Establishment of Medical College and Up-gradation & Modernizing the Railway Hospital at Chittagong, Bangladesh

Inception Report- Phase I

May 2015

26th May 2015

To
Chief Executive Officer,
Public-Private Partnership (PPP) Office,
Prime Minister's Office,
AIMS Tower (Level 13), 51-52 Mohakhali,
Dhaka-1212

Dear Sir,

Subject: PPP Transaction Advisory Services for establishment of medical college and up-gradation & modernization of existing Railway hospital at Chittagong – Submission of Inception Report for Phase I– Reg.

Reference: Contract no. PPP/TA/Dhaka-Chittagong Railway Hospital-208/2014 dated 09.04.2015

This is with reference to the subject mentioned above. We are herewith submitting the Inception Report for the subject project.

This Inception Report presents our understanding of project context, approach & methodology, proposed work plan, deliverables & timelines for Phase I of the project. In addition to this, a brief project overview is also presented in the report.

Yours sincerely,

Ashok Varma, Partner
PricewaterhouseCoopers Private Limited
DN 56& 57, Block DN, Sector V,
Salt Lake, Kolkata 700091
Telephone: +91(33)44043099, +91(33) 23579101
E-mail: ashok.varma@in.pwc.com

Table of contents

List of Tables

List of Figures

1. Background and Scope

1.1. Background

Bangladesh Railway, a government owned transportation agency of the country is the sole agency responsible for all railway operations of the country. It covers a length of 2855 km railway track linking the entire length and breadth of the country. Bangladesh Railway operates a number of hospitals catering to railway employees across different parts of the country. Many of these hospitals need to be upgraded with the latest equipment and expanded to cater for the growing demand and need for health services. Chittagong railway hospital at Central Railway Building (CRB), Chittagong is one of such hospital. In view of this, Bangladesh Railway proposed to upgrade and modernize this hospital and also establish a medical college and nursing institute under Public Private Partnership (PPP) mode. The proposed project has received in-principle approval by the Cabinet Committee for Economic Affairs (CCEA) on 14th August 2013. Bangladesh Railway requested support from PPP office, Government of Bangladesh for project development and transaction advisory services. Accordingly PPP office, Government of Bangladesh through a competitive bidding appointed PricewaterhouseCoopers Pvt. Ltd (PwCPL) as transaction advisor for the project vide contract no. PPP/TA/Dhaka-Chittagong Railway Hospital-208/2014 dated 09.04.2015. A kick off meeting with the client was organized on 11th May 2015 for discussing and finalizing the methodology and project timelines. As per the contract, an Inception Report is required to be submitted which will cover the methodology to be followed, work plan, deliverables & timelines for various activities of Phase I of the project.

1.2. Objective of the Assignment

The objectives of the assignment are:

- To assess the technical, commercial, financial, environmental and social viability of the project
- To structure the project and assist in the bidding process and award the project in a manner which ensures maximizing private sector participation in the bidding process, mobilizing private sector investment towards capital cost and optimizing the revenue potential of the project.

1.3. Scope of the assignment

The scope of services for the assignment is divided in to two phases as below:

- Phase I: Detailed feasibility study and project development
- Phase II: PPP procurement process development and implementation

Phase I: Detailed Feasibility Study and Project Development

- Identification of the requirements of the project including land, critical inputs, utility services and access arrangements
- Study the availability and level of service of physical infrastructure
- Broad technical assessment including site location & connectivity, land profile, access, water source, constraints if any from construction point of view, general cutting & filling area, boundary demarcation, requirement and use of open space and requirement of other facilities (e.g. parking, shop etc.)
- Prepare estimates of capital and operating costs of the project
- Develop required technical design, animation, graphical presentation etc. to display site planning and indicative layout and illustrative outline of the complex
- Identify responsibilities of /service to be provided by Bangladesh Railway.
- Assess how the provision of services to the Bangladesh Railway employee can be optimized with enhanced service provision and element of pro-poor

- Regulatory Review and Stakeholder Consultations
- Environmental and Social Impact Assessment
- Demand Assessment and market study
- Financial Analysis and PPP Transaction Structuring
- Project Risk Assessment
- Heads of Terms for Concession Agreement
- Procurement Plan

Phase II: PPP Procurement Process Development and Implementation

- Preparation of Procurement Documents
- Engagement with Market
- Project Management and Governance Arrangements
- Commercial and Financial Support
- Procurement Support
- Early Operations Support
- Training & Transfer of Knowledge

1.4. Content of this Report

This Inception Report covers the following aspects:

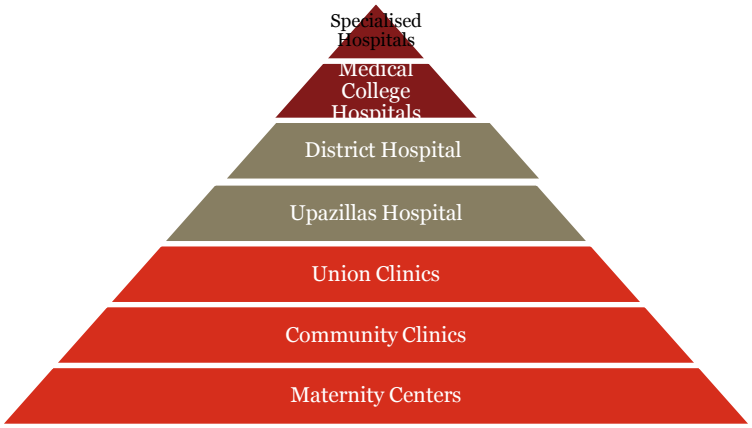
- Project overview
    - Our understanding of the project context
    - Project rationale & objective
    - Project location
    - Applicable regulations
    - Key issues & challenges
- Approach & Methodology
- Proposed work plan for phase I
- Deliverables & Timelines for phase I
- Way forward

2. Project Overview

2.1. Healthcare overview of Bangladesh

2.1.1. Public Healthcare delivery network

Figure 1: Public Healthcare Network in Bangladesh

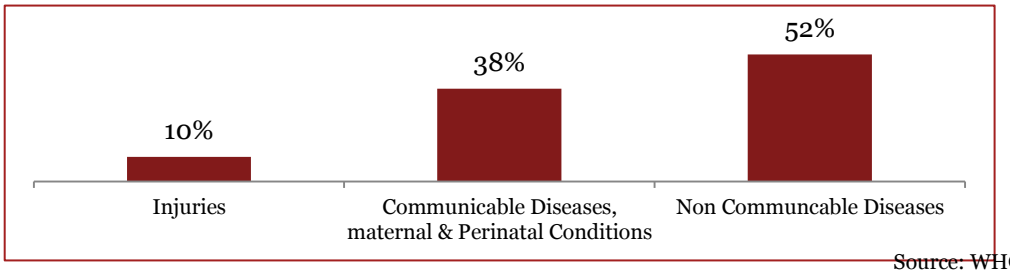


The public health system in Bangladesh represents a sizable network of health facilities at all levels of care. Specialized hospitals are national level "centers of excellence" offering treatment in tertiary care specialties. At the district level, Medical College Hospitals (500+ beds) commonly referred as teaching hospitals and District Hospitals (100-250 beds) are located. Upazilla Hospitals (10-50beds) are located at sub-district level and supervise public health programmes. Union and community clinics are basically the rural health centres functioning at the community level.

2.1.2. Disease burden

Bangladesh is facing a dual burden of both communicable and non-communicable diseases. Although considerable progress has been made in communicable disease control, non-communicable diseases are showing a rising trend due to unhealthy lifestyle, tobacco use, and an ageing population. Communicable diseases of concern are malaria, tuberculosis, diarrhoea, vaccine preventable diseases, HIV/AIDS, endemic diseases such as kala-azar and emerging diseases like avian influenza. Non communicable diseases are the leading cause of mortality in the country and account for 52% of all deaths. CVD, cancer and respiratory are the main contributors in the mortality profile.

Figure 2: Leading cause of deaths in Bangladesh



Source: WHO

2.1.3. Health PPP scenario in Bangladesh

In August 2010, Government of Bangladesh issued the Policy and Strategy for Public Private Partnership (PPP) to facilitate development of core sector public infrastructure and services vital for the people of Bangladesh. Dialysis PPP project in National Institute of Kidney Diseases and Urology, Dhaka and Chittagong Medical College Hospital has demonstrated government's objectives in improving public health infrastructure and services. According to a global report, Dialysis PPP project

is featured amongst top 100 infrastructure projects. In addition, there are numerous Health PPP projects identified by government to be rolled out in future.

2.2. Healthcare overview of Chittagong

2.2.1. Introduction

Chittagong is the second-largest city and main seaport of Bangladesh with a population of 7.6 million and population density of 1442 persons per sq. km. It is located in the southeastern region of the country at the mouth of the Karnaphuli river. The main segment of the population comprises of business owners and individuals with jobs who have greater purchasing power.

2.2.2. Healthcare Infrastructure

Chittagong has second highest no. of government owned secondary and tertiary care hospitals after Dhaka in Bangladesh. Majority of the population is dependent on the public healthcare infrastructure for their healthcare needs.

Public beds constitute more than 85% of the total beds in Chittagong; and majority of these beds are constituted by two public facilities viz; General Hospital & Chittagong Medical College. These two hospitals provide upgraded secondary care services to large section of society especially poor population.

Private beds constitute only 12% of the total beds, majorly providing secondary care services. Due to less no. of private facilities and absence of tertiary quality care, the paying population travel to Dhaka, India & Singapore for treatment.

Table 1: Existing Health Facilities in Chittagong

Facility type	Total	No. of beds
Medical college hospital	1	1010
General Hospital	1	250
Upazila Health complexes	14	736
No. of urban sub centres	73	-
No. of union health and family welfare centres	125	-
No. of Rural/Urban/Thana dispensaries	9	-
No. of community clinics	470	-
No. of trauma centres	1	-
No. of MCWCs	3	-
No. of Chest Disease Clinic (TB clinic/Hospitals)	1	-
No. of private clinics/facilities	105	245
Total	**803**	**2241**

Source: Civil Surgeon Office, Chittagong

2.2.3. Disease burden and prevalence

Communicable diseases including Diarrhoea, Acute respiratory infections and Malaria are most prevalent in the district specifically in children. Majority of the public and private hospitals in Chittagong offers specialty services like medicine, pediatrics and Gynecology while a few tertiary care hospitals treat cardiac ailments like hypertension, heart attack, myocardial infarction. This shows limited development of tertiary care infrastructure at district level and in semi urban areas.

Table 2: Top 10 diseases and % of patients admitted in district government health facilities

S no.	Disease	% of patients admitted in district government health facilities
1	Diarrhoea and gastroenteritis	7.40%
2	Bacterial pneumonia	6.43%
3	Asthma	6.27%
4	COPD with acute exacerbation	4.90%

S no.	Disease	% of patients admitted in district government health facilities
5	Peptic ulcer	3.93%
6	COPD	3.86%
7	Essential hypertension	3.28%
8	Poisoning by antiparasitics and anti –infectives	2.44%
9	Assault by unspecified means	0.74%
10	Assault by blunt object	0.52%

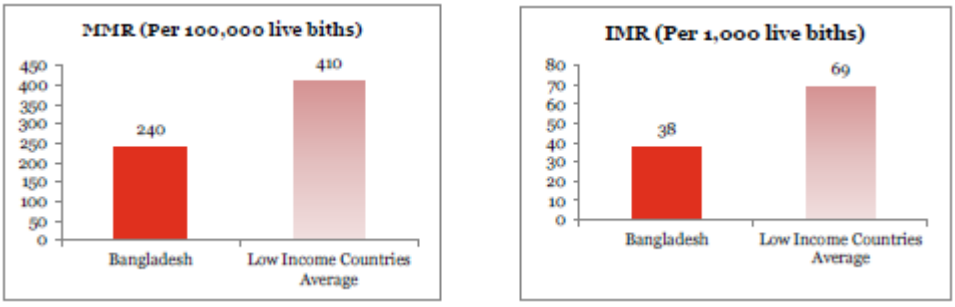
Source: Bangladesh Health Bulletin, 2014

2.3. Our Understanding of Project Context

Healthcare indices have shown improving trends in Bangladesh

Bangladesh with an estimated population of 160 million has made significant strides in delivering healthcare to its population. It's infant mortality and maternal mortality indicators are better than the average for low income countries.

Figure 3: Infant Mortality and Maternal Mortality Rate



(Source: WHO statistics, 2012)

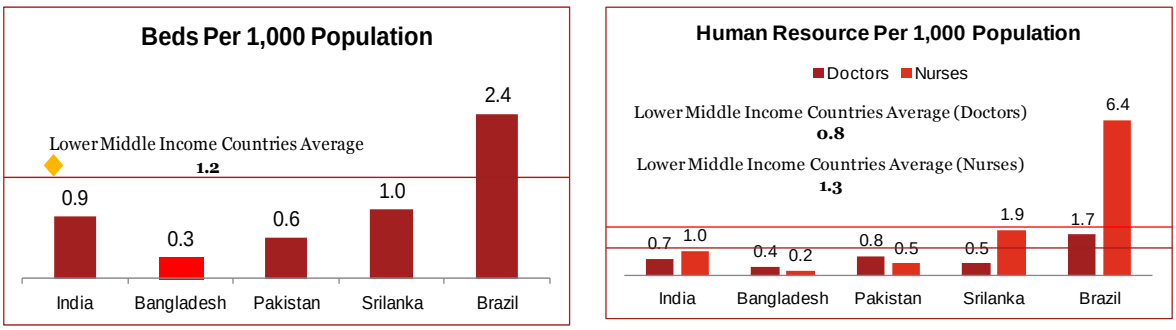
While healthcare indices have shown an improvement in the last 2 decades, the investment into both healthcare infrastructure and training has been low relative to demand.

The country is witnessing significant demand for quality healthcare infrastructure. Currently, the healthcare landscape in the country is marked by low public funding, shortage of beds and health workforce and low penetration of health insurance.

Healthcare infrastructure and human resource capacity in Bangladesh is a limiting factor

Bangladesh has 0.3 hospital beds per 1000 population which is far lower compared to the average of 1.2 beds for lower middle income country average. Similarly the health human resource (doctors and nurses) density of Bangladesh is lower than India, Pakistan, Srilanka and Bangladesh.

Figure 4: Beds and Human Resource per 1000 population



(Source: WHO Statistics, 2013)

Most healthcare facilities are confined to large cities with Dhaka becoming the healthcare hub for the country. With increasing economic prosperity, the demand for healthcare services in the country is bound to increase and there is therefore a need to develop sufficient facilities and infrastructure

Bangladesh Railways contributes significantly to the country's healthcare infrastructure

Bangladesh Railways today manages a vast network of health facilities, including hospitals, primary clinics. Railway hospitals & dispensaries form an integral part of its operations, safety of its employees and also fulfil the legal obligation as an employer to provide medical care to its workforce. In addition, it is also considered that providing health services to the employees is one of the social & customary traditions for Railways, and hence becomes essential for the department to ensure timely delivery of medical services. To summarize, Railway health facilities serves the following functions:-

- Provide medical care to railway employees & their dependents
- Deliver emergency medical services in accidents & mishaps
- Perform pre-employment health checks for the workforce

In terms of network of facilities, Bangladesh Railways today manages network of 10 hospitals and 21 dispensaries which is one of the largest amongst public sector undertakings in the country. Following table illustrates the network of health facilities under Bangladesh Railways:-

Table 3: Network of Health Facilities under Bangladesh Railways

Divisions	Hospitals	Dispensaries
Dhaka	1	10
Chittagong	3	4
Saidpur (Workshop)	1	2
Paksey	4	3
Lalmonirhat	1	2
Total	***10***	***21***

Source: Bangladesh Railways

However, with increasing demand for health services, Railway health system would require to expand its infrastructure. Hence, the challenge is to meet the employee expectations and to ensure that their "right to medical services" should not be curtailed. Managing & running health facilities are a complex & technical process and it is essential to ensure adequate infrastructure & human resources availability.

Our understanding of the key objectives of the project is as below:

- Exploring PPP as an effective means of attracting investments and expertise for expanding, upgrading and improving the effectiveness and efficiency of the healthcare services offered by the Railways.
- This shall also help Railways in focusing more on its core expertise of rail operations, providing better healthcare services to its employees and dependents and performing a larger national duty of making available better healthcare services to the general population of the country.

This project is also significant in the way that it intends to establish medical and nursing college along with the expansion of the hospital. Bangladesh faces an acute shortage of doctors and nurses and this project would go a long way in contributing positively to meet the healthcare requirements of the country.

2.4. Project Rationale and Objective

Demand for quality health services is significantly increasing amongst the population, owing to demographic & epidemiological transition, changing age profile etc. As such, railway health systems are

experiencing a need to revamp their services, infrastructure and deliver appropriate & affordable health services to the dependent population.

Railway health system in Bangladesh today faces challenges in providing quality & affordable medical care to its employees and for general population. With changing times, Railway has realized the need to revamp & modernize the healthcare facilities in the network, which could effectively, meet the medical needs of employees & dependent population. Moreover, human resource availability is also a key area of concern for successful management of health facilities and hence there is a need to find avenues for ensuring adequate supply of doctors, nurses and paramedics.

Partnering with private sector through PPPs could help Railways to deliver efficient & affordable health services and meet their strategic objectives of the provision of healthcare services

Public Private Partnerships (PPPs) in Healthcare has emerged as efficient mechanism to improve accessibility, affordability and quality of health services through leveraging private capital & managerial expertise.

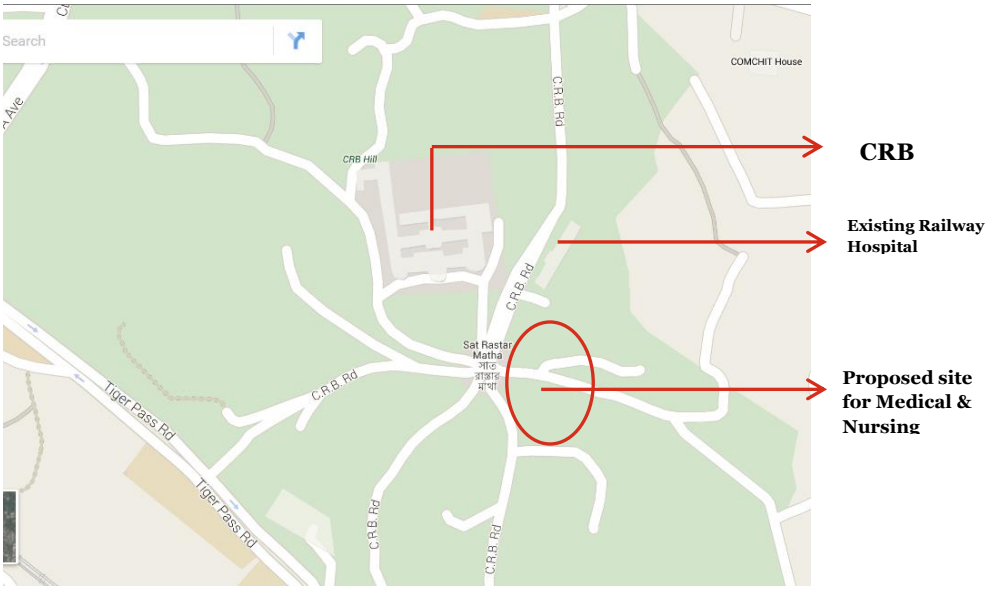
Private sector participation through PPP has the potential to provide additional resource mobilization and could augment the capabilities of Railways in delivering medical services more efficiently.

The proposed project could be an attractive proposition for private player, given the prime location of the railway hospitals, sizable proportion of railway employees and approximate similar size of general population (non-railway). Establishing medical college by Railways is an effective mechanism to utilize the unused land parcel and address the supply of medical human resources. In addition, this will also provide an additional source of revenue for Bangladesh Railways with effective commercial utilization of it non-core infrastructure

2.5. Project Location

The existing Railway hospital, proposed to be redeveloped, is located opposite to the Central Railway Building (CRB) along the CRB road in Chittagong. The site proposed by Bangladesh Railway for the medical and nursing institute is located towards southern side of the Railway hospital. The location of the project site and surroundings is depicted as below:

Figure 5: Project location



2.6. Applicable Regulations

During our initial research, following key regulations are found to be applicable for the project:

- Zonal regulations as per Detailed Area Plan for Chittagong Metropolitan Master Plan issued by Chittagong Development Authority
- Chittagong city building regulations 2008
- Rules & Regulations for establishing private medical colleges and administration 2011 (Revised) issued by Ministry of Health & Family Welfare, Government of Bangladesh
- Standard set up model for Human Resources needed for 10, 20,31,50,100,150,200,250,500 bed general hospital issued by Ministry of Health & Family Welfare, Government of Bangladesh

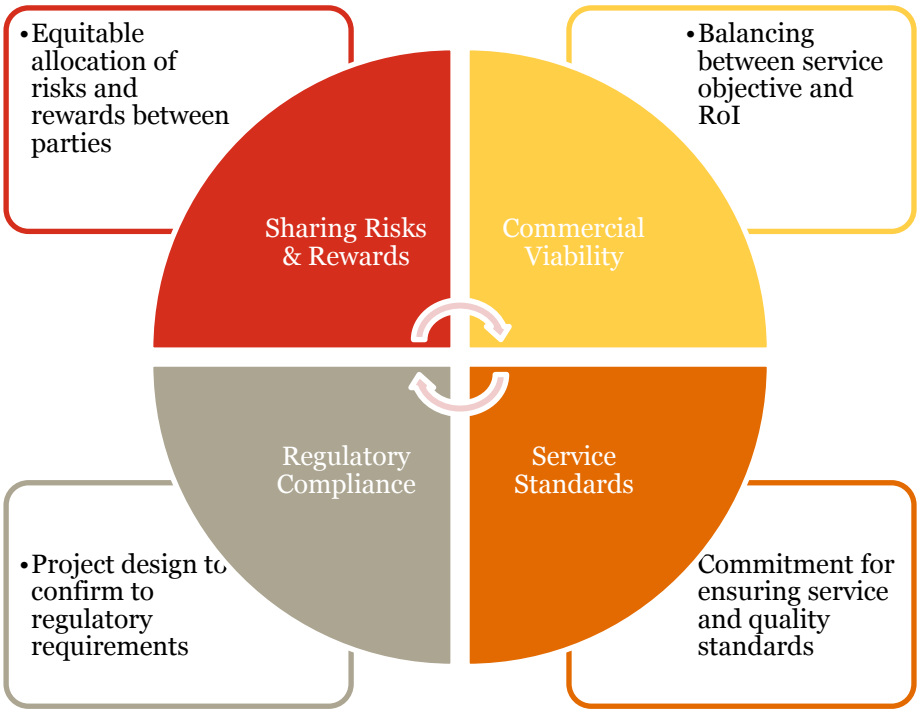
A detailed assessment of the aforesaid regulations and other related regulations if any will be presented in the preliminary findings report.

3. Approach & Methodology – Phase I

Our approach for the assignment shall be collaborative in nature and shall involve extensive stakeholder consultations and be based on deep industry and PPP expertise of the PwC team.

3.1. Guiding Principles for Transaction Advisory

Figure 6: Guiding Principles of Transaction Advisory



3.1.1. Sharing Risks & Rewards

Public Private Partnerships thrive on minimization of risks by way of allocation of risk to the partner better placed to manage the given risk. We will ensure that the project risk at various stages of development and operations are allocated to the partners based on their respective strengths. Also the project financials and returns needs to be structured in such a way that it ensures rewards for better performance thereby creating a win-win situation for private partner and government.

3.1.2. Commercial Viability

Ensuring commercial viability in private participation in public health services is perceived to be the biggest challenge in healthcare PPP. The government objective of providing affordable service to the bottom of the pyramid section of the society often conflicts with the private sector objective of return maximization. For the success of the project, it is utmost important that the financial viability of the project is taken care of at the project design stage.

3.1.3. Service Standards

Healthcare PPPs have a distinct feature of direct involvement with general public in large and being a service centered industry, quality of service at the operations phase is utmost important to ensure that Government perceives the value for money from the project in terms of satisfactory service to the general public.

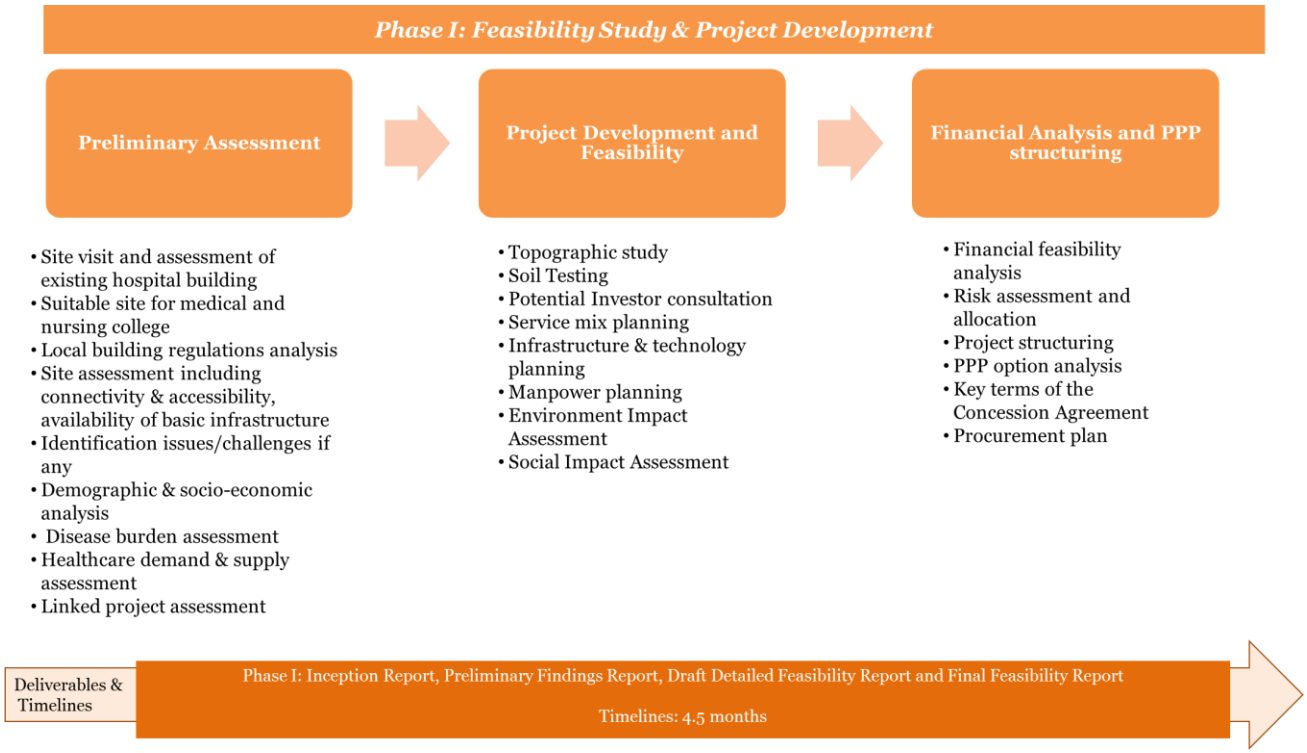
3.1.4. Regulatory Compliance

This plays a crucial role in PPP project cycle & overall project design. Broad objectives of ensuring statutory requirements laid down by government agencies like Department of Health & Family Welfare, Directorate of Medical Education and Chittagong Development Authority is to ensure that minimum service standards and applicable development regulations are followed. It is important that all the regulatory compliances are adequately taken care of at the project design stage to ensure minimization of any regulatory risks in the project and ensuring smooth implementation.

3.2. Our Methodology

Following diagram illustrates our overall methodology for the project

Figure 7: Our Methodology



3.2.1. Phase I: Detailed Feasibility Study and Project Development

Phase 1 of the project will encompass a detailed feasibility assessment, project development & transaction structuring. The project would require secondary research, primary research, interviews with stakeholders. PwC has already undertaken extensive market assessment study previously in all the major cities in Bangladesh (Dhaka, Chittagong, Sylhet, Moulvi Bazar)

3.2.1.1. Step 1: Preliminary Assessment

Preliminary Technical analysis

It will include preliminary technical assessment of the hospital project to understand the suitability of the location in terms of accessibility, site surroundings, applicable guidelines, development regulations like ground coverage, FAR (height and setback norms) etc. This will also provide us the understanding of future expansion possibilities. The activities will be in conjunction with local regulations in Chittagong for teaching hospital & college.

Key activities to be carried out as part of preliminary technical analysis will include:-

- Site visit and assessment of existing hospital building. Following data are required to be collected for assessment of existing hospital:

  - Site area
  - Available area & scope for expansion (Floor plans if possible)
  - Total no of beds & Operational beds
  - Number of paying Vs non-paying beds/subsidized beds
  - Room categories & % distribution
  - Number of floors, OTs
- Identifying a suitable site for the medical and nursing institute
- Identify any potential encumbrances on the project site
- Review & analysis of local building regulations
- Accessibility/Connectivity of the project site by road and distance from major landmarks like airport, railway stations, business and industrial establishments
- Assessment of trunk services available in the vicinity of site (including electricity, water supply, sewage & rain water disposal)
- Identify any issues/challenges like rehabilitation etc.

Demographic & socioeconomic analysis

Demographic Indicators

These will be done to provide an overview of population size, composition, major trends and other vital statistics in Chittagong. This will include the following information areas:

- **Current & Forecasted Population:** This will include estimated population of Chittagong and forecasted growth.
  - **Urbanization, Density & Growth Rate:** It will include analysis of level of urbanisation, population density & expected growth rate (annual/decadal) in Chittagong. This will aid in assessing the availability of existing infrastructure to meet the future demand of population.
  - **Age Group Distribution:** This will encompass the percent distribution of population by different age group such as child age group, working & elderly age group population. Age group distribution is an important measure to understand any demographic dividend and anticipate key trends.
- **Socioeconomic Indicators:** It will provide insights on social & economic components like literacy rate, education status, and economic profile. Key information areas to be studied in socioeconomic analysis will include:-
  - **Literacy Rate:** This will provide the educational level of the population. This is an important indicator and bear linkages with health seeking behavior of population. Educational level of population has a direct correlation with health outcomes & utilisation of services
  - **Economic Indicators:** It will include analysis of key economic indicators of Chittagong including per capita income, main trading & economic activities etc. This will provide an indication of affordability of local population & their purchasing power

Disease Burden Assessment

We will undertake an assessment of existing disease burden (communicable & non communicable) in Chittagong, to understand the major health conditions. This will be essential in developing the required clinical program for the railway hospital

This will provide health state of population and estimates of major disease incidence & prevalence, risk factors and impact on overall healthcare in Chittagong. Key factors to be considered in disease burden estimation includes:-

- **Estimation of disease incidence & prevalence:** This will include understanding of prevalent diseases in the region and estimated incidence & prevalence rate of diseases
- **Epidemiological Transition:** It will include burden of Communicable Vs Non communicable disease trend and analysis of major trends & growth pattern of disease segments
- **Causative factors:** It is also vital to understand any specific causative factors (environment, geography specific) that will have an impact and correlation with existing disease profile

Disease burden estimation will be undertaken through following methods:

- Existing report, data & health statistics at district level
- Disease pattern reported in existing railway hospital at Chittagong

Healthcare demand & supply assessment

This will include analysis of overall demand drivers for healthcare, catchment profile & attractiveness of Chittagong, estimation of bed density (per thousand populations) and presence of medical and nursing institutions to assess human resource availability in the local region.

Demand Assessment

This will encompass the quantity of healthcare services required by the population. We aim to address following questions in the demand assessment:-

- What are the key drivers of growth for healthcare in the region?
- What all factors propel the patient flow in Railway Hospital from nearby geographies?
- What is the need gap in terms of clinical specialties and level of care?
- What is the existing & future demand for quality healthcare in the region?

Demand Assessment shall take into consideration the following parameters

- **Utilisation trend** – Details of inpatient admissions & outpatient visits in major healthcare providers in Chittagong
- **Healthcare Catchment Population** – Estimated population constituting the primary & secondary catchment of railway hospital in Chittagong
- **Health seeking behavior of the employees of Bangladesh Railways** – assessment of the utilisation of the Railway hospital by the employees of BR shall be carried out and their healthcare seeking behavior including referral patterns shall also be assessed.
- **Health seeking behavior of population –** This will be important to understand the current behavior trends of the general population towards healthcare. This will include:-
    - Affinity of population towards public or private healthcare providers
    - Reasons for selecting healthcare provider
    - Perception & outlook towards existing healthcare services in Railway Hospital in Chittagong

Supply Assessment

A supply profiling of Chittagong shall be carried out to ascertain the availability and supply of services in the various specialties. It will include the profile of key healthcare providers in Chittagong with respect to followings:

- Number of beds & estimated breakup (e.g. Single, Double, ICU)
- Service offerings (e.g. clinical specialties, Diagnostics etc)
- Level of care (e.g Secondary care, tertiary care, multispecialty, single specialty etc)
- Estimated Inpatient Occupancy levels (%)
- Estimated Workloads (Outpatient workloads, inpatient admissions per day)

- Availability of medical technology infrastructure
- Tariff Structure & Pricing (Outpatient charges, room tariffs, pricing of key services like diagnostics, surgeries etc.)
- Level of technology deployed
- Payment mix (out of pocket, insurance, corporate etc.)
- Estimated Financial Indicators (Turnover, Profitability)

We aim to address following questions in healthcare supply assessment

- Who are the major public & private healthcare providers in the city?
- What is the estimated bed & physician density per thousand population in the city?
- What is the estimated distribution of public, private & teaching hospital beds?
- What is the provision (presence/absence) of medical educational institutes for supply of doctors, nurses & paramedical staff?
- What is the existing supply of medical specialists & super specialist in the region?
- What is the forecasted supply of new healthcare providers, which could be the potential competition to the Railway Hospital?

In addition, we would separately undertake an overall assessment of medical education landscape in Bangladesh and in the target geography (Chittagong). Through this analysis, we aim to cover the following aspects:-

- Overview of medical education landscape in Bangladesh
- Estimated number of medical & nursing institutes in Chittagong
- Assessment of healthcare human resources and infrastructure in Chittagong
- Demand and supply of MBBS seats in Chittagong
- Review of the functioning of private medical colleges in local region
- Guidelines of relevant regulatory agencies for establishing medical & nursing college in Chittagong
- Policies of the Government of Bangladesh on medical education

Need gap assessment

On the basis of information gathered in market assessment, analyze demand in conjunction with supply, and comment on the likely demand-supply gap existing in the market in terms of:

- Shortage of medical education institutes, human resources in the local market
- Medical infrastructure/bed shortage, clinical specialty need gap
- Number of seats available vs required (Medicine, nursing)
- Clinical specialties need gap in Railway hospital

In addition, we will also analyse the need gap of services for existing railway employees and their dependents

We have provided a checklist of information requirement from Bangladesh Railways in Annexure I

Linked Projects Assessment

As a part of the market assessment, we shall also identify linked projects if any to these projects and shall hold discussions with the Bangladesh Railway/PPP office.

3.2.1.2. Step 2: Project Development and Feasibility Study

In this step, we will develop the planning of the resource requirements for the project including assessing the size and scale of the hospital, the service mix plan, clinical specialties planning, manpower plan, infrastructure plan, and medical equipment plan. The key activities are detailed as below:

Technical Assessment of Site

Upon identification of site for the medical college and nursing institute, a technical assessment comprising the followings shall be undertaken for the identified site and the existing railway hospital site:

- Topographical study
- Soil testing analysis to assess safe bearing capacity of soil for building

Potential Investor Consultation

Potential private partners' survey in the project will be undertaken at this step, to understand their expectations and viewpoints on the proposed project.

Key considerations for undertaking the investor consultation will include:-

- What drives the investment decisions?
- What is the synergy between the enterprise strategy & health PPPs?
- What are the expectations from this project?
- What should be the key project features/structure, which could enhance the attractiveness for private sector?

Service Mix Planning

Service mix planning will include detailing clinical & non clinical mix in the proposed hospital & facilities in medical& nursing college. This will be based on existing medical education guidelines & demand supply assessment in Chittagong.

Infrastructure & Technology Planning

It will be based on the clinical and non-clinical requirements, as prescribed by regulatory agencies. Infrastructure & Technology planning of the facility will include following work activities:

- Determining the size & scale of hospital, college – We will define the infrastructural requirements for the Hospital and Colleges, based on applicable regulatory guidelines and inputs from market assessment study. The activities will be in conjunction with local regulations for teaching hospital & college. It will encompass the following areas:-
    - Determining the number of beds & bed mix
    - Correlation of maximum permissible built up area (BUA as per FAR) to financial viability
    - Medical technology planning, including setting out the technology options for delivering the solutions and assessment of preferred option
    - Framing of high level functional requirements for expansion of hospitals to cater to mandated compliment of medical college
    - Framing of functional requirements for proposed medical college, including staff housing and ancillary services
    - Developing the architectural layout plan for the hospital, which will cover the following
        - Site layout plan indicating preferable location of buildings and services
        - Layout plans indicating functional relationships

Manpower planning

Technical and managerial manpower are one of the critical requirements for success of such projects. Manpower requirements for the different types of planned centres shall be defined along with the level of expertise and experience required. Human resource requirements across medical, nursing, allied and non-medical professionals will be as per the local applicable regulations/guidelines.

Environment impact assessment

An environmental assessment shall be undertaken which shall include a Mitigation Plan that sets out feasible and cost effective measures that will reduce potentially significant adverse environmental effects, if any, to an acceptable level.

Common environmental issues relate to use and disposal of hazardous chemicals and other bio medical waste and adherence to them shall be ensured as a part of the monitoring guidelines and performance indicators.

Environment impact assessment will cover the following:-

- Environment/Baseline Studies Data Collection and Interpretation :- Description of study area/geographical boundaries, baseline development and survey for other data required during the length of the study to describe the physical and biological environments
- Review of environmental characteristics and the surrounding environment to identify and evaluate environmental effects of the project
- Carry out assessment of
    - Physical environment (Geology, topography and soils)
    - Natural drainage (surface drainage and flood risk)
- Assess the likely impact of the project development on the described environment including direct, indirect and cumulative long term and immediate/short term impacts and their relative importance to the design of the project including impact on air quality, noise, drainage and physical environment.
- Detail a set of mitigation and management measures to be taken during implementation of the project to avoid, reduce, mitigate or compensate for adverse environmental impacts in order of priority and their timelines
- Quantify and assign financial and economic values to mitigate methods; Quantify associated costs
- Prepare a monitoring plan which should ensure that the mitigation plans are respected.

Social impact assessment

We will undertake a comprehensive assessment of social effects of proposed hospital & medical college project and assess the direct impact on the society. The study will also review & analyse the applicable Bangladesh regulatory requirements. This will be studied separately for construction & operation phase of the project. The assessment study will be categorize in terms of positive effects – for instance, improved access to healthcare services by local community, and negative impact – for instance, displacement of local people/closure of smaller healthcare establishments.

Impact assessment study will be covering the mitigating mechanism to offset the identified social risks and predicted impact from the project.

The assessment methodology covers collection of qualitative and quantitative data and interviews with the stakeholders. Key considerations for social impact assessment would include:-

- Identification of impacted communities
- Review & analysis of state policies & legislations
- Identification of direct social impacts and mitigating mechanism

3.2.1.3. Step 3: Financial Analysis and PPP Transaction Structuring

Financial feasibility analysis

Financial model is an important decision making tool for finalizing the PPP transaction structure. The model so developed shall be used for assessing the viability of various options for structuring the project, impact of the structure on Government budget, amount of Viability Gap Funding (VGF) required, risk allocation, identification of various options for increasing the project viability and finalization of financial bid criteria.

The project feasibility will depend on the availability of finance for the project. We will assess the total fund requirement based on the investment requirement and future cash flow projections. We will also assess the requirement of equity funding from the private player and highlight possibility of debt financing for the project. Based on the business model and financing strategy we will also assess the requirement of assistance from Government in the form of VGF both at the development phase as well as the operation phase.

Developing a detailed financial model

This stage involves determining the financial viability of the proposed project. This will involve preparation of a financial model for the project. Key inputs will include project capital cost, capital structure & financing cost, operation cost, projected demand, proposed services to be provided & market rates for services and fiscal elements (tax) of the cost.

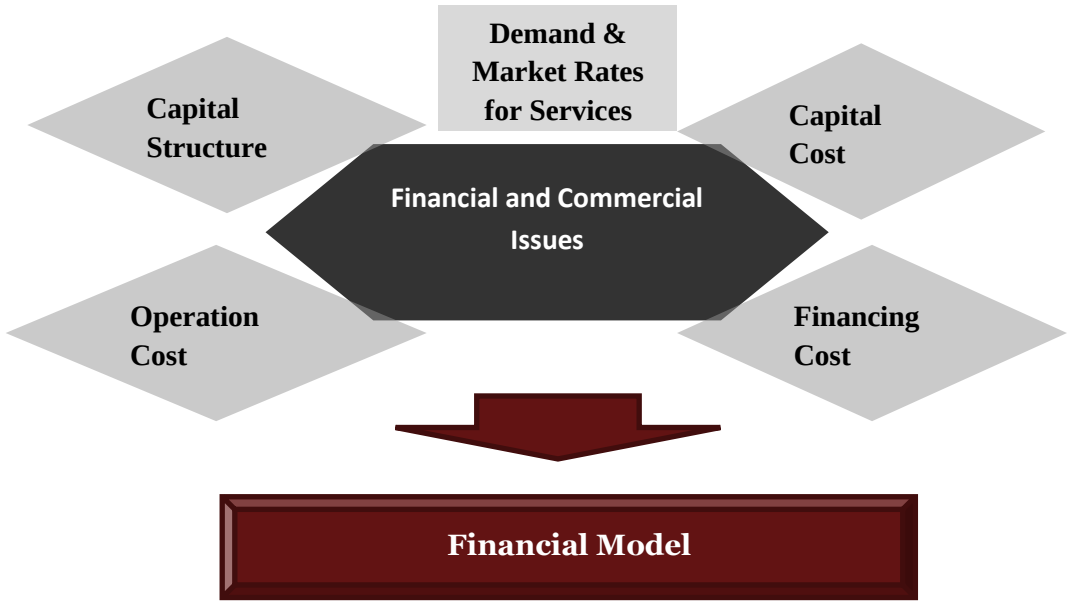
The key outputs of the financial feasibility analysis will include projected revenue & operational expenditure, projected cash flow, key financial indicators including Net Present Value, Project Internal Rate of Returns, Equity Internal Rate of Returns, Debt Service Coverage Ratios and Payback Period.

In addition to the above an economic rate of return from the project will be assessed based on the project contribution to the socio-economic factors of the region.

Methodology to check financial viability

In order to carry out the financial feasibility of the project, we propose to follow a pragmatic and practical methodology based on our experience in this sector. Our methodology for financial feasibility has been depicted in the figure below.

Figure 8: Methodology for Financial Feasibility



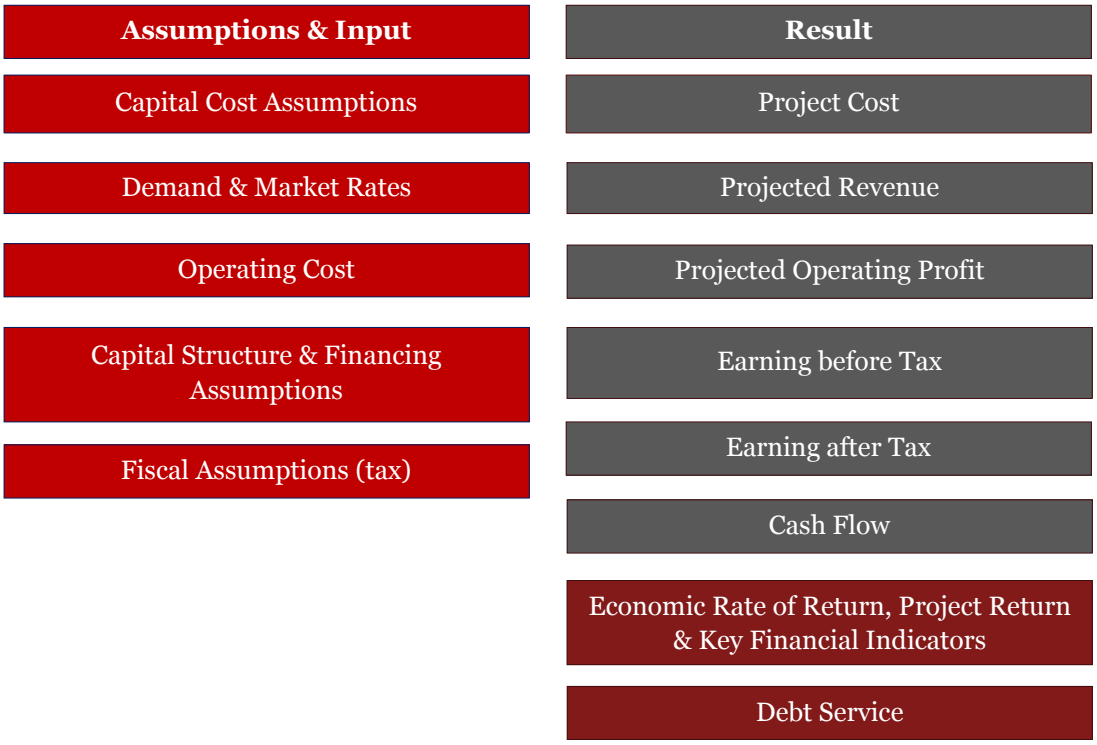
As an indicative, the financial model would be based on the following major elements:

- Capital Cost
- Capital Structure & Financing Cost

- Projected Revenue based on market demand and rates
- Operational Cost
- Fiscal cost (Tax)

The following figure shows a typical input and output of a financial model for the project:

Figure 9: Financial model - Illustrative assumptions & results

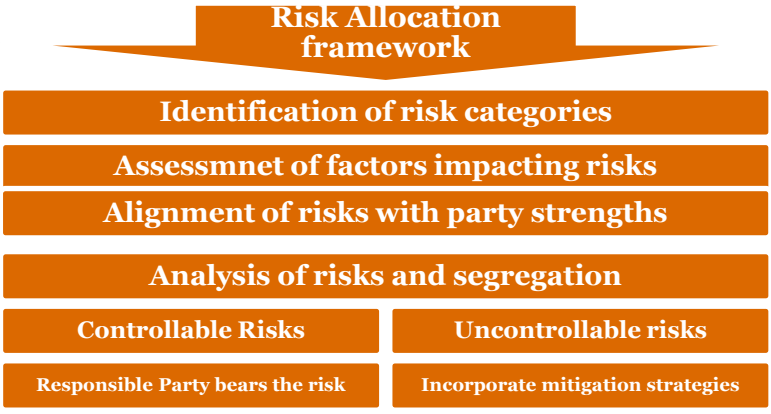


The model developed would be flexible to conduct sensitivity of project's financial viability with respect to fluctuations in (i) Capital Cost (ii) Market Demand (iii) Operational cost. The model would also be made flexible to incorporate changes as required in the assumption parameters.

Risk Assessment & Allocation

One of the critical factors of success of a PPP contract is the correct identification and allocation of risks between the private and public sector. This involves careful assessment of all foreseeable risks involved in pre commencement and post commencement phases of the project, considering impact and identifying probable mitigates.

Figure 10: Risk Allocation Framework



In most successful PPP projects risks are allocated to partners who are best placed to manage it. Similarly, in the envisaged project we will assign project risks based on resources and ability of the player who is best positioned to manage the risk. E.g. in the project, arranging and providing land and area for the facilities and associated risks seem to be borne by the Bangladesh Railway. From our extensive experience in PPPs worldwide, we have observed that the public sector generally bears risks related to politics and, to some extent, commercial risks. The private sector typically bears majority of commercial risks related to financing, developing, and managing a project.

Commercial risks in healthcare projects are often complicated because providing universal access to quality and affordable healthcare is one of the primary duties of government. This results in incorporation of various clauses specifying the minimum service & quality adherence provisions and price subsidization which often impacts the financial viability of the healthcare PPP projects. To minimize expected returns from the project by private partners, commercial risks are often needed to be shared between the public and private sector. We will ensure that sharing of risk enables both public and private players to focus on their competencies resulting in minimizing risk exposure for both the parties and the project as whole.

Minimization of risk is necessary to improve bankability of the project. Investing in an infrastructure project is risky for the private investor, the lenders and the guarantors. For the projects to be viable we will need to assess

- Financing sources available for the projects,
- Whether the projected returns and the risk allocation & mitigation strategies enable the project to become bankable i.e. it is capable of raising debt finance.

The activities involved in the initial stages of the project such as interviews with operators, investors and specialists, international and national benchmarking analysis of concession contracts and PPP projects are critical for the analysis and allocation of risks.

The allocation of risks between public and private initiatives will be incorporated in the PPP contracts through the clauses which deal with responsibilities of the parties, in accordance with the responsibilities detailed in the contract. These clauses should also contain mechanisms to mitigate the risks between the parties, for example, through clauses which define methods of readjusting the charge by the government in activities not controlled by, or the responsibility of, the private parties.

We will incorporate some of the risks and analyze them in our financial model while conducting sensitivity, scenario and stress analysis. After conducting detailed discussions with the stakeholders and prospective investors, we will finalize a PPP risk allocation structure for the projects. In turn, this will inform the development of the draft contract.

Project Structuring

Key Considerations for PPP structuring include:

- Specifying the minimum level of service required, accreditation requirements, benchmarking with best industry practices etc. are essential to ensure quality, safety and required range of services required in the new facilities. This will provide bidders with a good guide to expectations and estimate the investment requirement considering the level of service required. It also provides a benchmark against which performance can be measured and applicable penalties levied in cases of non-compliance.
- The potential to prescribe the minimum investment or the minimum capacity of the facilities required like minimum number of beds or minimum number of patients treated etc. and the quality of equipment to be installed along with the replacement schedule over contractual term can be a way of providing a safety net to ensure a minimum service and equipment quality, however it may impede bidders' ability to take advantage of new technologies, to negotiate equipment purchasing and equipment maintenance contracts, and manage the timing of their cash flows and financing.
- Fair and equitable allocation of risks and risk mitigation measures is an established principle of the PPP process. If a balanced approach to risk is not taken, optimal pricing and value for money is not

achieved, interest of the private sector is impeded and long term success of the project is compromised. This is of particular importance when considering how risks related to usage of equipment by Government employees are allocated to the private sector service provider.

- The financial viability of the project is crucial for the success of the PPP. The corporate should be able to make reasonable profits. This is important to make the project sustainable in the long run.
- The contract term will need to be long enough for the private sector service provider to demonstrate its capability to maintain and operate the hospitals but balanced by the need for Government to have the flexibility to redefine its requirements to reflect changes in the dynamic healthcare environment. If the contract term is too short, the private sector service provider may not be willing to invest the time and resources required to bid for the project and develop innovative whole-life costing savings, and bidder may not think they have sufficient time to make a real difference. However, this needs to be balanced by the Government's need for flexibility.
- It is important that the project procurement process is structured to encourage the very best quality bidding consortia, as this will ensure best quality service delivery. This includes:
    - Seeking to encourage sufficient, healthy competition while limiting the number to qualified and capable bidders only. This also limits the high level of bid costs that would otherwise be incurred. It also demonstrates to potential bidders that the Government employs the best practice to only pre-qualify a limited number of bidders. This will give bidders comfort that the process is well managed and will consequently attract serious, well-developed bids; and
    - Structuring the projects to allow the private sector to deliver the best solutions.
- The payment mechanism is a key within any PPP agreement as it is the primary financial and commercial lever by which the procurer achieves its objectives and manages the performance of the provider. The payment mechanism clearly sets out:
    - the level of performance that is required by the private sector service provider and how this will be measured;
    - the pricing arrangements and any volume or value guarantees;
    - the deductions that the private sector service provider will face should it not provide the expected level of service;
    - the points at which the lenders and government are able to step in should performance be poor as well as the consequences to the service provider should this arise; and
    - the point at which the contract can be terminated and the consequences to the service provider.

We will assist PPP office/Bangladesh Railway to focus on payment mechanism thereby ensuring that it is calibrated in such a way as to give the service level that you require. Our approach will be to set out initial proposals for the payment mechanism which will draw on the preferred risk allocation, options for the scope of services and implications for the financing structures.

- A clear definition of roles and responsibilities of the parties goes a long way in ensuring a cordial relationship during the operation stage of the project. The risk analysis conducted earlier plays an important role in assigning responsibilities to the parties under the contract.

PPP Option Analysis

After chalking out the strategies for designing PPP, it is imperative to properly structure the PPP so that the project meets the project objectives. There are various options of PPP structuring. However, the concept of PPP in healthcare in the developing world is evolving. The balance between infrastructure and service delivery in a PPP is critical as it impacts on i) who the likely bidders will be (and which entities will be lead contractors vs. subcontractors) and ii) the source of financing.

We will analyze the following influencing factors for designing suitable PPP framework, suitable to meet the objective of GoB.

Figure 11: Factor for designing suitable PPP framework

Factors	Key considerations
Investment	Capital subsidy by government/financial assistance to private operator will be an important consideration, while developing the PPP structure. This will be analyzed in order to assess the requirement of financial assistance from government for the project.
Operations	Option of operational subsidy by government mitigate the viability issue for the private operator and enhance the attractiveness for the project. This will be analysed during PPP option analysis
Financing	Cross subsidisation model is widely used in structuring the PPP projects. In this project, this model of project financing would be an important consideration to analyse.
Local regulations	Medical education is a structured and regulated sector within the healthcare and operates under a regulatory framework. We understand that Directorate of Medical Education under Ministry of Health & Family Welfare, Government of Bangladesh is the apex agency for regulatory approvals & statutory requirements and govern the medical education industry in Bangladesh. PPP options analysis will also depend on the structure & regulations, developed by the council for teaching hospital Recently, some states in India have also started **upgrading & modernize** the **District Hospital into teaching hospital**, in conjunction with the applicable regulatory framework. For instance, only those district hospitals were selected for up gradation, where the **district hospitals have more than 300 beds** (Medical education **guidelines** in India mandates the provision of **minimum 300 bed** affiliated hospital to start medical college) Another important aspect of **regulations** could be **land ownership**, which belongs to government. In certain projects, the mandatory requirement of having the land ownership right have the implication for the private operator to participate in PPP transactions.

3.2.1.4. Step 4: Key terms of the Concession Agreement

Based on the agreed PPP structure and PPP options, key terms of the Concession Agreement shall be drafted at this stage to serve as a guide during the development of the bid documents in Phase II.

3.2.1.5. Step 5: Procurement Plan

A procurement plan shall be developed highlighting the key activities of Phase II of the project and their timelines. This plan shall be a part of the Feasibility Report.

Note: The approach & methodology for Phase II activities will be submitted along with the Inception Report of Phase II.

4. Proposed Work Plan for Phase I

No	Activity	Month	May 2015			June 2015				July 2015				August 2015				September 2015		
		Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.1	**Project Inception**																			
1.1.1	Project Kick off Meeting		■	■	■															
1.1.2	Submission of Inception Report			■	★															
1.2	**Preliminary Assessment**																			
1.2.1	Site Visit, Selection, Site suitability assessment					■	■	■												
1.2.2	Applicable regulatory assessment for project site					■	■	■												
1.2.3	Availability of basic infrastructure					■	■	■												
1.2.4	Identification of site specific issues/challenges if any					■	■	■												
1.2.5	Demographic and Socioeconomic analysis					■	■	■												
1.2.6	Disease burden assessment							■												
1.2.7	Healthcare Demand and Supply Assessment							■												
1.2.8	Linked Project Assessment							■												
1.2.9	Submission of Preliminary Finding Report								★											
1.3	**Project Development and Feasibility Study**																			
1.3.1	Topographical Study									■	■	■	■							
1.3.2	Soil Testing Analysis									■	■	■	■							
1.3.3	Potential Investor Consultation and Feedback									■	■	■	■							
1.3.4	Service mix planning									■	■	■	■							
1.3.5	Infrastructure and technology planning									■	■	■	■							

No	Activity	Month	May 2015			June 2015				July 2015				August 2015				September 2015		
		Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.3.6	Manpower planning																			
1.3.7	Environment impact assessment																			
1.3.8	Social impact assessment																			
1.4	**Financial Analysis, Risk Assessment and PPP Transaction Structuring**																			
1.4.1	Developing a detailed Financial Model																			
1.4.2	Financial Feasibility Analysis																			
1.4.3	Risk Assessment & Allocation																			
1.4.4	Project structuring																			
1.4.5	PPP Option Analysis																			
1.5	**Key Terms of Concession Agreement**																			
1.5.1	Drafting of key terms of Concession Agreement based on project structure																			
1.6	**Procurement Plan**																			
1.6.1	Finalizing activities for Phase II, bidding strategy and planning of timelines																			
1.6.2	Preparation of a procurement plan																			
1.7	**Preparation and Submission of Draft Detailed Feasibility Report**																	☆		
1.8	**Submission of Final Detailed Feasibility Report (subject to receipt of comments from relevant authority)**																			☆

Note: The work plan for Phase II activities will be submitted along with the Inception Report of Phase II.

5. Deliverables & Timelines of Phase I

The deliverables for Phase I of the project is proposed to be submitted as per the following timelines:

Table 4: Deliverables & Timelines of Phase I

S No.	Deliverables	Timelines (Cumulative Weeks from the date of kick off meeting)
1	Inception Report	2 weeks
2	Preliminary Findings Report (Interim Report)	6 weeks
3	Draft Detailed Feasibility Report	16 weeks
4	Final Feasibility Report	18 weeks

Note: Deliverables & Timelines for Phase II will be submitted along with the Inception Report of Phase II.

Annexure I: Checklist of Information/Data Requirement

Information required from Bangladesh Railways

1. General Information

- General profile of Railway Health Systems in Bangladesh (Structure, No of hospitals, beds, services)
- Important functions of Railway Health systems
- Total no of employees and dependents
- Age structure of employees
- Health budget & total medical expenditure
- Policy guidelines (Empanelment mechanism/tie ups with private hospitals (if any), type of medical benefits offered by Railway to employees & dependents)
- Retirement age of employees
- Role of Health Ministry, if any

2. Information with respect to Chittagong Railway Hospital

- Year of establishment
- Available area & scope for expansion (Floor plans if possible)
- Total no of beds & Operational beds
- Number of paying Vs non-paying beds/subsidized beds
- Room categories & % distribution
- Number of floors, OTs
- Population served by Chittagong hospital (Employees & dependents)
- Split of patients (Railways Vs General Population)
- Clinical services (Specialties, Kind of surgical procedures)
- Diagnostic services
- Pricing of services (Rooms, surgeries, OPD, diagnostics)
- Patients Profile (Paying Vs Non Paying)
- % of patients coming from nearby areas Vs local
- Hospital timings/schedule
- Outsourced services, if any (advanced diagnostics like CT/MRI etc)
- Major equipment's & specifications (average age of equipment)
- Linkage with any health insurance schemes
- Any other services (Outreach camps etc.)
- HMIS system
- Number of Ambulances
- Utilization
    - Outpatient (per annum, specialty wise & total)
    - Inpatient (per annum, specialty wise & total)
    - Diagnostics (Lab & Radiology)
    - Occupancy
    - Surgeries (per annum, specialty wise & total)
    - ALOS (specialty wise)
- HR
    - No of doctors & levels, key qualifications
    - Doctor Salaries (Local vs Outside (e.g. India or other country)
    - Doctors engagement model (Full time/Salaried)
    - Nursing staff (Numbers , key qualifications)
    - Salaries of Nurses

    - Paramedical staff & their Salaries
    - Outsourcing staff categories (Housekeeping, Security etc.)
    - Training programs (if any)
    - Other benefits
- Financials
    - Total revenues (Split b/w paying & non-paying)
    - Expenses
    - Major expense categories
    - Any referral expenditure (patients coming to Dhaka for advanced treatment)
    - Source of funding
    - Any special fund/scheme maintained by Railways for special medical conditions
    - Any other benefits offered by government

Information required to be collected from Private Hospitals in Chittagong

- No of beds
- Occupancy
- OPD/day
- OPD by specialty
- Admissions per day
- Admissions by specialty
- Surgeries per day
- Surgeries by specialties
- No of doctors (Full time: Visiting:)
- Local Vs Outside doctors
- Doctors salaries
- No of Nurses, key qualifications & Salaries
- No of paramedical staff, key qualifications & salaries
- Pricing of services
    - OPD
    - Rooms
    - Diagnostics
    - Procedures
- Patient catchment areas
- Referral geographies & services
- Patient paying capacity (Insured Vs Cash patients)
- Utilities expense
    - Power tariff
    - Water tariff
- Challenges for private hospitals
- Demand of healthcare in Chittagong
- Any future plans for expansion
- Government benefits to private providers (Tax benefits etc.)

Disclaimer

This document has been prepared solely for PPP office, Government of Bangladesh, being the express addressee to this document. PwC does not accept or assume any liability, responsibility or duty of care for any use of or reliance on this document by anyone, other than (i) PPP office, Government of Bangladesh, to the extent agreed in the relevant contract for the matter to which this document relates (if any), or (ii) as expressly agreed by PwC in writing in advance.

This publication (and any extract from it) may not be copied, paraphrased, reproduced, or distributed in any manner or form, whether by photocopying, electronically, by internet, within another document or otherwise, without the prior written permission of PwC. Further, any quotation, citation, or attribution of this publication, or any extract from it, is strictly prohibited without PwC's prior written permission.