation</td>
<td>Theater; KTV, museum, gym, department store, commercial street, restaurant, tea house, cafe, bar, night club</td>
</tr>
<tr>
<td>Shopping</td>
<td></td>
</tr>
<tr>
<td>Socialization; meeting friends</td>
<td>Workplace, school, relevant institutions</td>
</tr>
<tr>
<td>Work</td>
<td></td>
</tr>
<tr>
<td>Continuous education; training</td>
<td>supermarket, food market</td>
</tr>
<tr>
<td>Food shopping</td>
<td></td>
</tr>
<tr>
<td>Family life</td>
<td>Lawn, yeards, open landscape in neighborhood, park, country side</td>
</tr>
</tbody>
</table>

Source: Author
and whether shopping is the single purpose of travel.

A total of 30 indicators were initially developed but were eventually reduced to 19 due to a lack of data. It was still difficult to apply all 19 indicators in regression models because of the auto-relation among these indicators. Therefore, factor analysis was employed to derive the main factors that captured the primary variation patterns. Principle Component Analysis (PCA) derived five factors with an eigenvalue larger than 1, which together explained 70 percent of the total variance of all 19 indicators. Below, the five factors are presented in a linear functional form. The magnitude of the coefficient of a given indicator signifies the extent to which the indicator is related to the factor, and only indicators with a coefficient larger than 0.01 are listed in the equation. It is considered that those indicators with a very small coefficient value could be deemed to have weak relationships and therefore could be ignored in favor of a better interpretation of the factor’s nature.

F1: weekend amenity orientation = 0.318 * weekend leisure duration + 0.310 * weekend leisure trip frequency + 0.215 * weekend socialization duration + 0.189 * weekend shopping duration + 0.122 * weekend shopping frequency + 0.187 * weekend recreation duration

F2: weekend career orientation = 0.377 * weekend overtime work duration + 0.355 * weekend overtime work frequency + 0.365 * weekend education/training duration – 0.147 * weekday overtime work duration – 0.107 * weekend socialization duration

F3: weekday career orientation = 0.415 * weekday overtime work duration + 0.347 * weekday overtime work frequency + 0.321 * weekday education/training duration + 0.185 * weekend socialization duration – 0.121 * weekend work duration

F4: weekday amenity orientation = 0.389 * weekday recreation + 0.351 * weekday recreation duration cumulative + 0.359 * weekday recreation frequency

F5: family life Orientation = 0.594 * food shopping frequency + 0.601 * daily shopping duration + 0.122 * weekend family activity duration + 0.150 * weekend family activity frequency – 0.222 * weekend recreation duration

After Varimax rotation, the five factors could be described in terms of three main dimensions or “orientations”: attachment to urban amenity (F1 and F4), attachment to career building (F2 and F3), and attachment to family life (F5). Further, activities relating to the first two dimensions were divided into two parts, with two factors representing weekday and weekend patterns respectively. In other words, five distinctive lifestyles were identified to be followed by the young professionals surveyed in this study, with three distinct orientation dimensions observed.

F1 and F4: According to the equations, long and frequent visits to urban spaces
for socialization, leisure shopping, and recreation contributed to a high value of F1 and F4. Therefore, these two lifestyles are suggested to be urban amenity–oriented lifestyle. The two factors measure the length and frequency of the respondents’ visits to the major amenity center—the traditional urban core with concentrations of commercial uses like department stores; cultural facilities like theaters, museums or art galleries; entertainment venues like karaoke bars, cinema, pubs and nightclubs; and meeting places like restaurants, cafes, and tea houses. The difference between the two factors was whether such activities took place on weekdays or weekends. The dimension “urban amenity orientation” tended to identify a group of people with a more extroverted urban lifestyle, appreciating social and cultural facilities, chasing fashionable living and welcoming a wider exposure to modern society. The subgroup clustered around a high value of F1 typically organized their life on weekends as follows: The frequency of trips concerned with leisure activities rose up to 1.6 times during the two days, with each trip lasting almost nine hours (526 minutes) on average. Multiple purposes are combined in trips to the urban core, which teems with many cultural, social and recreational facilities. Frequently, members of this subgroup would leave home at 1 pm for the city core, usually first to visit a venue like Xujiahui or the People’s Square to meet friends, and then they would hang out for the rest of the day at retail streets, cafés, karaoke, theaters, restaurants and bars.

F2 and F3: These two factors measured the time duration and frequency of extra work, as well as training programs or continuous education courses. The PCA showed the interrelationship between these two kinds of activities, both of which indicated an effort to further develop an individual’s career. Visits to workplaces, schools and other similar institutions were the main contributors to a high value of F2 or F3, depending on whether the activity was carried out on weekdays or weekends. The group at the top end of F3 stayed at their offices to work overtime for two out of the five weekdays reported, averaging about 2 hours (127 minutes) each time. There were cases where it was reported that people worked for 4 hours (240 minutes) at a time on all five days. They spent a lot of time on their present job as well as the preparation for future development.

F5: This factor measured the duration and frequency of activities related to family life, including daily shopping at a supermarket or food market, visiting parks with family members, playing with their children or accompanying older family members. Landscaped open space within neighborhoods or in nearby areas were the main destinations of such family activities. Typically, the respondents stayed out in landscaped open space for 30 to 45 minutes with family members and visited parks or theme parks for more than one hour (72 minutes) on weekends regularly. Households which scored high on this dimension expressed a clear priority given to family life; they sought to achieve a higher quality of life for their family members in terms of their physical environment, such as fresh air and a quiet place. They also cautiously expressed their rejection of recreational activities and avoided lengthy visits to entertainment places located in the urban core.
This result was expected because the main purpose of employing PCA in this study was to derive dimensions to classify lifestyle or orientations that influenced housing consumers’ preferences for housing location. The results also reflected the basic structure of the variables, indicating that even for people within the same orientation dimension, the differences in terms of when respondents preferred to arrange their desired activities could not be neglected. For example, the change in F1—the attachment to amenities on weekends—bore no relationship to the change in F4—the attachment to amenities during weekdays. People who preferred to work overtime on weekdays might be different from those who preferred to work on weekends. To test the interaction between socio-cultural group and housing location choice, housing location needs to be defined, as addressed in the following paragraphs.

MEASURING HOUSING LOCATION CHOICES

Regarding the housing location choices, options were designed to be a series of combinations in terms of commute time to workplace and to the major amenity center (MAC). While workplace refers to each of the five office clusters, the major amenity center is located in the traditional urban core, covering Nanjing Road, Huaihai Road, Hengshan Road and Xujiahui, which are well-known for their dense concentration of retailing, entertainment, cultural facilities and meeting places (Ning, 2005; W. Wu, 2004). The questionnaire sought to discover the respondents’ present and desired commute time with regards to workplace and major amenity center for both their present home and future home respectively. For revealed preference, the survey asked for the usual commute times to the two destinations, and for stated preference, the best combination of these two attributes of commute time. After studying the variations of commute time, we divided the whole observations into three levels: (1) a “median” level ranging from -0.5 to 0.5 standard deviation (std); (2) a “close” level with a deviation smaller than -0.5 std; and (3) a “far” level with a deviation larger than 0.5 std. The threshold for travel time to office to be scored as “close” was computed to be 30 minutes, while that for travel time to the MAC was 38 minutes. In a summary, three options were developed: (1) close to the office only, (2) close to both, and (3) close to the MAC only.

Figure 2 gives the three options defined by commute time to workplace and to major amenity center conjointly. For office workers collected from the different office zones, the geographic areas defined by the three options varied. Taking samples collected from Lujiazui for example, Option II (close to both) is illustrated by the intersection of the circle around Lujiazui and the ellipse surrounding the MAC, while the remaining parts of the circle and the ellipse refer to Option I (close to office only) and Option III (close to MAC only) respectively. In the same way, the three options for respondents working at the Tongji University or in the ChjETZ could be identified. It was noted that for respondents actually working in the major amenity center, their choice of housing close to the office, was most probably simultaneously close to the major amenity center. But not all residences
close to the major amenity center were also close to workplaces. Empirical observations indicated that there were 42 (revealed) and 97 (stated) observations in Option III (close to MAC only) among this sub-group. This is probably because the major amenity center was linear in shape, and the two office clusters within the major amenity center border is located at its two ends. Therefore, for a person working in Xujiahui (the southwest end of MAC), housing located at the east sector of the ellipse would be “close to MAC only”. In addition, it is acknowledged that the shapes of the three alternative options are merely rough estimations for illustration only. It is certain that regional differences—such as the varying efficiencies of different transportation lines and differences in geomorphology—will inevitably influence the contour of time distance.

Logistic regression was employed to test the probability of a given housing location being selected by respondents regimented by demographics, household income, and, more importantly, by lifestyle factors. Table 3 presents the outputs of three binary logistic regression models based on “present home” and “next home” respectively. In each model, the dependent variable was the binary choice.
Projections of “yes” or “no,” denoting whether a particular option was selected or not.

As indicated by the regression outputs, the hypothesized taste variations in commute time by various population segments was statistically supported. Significance of the overall performance of almost all models was confirmed by the Chi-square tests. In some models, the pseudo-R2 values were around 0.07, but as logit models usually do not have a good fit, such a low value was anticipated. Moreover, when stated preference was regressed, the three models all witnessed a significant improvement in overall performance (Chi-square test and pseudo-R2). Lifestyle factors were shown to be significant, not only through the Wald test of individual variables, but also through the test of overall performances of the models. Pre-conditioning factors of income, educational attainment, and age were also shown to be significant, especially for the present condition. It was understandable that income level seemed to be less influential for future home choice, because stated preference was more driven by desire and was less constrained by economic status. The impact of pre-disposing factors (lifestyle factors) and pre-conditioning factors (demographical, socio-economic variables) was addressed as follows.

FINDINGS AND INTERPRETATIONS

The first hypothesis was that households with certain orientations prefer living close to the corresponding land uses. The regression results of both revealed and stated preferences provided positive evidence for the hypothesis, with higher matches confirmed for the latter.

We found work-oriented lifestyle to be positively related to the desire for a short commute to one’s workplace, through both present and future home choices. According to the household’s current situation, positive coefficients were derived

<table>
<thead>
<tr>
<th>Variables</th>
<th>Definition and Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>INC (INC Sq, INC cub)</td>
<td>Family income level per month (income level squared, income level cubic): 1 (<del>6,385 RMB/month), 2 (6,386</del>11,999), 3 (12,000<del>17,999), 4 (18,000</del>23,999), 5 (24,000~)</td>
</tr>
<tr>
<td>EDU</td>
<td>Education attainment: years of schooling</td>
</tr>
<tr>
<td>CS</td>
<td>Presence of children under 19 years: 1 if yes, 0 if otherwise</td>
</tr>
<tr>
<td>HS</td>
<td>Household size: 1 (1 member), 2 (2 members), 3 (3 members), 4 (&gt;= 4 members)</td>
</tr>
<tr>
<td>AGE (AGE Sq)</td>
<td>Age group (age group squared): 1 (25-29), 2 (30-34), 3 (35-39), 4 (40-44), 5 (45-49), 6 (50-)</td>
</tr>
</tbody>
</table>

Note: 1 US $ = 8.06 RMB
Source: Author
from weekday career orientation (F3) for both Option I and Option II and from weekend career orientation (F2) for Option II. That is to say, the more actively one selects housing close to his or her workplace or close to both the workplace and the major amenity center. Similarly, the more active on weekends, the more likely for the person to live close to both. Moreover, when asked about future home choice, this type of respondent still preferred a residential site close to both.

The association between urban amenity–orientation and concerns over travel time to the major amenity center was also evident, but expressed in a more sophisticated way. When the present housing was analyzed, the factor of weekday amenity orientation (F4) was found to be insignificant for all three models. In other words, no specific differentiation in terms of the degree of weekday

<table>
<thead>
<tr>
<th>Table 3. ESTIMATION RESULTS OF HOUSING LOCATION CHOICES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Option I</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>Close to office only</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>INC</td>
</tr>
<tr>
<td>INCsq</td>
</tr>
<tr>
<td>INCcub</td>
</tr>
<tr>
<td>EDU</td>
</tr>
<tr>
<td>CS</td>
</tr>
<tr>
<td>HS</td>
</tr>
<tr>
<td>AGE</td>
</tr>
<tr>
<td>AGESq</td>
</tr>
<tr>
<td>F1</td>
</tr>
<tr>
<td>F2</td>
</tr>
<tr>
<td>F3</td>
</tr>
<tr>
<td>F4</td>
</tr>
<tr>
<td>F5</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>R5q</td>
</tr>
<tr>
<td>x²/df</td>
</tr>
</tbody>
</table>

Note:  
(1) dependent variable = 1, select; = 0, otherwise  
(2) Wald' : Backward Wald  
(3) **: significant at the 0.05 or above level; *: significant at the 0.1 level  
Source: Author
amenity orientation was identified in the three options. However, the desire for short travel time to the major amenity center was clearly expressed when the future housing location choices were analyzed. A positive coefficient derived from weekday amenity orientation (F4) indicated that the higher score a household got, the more likely it would be to move to a residence close to both (Option II). Regarding the weekend amenity orientation (F1), its degree was inversely related to the probability of selecting Option II when the present housing locations were analyzed. That is to say, the longer and more frequently a household visited urban amenities on weekends, the less likely it was to live close to the major amenity center. Or it would be better to be interpreted that, when a respondent was living far away from the major amenity center, he or she had to visit to the major amenity center on weekends. When future home choice was investigated by the logistic regression, a much better match was found: positive coefficients

<table>
<thead>
<tr>
<th>Option I</th>
<th>Option II</th>
<th>Option III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close to office only</td>
<td>Close to both MAC and Office</td>
<td>Close to MAC only</td>
</tr>
<tr>
<td>B</td>
<td>Wald</td>
<td>Wald'</td>
</tr>
<tr>
<td>INC</td>
<td>0.86</td>
<td>0.30</td>
</tr>
<tr>
<td>INCsq</td>
<td>-0.33</td>
<td>0.27</td>
</tr>
<tr>
<td>INC Cub</td>
<td>0.04</td>
<td>0.23</td>
</tr>
<tr>
<td>EDU</td>
<td>-0.11</td>
<td>5.23**</td>
</tr>
<tr>
<td>CS</td>
<td>0.16</td>
<td>0.29</td>
</tr>
<tr>
<td>HS</td>
<td>-0.09</td>
<td>0.59</td>
</tr>
<tr>
<td>AGE</td>
<td>-1.47</td>
<td>12.5**</td>
</tr>
<tr>
<td>AGESq</td>
<td>0.08</td>
<td>1.15</td>
</tr>
<tr>
<td>F1</td>
<td>-2.27</td>
<td>125**</td>
</tr>
<tr>
<td>F2</td>
<td>-0.04</td>
<td>0.15</td>
</tr>
<tr>
<td>F3</td>
<td>-0.18</td>
<td>2.90*</td>
</tr>
<tr>
<td>F4</td>
<td>-0.34</td>
<td>9.20**</td>
</tr>
<tr>
<td>F5</td>
<td>0.3</td>
<td>6.58**</td>
</tr>
<tr>
<td>C</td>
<td>3.66</td>
<td>6.48**</td>
</tr>
<tr>
<td>R Sq</td>
<td>0.40</td>
<td>0.4</td>
</tr>
<tr>
<td>x²/df</td>
<td>340/13**</td>
<td>337/6**</td>
</tr>
</tbody>
</table>

Note:
(1) dependent variable = 1, select; = 0, otherwise
(2) wald' : Backward wald
(3) **: significant at the 0.05 or above level; *: significant at the 0.1 level
Source: Author

Table 4. ESTIMATION RESULTS OF NEXT HOUSING LOCATION CHOICES
were generated from F1 for both Option II and Option III. In other words, a higher value of F1 would lead to a higher probability of living within a short distance of the major amenity center.

According to the equation derived from the PCA application, F5 equaled a sum of items supporting daily family life, from daily shopping in the supermarket to playing with one’s children in the neighborhood. The regression output confirmed that households with a high score of F5 were most probably living far from the city center, as indicated by a negative coefficient. This finding is consistent with the traditional explanation given for the preference for suburban living shown by housing consumers in the West. Many studies have shown that having a large private space for family members, especially for one’s children, is a very important criterion taken into consideration during the evaluation of housing alternatives. Although an apartment in a multiple-family residential building is usually the only type of housing available to housing consumers in Chinese cities at present and also potentially in the future, suburban neighborhoods were clearly perceived as being better in affording larger, quieter and safer outdoor spaces for children.

Comparing revealed and stated preferences, we observed a remarkable change in terms of the signs of coefficients for weekend amenity orientation (F1). Of the five models where F1 was revealed to be significant, changes of the signs of its coefficients took place in four models. The change was intended to signify a kind of insistence on a desired lifestyle. The negative coefficient of F1 seemed to reject the hypothesis that an urban amenity-oriented respondent would prefer proximity to the major amenity center; instead, it revealed a compromise made by the respondent. It should be noted that F1 represents activities taking place on the weekend. The negative association revealed by the present home choice is better interpreted as follows: For the group with a distinctively high value of F1, the current living environment is far away from the urban center; therefore, this group could only visit the major amenity center on weekends when they have more time available. When the environment did not offer a convenient setting for the respondents to carry out their desired activities during weekdays, they spent more time on such activities on the weekend as a kind of supplement, rather than giving them up. Future home choices then become an opportunity for the members of this group to resolve this tension. That is why positive coefficients were generalized for Option II and Option III. It was apparent that their stated preference is much better matched to their amenity-oriented lifestyle.

Another factor of weekday career orientation (F3) also witnessed the change of signs of its coefficients. Inspecting revealed preference, we found a positive relationship between F3 and the odds of living close to the workplace (both Option I and Option II). Inspecting stated preference, we found, however, the relationship between F3 and the concern of “close to workplace” to be negative. There appears to be a cautious rejection of a residence “close to workplace only” (Option I) while a residence “close to both” is preferred. This is very different from respondents with high scores of F1, who emphasized the attribute “close to
MAC” only. For them, both two options with the attribute “close to MAC” (Option II and Option III) were preferred, and the option without the attribute (Option I) was then devalued. Compared with the amenity-oriented respondents, the career oriented group seemed to be more cautious, because they expressed a dual concern on both two attributes. The author argues, however, that this group is somewhat eclectic in that they did not always stick to one principle. It was found that the attribute “close to workplace” was valuable only when it is combined with the attribute “close to MAC.” That is to say, career-oriented respondents do not always prefer living close to their workplace; moreover, the residential site “close to workplace only” was also devalued.

In addition, the decreased significance of career-orientation factors based on stated preference also indicates the somewhat eclectic characteristic of the career-oriented group. Among the six models, the significance of both career-orientation factors (F2 and F3) decreased, while the significance of almost all the other orientation factors increased. It should be noted that when amenity-oriented sub-group and family life-oriented sub-group tended to agglomerate and form specific clusters after other series of relocations, the career-oriented sub-group segregated. Their criteria in housing evaluation differed, and the original pattern of clustering might blur after relocation. Here it was argued that the regional spatial stratification of land status might be the noisy factor.

Inspecting Figure 2, which illustrated residential zones defined by the three options, we could get the impression that Option II and Option III were located in or around the urban core, and conversely, areas defined by Option I were located far from the urban core. From the perspective of land status, the urban core is overlapped with the “Upper End”—the superior residence in the local dialect. In other words, Option II and Option III could be also interpreted as close to the “Upper End” while Option I was far from it. Therefore, it was suggested that the impact of the traditional concept of the “Upper End” could not be ignored. The term “Upper End” has been current since the colonial period, which then referred to the concession areas (settlements of foreigners). While the British concession was developed into a business, commercial, and amenity core, the French concession became the residence of well-off classes. The Upper End covered present-day Jing’an, Luwan, the northern part of Xuhui and the eastern part of Changing district. In fact, it overlapped significantly with the ellipse around the amenity center shown in Figure 2. During the colonial period, the French Concession was regarded as a symbol of French lifestyle, constructed with many leisure facilities and designed in a French style, thus establishing the special atmosphere of decent, elegant, sociable and cosmopolitan living (W. Wu, 2004). The status of the Upper End was even enhanced during the socialist era although its social differentiation was expressed through its identity (as the living quarter of the educated population) instead of its wealth. It has been argued by many studies that the concept of the Upper End deeply influenced the whole population (Tang, 1986; F. Wu, 2002b), and it was also found to be true in this study. As the regression output revealed, except for the family-oriented subgroup, all other sub-
groups have shown a desire for proximity to the city’s major amenity center, which is where the Upper End resided. It is obvious that symbolic spaces have kept their attraction and thus weakened the power of job clusters to attract residents. This might explain why the amenity-oriented subgroup emphasized the attribute of “close to MAC” only and preferred both options involving the attribute, while the work-oriented subgroup preferred the option “close to both” and disliked option “close to job only.”

Once the concept of the Upper End came into existence, the value of the land was sustained by many means, like pricing in a market system. Economic factors also reveal the impact of the Upper End. As one advanced up the income ladder, the probability of selecting Option I declined while the probability of selecting Options II and III increased. In summary, it is evident that the residential ring around the city’s major amenity center is the place where the more affluent class gathered. Given the current price distribution context, a person with an amenity-oriented lifestyle could find himself or herself facing tougher economic constraints in the market. Because housing in the residential areas preferred by these households is more expensive, only the better-off within this group could, to a certain extent, fulfill their preferences, while others have to make compromises and adjust their lifestyles instead (the group scored high in F1 being a telling example).

CONCLUSION

This study suggests that individual lifestyles motivate the choices of housing location and should thus be given more attention in studies of Chinese cities. Given the gradual pace of change towards a market economy, it is important to gain a deeper understanding of housing consumers’ preferences and underlying motivations. The study suggests that residents select their housing location based on the options which provide a better fit with their own activity patterns, although personal income remains a major constraining factor.

Are young professional necessarily urban residents? In Shanghai, social groups (distinguished by differences in lifestyle) traditionally preferred different locations. According to the outputs, we did find an emerging trend of residential differentiation by lifestyles. The present location of career-oriented households forms a concentric zone around the respondents’ workplace and tended to congregate to the sectional part between work place and the major amenity center in the future. The desired housing of urban amenity–oriented respondents is located in the concentric zone around the major amenity center, as they are not concerned with the commute time to their workplace. Respondents emphasizing family life clearly expressed their resistance to living around the urban core, but they still prefer a short commute to their offices.

In addition, the degree to which individual lifestyles influenced the final housing location choice differed. As observed, it was in the context of regional spatial stratification structure that various individual lifestyles emerged. At the macro level, the status of the Upper End might prevail, as its impact on the young profes-
sionals was evident. For the case of Shanghai, the existing superior residences signified a mental attachment to an urban lifestyle. As a reaction, respondents with an urban-amenity orientation then emphasized the short travel time to the major urban amenity center. Respondents with a family-life orientation also express their rejection to the proximity to the major urban amenity center clearly; respondents with career orientation, however, also expressed a desire for residences around the major amenity center. Based on the findings of this study, the attraction of the central city area as a desirable housing location remains firm, at least for a majority of respondents. The decentralized clusters of employment opportunities outside the city center appear to be attractive only to family-oriented groups but not to others. If land-use planning intends to redistribute population to the newly developed areas, the more effective way is, as suggested by the author, to decentralize land use symbolizing the modern lifestyle— an amenity-oriented style.

Young professionals were the targeted population in this study. It is recognized, however, that the findings of studies only surveying young professionals may not be generalizable to the whole population of Shanghai, let alone to other large or small cities. Studies of other population groups must await future work.

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Wu, F. (2002b). The transformation of urban space in Chinese transitional economy: with special refer-


ABSTRACT

This paper discusses the challenges facing urban transportation in China. It reviews key research findings and strategic policies aimed at addressing these challenges. Although a great deal of research has been undertaken and a series of policies have been formulated, there are still notable gaps in the research, in the policies, and between the research and policies. Topics such as public participation, equity, non-motorized transportation (cyclists and pedestrians), and transportation financing have not been fully addressed. To overcome this, the paper recommends that research and policy formulation be subject to regular evaluation and review. The paper suggests forming new partnerships between researchers and policymakers and establishing a national library and a statistics agency on urban transportation.
INTRODUCTION

As the most populous country in the world, China has achieved staggering economic growth and social development since it began the process of reform and "opening-up" in 1978 (Fang and Zhang, 2003). This has generated increased demand for urban transportation infrastructure and mobility (Zhou et al, 1995; Liu, 2001; Luo and Qian, 2004) and put huge pressure on Chinese cities, which have had to adapt to survive. Adapting to the fast growth has not been easy and is causing serious problems such as increased congestion, pollution, noise, and accidents in nearly every major Chinese city. Institutional barriers and underinvestment in infrastructure coupled with rising motorization and the concurrent decline in traditional transportation modes such as cycling and walking, are compounding the problem, as many authors have documented (Akaha, 1990; Cherry, 2005; Editor, 2001; Gu, 1993b; Luo and Pu, 2004; Ma, 2004; Mu, 1997; Wu et al, 1997; Xiang and Zhang, 1998; Ying, 1998).

Many local and international experts, as well as officials within the Chinese government, have examined these issues and attempted to provide technical solutions and formulate national policies to address urban transportation challenges (see Table 1). To evaluate all these efforts would be an enormous task that few have tried, despite the urgency of the task (Pendakur, 1992; Ning, 1998 and Yang, 1999). Nevertheless, it is possible to identify and examine the most influential of these efforts and see what impact they have had. That is the aim of this paper. At some risk of oversimplification, for purposes of this analysis, the term “influential publications” comprises papers in peer-reviewed journals, scholarly books, and articles in nationally circulated newspapers, and “key policies” are limited to those have been adopted and/or implemented by the Chinese Central Government (CCG). Section 1 of this paper provides a brief overview of where urban transportation stands within the broader socioeconomic context in China and the challenges facing Chinese urban transportation. Section 2 categorizes the influential publications reviewed and explains how each author contributes to the arguments addressing each specific challenge. Section 3 summarizes and compares the publications and the policies to identify gaps in and between them, if any. Section 5 presents the conclusions and recommendations for future efforts aimed at filling in these gaps.

URAL TRANSPORTATION IN CHINA: SNAPSHOT

Since 1978, Chinese cities have experienced great change (Burton, 1990; Mackerras, 1998; Garnaut and Huang, 2000) especially with regard to transportation. This is evident from increases in the number and scale of cities, changes in population density, variations in patterns of personal travel and modal share, rising levels of motorization, increases in congestion, worsening noise levels, increases in air pollution from transportation sources, and expenditure on transport related infrastructure and equipment.
Table 1. SUMMARY OF SELECTED CHANGES IN CHINA'S URBAN TRANSPORTATION: 1978-2005

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<tr>
<td><strong>Institutional Changes and Establishment of Academic Associations</strong></td>
<td>MTPU* (1979)</td>
<td>Establishment of urban planning agencies (around 1985); UTPAC* (1985); China Society of Transportation and Logistics (1986)</td>
<td>China Urban Public Transit Association (Affiliated with MOC***, 1993)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Governmental Awareness and Response</strong></td>
<td>Transportation encompasses only highways, railways, and ports (Zhao and Kang, 1997); infrastructure construction management; travel survey in cities starting in the earlier 1980s; large-scale investment into urban transportation infrastructure beginning around 1990; greater attention to public transit; greater importance attached to urban transportation planning since the late 1980s; motor vehicle manufacturing industry given national policy priority in 1994; introduction of foreign transportation modeling software since the 1990s (Ma, 2004)</td>
<td>Greater investment in transportation infrastructure, especially after Southeast Asia financial crisis; continued policy priority given to public transit; rapid transit lines built in Shanghai, Beijing and Guangzhou; the &quot;Fluid Traffic Project&quot;; &quot;White Paper&quot; (MOC, 2000)</td>
<td>Green Olympic Games; green transportation; continued policy priority to public transit development (State Council, 2005); revised auto industry development policy (NDRC****, 2004); more rapid transit lines built; the &quot;Fluid Traffic Project&quot;; parking (2005); intercity rail transit (2005)</td>
<td></td>
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<tr>
<td><strong>Key Transportation Policy Topics</strong></td>
<td>Open the mind, seek truth from the facts</td>
<td>The &quot;Comprehensive Treatment&quot;</td>
<td>Public transit, travel demand management, transport development strategies (1995), motor vehicle industry development policy (1994)</td>
<td>Public transit, travel demand management, the Fluid Traffic Project; sustainable transportation (2000); integration of infrastructure construction, policies, planning, and management (Ma, 2004)</td>
<td>The &quot;Fluid Traffic Project&quot;: reform and renovation; city and transportation (2001); &quot;white paper&quot; for urban transportation in Shanghai (2002); public transit prioritization policy (MOC, 2005); Mass rapid transit urbanization and motorization (2005)</td>
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<tr>
<td><strong>Modal Split</strong></td>
<td>Predominantly bus and walk (1978-80) but bus ridership decline while bicycles increase greatly</td>
<td>Similar to 1978-80 but bus ridership declines while bicycles increase greatly</td>
<td>Motorcycles increase greatly, enterprise bus and taxi experience some increases</td>
<td>Private automobiles increase rapidly; bus trips decline and bicycle trips hold constant</td>
<td>Private automobiles increase rapidly; more rapid transit lines being built; small changes in bus and bicycle trips</td>
</tr>
<tr>
<td><strong>Scale of Congestion</strong></td>
<td>Negligible</td>
<td>Some</td>
<td>Intermediate</td>
<td>Increasingly serious (Li, 1997)</td>
<td>Some improvements in public transit but overall congestion still increasing</td>
</tr>
</tbody>
</table>

Source: Author's summary based on references cited for the paper and on personal knowledge.

* MTPU: Metropolitan Transportation Unit, the Architectural Society of China.
** UTPAC: Urban Transportation Planning Academic Committee (the successor of MTPU).
*** MOC: The Ministry of Construction, China, responsible for the public transit and road planning and construction in urban areas.
**** NDRC, the National Development and Reform Committee, in charge of industrial development strategies and planning at the CCG.
In 1978, there were only 40 cities with a population of 500,000 or more in the entire country; by 2000, however, this number had more than doubled, to 93. Just 13 cities had 1,000,000 residents or more in 1978; by 2000, 40 cities had reached that figure (CASSDRG, 2005). During the same period, population density in cities has almost tripled, increasing from 279 to 754 residents per square kilometer (Li and Zhang, 2004) ¹. This increase in density has not reduced demand for personal travel. Cities have experienced a 7% annual growth in passenger trips since 1990 (Liu, 2001a). Furthermore, as the wealth of many cities and individuals has increased, much of this growth has been driven by motor vehicles and their newly-licensed drivers. In all cities combined, the numbers of motorized vehicles and licensed drivers have increased annually by 19% and 15% respectively (Luo and Qian, 2004; Liu, 2001a). In Beijing and Shanghai, the two largest cities in China, the number of motorized vehicles grew 15% and 12% respectively over the past decade, despite the fact that they already had the largest motorized vehicle fleets in the nation (Zhang and Hu, 2003). Compared to this rapid growth, the expansion of roadways during the same time period was relatively modest. Despite the fact that the Chinese cities with a population of 1,000, 000 as a whole had only 8.27 M2 road area per registered resident as of 2000, the annual growth in road area in the cities was only 3-7% % (Li, 1998a; Zhou, 2001). As the gap between the number in motorized vehicles, licensed drivers, and road area per capita widens, many cities are suffering something they would have never expected decades ago: congestion. Even though enormous investment has been poured into their transportation systems, major cities such as Beijing, Shanghai, and Guangzhou still have many arterial roads and intersections approaching or exceeding their designed capacities (e.g., Wu, 2000; Zhou et al 1997). In these cities, automobiles and buses often operate at speeds of 20 kilometers/per hour or even less (e.g., Luo and Qian, 2004; Zhao and Tian, 2004).

China has an extremely low motor vehicle ownership rate of 34 vehicles per 1,000 inhabitants (in 2003) and fewer motor vehicles in use than the U.S., Japan, Germany, France, Italy, Russia, or the U.K. However, probably due to highly polluting vehicles, lack of effective emission regulations, and declining public transit patronage, China is currently the second largest CO2 emitter in the world (Zhang and Hu, 2003; NBS, 2004; ERF, 2005; JAMA, 2005). Emissions from motor vehicles have resulted in the degradation of air quality in most cities (He and Hao, 1996). Motor vehicle noise and vibration are also major sources of environmental pollution and emerging social concerns in cities (He, 2002; Qiu and Wang, 1997; Zeng and Huangpu, 1998; Zhang and Shen, 1998). Recent statistics indicate that even at this relatively early stage of motorization and urbanization, China is already beginning to suffer some very serious adverse impacts of both trends, which has degraded the quality of life (Shen and Chen, 1997; also see Table 2 below).

While the negative impacts of increased motor vehicle usage on Chinese cities have been growing, there has been a generally-accepted view to expand transportation systems to meet demand. Judging from their publications, many ana-
transportation systems than those found in developed foreign cities. Third, Chinese cities dedicate a much smaller percentage of land to transportation and related purposes than do similar cities in developed countries; third, investment in transportation would trigger economic development (Wang et al, 1995; Zhou et al 1995; Zhou, 1996). Great amounts of money have been spent and are being budgeted for expanding transportation systems based on these arguments. The composition of transportation infrastructure and equipment has greatly changed as a result. For example, there were only two Chinese cities with rail rapid transit lines in the 1980s. By May 2006 a dozen cities have subways or light rail systems that are operating or under construction. A total of 1,500 kilometers of subway and light rail lines have been or will be constructed in next 10 years (Wang, 2006). Many cities including Beijing, Wuhan, Shenyang, Tianjin, Guangzhou, Shanghai, and Chengdu now have expressways circling (ring-road systems) or transportation corridors running through their central areas (arterial road systems). Even though these might represent considerable progress, the fact remains that only 12% of China’s urban transportation funding is from regular and stable sources, meaning that the underlying challenges of appropriately meeting increased mobility in cities are still enormous (Zhao and Kong, 1999).

As a partial result of increased motor vehicle usage, modal split in cities has changed as well (See Table 1, row 4). The most significant change is declining public transit usage. About 20% of all urban travelers used this mode in the 1970-1980s. However, only a handful of cities such as Beijing, Shanghai, Guangzhou, and Nanjing have maintained this percentage, while other cities are experiencing significant declines in the public transit share of all trips (Luo and Qian, 2004). Authors argued that this decline may be due to several reasons: the low operational speed of public transit; more and more households can now afford private vehicles; the ever-present alternatives of bicycles and walking; and newly-built rapid transit lines that as yet do not capture much ridership (Wang et al 1995; Luo and Qian, 2004). Despite China’s success in doubling the urban public transit vehicle fleets and fixed-route lines in the past twenty years, it is disappointing to

Table 2. COMPARISONS BETWEEN THE CHINESE AND G7 CITIES

<table>
<thead>
<tr>
<th>Indicators</th>
<th>China</th>
<th>G7</th>
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<tbody>
<tr>
<td>Average journey to work time in minutes</td>
<td>47</td>
<td>25</td>
</tr>
<tr>
<td>(in cities with 1 million inhabitants of more)</td>
<td></td>
<td></td>
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<tr>
<td>Numbers of persons injured or killed per 1,000 vehicles per year</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td>Particulate Matter in the Air (mg/M3)</td>
<td>320</td>
<td>45</td>
</tr>
<tr>
<td>SO2 (mg/M3)</td>
<td>82</td>
<td>19</td>
</tr>
<tr>
<td>NOx (mg/M3)</td>
<td>88</td>
<td>56</td>
</tr>
</tbody>
</table>

Source: CASSDRG, 2005
see that the average operational speed of urban bus was halved over the same period (Luo and Pu, 2004). Even with a guaranteed operational speed, newly opened Mass Rapid Transit (MRT) systems have not retained public transit riders. For instance, even though it has one of the most complete systems in the country, the Beijing MRT accounts for only 2-3% of all trips (Luo and Qian, 2004). It is not surprising that other cities with less complete MRT systems such as Shanghai, Guangzhou, Tianjin, and Wuhan, expect the same patronage pattern.

With an MRT system or not, average travelers in most cities still depend on walking and cycling. Several of the most recent surveys show that bicycle and walking trips account for the lion’s share of all trips in Beijing, Shanghai, Guangzhou, Nanjing, Hangzhou, and Shijiazhuang (Qian and Chen, 1997; Luo and Qian, 2004; Deng and Xie, 2000). The numbers of other personal motorized trips—such as those by motorcycle and automobile—have increased rapidly in most cities, but their shares of all trips are still much less significant than cycling and walking combined. In most cities personal motorized trips account for 10-15% of all trips \(^3\). As mentioned above, however, the share of individualized motorized trips could quickly change because of the phenomenal growth each year in private car ownership rates.

WHAT HAS BEEN WRITTEN ON URBAN TRANSPORTATION CHALLENGES?

Domestic and foreign authors have published a vast body of literature dealing with various aspects of the above-mentioned challenges facing China. However, probably due to time constraints, language barriers and/or cultural gaps, few investigators have attempted to cross political boundaries and work together to synthesize and assess the existing research (Liu and Guan, 2005; Ning, 1998; Pendarkur, 1992; Yang, 1999). The intention in this article is to explain how domestic and foreign works can contribute to the understanding of transportation challenges in China. Relevant literature will first be categorized by the language in which it was originally published and then by other criteria such as themes the authors attempt to address, the date of publication, and underlying relationship between papers.

Publications in English

Although there are quite a few peer-reviewed papers focusing on China’s transportation since 1978, only a handful of them specifically deal with the challenges facing urban transportation (Chen et al, 1998; Chen, 1995; Hayashi et al, 1998; Yenny, 1990). At some risk of oversimplification, the latter can be categorized into six groups according to the theme addressed.

Evaluation of Current Challenges, Policies, and Recommendations

Several authors have assessed the challenges facing China’s urban transportation and the policies formulated to address the challenges. Based on the assessment, some recommendations have also been provided.
Taking challenges faced by urban transportation as a whole, Zhou (1996) argued that the most significant obstacles resulted from five interacting factors: inadequate road supply, rapid automobile growth, declining public transit ridership, inefficient management, and lack of integrated developmental strategies. He recommended that China focus on: unified leadership; improvements to and expansion of road facilities; adjustment of land uses in central cities; public transit prioritization policy; management of private cars; diversified financing sources for urban transportation; and extensive research on urban transportation.

Using Shanghai as a case in point, Zacharias (2002) emphasized that even though it was right to adopt a public transit prioritization policy, it should be implemented without discouraging cyclists. Examining the benefits and costs associated with motorization in Chinese cities, Cherry (2005) maintained that a balanced point should be sought between economic growth and the level of motorization. As motorization increases, however, Chinese cyclists and pedestrians have received secondary treatment as decision-makers view those modes as inferior and problematic in their interaction with motorized transportation.

After studying China’s urban road transportation policies over the long term, Liu and Guan (2005) argued that the policies followed have actually geared transportation infrastructure towards private automobiles. Nevertheless, when looking at commuting patterns, land availability, and affordability it is clear that the private automobile should not be the predominant mode in China. They therefore recommended that China adopt a multimodal perspective in urban transportation. With similar concerns, Peng (2004) argued that China’s supply-centered transportation strategy might have overlooked such modes as bus transportation, biking and walking, which are predominantly used by the poor. Based on an evaluation of the impacts of the CCG’s pro-auto-industry policy, Kenworthy and Townsend (2002) draw conclusions similar to those of Liu and Guan (2005). Furthermore, they concluded from several case studies that the lack of reserved rights-of-way for public transit and low levels of service with priority buses or urban rail systems suggest that Chinese cities will not be able to offer practical alternatives to private vehicles as personal wealth and the demand for ownership grow.

Motorization, Its Externalities, and Sustainable Transportation

The automobile industry (and private car ownership) faced uncertainties and a series of policy and regulatory barriers until China decided in 1994 to develop the industry into one of the four “pillar industries” and began gradually removing the barriers to private car ownership in 1996 (State Council, 1994a, 1994b, 1996). As these decisions were implemented, some authors realized that they would focus on externalities of motorization. These authors emphasized that private car usage in cities should be compatible with land-use affordability, street and road capacity, and environmental protection goals. Liu and Stares (1995) commented that China could follow the examples of selected Southeast Asian cities and implement controls on motor vehicle ownership in harmony with the
pro-auto industry policy. They believed that a combination of pricing and government intervention could keep motorization on the right track. To help China better prepare for increasing motorization, Walsh (1995) discussed in great detail various strategies to reduce and ameliorate the adverse impacts caused by motor vehicles. Triggered by similar concerns over motorization, other authors echoed that international experiences should be tailored to China’s context and/or to be adopted to manage motorization and private cars. Emphasizing policy incentives, He and Chen (1999) voiced support for advanced technologies in combustion, super low-emission vehicles, alternative energy, public transit, and Intelligent Transportation Systems. Schipper and Ng (2004) argued for an integrated approach to transportation, land use, equity and the environment. Other authors have proposed similar approaches (CFPTVC, 2003).

Going somewhat beyond the above discussions, a few other authors have touched on topics like the interaction between motorization and sustainable urban transportation. After an assessment of energy policy and energy-related challenges facing China’s urban transportation systems, Zhang and Hu (2002) argued for clean vehicle technologies, cleaner fuels, stricter vehicle emission standards, public transit development, and private car controls. Zhang and Hu (2003) also examined the dangers of “unsustainabilities” in urban transportation and advocated the adoption of more sensible road transportation policies (e.g., adjustment of the supply-centered or capacity-oriented policies in place) and integration of urban transportation planning with the nation’s pro-auto industry policy. Seoul’s transportation experience is also noted as being potentially instructive, in addition to that of Singapore.

A few authors concerned with measuring the impacts of urban transportation conducted quantitative research at the national and city levels (Hao and Wang, 2005; He and Chen, 1999; Walsh, 1999; Mao, 2002). Their findings confirmed that a few specific air pollutants such as PM, COx, NOx, and SOx from urban transportation had become major sources of pollution at both levels (see Table 2).

Public Transit

Public transit in many Chinese cities has been experiencing declining patronage since the mid-1980s. Recognizing public transit as the obvious solution for many of the urban transportation problems in China, since the 1990s, a number of authors have begun to explore how to reverse the public transit downturn. For instance, Wang et al (1995) drafted a report on China’s public transit based on a nationwide survey of public transit systems. They indicated that even though public transit had lost market share to other modes such as taxi and bicycles, it still accounted for 75% of the passenger transport volume in cities. Given the increasing demand for mobility triggered by urbanization and development, there would continue to be a gap between the public transit supply and demand, especially in large cities. This was largely due to the inertia of the planned economy
and the transfer of financial responsibility for public transit from the CCG to local
governments. State-owned public transit enterprises faced such challenges as
high staff/vehicle ratios, inefficient operations, lack of market/competition sens-
sibility, and unstable public financial support. These authors emphasized that
even though China was heading for a socialist market economy, there should
still be a balanced application of market forces and government interventions.
They contended that governments needed to study development strategy and
key technology policy, and identify and stabilize certain financial resources for
public transit, while public transit enterprises should learn to perform better in
a market economy. In response to the emerging enthusiasm for MRT systems in
China, Allport (1995) discussed the possible policy implications MRT experiences
in other countries might also have for China. He made several points: first, MRT
systems were probably not financially viable for Chinese cities; second, Chinese
cities should avoid making decisions on MRT systems based primarily on engi-
eering grounds; and third, MRT systems is not a panacea for public transit needs
and therefore sufficient attention should still be given to other alternatives such
as buses and busways.

Subsequent to those already cited, very few publications have dealt with China’s
public transit, perhaps due to the lack of venues. It was not until 1999 that the
topic was discussed again in a peer-reviewed journal. Chang (1999) surveyed
China’s public transportation experience from the 1980s through the 1990s and
commented that China had gradually recognized the need to manage auto use
and to develop public transit as a suitable alternative to the private car. However,
the reform of state-owned public transit enterprises, decentralization of decision-
making, and instability of transit finance could still endanger public transit devel-
opment. Chang and Zong (2000) noted that public transit reform was needed
and described some of the reform efforts that had been implemented or planned
since the 1990s. They also argued that even considerable progress had been
made, Chinese public transit still needed to address issues such as intermodal
policies which account for the fast motorization, integrated planning, economic,
and franchise regulations, separation of the responsibilities between government
and operating companies, and transparent fare and subsidy policies.

Bicycles and Pedestrians

Research conducted by several other authors focused on non-motorized modes
such as biking and walking. Welleman et al (1995) commented that since half of
all non-walking urban trips use the bicycle and many Chinese cities had impres-
sive facilities to support its usage, it made little sense to dismantle the facilities to
make way for motorized modes. It was feasible that cycling could be developed in
a manner that is compatible with other modes, as is the case in the Netherlands.
Zacharias (2003) commented that while the future of non-motorized modes is
unclear due to the lack of supporting policies for them, the use of bicycle, tricycle
and pedestrian modes remains a significant advantage for Chinese cities, which
face challenges to a viable and sustainable transportation future.
Liu and Guan (2005) argued that since ten million bicycles still coexisted with one million vehicles in Beijing, biking should not be given secondary treatment. However, Wang et al (1995, 311) hold a different view. “With one bicycle per capita in urban areas, bicycle ownership has reached a few millions in large cities. Operated in parallel with motor vehicles, they have overloaded the transport management capacity and congested the roads to an unbearable degree.” Lacking perhaps concrete experience with the drawbacks of extensive bicycle use in the fast motorized environment, other authors preceding Wang et al (1995) concerned themselves more with the operations and characteristics of bicycles, and their importance to Chinese cities (Liu et al, 1993a and 1993b; Ren and Koike, 1993; Yang, 1985; Tanaboriboon and Ying, 1993).

Urban Transportation Financing

Even though transportation financing is undoubtedly an underlying challenge facing China, few authors have focused on this topic. This is probably due to the fact that detailed transportation financing data (especially at the municipal level) is inaccessible to most authors. Nonetheless, many authors have generally believed that China did not adequately invest into its urban transportation system (Akaha, 1990; Zhou et al 1995; Wang et al, 1995; Wu et al, 1997). Despite the scarcity of such data, Chen (1995) and Hayashi et al (1998) still managed to explore the problems of urban transport in China from the financial side. Chen explored the applicability of the U.S. joint development and land use strategies to China’s urban development practice. Specifically, four strategies (fee-based, tax increment, equity investment, and development incentives) and their respective applicability were discussed. Hayashi et al described the beneficiary-paid system reforms occurring in China’s transportation system as a whole. They also provided a comparison of this system with those of Japan and the U.S. However, intercity highway rather than urban transportation financing that was the focus of the comparison.

Transportation Planning, Government Intervention, and Market Force

Gakenheimer was one of the few international authors who have shown a continued interest in urban transportation planning in China. He argued that largely due to lower land cost, new development in urban areas has been focused at the periphery despite a lack of transit service connecting new developments with urban centers, which pose transportation as well as planning problems (Gakenheimer, 1996). More recently, he has maintained that the problems faced by Chinese cities could be explained by parameters such as the time evolution of the increase in the proportion of automobile trip making and its rate of acceleration; the percentage and distribution of local automobile ownership; changes in urban structure; and the existence and reach of subways and other forms of public mass transportation (Gakenheimer, 2001). Regarding how to deal with congestion in China, he recommended that both municipalities and car owners should pursue shared goals to reduce congestion and they should learn from
instructive experiences in other parts of the world.

As practicing planners in China, Li and Yu (1995) argued that even though it is generally acceptable for market forces to guide urban land use development, government intervention was still needed to control adverse spillover effects. They urged planners and decision-makers to give priority to public transit and bicycles while treating private car development with caution. Using Shanghai as a case in point, Shen (1997) indicated that planning (government intervention) could play an important role in addressing urban transportation problems facing China. Specifically, he maintained that the expansion of the supply side of urban transportation systems was not feasible. He considered that trying to achieve a balance between restraining transportation demand and promoting important economic activities was more promising. Endowed with strong planning and decision-making powers, Chinese planners and government agencies are able to arrive at more effective demand-side policies such as stringent land-use plans and public transit provision requirements for new residential development.

Chinese Publications

There are many domestic publications on China’s urban transportation and the challenges facing it since 1978. Although it would be possible to draft a series of review papers for each specific challenge and for the arguments surrounding it, that is not the aim of this paper. By analyzing some key publications, this paper attempts to identify several groups of relevant publications in a chronological order, highlight their respective contribution(s), and to fit them into a framework based on the evolution of China’s urban transportation publications since 1978.

Growing Recognition of Urban Transportation

Before the mid-1990s, urban transportation and related policies were not separate topics of priority to most Chinese authors, professionals, and officials. This is largely due to the following: first, transportation congestion was not previously of the magnitude it is today; and second, the CCG had long emphasized freight transportation and seldom fully recognized the importance of urban road systems (Akaha, 1990; Bao, 2005; Xu, 1991; Zhong, 1993). Many governmental officials with final decision-making powers did not regard urban transportation as a separate and important topic parallel to highways, railways, and ports (Zhao and Kong, 1999). When urban transportation infrastructure and facilities had to be treated separately, they were deemed as something costly but generating few socioeconomic benefits (Xu, 1991). Probably due to the above ideologies, firmly embedded in so many crucial minds, urban transportation planning was reduced to a trivial subject and an engineering-centered activity. It was not until the mid-1990s that officials and planners began to divert their attention from the technical aspects to other (planning, economic, and societal) aspects of transportation (Xu, 1991). For decades, investment in urban transportation systems was minimal (see Table 3 below). Not surprisingly, very few national-level conferences were
Projections

held to specifically discuss urban transportation problems. Conferences that did
not take place resulted in the recognition of only a few all-too-common attributes of
urban transportation: (a) transportation in mega cities is as important as railway,
air, and water transportation; (b) urban transportation is not non-productive
and it can generate huge social and economic benefits; (c) a good transportation
system attaches importance to construction and to management; and (d) a
beneficiary-pay financing mechanism for urban transportation is very important
(Xu, 1991). It was largely due to the arrival of worsening road congestion in many
cities after the 1990s that governments have begun to treat urban transportation
more seriously (Li, 1997).

This attitude towards urban transportation had not, however, been ubiquitous. Before congestion worsened in Chinese cities, several authors had already started demanding more extensive research on the problems of urban transportation and a corresponding for “Comprehensive Treatment” (“Zonghe Zhili”—which will be discussed in detail later on), while advocating a clearer prioritization of policies for urban public transit, bicycle-public transit integration, static transportation, and controls of adverse impacts of motorization. Earlier, Xu (1989 and 1991) and Zhou (1993) Xu (1989 and 1991) and Zhou (1993) stressed the importance of furthering widespread “Comprehensive Treatment” awareness and supporting the Comprehensive Treatment programs in urban transportation. Zhou and Xu (1991) were advocates for public transit prioritization policy, bicycle and bus integration, traffic separation/channelization, and road redesigns/updates. Zhao (1990) took the lead in studying the upper limits of total transportation emissions applicable to Chinese cities and incorporating them into planning and policymaking processes. Zhai (1991) was among the few authors to initially recommend urban land use plans to keep pace with increased parking demands.

Increasing Interests in and Intensifying Research on Urban Transportation

Since the mid-1990s, urban transportation and its peripheral policies have become more heatedly debated topics (Li, 1997 and Zhou et al, 1995). Within a

Table 3. EXPENDITURE ON URBAN BASIC INFRASTRUCTURE (PERCENTAGE OF GDP)

<table>
<thead>
<tr>
<th>International Recommended Criteria</th>
<th>China</th>
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<tbody>
<tr>
<td>1953-1985 Annual Average</td>
<td></td>
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<tr>
<td>3 - 5%</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>0.68%</td>
</tr>
<tr>
<td>1993</td>
<td>1.66%</td>
</tr>
<tr>
<td>1994</td>
<td>1.1%</td>
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</tbody>
</table>

Note: According to China’s classifications and definitions, road and related facilities belong to urban basic infrastructure and the investments in road and related facilities were counted together with those in infrastructure. Therefore, China’s figures in the table only roughly reflect the overall expenditures on road and related facilities.

Source: Author’s summary of Wu et al, 1997
year or so, there were at least three documents published at the national level which deal with urban transportation development, strategies, and demand management (Li, 1997). Also, after years of debate, the CCG decided to give the auto industry national-level policy priority and to gradually remove policy and regulatory barriers and tax burdens that had prevented average households from owning private vehicles. The CCG hoped that the auto industry would become a pillar industry that would trigger a chain of development in the national economy (State Council, 1994a and People’s Congress, 1996, 2001). To facilitate the industry’s development, consumption taxes on domestically-manufactured automobiles were confined to 3-8% of the factory prices (State Council, 1994b). Moreover, in light of the popularity of public transit prioritization policy in both academia and the public domain, MRT has received unprecedented attention in large cities. Among the 36 cities with a population of a million or more in China, twenty have proposed developing MRT systems (Editor, 2001). Rising number of policies, increasing interest in public transit, and introduction of low tax rates for private vehicles all signify that urban transportation has gradually won wide recognition, after decades of being marginalized.

Along with the changes in policy, concerns about urban transportation in academia mushroomed as well. At least five scholarly books on urban transportation have been published since the mid-1990s (Liu, 2001b; Lu, 1998; Lu, 2001; Quan, 2002; Wang et al, 1999). This was an unprecedented number of studies within such a short period of time. For decades before the 1990s, there had only been a small number of such books in Chinese. In one of the recent publications, Lu (2001) argued that public transit, road structure, demand management, and advanced management technologies were the basic components of urban transportation policies, and that improvements to them can lead to greater efficiency of transportation systems. Compared to what was proposed before 1995 by authors advocating the “Comprehensive Treatment” awareness (Xu, 1989; Xu, 1991; Zhou, 1993), it becomes evident that noticeable changes in perceptions have gradually taken place.

Those who have not had time to read the above books have had many more papers to read since 1995. After synthesizing about 40 papers on urban transportation and related practices since the 1990s, Zhou (2001) contended that the quest to overcome congestion must take into account both the “hard” and “soft” aspects of urban transportation. Specifically, Chinese cities should (a) increase infrastructure capacity based on scientific research rather than leaders’ personal wills or wishes; (b) utilize the full capacity of current infrastructure, facilities and equipment by strengthening transportation demand management; (c) manage personal trips and harmonize the relationship among people, vehicles, and roads; and (d) regulate trip generation/attraction, parking, and public transit provision by passing well-thought-out regulations and legislation. Yang (1999) provided an even more intensive review than Zhou (2001). He categorized the literature into five groups and summarized the progress made in each category. He cites five topics of intensive study since the 1990s: sustainable transportation; congestion
and countermeasures (especially public transit prioritization policy and travel demand management); MRT systems; parking; and Intelligent Transportation Systems. He did not specifically address the gaps in existing literature and their policy implications.

Evaluation of Current Challenges, Policies, and Recommendations

As China moves forward towards a more open and democratic society, people have gradually become accustomed to debating themes that directly involve the correctness, effectiveness, and appropriateness of government policies and efforts. This is true in the field of urban transportation as well.

After briefly assessing the government-led efforts in addressing urban transportation problems since the 1990s, Li (1997) argued for innovative approaches to urban planning, private car ownership and usage, and balanced transportation demand and supply. He contended that accessibility is the key to handling the relationship of urban transportation and land use. He further noted that accessible cities were contingent on (a) compact urban form, high population density, and diversified land uses; (b) telecommuting that decreases the need to transport goods and people; (c) infrastructure and facilities accounting for the needs of non-motorized modes such as walking and bicycles; (d) competitive and attractive public transit systems covering large areas; (e) less personal motorized travel and more efficient utilization of existing facilities. He argued that private auto ownership could be encouraged, but that usage of private autos should be restricted to non-peak hours and non-congested sections of the transportation network. He also suggested several principles regarding the relationship of urban transportation supply and demand. Basically, these principles emphasized the “smart supply” approach designed to optimize modal split through travel demand management systems, transportation financing from user fees, socially acceptable transportation decisions, and greater focus on the needs of low-income, disabled, and other disadvantaged groups.

In a paper which was probably the first of its kind, Ning (1998) undertook a review of the interaction between national urban transportation and auto industry development policies and concluded that they were probably at odds. He contended that conflicts in these policies could be a primary cause of urban transportation problems. Boldly, Zhao and Kong (1999) pointed out six challenges faced by China’s urban transportation that were somewhat related to government performance: (a) out-of-date administrative mechanisms complicating the coordination of planning, construction, and management of urban transportation systems; (b) planning-, construction-, and management-related ideologies lagging behind the magnitude of the problems; (c) current policies and legislation being unresponsive to the scale and nature of problems confronting the sector; (d) codes of practice and standards not keeping pace with development; (e) experts, planners and designers not having the capabilities to handle the problems; and (f) lack of stable funding mechanisms, as most urban transportation funding was from
“irregular” (non-formalized) and unstable channels such as home bank loans and foreign government loans. They urged the government to acknowledge and fully address these obstacles.

Other authors, who did not specifically attribute the emerging transportation problems (especially congestion) to institutional factors, also started thinking more broadly about the problems and possible solutions. For instance, Xiang and Zhang (1998) made the case for solutions such as better road planning, public transit, grade separated intersections, highway flyovers, minimum parking requirements, guidance systems, wider dissemination of traffic laws and regulations, and “Comprehensive Treatment”. Ying (1998) contended that introducing public transit prioritization policies, widening trunk roads, building subways, developing multidimensional road networks, implementing traffic management, and improved urban planning, combined, were the solutions to the problems. Policy proposals similar to those described above have been proffered by many other authors (e.g., Hu, 1995, 1996 and 1998; Li, 1999; Lu, 1997; Lu and Yin, 1995; Peng, 1995; Qian, 1998; Shi, 1996; Zhang, 1992; Zhang, 1996). However, probably due to the constraints on length imposed by the journals in which the papers were published, few were able to discuss in great detail any single challenge facing Chinese cities or elaborated on why their proposed solutions would work. Also, few have attempted to do quantitative research. This might also be a result of the fact that few authors had access to detailed and systematic urban transportation data.

Increased concern about China’s growing transportation problems has not been restricted to researchers, academics, and other professionals; the media, too, have become more attentive to the problem. In 2001, the Chinese Construction Daily published an often-cited article titled “Resolving Urban Transportation Puzzles” (“Pojie Chengshi Jiaotong Nanti”) (Editor, 2001). The article indicated that Chinese cities have encountered transportation congestion since 1984 and that congestion had become a problem of national significance as of 2000. Lack of radial trunk roads, inefficient use of secondary roads and alleys, inadequate public transit supply, and poor transit services were the predominant contributors to the problem. To address the problem, China incorporated people’s concerns into its 10th national-level five-year plan (2001-2005). For instance, the plan decreed that 300 more kilometers of rail rapid transit lines be built, 20-40% more additional urban roads constructed, and 40% more public transit vehicles purchased. Unfortunately, as encouraging these goals might be, the sources of funding that were needed to facilitate their realization and the corresponding social acceptability were not even mentioned.

Advocating Public Transit

Partially due to the deterioration of urban transportation, public transit has received increased attention in peer-reviewed journals and national-level conferences since the 1990s (Hu, 1995, 1996, 1998; Li, 1999; Peng, 1995; Qian,
Projections

1998; Shi, 1996; Zhang, 1992; Zhang, 1996). In 1998, the annual conference of UTPAC was dedicated to urban transit. Conference participants agreed upon the conclusion that urban transportation administrative systems (and the reform thereof) play an important role in abating the transportation problems facing cities (Zhang, 1999). In 1999, public transit was still a popular topic among the UTPAC conference participants. However, from then on, public transit has been studied along with many other topics such as improvements to urban road systems and sustainable development.

PUBLIC POLICIES ADDRESSING THE CHALLENGES

Faced with the above-mentioned changes and challenges described above, the CCG has responded by giving urban transportation a much higher priority than before (e.g., Editor, 2001; Ma, 2004; MOPS and MOC, 2000; Zhou et al, 1995). As a result, many policies and proposals have been developed and/or implemented. Among them, the most notable are policies on the “Comprehensive Treatment” (1980 and onwards), public transit prioritization (since 1985), “Fluid Traffic Project” (“Changtong Gongcheng”) (since 2000), and “White Paper Regarding Recommendations for Improving Urban Public Transportation and the Environment” (“White Paper” hereafter) (2000). On the whole these proposals and projects served as the urban transportation authorization act of China, guiding various efforts in the field. The former three are policy principles or programs that dealt with increasing congestion while the last one is a policy memorandum aimed at addressing the adverse impacts of urbanization, motorization, and congestion. Therefore, they can be regarded as covering most of the major actions and policies the CCG has made to address the challenges. In light of the above, they are selected and examined here separately.

Comprehensive Treatment

To a great extent, the Cultural Revolution (1966-1976) put China’s transportation planning activities and related construction on hold. It was not until the late 1970s that the activities and construction gradually began to take place. What had been an artificially suppressed and distorted transportation demand in cities began to grow steadily thereafter. The drawbacks associated with under-investment in urban transportation infrastructure and facilities (especially for urban passenger transportation) during previous decades soon surfaced as the economy and urban residents demanded more mobility (Akaha, 1990 and Wu et al, 1997). As a result, many Chinese cities, especially the largest such as Beijing, Shanghai, and Guangzhou, began to suffer from serious transportation congestion (Zhou et al, 1997). This phenomenon soon caught the attention of professionals and scholars from various fields. For the first time since the end of the Cultural Revolution, a group came together to draft and submit a proposal to the CCG in 1980. In this document called “Proposals on Systematically Addressing the Metropolitan Transportation Problems by the Comprehensive Treatment” (“Guanyu Jiasu Chengshi Jiaotong Zonghe Zhili De Changyishu”), they expressed
their concern for emerging congestion, dilapidated state of urban transport infrastructure and equipment, and institutional arrangements associated with the planning, management, and construction of urban transportation systems. They indicated that the “Comprehensive Treatment” and “Systematic Methods” were the most effective ways to study and address such problems. Both the city and its transportation network are complex systems that should be studied in a systematic way. The problems in the systems can only be alleviated or solved through comprehensive measures taken by different functional government units. In other words, the political, economic, administrative, legislative, cultural, and educational means can and should be used interchangeably to address the problems (Gu, 1993a; Wang, 1989; Xu, 1989; Zhang, 2002; Zhou, 1993).

The above proposals have had far-reaching impacts. Since the 1980s, they have been incorporated into many important policies, plans, and programs endorsed by the CCG (Xinhua, 2005). In the 7th national five-year plan, adopted in 1985, the CCG adopted a comprehensive transportation policy. Unlike its 1958 and 1962 counterparts, the 7th five-year plan began to attach greater importance to passenger transportation. For decades, China has prioritized freight transportation rather than passenger and urban transportation, therefore this policy shift was considered to be very progressive at that time. In February 1991, the CCG issued another document on strengthening social and public regulations through “comprehensive treatment”, entitled “Decision on Strengthening Comprehensive Treatment of Social and Public Orders” (“Guanyu Jiangqiang Shehui Zhi’an Zonghe Zhili De Jueding”). In this document, fluid traffic was regarded as an integral part of the orders. Like a national law, this “Decision” was implemented nationally. So far, each city has had a corresponding context-specific work plan addressing the local orders.

The popularity of the “Comprehensive Treatment” approach also contributed to the birth of new research institutions and educational programs. Almost the same group of professionals and scholars who proposed the approach formed the Metropolitan Transportation Planning Unit (MTPU) under the roof of the Architectural Society of China (ASC) in the early 1980s, signifying that after decades of inaction, the study of urban transportation has been revived. Since its establishment, MTPU has helped gather more and more momentum and influence. In 1985, MTPU successfully achieved the status of an independent committee directly operating under ASC, giving birth to the “Urban Transportation Planning Academic Committee” (UTPAC). As a semi-governmental entity within the CCG, UTPAC was authorized to direct and improve the country’s research on urban transportation. With growing recognition of the importance of urban transportation, several new programs specializing in urban transportation were established outside of academic institutions affiliated with the Ministry of Communications (MC) and the Ministry of Railways (MR). With all this progress, once-neglected topics such as urban roads, MRT systems, and urban transportation planning were given greater attention (Zhang, 1999). Previously, highway engineering and railway engineering had been intensively studied within the MC and MR university
systems, but only a few urban transportation programs were in place outside
4. In this regard, the establishment of the above programs was progressive. It
reflects the partial development of the “Comprehensive Treatment” approach in
academia, as well.

Public Transit Prioritization Policy

In response to the problems of deteriorating urban transportation, the State
Council published a document on public transit entitled “On Reforming the Urban
Transit Work” (“Guanyu Gaige Chengshi Gonggong Jiaotong Gongzu De Baogao”) in
April 1985. This document clarified the CCG’s position on how to tackle
urban transportation problems. “Some systematic measures must be taken to
address the transportation congestion in the cities. All motor vehicles must be
strictly managed. Vehicles dedicated to public purposes are to be encouraged
and the number of passenger vehicles should be increased.” A year later, the
CCG National Committee of Science (NCS) further enhanced the position. In its
“Guideline for Chinese Scientific and Technological Policy” (“Zhongguo Kexue
Jishu Zhengce Zhinan”), NCS stated that “Greater improvements of urban transit
are to be encouraged. The current policy is to give priority to buses and trolley-
buses. Taxi is to be encouraged. Mega cities should gradually develop rail rapid
transit systems.”

Under the guidelines provided by the above documents, in June 1992 the CCG
reemphasized its support for urban transit. In its “Decision on Speeding up the
Development of the Tertiary Industries” (“Guanyu Jiakuai Fazhan Di San Chanye
De Jueding”), urban public transit was given priority and regarded as an important
component of the basic sectors that could affect the national economy to a large
degree. It stated that basic sectors should be developed ahead of non-basic sec-
tors. For the first time, some general goals regarding public transit and the tertia-
ry sector in which it resides were mentioned. A year later, the CCG explained these
goals in greater detail in the “Basic Thoughts on the National Tertiary Industry
Development Plan” (“Quanguo Di San Chanye Guihua Jiben Silu”): (a) all cities should develop an arterial road network with an appropriate layout and
a reasonable grade structure; (b) all cities should establish relatively complete
urban public utility systems of which public transit is a part; and (c) metropolises
should gradually build up MRT systems and arterial road systems.

Recently, the CCG again elaborated on its prioritizing strategies regarding public
transit development (State Council, 2005). It required that municipal govern-
ments (a) increase their awareness of public transit, improve public transit-support-
ing infrastructure and facilities, and optimize their public transit operational
and management structure; (b) ensure priority rights-of-way for public transit; (c)
reform the public transit sectors steadily and actively; (d) intensify supportive poli-
cies for public transit; and (f) streamline or reinforce the organization, leadership,
and supervision of public transit.

Since there are no equivalents of U.S. transportation Authorization Acts in China,
all the previously-mentioned CCG documents actually comprise national policies that deal with urban public transit. In addition to these policies, there are also some technical codes of practice specifically addressing public transit issues. For instance, the “Code for Transport Planning on Urban Roads” details many minimum planning requirements for cities of different sizes. It stipulates that during peak hours, the urban public transit plan should ensure that the maximum travel times of 95% of one-way trips should not exceed the figures given in Table 3.

The Fluid Traffic Project

The most recent national-level comprehensive program aimed at urban transportation problems in China is the “Fluid Traffic Project,” launched in 2000. Since the late 1990s, the Ministry of Construction (MOC) and the Ministry of Public Security (MOPS), the leading cabinet departments responsible for urban road planning, construction, maintenance, and traffic management, have attached greater importance to urban transportation and have organized many conferences focusing on urban transportation problems (Zhou et al, 1997; Li, 1998b; Wang, 2000). However, the actual influence of the various conferences has been limited. Partially due to this, the MOC and MOPS published a joint administrative mandate in January 2000 (MOPS and MOC, 2000), requiring that selected cities across the country implement the “Fluid Traffic Project” to deal with increasing traffic congestion. It is hoped that by better coordinating road construction and traffic management activities of different governmental agencies, several cities can alleviate congestion and also generate instructive experiences from which other cities can learn. To evaluate the progress made by different cities, the “Fluid Traffic Project” classified urban traffic management into four categories, distinguished by certain criteria: exceptional management, excellent management, good management and qualified management. A goal of the “Fluid Traffic Project” was that the 36 largest cities should reach the level of “good management”

Table 4. MAXIMUM TRAVEL TIMES AND RECOMMENDED MODES OF PUBLIC TRANSIT IN CITIES

<table>
<thead>
<tr>
<th>City Population</th>
<th>Maximum One-Way Travel Times (in min.)</th>
<th>Recommended Modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>&gt; 2 million</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>1-2 million</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>&lt; 1 million</td>
<td>40</td>
</tr>
<tr>
<td>Medium</td>
<td>0.5-1 million</td>
<td>35</td>
</tr>
<tr>
<td>Small</td>
<td>&lt; 0.5 million</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: The Ministry of Construction, 1995, the Code for Transport Planning on Urban Road
within 2-3 years. The criteria and framework used by the “Fluid Traffic Project” are summarized in Table 4.

Table 4 indicates that the “Fluid Traffic Project” is a fairly comprehensive government-led program focusing on congestion. Not shown in Table 4 are a few codes introduced in the 1990s such as the Road Signal Installation Codes (GB14886 94), the Road Traffic Order Evaluation (CA-T175-1998), and the Road Traffic Sign and Symbol (GB5768-1999). All the above made the “Fluid Traffic Project” the first of its kind to integrate road planning, construction and routine traffic management, and to link several seemingly unrelated codes and regulations together in a single government initiative. Like most other government programs, the project attaches the utmost importance to the leadership of the CCG, interagency coordination, “mass line”, and mass perspective.

White Paper

Almost at the same time that the “Fluid Traffic Project” was adopted, the MOC and the State Environmental Protection Agency (SEPA) co-published another document dealing with urban transportation and the environment. In this document titled “White Paper Regarding Recommendations for Improving Urban Public Transportation and the Environment”, the MOC and SEPA provincial and local branches were required to consider policy proposals made in the document. Several leading experts and government officials played an important role in generating this document. They had just been given the opportunity to visit selected Chinese and European cities and to investigate urban transportation and environmental issues internationally. Partially based on the investigation results, the experts thought that it was time for them to address the issues faced by urban transportation development should be subject to the sustainable strategy of the nation and should keep pace with growth in travel demand while ensuring improvements to the environment. They pointed out that Chinese cities faced six great challenges: (1) inefficient use of spatial and land resources; (2) huge amounts of wasted time; (3) air pollution; (4) noise; (5) excessive energy consumption; and (6) accidents. They emphasized municipal governments should strengthen the following: (a) coordination of different sub-agencies; (b) urban public transit planning and policies to give priority to public transit; (c) transportation laws and regulations, especially concerning urban transit; (d) application of advanced technologies to improve vehicle emissions and fuel quality; (e) pricing policies; and (f) propagation of transportation regulations and clean energy knowledge. To accumulate experiences applicable to Chinese cities, they also suggested that demonstration projects be carried out in Shenzhen, Dalian, Kunming, and Qingdao to comprehensively address urban and environmental problems. This makes the “White Paper” one of the earliest government documents to comprehensively address urban transportation and its environmental impacts. However, as a country, China has not yet fully implemented its transportation emission standards. Only a few cities such as Beijing, Shanghai and Shenzhen have decided to pursue the Euro
Table 5. **EVALUATION FRAMEWORK OF THE “FLUID TRAFFIC PROJECT”**

<table>
<thead>
<tr>
<th>1. Traffic Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Traffic Order (how drivers, cyclists and pedestrians obey the law)</td>
</tr>
<tr>
<td>1.2 Operational speeds of arterial roads</td>
</tr>
<tr>
<td>1.3 Rates of violation of traffic codes and regulations</td>
</tr>
<tr>
<td>1.4 Static traffic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Traffic Police: Leadership and Internal Management</td>
</tr>
<tr>
<td>2.2 Coordination and Planning</td>
</tr>
<tr>
<td>2.3 Supervising Center</td>
</tr>
<tr>
<td>2.4 Traffic Guidance</td>
</tr>
<tr>
<td>2.5 Traffic Circulation</td>
</tr>
<tr>
<td>2.6 Operation Efficiency</td>
</tr>
<tr>
<td>2.7 Response to Demands</td>
</tr>
<tr>
<td>2.8 Accident Handling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Codes and Regulations (availability and completeness)</td>
</tr>
<tr>
<td>3.2 Implementations of Codes and Regulations</td>
</tr>
<tr>
<td>3.3 Work Ethics and Behavior of Police</td>
</tr>
</tbody>
</table>

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<tr>
<th>4. Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Awareness of Serving the People</td>
</tr>
<tr>
<td>4.2 Concrete Measures to Help the Masses</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Propaganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1 Social Marketing</td>
</tr>
<tr>
<td>5.2 Educational programs</td>
</tr>
<tr>
<td>5.3 Awareness of the Masses Regarding Regulations and Laws</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 Transportation Signals</td>
</tr>
<tr>
<td>6.2 Intersection Channelization</td>
</tr>
<tr>
<td>6.3 Signage and Symbols</td>
</tr>
<tr>
<td>6.4 Separation of Traffic According to Modes</td>
</tr>
<tr>
<td>6.5 Parking Facilities</td>
</tr>
<tr>
<td>6.6 Public Transit</td>
</tr>
<tr>
<td>6.7 Public Facility: Road Network, Lighting, Sewage, and Toll Facilities</td>
</tr>
</tbody>
</table>

Source: Author’s summary based on MOPS and MOC, 2000

2 emissions standards (Wang and Liu, 2002).

**PUBLICATIONS AND POLICIES: A COMBINED LOOK**

The preceding sections are not exhaustive reviews of existing publications and policies related to China’s urban transportation and the challenges facing it. However, they do provide very good reference points by identifying milestones and to invite exploration of possible gaps in research. Because the publications
and policies reviewed in this paper are either from peer-reviewed journals or by or from the CCG, they may provide clues regarding the dominant features of the research and policy focusing on challenges facing China’s urban transportation systems. The following section discusses several of the possible gaps. (Interested readers can easily identify the milestone publications and policies on their own.)

One area of study where future research and policy would be useful is to explore the possibility of incorporating the ideas of accessibility and of fair treatment of bicycles and pedestrians in urban transportation plans and policies. Several authors have made notable research progress in these areas while the key policies reviewed in this article seem to have not fully considered the ideas.

Second, as a few authors have pointed out, China’s urban transportation policies and strategies probably have favored the private automobile (and therefore the wealthy) rather than public transit (and the poor). If this is true, this means that current transportation policies are probably not as effective as the policymakers had wanted them to be. Consequently, current policies should be somewhat modified to balance the increased demand for individualized mobility and the transportation needs for all.

Third, there might be some structural problems with China’s current transportation planning, management and/or construction systems. A few authors have argued for reform to the systems (Zhao and Kong, 1999). However, the contents of the key policies reviewed in this article indicate that the CCG-led efforts might still focus on interagency “coordination” rather than on reforming the systems.

Fourth, some authors have seen the role of financing in urban transportation, and advocated various measures to strengthen, stabilize, and sustain it (Xu, 1991 and Zhao and Kong, 1999). In contrast, the current key transportation policies reviewed in this article seem to emphasize visions but somewhat elude the issue of financing. Given that only 12% of urban transportation funding in China now is from relatively stable, reliable, and sustainable sources, it is probably worthwhile paying more attention to the issue of transportation financing in the public policy domain.

Fifth, assuming that the publications and policies reviewed in this article have largely reflect the situation of all the publications and policies focusing on China’s urban transportation, there might be some important topics missing in the areas. For instance, authors and policymakers might have not fully addressed such topics as the social goals of urban transportation systems, impacts of the global economy on them, and innovations within them.

Even though the publications focusing on China’s urban transportation are extensive; however, based on the publications reviewed in this article, it seems that only several of them have attempted to evaluate the past and existing publications and policies. Even fewer have tried to compare the existing local and international research findings and policies and evaluate the possible gaps
between them.

DISCUSSIONS AND CONCLUSIONS

This paper has explored both the challenges facing urban transportation in China and influential publications and key policies formulated since 1978 to address these challenges. This analysis indicates that China’s urban transportation is encountering multiple challenges such as fast urbanization, skyrocketing demand for mobility, rapid motorization, increasing congestion, noise, and air pollution. Important progress has been made in the research and policies aimed at addressing these issues. This exploration had begun to identify possible gaps in urban transportation research and between this research and policy making. It is possible that these preliminary research findings can affect both individuals that are or will be using China’s urban transportation system but also the well-being of the country.

The findings of this paper could also be used as information guide for meaningful partnerships among local and international authors, researchers, and policymakers and to facilitate the timely exchange of ideas and information in the field of urban transportation. Based on preliminary findings of this article, the author suspects that such partnerships might have been lacking.

This research suggests that the scale, diversity, complexity, and scope of the challenges in the field are large. The CCG might benefit from establishing a national urban transportation library and a national urban transportation statistics agency. It could serve as a source of information and a data clearinghouse to support the previous partnerships. Also, it is hoped by the author that, on the one hand, the library and agency can help local and international researchers and policymakers conduct better research on and make more informed policies for China’s urban transportation systems; on the other hand, resulting findings from the research can greatly enhance the world’s knowledge base of transportation, which is “crucial for our economic competitiveness and commercial, economic and cultural exchanges” (European Commission, 2001).

There have been few reviews of China’s urban transportation policies and publications. Given that both people and cities often make progress learning from past experience, regular review and evaluation of relevant existing publications and policies is highly recommended. It is important for such reviews to be made from an international perspective. There are opportunities for mutual gains in the urban transportation field if countries take the time to learn from one another’s experience.
ACKNOWLEDGEMENT

I am extremely grateful to Professors Genevieve Giuliano, Siim Sõöt, and James Polk, Mr. Peter Midgley, and Ms. Sara Hayden for their assistances and suggestions. I also thank four anonymous reviewers so much for their insightful comments on this paper. However, any remaining errors in the paper are my own.

ENDNOTES

1. If the “floating population” (undocumented or documented migration from rural to urban area) is taking into account, the figure is much higher.

2. For instance, the CCG claimed to spend at least 500 billion RMB in five years on basic infrastructure and facility in which transportation is a major part in 1998.

3. Since the majority of personal travel survey data in Chinese cities are not open to the general public, the figure was calculated from several cited references such as Luo and Qian 2004 and Qian and Chen, 1997.

4. There were no private universities in China until very recently and all the public universities had been separately supervised and funded by different cabinet departments at the CCG and their counterparts at the provincial and municipal governments.

5. During the evaluation process, whether a plan has met these requirements will primarily depend on blended information provided by respective travel demand models and external expert opinions.

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