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Report No: 60254-CN

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT FROM THE

GLOBAL ENVIRONMENT FACILITY TRUST FUND

IN THE AMOUNT OF

US$4.8 MILLION

TO THE

PEOPLE'S REPUBLIC OF CHINA

FOR THE

GEF CITY CLUSTER ECO-TRANSPORT PROJECT

FEBRUARY 22, 2012

China and Mongolia Sustainable Development Unit
Sustainable Development Department
East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective October 27, 2011)

Currency Unit = RMB
RMB 6.35 = US$1.00

FISCAL YEAR
July 1 – June 30

ABBREVIATIONS AND ACRONYMS

BAU	Business as Usual	MOF	Ministry of Finance
CZT	Changsha-Zhuzhou-Xiangtan	MOT	Ministry of Transport
CQS	Consultant Qualifications Selection	M&E	Monitoring and Evaluation
DA	Designated Account	NCB	National Competitive Bidding
EA	Environmental Assessment	NPV	Net Present Value
EIA	Environmental Impact Assessment	PDO	Project Development Objective
EIRR	Economic Internal Rate of Return	PMO	Project Management Office
EMP	Environmental Management Plan	PPG	Project Preparation Grant
FM	Financial Management	PSC	Project Steering Committee
FMM	Financial Management Manual	QBS	Quality-Based Selection
GEF	Global Environment Facility	QCBS	Quality- and Cost-Based Selection
GoC	Government of China	RAP	Resettlement Action Plan
GDP	Gross Domestic Product	RS-EF	Resource Saving-Environmentally Friendly
HDOT	Hunan Provincial Department of Transport	SBD	Standard Bidding Document
ICB	International Competitive Bidding	SEA	Strategic Environmental Assessment
ITS	Intelligent Transport System	TA	Technical Assistance
MBD	Model Bidding Documents	TOR	Terms of Reference

Regional Vice President:	Pamela Cox, EAPVP
Country Director:	Klaus Rohland, EACCF
Sector Director:	John Roome, EASSD
Sector Managers:	Paul Kriss, EASCS
	Vijay Jagannathan, EASIN
Task Team Leader:	Zhi Liu, EASTS

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PAD DATA SHEET

People's Republic of China

GEF City Cluster Eco-Transport Project

PROJECT APPRAISAL DOCUMENT

East Asia and Pacific Region

EASCS

Date: February 22, 2012 Country Director: Klaus Rohland Sector Director: John Roome Sector Managers: Paul Kriss/Vijay Jagannathan Team Leader(s): Zhi Liu Project ID: P121263 Lending Instrument: GEF Grant	Sector(s): General transportation sector (100%) Theme(s): Climate change (40%); Infrastructure services for private sector development (30%); Municipal governance and institution building (30%) EA Category: B – Partial Assessment

Project Financing Data:

Proposed terms:

[ ] Loan [ ] Credit [X] Grant [ ] Guarantee [ ] Other:

Source	Total Amount (US$M)
Total Project Cost:	34.12
Cofinancing:	
Recipient:	29.32
Global Environment Facility (GEF):	4.80
IBRD	0
IDA	0
New	0
Recommitted	0

Recipient: People's Republic of China

Responsible Agency: Ministry of Transport

Contact Person:
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Department of Comprehensive Planning
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Estimated Disbursements (Bank FY/US$ m)			
FY	2013	2014	2015
Annual	0.40	2.40	2.00
Cumulative	0.40	2.80	4.80

Project Implementation Period: Start March 29, 2012 End January 31, 2015
Expected effectiveness date: August 15, 2012
Expected closing date: June 30, 2015

Does the project depart from the CAS in content or other significant respects?	○ Yes ● No
If yes, please explain:	

Does the project require any exceptions from Bank policies?	○ Yes ● No
Have these been approved/endorsed (as appropriate by Bank management?	○ Yes ● No
Is approval for any policy exception sought from the Board?	○ Yes ● No
If yes, please explain:	

Does the project meet the Regional criteria for readiness for implementation?	● Yes ○ No
If no, please explain:	

Project Development Objective
To assist the Government of China in enhancing transport efficiency, energy saving and CO_2 emission reduction, by promoting and demonstrating multi-modal transport integration in city clusters.

Project description

1. Component 1: City cluster eco-transport development strategic planning
2. Component 2: Pilot demonstration in Changsha-Zhuzhou-Xiangtan (CZT) City Cluster
3. Component 3: Capacity building
4. Component 4: Project management

Safeguard policies triggered?	
Environmental Assessment (OP/BP 4.01)	● Yes ○ No
Natural Habitats (OP/BP 4.04)	○ Yes ● No
Forests (OP/BP 4.36)	○ Yes ● No
Pest Management (OP 4.09)	○ Yes ● No
Physical Cultural Resources (OP/BP 4.11)	○ Yes ● No
Indigenous Peoples (OP/BP 4.10)	○ Yes ● No
Involuntary Resettlement (OP/BP 4.12)	● Yes ○ No
Safety of Dams (OP/BP 4.37)	○ Yes ● No
Projects on International Waters (OP/BP 7.50)	○ Yes ● No
Projects in Disputed Areas (OP/BP 7.60)	○ Yes ● No

Conditions and Legal Covenants:

Financing Agreement Reference	Description of Condition/Covenant	Date Due
Section I.A., Schedule 2 of Grant Agreement	The Recipient shall cause the Ministry of Transport (MOT) to maintain, until the completion of the Project, a Project Management Office at MOT, with terms of reference, staffing, and other resources satisfactory to the World Bank, to be responsible for financial management, procurement, disbursement, monitoring, reporting, planning, and coordination in implementation of the Project, and to be responsible for strategic decision making and coordination in implementation of the Project.	Recurring
Section I.A., Schedule 2 of Grant Agreement	The Recipient shall maintain a Project Steering Committee consisting of senior officials from MOT, MOF, Hunan Department of Transport, and CZT, to provide overall guidance and oversight to the Project.	Recurring

I. Strategic Context

A. Country Context

1. China's transportation is facing significant challenges in energy saving and CO_2 emission reduction. With rapid economy growth at an average rate of about 10% a year for the last decade, passenger transport demand in terms of passenger-kilometers has grown at 7% per year and freight transport demand in terms of ton-kilometers 6% per year. As a result, transportation has become a major consumer of energy and a major source of CO_2 emissions in China. According to the International Energy Agency (IEA), the transport sector accounted for more than 38% of total crude oil consumption in China in 2007. According to the Ministry of Transport (MOT), the amount of CO_2 emissions generated from transport—roughly 290 million tons in 2004—is estimated to double by the end of 2015 and reach 1.1 billion tons in 2030.

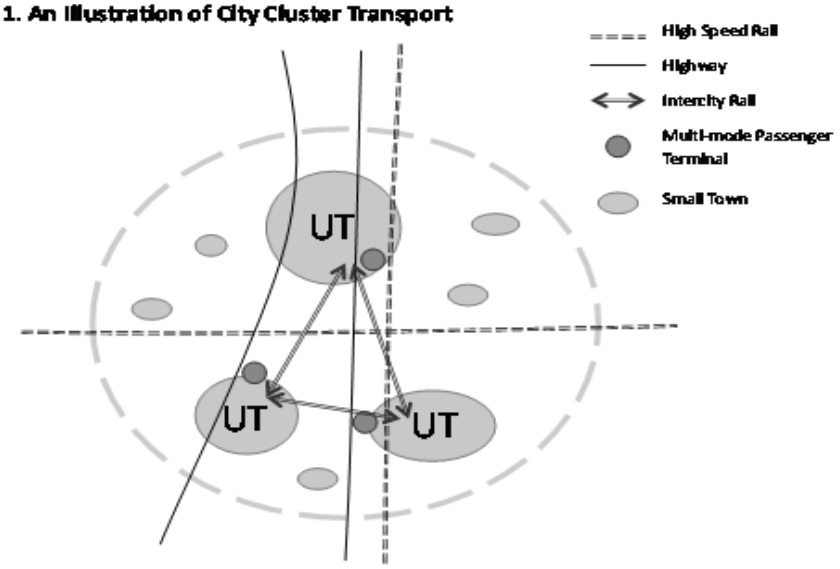
2. To achieve energy saving and CO_2 emission reduction amid the anticipated continuing rapid growth in transport demand, the transport sector must seize all opportunities in a strategic way to promote eco-transport—a way of sustainable transport development that is resources saving and environmentally friendly. Multi-modal integrated transport development in the rapidly growing city clusters is such an opportunity.

B. Sectoral and Institutional Context

3. By definition, a city cluster comprises two or more geographically adjacent cities linked by commuting corridors with increasing social and economic interdependence. To some extent, it is similar to the metropolitan areas in the western world. But it is also different, as it contains sizable rural areas within the cluster. Comparing to the highly developed, urbanized metropolitan areas in high-income countries, city clusters in China are developing metropolitan areas with multiple centers. Today, there are 22 city clusters taking shape in China, for example, Beijing-Tianjin-Tangshan, the Yangtze Delta, the Pearl River Delta and Changsha-Zhuzhou-Xiangtan (CZT) in Hunan Province.

4. The development of city clusters creates a set of transport problems which are quite distinct from those arising in a single stand-alone city. City cluster transport is more complicated than urban transport in a city and inter-city transport at the provincial or national scale. Physically, a city cluster is served by an urban transport system in each of the cities and parts of intercity transport systems within the geographic extent of the city cluster, as well as systems dedicated to serve the cluster (such as fast-speed passenger rail connecting cities in a city cluster or a metropolitan area) (see Figure 1). The cities in a cluster share the inter-city transport services to connect to other major economic centers of the country. In addition to the adjacent cities, a city cluster also covers a number of small towns and rural villages, requiring urban-rural transport integration. Therefore, the integration of transport systems and services at the urban, city cluster and inter-city levels is crucial for the functioning and economic efficiency of a growing city cluster.

Figure 1. An Illustration of City Cluster Transport



5. Institutionally, city cluster transport is also more complicated than urban transport and inter-city transport. In China, urban transport is under the management of municipal governments with long-established institutions. Until recently, intercity transport was managed by modal agencies such as Ministry of Railways, Ministry of Transport (highways, inland waterways, and ocean shipping) and Civil Aviation Administration, with a clear top-down management approach.[1] There is no formal institutional set-up for the management and coordination of city cluster transport. Coordination through higher level government exists, but is often carried out in a loose manner. As a result, transport infrastructure facilities (e.g. highways, rails, stations, airports, and passenger terminals) within the city clusters have mostly been developed by individual modal agencies with inadequate coordination and integration.

6. Despite significant investments that have been made by the modal agencies, there is no user-oriented mechanism in place to develop an integrated transport system that could serve the needs of users in the most efficient way possible. City cluster transport services are thus often not coordinated, ticketing is fragmented, and timetables are disjointed. It is not uncommon for any visitors who just arrive at the airport or rail station, to find out how inconvenient to make a transfer to another public transport mode to the final destination within the city cluster. Most passengers would simply opt to the use of taxi or private car. This major deficiency has resulted in low transport efficiency, increasing reliance on private vehicles, poor energy efficiency, overlapping investment and over-utilization of land resources for transport infrastructure.

7. Two key problems need to be specifically addressed in city clusters. One is an institutional problem. A more integrated institutional structure for better planning, design, operation and management of transport integration in city clusters would make system efficiency, energy saving and CO_2 emission reduction possible. In 2008 MOT assumed sector management responsibilities for all non-rail transport including urban transport operations. With

[1] This was changed in 2008, when an institutional reform gave all non-rail transport functions including urban transport operations to the Ministry of Transport (MOT).

a strengthened position for the development of comprehensive transport in China including the urban transport as well as intercity transport, MOT quickly recognized the opportunities and challenges for integrated transport development in city clusters. Through the proposed GEF project, MOT would introduce international best practices for integrated transport planning and management.

8. The second is an infrastructure problem. City clusters are unlike individual cities in that inter-city travel which is by public transport generally involves using a line-haul mode to a central hub and then transferring to local services for the distribution leg to a final destination. Research has shown that the quality of these interchanges is a major factor in determining users' choice of mode; a poorly-designed interchange, with long walks exposed to the elements and providing little or no information is a significant obstacle in attracting users to public transport instead of cars and taxis.[2] Instead, interchanges should be designed to minimize passenger inconvenience and reinforce the perception of an integrated city cluster-wide transport network with common standards and procedures. Knowledge and experience of interchange design are lacking in China.

9. CZT City Cluster is selected by the MOT for pilot demonstration. Located in Hunan Province, the CZT City Cluster comprises three major cities (i.e. Changsha, Zhuzhou and Xiangtan), four county-level cities, eight rural counties and 184 small towns, with a total population of 40.7 million and an area of 96,800 square km. The three major cities, all within 40 km to each other, have a total population of 13.2 million and a land area of 28,000 square km. They all have registered an annual GDP growth rate over 12 percent for the last decade. The individual modes of inter-city transport are quite developed there, except inland waterways (Xiang River and Liuyang River) which are under-utilized for passenger transport. The CZT cluster lies at the junction of several national expressways and railways including two new high-speed rails (Wuhan-Guangzhou and Shanghai-Kunming). Taking advantage of the highly developed highway network, Hunan Provincial Department of Transport (HDOT) is planning to add 16 public transport lines to link the three major cities and the small towns between them. An intercity fast-speed passenger rail system serving CZT is also being planned, with a total length of 136 km[3]. Changsha—the provincial capital—is implementing its first two urban rail lines.

10. In a policy directive issued by the central government in October 2005 to guide the formulation of the 11th National Economic and Social Development Five-Year Plan, the development of a resource-saving and environmentally friendly society (RS-EF Society) was called for as a long-term strategic task. In December 2007, the National Development and Reform Commission (NDRC) designated CZT City Cluster to be a pilot experiment region for the development of RS-EF Society. Under the strategic framework of RS-EF development, the Hunan Provincial Government is determined to develop or re-develop a number of multi-modal passenger terminals and logistics centers in CZT as a crucial task of integrating the individual

[2] See academic literature: (i) Zhan Guo and Nigel Wilson (2011), "Assessing the cost of transfer inconvenience in public transport system: a case of the London underground," Transportation Research Part A 45 (2011) 91-104; and (ii) Rongfang Liu, Ram Oendyala, and Steven Polzin, "Simulation of the effects of intermodal transfer penalities on transit use." Transportation Research Record 1623, Paper No. 98-0448.

[3] Reference: *Transport Development Study Report on CZT City Cluster Urban-Rural Comprehensive Planning,* September 2008. According to *CZT City Cluster Related Circumstance Report* (March 22, 2010), the total length is 760 km for a bigger plan.

modal systems to better improve transport efficiency. A great deal of planning work, including CZT City Cluster Regional Plan and Regional Transport Plan, has been or being carried out. To effectively translate the plans into reality and to achieve the desirable outcomes, MOT and Hunan are keen to learn from international best practice experiences in comprehensive transport planning, multi-modal passenger terminal design, multi-modal transport management and institutional arrangement, and integrated transport information platform.

11. CZT has a number of ongoing and planned multi-modal passenger terminals (including the Changsha Airport-Land Transport Interchange) that possess significant demonstration value if designed, implemented and managed according to the criteria of resource-saving and environmental friendliness. They will serve as the center-pieces of integrated eco-transport system in the city cluster. The construction, equipment (such as smart transport information system) and accessory facilities (such as electric charging facilities for electric buses) of these terminals will be jointly financed by the relevant modal agencies such as railway authorities and municipal transport bureaus of Changsha, Zhuzhou, and Xiangtan. Two of the multi-modal passenger terminals are selected for pilot demonstration of design: (i) the Southern Changsha High Speed Rail Line Station cum Bus and Urban Rail Terminal Complex located at Lituo (also called in a short form Lituo Terminal) and (ii) the Western Changsha Terminal. The Lituo Terminal is an annex to the Southern Changsha High Speed Rail Station which has been functioning since built three years ago. The underground level of the entire complex (i.e. HSR Station cum bus terminal) has been constructed. Part of the underground floor will be used as garage of the bus terminal. Connection with the future urban rail line is also included in the underground section of the terminal. A multi-floor building will be built above the garage to serve for passenger and terminal management purpose. The Western Changsha Terminal is an existing bus terminal located in the Wangchengpo Economic Zone of Changsha. The terminal is designed to be dismantled and reconstructed in order to function as the hub for long- and short-distance bus, urban public bus transport and urban rail in the future.

C. Higher Level Objectives to which the Project Contributes

12. The project is consistent with the pillars of the 2006-10 Country Partnership Strategy (CPS) for 2006-2010 (Report No. 35435-CN), approved by the Board on May 23, 2006. Specifically, the project supports the third pillar—managing resource scarcity and environment challenges. Under this pillar, the CPS highlights the need to promote "urbanization and transportation options, including public transportation that reduces pollution and fuel consumption." The CPS also describes how development of "efficient urban and public transportation network(s)" will support the achievement of national targets for GDP energy intensity, as well as climate change mitigation efforts. The project is expected to be consistent with the CPS for 2011–16, which is expected to be presented to the Board in 2012.

13. The proposed project supports comprehensive transport development and multi-modal service integration within a city cluster, which fits well into China's broad effort to save energy and reduce CO_2 emission. As transport energy efficiency is closely related to system efficiency and modal choices, greater integration and efficiency improvement of a multi-modal system are closely aligned to the national target for CO_2 emission reduction, and are consistent with the main strategic direction of the 12th National Economic and Social Development Five-Year Plan for transport.

II. Project Development Objectives

A. PDO

14. The Project Development Objective is to assist the Government of China in enhancing transport efficiency, energy saving and CO_2 emission reduction, by promoting and demonstrating multi-modal transport integration in city clusters.

15. The Global Environment Objective is the same as the PDO.

B. Project Beneficiaries

16. For MOT, the project will be a flagship activity to promote and guide multi-modal transport integration, which is one of the main mandated tasks of the Ministry. For CZT, the project will fit into its broad implementation strategy for the development of resource-saving and environmentally friendly society. Project beneficiaries in the demonstration city cluster are the ordinary travelers moving within and in and out of CZT who are expected to experience more efficient integration of different public transport modals, less transfer time, greater transfer convenience and better information services at terminals. More broadly, travelers in all other city clusters in China are expected to benefit indirectly from the multi-modal transport integration tested through the Project when replicated nationwide. These benefits are expected to translate into higher public transport modal share, resulting transport energy saving and CO_2 emission reduction.

C. PDO Level Results Indicators

17. The outcomes will be measured by the following indicators:

a) integrated eco-transport strategic planning guidelines and multi-modal passenger terminal design guidelines developed and adopted by MOT;

b) annual transport CO_2 emission of local trips via the two project terminals at least 5% lower than the business as usual (BAU) scenario; and

c) level of passenger satisfaction for the use of multi-modal terminals for pilot demonstration reported as higher than similar facilities around the country.

III. Project Description

A. Project Components

18. ***Component 1: China City Cluster Eco-Transport Development Strategic Planning (proposed GEF grant allocation US$2.25 million and counterpart fund US$0.35 million).*** This component will support consultant services to help MOT analyze the emerging transport patterns and issues of city clusters, propose multi-modal integrated transport strategies, policies, regulations, institutional framework and coordination mechanism, and develop technical guidelines for city cluster integrated transport planning and multi-modal passenger terminal

design. The component will be based on the in-depth analytical works on CZT and other selected city clusters in China. It is envisaged that three consultancies are required:

a) provision of technical assistance for policy analysis of emerging issues in transport development of city clusters and for developing integrated transport development strategies for city clusters;

b) provision of technical assistance for developing technical guidelines for city cluster integrated transport planning and multi-modal passenger terminal design, including guidelines for Strategic Environment Assessment (SEA); and

c) provision of technical advisory services for the establishment of a monitoring and evaluation system to measure and monitor transport energy consumption and CO_2 emissions in city clusters.

19. ***Component 2: Pilot Demonstration in CZT City Cluster (proposed GEF grant allocation US$1.3 million, counterpart co-financing US$27.27 million).*** This component will support the following activities, which will be carried out in parallel and in coordination with the implementation of Component 1:

a) provision of technical assistance for transport integration planning and implementation plan in CZT City Cluster, including the SEA at the planning level;

b) provision of technical assistance for (i) design of integrated multi-modal transport terminals in CZT City Cluster, including two to be constructed under Component 3(c) of the Project below, and (ii) design and supervision of customer satisfaction survey; and

c) construction of two multi-modal passenger terminals and installation of Smart Transport Management System and electric bus charging facilities for pilot demonstration, including: (i) Lituo Terminal, to become an integral part of the Southern Changsha High Speed Rail Line Station cum Bus and Urban Rail Terminal Complex located at Lituo; and (ii) the Western Changsha Terminal. This will be financed 100% by counterpart fund of US$ 27.27 million.

20. ***Component 3: Capacity Building (proposed GEF grant allocation US$0.95 million and counterpart fund US$1.20 million).*** This component supports the following training and capacity building activities.

a) development of a website for dissemination of Project design and implementation experience;

b) provision of technical advisory services for passenger demand model development and dissemination;

c) carrying out of workshops for knowledge and idea exchange and CZT City Cluster experience dissemination on the topics, without limitation, of: (i) eco-transport development planning for city clusters; (ii) integrated transport terminal design; and (iii) intelligent transport systems; and

d) provision of training on the topics, without limitation, of: (i) multi-modal integrated transport planning; (ii) planning and design of integrated multi-modal passenger

terminals; (iii) institutional development for integrated transport management; and (vi) intelligent transport systems for multi-modal passenger terminals.

21. ***Component 4: Project Management (proposed GEF grant allocation US$0.3 million and counterpart fund US$0.5 million).*** Provision of support to PMO to implement, supervise and manage the different Parts of the Project.

B. Project Financing

Lending Instrument

22. The Project is proposed as a three-year project, supported through a grant from the GEF totaling US$4.8 million, and following the structure of a Bank Specific Investment Loan.

Project Financing Table

Component and/or Activity	GEF (US$ million)	GOC (US$ million)	Total (US$ million)
China City Cluster Eco-Transport Development Strategy and Planning	2.25	0.35	2.60
Pilot Demonstration in CZT City Cluster	1.30	27.27	28.57
Capacity Building	0.95	1.20	2.15
Project Management	0.30	0.50	0.80
Total	4.80	29.32	34.12

IV. Implementation

A. Institutional and Implementation Arrangements

23. The project will be led by MOT with pilot demonstration in CZT City Cluster. MOT will be the Executive Agency (EA) of the project. The preparation and implementation of the project is managed by MOT's Comprehensive Planning Department. MOT has established a Project Steering Committee, consisting of senior officials from MOT, MOF, HDOT, and CZT, to provide overall guidance and oversight to the project. Both MOT and HDOT have years of experience in managing ADB and World Bank-funded transport projects and are familiar with the World Bank operational procedures and safeguards policies.

B. Results Monitoring and Evaluation

24. Annex 1 lists the outcome indicators on the PDO level, as well as the intermediate results indicators for each component. MOT, along with HDOT and the pilot cities of CZT, will regularly collect the data required for monitoring and evaluation of outcomes and results. A dedicated budget has been allocated for PMO to carry out M&E of project implementation. In addition, technical assistance is provided under the project for the establishment of a system for measuring and monitoring transport energy consumption and CO_2 emission in city clusters.

C. Sustainability

25. The city cluster eco-transport project concept was originated by MOT in the context of supporting the development of resource-saving and environmentally friendly society. To achieve the national target for CO_2 emission reduction, MOT has a strong commitment to integrated transport development and transport energy savings. In early 2010, China's top leadership proposed to accelerate the transformation of economic development model, from one mainly driven by investment and export and relying mainly on physical resources, to one driven by consumption, investment and export and relying on technological advances, human resources and management innovation. The proposed China city cluster eco-transport development strategy, which will be developed under the proposed project, is expected to have a significant impact on the transformation of transport systems in a resource-saving and environmentally-friendly manner.

26. The policy direction and technical guidelines developed for city cluster eco-transport strategic planning is expected to have an enduring influence on China's integrated transport development. The institutional reform will fill gap that currently exists in the management and coordination of the transport systems in city clusters. The technical guidelines and standards will be issued under the authority of MOT, for roll out to city clusters nationwide.

27. The pilot demonstration in CZT City Cluster provides a timely and valuable model for other city clusters to develop integrated transport systems in the next few years. The experience gained in project design and implementation will be exchanged in a number of workshops and the outcomes achieved will be disseminated through the project website.

V. Key Risks

28. Overall, the project is rated as moderate risk. As described in the ORAF (see Annex 4), the primary project risks are related to the following:

a) ***Coordination among central, provincial and municipal agencies.*** The planning and implementation of multi-modal transport integration in city clusters requires strong coordination among central, provincial and municipal agencies. While MOT's leadership for coordination is strong at the provincial level, coordination within CZT requires a significant role of the HDOT. However, technical accountability of local agencies is weak. A high-level Project Steering Committee (PSG) has been established. It is co-chaired by the Director of HDOT and includes officials from the CZT municipal governments, to ensure key players remain coordinated throughout its implementation.

b) ***Design***. This is a small TA project. Its impacts may not be adequate to contribute to the expected outcomes of promoting multi-modal transport integration in city clusters. To mitigate the risk, the project has been carefully designed. Within limited funding, it will support TAs both at the national and city cluster levels and pilot demonstration in a city cluster. Moreover, the project supports dissemination of lessons learned from the project.

c) ***Delivery monitoring and long term sustainability of project objectives***. In order to achieve better transport efficiency, energy saving and CO_2 emission reduction through integrated transport in city clusters on the national level, it is vital that the policy guidelines developed under the Project are effectively implemented in CZT for pilot demonstration and the experience is applicable to other city clusters. There is a moderate risk that the policy recommendations of the TAs may not be adopted by MOT due to inadequate quality of the TAs. One main mitigation measure is that the project design should take full advantage of MOT's commitment to integrated transport development, transport energy saving and CO_2 emission reduction, and rely on the strong leadership of MOT for quality monitoring and applicability. The project design and implementation should be robust through mobilization of top-notch international knowledge and experiences, but also practical in adapting to the reality of city clusters in China, through engagement of domestic experts. It is also important that demonstration and dissemination will be a process throughout project preparation and implementation, instead of a one-off activity.

VI. Appraisal Summary

A. Economic and Financial Analysis

29. The grant from GEF Trust Fund in an amount of US$4.8 million will mainly finance consultant services and, to a lesser extent, some IT goods. The consultant services are strategically justified and aim to help the government enhance transport efficiency, energy saving and CO_2 emission reduction. The goods will be related to the information management of the passenger terminals. Due to the small amount of investment, economic analysis is not carried out for the GEF supported components.

30. The counterpart fund of US$27.27 million will finance the construction of the two multi-modal passenger terminals. A portion of the GEF grant will be used to support consultant services to help improve the design, operation and management of the two terminals. The physical investment for the terminals is justified mainly on the planning ground, as multi-modal passenger terminals are a joint, vital component of the essential infrastructure facilities of individual transport modes (such as high-speed rail, urban rail, long distance bus transport, and urban bus transport). The project feasibility studies of the two terminals, which have been approved by the Hunan Provincial Government, include the forecast of passenger trips using the terminals and the financial analysis of the terminal investment.

31. According to the feasibility study, the Lituo High-Speed Rail Station, which has been in operation for two years, currently serves around 7,500 passengers a day, 36% of whom make transfer to/from buses. The financial analysis carried out for the terminal compares the financial revenues associated with the passenger services and other purposes, with the total investment costs for the terminal. As a usual practice in China, the local governments allow the passenger terminal buildings to include commercial and office functions that would generate additional revenues for the public transport enterprises to subsidize the public transport operations. With no exception, the Lituo Terminal is designed to include commercial and office space. The total revenues of the terminal include revenues from ticketing and passenger terminal services (usually set by regulation at 10% of the ticket prices), and leasing revenues for commercial and

office spaces. The financial internal rate of return is estimated at 7.15%, and the repayment period is 13 years (including 2 years for construction).

32. The Western Changsha Terminal will be a re-development from the current terminal, to accommodate the required integration with urban rail development. The terminal carried on average 24,000 passengers on a normal working day and 65,000 passengers on a weekend day or a national holiday in 2008. More passengers are expected with the re-development that would include a station of a new urban underground rail line. It is also expected that the urban rail line will bring about high density residential and commercial development around the area adjacent to the terminal, and thus passengers to the terminal. It is estimated that the re-developed terminal would carry 50,000 passengers per day when completed. Similar to the Lituo Terminal, the Western Changsha Terminal is designed to include commercial and office spaces. The financial internal rate of return is estimated at 6.85%, and the repayment period is 14 years (including 2 years for construction).

B. Technical

33. City clusters are an emerging spatial development pattern in China. Eco-transport is a new concept that needs to be operationalized in transport planning, design and implementation. The project is thus facing a technical challenge, and the quality of the technical assistance activities supported by the GEF grant is crucial for the achievement of the PDO. This requires a good combination of international and domestic expertise and experience. The Terms of Reference (TOR) for the major consultancies under the project are prepared by international and domestic consultants funded under the GEF Project Preparation Grant (PPG), and with a substantial assistance from World Bank specialists. The capacity building component is also designed to support the learning and skill development in the technical areas of integrated transport planning and design.

34. Expertise for the design of multi-modal integrated passenger transport terminals is largely lacking in China. For the two terminals in Changsha selected for pilot demonstration under the project, an experienced international consultant is engaged to advise the design of the terminals during the project preparation stage. Detailed analyses and surveys will be conducted to determine how to:

- minimize transfer times between modes;
- synchronize scheduling between multiple modes and agencies;
- synchronize fare collection systems and pricing across multiple modes and agencies;
- create effective way-finding systems;
- effectively utilize and assign space in multi-modal hubs to facilitate ease of transfer to multiple modes;
- prepare agreements and/or guidelines for regional and local transport providers to ensure optimal levels of service;
- coordinate, select and reserve right-of-way and hub space in master planning;
- assign zoning and density guidelines for areas surrounding multi-modal hubs;
- monitor and manage inter-cluster connectivity; and
- derive user preferences and sensitivities for mode choice.

35. The consultant support will continue to the implementation operation, and management stages.

C. Financial Management

36. The GEF grant, including oversight of the Designated Account (DA), will be managed by MOF. A financial management (FM) capacity assessment has been conducted by the Bank. The principal risk identified is that as the counterpart funds will be exclusively managed by the local implementing company in Changsha, the PMO in MOT may not have sufficient management and control over the local implementing company in FM. Mitigation measures include: (i) a project Financial Management Manual (FMM) which has been prepared and issued to standardize the FM work, especially the coordination among PMO and local implementing company; and (ii) financial management training to be provided to local financial staff to help them familiarize the Bank's FM requirements. The FM capacity assessment concluded that with the implementation of these proposed actions, the FM arrangements will satisfy the Bank's minimum requirements under OP/BP 10.02. Annex 3 provides additional information on FM.

37. **Retroactive financing**. Retroactive financing up to an amount of US$450,000 will be available under the project for financing eligible activities procured under the agreed Bank guidelines for the project in respect of payments made by the Recipient of the grant on or after April 1, 2011 and before grant signing.

D. Procurement

38. An assessment of the capacity of MOT to implement procurement actions for the project has been carried out and has concluded that MOT has adequate experience and capacity. MOT has successfully implemented several Bank-financed projects in the past. The key risk is the possible influence of domestic procurement practice. Risk mitigation measures have been discussed and agreed with MOT. These include provision of training to MOT and HDOT on procurement procedures of Bank financed projects, and where necessary, early procurement support missions and annual field procurement supervision missions by the Bank's procurement specialist. The procurement plan for the project has been agreed with the Bank during appraisal. It will be updated annually or as required to reflect project implementation needs. A brief summary of the procurement capacity assessment and project procurement arrangements are provided in Annex 3.

E. Social

39. The implementation of Western Changsha Terminal for pilot demonstration would involve certain amount of land acquisition and resettlement. The construction will involve occupation of 175 mu of land areas,[4] including 157 mu of the existing bus terminal site owned by the state, and 18 mu of collectively owned land. Along with land acquisition, a total of 11,398 square meters of houses will be removed and 20,266 square meters of existing bus terminal buildings will be demolished. The house demolition will affect a total of 110 households and

[4] Mu is a Chinese unit of land area. One Mu is equivalent to 666.67 square meters.

387 persons, with 64 households being physically relocated, including 56 urban households and 8 rural households. The demolition of existing bus terminal building will affect a total of 11 shops with 1348 square meters, and a total of 23 persons will be affected. For such impact, a Resettlement Action Plan (RAP) has been prepared based on detailed survey by the project sponsor with assistance from social consultant.

40. According to the RAP, the land acquisition and resettlement will be carried out by Yuelu District Land Resources Bureau and Yuelu District Real Estate Bureau with support from Wangchengpo Sub-district. Following relevant laws and regulations, a set of compensation policies and rehabilitation measures will be provided for the affected people. For demolition of urban houses, based on real estate appraisal, the final compensation rate would be around CNY4,500 including location price of CNY3,800 and various subsidies and incentives. In comparison, the price of resettlement housing in the project area is around CNY2,700 per square meter. Most affected urban residents appear to be pleased with such arrangement. For affected rural households, generous compensations and rehabilitation will be provided for those 8 households who still hold original rural status. Each person would get at least 80 square meters of resettlement housing with price set at CNY1,200 per square meter. For those temporary structures, based on consultation with affected households a lump sum of compensation will be provided to the affected households. The draft RAP was developed based on consultations with affected villages and individuals. The content of the RAP was disclosed in the project areas on February 15, 2011 and updated on April 6, 2011, and a qualified external monitoring agency will be selected to carry out resettlement monitoring and evaluation during resettlement implementation.

41. The Lituo Terminal occupies 20 mu of land within the newly constructed Changsha South Station along the High Speed Railway Line between Wuhan and Guangzhou. The construction of Changsha South Station involved permanent land acquisition of 1492 mu of land from 5 villages in the Lituo Sub-District, affecting 322 households and 1068 persons, including 275 households who were relocated. Since both land acquisition and resettlement for construction of Changsha South Station were implemented between 2007 and 2008, prior to the official involvement of the project, a due diligence review on resettlement has been carried out by an independent consultant to see whether the resettlement process has followed national laws and regulations and whether there are any remaining problems. The Bank's team reviewed the due diligence report. According to the review, which was based on interviews with relevant officials from Changsha Railway Company and local district and sub-district governments, as well as representatives from affected villages, the land acquisition process was in line with domestic regulations with no problems remaining; all compensations and rehabilitation measures had been delivered to the affected villages and individuals; and the income and livelihood of affected villagers have been restored or improved.

F. Environment

42. The project is classified as Category B as per OP4.01 due to its limited scale of civil works and anticipated environmental and social impacts associated with the Lituo Terminal and Western Changsha Terminal. Based on the environmental screening and assessment, the following safeguards policies are triggered: 1) OP4.01 Environmental Assessment; and 2) OP4.12 Involuntary Resettlement.

43. Accordingly, a partial Environmental Impact Assessment (EIA) for the Lituo Terminal and Western Changsha Terminal has been conducted by Hunan Provincial Environmental Science Institute and Hunan University Environmental Impact Assessment Center, respectively. Based on the two separate EIAs, the MOT engaged an independent EIA consultant to conduct due diligence review of the Lituo Bus Station EIA and prepare an English version EIAs and EMPs for both terminals. The draft environmental safeguards documents have been reviewed and commented on by Bank task team environmental specialist, and the final EA documents (including an EIA and EMP for each of the terminal) have incorporated Bank team's comments and found to be in compliance with Bank's policy requirements. The EIAs adequately addressed the key environmental issues, i.e. social disturbance, dust and noise, site cleanup and waste disposal during construction; and wastewater, vehicle emission and noise, safety concern, transport emission during operation, etc.. Stand-alone Environmental Management Plans (EMPs) have been developed based on the findings of EIA reports. The EMPs detailed the environmental management and supervision organization and responsibilities, mitigation measures, capacity training plan, monitoring plan, and budget estimates of EMP implementation. EMP measure to be implemented by the contractors will be incorporated into bidding documents and contractors to ensure effective implementation.

44. Public consultation and disclosure has been conducted according to Bank's OP4.01 during the preparation of EA documents. A combination of questionnaire survey and public meetings in the project areas have been carried out during public consultation. Public concerns have been responded to during the consultation and lately incorporated either in project design or in the EMP or RAP. Information disclosure of EA preparation has been carried out through posters, public bulletins, newspapers and internet, which are accessible to the general public. The draft EIA document has been disclosed in local transportation bureaus and internet on February 15, 2011.

45. A Strategic Environmental Assessment as part of the technical advisory services for the review and refinement of the CZT City Cluster Comprehensive Transport Integration Implementation Plan will be carried out during the project implementation.

46. **Global environmental benefits**. In addition to reducing the time, cost, and energy usage associated with transport hub modal transfers in emerging Chinese city clusters, the GEF program supports increased use of both intra and inter-urban mass transit.

47. These improvements are expected to result in both direct and in-direct greenhouse gas emissions mitigation. The direct GHG emission reduction from the two pilot terminals is estimated to be 204,096 tons of CO_2 equivalent over 20 years of project life. The top-down approach through capacity building and technical guideline implementation would result in a total in-direct reduction of 10.2 million tons, at a unit cost of US$0.49 per ton. Further details on the derivation of these emissions estimates are provided in Annex 7.

Annex 1: Results Framework and Monitoring

CHINA: GEF City Cluster Eco-Transport Project

<u>Project Development Objective (PDO)</u>: To assist the Government of China in enhancing transport efficiency, energy saving and CO_2 emission reduction, by promoting and demonstrating multi-modal transport integration in city clusters.

PDO Level Results Indicators*	Core	Unit of Measure	Baseline	Cumulative Target Values**					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3	YR 4	YR5				
Indicator One: Integrated eco-transport strategic planning guidelines and multi-modal passenger terminal design guidelines developed and adopted by MOT	☐	Official guidelines	Not yet existed	Preparation	Preparation	Endorsement by MOT			Annually	Project Progress Report	MOT/PMO	
Indicator Two: Annual transport CO_2 emissions of local trips via the two project terminals at least 5% lower than BAU scenario	☐	percentage	0 (BAU: 67,483 tons)			5% (against BAU 76,027 tons in Yr 3)			YR 3	Project M&E reported in Project Progress Report	MOT/PMO	
Indicator Three: Level of passenger satisfaction for the use of multi-modal terminals for pilot demonstration reported as higher than similar facilities around the country	☐	Satisfaction rating scale from 0 to 5	Not yet available						Annually after the terminals become functional	Project M&E and Customer Satisfaction Surveys	MOT/PMO/ Terminal Enterprises	Baseline will be established upon the opening of project terminals
INTERMEDIATE RESULTS												
Intermediate Result (Component One): City Cluster Eco-Transport Development Strategic Planning												
Intermediate Result indicator One: Eco-transport development strategies for city clusters proposed	☐	Technical reports	Not yet available	Preparation	Preparation	Completion			Annually	Project Progress Report	MOT/PMO	
Intermediate Result indicator Two: Technical guidelines for integrated eco-transport planning for city clusters prepared	☐	Technical reports	Not yet available	Preparation	Preparation	Completion			Annually	Project Progress Report	MOT/PMO	

Intermediate Result indicator Three: Technical guidelines for multi-modal passenger terminals prepared	☐	Technical reports	Not yet available	Preparation	Preparation	Completion			Annually	Project Progress Report	MOT/PMO	
Intermediate Result indicator Four: M&E methodologies established and used for measuring energy savings and CO_2 emission reduction	☐	Technical document	Not yet available	Preparation	Preparation	Completion			Annually	Project Progress Report	MOT/PMO	
Intermediate Result (Component Two): Pilot Demonstration in CZT City Cluster												
Intermediate Result indicator One: CZT Comprehensive Transport Integration Implementation Plan prepared	☐	Planning documents	A sketchy plan available	Update and Preparation	Update and preparation	Completion			Annually	Project Progress Report	MOT/PMO	
Intermediate Result indicator Two: Two multi-modal passenger terminals completed as technical specifications	☐	Terminal buildings and facilities	Not yet built	Construction	Construction	Completion and demonstration			Annually	Project Progress Report	MOT/PMO	
Intermediate Result (Component Three): Capacity Building												
Intermediate Result indicator One: A website for city cluster eco-transport development and demonstration established and functioning	☐	Number of website	Not yet created	Design and development	Roll-out	Functional			Annually	Project Progress Report	MOT/PMO	
Intermediate Result indicator Two: At least 5 national workshops for eco-transport knowledge exchange and experience dissemination held	☐	Number of workshops held	None	2	4	5			Annually	Project Progress Report	MOT/PMO	
Intermediate Result indicator Two: At least 150 central and local government officials, planners and designers trained for integrated transport policy, planning and design	☐	Number of people trained	None	30	80	150			Annually	Project Progress Report	MOT/PMO	

***Please indicate whether the indicator is a Core Sector Indicator (see further http://coreindicators)**
****Target values should be entered for the years data will be available, not necessarily annually.**

Annex 2: Detailed Project Description

CHINA: GEF City Cluster Eco-Transport Project

1. The Project consists of four components, including eco-transport development strategic planning, pilot demonstration in CZT City Cluster, capacity building, and project management. The Terms of Reference (TOR) for the main technical assistance activities are drafted as part of the project preparation.

2. ***Component 1: China City Cluster Eco-Transport Development Strategic Planning (proposed GEF grant allocation US$2.25 million and counterpart fund US$0.35 million).*** This component will support consultant services to help MOT analyze the emerging transport patterns and issues of city clusters, propose multi-modal integrated transport strategies, policies, regulations, institutional framework and coordination mechanism, and develop technical guidelines for city cluster integrated transport planning and design. The component will be based on the in-depth analytical works on CZT and other selected city clusters in China. The outputs from this component will be consultant reports with policy and technical recommendations. These will be reviewed by expert panels organized by the MOT. The recommended policies and technical guidelines will then be submitted to MOT Management for approval before final issuance in the forms of policy document, guidelines, regulations, or circulars, for implementation at the provincial and municipal levels. It is envisaged that three consultancies are required for the component:

a) **Technical assistance for policy analysis of emerging issues in transport development of city clusters and for developing integrated transport development strategies**. Based on the investigation of the development trends and characteristics of China's city clusters, the sub-component will analyze how different development modes will have an impact on economic and social development in city clusters and how eco-transport development can be best achieved, what are the key policy and institutional barriers that should be overcome in order to achieve eco-transport development. The sub-component will introduce international best practice experiences on integrated transport planning, institutional framework, policies and regulations. It will formulate objective and principles, propose development model, policy framework, and institutional reform, and explore strategic options for integrated transport development in China's city clusters.

b) **Technical assistance for developing technical guidelines for city cluster integrated transport planning and multi-modal passenger terminal design**. Through mobilization of international expertise, the Project will develop the technical guideline for city cluster integrated transport development, including planning methodology, design process, strategic environment assessment (SEA), as well as the technical guideline for multi-modal passenger terminal design.

c) **Technical assistance for establishing an M&E system,** to measure and monitor transport energy consumption and CO_2 emissions in city clusters.

3. ***Component 2: Pilot Demonstration in CZT City Cluster (proposed GEF grant allocation US$1.3 million, counterpart co-financing US$27.27 million).*** This component aims to promote integrated transport in CZT city cluster and to demonstrate the design and implementation of two integrated multi-modal passenger terminals. It will support the following activities:

a) **Technical assistance for transport integration planning and implementation plan in CZT City Cluster, including the Strategic Environmental Assessment at the planning level**. The transport integration planning and implementation plan developed will serve as a roadmap for CZT city cluster to achieve the goal of resource saving and environmentally friendly, as well as a reference for other city clusters in China to implement eco-transport integration. The Plan will cover all modes including inland waterways, inter-city transport corridors, transfer stations/terminals, public transport integration, transport information services and Smart Transport Management System. It will also propose the operational mode for government administration and enterprise management as well as policy framework for CZT city cluster. This technical assistance will also provide practical experience for 1(b) and 1(c) described above.

b) **Technical assistance for the design of integrated multi-modal transport terminals in CZT City Cluster, including two that will be constructed under the project and the design of customer satisfaction survey**. The sub-component will introduce international best practice design approach. It will help develop a passenger demand model system and collect relevant data for both terminals. The integrated multi-modal transport terminal design includes layout design, facilities design (including electric charging facilities), environmental design and ITS development. The sub-component will also provide technical assistance for the design and supervision of customer satisfaction survey.

c) **Construction and operation of two multi-modal passenger terminals for pilot demonstration**: (i) the Southern Changsha High Speed Rail Line Station cum Bus and Urban Rail Terminal Complex located at Lituo (also called in a short form Lituo Terminal) and (ii) the Western Changsha Terminal. Lituo Terminal is designed as an integral part of the multi-modal Railway-Urban Rail-Bus passenger terminal. Western Changsha Terminal is designed as the hub for long- and short-distance bus, urban public transit and urban rail. The construction will include civil works and equipment (Smart Transport Management System and electric bus charging facilities) needed for the operations and management of the terminals and will be financed 100% by counterpart fund of US$27.27 million.

4. ***Component 3: Capacity Building (proposed GEF grant allocation US$0.95 million and counterpart fund US$1.20 million).*** This component supports the following training and capacity building activities.

a) **Development of a website for dissemination of project design and implementation experience**;

b) **Passenger demand model development and dissemination**;

c) **Workshops for knowledge and idea exchange and CZT experience dissemination**, on the following topics: (i) eco-transport development planning for city clusters; (ii) integrated transport terminal design; and (iii) intelligent transport systems.

d) **Training** for the following topics: (i) multi-modal integrated transport planning; (ii) planning and design of integrated multi-modal passenger terminals; (iii) institutional development for integrated transport management; and (vi) ITS for multi-modal passenger terminals.

5. ***Component 4: Project Management (proposed GEF grant allocation US$0.3 million and counterpart fund US$0.5 million).*** This component will support the Project Management Office (PMO) to implement, supervise and manage the project components.

Component and/or Activity	GEF (US$ million)	GOC (US$ million)	Total (US$ million)
1. China City Cluster Eco-Transport Development Strategic Planning	**2.25**	**0.35**	**2.60**
a) Technical assistance for policy analysis of emerging issues in transport development of city clusters and for developing integrated transport development strategies	1.20	0.10	
b) Technical assistance for developing technical guidelines for city cluster integrated transport planning and multi-model passenger terminal design, including SEA	0.80	0.10	
c) Technical assistance for establishing an M&E system to measure and monitor transport energy consumption and CO_2 emissions in city clusters	0.25	0.15	
2. Pilot Demonstration in CZT City Cluster	**1.30**	**27.27**	**28.57**
a) Technical assistance for transport integration planning and implementation plan in CZT City Cluster	0.50		
b) Technical assistance for the design of integrated multi-modal transport terminals in CZT City Cluster and design of customer satisfaction survey	0.80		
c) Construction of two multi-modal passenger terminals		27.27	
3. Capacity Building	**0.95**	**1.20**	**2.15**
a) Development of a website for dissemination of project design and implementation experience	0.10		
b) Passenger demand model development and dissemination	0.09		
c) Workshops for knowledge and idea exchange and CZT experience dissemination	0.35	0.60	
d) Training	0.40	0.60	
4. Project Management and Monitoring & Evaluation	**0.30**	**0.50**	**0.80**
a) Support the PMO for project management	0.30		
Total	**4.80**	**29.32**	**34.12**

Annex 3: Implementation Arrangements

CHINA: GEF City Cluster Eco-Transport Project

Project Administration Mechanism

1. The Project is led by MOT with pilot demonstration in CZT City Cluster. MOT will be the Executive Agency (EA) of the Project. MOT has established a Project Steering Committee, chaired by the Director General of the Comprehensive Planning Department, with co-chairs and members from MOT, MOF, Hunan Provincial Government and CZT. The day-to-day management of the project implementation is the responsibility of the MOT's Department of Comprehensive Planning. A Project Management Office (PMO) is established by the MOT, and staffed by officials from MOT and Hunan Department of Transport (HDOT), as well as domestic consultants. Both MOT and HDOT have years of experience in managing ADB and World Bank-funded transport projects and are familiar with the Bank operational procedures and safeguards policies. The PMO will manage consultant services and capacity building activities and coordinate with HDOT and relevant agencies in Hunan Province for the implementation of the two multi-modal passenger terminals.

Procurement

2. The overall project risk for procurement is assessed as moderate. The key issue and risk concerning procurement for implementation of the project is the possible influence of domestic procurement practice. In view of this risk, the following actions will be taken during implementation: (i) provision of training to MOT and HDOT on procurement procedures of Bank financed projects; (ii) where necessary, early procurement support missions by the Bank's procurement specialist; (iii) annual field procurement supervision missions to review procurement actions where needed.

3. **General**. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated January 2011; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011, and the provisions stipulated in the legal agreements. The various items under different expenditure categories are described in general below. For each contract to be financed by the Grant, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame has been agreed between the Recipient and the Bank in the Procurement Plan during appraisal. The Procurement Plan will be updated annually or as required to reflect the actual project implementation needs and improvement in institutional capacity.

Types of Procurement

4. **Procurement of goods:** Goods procured under this project will include the procurement of office equipment for the PMO. The procurement will be undertaken using MoF's Model Bidding Documents dated May 1997 agreed with the Bank for National Competitive Bidding (NCB) (each contract more than US$100,000), and through Shopping procedure (each contract less than US$100, 000).

5. **Selection of consultants:** Consultant services provided by firms and individuals for the project will be identified during implementation. The procurement methods will be quality and cost based selection or quality based selection for all contracts above US$200K and consultant qualification based selection for all contracts below US$200K for consultant firm, as well as individual consultant procedure for Individual Consultant. Short lists of consultants for services estimated to cost less than US$300,000 or equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Bank's Consultant Guidelines. Select consultant services may be carried out by universities and government research institutions.

6. **Operational costs:** Operation costs for recruiting some staff in the PMO, communication service, translation service, international and domestic travel will be funded by the Grant. The staff recruited using Grant shall follow the Bank's guidelines for selection of individual consultants. (Section V of the Consultant Guidelines)

7. **Others:** Institutional Strengthening through the overseas and domestic training and study tours of staff of institutions/agencies involved.

8. **Procurement plan**: MOT has developed a Procurement Plan for project implementation, which provides the basis for the procurement methods. This plan has been agreed between the Recipient and the Project Team at appraisal and is available at MOT's office. It will also be available in the project's database and on the Bank's external website. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

9. **Advance contracting and retroactive financing**. Retroactive financing of up to US$ 450,000 will be allowed for eligible expenditures incurred after April 1, 2011 and before grant signing. All advance procurement and advance contracting contracts are subject to Bank's prior review. Payments will be made only for contracts procured in accordance with applicable Bank procurement procedures.

Details of the Thresholds for Procurement Methods and Prior Review

Thresholds for Procurement Methods

Description	Thresholds	
Goods	<=US$1,000,000	NCB
	<=US$100,000	Shopping
Consultant Services	<=US$200,000	CQS for firms
		IC for individual consultants

Thresholds for Prior Review

Description	Thresholds	
Goods	All ICB	Prior Review
	NCB >=US$500,000	Prior Review
	The first NCB contract irrespective of contract sum	Prior Review
Consultant Services	Consultant firm selection>=US$100,000	Prior Review
	All SSS contracts (either firm or individual)	Prior Review
	All individual consultant selection >=US$50,000	Prior Review

NCB=National Competitive Bidding; CQS= Consultants' Qualifications; SSS=Single Source Selection.

Financial Management

10. The FM capacity assessment identified the following principal risk: As the counterpart funds will be exclusively managed by the local implementing company in Changsha, the PMO in MOT may not have sufficient management and control over the local implementing company in financial management.

11. Mitigation measures agreed include: (i) a project Financial Management Manual (FMM) which has been prepared and issued to standardize the FM work, especially the coordination among PMO and local implementing company; and (ii) FM training to be provided to local financial staff to familiarize them with Bank's FM requirements. The overall pre-mitigation FM risk has been assessed as "Substantial" and post-mitigation has been assessed as "Moderate".

12. **Budget**. The overall project budget has been prepared and agreed among various stakeholders. The usage of GEF grant has been prepared in the procurement plan and approved by the task team. Counterpart funds will be mobilized by MOT and local implementing company in Changsha following domestic procedures. For budget variances arising during execution, necessary authorization and close monitoring should be established. Timely and accurate information on variances should be used as the basis for mid-term adjustments.

13. **Funds flow**. The grant will flow from the Bank into a project designated account (DA) to be set up at and managed by MOF's International Department or the Investment and Assessment Center. The grant will then be disbursed to contractors or reimbursed to the PMO based on the withdrawal applications submitted.

14. **Accounting and financial reporting**. The administration, accounting and reporting of the project will be set up in accordance with Circular #13: "Accounting Regulations for World Bank Financed Projects" issued in January 2000 by MOF. The standard set of project financial statements has been agreed between the Bank and MOF.

15. The PMO in MOT's Department of Comprehensive Planning and local implementing company in Changsha will be managing, monitoring and maintaining respective project accounting records and retaining original supporting documents. The PMO in MOT's Department of Comprehensive Planning will also prepare the unaudited interim financial reports (format in accordance with the aforementioned Circular #13 agreed with MOF) as part of the

Progress Report and it will be submitted to the Bank no later than 45 days following each semester (the due dates will be August 15th and February 15th), in form and substance satisfactory to the Bank.

16. **Internal control**. The related accounting policy, procedures and regulations were issued by MOF and the FMM will be prepared and issued to uniformly align the financial management and disbursement requirements among all concerned parties.

17. **Audit**. Audit Service Center of China National Audit Office for Foreign Loan and Assistance Projects (ASC) has been identified as the auditor for this project. One consolidated annual audit report, encompassing all project related activities, will be issued in the name of ASC and will be due to the Bank within 6 months after the end of each calendar year.

Disbursement

18. Three disbursement methods, advance, reimbursement and direct payment, are available for the project. Supporting documents required for different disbursement methods are documented in the Disbursement Letter issued by the Bank.

19. One designated account (DA) in US dollar will be opened at a commercial bank acceptable to the Bank and will be managed by MOF. The ceiling of the DA is documented in the Disbursement Letter.

20. The GEF Grant would be disbursed against eligible expenditures (taxes inclusive) as in the following table:

Category	**Amount of the Grant Allocated (in US$)**	**Percentage of Expenditures to be financed**
(1) Consultants' services	3,790,000	100%
(2) Goods, Incremental Operating Costs, Communications, Training and Workshops	1,010,000	100%
Total	**4,800,000**	

21. **Retroactive financing** will be applied for this project. The starting date of the eligible expenditures for retroactive financing is April 1, 2011. Eligible expenditures for retroactive financing will not exceed US$450,000. Retroactive financing will be processed according to the requirements specified in the Grant Agreement.

Environmental and Social

22. **Environmental Assessment**. Comprehensive assessment has been conducted for the potential impacts, based on which a set of mitigation measures have been developed in the project design and EMP. Overall the project is anticipated to have positive socio-economic and environmental benefits in terms of enhancing transport efficiency, saving energy and reducing CO_2 emissions. Due to the civil works under construction of the two terminals, the project has

the potential to cause social and environmental impacts, especially during construction of two integrated terminals, which have been appropriately assessed and can be adequately avoided, minimized and/or mitigated with engineering measures developed either in project design or included in the project's EMP and RAP. Manageable adverse impacts are primarily related to: (i) social disturbance, dust and noise, site cleanup and waste disposal during construction; and (ii) wastewater, vehicle emission and noise, safety, transport emission during operation etc. In summary, MOT implemented a two-fold approach to minimize environmental and social impacts. These are:

a) **Sound engineering**. The project has been designed compatible with relevant urban and land use plans. The Western Changsha Terminal will be reconstructed on the site of existent Western Changsha Bus Station. The overall layout of the terminal design has taken into account the integration with local urban roads system. As an integrated transport terminal, the Western Changsha Terminal will help cut the total wastewater discharge, vehicle and small restaurant air pollutants emission and solid waste that have to meet the current demand of the bus station.

b) **Mitigation plans**. Detailed environmental design plans such as landscaping, environmental management plans, resettlement action plans have been prepared in order to minimize and/or compensate unavoidable impacts from the project.

23. **Mechanism to supervise and monitor the agreed EMPs**. Two stand-alone Environmental Management Plans (EMPs) have been developed based on the findings of the EIA report of the two terminals. The EMPs detailed the environmental management and supervision originations and responsibilities, mitigation plans, capacity training plan, monitoring plan, and budget estimates of EMP implementation. EMP implementation will be managed by MOT. A Project Management Office (PMO) will be created by the MOT, and staffed by officials from the MOT and Hunan Department of Transport (HDOT), as well as domestic consultants. HDOT has years of experiences in managing ADB and World Bank-funded transport projects in Hunan and is familiar with the Bank operational procedures and safeguards policies. Environmental management responsibility will be built into the project management structure within the PMO, with dedicated environmental management staff. The contractors and supervision engineers will need to assign qualified environmental staff to their team to ensure effective implementation of the EMP. Environmental mitigation measures developed in EMP will be fully incorporated into the bidding documents and contractor contracts. Environmental supervision responsibility will be included in contracts with the supervision engineer firms as an integral part of the project supervision.

24. **Resettlement Action Plan**. Implementation of land acquisition and resettlement for Western Passenger Terminal subproject, according to the RAP, will be carried out by Yuelu District Land Resources Bureau and Yuelu District Real Estate Bureau, with support from resettlement office from Wangchengpo Sub-district.

25. **Public consultation and disclosure**. During the EIA preparation and RAP preparation, public consultations were conducted in accordance with the Bank's OP4.01 and OP4.12. The EIA and RAP have been disclosed in accordance with the Bank's policy to the Infoshop prior to project appraisal. Information disclosure of EIA preparation was carried out by posting posters

and bulletins in the project area and through the internet (www.eiacn.com) during October 2010-January 2011, which are accessible by the general public. The draft EIA document was disclosed in local transportation bureau and internet on February 15, 2011. Information disclosure on project land acquisition and resettlement was distributed in the affected communities during the resettlement impact investigation and planning process.

26. These were supplemented by a combination of opinion surveys and public meetings in the project areas and communities. Stakeholders such as local authorities, civil society, and the affected population were consulted through diverse ways such as internet, questionnaires, meetings, and focus groups on land acquisition matters. The local governments were consulted on the alignment and location of stations. All the affected communities are informed, investigated and consulted. Specific public concerns have been incorporated in project design, EIA and RAP.

27. **Safeguards monitoring**. The PMO will recruit an Independent Environmental Consultant (IEC) to conduct independent monitoring on performance of both the contractors and the supervision engineer firms in terms of EMP implementation. The PMO will also engage qualified environmental quality monitoring institute(s) to conduct environmental monitoring according to the monitoring plan set forth in the EMP. The IEC will assist the PMO to prepare semi-annual EMP implementation monitoring report to be submitted to the Bank. An external resettlement consultant will be engaged prior to commencement of land acquisition and resettlement by PMO. The monitor will conduct two rounds of field visits and monitoring in year during the project implementation, with semi-annual reports to the Bank.

28. **Capacity building**. MOT and HDOT have years of experiences in managing ADB and World Bank-funded transport projects in Hunan and are familiar with the Bank operational procedures and safeguards policies. They have developed good capacity to implement, supervise and monitor both the EMP and RAP. They will be trained to enhance their implementation capacity in accordance with the RAP and EMP. IEC and External Resettlement Consultant will be hired to provide training and monitor the implementation of the EMP and RAP by all parties involved and provide advice to the MOT and HDOT accordingly.

29. **Grievance handling**. Prior to the project appraisal, contact information (including contact agencies/persons and their telephone numbers) for the grievance channel was disclosed. The RAP indicates that any grievance should be rapidly handled through the resettlement management system, external monitor, local government system, or court system.

30. **Strategic Environmental Assessment (SEA)**. An SEA for the CZT City Cluster Comprehensive Transport Plan will be carried out as part of the technical advisory services for the review and refinement of the CZT City Cluster Comprehensive Transport Integration Implementation Plan.

Monitoring and Evaluation

31. The PMO will also be responsible for progress reporting and monitoring and evaluation. A consultancy is funded under the project for establishing an M&E system for measuring and monitoring the city cluster transport energy consumption and CO2 emissions. Moreover, customer satisfaction surveys for the pilot demonstration passenger terminals will be conducted under the project.

Annex 4: Operational Risk Assessment Framework (ORAF)

CHINA: GEF City Cluster Eco-Transport Project

<table>
<tr><td>1. Project Stakeholder Risks</td><td colspan="4">Rating: Low</td></tr>
<tr><td>Description:
(a) Changes of government’s development priorities.

(b) Insufficient incentives for transport users to use socially desirable public transport modes supported under the project.</td><td colspan="4">Risk Management:
(a) A high-level Project Steering Committee (PSC) with clear understanding of PDO has been established.

(b) The project will provide technical assistance that aims to help government improve the quality of public transport through integration, and all project activities are designed to improve the satisfaction level of public transport users as a key way to boost the use of public transport.</td></tr>
<tr><td></td><td>Resp: PMO and WB</td><td>Stage: Preparation & Implementation</td><td>Due Date: 4/2014</td><td>Status: PSC established</td></tr>
<tr><td colspan="5">2. Implementing Agency Risks (including fiduciary)</td></tr>
<tr><td>2.1. Capacity</td><td colspan="4">Rating: Low</td></tr>
<tr><td>Description:
(a) Resources and process for coordination among different agencies may not be adequate.

(b) Lack of standardized financial management processes may lead to misuse of project funds.

(c) The use of procedures or methods adopted in domestic practice may be in violation to the Bank’s policy.</td><td colspan="4">Risk Management:
(a) The implementation arrangement is designed to facilitate and demonstrate how coordination could be achieved under a common framework and with a shared objective. The project includes TAs that would support institutional capacity and process development for multi-modal and multi-agency coordination.

(b) Training has been and will be provided by the task team and necessary financial management requirement and disbursement procedures have been agreed among all parties and documented in the Financial Management Manual as the practical guidance.

(c) Training and guidance will have been and will be given by the Bank team on Bank’s procurement procedures and policies.</td></tr>
<tr><td></td><td>Resp: WB and PMO</td><td>Stage: P&I</td><td>Due Date: 4/2013</td><td>Status: Training given and FMM prepared.</td></tr>
</table>

2.2. Governance	**Rating: Moderate**			
Description: Sector governance structure is clear and sound, but there is lack of technical accountability at the local agency level when it comes to integrated public transport development and modal shift.	**Risk Management:** High-level PSC has been established, and project will support TAs that aim to ensure right incentives for agencies to achieve common objective in an accountable manner.			
	Resp: WB and PMO	**Stage: P&I**	**Due Date: 4/2013**	**Status: PSG established.**
3. Project Risks				
3.1. Design	**Rating: Moderate**			
Description: Impacts of the small TA project to be implemented within a short timeframe may not be adequate to contribute to the expected outcomes of promoting multi-modal transport integration in city clusters.	**Risk Management:** The project has been carefully designed to achieve the greatest impact with the small size of funding. The TAs for integrated transport policy, strategies and technical guidelines will be implemented in parallel with the implementation of two multi-modal passenger terminals for pilot demonstration. The project also includes a sub-component to support the dissemination of lessons learned from the project and replication to other city clusters.			
	Resp: WB and PMO	**Stage: P&I**	**Due Date: n/a**	**Status:**
3.2. Social & Environmental	**Rating: Low**			
Description: (a) The EMP may not be implemented in a satisfactory manner. (b) The implementation of RAP for Western Changsha Terminal may be delayed due to lack of experience in the part of the terminal developer.	**Risk Management:** (a) The Task Team will provide safeguard training and guidance to the PMO and EIA consultant throughout project implementation, and review implementation of the EMP on a regular basis both through reports from the PMO and through site visits. (b) The Bank will continue to provide social safeguards training to the local partners throughout the project implementation, and supervise the implementation of RAP closely.			
	Resp: WB and PMO	**Stage: P&I**	**Due Date: n/a**	**Status:**
3.3. Program & Donor	**Rating: Low**			
Description: The project is funded by GEF and final approval by GEF CEO is required before Bank Board approval.	**Risk Management:** The Bank team works closely with the MOF and MOT to seek final endorsement from GEF CEO.			
	Resp: WB and PMO	**Stage: Preparation**	**Due Date: 12/ 2011**	**Status: project approved by GEF CEO**
3.4. Delivery Monitoring & Sustainability	**Rating: Moderate**			
Description: (a) The recommendations of TAs supported under the project may not be adopted by the MOT in a timely manner due to quality of TAs.	Risk Management: (a) Both international and domestic expertise will be used for delivery of TAs, under the supervision of PSC and Bank.			

(b) The two terminals might be constructed with little innovative measures for demonstration. (c) Successful experience may not be widely replicated in other city clusters in China.	(b) Bank and PMO will provide advisory for the design and management of the terminals to ensure quality. (c) Extensive training programs and dissemination activities have been incorporated into the project design to ensure that the sustainability of project impact.			
	Resp: WB and PMO	**Stage: P&I**	**Due Date: n/a**	**Status:**
4. Overall Risk Rating: Moderate				
	Comments: The principal risks for the achievement of the PDO relate to the multi-agency coordination, which is inadequate in China. The project aims to address this institutional issue through policy and strategy to be developed under the project and the capacity building programs.			

Annex 5: Implementation Support Plan

CHINA: GEF City Cluster Eco-Transport Project

Strategy and Approach for Implementation Support

1. The objective of the Implementation Support Plan is to ensure: (i) risks identified in the ORAF would be mitigated through carefully designed measures; (ii) the project development objective would be satisfactorily achieved by the end of project; and (iii) implementation of all project activities would follow agreed procedures and complies with all fiduciary and safeguard requirements. Through the ORAF process, three risk categories have been rates "Moderate": (i) governance; (ii) design; and (iii) delivery monitoring and sustainability.

2. **Governance**. To mitigate the risk of weak coordination among relevant agencies in the CZT City Cluster, the Bank team will regularly monitor the implementation of the pilot demonstration component and maintain constant dialogue with the MOT. MOT/PMO has demonstrated solid capability for coordination with HDOT and local agencies involved in the two pilot demonstration terminals. Bank supervision will ensure that the institutional arrangements agreed at appraisal will be maintained and continue to function effectively.

3. **Design**. The Bank has provided significant expert support to the preparation of the project, and the support will continue throughout project implementation. Specifically, technical expertise will be mobilized by the Bank team to help the PMO and agencies in CZT address technical issues during project implementation, especially those related to public transport integration, Strategic Environment Assessment, integrated passenger terminal design, and M&E for transport CO_2 emission reduction.

4. **Delivery monitoring and sustainability.** Both international and domestic experts will be mobilized under the project and through Bank supervision activities, to ensure quality of delivery. The Bank supervision will ensure (i) consultants deliver high quality technical assistance; (ii) a good match of international expertise and experience; and (iii) the constant attention and participation of the Project Steering Committee on eco-transport development issues.

5. **Supervision Teams and Budget**

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First 12 months	• Procurement of consultant services • Final design of terminals • Resettlement Action Plan • Capacity building • M&E	Technical skills Technical skills Bank policies Technical Skills Technical Skills	$70,000	
12-36 months	• Project Quality / Sustainability • Capacity building • M&E	Technical Skills Technical Skills Technical Skills	$140,000	

6. **Skills Mix Required**

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
• Integrated transport planning	6	4	
• Multi-modal passenger terminal design	6	4	
• Institutional development for transport management	8	4	
• Bank Safeguard Policy	4	3	
• Bank FM Policy	3	1	
• Bank Procurement Policy	6		

Annex 6: Team Composition

CHINA: GEF City Cluster Eco-Transport Project

World Bank staff and consultants who worked on the project:

Name	Title	Unit
Zhi Liu	TTL / Lead Infrastructure Specialist	EASTS
Ke Fang	Senior Transport Specialist	EASIN
Kishor Uprety	Senior Counsel	LEGES
Luquan Tian	Transport Specialist	EASCS
Holly Krambeck	Transport Economist	EASIN
Ning Yang	Environmental Specialist	EASCS
Zhuo Cheng	Carbon Financing Specialist	EASCS
Jun Zeng	Social Development Specialist	EASCS
Youxuan Zhu	Social Safeguard Consultant	
Yi Geng	Senior Financial Management Specialist	EAPFM
Zheng Liu	Procurement Specialist	EAPPR
Junxue Chu	Senior Finance Officer	CTRDM
Samuel Zimmerman	Urban Transport Consultant	
Dick Bullock	Transport Consultant	
Yi Yang	Urban Transport Consultant	
Diyun Wang	Junior Professional Associate	TWITR
Wenyan Dong	Operations Analyst	EASCS
Yunqing Tian	Team Assistant	EACCF
Xuan Peng	Team Assistant	EACCF
Om Prakash Agarwal	Senior Urban Transport Specialist / Peer Reviewer	TWITR
Baher El-Hifnawi	Lead Transport Economist / Peer Reviewer	EASIN
Slobodan Mitric	Consultant / Peer Reviewer	
Victor Vergara	Urban Sector Leader / Peer Reviewer	EASIN

Annex 7: GEF GHG Emission Reduction Calculation

CHINA: GEF City Cluster Eco-Transport Project

1. The project is designed mainly as a TA project to support the formulation of policies, strategies and technical guidelines for city cluster eco-transport planning and design (under Component 1), as well as capacity development (under Component 3). It is expected that these upstream policy and technical works would lead to GHG mitigation through local implementation of the policies and strategies and adoption of technical guidelines. However, there is no reliable methodology to quantify such potential GHG emission reduction. Under Component 2, the TA to support the CZT integrated transport planning implementation plan (including strategic environmental assessment) will bring the eco-transport approach one step closer to implementation in a specific city cluster. Again, at this stage, there is no reliable methodology to quantify the potential GHG emission reduction as a result of the implementation of the integrated transport plan in CZT.

2. The GHG mitigation benefits under the proposed project are quantified for the Sub-component 2(b) and 2 (c), i.e. the design and construction of two multi-modal passenger terminals (Western Changsha and Lituo) in Changsha for pilot demonstration. Such terminals serve as the key nodal points for a multi-modal transport system that links the city cluster with other part of the country and links the cities, towns, and villages within the city cluster. The benefits are estimated on the assumption supported by international empirical evidence that better design of multimodal passenger terminals up to the international standards would induce more passengers to choose buses over private cars to go to Changsha as well as to encourage arrival/departure passengers to use public transport to complete the lag of the travel within the city. Part of the GEF Project Preparation Grant was used to hire an international consultant to advise CZT for the design of two selected terminals, Lituo and Western Changsha. Baseline data – passenger counts, mode splits, distance traveled are taken from the terminal feasibility studies.

3. International empirical evidence shows that poor transfer experience as a result of poor design substantially turns passengers away from transferring to another public transport mode. For example, a detailed regression analysis was conducted in 2010 for the London Underground system,[5] in which the time and costs associated with different elements of the transfer system were analyzed. Factors analyzed included initial waiting time, number of transfers from origin to destination, transfer waiting time, transfer walking time, presence of stairs, presence of escalators, and time spent walking at-grade. The main data source used to identify travel paths was the Rolling Origin and Destination Survey (RODS), which includes information about access, transfer, and egress stations; access/exit modes; purpose and frequency; ticket type; and travelers' gender and age for more than 250,000 trips between 1998 and 2005. Combined with supplemental data, the study derives coefficients for the impact of the different elements of transfer on mode choice. A similar study was conducted using stated preference survey data, derived from 2,914 respondents, on factors that affect modal choice at rail transfers. In this case,

[5] Guo, Zhan; Wilson, Nigel. 10 November 2010. "Assessing the Cost of Transfer Inconvenience in Public Transport Systems: A Case Study of the London Underground." Transportation Research. Part A 45 (2011) 91-104.

survey results were used to derive a logit model coefficient to estimate the impact of transfer "inconvenience" on mode choice.[6]

Direct GHG Emission Reduction

4. It is envisaged that the improvement of the transfer experience in Western Changsha and Lituo Terminals would result in GHG emission reduction at two levels: (i) **local level**, that travelers arriving/departing these two terminals would shift to public transport from private car/taxi, for their travel legs to/from their destination/origin in Changsha; and (ii) **regional level**, that travelers going to Changsha from other cities in Hunan Province (also including Zhuzhou and Xiangtan in the CZT City Cluster) would shift to long-distance buses from private cars.

Defining Transport Demand

5. Western Changsha Terminal serves as a transfer hub for long-distance buses and local transport (bus, subway, taxi, etc.). According to the terminal feasibility study, the number of terminal passengers is estimated to be 50,640 per day in the first year of completion. Among all long-distance bus routes in the Western Changsha Terminal, 15 routes with a total passenger volume of 38,467 per day travel within 200 km of Changsha, which is expected to be influenced by the better design of the terminal. The numbers of 50,640 and 38,467 are used as basis for emission reduction estimation of local and region levels, respectively, for Western Changsha Terminal.

6. Lituo Terminal serves as a transfer hub for High-Speed Rail (HSR), long-distance buses and local transport. According to the feasibility study, passengers arriving/departing the HSR station account for 48,000 per day in 2010, 7,900 of whom would transfer to long-distance buses to go to other cities and towns, mostly within the CZT. In addition to the HSR passengers, another 2,000 passengers per day would use Lituo as a transfer hub to long-distance buses. Among all long-distance bus routes in Lituo Terminal, 6 routes with a total passenger volume of 5,056 per day travel within 200 km of Changsha, which is expected to be influenced by the better design of the terminal. The above numbers of 42,100 and 5,056 are used as basis for emission reduction estimation of local and region level respectively for Lituo Terminal.

The Baseline Emissions

7. The CDM methodologies related to transport sector accept the common approach of baseline emission calculation as:

> (baseline emission in year y) = (amount of units of service for the vehicle) × (distance of the baseline trip) × (emission factor for different type of vehicle, i.e. kg CO_2 per passenger-km travelled).

8. **Determination of the distance of the baseline trip route**: Point A to Destination (AD), a term used by CDM for the distance of baseline trip route, is considered as the one way distance travelled in the baseline scenario.

[6] Faber, Oscar. January 1996. "Ameliorating the Disbenefits of Rail Interchange." Rail OR Report No. MPP018/01.

i. ***Local level***: No historical AD data are available. Discussions with transport planners familiar with travel patterns in CZT concluded that the average distance between the terminal and the final destination is roughly 12 km. The GHG emission reduction benefits at the local level attributable to better terminal design would be generated from more passengers using public transport, instead of private car and taxi, to complete the 12 km travel.

ii. ***Regional level***: It is assumed that the people traveling to Changsha within 200 km (about 3-hour bus ride) would be influenced to shift from private vehicles to long-distance buses. The passenger-km is calculated based on the actual route length and the number of passengers predicted for each route in the feasibility study.

9. **Determination of baseline emission factors:** The emission factor per passenger-km is calculated based on the assumption of average speed (22 km/hour) under different types of fuels and vehicles. CDM methodologies opt for the use of project data if they are available, instead of IPCC default values. The below table shows the baseline emission factors, which are taken from *Manual for Calculating Greenhouse Gas Benefits of Global Environmental Facility Transportation Projects*:

Vehicle Type	Speed	Fuel Type			Fuel Efficiency @ 50 km		CO_2 emissions factor per liter of fuel		CO_2 emissions per vkt		Average CO_2 efac per km	Average veh occupancy	Average CO_2 efac per passenger-km
	km/hour	%Split			km/liter		kg CO_2/liter		kg CO_2/km		kg CO_2/km		kg CO_2/km
		Petrol	Diesel		Petrol	Diesel	Petrol	Diesel	Petrol	Diesel	All Fuels	All Fuels	All Fuels
Cars	22	95%	5%	100%	9	11	2.75424	2.94348	0.3060267	0.2675891	0.304105	1.20	0.253421
Taxi	22	30%	70%	100%	8	11	2.75424	2.94348	0.34428	0.2675891	0.290596	1.10	0.264179
Bus	22		100%	100%	1.8	2.2	2.75424	2.94348	1.5301333	1.3379455	1.337945	45.00	0.029732
LRT													

Modal Shift Estimated from the Project

10. **Modal shift at the local level**: The feasibility study provides analysis on baseline modal split according to historical records of 2006-2008. The table below shows that the share of public transport for AD under the baseline scenario is 80% for Western Changsha Terminal and 36% for Lituo Terminal:

	Western Terminal	Lituo Terminal	Unit	Source
Passengers per day	50,640	42,100	person	Feasibility Study
Commuting distance	12	12	kilometer	Local Survey
Baseline modal split				
Urban rail	50%	20%		Project estimation
Bus	30%	16%		Project estimation
Taxi	12%	34%		Project estimation
Car	8%	30%		Project estimation

11. The impact of better terminal design on public transport mode share for onward transport at two terminals is estimated below, using a logit model for the choice between public transport and taxi/private car.[7] The improvement of generalized time (GT) is considered to be 8 minutes, with an increase in public transport (PT) share of 2.8% for Western Changsha Terminal and 5% for Lituo Terminal.

Western Changsha Terminal – Improved GT and PT share

	1	2	3	4
Improvement (GT mins)	5	**8**	10	15
Projected PT share	81.8%	**82.8%**	83.6%	85.2%
Increased PT share	1.8%	**2.8%**	3.6%	5.2%

Lituo Terminal – Improved GT and PT share

	1	2	3	4
Improvement (GT mins)	5	**8**	10	15
Projected PT share	39%	**41%**	43%	46%
Increased PT share	3%	**5%**	7%	10%

12. The different percentages of modal shifts are estimated and shown below:

Modal shift				
	Western Changsha Terminal	**Lituo Terminal**		
taxi to subway	0.8%	1.5%		logit model calculation
car to subway	0.6%	1.0%		logit model calculation
taxi to bus	0.8%	1.5%		logit model calculation
car to bus	0.6%	1.0%		logit model calculation
Total	2.8%	5%		
Passengers shifted	1,418	2,105	person	

13. ***Modal shift at the regional level***. Passengers traveling to Changsha within 200 km would be influenced to shift from private vehicles to long-distance buses. However, there are no regional all-mode passenger travel data available. A conservative assumption of 1% increase in total passenger volume on the bus routes within 200 km of Changsha due to better terminal design is used.

[7] This model, which is the most common approach used in transport planning to forecast users' choice between modes, can be expressed as:
Probability of choosing alternative A (p_A) from the choice of A and B is given by:

$$p_A = \exp(\lambda U_A)/(\exp(\lambda U_A)+\exp(\lambda U_B))$$

where U_A and U_B are the generalized times associated with the two choices. λ is a calibration constant which is derived from the elasticity of demand with respect to generalized time; this does not vary greatly between countries and is typically taken as -0.6 to -1 depending on the existence of competitive alternatives.

	Western Changsha Terminal	Lituo Terminal	Unit	Source
Load factor	80%	80%		
<200km				
Passengers per day	38,467	5,056	person	Feasibility Study
No. of routes	15	6		Feasibility Study
Total passenger-km	3,020,852	468,288	passenger-km	Feasibility Study
Modal shift				
<200km	1.0%	1.0%		Project assumption
Passengers shifted	385	51	person	
Passenger-km shifted	30,208	4,682	Passenger-km	

14. **Determination of project emission factor:** Referring to "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion," the project emission factors per passenger per km are pre-determined in the baseline scenario given that the technology development will continually improve the efficiency. Hereby the amount of fuel consumed by the projects and the net calorific value of each type of fuel will not be part of indicators to be monitored.

Emission Reduction

15. **Monitoring:** CDM methodologies accept the ex-ante method of emission calculation which will be subjected to actual monitoring. The projects will build the indicators into the M&E plan to verify the actual emission reductions. The indicators will include but not limited to:

- Number of passengers transfer at Lituo and Western Changsha to/from local transport;
- Number of passengers on the influenced long-distance bus routes;
- The origin and destination point and transportation route of the selected passengers transported by the project in year y;
- The distribution of passengers transported by the project by different modes through randomly survey (with the sample size to be decided to achieve 90-95% confidence level and a 5% maximum error to ensure the representativeness of samples).

16. **QA/QC (Quality Assurance/Quality Control):** QA/QC manual will be developed including institutional arrangement, reporting procedure, documents and records filing, data investigation, etc.

17. **Emission reduction (ER) volume over project life:** The ER is estimated to be 3,986 tons of CO_2 equivalent for Western Changsha and 2,641 tons for Lituo in the first year. Based on the increase of number of passengers for the two terminals in their respective 20 years of

project life predicted in the feasibility study, the accumulative ER of the two terminals will be 204,096 tons of CO_2 equivalent in total. The annual growth of 15% for the Western Changsha Terminal shown in the Table below is an expected jump in passenger volumes due to the opening of the Subway Line that links to the Terminal.

	Western Changsha		**Lituo**		
Project lifetime	20 Years				
	ER	Annual Growth	ER	Annual Growth	
1st	3986		2641		
2nd	4185	5%	2826	7%	
3rd	4395	5%	3024	7%	
4th	4614	5%	3236	7%	
5th	5307	15%	3462	7%	
6th	5466	3%	3705	7%	
7th	5630	3%	3964	7%	
8th	5799	3%	4241	7%	
9th	5973	3%	4538	7%	
10th	6152	3%	4765	5%	
11th	6152	0%	5003	5%	
12th	6152	0%	5103	2%	
13th	6152	0%	5206	2%	
14th	6152	0%	5310	2%	
15th	6152	0%	5416	2%	
16th	6152	0%	5524	2%	
17th	6152	0%	5635	2%	
18th	6152	0%	5747	2%	
19th	6152	0%	5862	2%	
20th	6152	0%	5862	0%	
Total		113,024		91,071	tons
Direct GHG reduction	**204,096**				tons

Indirect GHG Emission Reduction

18. The Western Changsha Terminal and Lituo Terminal in Changsha are selected as pilots to demonstrate how a better-designed terminal would attract more passengers to shift from the use of private vehicles towards public transport. The emission reduction for the 20-year project life of these two terminals is estimated to be 204,096 tons of CO_2 equivalent.

19. Under the proposed project Component 3 for capacity building, the MOT will organize site visits to these two terminals, so that more cities can see, feel and understand how efficient transfers between modes could be achieved. Dissemination workshops will be held to share the experience gained. In addition, a technical guideline will be developed under Component 1 to

provide guidance at the national level for integrated transport terminal planning, design, operation, institutional coordination and management. It is expected that these activities would substantially enhance the capacity of China's relevant authorities for terminal design and operation, who are currently well-known for providing some least convenient and attractive transfer facilities.

20. The Government of China has recognized the significance of providing convenient transfer services between transport modes and calls for the acceleration of the construction of multi-modal passenger terminals. In the recently issued 12th Five-Year Plan for the Transport Sector, MOT planned to build approximately 100 terminals nationwide, almost all of these new terminals are located in the 22 city clusters. It is an ideal opportunity for these terminals to benefit from the best practice demonstrations in Changsha and the guideline developed under the project.

21. Under the assumption that these 100 terminals will be of the similar scale as the Western Changsha and Lituo Terminals, an average of 102,048 tons per terminal of GHG ER over its 20 years' of life time is envisaged. The total amount of indirect ER of the 100 terminals for their respective life time would be 10.2million tons.

Passenger Terminal (Top-down)		
Terminals to be built over next 5 years	100	
Indirect GHG reduction	**10,204,786**	tons