CHAPTER 10

Cycling and Walking: Preserving a Heritage, Regaining Lost Ground

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Overview

Bicycling and walking are important aspects of city life, and this chapter summarizes the issues and challenges related to strengthening the bike and pedestrian accessibility of urban road networks in China. The chapter makes the case that apart from the greenhouse gas (GHG) benefits from avoiding motorized trips, cycling and walking are critical to well-functioning urban environments. After describing the current situation of pedestrian and bicycle access to China’s urban centers, the chapter highlights the factors that have influenced current policies and discusses their consequences. Viable solutions to the current situation are discussed under four main categories: network issues, last-mile quality, basic facilities, and the safe corridor concept. Project descriptions and case studies highlight practical aspects related to these categories. The chapter concludes by summarizing the main challenges and presenting recommendations for moving forward.

This chapter is based on practical experience from a range of World Bank–financed projects in China, as well as a number of surveys and related research projects. The analysis draws extensively on work published in a series of working papers, including Y. Chen and Mehndiratta (2007), Tao et al. (2010), Jiang et al. (2012), and W. Chen and Mehndiratta (2007).
Introduction: Cycling and Walking as Critical Elements of an Urban Environment

Walking and cycling are not only true low-carbon urban mobility choices; they are also critical elements of any modern urban mobility system. From a planner’s perspective, walking and cycling trips are space efficient, require low investments, and offer mobility without imposing external costs of noise, pollution, congestion, or accidents. In dense urban environments, walking and cycling often can be the most efficient modes of urban mobility. For users, they offer mobility at low cost, with the potential of health and lifestyle benefits. In all cities, these modes are the mainstay for short trips and often the only sources of mobility for the poor. In addition, walking and cycling are critical for providing last-mile access and connecting to public transport networks.

Though many cities globally—from New York and Buenos Aires to Paris and Copenhagen—actively promote and support cycling and walking as essential elements of their transport strategies, most would be envious of the situation in Chinese cities in terms of the share and importance of these modes. Chinese cities have a long and important tradition of cycling and walking. Even today, between 50 percent and 60 percent of trips in most Chinese cities are made on foot and by bicycle (see figure 10.1a). However, in most Chinese cities the trend is negative, and as shown in figure 10.1b, bicycle use in particular has been decreasing precipitously in recent years. China, as late as the 1980s, was often referred to as the “Bicycle Kingdom,” with bicycles dominating traffic in cities across the country. That is no longer the case, and economic growth, changing cultural perceptions, rapid motorization, spatial growth, and changes in trip patterns have all resulted in sharp declines in cycling and walking. Walking and cycling, however, remain important modes and the challenge for Chinese cities now is how to at least preserve, and perhaps increase, the share of trips made using these non-motorized modes.

Conditions for both pedestrians and cyclists, however, have been deteriorating across Chinese cities in the last few years. This is due to a combination of factors, including the lack of policies prioritizing these users (see box 10.1), cities sacrificing space for non-motorized traffic to be used for motorized traffic, the spatial growth of cities resulting in longer trips, and specific difficulties related to the big arterial roads of a typical Chinese city. While the primary focus of this chapter is on actions cities can take to improve conditions and preserve the quality of infrastructure
for cyclists and pedestrians, an overarching issue in this respect is the need to obtain strong policy-level support and guidance from the national government supporting and emphasizing the role of cycling and walking as part of the sustainable transport solution in China’s cities.
Box 10.1

Evolution of Government Policy and Planning Procedures Related to Cycling

After a period of sustained support in the 1970s and 1980s, government policies in the 1990s and early 2000s demonstrated a negative attitude toward bicycles. While all World Bank projects focusing on urban transport have encouraged and supported various actions to improve the state of cycling, non-motorized vehicles were often perceived as a cause of congestion and conflict and were widely considered to be symbols of a past era with no place in a modernized, industrialized China. Several cities actually had an official policy to get rid of bicycles. Many others took actions to discourage bicycles. For example:

- Zhengzhou, with its “Smooth Traffic” initiative in 2004, changed some bicycle lanes into motor vehicle lanes and combined bicycle lanes with pedestrian lanes on sidewalks at both sides of the road. Moreover, in 2004, the Zhengzhou Bureau of Education prohibited primary school students from bicycling to school. Middle schools also restricted the number of students cycling to school.
- Shanghai prohibited the use of bicycles on trunk roads in 2007.
- Shenzhen, in the 1997 Shenzhen Urban Planning Standards, removed bicycle lanes to increase the capacity of motor vehicle lanes.

While national policy now seems to recognize the importance of bicycles, the view at the city level is still mixed. For city leaders, cyclists and their concerns are often secondary to the concerns of motorized traffic. In terms of planning, one problem is that the formal four-step transport modeling framework used to evaluate transport investments, which originated in the United States and Europe and is now used extensively in China, focuses on motorized traffic only. The modeling process, however, can be adapted to explicitly account for cyclists, as has been done as part of World Bank appraisals of urban transport projects in Guangzhou, Wuhan, and Liaoning. In the Liaoning project, doing so helped prioritize investments in secondary streets, which disproportionately benefited cyclists. Estimates have since indicated that cyclists reaped 45 percent of the total economic benefits from the investments.

Source: Author.
Improving Cycling and Walking Infrastructure

To transition to a low-carbon growth path, the critical agenda for Chinese cities is to preserve, as far as possible, the trips currently made using non-motorized means, and then, ultimately, to attract the pool of trip makers who could consider these modes for some of their trips. Fundamentally, policy support is needed to create cities that encourage and enable walking and cycling as valid transport choices for all trip makers.

Recent experience suggests that four kinds of complementary improvements are needed to improve the quality of cycling and walking infrastructure in Chinese cities:

- **Addressing network issues**: Designing cities and road systems to better serve cyclists and pedestrians
- **Improving the quality of the “last mile”**: Improving the often atrocious condition of the secondary and tertiary roads, as these are needed to access origins and destinations once trip makers get off the primary roads
- **Providing basic facilities and street furniture**: Providing toilets, trees, benches, bollards, and street lighting
- **Designing and operating safe arterials**: Systematically addressing safety issues on the most critical traffic corridors.

**Addressing Network Issues**

Networks, rather than individual links or roads, are the essential elements of urban mobility. Thus, the primary effort of all World Bank interventions in the urban transport sector in China has been to improve the performance of road, public transport, and non-motorized transport networks. A key gap in the development of Chinese road networks in the last two decades has been the lack of good quality tertiary and secondary roads.

In the last 30 years, as Chinese cities have dealt with motorization at a pace never seen before, the primary response of city leadership has been to engage in a frenzy of road-building. By some accounts, the total annual investment in the urban road sector in China is a staggering US$35 billion. An overwhelming majority of this investment, however, is focused on a network of wide primary roads. Much of this new primary road network was needed to accommodate the growth in population and incomes in the last 30 years, even though it is not always clear that the road design, in terms of width, is optimal for an urban environment with mixed traffic. Optimally, however, these investments in the primary network should be complemented by increased investments in secondary
and tertiary roads that can serve non-motorized and local and short-distance trips, and as such take some pressure off the arterial road system. Currently, many primary roads have to perform incompatible mixed functions, such as providing for through traffic, local traffic, and other nontraffic functions such as shopping and local activities.

This weakness in the road networks has negative impacts on all modes of transport, but particularly so on walking and bicycling. In the case of cyclists, it is often the secondary and tertiary roads that form the core of a city’s bicycle network. In the absence of this network, cyclists have no choice but to use the primary road network, where speeds are the highest, conflicts at intersections are the most severe, and, consequently, safety is the biggest concern. In addition to encouraging cities, such as cities in Liaoning, Wuhan, and Luan in Anhui, to address this gap in their secondary and tertiary road networks, World Bank projects have made a particular effort to support improvements in bicycle networks. This has included the identification of a priority cycle network in Shanghai, the design of routes primarily for bicycles in Shijiazhuang, extensive support for segregated bicycle lanes in the cities of Liaoning and in Wuhan, and the integration of cyclists with pedestrians in traffic-calmed zones in Guangzhou and Xian (see figure 10.2) (Frame 2004).

Figure 10.2 Integrating Cyclists with Pedestrians Using Different Colored Pavement in Xian

In the case of pedestrians, the lack of a “thick” network of secondary streets fundamentally limits accessibility, the “walkability” of a city. Analytical work that compares pedestrian access to jobs and commercial opportunities in the central business districts of Beijing, London, and New York has been used to illustrate the issue to planners and decision makers in several Chinese cities (see box 10.2).

Box 10.2

Pedestrian Accessibility: Comparing Central Business and Commercial Districts in Beijing, London, and New York City

While planners agree that transit-oriented urban design is essential to attract those who have a choice in using public transport, it is not always easy to illustrate the concept of pedestrian accessibility to city leaders. Research by Torres et al. (2010), which was developed to illustrate this concept, shows the importance of coordinating urban design with public transport by looking at a basic accessibility indicator: the number of jobs and square feet of commercial floorspace accessible within a 10- or 20-minute walking radius of a major public transit station in the city’s central commercial or central business district. Data were gathered in three metropolitan areas: Beijing, London, and New York (see figure B10.2.1).

Figure B10.2.1 Pedestrian Accessibility

a. Number of jobs accessed within 10 or 20 minutes of walking

b. Commercial areas accessed within 10 and 20 minutes of walking (in 1,000 square meters)

Source: Torres-Montoya et al. 2010.

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The study demonstrated that a city with design characteristics like New York gives way to a much more accessible urban environment than a city with the design characteristics of Beijing, which has fewer and wider roads, large super-blocks, and widely spaced buildings set back from the road. The study highlighted the need to consider the following aspects when designing an urban area plan for high accessibility:

- High-density land use with high-rises built close together
- A dense grid network with sufficient secondary roads and small city blocks
- A pedestrian-friendly environment.

Source: Author, based on Torres-Montoya et al. 2010.

In Kunming, where the success of the World Bank–financed urban rail network in part depends on establishing high-quality urban design around stations, the focus has been on learning from global best practice.

Figure 10.3  **Best Practice Urban Design across Different Scales**

(a) Catchment Analysis
The project’s transport planners have used a series of analyses, from a large scale *catchment analysis* of an area within walking distance of a given station, to optimizing design details such as station entrances (see figure 10.3). As the project moves forward, the focus will shift to ensuring that design standards support the rail system and overall public transport.

Analytical work assessing the quality of pedestrian access to the Jinan Bus Rapid Transit (BRT) identified a particularly interesting insight related to pedestrian access networks (Jiang et al. 2012). Based on pedestrian interviews and a field investigation, the study found that people walk farther to BRT stations on “integrated-boulevard” corridors when the walking environment has certain “quality” features, such as a median transit way station, or when the corridor is shaded, busy, and interesting, or enables good orientation. In addition, mapping the walking paths revealed that a small network of paths accounted for a large portion of access trips (see figure 10.4). Through an unarticulated consensus, pedestrians seem to agree on a particular set of route choices due to a combination of quality, comfort, and safety. This suggests that, as with other modes, identifying and improving the quality of a relatively small pedestrian network can bring significant benefits by actively encouraging pedestrians to use the network.
Improving the Quality of the Last Mile

The Yanhe area where I live is located in the poorest outskirts of Wuhan. The roads here are muddy tracks maintained by trishaw traffic! On rainy days, we have to wear rubber boots—you just can’t go out in one pair of shoes, they’d be ruined! It’s just filthy and if you go out in your bare feet, you get infections. That’s tough on everybody, but especially on women. Sometimes I put on my boots to cross the road, change shoes when I get to the other side and ask older relatives to take those filthy boots back home.

– An unemployed woman from Qinduankou area, Hanyang District

A particular feature of the road network of many Chinese cities, related to the gap in secondary and tertiary road systems discussed above, is the often poor quality of the roads that provide last-mile access to residences and work buildings, as, for example, illustrated in figure 10.5. The poor
quality of this network is detrimental to all trips, but particularly troublesome for bicyclists and pedestrians, who are most vulnerable to water, potholes, parked vehicles, and other barriers to access.

Structured public participation processes can be an effective way to raise awareness for the problems related to access to the last mile. Feedback from user groups—people living in a project zone and specifically targeted vulnerable groups—has, for example, been incorporated in World Bank projects in Xian, Taiyuan, and Wuhan, and the cities in Liaoning and Anhui.

In Liaoning, this public participation process has been particularly successful in influencing the investment agenda (W. Chen and Mehndiratta 2007) and much of the investments in the Liaoning Medium Cities Urban Transport Project (LMCIP) focused on rehabilitation of branch, tertiary, and secondary roads. Indeed, in the US$113 million rehabilitation and maintenance component, 61 percent of the investments are targeted at tertiary roads, such as branch roads and streets in neighborhoods and alleys, and 29 percent are targeted at secondary roads. Most of this network was built in the early 1950s and has poor (if not nonexistent) drainage, and the reconstruction has significantly upgraded the quality of the cities’ road network. Moreover, the public participation process related to development of primary roads even led, in some cases, to direct city investments in the branch road network. The fact that the rehabilitation of tertiary roads is a low-cost solution was certainly a determining factor.

Providing Basic Facilities and Street Furniture: The Toilets, Benches, and Trees Agenda

The structured public participation processes also highlighted the need to improve basic facilities that provide cyclists and pedestrians with some safety, security, and comfort. This includes the finish of the road, the separation of non-motorized vehicles from motorized vehicles, street furniture, greening, lighting, and clearer intersection design.
It is important that, in addition to the road itself, these road facilities are of good quality. Adequate attention must be paid to issues such as sidewalk quality or curb cuts at intersections (which are sometimes not flush with the pavement, other times not aligned with the intersection). Basic facilities, such as trees, benches, and street lights, make the difference between a road for cars and a road designed to serve a city and its residents. While all pedestrians need these basic services, they are particularly important for people with mobility impairments. Features such as textured pavements, curb cuts, safety islands, and countdown and audible crossing signals are inexpensive elements of urban infrastructure, but essential for impaired people to be able to take advantage of roads, sidewalks, and other transport facilities.

Attention to these details of road facilities is essential to ensure newly developed roads serve all users. Ideally, the populations that benefit the most from this attention to detail should have a role in supervising road implementation. Box 10.3 describes an interesting and potentially significant development in Jinzhou, a city participating in the Liaoning Medium Cities Infrastructure Project, where the disabled community has had a role in ensuring that roads in the city were built with adequate attention to detail. Today, Jinzhou systematically involves the Jinzhou Municipal Federation of Disabled Persons (FDP) to provide feedback on the quality of its roads and facilities.

Box 10.3

Putting “People-Centered Development” in Practice in Jinzhou, Liaoning

The cities of Benxi, Jinzhou, and Panjin in Liaoning Province all have taken a series of highly innovative steps to include residents with disabilities in the implementation of their urban transport projects. In all three cities, the local government organized seminars to increase awareness of project activities among residents with disabilities, and invited members of the disabled community to test newly constructed road facilities and provide input on their accessibility and functionality.

In Jinzhou, the local government and the Jinzhou Municipal Federation of Disabled Persons (FDP) started to jointly convene annual meetings to solicit input
For cyclists, good-quality motor vehicle separators, which separate cyclists from motorized traffic, are critical (see figure 10.6). Using a “crashworthiness” assessment of different types of lane separators, cities have also been able to decide on the right vehicle separators for their situation. The assessment identified the separators that not only provided physical separation, but also had the capacity to withstand the impact of a car crashing into it at 30 kilometers per hour (figure 10.7).

Finally, street furniture can enhance a user’s experience and promote more extensive use of the network. Street lighting is a basic facility and critical for providing an environment that women experience as safe. Toilets, benches, trees, and bicycling parking places are other simple facilities that benefit pedestrians and cyclists in the urban environment. Box 10.4 illustrates how the city council of Jinzhou effectively addressed public concerns related to this topic.
Figure 10.6  Lane Separators in Jinzhou, Liaoning


Figure 10.7  Comparison of Lane Separator Displacement

Source: World Bank, Liaoning Medium Cities Infrastructure Project.
Designing and Operating Safe Arterials

Data suggest that pedestrians and cyclists are disproportionately involved in traffic fatalities in China. This is unfortunately all too true within the urban context, where most fatalities occur on a few, relatively high-speed arterials. To address this, cities can develop a “safe corridor” or “safe system” approach, which focuses on identifying and comprehensively treating exactly the sections of the network where the bulk of those deaths and injuries happen (Bliss and Breen 2009).

The first step of this approach is to map the location of all fatalities in the urban area using at least three years of data. Figure 10.8 is the fatality map for the urban area of Benxi in Liaoning for 2004–06. The map can be used to identify high concentrations of deaths and injuries on the network and design appropriate interventions. When used in the project cities in Liaoning and in Wuhan to identify high-risk corridors, the maps, in all cases, showed that a small portion of the urban network—just two or three corridors—was responsible for up to 40 to 50 percent of the total number of fatalities in the city. In Panjin, for example, three corridors with a total length of about 20 kilometers are responsible for 40 percent of the total number of fatalities.

The next step, building on this Safe System approach, is to design and implement complementary engineering, enforcement, and education
Figure 10.8  Fatality Map for Benxi (2004–06)

Source: World Bank, Liaoning Medium Cities Infrastructure Project.
initiatives, along with efforts to strengthen the lead agency and include a monitoring and evaluation component. World Bank interventions also typically follow this model and include (i) an infrastructure investment program, (ii) an enforcement program, and (iii) a complementary education program for surrounding areas and schools.

The infrastructure investment program for these high-risk corridors is based on a set of countermeasures designed to achieve a realistic reduction in fatalities on the corridor. Other measures, such as the distance between safe pedestrian crossings, the number of channelized intersections, the number of kilometers of traffic separators, and the number of traffic signals, can be used as intermediate outcome measures. Box 10.5 summarizes the key features of a final “safe-corridor” plan under implementation in Benxi, Liaoning.

**Network of safe crossings.** The distance between safe crossings and the provision of a regular network of those crossings is particularly important for creating a safe traffic corridor. In addition to providing safe crossings at sensitive points such as schools, hospitals, and other important destinations, safe crossings should be available at reasonable and regular intervals.

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**Box 10.5**

**Benxi Safe Corridor Case Study**

The city of Benxi has focused on the JieFang Road corridor as its pilot safe corridor. In 2004–08, 16 fatalities occurred on this 4.5-kilometer road corridor through the Benxi city center, representing 16 percent of the fatalities in the city.

The Benxi safe corridor plan is a comprehensive safety package that includes (i) providing safe crossings for pedestrians every 300 meters (accomplished by installing nine new traffic signals with pedestrian phases and rehabilitating eight existing ones), (ii) installing a median separator along 1 kilometer of the corridor, (iii) installing traffic signs and markings along the corridor, (iv) increasing the police capacity to provide patrols 24 hours per day, and (v) running an education campaign in neighboring schools. The plan has an estimated benefit of a 30 percent reduction in fatalities along the corridor. Figure B10.5.1 below shows the layout of the physical interventions on a portion of the corridor.

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This is a particular challenge in Chinese cities, which are built around long “superblocks” and in which it is not uncommon to go 750 meters or even a kilometer between legal, “safe” street crossings. Having about 200–300 meters between safe crossings is the international guideline. While Chinese standards actually suggest no more than 300 meters between safe crossings, this guideline is usually not observed. Finally, a concerted effort needs to be made to ensure the safety of these crossings.

A current and particular aspect of Chinese road protocol is that automobiles rarely, if ever, give way to pedestrians at designated but unsignalized pedestrian crossings (zebra crossings). To create safer crossings, a variety of design elements can be used, such as mid-block signalized pedestrian-activated crossings, speed breakers (speed bumps) and other traffic calming devices, and traffic enforcement cameras (see box 10.6).

**Limiting cars on sidewalks and cycle lanes.** Vendors and parked automobiles often occupy bicycle and pedestrian lanes (see figure 10.9). This inconveniences bicycle users and pedestrians, which may discourage them from future walking or biking and may also force them to use the automobile lanes, which is very unsafe. For people with impaired mobility, this situation can make their life extremely difficult and unsafe. Addressing the issue of parked vehicles remains an important but difficult element of any urban transport program. World Bank projects have
Box 10.6

World Bank–Financed Pedestrian Infrastructures in Guangzhou, 2003

**Figure B10.6.1  Intersection Channelization**

In Tianhe New District, junction channelization has been implemented along Tianhe Bei Lu, including this good example at the intersection of Tianhe Bei Lu/Tianhe Dong Lu. The pedestrian phase runs parallel with the vehicle phase with no conflicting turns. Junction channelization islands provide protection and storage for pedestrians and bicycles, and an opportunity exists to introduce some greening.

**Figure B10.6.2  Staggered Pedestrian Crossing**

The concept of crossing the road in two stages with a protected pedestrian storage island in the center of the carriageway has been implemented at several locations in Guangzhou, including at this crossing of Shui Yin Lu. The pedestrian stages do not conflict with motorized vehicle traffic. For a slightly safer design, the stagger can be set the other way—whereby pedestrians face the oncoming traffic from it as in this example—but it often means a reduction in junction capacity as the vehicle stop line has to be set farther back.

Source: Author.
supported many technical assistance studies of parking management systems and also focused on developing ways to create incentives for more aggressive parking enforcement and establishing a parking industry with private ownership of parking lots that would have an interest in such enforcement. In addition, bollards (see figure 10.10) can also be used at key spots, such as bus stops, to limit encroachment by cars.

**Intersection design.** The most stressful element of a pedestrian or cycling trip in Chinese cities is safely crossing intersections. There are often no signal phases where pedestrians and cyclists are able to cross without conflict from turning traffic. Intersections are very large and signal timings are often too short for most people to cross within a signal cycle. In addition, there are no refuges for pedestrians and cyclists and no clear paths or channels to restrict and guide automobile traffic through the intersection. Using a combination of signs, markings, traffic canaliza-

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Figure 10.9  Cars Parked on the Bicycle Lane

tion, and pedestrian refuges, however, it is possible to provide safety and comfort for pedestrians and cyclists without compromising the efficiency of the overall traffic. Because of a strong tradition of intersection design that has favored large, wide, and open intersection spaces, change is not always easy, but Guangzhou, Wuhan (see box 10.7), and other cities in Liaoning have illustrated it can be done.

**Computerized traffic control systems.** Computerized traffic control systems that facilitate automated and centralized control of traffic and traffic signal operations are another key element of support for pedestrian movements. Area traffic control, for example, has been used in World Bank projects to enable multiphasing of traffic signals at pedestrian crossings in Shanghai and Guangzhou or provide mid-block signalized crossings and physical junction channelization in Wuhan and in the cities of Liaoning. Area traffic control can also be used to provide traffic calming measures, such as those currently being implemented in Xian.
Box 10.7

Wuhan Implements Model Intersection Channelization

When exploring options to improve vehicle efficiency in Wuhan, Wuhan agencies were initially not in favor of designs that seemed to take road space away from motor vehicles. The city needed to be convinced that physical channelization could improve vehicle efficiency, which was in the end vividly illustrated at the junction of Jiefang Avenue and Jiefang Gongyuan Lu. The intersection was later even declared a “Model Intersection” by the mayor.

Figure B10.7.1 Model Intersection Channelization

Before, the junction was inefficient and unsafe. There were no clear paths for vehicles to travel through the junction, and turning traffic chose their own paths under the flyover piers. Traffic signal stop lines were set far back, resulting in long clearance times for the cars. Pedestrians crossing the wide street had no safe refuge in the center and had to negotiate disorderly turning traffic. In each traffic cycle, the pedestrian phase was not long enough to cross all the way, so pedestrians became stranded in the middle of traffic.

The new design proposed by the Wuhan Traffic Police (WPSB) initially met with some resistance from local police brigades. To overcome this, the WPSB commissioned the China Management Science Research Institute to model the proposed design using a microsimulation program. This showed that the design would not only improve pedestrian safety but would also increase capacity.

The key features of the new design are as follows:

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Challenges Going Forward

Bicycle users and pedestrians are key beneficiaries of the low-carbon mobility agenda in urban China. In the context of a bicycle and pedestrian environment that is generally deteriorating, several Chinese cities have already started to design and implement solutions that contribute to a safe and pleasant infrastructure for pedestrians and bicycle users. This chapter also has described several examples of World Bank investments and analytical work in China to support both modes of transportation.

In themselves, these various city actions are small compared to the magnitude of the Chinese cities’ urban transport challenges. However, they do provide a portfolio of actions and an agenda for Chinese urban decision makers to recognize the critical role cycling and walking can play in any low-carbon growth path. In fact, there is a perfect alignment between the needs from a low-carbon perspective and the broader demands of finding sustainable solutions to the urban transport conflicts that Chinese cities are facing. To move forward, first, cities need to curtail the decline of bicycling and pedestrian trips. Second, cities have to find ways to encourage people who have stopped using these modes of transport to consider them again. International experience suggests that there is potential for significant gains in addressing congestion if people who have choices can be persuaded to use bicycles and walking as modes of transport, especially for short trips.

Box 10.7 (continued)

- Physical channelization (and planting) under the flyover to provide a safe refuge for pedestrians to cross the road in two stages. The vast uncontrolled area under the flyover has been filled in to cater to pedestrians with no loss of capacity for vehicles.
- Physical islands to channel turning traffic into short, direct paths to clear the junction quickly.
- Stop lines brought forward to minimize clearance times.
- Multiphase traffic signals with special pedestrian signals (which run in parallel with vehicle signals with no conflict) to enhance efficiency for vehicles and safety for pedestrians.

Box 10.8 provides examples of some initiatives within China taken by various government agencies to promote cycling. These are welcome indications of a changing mind-set and cultural attitude toward cycling. However, more can certainly be done, to go from what is now at best an attitude of tolerance toward a mode of transport for the poor, to recognizing, supporting, and promoting cycling as a valid mode of choice for everyone. To achieve this, the focus should be on the following:

- **Development:** Designing proper networks and road hierarchies to encourage and support walking and cycling
- **Execution:** Improving facilities for pedestrians and cyclists
- **Education:** Cultivating a culture of respect for pedestrians and cyclists, particularly at intersections and crossings.

**Box 10.8**

**A Changing Attitude toward Cycling**

Attitudes toward walking and bicycling are changing, and increasingly cities and higher levels of government are again recognizing the important role of those activities in urban life:

- At the national level, a car-free day was held in 2009 with the theme: “Walking and cycling: Healthy and environment-friendly ways of travel.”
- In March 2010, the Beijing Development and Reform Committee released the Green Beijing Plan (2010–12) and promised to include bicycles in the municipal transport planning. Actions would include adding more demonstration areas for pedestrians and bicycling, adding more bicycle parking places, and providing a better connection between cycling and public transit, as well as more bicycle rental places. The projected proportion of bicycle travel in 2015 in Beijing is 23 percent, compared to less than 20 percent today.
- On May 1, 2008, Hangzhou initiated the first public bicycle rental system in China. More than 2,000 public bicycle stations and 50,000 public bicycles are currently for rent.

*Source: Author.*
Conclusion

This chapter presented a strategy and examples from World Bank programs to promote bicycling and walking and include cyclists and pedestrians in the mobility infrastructure of Chinese cities. It is obvious that the current situation is less than ideal, as cycling and walking in the modern Chinese city are often unsafe, or at best unpleasant. While cultural perceptions, noninclusive policies, and a lack of attention have contributed to the current situation, several simple measures can alleviate some of the problems. Four complementary approaches—addressing network issues, improving the quality of the “last mile,” providing basic facilities, and improving the safety of critical arterials—can do much to improve the overall environment for cyclists and pedestrians. Several challenges still lie ahead, with the main one related to changing mind-sets and perceptions about the importance of supporting walking and cycling. The low-carbon mobility agenda will help focus on these issues and strengthen future programs.

Notes

1. A small three-wheeled vehicle, with pedals, either electric or motorized, with a double passenger seat behind the driver.

2. According to the Traffic Accident Annual Report, People’s Republic of China, 2007, pedestrians accounted for 26 percent of traffic accident–related fatalities in 2007. In contrast, pedestrians accounted for about 20 percent of fatalities from traffic accidents in the European Union and 11 percent of traffic accident fatalities in the United States in that year. The absolute number of traffic-related deaths reported in China was also considerably higher, particularly when controlled for the amount of motorized traffic on the roads.

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