## PROJECT INFORMATION DOCUMENT (PID)
### APPRAISAL STAGE

**Report No.:** PIDA573

<table>
<thead>
<tr>
<th><strong>Project Name</strong></th>
<th>China GEF Large-City Congestion and Carbon Reduction Project (P127036)</th>
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<td><strong>Region</strong></td>
<td>EAST ASIA AND PACIFIC</td>
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<td><strong>Country</strong></td>
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<td><strong>Implementing Agency</strong></td>
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<td><strong>Environmental Category</strong></td>
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<td><strong>Estimated Date of Appraisal Completion</strong></td>
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<td><strong>Estimated Date of Board Approval</strong></td>
<td>28-Mar-2013</td>
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<td><strong>Decision</strong></td>
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### I. Project Context

#### Country Context

1. With rapid industrialization and urbanization, China faces severe challenges in combating climate change and reducing greenhouse gas (GHG) emissions. In November 2009, the Government of China (GoC) announced the national target of reducing carbon intensity—defined as the amount of GHG emitted per unit of GDP—by 40-45% by 2020, compared to the level in 2005. Accordingly, governments at every level and agencies in each sector are called upon to develop and implement the energy efficiency and fuel switching strategies and plans.

2. The 12th Five-Year Plan (FYP) for National Economic and Social Development (2011-2015), announced in March 2011, further promotes the development of a “resource-saving and environmentally-friendly society” as a broad direction for actions. The 12th FYP requires all sectors—manufacturing, building, transportation, agriculture, etc.—to establish their respective monitoring and evaluation systems for GHG emissions and specify their respective targets for GHG emissions reduction.

### II. Sectoral and Institutional Context

#### Sectoral and Institutional Overview

3. The transport sector accounted for 35% of total crude oil consumption in China in 2005, and this figure is estimated to increase to 55% by 2030, contributing to more than two-thirds of the overall increase in Chinese oil demand. The energy-related CO2 emissions from the transport sector are estimated to increase from 337 million tons to 1,255 million tons during the same period. Today, China is already the second largest car market in the world. The continuing increases in private car ownership and usage, which are driven by rapidly expanding economic activity and rising household incomes, will drive the growth in oil demand and CO2 emissions. This poses a serious challenge to the sector, but also presents great potential for the transport sector to achieve CO2 emissions reduction.

4. The increases in private car ownership and usage are especially rapid in large Chinese cities, which are generally experiencing faster economic growth and enjoy higher household disposable incomes than the country’s smaller cities and rural areas. As a result, and similar to what has already happened in other parts of the world, many large cities in China experience severe traffic congestion, as well as air pollution and CO2 emissions—which are in turn further intensified by the worsening traffic congestion. According to the International Road Transport Union statistics, fuel consumption and CO2 emissions under congested conditions could be up to four times higher than under a free flow condition. Traffic congestion lowers personal mobility and increases business logistics costs, causing significant economic losses. Traffic congestion is particularly damaging to bus transport services as it makes them less attractive and increases the amount of inputs (bus, labor, fuel, etc.) needed to maintain a certain level of services, which in turn reduces the amount of resources available for more and better bus services.

5. Evolving approaches to congestion reduction. The approaches to coping with traffic congestion problems in China have been evolving, roughly through three phases. During early-1990s to early-2000s, large cities in China responded to traffic congestion mainly with “build” options—i.e., meeting the travel needs of private car users through road construction and road widening, often displacing non-motorized transport (NMT) services in the process. The second phase started in 2005 when the State Council issued Document No. 46 which promoted urban public transport as one of the national policy priorities. Since then, governments of many cities—especially large ones—have responded by investing heavily in public transport, buying new buses, and building bus rapid transit (BRT) and urban rail systems. Some large cities also made initial effort to revitalize NMT and to introduce public bicycle-sharing programs. The third phase came in 2011 when the Ministry of Transport (MOT), GoC’s line agency for urban transport operations, initiated a pilot program to promote the development of public transit metropolises (PTM). By international benchmarks, a PTM is a city with the public transport modal share exceeding 60% of all motorized commuters. According to international experience, development of a PTM requires a comprehensive approach beyond merely investing in public transport. Specifically, it
requires: (i) urban transport and land use integration through, for example, transit-oriented development (TOD); (ii) operational, fare and physical integration of public transport services; (iii) systematic application of public transport priorities vis-à-vis the private car; (iv) travel demand management (TDM); and (v) state-of-the-art intelligent transport systems (ITS).

6. Current issues in congestion reduction. Despite significant capital investments and operating subsidies made to public transport in recent years, the public transport modal share remains low and traffic congestion continues to worsen in many large cities. The poor outcomes are related to several major issues. Many cities invest heavily in public transport infrastructure, but do not give sufficient attention to the quality of services. Institutional fragmentation often hampers the integration of different public transport modes and the practice of TOD. Due to the political difficulties to deal with the expanding private car user group, cities are reluctant to introduce TDM measures that have proven successful in other countries. The implementation of TDM measures has been made mostly in an ad hoc, piecemeal manner, often reactive to acute congestion along a main corridor or area of the city. Parking management is especially poor. So far, without systematic application of TDM measures, there are few successful cases where the improved quality of public transport services resulted in a modal shift away from private cars. It is increasingly recognized that public transport priorities must be complemented with better integration of transport and land-use planning, better integration of various public transport services, TDM, ITS, and human resource development. However, when every large city is overwhelmed with the delivery of various public services, external assistance from central government and international organizations could serve as an effective catalyst for the translation of knowledge into practices and outcomes.

7. Land use and transport planning. Internationally, sustainable congestion reduction takes place as part of a broader agenda of urban land use planning and sustainable urban mobility. Urban master planning drives mid- to long-term mobility needs as it shapes the trip making patterns and travel distances to access services, facilities, work places, recreational opportunities and other people. Urban forms that are effective for sustainable mobility include: (i) compact, mixed-land use and transit-oriented development; (ii) hierarchically classified road networks providing complete city coverage; and (iii) people-oriented facilities for safe walking and biking. At the micro level, traffic impacts should be analyzed and mitigation plans should be implemented for any major land use development. In most large cities in China, various gaps exist in land use and transport planning practices and implementation. These should be addressed both at the policy and practice levels.

8. Public transport. The PTM program initiated by MOT is a major effort to help transform the large Chinese cities into public transit metropolises comparable to international best practices. It also provides a clear direction for the urban transport sector to reduce GHG emissions. The attractiveness of public transport in large cities is envisaged to be promoted through increased investment in public transport infrastructure, expanded and improved services, enhanced roadway priority and favorable operational policies. By June 2012, the central government has approved urban rail networks totaling over 5,000 kilometer (including those in operation, under construction and to be constructed within the next few years), all of which are in large cities with a population of over 3 million. As more and more metro lines are being put in operation around the country, it has been increasingly recognized that the integration of metro and bus systems, and the creation of safe passenger accessibility zones, are critical to achieving an increase in the public transport mode share. All these would serve as the foundation of MOT’s mandate to promote sustainable urban transport and achieve GHG emissions reduction in the urban transport sector.

9. Transport demand management. Investment in public transport infrastructure and service improvements alone will not be sufficient to achieve the successful transformation of large cities into PTMs. MOT recognizes the need to develop a policy framework and guidelines for TDM as an enabling condition for PTM. TDM is still a relatively new practice for Chinese cities and will have to face the challenges of political will and public acceptance. It covers a myriad of monetary and non-monetary strategies and measures. On one hand, TDM could be implemented as a series of incremental digestible steps, starting with less sensitive measures—such as corporate mobility programs, traffic calming, improving facilities for walking and biking, etc.—which would not create a significant negative public backlash. On the other hand, it is essential for the transport users to understand that monetary measures such as congestion pricing and parking charging are intended to reflect the full financial, environmental and social cost of the roadway and parking capacity that they use. Learning from the recent experience of some Latin American cities, large cities in China may adopt a ladder approach—i.e. the break-down of TDM into a series of incremental digestible steps, each of which is politically acceptable and builds up awareness and acceptance for stronger steps in the future.

10. Intelligent transport system. Public transport development and TDM implementation would benefit from the application of the latest information and communication technologies, i.e. ITS. Internationally, ITS applications are increasingly effective and successful in managing urban traffic congestion when PTM and TDM are systematically implemented. While China has years of history in ITS application in urban transport, experience is lacking in integrating ITS with PTM and TDM effectively, and a great deal could be learned from international experience.

11. Institutional capacity building. Capacity building programs for both managerial and technical personnel at the national and local levels will help ensure that international best practices in PTM, TDM and ITS are appropriately adopted in China and spread through a range of agencies and localities. They will help lay a human resource foundation for replication of best practices and for innovative solutions.

12. Public consultation. Public perception is critical for PTM and TDM. Thus public consultation and pilot demonstration of good practices are important to raise public awareness that a range of PTM and TDM measures is positive for citizens in terms of green and sustainable urban mobility. In particular, the pilot on-street measures will not only provide practical lessons for the cities to learn from, but will also give visibility to TDM for the general public.

13. The project is to support the realization of the PTM vision promoted by the MOT, which would also contribute to a significant reduction in urban transport related GHG emissions. Learning from international experience, the project promotes a comprehensive approach and complements PTM implementation with the development and pilot demonstration of TDM strategies and measures, transit-oriented development (TOD) and advanced public transport systems (APTS). The project combines top-down and bottom-up activities, involving both the central government (mainly MOT) and selected large cities for pilot demonstration. The scope of activities ranges from policy, strategy and technical guidelines at the central level, to policy, strategy, implementation and monitoring and evaluation (M&E) at the local level. While MOT has various plans to formulate policy, strategy and technical guidelines, the project is expected to help MOT carry out the desired works faster and better. Moreover, as the amount of funds available for the project is relatively very small in comparison to the sizable investment program that each of the selected cities will carry out for the next few years, the project focuses on experimenting and demonstrating the comprehensive PTM concept and various measures to addressing traffic congestion. This is based on international experience that there is no one-time fix to traffic congestion, but there are a large number of worthy actions that should be taken no matter how small they are. Finally, recognizing the importance and political difficulties of TDM implementation in China, the project adopts a ladder approach and implements TDM measures
through a series of incremental steps.

An Overview of the Pilot Cities: Suzhou, Chengdu and Harbin

15. In order to establish models as well as to evaluate the impact of various public transport improvements and TDM measures across a range of cities, three large cities have been selected for pilot demonstration under this project: Suzhou in Jiangsu Province, Chengdu in Sichuan Province, and Harbin in Heilongjiang Province. All are among the largest Chinese cities, each with a population of over 10 million that is still growing rapidly. Despite significant investments in urban public transport in recent years, the overall level and quality of public transport services remains inadequate. Public transport suffers from poor coverage, accessibility and comfort, low speeds and reliability, and inconvenient and costly transfers. It is not by means the preferred mode of transport for urban residents who have a choice in any of these cities. As the quality of public transport declines with growing traffic congestion, the relative attractiveness of private cars increases. Congestion also increases the cost of providing even basic public transport services, creating pressure for even further reductions in service quality and quantity. A major objective of the project is to demonstrate how to reverse this “vicious cycle”.

16. Suzhou. Located 80 km west of Shanghai on the lower reaches of the Yangtze River, Suzhou is one of the most famous historic and cultural cities in China, which makes it a popular tourist destination. The historic Old Town attracted more than 80 million domestic and international tourists in 2010. The central city has an urban area of 1,650 km² and a residential population of over 4.07 million. As the most developed city in Jiangsu Province, Suzhou’s GDP reached 923 billion RMB (US$ 145 billion equivalent, or US$ 14,800 per capita) in 2010, increasing at an average annual rate of 13.9 percent during the 11th Five-Year period. A metro network is being developed: Line 1 (25km) opened in April 2012; Line 2 (27km) is under construction; and two more lines are currently planned. The city has experienced rapid motorization. By the end of 2011, total auto ownership in Suzhou was 1.5 million, 20.5% more than the previous year. Of the local person trips, 21.2% are by private vehicles and only 14.7% by public transport. Traffic congestion is a daily and worsening problem of the city. Average travel speeds on major roads are below 25 km/h during peak periods, with delays accounting for 28% of the total trip time.

17. Chengdu. It is the financial and trade center, as well as a comprehensive transport hub, of Southwestern China. Its central city has an urban area of 1,418 km² and a residential population of 5.90 million. By 2010, its GDP has reached 550 billion RMB (US$ 87 billion equivalent, or US$ 6,200 per capita), increasing at an average annual rate of 13.2% during the 11th Five-Year period. A metro network is being developed: Line 1 opened in September 2010; Lines 2 and 3 are under construction; and more lines are currently planned. By the end of 2010, the total auto ownership was 1.65 million, 25% more than the previous year. Public transport accounts for 22% of total trips in the city. The average speed during peak hours in the city center dropped from 22 km/h in 2005 to below 18 km/h in 2010. The city identified 12 seriously congested roads that operated at an average travel speed below 10 km/h during the peak hour. Facing worsening traffic congestion, Chengdu introduced a TDM policy in March 2012 to restrict one-fifth of private cars within the Second Ring Road and on seven arterial roads based on the last digits of the number plate. The first phase will be implemented from April 26, 2012 to July 31, 2013.

18. Harbin. It is a vital manufacturing base and a historic city in northeastern China. It is internationally renowned for its annual festival for ice sculpture exhibition. Its central city has an urban area of 7,068 km² and a residential population of 5.88 million. By 2010, its GDP has reached 367 billion RMB (US$ 58 billion equivalent, or US$ 6,200 per capita), increasing at an annual rate of 13.5% during the 11th Five-Year period. A metro network is slowly being developed: Phase 1 of Line 1 is planned to open at the end of 2012. By the end of 2010, the total auto ownership in Harbin was 545,000, increased by 20% over the previous year. Public transport accounts for 32% of total trips in the city. The average travel speed during peak hours in the city center dropped from 22 km/h in 2005 to below 18 km/h in 2010. The city plans to establish a comprehensive intelligent transport system within the next five years to help the management of urban transport operations.

19. Although congestion levels in these cities are not the most serious in China, they have learned the hard lessons from Beijing—considered the city with the most severe traffic congestion in China—and are determined to prevent congestion from getting out of control. They desire to develop into PTMs as one of their key long-term solutions to traffic congestion and GHG emissions. They have planned physical investments to a magnitude of billions of USD equivalent for public transport infrastructure (such as BRT and urban rail) and intelligent transport information and management systems in their local 12th FYPs. All three cities also plan to introduce comprehensive TDM programs to reduce congestion and to create favorable conditions for the development of PTM. However, knowledge and experience of TDM and its integration with ITS and public transport development are largely lacking.

III. Global Environmental Objective(s)
The development objective of the project is to help establish a policy framework to alleviate traffic congestion and reduce GHG emissions in large cities in China primarily through public transport development and travel demand management, and demonstrate local and global benefits of such policy framework in pilot cities.

IV. Project Description
Component Name
Component 1: National level support
Component 2: Pilot Demonstration in Suzhou, Jiangsu Province
Component 3: Pilot Demonstration in Chengdu, Sichuan Province
Component 4: Pilot Demonstration in Harbin, Heilongjiang Province

V. Financing (in USD Million)
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### VI. Implementation

#### A. Institutional and Implementation Arrangements

20. The Project will be implemented by the MOT at the national level and the municipal governments of Suzhou, Chengdu and Harbin at the local level. A National Project Steering Group (NPSG) has been established for overseeing project preparation and implementation, chaired by the Director General of MOT’s Department of Comprehensive Planning and consisting of senior officials from the Ministry of Finance (MOF), National Development and Reform Commission (NDRC), the Provincial Transport Departments of Jiangsu, Sichuan and Heilongjiang, the municipal governments of Suzhou, Chengdu and Harbin, and the Transport Bureau/Commission(s) of Suzhou, Chengdu and Harbin.

21. A National Project Management Office (PMO) under MOT has been established. In addition, there are three project implementing units (PIU), namely the China Academy of Transport Sciences (CATS), Transport Planning and Research Institute (TPRI), and Research Institute of Highway (RIOH). The National PMO will be responsible for the preparation and implementation of the national-level technical assistance, overall project coordination, management, monitoring and evaluation. It will also coordinate the activities of the three PIUs at the national level, and provide guidance to the PMOs of the three pilot cities, in consideration of their limited experience with Bank projects.

22. Each of the three pilot cities has established one municipal project steering group (MPSG) and one PMO to manage the project activities for the city. Each MPSG, chaired by a designated vice mayor and consists of heads of relevant municipal agencies, will be responsible for multi-agency coordination of project activities in its city. The city PMOs are established under the Transport Bureau/Commission(s) of their respective cities. Their responsibilities will be the daily management of the project implementation in their respective cities, including the management and coordination of the implementation of project components and sub-components, procurement, financial management, environmental and social safeguards, monitoring and evaluation, and project progress reporting.

#### B. Results Monitoring and Evaluation

23. The national PMO will be responsible for the overall monitoring and evaluation (M&E) of the project, with inputs from the local PMOs. A major task is the M&E of the GHG emission reduction in three pilot cities, as a result of the congestion reduction policies and measures implemented. The pilot cities have collected the required data for baseline calculation and business-as-usual (BAU) scenario forecast. The project also includes a technical assistance on developing the statistical mechanism and evaluation method for urban transport-related energy consumption and GHG emissions. Details on methodology for M&E of all four PDO-level indicators are provided in Annex 3.

#### C. Sustainability

24. The project concept was built on MOT’s recent PTM initiative to transform the Chinese cities into ones where public transport is the preferred means of transport. MOT has selected a number of cities nationwide as pilots to explore various measures for better managing available road space and parking and improving public transport that would facilitate such transformation, and to evaluate the outcomes afterwards. MOT has also realized that developing public transport alone would not achieve the ambitious goal, and that effective TDM measures should be developed as an enabling condition.

25. The project seeks GEF and the Bank’s support in developing the national policy framework and technical guidelines for public transport development as well as TDM. These policy directions and technical guidelines will be adopted and issued by MOT as national standardsand guidelines that will be rolled out to all Chinese cities within the next few years to support local public transport development, congestion reduction, and transport CO2 emissions reduction. The implementation in three cities under the project will serve as crucial pilot demonstration, as their experience and lessons learned will be synthesized and disseminated through workshops and peer learning supported under the project.

26. The project also fits in with the MOT’s broader plan to reduce energy consumption and GHG emissions in the transport sector. The project will support the establishment of the national statistical mechanism and evaluation method for urban transport-related energy consumption. It is expected that the M&E of transport energy consumption will become a standard practice nationwide after the project is successfully completed.

### VII. Safeguard Policies (including public consultation)

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