



**China Council for International Cooperation on Environment and  
Development (CCICED)**

## **Promoting Urban Green Travel**

**CCICED Special Policy Study Summary Report**

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## **Introduction**

This Executive Report provides an overview of the work carried out by the study team comprising Chinese and international experts, who were asked to develop a set of high level recommendations for the State Council on how to deal with the growing problems of traffic congestion and traffic-related air pollution in Chinese cities. The detailed findings and research evidence that underpins these recommendations can be found in the supporting full technical report.

This study forms part of a wider initiative on exploring the ways in which China might develop more sustainable cities, and focuses on the contribution that ‘green travel’ can make to achieve this goal. The report argues that tackling the twin problems of congestion and air pollution requires a switch in investment and policy away from car travel to encouraging the use of more sustainable and efficient ‘green’ modes of transport; in particular, enhanced rail (and bus) services, supported by better walking and cycling networks for local travel, and taxi travel for specific purposes.

While the use of cleaner cars and fuels help to reduce air pollution, they don’t reduce traffic congestion, and so are not considered in this report which focuses on what needs to be done to promote 'Urban Green Travel' – passenger transport by public transport, walking and cycling in cities.

## Summary of key findings

- **The main causes of the extensive traffic congestion and air pollution in Chinese cities**

Extensive traffic congestion and air pollution from road traffic in Chinese cities pose significant health and safety threats, compromise operational efficiency, and increase fuel consumption. Factors that contribute to this problem include rapid and extensive urbanization, increased usage of private cars, and the deterioration of good walking and cycling environments. The root cause of urban traffic congestion and traffic generated air pollution in China lies in the insufficient management of urban and transport development by public authorities. Insufficient management includes a lack of top-level vision for urban transport; insufficient attention to local government management and leadership, insufficient financial support, weak administrative capacity of local governments, imperfect performance evaluation systems, and the central government's limited influence on local governments.

- **China has an opportunity to change direction and promote urban green travel**

Currently the motor vehicle population in Chinese cities remains very low compared to economically developed countries, and in many small and medium-sized Chinese cities non-motorized transport modes still dominate. These factors provide a unique opportunity for Chinese cities to develop the more efficient, effective and economically sustainable modes of green travel. However, promoting green travel is a complex social project. If the 'green' travel environment is not continually and significantly improved, and if the government cannot provide a sufficiently attractive green travel system for potential car users or fail to adopt effective car ownership and use control policies that influence car ownership and use, it will become very difficult to curb the rising trend of car ownership and use. Ultimately, the prosperity of the large cities and the well-being of its citizens have to be built around walking, cycling and efficient rail and bus based public transport. Green travel has to be delivered by the city governments and the role of central government is to enable, encourage and support city governments to green their transport systems. Promoting urban green transport is vital to promoting equal urban access for all.

- **China should deliver its urban green travel 'vision' and become a role model for developing countries**

China's current situation makes it possible for China to become a role model or trendsetter for developing countries, and even developed countries, on urban green travel. Chinese cities should build a modern urban green travel system that reflects China's needs. Such an urban transport system will attract people from all social levels to make use of suburban rail services, subways, bus rapid transport (BRTs) and other types of

buses and enable residents to choose safe, environmentally friendly and health travel modes such as walking and cycling.

- **Central and city governments *both* need to take comprehensive measures to promote urban green travel**

City governments should be the principal actor to promoting green travel. Urban green transport will depend critically on city governments' organizational competence, long term administrative commitment and the quality of successive political leaderships. However city governments alone cannot establish a green travel system that provides services for all. The central government should therefore work together with the city government to establish a green travel system and to ensure a regional approach to the prevention and control of transport related air pollution. All levels of the Chinese government should make comprehensive use of the three major strategies of promoting public transport and walking and cycling, namely 'guiding city development, increasing green travel supply, improving traffic demand management', and the four strategies of 'avoid, shift, improve, increase' to promote green travel.

## **Summary of the six priority policy recommendations**

**China's urban transport systems are presently on the wrong course – the course towards low density and socially divisive car dependency. This is not a viable future for China, economically or socially.** The central government should urgently address the promotion of urban green travel as part of the necessary transformation of China's urban development strategies. This requires attention to cross-sector coordination and cooperation; strengthening of the ability of the central government to encourage and pressure local governments to develop urban green travel through financial leverage and other means; providing clear guidance for Chinese cities to promote green travel, and enhancing local governments' capacity to finance, supervise and assess the urban transport system.

Based on China's current situation and a review of international best practice, the Special Policy Study team proposes the following six priority policy recommendations.

### **Recommendation 1:**

**The State Council should agree on an 'Outline of China Urban Green Travel Implementation' as part of the national strategy for building an ecological civilization.** This should guide cities to build a modern green transport system following four principles. It should: i) be attractive to all social groups, have low emissions and have high operational efficiency; ii) prioritize public transport, walking, and cycling, with seamless transfers and facilities for those with special needs (e.g. people with disabilities, elderly, young children); iii) implement private vehicle ownership and usage management measures and; iv) ensure that city development makes efficient use of land and provides all residents a liveable environment, with safe access to basic services and jobs without undue time and cost burdens.

### **Recommendation 2:**

**Central government should: a) enable city governments to raise sufficient and sustainable local sources of revenue to fund local public transport companies and b) provide targeted financial support for specific projects.** More specifically, the central government should ensure that local cities can raise adequate funds through new forms of taxes, support green transport in cities through a variety of economic instruments, adjust public transport pricing, and establish a management system for the central funds that encourages green travel.

### **Recommendation 3:**

**The State Council should issue 'Policy Guidelines for the Rational Use of Vehicles**

**and Road Space' to reduce congestion and air pollution,** requiring that i) Public transport, walking and cycling should have clear priority in the allocation of city road space, ii) the definition of official vehicles should be broadened and strict limitations on official vehicle numbers and rules for the use of official vehicles should be issued, iii) free private parking spaces should be reduced or charged/taxed, iv) road user charges should be encouraged in congested areas, and limitations on car ownership should be implemented, v) and each city must have the final say on the best mix of policy instruments to meet agreed objectives.

#### **Recommendation 4:**

**The state and city administrations should be required to ensure cross ministry/department policy coordination, as well as enhanced performance appraisal and management accountability. Public participation should be encouraged.** i) The State Council should set up a coordinating mechanism within the central government to promote urban green travel, which should be led by the Vice Premier, (ii) The Ministry of Transport should set up a 'Bureau of Urban Passenger Transport Management', (iii) Local governments should set up a coordinating mechanism for Promoting Green Travel, (iv) To strengthen performance evaluation and accountability, and encouragement of public involvement, the State Council should order the Ministry of Transport to establish a National Green Travel Index Monitoring Mechanism for cities.

#### **Recommendation 5:**

**The central government should amend the Urban Public Transport and Air Pollution Management legislation** to require local governments to fulfil its duties to promote urban green travel.

#### **Recommendation 6:**

**Central government should select different types of cities to organize and implement a series of Demonstration Projects** to promote urban green travel.



## Background and implementation of project

With the rapid development of China's modernization and urbanization, the population of motor vehicles has been growing rapidly, and cities of all sizes are generally plagued by chronic urban diseases such as traffic congestion and traffic generated air pollution which significantly compromise residents' basic travel and quality of life, urban economic activity and national energy security. Together these urban transport problems have become a major national issue.

The 18<sup>th</sup> CPC National Congress proposed a series of new concepts, ideas and requirements, including "Beautiful China", "Ecological Civilization" and "Adopting a New Model of Urbanization". The 2013 Central Economic Work Conference further put forward the concepts of fully integrating the concept and basic principle of ecological civilization into the whole process of urbanization and adopting "a new intensive, intelligent, green, and low-carbon model of urbanization. As a result, urban transport development in China has also entered a crucial period of strategic transformation. *Guiding Opinions of the State Council on Giving Priority to Development of Urban Public Transport* (GuoFa [2012] No. 64) clearly points out that:

*"in accordance with the resource conservation and environmental protection requirements, focusing on energy conservation and emission reduction, we should vigorously promote the development of **low-carbon, high-efficient, large-capacity urban public transport systems**, speed up the popularization and application of new technologies, new energy, new equipments, and advocate green travel."*

The study team has taken the term 'urban green travel' to refer to the development of attractive alternatives to the private car which meet the twin objectives of reducing urban traffic congestion and traffic-related air pollution. This includes greatly enhanced rail and bus-based public transport services, plus taxis in selected situations, together with supporting enhanced walking and cycling to meet local travel needs and provide access to public transport stops, stations and terminals. By promoting these alternatives it should also be possible to capture valuable co-benefits such as reducing traffic accidents, CO<sub>2</sub> emissions, and to improve public health and enhance social inclusion.

**Promoting urban green travel is an important means to implement the new model of urbanization to reduce traffic congestion, improving traffic-related air quality and rebalanced urban and transport development.**

To strengthen the government functions of the State Council and the relevant departments in promoting urban green travel and increase the policy influence of the central government on promoting green travel to local governments, China Council for International Co-Operation on Environment and Development (CCICED), in conjunction with the European Commission (DG Mobility and Transport), organized experts from

China and abroad to undertake the special policy research project of “Promoting Urban Green Travel.” The project was led by the China Academy of Transportation Sciences, CANGO Green Commuting Fund and the Research Institute of Highway, who took part in the project. Beijing, Shanghai and Shenzhen were also involved as research survey and case study cities.

In a short period of six months from March-September 2013, the project team organized field surveys in Shenzhen, Shanghai and Beijing and held three seminars on promoting urban green travel with various stakeholders. These included government departments (including inter alia; Environmental Protection, Finance, Development and Reform), public transport companies, universities, research institutes, public welfare organizations. The project team listened to policy suggestions from all stakeholders on promoting urban green travel. The project team held several internal meetings, analysed different policy recommendations and finally selected policy recommendations based on an analysis of the opportunities and challenges China is facing in promoting urban green travel and the combined expertise of the experts at home and abroad.

The project team also launched a green travel survey via the online survey platform on ‘Sohu’ to obtain first hand data on the opinions and preferences of Chinese urban residents regarding public transport, walking and cycling conditions and transport demand management policies. The team prepared the *Special Report on Social Survey and Analysis of Green Travel in China 2013* (hereinafter referred to as the "*Green Travel Survey Report*"). The report provides a valuable support for the analysis of challenges and problems and the policy recommendations for promoting urban green travel.

The project team has also carried out research on how China might develop green travel indexes, by which it will be possible to appraise the implementation results of various measures adopted to promote urban green travel.

**The results of the research work have been discussed by the project team in order to agree on the policy recommendations.**

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**Key words: urban mobility, green travel, congestion management, pollution management and haze reduction, Transport Demand Management, fiscal matters, policy**

## **1. CAUSES AND CONSEQUENCES OF URBAN CONGESTION AND AIR POLLUTION**

Rapid urbanization and motorization has stimulated the economic vitality of Chinese cities, but it has also led to chronic ‘urban diseases’ such as traffic congestion and traffic-related air pollution. Beijing, Shanghai, Shenzhen, Guangzhou and other first-tier cities in China frequently suffer from large-scale traffic congestion during peak hours, as well as severe fog and haze pollution, and increasingly severe air pollution caused by motor traffic. Chongqing, Changsha and other second-tier cities, and even some prefecture-level cities, have also been seriously affected by traffic congestion in their central areas. The urbanization and motorization processes in China are still in the acceleration phase, which indicates that in the absence of strong, long term measures, traffic congestion and air pollution will get much worse and spread to small and medium-sized cities.

### **1.1. Serious consequences of urban congestion and air pollution**

Congestion and air pollution harms citizens’ basic ability to travel and quality of life, and rapid traffic growth threaten public health, urban economies, and national energy security.

**Threats to people’s basic travel, health, and safety.** Firstly, low-income groups mainly travel by public transport and non-motorized modes, and thus suffer more the inconveniences of travelling on overcrowded public transport and unattractive and unsafe walking and cycling networks. Secondly, motor vehicle exhaust pollution is one of the main sources of air pollution in the cities of China and a key cause of haze pollution. Serious traffic jams further increase air pollution. The environment monitoring agencies in Beijing and Shanghai have stated that 22% and 25% of PM2.5 in those cities came from vehicle pollution in early 2013. The air pollution index in many cities frequently exceeds the World Health Organization Standards by a factor of ten. Nearly half of 74 key monitoring cities across China suffer from serious pollution, with traffic related pollution being a major contributor to the problem in most cities. Haze pollution has seriously affected the health of urban residents, disproportionately affecting the low-income groups who adopt non-motorized travel modes<sup>1</sup> (see Box 1-1).

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<sup>1</sup>[http://www.news365.com.cn/xwzx/qc/201301/t20130116\\_900096.html](http://www.news365.com.cn/xwzx/qc/201301/t20130116_900096.html)

### **Box 1-1: Air pollution has severely harmed Beijing citizen's health**

The unprecedented scale of the haze in Beijing was reported for 8 minutes on China Centre Television (CCTV) news on January 12, 2013. The Beijing meteorological center announced the first haze 'Orange Alert' in history and initiated emergency response actions, on the most seriously polluted days official cars were required to stop driving. This haze has caused increased respiratory and cardiovascular diseases occurred such as tracheitis and bronchiolitis (upper and lower respiratory tract infections).

[http://www.news365.com.cn/xwzx/qc/201301/t20130116\\_900096.html](http://www.news365.com.cn/xwzx/qc/201301/t20130116_900096.html)

A decade ago road traffic injuries became the leading cause of death among persons age 45 and younger in China.<sup>2</sup> According to national statistics, based on police report, there were 220,000 road traffic accidents in China in 2010, which killed over 65,000 people. China already has the highest number of road deaths in the world. These traffic accidents caused 926 million Yuan (111 million €) of direct property loss, of which road traffic accidents in 36 central cities caused 224 million Yuan (27 million €) of direct property losses (about 25.3% of direct economic losses from road traffic accidents in China). Non-motorized green travel by foot and by bicycle accounts for 35% of all police-reported traffic fatalities.<sup>3</sup>

Recent research published by the World Health Organization compared police-reported traffic fatalities with official Chinese death registration data. The latter data source, which international best practice has found to be more reliable than police reports, suggests that traffic related fatalities in China may be double the police-reported statistics. Underreporting of traffic related fatalities for children and cyclists tend to be even greater.<sup>4</sup> In addition to the suffering and economic costs this is a question of social equity as this situation puts pedestrians, cyclists, and public transport users in peril and, importantly, **acts as a deterrent to urban green travel in China.**

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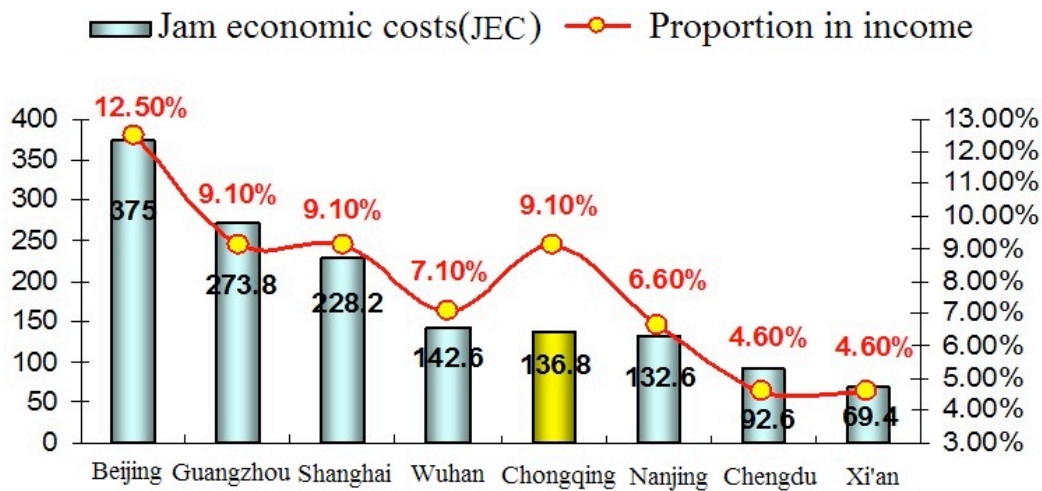
<sup>2</sup>Wang SY, Chi GB, Jing CX, Dong XM, Wu CP, Li LP. Trends in road traffic crashes and associated injury and fatality in the People's Republic of China, 1951–1999. *Inj Control Saf Promot* 2003; 10: 83-7 doi: [10.1076/icsp.10.1.83.14105](https://doi.org/10.1076/icsp.10.1.83.14105) pmid: [12772490](https://pubmed.ncbi.nlm.nih.gov/12772490/).

<sup>3</sup>2010 China Road Traffic Accident Annual Statistical Report, Traffic Management Bureau of Ministry of Public Security, 2010.

<sup>4</sup>Hu, Guiqing, Timothy Baker and Susan Baker, Comparing Road Traffic Mortality Rates From Police Reported Data and Death Registration Data in China, *Bulletin of the World Health Organization*, 07 September 2010, <http://www.who.int/bulletin/volumes/89/1/10-080317/en/>.

**Reducing the efficiency of the urban economy.** The daily hours subject to traffic congestion in Beijing have extended from 3.5 hours in 2008 to 5 hours in 2012, seriously affecting the operational efficiency of the city<sup>5</sup>. Due to congestion, the transport system has become increasingly unreliable. Adverse weather conditions or a single traffic accident can often cause massive traffic jams and even the collapse of the transport systems in the whole city. On September 17, 2010, five days before the Mid-Autumn Festival, due to heavy rain, 143 roads in Beijing suffered from congestion in the evening peak hours, causing traffic congestion lasting nearly nine hours<sup>6</sup>. The latest research of Niu Wenyan, chief scientist, counsellor of the State Council, shows that due to traffic congestion and management problems, China's 15 largest cities suffer a daily time loss of nearly 1 billion Yuan (12 million €), Figure 3-1 shows the additional fuel cost due to congestion in RMB and as a share of average monthly income. It can be seen that these direct economic costs of congestion in first-tier cities such as Beijing, Shanghai and Guangzhou are significantly higher than those of second-tier cities such as Chongqing and Xi'an.

**Figure 1-1: Congestion Costs in Chinese Cities<sup>7</sup>**



**Increasing energy consumption and intensifying energy shortage.** In recent years, energy consumption by transport vehicles has been growing rapidly, and traffic congestion uses fuel inefficiently. Transport, industry and construction are the three

<sup>5</sup>China's New-urbanization Report 2010 issued by the Chinese Academy of Sciences

<sup>6</sup> <http://city.ifeng.com/cshz/bj/20110121/34217.shtml>

<sup>7</sup>2009Foton Chinese Index for Mobility-Chinese residents motorization index report,

sectors that consume the most energy. According to national forecasts, the proportion of total energy consumed by the industry sector will gradually decline from 73% in 2000 to 57% - 59% in 2020, and the proportion of energy consumed by transport will increase from 11% in 2000 to 16% - 17% in 2020. At present, road transport fuel consumption is 40 - 50 million tonnes, accounting for a third of total oil consumption in China. By 2020, the transport sector will become China's largest oil consumer, accounting for about 55% - 60% of total oil consumption<sup>8</sup>.

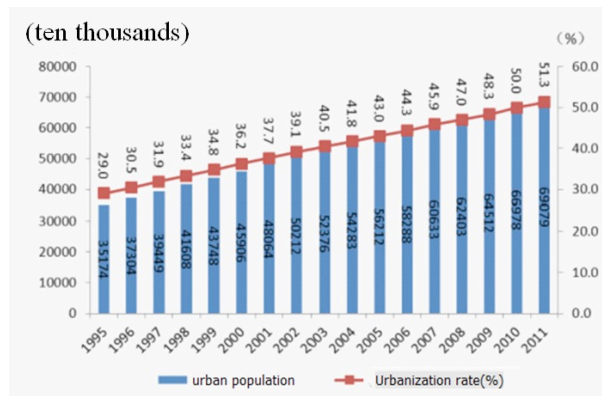
## 1.2. Factors causing urban congestion and air pollution

There are four main causes of congestion and traffic-related air pollution in mega- and large Chinese cities:

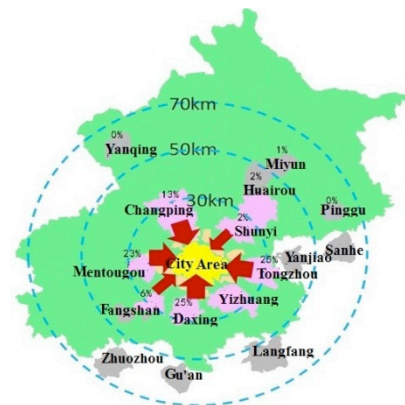
**Fast growing and spreading urbanization greatly increases travel needs.** Since the 16<sup>th</sup> CPC National Congress, urbanization in China has grown rapidly. From 2002 to 2011, China's level of urbanization increased on average 1.35% percentage points each year, and the urban population grew by 21 million each year<sup>9</sup>(as shown in Figure 1-2). By the end of 2012, China's urbanization rate reached 52%, starting to exceed the world average. Rapid urbanization has led to rapid growth and spread of urban population and multiplication of urban travel demand. However, the extensive rapid urbanization (as shown in Figure 1-3) has resulted in serious phenomena such as a greater separation of work and residence locations of new residents, thus causing higher motorised travel frequency and longer travel distances.

**Figure 1-2: China's Urbanization Process in sprawl<sup>10</sup>**

1995-2011<sup>11</sup>



**Figure 1-3: Urban sprawl**



<sup>8</sup>Data from Development and Research Centre of the State Council

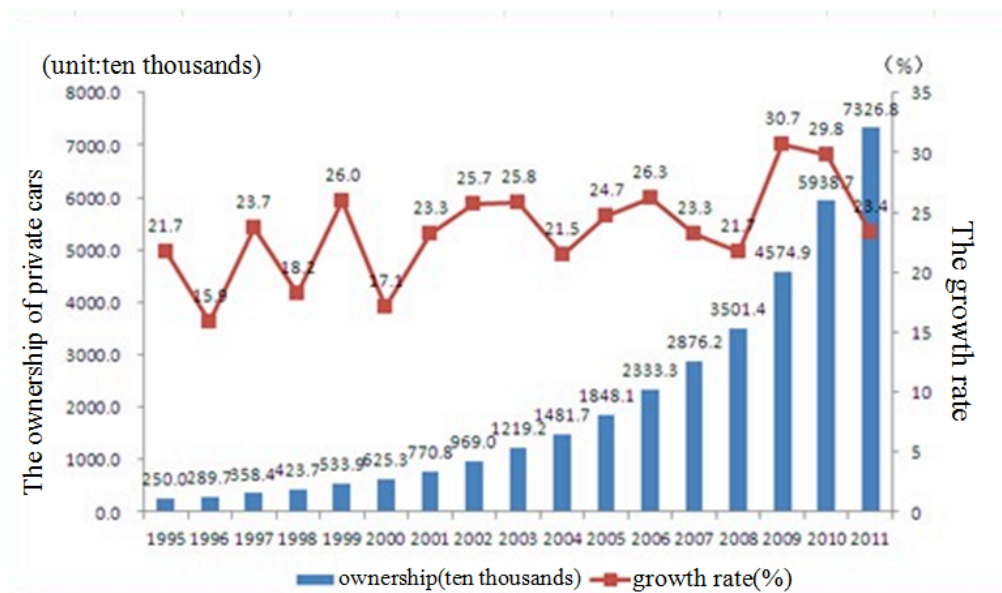
<sup>9</sup> Data from National Statistics Bureau

<sup>10</sup> Figure from Beijing Municipal Committee of Transportation

<sup>11</sup> Data from China Statistical Yearbook 2012

**Limited public transport supply and poor service levels, as well as the absence of effective car restraint policies** has stimulated the use of cars leading to fast growing private car ownership, high car use and high urban car density. The growth of motorization in China, averaging between 20% and 30% per annum over the past five years, is unprecedented in the world (see Fig. 1-4). The "three highs" phenomenon of car use (Figure 1-4) has caused traffic congestion in cities, intensified the disparities between transport demand and supply and brought huge pressure on urban road systems. If the car fleet and use continue to grow at the current rate, then expensive **road infrastructure construction will never catch up with the demand for car movement. In the absence of effective management urban mobility will inevitably deteriorate.**

**Figure 1-4: Development Trends in National Private Car Ownership<sup>12</sup>**

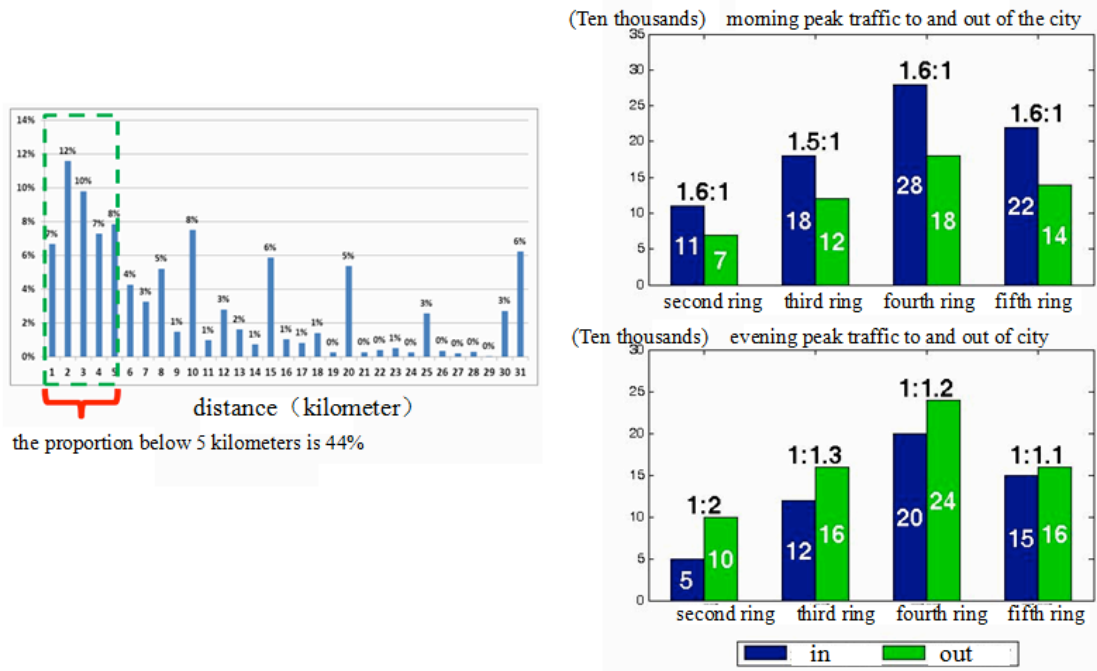


**The non-motorized travel environment is poor and has been deteriorating, as people who previously travelled by non-motorized modes have shifted to cars or road-based public transport. This has increased the pressure on urban road transport network – causing a further deterioration of the walking and cycling environments. This has exacerbated the imbalance of supply and demand. The *Green Travel Survey 2013 Report* shows that 81% of the participants were not satisfied with the urban pedestrian environment. Respondents’ complaints primarily related to vehicles’ and other facilities’ use of walking areas and vehicles’ priority over pedestrians in walking areas as shown in Table 1-1.**

<sup>12</sup> China Statistical Yearbooks



**Figure 1-5: Intensity of Use of Private Cars in Beijing<sup>13</sup>**



The survey showed a high level of dissatisfaction with cycling provisions as well; only 15% are satisfied. The main complains are lack of segregated facilities and vehicles asserting priority over cyclists, as shown in Table 1-2.

**Table 1-1: Complaints about walking conditions from participants<sup>14</sup>**

Causes	Vote s	Percentag e
Vehicle and other facilities' use of walking areas	2567	33%
Vehicle priority above pedestrians	2120	27%
Poor road condition	1285	16%
Not enough walking space	1157	15%

Complaint	Percentage
vehicles or other facilities' use of walking area	32.92%
not enough walking space	14.84%
poor road conditions	16.48%
vehicle's priority against pedestrians in walking areas	27.19%
generally satisfied	8.57%

13 Data from Beijing Municipal Committee of Transportation

14 Green Travel Survey Report 2013

Satisfied	668	9%	
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**Excessive use of official vehicles.** Official cars, with their large engines, high fuel consumption and intensive use, have long been regarded as one of the major symbols of the car orientated development in China. In 2010 there were over 62.000 official vehicles in Beijing, the Beijing Municipal government alone had over 20.000. Official vehicles are used more intensively than private vehicles and are not sensitive to economic instruments. On non-working days official vehicles have 1.94 trips per day on average, many of which must be for personal use.

**Table 1-2: Cycling environment complaints<sup>15</sup>**

Causes	Votes	Percentage									
Lack of separation facilities, not safe	2285	33%	<table border="1"> <tr> <td>not enough cycling space</td> <td>26.09%</td> </tr> <tr> <td>lack of separation facilities, not safe</td> <td>33.01%</td> </tr> <tr> <td>vehicle's priority against cyclers</td> <td>32.51%</td> </tr> <tr> <td>generally satisfied</td> <td>8.39%</td> </tr> </table>	not enough cycling space	26.09%	lack of separation facilities, not safe	33.01%	vehicle's priority against cyclers	32.51%	generally satisfied	8.39%
not enough cycling space	26.09%										
lack of separation facilities, not safe	33.01%										
vehicle's priority against cyclers	32.51%										
generally satisfied	8.39%										
Vehicle's priority against cyclers	2250	33%									
Not enough cycling space	1806	26%									
Satisfied	581	8%									

### 1.3. Key problems regarding China's urban transport development

The root causes of the extensive traffic congestion and traffic-related air pollution include the following:

**Lack of a top-level strategy and priority for sustainable urban transport development.** Although a transition to more green travel is generally considered as necessary in China's cities, there is no modern urban green transport vision. The contribution and role of urban transport in promoting sustainable urban development is not clear, and urban transport development goals are not coordinated with policies on environmental protection and efficient use of land. This means that the efficient provision of sustainable urban transport is not prioritized in urban development planning, resulting in the prevalence of car-oriented development. In urban transport systems priority is given to motor vehicles, resulting in a continuous rise in congestion despite the increase in the number of roads built.

<sup>15</sup> Green Travel Survey Report 2013

**Insufficient attention to transport demand management in smaller cities at the local level.** In response to the huge pressure from the rapid growth in the number of motor vehicles, Beijing, Shanghai, Guangzhou, Shenzhen and other first-tier cities in China have generally implemented a range of demand management measures, including differentiated parking fees, restricted purchase regulations, vehicle quota license auction, motor vehicle plate restrictions, staggered rush hours, to good effect.

However, the governments of many second-tier cities are still not fully aware of the potential or long term benefit of transport demand management and believe that there is no need to implement transport demand management measures as long as no traffic congestion occurs. Some cities dare not take necessary transport demand management measures due to social pressures. In addition, there are no national-level transport demand management laws and regulations, and the central government has no policy guidance for promoting green travel, controlling car ownership and introducing parking and congestion charging, which together has limited the implementation of transport demand management policies.

**Insufficient fiscal incentives to promote green travel.** First, the levels of fiscal support for green travel are weak, and the total central financial investment in public transport is insufficient to enable growth in travel demand to be carried by sustainable transport modes rather than by private cars. Compared with the investments in road infrastructure construction, investment in urban public transport is inadequate. Secondly, the present structure of financial investments in public transport is irrational. The existing annual fuel subsidies from the central government for urban public transport are several dozen billion Yuan (several billion €), but the use of those subsidies does not encourage the development of green transport systems. Third, there is no stable fiscal investment mechanism to fund urban public transport investment and operation. Cities rely considerably on one-off land sales for infrastructure finance, an unreliable long-term mechanism. The funds for public transport development at all levels are limited, and so cannot meet the needs for rapid development of urban public transport. Fourth, there is no standard fare setting and subsidy mechanism for urban public transport. In many cities, a mechanism to link transport cost, fare, subsidy, service quality and operational efficiency has not been established, fares income is too low, while the financial capacity of municipal governments to subsidise operations is limited.

**Weak administrative capacity of local governments and poor performance appraisal systems.** The relevant departments of the central government have long proposed the guiding principles of giving priority to the development of urban public transport, but in the rapid urbanization and motorization processes that have taken place in Chinese cities, urban transport development in many cities has been based around the private car. The main causes of this mismatch between aspiration and achievement are poor decision-making skills at the management level of municipal governments, imperfect cross-sector policy coordination, lack of rigorous performance assessment of policy implementation and lack of public participation.

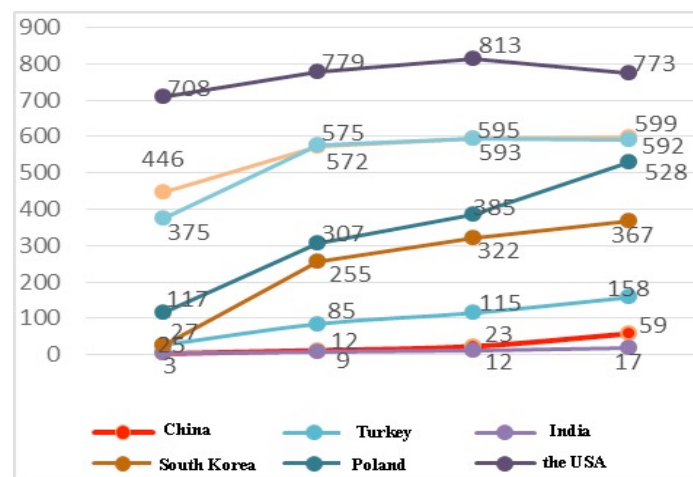
In terms of performance appraisal of system construction, *Guiding Opinions of the State Council on Giving Priority to Development of Urban Public Transport* (GuoFa [2012] No.64) has specifically put forward the proposal for the “implementation of an urban public transport development level performance assessment system”, but as public transport development involves several departments, the current lack of an effective coordination mechanism makes it difficult to implement such a performance assessment system.

## **2. PROMOTING URBAN GREEN TRAVEL – OPPORTUNITIES AND CHALLENGES**

### **2.1. China still has favourable conditions for promoting urban green travel**

**The level of motorization is low in China.** Figure 2-1 shows that in 2010, the number of motor vehicles was 773 per 1000 persons in U.S.A., which ranked first in the world, followed by France (599) and then Japan (592). In 2010 there were only 59 motor vehicles per 1000 persons in China. However, the level of motor vehicle ownership in cities like Beijing already exceeds that of Tokyo, despite a far lower level of per capita income in Beijing. Other cities across China could copy Beijing’s motorization pattern in the coming decade or the nation could build on its existing green transport foundations to avoid serious problems.

**Figure 2-1: Comparison of the Motorization Process of China and Foreign Countries -2010 numbers<sup>16</sup>**

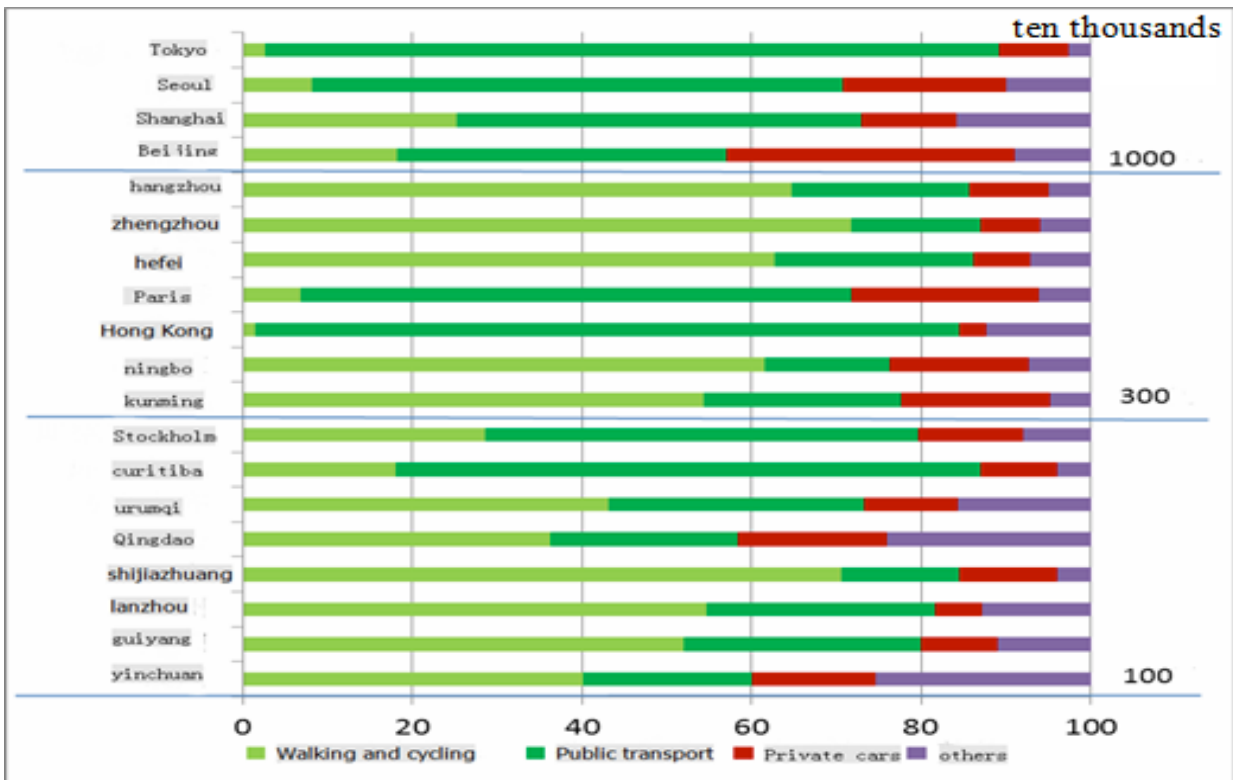


**The ratio of urban green transport in China is still high compared with developed countries.** Non-motorized travel modes in Chinese cities, especially in small- and

<sup>16</sup> Data from various web-pages of the included governments

medium-sized cities, still take a dominant position. In cities with a population of 3-10 million, such as Zhengzhou and Hefei, the proportion of non-motorized travel is more than 60% and in cities with a population of more than 10 million such as Shanghai, non-motorized urban travel accounts for over 25%. Small- and medium-sized cities have an even higher proportion of non-motorized travel. As the proportion of non-motorized travel is much higher than that in developed countries, China has a good foundation and tradition in urban green travel, which is illustrated in Figure 2-2. However, in most cities, current road conditions are discouraging rather than encouraging use of these modes.

**Figure 2-2: Comparison of Green Travel Mode ratios in cities of different population size<sup>17</sup>**



## 2.2. Promoting urban green travel supports China's national policy objectives

<sup>17</sup> Data for the Chinese cities in this figure are from the report of the Chinese Ministry of Transport. The data for international cities are from various webpages and materials received from officials during the Chinese study tour to Europe Summer 2013.

**Promoting urban green travel is in line with the policy objectives that China is advocating; namely ecological civilization; a new type of urbanization; safeguarding social fairness and justice;** The Chinese Government focuses on developing an ecological civilization and strives to promote green and low-carbon development. Furthermore emphasis is on land use patterns, industrial structures, production modes and lifestyles favourable to energy saving and environmental conservation. The Government has introduced a series of major initiatives that will play a strong supporting role in establishing the laws, regulations and systems and providing the financial security for promoting green travel and improving air quality.

**China is focusing on comprehensive and integrated transportation management in order to carry out the adjustment and improvement of transport in China, and should actively support the promotion of green travel.** China is moving towards building a safe, convenient and cost-effective green integrated transport system and to promote the smooth interoperability of infrastructures; the use of advanced, applicable, energy-saving and environmentally friendly transport equipment; intensive, efficient, economical and convenient transport organization; and quick, convenient, fair and high-quality transportation services. The Government is paying attention to improving the transport service levels to improve people's livelihood and try to provide a variety of high quality public transport services.

**Information technology and intelligent transport systems could provide the necessary support for China's promotion of green travel.** Information technology should be widely utilized in transport planning, design, construction, operation and management. The promotion and application of advanced transport technologies and products helps promote the transformation of traditional technologies and ensure that new infrastructure can be used intelligently. The above could raise the overall technological level and thereby support the promotion of green travel.

**The strengthening of the society and people's engagement in green travel will assist in stimulating the promotion of green travel.** The society, people, and media should be the advocator, propagator, and practitioner on promoting green travel and related activities to achieve a low carbon life style. This could create a positive social environment for green travel at the local level.

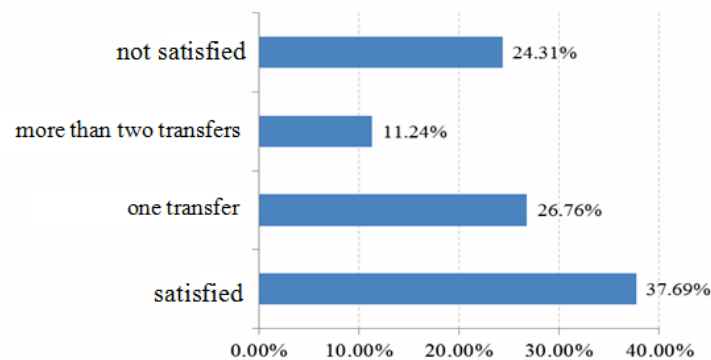
### **2.3. Promotion of urban green travel is a test of the governing capacity at all levels of government in China**

China's institutions must be capable of solving the problems caused by the increase of traffic demand due to fast urbanization, low public transport capacity and poor environments for walking and cycling. Urban travel demands are increasing dramatically with urbanization, which can be analysed from the growth of travels, both in terms of frequency and distance. China's traditional urban transport systems are used to adapting passively to the demands of urban development and are not prepared to actively influence the transport demand and deliver the service to support rapid urbanization. This has

resulted in growth in travel demand brought about by the rapid urbanization, a shortage of aggregate public transport supply, lack of coverage of public transport areas and a lack of attractiveness of public transport services for those with access to car travel.

Public dissatisfaction with public transport, walking, and cycling will drive more people to drive and erode the market share of green travel modes. A recent survey of 4,000 participants from 31 provinces on 'public transport coverage of commuting needs' found 24% of the participants unsatisfied with the commuting service provided by public transport, as shown in Figure 2-3.

**Figure 2-3: Level of Satisfaction: Commuting by Public Transport<sup>18</sup>**



**The long lasting conflict between the rapid increase in motorization and the idea of promoting green travel.** At present, there are three phenomenon; "fast growing private car ownership, high car use and high urban car density" that challenge the promotion of urban green travel. China's movement to green travel is in essence a competition between the supply of green travel services and the growth in private car ownership. China must seize the opportunity to properly manage and adjust urban transport, before motorized travel becomes the dominant travel mode. If the green travel environment cannot be improved continuously and significantly, and if the government fails to bring into place a sufficiently attractive green travel service system for potential car consumers, it will be difficult to curb the rising trend of car use. Chinese cities will miss the best timing to cultivate green travel modes.

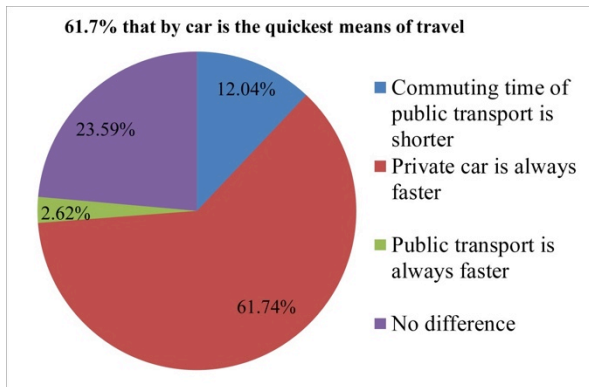
In a recent survey, 62% of respondents said that travelling by private car is always faster than by public transport, as shown in Figure 2-4, and 47% said that public transport's inability to cover special family travel needs is the main reason for buying cars. More than 35% believed that the added time of taking public transport is the main reason for buying cars, as shown in Figure 2-5.

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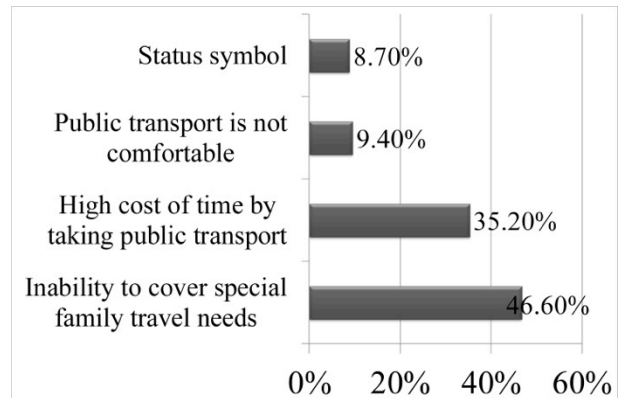
<sup>18</sup>Green Travel Survey Report 2013

**The challenges of promoting non-motorized travel (NMT) and halting the fast decline of NMT.** Non-motorized travel modes still have a dominant position in cities of China, but are adversely affected by fast growth in car use. Indeed the **mode share of non-motorized travel is declining rapidly** in Chinese cities. In a decade, the non-motorized travel rate in Beijing, Hefei, Changsha and other cities has decreased by more than 10%. Figure 2-6 shows the changing trend of bicycle sharing rate in Beijing, which dropped from 62.7% in 1996 to 16.7% in 2010. The decline in the share of non-motorized travel modes reduces the critical mass of pedestrians and cyclists on the streets. This reduces the social and political legitimacy and safety of these modes of transport, leads to a deteriorating non-motorized travel environment and increases average commuting distances in cities.

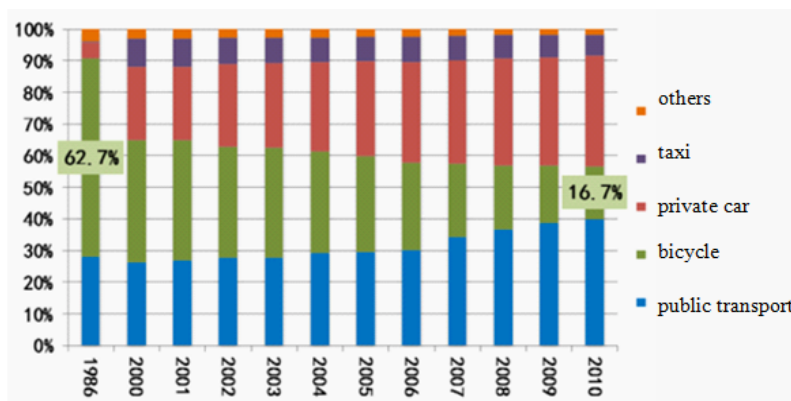
**Figure 2-4: Survey on Travel Efficiency of Cars<sup>19</sup>**



**Figure 2-5: Reasons for using Public Transport and Private Cars<sup>20</sup>**



**Figure 2-6: The Decline of Bicycle Mode Share in Beijing<sup>21</sup>**



<sup>19</sup>Green Travel Survey Report

<sup>20</sup>Green Travel Survey Report

<sup>21</sup>Data source: Beijing Municipal Committee of Transportation



**Different levels of governments face great pressure to ensure financial support to the infrastructure construction and operation of public transport.** To promote green travel the governments need to provide strong support to green transport infrastructure construction and public transport operations. The current funding for public transport and non-motorised is insufficient. In cities in mid-western China especially, the normal financial budget at the local level is insufficient. City governments in China need to provide a wide range of basic public service (public education, social service, social security, health system, population control, housing, public culture, infrastructure, and environmental protection), which results in difficulties ensuring funding for green travel infrastructure construction and operation.

**The current government institutions, urban policies, and implementation capacity are not capable to manage the urgent need for improving China's urban green travel.** Promoting green travel and prioritizing urban public transport is a complex social project. The related departments in the central government have long discussed the guidelines for prioritizing urban public transport, but many cities have made mistakes during the urbanization and motorization process. For example, the spatial layout and industrial structure planning are often disconnected from transport planning, urban transport management is car-oriented, and public transport development is not prioritized. These mistakes are related to the non-optimal distribution of department responsibilities, poor cross department coordination, low decision making and management capacity of the local governments, as well as lack of strict performance evaluation for policy implementation and public participant. At present China is in the middle of wide-ranging institutional reforms, and each reform will encounter many difficulties. The improvement of government capacity, performance evaluation and public participation need time to be completed. These unfavourable factors negatively influence the development and implementation of green public transport.

### **3. INTERNATIONAL EXPERIENCES**

The main lessons from international experience that have influenced this report are:

#### **3.1. 'Public transport oriented urban development' in EU and US**

Due to the pressure caused by raising prices on energy, urban air pollution and environmental damage, urban planning that makes efficient use of land and is ecologically friendly has become an internationally accepted sustainable urban development approach. Such approaches reduce transport demand and support the business case for the continued supply of quality public transport and local walking and cycling. It has also become an international trend to strengthen the integration of transport planning with urban spatial planning, environmental protection, and efficient land use, in order to achieve public transport-oriented urban development. The EU and the U.S. governments encourage and stimulate city governments to take actions through

regulations and guidance in the fields of planning, land use and pollution management, etc. The EU supports the implementation of Sustainable Urban Mobility Plans. These are strategic plans, developed at the local level, with the goal of ensuring urban accessibility for all; improve safety; reduce air pollution, carbon emission and improve energy consumption; improve efficiency of passenger and freight transport, and enhance the quality of the urban environment. The purpose of these plans is to develop, based on consensus and consultation, a long term, sustainable urban comprehensive transport vision necessary for the development of cities.

### **3.2. 'Public transport + cycling + walking' an internationally recognized concept**

The urban green transport system of 'public transport + cycling + walking' plays an increasingly important role in improving air quality and congestion management and in building sustainable cities. High quality and well managed taxis are an important part of the 'urban green transport' solution providing complementary services to public transport, walking and cycling. EU law on air quality drives the establishment of the urban green transport system of 'public transport + cycling + walking'; France has issued a law on air quality protection and energy conservation (e.g. the LAURE Act of 1996) which states six requirements for metropolis and urban transport planning. Some of the cities e.g. in France, Sweden, the UK, among others, have world class urban public transport systems. Under the guidance of EU policies and national transport development strategies, many EU cities are committed to prioritizing public transport, and improve public transport service quality. Cities like Paris and London are increasing walking areas and introducing more cycling lanes in the old town areas that have limited street space, as well as providing excellent public transport. Moreover, European and American cities focus on linking various modes and improve public transport transfers by taking a 'multi modal' approach to planning, system design, and transport management.

### **3.3. Sustainable financial for urban green travel**

The fare income of public transport cannot, and should not, cover the full costs of public transport infrastructure and facility investment, maintenance and operation. Therefore, in order to develop a stable public transport infrastructure and services, many countries in the world have assigned additional funding sources for urban transport development through national laws, and national funding mechanisms. The common sources of funds include local income tax, sales tax, taxes relating to land value appreciation, parking pricing, vehicle plate auction income, congestion charge, low emission zone charge and city maintenance charges.

Paris's employers pay a 'public transport' tax, which the city uses to reduce the operational deficit of the public transport companies. London and Stockholm collect congestion charges, apply differentiated parking charge, and use part of the income to improve public transport facilities. Many countries have developed reasonable fare adjusting mechanisms; in Singapore, Berlin, and New York the fare levels are linked with economic development and the increase of average income. In the 21st century, the

European and American countries tend to shift the function of urban transport financing to cities and the central governments provide part of the funding to guide and support investments at the local level. The projects that qualify for the use of the central funds include; large public transport infrastructure construction and investments in environmentally friendly transportation equipment. There are controls to ensure that the funds are used according to the rules. The US Clean Air Act states that transport development must be in line with air quality goals, the Federal Transit Administration and Federal Highway Administration can only approve and support transport projects and programs that conform to adopted mobile source air pollution emission budgets designed to protect public health and to meet national air quality standards.

The city governments generally perform ‘contract + performance appraisal’ tasks in relation to public transport companies, i.e. they sign service contracts or franchise contracts with the public transport company, and determine the amount of subsidy, award, and fines according to the performance appraisal. These processes ensure that the public transport companies will provide public transport services that are stable, in line with the quality requirements set in the contract and ensure value for money.

#### **3.4. Travel Demand Management (TDM) recognised as instrument for urban green travel**

It is generally agreed internationally that the citizens have the right to access different urban transport modes that include car ownership and use. However, when there are congestion and pollution problems, the priority should be given to green travel modes that are efficient and environmentally friendly. Under these circumstances, car ownership and use should be restricted. In the EU alleviating urban congestion and reducing transport emissions through controlling car ownership and use through the use of economic instruments and urban access regulations have the same importance as the policies of prioritizing public transport and non-motorised transport. Some EU member states require that TDM measures are included in regional and city transport planning, and countries such as Sweden have laws to guide the implementation of congestion charging and the use of the income it generates. Measures such as differentiated parking policies (including pricing), low emission zones and congestion charging have been adopted in many EU countries, and have generated promising results. It is fully expected that in the future TDM measures will become even more widely adopted around the world.

#### **3.5. The rise of comprehensive and integrated transport management**

Many countries are shifting the transport management system from single transport mode management to a more comprehensive, integrated management model. Transport for London has set up the Surface Transport and Traffic Operations Centre (STTOC) that creatively integrates different departments’ functions and even includes the police service. Moreover, the cooperation between organizations that have different responsibilities and roles plays an important role in comprehensive transport planning, operation organization,

and regional transport development coordination. In France, senators from cities and towns form an urban transport management commission (AOTU), which is independent from city and town governments, and monitor urban public transport network construction and management. In Germany, the Regional Transport Alliances (RTA) plays an important role in developing sustainable transport planning, coordinating regional capacity building, and improving service quality.

### **3.6. Increased public participation in urban transport planning.**

There is a consensus in Europe that urban transport development goals can only be achieved with the support of the citizens. Therefore, many EU cities put a strong focus on public involvement. In 2006, a year after Stockholm started collecting congestion charges in the downtown area, the city let the citizens decide through a referendum, whether to continue the charging or not, 52% of the voters favoured the policy. Paris developed an urban transport plan—the PDU<sup>22</sup>—by following nine criterions, one being to strengthen the sense of responsibility of the Paris citizens for participating in public transport planning decision making. By inviting the public into the public transport planning process policy making and implementation has been improved. Furthermore these processes mean urban green travel measures are more broadly accepted by citizens. Both the central and city governments in many countries are encouraging public involvement in developing or revising plans and policies in open and transparent processes.

### **3.7. Using information technology to deliver urban green travel**

Developed countries have been able to have good management of urban transport, and information is playing an increasingly important role in the management process. In the EU and US, the continuous improvement of urban transport and environment models, as well as support from new information products and software underpins nearly every aspect of transport: urban transport planning, transport policy making, public transport operation and management, parking management, congestion charging, low emission zone charging, and transport information services. Governments at different levels are becoming increasingly aware of the importance of information to urban transport and are providing support to data collection, monitoring, and information sharing. Success at this requires institutional capacity development. With wider use of new information technologies like smart phones, the urban transport sector is on the brink of a fundamental transformation in how it relates to real time data to manage, monitor, and operate systems that better serve customer needs. China needs to embrace these opportunities.

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<sup>22</sup>Plan de déplacements urbains (PDU) in French

## **4. PROMOTING URBAN GREEN TRAVEL - OBJECTIVES AND GOALS**

### **4.1. The objectives of urban green travel in China**

To achieve the goal of building a prosperous society, it is necessary that urban transport development benefit all people. To strengthen and improve public services, the first priority is to reflect social equity, guarantee the basic travel needs of all groups, and make utmost efforts to meet people's needs for high-quality travel services. With China's rapid urbanization and motorization, issues such as traffic congestion, environmental pollution, accidents and energy shortage are becoming more conspicuous. The rapidly developing new-type urbanization must have the objective of making people's lives more convenient and comfortable. It should ensure urban mobility for all and protect the vulnerable, and so improve social equity. Urban green travel is a key element in building green habitable cities that are socially, economically sustainable, and where human beings and nature can co-exist in harmony.

### **4.2. China's vision of promoting urban green travel**

Chinese Government has clearly put forward the “**Road of Intensive, Smart, Green and Low-Carbon New-type Urbanization,**” which serves as the basis for building an ecological civilization and achieving social equity objectives. An efficient urban transport system is conducive to urban economic development and social justice, reducing impacts on environment and people's health.

### **4.3. Widespread promotion of urban green travel in China**

To promote urban green travel, China has to follow three cardinal principles - guiding urban development with public transport friendly layouts, increasing supply of green travel and strengthening transport demand management, and carry out the tactics of “avoid, transfer, improve and enhance”. Due to the size of Chinese cities and their varying characteristics different guidance will be required to allow for the differences between cities.

#### ***4.3.1. Avoid, shift, improve and enhance***

**The strategy for promoting China's urban green travel – to reduce congestion and improve air quality can be summarized as “avoid, shift, improve and enhance”.**

***“Avoid” means:***

Managing travel demand by reducing unnecessary and low value travel through smarter urban spatial planning, communications, pricing, and logistics;

***“Shift” means:***

Establishing an urban public transport system featuring wider coverage, smoother linkages, enhanced safety and better services to meet people's diverse travel needs, and encouraging them to *shift* to green travel modes such as public transport, cycling, walking, and other high occupancy modes;

Pursuing the principle that every vehicle user has to pay a corresponding fee for the environmental and economic impacts he or she causes, and thereby making travel by car bear the cost for high resource occupancy, high energy consumption and high emission, pushing the transfer from travel by car to green travel.

Using administrative and technical means to influence traffic participants' choice of the mode, time, place and route of transportation, so as to minimize peak traffic flow, to *shift* the time and location of travel needs to make better use of the transport infrastructure.

***“Improve” means:***

Improving the public transport service capacity, equipment, smart management level and service quality to relieve such problems as “slow traffic, long waiting time, crowded vehicles and poor information services,” as well as making public transport considerably more attractive, thereby encouraging residents to travel by green modes rather than driving;

Improving the travel environment for non-motorized transport such as cycling and walking and ensuring the basic right of way for cycling/walking as well as promoting the development of non-motorized transport systems;

Improving the taxi information, reducing the practice of cruising empty searching for passengers, and decreasing taxi mileage to facilitate energy conservation and emission reduction;

Improving public travel information services in cities and gradually integrating the information resources of public transport, civil aviation, railway, highway and other transport modes so that comprehensive, trans-regional and one-stop information inquiry services can be provided through various media.

Improving motor vehicles and fuels to improve fuel economy and exhaust emission standards of vehicles, and adopting clean-energy vehicles to reduce exhaust emissions of motor vehicles.

***“Enhance” means:***

Enhancing public knowledge of green travel, strengthening public participation in promoting green travel and foster a cultural atmosphere conducive to green travel;

Enhancing the professional proficiency, sense of responsibility and politeness of transportation staff to support the growth of urban green travel.

#### ***4.3.2. Implement differentiated guidance according to city characteristics***

Guidance must take into account different types of cities and their situations (size, mode share, ambient air quality, geography, climate etc.), and recognize that city officials need to determine the most locally appropriate means to implement sound green urban transport practices and to achieve broad national goals.

### **5. POLICY RECOMMENDATIONS TO PROMOTE URBAN GREEN TRAVEL**

The Chinese Government has clearly put forward the “**Road of Intensive, Smart, Green and Low-Carbon New-type Urbanization**” strategy. Promoting urban green travel will become key for Chinese cities when adopting a new model of urbanization. **China has a high share of green travel, but a modern urban green transport system needs to be established.** The reason is not that the Chinese government is not determined to develop urban green transport, **but that neither the development nor the organization of cities and transport are reinforcing each other.** Funding and regulatory incentives from the central government for local transport are insufficient, **contributing to local disregard for national guidance** that promotes green urban development.

The Chinese government should make comprehensive use of the three major strategies for improving public transport, namely i) guiding city development, ii) increasing green travel supply and iii) improving traffic demand management, and the four strategies of ‘avoid, shift, improve and enhance’. The central government needs to link the promoting of urban green travel to the broader green transformation of China’s development strategies, relevant policies and key tasks.

Following international best practice, the central government should spur more effective local government actions promoting urban green travel with appropriate design of transport financing programs linked to regulatory guidance and local and central government capacity to supervise, assess, and monitor urban transport system development and operations.

The policy recommendations are:

**5.1. The State Council should issue the *Outline of China Urban Green Travel Implementation* as part of the national strategy framework for building an ecological civilization** and reform urbanization, help cities coordinate urban planning with transport, environment, and land use as well as establish a modern urban green transport system.

A key reason for why China’s larger cities suffer from serious congestion and air

pollution, even though the level of motorization is comparatively low, is the comprehensive disconnect between transport, environment, and land use planning and management.

**The State Council should develop the *Outline of China Urban Green Travel Implementation***, to guide cities in building a modern green transport system. The system should: 1) be attractive to all social groups, have low emission and high operation efficiency; 2) be walking and cycling friendly and have convenient public transport linkages; 3) implement management measures for private vehicle ownership and use and 4) ensure that city development makes efficient use of land and provides all residents with a liveable environment and safe access to basic services and jobs without undue time and cost burdens

The purpose is to lead the shift from the conventional urban transport system to a modern green transport system (see Table 5-1). The Outline will guide the overall urban planning, comprehensive transport planning, environmental protection planning, land use planning, and state the requirements for such elements as the fiscal mechanism, regulations and required performance appraisals.

**Table 5-1: Comparison between Conventional Urban Comprehensive Transport Planning and Urban Green Travel Planning**

<b>Conventional urban comprehensive transport planning</b>	↔	<b>Urban green travel planning</b>
Idea: focus on transportation supply	↔	Idea: focus on people's needs
Goal: transport flow, capacity, and speed	↔	Goal: accessibility and life quality
Method: government appoint experts to draft planning	↔	Method: important stakeholders participate in planning draft
Technology application: mainly on transportation	↔	Technology application: cross-departments and cross-field
Content: infrastructure	↔	Content: comprehensive planning of infrastructure, market frameworks, service, mechanics, information systems and coordination of software and hardware
Focus on large scale and high cost projects	↔	Focus on cost/benefit issues, gradually improve efficiency, service quality and system performance.
Limited impact evaluation	↔	Strengthen impact evaluation and revise as necessary to minimise adverse environmental, social, economic harms and maximise benefits.



**5.2. The Central Government should a) enable city governments to raise sufficient and sustainable local sources of revenue to fund local public transport companies and b) provide targeted financial support for specific projects.**

China's local public transport infrastructure construction and public transport companies are severely underfinanced. Public transport fares in most Chinese cities are lower than the cost price, and the government subsidies are insufficient. Consequentially the public transport companies do not receive enough funding, making it impossible to provide the high quality and stable public transport services that could attract new passengers.

**Cities should be able to raise adequate funds locally through new forms of taxes, e.g. local income taxes, sales taxes and the planned land value property tax, as well as parking charges, vehicle plate auction income, and possible congestion charges and other fees on road users, city maintenance and construction fees.**

**Box 5-1: International case—public involvement and transport congestion policy implementation**

In the 1950s, Sweden proposed to collect congestion charges in the heavily congested areas in downtown of Stockholm, and actually implemented the measure in 2006. The congestion in the downtown area was greatly alleviated. A year later the city let the citizens decide, through referendum, whether to continue the charging. The result was that 52% of the voters favored the policy. Since 2007 Sweden approved laws to authorize the city government to collect congestion taxes as necessary. At present 60%-70% of the Stockholm citizens favor the measure. Other cities in Sweden that have serious congestion problem are also considering implementing congestion charges. Sweden's second city Gothenburg started congestion charging on the 1st January 2013.

**Support green transport investments in cities by:** 1) enhancing existing transfer payments from central to local governments, i.e. adding urban public transport related indicators to the Transportation Standard Financial Expenditure of the Ministry of Finance's annual Central to Local Government Equalization Transfer Payment Methods; 2) establishing a specific central government fund for Urban Public Transport, which should also be available to fund complementary non-motorized transport investments, and fund this with revenues from the motor fuel tax system, the annual increase of the vehicle purchase tax, and/or the increment of pollution management charges, 3) enabling cities to improve public transport systems with funds drawn from the increment of the urban public transport fuel subsidy implemented in 2009; 4) shifting the fuel tax collection from a fixed amount of tax to an ad valorem basis, so that fuel tax income increases as fuel prices rise, and optimize the fund allocation formula for 'growth subsidy transfer payment'.

The central fund should mainly support high capacity public transport, non-motorized transport modes, comprehensive passenger transport hubs, low energy consuming transportation equipment purchase and updating, and intelligent public transport.

**Strengthen central government guidance on the public transport pricing mechanism in different types of cities in China to eliminate the deficit of the urban public transport companies caused by low fares.** Public transport should be incorporated into *the Fare Catalogue of NDRC* and related departments of the State Council. The Government should develop public transport fare adjustment methods and guide the city governments to ensure stable funds for public transport companies. The Central Government should furthermore encourage local governments to ‘contract out’ or franchise transport services with performance requirements, incentives, and penalties to ensure the provision of stable and high quality public transport services according to the contract. The Central Government should formulate guidance linking costs to fares and subsidies which should be sensitive to service quality and income inequality.

**The Ministry of Finance (MoF) should establish a management system for the central fiscal fund that promotes green travel** as well as monitor and appraise the usage of the fund. The MoF should ensure that the fund is used to increase the share of urban green travel, and is linked with green travel related planning. Funding for large urban transport infrastructure construction projects should be subject to a rigorous cost-benefit analysis comparing alternative plans for meeting their green travel objectives. Central funds shall be mostly used to support the following fields: mass transit, non-motorised transport, integrated passenger transport hubs, environmental friendly transport vehicle updates, and intelligent public transport construction. Infrastructure projects must be accompanied by complementary green travel supporting measures.

**Box 5-2: International case—sources of the U.S. Federal Government public transport fund**

The Federal Government of the United States established the Highway Trust Fund in 1956, and the Mass Transit Fund in 1982, and increased the gas tax with dedication of a portion of the revenue stream to a new Mass Transit Account that supports 50% to 80% of urban public transport construction costs, bus procurement, and other programs. The rest of the costs are covered by the state and city governments. This federal transportation funding covers less than 20% of the total spending by all levels of government on transportation. However, it provides a foundation for federal planning regulations that ensure state and metropolitan level coordination of transportation with land use plans and the conformity of transportation plans and programs with air quality plans designed to protect public health.

**5.3. The State Council should establish policy guidelines for the ‘Rational Use of Vehicles and Road Space’ to reduce congestion and air pollution, and provide access to a range of transport modes.**

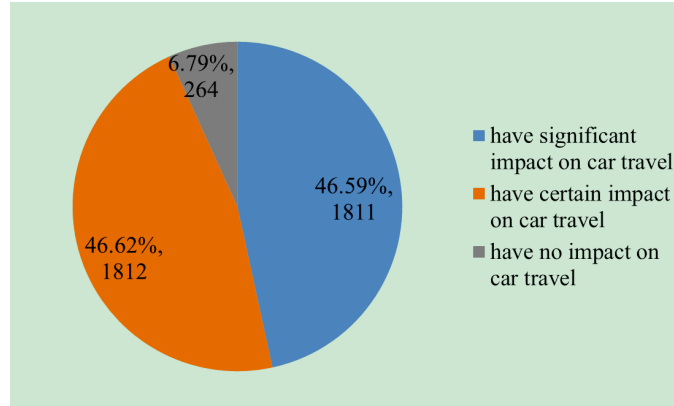
It is recommended that the State Council policy guidelines should require inter alia:

- i) Public transport, walking and cycling should have clear priority in the allocation of city road space,
- ii) The definition of official vehicles should be broadened to include vehicles of state owned institutes, state owned or state-holding companies; and strict limitations on official vehicle numbers and rules for the use of official vehicles should be issued,
- iii) Free private parking spaces should be reduced or charged/taxed and parking charges, with differential charges to reflect local conditions, should be introduced,
- iv) Road user charges should be encouraged in congested areas during congestion hours in major cities, and rational limitations on car ownership be implemented according to city circumstances,
- v) Each city must have the final say on the best mix of policy instruments to meet agreed objectives.

It is normal in many Chinese cities that private cars are given more road resources, which together with low variable costs, leads to very high usage, causes congestion and air pollution. As a consequence, green travel modes are less attractive.

**Evaluation of expected policy impacts:** The Analysis of Green Travel in China included an online survey on the *expected* impact of the car restraint policy. Consistent with international experience, the survey shows that more than 93% of the interviewees agree that implementing parking charges in congested areas will have an impact on car travel (see Figure 5-1). Furthermore, a survey on policies of plate number restriction and purchase restriction shows that around 80% of the interviewees think that the policies have impacts on car travel. Among the interviewees, around 25% think that plate number restriction will restrain car travel. However; around 32% think that plate number restriction will lead people to buy a second car (confirmed by international experience). It is therefore suggested that the government should be cautious about implementing number plate restriction (see Table 5-2).

**Figure 5-1: Raising Parking Charges<sup>23</sup>**



**Table 5-2: Plate Number Restriction and Purchase Restriction<sup>24</sup>**

impact evaluation	Number	Proportion
plate number restriction will lead people to buy a second car	1245	32.3%
plate number restriction will restrain car increase	963	24.77%
purchase restriction has impact on car purchase	899	23.13%
plate number restriction has no impact on car purchase	539	13.87%
purchase restriction has no impact on car purchase	241	6.20%

**5.4. The state and city administrations should be required to ensure cross ministry/department coordination, enhance performance appraisal and management accountability, public participation should be encouraged.**

There is no coordination mechanism for promoting urban green travel between agencies at neither national or city level. Furthermore, there is a lack of capacity with regards to performance monitoring and management accountability which results in different and often inconsistent policies for urban planning, transport, environmental protection and land use.

**(a) The State Council should set up a coordinating mechanism within the Central Government to promote urban green travel, led by the Vice Premier. This unit**

<sup>23</sup>Green Travel Survey Report 2013

<sup>24</sup>Green Travel Survey Report 2013

should be responsible for urban green travel strategy, including funding, planning and design of regulations; organisation and coordination of key practices such as congestion management, air quality improvement, accidents management, enforcement etc.; and ensure conformity between the urban transport development, land use and environmental protection goals. **Strengthen the integrated transport planning and Transport Demand Management (TDM) policy coordination of the economic zones (Yangtze River Delta, the Pearl River Delta, and the Beijing-Tianjin-Heibei area etc.) and city clusters.**

**(b) The Ministry of Transport should set up a Bureau of Urban Passenger Transport Management.** The objective of the Bureau should be to strengthen regional and municipal comprehensive transport planning, public transport planning, construction and operation, and transport safety management. The proposed Bureau will also play an important role in coordinating the management of urban congestion, transport air pollution, and the popularization and application of intelligent public transport and information systems. The proposed Bureau will compile, monitor, and evaluate data to better understand how the benefits and burdens of transportation are distributed among the population and across the economic zones to support the development of more effective and equitable long-term policies and programs.

**Box 5-3: International case—public transport management system and reform**

The U.S. Federal Transit Administration (FTA) is one of the thirteen functional agencies of the U.S. Department of Transportation and comprises 500 employees. The FTA aims to establish high quality transit in the U.S, and ensure motorization for everyone and livability of communities through proper guidance of works, technical support, and financial resources. Its responsibilities cover not only transit construction and operation, but traffic demand management. Also, the FTA works to ensure the conformity between transit development and air quality management.

The European Commission has set up the Directorate-General for Mobility and Transport (DG MOVE). The main objective of the DG MOVE is to ensure that the European transport system supports the broader EU social, environmental protection, economic development policies. It drafts necessary laws and funds investments in priority transport projects.

**(c) Local governments should set up a coordinating mechanism for promoting green travel.** With guidance from central government, following the principles of compact, integrated, and efficient systems, and learning from the experiences of Shenzhen and Zhuhai<sup>25</sup>, this mechanism should stimulate the development of a comprehensive urban transport management system. The system should promote green travel; strengthen coordination capacities across such areas as road space prioritization, congestion and transport pollution management, secure transport information integration, coordinate traffic accident and transport emergency management, secure transport financing, and carry out education and promotion campaigns. Other obligations should be public transport company management; ensure facilities for people with special needs; evaluate and report publically on progress and provide opportunities for public participation in planning and decision-making.

**Box 5-4: China's local transport management system reform. The case of Zhuhai.**

In March, 2013, the city of Zhuhai decided to conduct a major reform and established the Municipal Transportation Commission as the coordinating organization. The initiator of the project is the municipal authority leader that is responsible for transport management, and the commission members are 23 representatives from the Zhuhai Transport Bureau, Zhuhai Port Authority, Zhuhai Highway Bureau, Zhuhai Development and Reform Bureau, Zhuhai Finance Bureau, Zhuhai Human Resources and Social Security Bureau, the Land and Resources Bureau of Zhuhai, Zhuhai Bureau of Housing, Urban and Rural Planning and Construction, Zhuhai Bureau of Ocean, Agriculture, Fishery, and Water.

**(d) To strengthen performance evaluation and accountability, and encourage public involvement, the State Council should instruct the MoT to establish a National Green Travel Index Monitoring Mechanism for Central Cities.,** Provincial governments should guide city governments to establish a 'Green Travel Index Monitoring and Reporting Mechanism' and the data should be publicly available. Clear, accurate and comparable data should be published and be available to citizens, on a city by city basis, covering air pollution, road injuries and deaths and public transport performance. This will improve transparency and accountability of city managers as well as encourage public interest and participation in green urban travel.

Relevant departments should be coordinated to conduct a 'Central City public transport development performance evaluation', and a 'national green travel city appraisal'. **The level and quality of green travel provision should be a criterion in the performance evaluation and promotion of city officials and mayors.** Furthermore, it should guide

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<sup>25</sup> [http://epaper.oeeee.com/N/html/2013-06/19/content\\_1877774.htm](http://epaper.oeeee.com/N/html/2013-06/19/content_1877774.htm)

the local government to establish urban transport planning, Transport Demand Management, TDM, policy development (including vehicle restriction, car purchase restriction, congestion charging, low emission zone, etc.), and public involvement mechanisms.

**5.5. The central government should amend legislation on *Urban Public Transport Regulation and Law of Air Pollution Management* to require local governments to fulfil their duties to promote green travel.**

There are no public transport related laws in China. This results in a disconnect between urban transport development and environmental protection. The transport and environmental protection agencies at the state and city levels have been operating separately instead of working together. The fact that *Urban Public Transport Regulation* and the *Law of Air Pollution Management* have been included in the work plan of the State Council provides an opportunity to rectify this problem.

*The Urban Public Transport Regulation* should clearly emphasize the conformity of city comprehensive planning with coordinated land use and urban transport planning. It should also include a legal requirement for transport impact evaluation, and include Transport Demand Management and traffic safety in urban public transport planning.

**Box 5-5: International cases—laws and regulations related to promoting green travel**

The US Federal-Aid Highway Act of 1973 specified the procedures and arrangements of transportation planning. It also specified the members of the Metropolitan Planning Organization (MPO), and required that the MPO develop long-term Metropolitan Transportation Plan (MTP), mid-term Metropolitan Transportation Improvement Program (MTIP), and the Unified Planning Work Program (UPWP) that are comprehensive, cooperative & continuing (the ‘3C’), and use these programs as the preliminary conditions for applying for the federal funds. These requirements have been refined and strengthened over time through the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and subsequent legislation. The latest US federal transportation law, MAP-21, passed in 2012, retains these important reforms from decades ago, along with new requirements for transportation system performance monitoring.

The *Law of Air Pollution Management* should contain provisions for the control of urban transport pollution and emissions, which should a) be included in urban transport planning; b) require the establishment of an urban transport pollution monitoring system; c) require that monitoring data are available to the public and d) require that the use of central fiscal funds is connected with the control of urban transport pollution and traffic safety, and is in line with goals for transport development and environment and air quality management and, e) allow city government to implement congestion charges, low

emission zones, etc. The net income raised shall be used to develop walking, cycling, and public transport.

### **5.6. The Central Government should select different types of cities to organize and implement a series of Demonstration Projects Promoting Urban Green Travel.**

While the urbanization and motorization are rapidly developing, Chinese cities have little experience of how to implement green transport in an integrated and coordinated way.

The Central Government should take the lead in implementing a demonstration program showing new and improved ways of providing green urban transport by combining international experience with practices of Chinese cities promoting green travel. The State Council should appoint the Ministry of Transport as the leading department to organize related departments to select appropriate cities in which to conduct the following projects: 1) street-space reallocation to prioritize public transport, walking and bicycling, and to improve the street environment; 2) implement the Smooth Public Transport Project to attract more people to take buses; 3) select megacities like Beijing and Shanghai to set up congestion and Low Emission Zones, conducting research on implementation of such zones and drafting national principles for establishing urban congestion and Low Emission Zones; 4) establish and pilot a Transport Pollution Monitoring, Evaluation and Publishing System, in areas like Beijing, Tianjin, Heibei, and the Yangtze River Delta.

#### **Box 5-6: International case— EU CIVITAS urban mobility demonstration program**

The European Union funds the CIVITAS initiative to demonstrate and improve transport measures and policies in order to create cleaner and better transport in cities. CIVITAS has helped introduce numerous innovations and 650 measures that have already made transport more eco-friendly in over 60 European 'demonstration cities'. The EU has invested well over EUR 200 millions. The UK, Germany, Stockholm and Milan have adopted policies to re-allocate road space (i.e. provide non-motorized transport and public transport with more space), and have set up congestion charging areas and low emission zones. These actions have greatly promoted green travel, and alleviated congestion and air pollution. Germany started the Black Carbon Free initiative, and reduced vehicle pollution through setting up low emission zones. At present there are 54 low emission zones (850 km<sup>2</sup>) in Germany alone and hundreds more throughout Europe.



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