

Sector Guidelines

for Pre-Feasibility Studies on

URBAN TRANSPORT



A. Introduction

1. Context

Cities Development Initiative of Asia (CDIA) Sector Guidelines describes the approach to pre-feasibility studies in the sectors most commonly encountered in CDIA support to cities. These guidelines are a sector-specific appendix to the overarching *CDIA Pre-Feasibility Study Guidelines* (CDIA 2011) that sets out the format, process, and output requirements in general.

The Sector Guidelines are not meant to replace terms of reference or to provide detailed technical input for consultants, who are assumed to be qualified and experienced professionals in their field and thus technically capable. These apply to the conduct of a pre-feasibility study (PFS) for a project or group of projects (hereinafter referred to as “the project”) identified and prioritized in the plan and by the relevant authority for implementation.

These guidelines apply in the context of existing policies, visions, plans, and studies pertaining to urban transport and other related issues. Finally, these guidelines focus on passenger transport and nonmotorized transport (NMT) and transport management interventions. Goods transport faces many of the same issues, but these guidelines do not address goods transport issues, such as how to address the logistics needs of local enterprises and intermodal nodes.

2. Objective

CDIA support to the formulation of any urban transport project aims to enhance the sustainability and inclusiveness of the project. This means that the project should

1. Comprise a viable component of an *integrated transport system* (see section B);
2. Be *inclusive* in the sense that there affordable and accessible options are available to different income groups comprising its potential users, *and* that persons negatively affected by the project should be minimized and adequately compensated for any adverse impacts (see section C);



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3. Be *economically viable* and *financially sustainable* in that the economic rate of return on a project must be acceptable *and* that fare box revenue, subsidies, taxes or levies, concession and/or lease revenue, microfinancing, grants/loans, community service obligation payments, carbon credits, or any combination of these must be capable of funding capital and operational costs of various components of the project, including long-term maintenance and capacity building (see section D);
4. Be *environmentally sustainable* in that the proposed transport solutions should maximize the energy savings and/or potential mitigation of greenhouse gas of the system *and* that adequate measures will be taken to integrate climate resilience into, and mitigate any potential adverse environmental impacts of, the project (see section E); and
5. Have *sound, transparent governance* arrangements enabling efficient financing, design and construction, commissioning, and operation of the project (see section F).

B. Developing an Integrated Transport System

The vision for any city in Asia must include an environment-friendly, integrated, and inclusive transport system. To achieve this vision, the system must effectively utilize the available transport modes and support the development of these and other modes with appropriate planning and regulatory framework. The investment program to implement a project within a system should be based on a sound planning framework. This planning framework should embody a people-centered approach to urban transport that focuses on the need for (personal) mobility and accessibility rather than on transport as such. The consultant should review this framework and, if it is not adequate, the consultant should, within the limits of resources provided under the contract, review the options for integration as they impact the proposed project and make recommendations on related modes.

An investment in a transit project may form part of a larger system in one mode—for example, one line in a metro system, or the whole system, but crucial to its success will be promoting related "feeder" modes and addressing "competing" modes. "Feeder" modes, e.g., bus ways to metros, tricycle taxis to bus ways, etc., must be accommodated and their frequency and capacity must complement the project investment. Facilities for interchange with these modes may thus be crucial to project viability. In respect of "competing" modes—cars and motorbikes—management is crucial. Parking at major destinations should be restricted and (relatively) expensive.¹ Public transport rights-of-way and footpaths should be kept clear or ridership will suffer from larger trip times and/or lack of access. Potentials for fuel switching to reduce costs and/or reduce environmental impact should also be considered. Such measures may need to be paid for (see section D) and institutionalized in the governance structure of the project (see section F).

Alternative investments in NMT and traffic management may also be a high priority in their own right. Again, these need to be seen as contributing to the effectiveness of an integrated transport system—promoting integration of "feeder" modes such as walking and bicycling, and addressing "competing" modes by controlling parking, managing traffic routes and speeds, clearing and improving footpaths, and developing pedestrian precincts in "heavily walked" areas. Such measures may need to be paid for (see section D) and institutionalized in the governance structure of the project (see section F).

¹ The exception should be parking at transit situations, which should be cheap or free, and adequate to circumstance.



Summary

- ▶ Review planning framework for integration priorities.
 - ➔ Fill "gaps" with rapid analysis of options.
- ▶ Design measures to foster feeder services.
- ▶ Design measures to discourage "competing modes."
- ▶ Integrate NMT and traffic management measures.
- ▶ Consider alternative fuels.

C. Developing an Inclusive Transport Project

The baseline for developing an inclusive transport project is understanding and accommodating the needs of the passengers, especially women, and others affected by it. This includes an analysis of the following:

1. The need for services and willingness to pay for these (by different income groups and in relation to employment opportunities) keeping in mind that "need for services" is not just a matter of where you need to go but also *how* and *when*.²
2. Safety is an important aspect, especially from both poverty and gender perspectives, to ensure that services are accessible for all.
3. The holistic view on transport that takes into account transport as not just passengers and transport systems, but a whole related network involving cleaners, shopkeepers, street vendors, food stalls, informal transport systems, etc., which will invariably be affected positively or negatively by the project.

The first major task for the consultant assessing a transit system is to undertake a rapid screening of the proposed route(s) and facilities to determine the following:

1. The potential ridership by income groups and their relation to employment opportunities, improved mobility in terms of accessibility, affordability, and safety and time savings; ("potential" should be gauged not just by likely cost of assumed mode, but also include potential for cost-reduced modes—nonair-conditioned buses, for example—and cross subsidy possibilities; and
2. Likely disruption to communities along the route in terms of a relocation, division, noise vibration, disruption of the visual context of important historic or scenic sites. The scale and cost of relocation should be estimated along with options for near-site³ resettlement (to minimize disruption to employment).

Changes to the route and/or mode type or design should be considered where (i) significant employment opportunities could be easily accessed, particularly by low-income groups, or (ii) significant disruption could be reduced—for example, extending the system to a low-income area, which would thus gain access to employment, or undergrounding an LRT to avoid a dense, historic area. Costs associated with the social impact mitigation measures should be included in the financial assessment (section D) and the associated management systems should be incorporated into governance arrangements (section F).

² For example, the ban on taking luggage on the Delhi metro has discouraged some low-income groups from using it.

³ Off-site resettlement is to be avoided wherever possible. Potentials for urban renewal in parallel to the transit development should be assessed in order to provide additional units for resettlement.



Similar issues are faced when considering an NMT, traffic management, or fuel switching project. The project will, positively or negatively, affect the same, usually informal categories of stakeholders including cleaners, shopkeepers, street vendors, food stalls, informal transport systems, etc. Measures for mitigating social impact (or cross subsidies where those benefiting, directly or indirectly, transfer some of that benefit to those adversely affected) will need to be developed. The project design will integrate these mitigation measures and include the cost in the financial assessment (section D) and incorporate required management systems into governance arrangements (section F).

Summary

- ▶ Document the routes—identify potential user groups by income and other characteristics (e.g., gender) along the proposed corridor, and assess their mobility needs and problems as basis for project design.
- ▶ For the proposed design, estimate ridership by group and their access to employment (destination) centers.
- ▶ Consider options for route, and mode type and design to optimize ridership and access, and minimize disruption.
- ▶ Document impacts and mitigation measures, both for transit and NMT or alternate investments.

D. Ensuring Financial and Economic Viability

1. Financial Assessment

Crucial to the viability of a transit investment project will be a realistic assessment of ridership and fare income on the revenue side. The assessment of affordability and willingness to pay on the part of each market segment and the level of mode shift should be rigorous and well documented. If the assessment of preliminary figures is unrealistic, cheaper or more appropriate alternatives should not only be considered, but also strongly suggested (bus way instead of metro, for example). Costs should be benchmarked against average construction costs in country (preferably), or in similar country. Costs should explicitly include social (e.g., relocation) and environmental mitigation measures. For other NMT, transport management, and fuel switching projects, a similar approach is needed with other forms of revenue, such as parking fees, replacing fares as a main revenue source. Creativity, in terms of identifying potential alternative revenue sources, should be encouraged.

Subsidies, cross-subsidies from leasing of property, community service obligation payments, and others should be assessed for their sustainability and legal enforceability. Clean Development Mechanism and other credit or subsidies from international agencies should be assessed based on prior experience with similar projects and, if necessary, on engagement of specialist expertise⁴ to provide advice where such funding is crucial to the viability of the project.

The financial assessment should include cash flow, income statement, and balance sheet projections of any corporate or special purpose vehicle (SPV) entities involved in the financing as well as a standard financial cost benefit analysis (CBA). The hurdle rate adopted for this latter should be the relevant weighted average cost of capital (WACC) for the sector and country, but where private investors are involved, market rates for return in equity and debt should be the benchmark for viability.

⁴ ADB Clean Energy Facility can provide resources for assessments of Clean Development Mechanism.



In particular, the assessment must include an analysis of the cash flow of local government(s) with project capital expenses and subsidies included to determine the sustainability of the project in relation to the likely revenue streams for the local government(s). Such an analysis should be the basis for discussions about alternate organizational structures for implementation (see section F). For example, public–private partnership (PPP) models can be used on unbundled, commercially viable components of projects. Thus, such analysis should be done in a preliminary form at the start of the consultant engagement.

Summary

- ▶ Rigorously assess revenue assumptions and costing and strongly advocate alternatives where such assessments make viability suspect.
- ▶ Adopt realistic return hurdle rates.
- ▶ Assess impact of project on (local governments) budget and use as basis for developing implementation options.
- ▶ Provide financial analysis for all relevant organization participants and adopt realistic return hurdle rates.

2. Economic Assessment

Economic assessment techniques for transport projects are well understood by professionals— time savings and reduced operating costs (or increased costs, e.g., increase in congestion from some types of transit projects) are standard. Less common are broader estimates of willingness to pay, followed by health, employment (income increase or decrease), safety benefits, and other benefits or disadvantages, among others, the disruption caused to affected communities, or the reduction of such disruption. The economist/financial analyst should be aware that these are potentially significant and make all efforts to estimate them, adopting proxy values such as land value increase, where necessary, as set out in ADB's Guidelines for the Economic Analysis of Projects⁵ or alternate analysis such as Goals Achievement Matrices. Care should be taken to avoid double counting, such as health and employment productivity increases. Shadow pricing of costs is standard and follows an established process in each country. Hurdle rates for economic assessment are routinely set by ADB and other agencies in each country. Adopt ADB standards where available.

Summary

- ▶ Estimate all significant benefits and disadvantages of proposed project in addition to those routinely incorporated in transport models.
- ▶ Undertake economic assessment using established processes and hurdle rates in the country concerned using ADB standards where possible.

E. Ensuring Environmental Sustainability

Urban transport projects have both environmental benefits and environmental impacts. The objective of the PFS is to maximize the former while minimizing the latter. The project should include measures to minimize emissions of greenhouse gases and maximize energy savings through (i) fuel switching, (ii) discouraging private transport on the commute, (iii) fostering urban renewal (at higher densities and increased energy efficiency) along the transport corridor, and (iv) more efficient

⁵ ADB. 1997. *Guidelines for the Economic Analysis of Projects*.



feeder systems/NMT linkages. Options for these measures should be explicitly examined by the PFS. The revenues and cost implications of these measures, and their governance implications should be included in the financial (section D) and governance analysis (section F).

To address climate resilience issues, the proposed route(s) and facilities should be screened to determine potential impacts of climate-related events, such as flooding, drying and/or melting of substrata, etc. Resilience measures should be formulated, and preliminary design(s), sufficient for PFS cost estimates, developed. The implications of these measures should be included in the financial assessment (see section D) and governance arrangements (section F) of the project.

Most infrastructure projects would eventually require the preparation of an environmental impact assessment (EIA) as a basis for an environmental or similar permit. At the PFS stage, a rapid environmental assessment (REA) or a rapid environmental impact assessment (REIA) may be required.⁶ It is also vital that the requirements and the time frame for a full-blown EIA are identified already during the PFS stage to avoid delays in downstream work as well as unexpected investments costs for environmental protection measures.

In terms of reducing possible adverse environmental impacts, the process is similar to that adopted for social assessment. The proposed route(s) and facilities should be screened to determine (i) potential environmental impacts in terms of noise and pollution to communities, and (ii) potential impacts on water resources, forest resources, biodiversity, etc. as set out in ADB's environmental checklist.⁷ Mitigation measures should be formulated and costed. The implications of these measures should be included in the financial assessment (section D) and governance arrangements (section F) of the project.

Summary

- ▶ Document and cost proposed environmental benefits measures.
- ▶ Document and cost proposed environmental mitigation measures.

F. Ensuring Good Governance

The institutional arrangements for implementing the project must be clearly described and agreed with the city government.⁸ The ability to achieve integration of transport investments and social and environmental benefits, avoid and/or mitigate adverse impacts, and achieve financial sustainability, depends on a sound governance structure to provide a coherent policy, planning, regulatory and enforcement framework.

The PFS must include the following:

- (a) Discussion of organizational options for design, construction/commissioning and operation, including the possibility of PPP options. Where such options are pursued, the organization structure for transparent oversight and/or regulation of private operations needs to be considered. In terms of transport integration, the arrangements for coordination across modes and facility providers need to be described. Finally, arrangements for stakeholder participation (in particular, any affected persons as described in sections C and E) must be proposed.

⁶ADB *Rapid Environmental Assessment checklists for categorization of projects*.

⁷ADB. 2003. *ADB Environmental Assessment Guidelines*.

⁸CDIA 2011 *Guidelines for Urban Governance and Institutional Development*



- (b) Consideration of how, and with what incentives, will the existing institutions and stakeholders change to the proposed arrangements. For example, will existing companies on existing routes participate in owning the proposed bus way? Will their drivers be hired under the new scheme?
- (c) Consideration of the legal basis for each involved organization, its sources of revenue and responsibilities for expenditures (these two must match), and the hierarchy of authority across organizations (the legal basis of coordination).

Governance elements for public transport will often reflect funding arrangements. Components of public transport, e.g., the buses in a bus way can be "unbundled" and will have their own special purpose vehicle (SPV). Consultants must consider such requirements and design the governance structure accordingly. For example, what authority regulates the SPV, and on what legal basis? The organization design under construction may vary from that under operation. These should be described together with arrangements for the required transition.

Summary

- ▶ Design of institutional arrangements must be thoroughly documented, encompassing the legal and financial bases of sustainable operation.
- ▶ A clear description of how we get from where we are now to the proposed arrangements is required.

G. Institutional Strengthening

Since most Asian cities have various agencies working on different parts of the transport problem, initial priorities for a pre-feasibility team should focus on ensuring all concerned agencies participate in the PFS process. The team should design a structure of participation to engage these agencies throughout the duration of the pre-feasibility study. Such a process will improve institutional capacity by fostering dialogue, setting joint priorities, and coordinating the approaches to investment.

H. Capacity Development

It is clear that capacity development is an essential foundation for sustainable urban transport in any given city. The PFS must identify all stakeholders, define their respective responsibilities, and suggest a capacity development program that will match proposed projects and measures. The PFS team should also strive to stimulate dialogue between non-government organizations (NGO), government, and the private sector to ensure a common understanding and basis for action. The overarching goal is to create a safe and sustainable system and ensure that investments in the sector are properly handled.

The PFS team should explicitly plan activities for capacity development and training, designed and conducted to address the local situation and needs, during the PFS as well as part of a future capacity development program.

I. Conclusion

Although a PFS financed by CDIA will not support urban planning studies, it may help a city concretize its city development vision, examine alternatives to solve its transport problems, and recommend investments for further feasibility study and/or implementation.



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The criteria for a successful CDIA PFS, derived from the above, can be summarized as follows:

- *Technical effectiveness*—the extent to which proposed investments solve the stated transport problems in a city;
- *Impact*—the extent to which the investments impact, positively or negatively, nearby natural resources and neighborhood, air quality, energy, the connecting transport network and facilities, land use, the local economy, etc.;
- *Cost effectiveness*—the extent to which the costs of the investments are commensurate with their benefits;
- *Financial sustainability*—the extent that funds required to build and operate the preferred options are likely to be available and affordable; and
- *Equity*—the costs and benefits of the investments are distributed fairly across different population groups.