Terms of Reference: Cebu BRT Feasibility Study
September 7, 2011

I. Background:

Cebu City has a population of about 900,000 and a land area of 326 sq. kms, with the over-all population density of 2,450 persons per sq. Km. About 66 percent of the total City population is concentrated within 15 percent of land area.

In terms of motorization, the number of vehicle registration in Cebu City has displayed an annual growth rate of 7 percent for the period 1994 to 2000 and 4 percent for the period 2000 to 2006. The share of trips using the private modes increased from 9.7 percent in 1979 to 20.6 percent in 1992, while the share of trips using public transport decreased from 90.3 percent in 1979 to 79.4 percent in 1992. It is anticipated that the Metro Cebu will experience an increasing rate of person-trips due to rapid population growth and urbanization.

Cebu City's public transport is mainly road-based. According the CITOM (Cebu City Traffic Operations Management) there are around 8,329 units of Public Utility Jeepneys (PUJ), 5,788 units of Taxis and 952 units of Buses and Mini-Buses operating in the City in 2007. Existing public transport is dominated by the PUJ market which is regulated through LTFRB. Routing of all PUJ services in Cebu has been received from Cebu City. Larger buses operate across the island but, do not provide for travel within Cebu City. Taxi use is high with a large number of taxis operating throughout the City. Initial observations have identified the following issues that affect the efficient and effective operation of the transport network. Travel speeds of selected corridors in Cebu City by time of day were surveyed by CITOM in 2005. The travel speeds of Osmeña Boulevard towards the coastal area ranged from 7 kph to 17 kph while the travel speed of Juan Luna St. ranged from 4 kph to 18 kph. From the coastal area, the travel speeds of Osmeña Boulevard had a similar range from 6 to 17 kph while the same was true for Juan Luna with a range of 4 to 21 kph. The average travel speed for these major corridors is around 10 kph indicating severe congestion for most times of the day. The PUJ network is struggling to keep pace with the changing nature of demand. Population growth has increased the demand for travel and will do more so in the future. In parallel the car has become a viable mode of transport for a greater proportion of the population, although the majority of trips are still made by non car modes, and its increased use has led to increased congestion and in turn degraded PUJ operating conditions. The following are the issues on public transportation according to CITOM:

- too many PUJs/ vehicles on the road and there is no new infrastructure improvements
- in the City;
- uncontrolled/ unlimited issuance of franchise for the public utility vehicles and issues
- concerning travel lines;
- undisciplined drivers and pedestrians on the streets;
- large scale use of motorcycles for public transport known as the "habal-habal";
- illegal parking; and
- sidewalk encroachment and sidewalk vendors

The number of recorded accidents in Cebu City in 2000-2006 ranged from a level of 14,000 in 2000 to around 10,000 in 2006. The number of accidents is quite high considering that Metro Manila recorded a maximum of 11,185 accidents in 2005 in its 2002-2005 data. According to the Cebu City CLUP (2000), air pollution is now an increasing problem in the City. In the absence of heavy industries or thermal and coal fired plants in the City, the deterioration of air quality is mainly attributed to emissions from motor vehicles. Severe air pollution is now observed in many areas of the City particularly in major roads.

Data on the annual average concentration of total suspended particulates (TSP) in 1995 to 2006 in various air quality monitoring stations of the Environmental Management Bureau (EMB) in Metro Cebu shows that, in 1995-2000, all stations exceed the 1-year ambient air quality guideline value for TSP of 90 mcg/N. cu. m. with peak concentrations occurring in 1999. In 2001-2006, there has been a slight improvement due to presence of annual average concentration values below the guideline value. Around 1-2 stations still exceed the guideline value. With fewer available data, the annual average concentrations of PM10 were also obtained and it was observed that there was one station that exceeded the guideline value of 60 mcg/N. cu. m. in 2002-2003. This indicates that air pollution is still a continuing problem for the City. The annual average concentrations of other pollutants such as sulfur dioxide, nitrogen dioxide and ozone recorded in the DENR-EMB Monitoring Station in the University of San Carlos (USC) in Talamban in 2003 were also obtained and indicated that the ambient air concentrations of these 3 criteria pollutants are still below the guideline values.

The PUJ network is struggling to keep pace with the changing nature of demand. Population growth has increased the demand for travel and will do more so in the future. In parallel the car has become a viable mode of transport for a greater proportion of the population, although the majority of trips are still made by non car modes, and its increased use has led to increased congestion and in turn degraded PUJ operating conditions.

Land use change has created a largely polycentric City that is orientated by the traditional down town and up town areas but also new malls and business parks. The nature of demand will be further distorted by the South Reclamation Project. The changing nature of demand, the changing aspirations of the travelling public together with the need to address air quality and safety problems create a context for intervention of which BRT can play a central role.

In June, 2010 the World Bank, in cooperation with the Government of Cebu City and the Government of the Philippines Department of Transport and Communications, DOTC, and the National Economic Development Authority (NEDA), completed a "pre feasibility" study whose final report was entitled Study and Concept Plan for a Demonstration Bus Rapid Transit Corridor. At the same time the "Pre-FS" was underway, a broader study to prepare a comprehensive, multi-modal urban public transport master/strategic plan for Metropolitan Cebu was being carried out under the auspices of the DOTC.

The conclusions of the Pre-FS reflects the view of leadership of Cebu City and DoTC that a sea-change in the way public transport is provided is needed for Cebu to be able to avoid the environmental and transport issues that have accompanied rapid development in Manila and other Asian cities and develop in a sustainable direction. BRT thus was and is seen as a catalyst for change and the pre-FS was conducted with this perspective. It was thus more than a typically simple look at physical, operational and financial "feasibility" of a pre-ordained solution. It went to great lengths to consider the organization and institutional arrangements for public transport in general and BRT in particular. These and other open issues identified by the earlier studies that must be considered in more detail as part of this study.

II Study Objectives

- Carryout a feasibility study for the BRT demonstration corridor along Bulacao to Ayala Mall to Talamban, including service and operations plan, physical and

operational design of the BRT system, traffic engineering improvements, application of ITS technologies, fare collection mechanisms, etc

- Evaluation of how the BRT project can be used a way of fostering sustainable land development all along the Northeast and Southwest Corridors, particularly in the vicinity of the South Reclamation Area;
- Develop traffic management and diversion plans during construction and post-construction period
- Estimate the scale of climate change mitigation potential of PPP arrangements in urban public transport delivery
- Support in developing environmental and social alignment sheets
- Develop a World Bank appraisal report, with detailed economic, financial and risk analysis and PPP options
- Establish general bus and specific BRT bus operating standards and procedures and related business practices
- Prepare a formal public involvement/communications plan
- Prepare a BRT and general public transport brand concept and related graphic and design criteria

The objective of the Feasibility Study, (FS) is to carry out this work in sufficient detail and reliability so that implementation (i.e., final design, right of way acquisition, etc.) can begin.

The over-riding process objectives of the feasibility study itself are that its preparation process be inclusive, involving two-way communications with all stakeholders, particularly current private sector public transport owner/operators, and that the technical work be transparent and objective.

III. Scope of Work

The Consultant will:

Task 1: Compilation of all background information, analysis methods and models, data and other materials from the Pre-FS, the DOTC public transport strategic planning effort and planning work for the SRA of relevance to the feasibility study; Collection of additional data on an as-needed basis:

Work here will compile and then summarize all planning work with implications for the BRT project. On the transport side, this will include obtaining all relevant products, e.g., databases (e.g., population, employment by sub-area, current and forecast, mapping), models (e.g., network, demand forecasting, O/M costing), reports, technical memoranda, from the DOTC strategic public transport study and any highway planning work, while on the land use side, data and information related to the South Reclamation Area, Cebu City master plans and planning and other major development of relevance to the corridor.

Where necessary (e.g., the data is either unavailable or too old to be valid), additional data, primarily related to demand (general traffic, Jeepney vehicle and person travel counts, household, Jeepney O/D travel,) and jeepney operations may need to be collected depending on the status of the other studies (i.e., DOTC) and what assistance they can provide.

This data could include:

PT (Public Transport):

For each Jeepney route to be significantly impacted by project

- total daily passenger trips
- passengers getting on's and off's by stop or route segment (counted at stop or on board), by time of day (weekday daily total, am peak period, pm peak period, Saturday peak period)
- on-board passenger counts at key intersections by time of day
- O/D survey for routes significantly impacted by BRT:
    1. For statistical sample of passenger on routes:
        a. Personal characteristics such as worker? student? Income? Family size? Own car?
        b. Trip characteristics such as origin stop of trip?, destination stop of trip?, trip purpose? Time of day trip started, time ended
- Jeepney and bus operating and maintenance costs, wage rates
- Current Jeepney and bus depots, parking, other operating and maintenance arrangements.

A summary of current Jeepney business practices, including "dispatching," (where relevant), crew payment, revenue accounting, maintenance management, etc

Travel times: For every segment (intersection to intersection) over public transport (Jeepney) route alignment(s), times (peak, off-peak) period spent:

- moving
- stopped at signals
- stopped because of pedestrians
- stopped because of traffic
- stopped to pick-up/discharge passengers

As part of this task, the consultant will adapt GPS-enabled cell phones which will be provided to a selected sample of Jeepney operators to track the movement of Jeepneys over their respective routes. Drivers will be trained in their use. Software applications will be developed and/or implemented that will summarize this data for service planning to be done as part of this feasibility study work and other FS purposes. The software and related manipulation software will be handed off to the entity ultimately responsible for public transport management and oversight in Cebu.

General Traffic (vehicles)

1. traffic over critical segments – daily and by time of day (am peak period, pm peak period) – classified by auto/truck/bus/bicycle
2. b, turning movements at critical intersections

Bicycle and pedestrian "traffic"

1. At critical intersections
2. Along, across critical segments

Define the alternatives considered

1. Describe alternatives considered and compare them on technical, economic, environment, and social merits. The concept of alternatives extends to siting and design, technology selection, rehabilitation/construction techniques and phasing, and operating and maintenance procedures.

The data described above assumes that network and travel models are in place from the DOTC study. If that is not the case, additional information will have to be collected. Even where data such as the above is available and was utilized in the Pre-FS, its age may require new data to be collected for the FS.

Product:

- Databases and/or working models for input to analysis tasks
- Inception Report on status of development and transport in the demonstration corridor
- Report on analysis of alternatives for the BRT and their comparison on technical, economic, environment, and social considerations.

Task II: Analysis of the Current and Expected "No Project" Situations: The highway, public transport and non-motorized transport elements of the multi-modal system will be described/analyzed in both segment of the demonstration corridor in terms of supply (e.g., quantity of infrastructure, condition), demand (e.g., daily, peak period, peak hour public transport private vehicle travel) and performance (e.g., speeds, travel times, reliability, safety, related air quality, user satisfaction).
Urban and land development issues will be covered as well.

To the maximum extent, data and information will be drawn from the existing studies. Other relevant additional studies related to both transport and development (ADB study for SRA) will be included. Any new issues beyond those specifically treated in the Pre-FS will be called out, along with whatever modifications in the study plan that might be needed because of them.

Task III: Confirmation of all elements of BRT concept plan and subsequent preparation of preliminary plans:

- Over-all corridor service and operating plans, including BRT and conventional PT system (i.e., Jeepneys)

- Design of all hard elements dedicated running ways, stations, terminal/ interchanges, depots and ancillary facilities like sidewalks and bikeways and protected pedestrian crossings
- Traffic engineering improvements to make BRT and other public transport services safer and more secure
- Vehicles including internal/external layout, floor height, propulsion system
- Systems, including fare collection, AVL/computer–assisted dispatching and real-time service supervision, real-time passenger information, communications, passenger safety and security, and business management

The purpose of this task is two-fold. First, to confirm concept design decisions available from earlier studies, and Second, to describe the particular system element in the greater detail need to begin implementation. Each element of the concept plan will be described below in terms of issues and required work:

1. Service and Operating Plan: This task will incorporate an iterative process in which BRT route alignments are iteratively analyzed in terms of:

- physical and operational feasibility reflecting better knowledge of right of way and operational constraints on level of service
- Demand estimated using more detailed and capable network and travel models.

More than BRT should be considered in service plan development. Plans for service patterns for other public utility vehicles, i.e., Jeepneys, suburban buses should prepared and physical and operational integration needs specifically identified to that they can be incorporated into preliminary plans for physical and operational elements.

On the operations side, the focus should be on how BRT and other corridor services will actually be operated and maintained in the context of the over-all institutional context and business model selected for BRT's implementation and subsequent operation. This task will include development of specific business practices and processes for jeepneys in the context of their role in the new public transport system which will include a BRT component.

Though the issue of institutions will be covered in detail under another contract, care should be exercised to ensure that system and facility designs are consistent with the selected institutional and business framework that emerge from it.

Of particular interest to Cebu City and the World Bank, the consultant will explore ways that simple, easy to purchase and operate smart phones (GPS enabled) and appropriate applications could be used by jeepney operators to provide basic real time data (e.g., speed, delay, travel times) for use in monitoring by the entity ultimately responsible for public transport oversight as well as in service planning (first addressed in Task I). The consultant will also explore how the technologies could be used to assist Jeepney operators in performing the business practices and processes called for in this task. The objective here would be to make jeepney services faster and more reliable for both operators and customers, and increase load factors to make jeepney operations more financially sustainable.

2. Design of all civil works, e.g., hard elements dedicated running ways, stations, terminal/ interchanges, depots and ancillary facilities like sidewalks and bikeways and protected pedestrian crossings A much higher level of detail compared to the Pre-FS will be incorporated into all design activities in terms of mapping, plans and the explicit treatment of subsystems and BRT element components.

- Stations and passenger interchange terminals: Preliminary plans for each terminal or class of station, including off-transit way facilities, will be prepared. Longitudinal locations as well as locations in roadway cross sections will be confirm at a preliminary plan level of detail.

Care will be exercised to ensure system integrity between platform heights and lengths, platform edge door locations (need to be studied) with the service plan and vehicle specifications. Utility, major structure and other infrastructure plans will be reflected in the analysis and incorporated into preliminary plans.

Pedestrian, bicycle and private vehicle access provisions should be incorporated into location and design decisions. Provisions for tricycle and taxi stands, bicycle/motorcycle and even auto parking should be made as appropriate. The design of all civil works should explicitly consider the branding theme developed for the system as well as architecture consistent with Cebu's history and climate and integration into the immediate urban environment of each facility. This is critical for the design of stations and passenger interchange terminals.

Traffic engineering improvements to facilitate access by Jeepneys and other public utility vehicles at stations and especially end-of-the- line terminals should be explicitly treated. Special attention should be paid in the station and terminal design activity to how the BRT system and particularly stations and interchange terminals can be used to induce sustainable land use patterns at both the macro and site plan levels.

Safe, secure, attractive and comfortable (shaded) pedestrian access, including street crossings: Large numbers of pedestrians will need to cross the street to gain access/egress to/from BRT stations and interchange facilities. Specific provisions should be made at each facility for this purpose. Though surface, at grade access via sidewalks and signal-protected crossings is preferred, there will be situations where flyovers or underpasses are indicated. These should be designed with a special focus on access for the disabled.

It should be assumed that all facilities will be designed to be accessible to and useable by the disabled and other mobility impaired individuals per the BRT Accessibility Guidelines promulgated by the World Bank.

During station and especially terminal planning and design, major emphasis should be placed on integrating the respective facility into its surrounding urban environment from an aesthetics perspective.

The possibility of using facilities to "anchor and induce" adjacent sustainable urban developments for environmental and financing reasons should be explored. Making formal provision for kiosks and other retail services while preventing informal hawkers from taking over public areas is another issue that should be considered.

Signage, way-finding and for other functions and graphics and "art in transit"" should be considered as part of the preliminary design process and costed.

- Depots: Depots, needed to support operations (vehicle fueling, cleaning) and for over-night BRT vehicle storage/parking, routine and other maintenance, should be located and preliminary plans prepared in the FS. The functions outlined in the Pre-FS must be accommodated, including:
    - Bus parking area
    - Employee / visitor parking
    - Taxi / PUJ drop off / pick up
    - Administration offices, canteen and rest areas for staff
    - Bus fuelling / wash area
    - Fuel storage area
    - Inspection and maintenance area

Depending on how the institutional arrangements and operating plans are defined, the functions to be incorporated into the design may include heavy maintenance (e.g., rebuilding of engines and transmissions, major body work, etc.)

Special attention should be paid to community and environmental impacts as well to how sustainable development principals can applied in construction and operation with respect to water, power and other natural resources.

- Running ways: A major issue in running way design is the need for passing and how it might be accommodated at stations or otherwise. The service plan will naturally drive this process while consideration is also given to physical and operational (i.e., traffic) constraints.

A variety of pavement structures should be explored, with the objectives of cost (life cycle) - effectiveness and providing structural integrity and maintainability given the great loads applied by virtually 18 hour, 7 days per week BRT operations. This is especially an issue in the vicinity of stations and terminals where BRT vehicles will be decelerating, standing and accelerating with tires track in a very small, defined (need to line up doors and minimize vehicle platform gap) area. There will also be a focus on drainage, something that is very important in Cebu. Pavement markings and signage should be considered, shown in plans and costed.

A major assumption that should be reflected in design and costing is that the pavement will be colored (at least the surface) maroon (European standard), green (New Zealand) or yellow (Japan) for enforcement, marketing and passenger information purposes.

3. Traffic engineering improvements to make BRT and other public transport services safer and more secure: BRT systems generally have at least some locations where there is an interface between general traffic and BRT services. In the best of circumstances, these locations will be limited to at-grade intersections. In the case of Cebu, the demonstration corridor provides opportunities to construct dedicated running ways in only limited locations so the need for traffic engineering specifically to facilitate public transport operations is much more important.

Creative "traffic engineering for transit" will have to be undertaken to ensure that a BRT level of service – speed, reliability and safety can be provided everywhere.
Treatments will include "virtual bus lanes," signal priority and other forms of traffic management, turn prohibitions of all kinds, intersection channelization, grade separation, etc.

With the more detailed ridership forecasting and more detailed service and operational analyses to be accomplished in the FS, the elements of vehicle design should be recommended. In addition to vehicle size/capacity, an analysis of various door and seating configurations should also be done in the context of the demand estimates made and service and operations plans adopted in the FS.

The earlier studies have identified a range of propulsion systems for BRT. A much more in depth alternatives analysis will be done as part of the FS. The focus of this analysis will be on emissions and energy efficiency – fuel consumption, local pollutant and green house emissions and noise. It will have to look at all "clean" propulsion options, including various forms of hybrids, gas-fueled (CNG, LPG), spark ignition as well as clean diesel. This analysis will cover life cycle costs, fuel availability, maintainability in the specific Cebu operational context, and any other relevant factors.

4. Systems, AVL/computer–assisted dispatching and real-time supervision, real-time passenger information, communications, and business management*:* The key objective of work under this task is to prepare functional specifications for all intelligent systems needed for BRT, including but not necessary limited to the ones noted. Enough detail should be provided to enable accurate implementation, operating and maintenance costs to be prepared and bidding documents to be issued during subsequent project implementation at a later date.

It should be a core task of the Feasibility Study to develop business decisions, and to then make a definitive, rational choice about the fare collection technology.

Products: The following milestone reports and/or memoranda should be produced by this task, with timing consistent with the work of this and other tasks:

- Proposed Service Plan, Report
- Preliminary Plans for Running Ways, Report
- Analysis of Vehicle Options, Proposed Functional Specifications; Technical Memorandum
- Traffic Engineering for Demonstration Corridor BRT, Report

- ITS Applications for Cebu BRT, Proposed Functional Specifications (not including fare collection), Report
- Fare Collection System Functional Specifications, Report, to be prepared after completion of institutional arrangements/business model tasks and relevant decisions

Task IV: Passenger/Travel forecasting:

The currently underway DOTC Strategic planning effort has an elaborate household travel survey, other demand data collection and modeling efforts contained in its scope. The study is expected to be completed by October 2011. If that work is indeed complete, and a practical and implementable four-step model is available for use in this FS, then this task will adapt it to focus on the demonstration corridor. If the requisite data has not been collected, cleaned and models prepared and calibrated, than a demand analysis approach beyond that used in the Pre-FS but simpler, less time and resource consuming than a conventional 4-step model will have to be developed using existing data compiled or new data collected specifically for that purpose.

The approach could be as simple as development of a zonal-level public transport network in the corridor and conducting a Jeepney and Taxi on-board surveys, assuming that these are two modes from which almost all BRT riders will come. The resultant total current public transport trip table could be grown using employment and population growth factors applied in a "Furness" or "Fratar" framework.

Application of the requisite elasticity's or a pivot-point model could be used to account for additional public transport ridership attracted by a higher level and quality of service to transit.

The resulting trip tables could be "split" between Jeepney, Taxi and BRT services using a mode choice model "borrowed" from Manila or updated from earlier Cebu studies, and the output BRT trip tables assigned to the network to obtain a more accurate estimate of the total demand, maximum load point volumes, station boarding's and alighting's, access volumes. Etc. needed for preliminary design, environmental assessment and financial planning purposes.

An explicit "reasonability checking" process for all results will be included in the demand forecasting task.

Products:

- Technical memorandum describing the travel model that will be used, its development, calibration and validation and proposed input assumptions
- A milestone report documenting the results of its application to the preliminary BRT system scheme emerging from the other confirmation and preliminary design tasks

Task V: Traffic Management and diversion plans.

The BRT will involve construction along a busy corridor and is likely to result in traffic disruption during the construction period. The consultant will develop a detailed traffic management and diversion plan to minimize disruption and include the cost of traffic diversion as part of the project cost. There would also be significant impact on motorized traffic and pedestrians during the BRT operational phase with a reduction in the number of lanes available to "other motorized traffic" and the consequent impact on pedestrians and sidewalks. The consultant will develop a detailed plan to assess the impact during the post-construction period.

Product: Traffic management plan during construction and post-construction period to address the concerns of both motorized and non-motorized traffic (including pedestrians)

Task VI: Capital, operating and maintenance costing, revenue estimation and preparation of a detailed financial plan

All sources and uses of funds will be estimated and shown in the financial plan over the life of the project. These will include initial implementation costs covering all infrastructure, equipment, rights of way and systems as well as the sources of funds proposed to meet them.

Cash flow analyses over the life of the project (Opening plus five years) should be prepared under different sets of cost and revenue assumption covering a range from conservative to very conservative.

All costing should be done at a level of detail consistent with a preliminary design effort where a hard financial plan must be developed. A multi-factor, fully allocated operating and maintenance cost model should e developed for BRT reflecting accept international practice, required labor and other resources and Cebu specific unit costs.

On the capital cost side, contingency factors consistent with a preliminary design level of detail should be applied by system element, at an appropriate level of disaggregation (e.g., higher for utility work than for vehicles).

Revenue estimates will reflect the adopted institutional arrangements, business model and fare policy as applied to estimated ridership volumes. The adopted, final fare assumptions used to estimate ridership (proposed BRT fares, both in the absolute and relative to current and future Jeepney and taxi fares should be the same as those utilized to estimate operating revenue.

An evaluation of the potential for the project to generate non-operating revenue, e.g., from retail rentals at stations and terminals, to on-board and station/terminal advertizing should also be explored and conservative estimates made. The potential of using a PPP between Cebu City and the development community for providing construction financing via a "joint development" arrangement should also be explored.

Products: Technical memorandums describing development of the operating and maintenance costing and capital costing models and the results of their application; A milestone report containing the proposed financial plan with exhibits and schedules consistent with the role of the financial plan in initiating implementation

Task VII: Project Appraisal:

Following World Bank project appraisal guidelines, work under this task will evaluate the project in terms of ***all*** relevant factors. To the maximum possible extent, travel time savings, vehicle operating and maintenance reductions, pollutant reductions of all kinds, reductions in accidents and fatalities, etc., will be quantified and monetized and the requisite rates of return, etc. calculated.

The consultant will also explore opportunities for maximizing private sector involvement as part of the appraisal and propose alternative models for PPP.

Every major urban transport project involves significant risk. Cebu BRT is particularly important because there is risk in almost every aspect of the project such as:

- Political risk associated with unsolicited proposals for potentially competing "rival" investments like LRT
- Political risk from government or the private sector (e.g., Jeepney owner/operators) actors who may feel threatened by the project
- Risk associated with right of way acquisition
- Financial risk
- Environmental and social risk
- Operating/design risk

All of these potential sources of uncertainty should be explicitly accounted for in each of the relevant tasks above, but this task should summarize them along with specific recommendations for mitigating them, taken from the products of other tasks or developed exclusively by this task.

Product: Milestone Project Appraisal Report, risk analysis and PPP options

Task VIII: Estimation of CO2 emissions

Climate Change Mitigation Framework: A GHG emission monitoring and evaluation framework to understand the scale of climate change mitigation potential of PPP arrangements in urban public transport delivery, and to evaluate the implications of such potential on vehicle providers, service operators, and facilities service providers were such efforts to be scaled up substantially. The specific objectives are: i) to develop Cebu-specific drive cycles for enumerated vehicle types and estimates of vehicle-kilometers by enumerated vehicle types; and ii) to generate estimates of GHG emissions from project and baseline scenarios.

Product:

- Develop Cebu-specific drive cycles for enumerated vehicle types and estimates of vehicle-kilometers by enumerated vehicle types

- Generate estimates of CO_2 emissions from different scenarios

Task IX: Establish operating procedure.

The operating procedures and standards should define the principal characteristics for each component of the BRT with the objective to contribute to the vision of developing an integrated, customer focused, high quality public transport system, which is affordable, environmentally friendly and helps promote regional development. The key focus will be on:

i. Develop comprehensive operations strategy for the BRT system and BRT-related routes, including targets and performance measures
ii. Develop comprehensive operations management procedures for BRT-related routes
iii. Develop comprehensive procedures for organisation and management of the BRT running way and junctions
iv. Develop comprehensive procedures for operations management of BRT terminals and bus-stops
v. Develop comprehensive procedures for enforcement
vi. Establish internal organisational structure with capacity to deliver effective operations management

Product: bus operational and service plan and procedures

Task X: Preparation of a plan for integration of BRT into land development plans, strategic and site level, current and proposed:

Earlier it as noted that all civil works, especially stations and passenger interchange terminals would be designed with an emphasis on urban design integration, that is making all public transport facilities, including depots, fit into as well as enhance the aesthetics of their surroundings.

This having been said, there is a very positive urban development objective that must be considered during preliminary design. The objective of using the Cebu BRT system as a focal point for sustainable, mixed use, walkable and bikable urban development is to be highlighted in this task. This, especially important in a city as rapidly growing as Cebu will require specific attention to connections from BRT stations and terminals to surrounding development, connections that should be highlighted in detail by this task.

This is obvious with respect to the South Reclamation Area, but there are other important new developments planned in both segments of the demonstration corridor where this objective will also be important and these should be another focus of work under the task.

Station locations have to reflect market realities, but must also consider how the development objectives for the project can best be served.

The consultant will examine the inter-relationships between the BRT pilot route and the SRP access strategy focused on developing an integrate approach. Of particular mention is the Mambaling road which links the BRT route with the SRP access road and develop an integrated approach.

Product: Milestone Report on the use of BRT to foster Sustainable Development in Cebu and integrated evaluation of BRT pilot and SRP access strategy

Task XI: Preparation of a formal stakeholder/public involvement and communications plan:

A robust communications program has been the key to the success of most BRT projects. It is important to have a formal plan early in the FS process both to gain input and support and to properly budget sufficient resources.
This communications program will have three components:

- informing the public on the progress of the BRT development program
- making sure that the project team understands the needs and values of all stakeholders as well as obtaining stakeholder counsel and advice in the run up to milestone decisions (e.g., final alignment of running ways, station/terminal locations)
- after important milestone decisions have been made, "marketing" the decision to all stakeholders, especially those in the private public transport sector and the general public

Special attention will be paid to existing public transport (Jeepney) franchisee/operators and labor (driver, conductors, mechanics) in preparation and execution of the communications plan.

Activities may include focus group meetings with citizens and other stakeholders, satisfaction and attitude surveys, development and maintenance of a project website, stakeholder workshops and public meetings, etc. The client (Cebu City) will provide the following a liaison officer to work with the consultant.

Products: Communications and consultation plan, various communications materials, notes for each major focus group survey, stakeholder workshop or public meetings

Customer satisfaction survey for all users along the corridor

Task XII: Preparation of a brand concept and related graphic and design criteria

Much of the success of BRT systems throughout the World can be traced to the establishment of a "Brand" theme for them and the reflection of that theme in all hard

facilities, equipment and passenger interfaces. The brand them not only differentiates BRT from other surface modes (e.g., Jeepney, other bus services) in the competitive market places in terms of parameters important to customers (e.g., speed, reliability, comfort, convenience, safety and security) but also provides visual clues to station locations and service routing and schedules.

Work under this task will involve market research that translates into a name for Cebu BRT and related Banding elements like color and other design themes for vehicles/stations and terminals, graphic design, etc.

Product: Milestone report on BRT brand-related market research and the resultant branding recommendations

Task XIII: Support in developing environmental and social alignment sheets

The government will engage services of a consultant to produce a detailed Environmental Assessment report. The feasibility study consultant will provide engineering support to the environmental team in the following areas:

- preparation of environmental alignment sheet, including information on specific project alignment, layout and location of facilities, flow diagrams, design basis, size, capacity, pre-construction activities, construction activities, schedule, operation and maintenance activities. Provide maps at appropriate scale to illustrate the general setting of project-related development sites, as well as surrounding areas. The maps will include location of major project investments, including depot, terminals, stops, off site activities, etc.
- document the impact on current jeepney operators, safety, traffic calming measures, special design in critical junctions as part of mitigation measure, special measures to be taken during construction.
- Identify specific information for enforcement by the engineer to be included as contract clauses
- Identify specific construction activities both along the main BRT corridor as well as the traffic diversion route (during construction period) which impact the general environment

IV. Outputs

1. Inception Report: This will include preparation of a detailed work plan, including study organization and staffing, budgets and schedules, project management processes reflecting all tasks; summary of all tasks to be performed, including the study plan, work program, schedule, mobilization.

2. Interim Reports:

1. Feasibility Report, including proposed Service Plan, preliminary plans for running Ways, analysis of vehicle options, proposed functional specifications; traffic engineering for demonstration corridor BRT, ITS Applications for Cebu BRT, Proposed Functional Specifications (not including fare collection), fare collection system functional specifications
2. Report on travel model that will be used, its development, calibration and validation and proposed input assumptions; a milestone report documenting the results of its application to the preliminary BRT system scheme emerging from the other confirmation and preliminary design tasks
3. Traffic management plan during construction and post-construction period to address the concerns of both motorized and non-motorized traffic (including pedestrians)
4. Technical memorandums describing development of the operating and maintenance costing and capital costing models and the results of their application; A milestone report containing the proposed financial plan with exhibits and schedules consistent with the role of the financial plan in initiating implementation
5. Milestone Project Appraisal Report, risk analysis and PPP options
6. Technical memorandum on bus operational and service plan and procedures
7. Milestone Report on the use of BRT to foster Sustainable Development in Cebu and integrated evaluation of BRT pilot and SRP access strategy
8. Milestone report on BRT brand-related market research and the resultant branding recommendations

3. Draft Final Report

4. Final Report

V. Consultant Skill Mix Needed to Successfully Carry Out Work

Because of their flexibility, BRT projects require a unique skill mix to successfully plan and implement. Unlike the situation for other rail-based rapid transit modes, there is more of an emphasis during planning and project development in developing cities on "soft-side" activities such as service and operations planning, marketing and branding, communications, finance and institutional analysis.

Given Cebu's significant growth and history, emphasis should be placed during preliminary design on station/terminal architecture and urban design integration in addition to the traditional civil works and equipment engineering activities more commonly emphasized in major transport projects.

The successful team will be comprised of both local and international expert with the specific experience and background noted. International experts proposed as managers should have experience in developing city contexts. It is suggested that in putting

together its team, consultants consider designating individuals with the following roles, responsibilities and backgrounds:

The core staff to be evaluated will include: Project Manager, Public Transport Service and Operations Planning Manager, and Social/Environmental Specialist. Other specialists will be pass/fail.

Project director/manager with experience as the over-all project manager or director for some stage of BRT rapid transit project, preferably BRT, on at least 3 projects. The project manager director must have at least 20 years general experience in public transport planning and design, with an emphasis on project planning and development work for rapid transit projects successfully brought to implementation and operation. The project manager will commit much of his time based in the field.

Design Manager will oversee all design activities with an emphasis on system integration for BRT. The design manager must have at least 15 years general experience in public transport planning and design, with an emphasis on project planning and engineering work, including stations, terminals, depots and running ways for rapid transit projects successfully brought to implementation and operation

Public Transport Service and Operations Planning Manager will oversee all service and operations planning activities. This person should have at least 15 years general experience in public transport service and operations planning with with specific background on bus rapid transit projects successfully brought to implementation and operation.

Communications and Branding Manager will oversee all marketing, brand development and communication activities/This person should have at least 15 years general experience in public transport marketing and communication with specific experience in brand development and public involvement for public transport.

Architecture and Urban Design Manager will oversee all design activities from an aesthetics and urban design perspective. This person should have at least 10 years general experience on public transport projects successfully brought to implementation and operation.

Economic and Financial Planning/Appraisal Manager will oversee costing, appraisal and financial planning activities. This person should have at least 10 years general experience in public transport economics, finance and appraisal, with specific background on any type of rapid transit project successfully brought to implementation and operation.

Social/Environmental Specialist will oversee all environmental and social assessment activities. This person should have at least 10 years general experience in planning major urban transport projects, with specific background in the application of relevant World

Bank Guidelines and practices and on any type of rapid transit project successfully brought to implementation and operation.

Traffic Operations, Management and Safety Manager will oversee all activities intended to make BRT and all related public transport services safe and reliable with respect to general vehicular traffic. This person should have at least 10 years general experience in "traffic engineering for public transport, with specific background in planning public transport priority projects on any type of successfully brought to implementation and operation.

VI Person months requirement and other logistics: The assignment is expected to take about 30 person months.

VII. Schedule

Task/Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1) Detailed work plan preparation	X							
2) Communications Plan, branding development	X	X	X	X	X	X	X	
3) Data/information compilation, collection	X	X						
4) Analysis of current, do-nothing	X	X						
5) Preparation of preliminary plans		X	X	X				
6) Travel Forecasting		X	X	X	X			
7) Preparation of a Financial Plan					X	X		
8) Project Appraisal Report, including financial and economic analysis, PPP, risk analysis				X	X			
9) Traffic management plan								
10) Preparation of Land/Transport Integration Plan				X	X	X		
11) Preliminary design								
12) Draft Final Report						X		
13) Workshop							X	
14) Final Report							X	X