Collaboration and Learning:
The Means to Sustainable Transportation in China

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Collaboration and Learning:
The Means to Sustainable Transportation in China

By Alainna Thomas

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in City and Regional Planning in the Graduate Division of the University of California, Berkeley

Committee in charge:

Professor Elizabeth Deakin, Chair
Professor Karen Christensen
Professor You-tien Hsing

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“He who knows when he can fight and when he cannot, will be victorious.” --Sun Tzu

"It always seems impossible until it's done."--Nelson Mandela
Abstract
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Sustainable transportation measures have been widely promoted in China since the late 1990s; several organizations (Deutsche Gesellschaft für Technische Zusammenarbeit [GTZ], World Bank, Asian Development Bank) have provided training and exposure to Chinese planners and leaders on these practices. Yet few cities have incorporated them fully into their transportation systems. This dissertation investigates the reasons for the uneven implementation of sustainable transportation measures in China.

Many sustainable transportation policies require inter-agency collaboration, working across vertical boundaries, for these planning interventions to take hold. For example, a popular transportation intervention has been bus rapid transit (BRT), imported from the South American cities of Curitiba, Brazil and Bogotá, Colombia. These express bus systems can handle subway-level transit demand but are far less expensive than subways and can be delivered much faster. However, BRT implementation also requires coordinated action across multiple agencies – urban planners, bus operators, street engineers, traffic operations managers, and traffic enforcement officers.

Using a qualitative research approach based on field observations, interviews, and analysis of government records and reports, I investigate how two Chinese cities – Jinan and Kunming—incorporated sustainable transportation policies into their transportation systems. The impacts have been substantially different. Public transit accounts for 25% of daily trips in Kunming (38% in the central city area) and only 16% in Jinan, despite Kunming having twice the passenger vehicle population as Jinan. This research shows that these differences are related to how these cities learned about sustainable transportation practices and implemented them.

The research uncovered significant differences in the intellectual and practical framing of the issues between the two cities. Kunming planners frame public transit as the backbone of their transportation system and urban development. This unique and unusual perspective came out of a decades-long sister-city partnership with Zurich, Switzerland that took into account both theory of good urban form and practical examples of how to produce a sustainable transportation system by combining transportation and land use planning. The Kunming planners have consistently pursued sustainable transportation measures in their planning, and as a result of the partnership, transportation planning has greater legitimacy within Kunming’s urban planning system. In
contrast, while Jinan transit officials embraced sustainable transportation measures such as BRT and transit-oriented development (TOD), these measures were never fully integrated within their urban planning system. They were conceived of as projects. For BRT, the focus was placed on physical planning of the corridors and stations, but little attention was paid to organizational requirements for implementation. One result of these different approaches has been that Kunming planners have a range of sustainable strategies, the ability to adjust these strategies to changing conditions and contexts, can incorporate new knowledge, and support their strategic direction based on empirical evidence and experience, whereas Jinan has struggled to maintain and extend their BRT system and has only been able to make incremental changes.

This research draws upon theories of policy transfer and challenges claims that municipal leadership is the key to successful implementation of innovations. From my research, leadership support is only one ingredient; capacity building among staff, inter-agency collaboration, a combination of theoretical and practical examples, and empirical evidence of success are equally important to substantive and continuing learning and innovation.
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Chapter 1: Transportation Planning in China: Cars, Complexity, and Outdated Planning Practices

For the past two decades Chinese cities have experienced rapid growth along with substantial increases in vehicle ownership and use. While the economic reforms driving urbanization and motorization have increased incomes for many, they also have resulted in severe congestion, pollution, and motor vehicle fatality rates in many cities. In response, Chinese municipal governments have been searching for ways to improve transportation systems to make them safer, cleaner, more reliable, more efficient, and available to all. Strategies for delivering such systems are encompassed by the concept of sustainable transportation systems.

What are the reasons behind the uneven achievements on the sustainability front? Is this simply because car culture has taken over and city leaders are ambivalent about reining in auto use? Is it that despite the efforts of prominent international organizations, Chinese planners are still lacking the planning tools (strategies, technology, educational/professional background, policies) to address urban planning issues in this new dynamic market-oriented planning environment? Or are their other factors that explain the current situation?

In this chapter, I provide a brief overview of China’s urbanization and rising car ownership as well as the planning legacies that contributed to current conditions. I then provide an overview of the research I have undertaken to investigate the role of institutions and learning processes in the creation of more sustainable transport outcomes.

Chinese Cities: Rapid Urbanization and Rapid Motorization

Economic and Population Shifts

Rapid urbanization and massive land development have created a very challenging urban planning context for transportation planners. From 1990-2010, China underwent a drastic shift in its economy. The economy’s composition shifted as agriculture declined from 27% of the GDP to only 10% and service industries’ share of GDP grew from 32% to 43%. In parallel, the population changed from rural to urban. The population was 74% rural in 1990 but only 50% rural in 2010. The urban population increased 24%. Along the way, incomes increased greatly and vehicles became affordable for many citizens.

In terms of GDP growth for the country, China saw an average annual increase of 13% in real GDP. As hot as its economy was, once China entered the World Trade Organization in 2000 and luxury taxes on cars dropped, the passenger vehicle population outpaced GDP growth significantly (see Figure 1).
China’s energy consumption increased significantly to fuel such unprecedented growth. Since the 1990s, coal consumption has increased 300%, while crude oil consumption has doubled. China shifted from a crude oil exporter to an importer in the 1990s, increasing its oil dependency in parallel with its increase in car purchases.

Cities throughout China have not been able to keep pace with this rapid growth. In particular, infrastructure such as roads and public transit were in short supply and were quickly overburdened. Master plans intended to guide city development and growth for the next 20 years were overtaken by growth far faster than predicted. While roads are included as part of the master plans, public transit systems are seen as an afterthought (Zhi and Smith 2006, 4, Li and Yu 1996). Therefore, opportunities to link public transit to urban development are missed at critical moments of planning.

Because local governments have greater financial responsibilities, they are focused on raising revenue. Many local governments focus limited resources into new development to attract investment, at the cost of repairs to older areas of the city. A common sight is a deteriorating inner city juxtaposed against a nearby highly developed suburban new town (Zhi 2005).

A Modern Challenge – The Personal Car

Since the central government enacted the national Household Car Policy in 1994, encouraging personal car ownership, ownership has risen annually 30% since 2000 (see Figure 2), with the number of registered vehicles increasing almost 500% between 2001 and 2008 (Pan 2011). China’s transition to the top auto market has also led to increased environmental degradation (Watt 2013). According to a recent Organization for Economic Cooperation and Development (OECD) report, from 1990-2007, the country experienced 172% growth in CO₂ emissions from fuel combustion.
China went from contributing 7.3% of the world’s carbon emissions in 1973 to 27% in 2008. The 12th Five-Year Plan (2011-2015), the national plan the identifies the country’s economic and development objectives, called for a 16% reduction in energy use per unit of GDP and a 17% reduction in carbon dioxide emissions per unit of GDP. While improved technology is the main strategy for reducing carbon emissions, the government has also sought additional ways. For the transport sector, it has reiterated that public transit continues to be a priority, encouraging cities to have public transit comprise 40% of daily trips.

Chinese urban planning experts spoke out against the Household Car Policy in the early 1990s (Shen 1997) and warned that weak municipal infrastructure and the staggering rise in vehicle use, particularly in personal cars, would quickly lead to severe congestion. They recommended cities incorporate more sustainable transportation policies into their plans (Stares and Zhi 1995). Since the mid-1990s, efforts have been made to expose municipal leaders and urban planners to sustainable development concepts and strategies, including public transit improvements (Zhi and Smith 2006, 6). Nevertheless, the personal car population has grown in parallel to sustainability measures, from 259,000 to 38.3 million (see Figure ).

Alarmingly, a recent study (Darido, Torres-Montoya, and Mehndiratta 2009) on the motorization trends of 17 Chinese cities found that environmental improvements due to advances in vehicle technology were being eroded by shifts in travel behavior, such as personal car use. They cited “increases in trip rates, increases in distance of motorized trips, and decreases in vehicle size or occupancy as driving increases in emissions” (6). The decreases in vehicle size has allowed for lower prices, making ownership even easier.

Rapid growth has not only led to the severe congestion experts predicted (Wu, Wang, and Yao 1995), but also deadly urban environments with increasingly dangerous streets. Major

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1 This includes only civilian vehicles.
metropolises (e.g., Shanghai, Beijing, Guangzhou) have been the first to experience these woes
and are attempting more stringent responses, but now many second-tier Chinese cities are facing
rising personal car populations as a critical mass of consumers has become able to afford
personal cars. Some of these cities have experienced annual growth rates in their motor vehicle
fleets ranging from 10% to an astounding 50%. Second-tier cities are critical to any reduction in
China’s carbon footprint as they represent where a majority of China’s 1.4 billion people will be
living, especially since the central government has set a target of moving 400 million people
from rural areas to urban ones.

In prior years, even with the increase in traffic congestion and energy consumption, the State
Council did not act until 2005, issuing Opinion #46 calling on local governments to improve
public transit. This was widely considered a major first step, but while the Opinion provided a
number of suggestions, the definition of “improve” was left to interpretation. This vague
document encouraged local governments to increase funding of their public transit systems. But
public transit had been sorely overlooked and neglected for decades (Yang 2007). Public transit
supply was lacking in many cities, and even in cities with substantial public transit, customer
service and comfort were in need of great improvement.

Motivation for this research

“It’s not like…say China…where planning is done by fiat.” –3/12/2013, lecturer at
University of California, Berkeley

This remark from a western planning expert describing how planning in China is done reflects a
common belief among western planners that in China, once a leader issues a directive, planning
just gets done at a lightning pace; everyone falls into line and said task is completed. Within
western urban planning circles, I have heard this myth repeated often enough that it almost seems
real (and is real to some), even though tangible evidence illustrates that this is not the case
(Zhang 2002a, Wei 2005). There is an embedded assumption that planning expertise is in place
and that the only challenge to more sustainable planning in China is the approval of leadership.
The failures to take action are seen as failures of leaders either not being willing to prioritize
sustainable outcomes over short-term economic gains or failing to take full advantage of the
agency they have to redirect staff toward more sustainable strategies.

The belief that mayoral action leads to change is a corollary of this view and spurs many
advisors – from international banks to NGOs to university research groups – to focus on mayors
in China, aiming their efforts at persuading the mayors to pursue sustainable transportation
projects. But what happens after a mayor decides to move forward and do sustainable
transportation planning, such as bus rapid transit? Planners are now under pressure to implement
these plans in this fast paced environment. Do they know how to do this? As I will show in this
research, they may not in fact have adequate understanding of the basic planning tasks to know
how to implement them effectively, particularly if they need an understanding of the links
between transportation and land use. These are two different realms in China and both education
and employment opportunities for transportation and land use planners are disconnected in most
cities. Concepts of sustainable and “green” development show up in Chinese cities in widely
broadcast slogans (“better city – better life”), but these concepts are widely believed (at least in
the West) to require interdisciplinary approaches to planning, which contradicts the status quo of
traditional Chinese planning that relies on a formulaic and siloed approach to planning.
Contradictory policies at the national level may be part of the problem. A report by the World Bank on Sustainable Transport points to national policies and guidelines that contradict efforts at sustainable development, such as land use guidelines that restrict road space in new developments (Zhi and Smith 2006). One example is the national road design guidelines (see Appendix). The national road design guidelines are standards for cities to use in designing their roads and specify the width of streets based on the population. This contradictory policy environment, that on the one hand supports personal vehicle ownership and the other promotes public transit may also be why a mayor’s actions toward sustainable transportation seem inconsistent or wavering (Transport and Energy and Mining Sector Unit 2007).

Technical capacity has also been identified as impeding greater sustainable urbanization. A recent report from the World Bank Institute and the Urban Planning Society of China pointed to a significant lack of qualified planners and also identified a lack of training to address emerging problems that include both land use and transportation planning (2007). In fact, new forms of training for Chinese planners may indeed be a necessary part of the answer but it does not appear to be sufficient. Transportation planners in major cities have taken workshops on sustainable development policies such as bus rapid transit or transit oriented development, but per their own admission, that does not translate into the ability to implement these ideas within a Chinese planning context. As a senior transportation planner in Beijing told me:

I understand transit-oriented development, but what if we only have control over the land, and not the transportation. Or vice versa. How do we address that issue? You experts assume we have control over everything and we don’t. You can’t advise on real issues in Chinese planning. We need advice on how to do these things in China, not [just on the theoretical aspects].

Technical assistance can help fill gaps in local capacity but more often than not is delivered in a way that is only partially effective in the short term and does little to build local capacity for longer-term impacts. Many of the organizations that provide direct technical assistance are focused on project delivery and pay little attention to the need to revise Chinese planning practices so that the Chinese planners could develop and deliver projects themselves. These experts may work with local planners to the extent that they can but they often just do the work themselves and then depart. This approach gets the project built but it does not create the local capacity necessary to create additional projects or even manage existing ones under changing conditions. Of note, the World Bank from 1999-2009 spent over $3.24 billion in East Asia on transport projects and in loans (Mitric 2013), a majority of which were in China.

My experiences over the past decade working in China and witnessing the uneven success of sustainable development policies and projects led me to consider not only the current political context but also historical precedents and institutional structures that impede transportation planners from incorporating more sustainable policies. Having witnessed the introduction of sustainable transportation concepts, such as transit-oriented development, and watched them evolve from an idea to actual implementation, it has become clear to me that something got lost in the translation on both sides—from the Chinese and from the West.

I took part in a national forum2 that promoted bus rapid transit and saw many cities promising to put these systems into operation, but I also saw that most had difficulty carrying these promises

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2 The International Mayors Forum on Sustainable Urban Energy Development 2004. See the Kunming and Jinan chapters for more information about this forum.
out. When they did implement projects many of the projects had less of an impact than anticipated. I talked with many planners who expressed frustration over not knowing how to translate sustainable transportation ideas into the Chinese context even when their mayors were supportive.

I also talked with planners who felt that they knew what had to be done but were blocked by the structural limitations of planning institutions and assignments of responsibility. Based on my experiences, I sought to move away from conceiving of urban planning as solely a top-down exertion of power by the mayor, or something that could be fixed by reforming national policy and persuading mayors to order new projects, because I was witnessing something vastly more complex and nuanced on the ground. Having seen firsthand the difficulty in translating western practices to the Chinese context, and in implementing new ideas within the existing institutional structure, I sought to better understand and document the barriers impeding learning and action for these planners.

Planning by Numbers—The Soviet Planning Legacy

Although great improvements and gains have been made since the late 1970s in increasing personnel, funding, and decision making power, the current approach in China still tends to follow the Soviet mode, emphasizing physical planning, project allocation, and urban design. — (Wei and Li 2002)

One aspect of the problem can be traced back to the Soviet planning legacy still holding sway throughout China, a planning system that focuses on narrow technical application of standards and is unresponsive to the vast changes in the urban landscape that have occurred (e.g., economic development, household location, commuting patterns, mode choice, and auto ownership and use). It is also a planning system that separates economic planning from physical planning and social from economic planning (Li and Yu 1996).

Overwhelmingly, China’s urban planning system is perceived as ill equipped to address new planning issues that have emerged (Leaf 1998, Gar-on Yeh and Wu 1999, Lin 2002, Abramson 2006, Zhu 2004, Lin 2003, Wei 2005, Liang and Hui 2009). This system was introduced by the Soviets and despite a split in 1965, the Chinese continue to rely on the Soviet-approach to planning and practice (Xie and Costa 1993, Sit 1996, Lu 2003, Abramson 2006, Leaf 1998). The Soviet approach focused on physical planning, creating self-contained work units within cities, based on spatially based formulas. “Planning, in the sense of allocative decision making, took place within the cellular structure of the danwei (work unit), leaving only municipal engineering, a component of the municipal construction bureau, to maintain the basic infrastructural links between the cells”(Leaf 1998, 147).

Unlike western planning practice, social science did not influence urban planning and this adds to the current urban planning system’s inability to deal with these new planning issues. Abramson et al. (2002) argue

Urban planning practice in China…is a profession with a single tradition, derived virtually in its entirety from the design professions, and especially the socialist Soviet one. In Chinese, urban planning (guihua) is clearly distinguished from economic planning (jihua)…Under the centrally planned economy, therefore, urban planners have had little opportunity or reason to include economic or social analysis in their activities (with the occasional exception of user needs analysis), and, unlike in the West, neither theory nor practice has been fundamentally influenced by the social science critique (168).
Thus, issues such as the impact of redevelopment on communities or loss of community do not enter many planners’ minds or are not considered seriously. Furthermore, economic planning and urban planning are not only organizationally separated but also conceptually segregated (Li and Yu 1996).

To provide further evidence of this spatially focused approach, in Table 1 are national development standards for land use. These come from planning standards brought over by the Soviets. The impacts of this approach to transportation planning have resulted in large block parcels with few roads. Land is approached in a formulaic way, not taking into consideration the needs of the city or market.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Land use standard (m²/person)</th>
<th>Land use structure (% of the land parcel)</th>
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<tbody>
<tr>
<td>Residential Area</td>
<td>18-28</td>
<td>20-32</td>
</tr>
<tr>
<td>Industrial Area</td>
<td>10-25</td>
<td>15-25</td>
</tr>
<tr>
<td>Roads and Squares</td>
<td>7-15</td>
<td>8-15</td>
</tr>
<tr>
<td>Green space</td>
<td>≥ 9.0</td>
<td>8-15</td>
</tr>
<tr>
<td>Including public green space</td>
<td>≥ 7.0</td>
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Source: Ministry of Construction

Following these standards, China’s urban plans are often produced with swift action and little regard for on-the-ground conditions. The planning system has evolved to become a “blueprint planning” system. For example, land parcels can be divided up in ratios that match the land use standards for a projected population or the percent of land devoted to each use for a development area (see Table 1). But these land uses are very generalized and are open to interpretation. Green space, for example, can be interpreted as a park area or it can be a grass border around a parking lot. In addition, the road space as a percentage of overall land area – 8-15% – is less than half that in typical western cities. However, Chinese planners follow this in their designs, which is a factor in rising congestion in the country. Real estate developers use these standards to reduce the amount of infrastructure they have to provide. Thus, attempts to have smaller block sizes are thwarted because smaller block sizes would require an increase in roads that exceeds 15%.

The influence of the Soviets is also evident in the Urban Road Design Code (see Appendix) or the Residential Area requirements (see Table 1). The Urban Road Design Code (see Appendix) allows cities to build roads as wide as 70 meters based on their population size. This has resulted in cities with wide boulevards down the middle, creating barriers for pedestrians and encouraging more auto-use (Yang 2007). The Urban Residential Design code (see Appendix) creates superblocks, square-kilometer walled residential blocks that hinder access to public transit (Pan 2011).
How has the Soviet planning approach impacted transportation planning? Transportation planning as a legitimate discipline and institution is still a relatively new phenomenon. Until the 1990s, the main responsibility of transportation planners consisted of road design (Zhou 2006). Under a centrally planned economy, population and urban growth was controlled, people’s mobility restricted and private transportation options were limited, thus transportation planning’s role was minor. In the 1980s, with the rise of bicycles, transportation planning issues became more prominent. The lack of a dense road network married with millions of bicycles created congestion in cities across China. However, “in the 1980s, there were no studies on transport development strategies and policies” (Li and Yu 1996, 374).

By 1990, the bicycle population had reached nearly 300 million (Wang 1989, 171). Bicycles gained such popularity because they were as fast or faster than buses at this time; bus service was extremely poor. A popular idea for addressing congestion was to reduce the number of bicyclists by improving public transit and getting people to take transit. Many Chinese urban planning and transportation planning experts believed that bicycles were taking valuable road space from vehicles, such as buses. In their minds, bicycles competed with buses. If more people took public transit, and less people bicycled, the roads would be less congested. They did not consider how people accessed public transit or how far many of their trips were. In addition, in order for municipal governments to move people from bikes to buses, they would have had to make a substantial investment in public transit. For example, to get half the cyclists in cities such as Beijing, Tianjin, or Shanghai to take public transit instead of cycling would have required a 56% to 378% increase in buses (Wang 1989, 179). This is only taking into consideration the number of buses per capita. This does not take into account where people are actually going or if buses would actually be the best option.

Yet, a significant institutional bias against public transit exists because transportation planning has been second to land use planning within this system. Cities under a planned economy were defined as sites of production. Land and infrastructure, including public transit, were divided into two types of uses – productive and non-productive. Public transit was perceived as non-productive. For almost 30 years public transit, as a form of infrastructure, has been underfunded and neglected in China (see Table 2 below) (Wu 2010, Zhou 2006). For example, in 1985, public transit vehicles per capita was 2.5 vehicles to 10,000 people (Ganshi 1996). It was considered a cost, and its social benefits undervalued (Yang, Feng, and Cao 2007, Yang 2007). Furthermore, transportation planning-related national laws and guidelines were not drafted until the mid-1990s. Public transit did not become a critical national issue until the early 2000s; only after car ownership had gained popularity and vehicle congestion became a common urban dilemma did the central government issue edicts calling for making public transit a priority. Yet, the difference between national desires and local interpretations can be great (Yang, Feng, and Cao 2007). The mindset of many planners was transfixed on engineering and not on planning (Zhou and Qiu 2009).

Since the 2000s, more attention has been paid to transportation planning and numerous sustainable transportation projects, such as bus rapid transit have been launched in China to uneven results. While leaders may call for change, the system and institutions in place are not

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3 At the China Urban Transport Strategy Symposium in 1995, several leaders and experts from ministerial-level planning organizations expounded on this point. This corollary continues to this day, as bike and bus continue to be seen as adversaries, not cars.
fully equipped to address an increasingly complex environment that now includes greater personal travel choices (Wu, Wang, and Yao 1995, Transport and Energy and Mining Sector Unit 2007). And when planners have brought western ideas over, they often ignore the theories and contexts from which these planning models originate or that influenced these models (Li and Yu 1996).

Table 2. Infrastructure and Public Transit Investment, 1953-1994

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<td>Percentage of National Gross Domestic Product</td>
<td>0.37</td>
<td>0.68</td>
<td>1.66</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Source: Zhou (2006, 34)

Despite national calls in the early 2000s to make public transit a priority, transportation planners were not equipped to address these transportation-planning issues. Within the division of planning tasks, transportation was a separate technical exercise done to support land use, but the transportation-land use connection has only recently been brought into the discussion. The compartmentalization of planning over the past 30 years has concretized a static planning process that ignores the dynamism of Chinese cities – the rise of personal cars, continuous flows of migrant labor to cities, further separation of jobs and housing, etc. Politically, a segregated and siloed planning process means inter-agency collaboration is uncommon, weak, or done warily.

In sum, limited technical capacity is partially a result of China’s formulaic approach to planning. These formulas rely on sequential but isolated planning by subject area, not coordinated planning and collaboration. The institutionalization of sustainable measures within the transport sector continues to fail because of inadequacies in institutional capacity and incentives to translate knowledge to action (World Bank and Urban Planning Society of China 2007). Innovative transportation planning requires the ability to translate western concepts of sustainable transportation into a common language and then put them into action, essential skills for innovation to take place (Cohen and Levinthal 1990). In addition, an organization or a person’s ability to learn and exploit new ideas is based on their base knowledge (Hall 1993). As stated above, until recently transportation planning was seen as solely technical work requiring knowledge of engineering and the aforementioned standards. The economic, social, and administrative issues tied to transportation planning were overlooked (Zhou 2006).

Taking into consideration the abovementioned limitations and challenges, how then can sustainable development be achieved in China? Certainly stronger and more coherent national policies regarding sustainable transportation are needed, as are mayors who are willing to lead in promoting sustainable practices and policies; but equally important is the need for a new approach to planning, in contrast to China’s traditional rational comprehensive planning, in order to more be able to do more dynamic and responsive planning to address wicked problems (Wu 1997).

Locating the Barriers to Innovative Planning

Understanding how and where the implementation of sustainable transportation policies flounder could foster new approaches to and a greater understanding of the learning process. Yet, little
research exists on planning practice or how learning happens in China (see Chapter 2). My research contributes to a greater understanding of the learning process and identifies the challenges to incorporating new transportation planning concepts such as bus rapid transit into Chinese transportation systems. I focus on how planners learn to implement new ideas such as these within a conflicted planning context that on the one hand promotes more public transit, and on the other promotes car ownership.

Municipal transportation planning agencies oversee the design, planning, and implementation of policies that could mitigate China’s current path of environmental degradation. If one of the keys to reducing emissions within the transportation sector is to reduce reliance on cars, and transportation planners play a significant role in the design and planning of transportation systems, then transportation planning practice and the actors involved need to be better understood.

To study these issues in detail, I have chosen to focus on the experiences of two second-tier cities that have been active in improving their transportation systems and incorporating bus rapid transit (BRT) — Kunming, capital of Yunnan province in the southwest, and Jinan, capital of Shandong province in the northeast. Despite having similar populations (~6 million) and bureaucratic structures, they have vastly different approaches to balancing the needs of public transit and private cars. Both have extensive networks within the planning field comprised of international and Chinese planning experts. However, the cities’ transportation planning practices diverge and have resulted in two dissimilar transportation systems. Kunming has a multi-modal system that prioritizes transit and non-motorized modes; links bikes, buses, and pedestrians; and limits car use. The result is that 38% of daily trips in Kunming are by bus. In contrast, Jinan, while incorporating bus lanes and BRT, has mainly addressed its burgeoning private car population by widening roads and moving bike lanes to sidewalks. While they have built an extensive BRT system, its run on less politically risky streets with lower capacity demand to assuage motorists and stifle internal politics. Public transit only comprises 16% of daily trips.


![ Indexed Growth of Passenger Vehicles, Urban Population, and GDP in Kunming, 2001-2009 ](image)
If Kunming and Jinan have essentially the same transportation planning organizations, are facing similar growth pressures, and both have attempted to promote transit, what has led to such differences in outcomes in these cities?

I argue that differences in outcomes are related to local institutional capacities, specifically (1) how and what they learned, including who the purveyors of these policies were (e.g., policy transfer agents) and (2) the organizational culture present (or systematically developed) in these cities that acted as a receptors or rejecters of these ideas. The institutional framework that was systematically developed in Kunming allowed Kunming planners to address gaps in their understanding of transportation planning and integrate new approaches and related urban planning issues, such as land use. The more traditional framework in Jinan was less able to internalize new approaches and instead focused on project delivery while continuing in other respects along standard paths.

**Research Design**

My research focused on sustainable transportation policies, concepts, and lessons that have come from abroad and have been adapted in two Chinese cities. The objective of this dissertation is to understand what factors may have led to differences in transportation planning organizations, taking into consideration how planners learned sustainable transportation policies in these cities. The specific research questions addressed in this dissertation include:

1. How do transportation planners in second-tier Chinese cities learn about sustainable transportation policies and practices?
2. What are the ways in which their organizations support or limit their learning?
3. How does the type of knowledge exchange or transfer impede or foster learning?
4. Given their exposure to sustainable transportation policies and practices, how do transportation planners define the role of transportation planning within a rapidly motorizing context?
5. How have the transportation planning organizations’ understandings influenced the physical design of planned public transit projects (i.e., bus rapid transit/bus corridor projects, subway, light rail systems), strategies intended to provide better mobility?

My research is guided by these initial propositions derived from my own on-the-ground experience:

1. An organization’s culture hinders or fosters new ideas and learning.
2. Key individuals play significant roles in the transfer of ideas, concepts, and policies to China.
3. Because of the historical and political nature of urban planning in China, a paradigm shift is necessary to get agencies to work together in ways other than prescribed.
4. The relationship between agencies establishes a foundation that allows planners to take risks and accept uncertainty in planning because they have formed a coalition of multiple agencies. Over time and with a stronger base knowledge, planners are able to see the benefits of these ideas and these ideas become institutionalized.

These propositions also guide my case study analysis. I revisit these propositions in Chapter 5, my analysis chapter.

Other factors that impact learning also discussed in this dissertation include:

1. Political and historical issues impact the learning capacity of organizations.
2. The role key actors played in introducing these policies to China and working with local organizations in Kunming and Jinan to adapt these policies to their local needs (or not).

Studying how planners and their organizations learned and continued to pursue more sustainable transportation means provides insight into how ideas and practices become institutionalized (or not) and how planners are allowed to innovate or not. These cases also offer insight into the limitations of the policy transfer framework used for promoting urban planning best practices.

Conceptual Framework

Research on learning in China and on planning practice has been limited; my research provides an initial step in understanding the learning process, particularly in second-tier cities, which may not have the technical capacity or access to the types of transportation planning tools that major metropolises such as Shanghai or Beijing have to address their transportation planning issues.

Figure 4 is the conceptual framework that guided my research design and analysis of the case studies. This is a simplified conceptualization of a dynamic and complex process. A transportation planner’s learning of sustainable transportation policies is influenced by organizations involved, the way the learning or transfer process is conducted, the actual knowledge that is “transferred,” the main agents involved with bringing this knowledge to them, and the planner’s own educational background and training.
Methodology

Because my research focused on the learning processes of transportation planners in Kunming and Jinan, I sought to understand how the processes in these two cities differ and how that is related to the knowledge transfer approach, actors involved, planners’ educational background, and organizations involved. I combined historical research, interviews, and participant observation to understand (1) how Chinese transportation planners learned about and applied sustainable development policies and (2) the role their respective organizational cultures played in hindering or supporting their learning in the Chinese provincial capitals of Kunming and Jinan.

As my research questions ask how and why, I relied upon a case study method of analysis (Yin 2003) that incorporated an ethnographic approach including participant observation, interviews, review of planning documents, and on-the-ground field observations. The case study method allows for multiple perspectives. As I was interested in understanding how planners coordinate transportation planning, a case study approach allowed me scale and scope and gave me flexibility in my approach as each case was different.

Participant Observation

A key part of my research was participant observation, both during the main timeframe of this project and before. From 2002 to 2005, I worked at the Energy Foundation’s China Sustainable Energy Program based in Beijing, China. The projects focused on non-motorized transportation,
transit-oriented development around the proposed BRT stations, and study exchanges. From 2005 to 2010, I made 20 trips to China, staying for two weeks to two months. For my fieldwork, from spring semester 2011 to Summer 2012, I spent 12 months in China living in Beijing, Shanghai, Jinan, and Kunming. My own personal experience working with a policy organization and its own networks allowed for me to consider the role networks play in influencing local planning.

**Interviews**

I conducted 75 formal and informal interviews. I targeted planners who work on or draft transportation plans, junior and senior staff. I conducted two types of interviews: Standardized, open-ended interviews and informal, conversational interviews. Through the interviews I was able to see how planners define and perceive the motorization phenomenon. I also learned about the organizations they worked with and how they established familiarity with those organizations.

None of my interviews were recorded, which is standard practice for fieldwork in China. I took notes throughout the interviews. Once the interview was over, I would type up and edit my notes.

**Document review**

A major task that was conducted in parallel to the interviews was to review planning documents for each city. Documents included city plans, master plans, detailed plans, newspapers, and organizational reports to see how transportation is discussed and interpreted in these documents. I also reviewed national policies and guidelines that influence transportation planning, including the Urban Planning Laws (1989, 2005) and national road design guidelines (GB-50220-95).

Other documents included meeting and conference presentations and planning documents associated with these presentations.

**Field Observations**

I also spent time in each of my case study cities observing the transportation system and its users. I went to Jinan from 2005 through 2010 at least three times a year for research projects through the University of California, Berkeley. For fieldwork, I lived in China from January 2011 to August 2012. I lived in Kunming for six months of that time. I traveled the city using all forms of transportation and documented changes in these cities with photos and field notes. I also attended meetings (informal and formal) and met with informants at regular intervals.
**Explanation of selection of case studies**

Figure 5. Map of China showing Kunming and Jinan  
Source: http://www.chinapage.com/map/province-english.jpg  

Two biases in research on Chinese cities create limitations in the existing literature: a geographical focus on coastal cities and on cities of the largest scale. Research on urban planning in China has been concentrated on the large coastal municipalities (Shanghai, Beijing, Guangzhou, Shenzhen); for examples, see the literature review by Zhang and Pearlman (2004). However, Shanghai, Beijing, and Guangzhou are not only relatively wealthy megacities with populations exceeding 10 million, they also have political power that far exceeds those of second-tier cities. Their responses and capacities are not necessarily representative of the majority of Chinese cities where a large part of China’s urban growth is taking place.

Only a few studies focus on transportation planning issues in second-tier cities (for example, Jinan-Thomas and Deakin 2008; Hefei -Peng 2008). I have chosen cases from among these second-tier cities as a step toward remedying this imbalance. By focusing on the cities of Kunming and Jinan, both second-tier cities, this dissertation expands urban planning research to include greater geographical and urban scale representation and to demonstrate the diversity of planning within China (see Figure 5).
Table 3 shows the population and GDP rankings of the two cities selected for case study. As the table shows, the two cities have some things in common – similar roles as provincial capitals and similar population, but they also have significant differences, notably Jinan’s substantially higher per capita GDP (approximately $10,600 US dollars per capita in Jinan vs. $6,400 for Kunming.) The GDP difference is a potential limitation of the study to the extent that it also reflects median income differences for households, since it is well understood that auto ownership is dependent in part on household income and not just on the availability of travel options. Yet, Kunming has the greater number of vehicles, despite a lower GDP. The fact that it nevertheless maintains a much higher transit mode share indicates that vehicle use is more selective in Kunming.

Table 3. Kunming and Jinan rankings within West and East China

| Region: Western China |  |
|---|---|---|
| Rank | Provincial Capital or Municipality | Per Capita GDP in 2011 | Population (Millions) |
| 1 | Yinchuan, Ningxia | ¥48,964 | 1.58 |
| 2 | Chengdu, Sichuan | ¥48,755 | 11.49 |
| 3 | Xi'an, Shaanxi | ¥45,495 | 7.82 |
| 4 | Kunming, Yunnan | ¥38,831 | 5.83 |
| 5 | Lanzhou, Gansu | ¥37,570 | 3.23 |
| 6 | Xining, Qinghai | ¥34,743 | 2.20 |
| 7 | Chongqing | ¥34,500 | 15.42 |
| 8 | Guiyang, Guizhou | ¥31,712 | 3.37 |
| 9 | Lhasa, Tibet | ¥20,077 | .550 |
| 10 | Nanning, Guangxi | ¥11,057 | 7.07 |

| Region: Eastern China |  |
|---|---|---|
| Rank | Provincial Capital/Municipality | Per Capita GDP in 2011 |
| 1 | Guangzhou, Guangdong | ¥97,588 |
| 2 | Tianjin | ¥85,213 |
| 3 | Shanghai | ¥82,560 |
| 4 | Beijing | ¥81,658 |
| 5 | Hangzhou, Zhejiang | ¥80,478 |
| 6 | Nanjing, Jiangsu | ¥76,263 |
| 7 | Jinan, Shandong | ¥64,311 |
| 8 | Fuzhou, Fujian | ¥52,152 |
| 9 | Shijiazhuang, Hebei | ¥39,919 |
| 10 | Haikou, Hainan | ¥35,669 |

Source: China Statistical Yearbook, 2012
The key differences of interest, however, are related to the cities’ networks and relationships with other cities. Kunming has maintained a 30-year relationship with the city of Zurich. Early in this relationship, significant investment in infrastructure projects and training were provided. The Zurich officials had close ties with the top leaders – the mayor and the party secretary; from the beginning, the city took the relationship seriously. Planners and Planning Directors went to Zurich and Swiss experts came to Kunming to provide trainings. This relationship has evolved from strictly professional to a more personal relationship. Significant trust has been built up and the local planners see the Swiss as allies. As Swiss direct engagement has been reduced, the influence over the top leaders (party secretary and mayor) has diminished. Local planners have to “re-educate” new leaders each time one is appointed into office to explain why they have bus corridors and how they operate. Interestingly, key players in the planning organizations have remained in leadership positions or positions of influence over the past 20 years. Therefore, the institutional memory is strong and the lessons and ways that Zurich planners look at planning problems have strongly influenced Kunming planners. They have had time to learn from their mistakes. The Zurich planners/experts have also had the opportunity to change the way they “train” their Chinese counterparts, moving away from only best practice to providing alternatives.

While Kunming is the capital of one of the poorest provinces, it is a major contributor of the province’s GDP. Also, Yunnan province has a prominent role as one of the gateways to Southeast Asia. It has a close relationship to the central government (Donaldson 2009).

Jinan also has an extensive knowledge network but no long-term relationship with a foreign organization like Kunming. They have worked with the U.S.-based Energy Foundation since 2005. Energy Foundation (EF) has provided extensive technical training and advising for their bus rapid transit system as well to improve bus operations overall. They have also provided experts to address incorporating more transit-oriented development in their plans, using the BRT stations as areas to develop. Part of my research included working on these projects as a participant on the teams assisting local planners in Jinan.

![Comparison of per capita GDP of Jinan, Kunming, and China, 2002 - 2011](image)

*Figure 6: Comparison of per capita GDP — China, Jinan, and Kunming, 2001-2011*

Case Study Analysis

I organized each case study chapter in the following manner. The first section describes the urbanization context — economic development, social/demographic characteristics, and motorization patterns. The second section describes the policy transfer process, focusing on the main actors involved, activities conducted, and the outcomes. In the third section, I analyze the process, focusing on the how knowledge was transferred, the organizations involved and their role in supporting or hindering learning. I conclude each chapter by summarizing the key findings. In Chapter 5, I analyze the key findings of the cases side by side using the theoretical propositions as the test points.

Research Significance and Contribution

While there is a growing body of research on how organizations learn and how that learning becomes institutionalized (Marsden and Stead 2011, De Jong and Edelenbos 2007, Marsden et al. 2010), little of it has been based on the experiences of the developing world. Insight gleaned from my dissertation provides a basis for new approaches to knowledge transfer in China, particularly for those types of policies that incorporate new technology, policy, and urban planning.

Because urban planning was initially a land development process, planning issues within China are still framed as land development issues. Now, with the introduction of personal cars, transportation planning has been elevated in national policy debates. Scholarship needs to follow this trend and help to situate transportation planning’s role within urbanization. My research also offers the opportunity to go deeper and dismantle the myth of a monolithic, top-down government and analyze urban governments with a more critical and detailed lens.

The scarcity of information on municipal government planning practices in China is unfortunate, as it would help expand upon current knowledge in the social science fields as well as urban planning. If planning practitioners and consultants had a better understanding of how urban planning functions within the Chinese municipal government, more complex strategies and recommendations for encouraging sustainable transportation could be promoted. These strategies would actually fit China’s planning system, or perhaps would reveal ways to transform that system into something more suitable for today’s economic and social conditions.

A clearer understanding of the planning process would assist in clarifying the limitations and opportunities for more sustainable development planning. Understanding the motivations to coordinate or the lack thereof could provide the central government with a better way to encourage more sustainable transportation policies that are tied to promoting officials based on coordination and collaboration. Further, it opens the doors to further research within the social sciences that moves beyond seeing the municipal government as a cohesive unit and more into the complex organizations.

Organization of the Dissertation

Taking into consideration my research questions, subsequent chapters address the historical barriers to policy learning and each case study.

Chapter 2 provides a review of literature and identifies deficiencies/gaps in this literature. I then identify literature that informs my theoretical framework for my research. Policy transfer
literature (e.g., lesson-drawing, social learning) and organizational behavior comprise my theoretical framework. I focus on two aspects within this literature that have been understudied:

1. **Policy transfer agents** – those actors responsible for “transferring” the policies. Policy transfer agents are organizations (government or non-governmental) or individuals that promote best practices.
2. **Hard and soft transfer** – Hard transfer refers to the transfer of regulations, laws, or in the case of transportation planning, the physical infrastructure. Soft transfer is the spread of “ideas, concepts, and attitudes” (Evans and Davies 1998, 382) or “the spread of norms and expertise” (Stone 2010, 270). Stone holds that soft transfer is “a necessary complement to the hard transfer of policy tools, structures and practices. Learning can make the difference between successful transfers as opposed to inappropriate, uninformed or incomplete transfer” (2004, 546).

**Chapter 3** presents the Kunming case study. It focuses on the 30-year relationship Kunming established with Zurich. I look at the second phase of their relationship that centered on urban planning. This case illustrates how the learning process can overcome institutional issues and can transform organizations. The training provided by the Swiss evolved over time to be more aware of the local context and the idiosyncrasies of Chinese planning. More importantly, they provided a framework of sustainability that took into account both transportation and land use and that was both theoretical and practical. The mechanism used for the transfer was institutional and the process took into account both hard and soft transfer.

**Chapter 4** presents the Jinan case study. It focuses on the recent partnership between Jinan and the Energy Foundation. Established in 2005, the partnership included a large network of experts and scholars to work on Jinan’s Bus Rapid Transit Network. Yet, because of the need to get the corridors in operation by 2009, the conservative planning culture, and political climate within the municipal government, the main focus of the transfer was on delivering infrastructure rather than on capacity building. The policy transfer was hindered by a lack of technical expertise within multiple stakeholders and a conservative culture. The Energy Foundation as a policy transfer agent was unable to make full use of the expertise it had to promote BRT in Jinan and Jinan’s planners were not able to take full advantage of the expertise because of (1) their own educational backgrounds, and (2) the closed organizational culture that hindered information exchanges and continued to rely upon the “safety” of regulations and rules. In addition, the Energy Foundation’s need to see on the ground results relegated the establishment of local capacity to secondary importance.

**Chapter 5** is my analysis. I analyze the key findings of the cases side by side using the theoretical propositions as the test points. The objective is to review the approaches and to provide a greater understanding of the complexity of Chinese planning and the challenges to incorporating more sustainable planning.

**Chapter 6** presents lessons learned from this research.
Chapter 2: Literature Review and Theoretical Framework

Introduction
This literature review serves two purposes. First, it presents previous research on Chinese urban planning, policy transfer, and organizational studies. Second, it aims to identify the limited information these studies provide in understanding learning processes in China. The objective of my dissertation is to redress this gap in the literature and apply theories of learning to China, which a relatively understudied country within these literatures.

Overview of Chapter 2
In the first section, I review previous research on urban planning in China, including transportation planning. In the second section, I review literature that comprises my conceptual framework of the learning process for transportation planners.

Policy transfer and organizational studies research form my theoretical framework. Many areas within these bodies of literature overlap. They provide a framework for understanding the learning processes that took place in Jinan and Kunming. Drawing upon the organizational behavior literature, little attention has been given to the constraints on innovation created by Chinese planning organizations. Within policy transfer literature, expanding on previous criticisms, more research needs to be conducted on the actors involved and their capabilities. Their influence is not fully understood; only a few studies have focused on this.

Previous Research
Overall, a lack of research exists on urban planning practice in China, especially in second-tier cities. Transportation planning’s role in urban planning has only recently been considered in the literature on China. Historical literature reveals serious limitations in the urban planning system, including professional development and education biases that put urban and transportation planners at a disadvantage to fully exploit sustainable transportation policies, especially since they require a collaborative approach.

Urban Planning in China
When Deng Xiaoping became Chairman in 1978, as part of his effort to rebuild China, urban planning was reinstated as an institution. Prior to this, urban planning had been abandoned for almost 20 years. This change in policy re-envisioned the role of cities and their relationship to the central government. Several policies instituted under Deng gave local governments more power over the direction of their cities. New types of land uses emerged, including special economic zones. Land became a commodity as its use rights could be sold on a land market.4

Previously, a city’s role in the development of the country was decided by the central government. Now, municipal governments started to market themselves and become more entrepreneurial.


4 The land remains under the control of the government agency but the land use rights are sold for varying time periods (for example, 50 years).
development acted as a driver of urbanization; through urbanization local governments increased their power. Scholars noted the rise of “pro-growth coalitions” comprised of local government and semi-private developers (Zhu 1999, Zhang 2002b). Lin (2000) takes a macro-level approach to understand how changes in local government’s functions and spatial restructuring are linked from 1978 to 1995 and the national implications of this restructuring. In essence, two land markets were created – urban and rural. Ho and Lin (2003) describe the emergence of these markets and the rise of illegal sales of agricultural land. Local governments do not want to share land profits with national government by converting land from rural to urban.

Wu and Yeh (1999) describe the emerging inter-organizational conflicts that are arising as more stakeholders are becoming involved in urban planning at this time. They provide an overview of the urban planning system as it transitions from a centrally-planned to a market-oriented economy and the role of the City Planning Act of 1989. They point out the weak legal system and vague guidance provided to planners. The ability for discretion on the part of planners, leaders, and developers reduces the master plan to nothing more than a proposed technical document, not necessarily a commitment to specific physical interventions. And the long legacy of planning as a narrow technical exercise responding to political direction means that “persuasion” is the main means of enforcement, as is planning in isolation, with work units taking planning into their own hands.

The local government’s profit-seeking behavior undermines local planning efforts. Some research has focused on municipal governments and their decision-making behavior within a socialist market economy (Wei and Li 2002, Yang 2007). Urban planning is a relatively new institution and its legitimacy as a regulator is often called into question (Gar-on Yeh and Wu 1999, Leaf 1998, Wei 2005).

The role of urban planners in the process has come under scrutiny and begs for greater research. Studies on planners describe the contentious nature of planning in China’s transitional economy (Zhang 2002a, Abramson 2006). Zhang (2002a) interviewed urban planners working in central and local government agencies. He discovered the role of the planner has evolved to require addressing more complex issues, such as balancing development with social needs, but their skills and professional development have not kept pace.

Abramson (2006) describes the contradictory nature of Chinese planning that separates economic planning from spatial planning within a market-oriented context. The framing of planning in this way puts planners at a disadvantage, as their role as regulator is limited; “their plans tend either to be subverted by development, or used as blueprints for it” (Abramson 2006, 204).

There are, however, examples of positive change in planning practice. Abramson (2006) has done extensive research in Quanzhou, Fujian over a ten-year period. In his 2002 study, he holds that the role of planner has evolved from supporter of early economic development, in which its role was exclusively technical, to a full profession (Abramson et al., 2002). He and his colleagues use Quanzhou as a case study to see if it is possible for “social science research practices to support urban planning in China” (169) and to see if planning can take a more localized approach. What they uncovered in their research, which focused on three neighborhoods, was a multitude of actors – local state, village and neighborhood committees, developers, and recent arrivals, to name some. Through their work they were able to persuade the Planning Bureau to consider a more participatory approach to planning. In a follow-on article, Abramson (2006) outlines the private and public coalition that worked to redevelop an area of
Quanzhou and how planners changed from “cavalier” attitude toward the demolition of this area to increased engagement with the local residents and preserving the area’s historical architecture. Even though this was a neighborhood project, national government played a role in changing the direction of the project. The area was going to be demolished to widen roads until a national leader stepped in to question the impact of destroying a local temple. This gave local government pause and led them to redirect planners to consider historical preservation.

Abramson’s engagement with Quanzhou can be traced back to the early 1990s when he was a student at Tshinghua University. Long-term engagement such as his is rare and may explain the lack of research at the micro-level. Yet, research such as this gives insight into lack of exposure and experience with social science approaches, gaps in training that can be traced to China’s current educational and professional development opportunities. It also provides insight into possibilities for change.

Planning education and professional development

Despite rapid changes in urban environments, planning education, by and large, continues to focus on technical aspects (Zhou and Qiu 2009, Wang, Barry, and Huang 2006). Chinese urban planning education is divided amongst three separate disciplines: civil engineering, architecture, and geography. It is still a relatively new field. Engineers are trained to address the physical design aspects of infrastructure projects and systems but not the social, economic, or political issues. Geography students may have a better understanding of the social issues, but no design skills and in most cases their technical know-how is limited. Architecture students focus exclusively on the physical space of buildings. Multidisciplinary approaches to planning in academia are lacking (Zhou and Qiu 2009). Sustainable development likewise is taught theoretically with few opportunities for hands-on learning or application (Zhou and Qiu 2009).

These studies point out that graduates leave school without exposure to real-life urban planning issues. Unlike U.S. planning schools, many urban planning students do not work within communities or with cities to solve a planning problem. Scholars have called for reforms in urban planning education (Li and Li 2005, World Bank and Urban Planning Society of China 2007), but they have been slow in coming.

Reforms are also needed in the professional world. According to a World Bank and Urban Planning Society of China (2007) study of urban planners and their professional development opportunities, a serious lack of training and trained urban planners exists. This report recommended increasing the availability of programs, improving content so that it provides a multidisciplinary approach, and decreasing the gap between eastern and western China in terms of capacity. They also encouraged more international partnerships. The report echoes earlier reports within transportation planning profession about capacity and highlights the continued lack of capacity and inter-disciplinary framework as hindering planners’ abilities to address planning issues (Zhi and Smith 2006).

Transportation Planning Issues

Research on transportation planning issues (Deng and Liu 2007, Liu and Guan 2005, Chinese Academy of Engineering and National Research Council of the National Academies 2003, Chien and Ho 2011, Shen 1997, Pan 2011), while addressing the externalities of the national Household Car Policy or rapid urbanization, often identify the urban form as a major challenge for planners. Shen (1997), in his description of Shanghai’s transportation planning issues, pointed to weak
road networks (9% of Shanghai’s land) and an outdated public transit system. Similarly, in a study on Tianjin and the impending rise of personal cars, Zacharias (2004, 237) describes Tianjin’s “contiguous urban area” as less than 8 km in diameter, making vehicle congestion inevitable with even minimal growth.

With population increases and greater modes of transit, urban planners started to favor thinning out downtown populations; the rise of personal cars made this possible (Liu and Guan 2005). Shifts in national housing policy to smaller units (less than 90 square meters) could spur greater commutes for lower income workers, as developers build away from downtowns. The smaller units mean a greater population could afford to buy, spurring a “drive to qualify” pattern similar to what is seen in the United States.

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Similar to urban planning, transportation planning was also considered solely a technical field until recently (Zhou 2006, Ganshi 1996). Social implications are beyond the scope of transportation planners. Increased car use, however, creates new barriers to sustainable development and social equity (Gan 2003, He 2005, Ng and Schipper 2005, Peng, Zhu, and Song 2008, Pucher et al. 2007, Schipper and Ng 2004). Attempts to “green” the automotive industry by using cleaner vehicle technology such as electric vehicles are challenging. Huo et al (2007) propose improved fuel efficiency standards to reduce oil consumption, but a recent study by the World Bank states that the rapid shift to personal cars is trumping any gains made through technology (Darido, Torres-Montoya, and Mehndiratta 2009).

Schipper and Ng (2005, 2004) identified the environmental and social externalities of increased motorization in Chinese cities and provide recommendations such congestion pricing and increased investment in mass transit. Some counter that policies such as congestion pricing are difficult to implement in China (Wang 2010). Wang cites the political and financial costs of implementing technologically dependent schemes in Chinese cities as impediments because of the lack of coordination and collaboration amongst different agencies. Within Chinese transportation planning, the central or provincial governments will often recommend cities behave more sustainably, but provide little or no guidance as to their implementation at the local level. For example, the central government has called on cities to improve public transit and that has resulted in a default response of increasing the number of buses without analyzing if that is the best solution or if improvements can be made with the current bus fleet. This response allows for a measurable improvement; it is easy to quantify.

**Car Culture**

Car culture has taken hold of Chinese consumers. The desire to purchase a car is not only utilitarian, but also status driven. Popular media has focused on the strong pull of the automobile for Chinese consumers (Goodman 2004, Bradsher April 24, 2008, 2005), noting that owning a car has become a powerful indicator of social status and success in addition to often being a more comfortable way to travel than on crowded, slow transit systems. This points to what sociologist John Urry described as a system of automobility taking hold in China (Urry 2004) in which the car embodies globalization and a national policy. Even though a minority of urbanites own cars, Chinese consumers have become a powerful force that influences local policy decisions about the car’s place in urban society.

The growing Chinese auto industry both induces and reinforces this consumer interest in automobiles. A number of studies document the powerful role that the auto industry has in
China’s economic development plans. Harwit (1995, 2001) focuses on the burgeoning auto industry in China, its impacts on the economy, and the challenges it faced as it transitioned from state-owned enterprises to privately owned ones as China enters the World Trade Organization (WTO). Thun (2004) examines how the central government used foreign direct investment and joint ventures in the auto industry to increase technology transfers as well as control local governments. With decentralization, the central government was losing control of the auto market and wanted to reduce the number of manufacturers. These studies underscore the importance of the auto industry to China’s economic development, which in turn helps to explain the policies that encourage car ownership for Chinese households.

Concerns about the automobile’s negative externalities have been noted. A report by the National Research Council and the Chinese National Academy of Engineers (2003) outlined the environmental, economic, and equity issues of China making the auto industry a national pillar, including the loss of road resources to cars at the expense of other modes, such as public transit, walking, and biking. Yet Chinese society has already started to rearrange itself to accommodate the car; examples of this include the rapid expansion of road networks to reduce congestion, sacrificing public space and marginalizing other modes of transportation (Yang, Feng, and Cao 2007, Gan 2003, Liu and Guan 2005). In an extreme case, a municipal master plan encouraged households to purchase cars (Chen, 2008). Yet, as congestion and pollution from cars increases, Chinese cities have increasingly had to confront these problems and to more explicitly consider what role the car should play in transport policy and urban planning.

Thus, within the literature, most research has identified issues within Chinese urban planning and transportation planning that includes a weak legal system, lack of enforcement, inconsistent or even conflicting policies, and limited professional development and training. Despite numerous reports and studies identifying a serious lack of capacity and training, few cases exist that illuminate where the learning process breaks down.

**Conceptualizing Learning: Policy Transfer and Organizational Behavior**

In this section, I focus on the research that comprises my theoretical framework—policy transfer and organizational behavior. Following on policy transfer and organizational behavior literatures, I argue that differences in their systems are related to (1) how and what they learned, including who the purveyors of these policies were (e.g., policy transfer agents) and (2) the organizational culture present in these cities that acted as a receptors or rejecters of these ideas.

Organizational behavior research aimed at the ways organizations behave under uncertainty and increased risk, provide an understanding of the organizational culture and planning framework. Policy transfer has increased its linkages to organizational behavior research. Thus, my theoretical framework moves this research forward by linking these bodies of work and applying it to Chinese planning institutions.

**Policy Transfer and Transnationalism**

The movement of planning ideas from one context to another has been widely discussed and debated within urban planning research (Healey and Upton 2010, Sanyal 2005). Some of the concerns voiced in this literature include the applicability of these policies, power dynamics embedded in the flow of ideas especially between developed and developing countries, and methods used to transfer policies. Others point to structural differences as barriers to transfer (Wang 2010, Masser 1986). On the other hand, recent research points to ways to overcome these
barriers. In a study of knowledge transfer between Canadian and Jordanian planners, Khirfan (2011) found that a mutual exchange of knowledge between two groups of planners occurred. They were able to come to a mutual understanding by continuous engagement and making mutual understanding a goal of the partnership. Khirfan (2011, 543) concludes:

Amman planners’ experience of successfully acquiring knowledge from their Toronto counterparts demonstrates that when the transfer agents on both sides emphasize interpersonal interactions, where political support for knowledge transfer is strong, then filtering of the transferred-acquired knowledge also occurs.


Marsden et al. (2010) looked at how transportation planners in 11 North American and northern European cities learned about innovative policies such as congestion charging, compact growth and transport planning, and carsharing. Their work highlighted a strong correlation between personal and professional contacts, organizational culture that supported learning, and multiple sources of empirical evidence.

Stead, Jong, and Reinholde (2008) focused on two eastern European cities – Wroclaw, Poland and Riga, Latvia – that were trying to incorporate a German-style public transit institutional structure. Stead et al. (2008) discovered that institutional and political differences weren’t the only source of challenges; the social status of cars in these countries and public transit’s role were also factors. Public transit had a lower status in eastern European countries than in western European ones. Poland and Latvia experienced declining public transit service and rising personal car use as the economy liberalized and established an auto industry. They sought out initiatives to address the growing crisis of congestion, poor public transit, and parking. Both had projects funded by the German Federal Environment Agency (UBA). The two cases had vastly different outcomes. The findings suggest the differences were related local government perceptions of their partnership with UBA and their resulting behavior, and initiative taken by local planners to champion these policies. Wroclaw planners and the local government already perceived public transit as vital. They had greater stability in their government and welcomed the partnership with Germany. But the suggested financial and governance schemes did not work with their system; they ended up adapting the policies, but still improving the system. The Latvian government saw the partnership as an outside project. Their government had continuous turnover; local policy champions were few. Overall, Stead et al.’s findings suggest pragmatic approaches to policy transfer led to success. Adapting the concepts to local realities was a better approach than copying.

Matsumoto (2006) provides the one case that looks at BRT from a policy transfer framework. She conducted a comparative study of the transfer of bus rapid transit to Jakarta, Seoul, and Beijing. She holds that “political will” was an important ingredient for making BRT work in all three cases. She also found that the historical context was critical as certain moments were more
supportive of change than others. For instance, when Beijing needed an alternative to mass transit, BRT became more attractive as opposed to subways.

Policy Transfer—Dolowitz and Marsh’s Definition and Framework

Marsh and Dolowitz define policy transfer as “a process in which knowledge about policies, administrative arrangements, institutions etc. in one time and/or place is used in the development of policies, administrative arrangements and institutions in another time and/or place” (1996, 344). In their work, “Learning from Abroad: The Role of Policy Transfer in Contemporary Policy-Making”, Dolowitz and Marsh propose a model or framework for analyzing the policy transfer process. This model is organized around six questions: (1) Why do actors engage in policy transfer? (2) Who are the key actors involved in the policy transfer process? (3) What is transferred? (4) From where are lessons drawn? (5) What are the different degrees of transfer? What restricts or facilitates the policy transfer process? (6) How is the process of policy transfer related to policy “success” or policy “failure”? These questions were first proposed in their review of policy transfer literature (Dolowitz and Marsh 1996). Their conceptual framework illustrates not only the types of learning that emerge from policy transfer, but also the diverse groups of actors involved and the levels of learning that can take place (individual, local, national, global) (see Table 4).

Their work provides a general conceptual framework of the transfer process –the classification of different actions – but it is weak in explaining how policies are learned (Wolman and Page 2002, 478). Marsh and Dolowitz’s work on policy transfer (2000, 1996) is the most cited and their definition most often used, though it is not the earliest (Dussauge-Laguna 2012). Their work builds upon the work of Bennett and (Rose 1991).

Table 4. Policy Transfer Framework (Marsh & Dolowitz 2000, 9)
Uncertainty—Where Policy Transfer and Organizational Studies Link

Dussauge-Laguna (2012) in a recent piece in *Political Studies Review* argued against delimiting policy transfer literature “because drawing a clear-cut line between policy transfer and other associated fields of inquiry is not a straightforward thing to do; and second, because even if we are able to do so, we might actually lose more than we gain along the way” (Dussauge-Laguna 2012, 317). Uncertainty is one area where policy transfer and organizational behavior research overlap. Rose (1991), one of the earlier scholars to research policy transfer, identified three motivations for seeking out new policies: uncertainty, changes in the policy environment, and changes in political values. Organizational behaviorists have identified similar concepts in their work (Simon 1967, Thompson 1967, March and Simon 1958, Scott 1992, Christensen 1985).

J.D. Thompson’s seminal work, *Organizations in Action: Social Science Bases of Administrative Theory* (1967) looked at rational, natural, and open organizations. Thompson argued that organizations that adapt to and acknowledge uncertainty are following an open-system strategy and by doing so are more likely to become dominant (successful) where technology or markets were rapidly changing. Thompson saw closed organizations as those organizations that believed they were autonomous from their environment; they sought out certainty. While Thompson did not believe there were truly closed organizations, some organizations may in fact be operating as if they are closed organizations, autonomous from other organizations, thus, not taking into consideration how other organizations’ decisions may affect them — or in the case of China, how more cars on the road impacts an organization’s work.

Christensen (1985) examines government organizations and how they address uncertainty. She argued that the way to address uncertainty is through social learning. Social learning emerges from collaborative types of planning, where all stakeholders are taken into consideration. “When technology is uncertain, no imposition of rules can make a policy predictable or equal; its guiding rules must be discovered or invented” (Christensen 1985, 95). Christensen’s view of technology is broad; it includes a variety of potential solutions and approaches. In her examples drawing on U.S. experience, she points out that housing policy was to provide more and better housing but the technology used to deliver it metamorphosed from brick and mortar buildings to user-side subsidies using vouchers for housing produced in private markets.

Using the Christensen framework, sustainable urban development, in general, could be defined as a case of “unknown technology, agreed goal” (see Figure 7). However, in this transitional period, Chinese municipal governments and planners do not even acknowledge this uncertainty and plan as if it does not exist (Yang, 2005).
Yu (2008) analyzes the Xiamen municipal government and how it addresses uncertainty. He draws on Christensen’s work (1985) on uncertainty to analyze planning practices of the government. Looking at the case of economic development planning under the more market-driven economy, Yu found that Chinese planners are now faced with greater uncertainty. Yet, Yu also discovered that uncertainty is not discussed nor addressed in their plans (230). Uncertainty was relatively minimal in China under a planned economy, now with a greater decentralization and greater local discretion; there are higher levels of uncertainty.

Scholars researching how organizations innovate have found that networks of association create opportunities for learning and for reducing risk and uncertainty (March and Simon 1958, Hall 1993, Weber and Khademian 2008, Healey 1998). This literature suggests that planners might be able to reduce barriers posed by institutional structures through these networks.

Rose’s work (1991) on lesson drawing assumed that governments were rational and sought ideas that would work from similar political environments. He also assumed that the decision makers have perfect knowledge of these programs and could rationally evaluate them. Later studies went on to contradict this notion. They found decision makers had (1) imperfect information in making these decisions (Wolman and Page 2002, Dolowitz and Medearis 2009, Dolowitz and Marsh 2000, 1996) and/or (2) that decisions were based on trust or reliance on the source of the policy (Marsden et al. 2010), not a thorough scanning of policies. In many cases, planners rely upon their social networks for information about policies; in some cases, these are epistemic communities or policy transfer agents (see next section).

**Policy Transfer Agents and Knowledge Networks**

As organizations seek out new ideas, they search for information from informal networks such as “epistemic communities” (Rose 1991). These epistemic communities could include information sources such as journals or fellow planners. They can also be think tanks, international non-governmental organizations, and/or expert networks (Prince 2010, De Jong and Edelenbos 2007, Stone 2010, 2004, Christensen 2007).

A key component of policy transfer is the policy transfer agent or policy transfer entrepreneur. These agents or entrepreneurs have been identified as influential forces in the learning process.

The information transmitted between different actors within these networks influences what gets applied or institutionalized (Wolman and Page 2002, Marsden et al. 2010). Planners interested in new policies take into account the source of information and that person or organization’s experiences with the policy, before deciding on the policy. More work is needed in understanding the policy transfer agents’ roles in policy transfer (McCann 2010). The focus has largely been on the process and actions taken, but not a clear theory of learning. McCann contends: “Studies of urban policy mobilities must take seriously the role that apparently banal activities of individual policy transfer agents play in the travels of policy models and must also engage in fine-grained qualitative studies of how policies are carried from place to place, learned in specific settings, and changed as they move” (McCann 2010, 107).

Wolman and Page (2002) classify policy transfer agents by the tasks they perform. They defined policy transfer as an information exchange; within this exchange are “networks [comprised] of producers, senders, facilitators of information” (483). Betsill and Bulkeley (2004) categorized the networks into three types: transnational advocacy networks (TANs), epistemic communities, and global society.

Studies by Bache and Taylor (2003) and De Jong and Edenlebos (2007) are examples of “fine-grained” qualitative studies. Bache and Taylor (2003) participated in a program to help a Kosovo university incorporate lessons from British higher education. They observed “policy resistance,” in which different staff involved slowed the process down. Despite “asymmetrical power,” Kosovo educators were able to exert influence over the process. De Jong and Edenlebos (2007) focused on knowledge exchanges of transnational networks at the city level. The goal of the project was to pass on information of one city’s experience on urban development to other European cities. They focused on two specific aspects under-studied in policy transfer: (1) social interaction among participants and (2) conceptual replication.

Overall, the literature illustrates that networks of information exchange are instrumental in both transferring information and in transforming it for local use. However, it is noteworthy that little research focuses on developing countries.

One exception is Chien and Ho (2011), who conducted a study on transnational policy learning in China’s Yangtze River Delta in three cities – Kunshan, Shanghai, and Suzhou. Their work focused on economic development projects and the transfer of innovative policies and practices to Chinese officials from international counterparts. Taking Coe and Bunnell’s concept of policy innovation (Coe and Bunnell 2003), they argue “that one can understand transnational policy learning through three different but interrelated mechanisms” – personal networking, institutional alliance, and hegemonic discourse (318; see Table 5). Projects included an export-processing zone in Kunshan, Suzhou Industrial Park, and the Pudong District in Shanghai. These mechanisms tie in well with the concepts of soft and hard transfer (discussed below).
Table 5. Chien and Ho’s mechanisms of transnational policy learning (2011, 318)

<table>
<thead>
<tr>
<th>Transnational learning mechanism</th>
<th>Characteristics of the learning mechanism</th>
<th>Relationship between parties involved in learning mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal networking</td>
<td>Informal, personal contact relying on personal relationships and networking</td>
<td>Mostly informal, non-binding, Low profile transfer of information between individuals based on trust</td>
</tr>
<tr>
<td>Institutional alliance</td>
<td>Formal, contracted and structured cooperation and transfer of knowledge between institutions, local or national governments and firms</td>
<td>Binding cooperation that involves both parties as stakeholders</td>
</tr>
<tr>
<td>Hegemonic discourse</td>
<td>Transfer of knowledge from institutions, firms and consultancies based on prevailing ‘best practice’ and commonly accepted international standards</td>
<td>Non-binding relationship with transfer of knowledge that may not be immediately useful</td>
</tr>
</tbody>
</table>

Components of Learning: Hard and Soft Transfer

The previous sections pointed to the ways in which learning and policy transfer may take place. Of importance, what is transferred can be complex and can encompass not only the transfer of specific ideas, policies, and practices, but also the transfer of institutional arrangements and the norms attached to these components. A distinction has been made between hard transfer and soft transfer. Hard transfer refers to the transfer of regulations, laws, or in the case of transportation planning, can include physical infrastructure designs. Evans and Davies (1999, 382) define this as programs and implementation. Soft transfer is the spread of “ideas, concepts, and attitudes” (1999, 382) or “the spread of norms and expertise” (Stone 2010, 270). Stone has argued soft transfer is “a necessary complement to the hard transfer of policy tools, structures and practices. Learning can make the difference between successful transfers as opposed to inappropriate, uninformed, or incomplete transfer” (Stone 2004, 546).

Hard transfer can often be the overriding goal and indicator for many development organizations and foundations – the physical and tangible results that can be identified as evidence to support a development organization’s goals, while transference of the norms behind these policies is not considered. Soft transfer needs to be further researched as it plays an important role in institutionalizing these ideas and legitimizes these sustainable transfer concepts. I draw upon these concepts in my research.

Critiques of Traditional Policy Transfer Literature

Policy transfer as an approach is not without criticism; many find policy transfer to be a flat description5 of a complex process(Peck and Theodore 2010, Massey 2009, Prince 2010). Instead, Peck and Theodore (2010) use the term “policy mobilities.” They are critical of the traditional literature because they also believe that transfer is a highly political process. They point to the power dynamics embedded in the process, assumptions of the policy being transferred as a better

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5 Some may counter that it is an outdated term, but policy transfer continues to be used in development policy and by development organizations in their attempts at bringing best practice to developing countries.
solution, the policy actors involved who influence the process, and finally, “mobile policies rarely travel as complete ‘packages,’ they move in bits and pieces — as selective discourses, inchoate ideas, and synthesized models—and they therefore ‘arrive’ not as replicas, but as policies already-in-transformation”(170). Prince (2010) looked at the policy transfer process of New Zealand’s creative industries. He argues that the process is both “political and technical” and this complex process influences how policies are “assembled” and “result[s] in the co-constitution of the policy object as a global form and the associated policy programs as a global assemblage” (172). His use of assemblage also addresses issues of scale within policy transfer literature. Assemblage acknowledges the multiple actors involved in the process. Massey (2009) argues that each attempted transfer of a policy is unique; thus, a generalizable process is non-existent. For the sake of my research, I consider these critiques in my analysis. My objective is to understand where learning breaks down or meets challenges within the transfer process.

Framing the Dissertation

In this dissertation, I use this literature to frame my research into the process by which the idea of sustainable urban development has been introduced in China and the varying outcomes that have resulted from different approaches to policy transfer and learning. The main concepts from policy transfer literature that guide my research are that both hard and soft transfer can occur and policy transfer agents can play different roles; I hypothesize that the way the transfer is framed shapes the outcomes observed.

Below is my conceptual framework (see Figure 8) of the learning process. Although I have separated out organizations, processes, and knowledge, I believe that the each of the identified components interact with each other. I separate them to identify key characteristics of each for my analysis of the cases studies in Chapter 6.
As discussed in the previous section, little research has focused on the learning process of Chinese urban planners or planning practice. I am interested in the planners who implement these projects to show the need for a multi-layered approach to this type of work. A multilayered approach considers both top-down and bottom-up processes in bringing these types of sustainable development concepts and ideas to China or in the strategies that assist cities in adopting sustainable development concepts into their urban planning systems.

As will be described in the following chapters, the cases of Jinan and Kunming illustrate the importance of the approach to learning, the organizations involved, and knowledge that is exchanged. These cases also illustrate how crucial interagency collaboration is to long-term improvements in public transit and planning better systems in China, particularly because the planning context has become much more complex. Inter-agency collaboration provides a strong foundation and a politically savvy way to address shifts in leadership and to keep political momentum continuing, as seen in Kunming. Despite major changes in leadership, the strong relationship between the planning institutes and other institutes has been leveraged to maintain their vision for a more sustainable transportation system.
Chapter 3: Kunming—An Alternative to the Mainstream

In the 1980s, Kunming, an underdeveloped southwestern Chinese city, became the sister-city to one of the world’s most developed cities, Zurich, Switzerland. The Kunming-Zurich partnership evolved from a cultural exchange to focus on urban planning. This relationship helped establish a strong relationship that launched innovative and pioneering urban planning policies and initiatives in China with public transit, not cars, central to urban development.

The Zurich team’s planning approach—in stark contrast to Chinese planning—identified public transit as the critical link to a sustainable urban development strategy. Public transit policies and projects, such as bus rapid transit (BRT), were seen as steps toward moving the city closer to sustainability; transportation planning’s role was elevated. Urban plans for Kunming were considered within the Chinese national, regional, and city context. The Swiss provided a planning framework within their training that was “dynamic.” With sustainability as the overarching framework, land use and transportation planning policies had to be considered simultaneously, not separately. Kunming’s leaders and planning organizations welcomed these new ideas and made them their own.

The knowledge and experience gained from the partnership between Zurich and Kunming manifests not only in the physical infrastructure and regulatory framework (e.g., hard transfer), but also in the theoretical and conceptual framing of transportation planning and norms that planners use in evaluating their own work (e.g., soft transfer). Soft transfer (e.g., norms and attitudes) is an area under-studied in the policy transfer literature and by international organizations, which is critical to sustainable development taking hold in China and becoming institutionalized. Because sustainability is a dynamic process, one of the major tools necessary to ensure cities are moving toward sustainability is a stronger theoretical framework to guide their work.

This chapter focuses on how and why Kunming transportation planners became such proponents of public transit, given the major historical, political, and institutional barriers they faced. As described in Chapter 1, transportation planning historically has been an overlooked and neglected area within Chinese urban planning. This chapter considers the key role partnerships played in influencing the direction of Kunming’s planning. The 30-year sister-city partnership between Kunming and Zurich, Switzerland, transitioned from professional to personal, and as it evolved, mutual learning took hold between foreign and Chinese planners. Next, because of the knowledge transfer process undertaken, which incorporated both theoretical and practical elements, the Chinese planning organizations were able to facilitate greater learning. And finally, key actors in these organizations went on to shape Kunming’s planning organizations, institutionalizing a new planning framework and hence, the legacy of linking transportation and land use continues to this day.

The chapter is organized into five sections. The first section describes the methods used to document the case. The second section describes the socio-economic context of Kunming—an overview of both the city and the province, including transportation trends over the past decade. The third section is an overview of the Kunming-Zurich sister city relationship and the main outcomes, focusing on hard and soft transfer. The fourth section focuses on the knowledge transfer process and key components of Zurich’s approach, focusing on soft transfer. This section also focuses on key actors in Kunming involved in the transfer, and key organizations’ roles in supporting (or hindering) learning. The final section is an analysis of the case.
Methods and data

The methods used for this chapter include interviews, documentation, and field observations. The focus of this case was to understand how over time ideas introduced by the Swiss teams were adapted to the Chinese context and then institutionalized in the transportation planning institute. Interviews included staff at the Kunming Urban Transportation Planning Institute, Swiss Federal Institute of Technology (ETH), Energy Foundation, and Kunming Urban Design and Planning Institute. I also compared planned approaches with outcomes to see how much was incorporated into plans and was actually planned. In addition, I have visited and/or lived intermittently in Kunming from 2004 through 2012. I have been able to speak with staff in these institutes formally and informally as well as document changes in the city through field observations. I also utilized national, provincial, and municipal statistical yearbooks to analyze urbanization trends as they related to GDP, personal car growth, and population.

Figure 9. Aerial view of Kunming, Yunnan

Source: Google Maps

Background

Kunming, capital of the southwestern province Yunnan, was founded over 2,400 years ago. As the provincial capital, it serves as the province’s political, social and economic center. Unlike most provincial capitals, however, Kunming is the only major city in the province. As a result, the city’s economic output comprises 30% of the province’s gross domestic product (GDP) (Yunnan Province Statistical Yearbook 2010). Additionally, it faces significant urbanization
pressures as many come here to seek work because so few other opportunities exist in the region, resulting in 10% of the province’s population living in the greater Kunming area.

Kunming’s metropolitan population numbers 6.4 million, with 4.5 million living in the urban center. The urban population within the metropolitan area grew 33% from 1999 to 2009, and in the city proper 20% (Kunming Statistical Yearbook 2000-2010). The physical area of Kunming’s metropolitan area has expanded to over 21,000 square kilometers, of which 2,622 square kilometers is considered urban. The metropolitan area includes five districts (Panlong, Wuhua, Guandu, Xishan, and Chenggong) and eight counties (Jinning, Fumin, Yiliang, Songming, Shilin Yi Autonomous, Luquan Yi and Miao Autonomous County, Xundian Hui and Yi Autonomous County).

The population is expected to continue to grow as the central government has chosen Kunming to be the gateway city to Southeast Asia. Yunnan province shares a 4,060-kilometer (2,522 miles) long border with Burma, Thailand, and Vietnam to its south, and, as the capital and gateway city, Kunming is host to several international trade events with these countries. Many businesses have already established offices in Kunming as several high-speed rail lines connect Kunming with eastern China and southern China.

Kunming’s main industries are machinery, tobacco, tea, pharmaceuticals, and high tech. Because of its location and mild climate, tourism has been one of its main growth industries. Of note, Yunnan is the only province for which tourism is a leading growth industry (Peters and Yang 1999). In 2005, tourism revenue totaled CNY 41 billion (USD 5.35 billion) and accounted for 12% of Yunnan’s total GDP. By 2020, the government aims to substantially increase these figures with a targeted 100 million visitors (China National Tourism Association, 2006). Kunming received a major boost in tourism by hosting the 1998 Botanical Exposition, which spurred major redevelopment and spotlighted their bus rapid transit corridor.

These urban development growth pressures are fairly recent. Until about 15 years ago, Kunming’s growth was slower than most provincial capitals, as was typical for western provincial capitals. However, in 1999, the central government launched the “Develop the West” Program. The focus of this program was to increase investment in and promote the western provinces with the objective of reducing development gaps between the east and west of China. Since the launch of Develop the West in 1999, Kunming’s GDP has grown from 5.9 billion Yuan to 25 billion Yuan in 2011, an increase of 324%. Not all of this growth can be attributed to the program, but it was a significant factor. The annual increase in GDP during this same time period was 13% for China. Per capita GDP has grown from 14,864 RMB in 2002 to 38,381 RMB in 2011, an increase of 161%. Although Kunming is ranked 24th among the country’s 31 capitals and municipalities, Kunming is among the top five cities in western China for per capita GDP.

However, amongst all provincial capitals, Kunming’s per capita GDP is amongst the lowest in China, an indicator of its later development in comparison to eastern provincial capitals, which benefitted from national economic policies that favored them (see Chapter 1, Table 3). As discussed in Chapter 1, China was undergoing rapid urbanization and, by the late 1990s/early 2000s, rapid motorization. In parallel, Kunming underwent similar patterns. The next section describes the urbanization trends that Kunming had to address.
Motorization Trends: Passenger Vehicles Growing at a Higher Rate than GDP

The city of Kunming currently has over 1 million passenger vehicles on the road, of which approximately 85% are privately owned. As Figure 10 illustrates, its vehicle growth has been on a steady rise since 2000, with an average annual growth rate of over 10%. From 2001 to 2009, this amounted to a 278% increase. This amounts to 290 vehicles per 1,000 urban residents. This is less than half of the vehicles per capita found in cities such as San Francisco (658) or Chicago (659) but is higher than that of such European cities at Berlin, Glasgow, or Manchester (City Mayors, Eurostat, and UK Office for National Statistics 2013). The vehicle growth rate has outpaced GDP growth. The speed of growth in passenger vehicles has outpaced the city’s ability to keep up in infrastructure, such as public transit and roads. Added to this, the historical bias of municipal government’s against public transit investment set Kunming for a course of heavy reliance on personal vehicles. Despite a high vehicle ownership rate, the city has been able to maintain its status as a city with one of the highest public transit usages in China.

Figure 10. Kunming’s growth, 2001-2009  Source: Yunnan Province Statistical Yearbooks 2001-2010; Kunming Statistical Yearbook 2001-2010
Kunming has also had a steady rise in non-motorized transportation modes. In 2012, China’s national average of daily bike and walk trips was approximately 40%. In Kunming, those same trips comprise 60% of daily trips. Currently, 24% of daily trips are done by public transit. Within the Second Ring Road, 38% of daily trips are by public transit. Daily trips went from 500,000 in 1999 to 1.264 million trips in 2005 to 2.473 million trips in 2010. The percentage of daily trips by bus doubled in that same time period, increasing from 14.8% to 38% of daily trips. From 2005 to 2010 exclusive bus lanes totaled 81 kilometers. By the end of 2010, bus corridors in Kunming totaled 117 kilometers.

Overview of the Kunming-Zurich Sister-city Partnership

Early Years –1980s

Two cities that could not have been more different began their sister-city partnership in 1982. Kunming was a western Chinese city, far away from the rapidly developing eastern coast. Zurich was known for its financial institutions and its highly developed urban planning. The early years focused on cultural exchanges with artists, musicians, and dancers from each country visiting in addition to mayors and city leaders. It seemed at the beginning that they would follow the path of most sister-city partnerships, going no further than cultural exchanges (Fingerhuth and Joos 2002a) and remaining merely a symbolic relationship.

During this period, China’s political, economic, and social climate was undergoing major shifts. At this time, China had just re-established relations with the international community; it had been isolated from the world for almost 30 years. More decision-making power and revenue generation responsibility was being given to cities. The land market, in which land use rights were sold, was just starting. Housing was becoming privatized. Work units, which previously supplied employment and housing, were no longer responsible for the latter. Yet, many of the rules and regulations guiding these changes were vague.

During an exhibition Zurich held in Kunming in the late 1980s, Chinese leaders were able to see Zurich’s multiple accomplishments in urban planning and water treatment. Chinese leaders sought help in water treatment, as Lake Dianchi, located in southern Kunming and the fourth largest lake in China, was highly polluted. Kunming lacked clean water and had difficulty supplying water to its residents. Zurich financed and provided expertise that included wastewater management, water treatment, and lake cleanup (Feiner, Shiwen, et al. 2002).
These early projects allowed Zurich’s team to learn about the complex and fragmented nature of Kunming’s local planning. Because the relationship was seen as important to both sides, several exchanges and visits occurred in the first decade of the relationship (1982-1992). These visits, along with the success of early water improvement projects, helped to establish a strong foundation as the cities’ relationship transitioned from merely cultural to focus on urban planning (Fingerhuth and Joos 2002a). Kunming officials were impressed by Zurich’s planning and sought help.


The shift in focus from wastewater projects to urban planning took place in 1993. Kunming’s leaders and planners sought help in addressing urbanization issues. They wanted new planning approaches. They formalized this new path by establishing the Kunming-Zurich Public Transportation Plan Cooperation Office. This launched a new project focused on urban development and public transit, with “Public Transit First” becoming a main strategy. This was a major shift away from transportation planning at that time, which continued to underfund public transit. The National City Planning Law of 1989, which had only been in practice for a short time, did not address public transit or transportation planning in a comprehensive way. Cities were already facing congestion issues despite relatively small motor vehicle populations.

The Swiss team included both municipal leaders such as Dr. Thomas Wagner, First Deputy Mayor of Zurich, Ernst Joos, general director of projects and deputy director of the Transport Authority, and Prof. Willy A. Schmid from the Swiss Federal Institute of Technology (ETH). Prof. Schmid was also head of the Division of Landscape and Environmental Planning (LEP), of the Institute of National, Regional and Local Planning (ORL). ORL was responsible for training on regional and local planning in Phase II of the Kunming Urban Development and Transportation Master Plan Project. The Kunming Urban Development and Transportation Master Plan Project was funded by the Swiss Agency for Development and Cooperation and was going to be used as a best practice/pilot project case. Their positions in these high-level institutes and organizations indicated the importance this partnership had for them and how they saw this as an opportunity as a best practice pilot program.

The Chinese team was comprised of several municipal leaders including the mayor Wang Jincheng and later Zhang Zhenguo, the Party Secretary. Planning leaders included Zhou Jie and Xue Hai, Deputy Directors of the Kunming Urban Planning Institute, Tang Chong, civil engineer, Lin Wei, Deputy Chief Engineer of KMUPDI and Liu Xue, Director General of the Kunming Urban Planning Authority and Director of KMUPDI.

As the sister-city relationship evolved, the influence of Swiss planning on Kunming’s traditional planning would increase because both sides became more flexible in their approach as trust was built. The sister-city relationship with Zurich was taken seriously by Kunming’s leaders and planners. One Kunming planner told me:

> At that time, they [the Swiss] could meet with the mayor and party secretary. They had a lot of influence on them. Now, it’s still an important relationship, but their influence isn’t as strong as it used to be. We would have them advocate for us because the leaders would listen to them (Interview, Kunming June 2012).

Diego Salmeron, a member of the Zurich team that worked in Kunming in the 1990s echoed this.
We had a lot of influence and we had direct access to the top leaders. Our relationship was taken seriously because at that time there were so few foreign experts in China. We also had built up trust from our water treatment projects. There also wasn’t a lot of money like there is today. Now the cities have more money (Zurich, 2013).

Zurich saw this relationship as part of a strategy to have a stronger global presence (Van der Heiden and Kubler 2005) and to address sustainable development (Fingerhuth and Joos 2002a). Kunming saw (and continues to see) this as a valuable opportunity for them to work with an international city (Xinhuanet 2012) Kunming’s leaders actively sought help with their urban planning issues.

**Traditional Chinese Approach to Planning**

The urban planning system at the time Zurich and Kunming established their relationship was just getting re-established. Master planning had only become required in 1984 (Xie and Costa 1993). In Kunming, as in most capital cities, each department involved with planning was responsible for specific tasks. The work was divided amongst several departments, but it was done in a step-by-step approach, with each department adding their input at certain stages.

The main Kunming bureaus involved in the Zurich-Kunming partnership included the Planning Bureau, Public Works Department, Construction Commission, and Public Security Bureau (PSB). These bureaus traditionally did not collaborate on urban plans; the responsibilities were divided amongst each bureau and basically each bureau added their piece to the plan.

The Public Works department oversaw all infrastructure needs in Kunming, including public transit. The Planning Commission, later named the Development and Reform Commission, was responsible for economic development. The Planning Bureau oversaw the master plans that start with land use planning and then incorporated transportation planning. This originated with Soviet-style planning, the planning was done parcel by parcel and regional plans were generalized. They oversaw the planning of public transit.

In this top-down system, the interaction between land use and transportation was not considered or acknowledged, meaning the decisions to locate certain types of land use were not connected to the transportation available or likely did not take into consideration transportation impacts. The Planning Bureau’s technical staff works in the Urban Planning and Design Institute, which had only the Kunming Urban Planning and Design Institute (KMUPDI), but later added the Kunming Urban Transportation Planning Institute (KMUTI). The Swiss team brought all these groups to work on plans, despite resistance to this idea by leaders.

Economic development and planning were not linked together nor was land use and transportation planning, meaning that types of land uses that attract more people, such as employment, did not take into consideration transportation demands or increased transportation pressures (Zhou 2006, Zhi 2005). Zoning was done on a parcel-by-parcel basis in the detailed control plan (DCP). Yet, what some have detailed in their research plans may not be followed (Gar-on Yeh and Wu 1999, Zhang 2002a, Ho and Spoor 2006). An overall vision and implementation framework that linked economic development, transportation, and land use was missing at this time.
Kunming officials wanted to have a more sustainable system. These officials identified the following as issues that would hinder their attempts (Schmid and Eggenberger 1997, 4):

- Weak cooperation between different sectors and consequently poor coordination of goals, policies, programs, activities, etc.
- Inconsistent and deficient legal system in parallel with poor and random enforcement of plans, programs, and existing regulations.
- Inappropriate tools and instruments to deal with Kunming’s dynamic development (monitoring and control).
- Inadequate [ability] to address the impending and future environmental problems related to economic development, taking into consideration environmental aspects in the spatial and infrastructure planning process.
- Failing (institutional) capacities with regard to development dynamics and appropriate urban and environmental planning approaches.

The Swiss team had a clear idea of not only the practical problems, but also the theoretical and normative differences. This assessment along with their earlier project experiences in Kunming, guided their decision to create a training program in parallel to their work (Schmid and Eggenberger 1997, 4)

**Phase I: Planning**

In the first phase (1993-1996) of this project, the Sino-Swiss team drafted the Kunming Urban Development and Public Transit Master Plan. The Swiss Agency for Development and Cooperation provided financial support from 1996 to the project, with the goal of making it a best practice. They wanted information about the project to be made widely available for other cities to learn from. “Public Transit First” was central to their urban development strategy (公交优先 “的交通发展战略). The Swiss completed most of the work, as this type of comprehensive land use and transportation master planning had not been done previously in China. However, the Chinese planners worked closely with the Swiss to make sure the plans took into account the city’s goals and cultural aspects, such as how buildings were sited. They were also learning the approaches the Swiss took toward planning and the types of data that was used for doing these plans.

By April 1994, the newly drafted Kunming Urban Development and Public Transit Master Plan (昆明城市发展及公共交通总体规划) was almost complete. The Kunming Urban Development and Public Transit Master Plan was the first professional formalized plan for Kunming. Kunming’s planners were able to incorporate not only transportation modeling into the plan, but a GIS office was established that mapped out all of the land parcels (Fingerhuth and Joos 2002b). This information could be incorporated into modeling software; which was not widely used in China at the time.

This Master Plan provided a framework for guiding city development and provided greater direction than the 1989 City Planning Law. The Plan considered not only the urban core, but also the Kunming Region. Growth was already infringing on environmentally sensitive areas such as Lake Dianchi; the regional plan redirected growth away from this area.
In drafting this plan, several agencies worked together – the Kunming Planning Bureau, KMUTI, Public Works, PSB, and Planning Commission. From the earliest stages, they worked together and shared information. The Zurich team continued to bring them together. In later years, it became natural for these organizations to continue working together.

**Phase II: Implementation Phase Multilevel Approach – Regional, Metropolitan, Local**

In the second phase (1996-2002), the Swiss Institute for National, Regional and Local Planning (ORL) of the Swiss Federal Institute of Technology (ETH) in Zurich became a partner and focused on the local and regional planning and trained planners in spatial development (Schmid and Eggenberger 1997). As part of this phase, they focused not only on the city, but the region.

The role of ORL included not only training on spatial and environmental planning but also how to take part in local meetings, oversee and comment on ongoing work, and “to play devil’s advocate.” They wanted to ensure that local planners had considered all the possibilities in the types of plans they drew up. In the beginning, it was a very top-down type of training, but evolved to provide scenarios so that local planners could understand the implications of their decisions and interventions. The ORL also used a framework that defined sustainability as dynamic, which linked transportation and land use patterns to the environment and also considered equity.

The Public Transportation Plan was based on household surveys, traffic counts, and analysis of multiple modes of transportation; these were all new transportation planning methods to Chinese planners. Zurich’s transportation system was used as the model because it had a successful multimodal system that linked bus, tram, and rail and provided space for pedestrians and bicycle traffic. Zurich’s system also linked to regional transportation.

**Transportation Policy**

In addition to various plans and projects, new policies were created. The basic ideas guiding these policies were the following (Traber 2002, 157):

- The transportation system must support the formation of a reasonable city pattern and structure.
- The fundamental role of a transportation system is to move people and goods, not vehicles.
- While pursuing a high-efficiency system, attention should still be paid to the plurality of the system.
- Constructing modern urban public transportation
- Implementing traffic demand management in time and space.
- Deal reasonably with car traffic in city centers.
- The transportation system must be economically feasible and environmentally friendly.

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6 In my field observations in 2011-2012, I met with planners in both institutes, which are located across town from each other. When I attended informal meetings on upcoming projects, often both institutes had representatives.
These ideas link economic, environmental, and equity concerns. Transportation is not seen as separate but a central part of Kunming’s urban planning system.

*Kunming Bus Rapid Transit System*

The bus corridor system was part of the larger strategy of “People oriented, Public Transit First”. Kunming was to host the 1999 World Horticulture Festival and the Festival would be the perfect venue to showcase this advanced system. The first bus corridor was Beijing Road, a north-south arterial road from Kunming Train Station to the North Train Station, a total of five kilometers. The bus corridor had large station areas in the center of the road, which were accessed at the intersection crosswalks.

The first corridor, however, almost never happened. Leaders were skeptical about doing something so innovative, meaning untested and unfamiliar. There was no precedent for this type of transportation infrastructure in China. The car lobby was quite influential at this time in Kunming and saw the lack of road space as an affront to motorists.

To gain support and buy-in from Chinese municipal leaders, the Swiss team took a group of city leaders to Zurich to see their system (Joos 2002). The leaders eventually were convinced, but the car lobby was quite strong and the Kunming Party Secretary was having doubts about the corridor (Interview, Kunming 2013). Zurich had a Swiss expert living in Kunming for two years to provide hands-on training for the design and operation of the bus corridor (Feiner et al. 2002, 61). He was alerted to the possibility of the Party Secretary caving in to the pressure from auto interests. A call was made to the Deputy Mayor Wagner of Zurich, who was one of the strongest proponents for this project and highly involved. Wagner had made several trips to Kunming to provide high-level support for the project and was enamored with Kunming. He was also culturally astute and knew that direct confrontation would immediately halt the project. He called the Mayor of Kunming to let him know that he was sad to hear they would not be putting the bus corridor into operation and that their relationship would probably change if the bus corridor project did not go through as planned. The Mayor quickly understood that Zurich would not continue to provide the same support. The Beijing Lu corridor was quickly put into operation and became a major highlight of the 1999 International Horticultural Exposition.

The bus corridor was a modification of the Zurich team’s proposal for a light rail system on the corridors (Lin 2003). The Kunming municipal government did not have the money for light rail. Even though forecasts illustrated that population growth and economic development would support a light rail, it was impossible to get the approval or financing. In fact, during this time few cities had subway systems, the exceptions being Shanghai and Beijing, China’s financial capital and the political capital, respectively.

With the success of getting the first corridor built and put into operation, the transportation planners were able to continue building upon their bus corridor system. In the next phase of bus corridor development, Kunming’s planners wanted to have a crisscross pattern to increase ridership and improve the efficiency of the bus corridors. They chose Renmin Road, an east-west street to have an exclusive bus corridor; it totaled 9.9 kilometers. By 2004, they had approximately 15 kilometers of bus corridors, and Kunming had the most technologically advanced bus corridor system in China. They were able to improve speeds from 9.6 kilometers an hour to 18 kilometers per hour in bus corridors. They doubled their passenger trips in their public transit system from 500,000 in 1999 to 950,000 by 2004 (Tang 2004). With the early
corridors in operation, passenger flow and ticket purchases increased annually 10% and the subsidies needed by the government dropped. In addition, based on a 2002 passenger survey, public transit had a 96% approval rating for their transit service (Lin and Tang 2002).

Political and Economic Context

During this same time period, the central Government identified the auto industry as an economic pillar and set in motion a number of policies to encourage car use, including the national Household Car Policy, which fostered a domestic auto market. While Kunming at this time may have been perceived as the least viable place for auto ownership as it was amongst the most impoverished provincial capitals in China, rough estimates pointed to a potentially large vehicle population (Feiner, Shiwen, et al. 2002).

The economic benefits derived from public transit were just becoming a part of the Chinese nomenclature, as “market-oriented” as a concept was only introduced in 1994. Understanding the relationship between transportation access, location, and land price was still in its infancy in China (and a contentious issue in planning academia, Sherry 1999). Local governments looked for ways to generate revenue in the short-term.

The Swiss turned to their own experience with rapid development and suburban sprawl. Between 1970 and 1990, Zurich experienced significant suburbanization and sprawl (Feiner et al., 2002); in response, planners restructured their urban planning system into one of the best transportation and land use planning systems in the world. This led them to take a multidisciplinary approach to urban planning that considered transportation and land use. The Kunming planners lacked these opportunities because of China’s isolation from the world until 1978. And because of their limitations, they were not seen as authoritative. The institution of planning was not perceived as critical because its historic role had basically been to supply infrastructure to different state-owned enterprises for their work units (Leaf 1998). Because urban planning was decoupled from economic planning, its role and again the institution, were not perceived as critical. The Swiss team, coming from a highly developed country, in the eyes of leaders had more clout in what they suggested.

A Swiss team came twice a year and held workshops with their Chinese counterparts. According to Feiner et al.: “All of these workshops were multidisciplinary and organized as discussion and project forums” (2002, 60). Workshops culminated in tangible products – plans and reports sent to municipal leadership to help guide their planning. The Zurich team also organized visits to Zurich and other European cities for Kunming planners; these trips included leaders and technicians, with the goal that they could see what Zurich planners had actually done. These workshops were co-sponsored by the Chinese Ministry of Construction (now the Ministry of Housing and Urban-Rural Development), which lent credence to the workshop. The influence of the Swiss planners was not limited to Kunming; some spatial planning concepts were incorporated into the national planning law (Feiner, Salmeron, et al. 2002, 66).

At the workshops, planners were able to ask questions and get help or advice on how to proceed on their work. Everything discussed in these workshops was written up in a report to be disseminated to participants and anyone else interested. The objective was “to make the planning process visible (transparent) and comprehensible even after three years (the end of the project)” (Fingerhuth and Joos 2002a).
Creating a Transportation Planning Institute

In 2003, the Kunming Urban Transport Institute was established. Previously, the transportation planners were part of the urban planning and design institute. This was a key shift in the perception of transportation planning. It was now established as its own institution and seen as an equal part of urban planning.

By this time, the planning institute had a strong belief that the city should focus its limited road resources to serving the most people. Public transit was identified as the lynchpin to development, not an afterthought of urban planning. This was a major shift in urban planning and transportation planning in Kunming. Ironically, most Kunming’s residents were not taking public transit. In fact, only 8% of daily trips were done by bus; most trips were done by foot or bike. Making public transit the backbone of development was a politically risky idea. In a top-down planning environment, to make public transit a priority before a national edict was issued was unusual. To give limited road space to public transit when few were using it was even more precarious. However, the planners linked transportation planning to urban development and made public transit the backbone. Both the Kunming Urban Transportation Institute and the Kunming Urban Planning and Design Institute supported and fostered this idea and supported the learning of planners. They also used their close ties with the Swiss to advocate policies that supported increased public and pedestrian space to their leaders (Joos et al. 2002).

New Partnership—The Energy Foundation

In 2004, Zurich shifted to a more advisory role with Kunming after Swiss citizens voted to reduce the amount of money spent on the sister-city partnership. From then on, activities were funded solely through the Swiss Agency for Development Cooperation (SDC) and the scale of the project was reduced. The relationship was still considered important, particularly for Swiss businesses. The relationship allowed businesses recognition and linked them to this long-term sister-city relationship. Yet, even after the relationship shifted in intensity, significant work continued to be done and the ties remained strong between Swiss and Chinese planners.

By this time Kunming was undergoing rapid urbanization in part as a result of the “Develop the West” plan of the Chinese Central Government. However, little was being done to expand the city’s 14-kilometer bus corridor network. In 2003, KMUTI signed a memorandum of understanding with the Energy Foundation, an American foundation, to support efforts to improve the bus corridor system and elevate it to a full bus rapid transit (BRT) system, which would include pre-board ticketing, a transfer system, and enclosed corridors. Political momentum for the public transit system had waned, but keeping the relationship was still important for both sides. This friendly relationship helped in maintaining trade relationships and provided an avenue for businesses on both sides. There had been a shift in leadership and new party secretaries had been appointed. With support from the Energy Foundation, KMUTI conducted a report to identify ways to improve their BRT system; they identified several ways including a free transfer system.

7 Several planners that I spoke with in Kunming describe the relationship as strong. This was echoed by Swiss planners that I spoke with as well.

8 The Energy Foundation’s China Sustainable Energy Program was started in 2000 which is also when it opened the Beijing office.
International Mayors Forum and Building Momentum to Expand Kunming’s BRT System

In late 2004, the city of Kunming hosted the International Mayors Forum on Sustainable Urban Energy Development. This was an important opportunity to show off their bus system and their city to other mayors. This forum included international and Chinese urban planning experts, Chinese mayors, and the former mayor of Bogotà, Enrique Peñalosa, who was one of the key speakers. He discussed the role of cities over time and praised Kunming experts as well. His talk targeted leaders, encouraging them to use BRT and showing them how it could transform their cities.

The Energy Foundation chose Kunming to spotlight BRT systems to support Kunming planners’ efforts and to get other mayors to support BRT plans in several cities including Beijing, Changzhou, Xi’an, and Jinan. Kunming was the only local example in operation. Kunming had already signed a Memorandum of Understanding with the Energy Foundation to do research on how to transform its bus corridor system to a full bus rapid transit system. Having a Mayors Forum was seen as a way to support both organizations. The Mayors Forum was jointly sponsored by the Ministry of Construction and The Chinese Academy of Engineering. The Ministry of Construction was instrumental in disseminating urban planning best practices to cities across China. It was supported by the National Development and Reform Commission and the Energy Foundation, China-EU Energy and Environment Project, and Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)⁹.

The Forum resulted in greater political support for the bus corridors throughout China, including Kunming (Lin 2004). According to a report by Lin Wei, director of the Kunming Urban Transportation Institute, “KMUTI did significant outreach to the public on BRT with the help of the media and submitted Working Plan on the Comprehensive Control of the Urban Traffic of Kunming City 2005 to municipal government leaders. This helped them to gain leadership support to improve upon their bus system” (Lin 2004, 2). After the Mayors Forum, Xichang Road BRT was put in operation by June 2005. In 2006, they added Beijing Road and increased the height of the corridor separator to 1.3 meters. By 2007, Kunming had a total of 45.8 kilometers of exclusive lane-bus corridors serving the downtown area of the city. And in 2007, when planning for the corridor on Guangfu Road, the planners decided to increase the densities along the route to follow a transit-oriented development style of planning. The only drawback was that bus operations did not improve until recently. The bus company refused to change its ticketing system and allow for free transfers or to do pre-boarding ticketing.

Thus, despite the shift in the Kunming-Zurich relationship, Kunming planners continued to pursue a Public Transit First strategy. They continued to expand upon the bus corridors, which now total over 107 kilometers.

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⁹ Now known as GIZ.
Table 7. Timeline of Kunming’s bus corridors

<table>
<thead>
<tr>
<th>Location</th>
<th>Length (kilometers)</th>
<th>Year built</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing Road</td>
<td>5</td>
<td>1998-1999</td>
</tr>
<tr>
<td>Renmin Road</td>
<td>10</td>
<td>2002</td>
</tr>
<tr>
<td>Jinbi Road</td>
<td>4.7</td>
<td>2003</td>
</tr>
<tr>
<td>Xichang Road</td>
<td>3.7</td>
<td>2005</td>
</tr>
<tr>
<td>Guangfu Road</td>
<td>15.3</td>
<td>2007</td>
</tr>
<tr>
<td>Chunxiu Boulevard</td>
<td>4.3</td>
<td>2008</td>
</tr>
<tr>
<td>Chunrong East Road</td>
<td>6.8</td>
<td>2008</td>
</tr>
<tr>
<td>Baijin Avenue</td>
<td>1.2</td>
<td>2008</td>
</tr>
<tr>
<td>Kunrui Road</td>
<td>2.1</td>
<td>2009</td>
</tr>
<tr>
<td>Xiba Road</td>
<td>2.8</td>
<td>2009</td>
</tr>
<tr>
<td>Haigeng Road</td>
<td>2.8</td>
<td>2009</td>
</tr>
<tr>
<td>Qianxing Road</td>
<td>2.1</td>
<td>2009</td>
</tr>
<tr>
<td>Caiyun Road</td>
<td>21.9</td>
<td>2010</td>
</tr>
<tr>
<td>7204 Expressway</td>
<td>1.6</td>
<td>2010</td>
</tr>
<tr>
<td>Haiyuan Middle Road</td>
<td>2.5</td>
<td>2010</td>
</tr>
<tr>
<td>Total Length</td>
<td>81.8</td>
<td></td>
</tr>
</tbody>
</table>

Source: Kunming Urban Transportation Institute

Learning Process

Zurich underwent rapid suburbanization in the 1970s and 1980s with construction of a major highway. The typical leapfrog, suburban sprawl pattern was emerging. The municipal government and its agencies re-evaluated their development pattern and reorganized their planning system to incorporate a “multi-disciplinary and multi-phased” approach to provide their city population with a better quality of life. This involved a re-organization of their transportation and land use planning. They brought together different departments to work together comprehensively and collaboratively. Zurich’s municipal leaders and planners understood that the process of urban planning needed better coordination between transportation and land use to reduce reliance on automobiles and to reduce sprawl. They came up with a new theoretical model that was interdisciplinary and multilayered, as shown in Figure 10. This is also the model that they brought to Kunming.
This conceptual model was not just a top-down or bottom-up but included lateral cooperation, moving beyond just a planning organization’s silo. It included not only taking into consideration environmental issues, but also socio-economic issues. Shmid and Eggenberger (1997) explain the model:

Its purpose as a model is to help exemplify the different theoretical elements in their overall context and interaction... Within the TRP [Training and Research Project] it serves as a methodological framework—helping us at the same time to illustrate the requirements of a comprehensive and sustainable planning approach together with our colleagues in Kunming (6)

Some of the same people who were part of this evolution of Zurich’s planning system were part of the Swiss team that came to Kunming (Feiner, Shiwen, et al. 2002). They brought their experience and knowledge with them and were an integral part of the trainings described previously.

Of course, translating sustainability and collaboration concepts into the Kunming planning system took time. Both sides—the Swiss and the Chinese—needed to understand what sustainable development planning meant within a Chinese context, to learn from mistakes and to re-evaluate planning approaches. Many of the early training sessions went over the theories behind their approach and described the urban experiences the Swiss dealt with and learned from to inform these theories. According Diego Salmeron, “Many of the [Chinese] leaders present were not interested in our theories, but we were able to get a core group of planners and technicians to eventually understand. We wanted everyone involved with planning to be at these meetings. We weren’t going to go office to office to explain our ideas.”

The conceptual models they brought (see Figures 10 and 11) were both multi-disciplinary and multi-scalar. As one Zurich planner explained, they understood their limitations. They identified systemic problems, but were limited as to what they could suggest to the Chinese planners and
leaders or what the Chinese planners could actually do to change these systemic issues. They couldn’t effect the fragmentation of planning or weak policy, so they focused on what could be changed while also making suggestions.

Figure 11 is how the Swiss conceived of the TRP and how each of its trainings were linked together. As part of their goals for the project they believed

The TRP had to be seen as process, requiring a continuous assessment of the preconditions and subsequent adaptation of goals, necessary measures and activities to the present – and quite often rapidly changing – status of planning in Kunming. [Figure 11] illustrates the dynamics inherent to the project and requires a close and continuous interaction of time, space, stakeholders and functional (planning) activities (Schmid and Eggenberger 1997, 6).

Once everyone had a basic understanding of the theories behind the urban planning approach of the Swiss, they moved on to apply it to actual practice in Kunming. The training was based on case studies (Salmeron, 2013). With sustainable development as the theoretical approach, they focused not only on the urban core, but the regional level as well. They (Swiss and Chinese planners) took a multi-layered theoretical approach to address urban development, seeking to understand the impacts of decisions and plans on each level – regional, local, and neighborhood. This was a quite a different approach to planning as the interaction between the levels was not considered in Chinese planning. Chinese planning separated land use from transportation. Transportation was seen as a technical exercise.

Within the Chinese top-down approach, the road networks, for example, had to conform to the land use needs. This approach meant that they were considered simultaneously and at three levels—neighborhood, local, and regional. With the inclusion of GIS and new forecast modeling, they were able to conduct scenario analysis that showed the impacts of different types of decisions (Feiner, Salmeron, et al. 2002). The urban planning modeling that the Kunming planners were exposed to opened up a different perspective as to how planning could be done and shifted it away from looking at plans as formulaic. Transportation planning’s role was
elevated because understanding its role in planning – as the backbone of development – meant that it was considered in all land use decisions. The transportation impacts and the need to have bus corridors on the arterial roads became second nature. They not only had theory, they had tools and a new approach.

The Swiss worked with local planners to have them apply these theoretical ideas and concepts to real planning issues. One example was the regional planning area. The Zurich planners did a majority of the work side-by-side with the Chinese planners, but incorporated different ideas and concepts. They then presented their final concepts in two different scenarios – best case and business as usual. Regional planning requires population forecasts, transportation forecasts, and land use changes.

**Operationalizing the Sustainable Development Framework**

The multidisciplinary, multilateral approach that proved successful for Zurich to move away from suburbanization and auto dependence was brought to China. Organizational barriers were lowered because the Swiss were persistent in their approach to provide both a theoretical framework and to apply that framework to local Chinese practice using modern tools such as GIS mapping and travel forecasting. They brought together every bureau or agency that would have some responsibility for the urban development plans. They discussed not only the concepts behind their approach but also how to put it into practice. At first, several of the Chinese leaders did not understand why the Swiss were at the meeting. As the projects moved from early conceptual stages to planning stages, those involved took a greater understanding and interest in the work. As Feiner et al. (2002, 62-63) explains:

> In general, the multidisciplinary cooperation on transportation-related issues between Swiss and Chinese, between the traffic police, the transportation and planning departments of the urban planning bureau, the railway authority, and the other local authorities, was impressive and led quickly to good results. In addition, awareness-raising among the concerned governmental agencies is a very important issue. They have to be helped to understand why public transportation is crucial to the development of modern, sustainability-oriented cities.

Early on Swiss experts did the work. Later, as the Kunming’s planners gained stronger capacity in planning, mostly the Chinese did the work. As Salmeron noted: “The collaboration has changed over time and the methods and instruments used are today different from a decade ago. In the nineties, emphasis was given to the development of master plans in various fields and the experts from Zurich played an important role in working out these plans. This has considerably changed and today the role is to give advice, to give second opinions, and to inform on new developments.”

**The Knowledge Exchange Process**

The knowledge transfer process evolved from being unidirectional to a true collaboration. This exchange of information was used to inform future work. The Zurich planners learned from mistakes in their approach and in their understanding of Chinese planning and this informed how they approached the process moving forward (Diego Salmeron, Interview, 2012). A local planner explained to me how it changed:

> At first the Swiss told us what to do and we didn’t like this. Later, they provided us with scenarios so that we could see issues with different scenarios. We couldn’t do a light rail...
line. We didn’t have the money for that. That’s why we did the bus corridors. They started to understand that we had limitations.

Chinese planners were able to provide more information about the planning process and understand the limitations of the formulaic approach. They became more invested in the learning and in gaining new tools for dealing with urban planning issues (Interviews, Kunming 2012, 2011a, 2011b, 2011c, 2011d). They saw the potential for their city and the link to a higher quality of life for citizens (Interview, Kunming 2011c).

**Conceptual Framework**

In the conceptual model in Figure 12, the learning process is illustrated. Earlier projects focused on teaching new concepts and understanding the technical and theoretical, but as time went on this changed to incorporate more of the cultural, social, and political issues in Chinese planning. The Zurich planning team was under no time pressure; they believed urban planning projects required a longer term to ensure concepts and objectives were met and to see what issues arose. They believed this gave them more time to evaluate the work and the process and to make adjustments accordingly, meaning working on approaches that were more in line with Chinese needs versus what they believed should happen. They incorporated more culturally appropriate approaches to planning that took into account the role of *feng shui*. At the same time, they could act as advocates for the planners to leaders. Planners wanted to preserve historical areas of Kunming as well as preserve walking space, but leaders did not see why these things had value.

**Figure 12. Conceptual Framework of Kunming-Swiss Partnership**
Knowledge and insight gained throughout this learning process could be put into practice as reflected in the local context. This approach and learning helped Kunming’s planners to build upon their knowledge, defend their practices, and institutionalize these concepts, even when the relationship with Zurich became less influential and transitioned to more advisory.

The planning framework of Kunming’s transportation planners contradicts much of what is taught or done in planning practice in China. Two major differences imported from Zurich were (1) transportation planners were taught to consider the short and long term impacts of land use decisions on transportation planning and vice versa, and (2) they were taught to think of transportation planning on three levels: neighborhood, city, and regional.

**Key Actors**

Continuity has played a major role in this partnership. Both Kunming and Zurich have been able to have key actors involved throughout the duration of the project. In Kunming, many of the leaders of the planning institutes were involved in the Sino-Swiss partnership. Several planners who were involved with the Kunming-Zurich relationship in the early stages has gone onto have influential positions in both the Kunming Urban Transportation Institute (KMUTI) and KMUPDI.

Two key actors involved in transportation planning are Lin Wei and Tang Chong of the Kunming Urban Transportation Institute. Lin Wei was a young planner at the start of the Kunming-Zurich partnership. He later became the vice director of the Kunming Urban Planning and Design Institute. When the Transportation Planning Institute was established and he was made director, Lin Wei brought his knowledge of both land use planning and transportation. This meant that as he built the organization, the organizational environment and the ways in which new staff were trained included these methods and ways of thinking about the role of transportation planning. Younger staff took pride in the bus corridor system and the impact that public transit has had on their city (Interview, Kunming 2007). The impact of the learning and knowledge exchanges also expanded beyond just the bus corridors and went into density bonuses for developers and reduced parking around transit stations. As a recent graduate from Tongji University, with a few years of experience, the Zurich partnership was a fortuitous opportunity for Lin Wei because it gave him the opportunity to learn new planning techniques, transportation planning in particular (Joos et al 2002).

Tang Chong who is the now director of KMUTI and was previously the vice director, has done extensive work and training with the Swiss as well. He has also studied abroad at UC Berkeley and has written journal articles on Kunming’s public transportation system. Both he and Lin Wei have been in their posts for over a decade and do not want to go any further in the government. They are dedicated to their work and believe that they need to continue to fight to maintain their public transit system.

Tang Chong stated: “Public Transit First means buses are allowed to go faster than cars. We should use our resources to serve the people who need it the most – transit users.” This is directly from the ONL objectives and framework of sustainability almost a decade later. He later said that no city could completely rid itself of congestion. “The key is using the road resources a city has wisely.” This is a critical difference from the thinking of many planners in China. Quantity is often touted and promoted in public transit articles and newspapers. He went on to
point out the technology and planning needed to improve the system, including GPS systems and limitations on the number of transfers.

Because they have risen to positions of leadership, these two are able to institutionalize these views and train the next generation of transportation planners to frame public transit as the backbone of urban development. Case in point, during a visit in 2007, I was investigating Kunming’s recent expansion of their BRT network. I asked a young staff member if he worried about the motorists getting upset about the buses moving faster than them. He answered, “No. We don’t try to compete with cars. We focus on improving bus services.” In visits two years later, I continued to hear the same thing, not only from people at KMUTI but others in the Kunming Urban Planning Institute (KMUDI). They echoed each other. They truly believed that buses should be given priority over the roads and had made efforts to make it difficult for drivers to continue driving. The senior staff in both of these institutes spoke quite bluntly in interviews: “We don’t want to be like America.” By this they meant that they did not want to follow an automobile dependent path that America is known for. And they not only had individual beliefs in having a more sustainable development path, but their institute had incorporated it into training of staff. Whether I was speaking with a young staff member or senior one, they all believed that public transit had to be the backbone of Kunming’s urban development, not cars.

During this same site visit in 2007, I took a tour of the Beijing Road bus corridor, the first one that was put into operation. As real estate development took off along that route, developers along the corridor were given density bonuses and their parking space requirements were reduced. Density bonuses are not a common planning tool and are not a tool that a transportation planner would be familiar with in China because their main responsibilities are to provide road networks, not consider policies like this. Kunming’s planners decided to limit parking within the downtown area and make parking more available outside of the Third Ring Road because there were ample transportation resources in downtown. In contrast to many of the other BRT systems in China, Kunming had chosen high volume roads for their exclusive lane corridors from the start. They were able to continue to expand upon their system, despite threats to the system with the increase in cars and the ignorance of leaders. Many leaders opposed the central lane. Motorists were worried about the loss of road space.

While the power of these KMUTI planners is limited, it can still be influential. They strongly believe in developing their city with public transit at the center. They have continued to keep bus corridors as part of a fundamental planning design.\textsuperscript{10} It is not just what they say but what they do that makes Kunming an interesting case study. None of the planners that I spoke with thought that it was strange to critique the car or to state that its use should be limited. This was years before it was safe (politically) to say these things. In the early years of rapid motorization, many planners were careful about what they said in terms of cars.

I have witnessed this in impassioned presentations by Lin Wei, calling on the city to create a new type of government organization (Wei 2012) to address multiple types of transportation as well as in discussions with other experts who work in Kunming that told me that these senior staff are often not asked to speak publicly because they are too honest and critical of where Kunming is going in its development.

\textsuperscript{10} In the Chenggong New Town plan, BRT corridors were part of the master plan.
**Social Networks**

Even though Kunming promotes itself as a public transit city, it still has to fight the car bias that exists. They have been able to leverage their personal networks to address some of these issues and cross siloes. Tang Chong has a vast network of school friends who are also a part of the Public Security Bureau’s traffic police. By relying on these connections, he is able to get support for enforcement of traffic rules, such as not allowing cars in the bus corridors. This has been critical to improving public transit service. The traffic police have come on board and supported the corridors because they have resulted in greater overall traffic speeds. Both Lin Wei and Tang Chong have established a reputation with many organizations that may not be supportive of public transit measures. Tang Chong states: “At first they may not listen to us, but after there’s a problem which we warned them about, they believe us. That’s happened enough times that they usually go along with what we suggest” (Interview, Kunming 2011).

**Revisiting Key Concepts: Policy Transfer Agents, Soft and Hard Transfer, and Organizational Behavior**

Zurich helped foster inter-agency, multilateral partnerships within city government agencies. They brought their own multidisciplinary approach to Kunming. While this was resisted at first, Zurich’s insistence on this approach carried it forward and eventually the Chinese planners saw it as advantageous. Initially, the Swiss had significant influence because so few foreigners were in China or were doing this kind of work. Over time, more international experts appeared on the scene but the ties with Zurich have persisted even when their relationship changed to a lower level of engagement. In addition, Kunming’s planners were able to take full advantage of new partnership with the Energy Foundation to reinvigorate the BRT system from 2004 to the present, using what they had learned from their Zurich colleagues. Kunming had learned a new theory of planning that focused on the transportation land use connection, interagency collaboration, and partnerships. At least equally importantly, they were able to use their personal and professional networks to foster cooperation across local agency lines, and they understood the value of doing so.

This combination of hard and soft transfer provided a strong foundation for the planners. They not only learned how to do more integrated planning, but also understood why to do it that way. The norms and the practices were transferred multiple times. Time allowed them to see how this approach was beneficial for them. While they were able to train in Zurich and tour Europe to see empirical evidence, having it work in a Chinese context was considerably a stronger reinforcement. They then passed on these norms to the next generation of planners.

KMUTI became a recognized branch of the urban planning within Kunming. It acts as a quasi-independent office because its two leaders have come to understand the importance of transportation within urban planning. This is different from a silo-style of planning. Because they are recognized as a separate unit, the role of transportation planning within the urban planning system has more legitimate place. The Institute believes public transportation is the backbone for any urban development. They have a strong set of analytical tools that not only includes this framework but software and training. They still promote ideas learned from the Swiss and have seen the benefits of collaboration using their ties at the Public Security Bureau and other institutes to strengthen their work. Even though public transit planning is no longer under their purview (it has now been moved to a new bureau), they use their personal ties to provide advice to friends in those agencies. They themselves have become policy entrepreneurs, both informally
and formally. They have institutionalized these ideas and promote their work and ideas to other cities. They have also created an institution in which the next generations of planners learn an integrated approach to transportation planning.

Because of their long-term involvement with Zurich and the type of training (hands on, context sensitive, proactive, adaptable) they received, the Kunming planners not only gained skills but a new planning framework. The Swiss also realized that local knowledge was just as important in informing their approach to bringing new ideas to Kunming. In earlier projects, they may have thought that getting the leader to agree was all that was needed, but later learned that multiple leaders and multiple actors played roles in transferring of knowledge. They adjusted their approach to include multiple agencies to get everyone involved from the beginning.

In addition, the municipal leadership was open to learning (with their resolve bolstered at critical junctures by visits from Zurich counterparts and by being selected to host leadership conferences) and this allowed for greater risk taking. Even as leadership changed, key planners involved in the Kunming-Zurich partnership were able to bring their learning to their organizations as leaders themselves. Long-term leadership positions have solidified a view amongst their staff of making public transit the priority and the backbone of Kunming’s development.

This relationship was framed as a long-term commitment; linking theory to practice was a key objective. Timing was favorable. Once the focus of the Kunming-Zurich partnership shifted to urban planning, the Swiss knew that the modeling, engineering, and planning would take considerable time. They assumed at least five years. They believed that not rushing the work, not only helped their Chinese colleagues to apply this knowledge and adapt it to the Chinese context, but that as part of the grant funding this project, they would have ample time to see whether the project was successful and to make adjustments as necessary.

The Kunming bus corridor gave buses exclusive central lanes on major arterials, physically allotting buses priority over cars. The decision to have bus corridors and place them on busy arterials is still pioneering and politically risky given the heightened status personal cars have already attained in China. Even in cities such as Guangzhou, which is one of most developed cities in China, the government only recently started BRT operations, taking nine years from plan to operation

Kunming’s “alternative” approach to planning—collaborative, integrated and holistic—is the diametric opposite of the planning norm that has become institutionalized in China. The BRT was not an end of itself but part of a greater plan that moved Kunming toward a more sustainable development path.

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11 ITDP established an office in Guangzhou in 2004.
Figure 13. Map of Jinan, Shandong province  Source: Geoatlas.com
Chapter 4: Jinan – Local Politics and Policy Transfer

An international consensus may prevail on ‘best practice’ but local political realities may mean that this consensus cannot take root in policy development. Political and bureaucratic interests are constrained by electoral considerations, issues of feasibility, funding shortfalls, war or famine that prevent ‘harder’ institutional forms of transfer (Stone 2004, 549).

Jinan’s planners, led by a local champion, innovated against the odds. The Deputy Director of the Construction Commission gathered a multi-organizational team to put Jinan’s first BRT system into operation. The BRT had been included in Jinan’s 11th Five Year plan, which elevated its status and increased pressure on him to follow through. The Five Year Plan is considered a checklist of tasks for government leaders to accomplish. Tasked with finding a way to transport a significant number of people for a national event and to meet long-term transit demands, he pursued BRT because it was the fastest way to deliver the services he was expected to produce. To ensure the BRT was operational in time, he had to make compromises to the design, construction, and operation of the BRT. This included narrower stations, siting the bus corridors on streets with less than sufficient ridership, and allowing normal buses to use the BRT lanes.

Despite exposure to new urban planning ideas, having the same experts who worked on Bogotá’s Transmilenio with Enrique Peñalosa, financial support from the Global Environment Fund (GEF), as well as training from GTZ (Deutsche Gesellschaft fur Technische Zusammenarbeit), they were unable to fully exploit BRT as a mass transit alternative. Their BRT system was pegged to be a carbon development mechanism (CDM) project of the World Bank; they would have been the first city to do so. In parallel to their BRT aspirations, planners in the city also pursued transit-oriented development (TOD) to support its BRT system. It appeared as if all the technical and logistical support was there. Yet, within such a short timeframe of less than five years, many of these ideas did not take root. Attempts at collaboration beyond formal meetings were few. Inter-agency conflicts and local politics continually undermined the project.

The questions this chapter focuses on are how and why Jinan’s planners, despite having strong technical support and guidance, were unable to take full advantage of BRT. This chapter is organized into four sections. The first section provides background information on Jinan’s history, economic development, and motorization between 2000 and 2010. The second section describes the partnership formed with the Energy Foundation that included work on both BRT and TOD. The third section focuses on the learning process, its key characteristics, and the actors involved. I conclude with an analysis of this case study focusing on the three main components of my research — the transfer process, the transfer agents, and the approach.

Methods and Data

The methods for this chapter relied heavily on participant observation. I officially became involved with the BRT project in Summer 2006, continuing through the opening of the Lishan Road corridor in 2008. To supplement my findings, I conducted interviews with staff from the Public Security Bureau (PSB), Jinan Bus Company, Urban Transportation Institute, Public Construction Commission, and Shandong University. I also utilized national, provincial, and municipal statistical yearbooks to analyze urbanization trends as they related to GDP, personal car growth, and population.
Figure 14. City scale analysis of Jinan, Shandong
Source: University of California at Berkeley’s Global Metropolitan Studies China Project 2009

Background

Jinan is the capital of the eastern province of Shandong, one of the richest provinces in China. As the capital, it is the political, economic, and cultural center for the province. It is located inland, almost in the center of the province. Its history can be traced back over 4,000 years. It is known as the City of Springs for its natural underground springs and lake in the center of the city (see Figure 14), a major tourist attraction. It is also not far from the home of Confucius, and is known for its history of scholars and philosophers.

The Jinan metropolitan population in 2010 totaled 6.8 million, of which 4.3 million lived in the urban metropolitan area. It has a built area of 281 square kilometers (108 square miles). It is over twice the size of San Francisco (46.9 square miles) with over six times the population. The city of Jinan itself has a population of 2.8 million. It is comprised of four districts: Lixia District, Shizhong, Huaiyin, and Tianqiao. Jinan’s metropolitan region includes jurisdiction over six districts, one county level city, and three counties. Recently, the local government has expanded Jinan’s metropolitan area to include two new districts — the East and West Districts. This is part of its 2005-2020 Master Plan. Included in this expansion was the creation of a new high-speed rail station in the West District that is a major transportation hub between Beijing and Shanghai.

12 The hierarchy of cities in China is as follows: city (provincial capital), county-level city, county, town, and village.
In Jinan’s 2005-2020 Master Plan entitled, “One Center, Two Districts,” the city’s urban core is forecast to grow to 4.3 million people, 3.1 million in the urban center. The West District is to have a population of 500,000 and an area of 50 square kilometers. The East District is 700,000 residents and 70 square kilometers. With this expansion, from north to south Jinan will measure 14 kilometers long but from east to west it will measure 55-60 kilometers wide — a belt-shaped metropolitan area. This wide but narrow shaped city makes mass transit necessary to move people from the city center to the outer districts (see Figure 15). The eastern district is a major government hub, with several thousand workers. The western district is home to several universities and technology hubs.

Figure 15. Jinan's urban area expansion 2000-2004
Because Jinan’s population has a relatively high education level, it has been successful in shifting its economy from a traditional heavy industry and textiles to information technology, household appliances, and bioengineering products. Figure 16 shows how Jinan’s economy has shifted to become more service-oriented from 1990-2010.

Table 8. Jinan's modal split from 1995, 2005, and 2009  

<table>
<thead>
<tr>
<th>Mode</th>
<th>1995</th>
<th>2004</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>25%</td>
<td>32.5%</td>
<td>32.38%</td>
</tr>
<tr>
<td>Bike/Electric Bike</td>
<td>49%</td>
<td>37.95%</td>
<td>35.79%</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>6.6%</td>
<td>2.4%</td>
<td></td>
</tr>
<tr>
<td>Taxi</td>
<td>1.11%</td>
<td>0.79%</td>
<td></td>
</tr>
<tr>
<td>Private Vehicle</td>
<td>2.16%</td>
<td>6.24%</td>
<td></td>
</tr>
<tr>
<td>Company Small Passenger Vehicle</td>
<td>1.8%</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Company Large Passenger Vehicle</td>
<td>2.79%</td>
<td>2.18%</td>
<td></td>
</tr>
<tr>
<td>Public Transit (bus)</td>
<td>10%</td>
<td>14.4%</td>
<td>16.82%</td>
</tr>
<tr>
<td>Truck</td>
<td>0.37%</td>
<td>0.24%</td>
<td></td>
</tr>
</tbody>
</table>

With the Opening up and Reform period, resources and investment were focused on the eastern provinces. Jinan is now one of the wealthiest provincial capitals on the east coast and in China. It has one of the highest GDP per capita in China. Despite this, personal car ownership did not fully take off until the mid-2000s for Jinan (see Table 8), as prices for cars prior to that were still prohibitive for locals.
Motorization Trends

From 2000 to 2010, Jinan maintained an average annual vehicle growth rate of 20%. Vehicles include passenger vehicles and motorcycles. Jinan’s vehicle population exceeded one million in 2008, with almost half of them passenger cars. From 2004 to 2009, personal vehicles grew 150%, from 157,000 to 489,693 (Jinan Statistical Yearbook 2000-2010). Yet, public transit infrastructure investment has only grown 11% annually (Darido 2011). Considering the history of neglect of public transit, it is still not enough to meet basic road needs.

Public transit use also increased during this time (see Table 8). Public transit use rose from 14.44% in 2004 to 16.82% in 2009. Yet, Jinan was far short of their projections to have public transit comprise 25% of daily trips by 2010 (Jinan Transportation Report 2004).

Taking into account its population growth and passenger vehicle ownership, vehicle growth rose at a rate three times faster than GDP (see Figure 18). Its urban population increased slightly during this same time period. The number of vehicles per capita increased 232%, from 34 per thousand residents to 113 per thousand residents. While this is smaller than most developed countries per capita ratio, it is still significant given Jinan’s urban form.

![Figure 18. Jinan growth rates of population, passenger vehicle growth, and Gross Domestic Product](image)

Source: Jinan Statistical Yearbooks 1990-2010
Urban Layout

Jinan has a big block urban layout, dotted with military bases, commercial areas, and work units (see Figure 19). Its road network is limited; almost all modes of transportation use the same streets. With every increase in motor vehicles, has come a similar increase in congestion, despite a relatively small vehicle population. Figure 20, a spaces and voids analysis, provides an illustration of the limited network and how it compares to downtown San Francisco.

Figure 19. Typical big block layout found in Jinan

Figure 20. Comparison of road density, Jinan and San Francisco
Jinan’s Bus Rapid Transit System and Transit-oriented development

Background

In 2003, the Chinese Central Government halted all new subway projects, causing many cities to search for alternatives. As Chinese cities had undergone decades of rapid urbanization, city populations were swelling. Many city governments had submitted project proposals to address growing demands for public transit.

The Energy Foundation had been promoting BRT through a number of meetings and workshops in Beijing and Shanghai in early 2004. They promoted best practices from the South American cities of Curitiba, Brazil and Bogotá, Colombia. The Energy Foundation decided to take advantage of their annual high-level meeting as a platform to launch bus rapid transit to gather momentum.

In November 2004, the Energy Foundation held the International Mayors’ Forum on Sustainable Urban Energy Development in Kunming, Yunnan, China. Among the mayoral delegations were representatives from Jinan including Zou Shiping, a vice mayor and Jia Yuliang, Deputy Director of the Jinan Construction Commission, who would later oversee the project in Jinan. One of the biggest advocates of BRT, Enrique Peñalosa, former mayor of Bogotá, attended and spoke at the Forum. Earlier that same year, in Beijing, Jaime Lerner from Curitiba, Brazil spoke on BRT as well as more integrated transportation and land use planning. Many people at the Energy Foundation, including international experts, believed BRT was a viable option for Chinese cities because of similarities between South American cities and Chinese ones — huge ridership and cities located in developing countries.

The Energy Foundation’s China Sustainable Energy Program (CSEP)13, located in Beijing, began operations in 2000. The program focuses on six policy areas: Buildings, Industry, Renewable Energy, Electric Utilities, Sustainable Transportation Systems and Vehicle Technology, and Low Carbon Development Paths. The Energy Foundation (EF) focused its funding strictly on policy because policy was an overlooked area within the development field and often became the stumbling block for many government agencies. Because of this focus, it became a policy entrepreneur or policy transfer agent. Lack of policies hindered or delayed opportunities for local governments to get larger funding streams from the Asian Development Bank or World Bank as well as held up the progress of projects.

One of the ways that CSEP stands apart from many foreign foundations in China is that the staff members are locals. Staff were chosen or “poached” from the top governmental and academic organizations in China because of their talent and their connections. During the initial phase of introducing BRT, this cultural advantage was instrumental in getting representatives to the Mayors Forum. Many of the leaders interested in BRT required convincing that required face-to-face meetings, such as bringing top leaders from EF to meet them to establish respect and trust.

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13 In this dissertation, Energy Foundation and CSEP mean the same thing. I describe the program to clarify when the Chinese office was launched and identify the staff involved. Unlike many development agencies or foundations in the early 2000s, all project managers and assistants were Chinese nationals. The head of the China office was also Chinese. In most foundations at this time, the senior leadership was not Chinese. I mention this because EF has a better reputation than many foundations because they have Chinese staff in leadership and they are the top in their fields. The Energy Foundation is also respected because salaries are comparable to U.S. salaries; this has come up in discussions with grantees. Often Chinese staff were getting paid a fraction of their western counterparts’ salaries.
The Forum had over a dozen cities represented including Shanghai, Beijing, and Chengdu. The Forum was organized by the Energy Foundation, but sponsored by the Chinese National Development and Reform Commission and the Ministry of Construction\(^\text{14}\). Sponsorship was essential to getting the mayors and other city leaders to attend the conference. International and Chinese experts spoke on building energy and sustainable transportation, in particular, BRT.

With the various shifts in the government, cities were looking for alternatives to subways that could accommodate growing transit demands swiftly. The central government had drastically reduced funding to subways and many projects had been put on hold. Subways were too expensive for cities to fund on their own. At the same time the Ministry of Construction had also sent out an edict calling on cities to make public transit a priority to address growing congestion. Bus rapid transit systems in Bogotá, Colombia and Curitiba, Brazil—both developing countries—demonstrated that large ridership demands could be met with buses at a much lower cost.

Jinan’s municipal government had been planning for a light rail system when funding was halted. Added to their concern, the city was to hold a major event in the near future — the 2009 Chinese National Games. They needed a mass transit system to deal with both National Games attendees and its own rising public transit demands. Jinan’s public transit had seen a 56% increase in daily trips from 1993 to 2004 (Sheng 2006, 43).

The Forum was seen as a success as many leaders promised to pursue BRT in their cities. Case in point, the Jinan municipal government and the Energy Foundation signed a memorandum of understanding to launch a feasibility study on BRT (Energy Foundation 2004). The Forum’s success also allowed EF to secure greater funding in support of their BRT projects. EF was able to secure funding from the Hewlett Foundation to open its technical center, the China Sustainable Transportation Center, to provide technical support for bus rapid transit projects in China. The Center was launched in 2005.

The BRT Best Practice – Bogotá’s Transmilienio

Bogotá’s Transmilienio system has been in operation since late 2000 and now transports 1.3 million people per day. The Transmilienio system provides the same capacity and speed of a subway but at a fraction of the cost in terms of construction. Busier sections of Transmilienio can carry 44,000 people per hour per direction. The ideal use of BRT is on arterials with higher demand.

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\(^\text{14}\) The National Development and Reform Commission is responsible for overseeing social development and economic policies in China. The Ministry of Construction (later named the Ministry of Housing and Urban and Rural Development) is responsible for planning, including public transit.
The Transmilenio system was at the center of an urban renewal plan initiated by Mayor Enrique Peñalosa (see Figure 21). Part of his urban renewal plan included increased and improved public space throughout the city. He promoted bike lanes, pedestrian boulevards, and green spaces. He wanted to “restrict private car use and stimulate urban renewal through public space improvements.” The areas around the BRT stations were redesigned to incorporate better access for pedestrians and bicyclists to the stations, including walkways and sidewalks.

The Transmilenio system was the model that Jinan based its BRT system on. In the following section in which I describe Jinan’s process in pursuing a BRT network, having this ‘best practice” example in mind, will illustrate how the norms were not transferred. Instead, the focus was on the infrastructure or the practice or hard transfer. Without the norms, the BRT system could not be used to its full advantage.

Jinan’s Bus Rapid Transit Project (2004-2010)

Phase I: 2004-2008

In late November 2004, the Jinan Municipal Government launched a feasibility study for a bus rapid transit network. By October 26, 2005 the Jinan Municipal Government and the Energy Foundation signed a Memorandum of Understanding to work together on a BRT network. The Energy Foundation had already been working with the Jinan Bus Company and Planning Institute through the Jinan Construction Commission. EF had supported a feasibility study and had hired South American engineering firm, Milenia Group, to work with Jinan’s bus company.
to design the bus corridor in April 2005. With the signing of the MOU, Jinan would be one of the Energy Foundation’s first BRT demonstration cities in China.

Jinan was seen as one of the best places to launch a BRT pilot. They already had bus lanes on 50 kilometers of their roads (Wei Tao 2005). They wanted to upgrade their system to a full BRT. The Vice Mayor became a major champion after the Mayors Forum and a tour of Beijing’s BRT, which opened shortly after the Mayors Forum in December 2005. The Energy Foundation had also been working with Beijing.

Jinan’s planners were also interested in pursuing transit-oriented development (TOD) along the planned BRT corridors (Correspondence 2005). The mayor, Bao Zhiqiang, provided political and financial support for the idea of TOD (Correspondence, December 27, 2005). He also wanted to move quickly on the BRT corridor and have it built within 11 months. The problem was that while conceptually the planners at the Planning Institute “understood” BRT, they did not know how to design a BRT corridor. The quality of roads was also another factor. Many of Jinan’s roads were in need of repair.

**Beiyuan Road—Jinan’s First BRT Corridor**

Beiyuan Road was chosen to be the first BRT corridor because it was one of four roads slated for infrastructure improvements by the Public Works Bureau. The BRT corridor would be 18 kilometers long; the Energy Foundation’s international expert technical team, with the Milenia Engineering firm, led by Paulo Custodio, would design it. Milenia, along with the local bus company, conducted a massive bus survey along Beiyuan Road to see if having a BRT would be feasible (Milenia Engineering 2005). Their investigation found that the number of riders on this corridor would not be enough to sustain the corridor. The analysis suggested that a network of crisscrossing routes would be a better option. According to the report, the daily passenger total would be 68,000 at the most. For the morning commute, the maximum number of passengers for the corridor was 6,200. Beiyuan was not a major destination for most riders but was a street they had to travel to get to their final destination, therefore it was recommended that the BRT network be created to connect the east and western areas and the northern and southern to take advantage of BRT’s ability to provide high capacity mass transit. In a best case scenario, with a full BRT network, Beiyuan BRT corridor would be able to carry more than 180,000 passengers per day (Milenia Engineering 2005).

**Data and Training Issues**

To identify the best location for corridors, multiple ridership studies were done on the heaviest bus lines to see where the greatest need was for BRT. Training had to be done for the surveying as this type of survey work had not been done in Jinan previously. In addition, Custodio’s team wanted to identify ways to optimize the bus lines. Redundancy of bus lines was a major issue for Jinan’s bus company. This type of technical work required extensive training on optimization software.

One issue that emerged on the BRT project for many experts was access to common data. Maps of the city were restricted because of the city’s military role. Shandong University students had done an extensive mapping of the city in AutoCAD, but could not provide it to the foreign technical experts. Custodio’s team spent several months working on getting permission to acquire the map that would allow them to do route optimization for the bus lines. To get around this major roadblock, members of the experts’ team who worked closely with young engineers at
the bus company’s planning institute asked for help in getting access. The engineers used their connections with the university and were able to get the data. The experts’ team could only access it at the planning institute’s office.

However, this was not the only reason we could not have access to the map. The Transportation Engineering Department was new to Shandong University. Its chair, Prof. Zhang Ruhua, was a recent PhD graduate, but his experience in these types of projects was limited. Thus, the AutoCAD map was important to him because it showed he could complete a major project. This information was a funding source.

Also, organizations involved in this project did not want to share because they did not want to help other organizations. In a top-down bureaucracy, horizontal cooperation is not acknowledged and does not allow you to move up in the silo.

Training

Another issue that emerged was the uneven training and educational background of leaders and planners. Some leaders were appointed to their positions but lacked transportation engineering or urban planning experience. Even those with some training were unfamiliar with modeling for transit optimization. The gaps in training created further issues in gaining access to the data. Because these leaders did not understand how the data was going to be used, they would not give permission to share it.

Elevated Expressway with or without BRT

While subway funding had been put on hold for new projects, expressway funding was widely available. The Ministry of Communications was investing billions in expressways and roads across China. Jinan was also one of their recipients. The expressway became a major challenge to the BRT system. I attended BRT meetings in Jinan in late December 2005. The following is a report I sent to Prof. Deakin about one of these meetings:

Mainly, [the meeting] went over the construction of various hubs that will be situated along an elevated highway. None of the Chinese transit organizations want the elevated highway, but the Ministry of Communications [the National Highway Department] has provided Jinan with a free expressway. CSTC and EF have both advised putting the expressway outside of the city, but Jinan officials have decided that putting [the expressway] through the center of the city is the best idea. There is no need for such a large elevated expressway and at one point, there will be ten lanes going through the city (including 2 BRT lanes).

The main point of the meeting was to discuss engineering aspects of the expressway because until the expressway is built, BRT can’t be implemented (personal communication, January 6, 2006).

With the agreement to have an elevated expressway, multiple levels of government became involved in the BRT project – national, provincial, and local. This influenced early designs and stalled progress. In early planning phases, the Beiyuan BRT corridor was designed to be part of the elevated expressway (see Figure 22). The Energy Foundation and its newly created technical center, the China Sustainable Transportation Center (CSTC), pressed to have the BRT separated from the elevated expressway. They argued against this and persuaded the various agencies involved to place the BRT corridor on the street.
By March 22, 2008, the Beiyuan BRT corridor went into operation (see Figure 23). Beiyuan’s operations were problematic and controversial from the start. Several times the buses left the hub late. Buses then would bunch up in the lanes at the stations because they left too early or too late. The corridor had no passing lane, even though the design included one. Even though experts explained to the bus company the importance of timely departures, the bus company did not seem to understand how it was related to back-ups at the stations or fewer buses for rush hour. In an email describing the situation, a foreign expert explained the implications:

There are …problems right now in Jinan (political). The new mayor [Zhang Jianguo] is questioning BRT a lot. BRT was not constructed [like it was] designed. Operation[s] are not efficient. ITS equipment is very sophisticated but they do not know how to use it and the systems are not working at all. They never allowed anybody [e.g., experts] to get near the ITS design. Because of some construction materials and ITS, cost of stations got very high. Other things went wrong like the small size of some stations, there is one station on curve, intersections were not built as designed, no traffic management actions were taken (leaders of traffic police are in jail for corruption). So many things went wrong and need to be addressed properly. We want to help Mr. Jia in this because he is now in a difficult position. Demand on BRT is good and evaluation by users is high. Mr. Jia wants some evidence and some recommendations to improve it. We gave him recommendations but he wants stronger evidence (Correspondence, May 23, 2008).

The Beiyuan corridor’s poor operations were undermining the opening of future corridors, such as Lishan Road. At this time no opening date had been set for Lishan Road, even though the stations had already been built. The BRT project could have been halted, with Beiyuan as the only corridor. It is not unusual in China for infrastructure to be built and then torn down. We (UC Berkeley and Milenia) were asked to provide data and analysis to support further development of the BRT and to show ways to improve the Beiyuan corridor.

Prof. Deakin provided Shandong University with recommendations on how to analyze the intersections and signalization. We met with Prof. Zhang, Remi Jeanneret (Milenia), and
Shandong University students who were working on conducting opinion surveys on BRT. They provided us with a survey they were working on and asked us for feedback. We helped revise the questionnaire. All the intersections were at level of service “F”.

![Figure 23. Beiyuan BRT station in operation](source: author, 2008)

The report we later helped to draft that would be submitted to the municipal government, not only showed overall support of BRT, but also identified current operating problems. The objective was to get other agencies to support BRT operations, for example the bus company and the PSB traffic police. Other issues had to do with enforcement. Cars would drive in the BRT corridor and this slowed bus speeds. The PSB’s support was needed to stop cars from doing this. In terms of operations, if the report could persuade the leaders to give greater support, then operations would have to be changed. Foreign experts’ voice in the matter gave these recommendations greater latitude in this case.

Signal timing at intersections caused some of the traffic conflicts identified. BRT’s fast service relies on signal priority. Signals are set up to give buses priority to ensure faster and more efficient traffic movement. However, Jinan’s BRT buses were not given signal priority. In fact, at some of the intersections, every movement had its own signal phase, resulting in cycles over 4 minutes long. The traffic engineering department of the PSB times intersections to move as many vehicles through as quickly as possible. The PSB’s effectiveness is measured by traffic volume, not the number of people moved. They would need persuading from municipal leadership to support any signal timing changes. In fact, staff in several different organizations told me that leaders do not want to wait at the intersection and do not want to see buses moving past them while they wait. While the experts’ report helped to get support for Lishan Road’s opening, it did not get the PSB to change their signal timing issues.
Leadership Change—Jinan Urban Planning Institute

By December 2008, the Planning Institute had a new director; Director Pan moved onto another department, no longer affiliated with this project. The dynamics with the Planning Institute changed. The staff involved in the BRT project had to rethink their strategies because they were not sure how the new director would take to either the transit-oriented development or BRT. Thus, despite having support for these projects within the main bureaus, smaller agencies within the bureaus could undermine the projects.

Phase II: Lishan Road

Some experts involved, both foreign and Chinese, voiced concern over the choice of Lishan Road as the second corridor because it was only 50 meters wide. This was much narrower than Beiyuan. The Public Works department was only going to have 10 additional meters of right-of-way, for a total of 60 meters.

The Municipal Transportation Plan designated Lishan Road to be widened and redesigned. Thus, similar to Beiyuan, it was the right opportunity politically for a BRT corridor. Since Lishan Road intersects Beiyuan Road, it would provide a BRT link with the southern part of the city. Lishan Road opened in September 2008.

Lishan Road runs north-south 9.1 kilometers from Jingshi Yi Road to Beiyuan Road, less than a kilometer east of downtown. All along the street are numerous government agencies, small shops, military zones, educational areas, two big box retail stores (Carrefour and RT-Mart), and offices (see Figure 24). I conducted an extensive study of the transportation and land use challenges for Lishan Road, noting the high number of driveways, high density uses, conflicting land uses, and narrow space (Thomas and Deakin 2008).
Figure 24. Land Uses along Lishan Road and Traffic flow (pre-BRT)  

Table 9. Lishan Road Morning Peak Data  

<table>
<thead>
<tr>
<th>Segment</th>
<th>Length of Segment</th>
<th>Type of Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beiyan-Huayuan Road (North end of Lishan Road)</td>
<td>1 kilometer</td>
<td>Government and educational institutes, including the Environmental Bureau. The Chinese opera and a movie theater along with dozens of retail stores and restaurants. Access to Lishan Road is limited near the rail line. Up to that point there are small retail shops lining the streets.</td>
</tr>
<tr>
<td>Huayuan Road–Jiefang Road</td>
<td>1 kilometer</td>
<td>Carrefour, a hypermart, with 150+ parking spaces on the roof, gas station near Jiefang intersection. Lots of government institutions and their residential housing units. Hospitals, retail, restaurants.</td>
</tr>
<tr>
<td>Jiefang Road–Heping Road</td>
<td>600 meters</td>
<td>Theater, 10+ story hotel/office building, military base, smaller hospitals, and residential compounds. Many one-story retail stores, restaurants directly adjacent to Lishan Road. A provincial government department takes up 1% of the west side with its own guesthouses, residential buildings, and institutes but there are small retail shops bordering it.</td>
</tr>
<tr>
<td>Heping Road–Wenhua Road</td>
<td>600 meters</td>
<td>RT-Mart, a hypermart, located on southwest corner of the corridor with a 150+ space parking lot. Mainly government buildings—Provincial Supreme court building; housing is predominantly older 3-4 story buildings, and a few newer 15+ story housing units. All housing is work unit housing. Retail is mainly one-story small shops clustered together on both sides.</td>
</tr>
<tr>
<td>Wenhua Road-Jingzhi Road (South end of Lishan Road)</td>
<td>680 meters</td>
<td>Mainly offices, banks, and government buildings at the four corners. New residential and office development is coming up on the west side, with several 15-story buildings; the middle of the east side is a wall bordering Shandong Normal University with no entry point.</td>
</tr>
</tbody>
</table>

Table 9. Lishan Road Morning Peak Data  

<table>
<thead>
<tr>
<th>Pedestrians</th>
<th>Bikes and Ebikes</th>
<th>Motor Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>N</td>
<td>S</td>
</tr>
<tr>
<td>Beiyan-Huayuan</td>
<td></td>
<td>4,100</td>
</tr>
<tr>
<td>Southbound</td>
<td>Northbound</td>
<td>3,500</td>
</tr>
<tr>
<td>Huayuan-Jiefang (Carrefour)</td>
<td>1,340</td>
<td>2,400</td>
</tr>
<tr>
<td>Southbound</td>
<td>Northbound</td>
<td>1,640</td>
</tr>
<tr>
<td>Heping–Wenhua (RT Mart)</td>
<td>816</td>
<td>1,616</td>
</tr>
<tr>
<td>Southbound</td>
<td>Northbound</td>
<td>1,308</td>
</tr>
</tbody>
</table>
I submitted this report to the Jinan Public Works Department and reported my findings at the meetings and made recommendations about how some of these conflicts could be resolved. This included accessing some of these commercial areas through a back road, building underpasses for pedestrians, and relocating some stations further away. The original design ideas for the Lishan Road corridor came out of a survey of the road that I did with Paulo Custodio and Wei Tao, an EF staff member in 2005-2006. We walked the entire corridor and took photos. Using an AutoCAD printout, Paulo marked potential areas (see Figure 25) for the BRT stations on this road. These potential station locations became the permanent ones in the final plan.

Figure 25. Potential BRT station sites that were later made part of the BRT final plan
Source: Jinan Construction Commission
The street intersects major arterials in Jinan and traverses several university areas, government districts, and retail districts. The road was a boulevard, lined with trees and auxiliary lanes that accommodated slower traffic. Bikes used the auxiliary lane and were physically separated from pedestrians (see Figure 26).

![Figure 26. Lishan Road with different modes physically separated](source: author, 2005)

Buses also used these lanes and there was on-street parking. In order to accommodate the BRT stations, which would be in the center of the road, the right-of-way was expanded to 60 meters (~190 feet) (see Figure 27). The Planning Institute's original BRT corridor plan provided enough space for all modes; bikes and pedestrians were to have 6 meters on each side. The Deputy Director was able to get the Construction Commission's support to tear down all of the buildings it needed to make space for the wider road.

![Figure 27. Lishan Road Bus Rapid Transit Proposed Design](source: Jinan Construction Commission, 2006)

However, they were not able to get the approval to cut down trees from the Parks and Forestry Bureau, a separate agency that did not agree with the plan. Despite the lack of approval from the Parks and Forestry Bureau, the Public Works Bureau went ahead and repaved and redesigned
Lishan Road, hoping to force a compromise. The Deputy Director believed that it was better to have something in place than wait to get everyone in agreement. As long as the cars were taken care of in the design, everything else could be worked out. Later, he stated in private that politically Lishan Road was a safer choice than other roads proposed as it was already slated for road widening (to make room for the burgeoning car population). The project was under attack by the mayor.

To ensure enough space for car lanes, bike lanes were removed and bikes were placed on the sidewalk with pedestrians (see Figure 28 for an example). Additional buildings and structures were torn down or moved. For example, the front gate of a People's Liberation Army base was moved back to gain more space. The car lanes were designed based on road speeds. The designs came from the U.S. AASHTO guidelines. The wider a street lane, the faster the cars can go. Yet, at this time, most street speeds were less than 30 kilometers per hour. The design of some streets was for twice this speed.

Cars were at the center of most discussions about the Lishan Road BRT at meetings that I attended in 2006. The main concern voiced was about the car lane widths. While Jinan's car population was relatively small (less than 200,000 and only 3% of daily trips), car culture had already taken hold. The UC Berkeley group focused on the non-motorized modes of transportation – biking and walking to provide evidence of their importance and the need to keep them in consideration of the BRT planning. I, as well as Prof. Deakin, presented at a number of meetings, describing the land use conflicts that would hinder the Lishan Road BRT’s efficiency.

![Figure 28. Shared sidewalk and bike lane on Lishan Road](image)

Source: Brittany Montgomery, 2007

The Engineering Design Institute (EDI), which works under the Public Works Department, made several changes to the original design. In the original design, the BRT stations were to be a minimum of 4.5 meters wide. The EDI removed 1.5 meters from the station to give more space to cars. The political pressure to serve motorists was high (Interviews JN1, JN2, JN3 2011). When I asked why they made the stations smaller and narrower (see Figure 29), an official

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15 The extensive role that inter-office politics played in hindering this project would not emerge until after the project was finished. It was clear that there were political struggles, but the extent to which it happened within the same planning silo was not clear until later.
working for the bus company stated, “We know the stations aren't great but we can't compete with the car.” Many of the BRT stations were redesigned to be shorter and narrower than the original design. But it was not just the reduction of space, but also the location of the board/alight doors. They faced each other. This meant that passengers getting off in either the north or southward directions were going to run right into each other.

![Image of BRT station](image)

**Figure 29. One of the narrower BRT stations on Lishan Road**  
Source: author, 2008

I followed up on this question with planning institute staff. When I asked about the narrow station and how this might impede bus riders getting on and off the bus, her reply was: “They'll get used to it.” The cars had a much greater status and greater comfort. When I suggested that they could have fewer car lanes or make it difficult for motorists to use Lishan Road, I was told that was not possible. In fact, in the early planning for Lishan Road, road capacity for cars was a major concern. By expanding the road, it allowed for a total of 6 lanes, which meant that capacity would increase from 3,051 per lane per hour to 4,800 vehicles per lane per hour, in theory (Jinan Municipal Design Research Institute 2006). In reality, traffic was so congested on this street that that did not seem plausible (Table 9 above).
Coordination of Jinan’s BRT Project

Figure 30 provides a simplified view of the Jinan municipal organizations involved in transportation planning. Figure 31 shows an organizational chart of how BRT project responsibilities were to be divided among different consultants and government organizations. Consultants also included Chinese universities — Tongji University in Shanghai and Shandong University. UC Berkeley worked with Shandong University’s Transportation Engineering Department as well as with the bus company, as did Custodio’s group. Even though the arrows show communication as bi-directional between the Energy Foundation and the Urban Design...
Institute and Planning Bureau, this is not what happened. We were often not aware of each other until we met at a meeting to update work or to discuss a problem during the planning stages of the Beiyuan and Lishan BRT corridors. Custodio’s group and the Berkeley group worked together and kept each other informed, but neither group had much contact with the China Urban Design Institute or any of the other organizations, outside of these meetings.

Organizational arrangements and work practices were barriers to coordination. First, transit, traffic, land use, parks and landscape design were each in separate agencies and reported to different leaders. Each group was isolated from each other. Bus operations were separated from the land use planning and the detailed design group. Each of the private companies (Lin Li Company, Ding Han, and Hong Kong Planning) came up with separate plans for the BRT, which we would learn about at different meetings when they presented. While Custodio’s team tried to attend meetings and contact others involved, they often were rebuffed and not included (Custodio 2006). Likewise when the UC Berkeley team requested joint meetings with the land use and transit planners, they instead were scheduled into separate meetings with each group. Even in meetings where many of the departments were represented, they ended up reporting results from their own work without discussing how it would be coordinated with the work of others, even when there were apparent conflicts. When we tried to engage conversations between the organizations to discuss such conflicts they were not responsive nor were they necessarily allowed to spend extra time on the project to deal with identified conflicts. In some cases the staff assigned to attend project meetings for their organization were not the staff that were actually involved in the project. In addition, staff was frequently reassigned from one project to another so there was little continuity. Taken together, these work practices made it very difficult to coordinate planning, land use, street design, transit, traffic management, etc.

Figure 32. The Lishan BRT is stopped by traffic trying to enter the Carrefour parking lot or turn left
Source: author, 2007
Transit-Oriented Development

In December 2006, I went to Jinan with two other graduate students to do fieldwork on the next proposed corridor – Lishan Road. We focused on non-motorized transportation and land uses along the Lishan Road. During our time there, we made contacts with Shandong University’s Transportation Engineering Department, Construction Commission, Public Works Department, Jinan Bus Company, Engineering Design Institute, and the Jinan Urban Planning Institute. This launched our relationship with Shandong University; a number of students helped us to do transportation and land use surveying on Lishan Road.

In December, we (UC Berkeley) took part in a meeting of 40-50 researchers and decision makers in the BRT project. Energy Foundation representatives, consultants from various institutes, and Jinan city officials all participated in this two-day event. The UC Berkeley group was asked to give a short presentation. We reported some preliminary findings on our TOD work. The reception was positive – there was an interest in trying to integrate non-motorized transportation, parking, and land use density into the discussion of BRT. The advantage of such an event was that we could hear what other people were researching on BRT – anywhere from the hub design to the network plan to the ITS support system. It was a good opportunity to understand all of the working parties involved in the BRT undertaking. Mr. Jia presided over the meeting.

In Summer 2007, UC Berkeley continued to do work in Jinan and looked at possible sites around Lishan Road that could be TOD sites. We also (UC Berkeley and Shandong University) conducted a major transportation survey of Jinan, focusing on all modes of transportation, including electric bicycles. Jinan experienced one of the worst summer rainfalls and had serious flooding throughout the city. This culminated in a transportation report submitted by Shandong University. In the summer I analyzed land use conflicts for a client report to the Public Works Department and submitted it to both the Deputy Director Jia and the Energy Foundation. TOD did not seem to gain real traction again until 2008 when Beiyuan BRT was in operation.

In March 2008, Prof. Deakin and I went to Jinan to discuss possibilities for doing a transit-oriented development site. We were sent several documents on the Luokou Area in the months

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16 I had previously met Mr. Jia in December 2005 through my contacts at the Energy Foundation.
leading up to our visit, but were still unclear as to the scope and scale of the project; the documents contradicted each other. The initial description was of upscale housing development. When we arrived we also discussed Jinan’s current plans for the High Speed Rail (HSR) station in the West District. Jinan was to be one of the stops for the Shanghai-Beijing HSR. The main proponent for the TOD project was Director Wang of the Planning Bureau.

From April to May 2008, in discussions via email and Skype about the Luokou Area, we were told that we should focus on the western high-speed rail area; we would only have an advisory role/input on the Luokou Plan. But in June 2008 when Prof. Deakin visited Jinan, the Planning Institute wanted a more in-depth critique of the Luokou Plan, which we later discovered was in response to a plan submitted by the developer. Their advising needs required an in-depth analysis of the plan to see if there were ways to incorporate TOD elements (e.g., smaller block size, denser road network) into the plan. The control plan would be the main guideline for the developer.

We decided to use this as an opportunity to create a case study show on how to incorporate TOD into control plans, how data could be interpreted and analyzed to create different scenarios, methodologies that can be used, etc. We wanted this to be a learn-as-you-go model and also to create a TOD manual to illustrate to other cities how they could apply these concepts to their control plans. We knew that working in Jinan was difficult because of inter-agency issues, but that the case study would be more useful approach to learning about TOD than western examples.

Jiaching Chen, a fellow UC Berkeley graduate student and I went to Jinan in early June 2008. We walked the entire area of Luokou District. We documented land uses and transportation infrastructure and had informal interviews with residents to understand who lived there, the types of work they did, and their overall opinions on the area. We did not talk about possible redevelopment, as the Planning Institute told us not to. Through our field site visits, we discovered the control plan was missing significant bits of information, such as recently built apartment buildings (see Figure 34).

While the Jinan Planning Institute wanted us to provide them guidance on applying TOD principles to their plan, the Energy Foundation wanted us to do transportation analysis. The Milenia group was overseeing the creation of a database to do a citywide analysis, which included the Luokou Area. Energy Foundation staff persisted in having us do basic traffic
analysis. Many times during our work on this project we would have to explain how urban design aspects were just as important as quantitative data and/or that traffic analysis cannot support all of our recommendations. The Planning Institute wanted to visually understand what applying TOD would be like in a Chinese context. They did not want transportation analysis.

**Background on Luokou**

Luokou Area was designated as a redevelopment site within the Xiaoqing River Area in northern Jinan. It was located at the north end of the north-south development axis of downtown Jinan (see Figure 35). With the Yellow River and ring road to its north, the Luokou Area was categorized as a lynchpin to accomplishing the Jinan Municipal Government’s North Extension Development Strategy (“北跨”发展战略). The main objective for this site was to improve the quality of life for residents living in the northern area of the city; they wanted high-end housing in this area. This was a three-square kilometer parcel that currently houses 30,000 residents. The plan was to provide upscale housing, retail and office space for more than 100,000 people.

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**Figures 35. Analysis done by University of California Berkeley team for the Luokou TOD project**

Source: Global Metropolitan Studies China Project 2009
We analyzed this project at the regional, local, and area levels (see Figures 35-36). The TOD was going to almost quadruple its population; we conducted a basic preliminary transportation analysis to understand future transit demands. According to Jinan’s Transportation Planning Report (2006), the mode split is to have less bike use and walking in the future, but increased public transit. However, because the population of the municipal area will increase by over 1 million, there would actually be no real change in the number of pedestrians and bicyclists but a significant increase in vehicle trips (personal cars, taxis) and public transit use.
The original plan only provided a total of 10 intersections and few through-streets (see Figure 37). One of the main issues with increasing street space is that the urban planning law requires developers to provide only 15% of the project land for roads and squares (see Chapter 1, Table 4).

The Luokou project was not only going to be impacted by its own population increase, but also by demographic changes in areas surrounding it. Unfortunately, this was not considered in the original plan. The TOD was looked upon as a separate entity, despite the fact that it could have major impact on the city. This goes back to the spatial planning approach introduced by the Soviets, which treated such area plans as independent of the larger region and enforced such independence by assigning workers and housing to the same area. With the opening up of job and housing markets, no such enforcement of co-location persists and very few employers continue to provide worker housing nearby. However, the planning approach continues unchanged.

One of our early recommendations was that the planners push for more space to be used for roads, supplementing major arterials, which could be used for mixed-flow traffic and BRT lanes with a complete bike network as well as a complementary network of smaller, neighborhood connector roads. A denser road network would provide smaller blocks and a more walkable environment. The concern raised was that the developer did not want to provide that much road infrastructure and could use the national urban planning guidelines as a legal support for his resistance.

We continued to work on these plans throughout 2008 and 2009. Another group of graduate students and Prof. Deakin went to Jinan in the winter to walk the sites. They had more urban design experience. In addition, an urban design studio course took on the Luokou project and

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**Figure 37. Original Plans for the Luokou Area** (Source: Jinan Municipal Planning Bureau)

The original plan only provided a total of 10 intersections and few through-streets (see Figure 37). One of the main issues with increasing street space is that the urban planning law requires developers to provide only 15% of the project land for roads and squares (see Chapter 1, Table 4).
analyzed the area. We were doing more and more of the work, and less was being done by the Jinan Planning Institute. In 2009, a staff member from the Planning Institute came to UC Berkeley as a visiting scholar. She took advantage of her time here to read up on TOD as well as travel to various cities in the U.S. to see how different transportation systems worked. We continued to work on a detailed analysis of the Luokou Area. An entire urban design report was drafted providing prototypes of street blocks, roads, and building styles, taking into account cultural and regulatory differences (see Figures 38-39).

Figure 38. Street design for the Luokou area
Source: Global Metropolitan Studies China Project, 2009
Figure 39. Street design Recommendations for the Luokou area
Source: Global Metropolitan Studies China Project, 2009
In the end, we provided the Jinan Planning Institute with our report and then moved onto another TOD project in the southern part of the city. For that project, I only conducted preliminary transportation analysis based on population forecasts. We made similar recommendations to the Luokou project – denser road network, smaller block sizes, etc. But in this last project, we did even more of the work and it was more like a consulting job than a collaboration.

**Learning Process**

Learning can make the difference between successful transfers as opposed to inappropriate, uninformed or incomplete transfer (Stone 2004, 546).

Overall, Jinan’s learning process, whether on the BRT project or the TOD projects, was piecemeal and ad hoc. Some of the issues that emerged may have been related to the narrow education that many Chinese planners have, resulting in limited competency that hindered available staff’s understanding of new concepts and also inhibited their ability to work across agencies. However, institutional arrangements and assignments of responsibility separated various planning functions into different organizations, made data a jealously protected asset for each agency, and disrupted opportunities for staff to learn from each other, from the outside experts, or from continuous experience on a project. All of this exacerbated any underlying educational deficits that may have been in place. In addition, the sponsor’s desire for quick results limited the possibilities for longer-term training. As a result, much of the work done on the project by outside experts came to focus on hard transfer. In Figure 40, I have come up with conceptualization of the learning process. While there were attempts at incorporating more feedback into the process and adapting our approach to the projects, the work mainly became focused on getting the BRT to look a specific way.

Jinan’s BRT project was modeled after best practices from Bogotá and Curitiba. However, only the system design (hard elements) was in fact modeled. The South American cities were able to put BRT into operation because they had highly trained engineers working on the projects and political buy-in from the public. In Bogotá, Mayor Peñalosa used public support and polls to leverage his ideas. He had a strong coalition of experts and government aides. He also was a highly educated politician who had a strong background in public administration and extensive experience studying and working abroad. In addition, the city had a history of trying to address its sustainability issues dating back to the 1970s (Montero 2013).
In stark contrast, this was Jinan’s first attempt. Jinan’s planners lacked the resources that helped Mayor Peñalosa and Bogotá’s BRT succeed. Yet, the narrative that I heard working in Jinan was that the BRT would get built and put into operation using the same top-down manner that Peñalosa had used. First, this understanding of Bogotá’s Transmilenio is wrong (Ardila-Gomez 2004), but continues to be popular. Even if it was true, Jinan lacked the political momentum and technical capacity. Much of the piecemeal quality of the project had to deal with struggles taking place behind closed doors. Some of these we were only made aware of after the project, such as consistent undermining of the project by other agencies, either through slowing the project or by using standards to alter the design of the project (Interviews Jinan 2011).

While Bogotá’s Transmilenio system was part of an urban renewal plan initiated by Mayor Peñalosa that also included increased and improved public space throughout the city, the BRT system in Jinan was seen as separate from land use issues. Even though planners in Jinan, with the encouragement of the Energy Foundation, considered incorporating or showed interest in incorporating transit-oriented development around the BRT stations, they were seen as a separate project from the BRT. This separate view was further reinforced because of rivalries between the Planning Bureau Director Wang and the Construction Commission Deputy Director Jia. Thus, UC Berkeley worked with the Planning Institute on Luokou. Even though the Planning Institute worked for both the Planning Bureau and the Construction Commission, and the projects were in the same city, they were seen as separate projects. Ironically, one of the BRT corridors planned would originate in the Luokou District.

Key actors within the Energy Foundation had concerns about how BRT was being interpreted in their projects in China. Their main worry was that local governments would see BRT as just a
“marginal improvement for a traditional bus system” but overall reforms to the urban transportation system would be neglected (Interview, Beijing 2011). With such a superficial understanding of BRT, “they won’t support or stand up for BRT when they are criticized by leaders or by motorists because they don’t know its full potential.” Yet, The Energy Foundation also was anxious for on-the-ground accomplishments and resisted recommendations to create international study tours for officials, educational exchanges, and formal and ongoing training programs (although toward the end some training was supported).

Likewise, from the beginning, Custodio proposed having a training program to support the efforts of Jinan’s leaders and planners and to bring skill levels up so that the BRT would be sustained long after the consultants left. The original vision for the China Sustainable Transportation Center (CSTC) was that it would be an independent storehouse of knowledge and that it would support BRT projects throughout China. Custodio wanted to leverage that idea and provide a way for CSTC to be self-sufficient by providing these types of “learning as you go” training programs. The idea never took off. The fast pace of changes within Jinan and CSTC made it difficult. CSTC underwent three leadership changes from its opening in 2005 through 2010.

We (UC Berkeley) agreed with Custodio and also provided feedback and ideas on how to expand the program to include more than just transportation related training. Custodio and UC Berkeley continued to pursue this idea of training and eventually worked with Shanghai’s Tongji University to do hands-on training. In recent years the Energy Foundation has been actively pursuing funding to do more training programs and is partnering with national training organizations, but the amount of training and the lack of skilled professionals to conduct the training is daunting.

In terms of the TOD project, while it started out as a possible case study that could be used as part of a training program for other Chinese cities on how to apply TOD principles to their planning, in the end it just became another report to the local planners. We tried to create connections between organizations through our connections as experts working on the projects. While the organizations themselves did not end up working together, they did not have problems working with different groups of international experts over time.

**Revisiting Key Concepts: Soft and Hard Transfer, Policy Transfer Agents, and Organizational Behavior**

The Jinan case provides significant insight into the policy learning process on-the-ground. Because bus rapid transit was perceived as a technical infrastructure project, it was viewed as something that could be engineered and constructed. There was little understanding locally that institutional and bureaucratic changes would also be necessary to accommodate and fully exploit bus rapid transit—both hard and soft transfer. Not only were knowledge and norms critical to this process, but organizational structures and processes to support these norms were needed. However, Jinan’s planning culture was conservative and traditional and proposals to change practices were resisted. The approach to getting the BRT system put into operation relied on the political will of one main leader, who went up in leadership positions twice during the project—from director of Public Works to Deputy Director of the Construction Commission—and is now the head of the Planning Bureau. The desire both locally and at the Energy Foundation to deliver the project worked against long-term commitments to learning through training, practice, evaluation of results, and adjustment.
Jinan’s government viewed the BRT as infrastructure, not as a policy. It was seen as a public transit improvement but it was not framed as part of a larger system. Nor were non-motorized modes considered. While numerous experts, including the UC Berkeley group, tried to incorporate more social equity into Jinan’s BRT project through emphasizing non-motorized transit, the project was never seen as a way to reduce or limit driving, only to improve bus service.

The interpretation of these policies led to the reduction of space for pedestrians and bicyclists. They ended up sharing space. The need to appease competing demands, motorists and public transit users, resulted in an inhospitable environment for the most vulnerable – pedestrians (see Figure 3).

**Organizational Culture**

Resistance to new ideas came at multiple levels and from multiple organizations within Jinan. Some organizations were suspicious of framing planning away from physical planning and the familiarity of regulations and requirements to more integrated perspective that incorporated transportation and land use. Moreover, key actors were moved up in leadership positions so quickly that the BRT project was no longer their main concern, but one of several projects; institutionalizing the concepts became impossible. Director Jia became synonymous with the project; other leaders within the municipal government saw the BRT as a vanity project. This has been helpful for him now as he is head of the Planning Bureau and he is redirecting his energy toward improving public transportation. Yet, unlike Bogotá, he does not have a strong foundation of support amongst the agencies, in terms of capacity, to do this kind of work.

The Jinan case follows a path described by Christensen in her chapter “Behavior Arising From Delusions of Certainty.” Many of the ways the lead organizations behaved during this project were based on “faulty reasoning,” which is a heavy reliance on rules. These rules are used to foster a false sense of certainty (Christensen 1985, 102). These actions were based on their design codes and guidelines. The rules provided certainty to those overseeing the project, particularly those participants who were not part of the social learning that did occur. For example, the Engineering Design Institute redesigned the stations and the lanes to conform to standards.

**Policy Resistance**

In an interview I conducted on the BRT project, interviewees told me that some of the behaviors we had observed as barriers to the project were intended as such: some of the agencies did whatever they could to stop the BRT project. They slowed the project down through additional meetings, changing designs, or switching people who were to take part in the project; this type of resistance is a way to undermine a project even after it has gained approval (Bache and Taylor 2003). This happened with both Beiyuan and Lishan Roads.

Many of the compromises the director ended up making were to get compliance so that he could get the transportation system operating. As one staff member put it, “He deserved a medal because it was like a war to get this BRT built.” Many of his decisions were made from a perspective of desirability over feasibility. He pushed to get the stations built so that he could claim his ever-decreasing space on Lishan Road.
Policy Transfer Agents

The policy transfer agent, an understudied aspect of policy transfer literature, plays an essential role in the process. In this case, the Energy Foundation, as one of the main policy transfer agents, at certain times hindered the process, often unknowingly. Because the organization had limited experience with urban planning, it was difficult for staff to filter all of the different issues and challenges that arose. The Energy Foundation was a relatively new organization in China and was just gaining in-roads within China and fostering a good reputation. Unlike other international organizations, EF does not seek to have its name attached to a project. The organization’s motto is to serve the grantee. Yet, they still felt pressures to document what they had achieved and because many of the staff were engineers, they felt that transportation projects equated with engineering projects built and in operation.

The lack of experience in urban planning projects was a challenge for the EF staff involved. Senior and experienced experts such as Paulo Custodio or Prof. Deak would speak in shorthand about planning concepts. Both were educated in western universities. But their shared language left out the Energy Foundation staff, many of whom were young and lacked experience with urban planning in this way or who had come from engineering backgrounds that did not expose them to transportation policy. Much of the work was led in a hierarchal fashion in which the Chinese staff had limited say at the China Sustainable Transportation Center. Altogether, in terms of advocacy for certain plans, youth and inexperience made the project difficult.

Within the timeframe of the Jinan BRT and TOD projects (2005-2010), the China Sustainable Transportation Center, the Energy Foundation’s technical center, was reorganized and became the Sustainable Cities Initiative. Leadership changed twice during that time. Each leader had a different approach. The Energy Foundation itself was under pressure to move these projects quickly to make significant changes because it was hoped that these best practice pilots would spur other bus rapid transit projects. They were successful in getting the projects built but unfortunately their ability to be fully exploited, e.g., as TOD locations, lagged. This was not solely because of the learning processes but also because of the local politics of each city, financing, and timing.

Jinan’s leaders and planners could also have been policy transfer agents, further disseminating their own understanding of these policies. To some degree this has occurred, but its impact has been limited because of the lack of interagency collaboration and partnerships.
Chapter 5: Analysis
In this dissertation, I set out to outline how differences between Kunming and Jinan’s transportation planning practice were related to how planners learned about sustainable transportation practices (including duration, content, and local context), who introduced these policies (e.g., policy transfer agents), and the organizational culture of their planning institutions.

The cases of Jinan and Kunming illustrate the importance of the approach to learning, the organizations involved, the amount of time devoted to the process, and knowledge that is exchanged. These cases also illustrate how crucial interagency collaboration is to long-term improvements in public transit and planning better systems in China, particularly because the planning context has become much more complex. Interagency collaboration provides a strong foundation and a politically savvy way to address shifts in leadership and to keep political momentum continuing, as seen in Kunming. Despite major changes in leadership, the strong relationship between the planning institutes and other institutes has been leveraged to maintain their vision for a more sustainable transportation system.

Conceptual Framework
To review, I will discuss the conceptual framework guiding the analysis that I introduced in Chapter 1. A planner’s learning and understanding of sustainable transportation policies is influenced by a number of factors – organizational culture, policy transfer process (policy transfer agents involved and the knowledge being transferred), and the planner’s own technical capacity. This is also impacted by the historical context of this learning and the local politics overshadowing this process. The planner’s learning then impacts how the policy is actually implemented. The objective of my dissertation was to identify challenges to the planner’s learning and the implementation of sustainable transportation policies such as bus rapid transit (BRT) or transit-oriented development (TOD) with this conceptual framework in mind as I investigated each case study.

In both cases, it became clear that hard and soft transfer were important to creating a strong foundation for the transfer of these policies that would lead to institutionalization. Theoretical learning strengthens practical learning and could support collaboration. The Swiss promoted a theoretical framework that integrated transportation and land use planning and established a pattern of collaboration between land use and transportation planners. This provided more tools to address uncertainty within urban planning. Part of that approach included fostering collaboration with different organizations. The approach and the relationships it established grew up over a number of years and there was mutual learning and responsive accommodation in approaches. These inter-agency collaborations continued long after the Swiss left and were seen as an important tool for doing planning work.

Time was a critical component for both cases. Long-term collaboration allowed for greater trust and mutual learning. The Jinan case points to the difficulties of trying to do BRT in a short-time frame. The trust that needs to be built between foreign experts and local planners, between transportation planners and land use planners, police, etc. could not happen in only a few years. Many of the trust issues and problems that we experienced in Jinan occurred in Kunming in early years but were overcome through persistence and longevity of the relationship. The approach the Swiss took in working with multiple agencies and continuing to pursue an interdisciplinary approach to planning were the outcome of earlier projects they had done.
Finally, not only a multidisciplinary approach, but also a multilevel approach to learning is critical. The focus on mayors and party secretaries as the lynchpin ignores the technicians who will be charged with the planning and implementation of these sustainable policies. For Kunming, this meant their BRT corridors continued to exist, even when municipal leadership changed and their relationship with Zurich focused less on urban planning. Jinan’s leadership changes impacted the pace and focus of the project, but real problems existed in the planners understanding of BRT and TOD and how to apply these ideas to a Chinese context. Even with strong support for BRT, which existed in the early phases, the lack of theoretical understanding of the impact of BRT on the city hindered how it could be fully exploited.

**Historical context**

These cases both happened in different historical and political contexts. Before I analyze and compare the cases using my propositions, I will discuss these historical differences.

In the late 1980s when Zurich and Kunming were in the initial stages of their sister-city relationship, urban planning was still gaining traction as an institute in Kunming. By the time the relationship focused on urban planning issues, the two cities/participants had already established an element of mutual trust. This historical period was also a time of very few sister-city relationships, especially in western provinces. The West has been an area that was not the main focus of urbanization; it was used mainly for its natural resources. Kunming’s leaders valued this relationship because they knew it was a rare opportunity; few opportunities existed at this time to work with other countries. Also, Zurich was able to finance several projects. They had access to significant funding. They provided financing, expertise and training. This direct assistance, however, does not explain why Kunming continues to have BRT corridors or to have such a strong identity tied to these corridors. This was transformational for Kunming officials. Kunming’s leaders, particularly the urban planning leaders, came to see how the ideas introduced by Zurich do work in a Chinese context. Even though Zurich’s influence weakened in the early 2000s, the ideas they had seeded had taken root and continued to flourish. The field has become flooded with international planners and consultants and Kunming planners do work with them, but continue to draw upon their broader networks of knowledge established in the Zurich partnership years. They renew these networks and bring new staff into them. They are critical and discriminating consumers of experts’ advice.

In contrast, Jinan had several international organizations involved with its planning. They had already hired several consultants to work on the BRT and TOD projects. In some cases the consultants were on the same page, but in other cases they presented conflicting recommendations. The Energy Foundation was respected but it was one of many voices. The urban planning context also has multiple actors seeking to make profits, so deals are made with bus suppliers, ITS companies, etc. In other words, it’s a very complex planning context that requires organizations involved to be savvy about it. The Jinan BRT project and later TOD projects were framed in many ways as consulting projects. And while local planners wanted to learn or understand these western concepts, in the end, in the case of the TOD project, they were happy to get a consultant report. They did not themselves prioritize learning the theories or techniques that their consultants used.

These multiple perspectives point to a major shift in the landscape. Whereas in the early 1990s, few partnerships were possible, by the early 2000s, several of the Sino-western partnerships were
possible. Cities were encouraged to seek out new ideas and have consultants work on their plans. This use of western architects helped to sell a city’s development.

The Sino-Swiss relationship in Kunming was fortuitous because of timing, but that does not fully explain how the transportation system continued to expand and grow after their relationship became more symbolic in the early 2000s. A thorough training program that took place in Kunming and in Switzerland overcame significant systemic barriers. They were also able to provide the Chinese with dynamic modeling tools and information. The Swiss were able to move from consultants to teachers to partners. From my experience in Jinan, we wanted to provide more training and means for locals to be self-sufficient, but we were often asked only to provide consultation. Furthermore, because there was relatively little local understanding of the methods planners use, the consulting we were asked to do often had very little data to support it. It became apparent that many of the Jinan planners thought they should replace the Soviet standards with newer, Western versions of the same. Our attempts to provide frameworks and general approaches to planning and to argue for context-based evidence and data analysis were met with puzzlement. They wanted a specific set of regulations and formulas for how to implement a TOD, for example – the right proportion of land to be devoted to various uses – so that they could apply this formula over again and again.

**Proposition 1: An organization’s culture hinders or fosters new ideas and learning.**

Both cases studies suggest that organizational culture plays a major role in how an idea or concept was accepted and its overall impact. The degree of openness of an organization to new ideas and the institutional support for learning were critical factors for both cases.

In Kunming, multiple levels of government supported the work being done on the urban and public transportation master plan. Second, key individuals working on this project went on to shape institutions they led. In both the short term and long term, organizational support was necessary. As Wolman and Page (2002) asserted, key individuals can reshape the organization, which results in learning. Timing was a critical element for this to take place in Kunming. At that time, few international partnerships existed in China. The local government understood that it had significant urban planning problems that it was not equipped or trained to deal with. In addition, at the national level, sustainable development was becoming a part of the party line, as the central government was taking part in international actions on climate change, such as Agenda 21.

Challenges emerged but were dealt with; Kunming organizations adapted Swiss ideas to local contexts. Flexibility was possible. Many of the organizational barriers that emerged in Jinan, emerged earlier on in Kunming but new strategies were created for dealing with issues around training, data sharing, etc. The framing of the urban planning project as a learning and capacity building project, shifted attention away from solely looking at physical outcomes but also took into account the transfer of norms or soft transfer.

In contrast, Jinan’s organizational culture was less open. Policy resistance was at every corner, undermining efforts at collaboration. Multiple champions did exist, but they were spread across different agencies. They had neither the time nor the information to collaborate. Or, key actors/technicians were replaced or promoted during the process. A mayor that supported BRT was replaced with a mayor highly critical of the project. The critical mass of stakeholders and technicians in support of the project was lacking, as was project stability. Significant compromises were made to get the BRT system into operation. The compromises and the lack of
consensus helped to make the BRT project be viewed as an outside project, not one that was a part of the city’s identity. Timing was also a factor for Jinan. At this time, international organizations and partnerships were widely available in China.

As suggested in (Stead, Jong, and Reinholde 2008), local champion organizations are critical to adapting foreign ideas to their local needs. While Kunming’s BRT system may be less physically like a BRT, its corridors are part of the urban planning and transportation planning systems. Their planning is based on the concept of public transit as a priority. Through time this has been institutionalized and passed onto the next generations. While Kunming planners may face political barriers to BRT improvements, such as the bus company’s unwillingness to have free transfers, other avenues are still pursued to have a more integrated transportation system. Jinan’s leaders and other departments were never able to see these projects as part of the system; they share similarities to Stead et al.’s (2008) finding on Latvia. The BRT project was seen as something exceptional in Jinan and to date has not been fully integrated into the urban planning system. While it has had a local champion, his championing of the project was seen by many as a form of self-aggrandizement, according to staff involved in the project. It was not seen as a city project to which all agencies could contribute and from which they could, in turn, benefit. This perspective appears to be reflective of Jinan’s conservative culture that makes highly fragmented and siloed agencies sources of power for those who lead them.

**Proposition 2: Key individuals in government and non-governmental agencies play significant roles in transfer of ideas, concepts, and policies to China.**

The transferring of planning ideas and concepts from one international context to another requires “policy entrepreneurs with cosmopolite qualities who bridge…[urban] planning communities in both countries” (Medearis 2007, iii).

Local champions are needed and at different levels within local governments. It is not just the mayor that needs to support and provide momentum for these ideas, but key players in leadership and technical positions. A diversity of policy transfer agent roles was apparent in both cases but with different impacts.

According to Wolman and Page (2002), policy transfer is an information exchange in which multiple types of transfer agents exist playing different roles; together all of these agents comprise information networks. Senders, producers, and facilitators all have a role. From this perspective, Kunming had multiple transfer agents embodied in both Chinese planners and leaders and the Swiss. These roles overlapped as well. Planners can be senders of knowledge as well as facilitators, which is what is exhibited in the Kunming Urban Transportation Institute. They continued to transmit and produce knowledge. The Ministry of Construction also played a role in disseminating the work done in Kunming and by the Swiss to other parts of China. But they all comprised a common network.

Jinan also had multiple policy agents, but their impacts were limited as it was not a collective action. The networks were fragmented and agencies were siloed from each other. The TOD and BRT projects had areas of collaboration, but at times even those working with the Energy Foundation acted in contradiction to each other because we were unaware of what the other was doing. In addition, the Energy Foundation staff and the experts were sometimes at odds with each other because of a lack of understanding about urban planning and what type of data or training was needed. Such conflicts weakened knowledge exchanges.
<table>
<thead>
<tr>
<th>Characteristics of the partnership</th>
<th>JINAN</th>
<th>KUNMING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Used a policy transfer model to bring BRT to Jinan in a five-year timeframe.</td>
<td>Hegemonic discourse: Transfer of knowledge from institutions, firms and consultancies based on prevailing “best practice” and commonly accepted international standards.</td>
<td>Institutional alliance: Formal, contracted, and structured cooperation and transfer of knowledge between parallel institutions, local or national governments and firms.</td>
</tr>
<tr>
<td>2. Engineering-focused.</td>
<td>Examples: Bus Rapid Transit was promoted as the best practice. They focused on the best examples – Quito, Curitiiba, and Bogotá. The relationship with EF was formalized in an MOU, but its influence was limited.</td>
<td>Examples: They have a formalized sister-city relationship; an office was established to launch the urban planning program; bi-annual workshops/meetings were conducted to disseminate their work and lessons. They had a formal relationship with the Ministry of Construction (now MOHURD) to disseminate their work.</td>
</tr>
<tr>
<td>3. Restricted timeframe, needed to show annual progress.</td>
<td>Hegemonic discourse: Transfer of knowledge from institutions, firms and consultancies based on prevailing ‘best practice’ and commonly accepted international standards.</td>
<td>Formulated training program.</td>
</tr>
<tr>
<td>Hard transfer (laws, regulations, urban form) and Soft Transfer (theories and concepts)</td>
<td>Hard transfer—focus on physical infrastructure</td>
<td>Focused on Theory and Practice; practice extended to ways of achieving interagency cooperation</td>
</tr>
<tr>
<td>Planning Framework</td>
<td>Multiple visions; lack of urban planning experience guiding project</td>
<td>Overarching vision</td>
</tr>
<tr>
<td>Policy Transfer Agent Approach</td>
<td>Multiple agents at different phases; new people put into the project at different times.</td>
<td>Holistic/Systemic approach; then divided into individual tasks</td>
</tr>
<tr>
<td>Historical Context</td>
<td>Early 2000s; multiple international organizations in China</td>
<td>Early 1990s (urban planning); very few international organizations in China, fewer working on urban planning</td>
</tr>
</tbody>
</table>
The type of organizations involved bringing sustainable transportation policies to these cities differed extraordinarily between the two cases. First, Zurich as a city came into the partnership with Kunming as a sister-city relationship. In 2004, the Swiss Foundation took over, but it is still seen as a sister-city relationship. This was seen as a long-term partnership of equals. In stark contrast, the Energy Foundation was a small, 10-staff organization that contracted out its work via expert groups. These groups were somewhat independent of each other and information was not commonly shared. While the expert groups members’ sought to share information, often they would show up with little information as to what was expected of them. In addition, the Energy Foundation had its own pressures to make certain “progress.” They had to demonstrate that the funding they provided made an impact and was moving their organization closer to its goals. They had quarterly board meetings, in which they needed to show the progress they made to reinstate funding proposals or to extend them. They also had yearly or bi-annual reports that had to be made to major funders such as the Hewlett or Packard Foundations. These reports also had to show progress was being made.

In Table 10, I incorporate Chien and Ho’s analytical framework to identify the mechanisms used by each of the main organizations in Jinan and Kunming to help explain the differences. I also pull in the concepts of hard and soft transfer. This provides insight into the differences between the two cases. While both cases relied on hegemonic discourse as a policy learning mechanism, Kunming also had the added advantage of institutional alliance as another mechanism for learning. The limitations of this study cannot conclusively point to the key, but having multiple avenues for learning could provide a better environment for institutionalizing ideas and creating greater inter-organizational alliances.

**Proposition 3: The relationship between agencies establishes a foundation that allows planners to take risks and accept uncertainty in planning because they have formed a coalition of multiple agencies.**

The Kunming case illustrates how interagency collaboration can work to foster greater risk taking and to seek out greater collaboration, even informally. Time and again in my visits to Kunming and during my longer stays, I ran into the urban planners and transportation planners working together or meeting informally. Collaboration amongst these organizations (KMUDI, KMUTI) along with their ties to the PSB strengthened efforts toward more sustainable transportation. The evidence is in greater ridership and the fact that the BRT system continues to exist and be expanded upon even though several mayors and party secretaries have come and gone. The planners at KMUTI told me that many times leaders in other departments might not agree with them but later realize they should have listened. These doubters later become their advocates.

Even if leaders do not agree with them or agencies do work that undermines their projects, they still focus on having an integrated transportation and land use approach to planning. They still firmly believe that public transportation is a key element to economic development. This is
important because when the politics change in their favor, they are able to fully exploit and act on them. Recent research on Bogotá and its rise as a best practice case has discovered that ideas for sustainable transportation, such as bicycling, had their origins in the 1970s (Montero 2013). When leaders such as Peñalosa took office, he was not starting at ground zero in getting support from planners; they already had these ideas planted in their heads.

Jinan’s collaborations were more formal. They were called together by the Deputy Director of Public Works or the Vice Mayor. Some informal meetings did occur but often it was from prior relationships. For example, a director of the planning institute is now the head of the mapping bureau. He keeps in contact with people in the planning bureau and institute. However, collaboration within the planning institute between the urban planners and transportation planners is still formal and less collaborative. Jinan may have information sharing between different organizations, but they are more cautious in taking risks. They had less time to see what the benefits would be of working together; it was a short-term project. The goals of the project were not to foster increased capacity as much as getting the BRT operating.

**Proposition 4: Over time and with a stronger base knowledge, planners are able to see the benefits of these ideas and these ideas become institutionalized.**

Longevity of the relationship with Zurich provided Kunming with the opportunity to gain their own empirical evidence that this type of planning could work and that it was beneficial for them. They continue to pursue this work and seek opportunities with international partners to expand upon it. They continue to defend their corridors and they are seen as an important part of the city’s identity. They are also able to see outside examples of countries, which have not followed a public transit priority strategy, such as the United States. Examples of “worst practices” also influenced their decisions. They have been able to see through visits to these countries, as well as through their own research, that an auto-oriented pathway is limiting, resulting in greater oil dependence, pollution, and congestion. They are also able to see this through Chinese examples of Shanghai, Beijing, and Guangzhou.

Many of the Jinan planners involved in the project have gone onto other departments. They have been able to use the success of the BRT to help advance themselves. Yet, the project continues to be identified with only a few individuals. Despite it being seen as a municipal government project, internally, it was seen as a Construction Commission Project. There is greater awareness that public transit is important, but ideas are still pursued in which streets are widened and more lanes are given to cars. The BRT corridors are no longer segregated; their remaining physical barriers have been removed and cars are able to drive in the BRT lanes. The norms of prioritizing public transit were not institutionalized.
Chapter 6: Conclusion

This dissertation has contrasting outcomes of Kunming’s and Jinan’s efforts at sustainable transportation planning. The Kunming example can be identified as more “successful” when measured by stability of support for sustainable development strategies and ability to carry out projects locally. In contrast, this same support has not been sustained in Jinan. The key difference points to a transfer process that incorporated both soft and hard elements, whereas in Jinan the emphasis was almost entirely on physical infrastructure design.

These cases are illustrative for several reasons. First, the role of capacity building is often not considered or even discussed in transportation planning literature in terms of knowledge transfer, but whether an idea is being transferred from a developed country to a developing country or from developed to developed, capacity building is critical. This means incorporating the theory behind the idea, teaching how organizations need to work together and what that means. As a fellow academic told me, “you first have to agree on the same language.” Your terms have to be clearly defined in each other’s language. Capacity building has to occur at multiple levels, from leaders who are needed to get buy-in, to the technical staff. The technicians should not be overlooked, as they may one day be the directors of these institutes. This was a critical component for the Kunming-Zurich partnership, as key actors who were a part of the partnership early on went on to be the director and vice directors of the planning institutes and transportation planning institutes. This also showed up in Jinan because of the limitations of capacity building efforts.

Given China’s history, capacity building is fundamental and could be the gateway to creating greater avenues for collaboration. As rapidly as China has urbanized, education and professional development continue to lag in new approaches to urban planning problems. A new urban planning context exists that sees the intersection of social, economic, and environmental issues as well as transportation and land use issues. Planners and leaders lack the tools to navigate within this complex planning context. Any type of policy learning program needs to take this into account.

Finally, capacity building relies on the learning of norms and practice, but this necessitates a more open timeframe and greater flexibility for larger projects such as Bus Rapid Transit or Transit-Oriented Development. Sustainable transportation policies require greater collaborative efforts than are the norm in Chinese urban planning. As part of a comprehensive policy transfer process, that includes both soft and hard transfer, collaboration as a norm could foster significant institutional changes. Planners can gain a greater sense of the importance of collaboration when they have the time to see how it can benefit them.

Policy Implications

International development organizations and foundations often measure successful policy adoption through physical infrastructure. However, merely delivering projects will not result in long-term sustainability. A fundamental understanding of the theories and norms that are attached to sustainable policies is needed. My research suggests that other aspects should be considered in measuring policy adoption. Sustainability requires tradeoffs. Not all modes of transportation can be accommodated to the satisfaction of its users. A fundamental way this is understood in transportation planning is the number of people being moved through streets versus the number of cars being moved through streets. In an auto-centric culture, this requires a
deep commitment and understanding to sustainability. Thus, simply having a BRT system that physically resembles best practice does not lead to a best practice.

In addition, leaders are important to providing momentum for projects, but planners can help to foster true institutional change. Investment in training technicians and leaders on sustainability may kill two birds with one stone. Both can shape the direction of their organizations and cities; both can institutionalize innovative ideas and practices. Development organizations and foundations may want to consider a multilevel approach in their capacity building strategies aimed at introducing innovative planning and take a more multilateral approach that includes these planners.
Appendix 1

National Road Design Standards (GB 50220-95)

The table below breaks down how the standards are applied to different sized cities. Sections 7.1.4 and 7.1.5 are the translated text for the table explaining how the standards are divided amongst different land uses.

Section 7: Urban Road System

7.1.4 Urban Roads should make up 8-15% of built space. For big cities with planned populations of over 2 million, urban roads should comprise 15-20% of built space.

7.1.5 Per capita built road space is 7-15 square meters per person. Of this, street space is 6.0-13.5 sq. meter/person, public square space is 0.2-0.5 sq. meters/person, and public parking is 0.8-1.0 square meters/person.

Standards for Large and Medium-sized Cities (GB 50220-95 Part 7.1, Table 7.1.6-1)

<table>
<thead>
<tr>
<th>City population</th>
<th>Expressway</th>
<th>Arterial</th>
<th>Local</th>
<th>Feeder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor vehicles speeds (km/h)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 2 million</td>
<td>80</td>
<td>60</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Less than 2 million</td>
<td>60-80</td>
<td>40-60</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>Midsize city</td>
<td>-----------</td>
<td>40</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td><strong>Road network density (Km/km(^2))</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 2 million</td>
<td>0.4-0.5</td>
<td>0.8-1.2</td>
<td>1.2-1.4</td>
<td>3-4</td>
</tr>
<tr>
<td>Less than 2 million</td>
<td>0.3-0.4</td>
<td>0.8-1.2</td>
<td>1.2-1.4</td>
<td>3-4</td>
</tr>
<tr>
<td>Midsize city</td>
<td>-----------</td>
<td>1.0</td>
<td>1.2</td>
<td>3-4</td>
</tr>
<tr>
<td><strong>Number of Motor vehicle lanes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 2 million</td>
<td>6-8</td>
<td>6-8</td>
<td>4-6</td>
<td>3-4</td>
</tr>
<tr>
<td>Less than 2 million</td>
<td>4-6</td>
<td>4-6</td>
<td>4-6</td>
<td>2</td>
</tr>
<tr>
<td>Medium</td>
<td>-----------</td>
<td>4</td>
<td>2-4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Road Width (Meters)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 2 million</td>
<td>40-45</td>
<td>45-55</td>
<td>40-50</td>
<td>15-30</td>
</tr>
<tr>
<td>Less than 2 million</td>
<td>35-40</td>
<td>40-50</td>
<td>30-45</td>
<td>15-30</td>
</tr>
<tr>
<td>Medium</td>
<td>--</td>
<td>35-45</td>
<td>30-40</td>
<td>15-20</td>
</tr>
</tbody>
</table>
Appendix 2

Urban Planning Process Diagram
In the 1980s, the central government promoted and implemented several pieces of legislation. The City Planning Act of 1989 was the first planning act in China’s history. It was a major turning point because it separated land ownership from land use rights. It also formalized the two-tier planning system, made up of a master plan and a detailed plan, which was a throwback to the centrally planned economic system. The Act defined urban planning as “defin[ing] the size and economic orientation of the city, prepar[ing] rational plans, and carrying out construction to meet the needs of development for socialist modernization.” (Yeh and Wu, 1999; p.182).

The municipal master plan is similar to general plans in the US, it outlines the overall land use pattern of the city and has a planning scope of 20 years. The plan can include everything from population projections to disaster planning to urban renewal proposals; its elements vary depending on the city and the professional support available. Master plans are reviewed by the central government and most major cities get technical support from the Ministry of Construction’s Urban Planning Institute. Even though they are submitted to the central government for approval, the local jurisdiction still has the power under the Act to make alterations to the plan.

![Urban Planning Process Diagram](image)

Figure 171 Past and Present Urban Planning System (Yeh and Wu, 1999)
The detailed plan is used for land that is going to undergo immediate development. There are two types of detailed plans—the detailed development control plan (DDCP) and the detailed construction plan (DCP). The DDCP is for future projects listed in the district plan. This is not a statutory element of the City Planning Act, only a guideline. The DCP is for development projects that are about to undergo construction. Within these plans, building height, plot size, engineering/infrastructure, and building density are discussed, i.e. zoning.
Additionally, because of the complex and changing economic landscape of cities in the last twenty years, other types of plans have emerged. They include district plans, city-region plans, and urban system plans. Officially, the planning system in China is two-tier, but with the inclusion of these types of plans, it is actually multi-tier (Yeh and Wu, 1999).

The approval process can require several levels of government depending on the size and type of city. Cities that are provincial capitals usually need the approval of their provincial government first before they are sent to the State Council for approval. Usually, the Vice Mayor overseeing the Planning Bureau approves local projects, such as major developments. The developer works with the Planning Bureau’s Planning Institute to ensure the plans are within the guidelines of the city.
Appendix 3

Transportation Planning and Management

This chart below provides an overview of all the organizations involved in urban transportation planning in cities over a million in population up until 2008. In 2008, public transit was no longer under the purview of the Public Utilities/Public Works Department; instead, it was moved to the newly created Transport Bureau.

The main organizations that oversee transportation planning are the Ministry of Construction (which changed to the Ministry of Housing and Urban and Rural Development (MOHURD) in 2008) and the Ministry of Public Security. The MOC is responsible for the planning and implementation of transportation plans. The MPB is responsible for traffic management and traffic safety. At the municipal level, planning work is done by multiple agencies, including the Urban Planning Bureau, Civil Engineering Bureau, Public Utility Bureau and Civil Engineering Design Institute. The technical work of planning is done by the Urban Planning and Design Institute. In some cities, there is also an Urban Transportation Planning Institute.
## Urban Planning and Transportation Planning Timeline of Major Events

<table>
<thead>
<tr>
<th>Period</th>
<th>Historical Context</th>
<th>Urban planning in China (Including Transportation Planning and Management)</th>
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</table>
| 1949-1952 | The People’s Republic of China founded in 1949  
Technical and financial aid from USSR in preparing China’s reconstruction, including the introduction of the central-planning system.  
Soviet Union (USSR) as the leader of the socialist alliance                                                                 | Planning institutions created. Planning done in 5 year increments—Five Year Plans  
Role of the city—support national development plans  
Economic and Physical Planning separated  
*Municipal funding came from national government*                                                                                           |
| 1953-1958 | Industrialization with help of the USSR  
The 1956 Socialist Education movement in which private businesses and urban housing were nationalized  
The 1957 “Anti-Right” movement in which intellectuals were forced to receive socialist re-education  
The 1958 “Great Leap Forward” as a political and economic development movement to “beat the West”; its failure was blamed on urban planning.  
Chinese foreign policy: “Leaning to the side of the Soviet Union” increases its exclusion from US and other developing countries. Isolationist period with only Soviet Union as an ally.  
Sino-Soviet Alliance reaches its peak between 1953-1956 (Zhang, Zhang, and Yao 2006)                                                      | Soviet planners trained Chinese peers both in China and in the USSR. Over 150 projects planned from 1953 to 1957 (the first Five-Year Plan)  
The number of cities increased from 135 in 1949 to 176 in 1957; 150 cities developed and adopted master plans.  
Establishment of planning institutions in charge of land use and infrastructure planning in all cities.  
The predominance of the Soviet planning model: emphasizing economic development and industrialization rather than quality of urban life. |
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<th>Period</th>
<th>Description</th>
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<td>1959-1965</td>
<td>“Planning should serve for the transition to communist society” in 1958-59&lt;br&gt;Dissolution of the Soviet-China coalition&lt;br&gt;China adopted a self-sufficiency policy with the dissolution of the coalition with the USSR&lt;br&gt;All planning activities halted for three years (1960-62) due to Great Leap Forward&lt;br&gt;Depression and natural disasters from 1959 to 1962&lt;br&gt;No infrastructure and housing construction from 1960 to 1962&lt;br&gt;The 1964 ideology purification movement and against USSR’s “revisionism”&lt;br&gt;Planning for “socialist city” since 1964: emphasizing production rather than consumption</td>
<td>Urban residents, including planners, were forced to go to the countryside to reduce population in cities.&lt;br&gt;Planning for “socialist city” since 1964: emphasizing production rather than consumption</td>
</tr>
<tr>
<td>1966-1976</td>
<td>Planning is Dead&lt;br&gt;“Planning is useless should it not serve proletarian politics and reduce differences between urban and rural life”&lt;br&gt;Cultural Revolution isolated China from the outside world&lt;br&gt;Anti-intellects of all professions, including planners&lt;br&gt;Mao’s death in 1976&lt;br&gt;Eliminated planning institutions and activities in most cities for ten years&lt;br&gt;Planners were forced to receive reeducation by workers and peasants</td>
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<td>1977-1991</td>
<td>End of the Cultural Revolution; economic development rather than politics received more attention</td>
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<td></td>
<td>1976: Deng Xiaoping’s Opening Up and Reforms</td>
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<td></td>
<td>1980s: Housing reform: the rebirth of the real estate industry in the late 1980s</td>
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<td>The 1988 Constitution: allowed various land ownership and the separation of land ownership from land use rights, which laid the foundation for a land market → Land Markets</td>
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<td>Revised and developed master plans for almost all cities and towns in the 1980s</td>
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<td>During 1980s no studies on transport development strategies and policies. Emphasis was placed on the analysis of road network and planning, as well as construction targets of urban transport infrastructure (p.374 WB China’s Urban Transport strategy</td>
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<td>In 1985, the China Academy of Urban Planning and Design (CAUPD) prepared Shenzhen’s transportation plan. This was the first of its kind in China. By 1995, 50 cities had urban transportation plans.</td>
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<td>1986-1989 Urban transportation surveys, forecasting, planning, new road construction, redesign, overpasses, all became a part of the planning toolkit in cities. Many transportation experts began to realize that transportation planning for the modern city was complicated.</td>
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<td>The 1989 City Planning Act gave legal teeth to local planning but included no detailed requirements for transportation planning.</td>
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</table>
| 1992- | Deng’s efforts of speeding up economic reforms in 1992  
Decentralization of revenue distribution and development funding  
Rapid economic growth: average growth rate more than 8 percent  
High inflation from 1992 to 1995  
Rapid urbanization and large-scale rural-urban migration  
The emergence of a market economy, and the booming of the land and property market  
China integrated into the global economy: World Trade Organization  
Slow political reforms  
Booming urban development activities and large-scale infrastructure improvement projects  
Urban population growth and the pressure of migrants on cities  
The equity problem: gaps between the East and the West, and between the rich and the poor – 1999 Develop the West Policy was launched to bridge the gap between eastern and western provinces  
Urban sprawl in large cities and the 1998 Land Acquisition Regulation | 1995 Design Criterion on Urban Road Transportation Planning (Ministry of Construction GB 50220-95)—technical document (see appendix) that establishes guidelines for road width, subways, etc. based on population of city, town, etc.  
By 1995, only 50 cities had formulated urban transport plans.  
Institutional reforms: Ministry of Construction and the Public Security Bureau both oversee urban transport.  
The Ministry of Construction is responsible for urban infrastructure and public transport operations. It is in charge of making policies and strategies for the development of urban transport, making the long-term and mid-term plans and drafting a reform plan and related laws, regulations, technical norms and standards and technical policies.  
Public Transit: in 1985: 2.5 public transit vehicles per 10,000 people in China. In 2008, 11.13 per 10,000 persons |
| 2000s | 2008: Ministry of Transport created combining all transportation operations into one “super-ministry”.  
At municipal level, public transit is moved to new bureau; planning remains with Planning Bureau’s Transportation Institute |
References


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