Technical Assistance Consultant's Report

Project Number: TA-8575 THA

December 2015

Kingdom of Thailand: Piloting PPP in Thailand's Social Sectors

Final Report

Prepared by:

EY Corporate Services Limited, Thailand

For:
Ministry of Public Health, Thailand

Asian Development Bank

TA-8575: Piloting PPP in Thailand's Social Sectors

Final Report

December 2015

Building a better working world

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Glossary

Glossary of terms	
Term	Definition
ADB	Asian Development Bank
AFP	Alternative Financing and Procurement
Availability based PPPs	PPP projects that rely on an "availability payment" from government as their primary revenue stream. Such availability payments are typically subject to the private sector meeting certain operational / quality KPIs
Bankable	A project or proposal that has sufficient collateral, expected future cash flow, and high probability of success, to be acceptable to private sector lenders for financing
BOT	Build-Operate- Transfer
BOOT	Build, Own, Operate Transfer
BTO	Build-Transfer-Operate
CAPEX	Capital Expenditure
Competitive Neutrality	A mechanism to ensure state-owned and private businesses compete on a level playing field. An example includes adding "shadow taxes" to a government business model when comparing to a private business model in order to recognize tax revenue foregone by government, and the otherwise perceived cost advantage for the state-owned model
CSMBS	Civil Servant Medical Benefit Scheme
CUP	Contracting Units for Primary care
D&C	Design and Construct
DBFM	Design, Build, Finance, Maintain, Operate
DBFMO	Design, Build, Finance, Maintain
DBM	Design, Build, Maintain
DBMO	Design, Build, Maintain, Operate
DMS	Department of Medical Services
DSCR	Debt Service Coverage Ratio
ECAs	Export Credit Agencies
EIRR	Economic Internal Rate of Return
EPC	Engineering, Procurement, Construction
EY	Ernst & Young
FFE	Furniture, fixtures and equipment
FIRR	Financial Internal Rate of Return
FMS	Facility Management and Safety

Glossary of terms	
Term	Definition
GDP	Gross Domestic Product
GFA	Ground Floor Area
GP	General Practitioner
ICU	Intensive Care Unit
IN	In-patient
IT	Information technology
ITU	Intensive Therapy Unit
KPI	Key Performance Indicator
MOE	Ministry of Education
MOF	Ministry of Finance
MOPH	Ministry of Public Health Thailand
MRI	Magnetic Resonance Imaging, a medical imaging technique used in radiology to investigate the anatomy and physiology of the body. MRI scanners use strong magnetic fields and radio waves to form images of the body
MRTA	Mass Rapid Transit Authority of Thailand
NESDB	National Economic and Social Development Board
NESDP	National Economic and Social Development Plan
NHSO	National Health Security Office
NP	Nakhon Pathom Hospital
NPV	Net Present Value
O&M	Operation and Maintenance
OP	Out-Patient
OPEX	Operating Expenditure
P&L	Profit and Loss
Payment Mechanism	The way in which a private sector party is paid to undertake a PPP project. The Payment Mechanism the principal means for allocating risks and providing incentives in the PPP contract, as payments are often linked to achieving pre-determined operational KPIs
PDMO	Public Debt Management Office
PISU Act	Private Investment in State Undertaking Act B.E. 2556
PPP	Public Private Partnership
PSC	Public Sector Comparator
R&M	Repair and Maintenance

Glossary of terms	
Term	Definition
RFEI	Request for Expressions of Interest
RFP	Request for Proposal
SEPO	State Enterprise Policy Office
sqft	Square feet
SSS	Social Health Insurance
TA	Technical Assistance
THB	Thai Baht
TOR	Terms of Reference
TSU	Transaction Support Unit
UCS	Universal Coverage Scheme
USD	United States Dollar
VAT	Value Added Tax
VfM	Value for Money, being the relative value benefit of either or all of (i) cost savings, (ii) risk transfer, or (iii) enhanced outcomes, of a project being delivered by PPP as compared with traditional government procurement

Executive Summary

The objective of the Technical Assistance (TA) 8575 is to assist the Ministry of Public Health to identify and advance a pipeline of PPP projects in Thailand health sector, with a secondary objective of develop and promote capacity of the Ministry of Public Health and Ministry of Education (Government) to procure, manage, and monitor social sector PPPs.

In this final report we set out the results of key activities performed under TA 8575 with respect to the simulation case studies, development of the content of the PPP knowledge database, review of the current status of the institutional framework and the additional capacity building workshops.

Scope of work

The results of our original scope of work which comprised of the following six key tasks were presented in our Mid-Term Report:

- **Task 1:** Project inception and kick-off
- **Task 2**: Review PPP policy and institutional frameworks
- **Task 3**: Identify potential health PPP projects
- **Task 4**: Build capacity and develop health PPP projects
- **Task 5**: Conduct pre-feasibility study for pilot project
- **Task 6**: Identify potential for education sector PPPs

As outlined in our Mid-Term Report, the scope of the TA was amended as follows given limited information available on potential health PPP projects :

- **Stream 1:** Simulation study of two potential projects
- **Stream 2:** Additional capacity building workshops
- **Stream 3:** Preparation of the content for the MoPH PPP unit's knowledge database
- **Stream 4:** Identification of main legal and regulatory issues

Results of these activities and main results are presented in the following chapters of this report.

Analysis of MOPH priorities for suitability for PPP delivery

Thailand has a long history with PPP and the vast majority of Thailand's PPP projects have been in the energy and transport sectors, including power stations and expressways. Projects in these sectors in particular are considered economic assets, in that charges levied on end users are almost always sufficient for project owners to generate sufficient returns, thereby limiting any financial support required from government. It is for this reason that projects in this sector are typically the first PPPs in any market.

MOPH has provided us with a list of nine priority areas and has asked us to use this as a long list of possible PPPs given they best reflect the areas where the ministry considers investment is required. MOPH has also previously shared these nine priority areas with SEPO as possibly suitable for PPP delivery.

In order to turn the priority areas into a pipeline of possible health sector PPPs, the priority areas need to be developed into clear and discrete projects with a clear understanding of the size, scale and location(s) of the projects, and the services that the private sector is expected to deliver. This, in turn, will allow the development of a realistic risk allocation, likely contractual structure, and financial analysis to be undertaken.

From our work, we have identified certain key factors which will need to be addressed to enable the development of viable social sector PPP projects in Thailand. From our experience and discussions with SEPO, MOF, MOPH and MOE officials, these are issues which are related to the budgetary and financial arrangements and regulatory framework where these projects may require long term payments by government for the PPP services provided by the private sector. These issues are outlined below and can be further explored and developed as part of the prefeasibility and feasibility stages of developing viable PPP Projects.

- **Current budgeting presents a challenge to MOPH-led PPP program**
  - **We understand that The MOPH plays mostly a regulatory function and does not play a significant role with respect to healthcare funding and hospital procurement and operations. As such, MOPH may lack the financial and operational levers to incentivize hospitals to pursue an alternative procurement options such as PPP. Operational healthcare funding is provided most by the universal healthcare insurance scheme (on a per patient basis) which goes directly to the hospitals, and some hospitals may also charge the patients directly for certain medical services, within the public system.**

    Investment proposals are put forward to MOPH through regional Inspector Generals and funded separately. Under existing arrangements, our discussions with MOPH and hospital directors suggest there are many public hospitals in Thailand that are either just breaking even or generating operating losses. With some exceptions, it would appear that the ability of hospitals to commit to fixed annual PPP availability payments could be limited given uncertainties on revenue flows. Projects involving multiple hospitals and/or regions would also present additional complexity.

  - **Discretionary nature of annual budgetary process could potentially cause some concern for bidders looking to deliver availability PPPs. This is likely to be manageable where there is a sufficient field of local bidders and financiers for the first few social sector PPPs.**

    PPP contracts are typically long term in nature, and the process of annual Cabinet approval creates a risk that Cabinet may not approve the budget at some point in future. This can create difficulties for private sector bidders in raising funding to deliver projects, as their investors and lenders cannot look through to an "automatic" and non-discretionary source of revenue for the project. Given Thailand's strong credit rating and the existence of deep and liquid domestic debt and capital markets, this issue may not be as significant as in other South East Asian markets, especially where there is sufficient market appetite from local bidders that understand local government practices. Longer term, once a track record of successful projects has been established, this would no longer be an issue even to international bidders and financiers.

- **In the absence of any MOF or other central guarantee from the Thai Government, the appetite of the private sector to bid for projects relying on long term MOPH or MOE payment streams, and bidders' ability to raise private sector finance on this basis, needs to be tested.**

  Discussions with both PDMO and SEPO indicate that availability payments to private bidders are not likely to obtain the benefit of MOF or other government guarantees as there is no existing guarantee arrangement within government that could be applied to this type of project. Given the ministries' reliance on funds appropriated from an annual budgeting process reliant on Cabinet approval, private bidders may face difficulty in raising finance on the basis of perceived risk. Again, this risk is likely manageable given the strengths of Thailand's domestic debt and capital markets, field of local bidders, and strong sovereign credit rating.

- **Operational challenges**

  - **Hospitals also have substantial operational autonomy with all operational decisions made at the local level. In our discussions with hospital officials, there appears to be little or no interest in ceding this operational autonomy either to MOPH or to a long-term concessionaire under PPP unless the PPP would allow them to continue to maintain full control which given.**

    For example, the desire to aggregate equipment and services across hospitals to derive economies of scale would certainly lead to some divestment of control. We view that the Hospital would be incentivized to explore PPP only be happy with PPPs that provide them the needed assets if they can maintain full control or provides them with significant financial benefit. As such our view is that given the current institutional and funding framework of the healthcare sector that unless the demand is identified by the hospital or at a regional level, by the health inspector, it is unlikely that MOPH will be able to initiate pre-feasibility assessments. However, this does not fit viable models for PPP under the nine priority areas to assess the demand and suitability of a PPP arrangement under the current approach with MOPH.

    Given limited ability of Hospitals to fund support infrastructure projects (for example, car park) from their operational budgets and luck of government funding for these type of projects, PPP seems to be the main option available. It has to be noted, that feasibility of these projects will be defined by commercial potential of such infrastructure projects to generate commercial revenue and/or ability of the private partner to bundle additional commercial ventures to cross subsidise delivery and operations of infrastructure assets. For example, a car park may not be commercially sustainable due to low revenue potential, but overall project can be still commercially viable if car park bundled is bundled with a retail real estate development.

- **Institutional challenges**

  - **Further guidance on the methodology for business casing projects and PPP approval criteria would facilitate development of a market in Thailand for social sector PPPs and like-for-like comparisons of proposals.**

    The PISU Act in its current form, including the expected content of subordinate regulations, is largely concerned with the high-level process that should be followed in order to undertake a

project under the PPP modality. There is limited guidance on the specific analysis and outputs required for government's decision-making.

Specific methodology for the quantification of risk, discount rate to be applied in calculating PSC, including any competitive neutrality adjustments, and other pre-requisite criteria are not clearly defined. This could present a challenge when a full feasibility study is to be prepared for a given project at a subsequent date, particularly in the case where multiple projects will be reviewed by SEPO in parallel for approval, and capital limitations require proposals to be prioritized. The lack of prescriptive guidance could result in concurrent feasibility studies put up for approval that do not allow a direct like-for-like comparison of projects.

- **Further clarity needed on sources of PPP payment stream**

  Market interest is likely to be stronger where the contractual counterparty to a PPP agreement is MOPH and not an individual hospital, as the certainty of the availability payments would be improved, in turn assisting private sector bidders to obtain the necessary financing they require. However, as described above, MOPH currently has no mechanism to fund or support an availability payment to a PPP project.

Application of findings to date to MOE

Projects and programs to be procured as PPPs should be centrally coordinated at MOE as this is where most PPP contracts will likely be signed with the private sector, and where major investment budgeting decisions are likely to be made. A clear ministry-wide process for identifying capital projects suitable for PPP delivery should be established.

Central collation of information on demand for education services, condition of facilities and current service capabilities will provide MOE with the evidence needed for robust project identification and prioritization between various possible PPPs.

A component of the operating income from the various departments, particularly in relation to projects procured as PPPs, may need to be channeled back to MOE centrally in order to cover part of any availability payments that MOE may have committed to.

Ongoing engagement with SEPO to understand the evolution of the PISU Act will be important to ensure PPP proposals submitted are properly business cased and in line with the Act's requirements.

Private Partners' readiness to participate in a social sector PPP project

As part of our scope of work, we have conducted initial consultations with selected private sector representatives whom we identified to be potential private sector partners, to determine their interest in participating in a healthcare PPP projects in Thailand. From our discussions, while there is no precedent case of a PPP in Thailand's social sector, we found that there is interest from the private sector to potentially participate in well-structured PPP Projects. The key groups of private sector participants interviewed are the financiers (banks), sponsors and construction companies and facilities management service providers.

Local commercial banks and project finance banks will most likely be primary providers of debt finance for green-field PPP Projects. Thai banks have indicated their interest to participate in a social sector PPP project. During our interviews, it was clear that further market testing should be conducted as part of the pilot project's feasibility study to develop the these banks' understanding of the project risks and potential project structures, especially with respect to the payment mechanism and in particular the extent of government support underpinning the long term payment obligations. Another area which would support bank participation would be the presence of financially strong and experienced sponsors.

Thailand has the benefit of precedents of large local construction firms who have acted as sponsors and invested in infrastructure projects. While these firms are familiar with the construction delivery of the hospitals, they will need to enter into long term arrangements with hospital design and facilities management firms who are inexperienced with the healthcare industry's specific infrastructure requirements, including safety standards, such as providing for the efficient flow of the patients or the infrastructure support required for operating/ emergency rooms. While healthcare facilities are generally perceived to be "simpler" to maintain that an MRT system, or an IPP, it should be recognized that these hospital facilities are used by doctors, nurses and medical staff who will have to engage with the private sector partner to deliver the infrastructure services to appropriately support the medical services.

We view that as part of the pre-feasibility and/or feasibility phases, additional consultation and project awareness activities will be recommended to ensure proper understanding of all risks involved in the PPP project by both private and public sector stakeholders to ensure appropriate project structuring and optimal risk allocation. In addition, as pilot projects are rolled out, one of the recommendations would be to include Request for Expressions of Interest in the procurement process to provide Government with sufficient information to draft a clear RFP given limited information on market capacity and competitiveness. This would also allow private sector representatives to express their concerns regarding proposed PPP project scope and will give them advance notice on Government's intentions to develop particular project as a PPP. It is also recommended to provide workshops and educational material to the private operators in order to increase their understanding, and entice their interest and competiveness.

Key factors which assist to promote private sector interest and competitiveness include:

- **Clear scope of work and business case for private sectors:** Private sector must have a clear understanding of their area of potential participation in the PPP project (including the roles of public sector) in order to determine their interest. The payment mechanism and allowance for reductions must be clearly defined to enable the private party to perform a comprehensive and thorough assessment.
- **Allocation of risks:** Based on the assigned responsibility of the private sector in the PPP project, private operators would assess all the possible risks involved and compare it against their acceptable level of risks in order to determine their interest. However, the healthcare industry's specific requirements could add incremental risks and complications to the private partners and to the project (i.e. health and safety standard requirements).
- **Required returns:** The returns offered by the Government should be adequate to incentivize the private party to participate in the project, and should sufficiently compensate for the allocated risks.

PPP Project Simulation Studies

From discussions with MOPH PPP Committee, three projects were selected and developed as simulation study projects:

- **Project 1: Mid-Size General Hospital – Nakhon Pathom Hospital**
  The management of Nakhon Pathom Hospital has indicated that a new 90-bed general urban hospital is required to overcome existing capacity problems at Nakhon Pathom Hospital. Current space shortage has resulted in inpatient beds being located in common areas and significant waiting time for various medical procedures. With additional mid-size general hospital facility located nearby, Nakhon Pathom Hospital will be able to shift number of patients away from the existing facility, provide more specialised services in its existing facility and maintain its role as the center of medical network for Nakhon Pathom provinces and to focus on providing tertiary care level services and treatments to chronic patients.

  We have undertaken a preliminary financial assessment for the Mid-Size General Hospital project developed. Based on preliminary findings, the PPP Project value (NPV) is estimated to be close to Baht 640 million. The total VfM gains (NPV) from this PPP project are estimated at approximately Baht 195 million.

  Based on the results of the simulation study a development of a new mid-size general hospital facility at the Nakhon Pathom Hospital represents a potentially good candidate for a pilot healthcare PPP project and can be considered to be bundled and undertaken as a group of urban hospitals if appropriate for private sector participation. There are several considerations regarding next steps:

  - **PPP Project size**
    The initial estimates of the PPP project value is below THB 1 billion (~USD 28 million). It will be important to conduct market consultations to evaluate if private investors will be interested in this project on a stand-alone basis. The PPP project value needs to be significant enough to justify private sector investment and effort to participate in the PPP tender process. The approach of bundling 2-3 or more medium size general hospitals in one region may enhance private sector interest.

  - **PPP Project scope**
    The simulation study assumed that the private sector provides only the core infrastructure services provision. As part of the feasibility study, it is also possible to explore the inclusion of other support services and commercial potential to be provided by the private partner to realise better value for money benefits, including car park facilities. This could also assist to potentially reduce government funding requirements if private investor is given opportunity to generate some commercial revenue from other services.

  - **Budget allocation**
    MOPH will need to use updated budget appropriation rules that are currently been developed by SEPO to use VfM results in the budget application to ensure long term budget appropriation is secured for the project. In addition, some of the Nakhon Pathom Hospital operational budget received from the government under the Universal Service Obligations for its capital projects

based on annual allocation can also be applied towards the PPP payments. This is an area to be developed in detail as part of the Feasibility Study.

- **Medical personnel shortage**
  On a separate but related note, we have been informed by the NP management that one of the major limiting factors that directly impact size of the new facility is ability to hire sufficient number of support medical specialists. Assessment of private partner's ability to attract support medical personnel can also be explored during the feasibility study and market sounding.

- **Project 2: Medical Excellence Center – Department of Medical Services**
  The management of DMS has proposed to develop a 250-bed Medical Excellence Center for DMS to overcome congestion problems in all the hospitals / institutes under DMS as well as to reduce waiting time of patients who are self-financed, under CSMBS and with private insurance. The new center will be a multidisciplinary medical service center that aims to deliver 13 specialized treatments with skilled professionals from various hospitals / institutions under DMS.

  Based on preliminary financial assessment for the Medical Excellence Center project, the PPP project value (NPV) is estimated to be Baht 4.3 billion. The total VfM gains (NPV) are estimated at approximately Baht 1.2 billion.

  Development of the Specialised Medical Centre represents a potentially good candidate for a pilot healthcare PPP project. There are several considerations regarding next steps:

  - **Location of a suitable land plot**
    The availability of a suitable land plot for the Project is an important consideration. This land will need to be provided by the government

  - **Validation of project scope and design specification assumptions**
    Given the scale and range of services which may be provided, the project's capital and operational expenditure will need to be refined. Further analysis to review the planned capacity of 250 beds and assessment of patient profile / forecast bed requirements by types of services should be conducted in more detail as part of the Feasibility Study.

  - **Medical Excellence Center revenue generating potential to Offset PPP Project Payments**
    The Medical Excellence Center has the potential to generate its own revenues through paying patients. Further financial analysis of the extent of hospital operations revenue generation will be required during the feasibility stage. This will assist to determine the level of excess cash available to pay for the project and the remaining amount which requires support from the Government / MoPH.

  - **Commercial Revenue Potential**
    The Private partner's project scope and opportunities to generate commercial revenue will need to be further developed to evaluate the extent to which commercial revenue generated by the MEC may reduce the Government payment

- **Project 3: Carpark for Rajavithi Hospital**

  One of the major concerns faced by Rajavithi Hospital today is significant shortage of car parking space in close proximity to the hospital. Today, there are about 1,500 parking spaces available

within the hospital area. Based on preliminary high level demand assessment performed by the hospital management, it is estimated that Rajavithi Hospital has a major shortage of car parking spaces and the development of a new car parking facility is urgently required to increase total car park capacity to 4,000 cars to improve access for patients and staff of the hospital.

Based on preliminary financial assessment for the carpark project, the PPP Project value is estimated to be NPV of Baht 1.5 billion.

For the Rajavithi Carpark Project, the payment mechanism can be fully or partially based on commercial revenue generated from operations of the car park or other commercial real estate bundled with the car park. Based on preliminary assessment, there is the potential that the government will not have to make any payment to the Private sector / concessionaire for making the carpark available for use, regardless of the utilization of the asset.

Development of a car park facility at the Rajavithi Hospital represents a good potential candidate as a potential PPP project.

Project specific issues which require further development at the next stage include:

- **Developing a self-sustainable commercial business case / Demand risk assessment**
  The Project's potential to generate its own revenues through paying patients will be critical to attract private sector investors. The revenue generation potential can be assessed by undertaking a study of users' willingness to pay for the usage of the carpark. At the moment, in order to make the carpark commercially viable, average parking fee per hour is estimated at Bhat 17.5. This is comparable with current parking fee levels in the area. The private partner may also be able to generate commercial revenue from other services eg retail in addition to revenues generated from operations of the car park or other commercial real estate bundled with the car park. As such, if the project is able to generate sufficient revenues from car park and other ancillary operations, then for such a Project private sector will not require any payment from Government to develop the Project.

Overall Project Structuring Considerations and Next Steps

From the simulation studies for the three projects, we outline the key project development activities as part of the feasibility phase.

- To finalise the medical facility size and project cost and scope of medical infrastructure services to be provided by the private partner. Working with the relevant public sector project team, to ensure that the project objectives are aligned to deliver the proper medical services facility which is required. There are many international precedents where PPPs in the social sector have been successfully implemented which incorporate the design, construction and provision of both soft and hard facility management services to be provided by the private sector. Our preliminary findings indicate that there is sufficient interest and capabilities in the Thai market to provide these services however this will need to be developed and tested in more detail as part of the pilot project during market sounding consultations.
- As a PPP in the social sector will likely be a pilot which requires a long term payment to the private sector from government (subject to deductions for any poor performances of the private partner), and given that there is no precedent in the Thai market, detailed development of a viable and

bankable payment mechanism for a social PPP project should be undertaken as part of the feasibility study. Private sector investors and funder's assessment of the payment mechanism and private sector's ability to deliver the prescribed services will be a critical component to drive market interest and developing a successful PPP project.

- As part of the wider stakeholder consultation process, we would recommend further be to conducts early consultations with private sector representatives to provide Government with sufficient information to draft a clear RFP given limited information on market capacity and competitiveness. This would also allow private sector representatives to provide input regarding proposed PPP project scope and structure and may assist to create market interest of Government's intentions to develop particular project as a PPP.

Capacity Building Workshops

The goal of the capacity building workshops was to support medical / hospital representatives to understand the general principles of PPP as well as to update them on the status of the TA, particularly on the work done for the simulation studies.

The participants were briefed on general PPP principles, PPP projects in healthcare and the detailed steps required during the feasibility phase. Key results, issues and recommendations from the simulation studies were presented to participants. During the working group discussion, the participants were grouped according to respective hospital to discuss on respective needs and prepare an overview of the project scope. The representatives from Nakhon Pathom Hospital and DMS continued to refine respective business case with the guidance of the follow-up question presented in Appendix C-7 and in the presentation deck.

Key findings include:

- Most of the regional hospitals (i.e. Nakhon Pathom Hospital, Ratchaburi Hospital, Rajavithi Hospital) have placed the development of the carpark building as main priority of their infrastructure needs
- The working group session has assisted Rajavithi Hospital to present a potentially feasible PPP carpark project which we have further expanded and detailed in the Section 5.D
- A procurement representative from Chiangrai Prachanukroh Hospital has informed that under the existing regulations, Chiangrai Prachanukroh Hospital has received all required government approval to develop a car park building with private investor. The carpark model shared has similar concept with PPP model. The revenue to private sector is structured such that the private sector is able to collect retail rental from the retail spaces to compensate free / low carpark revenue collection from the hospital users.
- Representatives from Nakhon Pathom Hospital have raised their concern on the various infrastructure needs which will eventually make the project scope complex. For example, 90 beds general hospital, private wards, carpark and etc.
- As the Medical Excellence Center requires more complicated scope, the representatives from DMS are aware that further analysis and more historical data / information is required in order to create a better business case and be prepared for the feasibility stage. Please refer to Appendix C-7 for the work done during the workshop session.

Knowledge Database

The purpose of MoPH's PPP TSU knowledge database is to proactively inform the public on structure of PPPs in the healthcare sector. The knowledge database will be a centralized source of information on:

- PPP concepts and principles
- Thailand's PPP framework
- Global hospital PPP case studies
- Projects pipeline
- Projects database

The initial content support for development of the MoPH website will be exclusively constrained to PPP concepts and principles, Thailand's PPP framework and case studies. A brief overview of section contents is described below.

- **PPP concepts and principles**

  The website content describes the common elements attributable to various PPP definitions, PPP models in their varying degree of roles and responsibilities of the private sector, contractual arrangements of PPPs, key stakeholders, advantages of PPP over traditional procurement, risk allocation and the concept of Value for Money. This should provide readers with the foundation to explain the benefits of implementing the PPP model, understand criteria for performance measurement and how an appropriate risk – reward mechanism can make the private sector more effective than the public sector.

- **Thailand's PPP framework**

  The website content describes the background of the Thai PPP framework, focusing on the PISU Act, national development objectives and fundamental state policies under the "National Economic and Social Development Plan" (NESDP)

  The PISU Act mandates a five-year Master Plan, or "Strategic Plan on Private Investment in State Undertaking," which lays out operational direction and considerations for private participation priorities and investments in line with the NESDP. The Master Plan is prepared jointly by the SEPO and the PPP Committee and submitted to the Cabinet for approval, which outlines investment policy, type of projects in priority areas, investment target and time frame.

- **Global Hospital PPP Case Studies**

  Several case studies illustrating the application of the theoretical knowledge of PPPs in real-world scenarios and how the model is specifically adapted to each project to achieve success were prepared to be included in the website content.

1. Introduction and Background

This section outlines the purpose of this document along with the background of TA-8575 and our approach to support the anticipated scope of work.

A. Background to TA-8575

The objective of the Technical Assistance (TA) 8575 is to identify and advance a pipeline of PPP projects in Thailand health sector, with a secondary objective of develop and promote capacity of the Thailand Government (Government) to procure, manage, and monitor social sector PPPs.

The Thai Ministry of Public Health (MoPH) has set out objectives to increase the reach and depth of health service coverage and offerings across the country. PPP offers the potential to increase private sector participation in the delivery of supporting infrastructure and related services to deliver the increased level of public health services by leveraging private sector financing, innovation and technical and management knowhow, to attract the required investment.

We also understand that the Government has undertaken a number of reforms both directly related to the health market and more generally with respect to the enabling environment for PPPs in the country to enable greater private sector participation.

B. Original scope of work

Subsequent to the Inception Mission and as outlined in our Inception and Mid-term Reports, EY's scope of work originally comprised the following six key tasks:

- **Task 1:** Project inception and kick-off
- **Task 2**: Review PPP policy and institutional frameworks
- **Task 3**: Identify potential health PPP projects
- **Task 4**: Build capacity and develop health PPP projects
- **Task 5**: Conduct pre-feasibility study for pilot project
- **Task 6**: Identify potential for education sector PPPs

Results of this work were presented in our Mid-Term Report.

C. Amended scope of work

As outlined in our Mid-Term Report, as endorsed by the MoPH PPP project committee chaired by Dr. Amnuay on 8 June 2015, the scope of the TA was amended as follows given limited information available on potential health PPP projects. The amended scope of work is summarised below:

- **Stream 1:** Development of high level assessment and evaluation of procurement strategy for 2 simulated hospital PPP projects: Mid-size General Hospital Facility and Specialised Medical Services Centre;
- **Stream 2:** Conduct additional capacity building workshops;
- **Stream 3:** Provide support in building knowledge database for the MOPH PPP unit; and

- **Stream 4:** Identify main legal and regulatory issues and support capacity and knowledge building for legal and regulatory matters.

The detailed scope of work is provided in the Appendix A.

D. Report structure

This Report (Report) is sets out the key issues, results, conclusions and recommendation developed of the course of the entire TA. The Report includes summaries of certain critical observations and issues presented in the Mid-Term Report (included as Appendix B) to provide relevant context and background in relation approach and results of our analysis to inform our final analysis of the issues and recommendations.

The Report has been structured as follows:

1. Introduction and background
2. Overview of Thailand healthcare industry
   - Existing healthcare infrastructure and services
   - Future demand for healthcare
3. Institutional and budgetary framework
   - PPP regulatory framework
   - Budgetary framework overview
4. Market capacity overview and considerations
   - Service providers
   - Funding providers and investors
5. Overview of the PPP projects simulation studies
   - Mid-Size General Hospital (Nakhon Pathom Hospital)
   - Medical Services Excellence Centre (Department of Medical Services)
   - Car park (Rajavithi Hospital)
6. Summary of the main issues and recommendations
   - Main issues
   - Recommendations
7. Procurement strategy guidelines and recommendations
8. Development plan for the MOPH PPP-TSU
9. Summary of other TA tasks and initiatives
   - Knowledge database overview
   - Project communication strategy
   - Capacity building results
   - Summary of work completed for the Ministry of Education
10. Next Steps
    - TA's continuation – pre-feasibility study
    - Information required for the pre-feasibility study
    - Terms of Reference for transaction advisor to develop feasibility study

2. Overview of Thailand Healthcare Industry

A. Existing Healthcare Infrastructure and Healthcare Services

2.A.1 Hospital Segmentation in Thailand[1]

The hospitals and healthcare facilities in Thailand can be segmented into 3 main categories: Public hospitals, medical schools/teaching hospitals and private hospitals. Most hospitals in Thailand are provincial public hospitals of various sizes that are supervised by the Ministry of Public Health.

Public Hospitals	Medical Schools	Private Hospitals
RRegional Hospitals ► Bed: more than 500 ► 26 regional hospitals, serving healthcare in 4 regions ► Tertiary Care	**Medical schools / Teaching Hospitals** ► Providing most advanced medical capacities (Super Tertiary Care) ► 13 medical schools in Thailand ► Maharaj Nakorn Chiang Mai Hospital **(1,375 beds)** ► Siriraj Hospital **(2,221 beds)** ► King Chulalongkorn Memorial Hospital **(1,439 beds)** ► Phramongkutklao Hospital **(1,236 beds)** ► Ramathibodi Hospital **(1,378 beds)** ► Vajira Hospital **(875 beds)** ► Srinagarind Hospital (**991 beds)** ► Songklanagarind Hospital **(855 beds)** ► HRH Princess Maha Chakri Siridhorn Medical Center **(500 beds)** ► Thammasat University Hospital **(439 beds)** ► Panyananthaphikkhu Chonprathan Medical Center **(320 beds)** ► Mae Fah Luang University Hospital **(107 beds)** ► Naresuan University Hospital **(400 beds)**	**Key facts:** ► 321 private hospitals nationwide
General Hospitals ► Bed: 120 to 500 ► 71 general hospitals nationwide ► Secondary Care		**Listed-Chain Hospitals** ► 8 hospitals listed in the Sock Exchange of Thailand: ► Aikchol Hospital (AHC) ► Bangkok Dusit Medical Services (BGH) ► Krungdhon Hospital (KDH) ► Lanna Hospital (LNH) ► Mahachai Hospital (M-CHAI) ► Ramkhanhaeng Hospital (RAM) ► Samitivej Hospital (SVH) ► Vibhavadi Hospital (VIBHA)
Community Hospitals ► Bed: 10 to 120 ► 723 community hospitals nationwide ► Primary and Secondary Care		
Public Healthcare Centers ► Bed: nil ► Primary Care		**Provincial Private Hospitals** ► Refers to medium to small size private hospitals, facilitating needs for faster and more comfortable services compared to public hospitals
► Supervised by Ministry of Public Health	► Governed by Ministry of Education (medical schools with Super Tertiary Care capacities)	► Private sector

[1] Sources: (i) Soldiance, "The future of Thailand's Helathcare Industry in Tier 2 Cities – Outlook for 2015 – 2020"

2.A.2 Key facts of Thailand Healthcare

2.A.2.1 Number of hospital beds and doctors per 10,000 population (2013)

Despite having relatively high number of hospital beds per capita in comparison to the ASEAN median, number of doctors per capita in Thailand is below average. Shortage of doctors and nurses is one of the main challenges of Thailand's healthcare sector that hamper growth of its healthcare industry.

Area	Hospital beds / 10,000 people	Doctors / 10,000 people
Global	26	13
ASEAN	10	6
Thailand	21	4

Sources: The World Bank, Hospital beds (per 1,000 people), Physicians (per 1,000 people)

2.A.2.2 Thailand healthcare spending

Public sector is the main provider of healthcare spending in Thailand. The spending is contributed primarily from the Ministry of Public Health and from insurance schemes (national universal healthcare, social security and civil service scheme).

Description	2008	2009	2010	2011	2012	2013	2014
Healthcare expenditures (Baht 'bil)							
- Private healthcare expenditure	2.6	2.8	3.1	3.3	3.3	3.4	3.7
- Public healthcare expenditure	8.2	8.2	9.3	10.1	9.9	10.5	11.4
Healthcare spending (% of GDP)	3.9%	4.2%	3.9%	3.8%	3.8%	n/a	n/a

Source: Soldiance, "The future of Thailand's Helathcare Industry in Tier 2 Cities – Outlook for 2015 – 2020"

2.A.2.3 Top 5 leading causes of medical treatments and deaths in Thailand (2012)

Table below summarises the top 5 leading causes of inpatient treatment, outpatient treatment and deaths in 2012:

Rank.	Inpatient treatments	Outpatient treatments	Deaths
1	Hypertensive diseases	Respiratory system diseases	Cancer
2	Hemorrhagic and other blood and immune system diseases	Circulatory system diseases	Accidents and poisonings
3	Digestive system diseases	Endocrine, nutritional and metabolic diseases	Hypertension and cerebrovascular diseases
4	Diabetes mellitus	Digestive system diseases	Heart diseases
5	Heart diseases	Musculoskeletal system diseases	Pneumonia and other lung diseases

Source: (i) Soldiance, "The future of Thailand's Helathcare Industry in Tier 2 Cities – Outlook for 2015 – 2020"

B. Future demand of healthcare

Demand for healthcare services in Thailand is expected to increase as a result of the following:

- **Aging population:** Thailand's population is aging and Thailand is expected to become an aged society by 2022 with the number of senior citizen to increase to 19% of the total population compared to 13% in 2012. The demand for healthcare services (particularly treatment and care for chronic diseases) and elderly care is expected to grow with aging population trends.
- **Medical tourism:** Medical tourism in Thailand increased by 17.5% annually from 2007 – 2011. In 2012, the number of foreigners seeking medical treatment in Thailand reached 2.53 million and brought Baht 121.6 billion of revenue to the country. With the existing Thai's Government's effort in promoting Thailand as a hub for medical, the number of medical tourist to Thailand is expected to increase.
- **Urbanization outside Bangkok:** Urbanisation outside Bangkok has been identified as one of the key drivers for private hospitals investment. Higher purchasing power has encouraged consumers to pay extra for similar healthcare services in private hospitals but with faster services and better comfort. The demand for self-paid patients is expected to increase.

As part of health service planning it is critical to identify potential infrastructure gap in the near future and the extent to which this gap can be met by existing hospitals (public hospitals, medical schools and private hospitals). It is also important for the Government to analyse various infrastructure procurement methods to fulfil this gap, for example, how a PPP could contribute to meeting this gap. A PPP could be one of many procurement options used by the Government to deliver infrastructure needed to meet increasing demand within the required timeframe by engaging private sector expertise and funding capacity to deliver modern healthcare infrastructure facilities and to improve healthcare delivery outcomes.

The following sections set out the key issues, findings and recommendation developed over the course of the TA in identifying / developing a PPP healthcare project.

3. Institutional and Budgetary Framework

A. PPP Framework Overview

3.A.1 PISU Act and its Regulations

The Government has taken an active stance in pushing forth legislative changes to garner greater private sector participation in infrastructure projects. In early 2013, SEPO, within the Ministry of Finance in Thailand, announced its plans to raise 30% of its THB 2.27 trillion (US$76bn) transport infrastructure program from the private sector over the next seven to eight years. This figure reportedly covers the Government's entire transport investment budget, and within this will be included projects for high speed trains, double track rail and roads. According to government officials, likely PPPs comprise electric-train projects including investments in the physical rolling stock.

The most recent initiative by the Government to stimulate the PPP market has been the introduction of a new PPP law which aims to foster competition among private sector operators to generate higher VfM for the Government's authorities. Effective from April 2013, this Act titled Private Investment in State Undertaking Act B.E. 2556 ("PISU Act") seeks to remove some of the challenges faced in the previous PPP Act. For example, the new PPP Act will provides for a more streamlined approval process which is intended to accelerate the processing of public-private partnership based contracts, from nearly 2 years to under 1 year possibly leading to faster project implementation.

The PISU Act governs the following chapters:

- General Provisions
- PISU Policy Committee
- Strategic Plan for PISU
- Project Proposal
- Project Implementation
- Supervision and Monitoring
- Contractual Amendment and New Contract
- PISU Promotion Fund
- Miscellaneous Provisions
- Penalties

PISU Act and the sub regulations address a number of issues that its predecessor failed to address which previously caused uncertainties and require interpretations from relevant government agencies, e.g. definitions, calculation of project value, renewal of contract, etc. The Act prescribes that SEPO shall enact regulations within 180 days from the effective date and since then, the following regulations have to date been enacted:

No.	Regulations	Effective Date
1.	Rules and Procedures for Selecting a Qualified Member of PISU Policy Committee	26 June 2013
2.	Rules and Procedures for Preparing List of Experts Appointed as Qualified Member of Selection Committee and Supervisory Committee	15 October 2013

No.	Regulations	Effective Date
3.	Rules and Procedures for Hearing of Opinions for Preparing a PISU Strategic Plan	29 January 2014
4.	Required Details in a Project Appraisal Report of Project Agency	29 January 2014
5.	Qualifications of a Consultant	29 January 2014
6.	Descriptions of Private Party which are not Qualified for Pand Persons who are Unsuitable to Act as Consultants	29 January 2014
7.	Remuneration of Member of Committee, Subcommittee and Expert under PISU Act	7 February 2014
8.	Rules and Procedures for Appraisal the Value of a Project	11 February 2015
9.	Characteristics of Investment Contract Amendments which are considered as Amendments to the Essential Substance	11 February 2015
10.	Rules and Procedures for PISU in a Project having a Value Less than THB 1 billion – Section 23 of PISU Act (also known as "**Below THB 1 Billion Regulations**")	17 March 2015
11.	Strategic Plan for PISU in 2015 – 2019	10 June 2015

The cabinet has approved in principle the draft Ministerial Regulation to increase the project value under section 23 of PISU Act from below THB 1 billion to be below THB 5 billion. We understand that the "Below THB 1 Billion Regulations" shall be amended and will categorize two types of projects:

a) a project with project value of THB 1 billion and below THB 5 billion, and
b) a project with project value below THB 1 billion.

The draft Ministerial Regulation and the Notification are not publicly available for our review today. In this report, we set out the laws and procedures under the existing legal thresholds (ie below THB 1 billion and THB 1 billion or more).

On 11 February 2015, SEPO and the policy committee have approved 5 sub-ordinate regulations under PISU Act, B.E. 2556 as follows:

1. **Project Calculation:**

Project value calculation = total public and private investment/ assets, both tangible and intangible, creates an optimal-level of utilization capacity during the whole life of the project. This should include initial investment, CAPEX, and OPEX.

2. **Selection Guidance:** Guidance for private sector invitation and selection

- The majority concept of the regulation shall be aligned on the old PPP act, but with more transparency.
- Project evaluation criteria are currently developed and consultation process takes place with private sector representatives and government agencies.
- The primary evaluation criteria on selecting PPP project by SEPO :
    - Primary need, necessity and urgency for the project

- Alignment of the project with the country/ministry's policy/strategy
- Value for Money when comparing with the costs if project is done by the government

3. **Standard topic:** The commercial principles in the PPP contract shall include:

- Right and duty of each parties
- Service fees and interest determination
- No automatically extending of the contract
- No potestative condition on private sector side

4. **Important amendment topics in PPP contract:** (i.e. any amendment that increases benefit to the private) shall be reviewed and approved by the Cabinet in order to improve transparency.

5. **PPP process of each level:**

- First, the project should be clearly stated by its definition whether it's under PISU Act or not. PPP project is defined as either infrastructure or public service project that provides benefit to the mass. The PISU Act governs all private participation in state undertakings except for (a) concessions under the law on petroleum, (b) concessions under the mining law and (c) any projects to be prescribed under the Royal Decree.(section 7 of PISU Act).

  Under section 4 of PISU Act, 'State Undertaking means an undertaking having one of the following descriptions:
  - an undertaking which a government agency, state enterprise, other state agency or local administrative organization, either singly or collectively, have legal obligation to perform; or
  - an undertaking which requires the utilization of natural resources or properties of one or the several government agencies, state enterprises, other state agencies or local administrative organizations, either singly or collectively.

  "Investment" means a public-private participation undertaken by any means, or designation of a unilateral private investment by way of a licence or concession or grant of any kind of right.

  The key criteria to consider if a contemplated project is considered a PPP Project under PISU Act are:
  - Projects that government agencies have legal obligation to perform under the law (eg to provide health services to the public in case of Ministry of Public Health, while a car park service to the hospital may not be the legal obligations for the Ministry of Public Health is required by law to perform); or
  - Projects involving utilization of natural resources or state properties (eg a car park building constructed upon state properties operated by a private sector fall under this criteria).

  A project that does not fall within these two criteria does not fall under the definition of state undertaking and therefore PISU Act shall not apply.

  An infrastructure project without private investment may not be a project under PISU Act. For example, a construction of a public infrastructure by a private entity in the state properties under the traditional procurement where the government agencies engage a private party to construct infrastructure on private land in exchange of fees and the private sector does not have any rights over the constructions after the completion. The private sector does not jointly invest with the

government agencies and the government agency does not grant any concession or rights to the private sector in constructing the project under traditional procurement method.

- Second, the government agencies and private party must comply with provisions under the PISU Act for a project with private investment in state undertakings regardless of the amount of the project. However, the guidance of the procurement approach should be leveled by the project value, which are:
  a. For > THB 5 bn. project; the project shall align under PISU act either the project is under PPP definition or not.
     - A project with a project value more than THB 1 billion under section 23 of the PISU Act (to be increased to THB 5 billion under the draft Ministerial Regulation) has to comply with the procedures set out under the PISU Act.
  b. For THB 1-5 bn. project, the guidance is divided by its definition:
     - Under PPP definition: the project shall align under PISU act
     - Not under PPP definition, e.g. commercial real estate development project on government's land: the project shall apply the same process as the project under THB 1 bn. Moreover, the project shall be monitored by PPP committee and recorded in PPP database.
  c. For < THB 1 bn.: the project shall be approved by its authorized ministry.
- In practice, every project that uses long term commitment for the government budget shall be approved by the Cabinet (at any cost). A cabinet approval dated 10 February 2009 requires an approval from the cabinet for any long term budgetary commitment for more than five years.
- For projects below Baht 1 billion, the SEPO guideline is to apply existing Procurement Regulations with mutatis mutandis principle. SEPO has clarified that the responsible agency has to consider competitive tender as the first procurement option. If competitive tender procurement option is not available, then the Minister of the responsible agency will have to approval non-competitive procurement method (direct negotiations with a sole-source proponent).
- A Standard PPP Contract is currently being developed by SEPO for PPP project of Baht 1 billion and above (to be revised to THB 5 billion and above). SEPO has indicated that no additional guidelines will be released on the Standard PPP Contract for projects valued under Baht 1 billion (to be revised to under THB 5 billion). However, responsible agency can apply/ select relevant topics from Standard PPP Contract of project under Baht 1 billion (to be revised to THB 5 billion) and above to be used for project under Baht 1 billion. We note, that at the date of this report, the Commission has not enacted the notification regulating the project with value between THB 1 billion to THB 5 billion.

Moreover, the SEPO informed that Thai PPP projects pipeline will see all projects divided according to 2 types as noted in the table below. Projects which must be undertaken under a PPP arrangement include transport infrastructure projects which have been identified as critical requiring significant capital investments, and considered complex to deliver hence there is merit to involving private sector to be more efficient and effective in delivering and operating these types of infrastructure.

The projects that MUST be PPP	The projects supported by government to be PPP
Transportation	**Transportation**
1. City railway	1. Packaging and distribution station
2. City toll way	2. Turnpike road development
3. Port	3. Common ticket management and maintenance
4. High-speed train	4. Airport operation and management development
Telecommunication	**Irrigation water and environment**
1. Telecommunication network	1. Water quality system management and development
2. High-speed internet	2. Irrigation water management and development
	3. Waste management
	Public health and economics
	1. Public education institution development
	2. Science, technology, and innovation infrastructure development
	3. Public health infrastructure development
	4. Drug, medical supplies, devices and equipment management
	5. Public convention center development

Source: SEPO

B. Legal and regulatory framework issues

3.B.1 Distinguish the Procurement Methods and Authorization Matrix based on Project Value

The procurement methods under the current regulations are in the following arrangement:

- Project below THB 1 billion: Regulations of the Office of the Prime Minister B.E. 2535 (1992) (see Item 4.3.3 for more details)
- Project of THB 1 billion and above: Procurement processes under Chapter 5 of the PISU Act

The Below THB 1 Billion Notification prescribes that the Project Agency, which does not have its own procurement regulations governing the state undertakings, shall apply the procurement regulations applied to its procurement *mutatis mutandis*. Most of the government agencies apply the Procurement Regulations of the Office of the Prime Minister for its procurement.

There are no guidelines to which extent the Procurement Regulations covers the process. The Procurement Regulations governs procurement of goods and services including hire of consultants and contain various types of procurement methods (eg bidding, special method, etc). This leads to uncertainties on which provisions shall apply to a project with the value below THB 1 billion.

Principally and practically the Procurement Regulations focus on the bidding of the lowest price while the PISU Act focuses on value for money. The government has approved in principle a Procurement Bill which is under consideration of the Office of the Council of State and certain criteria including the value for money could be one of the criteria for government procurement.

3.B.2 Possible impacts from upcoming new procurement act

Further to Item 4.3.2, as Project below THB 1 billion relies on the Procurement Regulations, the Regulations itself has not been up-to-date with the needs of procurement and has created some obstacles over the years, particularly in connection with the efficiency on the procurement. The Procurement Regulations have binding authorities within the government agencies and not the private parties. The state enterprises are not directly subject to the procurement regulations but the cabinet resolved that the state enterprises shall adopt the Procurement Regulations to the extent possible.

The Government is therefore introducing a new Draft Procurement Act to replace the current Regulations. It is currently being reviewed by the Office of the Council of State and is expected to be proposed to the National Legislative Assembly for the enactment process by the end of this year which will be in force by mid-2016. The new Act will only stipulate the procurement broadly in principle; while its regulations detailing the procurement process, which are still being drafted by the Comptroller's General Office, will be issued by the time the Draft Act is effective.

The most significant alteration to the procurement process is that it will take into account the concept of 'value for money' which is in line with the PISU Act procurement.

3.B.3 Land related issues

PISU Act does not supersede any other existing laws or regulations. The government agencies must comply with other laws and regulations in implementing the projects.

At this stage, the key issue that obstructs the development of the PPP project is in connection with the with the use of land.

The following issues are challenges to the implementation of PPP project involving the use of public land.

1) Project Agencies, e.g. MoPH, cannot enter into the PPP Contract with private partners

   The Public Land, also known as *Ratchaphatsadu* Land, is governed by the *Public Land Act B.E. 2518 (1975)* and regulations thereof under the sole responsibility of the Treasury Department, Ministry of Finance.

   All land that categorized as a Public Land will be in the responsibility of the Treasury Department even the land is acquired by other government agencies (eg If the land obtained for hospital by means of donation or using hospital fund to acquire, such land will automatically become Public Land under the supervision of the Treasury Department and the Treasury Department could then distribute the said land to the MoPH to be administered and utilized in accordance with their relevant intended objectives).

Any other utilizations of the Public Land must acquire a prior approval from the Director-General, Treasury Department. In this case, the utilization of Public Land by private partners under the PPP Project would require the private partners to directly enter into agreements with Treasury Department and not the government agencies who would in fact utilize the Public Land. This results in a situation when Treasure Department will need to be another party of the PPP agreement and will need to enter in a land lease / transfer agreement with MOPH.

MoPH will have to temporarily transfer the land to the Treasury Department for a limited period of time concurrent to the project; in turn, the Treasury Department will enter into contractual agreement with the private partner in the name of the Treasury Department and then delegate certain work to MoPH to transact directly with private partners on behalf of Treasury Department.

The issues arising on the delegation and control between MoPH and Treasury Department and to what extent Treasury Department wish to delegate the authority.

2) Restrictions on entering into long-term lease on Public Land

Under the regulations issued under the Public Land Act, it may not be possible for the Treasury Department to enter into a long term lease with private partners.

3) Reluctance to return the Land to MoF by relevant Project Agencies

Once the Public Land is returned to the Treasury Department, Ministry of Finance, the Treasury Department in theory is able to permit the other government agencies to use the Public Land.

We note that the Treasury Department does not permit sub-leasing in the lease agreement in practice and private partner cannot create any encumbrances, e.g. selling, mortgaging, etc., to the Public Land.

In recent development, the Treasury Department has informed that there will be an amendment to the Treasury regulations in order to pave way for PPP project in the future, whether by amending the current regulations or issue a new set of regulations to deal with this issue, it is yet to be confirmed.

Recommended action: There should be an enactment of new regulations to specifically carve out PPP Project from regulations issued under the Public Land Act.

3.B.4 Asset ownership, transfer and security

Under the Treasury Regulations, the ownership of any structure constructed on the Public Land shall be transferred to the Treasury Department upon completion (BTO).

However, the Director-General of the Treasury Department can permit the structure constructed on the Public Land it can be transferred upon termination of lease term (BOT) for the public interest or of governmental necessity.

The question at issue is whether this PPP Project is regarded to be for the public interest by the Treasury Department and thus will delay the transfer of ownership to allow bankability for private partner.

We note that the Business Collateral Act, which is currently in the final stage of the National Legislative Assembly, will be enacted within three months and enter into force one year therefrom, might facilitate collateral enhancement for private partner.

Recommended action: MoPH is to request a confirmation from MoF that this PPP Project will be considered a project developed for the public interest.

3.B.5 Standard contract framework

Currently, there are no specific guidelines for standard PPP contract. SEPO will issue the framework for the standard PPP contract and calculation method for PPP Project evaluation guidelines for Project above THB 5 billion. For Project below THB 5 billion, it is envisaged that the standard PPP contract for Project above THB 5 billion can be used since it is not known if SEPO intends to issue any additional standard contract. The timeframe for the issuance of such framework and guidelines is not yet known.

The current lack of proper regulations regarding procedures for PPP Projects particularly below THB 1 billion and THB 1 – 5 billion, and lack of a Standard PPP Contract is likely to cause some delay as there is no clear structure or guideline for relevant parties to implement PPP. MoPH can also use it's existing procurement framework for PPP projects below THB 1 billion, particularly for commercially viable projects that require no government funding.

3.B.6 Payment mechanism

The Payment Mechanism is a key financial factor underpinning the financial viability of any social sector PPP project, as it governs how the private party will be paid for the services provided.

For many social sector PPPs, the private sector needs to rely on a payment stream from Government as third party revenues derived from the delivery of the public health, education or other social services are generally not sufficient to cover the private sector's costs of delivering and operating the related physical infrastructure. This is often as a result of pricing for medical, education and other such social services typically being regulated to ensure universal access.

As a result, the private sector needs to be confident that the government payment obligations under the Payment Mechanism will be forthcoming. As such private sector will seek to understand the Government budgetary and appropriation process to determine the likelihood that such a process can impact payments due to them by delay or non-payment.

As mentioned in Item 2.2.4, the budget appropriation is typically carried out on a yearly basis. In addition, the *Cabinet Resolution of 10 February B.E. 2552 (2009)* resolved that a budgetary commitment should not be longer than 5 years; otherwise, a prior Cabinet's approval is required. As such the following challenges should be recognized, which affects both private and public sector who seek long term financial commitment, to support the PPP availability payments:

- Given the budgetary process, relevant government agencies would be disinclined to appropriate budgetary commitment over a long period of time.
- For Project below THB 1 billion, as it's a long term budget commitment, a require Cabinet approval is likely to be required even the "Below THB 1 Billon Regulations" does not require cabinet approval.
- No priority is given to budget appropriation for PPP Project.

These are issues which are recognized by SEPO, so SEPO and the Bureau of the Budget are working together to develop the amendment for PPP Project exception to this rule. However, the timeframe for this process is yet to be confirmed.

3.B.7 Operational budget

It is possible and advisable to use some funds from the hospital operational budget to support the hospital infrastructure activities pursuant to its internal regulation - we understand that MoPH is currently reviewing the rules on how to carve out the use of funds from the operational budget provided to a hospital for the PPP Project. Further evaluation will be undertaken as to how to utilize a component of the hospital operational budget for PPP payments. Importantly this will serve to avoid double payments if government funding provided to the hospital also covers infrastructure related expenditures, both capital and operational. It will require additional analysis to determine what portion of the hospital operational budget will need to be allocated to the PPP project to partially cover construction and maintenance of new infrastructure assets.

C. Budgetary Framework

We have examined the budgetary process in Thailand and presented our conclusions and likely impact to potential social sector PPPs in the Mid Term report. The following sections are a summary of this analysis to inform the project team on how best to structure commercial arrangements, or whether projects will require some form of financial support to mitigate budget appropriation risk (e.g. political insurance).

Our analysis in this section was informed by meetings held with the Bureau of the Budget and SEPO conducted in August and September 2015.

3.C.1 Ministries relevant to budgetary matters

There are three primary government entities involved in the budgetary process in relation to social sector PPPs, namely the:

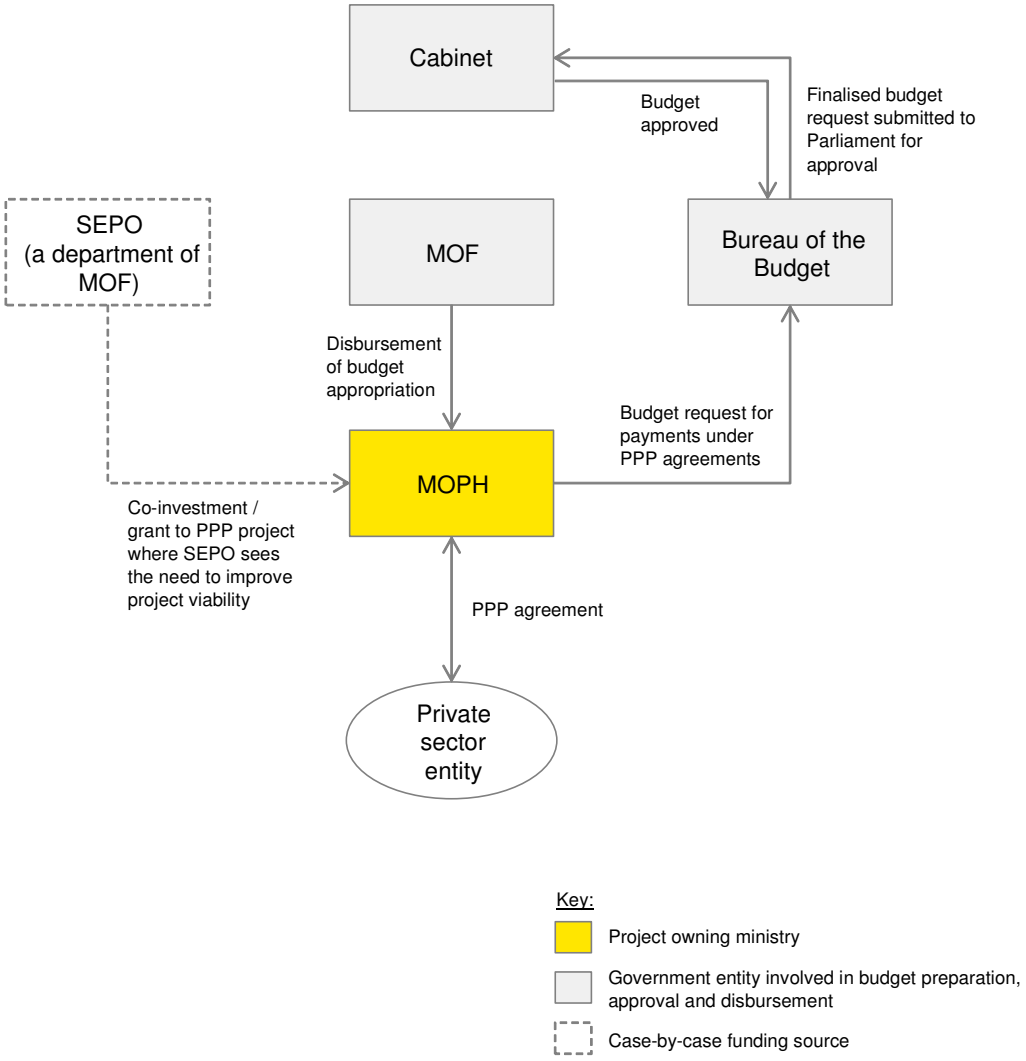
Procuring Authority, MOPH (healthcare) or MOE (education), which collates all its budgetary requirements and submits to the Bureau of the Budget for approval,

Bureau of the Budget, which reports directly to the Prime Minister, collates the budgetary requests from all ministries in Thailand and submits proposed appropriations to Cabinet for formal approval, and

MOF, which is responsible for disbursing approved appropriations.

Figure 1 below provides a high-level overview of the parties involved in so far as they relate to funding PPP arrangements. We have used a health sector project as an example below so MOPH has been shown as the project owning entity. This would be replaced with MOE in the context of an education project example.

Figure 1 – Overview of Thailand's budgetary process



In addition to the three ministries mentioned above, there are two other government bodies that will be involved specifically with PPP projects:

NESDB, which will assess a proposed project for its alignment with the Thai Government's medium term investment plan, and

SEPO, a department within MOF which is responsible for development of the PISU Act, and overall management of PPP projects that fall under the Act. We understand that SEPO also evaluates the

merits for providing grants or other special funding to PPP projects to improve their viability and/or appeal to private sector bidders.

3.C.2 Budgetary process

Thailand has a well-established budgetary process. Central to this is the Bureau of the Budget, which reports directly to the Prime Minister and is primarily responsible for the budget's preparation, collation and disbursement. The Thai budgetary process is as follows:

On an annual basis, ministries (e.g. MOPH, MOE, etc.) collate and consolidate the budget requests of their departments. They prepare a formal budget request that separates their operating and investment requests. The request is submitted to the Bureau of the Budget.

The Bureau of the Budget assists government agencies prepare their annual budgets and collates all budget requests from the various ministries. It analyses budget requests for reasonableness by comparing against prior years, and for the investment budget in particular, against precedent projects. It seeks clarifications if necessary. It also moderates requests based on 'budget ceilings' which are determined using economic assumptions and calculations prepared in collaboration with the Bank of Thailand (Thailand's central bank), MOF and NESDB. A consolidated budget request outlining proposed appropriations to the various ministries is submitted to Cabinet for approval.

The Prime Minister introduces the budget to Cabinet, first to be approved by the House of Representatives (lower house), and then the Senate (upper house). The House of Representatives cannot propose additional expenditures in the budget, it can only seek reductions. To do this, the House of Representatives requires the endorsement of the Prime Minister. The Prime Minister therefore effectively has a veto over any proposed amendments. Once approved by the House of Representatives, the budget is presented to the Senate.

The Senate cannot make any changes to the budget, it can only vote to approve or deny the budget as a whole.

Once the Senate has approved the budget, it is submitted to His Majesty the King for Royal Assent. Upon receiving Royal Assent, the Bureau of the Budget works with MOF to make the approved appropriations.

3.C.3 Implication on PPP project

The above process is comprehensive and results in annual appropriations to Government Ministries categorized as one of the five following types:

1. Personnel expenses
2. Operating expenses
3. Subsidies
4. Investments
5. Other expenses

The "other expenses" category is typically used for small items that are closely monitored and separately reported.

We are not aware of any, large scale social sector PPP projects in Thailand, i.e. those relying on government funded availability payments as a primary source of revenue. .

We summarise some of the key challenges to procuring PPPs resulting from the existing budgetary process including a discussion on how each could impact the bankability of PPP Project (see Figure 2):

Figure 2 – Key areas to address to procuring PPPs resulting from Thailand's budgetary process

Consideration	Discussion
Operating vs. investment budget	Social sector PPPs typically rely on availability payments from Government as their primary revenue streams. These payments are generally structured as escalating fixed annual payments, covering the life of the PPP agreement As each annual payment incorporates an element of capital, financing and operating expense throughout the term of the contract. As such the nature of the payment would not directly align into the five categories of budget allocation currently used by the Bureau of the Budget Government will need to decide which of the five categories, or part thereof above the payment will need to be classified as from a budgetary perspective Our initial discussion with the Bureau of the Budget indicated that funding would be allocated to each of the five categories based on a pre-determined formula for such projects. This approach is yet to be tested by the Bureau of the Budget and MOF to ensure sufficient funds will be committed over the long term. We view this as a key area to be developed as part of the pilot project
Annual appropriation	From our discussions with SEPO, it is unlikely that government guarantees will be provided to support government's long term payment obligations. The government's budget appropriations are annual in nature, with the budget process repeated each year. As such private sector will need to be comfortable that the government's budgetary processes are sufficient to ensure that funds are available to meet the PPP payment obligations over the long term. The extent of level of comfort in relation the government budgetary process will need to be tested as part of the pilot projects. Given Thailand's investment grade credit rating and the existence of a liquid domestic debt and capital markets especially where there is sufficient market appetite and sponsors who may be willing to take a view on government's commitment to long term payment obligations.. We note also that certain credit enhancement products from ADB may be available in the event budget process risk needs to be further managed

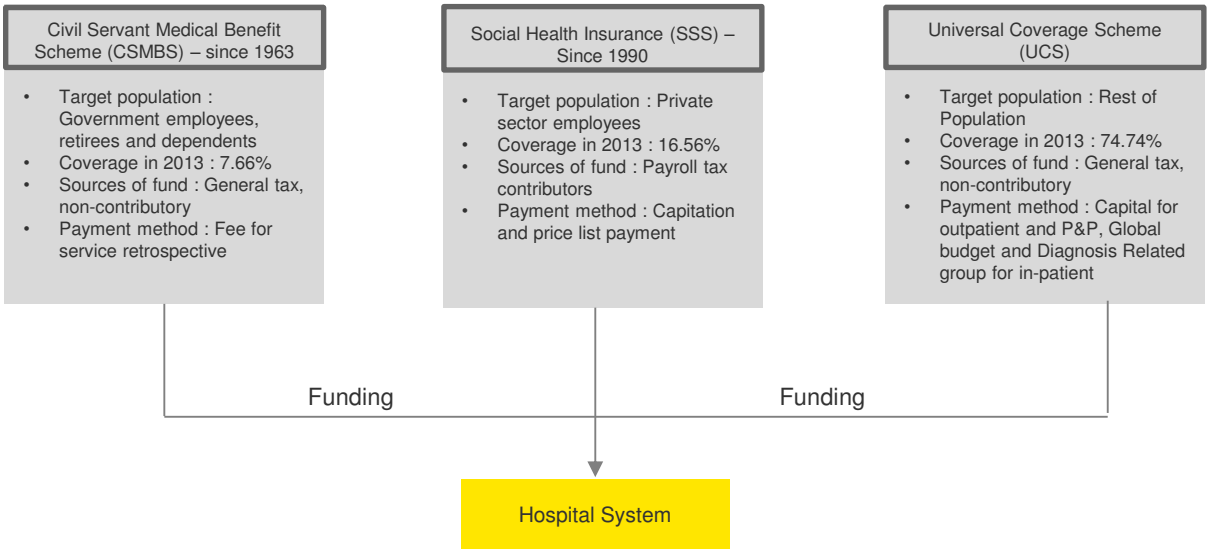
The above considerations are key issues which require further development during the pilot project phase to ensure that availability based social sector PPP projects can be bankable.

The MRTA Purple Line PPP, which is currently in market and is Thailand's first ever "availability payment" PPP, will be a good indicator of the market's appetite for such arrangements. While the MRTA Purple Line PPP is a transport sector project with which the private sector in Thailand is more familiar, it should provide lessons that can be applied to social sector PPPs, specifically in relation to risk allocation, contractual structures and importantly, how the private sector deal with some of the government budgetary process challenges noted in the table above.

3.C.4 Flow of funds within MoPH

Government expenditure on health in Thailand is relatively high, and has doubled over the last two decades from 1.5% of GDP in 1995 to 3.7% in 2013[4]. It is expected that health care expenditure will continue to rise both in nominal terms and as a percentage of GDP.

Figure 3 – Summary of public health insurance schemes in Thailand



Source: Bureau of Policy and Strategy, Ministry of Public Health; NHSO Annual report 2013

As the table shows, the chief funding mechanism for health care is the Universal Coverage Scheme (UCS) managed by the National Health Security Office. This scheme and the National Health Security Office were established in 2001. The UCS allows members to receive services at registered contracting units for primary care (CUP) of which almost all are public facilities. If registered facilities cannot provide proper treatment, patients will be referred to a higher level of health facility. The payment mechanism for the UCS is a capitation grant (a fixed rate paid per user registered to a CUP). The grant was based on a rate of THB 2,693[5] as of 2011 per registered person and is prepaid to the CUP.

For SSS, users must receive services at a registered provider's hospital, which can be either private or public, with most located in Bangkok and other urban areas. The payment method for the SSS is a similar capitation payment from government, with hospitals eligible for additional payments based on volume of use and a pre-agreed price list for services.

[4] Database: World Development Indicators, Last updated 10th September 2015

[5] World Bank Report - Health Financing Reform in Thailand: Toward Universal Coverage under Fiscal Constraints -2013

For the CSBMS, participants are eligible to receive treatment at any regional hospital and the hospitals are paid on a fee-for-service basis.

Funding for public healthcare currently flows through to public and private health providers via Universal Health Care Coverage, Social Security Scheme and Civil Servant Medical Benefit Scheme (CSMBS). Responsibility for the Health budget in Thailand rests with National Health Security Office (NHSO).

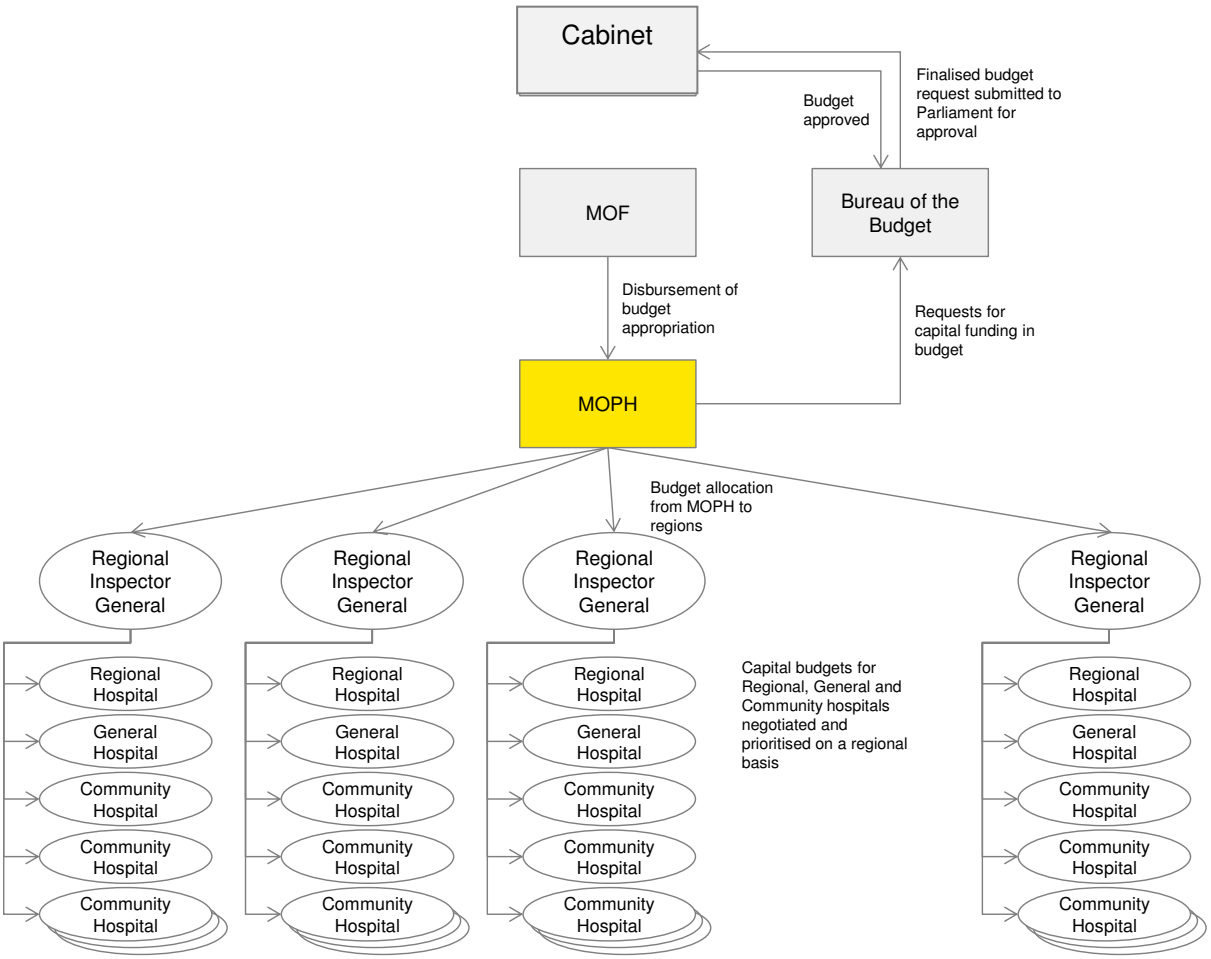
3.C.5 MoPH budgeting process

The budgeting process is differentiated between budgeting for capital expenses and operating expenses. Individual hospitals may have the ability to generate their own revenues which can cover operating costs, and as such hospitals have in theory a degree of autonomy over budgeting for operating expenses.

Hospital revenues are primarily from the three public insurance schemes, plus any additional patient fees or co-pays the hospital collects. While the flow of funds would indicate a high degree of autonomy in theory over budgeting and expenditure for operations, in practice as a result of recent anti-corruption measures, hospitals must apply centrally for approval to disburse funds even for small expenses. As a result, there is an increasing level of centralization over hospital operating budgets.

Budgeting and decision making for capital expenditure is more centralized. The regional inspector generals prepare capex plans for the hospitals in their regions, and then submit the region-wide plans to the Ministry for approval.

Figure 4 – Representation of MOPH's budgeting process for new capital investment



3.C.6 MoPH procurement process

Through our discussions with both the MOPH and input from our national health sector expert, we understand that the ministry's procurement process for major investment initiatives mirrors the budgeting process in that it is decentralized and largely under the control of the Regional Inspector Generals.

Investment requests from hospitals within a region are submitted to that region's Inspector General and prioritized at that level. Investment budget is allocated to the region from MOPH, which we understand to be a simple pro-rata of MOPH's overall investment budget, is then applied to specific projects in accordance with this priority. Priority projects are reported to MOPH for official central approval, however our discussions with MOPH suggest that there is no central oversight or control of these investment decisions.

As far as we have been so far able to ascertain, each region has autonomy over how it prioritizes investment so long as the region's general direction of investment is in line with the national health agenda.

Recommended Actions: We view that it would be appropriate for MOPH to establish a clear decision tree with embedded delegations of authority to assess the suitable procurement options which require capital investments. This will allow a clear and consistent mechanism for projects to be identified by the Inspector Generals as suitable for PPP to then be elevated to MOPH level for central coordination of pre-feasibility / feasibility studies, and ultimate tendering / procurement.

4. Market Overview and Considerations

A. Market capacity to deliver services

The extent of involvement of private sector under a PPP arrangement may vary depending on the PPP model adopted. Under a "simple PPP" project private sector can provide a range of services, from the facility design and construction during construction phase, to various services during operational phase, such as facilities maintenance and support services provision.

In a typical health care PPP model private sector will be responsible for the design, construction, infrastructure maintenance and some support services (such as medical equipment services). In most cases the public sector in most PPP arrangements will retain the responsibility for the provision of medical and nursing services and hospital operations.

There is extensive international private sector expertise to deliver healthcare PPP projects as evidenced by the number of PPPs undertaken in the healthcare sector globally. We view that international players will likely be interested to participate in well-structured healthcare PPPs in Thailand.

In this section, we assess the readiness of Thailand's market to participate in healthcare PPPs. We have undertaken an assessment of the pool of firms which are based in Thailand that could potentially participate in healthcare PPPs.

4.A.1 Construction contractors and EPC Companies

There are more than 590 companies operating in the construction business that are members of the Thai Contractors Association, including Thai companies, foreign companies and joint ventures between Thai and foreign companies. The main domestic EPC (engineering, procurement, construction) companies in Thailand are Italian-Thai Development, CH Karnchang and Sino Thai Engineering & Construction. These companies are mainly concentrated in developing transport and power PPP infrastructure projects.

Company	No. of hospital projects
Italian-Thai Development Plc	3
Ch. Karnchang Plc	1
Sino Thai Engineering and Construction Plc	5
Syntec Construction Plc	8
27 Engineering Co. Ltd.	5
Thai Polycons Plc	8
Ritta Co. Ltd	2
Powerline Engineering Plc	7

Based on the extent of developments in Bangkok, we view that there is a good availability of constructions companies which are capable of delivering high quality buildings.

From our discussions with these companies, one of the main concerns regarding Thailand's construction sector is related to growing indications that Thailand does may not have sufficient

workers and construction materials to complete its growing pipeline of construction projects. While this is not a specific PPP concern, this may reduce construction companies' interest and ability to take on new infrastructure projects, particularly more complex ones. Recently, the Thailand Labour Ministry projected that Thailand will be short of 1.6mn labourers over the next five years.

Hospital Design Companies

Building a healthcare facility requires industry specific expertise to design a facility that would create operational efficiency promoting economy, convenience, and comfort whilst ensuring the necessary health and safety standards are met.

The basic form of a hospital is based on its functions: inpatient related, outpatient related, diagnostic and treatment functions, administrative functions, etc. The design of the hospital will govern the physical relationship existing between these functions and should facilitate easy movement of people, materials and waste.

Additionally, the hospital design may adhere to other guidelines, for example the recommendation for naturally-ventilated healthcare facilities set by the World Health Organization. Furthermore, the facility designs are required to be compliant with the standards of the Design and Construction Division (Department of Health Service Support).

It is therefore, imperative, to select a hospital design company with prior experience to avoid delays in the PPP process. Listed below are hospital design companies and their number of project experiences in both public and private hospitals in Thailand.

Given that Thailand has developed world class private hospitals we view that there would be good availability of hospital design expertise.

Company	No. of hospital projects
Architects one hundred and ten Co. Ltd.	15
Teac Company Limited	13
DESIGN + DEVELOP Co. Ltd.	25
Satapanik Sutham Co. Ltd.	4

4.A.2 Property Management Companies

We view there is good availability of property management companies who are able to provide the envisaged facilities management services. Numerous property management companies are present in Thailand, including internationally based global providers of this service. These companies essentially oversee the services related to the maintenance of the building structure of a facility to ensure the entire property is in the correct working order. It is common for many public hospitals to carry out minor maintenance tasks in-house and individually outsource major maintenance tasks, such as elevator servicing, to private companies.

Incorporating property management encourages private sector to incorporate whole-of-life cost into the design and construction of a facility. It has been noted that the private sector is aware of the synergies that exist, and perceive a model that incorporates DBFOM into the PPP, constitutes as a less risky project.

Below is a limited list of property management companies present in Thailand.

- Savills Thailand
- Jones Land LaSalle Thailand
- Knight Frank Thailand
- CBRE Thailand
- DTZ Thailand
- Plus Property Co., Ltd.
- Property Professional Services Co., Ltd.
- ACR Management Co., Ltd.

4.A.3 Medical equipment suppliers

As is the trend in many developing countries, Thailand imports most of the major medical equipment from multinational companies while the domestic companies could only provide small equipment and medical supplies. Currently, public hospitals have either bought major equipment such as CT from their own funds (mainly from donations) or outsourced the service to certain private companies on a short term contract with either a rental or profit-sharing payment arrangement.

Commissioning the supply of medical equipment to the private sector will ensure close coordination between the design and construction contractors, and the equipment vendors to ensure operational design is optimal. As previously mentioned, this will also ensure the incorporation of whole-of-life cost.

Global firms which currently provide medical equipment to hospitals in Thailand include GE Health Care, Siemens and Phillips.

A Managed Equipment Service (MES) is a typical solution offered to manage all medical equipment in a hospital including the ownership, provision, purchase, installation and commissioning, user training, asset management, maintenance and replacement. GE Health Care, Siemens and Phillips have established local service networks in Thailand as they are the main medical equipment providers.

4.A.4 Support services providers

Supporting services, otherwise referred to as soft facilities management, refer to services required for the operation of the facility but not related to the building structure. Soft services provide support to the activities within the Facility and may comprise general management services, helpdesk services, catering services (patient and non-patient), housekeeping services, laundry / linen services, information and communication technology, security and waste management. These services are mostly carried out in-house by public hospitals specifically the cleaning, laundry, catering and security services. In some cases, catering to visitors in the form of a canteen is outsourced to local merchants around the area. However, there are major private companies who provides services such as cleaning (PCS), laundry, security (ISS) and catering (Sodexo) for office/ commercial buildings as well as for private hospitals.

We view that there is market capacity is currently available in all service lines. These services are primarily being outsourced by private hospitals in Thailand, on an independent basis. However, the PPP model typically consists of a consortium of members incorporating these services into one package.

A lead consortium member would package these services and collaborate with the other consortium members to work under one PPP umbrella for MoPH. Key considerations for enhancing the local market

capacity in making PPP implementable would be to further test and assess the willingness of such service providers (mentioned above) in becoming the consortium leader for this PPP project, in which the party with the highest stake would normally become the leader. Additionally, the existing scale and future expansion plan of these private operators must be further investigated in depth in order to assess their ability to deliver the proposed scope of the PPP project.

B. Readiness of service provides to participate in PPP projects

The PPP model has been implemented in Thailand primarily in the transport and power sectors, however a clear understanding of the benefits that can be realized from the PPP model in the social sector is still varied amongst public and private sectors.

As such, there is strong interest to participate in large transport projects as well as projects in power and utilities sectors. Thailand is primarily knowledgeable of project schemes where private sector is required to provide a significant investment as well as the revenue / demand risk absorption.

Market interest for PPP projects in the social sector will required building awareness based on the fact that these types of projects would normally rely mostly on Government funding. The Government's payment would be required to fully support such projects with none or limited commercial revenue potential. Apart from the few major players/ companies with an abundance of skilled resource and with prior work experience with the government, the mid-sized companies and investors will also be less familiar with PPPs and market soundings will be required to entice interest and competitiveness. Hence, key factors to promote market competitiveness include:

- **Clear scope of work and business case for private sectors:** Private sector must have a clear understanding of their area of potential participation in the PPP project (including the roles of public sector) in order to determine their interest. The payment mechanism and allowance for reductions must be clearly defined to enable the private party to perform a comprehensive and thorough assessment.
- **Allocation of risks:** Based on the assigned responsibility of the private sector in the PPP project, private operators would assess all the possible risks involved and compare it against their acceptable level of risks in order to determine their interest. However, the healthcare industry's specific requirements could add incremental risks and complications to the private partners and to the project (i.e. health and safety standard requirements).
- **Required returns:** The returns offered by the Government should be adequate to incentivize the private party to participate in the project, and should sufficiently compensate for the allocated risks.

As there is no precedent case of a PPP in Thailand's social sector, it is recommended to provide workshops and educational material to the private operators in order to increase their understanding, and entice their interest and competiveness.

It will be also useful to include Request for Expressions of Interest (RFEI) in the procurement process to provide Government with sufficient information to draft a clear RFP given limited information on market capacity and competitiveness.

The feasibility study of the pilot should assess the optimal model to ensure market attractiveness for a healthcare PPP project. A number of countries in ASEAN are also exploring or have implemented social

sector PPP projects including Singapore and Philippines. These learnings should be taken into account as part of the pilot study.

C. Funding providers and investors

4.C.1 Funding providers

The characteristics of the infrastructure project, including the design and engineering challenges, and project risks allocation, are important determinants to the application of debt capital. In addition, the contractual framework and the institutional arrangement are also crucial factors determining the debt capital. Various funding providers have different appetite for risk and can offer different strengths and drawbacks in relation to the funding solution.

Government Loans	Commercial Banks	Debt Capital Markets	Export Credit Agencies	Multilateral Agencies
• Direct Government equity participation • Support inward funding and investment into their economy, particularly for high profile projects • Government participation brings credibility to an investment and generally strengthens the ability to raise other capital funds from the private market. • Supports / incentives may also be in the form of: – Regulatory changes – Tax concessions – Government guarantees	• Primarily focus on senior debt • Given high capex, loans typically require syndication • May be in the form of term loan, bridge loan or working capital facilities • Debt is typically provided based on floating interest rates such as LIBOR or other relevant cost of funds plus applicable interest margin • Documentation typically consists of loan agreement, inter-creditor agreements and security documents • Long-term loan available and may be made in more than one currency	• Infrastructure project bond • Primarily used for infrastructure and PPP • Offers long-term fixed-rate financing • Coupon (interest rate) and other key conditions of the bond are fixed based on the market at the time of underwriting • Credit rating is assigned to the bond by rating agencies • Tax advantage to bond investors	• ECAs that are active in project finance: USEXIM; JBIC; KEXIM • Facility is used to promote the sale and export of products manufactured by resident companies • Support projects through direct loans and/or export credit guarantees / insurance (political and/or commercial risks) • Common for EPC contracts to contain local content requirements that oblige the contractor to source materials from the country where the project is being constructed • Commercial lenders may rely on the guarantees to support the borrowings	• Some multilaterals are IBRD; IFC; ADB; JICA • Promote int'l investment for regional development • In challenging liquidity cycle and limited commercial debt,, multilateral agencies are playing increasingly important roles in providing debt and guarantees to infrastructure projects • Support from multilateral agencies mitigates political and regulatory risk • Mobilizes commercial / private financing that would otherwise be unavailable • Supports may be provided through a range of equity, loan and guarantee products

Commercial banks

Thailand has an active and liquid banking market which is critical to development of a successful PPP program. There are 14 registered Thai commercial banks, 4 subsidiaries of foreign banks, 12 foreign bank branches, and numerous foreign bank representative offices in Thailand. Local financial institutions are active in providing funding to listed companies who are involved in infrastructure projects, especially in the power sector, in the form of syndicated loans or as an underwriter on infrastructure fund. Additionally, various local commercial banks are providing construction funding to private companies, particularly on the mass rapid transit projects. The construction funding arrangement typically includes a bullet payment upon completion with interest to be paid by the government. These terms are in addition to the normal credit lines in which local commercial banks supported the private companies on working capital or extended into bridging loans. Below is the list of commercial banks which have experience funding infrastructure projects:

Bank	Projects
Siam Commercial Bank (SCB)	► EGATIF (infrastructure fund) ► Various SPP projects ► Gulf power generation (syndicated loan) ► Ratchaburi power plant (syndicated loan)

Bank	Projects
	► True Crop. On 2G/3G network expansion
Kasikornbank (KBANK)	► ABPIF (Infrastructure fund) ► Coordination with leading company in renewable energy business to support on its project funding ► Various SPP projects ► Gulf power generation (syndicated loan) ► Ammata B. Grimm power plant projects ► EASTW on water concession project
Bangkok Bank (BBL)	► Ammata B. Grimm power plant projects ► Ratchaburi power plant (syndicated loan) ► Krungthai Bank (KTB) ► Ratchaburi power plant (syndicated loan) ► True Crop. On 2G/3G network expansion ► EASTW on water concession project
Bank of Ayudhya (BAY)	► Ratchaburi power plant (syndicated loan)
CIMB (Thai)	► Gulf power generation (syndicated loan)
LHBank	► ABPIF (infrastructure fund)

In addition, there are a number of foreign commercial banks, such as Mizuho and BTMU, who are active financing power projects in Thailand including the syndication of Gulf power generation.

Commercial banks will most likely be primary providers of debt finance for greenfield PPP Projects. There is significant international precedent of successfully financing and delivering social sector PPPs however as of today, there is limited precedent. The local banks have expressed initial concerns with respect to the payment mechanism and the extent of government support underpinning the long term payment obligations. Another area which would support bank participation would be the presence of financially strong and experienced sponsors.

It has also been suggested that, if possible, there shall be participation from government banks for the first few PPP projects, this could provide the wider banking with further comfort of the government's commitment to such projects. Furthermore, other significant terms such as entitlement rights of assets, recourse terms, minimum cash flow cushion, etc., could also be added into the bank's consideration list. Similarly, for construction companies, the valuation of all risks involved in the project is more of a concern than project during evaluation.

In conclusion, there is positive interest from the local banks however further market testing must be conducted as part of the pilot project phase continue to develop the banks' understanding of the project risks.

Capital Markets

There are over 500 companies listed in the Stock Exchange of Thailand, which readily issue corporate bonds as an alternative source of capital for infrastructure projects. According to the Thai Bond Market Association (September 2015), the country's overall registered outstanding bonds are valued at THB9.8 trillion, in which 75% are being issued by the government and its agencies (including SoEs)

followed by over 24% by private sectors and less than 1% from international entities. Given that most of the 1-year corporate bonds are normally rated BBB- or above, by either international or local rating agencies, almost 45% are being subscribed by local asset management companies, 36% by non-resident (foreign) investors and 6% by insurance companies. In 2014, the largest portion of outstanding long-term corporate bonds was in Energy & Utilities 20%, followed by the Banking sector 18%, Property Development sector 11%, Financial and Securities sector 9%, Construction Materials sector 9%, Transportation and Logistics sector 4%, Information and communication Technology 3%, and others on the remaining.

Below is the list of major infrastructure players with bond issuance for funding:

- Power and utilities: EGAT, GLOW, NPS, EASTW (water), TTW (water)
- Transport: AOT (airport), BTS (rail), BECL (highways), Don Muang Tollway
- Telecommunications: DTAC, TRUE, ADVANC
- Renewable energy (B/E issuance): Gunkul, EA, Demco, Solar, TSE

Although the government bond duration could reach up to a 30-year period, with returns of almost 4%, the timing of major corporate bonds could be up to 15-years with returns varying according to the business risks and rating. Hence, the capital markets present an additional potential funding source for PPP project, however further education is required similar to banks.

Equity Investors

Equity investors will require a risk-adjusted return on their investments. Project bankability, legal and institutional stability, project risk profile, and robustness of regulatory and economic frameworks are critical components to attract equity capital into infrastructure projects.

Government Equity	Operators	Strategic Investors	Construction Company	Private Equity
• Direct Government equity participation • Demonstrate Government commitment and support for the project • Typically a minority stake to allow for private control and operation • Support inward funding and investment into their economy, particularly for high profile projects • Government participation brings credibility to raise other capital funds from the private market.	• Global telecommunication companies with technical and commercial expertise to operate the business • Long-term investors that can export institutional capability and technical know-how to the local Government and people • Active investors that demand significant or full control of the business operation • Creating value across the asset lifecycle	• Financial institutions or conglomerates that are diversifying their portfolios • Passive investors • Critical of corporate governance principles • Deployment of capital subject to fulfillment of condition precedents or project milestones • Will require a technical partner for the business operation	• Engineering, procurement and Construction Company (EPC) that has the technical capability and financial means to undertake the construction • Short-term investors that intent to exit upon asset commercialization • Will require a technical partner for the business operation	• Dedicated funds targeting infrastructure investments • Looking for growth potential from early investment • Appetite for risk but also demand high return from investment • Defined investment period • Working towards investment objectives and exit strategy within the defined period • Management control but will require technical partner for the business operation

Developers / Construction Companies

Globally, developers and construction firms continue to be key investors and sponsors of greenfield PPP projects. These firms play lead role to develop the project in addition to also delivering the construction element of the Project. A strong sponsor, as noted in our previous section, is a critical component to the a successful PPP Project.

Although the majority of the construction companies have a certain level of familiarity with government processes, as they are frequent bidders for government's construction projects, there is not yet clear understanding of PPPs and their benefits and no defined attracting incentives. Hence,

construction companies may not be keen to absorb any additional risks, especially providing the equity investment.

However, Thailand has precedents of large local construction firms who have acted as sponsors and invested in infrastructure projects. Examples include Ch. Karnchang (CK) who is holding shares in BECL (operator of expressway), BMCL (O&M of MRT), CKP (power company – IPP), and TTW (water production company).

While these firms are familiar with the construction delivery of the hospitals, they will need to enter into long term arrangements with hospital design and facilities management firms who are inexperienced with the healthcare industry's specific infrastructure requirements, including safety standards, such as providing for the efficient flow of the patients or the infrastructure support required for operating/ emergency rooms. While healthcare facilities are generally perceived to be "simpler" to maintain that an MRT system, or an IPP, it should be recognized that these hospital facilities are used by doctors, nurses and medical staff and their actions will need to be taken into account by the facilities management operators in order to ensure that their actions do not negatively affect the PPP concessionaires ability to deliver the infrastructure services as envisaged.

Institutional Investors

As it is typical in other countries, local institutional investors in Thailand are represented by insurance companies, mutual funds, wealth management funds and private pension funds. These institutional investors tend to be risk averse and cautious and tend to move in unison with a preference to invest in conservative, low risk investment products that are designed to minimize risk, even at the expense of superior performance.

Thai institutional investors mainly come from asset management companies (AMC), of which there are 38 in Thailand. Most AMCs are investing in liquid-able assets with clear exit strategy such as stocks/ options/ bonds in the capital market or notes/ bills in the money market. As different funds may vary in terms of investment policy, it may limit the numbers of potential investors for this social sector PPP project. For example, the insurance companies could establish the investment fund under its portfolio; however, their investment policy might be restricted and must be in compliance with the Office of Insurance Commission, who has released strict guideline on assets allowed for investment of which are normally low-risk and liquid-able instruments. Therefore, it is advisable for the PPP project's business case to be further defined in order to accurately design and identify possible options for financing in order fit with the investment criteria of these institutional investors.

Infrastructure Funds

In order to meet some of the financing needs of infrastructure development, the Government has recently launched several infrastructure funds to raise money for projects developed by the Government-owned companies. The creation of infrastructure funds was expected to boost Thailand's attractiveness by allowing investors to pool their resources to invest in infrastructure without assuming all of the idiosyncratic risks from individual projects. These infrastructure funds were also provided with some tax benefits, allowing investors to gain a stable and relatively attractive return over a fixed timeframe.

The first infrastructure fund - BTS Rail Mass Transit Growth Infrastructure Fund was launched in April 2013 and raised THB62.5bn from equity market investors in a deal arranged by Morgan Stanley, Phatra Securities and UBS. The listing comprised 66.7% of the infrastructure fund, while the sponsor, Bangkok-listed BTS Group, bought the remaining 33.3% of the offering. The proceeds of which will go towards expand the existing SkyTrain network. The level of interest for the BTS infrastructure fund was very high as the float was the largest ever offering in Thailand.

Other examples of infrastructure fund could include Digital Telecommunications Infrastructure Fund (or formerly known TRUEIF), which is the first telecommunication infrastructure fund in the country. It was launched in December 2013, and raised THB58bn for the expansion of TRUE's telecom towers with 67% shares floated in the market. Another telecommunications fund, Jasmine Broadband Internet Infrastructure Fund (JASIF), launched in February 2015 and raised THB55bn for the investment on core fiber-optic network for internet broadband, having 67% floating shares.

Infrastructure funds are also present in power sector, for example, EGAT infrastructure fund which was the first state-enterprise infrastructure fund that was launched in July 2015, raising over THB20.9bn with 75% floated shares. The proceeds will be used on further electricity-generation expansion. Another example would be the Amata B. Grimm Power Plant Infrastructure Fund, which piloted the first infrastructure fund in this sector in September 2013 with 70% floated shares. The proceeds of THB6bn will be used on the investment of its 2 cogeneration power plants.

It has to be noted that currently only selected sectors (transportation, power and utilities and telecommunications) are permitted to secure financings via infrastructure funds. Social infrastructure projects, including hospitals and other medical services infrastructure, are currently not included in this list.

5. PPP Project Simulation Studies

A. Project identification and selection

Three projects were identified to be considered as the simulation project:

- **Project 1:** Development of urban hospital to support Nakhon Pathom hospital
- **Project 2:** Development of medical complex under the Department of Medical Service
- **Project 3:** Carpark for Rajavithi Hospital

The projects have been considered as potentially best suitable PPP projects based on the selection criteria below:

- Demand for medical services is evident and implementing agency is interested to assess PPP development option for the project
- Ability to define scope of services to be provided by private partner sufficient to expect Value for Money
- Project size and scope likely to be attractive to private investors
- Payment mechanism and legal structure can be defined based on existing regulations
- Availability of land

B. Mid-Size General Hospital – Nakhon Pathom Hospital

5.B.1 Hospital Overview

5.B.1.1 Background

The Thai Ministry of Public Health (MOPH) has ambitious objectives both in increase the depth of health service and offerings and the breadth of its geographic coverage across the country. PPP has the potential both to leverage private sector financing to meet the large funding gap in providing this increased level of service and to bring in additional technical and management expertise needed to facilitate new investment. MoPH has identified the urgent need to expand the number of general urban hospital within the country.

The objective of this chapter is to demonstrate the development of pre-feasibility and procurement guide based on a simulated general urban hospital PPP project. Nakhon Pathom Hospital has been selected by MoPH to assist EY with the simulation study.

Nakhon Pathom Province (the "Province") is located at the central of Thailand, approximately 60km from Bangkok. The total population of the Province as of 2014 is more than 890,000 people. The Province itself is home to 1 general hospital, 9 community hospitals, 3 hospitals under jurisdictions other than MoPH's permanent secretary office, 4 private hospitals and 34 private clinics. Nakhon Pathom Hospital was established in 1952 and has since expanded to become a general hospital with 670 beds in 2010. Nakhon Pathom Hospital, the only general hospital in the Province provides the following services:

- Accident, emergency, autopsy emergency medical support
- Primary care on outpatient as well as tertiary care
- Health promotion such as Palliative care
- Excellence centre in heart, cancer, accident and infant
- Tertiary referral hospital which receive referral cases from smaller hospitals and other medical centres

Tables below summarise some basic medical statistics of Nakhon Pathom Hospital:

Subject	Year 2014 (full year)	Year 2015 (6 months)
OP patients (per year)	757,946	399,387
Average OP patients (per day)	2,650	2,793
IP patients (per year)	51,549	25,017
ER patients (per year)	66,975	34,126
Average ER patients (per day)	183	188
CMI (Case mix index)	1.59	1.67
Bed occupancy rate (%)	99.56	100.75
Fatality rate (IP)	4.17	4.47

Subject	Year 2014 (full year)	Year 2015 (6 months)
Top 5 OP diseases	1. **I10** - Essential (primary) hypertension 2. **E11** - Non-insulin-dependent diabetes mellitus 3. **E78** - Disorders of lipoprotein metabolism and other lipidaemias 4. **J06**-Acute upper respiratory infections of multiple and unspecified sites 5. **N18** - Chronic renal failure	1. **I10** - Essential (primary) hypertension 2. **E11** - Non-insulin-dependent diabetes mellitus 3. **E78** - Disorders of lipoprotein metabolism and other lipidaemias 4. **N18** - Chronic renal failure 5. **E14** - Unspecified diabetes mellitus
Top 5 IP diseases	1. **O80** - Single spontaneous delivery 2. **H25** - Senile cataract 3. **A09** - Diarrhoea and gastroenteritis of presumed infectious origin 4. **K35** - Acute appendicitis 5. **I63** - Cerebral infarction	1. **H25** - Senile cataract 2. **A09** - Diarrhoea and gastroenteritis of presumed infectious origin 3. **O80** - Single spontaneous delivery 4. **I63** - Cerebral infarction 5. **I50** - Heart failure
Top 5 primary cause of death	1. **J15** - Bacterial pneumonia 2. **I61** - Intracerebral haemorrhage 3. **J18** - Pneumonia 4. **I63** - Cerebral infarction infarction 5. **E11** - Non-insulin-dependent diabetes mellitus	1. **J18** - Pneumonia 2. **I61** - Intracerebral haemorrhage 3. **N18** - Chronic renal failure 4. **I21** - Acute myocardial infarction 5. **B20** - Human immunodeficiency virus

In 2015, the management of Nakhon Pathom Hospital proposed to develop a 90-bed general urban hospital (the "Hospital") to overcome the following problems in Nakhon Pathom Hospital:

- **Operating above capacity level:** The current inpatients (IP) occupancy rate for the 670 beds hospital is at 98% to 100%. Due to high demand, there are 130 beds being placed along the corridors and walkways to cater for extra IP. Please refer to Appendix 11.C (C-2: Responses received from Nakhon Pathom) for further details.
- **Long waiting time:** The average waiting time for outpatients (OP) treatment and cardiac surgery are approximately 90 minutes and 3 months respectively.
- **Shortage of nursing staff:** One of the main challenges facing Thailand's healthcare sector is the shortages of healthcare providers (doctors and nurses). This has indirectly influenced the decision of the development of a 90-bed general urban hospital even though there is a greater demand for beds.

5.B.1.2 Initial Design Specification Considerations

The following table sets out the high level service delivery objectives provided by the management of Nakhon Pathom Hospital. This information is sufficient for the initial high level project assessment, however further details will be required for more rigorous analysis, including more detailed costing and design specific inputs from technical and health facility planners to develop a costing and services plan as part of the feasibility assessment in the next phase. More detailed inputs will also allow to narrow the project scope including more detailed specification of services, identification of infrastructure and equipment requirements and support activities and services.

Table below summarises the proposed 3-phase development plan of the Hospital (1 year interval between each phase):

Six Building Block	Action plan		
	Phase 1	Phase 2	Phase 3
Service delivery	• 60 beds hospital • Provide primary and secondary services in urban area • General clinic, obstetrics and gynecology, general surgery, general medicine, pediatrics, surgery • To have specialized non-communicable disease (NCD) clinic • ER during office hours • To receive referral case from smaller hospitals • Health promotion within the urban area • 2 IP wards (30 beds for male patients and 30 beds for female patients) • To support referral system • To include medicine dispensing room for both IP and OP	• 90 beds hospital • To add more specialized clinics (i.e. occupational medicine, rehabilitation medicine and dentistry) • To add Thai traditional clinic • To add a 30-bed ward • To support refer back case from Nakhon Pathom Hospital for admission (simple case) • 24 hrs. ER • Palliative care service and to set up health network within urban community	• To have own laboratory service • To become training center for doctor of family medicine • To become learning center for continuing care treatment
Workforce	• 3 of GP doctors or 2nd year medical intern • 1 Family medicine doctor • To share specialized doctors in 5 main service areas (1 doctor per area) with Nakhon Pathom Hospital • To share registered nurse for OP	• To add 2 of 2nd or 3rd year medical interns • To add 5 more registered nurses for additional ward and 7 OT nurses from Nakhon Pathom Hospital	• To add 1 more family medicine doctor • To share laboratory staff with Nakhon Pathom Hospital as OT staff

Six Building Block	Action plan		
	Phase 1	Phase 2	Phase 3
	and ER with Nakhon Pathom Hospital • To share IP nurse in 2 wards (5 nurses per ward) and OT nurse from Nakhon Pathom Hospital (7 nurses per ward) • To share facilitating staff for OP and ER with Nakhon Pathom Hospital • To have facilitating staff for 2 IP wards (5 staffs per ward) • To share pharmacist and pharmaceutical staff with Nakhon Pathom Hospital • To share bed lifter with Nakhon Pathom Hospital • To share cleaning staff with Nakhon Pathom Hospital • To utilize same management team with Nakhon Pathom Hospital	• To add 2 registered nurses for OPD and ER; the rest to be shared with Nakhon Pathom Hospital • To add 1 permanent pharmacist and 1 pharmaceutical staff; the rest to be shared with Nakhon Pathom Hospital	
Health Information System	• Computer system which connects with Nakhon Pathom Hospital and local health office/ MoPH bureau of strategy and policy databases		
Drug and Equipment	• To use same medicine list with Nakhon Pathom Hospital • To share procurement with Nakhon Pathom Hospital • 12-floor building: 1st Fl.: medicine dispensing room, ER, First aid/ injection room 2nd – 3rd Fl.: OP examination rooms 4th Fl.: Rehabilitation and Thai traditional clinics 5th-7th Fl.: IP wards 8th-9th Fl.: IP private wards 10th Fl.: Occupational medicine clinic 11th Fl.: Back office 12th Fl.: Meeting room	• To add: 2nd Fl.: 10 units on dentistry 4th Fl.: additional units on rehabilitation and Thai traditional clinics 5th Fl.: 1 additional IP ward 10th Fl.: additional units on occupational medicine clinic • 8-floor nurse dormitory building (100 units) • Doctor dormitory (20-40 units)	• To add services for private wards as training center • Car park building of 300-600 lots
Financing	• To receive UC capitation (OP/PP) based on urban population, direct reimbursement on IP with DRG guidance, CAPEX and depreciation budget from UC • To be under the management of Director General – Nakhon Pathom Hospital (including financial management aspects) • To separately manage the budget from Nakhon Pathom Hospital		
Governance	• To manage Contracting Unit for Primary Care (CUP) in urban area with Nakhon Pathom Hospital • To coordinate with local administrative unit regarding		

Six Building Block	Action plan		
	Phase 1	Phase 2	Phase 3
	budget and other supports		

Current Status:

As the information provided at this stage is sufficient primarily for high level planning purposes, for the purpose of the report, we have assumed the following:

- The private partner provides the core health infrastructure services. With more information at the next phase, it may be possible to expand the services provided by the private sector to include more services including commercial related services. The PPP project will be based on the development of a 90 bed urban hospital. This was based on input from the Hospital management as sufficient to meet the current demand. .
- While this is sufficient for the purposes of the simulation study and based on the available information however we recommend that a detailed needs assessment will be required to more accurately estimate the demand and hence the appropriate design / cost of the hospital to meet the demand as well as other issues for consideration, for example, the availability of sufficient skilled personnel.
- Additional Information Requirements for the next stage should include:
  - Further analysis to review if the planned capacity of 90 beds would be sufficient to meet existing demand as well as future demand in the Province. If available should include an analysis of the population growth (demographics) / demand of specific medical services will impact the future demand Identification of the patients profile (forecast) by types of services offered in order to determine the design / equipment requirement for the Hospital
  - This will assist in the proper assessment of the infrastructure requirement (no. of clinics, no. of operating rooms, etc) and equipment requirement (e.g. no. of unit per operating room) to be able to achieve a more accurate calculation of the appropriate size and cost of the Hospital.

5.B.2 PPP Project Summary

5.B.2.1 PPP Project Overview

The development of the Hospital (the "Project") is a vital element to resolve the problems facing Nakhon Pathom Hospital and to maintain its role of as the center of medical network for the Province. In addition to providing additional capacity to Nakhon Pathom Hospital, the Hospital will also allow Nakhon Pathom Hospital to focus on providing tertiary care level services and treatments to chronic patients.

5.B.2.2 Availability of Land

To deliver this Project, the management of Nakhon Pathom Hospital has made available a land plot area within its compound to MoPH for the Project use. This will enable MoPH to enter into a Build, Operate and Transfer (BOT) contract with the private sector to allow them to design, construct and finance the Hospital as well as to maintain and operate the Hospital to the most efficient way over the operating period.

5.B.2.3 PPP Project Objectives

The objectives for this Project are as follows:

- Nakhon Pathom Hospital's aims to achieve the following outcomes:
  - Increased capacity of Nakhon Pathom Hospital's to meet the increasing demand
  - Provide proper and effective inpatient facilities
  - Assign OP clinics in all main specialties to the Hospital to enable better deployment of OP services
  - Improved waiting time
- Scaling up the capacity of the Thai Government to procure, manage and monitor social sector PPPs

A copy of the questionnaire / information request list provided to Nakhon Pathom Hospital is included in the Appendix C.

5.B.2.4 PPP Project Scope

For the purposes of establishing the value for money proposition of the Project, the extent of infrastructure related services to be included as part of the PPP will need to be determined.

Based on many international precedents where PPPs have been successfully implemented, the PPP scope of services includes the design, construction and provision of both hard and soft facility management services and provision of medical healthcare services remain with the public sector.

As such, for the purpose of this simulation, MoPH and Nakhon Pathom Hospital will continue to control and provide all clinical and diagnostic services while the private sector will be responsible for the design, construction and long term management and maintenance of the overall facilities over the life of the concession. The key aspects of provision of hospital infrastructure services to be provided by the private sector as part of the PPP are set out below:

Services	Descriptions	Private sector role
Design	Design of the Hospital	Yes
Construction	Construction of the Hospital	Yes
Hard facilities management	Hard services consist of services related to the maintenance of the building structure of the Hospital as follows: ► Repair and maintenance of the Hospital structures and equipment ► Refurbishment	Yes
Soft facilities management	Soft services refer to services required for the operation of the Hospital but not related to the building structure. Examples of potential soft services are as follows: ► General management services, ► Helpdesk services, ► Food services (patient and non-patient),	Partially yes. To be defined based on additional market capacity assessment and full feasibility study

Services	Descriptions	Private sector role
	► Housekeeping services, ► Laundry / linen services, ► Information and communication technology ► Security ► Waste management	
Procurement of medical equipment	Medical equipment refers to all equipment used for diagnosis, treatment and rehabilitation. Medical equipment includes: ► X-ray machines ► CT scans ► MRI machines, etc.	Partially yes. To be defined based on additional market capacity assessment and full feasibility study
Materials	Materials include all non-medical equipment required to bring the Hospital to operation. Materials include: ► Medicines ► Admin supplies, etc.	Partially yes. To be defined based on additional market capacity assessment and full feasibility study
Medical services and hospital operations	Day to day operations of the Hospital	No. This service will be retained and provided by the public sector / MoPH

5.B.2.5 PPP Specifications and Standards

The PPP output specifications define the private sector's deliverables in the Investment Contract / Concession Agreement. Based on the PPP project scope identified, the common output specifications (KPIs) and penalty (if KPIs are not met) are as follows:

KPI	Threshold value	Penalty
Design, Technical and Construction	► The private sector will need to ensure the Hospital is fully completed and comissioned on the project operational start date	► Availability payments will start only after the facility is available and services are delivered in line with the output specification.
Hospital operation period	► The Hospital should be made available for use round the clock 24 hours a day and 365/366 days a year during the Concession Period	► For every closure of the hospital, Baht [x] per day shall be deducted from the monthly payment from the Government
Lifesaving equipment downtime (Ventilator, Oxygen Pipeline, Heart Lung Machine ,	► Zero number of hours of default	► For every failure, Baht [x] per hour shall be deducted from the monthly payment from the Government

KPI	Threshold value	Penalty
etc.)		
Overall equipment uptime	► CT/MRI shall be made operational within 24 hours of default ► USG shall be made operational within 12 hours of default ► Key Pathology equipment as defined in the Concession Agreement shall be made operational within 24 hours of default	► For every failure, Baht [x] per hour shall be deducted from the monthly payment from the Government
Facilities management	► the private sector will need to undertake routine maintenance including prompt repairs of the Hospital including its structures and equipment	► For every failure (building structures / equipment), Baht [x] per day shall be deducted from the monthly payment from the Government

In addition to setting the PPP output specifications, the Hospital will need to comply with the following standards / guidelines:

- **Construction** – International standard ISO
- **Accreditation Participation Requirements** - Joint Commission International (JCI) Standard
- **Facility Management and Safety (FMS) –** JCI Standard

The above will need to be further developed in close consultation with MoPH's representatives, Design and Construction Division under the Department of Health Service Support and other project advisors such as technical consultant during the feasibility study stage.

5.B.2.6 Risk Assessment and Risk Management

5.B.2.6.1 Risk assessment

A risk is defined as an occurrence which may affect the cost, quality or timely completion of the project. Optimal allocation of risks to the party best able to manage it is a key value for money driver of a PPP, therefore, successful delivery of risk sharing procedures is a key instrument to ensuring long term success.

The objective of assessing the risk is to:

- Enable MoPH to identify and understand the project risks
- Ensure that risks are allocated to whoever that is able to manage and control the risks
- Ensure that the allocation of risks between MoPH and Private sector is clearly set out and demonstrated within the contractual structure
- Develop risk management / mitigation strategies for each identified risk to reduce the likelihood of occurrence

5.B.2.6.2 Risk allocation matrix

Based on many international precedents where PPPs have been successfully implemented, we set out the common projects risks for similar projects and how these risks are borne by private or public sector.

Risk event	Risk borne by	Impact	Risk Mitigation
Construction or completion risk: Construction risks may be due to construction techniques, cost escalation and delays, poor quality in workmanship or availability of appropriate labor or material.	Private	Delays in construction and commissioning of the Project	No payment to the private sector until the start of the operation
Legal Requirements: Changes to legislation, codes and / or MoPH guidelines that may result in changes in Facility design or a request from supply authorities, such as power and utilities suppliers, to deviate from actual design	Private	Increase in cost due to modification of design and delay of works or in commissioning of the Project.	The private sector may be entitled to a time extension, compensation and, if it is a prolonged delay, the private party has a right to terminate.
Furniture, fixtures and equipment (FFE): Insufficient FFE allowance to deliver scope	Private	Increase in project capital cost to satisfy FFE requirements	Costs to rectify inefficiencies are generally borne by the private sector.
Maintenance cost: Facilities maintenance costs are higher than the budgeted amount.	Private	Greater maintenance costs compared to budget, affecting project returns	Maintenance cost is generally based on a fixed-fee contract. Any cost overruns are generally borne by the private sector.
Obsolescence FFE: FFE obsolescence occurs more frequently than expected	Private	Increase in costs to replace the hospital's FFE, affecting project returns.	Any additional replacement cost is generally borne by the private sector
Design inefficiencies: Inadequate / inefficient circulation routes leading to increased staff time and reduction in quality of care.	Private	Increased staff time and reduction in quality of care.	Strict supervision should be carried out throughout the design process. The private sector will have an obligation to take all reasonable action to mitigate the consequences.
Demand risk: Changes to market conditions that significantly	Public	Reduction in revenue sources	As the public sector is operating the hospital, all

Risk event	Risk borne by	Impact	Risk Mitigation
affecting the pricing and demand / competition in the healthcare sector			demand risk relating to medical services will be borne by them.
Market condition: Changes to market conditions that significantly affecting the salary of the medical staff	Public	Increase in operating expenses	As the public sector is operating the hospital, all medical related risk will be borne by them.
Availability of data: Data availability is crucial in the preparation of bids	Public	Insufficient data availability can result in inaccurate bid prices, affecting the budget, KPIs and returns to investors.	Public sector is to ensure all information is made available to bidders to provide accurate bid prices. Private sector should have an opportunity to request for further additional information they may require.

Once specific project parameters are developed during the pre-feasibility stage, the above factors will be taken into consideration and further refined with detailed recommendations.

5.B.2.7 Procurement Model

The selection of the delivery model is a critical decision for any infrastructure project. The purpose of this process is to determine the delivery model which is best suites the risks and opportunities identified for the Project.

Table below presents a brief description of the different procurement models:

Delivery model	Descriptions	Likelihood to achieve VFM under a PPP
Public Build, Own and Operate	The Project is undertaken by government and the design and construction roles are tendered separately to the private sector	Low: Similar to conventional public procurement and it is used when there are no capital constraints on Government spending
Design and Construct (D&C)	The Project is undertaken by government and the design and construction roles are tendered separately to the private sector	Low: Similar to conventional public procurement and it is used when there are no capital constraints on government spending
Design, Build, Maintain (DBM)	The private sector is contracted to design, construct and maintain the facilities, with government retaining the operating responsibility	Medium: Private assumes the construction and maintenance risk only. It is used when there are no capital constraints on government spending

Delivery model	Descriptions	Likelihood to achieve VFM under a PPP
Design, Build, Maintain, Operate (DBMO)	The private sector is contracted to design, construction, maintenance and operate (infrastructure only) the facilities	Medium: Assumes that there is no government funding constraints. Government provides the construction financing and also makes ongoing payments to the private sector for the operations,
Design, Build, Finance, Maintain (DBFM)	The private sector is contracted to provide financing, design, construction and maintenance ("hard services") of the infrastructure	Likely: Private sector only receives payments (capital and operational) when services are performed.
Design, Build, Finance, Maintain and Operate (DBFMO)	The private sector is contracted to provide financing, design, construction, maintenance ("hard services") and operation ("soft services") of the infrastructure. Medical healthcare services remain with the public sector.	Likely: Private sector only receives payments (capital and operational) when services are performed. VFM can also be achieved for the provision of the soft services if there is market capability to so over the long term.

Based on international best practice, PPP projects with similar scope required by this Project, Design, Build, Finance and Maintain (DBFM) and Design, Build, Finance, Maintain and Operate (DBFMO) are models which may deliver VFM under a PPP arrangement.

In the case of Nakhon Pathom hospital, the DBFM may be more suitable as the new 90 bed facilities is a new building to complement the existing building facilities and the public sector may wish to continue to provide "soft services" element for the buildings.

Applying similar model, MoPH will enter into a contract with a special purpose vehicle that will be required to:

- Design and construct the Hospital
- Raise all necessary debt and equity funding to finance the construction of the Hospital
- Maintain (and operate) the Hospital over the operating period
- Hand back the Hospital to MoPH at the end of the concession period in a pre-defined condition

The key benefits to the Government with this model include:

- Significant design and construction risk transfer to the private sector
- The construction of the Hospital without significant financial outlay or debt by the government
- Maximum incentive for the incorporation of private sector's innovation, whole life design approach and operational solutions
- Full control of the Hospital operations by the public sector e.g. provision of medical services

The appropriate PPP modality and procurement model will need to be confirmed during the pilot project phase by taking into consideration, market capability, detailed risk assessment and allocation as well as potential for the value for money.

5.B.3 Financial Assessment of the PPP project

5.B.3.1 Methodology

A financial model was prepared in order to develop the preliminary Financial Projections for the Project. The formulation of the Financial Forecast is drawing on the following key parameters:

- Key Assumptions
- PPP Project Value (Public and Private sector investment)
- Financing
- Payment Mechanism Structure
- Conclusion on Financial Assessment

The approach and detailed key assumptions used for each aspect are described in detail in the following sub-sections.

5.B.3.2 Key Assumptions

Table below summarises the key general assumptions used in the Financial Projections:

Description	Assumption	Remarks
Concession start year	Year 1	Beginning of construction period
Concession end year	Year 22	Including construction period
Construction period	2 years	Based on industry norm
Operating period	20 years	Based on industry norm
Size of the Hospital	90 beds	Based on inputs from the management of Nakhon Pathom Hospital
Support Infrastructure: - Carpark - Cafeteria - Hotel - Others	Not required	Based on inputs from the management of Nakhon Pathom Hospital
Equipment procurement	Yes	Based on inputs from the management of Nakhon Pathom Hospital
Commercial opportunities	None	As the scope of the Project did not include any support infrastructure, we assumed that there will no commercial opportunities to the private sector

General assumptions:

Description	Assumption	Remarks
Inflation rate	2.5%	Based on last 10 years inflation in Thailand
Discount rate	10%	Used to discount all project cash flows. Could be adjusted to reflect weighted average cost of capital
Depreciation		
- Building and structures	20 years	Based on industry norms
- Equipment	10 years	Based on industry norms
Corporate tax rate	20%	Based on prevalent law

Construction schedule assumptions

Key assumptions for construction timeline are as follows:

- Construction period – 2 years
- Project progression during construction phase:

Progression (%)	Total	Year 1	Year 2
1. Construction - Hospital	100%	40%	60%
2. Construction – other support infrastructure	100%	40%	60%
3. Equipment procurement	100%	0%	100%

Financing assumptions

Table below summarises the financing and senior debt assumptions used for the Financial Projections for the Project:

Description	Assumptions /Remarks
1. Funding requirement	Includes initial capital expenditure, any financing cost requirements and
2. Target gearing	70% Debt : 30% Equity
3. Debt tenor	22 years
4. Repayment period	20 years
5. Repayment profile	Annuity
6. Interest rate	7%

5.B.3.3 PPP Project Value

SEPO has defined the Project Value calculation as total public and private investment / assets, both tangible and intangible, which create an optimal-level of utilization capacity during the whole life of the project. The Project Value includes initial investment / capital expenditure (CAPEX), on-going CAPEX and operating expenses (OPEX). The PPP Project Value calculation will then determine the procurement approach of the project whether to apply existing Procurement Regulations with mutatis mutandis principle or to obtain approval from the Cabinet (above THB 5 billion).

5.B.3.3.1 Public Sector Investment

Land and other government investment / asset transfer represent the public sector investment for the PPP Project Value calculation. For the purpose of land value calculation for this simulation study, we

have used Baht 30,000 per sqm (average land market value in the area[6]) over a total land area of approximately 5,000sqm[7].The definition and cost of these items will need to be defined in a more precise manner and to be confirmed during the feasibility study.

5.B.3.3.2 Private Sector Investment

a) Initial Capital Expenditure

Initial CAPEX refers to the construction costs of the Hospital building with support infrastructure and the procurement of equipment by the private sector.

Space Planning

- Hospital space planning
  Based on the hospital space planning guide prepared by Marshall & Swift Valuation Service in September 2013, the average gross area per bed for a general hospital is estimated at 1,225 sqft per bed.

Area	Gross area per bed (sqft)[8]	Gross area (90 beds)
Administrative	73	6,570
Obstetrics	24	2,160
Central Sterile Supply	19	1,710
Dietary	62	5,580
Emergency	14	1,260
Pharmacy	10	900
General Storage	33	2,970
Housekeeping	26	2,340
Intensive Care	16	1,440
Nursery	13	1,170
Locker Rooms	12	1,080
Nursing	259	23,310
Outpatient	44	3,960
Pathology	26	2,340
Maintenance	13	1,170
Radiology	25	2,250
Surgical	54	4,860
Therapy	20	1,800
Mechanical	98	8,820
Circulation	252	22,680
Structure	132	11,880
Total (AVERAGE)	**1,225**	**110,250**

Other Grades	Gross area per bed (sqft)[9]	Gross area (90 beds)
LOW	**630**	**56,700**
GOOD	**2,425**	**218,250**

[6] Source: www.land.co.th and www.treasury.go.th

[7] Please refer to Appendix 11.C (C-6 "Land area: Key drivers / assumptions") for the key drivers and assumptions used

[8] Source: Marshall & Swift Valuation Service

[9] Source: Marshall & Swift Valuation Service

Construction cost – Hospital:

The preliminary construction cost data[10] presented in this section is based on the valuation, appraisals and analysis of the costs of new buildings in the United States. The buildings are divided into five basic cost groups by type of framing (supporting columns and beams), walls, floors and roof structures and fireproofing as below. Please note that the cost classifications are merely indicative of many sampling buildings and are not meant to be building specifications. For further details, please refer to Appendix 11.D.

Class	Description
A	Buildings consist of fireproofed structural steel frames with reinforced concrete or masonry floors and roofs.
B	Buildings consist of reinforced concrete frames and concrete or masonry floors and roofs
C	Buildings consist of masonry or concrete exterior walls, and wood or steel roof and floor structures, except for concrete slab on grade.
D	Buildings generally consist of wood frame, floor, and roof structure. They may have a concrete floor on grade and other substitute materials, but are considered combustible construction. This class includes the pre-engineered pole- or post-frame, hoop and arch-rib-frame buildings.
S	Buildings consist of frames, roofs, and walls of incombustible metal. This class includes the pre-engineered metal buildings, including slant-wall and quonset structures

The average hospital construction costs by cost groups are summarised below:

	Cost per sqft[11] (USD)				Assumptions
Class	Low cost	Average	Good	Excellent	
A	209.37	272.39	354.99	464.41	**Low Cost – Class C**
B	206.26	267.79	348.27	454.68	
C	**151.33**	203.23	270.45	361.09	
D	146.56	194.09	257.20		
S	141.79				

The average costs shown above include architects' fees and contractors' overhead and profit, sales taxes, permit fees and insurance during construction. Financing costs, real estate taxes or brokers' commissions are not included. We have assumed the construction cost for the Medical Excellence Center to be under category **Low Cost – Class C (USD151.33per sqft).**

Converting to Local based costs via a Construction Cost Index: As the unit rate is being benchmarked with cost data from the United States, we have assumed a local cost multiplier of **0.5 times**[12] to reflect

[10] Source: Marshall & Swift Valuation Service

[11] Source: Marshall & Swift Valuation Service

and to adjust to local cost conditions. As a result, a unit construction cost is assumed at **USD75.67 per sqft**. The resulting preliminary construction cost per bed for the General Hospital building is estimated to be **USD122,000**. The unit rate is consistent with the cost data from other hospital development projects of similar size and with publicly available information as summarized in Appendix 11.D.

The building specifications and construction cost will need to be further developed and confirmed in the feasibility study stage.

Construction cost – Support Infrastructure:

Support infrastructure refers to other infrastructure needed to sustain the hospital's day to day operations and to improve services to the patients / users such as carpark, cafeteria, hotel and others.

High level assumptions for the construction cost and requirement of these infrastructures for the Project is summarized as follows:

Support Infrastructure	Requirement	% of Hospital construction cost
1. Carpark	No	10%
2. Cafeteria	No	5%
3. Hotel	No	10%
4. Others	No	3%

Equipment procurement:

The high level assumption used for the procurement of the medical equipment is as follows:

Equipment	Requirement	% of Hospital construction cost
1. Equipment procurement	Yes	30%

5.B.3.3.3 Repair & maintenance and Operating Expenses

Repair & maintenance (R&M) represents the potential expenditure required during the concession operating period to retain the infrastructure fit for purpose. R&M expenditure is assumed as follows:

Description	Assumptions /Remarks
1. Building maintenance	3% of Hospital construction cost per annum
2. Equipment maintenance and replacement	10% of equipment procurement cost per annum
3. Support services (carpark, cafeteria, hotel, etc)	10% of respective construction cost per annum

5.B.3.3.4 Summary of PPP Project Value

Table below represents the PPP Project Value estimate in NPV terms and in current price:

PPP Project Value (Baht 'mil)	NPV	Current price
Public sector's contribution		
1. Land cost	136	150
2. Other Government investment and assets transfer	TBD	TBD
Private sector's contribution		
3. Initial capital expenditure		
3a. Construction cost - Hospital	265	308

[12] Source: Arcadis International Construction Report (International cost comparison: Indexation based on UK = 100, Thailand = 34, US = 90, Thailand : US = 0.4 times) and International Construction Intelligence (Thailand: US = 0.7 times)

PPP Project Value (Baht 'mil)	NPV	Current price
3a. Construction cost - Support infrastructure (carpark, hotel, etc)	-	-
3b. Equipment procurement	77	93
Total initial capital expenditure	**342**	**402**
4. Repair & maintenance and operating expenses:		
4a. Building maintenance	80	245
4b. Equipment maintenance and replacement	80	245
4c. Support services (catering, laundry, etc)	-	-
Total operating expenses	**160**	**490**
TOTAL PPP PROJECT VALUE	**638**	**1,042**

5.B.3.4 Financing

The funding requirement from the private sector for the Project is estimated as the initial capital expenditure of THB 434 mil (NPV of THB 369 mil) over the construction period.

The proposed gearing for the funding structure for the Project is expected to be at 70% debt and 30% equity based on conservative industry norms. This is consistent with input based on early discussions with Siam Commercial Bank. Please refer to Appendix E in Section 11 for further details.

5.B.3.5 Payment Mechanism

For this Project, as the Public sector retains the demand risk as MoPH continues to provide medical services and collect revenue generated from these services, the payment mechanism is structured as an availability payment for the provision of the infrastructure services. The Public sector will make monthly payments to the Private sector / concessionaire for making the Hospital available for use, regardless of the utilization of the asset. In order to receive the monthly payment, the Private sector on the other hand will ensure that the Hospital meets the minimum / certain requirement standards and is available for use by the public.

5.B.3.5.1 Payment by the Government

The payment mechanism is critical for effective delivery of the Investment Contract. It defines the risk transfer and established incentives for the private sector to offer continuous services to agreed-upon performance standards summarised in Section 5.B.2.5.

5.B.3.5.2 Commercial Revenue Potential

The primary form of revenues to the private sector will be the availability payment. However, it is likely that selected commercial revenues from third parties users may be generated including :

- **Carpark** – collection of car parking fees from Hospital's users
- **Cafeteria** – sales of food and beverages to Hospital's users
- **Rental of retail spaces** – collection of monthly rental fees for retail spaces

These revenues may be collected by the private sector or the public sector.

Based on the inputs provided by the management of Nakhon Pathom Hospital in Section 5.B.2.4, the PPP Project scope will only cover the basic hospital building with equipment and not any support infrastructure. As such, we have assumed that there will be no commercial revenue options available for this Project, but this assumption will need to be revised during the full feasibility study.

5.B.3.6 Financial Assessment Summary

5.B.3.6.1 Sources and Uses

Figures in Baht 'mil	NPV	Total	1	2	3	4	5	6	7	8	9	10	11
Sources													
Government payment/Availability Payment	525	1,493	-	-	75	75	75	75	75	75	75	75	75
Commercial revenue	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt	295	347	103	244	-	-	-	-	-	-	-	-	-
Equity	74	87	26	61	-	-	-	-	-	-	-	-	-
Government upfront payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sources	**894**	**1,927**	**129**	**305**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**
Uses													
Operating expenses	160	489	-	-	19	20	20	21	21	22	22	23	23
Tax paid	33	115	-	-	2	2	2	2	6	6	6	6	6
Capital expenditure	342	402	122	280	-	-	-	-	-	-	-	-	-
Interest during construction	27	31	7	24	-	-	-	-	-	-	-	-	-
Repayment of debt	122	347	-	-	17	17	17	17	17	17	17	17	17
Interest during operation	107	230	-	-	23	22	21	19	18	17	16	15	13
Dividend payment	104	312	0	0	14	14	15	15	12	13	13	14	14
Total Uses	**894**	**1,927**	**129**	**305**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**

Figures in Baht 'mil	NPV	Total	12	13	14	15	16	17	18	19	20	21	22
Sources													
Government payment/Availability Payment	525	1,493	75	75	75	75	75	75	75	75	75	75	75
Commercial revenue	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt	295	347	-	-	-	-	-	-	-	-	-	-	-
Equity	74	87	-	-	-	-	-	-	-	-	-	-	-
Government upfront payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sources	**894**	**1,927**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**
Uses													
Operating expenses	160	489	24	25	25	26	26	27	28	28	29	30	31
Tax paid	33	115	6	7	7	7	7	7	7	7	7	7	8
Capital expenditure	342	402	-	-	-	-	-	-	-	-	-	-	-
Interest during construction	27	31	-	-	-	-	-	-	-	-	-	-	-
Repayment of debt	122	347	17	17	17	17	17	17	17	17	17	17	17
Interest during operation	107	230	12	11	10	8	7	6	5	4	2	1	(0)
Dividend payment	104	312	15	15	16	16	17	17	18	18	18	19	19
Total Uses	**894**	**1,927**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**	**75**

5.B.3.7 Value for Money (VfM) Assessment

Value for Money (VfM) assessment or VfM test is typically used to assess if PPP contracting model for a certain project (Shadow Bid) can be advantageous compared to contracting of the same project by the government (Public Sector Comparator or PSC). The key objective of the VfM test is to assess and quantify of how the transfer of asset delivery, operations and maintenance to a private sector partner can create a higher value to the Government by leveraging private sector's technical, operational and financial capabilities. It has to be noted, that potential VfM gains should be considered as approximate and have indicative nature of comparison between contracting models.

The VfM analysis provides some perspective as to whether transferring of project risks to a private partner will yield a higher aggregate value to infrastructure users and taxpayers compared a traditional procurement route. This can be expressed either in direct cost savings for the same service or a higher quality of service to users for the same or lower price. Alternative way to identify VfM is to test whether the anticipated value of project risk transferred to the private sector would offset the risk premium embedded in the rate of return of private investors, and therefore achieves a better risk adjusted price/quality ratio of the project delivery to the Government.

5.B.3.7.1 Public Sector Comparator

PSC model is designed to forecast total costs of project delivery, operations and maintenance to the Government considering that all project risk will be retained by the government. PSC model is based on the assumption that all costs will be adjusted to take the consideration effect of risk i.e. cost overrun and time delays leading to increase in cost over the construction and operating period which are equivalent to a PPP project period.

5.B.3.7.2 Shadow Bid Model

Shadow Bid Model is structured to quantify all project risks retained by the government under PPP contracting model and total payments received/made by the Government from/to a private sector partner over entire PPP project period.

5.B.3.7.3 Value for Money

Total VfM gains are typically driven by the Project whole life costing factor. It is assumed that, efficiencies from integrated life-cycle contracting are derived from standard cost saving estimates commonly applied in various infrastructure projects with differences in actual bid prices and reference prices. We assume that potential cost savings for construction, operations and maintenance if project is delivered by a private partner as compared to a standard government contracting would be as follows:

- **Construction costs (including interface risks)**

  A study[16] performed in 2007 by Allen Consulting Group and the University of Melbourne (Australia) compared the cost overruns under Public Private Partnership (PPP) projects versus traditional procurement. The methodology used to review 54 infrastructure projects in Australia defines four stages in project implementation as follows:

16 Source: Allen Consulting Group / University of Melbourne, "Performance of PPPs and Traditional Procurement in Australia"

- Stage 1: Original approval to contract close
- Stage 2: Final budget to actual delivery
- Stage 3: Contract close to actual delivery
- Full Period: Original Project budget approval to actual delivery

The result of the study is summarized in the table below:

Description	Stage 1	Stage 2	Stage 3	Full Period
Traditional	24.7%	24.6%	13.8%	44.7%
PPP	11.5%	3.0%	2.4%	13.9%
Difference	13.2%	21.6%	11.4%	30.8%
Significance	87%	96%	99%	96%

It is observed that in each of the 4 stages identified, projects undertaken via PPP were completed with significant lower cost over-run compared to traditional procured projects. PPPs tended to display greater cost discipline as compared to traditional procurement. As such, potential construction cost savings for private partner is assumed at approximately 15%.

- **Operations and maintenance costs**

During operational phase, the private partner is expected to incur lesser operations and maintenance costs due to the following factors:

- Installation of efficient technologies and equipment during construction phase
- Optimisation of assets' life-cycle with regular maintenance
- Regular operational cost control in order to operate at profit and to meet financial obligations
- Ability to obtain economies of scale and optimizing maintenance programs from existing common businesses or activities

Potential operations cost savings for private sector is assumed at 20%.

- **Other costs**

During construction and operational phase, the PSC is also expected to incur financing cost in full. For VfM analysis, it is assumed that the PSC is able to obtain financing at a lower interest rate of 2.7%[17] as compared to private sector of 7%[18].

5.B.3.7.4 Preliminary Quantitative Assessment

Table below summarises the key assumptions used in both the Shadow Bid model and the PSC model:

Description	Shadow Bid	PSC
CAPEX (NPV, PHP mil)	342	384
OPEX cost overrun	n/a	20% higher

17 Source: Bloomberg, November 2015 – Thailand's 10-year government bond yield

18 Source: Bank of Thailand, August 2015 – Interest rates in financial market (2005 – present)

VFM Components matrix:

Description (NPV, PHP mil)	Shadow Bid	PSC
Payment from the Government	525[a]	-
Total CAPEX	-	384
Total OPEX	-	220
Financing cost	-	82
Total Project NPV (Pre Tax)	**525**	**687**
Corporate Tax	(33)	-
Total Project NPV (After Tax)	**492**	**687**
VfM gain (PSC – Shadow Bid)	195	

Details of uses of the Government payment is as follows:

Description (NPV, PHP mil)	Payment received from the government
Repayment of debt	122
Financing cost	107
OPEX	160
Tax payment	33
Dividend payment	104
Total	**525**

Preliminary results of the VfM quantification determined positive value that could be generated if project is procured as a PPP. Total NPV of all cash outflows from the Project to the Government over entire project life (20 years) if standard procurement method is selected is estimated at Baht 687 million, compared to Baht 492 million if project procured as a PPP. In other words, total VfM gains are estimated at about Baht 195 million.

5.B.4 Summary of Project 1: Nakhon Pathom Mid-size General Hospital

The management of Nakhon Pathom Hospital considers development of a 90-bed general urban hospital to overcome existing capacity problems at Nakhon Pathom Hospital such as considerable number of inpatient beds located in common areas and significant waiting time for various medical procedures. With additional mid-size general hospital facility, Nakhon Pathom Hospital will be able to shift number of patients away from the existing facility, provide more specialised services in its existing facility and maintain its role as the center of medical network for Nakhon Pathom provinces and to focus on providing tertiary care level services and treatments to chronic patients.

Based on preliminary financial assessment for the Mid-Size General Hospital project developed during the course of our study, the PPP Project value (NPV) is estimated to be close to **Baht 640 million**. The total VfM gains (NPV) from this PPP project are estimated at approximately **Baht 195 million.**

Based on the results of the simulation study a development of a new mid-size general hospital facility at the Nakhon Pathom Hospital represents a potentially good candidate for a pilot healthcare PPP project and can be considered to be bundled and undertaken as a group of urban hospitals if appropriate for private sector participation. There are several considerations regarding next steps:

- **PPP Project size**
  The initial estimates of the PPP project value is below THB 1 billion (~USD 28 million). It will be important to conduct market consultations to evaluate if private investors will be interested in this project on a stand-alone basis. The PPP project value needs to be significant enough to justify private sector investment and effort to participate in the PPP tender process. The approach of bundling 2-3 or more medium size general hospitals in one region may enhance private sector interest.

- **PPP Project scope**
  The simulation study assumed that the private sector provides only the core infrastructure services provision. As part of the feasibility study, it is also possible to explore the inclusion of other support services and commercial potential to be provided by the private partner to realise better value for money benefits, including car park facilities. This could also assist to potentially reduce government funding requirements if private investor is given opportunity to generate some commercial revenue from other services.

- **Budget allocation**
  MOPH will need to use updated budget appropriation rules that are currently been developed by SEPO to use VfM results in the budget application to ensure long term budget appropriation is secured for the project. In addition, some of the Nakhon Pathom Hospital operational budget received from the government under the Universal Service Obligations for its capital projects based on annual allocation can also be applied towards the PPP payments. This is an area to be developed in detail as part of the Feasibility Study.

- **Medical personnel shortage**
  On a separate but related note, we have been informed by the NP management that one of the major limiting factors that directly impact size of the new facility is ability to hire sufficient number of support medical specialists. Assessment of private partner's ability to attract support medical personnel can also be explored during the feasibility study and market sounding.

C. Medical Excellence Center – Department of Medical Services

5.C.1 Medical Centre Overview

5.C.1.1 Background

The Department of Medical Services (DMS) is a government agency responsible for 32 hospitals and institutes, and 12 Central Support Agencies. The DMS has a vision to be the leader in the academic and technological fields of medicine to support and improve the well-being of the Thai citizens. DMS has a duty to develop the department's hospitals and institutes to be Centers of Excellence, increase the capacity of regional referral centers as tertiary care service centers, and to apply policies and other mechanisms to improve the centers.

Fifteen hospitals and institutes under DMS each have a capacity of 500-1,000 beds on average. Most of these hospitals and institutes are located in Bangkok and the surrounding Greater Bangkok Area. Most of the revenue sources are based on:

- **Self-financed:** 35-50 %
- **CSMBS:** 30 %
- **Social Security Rights:** 10-20%
- **UCS:** 0 – 25%

The hospitals and institutes under DMS are generally reputed for being specialized medical institutions. However, most of the hospitals face the problem of high occupancy resulting in congestion and long waiting times for patients. To alleviate these issues, DMS has proposed to develop a 250-bed Medical Excellence Centre ("Medical Excellence Center") for DMS to overcome congestion problems in all the hospitals / institutes under DMS as well as to reduce waiting time of patients who are self-financed, under CSMBS and with private insurance. The new center will be a multidisciplinary medical service center that aims to deliver the following specialized treatments:

Medical Services	Skilled professionals
Otorhinolaryngology / Ear, Nose, Throat (ENT)	Rajvithi Hospital
ER	Nopparat Hospital
Eye specialist	Mettapracharah (Rai-king) Hospital
Orthopedic	Lerdsin Hospital
Pediatric	Queen Sirikit National Institute of Child Health
X-ray / Lab	Institute of Pathology
Skin specialist	Institute of Dermatology
Neurology	Prasat Neurological Institute
CVT	Chest Disease Institute
Dental	Institute of Dentistry
Rehabilitation	Rehab (Sirindhon)
Cancer	National Cancer Institute
Psychiatry and narcotics	Thanyaburi

5.C.1.2 Initial Design Specification Considerations

The management of DMS has provided some high level design brief of the Medical Excellence Center. We understand that the information provided is preliminary and it will need to be reviewed and improved by the engineers and health facility planners during the feasibility stage.

Planning integration:

When establishing the design brief of the Medical Excellence Center, the management of DMS has highlighted that the planning needs of the Medical Excellence Center should reflect the following:

- Proposed location to be near skytrain/subway station and highway, i.e. area such as Rama 9, Ngam Wong Wan, Taling Chan, or Rama2
- Energy saving and environmental-friendly facility

Size of the Medical Excellence Center:

Table below summarises the inputs provided by the management of DMS:

Area	Descriptions
Hospital building	
Outpatient department (OPD)	15 clinics (co-partner among hospitals and medical institutes under Department of Medical Service)
ER	-
IPD	200 beds (private room)
Ambulatory	50 beds (private room + shared room)
ICU	20 beds
Operating room	20 rooms
Hemodialysis center	20 units
Labour and Delivery Unit	5 rooms
Dentistry	10 units
Other facilities / area	
Administration	Administration, medical records, pastoral care, general storage
Commercial	Cafeteria, retails, convenience store
General support	Kitchen, doctor's lounge, staff and public amenities
Teaching, training and research center	Education, clinical research, academic research
Conference and meeting rooms	Estimated to cater up to 400 people
Other site facilities	Staff accommodation (20 rooms), hostel to accommodate visitors from other provinces (50 rooms)
Others	Thai massage/ Fitness/ Spa
Carpark	Up to 1,000 lots

Medical Excellence Center Functional Planning Units:

A standard set of functional planning units has been developed to enable a common approach to the capital planning process for the PPP project in Section 5.C.3.3.2. Medical Excellence Center functional planning units are summarised in Appendix 11.C (C-4: Responses received from DMS).

Additional Information Requirements for the next phase:

While the information provided is sufficient for a simulation study, further information is required to undertake a fuller assessment of the Project:

- While we have made the assumption of developing a 250-bed hospital for the purpose of this report, a detailed needs assessment will be required to validate these assumptions as the demand assessment will impact the design and size / cost of the hospital. The potential next steps include:
  - Further analysis to review if the planned capacity of 250 beds would be sufficient to meet existing demand (potentially to attract 30% of DMS existing patients) as well as future demand – this will include how population growth / demand of specific medical services will impact the future demand
  - Assessment of patient profile / forecast bed requirements by types of services offered in order to determine the design / equipment requirement for the Medical Excellence Center
  - The above will assist to provide a better assessment of the infrastructure requirement (no. of clinics, no. of operating rooms, carpark lots, etc) and equipment requirement (e.g. no. of unit per operating room) to develop a more accurate design and cost assessment of the Medical Excellence Center

5.C.2 PPP Project Summary

5.C.2.1 PPP Project Overview

The development of the Medical Excellence Center (the "DMS Project") is a vital element to resolve the congestion problems facing hospitals and institutes under DMS. In addition to providing additional capacity to the hospitals and institutes, the Medical Excellence Center will also become DMS first one-stop center that provide multiple specialties under one roof.

The following section provides high level summary of the overall DMS Project scope, PPP project and service delivery objectives provided by the DMS management. While this information is sufficient for the initial high level project assessment, further details will be required for more rigorous analysis, including more detailed costing and design specific inputs from technical and health facility planners to develop a costing and services plan as part of the feasibility assessment in the next phase. More detailed inputs will also allow narrowing the project scope including more detailed specification of services, identification of infrastructure and equipment requirements and support activities and services.

5.C.2.2 Availability of Land

To deliver the DMS Project, the management of DMS has informed that there is no specific land plot identified for the Project use. DMS has suggested for a possible site within the MoPH compound or any land plot from the DMS land bank. The size of the land is expected to be 5 Rai (8,000 sqm.). Upon identification of land plot, it will enable MoPH to enter into a Build, Operate and Transfer (BOT)

contract with the private sector to allow them to design, construct and finance the Hospital as well as to maintain and operate the Hospital to the most efficient way over the operating period.

5.C.2.3 Project Objectives

The objective of the DMS Project is to create a new Medical Excellence Centre to achieve the following outcomes:

- Reduce congestion and waiting periods of patients in hospitals/ Medical Institute of the DMS
- Increase access for patients referred to the hospital/ Medical Institute of the DMS
- Add convenience to patients through a form of clinical specialties
- Income generated from the project can be utilized in the implementation of the mission and policies of the Department of Medicine.
- Create a support network for other hospitals and small to medium private clinics, to create a Medical Hub.
- Become learning and training center under JCI-DNV GL standard
- To achieve value for money from the efficient use of the organization's resources
- To comply with the Government's PPP policy

A copy of the questionnaire / information request list provided to DMS is included in the Appendix C.

5.C.2.4 PPP Project Scope

For the purposes of establishing the value for money proposition of the DMS Project, the extent of infrastructure related services to be included as part of the PPP will need to be determined.

Based on many international precedents where PPPs have been successfully implemented, the PPP scope of services includes the design, construction and provision of both hard and soft facility management services and provision of medical healthcare services remain with the public sector.

As such, for the purpose of this simulation, MoPH and DMS will continue to control and provide all clinical and diagnostic services while the private sector will be responsible for the design, construction and long term management and maintenance of the overall facilities over the life of the concession. The key aspects of provision of hospital infrastructure services to be provided by the private sector as part of the PPP are set out below:

Services	Descriptions	Private sector role
Design	Design of the Hospital	Yes
Construction	Construction of the Hospital	Yes
Hard facilities management	Hard services consist of services related to the maintenance of the building structure of the Hospital as follows: - Repair and maintenance of the Hospital structures and equipment - Refurbishment	Yes
Soft facilities	Soft services refer to services required for the operation of the Hospital but not related to the	Partially yes.

Services	Descriptions	Private sector role
management	building structure. Examples of potential soft services are as follows: ► General management services, ► Helpdesk services, ► Food services (patient and non-patient), ► Housekeeping services, ► Laundry / linen services, ► Information and communication technology ► Security ► Waste management	To be defined based on additional market capacity assessment and full feasibility study
Procurement of medical equipment	Medical equipment refers to all equipment used for diagnosis, treatment and rehabilitation. Medical equipment includes: ► X-ray machines ► CT scans ► MRI machines, etc.	Partially yes. To be defined based on additional market capacity assessment and full feasibility study
Materials	Materials include all non-medical equipment required to bring the Hospital to operation. Materials include: ► Medicines ► Admin supplies, etc.	Partially yes. To be defined based on additional market capacity assessment and full feasibility study
Medical services and hospital operations	Day to day operations of the Hospital	No. This service will be retained and provided by MoPH / DMS

5.C.2.5 PPP Specifications and Standards

The PPP output specifications defined the private sector's deliverables in the Investment Contract / Concession Agreement. Based on the PPP project scope identified, the common output specifications (KPIs) and penalty (if KPIs are not met) are as follows:

KPI	Threshold value	Penalty
Design, Technical and Construction	► The private sector will need to ensure the Hospital is fully developed on the project operational start date	Availability payments will start only after the facility is available and services are delivered in line with the output specification.
Hospital operation period	► The Hospital should be made available for use round the clock 24 hours a day and 365/366 days a year during the Concession Period	► For every closure of the hospital, Baht [x] per day shall be deducted from the monthly payment from the Government

KPI	Threshold value	Penalty
Lifesaving equipment downtime (Ventilator, Oxygen Pipeline, Heart Lung Machine , etc.)	► Zero number of hours of default	► For every failure, Baht [x] per hour shall be deducted from the monthly payment from the Government
Overall equipment uptime	► CT/MRI shall be made operational within 24 hours of default ► USG shall be made operational within 12 hours of default ► Key Pathology equipment as defined in the Concession Agreement shall be made operational within 24 hours of default	► For every failure, Baht [x] per hour shall be deducted from the monthly payment from the Government
Facilities management	► the private sector will need to undertake routine maintenance including prompt repairs of the Hospital including its structures and equipment	► For every failure (building structures / equipment), Baht [x] per day shall be deducted from the monthly payment from the Government

In addition to setting the PPP output specifications, the Hospital will need to comply with the following standards / guidelines:

- **Construction** – International standard ISO
- **Accreditation Participation Requirements** - Joint Commission International (JCI) Standard
- **Facility Management and Safety (FMS) –** JCI Standard

The above will need to be further developed in close consultation with MoPH's representatives, Design and Construction Division under the Department of Health Service Support and other project advisors such as technical consultant during the feasibility study stage.

5.C.2.6 Risk Assessment and Risk Management

5.C.2.6.1 Risk assessment

A risk is defined as an occurrence which may affect the cost, quality or timely completion of the project. Optimal allocation of risks to the party best able to manage it is a key value for money driver of a PPP, therefore, successful delivery of risk sharing procedures is a key instrument to ensuring long term success.

The objective of assessing the risk is to:

- Enable MoPH to identify and understand the project risks
- Ensure that risks are allocated to whoever that is able to manage and control the risks
- Ensure that the allocation of risks between MoPH and Private sector is clearly set out and demonstrated within the contractual structure
- Develop risk management / mitigation strategies for each identified risk to reduce the likelihood of occurrence

5.C.2.6.2 Risk allocation matrix

Based on many international precedents where PPPs have been successfully implemented, we set out the common projects risks for similar projects and how these risks are borne by private or public sector.

Risk event	Risk borne by	Impact	Risk Mitigation
Construction or completion risk: Construction risks may be due to construction techniques, cost escalation and delays, poor quality in workmanship or availability of appropriate labor or material.	Private	Delays in construction and commissioning of the Project	No payment to the private sector until the start of the operation
Construction or completion risk: Land acquisition is usually identified and the most common risk attributable to PPPs, and usually arises when the project land is unobtainable or unable to be occupied at that time.	Public	Delays in construction and commissioning of the Project	Provision of land for construction should be made Condition Precedent in the Investment Contract. Government delays in approvals and consents, should result in the concession period is extended by an equivalent period.
Legal Requirements: Changes to legislation, codes and / or MoPH guidelines that may result in changes in Facility design or a request from supply authorities, such as power and utilities suppliers, to deviate from actual design	Private	Increase in cost due to modification of design and delay of works or in commissioning of the Project.	The private sector may be entitled to a time extension, compensation and, if it is a prolonged delay, the private party has a right to terminate.
Furniture, fixtures and equipment (FFE): Insufficient FFE allowance to deliver scope	Private	Increase in project capital cost to satisfy FFE requirements	Costs to rectify inefficiencies are generally borne by the private sector.
Maintenance cost: Facilities maintenance costs are higher than the budgeted amount.	Private	Greater maintenance costs compared to budget, affecting project returns	Maintenance cost is generally based on a fixed-fee contract. Any cost overruns are generally borne by the private sector.
Obsolescence FFE: FFE obsolescence occurs more frequently than expected	Private	Increase in costs to replace the hospital's FFE, affecting project returns.	Any additional replacement cost is generally borne by the private sector

Risk event	Risk borne by	Impact	Risk Mitigation
Design inefficiencies: Inadequate / inefficient circulation routes leading to increased staff time and reduction in quality of care.	Private	Increased staff time and reduction in quality of care.	Strict supervision should be carried out throughout the design process. The private sector will have an obligation to take all reasonable action to mitigate the consequences.
Demand risk: Changes to market conditions that significantly affecting the pricing and demand / competition in the healthcare sector	Public	Reduction in revenue sources	As the public sector is operating the hospital, all demand risk relating to medical services will be borne by them.
Market condition: Changes to market conditions that significantly affecting the salary of the medical staff	Public	Increase in operating expenses	As the public sector is operating the hospital, all medical related risk will be borne by them.
Availability of data: Data availability is crucial in the preparation of bids	Public	Insufficient data availability can result in inaccurate bid prices, affecting the budget, KPIs and returns to investors.	Public sector is to ensure all information is made available to bidders to provide accurate bid prices. Private sector should have an opportunity to request for further additional information they may require.

Once specific project parameters are developed during the pre-feasibility stage, the above factors will be taken into consideration and further refined with detailed recommendations.

5.C.2.7 Procurement Model

The selection of the delivery model is a critical decision for any infrastructure project. The purpose of this process is to determine the delivery model which is best suites the risks and opportunities identified for the Project.

Table below presents a brief description of the different procurement models:

Delivery model	Descriptions	Likelihood to achieve VFM under a PPP
Public Build, Own and Operate	The Project is undertaken by government and the design and construction roles are tendered separately to the private sector	Low: A similar to conventional public procurement and it is used when there are no capital constraints on Government spending

Delivery model	Descriptions	Likelihood to achieve VFM under a PPP
Design and Build (D&B)	The Project is undertaken by government and the design and construction roles are tendered separately to the private sector	Low-Medium: Innovation potential could be low, though risks of project delays and additional costs are passed to the private partner
Design, Build, Maintain (DBM)	The private sector is contracted to design, construct and maintain the facilities, with government retaining the operating responsibility	Medium: Private assumes the construction and maintenance risk only. It is used when there are no capital constraints on government spending
Design, Build, Maintain, Operate (DBMO)	The private sector is contracted to design, construction, maintenance and operate (infrastructure only) the facilities	Medium. Assumes that there is no government funding constraints. Government provides the construction financing and also makes ongoing payments to the private sector for the operations,
Design, Build, Finance, Maintain (DBFM)	The private sector is contracted to provide financing, design, construction and maintenance ("hard services") of the infrastructure	Likely. Private sector only receives payments (capital and operational) when services are performed. VFM can also be achieved for the provision of the soft services if there is market capability to so over the long term.
Design, Build, Finance, Maintain and Operate (DBFMO)	The private sector is contracted to provide financing, design, construction, maintenance ("hard services") and operation ("soft services") of the infrastructure. Medical healthcare services remain with the public sector.	Likely. Private sector only receives payments (capital and operational) when services are performed. VFM can also be achieved for the provision of the soft services if there is market capability to so over the long term.

Based on international best practice, healthcare PPP projects with medical services and hospital operations provided with by the Government are typically procured using Design, Build, Finance and Maintain (DBFM) models which delivers maximum VFM for the Government.

In the case of the Medical Excellence Centre, both DBFM and DBFMO should be considered to assess if Value for Money can be achieved, as part of the pre-feasibility phase.

Applying a similar model, MoPH will enter into a contract with a special purpose vehicle that will be required to:

- Design and construct the Medical Excellence Center

- Raise all necessary debt and equity funding to finance the construction of the Medical Excellence Center
- Maintain (and operate) the Medical Excellence Center over the operating period
- Hand back the Medical Excellence Center to MoPH / DMS at the end of the concession period in a pre-defined condition

The advantages of this model include:

- Significant design and construction risk transfer to the private sector
- The construction of the Medical Excellence Center without significant financial outlay or debt by the government
- Maximum incentive for the incorporation of private sector's innovation, whole life design approach and operational solutions
- Full control of the Medical Excellence Center operations by the public sector e.g. provision of medical services

The appropriate PPP modality and procurement model will need to be confirmed during the pilot project phase by taking into consideration, market capability, detailed risk assessment and allocation as well as potential for the value for money.

5.C.3 Financial Assessment of the PPP project

5.C.3.1 Methodology

A financial model was prepared in order to develop the preliminary Financial Projections for the Project. The formulation of the Financial Forecast is drawing on the following key parameters:

- Key Assumptions
- PPP Project Value (Public and Private sector investment)
- Financing
- Payment Mechanism Structure
- Conclusion on Financial Assessment

The approach and detailed key assumptions used for each aspect are described in detail in the following sub-sections.

5.C.3.2 Key Assumptions

Table below summarises the key general assumptions used in the Financial Projections:

Description	Assumption	Remarks
Concession start year	Year 1	Beginning of construction period
Concession end year	Year 22	Including construction period
Construction period	2 years	Based on industry norm
Operating period	20 years	Based on industry norm
Land area	5 rai / 8,000 sqm	Based on inputs from the management of DMS

Description	Assumption	Remarks
Size of the Hospital	250 beds	Based on inputs from the management of DMS
Support Infrastructure: - Carpark - Cafeteria - Hotel - Others	Required	Based on inputs from the management of DMS
Equipment procurement	Yes	Based on inputs from the management of DMS
Commercial opportunities	No	In order to demonstrate the relationship between total private partners' investment and the amount to be paid by the Government, we have excluded the commercial opportunities in this report

General assumptions:

Description	Assumption	Remarks
Inflation rate	2.5%	Based on last 10 years inflation in Thailand
Discount rate	10%	Used to discount all project cash flows. Could be adjusted to reflect weighted average cost of capital
Depreciation		
- Building and structures	20 years	Based on industry norms
- Equipment	10 years	Based on industry norms
Corporate tax rate	20%	Based on prevalent law

Construction schedule assumptions

Key assumptions for construction timeline are as follows:

- Construction period – 2 years
- Project progression during construction phase:

Progression (%)	Total	Year 1	Year 2
1. Construction – Medical Excellence Center	100%	40%	60%
2.Construction – Parking structures	100%	40%	60%
3. Construction – other support infrastructure	100%	40%	60%
4. Equipment procurement	100%	0%	100%

Financing assumptions

Table below summarises the financing and senior debt assumptions used for the Financial Projections for the Project:

Description	Assumptions /Remarks
1. Funding requirement	Includes initial capital expenditure, any financing cost requirements and
2. Target gearing	70% Debt : 30% Equity

Description	Assumptions /Remarks
3. Debt tenor	22 years
4. Repayment period	20 years
5. Repayment profile	Annuity
6. Interest rate	7%

5.C.3.3 PPP Project Value

SEPO has defined PPP project value calculation as total public and private investment / assets, both tangible and intangible, which create an optimal-level of utilization capacity during the whole life of the project. The Project Value includes initial investment / capital expenditure (CAPEX), on-going CAPEX and operating expenses (OPEX). PPP project value calculation will then determine the procurement approach of the project whether to apply existing Procurement Regulations with mutatis mutandis principle or to obtain approval from the Cabinet (above THB 5 billion).

5.C.3.3.1 Public Sector Investment

Land and other government investment / asset transfer represent the public sector investment for the PPP Project Value calculation. For the purpose of land value calculation for this simulation study, we have assumed Baht 100,000 per sqm (land market value in Bangkok[19]) over a land area of 8,000sqm. The definition and cost computation of these items will need to be defined in a more precise manner and to be confirmed during the feasibility study.

5.C.3.3.2 Private Sector Investment

b) Initial Capital Expenditure

Initial CAPEX refers to the construction costs of the Hospital building with support infrastructure and the procurement of equipment by the private sector.

<u>Space Planning</u>

- Hospital space planning
  Based on the hospital space planning guide prepared by Marshall & Swift Valuation Service in September 2013, the average gross area per bed for a general hospital is estimated at 1,225 sqft per bed.

Area	Gross area per bed (sqft)[20]	Gross area (250 beds)
Administrative	73	18,250
Obstetrics	24	6,000
Central Sterile Supply	19	4,750
Dietary	62	15,500
Emergency	14	3,500
Pharmacy	10	2,500
General Storage	33	8,250
Housekeeping	26	6,500
Intensive Care	16	4,000
Nursery	13	3,250

[19] Source: www.land.co.th and www.treasury.go.th

[20] Source: Marshall & Swift Valuation Service

Area	Gross area per bed (sqft)[20]	Gross area (250 beds)
Locker Rooms	12	3,000
Nursing	259	64,750
Outpatient	44	11,000
Pathology	26	6,500
Maintenance	13	3,250
Radiology	25	6,250
Surgical	54	13,500
Therapy	20	5,000
Mechanical	98	24,500
Circulation	252	63,000
Structure	132	33,000
Total (AVERAGE)	**1,225**	**306,250**

Other Grades	Gross area per bed (sqft)[21]	Gross area (250 beds)
LOW	**630**	**157,500**
GOOD	**2,425**	**606,250**

- Parking structures space planning

Marshall & Swift Valuation Service's space planning guide compared the grade of parking facilities by gross area per parking space. The assumptions used to determine the size of the carpark for this Project are as follows:

Descriptions		Assumptions
No. of parking space per bed		2.5
No. of parking space required for a 250-bed hospital		625
Facilities Grade:	**Gross area per space[22]:**	350
- Low	310	
- **Average**	**350**	
- Good	390	
- High	440	
Total parking area (sqft)		**218,750**

- Other support infrastructures space planning

Table below summarises the assumptions used to determine the area of other support infrastructure:

Description	Assumptions	Gross area (250 beds)
Cafeteria	5% of Hospital space	15,313
Hotel	10% of Hospital space	30,625
Others	5% of Hospital space	15,313
Total area for other support infrastructures (sqft)		**61,250**

[21] Source: Marshall & Swift Valuation Service

[22] Source: Marshall & Swift Valuation Service

- Summary of Total Area

Description	Gross area (250 beds)
Hospital / Medical Excellence Center	306,250
Carpark	218,750
Other support infrastructures	61,250
Total area (sqft)	**586,250**

Construction cost – Medical Excellence Center:

The preliminary construction cost data[23] presented in this section is based on the valuation, appraisals and analysis of the costs of new buildings in the United States. The buildings are divided into five basic cost groups by type of framing (supporting columns and beams), walls, floors and roof structures and fireproofing as below. Please note that the cost classifications are merely indicative of many sampling buildings and are not meant to be building specifications. For further details, please refer to Appendix 11.D.

Class	Description
A	Buildings consist of fireproofed structural steel frames with reinforced concrete or masonry floors and roofs.
B	Buildings consist of reinforced concrete frames and concrete or masonry floors and roofs
C	Buildings consist of masonry or concrete exterior walls, and wood or steel roof and floor structures, except for concrete slab on grade.
D	Buildings generally consist of wood frame, floor, and roof structure. They may have a concrete floor on grade and other substitute materials, but are considered combustible construction. This class includes the pre-engineered pole- or post-frame, hoop and arch-rib-frame buildings.
S	Buildings consist of frames, roofs, and walls of incombustible metal. This class includes the pre-engineered metal buildings, including slant-wall and quonset structures

The average hospital construction costs by cost groups are summarised below:

	Cost per sqft[24] (USD)				Assumptions
Class	Low cost	Average	Good	Excellent	
A	209.37	**272.39**	354.99	464.41	**Average – Class A**
B	206.26	267.79	348.27	454.68	
C	151.33	203.23	270.45	361.09	
D	146.56	194.09	257.20		
S	141.79				

The average costs shown above include architects' fees and contractors' overhead and profit, sales taxes, permit fees and insurance during construction. Financing costs, real estate taxes or brokers'

[23] Source: Marshall & Swift Valuation Service

[24] Source: Marshall & Swift Valuation Service

commissions are not included. We have assumed the construction cost for the Medical Excellence Center to be under category **Average – Class A (USD272.39 per sqft).**

Converting to Thai cost base using construction cost index : As the unit rate is being benchmarked with cost data from the United States, we have assumed a local cost multiplier of **0.5 times** [25] to reflect and to adjust to local cost conditions. As a result, a unit construction cost is assumed at **USD136.20 per sqft**. The resulting preliminary construction cost per bed for the Medical Excellence Center building is estimated to be **USD220,000**. The unit rate is consistent with the cost data from other hospital development projects of similar size and with publicly available information as summarized in Appendix 11.D.

The building specifications and construction cost will need to be further developed and confirmed in the feasibility study stage.

Construction cost – Parking structures:

The average carpark construction costs by cost groups are summarised below:

	Cost per sqft[26] (USD)				Assumptions
Class	Cheap	Low cost	Average	Good	
A			52.88	68.80	Average – Class A
B		39.17	50.25	64.73	
S	28.77	36.67			

The average costs shown above include architects' fees and contractors' overhead and profit, sales taxes, permit fees and insurance during construction. Financing costs, real estate taxes or brokers' commissions are not included. We have assumed the construction cost for the parking structures to be under category **Average – Class A (USD52.88 per sqft).**

Converting to Thai cost base using construction cost: As the unit rate is being benchmarked with cost data from the United States, we have assumed a local cost multiplier of **0.5 times**[27] to reflect and to adjust to local cost conditions. As a result, a unit construction cost is assumed at **USD26.44 per sqft**.

The building specifications and construction cost will need to be further developed and confirmed in the feasibility study stage.

Construction cost – Support Infrastructure:

[25] Source: Arcadis International Construction Report (International cost comparison: Indexation based on UK = 100, Thailand = 34, US = 90, Thailand : US = 0.4 times) and International Construction Intelligence (Thailand: US = 0.7 times)

[26] Source: Marshall & Swift Valuation Service

[27] Source: Arcadis International Construction Report (International cost comparison: Indexation based on UK = 100, Thailand = 34, US = 90, Thailand : US = 0.4 times) and International Construction Intelligence (Thailand: US = 0.7 times)

Support infrastructure refers to other infrastructure needed to sustain the Medical Excellence Center's day to day operations and to improve services to the patients / users such as carpark, cafeteria, hotel and others.

High level assumptions for the construction cost and requirement of these infrastructures for the Project is summarized as follows:

Support Infrastructure	Requirement	% of Medical Excellence Center / Hospital construction cost
1. Cafeteria	Yes	5%
2. Hotel	Yes	15%
3. Others	Yes	5%

Equipment procurement:

The high level assumption used for the procurement of the medical equipment is as follows:

Equipment	Requirement	% of Medical Excellence Center / Hospital construction cost
1. Equipment procurement	Yes	30%

5.C.3.3.3 Repair & maintenance and Operating Expenses

Repair & maintenance (R&M) represents the potential expenditure required during the concession operating period to retain the infrastructure fit for purpose. R&M expenditure is assumed as follows:

Description	Assumptions /Remarks
1. Building maintenance	3% of Medical Excellence Center construction cost per annum
2. Equipment maintenance and replacement	10% of equipment procurement cost per annum
3. Support services (carpark, cafeteria, hotel, etc)	10% of respective construction cost per annum

5.C.3.3.4 Summary of PPP Project Value

Table below represents the PPP Project Value estimate in NPV terms and in current price:

PPP Project Value (Baht 'mil)	NPV	Current price
Public sector's contribution		
1. Land cost	727	800
2. Other Government investment and assets transfer	TBD	TBD
Private sector's contribution		
3. Initial capital expenditure		
3a. Construction cost - Medical Excellence Center	1,324	1,542
3b. Construction cost – Parking structures	184	214
3c. Construction cost – Other support services	331	385
3b. Equipment procurement	386	467
Total initial capital expenditure	**2,225**	**2,608**
4. Repair & maintenance and operating expenses:		
4a. Building maintenance	399	1,223
4b. Equipment maintenance and replacement	399	1,223
4c. Support services (catering, laundry, etc)	517	1,584
Total operating expenses	**1,315**	**4,030**
TOTAL PPP PROJECT VALUE	**4,268**	**7,439**

5.C.3.4 Financing

The funding requirement from the private sector for the Project is estimated as the initial capital expenditure of THB 3,055 mil (NPV of THB 2,606 mil) over the construction period.

The proposed gearing for the funding structure for the Project is expected to be at 70% debt and 30% equity based on conservative industry norms and consistent with preliminary discussions with local banks. Please refer to Appendix E in Section 11 for further details.

5.C.3.5 Payment Mechanism

For this Project, as the Public sector retains the demand risk as MoPH continues to provide medical services and collect revenue generated from these services, the payment mechanism is structured as an availability payment for the provision of the infrastructure services. The Public sector will make monthly payments to the Private sector / concessionaire for making the Medical Excellence Center available for use, regardless of the utilization of the asset. In order to receive the monthly payment, the Private sector on the other hand will ensure that the Hospital meets the minimum / certain requirement standards and is available for use by the public.

5.C.3.5.1 Payment by the Government

The payment mechanism is critical for effective delivery of the Investment Contract. It defines the risk transfer and established incentives for the private sector to offer continuous services to agreed-upon performance standards summarised in Section 5.B.2.5.

5.C.3.5.2 Commercial Revenue Potential

The primary form of revenues to the private sector will be the availability payment. However it is likely that selected commercial revenues from third parties users may be generated including :

- **Carpark** – collection of car parking fees from Hospital's users
- **Cafeteria** – sales of food and beverages to Hospital's users
- **Rental of retail spaces** – collection of monthly rental fees for retail spaces

These revenues may be collected by the private sector or the public sector.

Based on the inputs provided by the management of DMS in Section 5.C.2, the Project scope will include design and construction of the hospital building as well as supply and maintenance of medical equipment and support infrastructure such as carpark, cafeteria, hotel and etc. However, additional analysis will be required to evaluate and assess commercial revenue potential available for the private partner. As such, we have assumed that there will be no commercial revenue available for this Project. This commercial potential will be further analysed at the feasibility stage.

5.C.3.5.3 Other cash inflow to the Government

From the Government's budgetary process perspective, the medical services profit generated by DMS from this Project could also be an option to reduce the payment from the Government. This approach will require the net profit generated by the Project to subsidized the availability payment made by the Government to the private sector. In addition, tax income received from the Project Company will also reduce the Government's payment indirectly. A high level Illustration of the net impact to the Government payment is as follows:

Government's net cashflow	NPV	Current price
Total PPP payment to the private sector [a]	(3,703)	(10,525)
Tax income received from Project Co	230	753
Excess cash from Medical Excellence Center operations [b]	1,200	3,648
TOTAL	**(2,272)**	**(5,923)**

[a] The PPP payment to the private sector could be reduced further once 5.C.3.5.2 is determined.

[b] The approach on utilizing the Medical Excellence Center's profit to reduce the Government's payment could be further explored during the feasibility stage. Detailed revenue – cost financial model of the Medical Excellence Center is required in order to estimate the potential excess cash to reduce the PPP payment. Please refer to Appendix 11.C and Appendix 11.F for further details.

5.C.3.6 Financial Assessment Summary

5.C.3.6.1 Sources and Uses

Figures in Baht 'mil	NPV	Total	1	2	3	4	5	6	7	8	9	10	11
Sources													
Government payment/Availability Payment*	3,703	10,525	-	-	526	526	526	526	526	526	526	526	526
Commercial revenue	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt	1,921	2,253	715	1,538	-	-	-	-	-	-	-	-	-
Equity	480	563	179	384	-	-	-	-	-	-	-	-	-
Government upfront payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sources	**6,104**	**13,340**	**894**	**1,922**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**
Uses													
Operating expenses	1,315	4,030	-	-	158	162	166	170	174	179	183	188	192
Tax paid	230	753	-	-	16	17	18	19	38	39	40	40	41
Capital expenditure	2,225	2,608	844	1,764	-	-	-	-	-	-	-	-	-
Interest during construction	176	208	50	158	-	-	-	-	-	-	-	-	-
Repayment of debt	792	2,253	-	-	113	113	113	113	113	113	113	113	113
Interest during operation	693	1,498	-	-	150	142	134	126	118	110	102	95	87
Dividend payment	672	1,990	-	-	90	93	96	99	83	86	89	91	94
Total Uses	**6,104**	**13,340**	**894**	**1,922**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**

* Note: Government payment / Availability payment could be further reduced with the excess cash available from the hospital operations and commercial revenue potential to the private sector.

Figures in Baht 'mil	NPV	Total	12	13	14	15	16	17	18	19	20	21	22
Sources													
Government payment/Availability Payment	3,703	10,525	526	526	526	526	526	526	526	526	526	526	526
Commercial revenue	-	-	-	-	-	-	-	-	-	-	-	-	-
Debt	1,921	2,253	-	-	-	-	-	-	-	-	-	-	-
Equity	480	563	-	-	-	-	-	-	-	-	-	-	-
Government upfront payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sources	**6,104**	**13,340**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**
Uses													
Operating expenses	1,315	4,030	197	202	207	212	218	223	229	234	240	246	252
Tax paid	230	753	42	42	43	43	44	44	45	45	46	46	46
Capital expenditure	2,225	2,608	-	-	-	-	-	-	-	-	-	-	-
Interest during construction	176	208	-	-	-	-	-	-	-	-	-	-	-
Repayment of debt	792	2,253	113	113	113	113	113	113	113	113	113	113	113
Interest during operation	693	1,498	79	71	63	55	47	39	32	24	16	8	-
Dividend payment	672	1,990	96	99	101	103	105	107	109	111	112	114	115
Total Uses	**6,104**	**13,340**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**	**526**

* Note: Government payment / Availability payment could be further reduced with the excess cash available from the hospital operations and commercial revenue potential to the private sector.

5.C.3.7 Value for Money (VfM) Assessment

Value for Money (VfM) assessment or VfM test is typically used to assess if PPP contracting model for a certain project (Shadow Bid) can be advantageous compared to contracting of the same project by the government (Public Sector Comparator or PSC). The key objective of the VfM test is to assess and quantify of how the transfer of asset delivery, operations and maintenance to a private sector partner can create a higher value to the Government by leveraging private sector's technical, operational and financial capabilities. It has to be noted, that potential VfM gains should be considered as approximate and have indicative nature of comparison between contracting models.

The VfM analysis provides some perspective as to whether transferring of project risks to a private partner will yield a higher aggregate value to infrastructure users and taxpayers compared a traditional procurement route. This can be expressed either in direct cost savings for the same service or a higher quality of service to users for the same or lower price. Alternative way to identify VfM is to test whether the anticipated value of project risk transferred to the private sector would offset the risk premium embedded in the rate of return of private investors, and therefore achieves a better risk adjusted price/quality ratio of the project delivery to the Government.

5.C.3.7.1 Public Sector Comparator

PSC model is designed to forecast total costs of project delivery, operations and maintenance to the Government considering that all project risk will be retained by the government. PSC model is based on the assumption that all costs will be adjusted to take the consideration effect of risk i.e. cost overrun and time delays leading to increase in cost over the construction and operating period which are equivalent to a PPP project period.

5.C.3.7.2 Shadow Bid Model

Shadow Bid Model is structured to quantify all project risks retained by the government under PPP contracting model and total payments received/made by the Government from/to a private sector partner over entire PPP project period.

5.C.3.7.3 Value for Money

Total VfM gains are typically driven by the Project whole life costing factor. It is assumed that, efficiencies from integrated life-cycle contracting are derived from standard cost saving estimates commonly applied in various infrastructure projects with differences in actual bid prices and reference prices. We assume that potential cost savings for construction, operations and maintenance if project is delivered by a private partner as compared to a standard government contracting would be as follows:

- **Construction costs (including interface risks)**

  A study[28] performed in 2007 by Allen Consulting Group and the University of Melbourne (Australia) compared the cost overruns under Public Private Partnership (PPP) projects versus traditional procurement. The methodology used to review 54 infrastructure projects in Australia defines four stages in project implementation as follows:

  - Stage 1: Original approval to contract close

[28] Source: Allen Consulting Group / University of Melbourne, "Performance of PPPs and Traditional Procurement in Australia"

- Stage 2: Final budget to actual delivery
- Stage 3: Contract close to actual delivery
- Full Period: Original Project budget approval to actual delivery

The result of the study is summarized in the table below:

Description	Stage 1	Stage 2	Stage 3	Full Period
Traditional	24.7%	24.6%	13.8%	44.7%
PPP	11.5%	3.0%	2.4%	13.9%
Difference	13.2%	21.6%	11.4%	30.8%
Significance	87%	96%	99%	96%

It is observed that in each of the 4 stages identified, projects undertaken via PPP were completed with significant lower cost over-run compared to traditional procured projects. PPPs tended to display greater cost discipline as compared to traditional procurement. As such, potential construction cost savings for private partner is assumed at approximately 15%.

- **Operations and maintenance costs**

During operational phase, the private partner is expected to incur lesser operations and maintenance costs due to the following factors:

- Installation of efficient technologies and equipment during construction phase
- Optimisation of assets' life-cycle with regular maintenance
- Regular operational cost control in order to operate at profit and to meet financial obligations
- Ability to obtain economies of scale and optimizing maintenance programs from existing common businesses or activities

Potential operations cost savings for private sector is assumed at 20%.

- **Other costs**

During construction and operational phase, the PSC is also expected to incur financing cost in full. For VfM analysis, it is assumed that the PSC is able to obtain financing at a lower interest rate of 2.7%[29] as compared to private sector of 7%[30].

5.C.3.7.4 Preliminary Quantitative Assessment

Table below summarises the key assumptions used in both the Shadow Bid model and the PSC model:

Description	Shadow Bid	PSC
CAPEX (NPV, PHP mil)	2,225	2,502
OPEX cost overrun	n/a	20% higher

29 Source: Bloomberg, November 2015 – Thailand's 10-year government bond yield

30 Source: Bank of Thailand, August 2015 – Interest rates in financial market (2005 – present)

VFM Components matrix:

Description (NPV, PHP mil)	Shadow Bid	PSC
Payment from the Government	3,703[a]	-
Total CAPEX	-	2,502
Total OPEX	-	1,815
Financing cost	-	371
Total Project NPV (Pre Tax)	**3,703**	**4,688**
Corporate Tax	(230)	-
Total Project NPV (After Tax)	**3,473**	**4,688**
VfM gain (PSC – Shadow Bid)	**1,215**	

[a] Details of uses of the Government payment is as follows:

Description (NPV, PHP mil)	Payment received from the government
Repayment of debt	792
Financing cost	693
OPEX	1,315
Tax payment	230
Dividend payment	672
Total	**3,703**

Preliminary results of the VfM quantification determined positive value that could be generated if project is procured as a PPP. Total NPV of all cash outflows from the Project to the Government over entire project life (20 years) if standard procurement method is selected is estimated at Baht 4.7 billion, compared to Baht 3.5 billion if project procured as a PPP. In other words, total VfM gains are estimated at about Baht 1.2 billion.

5.C.4 Summary of Project 2: Medical Excellence Center

The management of DMS has proposed to develop a 250-bed Medical Excellence Center for DMS to overcome congestion problems in all the hospitals / institutes under DMS as well as to reduce waiting time of patients who are self-financed, under CSMBS and with private insurance. The new center will be a multidisciplinary medical service center that aims to deliver 13 specialized treatments with skilled professionals from various hospitals / institutions under DMS.

Based on the simulation study for the Medical Excellence Center project, the PPP Project value is estimated to be NPV of **Baht 4.3 billion**. The availability payment from the Government over the projections period of 22 years is estimated at NPV of **Baht 3.7 billion** and the total VfM gains are estimated at approximately **Baht 1.2 billion**.

Development of the Specialised Medical Centre represents a potentially good candidate for a pilot healthcare PPP project. There are several considerations regarding next steps:

- **Location of a suitable land plot**
  The availability of a suitable land plot for the Project is an important consideration. This land will need to be provided by the government

- **Validation of project scope and design specification assumptions**
  Given the scale and range of services which may be provided, the project's capital and operational expenditure will need to be refined. Further analysis to review the planned capacity of 250 beds and assessment of patient profile / forecast bed requirements by types of services should be conducted in more detail as part of the Feasibility Study.

- **Medical Excellence Center revenue generating potential to Offset PPP Project Payments**
  The Medical Excellence Center has the potential to generate its own revenues through paying patients. Further financial analysis of the extent of hospital operations revenue generation will be required during the feasibility stage. This will assist to determine the level of excess cash available to pay for the project and the remaining amount which requires support from the Government / MoPH.

- **Commercial Revenue Potential**
  The Private partner's project scope and opportunities to generate commercial revenue will need to be further developed to evaluate the extent to which commercial revenue generated by the MEC may reduce the Government payment

D. Project 3: Carpark for Rajavithi Hospital

5.D.1 Carpark Overview

5.D.1.1 Background[31]

Rajavithi Hospital is a 1,200-bed medical center located near to Victory Monument Bangkok, one of the busiest transportation hubs in Bangkok. Rajavithi Hospital is the largest public hospital in Ministry of Public Health's system and has been providing medical services for more than 60 years. Rajavithi Hosptal has a strong reputation as an excellent and modern medical facility in providing medical and paramedical services in all medical specialties, appropriately equipped: intelligent operating room or center of endoscopic surgery, Image Guided Radiation Therapy (IGRT), 3D Conformal Radiation Therapy, and Elekta LINAC with MLC and Surgical Skill Training Center.

Rajavithi Hospital is currently accommodating the following number of annual patients and staff:

- **In-patients:** 40,000
- **Out-patients:** 1,000,000 (or a daily average of 4,000 patients)
- **Referral patients:** 200,000 (both in-patients and out-patients)
- **Medical doctors:** 200
- **Professional nurses and specialized staff:** 800
- **Other supporting staff:** 4,000

One of the major concerns faced by Rajavithi Hospital today is significant shortage of car parking space in close proximity to the hospital. Today, there are about 1,500 parking spaces available within the hospital area.

Based on preliminary high level demand assessment performed by the hospital management, it is estimated that Rajavithi Hospital has a major shortage of car parking spaces as 95demonstrated below:

Demand Category	No. of cars parked per day
Medical staff – parking	1,500
Out-patient (cars)	2,000
In-patients and visitors	500
Total demand, cars	**4,000**
Medical staff (motorcycle)	500

At the moment most of the existing parking spaces are provided for free, so additional operational funding is required to operate and maintain the car park. Hospital patrons who are unable to find car parking in the existing hospital car park can use alternative paid-for parking lots:

Alternative parking	No. of parking lots	Distance to Rajavithi Hospital	Parking fee (Baht)
Royal Thai Army Medical Department	500	350 meter (4 mins walk)	20 per hour
Wat Aphaitayaram (Wat Makok)	150	500 meter (6 mins walk)	40 per entry
Children Hospital	n/a	350 meter (4 mins walk)	20 per hour

[31] Source: www.rajavithi.go.th/eng and information provided by Rajavithi Hospital's representatives at the PPP workshop session conducted on November 25th/ 26th, 2015

To resolve the car parking shortage issues, the management of Rajavithi Hospital has determined that a new car parking facility is urgently required to increase total car park capacity to 4,000 cars to improve access for patients and staff of the hospital.

5.D.1.2 Initial Design Specification Considerations

The representatives of Rajavithi Hospital have provided some high level design brief of the carpark. We understand that the information provided is preliminary and it will need to be reviewed and improved by the engineers and health facility planners during the feasibility stage.

When establishing the design brief of the carpark, the representatives of Rajavithi Hospital have highlighted that needs of the carpark should reflect the following:

- Proposed location to be within the hospital compound (the land plot has been identified)
- Capacity of 4,000 car parking spaces
- Parking fee of Bhat 10-20 / hour
- Potential to add commercial retail area

Additional Information Requirments for the next phase:

While the information provided is sufficient for a simulation study, further information is required to undertake a fuller assessment of the carpark Project:

- While we have made the assumption of developing a 4,000-lot carpark for the purpose of this report, a detailed needs assessment will be required to validate these assumptions as the demand assessment will impact the design and size / cost of the carpark.
- The potential next steps include:
  - Assessment of users profile (e.g. no. of medical staff, no. of hospital visitors, no. of other users, etc) to determine the potential parking rates for each category
  - Research /market survey on the users' willingness to pay
  - Identification of other commercial revenue opportunities (retail)

5.D.2 PPP Project Summary

5.D.2.1 PPP Project Overview

The development of the carpark is a vital element to resolve parking congestion problems at the Rajavithi Hospital. In addition to providing current and future users with adequate, efficient and safe access to the hospital, the new carpark will also indirectly improve the hospital users' comfort level and satisfaction visiting the hospital.

5.D.2.2 Availability of Land

To deliver this Project, the representative of Rajavithi Hospital has informed that there is a land plot available within the hospital compound for the Project use. The suitability of this land plat will need to be confirmed. Upon identification of land plot, it will enable MoPH to enter into a Build, Operate and

Transfer (BOT) contract with the private sector to allow them to design, construct, finance, maintain and operate the Carpark to the most efficient way over the operating period.

5.D.2.3 Project Objectives

The objective of this Project is to create a new carpark to achieve the following outcomes:

- Improving accessibility for all hospital users
- Providing centralized, safe and secure on-site parking facilities
- Delivering the Project by the private sector without support or funding from the Government or Rajavithi Hospital

5.D.2.4 PPP Project Scope

Based on many international precedents where carparks has been successfully implemented as PPPs, the PPP scope of services includes the design, construction, operations and maintenance of the car park facilities by the private sector. Public sector will potentially retain some regulatory function depending on the demand risk sharing model.

As such, for the purpose of this simulation, the private sector will be responsible for the design, construction and long term operations and maintenance of the car park facilities over the life of the concession. The key aspects of provision of car park infrastructure services to be provided by the private sector as part of the PPP are set out below:

Services	Descriptions	Private sector role
Design	Design of the carpark	Yes
Construction	Construction of the carpark	Yes
Hard facilities management	Hard services consist of services related to the maintenance of the building structure of the carpark as follows: - Repair and maintenance of the carpark structures and equipment - Refurbishment	Yes
Soft facilities management	Soft services refer to services required for the operation of the carpark but not related to the building structure. Examples of potential soft services are as follows: - General management services, - Cleaning, - Security	Yes
Operations	Collection of parking fees throughout the concession period	Yes

5.D.2.5 Procurement Model

Based on international best practice, carpark projects are typically procured using Design, Build, Finance, Maintain and Operate (DBFMO) model which delivers maximum VfM for the Government. This model should be considered to assess if VfM can be achieved, as part of the feasibility phase.

Applying a similar model, MoPH will enter into a contract with a Private partner to:

- Design and construct the carpark
- Raise all necessary debt and equity funding to finance the construction of the carpark
- Maintain and operate the carpark over the operating period assuming full demand risk
- Hand back the carpark to MoPH / Rajavithi Hospital at the end of the concession period in a pre-defined condition

The advantages of this model include:

- Design and construction risk is fully transferred to the private sector
- Private sector assumed full demand risk
- The construction of the carpark without any financial support from the government
- Maximum incentive for the incorporation of private sector's innovation, whole life design approach and operational solutions

The appropriate PPP modality and procurement model will need to be confirmed during the pilot project phase by taking into consideration, market capability, detailed risk assessment and allocation as well as potential for the value for money.

5.D.3 Financial Assessment of the PPP project

5.D.3.1 Methodology

A high level financial model was prepared in order to develop the preliminary Financial Projections for the Project. The formulation of the Financial Forecast is drawing on the following key parameters:

- Key Assumptions
- PPP Project Value (Public and Private sector investment)
- Financing
- Payment Mechanism Structure
- Conclusion on Financial Assessment

The approach and detailed key assumptions used for each aspect are described in detail in the following sub-sections.

5.D.3.2 Key Assumptions

Table below summarises the key general assumptions used in the Financial Projections:

Description	Assumption	Remarks
Concession start year	Year 1	Beginning of construction period
Concession end year	Year 22	Including construction period

Description	Assumption	Remarks
Construction period	2 years	Based on industry norm
Operating period	20 years	Based on industry norm
Land area	TBD	To be determined
Size of the carpark	4,000 lots	Based on inputs from representatives from Rajavithi Hospital
Commercial opportunities - Retail spaces	Yes	Commercial revenue potential is estimated for the car park only, but may include other opportunities, for example, retail space.

General assumptions:

Description	Assumption	Remarks
Inflation rate	2.5%	Based on last 10 years inflation in Thailand
Discount rate	10%	Used to discount all project cash flows. Could be adjusted to reflect weighted average cost of capital
Depreciation		
- Building and structures	20 years	Based on industry norms
- Equipment and fittings	5 years	Based on industry norms
Corporate tax rate	20%	Based on prevalent law

Financing assumptions

Table below summarises the financing and senior debt assumptions used for the Financial Projections for the Project:

Description	Assumptions /Remarks
1. Funding requirement	Includes initial capital expenditure, any financing cost requirements and
2. Target gearing	50% Debt : 50% Equity
3. Debt tenor	22 years
4. Repayment period	20 years
5. Repayment profile	Annuity
6. Interest rate	7%

5.D.3.3 PPP Project Value

SEPO has defined the Project Value calculation as total public and private investment / assets, both tangible and intangible, which create an optimal-level of utilization capacity during the whole life of the project. The Project Value includes initial investment / capital expenditure (CAPEX), on-going CAPEX and operating expenses (OPEX). The PPP Project Value calculation will then determine the procurement approach of the project whether to apply existing Procurement Regulations with mutatis mutandis principle or to obtain approval from the Cabinet (above THB 5 billion).

5.D.3.3.1 Public Sector Investment

Land and other government investment / asset transfer represent the public sector investment for the PPP Project Value calculation. For the purpose of land value calculation for this simulation study, we

have assumed Baht 100,000 per sqm (land market value in Bangkok[32]) over a land area which is yet to be determined. The definition and cost computation of these items will need to be defined in a more precise manner and to be confirmed during the feasibility study.

5.D.3.3.2 Private Sector Investment

c) Initial Capital Expenditure

Initial CAPEX refers to the construction costs of the carpark structures with potential additional infrastructure for commercial spaces the private sector.

Space Planning

- Parking structures space planning

  Marshall & Swift Valuation Service's space planning guide compared the grade of parking facilities by gross area per parking space. The assumptions used to determine the size of the carpark for this Project are as follows:

Descriptions		Assumptions
No. of parking space required		4,000
Facilities Grade:	**Gross area per space[33]:**	350
- Low	310	
- **Average**	**350**	
- Good	390	
- High	440	
Total parking area (sqft)		**1,400,000**

Construction cost – Parking structures:

The average carpark construction costs by cost groups are summarised below:

	Cost per sqft[34] (USD)				Assumptions
Class	Cheap	Low cost	Average	Good	
A			52.88	68.80	**Average – Class A**
B		39.17	50.25	64.73	
S	28.77	36.67			

The average costs shown above include architects' fees and contractors' overhead and profit, sales taxes, permit fees and insurance during construction. Financing costs, real estate taxes or brokers' commissions are not included. We have assumed the construction cost for the parking structures to be under category **Average – Class A (USD52.88 per sqft).**

[32] Source: www.land.co.th and www.treasury.go.th

[33] Source: Marshall & Swift Valuation Service

[34] Source: Marshall & Swift Valuation Service

Converting to Thai cost base using construction cost: As the unit rate is being benchmarked with cost data from the United States, we have assumed a local cost multiplier of **0.3 times**[35] to reflect and to adjust to local cost conditions. As a result, a unit construction cost is assumed at **USD15.86 per sqft**.

The building specifications and construction cost will need to be further developed and confirmed in the feasibility study stage.

5.D.3.3.3 Repair & maintenance and Operating Expenses

Repair & maintenance (R&M) represents the potential expenditure required during the concession operating period to retain the infrastructure fit for purpose. R&M expenditure is assumed as follows:

Description	Assumptions /Remarks
1. Building maintenance - carpark	10% of construction cost per annum

5.D.3.3.4 Summary of PPP Project Value

Table below represents the PPP Project Value estimate in NPV terms and in current price:

PPP Project Value (Baht 'mil)	NPV	Current price
Public sector's contribution		
1. Land cost	100	100
Private sector's contribution		
3. Initial capital expenditure		
3a. Construction cost – Parking structures	705	821
4. Repair & maintenance and operating expenses:		
4a. Building maintenance - carpark	708	2,171
TOTAL PPP PROJECT VALUE	**1,513**	**3,092**

5.D.3.4 Financing

The funding requirement from the private sector for the Project is estimated as the initial capital expenditure of THB 893 mil (NPV of THB 767 mil) over the construction period.

The proposed gearing for the funding structure for the Project is expected to be at 50% debt and 50% equity based on conservative industry norms and consistent with preliminary discussions with local banks.

5.D.3.5 Payment mechanism

For this Project, the payment mechanism can be fully or partially based on commercial revenue generated from operations of the car park or other commercial real estate bundled with the car park. The Public sector will make **no** payments to the Private sector / concessionaire for making the carpark available for use, regardless of the utilization of the asset.

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35 Source: Arcadis International Construction Report (International cost comparison: Indexation based on UK = 100, Thailand = 34, US = 90, Thailand : US = 0.4 times) and International Construction Intelligence (Thailand: US = 0.7 times)

5.D.3.5.1 Commercial Revenue Potential

The primary form of revenues to the private sector will be the commercial revenue and collection of car parking fees from the users. Also, it is possible that other commercial revenues from third parties users may be generated such as collection of monthly rental fees for retail spaces.

The following high level assumptions have been used to analyse the potential revenue required in order to cover the cost of operating the carpark (for the project to break-even):

Description	Assumption	Remarks
Number of parking lots	4,000	Based on Rajavithi Hospital input
Occupancy rate	80%	
Days of operation per annum	365	Based on preliminary discussion with workshop attendees
Average hourly parking rate per car	Baht 14.00	This base rate is lower than the rates charged by alternative carparks surrounding the hospital
Average other commercial revenue per car	Baht 2.50	
Inflation rate	2.5%	

The Project results are summarised in the table below:

Description	NPV (Baht, mil)
Revenue (carpark + others)	1,470
Operating expenses	(708)
EBITDA	762
CAPEX	(705)
Project NPV (before tax)	762
Project NPV (after tax)	660
Dividends paid	193
Project IRR, after tax	9%
Equity IRR	10%

5.D.3.6 Financial Assessment Summary

5.D.3.6.1 Sources and Uses

Figures in Baht 'mil	NPV	Total	1	2	3	4	5	6	7	8	9	10	11
Sources													
Commercial revenue (carpark)	1,470	4,506	-	-	176	181	185	190	195	200	205	210	215
Debt	383	447	172	275	-	-	-	-	-	-	-	-	-
Equity	383	447	172	275	-	-	-	-	-	-	-	-	-
Government upfront payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sources	**2,237**	**5,400**	**344**	**550**	**176**	**181**	**185**	**190**	**195**	**200**	**205**	**210**	**215**
Uses													
Operating expenses	708	2,171	-	-	85	87	89	92	94	96	99	101	104
Tax paid	102	342	-	-	9	10	11	11	12	13	14	15	16
Capital expenditure	705	821	324	497	-	-	-	-	-	-	-	-	-
Interest during construction	37	43	12	31	-	-	-	-	-	-	-	-	-
Repayment of debt	157	447	-	-	22	22	22	22	22	22	22	22	22
Interest during operation	137	297	-	-	30	28	27	25	23	22	20	19	17
Dividend payment	390	1,279	8	21	30	33	37	40	43	46	50	53	56
Total Uses	**2,237**	**5,400**	**344**	**550**	**176**	**181**	**185**	**190**	**195**	**200**	**205**	**210**	**215**

Figures in Baht 'mil	NPV	Total	12	13	14	15	16	17	18	19	20	21	22
Sources													
Commercial revenue	1,470	4,506	220	226	231	237	243	249	255	262	268	275	282
Debt	383	447	-	-	-	-	-	-	-	-	-	-	-
Equity	383	447	-	-	-	-	-	-	-	-	-	-	-
Government upfront payment	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Sources	**2,237**	**5,400**	**220**	**226**	**231**	**237**	**243**	**249**	**255**	**262**	**268**	**275**	**282**
Uses													
Operating expenses	708	2,171	106	109	111	114	117	120	123	126	129	133	136
Tax paid	102	342	16	17	18	19	20	21	22	23	24	25	26
Capital expenditure	705	821	-	-	-	-	-	-	-	-	-	-	-
Interest during construction	37	43	-	-	-	-	-	-	-	-	-	-	-
Repayment of debt	157	447	22	22	22	22	22	22	22	22	22	22	22
Interest during operation	137	297	16	14	13	11	9	8	6	5	3	2	(0)
Dividend payment	390	1,279	60	63	67	71	74	78	82	86	90	94	98
Total Uses	**2,237**	**5,400**	**220**	**226**	**231**	**237**	**243**	**249**	**255**	**262**	**268**	**275**	**282**

5.D.4 Summary of the Rajavithi Hospital Carpark Project

One of the major concerns faced by Rajavithi Hospital today is significant shortage of car parking space in close proximity to the hospital. Today, there are about 1,500 parking spaces available within the hospital area. Based on preliminary high level demand assessment performed by the hospital management, it is estimated that Rajavithi Hospital has a major shortage of car parking spaces and the development of a new car parking facility is urgently required to increase total car park capacity to 4,000 cars to improve access for patients and staff of the hospital.

Development of a car park facility at the Rajavithi Hospital represents a good potential candidate as a potential PPP project.

For the Rajavithi Carpark Project, the payment mechanism can be fully or partially based on commercial revenue generated from operations of the car park or other commercial real estate bundled with the car park. Based on preliminary assessment, there is the potential that the government will not have to make any payment to the Private sector / concessionaire for making the carpark available for use, regardless of the utilization of the asset.

Project specific issues which require further development at the next stage include:

- **Developing a self-sustainable commercial business case / Demand risk assessment**
  The Project's potential to generate its own revenues through paying patients will be critical to attract private sector investors. The revenue generation potential can be assessed by undertaking a study of users' willingness to pay for the usage of the carpark. At the moment, in order to make the carpark commercially viable, average parking fee per hour is estimated at Bhat 17.5. This is comparable with current parking fee levels in the area. The private partner may also be able to generate commercial revenue from other services eg retail in addition to revenues generated from operations of the car park or other commercial real estate bundled with the car park. As such, if the project is able to generate sufficient revenues from car park and other ancillary operations, then for such a Project private sector will not require any payment from Government to develop the Project.

5.D.5 Successful Car Park PPP in Thailand

During our PPP workshop session on 31st November 2015, a representative from the Chiangrai Prachanukroh Hospital has informed us that Chiangrai Prachanukroh hospital has already received all the required government approvals for entering into contract with a private investor for establishing a car park facility. A brief summary of the project is provided below:

Item	Description
Hospital needs	Provision of 1,000 car parking spaces
Project scope	• ***Public:*** - Provided land plot of 5 rai within Chiangrai Hospital (downtown

Item	Description
	area) - Design the car park building to avoid EIA approval process • ***Private:*** - Construct and invest on the building (approximately Baht 300 million) - Agreement to operate and maintain the carpark up to 30 years - Manage commercial and retail space adjusted to the car park
Business model	• ***Pubic:*** Receives rental income from the private partner (MoF Treasury Department: 70% of rent; Hospital's Welfare Committee: 30% of rent) • ***Private:*** Receives commercial revenue from the project (including parking fees and revenue generated from commercial and retail space) in returns of invested construction costs and rental expense
Fee structure	• Free-parking for the hospital staff • Special rates for hospital's patients/ visitors with hospital's stamp • Market rates for other categories
Project status	• Received all government's approvals required • In the process of completing design before tendering the project • Received responses from 5 private parties who expressed their interests
Regulations	The Prime Minister's Office Regulations re: Internal welfare regarding private investment on public land use for commercial purpose (2004)

E. Taking the Projects Forward

The Projects require the following structuring considerations in the next phase:

- **Project scope and size**
  Project size and scope of medical and support services will need to be finalized based on detailed information and inputs provided by technical and healthcare experts and with considerations given to the current and future demand for specific services. Project scope and objectives will need to be adjusted to ensure proper medical services facility is procured. This exercise will need to be completed during the feasibility phase.

- **Scope of PPP services**
  Based on many international precedents where PPPs have been successfully implemented, the PPP scope of services includes the design, construction and provision of both soft and hard facility management services. The eventual scope for a PPP healthcare project in Thailand will likely be a function of market capacity to competitively deliver services and this will be further tested as part of the pilot project. The long term nature of the PPP contract arrangement and the focus on service quality will motivate the private provider to ensure greater innovation and long term approach to cost and quality management which would generate a VfM solution for the Government.

- **Risk sharing**
  Risk sharing needs to be transparent and well defined in the PPP contract arrangement. As such the private sector is responsible only for those risks that it can manage best (e.g. construction, project budget, timing). Standard international risk sharing practices should be implemented. Given clear project scope, risk sharing will be easy to structure.

- **Bankability and commercial structure**
  Payment for services will be linked to the performances of the private partner. As such private sector investors and funders will undertake analysis of the payment mechanism and will assess the private sector's ability to deliver the services such that the payment risk is minimized.

- **Commercial revenue potential**
  For projects with considerable commercial revenue potential it could be possible to attract private investor willing to take full demand risk and commit funding to the project. Such projects could be much simpler to structure given that no government would be required. Commercial revenue potential has to be considered in all types of PPP projects as it will to reduce government funding.

- **Readiness of hospital management / public sector to pay for the PPP project**
  The value for money of the PPP project is not yet fully understood by the hospital management. It is proposed further capacity building workshops are conducted during the pilot project phase to share the knowledge of benefits of PPP as well as to test and obtain feedback from the hospital management team.

There are several other related risks relating to the Project which will be explore during the pilot project phase such as issues relating to the government procurement rules & policies, including MoPH capacity to develop PPP projects and the current market capacity / readiness of Thai private sectors to participate in PPP projects.

F. Key Areas of Focus for the Next Phase

The following tasks will need to be completed during the next phase to advance projects forward:

- Finalise projects scope and validate detailed costing estimates when further details on the design specification is available;
- Confirm that project scope is in line with MoPH strategic objectives;
- Undertake a market awareness exercise to understand how project scope is aligned with market's requirements, capacity, concerns, specific funding and guaranties requirements, etc.;
- Determine project VfM based on key VfM criteria developed by SEPO for a social sector PPP;
- Consider bundling of several similar facilities (mid-size general hospitals) to ensure project size is attractive to investors;
- Work with SEPO / MoF / Budget of the Bureau on evaluation criteria to ensure funding allocation for PPP hospitals;
- Explore possibility to request private partner to provide a solution to the shortages of medical personnel particularly nursing staff under a PPP project.

6. Procurement Strategy Guidelines and Recommendations

This section outlines main principles and considerations for the procurement process proposed for the projects analysed in Sections 4.2 and 4.3. The initial analyses of the two simulation projects indicate that Value for Money can be achieved under Design Build Finance Maintain (DBFM) procurement model compared to conventional procurement. The provision of soft services can be further explored as part of the pilot project phase to assess if Value for Money can achieved.

Once the feasibility study for each project is approved, project procurement phase can start. Outlined below are the main steps required for each project to reach financial close.

6.A.1 Procurement principles

An open and competitive procurement procedure typically begins with Government's description of its requirements and an invitation to suppliers to indicate their interest in the contract and their professional capacity to fulfil it. Government then identifies potential suppliers and invites them to submit bids. After the bidding phase, a public declaration of the competitors' names and often their bid prices are announced and, ultimately, the successful bidder is determined.

There is a wide variety of procurement procedures available for use in tendering when it comes to PPP arrangements. Many of these procedures have become prescriptive in nature. Most commonly, PPP contracts are awarded as the result of some form of competitive bidding procedure.

As part of achieving an optimal outcome from a competitive bidding process it is important that the tender documents provide clear information about roles of the private and public sector. We propose that a competitive bidding for each project will consists of:

- Public notification of Government's intention to seek a private partner for the provision of defined infrastructure services. This includes requirement of prequalification and sometimes a request for expressions of interest from private companies;
- Request for Expression of Interest phase conducted as part of the feasibility study;
- distribution of bidding documents to potential bidders;
- Formal process for screening potential bidders and finalising a short list of qualified bidders; and
- Formal public process for presenting proposals, evaluating them, and selecting a winner.

Different procedures for procurement include invitation to tender; and request for proposals (one- and two-stage processes). We propose to conduct 2 phase tender process with Request for Expression of Interest Phase taking place as part of the Feasibility Study before RFQ and RFP phases.

6.A.2 Invitation to tender option

Generally, an invitation to tender is issued when Government knows exactly what it wants and how it wants to achieve its goals. This is the case what a standard and simple scope is tendered. Most often, the lowest bidder is awarded the contract. Although this approach requires little time and significantly reduces the cost involved in developing a PPP, it may limit Government's opportunities to view other,

more efficient and/or more cost-effective options for delivery of the service. We also view that given uncertainty in market capacity to deliver services, this option may not generate the optimal value for money.

6.A.3 Request for Expressions of Interest (RFEI)

The RFEI is intended to provide Government with sufficient information to draft a clear Request For Proposal in cases when project objectives have been identified, but the project or service to be delivered have not been fully defined. The use of an RFEI should be considered for the projects reviewed in this study as it reduces the procurement time and expense in evaluating a larger number of proposals and it simplifies negotiations with the bidders improves the quality of proposals. In this sense, the RFEI is used to gain information to help in drafting the RFP.

We anticipate that RFEI would require 1 to 3 months to be completed.

6.A.4 Request for Qualifications (RFQ) or Pre-qualification

A RFQ is used in situations where Government have defined project, but need to confirm if there are any private sector partners with the resources, experience or interest to undertake the project. It is a critical step within a contract awarding procedure in which the party inviting the tenders selects the companies to participate in competitive bidding for the contract. Potential participants interested in the project are requested to submit information about their companies.

The RFQ document is more specific than the RFEI document. In traditional government procurement it consists of the verification of certain formal requirements, such as adequate proof of technical capability or prior experience in the type of PPP, so that all bidders who meet the pre-selection criteria are admitted automatically to the tendering phase. Bidders should be required to demonstrate that they possess the professional and technical qualifications, financial and human resources, equipment and other physical facilities, managerial capacity, reliability and experience necessary to carry out the project.

The RFQ process is used as a "shortlisting" method to pre-qualify selected potential partners who will then receive the RFP. It is not designed to gain answers as to how the project will be completed.

Qualification requirements should cover all phases of an infrastructure project, including financing, management, engineering, construction, operation and maintenance, where appropriate.

Based on the pre-qualification results, a shortlist is drawn up of the companies eligible to compete. The bidders answer the RFQ with Expressions of Interest.

Often local small businesses or community-based organisations are best suited to resolve a particular service delivery problem. In such cases, it is important not to leave them out of the bidding process. One of the means through which this can be achieved is to simplify the tender documents. Obviously, pre-qualification, drafted without taking these potential bidders into account, could serve as an obstacle to the effective and innovative solutions to the existing problems.

6.A.5 Request for proposals (RFP)

A request for proposals phase is initiated when Government knows what it wants to achieve, but would like prospective partners to use their experience, technical capabilities and creativity to identify how the project objectives can best be met.

One of the main differences between an RFP and an invitation to tender is that in an RFP Government is looking for value for money (operating efficiency, cost-saving measures, innovations, etc), rather than the lowest bid. The request for proposals can be issued through either:

- a one-stage; or
- a two-stage process.

The decision between having a single or a two-stage procedure for requesting proposals will depend on the nature of the contract, on how precisely the technical requirements can be defined and whether output results (or performance indicators) are used for selection of the contractor or concessionaire. If it is deemed both feasible and desirable for the contracting authority to formulate performance indicators or project specifications to the degree of precision or finality necessary, the selection may be structured as a single-stage process. In that case, after having concluded the pre-selection of bidders, the contracting authority would proceed directly to issuing a final request for proposals.

6.A.6 One-stage procurement process

A one-stage RFP may be appropriate in the following circumstances:

- Parties are known to Government to have the capability to be successful partners;
- Only a limited number of suppliers have the resources and capabilities to be a successful partner;
- The project must be implemented under a tight timeframe; and/or
- Government is not able to spend a large amount of funds on the process.

6.A.7 Two-stage procurement process

Government should consider using the two-step process in the following situations:

- The project is large and complex or of a special nature;
- The required proposal will be time-consuming and expensive for the proponent to prepare;
- Qualified firms would not take the time and expense of preparing a response to an RFP if there were too many other firms submitting;
- There is an advantage to initially inviting a large number of firms and then narrowing the field to those most qualified; and/or
- The RFP process will involve distribution of information that is sensitive or even confidential.

The two-stage RFP process involves an initial stage that screens potential partners. Generally, this first stage involves the issuance of a Request for Qualifications (RFQ). This screening allows the project team and the evaluation committee a chance to consider a wide range of proponents initially and then to narrow the field to those most qualified.

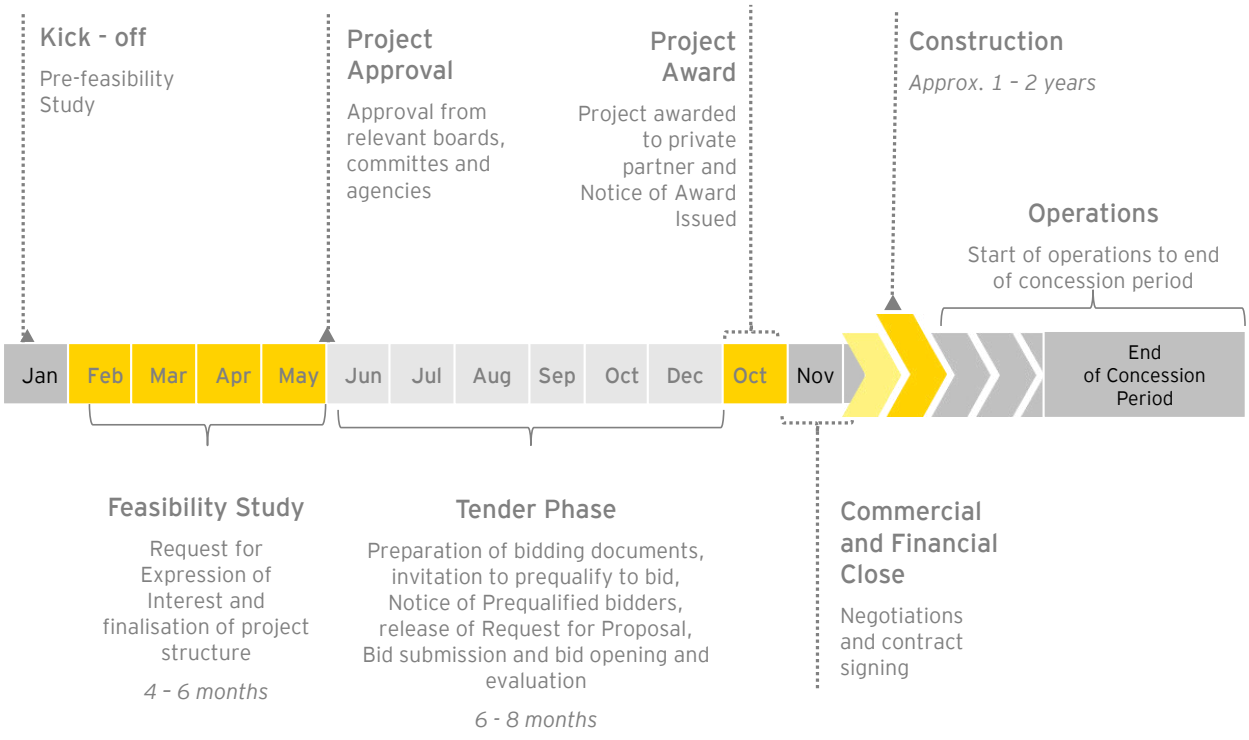
The main objective of the competitive bidding is to provide a wide range of choice in selecting the best bid from competing suppliers/contractors and to give to all prospective bidders adequate, fair and equal opportunity to bid.

Given limited information available today about market potential to deliver services and to offer competitive bidding process, we propose to incorporate Request for Expression of Interest as part of the Feasibility Study so project scope can be properly tailored. This would significantly shorten a procurement timeline given that bidders' views will be taken into consideration in the project scope and structure.

We also propose to procure both projects using the two-stage RFP given potential complexity of the projects the fact that these would be first social infrastructure PPPs in Thailand. This process will allow evaluation committee to consider a wide range of proponents initially and then to narrow the field to those most qualified.

6.A.8 Procurement Timeline

Presented below is a timeline for the project development and procurement.



7. Key Project Issues and Recommendations

A. Overview of the main issues

7.A.1 Issues related to government procurement rules & policies and MOPH capacity to develop PPP projects

Affordability / Limited Budget: A PPP project typically requires more government funding and budget allocation compared to standard government procurement where many things / risks are paid for post-factum and given that in order to achieve Value for Money, private partner has to be paid for all risks transferred from the government. Any PPP project will cost more from the committed budget point of view, particularly in nominal terms, as availability payment is spread over several years and total nominal funding amount is higher given time value of money as well as added financing costs.

PPP Evaluation Methodology: The methodology to evaluate benefits of a PPP project is still being developed by SEPO. "PPP friendly" rules will need to be introduced into budgeting process, so risk transfer potential can be valued as part of the Value for Money assessment.

Robust Regulatory Framework: A clear legal and regulatory framework is crucial to achieving a sustainable solution. Certain areas (land transfer policy and solution) still need to be developed by SEPO.

MOPH PPP-TSU Project Development and Contract Management Capacity: Given that MOPH will be the implementing government agency, it will need to continue to build Ministry's capacity to develop and manage PPP Projects given that SEPO may be able to provide only general project development / procurement support. Additional resources will need to be allocated.

7.A.2 Market capacity to provide services and readiness of the private sector to participate in PPP projects

Market Capacity to Deliver Services. We expect that core infrastructure services will be relatively easy to procure during construction phase. More research during feasibility phase will be required to analyze market capacity / readiness to enter into a long term service provision agreement for wider range of services.

Competitive market may not exist for some services at the moment (specialized hospital catering or cleaning) as existing private and government services use "in-house" solutions, but is expected to come to life over time once demand for such services is initiated in first PPP projects.

Market capacity / willingness to investment equity into a PPP project will need to be tested during project feasibility. Given open and fair procurement process, simplified project scope and transparent payment mechanism, equity investments are expected from project participants (construction companies, investment funds). Institutional investors may not be willing to invest into pilot projects as they would require more cash flow certainty.

Lenders capacity / willingness to fund PPP projects. Large Thai banks have already participated in long term project finance deals in Thailand. Given presence of a strong equity investor and properly structured government contract, local lenders indicated their willingness to provide funding. Some government guaranties and/ or IFI support may be required (will be tested during the feasibility phase)

Private sector's limited understanding of risk sharing principles in PPP projects. Based on discussions and interviews conducted with various private sector representatives we note that complex risk sharing structure typical for any PPP project is something new for majority of private companies and investors. For example, construction companies expressed concerns with taking on or sharing any risks that they cannot manage directly. This would include most risk at the design phase and post construction phase. It will require additional analysis to determine the best risk sharing option suitable for various Thai private service providers and private investors.

B. Recommendations

Most of the issues listed above are interrelated and cannot be solved individually. Proposed below are some general recommendations that could be used to move our pilot PPP projects forward:

1. MOPH will need to evaluate individual projects against policy priorities. Investment decisions will have to be made independently of decisions on procurement alternatives. To ensure that all options are adequately considered, the decision to build and the decision to finance should be evaluated separately. The costs and benefits of all feasible procurement alternatives should be evaluated during prefeasibility phase.
2. Project size of THB2-5 billion is recommended to generate sufficient market interest.
3. Expression of Interest project phase is strongly recommended as part of the pre-feasibility study. This will allow to tailor project scope to current market capacity in terms of scope of services. This would also allow to adjust payment mechanism to ensure that private partner requirements are met and to provide sufficient amount of government guarantee.
4. Before the final decision is made to enter into a PPP arrangement, a comprehensive market assessment (requirements, capacity, concerns, guaranties required, etc) should be carried out during the feasibility phase.
5. Simplified project scope is recommended with the focus on core infrastructure provision and maintenance services.
6. Consideration should be given to expanding the capacity of the MOPH PPP Unit and involvement of SEPO to evaluate all potential PPP projects using robust and transparent project assessment methodology. Value-for-money assessment should have relevant and clear criteria, and should be conducted at the earliest stage of the procurement process (pre-feasibility). Comparing costs under the traditional approach and the AFP approach should be an objective process to reduce the risk of any bias in comparison.
7. Continuing collaboration with ADB is critical to provide additional support to the pilot project development when required.

8. MoPH PPP-TSU Development Plan

Successful PPP projects require personnel that have the ability to identify and develop PPPs, evaluate alternative financing options, perform an assessment of risks and determine optimal risk sharing, as well as the ability to advise on policy and, draft and negotiate legal contracts. However, these skills generally lack in the public sector and, therefore, a dedicated PPP Unit is set up. A PPP Unit is defined as an organization established, with either full or partial support from the government, to ensure that the public sector has the necessary capacity to identify and develop multiple PPP projects, through legal, commercial and technical support.

As presented in the Midterm Report, the MoPH has established a PPP Transaction Support Unit (PPP-TSU) to centrally coordinate the analysis and procurement of healthcare infrastructure projects in Thailand. Sections of the Midterm Report will reappear in this chapter to establish the context for the benefit of the reader. This chapter will further detail specific sections of the Midterm Report to form a comprehensive view of the proposed organization structure of the PPP Unit to allow MoPH to function as a lean and effective organization capable of undertaking project development, execution, maintenance and operations for health infrastructure projects in Thailand.

A key objective of this Project is to simultaneously build the capacity of this PPP-TSU, whilst establishing the organization structure of the TSU.

A. MoPH PPP Unit Objectives

The functions of various PPP units around the world significantly vary from one country to another, reflecting its purpose of addressing gaps or weaknesses in the individual PPP institutional frameworks, which contrast due to differing legal frameworks, project pipelines, markets and policies. The requirement to creating a dedicated PPP Unit within the MoPH should drive the functions of it, therefore, prior to reforming the TSU, a thorough analysis of the institutional framework and policy drivers for applying the PPP model to health infrastructure projects is vital.

By developing and rolling out a pipeline of PPP projects, assistance to the Unit is provided to achieve the TSU's primary and secondary mandates.

The primary mandate is to:

Screen projects in the health sector to identify potential PPP projects and act as Transaction Manager for identified (pilot) PPP projects on behalf of the Project Owner Agency, in coordination with relevant central agencies.

The secondary mandate is to:

Inform further development of the policy framework and models for PPPs in the health sector based on experience from the implementation of (pilot) PPP projects, and develop and retain capacity and experience within MoPH and relevant service providers related to PPP projects in the health sector.

The split of mandates is to ensure that the PPP-TSU maintains its focus on the use of resources to move projects forward in a concrete way, and focuses on policy only to the extent that any policy changes are required to support concrete project implementation.

Numerous activities have been completed to ensure the development of the organization structure of the TSU.

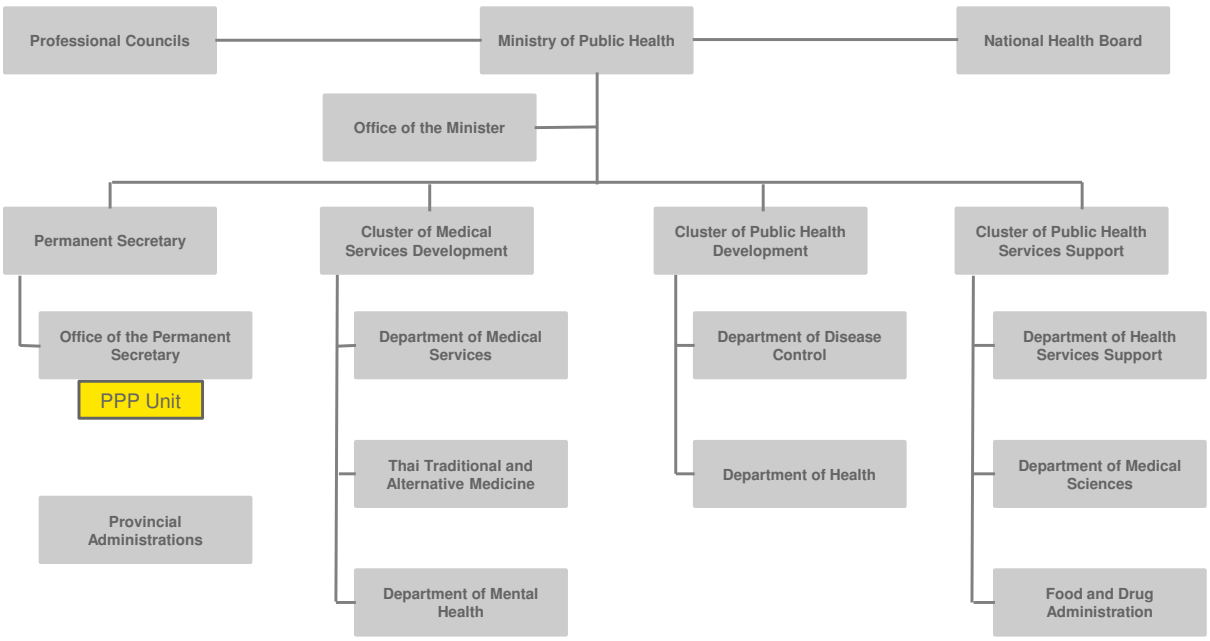
Table 1 – TSU development activities

Activities	Outcome	Reference Section
1. Identification of the dependencies of MoPH on other government agencies for PPP procurement	Through this report, MoPH's dependencies on various government agencies (PPP Committee, SEPO, MOF, NESDB, Bureau of the Budget) to implement PPP were established.	Section D
2. Review the skill levels of existing staff with reference to proposed health PPP projects	Discussions initiated with the MoPH PPP Unit to assess their understanding of their responsibilities across project life cycle including structuring, implementation and contract management. This information is utilized to map the roles and responsibilities of the existing, and future, staff with prospective functions	Section D
3. Establish the process for coordination for various projects	Based on review of the above step 2, the functions of the PPP unit are expected to mirror the project lifecycle. Our assessment ensures the functions have been set in a way which allows for effective coordination amongst all functions.	Section C
4. Review procedural hindrances - approvals and consultation process across departments in PPP TSU unit within MoPH	The review is to assist in identifying the procedural hindrances which can impede the future implementation of projects. The revised organization structure has addressed such impediments to ensure a fully functional PPP TSU unit.	Section D
5. Develop reporting structures for the proposed MoPH unit	Based on the understanding developed through the review of the existing organization structure and procedural hindrances, workshops / working sessions were organized to establish	Section D

Activities	Outcome	Reference Section
	roles and responsibilities for various levels.	

B. Location of PPP Unit within MoPH

Figure 5 – Location of TSU in MoPH



TSU is a separately based unit, located within the Office of the Permanent Secretary, reporting directly to the Permanent Secretary of MoPH. The Permanent Secretary is the authoritative party accountable to Parliament / Cabinet for the daily activities of the MoPH. This provides a direct link to expenditure and capital investment decision-making authorities, ensuring that the budgetary considerations and contingent liabilities are appropriately evaluated for healthcare PPP projects.

C. Roles and Responsibilities

Whilst some PPP Units solely play an advisory role to the Government, others play a bigger role in implementation and approval of PPP projects. The different functions of a PPP Unit can be broadly categorized into:

- Policy guidance
- Project development, procurement and management
- Capacity building; and
- Marketing and promotion

Although SEPO largely acts as the national PPP policy unit, it is imperative for the MoPH PPP Unit to ensure there is an alignment between Ministry and Governmental policies and procedures.

As previously stated, SEPO is responsible for drafting guidelines to encourage PPPs, recommending selection methods to the PPP Committee, studying and analyzing projects, preparing a draft PPP Strategic Plan, and related matters, all at the approval of the PPP Committee. It is, therefore, vital for SEPO, the PPP Committee and the MoPH PPP Unit to collaborate and communicate on policies and procedures.

8.C.1 Policy Guidance

Developing PPP policy by means of a PPP manual is an important component of the PPP delivery system and a PPP Unit can play a crucial role in this activity. The PPP manual, which is the ultimate responsibility of SEPO / PPP Committee, may be complimented with a Healthcare PPP Manual to further benefit healthcare PPPs by having a comprehensive and consistent PPP policy entailing clear guidelines regarding when the PPP model should be considered and how it should be implemented specifically for clinics, hospitals, etc.

Given that PPP policy can be technically demanding, a core body of expertise focused on PPP issues can advise on the content of legislation, long-term fiscal implications of a PPP policy specifically impacting the healthcare sector, and developing approaches to risk allocation, as well as procedures for conflict resolution/termination.

8.C.2 Project development, procurement and management

The PPP Unit will be actively overseeing healthcare PPP projects during various stages of the PPP lifecycle, from project inception to financial close.

Project identification and delivery typically involves providing support to the implementing agency. During the pre-tender phase, the PPP Unit would naturally provide support to MoPH to identify healthcare PPP projects taking into consideration the requirements for healthcare facilities in specific locations, the location's demographic profile, a suitable size of the facility, and the type of facility in order to establish a suitable project pipeline. The PPP Unit supports the assessment of the feasibility study, budgeting, Value for Money (VfM) assessment and project approval.

The PPP Unit provides technical support to the MoPH during identification, and once projects are identified and approved, support is offered through evaluation, procurement and contract management. The PPP Unit should encourage competition and ensure due diligence through facilitation of transparent bidding processes (including drafting of the invitation to tender, Terms of Reference, bid evaluation, negotiations, contractual agreements etc.).

Additionally, the PPP Unit will aim to ensure funds are effectively disbursed and that quality control is assured through contract management, benchmarking and continued VfM and operational savings are delivered post-award.

8.C.3 Capacity building

The success of PPPs is dependent on the knowledge and skills of the persons involved amongst both the public and private sectors. Globally, a number of PPP Units provide training or may outsource the training whilst overseeing the content of training materials. The training shall be complimented by a healthcare PPP manual, previously discussed in Section 8.C.1.

The PPP Unit shall ensure trainings are frequently given to various levels of staff including medical doctors, MoPH representatives, operations and management staff.

8.C.4 Marketing and promotion

It is important to raise awareness of PPPs, especially in new markets like Thailand, to increase visibility amongst international contractors and investors. Promoting projects in the most appropriate way and at a suitable time in their development is crucial to ensuring the project's integrity and credibility. The PPP Unit can assist in screening projects to avoid a poorly developed pipeline of projects being publicized which may deter potential bidders.

However, there is a vulnerability of a dedicated PPP unit encouraging the use of a PPP model in order to provide a business case for its existence. Such a risk may be deterred by maximizing transparency, issuing codes of conduct, and ensuring stakeholders are fully knowledgeable of PPPs. In addition, the key performance indicators and remuneration incentives of the PPP Unit need to be aligned to address such complications, in additional to the required alignment with objectives of the Government.

8.C.5 Specific Functions

Specific functions of the PPP Unit, with reference to its mandates, include:

- Conduct project screening for potential PPP projects within the public health sector;
- Request / invite PPP project applications from hospitals and other public sector agencies within the public health sector;
- Identify and develop potential PPP projects in public hospitals;
- Initial PPP project selection and assessment;
- Pre-feasibility and PPP project application;
- Manage the procurement process (feasibility assessment, preparation of relevant bid documentation, procurement, evaluation of bids and award of PPP contract);
- Organization of resources for PPP project screening and pilot PPP transactions;
- Standardize transaction materials to bring down transaction costs;
- Coordination with relevant central agencies;
- Identify any specific constraints encountered with regard to implementing PPP projects;
- Support MoPH in its PPP strategic planning process;
- Coordinate and provide input with PPP policy development;
- Capacity building; and

► Marketing and promotion.

D. Organisational Structure

A fundamental challenge for the public sector is the wide range of specialist skills required in the selection of projects suitable for PPP procurement, their preparation for market, procurement and subsequent implementation and contract management. These required skills include legal, technical, financial / commercial and project management skills. However, the nature and need for specialist skills may not always be obvious to the procuring authority itself, especially when the PPP process is new. This can lead to underestimating the mix of specialist skills necessary and the extent to which such skills are lacking in the public sector.

Specifically, contracting and procurement experts from the market can often be more efficient and effective than establishing these skills in-house. Therefore, it has become more common for PPP units around the world to rely extensively on the use of external consultants and advisors. It is, however, crucial for these external consultants to be contracted on the appropriate terms, and their subsequent management. This can present a challenge for less experienced procuring authorities, such as MoPH.

Figure 6 below, illustrates the proposed initial structure of the PPP Unit.

Figure 6 - Proposed structure of the TSU

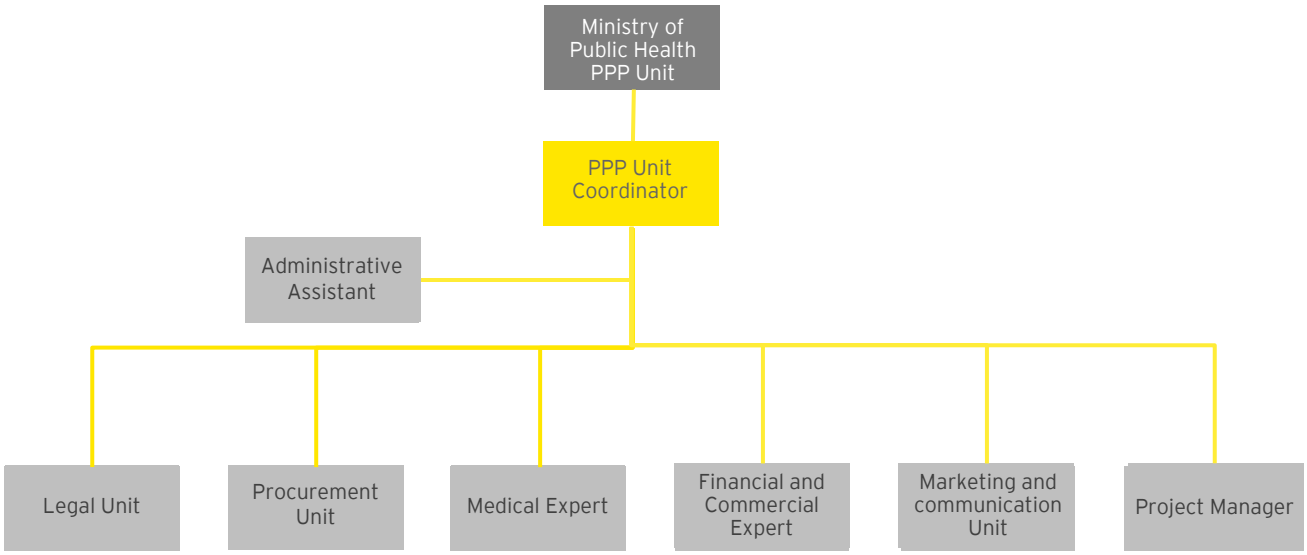


Table 2 below, illustrates specific roles and qualifications for the PPP Unit.

Table 2 – roles and required qualifications of TSU Staff

Position	Role within PPP Unit	Qualifications
PPP Unit Coordinator	PPP Units are small but highly visible work streams that interact	► BA/BSc. degree majored in economics or other related majors. A Master degree is an

Position	Role within PPP Unit	Qualifications
	with officials at senior Government and private sector levels. Therefore, the experience and proficiency of the head of the PPP Unit is crucial to its effectiveness. The head of the PPP Unit is typically in the public eye, supporting ministers and representing policy. The head of the PPP Unit is required to lead and motivating the team in a challenging and fluid environment.	advantage. ► At least 15 years' experience in managing international projects ► Experienced in working as Project Manager/ Team Leader. ► Involved in at least 3 projects providing technical assistance and capacity building, with at least 2 in the healthcare sector. ► Experienced in working with government agencies, prestigious PPP institutions and worked for PPP projects in charge of management and finance. ► Experienced in working for PPP projects in countries similar to Thailand
Project Manager	The project manager will manage project agreements from project inception until financial close, and the first few years of the project delivery. This requirement is aimed to ensure relationships with the client are durable and long-term.	► BA/BSc. degree majored in economics or other related majors. ► At least 10 years' experience in managing international projects ► Experienced in working as Project Manager/ Team Leader. ► Involved in at least 3 projects providing technical assistance and capacity building ► Experienced in working with government agencies, prestigious PPP institutions and worked for PPP projects in charge of management and finance. ► Experienced in working for PPP projects in countries similar to Thailand
Legal Unit	The Legal Unit will focus on the legal, technical and financial aspects of project agreements. This includes, but not limited to, reviewing project feasibility studies, preparing the necessary documents for Cabinet approval as well as drafting contract agreements between all parties involved. The legal unit will provide support from project inception until financial close, and the first few years after delivery.	► LLB degree in Law ► At least 10 years' experience in legal and regulatory-related and capacity-building experience. ► At least 10 years' experience reviewing, analyzing and developing project documentation. ► Participated in at least 1 institutional development project in the heathcare sector. ► Involved in implementing PPP projects in countries similar to Viet Nam. ► Knowledge of international procedures and practices on PPP project management and implementation. ► Working experiences and knowledge PPP policy and procedures of Vietnam are an advantage.
Procurement Unit	The Procurement Unit will focus on the procurement of contractors during prefeasibility, feasibility and,	► BA/BSc. degree majored in public finance, or a related field. ► At least 10 years' experience in

Position	Role within PPP Unit	Qualifications
	delivery of the project. This includes, but not limited to, drafting invitations to bidders, Terms of Reference, assisting in market soundings and responding to bidder's questions, evaluation of bids including VfM analysis, risk assessment and allocation.	international project management, including PPP projects. ► Knowledge of Thailand procurement law and regulations. ► Proven experiences in preparing documents, bidding forms and procedures and implementing bidding activities in Thailand. ► Proven experiences in PPP contract negotiations. ► Proficiency in international contract management including PPP contracts. ► Experience in Thailand, with experience in the rest of South East Asia as an advantage.
Medical Expert	The Medical Expert works throughout the projects on the medical and technical aspects of the projects, including operational design and quality assurance of equipment, etc. This includes, but not limited to, reviewing project feasibility studies, selection and evaluation of bidders, and providing support during the first few years of project operation.	► Bachelor of Medicine, Bachelor of Surgery ► At least 10 years' experience in the medical field, preferably with exposure to hospital management ► Knowledge of Thailand health and safety standards and regulations.
Financial and Commercial Expert	The Financial and commercial Expert works on the commercial, economic and financial aspects of the project. The Expert will provide support from project inception until financial close, and the first few years after delivery. The role includes, amongst other things, reviewing commercial and financial aspects of project feasibility studies and playing a key supporting role to the Procurement Unit in the commercial and financial aspects of their activities.	► BA/BSc. degree in finance/accounting or related fields ► At least 15 years' experience in project financing management. ► Involved in implementing PPP transactions and skilled in designing and developing PPP financial models ► Specific experience includes: budgeting healthcare infrastructure projects, selecting financial models for various types of PPP transactions, financial analysis, familiarization with the borrowing procedures of international institutions.
Marketing and Communications Unit	The Market and Communications Unit will be responsible for marketing the PPP projects through press releases, updating the intranet and ministry website and distribution of newsletters. The Expert will provide support from project inception until financial close, and the first few years after	► BA/BSc. degree in marketing / digital marketing or related fields ► At least 5 years' experience in marketing and digital marketing ► Further requirements are to be decided by the TSU once the PPP Unit is more established and defined.

Position	Role within PPP Unit	Qualifications
	delivery. The role includes, amongst other things, reviewing commercial and financial aspects of project feasibility studies and playing a key supporting role to the Procurement Unit in the commercial and financial aspects of their activities.	

The above will provide support to healthcare PPP projects and may rely on the use of external consultants for additional services, when required. Table 3 illustrates the number of core members of each sub-unit within the PPP Unit, in both the short term (1 – 5 years) and the longer term (over 5 years). Additionally, Table 3 states the potential to outsource, or hire external consultants to assist the TSU, specifically in the short term, until the TSU is more established and fully possesses the skills required.

Table 3 – TSU staff requirements

Position	Number of Persons		Internal Staff / External Consultants
	Short Term	Long Term	
PPP Unit Coordinator	1	1	The Project manager is required to be a MoPH internal resource.
Project Manager	1 or outsourced	2 – 3	The head of the Project Management Team is required to be a MoPH internal resource; however, the rest of the unit may be an external consultants hired specifically for certain projects.
Legal Unit	Outsourced	2 – 3	The head of the Legal Unit is required to be a MoPH internal resource; however, the rest of the unit may be an external consultants hired specifically for certain projects.
Procurement Unit	1 or outsourced	2 – 3	The head of the Procurement Unit is required to be a MoPH internal resource; however, the rest of the unit may be an external consultants hired specifically for certain projects.
Medical Expert	1	1 – 3	The Medical Expert is required to be MoPH internal resource; however, if and when required external consultants may be hired specifically for certain projects.
Financial and Commercial Expert	Outsourced	1 – 3	The Financial and Commercial Expert shall be a MoPH internal resource; however, if and when required, external consultants may be hired specifically for certain projects.
Marketing and Communications Unit	1	1 - 2	The head of the Marketing and Communications Unit is required to be a MoPH internal resource; however, the rest of the unit may be an external consultants hired

Position	Number of Persons		Internal Staff / External Consultants
	Short Term	Long Term	
			specifically when required.

Overall, the PPP Unit will be largely staffed by MoPH internal resources, with supplementing skills from external consultants in numerous ways, with the various degrees of expert requirements.

E. Funding

Due to the location of the PPP Unit within the MoPH and, its mandated objectives, the PPP Unit will be funded by the MoPH.

In order to successfully fulfil its mandated functions, the PPP Unit requires expert staff with specialist skills. To attract the most competent staff with the right skills, including external consultants, the PPP Unit is required to offer attractive remuneration packages to both permanent staff and external advisors.

Table 4 – TSU annual budgetary requirements

Position	Internal Staff / External Consultants	TSU Annual Salary Budget ('000 THB)[36]	Total TSU Annual Budget ('000 THB)	
			Short Term	Long Term
PPP Unit Coordinator	Internal	150	150	150
	External	-	-	-
Project Manager	Internal	100	100	300
	External	150	150	450
Legal Unit	Internal	100	100	300
	External	150	150	450
Procurement Unit	Internal	100	100	300
	External	150	150	450
Medical Expert	Internal	100	100	300
	External	-	-	-
Financial and Commercial Expert	Internal	100	100	300
	External	150	150	450
Marketing and Communications Unit	Internal	100	100	200
	External	150	150	300
Administration		300	300	400
Total			Between 1,000 – 1,200	Between 2,200 – 3,000

The above table provides a guideline of the funding requirements for the TSU in the short and long term. A detailed budget is to be decided by the TSU once the PPP Unit is more established and defined.

[36] Salary based on Adecco Thailand Salary Guide 2015

F. Performance Assessment

As stated in Section 8.C.4, the key performance indicators (KPIs) of the PPP Unit need to be aligned with the remuneration and incentives as well as with the objectives of the Government. This will, in turn be defined in terms of a PPP that yields value for money.

There is no universal set of KPIs due to the variety of functions performed, and degree of involvement in these functions, that various PPP Units around the world undertake. Measuring success solely by the number of PPP projects is largely considered to be inadequate as part of the functions of successful PPP Units will often need to prevent projects unsuitable for PPP from being undertaken. Successful PPP Units should contribute to PPP transactions that are in line with the objectives of the Government and offer value for money. A PPP Unit should be rated on the quality of analysis and ability to effectively and collaboratively work with the MoPH and the rest of the government ministries to contribute to innovative projects.

G. Recommendations and next steps

PPP units for facilitating and managing infrastructure projects have existed for many years, where some have achieved great success for example the Partnerships Victoria in Australia, whilst others achieved little success due to misalignment between PPP unit objectives and Government objectives, lack of Government support, and the PPP unit's location within the government structure deterring coordination and integration. The proposed location and organizational structure of the MoPH PPP Unit has been designed to ensure effective governance and integration with the MoPH, with the adequate staffing and funding.

8.G.1 Communication Plan

A suitable communication strategy for MoPH PPP Unit has been established to demonstrate the communication plan and flow, including the development of the PPP intranet site for in order to facilitate sharing of key project information with all relevant stakeholders. An outline of the strategy is discussed below.

Based on our understanding of the key stakeholders and their overall roles in the PPP delivery of social sector infrastructure, provided below is a summary of the proposed TSU communication plan.

Table 5 – TSU Communication Plan

Project key stakeholders	Required information	Frequency	Methods/ Channels
PPP Committee	Committee update (including meeting agendas/ minutes)	Every 3 months, or as requested by Committee	Group meeting, email thereafter
	Progress report on proposed and approved PPP projects	Every 2 months	Intranet Email presentation pack

Project key stakeholders	Required information	Frequency	Methods/ Channels
	Updates on PPP regulations	Upon release of update	Intranet alert Presentation / discussion at next meeting Email alert
PPP Project Working Team	Working team update (including meeting agendas/ minutes)	Monthly, or as requested by Working Team	Group meeting, email thereafter
	Progress report on proposed and approved PPP projects	Ongoing	Working emails Intranet update
	Updates on PPP regulations	Upon release of update	Intranet alert Presentation / discussion at next meeting Email alert
	PPP approval process	Upon any update	Intranet Email alert
	PPP training materials	Every 6 months, or upon an update of regulations	Training workshop Materials on intranet
	PPP framework and news	Weekly	Intranet
Project owner	PPP project status	Weekly	Email / phone
	Updates on PPP regulations	Upon release of update	Email / phone Intranet alert Meeting, if warranted by update
	PPP approval process	Upon release of update	Email / phone Intranet alert Meeting, if warranted by update
	PPP training materials	Ongoing updates, 6 monthly training workshops	Materials shared through intranet Project owners invited to training workshops as appropriate
	PPP framework and news	Weekly	Intranet
Wider operational management and personnel	Progress on approved PPP projects	Every 2 months	Intranet
	PPP training materials	Upon release of update	Intranet
	PPP framework and news	Weekly	Intranet Email alert
Relevant functions	Status on proposed and approved PPP projects	Every 2 months	Intranet
	Updates on PPP regulations	Upon release of update	Intranet Email alert
	PPP training materials	Upon release of update, 6 monthly training workshops	Materials shared through intranet Personnel from relevant functions invited to training workshops as appropriate
	PPP framework and news	Weekly	Intranet Email alert

Project key stakeholders	Required information	Frequency	Methods/ Channels
MOPH / MOE officials	Status on proposed and approved PPP projects	Every 2 months	Intranet
	PPP training materials	Upon update	Materials shared through intranet MOPH / MOE officials invited to training workshops as appropriate
	PPP framework and news	Weekly Monthly	Intranet Column in relevant journal/newsletter
End users	PPP training materials	n/a	n/a
	PPP framework and news	Monthly Annually	Column in journal/newsletter, but confined to market relevant material only Exhibition/ Booth in MoPH's annual meetings and conference
Government's money-keepers (MoF's relevant agencies)	Status on proposed and approved PPP projects	Every 2 months	Email presentation pack Face-to-face meetings, as appropriate
	Updates on PPP regulations	Upon release of update	Phonecalls / emails Face-to-face meetings, as appropriate
	PPP training materials	n/a	n/a
	PPP framework and news	As required only	Phonecalls / emails or face-to-face meetings as required
Regulators/ Policy makers	Status on proposed and approved PPP projects	Every 2 months	Email presentation pack, face-to-face meetings as required
	PPP training materials	n/a	n/a
Investors	List of PPP projects available for bidding and associated project detail	Upon updates (likely after conclusion of our TA)	Ministry website
ADB	List of approved PPP projects	Monthly	Email presentation pack
	Updates on PPP regulations	Upon release of update	Email alert Face-to-face meetings, as appropriate
	PPP approval process	Upon release of update	Email alert
	PPP training materials	Every 6 months	Email presentation pack to ADB Attendance at training workshops
	PPP framework and news	Weekly	Email alerts
Media	PPP framework and news, progress of projects	Ongoing	Ministry website Press release

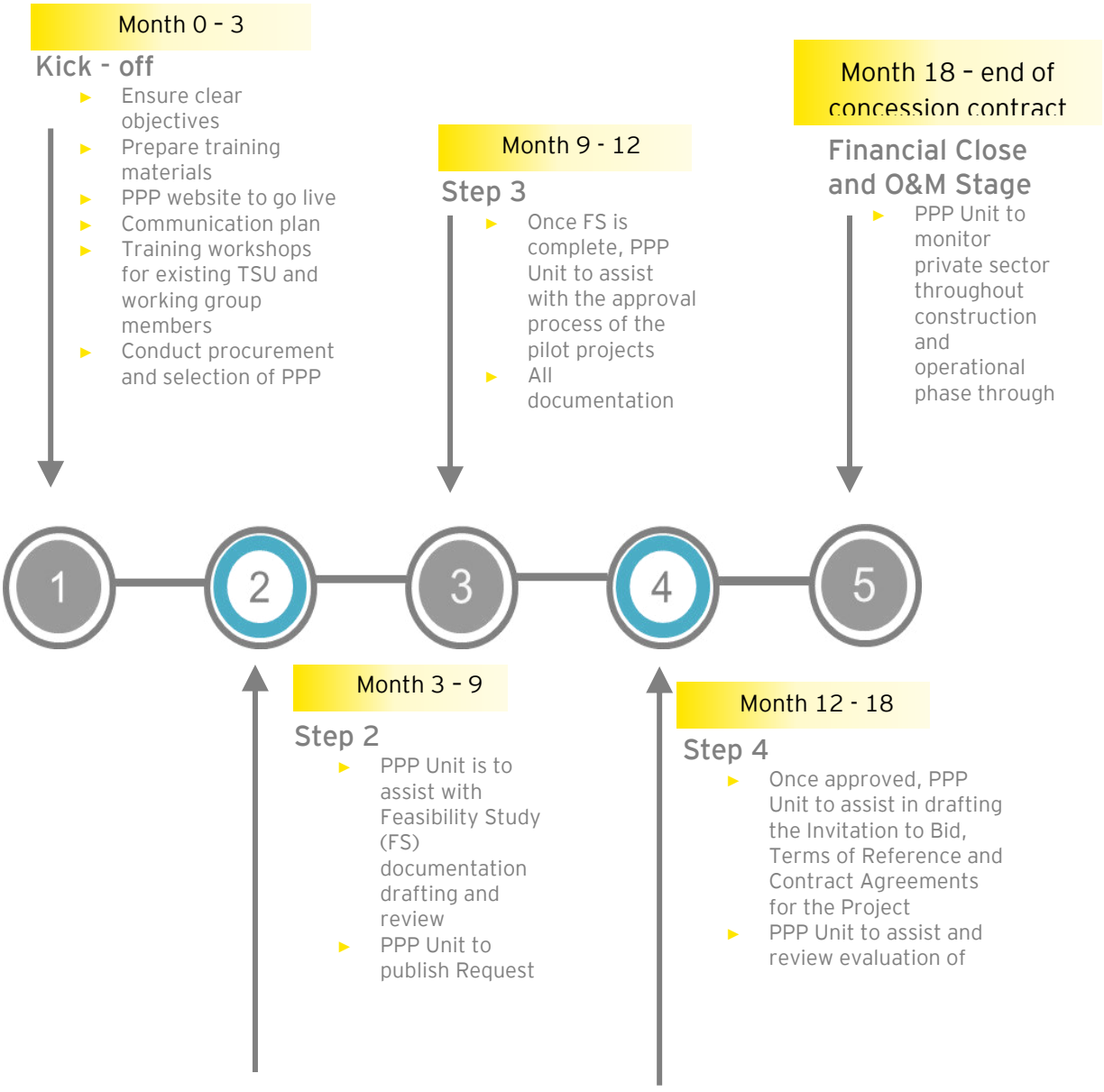
8.G.2 Proposed Timeline

The diagram below illustrates the proposed actions to kick-off the TSU program, which has been specifically designed in accordance with the Unit's mandated objectives. At kick-off, it is vital for the

TSU staff to have a clear vision of the Unit's key roles and responsibilities, and therefore a training workshop is imperative to providing guidance before projects are implemented.

The diagram is a comprehensive illustration of the work flows and indicative timeline of the activities of the TSU. It is, however, important to consider views of the existing TSU, and based on discussions the below may be further defined at a later stage.

Table 6 – TSU program development timeline



9. Other Initiatives

A. MoPH PPP TSU knowledge database

Stream 3 of EY's amended scope of work is to provide support in building a knowledge database for the MoPH PPP TSU. The purpose of the knowledge database is to proactively inform the public on structure of PPPs in the healthcare sector. The knowledge database is a centralized source of information on:

- PPP concepts and principles
- Thailand's PPP framework
- Global hospital PPP case studies
- Projects pipeline
- Projects database

The initial content support for development of the MoPH website is exclusively constrained to PPP concepts and principles, Thailand's PPP framework and case studies. A brief overview of section contents is described below.

9.A.1 PPP concepts and principles

By engaging the private sector and leveraging their resources and expertise, with innovative solutions and better technologies, PPP realizes greater efficiency and effectiveness in delivering the service. For the reason that there is no universally accepted definition of a PPP, the website content describes common elements attributable to various PPP definitions and further discusses PPP models in their varying degree of roles and responsibilities of the private sector. Private sector involvement can range from a set of services extending across design, construction, financing, operation, and maintenance of a new facility used for service delivery over the duration of the contract.

Additionally, the website content describes the contractual arrangements of PPPs, key stakeholders, advantages of PPP over traditional procurement, risk allocation and the concept of Value for Money. This should provide readers with the foundation to explain the benefits of implementing the PPP model, understand criteria for performance measurement and how an appropriate risk – reward mechanism can make the private sector more effective than the public sector.

9.A.2 Thailand's PPP framework

The first PPP framework in Thailand was established by the "Private Participation in State Undertakings (PPSU) Act" in 1992, which set forth an institutional framework for interpretations of PPP projects in Thailand and for facilitating the private sector's participation and investment in relevant activities. The Act was replaced with the "Private Investments in State Undertakings (PISU) Act" in 2013, with appointment of State Enterprise Policy Office (SEPO), under the Ministry of Finance, a secretariat office to the PPP Policy Committee within the PPP unit acting as a coordinating agency.

The Act applies to "private investments" to be made in "public projects" with the value of at least THB 1 billion. The Act does not have any provisions on specific sectors or businesses as eligible types of PPP projects, the current Master Plan includes a list of fields that are identified as "Group 1 - priority areas" (projects which must have private investment) or "Group 2 - recommended areas" (projects for which the state should encourage private investment) for private undertakings under PPP scheme. Public health infrastructure and medical services are classified under Group 2.

Private undertakings as set forth in the PISU Act must be aligned with overarching national development objectives and fundamental state policies under the "National Economic and Social Development Plan" (NESDP). The "Eleventh National Economic and Social Development Plan" for 2012-2016, in adherence to the Philosophy of Sufficiency Economy, lays out an indicative medium-term development strategic plan to achieve sustainable, balanced economic development towards a more competitive, knowledge-based economy.

The PISU Act mandates a five-year Master Plan, or "Strategic Plan on Private Investment in State Undertaking," which lays out operational direction and considerations for private participation priorities and investments in line with the NESDP. The Master Plan is prepared jointly by the SEPO and the PPP Committee and submitted to the Cabinet for approval, which outlines investment policy, type of projects in priority areas, investment target and time frame.

9.A.3 Global Hospital PPP Case Studies

The case studies cover successful hospital PPPs in Canada, the UK and Australia. These case studies illustrate the application of the theoretical knowledge of PPPs in real-world scenarios and how the model is specifically adapted to each project to achieve success.

Canada's Abbotsford Regional Hospital & Cancer Center is the first major PPP project in Canada to design, build, finance, manage, and operate (DBFMO) a regional hospital with an integrated cancer treatment center. Operations started in 2008 contracted with the private sector until 2034.

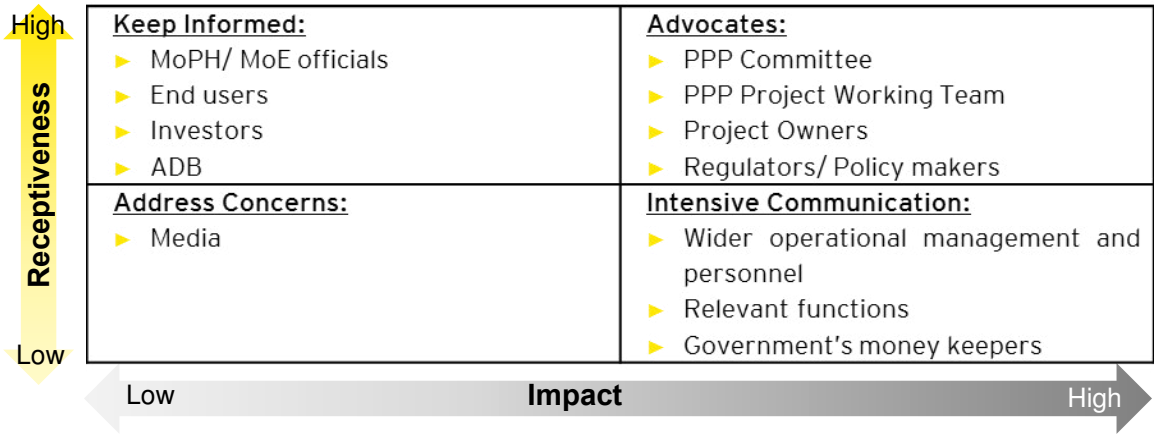
St. Bartholomew's and The Royal London Hospitals are the largest healthcare PFI project in UK with estimated £1 billion capital cost for overhaul and redevelopment of the two existing hospital sites. Construction began in 2006 and is due for completion in 2016. The DBFO contract end date is estimated to be in 2048.

Australia's Victorian Comprehensive Cancer Centre (VCCC) is a PPP project to replace and expand the existing hospitals with a new $1-billion facility purpose-built for comprehensive cancer care in Melbourne. Construction began in 2011 and is due for completion in 2016. The DBFM is contracted for a period of 25 years, including construction.

B. Project Communication Strategy

A suitable communication strategy for MoPH PPP has been established as part of the project's deliverables. Such a strategy demonstrates the communication plan and flow throughout the project. This includes development of a PPP-specific intranet site for MoPH and MOE apart from other media

such as email newsletters, workshops, etc., in order to facilitate sharing of key project information with all relevant stakeholders. An outline of the strategy is discussed below.
The key stakeholders of this TA have been identified and mapped according to their likely interest and impact, and the proposed pipeline of PPPs as follows:



9.B.1 High priority groups

- **Advocates:** Individuals or groups who are significantly impacted by the project who endorse rationale and implementation. These people should be encouraged to act as an agent of change for the project and need regular two way (face-to-face) communication and consultation.

- **Intensive communications:** People significantly impacted by, or who could impact, the project but who currently either have a low level of awareness or interest in the project, or are actively resistant. This is a priority audience, therefore, communication activity must be intensive, and face-to-face where feasible.

9.B.2 Low priority groups

- **Keep informed:** This group of people is less directly impacted than other groups but have a high level of positive interest in the project. Some issues raised by the project are relevant to their activities/work. Written 'blanket' approach project communication will generally suffice, though will need tailored communication if there is any information directly relevant to their area.

- **Address concerns:** Not directly impacted but may have some concerns. It is necessary to ensure negative opinion is neutralized/managed and not allowed to 'spread'. Generally, one-off customized communication is required to allow for issues to be investigated and answers provided.

9.B.3 Communication plan

Based on our understanding of the key stakeholders and their overall roles in the PPP delivery of social sector infrastructure, we have provided a summary of our proposed communications plan in the Section 8.G.1.

C. Capacity building

Stream 4 of EY's scope of work is to provide support in capacity and knowledge building. Capacity building is the "development and strengthening of human and institutional resources,[37]" that extends beyond the public sector to other private sector stakeholders affected by PPP projects.

Several capacity building workshops were carried out, as illustrated bellow.

Workshop name	Region	Date
Training Workshop for MOPH - PPP in the Health Sector	Bangkok	28 August 2014
Education Sector Workshop	Bangkok	16 January 2015
MoPH PPP Workshop	Bangkok	7 April 2015
Regional PPP Workshop	Bangkok	25-26 November 2015
Regional PPP Workshop	Bangkok	30 November-1 December 2015

The main objective of these workshops was to:

- To build capacity at MoE and MoPH on PPPs and practical PPP case studies in education and healthcare aspects respectively
- Improve the understanding of the legal and regulatory framework
- Understand the existing issues in the PPP procurement framework and identify potential solutions
- Identify gaps in the legal framework which may need to be addressed, to implement PPP in the healthcare sector

9.C.1 Healthcare Sector Workshops

The workshops discussed the PPP model and relevant concepts, together with case studies of PPPs in Thailand, as well as health sector PPPs around the world. EY's role in this Technical Assistance Project was explained to the audience, and to fully comprehend healthcare PPPs in the local context, two MoPH simulation projects were thoroughly described and discussed.

9.C.2 Education Sector Workshop

The workshop discussed the PPP concept and case studies in education sector to the participants, as well as EY roles and procedures over TA in order to identify MoE's potential project. In addition, SEPO

[37] World Health Organisation

contributed to the workshop by discussing regulation issues, the most concerning issue amongst the participants. Some universities raised landlord and tax issues to be considered in PPP implementation.

9.C.3 Additional capacity building workshops

9.C.3.1 Goals

The goal of the additional workshops was to support medical / hospital representatives to understand the general principles of PPP as well as to update them on the status of the TA, particularly on the results of the simulation studies.

9.C.3.2 Workshop agenda

During the two workshop sessions (1st session on 24th / 25th November 2015 and 2nd session on 30th November / 1st December 2015), participants from Nakhon Pathom Hospital, Department of Medical Services, Ratchaburi Hospital, Rajavithi Hospital and Chiangrai Prachanukroh Hospital were introduced to the following topics:

- **PPP principles and PPP projects in healthcare**
- **PPP deal development process**
  i) Phase 1: Project Identification and Justification
  ii) Phase 2: Initial Feasibility Assessment
  iii) Phase 3: Detailed Feasibility Study / Business Case Preparation
  iv) Phase 4: Procurement / Tender Phase
- **Overview of Simulation Studies**
  i) Simulation Section Criteria
  ii) Project 1: Urban General Hospital
  iii) Project 2: Medical Excellence Center)
- **Working Group discussion**
  i) Goals of working group discussion
  ii) Working group questions – Needs assessment, overview of the Project Scope, PPP project scope

9.C.3.3 Key results

The participants were briefed on general PPP principles, PPP projects in healthcare and the detailed steps required during the feasibility phase. Key results, issues and recommendations from the simulation studies were presented to participants. During the working group discussion, the participants were grouped according to respective hospital to discuss on respective needs and prepare an overview of the project scope. The representatives from Nakhon Pathom Hospital and DMS continued to refine respective business case with the guidance of the follow-up question presented in Appendix C-7 and in the presentation deck.

9.C.3.4 Conclusions and recommendations

- Most of the regional hospitals (i.e. Nakhon Pathom Hospital, Ratchaburi Hospital, Rajavithi Hospital) have placed the development of the carpark building as main priority of their infrastructure needs

- The working group session has assisted Rajavithi Hospital to present a potentially feasible PPP carpark project which we have further expand and detailed in the Section **Error! Reference source not found.**
- A procurement representative from Chiangrai Prachanukroh Hospital has informed that under the existing regulations, Chiangrai Prachanukroh Hospital has received all required government approval to develop a car park building with private investor. The carpark model shared has similar concept with PPP model. The revenue to private sector is structured such that the private sector is able to collect retail rental from the retail spaces to compensate free / low carpark revenue collection from the hospital users.
- Representatives from Nakhon Pathom Hospital have raised their concern on the various infrastructure needs which will eventually make the project scope complex. For example, 90 beds general hospital, private wards, carpark and etc.
- As the Medical Excellence Center requires more complicated scope, the representatives from DMS are aware that further analysis and more historical data / information is required in order to create a better business case and be prepared for the feasibility stage. Please refer to Appendix C-7 for the work done during the workshop session.

D. MoPH's PPP-TSU Establishment

MoPH is committed to fully exploring PPP as a delivery model for new health infrastructure in Thailand. In order to facilitate this, MoPH has established a PPP Transaction Support Unit (PPP-TSU) to centrally coordinate the analysis and procurement of such projects.

By developing and rolling out a pipeline of PPP projects, assistance to the Unit is provided to achieve the TSU's primary and secondary mandates:

- The PPP-TSU's primary mandate is to screen projects in the health sector to identify potential PPP projects and act as Transaction Manager for identified (pilot) PPP projects on behalf of the Project Owner Agency, in coordination with relevant central agencies.
- Its secondary mandate is to inform further development of the policy framework and models for PPPs in the health sector based on experience from the implementation of (pilot) PPP projects, and develop and retain capacity and experience within MOPH and relevant service providers related to PPP projects in the health sector.

Please refer to Chapter 8 for further details.

E. Summary of Work completed for the Ministry of Education

Given the commonality of the health and education sectors being "social" infrastructure projects, the studies performed on health PPPs produced substantial lessons about the viability and structuring issues for education sector PPPs. Through review of the Thailand's education sector including the structure of the MoE, its budgeting process and strategic priorities, implications for structuring PPPs for schools and other institutions in Thailand were determined.

It is typically unviable to conduct cost-benefit analysis for every potential project. Therefore, a "preliminary" or high-level cost benefit test may be undertaken to assess whether the project can generate sufficient revenues to sustain project costs. The two potential scenarios for a PPP project are:

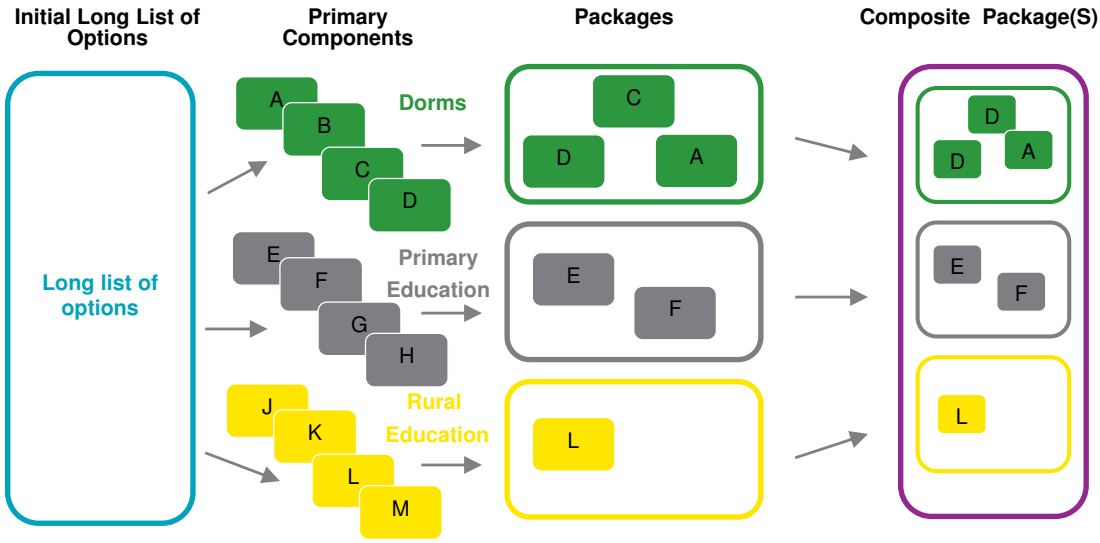
- Scenario 1: project generates enough cash flows to support its cost
- Scenario 2: project does not generate enough cash flows to support its costs, hence requires government subsidies.

Scenario 2 is a highly likely scenario for social sector (health and education) projects, where a comprehensive cost benefit analysis may be undertaken to establish the economic benefits of the project against the government subsidies requirement.

In a typical project appraisal and selection process, projects will become more defined the further they progress along the pipeline. A project selection approach would be undertaken, as described below, on projects as the projects progress from being preliminary proposals to those ready for funding:

Activities	Progress / next steps
Strategic case	Sets the strategic context and presents a shared understanding of the scale and significance of problems, the outcomes sought and the benefits desired. This stage is a central pillar to subsequent business case stages and enables the sponsoring agency (for example MOE) to provide early investment signals to potential investors.
Program business case	Identifies an optimal mix of alternatives and options, but does not consider detailed solutions. The preferred program could include a broad mix of activities that might be delivered by multiple parties over a period of time. This business case will receive official sponsoring agency support, including assessment of strategic fit. An anticipated effectiveness and efficiency assessment is also undertaken at a program level.
Indicative business case	Further develops specific activities. It provides a long list to short list of options and it recommends a preferred way forward as part of the short-listed alternatives. An indicative business case receives official sponsoring agency support, including assessment of strategic fit and effectiveness, with anticipated efficiency assessment.
Detailed business case	Confirms an activity that comes from the detailed program (previously called 'package') of activities and confirms the overall assessment profile. It includes a more detailed reporting of economic, financial and commercial aspects of the activity.

Following the above framework, the strategic case sets out which "options" from the long list may be worthwhile to pursue. During program and indicative business case, decisions are made about how best to package those options together, whether by type of project (for example dormitory or primary education facilities) and/or by region, depending on the economics of each project.



A list of proposed projects for PPPs in education sectors have been submitted to SEPO for PPP pipeline projects including Chiang Mai University (CMU), Naresuan University, National Scout Organization of Thailand and Chulalongkorn University. However, a major challenge includes the lack of clarity in the regulations, for example, the definition of the public service under PPP, the method of project calculation, the guideline for projects under the Baht 1 billion threshold, the details on contract and its amendment and etc.

Additionally, the following 10 projects are undergoing feasibility studies, and are being considered by the MoE as potential PPP projects in the educational sector:

- Green Nimmarn @ Chiang Mai University
- King Naresuan The Great Park
- Online learning center development
- Center of Aquatic (Lake) Animals Breeding Studies in Songkhla (Phase 2)
- International Vocational Training Center Phase 2; and
- Central Region 1 Institute of Vocational Study, Patumthani Vocational Education College
- Modern Town Chian Rai Rajabhat university
- Innovation and Technology Park (to promote hands-on graduates)
- Establish Faculty of Nursing under the Supervision of Nursury degree to be under the
- supervision of Rajamangala University of Technology Thanyaburi

9.E.1 Applicable learnings from the MoPH experience to date

- Projects and programs should be agreed at the regional/district level, as this is where most capital budgeting decisions are made and operating budgets are set
- Some capital top up will be needed for projects to be viable, and it makes sense for this to be provided from the MOPH level via a PPP fund, down to regions and districts that apply for funding help with PPP
- MOPH will require clear criteria be following by applicants for PPP funding (as referenced above) so as to ensure fair comparison and best VfM.

- Guidance should always be provided on funding envelopes (albeit with a range) to manage stakeholder expectations and avoid uncosted and unfundable wish lists.
- With sufficient guidance on information requirements, local agencies can supply MOPH with the evidence needed for robust prioritization between various proposed PPPs.
- Funding application requirements and information requirements should take into consideration the capacity and information availability at the regional level so as to provide the best possible analysis of project merit while being feasible for regional authorities to comply with.

9.E.2 Next Steps

The list of potential education PPP projects appears to contain several potentially viable PPP opportunities, such as student dormitories and privately-managed educational facilities. In addition, we view during the workshops undertaken that some education agencies had actively considered PPPs as a means to develop education facilities. . As such we view MOE should consider exploring prefeasibility studies in the education sector .

Similar to Health PPPs, there are numerous examples of Education PPPs internationally and therefore well structured projects in the education sector should generate significant private sector interest, locally and internationally.

The existing terms of reference for this report covers a high-level review and shortlisting of the viability of these opportunities. In consideration, the next step would be a continuation of this project to identify which shortlisted education opportunities could be taken forward to prefeasibility studies.

10. Next Steps

A. TA Continuation – Pre-feasibility Study

Table below summarises the detailed intermediate steps for the development of a high level business case (pre-feasibility study) and procurement guide for a simulated hospital PPP project:

Tasks / steps	Involved parties	Expected outcome
Phase 1: Confirmation on hospital scope of services		
a) Formalise and agree with MoPH hospital specification which includes the following: ► Overall concept: o Understand the general concept for a hospital such as size type; o Confirm physical specification (area requirement, number of beds and etc). ► Location: o Understand key location selection criteria (regional demographics and health trends); o Availability of land and size of land plot required. ► Medical services and specialties: o Strategic model of care; o Identify medical services and specialties to be included in a hospital scope of services; o Understand how level of care are determined by location; o Expected volume of service by specialty; o OPD, emergency services. o Understand how the requirement above will determine the size of the hospital ► Major investment requirements: o Identify major investment categories such as main building, medical and IT equipment, non-medical equipment, support infrastructure (i.e. car park). ► Major support and ancillary services: o Identify main support services to be included in the PPP Project such as carpark, cafeteria or commercial spaces ► Approximate capital and recurring costs and revenue sources	MoPH TAs	Hospital size, medical services specification
Phase 2: Development of PPP project structure and project specification		
b) Develop initial outline of PPP project scope and key responsibilities for public and private partners; ***PPP project scope:*** ► Develop and confirm with MoPH initial outline of	MoPH Relevant key stakeholders (public and private)	► Private sector's involvement in the project ► Type of PPP for

Tasks / steps	Involved parties	Expected outcome
PPP project scope: ○ The extent of private sector participation in the PPP project; ○ List of main and ancillary services provided by a private partner(s). ***Stakeholders roles:*** ► Identify all key stakeholders involved in PPP project; ► Roles and responsibilities of each key stakeholder; ► Identify public sector agency/authority responsible for project procurement. This will include determining roles and responsibilities throughout the construction and operation phases of the project.		the project ► Roles and responsibilities of each key stakeholder
c) Analysis ► Develop main principles and payment mechanism structure; ► Output specification principles; ► Summary of design specification requirements; ► Conduct preliminary assessment of market capacity to provide services; ► Assess commercial potential and propose options to reduce financial burden to the Government; ► Develop high level financial model to review the project options and establish government funding requirements as well as affordability of the project; ► Identify main financial drivers of the project structure to insure project sustainability and bankability.	TAs	Financial model
Phase 3: Development of PPP Procurement Guide and contract principles		
a) Structuring ► Preferred type of PPP contract; ► Timeline and size of the project; ► Evaluate and recommend options that Government can utilize in relation to private sector participation. ► Evaluate various PPP structures and options based on risk transfer objectives and potential to recommend PPP structure used. ► Preparation of project risk matrix and likely impacts to the Government, private investors and other stakeholders based on the chosen structure and risk transfer objectives.	TAs	Contractual agreement structure Risk matrix

Tasks / steps	Involved parties	Expected outcome
b) Develop procurement strategy and project timeline: ► Define main principles and objectives of the procurement process; ► Analyze project implementation and tender alternatives; ► Establish objective criteria to prequalify the bidding consortia with the appropriate capability and financial means and to be taken through the selection stages. The proposed approach may include: ○ Two staged bid selection process (Instruction to Bidders, Best and Final Offer) where key risks are negotiated under competitive tension through successive selection stages or ○ Selecting both a Preferred Bidder and Reserve Bidder to replicate the competitive tension	TAs MoPH	Procurement strategy and project timeline
c) Outline legal framework for project implementation: ► Develop contractual agreement principles which include identifying types of contractual agreements such as sub-contracts, direct agreement, funding agreements and etc.		

B. Information required to conduct Feasibility Study

Information request for a typical hospital PPP feasibility study includes the following items:

Area	Comments / Queries	Info request list
Hospital specification		
Overall concept	• Please provide supporting to justify the no. of beds requirement • Please provide the number of floor for this centre. This input is required in order to calculate the Ground Floor Area / land area for the Project.	• No. of beds • No of floors
PPP Project Scope		
Soft facilities management	Please identify which of the following soft facilities management will required the role of the private sector ► General management services, ► Helpdesk services, ► Food services (patient and non-patient), ► Housekeeping services, ► Laundry / linen services,	• List of soft facilities management • Rationale for retaining services with the public sector

Area	Comments / Queries	Info request list
	► Information and communication technology ► Security ► Waste management	
Project Value / Project Cost		
Land area	• What is the estimated land area for this Project? Has such information being computed? If not, please respond to the subsequent queries below.	Land area / land value

Land area: Key drivers / assumptions	• Based on preliminary research, the computation of a hospital land area requires the following assumptions:
	  • Built area per bed
	  • Allowance for built area (circulation, walls, utilities, etc):
	  • Ground Floor Area (GFA): Built area over no. of floor
	  • Allowances for external services (cables, pipes, landscape):
	• Parking:
	  • Will the parking be part of the building or external?
	  • Key drivers include number of parking per bed and area of one parking (in sqm)
	• Land cost per sqm is required in order to compute the cost for the land for the PPP Project Value (SEPO method)
	• The computation of land value may differ and all the cost will need to be confirmed
		• Built area per bed: 125 sqm
		• Allowance for built area (circulation, walls, utilities, etc): 36% of built area
		• Ground Floor Area (GFA): Built area over no. of floor
		• Allowances for external services (cables, pipes, landscape): 40% of GFA
		• Number of parking per bed: 2.5 parking
		• Area of one parking: 15 sqm
		• Land cost per sqm: Baht 45,000 per sqm

Development cost, without equipment	• One of the methods to calculate development cost is to assume the development cost per bed.	• A range of development cost per bed.
Equipment	• Please identify a list of major equipment investment for the Hospital based on the medical services and specialties identified	List of equipment and cost
Number of patients (supply and demand)		

Total patients (volume) / capacity	• It is critical to take note the following has to be taken into consideration when projecting the total patients:
	  • Capacity of the hospital / beds available for each specialties
	  • Patients forecast by specialties (to match with capacity and revenue projections as each specialties will charged differently)
	  • Outpatients forecast
		• Patients forecast by specialties
		• Outpatients forecast

Revenue		
Clinical revenue		
Average Top 10	• What are the major types of revenue /	• average Top 10

Area	Comments / Queries	Info request list
services	specialties for the Hospital? • Total revenue forecast is also subjected to average length of stay for the patients by specialties	services revenue per inpatient • average charge per outpatient • Patients allocation for each specialties (inpatient and outpatient) • average length of stay for the patients by specialties
Non-clinical revenue		
Non-clinical revenue	• Please identify list of non-clinical revenue. • Please provide the composition of non-clinical revenue from the total revenue. • Please identify the potential non-clinical revenue / commercial revenue to the private sector	• List of non-clinical revenue • % of non-clinical revenue over total revenue
Others		
Existing operating expenses	• Please provide the latest operating expense	• Latest operating expenses / P&L

C. Terms of Reference for Transaction Advisor services to conduct feasibility study

Presented below is a scope of work to be conducted by transaction advisors for the development of the business case.

10.C.1 Background

The Ministry of Public Health of Thailand (MoPH) have identified the need to develop the PPP Project healthcare facility in Thailand [*describe project*], to [*describe project objectives*].

MoPH would like to explore the feasibility of this project as a public-private partnership (PPP). MoPH thus intends to procure the services of a consortium of experienced transaction advisors to assist it through the phases of the PPP project cycle. These terms of reference invite proposals from a transaction advisor representing a team of suitably qualified and experienced financial, technical and legal advisors to help MoPH to:

Phase 1: Undertake a comprehensive feasibility study for the Project.

Phase 2: If required afterwards, provide advisory services for the procurement of the project (scope of work will be developed separately).

The scope of work covers the Phase 1. The transaction advisor needs to submit a single bid, in the formats prescribed in these terms of reference. (Reference to 'the transaction advisor' includes the entire advisory team, or relevant members, under the management of a single lead advisor who shall contract with MoPH.

10.C.2 Scope of work

This is the first healthcare PPP project to be implemented in Thailand. It is intended to be used as a model for future project development. Therefore, when performing the following scope of work, the transaction advisor will need to provide its services in a manner propitious to replication by MoPH for other projects.

10.C.2.1 Part 1: Feasibility study

The transaction advisor will be required to produce a comprehensive feasibility study for the Project using a public sector comparator (PSC) and PPP reference (Shadow Bid) models. This must enable MoPH to determine:

- full project cycle costs
- affordability limits
- risks and their costs
- optimal value-for-money methods of delivery

Section 4 below sets out the deliverables required of the transaction advisor for the feasibility study.

10.C.2.2 Part 2: PPP procurement

If, on the basis of the feasibility study, a PPP solution is decided on, and if MoPH requires it, the transaction advisor will provide the necessary technical, legal and financial advisory support for the procurement of a private partner. This must be in compliance with all elements of the PISU Act and all implementing regulations.

The procurement deliverables will be developed separately.

10.C.3 Project Background

10.C.3.1 Mandate

Hospital Management's mandate is [*describe mandate*].

10.C.3.2 Objectives

The objectives for this project are [*describe objectives*].

10.C.3.3 Background documentation and preparatory work

The transaction advisor will have to become familiar with all background documentation and preparatory work conducted to date and shall be responsible for carrying out initial technical, financial

and legal framework reviews that are deemed necessary for a successful completion of the transactions, including, but not limited to:

- Relevant existing reports, studies, audits, etc. necessary to become familiar with the healthcare sector in Thailand.
- All information pertaining to healthcare sector and healthcare services market structure.
- Existing financial forecasts, historical financial performance and technical operating history for MoPH hospitals and existing health infrastructure arrangements in Thailand.
- Existing PPP Laws and regulatory functions.
- Responsibilities and relationships of MoPH with other government entities at different levels .
- The reports annexed to this ToR.

A preliminary needs analysis (pre-feasibility study) has been undertaken, establishing [*describe what the needs analysis has established, including any initial costings*]. MoPH has identified the following challenges which it faces in pursuing the project: [*list challenges*].

The legal and policy framework for the project is [*describe legal and policy framework*].

10.C.4 Feasibility study deliverables

The transaction advisor is required to produce, in close liaison with MoPH, a comprehensive feasibility study for Project. The feasibility study needs to clearly demonstrate affordability for the full project cycle and propose the optimal value-for-money solution for MoPH to achieve all desired outcomes.

The feasibility study is to be conducted in compliance with [*applicable standards*].

10.C.4.1 Components of the feasibility study

The feasibility study must include the following:

- Introduction
  - Covering letter from the authority
  - Executive summary
  - Introduction
  - Project background
  - Approach and methodology to the feasibility study
- Section 1 - Needs analysis, including
  - Institution's strategic objectives
  - Budget
  - Institutional analysis
  - Output specifications
  - Scope of the project

- Section 2 - Solution options analysis, including
  - Options considered
  - Evaluation and assessment of each option
  - Assessing Government role in the proposed PPP project, whether that role corresponds with the Government's legal obligations, maintains sufficient power to protect the Government's interests and corresponds to the proposed corporate structure of the project vehicle and how in practice the Government role will be established in the project vehicle (e.g. voting rights, pre-emption rights, golden shares and the protection of minority shareholders)
  - Developing and providing detail to the legal architecture and design of the transaction, identifying e.g. the (i) type of PPP contract to be used (e.g. concession, BOT or management contract) (ii) investment commitments to be required, their nature and management, (iii) investment plan, how, where and when investments will be made (iii) type of public sector support required, including terms and conditions and (iv) corporate structure for the investment and commercial management including nature of the SPV holding the concession, etc.
  - Summary of evaluation and assessment of all procurement options considered
  - Review of risk allocation assumptions to assess whether those risks can be allocated (e.g. legally) to the private sector (e.g. land acquisition, collection of tariffs from individual consumers and safety monitoring).
  - Review of project assumptions and whether they are practically and legally viable.
  - Assess the financial management and accounting structures proposed to identify efficiency gains available through other structural mechanisms, e.g. taxation of revenues and accounting methods for depreciation of assets.
  - Identifying other contractual and commercial relationships in the sector or related to the sector and how those relationships will interface with the PPP project.
  - Assess risk management structures for potential efficiency gains through alternative structures or modifications.
  - Assess the financial feasibility and provide valuation of revenues according to the different options and based on various assumptions used in the forecasts including those of demand and pricing should be stated clearly.
  - Advise on a financial (capital) structure for mobilizing debt.
  - Confirming legality of budgeting assumptions and the management of revenue flows (e.g. are there restrictions on the use of monies collected for use with public services).
  - Assessing risk allocation approaches to ensure that they correspond with private sector appetite and lender requirements.
  - Assessing chosen approach to PPP and whether any aspect of that approach will conflict with available or required procurement, contracting and financing structures.
  - Recommendation of a preferred procurement option
- Section 3 - Project due diligence, including
  - Legal aspects, including
    - Land access/rights

        - Use rights
        - Regulatory matters
        - Approvals required
        - Key challenges to risk allocation as law
    - Identify licensing, permitting and other legal risks that need to be addressed and allocated under the chosen approach.
    - Ensuring all necessary approvals and permissions are obtained for PPP processes before commencement of tender process, in particular to allow the relevant Government entity to sign the tender documents and the PPP contract.
    - Site enablement
    - Socio-economic and environmental
    - Initial market testing
- Section 4 - Value assessment, including
    - PSC model
        - Technical definition of project
        - Discussion on costs (direct and indirect) and assumptions made on cost estimates
        - Discussion on revenue sources (if relevant) and assumptions made on revenue estimates
        - Discussion on all model assumptions made in the construction of the model, including inflation rate, discount rate, depreciation, and budgets
        - Summary of results from the base PSC model: NPV, FIRR, DSCR
    - PPP reference
        - Technical definition of project
        - Discussion on costs (direct and indirect) and assumptions made on cost estimates
        - Discussion on revenue (if relevant) and assumptions made on revenue estimates
        - Discussion on proposed PPP type
        - Proposed PPP project structure and sources of funding
        - Payment mechanism
        - Discussion on all model assumptions made in the construction of the model, including inflation rate, discount rate, depreciation, tax and VAT
        - Summary of results from the PPP-reference model: NPV
    - Risk assessment
        - Comprehensive risk matrix for all project risks:
            - identify the risks that the Project would face;
            - who among the stakeholders (governments, investors, lenders and other financiers) would be negatively affected in the event of the risk materializing;
            - summary of the retained and transferable risks.

- The NPV of all risks (retained and transferable) to be added onto the base PSC model;
- The NPV of all retained risks to be added onto the Shadow Bid model.

- The review should contain recommendations on the mitigation mechanisms for each of the identified risks to be implemented by the party identified to bear that risk . In doing so, assessment and applicability and economy of various risk mitigation mechanisms should be carried out, including but not limited to: (a) private mechanisms such as commercial insurance; (b) specific developed country mechanisms such as export credit insurance and investment insurance available from national agencies; (c) risk mitigation and insurance mechanisms from lenders, including partial risk and partial credit guarantee mechanisms; (d) the risk mitigation instruments available from International Development Agencies; and (d) any special mechanisms that have been developed/deployed around the world in a high risk contexts and their applicability and adaptation for the current context.

- Risk-adjusted PPP-reference
  - Summary of results: NPV, key indicators
  - Sensitivity analyses
  - Statement of affordability
  - Statement of value for money
  - Recommended procurement choice
- Information verification
  - Summary of documents used to verify information that is the baseline for the feasibility study report

- Section 5 - Economic impact and benefits evaluation:
  - Introduction and evaluation approach
  - Assumptions
  - Valuation results
  - Macroeconomic Impact - This should analyze the: (a) revenues that would accrue to the Government through (i) value-added taxes; (ii) other taxes and levies as contributions to specific funds (e.g- Social Fund); (iii) corporate taxes; (iv) municipal taxes; (v) customs duties and excise levies on equipment and services imported/ purchased; (vi) guarantee/on-lending margins charged by Government; (b) impact on Governments overall debt and debt service position; and (c) employment generation, regional development, betterment of people directly affected etc;
  - Market Analysis – Economic aspects of the target markets: demand projections for the length of the project period (minimum [20] years); alternative options to meet the projected demand; the competitiveness of the Project vis-à-vis private hospital in Thailand; and
  - Project Level Analysis - Project cost-benefit analysis, including net present value (NPV), financial internal rate of return (FIRR) and economic internal rate of return (EIRR).
- Section 6 - Procurement plan
- Annexure 1: PSC model
- Annexure 2: PPP reference model
- Annexure 3: Risk assessment and comprehensive risk matrix

- Annexure 4: Document list (list of all documents related to the project, where they are kept, and who is responsible for ensuring that they are updated)
- Annexure 5: Attach as annexure all other documents that have informed the feasibility study and that are of decision-making relevance to the project.

10.C.4.2 Presentation of the feasibility study

The feasibility study, comprising all the above deliverables, must be compiled in a single report in Word format (with relevant annexures), and delivered as both electronic and hard copy documents. All financial models must be in Excel format, and must clearly set out all assumptions made, sensitivity analyses carried out, and model outputs. The financial models must be sufficiently adaptable for use by others at later stages. The feasibility study must be presented with a thorough executive summary and must be accompanied by a PowerPoint presentation that encapsulates all the key features of the study. The executive summary and PowerPoint presentation must be compiled in such a manner that they can be used by MoPH for decision-making purposes.

10.C.4.3 Submission requirements for the feasibility study report

If MoPH decides to pursue a PPP solution for the Project, the feasibility study must be of a standard that will be accepted by relevant authorities for the purposes of obtaining Government approval. The transaction advisor is therefore advised to be fully familiar with the requirements of the relevant authorities.

10.C.5 PPP procurement deliverables (to be developed at a later stage)

If MoPH decides on a PPP procurement solution, the transaction advisor will be required to work with the MoPH to manage the procurement process for securing contracts with a private party. This process will need to be structured in accordance with the rules and standards set out for PPPs in relevant laws and regulations.

The transaction advisor will have to deliver the following:

Approval and administration of the bidding process

- Detailed procurement plan
- Pre-qualification
- Bid evaluation criteria and bid process design
- Request for proposals (RFP)
- A draft PPP agreement

Administration of the bidding process

- Evaluation of bids, demonstrating value for money
- Evaluation of bids
- The value-for-money report and approval

PPP agreement negotiations, PPP agreement management plan

PPP agreement signature, close-out report and case study, and financial closure

10.C.6 Transaction advisor skills and experience

The transaction advisor will comprise a team, managed by a single lead advisor. The members of the team will have the skill and experience necessary to undertake the range of tasks set out in these terms of reference. Each individual on the team must be personally available to do the work as and when required. The lead advisor will be held accountable, in terms of the transaction advisor contract, for ensuring project deliverables and for the professional conduct and integrity of the team.

The skills and experience required in the transaction advisory team are as follows:

- financial and economic analysis, with relevant PPP and project finance experience through to financial close
- PPP procurement and structuring
- legal, with relevant law and experience in the drafting and negotiating of PPP agreements
- technical due diligence and advice on PPP structuring and contracts
- relevant expertise in PPP projects in healthcare
- project management

10.C.7 Remuneration schedule and disbursement arrangements

The total sum budgeted for remuneration of professional services under these terms of reference is [*Amount is TBD*]. Bidders are advised to bid within this figure, and to allocate resources according to the remuneration schedule below [*Schedule is TBD*]. Remuneration of the transaction advisor will be payable in Thai Baht, on a fixed price corresponding to the scope of the PPP Feasibility Study set out above. The procurement portion of the work may or may not transpire at the end of the feasibility study, and will be costed accordingly.

11. Appendices

A. Scope of work

B. Mid-Term Report

C. Questionnaire sent to and responses received from Nakhon Pathom Hospital and DMS

D. Extractions of Marshall Valuation Service Report

E. Questionnaire sent to Siam Commercial Bank

F. Preliminary Financial Projections (DMS)

G. Reports, presentations and workshops materials

H. Global Health PPP case studies

Appendix A – Amended Scope of Work

Stream / Task	Sub-tasks / intermediate steps	Expected outcome	Deliverables Timeline
Stream 1: Hospital PPP project – Simulation Study			
Develop high level business case (pre-feasibility) and procurement guide for a simulated hospital PPP project (Led by EY)	► Formalize and agree with MoPH scope of services for a hospital project; ► Discuss and agree with MoPH (Dr. Supakit) details required to outline project scope: ‣ Location; ‣ Size; ‣ Strategic model of care; ‣ Medical services and specialties; ‣ Main infrastructure requirements; ► Develop initial outline of PPP project scope and key responsibilities for public and private partners; ► Analyze project implementation alternatives; ► Identify and propose public sector agency/authority responsible for project procurement; ► Develop procurement strategy and project timeline; ► Develop main principles and proposed structure of the payment mechanism; ► Develop project risk matrix including main risks allocation principles; ► Conduct preliminary assessment of market and commercial potential to reduce financial burden to the Government; ► Develop high level financial model and government funding requirements; ► Outline legal framework for project implementation.	Report inclusive of a high level business plan and procurement guide for a simulated PPP hospital project	Jun 2015 – rapid start Oct 2015 - Draft report Dec 2015 - Report

Stream / Task	Sub-tasks / intermediate steps	Expected outcome	Deliverables Timeline
Stream 2: Capacity building			
Conduct additional capacity building workshops for up to four (4) regions (Led by EY)	► Prepare workshop materials. ► Discuss and agree with the senior members of MoPH team (Dr. Supakit) ► Discuss workshop strategy with key stakeholders such as working sub-committees and MoPH PPP unit to confirm main focus and adjust messaging; ► Identify target audience and select regions to conduct workshops; ► Develop case studies and present examples of successful PPP projects in health care; ► Present key PPP principles and project requirements within Thai healthcare context; ► Provide an overview of current procurement and legal framework; ► Present summary of existing institutional obstacles and success factors required to develop successful PPP projects.	Improved understanding among workshop participants of PPP concepts and principles, specific regulatory environment and key steps required to initiate PPP project development	MOPH to select the region / hospital Dates to be confirmed – target Sept / Oct 2015
Stream 3: Knowledge Management			
Support in building knowledge database of the MoPH PPP unit (Led by EY)	► Confirm and assist communication strategies, timeframe, role and responsibilities with PPP-unit; ► Involve in knowledge management via: ‣ Provide initial content support for development of MoPH website; ‣ Provide initial content support for other communication tools such as email, bulletin, or newsletters; ‣ Produce guidelines on what content to be added to website and other media.	Materials required to support development of the knowledge base of the MoPH PPP unit and PPP program within the Thai health sector	July / August 2015 – knowledge base structure Sep 2015 – draft materials and case studies Nov 2015 – final set of materials

Stream / Task	Sub-tasks / intermediate steps	Expected outcome	Deliverables Timeline
Stream 4: Support from local legal expert			
Identify main legal and regulatory issues; Support capacity and knowledge building (Led by SPI)	► Develop and present overview and interpretation of MoPH existing procurement regulation and PPP sub-regulation; ► Identify legal issues under each procedure of PPP proposal (group into common issues and MoPH specific issues); ► Provide ongoing support and guidance to the working team, sub-committees and MoPH PPP-unit; ► Educate stakeholders on legal issues via briefing sessions and during capacity building workshops; ► Advise on any arising inquiries during the sub-committee meetings; ► Provide input with respect to legal aspects of the PPP hospital simulation.	Improved understanding of legal and regulatory issues for MoPH existing procurement framework and for the PPP procurement and the indentify the gaps which may need to be addressed, if any, to implement PPP in the healthcare sector	July / August ; conduct legal briefings Sep 2015 - draft report on legal and regulatory issues for MoPH existing procurement framework and for the PPP procurement Ongoing support for remainder of the project

Appendix B– Mid-Term Report Scope of Work

EY's scope of work per mid-term report can be summarized into the following tasks

- Task 1: Review PPP policy and institutional frameworks
- Task 2: Identify potential health PPP projects
- Task 3: Build capacity and develop health PPP projects
- Task 4: Pre-feasibility studies for pilot projects
- Task 5: Identify potential for education sector PPPs

We set out the summaries of critical observations and issues presented in the mid-term report.

Thailand's experience with PPP to date

- Thailand has a long history with PPP and the vast majority of Thailand's PPP projects have been in the energy and transport sectors, including power stations and expressways.

- Projects in these sectors in particular are considered economic assets, in that charges levied on end users are almost always sufficient for project owners to generate sufficient returns, thereby limiting any financial support required from government. It is for this reason that projects in this sector are typically the first PPPs in any market.

- Thailand is currently expanding its MRT network with the addition of a purple line. This is to be Thailand's first availability payment PPP under current PPP legislation. While not a social sector project, it nonetheless provides a template project on which to base any future social sector project given the availability payment structure being implemented.

Analysis of MOPH priorities for suitability for PPP delivery

- MOPH has provided us with a list of nine priority areas and has asked us to use this as a long list of possible PPPs given they best reflect the areas where the ministry considers investment is required. MOPH has also previously shared these nine priority areas with SEPO as possibly suitable for PPP delivery.

- In order to turn the priority areas into a pipeline of possible health sector PPPs, the priority areas need to be developed into clear and discrete projects with a clear understanding of the size, scale and location(s) of the projects, and the services that the private sector is expected to deliver. This, in turn, will allow the development of a realistic risk allocation, likely contractual structure, and financial analysis to be undertaken.

- The ability of MOPH to transform the nine priority areas into viable project ideas is limited by the challenges outlined below. Based on our recent engagement with hospitals and officials, we believe these challenges will need to be overcome before viable projects in these priority areas can be progressed to the prefeasibility and feasibility stages.

►

Current budgeting presents a challenge to MOPH-led PPP program

► **We understand that The MOPH plays mostly a regulatory function and does not play a significant role with respect to healthcare funding and hospital procurement and operations. As such, MOPH may lack the financial and operational levers to incentivize hospitals to pursue an alternative procurement options such as PPP. Operational healthcare funding is provided most by the universal healthcare insurance scheme (on a per patient basis) which goes directly to the hospitals, and some hospitals may also charge the patients directly for certain medical services, within the public system.**

Investment proposals are put forward to MOPH through regional Inspector Generals and funded separately. Under existing arrangements, our discussions with MOPH and hospital directors suggest there are many public hospitals in Thailand that are either just breaking even or generating operating losses. With some exceptions, it would appear that the ability of hospitals to commit to fixed annual PPP availability payments could be limited given uncertainties on revenue flows. Projects involving multiple hospitals and/or regions would also present additional complexity.

► **Discretionary nature of annual budgetary process could potentially cause some concern for bidders looking to deliver availability PPPs. This is likely to be manageable where there is a sufficient field of local bidders and financiers for the first few social sector PPPs.**

PPP contracts are typically long term in nature, and the process of annual Cabinet approval creates a risk that Cabinet may not approve the budget at some point in future. This can create difficulties for private sector bidders in raising funding to deliver projects, as their investors and lenders cannot look through to an "automatic" and non-discretionary source of revenue for the project. Given Thailand's strong credit rating and the existence of deep and liquid domestic debt and capital markets, this issue may not be as significant as in other South East Asian markets, especially where there is sufficient market appetite from local bidders that understand local government practices. Longer term, once a track record of successful projects has been established, this would no longer be an issue even to international bidders and financiers.

► **In the absence of any MOF or other central guarantee from the Thai Government, the appetite of the private sector to bid for projects relying on long term MOPH or MOE payment streams, and bidders' ability to raise private sector finance on this basis, needs to be tested.**

Discussions with both PDMO and SEPO indicate that availability payments to private bidders are not likely to obtain the benefit of MOF or other government guarantees as there is no existing guarantee arrangement within government that could be applied to this type of project. Given the ministries' reliance on funds appropriated from an annual budgeting process reliant on Cabinet approval, private bidders may face difficulty in raising finance on the basis of perceived risk. Again, this risk is likely manageable given the strengths of Thailand's domestic debt and capital markets, field of local bidders, and strong sovereign credit rating.

Operational challenges

- **Hospitals also have substantial operational autonomy with all operational decisions made at the local level. In our discussions with hospital officials, there appears to be little or no interest in ceding this operational autonomy either to MOPH or to a long-term concessionaire under PPP unless the PPP would allow them to continue to maintain full control which given.**

  For example, the desire to aggregate equipment and services across hospitals to derive economies of scale would certainly lead to some divestment of control. We view that the Hospital would be incentivized to explore PPP only be happy with PPPs that provide them the needed assets if they can maintain , but allows them to maintain full control or provides them with significant financial benefit. As such our view is that given the current institutional and funding framework of the healthcare sector that unless the demand is identified by the hospital or at a regional level, by the health inspector, it is unlikely that MOPH will be able to initiate pre-feasibility assessments However, this does not fit viable models for PPP under the nine priority areas to assess the demand and suitability of a PPP arrangement under the current approach with MOPH

Institutional challenges

- **Further guidance on the methodology for business casing projects and PPP approval criteria would facilitate development of a market in Thailand for social sector PPPs and like-for-like comparisons of proposals.**

  The PISU Act in its current form, including the expected content of subordinate regulations, is largely concerned with the high-level process that should be followed in order to undertake a project under the PPP modality. There is limited guidance on the specific analysis and outputs required for government's decision-making.

  Specific methodology for the quantification of risk, discount rate to be applied in calculating PSC, including any competitive neutrality adjustments, and other pre-requisite criteria are not clearly defined. This could present a challenge when a full feasibility study is to be prepared for a given project at a subsequent date, particularly in the case where multiple projects will be reviewed by SEPO in parallel for approval, and capital limitations require proposals to be prioritized. The lack of prescriptive guidance could result in concurrent feasibility studies put up for approval that do not allow a direct like-for-like comparison of projects.

- **Further clarity needed on sources of PPP payment stream**

  Market interest is likely to be stronger where the contractual counterparty to a PPP agreement is MOPH and not an individual hospital, as the certainty of the availability payments would be improved, in turn assisting private sector bidders to obtain the necessary financing they require. However, as described above, MOPH currently has no mechanism to fund or support an availability payment to a PPP project.

Application of findings to date to MOE

- Projects and programs to be procured as PPPs should be centrally coordinated at MOE as this is where most PPP contracts will likely be signed with the private sector, and where major investment budgeting decisions are likely to be made. A clear ministry-wide process for identifying capital projects suitable for PPP delivery should be established.
- Central collation of information on demand for education services, condition of facilities and current service capabilities will provide MOE with the evidence needed for robust project identification and prioritization between various possible PPPs.
- A component of the operating income from the various departments, particularly in relation to projects procured as PPPs, may need to be channeled back to MOE centrally in order to cover part of any availability payments that MOE may have committed to.
- Ongoing engagement with SEPO to understand the evolution of the PISU Act will be important to ensure PPP proposals submitted are properly business cased and in line with the Act's requirements.
- Given the learnings to-date, we set out the key activities which have been agreed with ADB and the MOPH PPP sub-committee as the next steps to be taken. The detailed work-streams in relation to these activities are set out in 5.2.4.2. In summary, as next steps after the interim report, EY has:
  - Undertaken PPP simulation projects
  - Conducted additional capacity building workshops for up to four (4) regions
  - Provided supported in building knowledge database of the MoPH PPP unit
  - Identified main legal and regulatory issues and support capacity and knowledge building to key stakeholders including conducting legal briefings

Appendix C – Questionnaire sent to and responses received from Nakhon Pathom Hospital and DMS

- C-1: Questionnaire
- C-2: Responses received from Nakhon Pathom Hospital
- C-3: Follow up questions on the responses received from Nakhom Pathom Hospital
- C-4: Responses received from DMS
- C-5: Follow up questions #1 on the responses received from DMS
- C-6: Follow up questions #2 with DMS
- C-7: Follow up questions #3 during workshop sessions

แบบสอบถามข้อมูลในการกำหนดขอบเขตของโครงการร่วมทุนฯ

C-1: Questionnaire for the Scope of PPP Project

แบบสอบถามนี้ได้จัดทำขึ้นเพื่อวัตถุประสงค์ในการเก็บข้อมูลสำหรับการวิเคราะห์โครงการร่วมทุนฯ กรุณากรอกข้อมูลโดยละเอียดในหัวข้อดังต่อไปนี้

The objective of this questionnaire is to gather critical information for the development of Business Case for PPP Hospital in Thailand. Please fill in the details on the following topics.

ชื่อโครงการ_____

Project Name

ข้อควรพิจารณา

Considerations

ลักษณะและขนาดของโครงการที่ต้องการ Overall Project Concept

วัตถุประสงค์ของโครงการที่ต้องการ_____

Objectives of the Project

ขนาดของโรงพยาบาล

)เตียง(_____

Size of the Hospital (Number of beds)

ลักษณะของอาคาร (จำนวนชั้นอาคารของโครงการที่เหมาะสม)_____

Building design specification (e.g. low/ single level building or multi-level building)

ลักษณะที่ต้องการอื่น ๆ

)โปรดระบุ(_____

Other design specification/ requirements (Please specify)

ลักษณะของพื้นที่จัดตั้ง Characteristic of Project Location

มีพื้นที่สำหรับจัดตั้งหรือไม่

คือที่ใด_____

Is there any land available? Where is the recommended site for the project?

เป็นที่ดินสาธารณะหรือไม่/กรรมสิทธิที่ดินคือผู้ใด_____

Is it a public land? Who has the land ownership?

ขนาดของที่ดินเป็นจำนวนเท่าใด_____

What is the area size?

โรงพยาบาลที่ใกล้เคียงจากพื้นที่จัดตั้งโครงการคือโรงพยาบาลใด_____

Based on the identified location, where is the nearest hospital?

การบริการทางการแพทย์ที่จำเป็นของโครงการ) โปรดทำเครื่องหมาย ✓ (

Required medical services for the project (Please put ✓)

แผนก Medical Department	สาขา/ด้าน Specialties	จำเป็น Required	ไม่จำเป็น Not Required
Medicine อายุรกรรม	General Medicine / Acute admissions	☐	☐
	Elderly Care	☐	☐
	Respiratory	☐	☐
	Cardiology	☐	☐
	Neurology	☐	☐
	Gastroenterology	☐	☐
	Nephrology	☐	☐
	Dermatology	☐	☐
	Rheumatology	☐	☐
	Cardiology	☐	☐
	Hematology	☐	☐
	Oncology	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Women and Children เด็กและสตรี	Obstetrics	☐	☐
	Gynecology	☐	☐
	General pediatrics	☐	☐
	Neonatology	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Surgery ศัลยกรรม	General surgery (Gastrointestinal, Breast, Vascular)	☐	☐
	Orthopedics	☐	☐
	Urology	☐	☐
	Ear, Nose, Throat	☐	☐
	Ophthalmology	☐	☐
	Plastic Surgery	☐	☐
	Maxillofacial	☐	☐
	Neurosurgery	☐	☐
	Cardiothoracic	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Acute services อุกเฉิน	Accident and Emergency Resuscitation (Red) Majors (Amber) Minors (Green)	☐ ☐	☐ ☐

แผนก Medical Department	สาขา/ด้าน Specialties	จำเป็น Required	ไม่จำเป็น Not Required
		☐	☐
	Anesthetics and intensive care	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Rehabilitation Center เวชศาสตร์ฟื้นฟู	Rehabilitation unit	☐	☐
	Acute stroke unit	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Radiology รังสีวิทยา	Ultrasound/ X ray/ CT/ MRI	☐	☐
Allied Professionals ด้านเชี่ยวชาญอื่น	Physiotherapy	☐	☐
	Occupational Therapy	☐	☐
	Dietician	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Pharmacy เภสัชกรรม) จ่ายยา(	Inpatient Pharmacy	☐	☐
	Outpatient Pharmacy	☐	☐
Laboratories	Biochemistry, Hematology, Blood Bank	☐	☐
	อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐
Other (please specify) แผนกอื่น ๆ) โปรดระบุ(		☐	☐

การจัดสรรพื้นที่และสิ่งอำนวยความสะดวกที่จำเป็นของโครงการ) โปรดทำเครื่องหมาย ✓ และโปรดให้รายละเอียดเพิ่มเติม (

Required hospital facilities and convenience (Please put ✓ and please provide more details)

การจัดสรรพื้นที่และสิ่งอำนวยความสะดวก Hospital Facilities	จำเป็น Required	ไม่จำเป็น Not Required	หมายเหตุ Remarks/ Notes
โรงอาหาร Cafeteria	☐	☐	
ห้องพักสำหรับแพทย์ Doctor's lounge	☐	☐	
ห้องเด็กเล่น Playroom	☐	☐	
ลานจอดรถ Carpark	☐	☐	โปรดระบุจำนวนที่จอดรถที่ต้องการ Please provide the required number of parking lots.
ห้องพักสำหรับพนักงาน Staff accommodation	☐	☐	โปรดระบุจำนวนห้องที่ต้องการ Please provide the required number of rooms.
ห้องสำหรับการเรียนการสอน ฝึกอบรม และวิจัย Teaching, training and research center	☐	☐	
ห้องประชุม/สัมมนา Conference/ meeting room	☐	☐	

การจัดสรรพื้นที่และสิ่งอำนวยความสะดวก Hospital Facilities	จำเป็น Required	ไม่จำเป็น Not Required	หมายเหตุ Remarks/ Notes
ศูนย์เวชศาสตร์ฟื้นฟู Rehabilitation center	☐	☐	
พื้นที่สำหรับร้านค้า (เช่น ร้านสะดวกซื้อ ร้านขายยา) Commercial spaces (e.g. convenience store, pharmacy)	☐	☐	
พื้นที่อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐	

ความสามารถในการรองรับผู้ป่วยของโครงการ

Project Capacity

5.1 ภาพรวมของผู้ป่วย Patients profile

ผู้รับบริการ/ลูกค้าเป้าหมาย

คือ_____

Target customers

จำนวนผู้ป่วยนอกเฉลี่ยต่อปีที่ต้องการรองรับ_____

Please provide the estimated total outpatients to support per year.

จำนวนผู้ป่วยในเฉลี่ยต่อปีที่ต้องการรองรับ_____

Please provide the estimated total inpatients admission to support per year.

จำนวนวันอยู่ของผู้ป่วยในเฉลี่ยต่อปี_____

What is the patient's average length of stay in hospital?

อัตราการครองเตียงเฉลี่ยต่อปี_____

What is the average bed occupancy?

5.2 จำนวนขั้นต่ำของอุปกรณ์เครื่องมือทางการแพทย์หลักและระบบที่ใช้ในโครงการ

Minimum number of specialized medical equipment and system to be used in the project

รายละเอียด Key item	จำนวนขั้นต่ำ Minimum no. of unit	ราคาเฉลี่ยต่อหน่วย (บาท) Estimated cost per unit (Baht)	เพื่อใช้ในแผนกใด For which area of specialty?	หมายเหตุ (ระบุหากต้องการจัดจ้างบุคคลภายนอก(Remarks/ Notes (Desire for outsource?)
อุปกรณ์ที่ 1/ Equipment 1				
อุปกรณ์ที่ 2/ Equipment 2				

อุปกรณ์ที่ 3/ Equipment 3				
อุปกรณ์ที่ 4/ Equipment 4				
อุปกรณ์ที่ 5/ Equipment 5				
ระบบ IT ต่างๆ/ IT system				
อื่นๆ) โปรดระบุ(Other (please specify)				

การจัดสรรหน้าที่และความรับผิดชอบระหว่างภาครัฐและภาคเอกชน)โปรดทำเครื่องหมาย ✓ และโปรดให้รายละเอียดเพิ่มเติม)

Allocation of responsibilities between public sector and private sector. (Please put ✓ and please provide more details)

ประเภทกิจกรรม Type of activities	ภาครัฐ Public Sector	ภาคเอกชน Private Sector	ความคิดเห็น)ระบุหากต้องการจัดจ้างบุคคลภายนอก(Comments (Desire for outsource?)
การตรวจและวินิจฉัยโรค All clinical and diagnostic services	☐	☐	
การสอนและฝึกอบรม Teaching and training	☐	☐	
การบริหารจัดการทั่วไป General management services	☐	☐	
แผนกติต่อสอบถาม Helpdesk Services	☐	☐	
การบริการด้านอาหาร)ของผู้ป่วยและบุคคลภายนอก(Food services (patient and non-patient)	☐	☐	
การดูแลความสะอาด Housekeeping services	☐	☐	
การซักรีดเสื้อผ้า Laundry / linen services	☐	☐	
การทำความสะอาด (เช่น พื้นที่โดยรอบ ห้องผ่าตัด ฯลฯ(Cleaning services (e.g. general area, operating theatre, etc.)	☐	☐	
การกำจัดขยะของเสีย	☐	☐	

ประเภทกิจกรรม Type of activities	ภาครัฐ Public Sector	ภาคเอกชน Private Sector	ความคิดเห็น)ระบุหากต้องการจัดจ้างบุคคลภายนอก(Comments (Desire for outsource?)
(เช่น ของเสียทางการแพทย์ ,ขยะทั่วไป , ของมีคม ,ของเสียเป็นพิษ) Waste disposal (e.g. clinical waste, non-clinical waste, sharps, toxic waste)			
ด้านเทคโนโลยีสารสนเทศและการสื่อสาร Information and communications technology (ICT)	☐	☐	
อื่น ๆ) โปรดระบุ(Other (please specify)	☐	☐	

8. ข้อมูลทางการเงิน

Financial Information

รายได้

Revenue

รายละเอียดของโครงสร้างรายได้ในปัจจุบัน

Details of current revenue structure

รายได้เฉลี่ยต่อหัวในการให้บริการในปัจจุบัน) ผู้ป่วยใน และผู้ป่วยนอก (และอัตราการเติบโตต่อปีของรายได้เฉลี่ยต่อหัว

Average revenue per head (OPD vs IPD) and growth rate for revenue per head

ประมาณการความต้องการในการใช้บริการ และความสามารถ/ความเต็มใจในการจ่ายเพื่อใช้บริการ) เฉลี่ยต่อหัว(

Forecasted demand for medical services and ability/ willingness to pay for the service (average per head)

รายละเอียดของรายได้อื่น เช่น ค่าเช่าและค่าจอดรถ ในปัจจุบัน) หากมี(

Details of other income at present (e.g. rental and parking fee rate) (if available)

ค่าใช้จ่ายและเงินลงทุน

Expenses and investment

รายละเอียดค่าใช้จ่ายในการดำเนินงานรายปีของโรงพยาบาล โดยแยกประเภทตามส่วนที่ผันแปร และส่วนที่คงที่ Details of the hospital's annual operating expenses by category (including variable and fixed expenses)

ค่าใช้จ่ายในการบำรุงรักษาเป็นจำนวนเท่าใด)เป็นสัดส่วนเท่าใดของค่าใช้จ่ายในการดำเนินงานทั้งหมด(

The amount of the hospital's maintenance costs (as a percentage of total operating expenses)

จำนวนของบุคลากร) แพทย์ พยาบาล และเจ้าหน้าที่ (ในการดำเนินงาน และประมาณการค่าใช้จ่ายของบุคลากรดังกล่าว

Number of operating personnel (Doctors, nurses, other staff) and the respective average annual personnel expenses

ประมาณการขนาดของเงินลงทุนของโครงการ

Estimated size of project capex based on the proposed size and services of the project

9. ข้อมูลด้านอื่นๆ

Other information

ในเบื้องต้น มีข้อมูลของภาคเอกชนที่มีความพร้อม ความเชี่ยวชาญ ประสบการณ์ และความสนใจ

ที่จะเป็นผู้ดำเนินโครงการตามมาตรฐานที่เจ้าของโครงการกำหนดไว้ หรือไม่ จำนวนของภาคเอกชนดังกล่าวมีมากน้อยเท่าใด

โดยคำนึงถึงความสามารถทางเทคนิคและขนาดโครงการ ข้อจำกัดในการจัดสรรความเสี่ยง การจัดหาเงินทุน และข้อจำกัดเฉพาะทางอื่น ๆ ของโครงการ

Preliminary, is there any information on the availability of private sector skills, experience and interest necessary to undertake the project and deliver services to the required standard? How many parties of such private sector are available given the technical capability and project scale, constraints to risk allocation, financing, and other specific project features?

C-2: Responses received from Nakhon Pathom [Translation]

Project name: Urban Hospital in Nakhon Pathom

Project owner: Nakhon Pathom Hospital

General information on Nakhon Pathom province:

- A province in central part of Thailand which is about 60 km from Bangkok
- Total population of 890k where 280k is in state capital
- 59% of total area is for agriculture; 24% of people is farmer
- Has 1 general hospital (Nakhon Pathom Hospital), 9 community hospitals, 3 hospitals under jurisdictions other than MoPH's permanent secretary office, 4 private hospitals, 34 private clinics

Information on Nakorn Pathom Hospital:

- Established since 1952; expanded to become general hospital with size of 670 beds in 2010
- Responsible to receive referral case from smaller hospitals/ health units in the province, being the node (center of medical network for the province)
- Able to provide treatment in many specialties, being the training center of medical doctors/staffs
- Providing services:
  - Accident, emergency, Autopsy Emergency Medical Support
  - Primary care on OP as well as Tertiary care
  - Health promotion within the area such as Palliative care
  - Excellence center in heart, cancer, accident and infant

Urban Hospital Project

Objective:

- To reduce patient congestion in Nakhon Pathom Hospital, both OP and IP
- To increase capacity in treating patient at tertiary care level and enhance/focus on excellence center of Nakhon Pathom Hospital
- To strengthen the treatment at primary care level via building health network members
- To increase efficiency in treating chronic patients

Target:

- To set up urban Nakhon Pathom Hospital of 90 beds in size
- To use the area within Nakhon Pathom Hospital Compound
- To have medical personnel belonged to Nakhon Pathom Hospital and to share some of its resources
- To open OP clinic in all main specialties and in certain specific chronic diseases
- To become a center upon receiving referral case from other small health care units/hospitals

Urban Nakhon Pathom Hospital is divided into 3 phases for implementation (having 1 year interval between each phase) to fully develop into 90 beds. It is intended to support patients under primary and secondary care with shared resources from Nakhon Pathom Hospital (in the early phase) and under coordination with health network members in Nakhorn Pathom province in according to the Six Building Block Framework as follows:

Six Building Block	Action plan		
	Phase 1	Phase 2	Phase 3
Service delivery	• 60 beds hospital • Provide primary and secondary services in urban area • General clinic, obstetrics and gynecology, general surgery, general medicine, pediatrics, surgery • To have specialized noncommunicable disease (NCD) clinic • ER during office hours • To receive referral case from smaller hospitals • Health promotion within the urban area • 2 IP wards (30 beds for male patients and 30 beds for female patients) • To support referral system • To include medicine dispensing room for both IP and OP	• 90 beds hospital • To add more specialized clinics (i.e. occupational medicine, rehabilitation medicine and dentistry) • To add Thai traditional clinic • To add a 30-bed ward • To support refer back case from Nakhon Pathom Hospital for admission (simple case) • 24 hrs. ER • Palliative care service and to set up health network within urban community	• To have own laboratory service • To become training center for doctor of family medicine • To become learning center for continuing care treatment
Workforce	• 3 of GP doctors or 2nd year medical intern • 1 Family medicine doctor • To share specialized doctors in 5 main service areas (1 doctor per area) with Nakhon Pathom Hospital • To share registered nurse for OP and ER with Nakhon Pathom Hospital • To share IP nurse in 2 wards (5 nurses per ward) and OT nurse from Nakhon Pathom Hospital (7 nurses per ward) • To share facilitating staff for OP and ER with Nakhon Pathom Hospital • To have facilitating staff for 2 IP wards (5 staffs per ward) • To share pharmacist and pharmaceutical staff with Nakhon Pathom Hospital • To share bed lifter with Nakhon Pathom Hospital	• To add 2 of 2nd or 3rd year medical interns • To add 5 more registered nurses for additional ward and 7 OT nurses from Nakhon Pathom Hospital • To add 2 registered nurses for OPD and ER; the rest to be shared with Nakhon Pathom Hospital • To add 1 permanent pharmacist and 1 pharmaceutical staff; the rest to be shared with Nakhon Pathom Hospital	• To add 1 more family medicine doctor • To share laboratory staff with Nakhon Pathom Hospital as OT staff

Six Building Block	Action plan		
	Phase 1	Phase 2	Phase 3
	• To share cleaning staff with Nakhon Pathom Hospital • To utilize same management team with Nakhon Pathom Hospital		
Health Information System	• Computer system which connects with Nakhon Pathom Hospital and local health office/ MoPH bureau of strategy and policy databases		
Drug and Equipment	• To use same medicine list with Nakhon Pathom Hospital • To share procurement with Nakhon Pathom Hospital • 12-floor building: 1st Fl.: medicine dispensing room, ER, First aid/ injection room 2nd – 3rd Fl.: OP examination rooms 4th Fl.: Rehabilitation and Thai traditional clinics 5th-7th Fl.: IP wards 8th-9th Fl.: IP private wards 10th Fl.: Occupational medicine clinic 11th Fl.: Back office 12th Fl.: Meeting room	• To add: 2nd Fl.: 10 units on dentistry 4th Fl.: additional units on rehabilitation and Thai traditional clinics 5th Fl.: 1 additional IP ward 10th Fl.: additional units on occupational medicine clinic • 8-floor nurse dormitory building (100 units) • Doctor dormitory (20-40 units)	• To add services for private wards as training center • Car park building of 300-600 lots
Financing	• To receive UC capitation (OP/PP) based on urban population, direct reimbursement on IP with DRG guidance, CAPEX and depreciation budget from UC • To be under the management of Director General – Nakhon Pathom Hospital (including financial management aspects) • To separately manage the budget from Nakhon Pathom Hospital		
Governance	• To manage Contracting Unit for Primary Care (CUP) in urban area with Nakhon Pathom Hospital • To coordinate with local administrative unit regarding budget and other supports		

Table 1: Number of medical service receivers in Nakhon Pathom classified by the type of health insurance scheme

Nakhon Pathom Province	Nakhon Pathom Hospital
· UC 597,343 ppl.	· UC 220,624 ppl.
· CSMBS 67,996 ppl.	· CSMBS 27,561 ppl.

· Social Security 171,522 ppl.	· Social security (Nakhon Pathom Hospital 53,731 ppl.
· Aliens 2,434 ppl.	· Social security (other hospitals) 171,522 ppl.
Total 839,295 ppl.	**Total 473,438 ppl.**

(As of September 2014)

Table 2: Number of medical staff of Nakhon Pathom Hospital (as of June2015) classified by field of profession

Field of profession	Number of staff
Doctor	112
Dentist	21
Pharmacist	47
Registered Nurse	610
Technical Nurse	26
Medical Technician	27
Others	1,026

Table 3: Number of beds in each specialty of Nakhon Pathom hospital

No.	Type of room	Registered bed	Actual bed	General room	Private room	Remark
1	ICU Surgery	8	9	8		
2	ICU (Neurosurgery and brain surgery)	8	8	8		
3	ICU (Medicine)	8	10	9		1 Extra bed
4	ICU (Pediatrics)	8	9	9		1 Extra bed
5	Male Medicine 1	30	37	37		Canvas bed, unlimited
6	Male Medicine 2	30	49	49		Canvas bed, unlimited
7	Female Medicine 1	30	45	45		Canvas bed, unlimited
8	Female Medicine 2	30	52	52		Canvas bed, unlimited
9	Male Surgery	30	33	31		Canvas bed, unlimited
10	Female Surgery	30	32	30		Canvas bed, unlimited

No.	Type of room	Registered bed	Actual bed	General room	Private room	Remark
11	Male Orthopedic	30	39	36	3	Canvas bed, unlimited
12	Female Orthopedic	30	35	32	3	Canvas bed, unlimited
13	Obstetrics	30	46	40	6	Canvas bed, unlimited
14	Gynecology	30	36	32	4	Canvas bed, unlimited
15	Pediatrics 1	30	32	32		10 Canvas beds
16	Pediatrics 2	30	40	40		
17	ENT and Ophthalmology	30	30	29	1	Canvas bed, unlimited
18	Private ward 1	20	18		18	Shared room
19	Private ward 3 (Monk)	20	20		20	
20	Private ward 4	20	20		20	
21	Special common	22	22		22	
22	Special 1	18	18		18	
23	Special 2	24	24		24	
24	Delivery room	18	30	30		24 beds and 6 extra bed
25	Trauma surgery	30	32	30		Canvas bed, unlimited
26	Special 55 years	26	26		26	
27	Surgery 55 years	30	35	32	3	Canvas bed, unlimited
28	Special surgery 6th floor	19	19		19	1 room is out of order, 1 Director's room
29	Special surgery 7th floor	19	19		19	Included 2 VIP rooms
Total		**688**	**825**	**611**	**206**	
	Exclude 18 delivery beds	**670**				

Table 4: Basic information of Nakhon Pathom hospital

Information	Year 2014 (patient)	Year 2015 (6 months) (patient)
OP patients (per year)	757,946	399,387

Average OP patients (per day)	2,650	2,793
IP patients (per year)	51,549	25,017
ER patients (per year)	66,975	34,126
Average ER patients (per day)	183	188
CMI (Case mix index)	1.59	1.67
Bed occupancy rate (%)	99.56	100.75
Fatality rate (IP)	4.17	4.47

Table 5: Top 5 OP diseases of Nakhon Pathom Hospital

Fiscal year 2014	Fiscal year 2015 (6 months)
Type of Disease	Type of Disease
1. I10 - Essential (primary) hypertension	1. I10 - Essential (primary) hypertension
2. E11 - Non-insulin-dependent diabetes mellitus	2. E11 - Non-insulin-dependent diabetes mellitus
3. E78 - Disorders of lipoprotein metabolism and other lipidaemias	3. E78 - Disorders of lipoprotein metabolism and other lipidaemias
4. J06-Acute upper respiratory infections of multiple and unspecified sites	4. N18 - Chronic renal failure
5. N18 - Chronic renal failure	5. E14 - Unspecified diabetes mellitus

Table 6: Top 5 IP diseases of Nakhon Pathom Hospital

Fiscal year 2014	Fiscal year 2015 (6 months)
Type of Disease	Type of Disease
1. O80 - Single spontaneous delivery	1. H25 - Senile cataract
2. H25 - Senile cataract	2. A09 - Diarrhoea and gastroenteritis of presumed infectious origin
3. A09 - Diarrhoea and gastroenteritis of presumed infectious origin	3. O80 - Single spontaneous delivery
4. K35 - Acute appendicitis	4. I63 - Cerebral infarction
5. I63 - Cerebral infarction	5. I50 - Heart failure

Table 7: Top 5 Surgery in Nakhon Pathom Hospital

Fiscal year 2014	
Type of surgery	Times
1. Cesarean section	2,154
2. Bone fixation	1,687

3. Cataract	1,629
4. Tubal ligation	1,412
5. Appendectomy	1,382

Table 8: Top 5 primary cause of fatality

Fiscal year 2014	Fiscal year 2015 (6 months)
Type of Disease	Type of Disease
1. J15 - Bacterial pneumonia	1. J18 - Pneumonia
2. I61 - Intracerebral haemorrhage	2. I61 - Intracerebral haemorrhage
3. J18 - Pneumonia	3. N18 - Chronic renal failure
4. I63 - Cerebral infarction infarction	4. I21 - Acute myocardial infarction
5. E11 - Non-insulin-dependent diabetes mellitus	5. B20 - Human immunodeficiency virus

Table 9: Rate of referred patients from community hospitals in Nakhon Pathom

Hospital	Fiscal year 2014				Fiscal year 2015 (6 months)			
	OPD		IPD		OPD		IPD	
	Patient	Rate	Patient	Rate	Patient	Rate	Patient	Rate
Kamphaeng Saen	11,971	16.00	2,749	16.29	6,650	16.17	1,366	15.85
Nakhon Chai Si	11,980	16.01	2,341	13.87	6,491	15.78	1,277	14.82
Huayploo	8,234	11.01	1,595	9.45	4,391	10.68	765	8.88
Don Tum	7,762	10.38	1,837	10.89	4,327	10.52	839	9.74
Bang Len	11,267	15.06	2,461	14.58	5,866	14.26	1,177	13.66
Sam Phran	13,111	17.53	3,301	19.56	6,960	16.92	1,562	18.13
Phutthamonthon	3,965	5.30	1,241	7.35	2,326	5.66	721	8.37
Luang Phor Pern	4,037	5.40	736	4.36	2,293	5.58	386	4.48
Others	2,482	3.32	615	3.64	1,823	4.43	523	6.07
Total	**74,809**	**100.00**	**16,876**	**100.00**	**41,127**	**100.00**	**8,616**	**100.00**

Table 10: Number of patients referred to other regional health area

Fiscal year 2014	Fiscal year 2015 (6 months)
8,901 patients	4,619 patients

C-3: Urban Nakhon Pathom Hospital PPP Project (follow up questions)

Objective: Development of urban hospital, including carpark, private ward and dormitory for medical staff, to support the existing Nakhon Pathom Hospital.

Urban Hospital Facility:
Size of IPD: 90 beds
Size of OPD: 2,000 patients per day (to be confirmed)
Support infrastructure: Dormitory for nurse and doctor, carpark, additional private wards, cafeteria, etc (to be confirmed)
Land plot: Land in front of existing Nakhon Pathom Hospital (57 rai or equivalent 91,200 sqm) (to be confirmed)
Estimated CAPEX: Baht: to be confirmed
Estimated annual revenue: to be confirmed
Estimated OPEX and maintenance costs: to be confirmed

PPP Project Principles:
Public sector: provision of medical services and medical centre operations
Private partner: development and maintenance of medical centre infrastructure and medical equipment, as well as provision of support services (security, housekeeping, cafeteria, laundry, pharmacy – list to be confirmed)

Questions to clarify scope and costing assumptions:
1. Please confirm and clarify hospital infrastructure requirement: Is the infrastructure requirement specifically cater for the Urban Hospital PPP Project or does it includes the requirement for existing Hospital?
2. Size of OPD: Is 2,000 patients per day referring to an estimate for the Urban Hospital Project or for the existing Hospital?
3. Please confirm assumptions and sources of information used to quantify revenues and costs related to urban hospital operations:
    - Total medical service receivers that will be treated in the urban hospital (classified by type of health insurance scheme)
    - Average revenue (medical fee) per patient
    - Inclusion of other revenue sources (car park, cafeteria, pharmacy, etc)
    - Medical centre construction costs and inclusions (design, building permits, equipment, etc)
    - Medical centre operating costs and inclusions (main cost categories for medical, non-medical and support services, including key assumptions & drivers)
    - Costs related to facility and equipment maintenance and replacement
    - Please identify costs and expenses that will be directly covered / shared by the existing Nakhon Pathom Hospital (medical, non-medical and support)
4. Please confirm and clarify private sector's role and scope of services: What services have to be provided by the private partner (construction and maintenance, equipment procurement and service, carpark, dormitory, pharmacy, etc)?

C-4: Responses received from DMS [Translation]

แบบสอบถามข้อมูลในการกำหนดขอบเขตของโครงการร่วมทุนฯ

Questionnaire for the Scope of PPP Project

แบบสอบถามนี้ได้จัดทำขึ้นเพื่อวัตถุประสงค์ในการเก็บข้อมูลสำหรับการวิเคราะห์โครงการร่วมทุนฯ กรุณากรอกข้อมูลโดยละเอียดในหัวข้อดังต่อไปนี้

The objective of this questionnaire is to gather critical information for the development of Business Case for PPP Hospital in Thailand. Please fill in the details on the following topics.

ชื่อโครงการ *โครงการศูนย์การแพทย์เฉพาะทางกรมการแพทย์*

Project Name *DMS Medical Complex*

ข้อควรพิจารณา

Considerations

1. ลักษณะและขนาดของโครงการที่ต้องการ Overall Project Concept

1.1 วัตถุประสงค์ของโครงการที่ต้องการ

Objectives of the Project

- ลดความแออัดและระยะเวลารอคอยของผู้ป่วยในโรงพยาบาล/สถาบันของกรมการแพทย์
  To reduce congestion and waiting time of patients for hospitals/ medical institutes under the Department of Medical Service
- เพิ่มการเข้าถึงบริการให้แก่ผู้ป่วยที่ส่งต่อมายังโรงพยาบาล/สถาบันของกรมการแพทย์
  To increase access of referral patients to hospitals/ medical institutes under the Department of Medical Service
- เพิ่มความสะดวกสบายให้ผู้ป่วยด้วยบริการรูปแบบคลินิคพิเศษ
  To provide convenience to patients under a special clinic's services
- เพื่อเป็นแหล่งรายได้ เงินบำรุงสามารถนำไปใช้ประโยชน์ในการดำเนินงานตามภารกิจของหน่วยงานและนโยบายของกรมการแพทย์
  To generate higher income to be utilized further in Department of Medical Service's projects
- สร้างเครือข่ายสนับสนุนโรงพยาบาล-คลินิคเอกชนระดับเล็ก-กลาง ให้เข้าสู่ Medical Hub
  To support hospital network as well as small-medium private clinics network, moving toward medical hub
- เป็นศูนย์เรียนรู้-อบรมระบบมาตรฐาน JCI-DNV GL
  To act as a learning and training center under JCI-DNV GL standard
- เพื่อให้เกิดความคุ้มค่าในการใช้ทรัพยากรของหน่วยงาน
  To maximize the utilization of medical resources
- เพื่อสนองนโยบายรัฐร่วมเอกชน
  To support the government's policy on PPP

1.2 ขนาดของโรงพยาบาล (เตียง)

Size of the Hospital (Number of beds)

- OPD 15 คลินิค (ดำเนินการร่วมกันโดยโรงพยาบาล/สถาบันสังกัดกรมการแพทย์)
  OPD 15 clinics (co-partner among hospitals and medical institutes under Department of Medical Service)
- ER
- IPD 200 เตียง (ห้องเดี่ยว)
  IPD 200 beds (private room)
- Ambulatory 50 เตียง (ห้องเดี่ยว+ห้องรวม)

Ambulatory 50 beds (private room + shared room)

- ICU 20 เตียง
  ICU 20 beds
- OR 20 ห้อง
  OR 20 rooms
- ไตเทียม 20 หน่วย
  Hemodialysis center of 20 units
- ห้องคลอด 5 ห้อง
  Labour and Delivery Unit 5 rooms
- ทันตกรรม 10 หน่วย
  Dentistry 10 units

1.3 ลักษณะของอาคาร (จำนวนชั้นอาคารของโครงการที่เหมาะสม)

Building design specification (e.g. low/ single level building or multi-level building)

- อาคารสูง
  Tall building
- มีลิฟท์จำนวนเพียงพอ
  Sufficient number of elevators
- มีบันไดเลื่อนในชั้น OPD
  Escalators in the OPD floors

1.4 ลักษณะที่ต้องการอื่น ๆ (โปรดระบุ)

Other design specification/ requirements (Please specify)

- ประหยัดพลังงาน พลังงานทางเลือก รักษาสิ่งแวดล้อม
  Energy saving, using alternative energy, and environmental-friendly facility
- มี Hostel สำหรับญาติหรือผู้ป่วยต่างจังหวัดพักรอตรวจ 50 ห้อง
  Have a hostel of 50 rooms to accommodate patients' relatives or patients from other provinces

1. ลักษณะของพื้นที่จัดตั้ง Characteristic of Project Location

2.1 มีพื้นที่สำหรับจัดตั้งหรือไม่ คือที่ใด

Is there any land available? Where is the recommended site for the project?

- ยังไม่มี ควรเป็นที่ติดสถานีรถไฟฟ้า และใกล้ทางด่วน ทั้งปัจจุบันและอนาคต เช่น ย่านพระรามเก้า งามวงศ์วาน ตลิ่งชัน พระราม 2
  No specific land for the project at this moment; proposed location to be near skytrain/subway station and highway, i.e. area such as Rama 9, Ngam Wong Wan, Taling Chan, or Rama2

2.2 เป็นที่ดินสาธารณะหรือไม่/กรรมสิทธิที่ดินคือผู้ใด

Is it a public land? Who has the land ownership?

- เอกชนจัดหาที่ดิน โอนให้รัฐหลังสิ้นสุดโครงการ 20-30 ปี
  Private sector to find the land and transfer to the state at the end of the project (20-30 years)

2.3 ขนาดของที่ดินเป็นจำนวนเท่าใด

What is the area size?

- 5-10 ไร่
  5-10 Rai or equivalent to 8,000 – 16,000 sqm.

2.4 โรงพยาบาลที่ใกล้เคียงจากพื้นที่จัดตั้งโครงการคือโรงพยาบาลใด ขึ้นอยู่กับที่ดินที่จัดหาได้ / depending on the location

Based on the identified location, where is the nearest hospital?

3. การบริการทางการแพทย์ที่จำเป็นของโครงการ (โปรดทำเครื่องหมาย ✓)

Required medical services for the project (Please put ✓)

แผนก Medical Department	สาขา/ด้าน Specialties	จำเป็น Required	ไม่จำเป็น Not Required
Medicine อายุรกรรม	● General Medicine / Acute admissions	☒	☐
	● Elderly Care	☒	☐
	● Respiratory	☒	☐
	● Cardiology	☒	☐
	● Neurology	☒	☐
	● Gastroenterology	☒	☐
	● Nephrology	☒	☐
	● Dermatology	☒	☐
	● Rheumatology	☒	☐
	● Cardiology	☒	☐
	● Hematology	☒	☐
	● Oncology	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Women and Children เด็กและสตรี	● Obstetrics	☒	☐
	● Gynecology	☒	☐
	● General pediatrics	☒	☐
	● Neonatology	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Surgery ศัลยกรรม	● General surgery (Gastrointestinal, Breast, Vascular)	☒	☐
	● Orthopedics	☒	☐
	● Urology	☒	☐
	● Ear, Nose, Throat	☒	☐
	● Ophthalmology	☒	☐
	● Plastic Surgery	☒	☐
	● Maxillofacial	☒	☐
	● Neurosurgery	☒	☐
	● Cardiothoracic	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Acute services ฉุกเฉิน	● Accident and Emergency ▪ Resuscitation (Red) ▪ Majors (Amber) ▪ Minors (Green)	 ☒ ☒ ☒	 ☐ ☐ ☐

แผนก Medical Department	สาขา/ด้าน Specialties	จำเป็น Required	ไม่จำเป็น Not Required
	● Anesthetics and intensive care	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Rehabilitation Center เวชศาสตร์ฟื้นฟู	● Rehabilitation unit	☒	☐
	● Acute stroke unit	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Radiology รังสีวิทยา	● Ultrasound/ X ray/ CT/ MRI	☒	☐
Allied Professionals ด้านเชี่ยวชาญอื่น	● Physiotherapy	☒	☐
	● Occupational Therapy	☒	☐
	● Dietician	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Pharmacy เภสัชกรรม (จ่ายยา)	● Inpatient Pharmacy	☒	☐
	● Outpatient Pharmacy	☒	☐
Laboratories	● Biochemistry, Hematology, Blood Bank	☒	☐
	● อื่น ๆ (โปรดระบุ) Other (please specify)	☐	☐
Other (please specify) แผนกอื่น ๆ (โปรดระบุ)		☐	☐

4. การจัดสรรพื้นที่และสิ่งอำนวยความสะดวกที่จำเป็นของโครงการ (โปรดทำเครื่องหมาย ✓ และโปรดให้รายละเอียดเพิ่มเติม)

Required hospital facilities and convenience (Please put ✓ and please provide more details)

การจัดสรรพื้นที่และสิ่งอำนวยความสะดวก Hospital Facilities	จำเป็น Required	ไม่จำเป็น Not Required	หมายเหตุ Remarks/ Notes
โรงอาหาร Cafeteria	☒	☐	
ห้องพักสำหรับแพทย์ Doctor's lounge	☒	☐	
ห้องเด็กเล่น Playroom	☐	☒	
ลานจอดรถ Carpark	☒	☐	โปรดระบุจำนวนที่จอดรถที่ต้องการ ~1,000 คัน Please provide the required number of parking lots. ~1,000 parking lots
ห้องพักสำหรับพนักงาน Staff accommodation	☒	☐	โปรดระบุจำนวนห้องที่ต้องการ 20 ห้อง Please provide the required number of rooms. 20 rooms
ห้องสำหรับการเรียนการสอน ฝึกอบรม และวิจัย Teaching, training and research center	☒	☐	
ห้องประชุม/สัมมนา Conference/ meeting room	☒	☐	สำหรับ 400 คน For 400 people

การจัดสรรพื้นที่และสิ่งอำนวยความสะดวก Hospital Facilities	จำเป็น Required	ไม่จำเป็น Not Required	หมายเหตุ Remarks/ Notes
ศูนย์เวชศาสตร์ฟื้นฟู Rehabilitation center	☒	☐	
พื้นที่สำหรับร้านค้า (เช่น ร้านสะดวกซื้อ ร้านขายยา) Commercial spaces (e.g. convenience store, pharmacy)	☒	☐	
พื้นที่อื่น ๆ (โปรดระบุ) Other (please specify)	☒	☐	นวดแผนไทย/ ห้องออกกำลังกาย/ สปา Thai massage/ Fitness/ Spa

5. ความสามารถในการรองรับผู้ป่วยของโครงการ

Project Capacity

5.1 ภาพรวมของผู้ป่วย Patients profile

- ผู้รับบริการ/ลูกค้าเป้าหมาย คือ

  Target customers

- ผู้ป่วยจ่ายเงินเอง (หน่วยงานกรมการแพทย์มีผู้ป่วยกลุ่มนี้เฉลี่ย 35% ของผู้ป่วยทั้งหมด)

  Patients who paid by themselves (accounted about 35% of Department of Medical Service's total patients)

- ผู้ป่วยสิทธิข้าราชการ จ่ายส่วนเกิน

  Patients with Civil Servant Medical Benefit Scheme (CSMBS), but paid the excess amount

- ผู้ป่วยประกันเอกชน

  Patients that have private insurance

- จำนวนผู้ป่วยนอกเฉลี่ยต่อปีที่ต้องการรองรับ

  Please provide the estimated total outpatients to support per year.

- เฉลี่ย 1,500-2,000 คนต่อวัน

  Approximately 1,500-2,000 patients per day

- จำนวนผู้ป่วยในเฉลี่ยต่อปีที่ต้องการรองรับ

  Please provide the estimated total inpatients admission to support per year.

- เฉลี่ย 20,000 admission ต่อปี

  Approximately 20,000 admissions per year

- จำนวนวันอยู่ของผู้ป่วยในเฉลี่ยต่อปี

  What is the patient's average length of stay in hospital?

- 60,000 วันต่อปี (3 วันต่อ admission)

  60,000 days per year (3 days per admission)

- อัตราการครองเตียงเฉลี่ยต่อปี

  What is the average bed occupancy?

  - 80%

5.2 จำนวนขั้นต่ำของอุปกรณ์เครื่องมือทางการแพทย์หลักและระบบที่ใช้ในโครงการ

Minimum number of specialized medical equipment and system to be used in the project

รายละเอียด Key item	จำนวนขั้นต่ำ Minimum no. of unit	ราคาเฉลี่ยต่อหน่วย (บาท) Estimated cost per unit (Baht)	เพื่อใช้ในแผนกใด For which area of specialty?	หมายเหตุ (ระบุหากต้องการจัดจ้างบุคคลภายนอก) Remarks/ Notes (Desire for outsource?)

CT				
MRI				
X-Ray				
Ultrasound				
EMR – PAC system				
ระบบ IT ต่างๆ/ IT system				
อื่นๆ (โปรดระบุ) Other (please specify)				

6. การจัดสรรหน้าที่และความรับผิดชอบระหว่างภาครัฐและภาคเอกชน (โปรดทำเครื่องหมาย ✓ และโปรดให้รายละเอียดเพิ่มเติม)

Allocation of responsibilities between public sector and private sector. (Please put ✓ and please provide more details)

ประเภทกิจกรรม Type of activities	ภาครัฐ Public Sector	ภาคเอกชน Private Sector	ความคิดเห็น (ระบุหากต้องการจัดจ้างบุคคลภายนอก) Comments (Desire for outsource?)
การตรวจและวินิจฉัยโรค All clinical and diagnostic services	☒	☐	
การสอนและฝึกอบรม Teaching and training	☒	☒	
การบริหารจัดการทั่วไป General management services	☒	☒	
แผนกติต่อสอบถาม Helpdesk Services	☒	☒	
การบริการด้านอาหาร (ของผู้ป่วยและบุคคลภายนอก) Food services (patient and non-patient)	☐	☒	
การดูแลความสะอาด Housekeeping services	☐	☒	
การซักรีดเสื้อผ้า Laundry / linen services	☐	☒	
การทำความสะอาด (เช่น พื้นที่โดยรอบ ห้องผ่าตัด ฯลฯ) Cleaning services (e.g. general area, operating theatre, etc.)	☐	☒	
การกำจัดขยะของเสีย (เช่น ของเสียทางการแพทย์, ขยะทั่วไป, ของมีคม, ของเสียเป็นพิษ) Waste disposal (e.g. clinical waste, non-clinical waste, sharps, toxic	☐	☒	

ประเภทกิจกรรม Type of activities	ภาครัฐ Public Sector	ภาคเอกชน Private Sector	ความคิดเห็น (ระบุหากต้องการจัดจ้างบุคคลภายนอก) Comments (Desire for outsource?)
waste)			
ด้านเทคโนโลยีสารสนเทศและการสื่อสาร Information and communications technology (ICT)	☐	☒	
อื่น ๆ (โปรดระบุ) Other (please specify) ระบบเวชระเบียน/ medical records CT, MRI, X-Ray, hemodialysis	 ☐ ☐	 ☒ ☒	

8. ข้อมูลทางการเงิน

Financial Information

- รายได้

Revenue

- ประมาณการรายรับ 1,000 – 1,500 ล้านบาท ต่อปี

  Estimated revenue of Baht 1,000-1,500 million per year

  - รายละเอียดของโครงสร้างรายได้ในปัจจุบัน

    Details of current revenue structure

  - รายได้เฉลี่ยต่อหัวในการให้บริการในปัจจุบัน (ผู้ป่วยใน และผู้ป่วยนอก) และอัตราการเติบโตต่อปีของรายได้เฉลี่ยต่อหัว

    Average revenue per head (OPD vs IPD) and growth rate for revenue per head

  - ประมาณการความต้องการในการใช้บริการ และความสามารถ/ความเต็มใจในการจ่ายเพื่อใช้บริการ (เฉลี่ยต่อหัว)

    Forecasted demand for medical services and ability/ willingness to pay for the service (average per head)

  - รายละเอียดของรายได้อื่น เช่น ค่าเช่าและค่าจอดรถ ในปัจจุบัน (หากมี)

    Details of other income at present (e.g. rental and parking fee rate) (if available)

- ค่าใช้จ่ายและเงินลงทุน

Expenses and investment

  - รายละเอียดค่าใช้จ่ายในการดำเนินงานรายปีของโรงพยาบาล โดยแยกประเภทตามส่วนที่ผันแปร และส่วนที่คงที่

    Details of the hospital's annual operating expenses by category (including variable and fixed expenses)

  - ค่าใช้จ่ายในการบำรุงรักษาเป็นจำนวนเท่าใด (เป็นสัดส่วนเท่าใดของค่าใช้จ่ายในการดำเนินงานทั้งหมด)

    The amount of the hospital's maintenance costs (as a percentage of total operating expenses)

    - 10%

  - จำนวนของบุคลากร (แพทย์ พยาบาล และเจ้าหน้าที่) ในการดำเนินงาน และประมาณการค่าใช้จ่ายของบุคลากรดังกล่าว

    Number of operating personnel (Doctors, nurses, other staff) and the respective average annual personnel expenses

- 40% ของค่าใช้จ่ายในการดำเนินงานทั้งหมด

  40% of total operating expenses

  - ประมาณการขนาดของเงินลงทุนของโครงการ

    Estimated size of project capex based on the proposed size and services of the project

- 1,000 ล้านบาท

  Baht 1,000 million

- ประมาณการอัตรากำไรสุทธิ 10%

  Estimated profit margin of 10%

9. ข้อมูลด้านอื่นๆ

Other information

- ในเบื้องต้น มีข้อมูลของภาคเอกชนที่มีความพร้อม ความเชี่ยวชาญ ประสบการณ์ และความสนใจ
  ที่จะเป็นผู้ดำเนินโครงการตามมาตรฐานที่เจ้าของโครงการกำหนดไว้ หรือไม่ จำนวนของภาคเอกชนดังกล่าวมีมากน้อยเท่าใด
  โดยคำนึงถึงความสามารถทางเทคนิคและขนาดโครงการ ข้อจำกัดในการจัดสรรความเสี่ยง การจัดหาเงินทุน และข้อจำกัดเฉพาะทางอื่น ๆ ของโครงการ

  Preliminary, is there any information on the availability of private sector skills, experience and interest necessary to undertake the project and deliver services to the required standard? How

many parties of such private sector are available given the technical capability and project scale, constraints to risk allocation, financing, and other specific project features?

ประเภทเอกชนที่สนใจลงทุน/ Group of private sectors that might be interested upon investing in this project

- Health care operators group
- Constructor group
- Insurance provider group

ตัวอย่างโครงการที่ดำเนินการแล้วประสบความสำเร็จ/ Examples of successful projects

- ศูนย์โรคตา โรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง) สาขาสุขุมวิท
  Metta International Eye center, Sukhumvit branch
- โรงพยาบาลศิริราช ปิยมหาราชการุณย์
  Siriraj Piyamaharajkarun Hospital
- ศูนย์การแพทย์สิริกิติ์ โรงพยาบาลรามาธิบดี
  Queen Sirikit Medical Center at Ramathibodi Hospital
- ศูนย์การแพทย์ศรีพัฒน์ คณะแพทย์ศาสตร์ มหาวิทยาลัยเชียงใหม่
  Sriphat Medical Center, Faculty of Medicine, Chiang Mai University

- หลักการและเหตุผล/ principle and rationale

กรมการแพทย์มีโรงพยาบาลขนาดใหญ่ที่มีความเชี่ยวชาญหลายด้านและสถาบันเฉพาะทางในสังกัด ได้แก่
โรงพยาบาลราชวิถี เด่นด้านสูติ-นรีเวช หูคอจมูก โรงพยาบาลเลิดสิน เด่นด้านกระดูกและข้อ โรงพยาบาลนพรัตน์ราชธานี เด่นเรื่องโรคจากการทำงาน และเวชศาสตร์ฉุกเฉิน โรงพยาบาลเมตตาประชารักษ์ (วัดไร่ขิง) เด่นด้านจักษุวิทยา โรงพยาบาลสงฆ์ สถาบันเด็กแห่งชาติมหาราชินี สถาบันมะเร็งแห่งชาติ สถาบันโรคผิวหนัง สถาบันโรคทรวงอก สถาบันประสาทวิทยา สถาบันเวชศาสตร์ผู้สูงอายุ สถาบันธัญรักษ์ สถาบันพยาธิ โรงพยาบาลและสถาบันดังกล่าวนอกจากจะรับส่งต่อโรคเฉพาะทางที่ยุ่งยากซับซ้อนแล้ว ยังมีการผลิตแพทย์-พยาบาลเฉพาะทางหลายสาขา ทุกแห่งมีผู้ป่วยศรัทธา เชื่อมั่น มารับการรักษาเป็นจำนวนมากทำให้เกิดความแออัด และจากข้อมูลผู้มารับบริการพบว่า 35-50% ของผู้ป่วยจ่ายเงินเอง 30% เป็นสิทธิ์ราชการ 10-20% สิทธิ์ประกันสังคม และ 10-20% เป็นสิทธิ์บัตรทอง

ดังนั้นหากจัดบริการรูปแบบพิเศษ โดยทุกโรงพยาบาล/สถาบัน เอาจุดเด่นของแต่ละแห่งมารวมกัน โดยกำหนดค่าบริการที่สูงกว่าปรกติแต่ต่ำกว่าเอกชน จะทำให้กลุ่มจ่ายเงินเองและสิทธิ์ราชการที่จ่ายส่วนเกิน สามารถเลือกมารับบริการเพื่อความสะดวก และจะทำให้ความแออัดในโรงพยาบาล/สถาบันหลักลดลง ยังผลให้ผู้ป่วยรายได้น้อยที่ส่งต่อมาตามระบบได้รับบริการที่รวดเร็วขึ้น

Department of Medical Service has many large specialized hospitals in various field of medical services; for example, Rajavithi Hospital is specialized in Obstetrics-Gynecology and ENT, Lerdsin Hospital is specialized in Orthopedic, Nopparat Rajathanee Hospital is specialized in Occupational Related Diseases and Emergency medicine, and Mettapracharak Hospital is specialized in Ophthalmology. Additionally, other specialized hospitals/ medical institutes expecting to be co-partners under this project included Priest Hospital, Queen Sirikit National Institute of Child Health, National Cancer Institute, Institute of Dermatology, Central Chest Institute of Thailand, Neurological Institute and Hospital, and Institute on Drug Abuse Treatment. Producing competent and specialized doctors, these large hospitals are able to provide treatments for complex cases for both walk-in and referral, thus, being overcrowded with patients. The data showed that 35-50% of the patients paid by themselves, 30 % under CSMBS, 10-20% under Social Security and 10-20 % under Universal Coverage Scheme.

Hence, if combining the specialties of those hospital under one roof (excellence center) charging higher medical fees than normal hospitals (yet lower than private hospital), it could provide more convenience to those who are able to pay on their own or those civil servants who could pay in excess, while reducing the congestion from the main hospitals/ medical institutes (helping low-income patients to have faster access/ services from the main hospital).

C-5: Medical Excellence Centre PPP Project (follow up questions #1)

Objective: Development of a multidisciplinary specialised medical services facility to provide complex treatments by highly skills specialists

Medical Centre Facility:
Size of IPD: 200-250 beds (75,000 – 90,000 bed days)
Size of OPD: 1,500-2,000 outpatients daily
Support infrastructure: laboratory, pharmacy, hotel, staff accommodation facility, carpark, cafeteria, training centre, conference room, etc.
Land plot: 10,000-15,000 sq.m – availability in a suitable area needs to be confirmed
Estimated CAPEX: Baht 1 billion (to be confirmed)
Estimated annual revenue: Baht 1-1.5 billion (to be confirmed)
Estimated OPEX and maintenance costs: to be confirmed

PPP Project Principles:
Public sector: provision of medical services and medical centre operations
Private partner: development and maintenance of medical centre infrastructure and medical equipment, as well as provision of support services (security, car park, hotel, cafeteria, laundry, pharmacy – list to be confirmed)

Questions to clarify scope and costing assumptions:

5. Please confirm assumptions and sources of information used to quantify revenues and costs related to medical centre operations:
   - Total medical centre revenue estimates (revenue per patient by main specialty)
   - Inclusion of other revenue sources (car park, cafeteria, pharmacy, etc)
   - Medical centre construction costs and inclusions (design, building permits, equipment, etc)
   - Medical centre operating costs and inclusions (main cost categories for medical, non-medical and support services, including key assumptions & drivers)
   - Costs related to facility and equipment maintenance and replacement
   - Please identify costs and expenses that will be directly covered by MoPH / DMS (medical, non-medical and support)

6. Land plot availability and acquisition costs: who will be responsible for land acquisition and have land acquisition costs been considered?

7. Please confirm and clarify private sector's role and scope of services: What services have to be provided by the private partner (medical centre construction and maintenance, equipment procurement and service, carpark, hotel, pharmacy, etc)?

8. Are there any restrictions regarding revenue / profit sharing with the private partner?

C-6: Medical Excellence Centre PPP Project (follow up questions #2)

Area	Comments / Queries	Info request list
Project Value / Project Cost		
Project scope: no. of beds and no. of floor	• Please confirm the Project involves the development of 250 beds centre. • Please provide the number of floor for this centre. This input is required in order to calculate the Ground Floor Area / land area for the Project.	• Justification of the size requirement • No. of beds by medical department • No of floors
Land area	• What is the estimated land area for this Project? Has such information being computed? If not, please respond to the subsequent queries below.	5 rai. Please provide further supporting

Land area: Key drivers / assumptions	• Based on preliminary research, the computation of a hospital land area requires the following assumptions:
	  • Built area per bed
	  • Allowance for built area (circulation, walls, utilities, etc):
	  • Ground Floor Area (GFA): Built area over no. of floor
	  • Allowances for external services (cables, pipes, landscape):
	• Parking:
	  • Will the parking be part of the building or external?
	  • Key drivers include number of parking per bed and area of one parking (in sqm)
	• Land cost per sqm is required in order to compute the cost for the land
		• Built area per bed: 125 sqm
		• Allowance for built area (circulation, walls, utilities, etc): 36% of built area
		• Ground Floor Area (GFA): Built area over no. of floor
		• Allowances for external services (cables, pipes, landscape): 40% of GFA
		• Number of parking per bed: 2.5 parking
		• Area of one parking: 15 sqm
		• Land cost per sqm: Baht 45,000 per sqm
		•

Development cost, without equipment	• One of the methods to calculate development cost is to assume the development cost per bed.	• A range of development cost per bed.
Equipment	• Please identify a list of major equipment investment for the Excellence Centre	

Number of patients		
Total patients (volume) / capacity	• Based on the information received, it is estimated that the total patients for the Excellence Centre will be approximately 30% of the existing total patients for DMS (~ 789k patients).	• Patients forecast by specialties • Outpatients forecast

	• It is critical to take note the following has to be taken into consideration when projecting the total patients:
	  • Capacity of the hospital / beds available for each specialties
	  • Patients forecast by specialties (to match with capacity and revenue projections as each specialties will charged differently)
	  • Outpatients forecast	

Revenue		
Clinical revenue		
Average Top 10 services	• What are the major types of revenue / specialties for the Medical Excellence Centre? • Total revenue forecast is also subjected to average length of stay for the patients by specialties	• average Top 10 services revenue per inpatient • average charge per outpatient • Patients allocation for each specialties (inpatient and outpatient) • average length of stay for the patients by specialties
Non-clinical revenue		
Non-clinical revenue	• Please identify list of non-clinical revenue. • Please provide the composition of non-clinical revenue from the total revenue.	• List of non-clinical revenue • % of non-clinical revenue over total revenue

Others		
Area	Queries	Info request list
Existing operating expenses	• Please provide the operating expenses of one of the existing hospital under DMS which has similar capacity with Excellence Centre.	• Latest operating expenses / P&L
Net profit margin	• What is the expected net profit margin for this project?	• Net profit margin

C-7: Medical Excellence Centre PPP Project (follow up questions #3)

The following next steps have been discussed with the DMS representatives during the workshop session on 30th Nov and 1st Dec 2015:

1. **Demand assessment** – justification of the Medical Centre capacity (number of beds) and types of services offered based on the current demand at DMS hospitals. The key question to be answered if planned capacity of 250 beds would be sufficient to meet existing demand (potential to attract 30% of DMS patients) and future demand. Another question raised was the justification of the relationship between the demand and the proposed hospital size indicated in item 1.2 in C-6 (e.g. ICU 20 beds, hemodialysis center of 20 units, dentistry 10 units and etc)

2. **PPP Project scope and business case** – analysis of potential non-medical revenue sources that could be available to the private partner and risk allocation between DMS and private sector

3. **Financial forecast for the Medical Center** –assessment of what level (if any) of the Government funding (viability gap funding) would be required to make the PPP project feasible and bankable. Development of a profit & loss projections for the Medical Centre will be required based on planned medical services and more detailed forecast of number of patients (IPD, OPD, other medical related revenue) as well as operating expenses (medical staff salary and other medical related expenses).

Based on the information previously received from DMS (no of patients from relevant medical services / hospitals), the following template was developed in order to support the demand assessment and to compute the number of patients by specialty. We were informed that the information on the number of patients provided to us previously will need to be reviewed to ensure that it is up to date. Table below illustrates the work-in-progress computation for the needs assessment:

Hospital	Medical Services	IPD (Actual) – to be reviewed	IPD (New Hospital)*	Ave. length of stay	no. of beds	OPD (Actual) – to be reviewed	OPD (New Hospital)*	OP per day
Rajvithi	ENT	1,665	500	3	4	446,110	133,833	367
Nopparat	ER	20,796	6,239	3	51	248,041	74,412	204
Mettapracharah (Rai-king)	Eye	7,000	2,100	3	[illegible]	182,500	54,750	150
Lerdsin	Ortho	19,593	5,878	3	48	613,385	184,016	504
Child institute	Pediatric	9,724	2,917	3	24	373,100	111,930	307
Pathology	X-Ray, Lab	-	-	3	-	29,494	8,848	24
Dermatology	Skin	253	76	3	1	185,292	55,588	152
Neurological	Neuro	3,974	1,192	3	10	226,846	68,054	186
Chest (CVT)	CVT	40,150	12,045	3	99	4,354	1,306	4
Dentistry	Dental	-	-	3	-	100	30	0
Rehab (Sirindhon)	Rehab	368	110	3	1	106,611	31,983	88
Cancer	Cancer	8,231	2,469	3	20	301,622	90,487	248
Thanyaburi	Psychiatry & narcotics	3,549	1,065	3	9	20,351	6,105	17
TOTAL		**115,303**	**34,591**		**284**	**2,737,806**	**821,342**	**2,250**

* Based on DMS' assumption to allocate 30% of the existing patients to the new Medical Excellence Center

Appendix D – Extractions of Marshall Valuation Service Report

D-1: Overview of hospital by construction classes

HOSPITALS

67. EXCELLENT CLASS A

68. GOOD CLASS A

69. GOOD CLASS A

70. GOOD CLASS A

71. GOOD CLASS A

D-1: Overview of hospital by construction classes (cont'd)

72. AVERAGE CLASS B

75. AVERAGE CLASS A

73. AVERAGE CLASS A

76. AVERAGE CLASS B

74. AVERAGE CLASS A

77. LOW — AVERAGE CLASS C

SUMMARY OF ILLUSTRATIONS

67. The Excellent Class A with highly detailed exterior walls with good finishes.

68. – 71. The Good Class A general hospital has complete facilities and good exterior detail although it is the interior, particularly the mechanical and electrical items, which have the largest cost variations and may show it to be of lower or higher cost than the basic cost for good quality.

72. – 73. These appear to be Average general hospitals, but closer inspection may put them in the upper half of that cost range.

74. – 76. The Average Class A or B is a plain building and may lack many of the interior details of the Good quality.

77. A Low — Average Class C hospital, typical of many doctor owned hospitals.

D-2: Cost per unit area of hospitals and hospital basement

Class	Type	Exterior Walls	Interior Finish	Lighting, Plumbing and Mechanical	Heat	Cost/Sq Metre (USD)	Cost/Cubic Foot (USD)	Cost/Sq Foot (USD)
A	Excellent	Marble, granite, best metal and glass, highly decorative	Plaster, vinyl and tile wall surfaces, best ceilings and floors	*Oxygen, pneumatic conveyor, signal, much automation	Complete HVAC	4,998.91	38.70	464.41
	Good	Brick, metal and glass, stone trim, some ornamentation	Plaster or drywall, best enamels or vinyl walls, ceramic, vinyl, rubber tile	*Signal system, oxygen piping, pneumatic conveyors	Complete HVAC	3,821.11	29.58	354.99
	Average	Metal and glass, concrete, brick panels, little ornamentation	Drywall, acoustic ceilings, vinyl and ceramic floors, linoleum	*Signal system, oxygen piping, adequate lighting and plumbing	Complete HVAC	2,932.01	22.70	272.39
	Low cost	Concrete panels, brick, very plain, small entrance	Drywall, acoustic ceilings, vinyl composition, minimum detail	*Signal system, adequate lighting and plumbing	Complete HVAC	2,253.66	17.45	209.37
B	Excellent	Marble, granite, face brick, highly decorative	Plaster, vinyl and tile wall surfaces, best ceilings and floors	*Oxygen, pneumatic conveyor, signal, much automation	Complete HVAC	4,894.18	37.89	454.68
	Good	Brick, metal and glass, stone trim, some ornamentation	Plaster or drywall, best enamels or vinyl walls, ceramic, vinyl floors	*Signal system, oxygen piping, pneumatic conveyors	Complete HVAC	3,748.78	29.02	348.27
	Average	Metal and glass, concrete, brick, little ornamentation	Drywall, acoustic ceilings, vinyl and ceramic floors, linoleum	*Signal system, oxygen piping, adequate lighting and plumbing	Complete HVAC	2,882.49	22.32	267.79
	Low cost	Concrete panels, brick, very plain, small entrance	Drywall, acoustic ceilings, vinyl composition, minimum detail	*Signal system, oxygen piping, adequate lighting and plumbing	Complete HVAC	2,220.18	17.19	206.26
C	Excellent	Stone ashlar, best metal or concrete and glass panels	Plaster, vinyl and tile wall surfaces, best ceilings and floors	*Oxygen, pneumatic conveyor, signal, much automation	Complete HVAC	3,886.77	30.09	361.09
	Good	Brick, metal and glass, stone, good ornamentation	Plaster or drywall, best enamels or vinyl walls, ceramic, vinyl floors	*Signal system, oxygen piping, good lighting and plumbing	Complete HVAC	2,911.12	22.54	270.45
	Average	Metal and glass, brick, block, concrete, little ornamentation	Plaster or drywall, acoustic ceilings, vinyl or tile floors, some ceramic	*Signal system, oxygen piping, adequate lighting and plumbing	Complete HVAC	2,187.57	16.94	203.23
	Low cost	Brick, block, tilt-up, small entrance, very plain	Plaster or drywall, acoustic tile, vinyl composition, minimum detail	Adequate lighting and plumbing, signal system, few extras	Complete HVAC	1,628.92	12.61	151.33
D	Good	Brick veneer, EIFS, good entrance and ornamentation	Plaster or drywall, enamel or vinyl, ceramic tile and vinyl floors	Signal system, oxygen piping, good lighting and plumbing	Complete HVAC	2,768.50	21.43	257.20
	Average	Brick veneer, good stucco or siding with brick or stone trim	Plaster or drywall, acoustic ceilings, vinyl or tile floors, some ceramic	Adequate lighting and plumbing, signal system, some extras	Complete HVAC	2,089.18	16.17	194.09
	Low cost	Stucco or siding, little trim or ornamentation	Drywall or plaster, acoustic tile, vinyl composition, minimum extras	Adequate lighting and plumbing, minimum signal system	Complete HVAC	1,577.57	12.21	146.56

Class	Type	Exterior Walls	Interior Finish	Lighting, Plumbing and Mechanical	Heat	Cost/Sq Metre (USD)	Cost/Cubic Foot (USD)	Cost/Sq Foot (USD)
S	Low cost	Insulated panels	Metal or drywall, acoustic tile ceilings, vinyl composition	Minimum general hospital facilities	Complete HVAC	1,526.23	11.82	141.79

Hospital basements

Class	Type	Exterior Walls	Interior Finish	Lighting, Plumbing and Mechanical	Heat	Cost/Sq Metre (USD)	Cost/Cubic Foot (USD)	Cost/Sq Foot (USD)
A-B	Finished general hospital	Reinforced concrete, plaster interior	Hospital finish, administrative and technical facilities and services	Adequate lighting and plumbing for hospital facilities	Complete HVAC	1,646.78	12.75	152.99
	Finished OP	Heavy reinforced concrete, plaster interior	Outpatient finish, heavy shielding, imaging and radiation, some offices	Adequate lighting and plumbing for diagnostic facilities	Complete HVAC	1,943.12	15.04	180.52
CDS	Finished general hospital	Reinforced concrete, plaster or drywall interior	Hospital finish, administrative and technical facilities and services	Adequate lighting and plumbing for hospital facilities	Complete HVAC	1,175.00	9.10	109.16
	Finished OP	Heavy reinforced concrete, plaster or drywall interior	Outpatient finish, heavy shielding, imaging and radiation, some offices	Adequate lighting and plumbing for diagnostic facilities	Complete HVAC	1,551.20	12.01	144.11

Notes:

Hospital equipment

Group I equipment is permanent equipment, installed in or attached to the building, part of the general contract, and included in calculator costs.
Group II equipment is equipment often installed and becoming part of the real property, but typically not part of the general contract, such as autoclaves, permanent surgical lights, imaging equipment, etc.
Group III equipment is movable personal property such as furniture, fixtures, instruments, etc.
Group II and III equipment is not included in calculator costs. These definitions are for the purposes of this manual and do not conform entirely to Medicare or other divisions of hospital equipment.

Elevators

Base costs of buildings marked with an asterisk* include elevator cost. If the subject building has no elevators, deduct the following from the base costs.

Classes	Grade	Sq Metre ($)	Sq Foot ($)
A and B	Excellent	131.32	12.20
	Good	88.70	8.24
	Average	60.49	5.62
	Low cost	41.23	3.83
C	Excellent	66.84	6.21
	Good	42.19	3.92
	Average	26.59	2.47

Complete Heating, Ventilating, and Air Conditioning (HVAC)

Because of the higher requirements for hospitals and surgical Centres, the average heating and air conditioning costs are listed separately below. The moderate climate cost is included in the base cost in the tables. The basement costs include low quality HVAC. If a cubic foot cost is used, use one-twelfth the difference shown to adjust the base cubic foot costs.

Sq Metre Costs ($)					Sq Foot Costs ($)				
Class		Mild Climate	Moderate Climate	Extreme Climate	Class		Mild Climate	Moderate Climate	Extreme Climate
A - B	Excellent	411.72	524.21	667.37	A - B	Excellent	38.25	48.70	62.00
	Good	322.92	408.49	516.67		Good	30.00	37.95	48.00
	Average	253.49	320.77	406.34		Average	23.55	29.80	37.75
	Low cost	198.60	251.34	317.54		Low cost	18.45	23.35	29.50
C, D, S	Excellent	363.29	459.62	581.26	C, D, S	Excellent	33.75	42.70	54.00
	Good	285.25	361.13	457.47		Good	26.50	33.55	42.50
	Average	223.89	284.17	360.59		Average	20.80	26.40	33.50
	Fair	198.60	251.34	317.54		Fair	18.45	23.35	29.50
	Low cost	175.99	221.74	279.86		Low cost	16.35	20.60	26.00

D-3: General information – General Hospitals

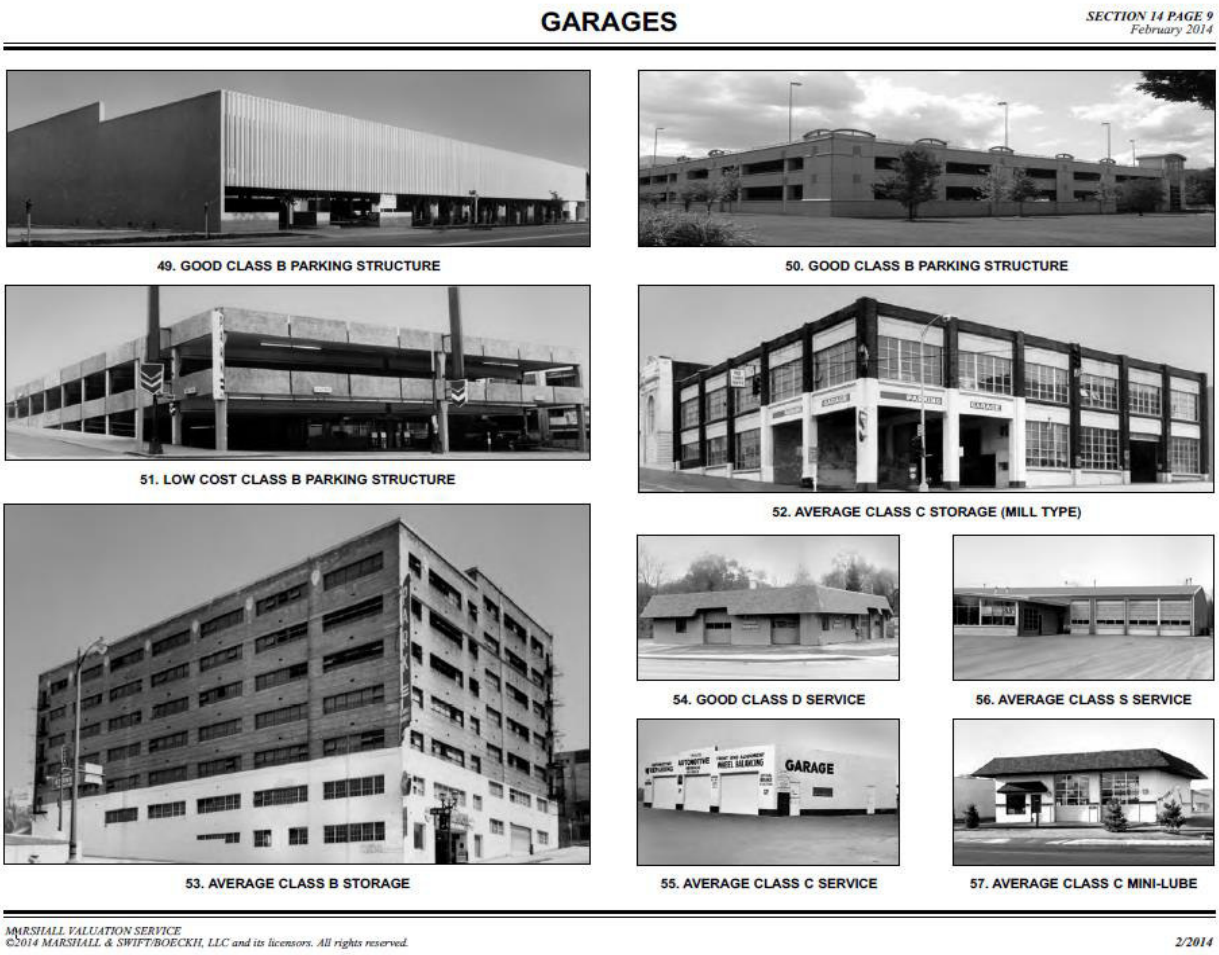
The rules of thumb listed here should not be used for actual appraisals, but should be considered budgeting guides and checks only. The costs in some cases are based on only a few construction projects. They are presented here in conformity with Marshall Valuation Service's policy of furnishing all possible information to the users of the Marshall Valuation Service, with the knowledge that they will use the data with consideration for its probable degree of accuracy. Size and shape, Current Cost and Local Multipliers should be used for adjustment.

The median area per bed in general hospitals is 1,225 square feet (113.8 square meters) with a typical range of 630 to 2,425 square feet (58.5 to 225.3 square meters). Some large medical complexes with extensive outpatient and wellness facilities will range up to 4,000 square feet (371.6 square meters). Regional hospitals, particularly teaching, and newer hospitals with a high percentage of private rooms tend toward the higher area per bed, while older public hospitals with more ward areas and investor owned hospitals tend toward the lower side of the range. The following are costs per bed of completely equipped general hospitals, including Group I and II equipment, excluding extremes, at designed capacity.

Classes	Average cost (USD)	Typical cost range (USD)	Typical cost range after local multiplier adjustment (USD)*
A and B	575,000	313,000 – 1,082,000	157,500 – 541,000
C and D	385,000	204,000 – 763,000	102,000 – 381,500

* Assuming local multiplier of 0.5 times

D-4: Overview of parking structures (Picture no. 49 / 50 / 51)



D-5: Cost per unit area of parking structures

Class	Type	Exterior Walls	Interior Finish	Lighting, Plumbing and Mechanical	Heat	Cost/Sq Metre (USD)	Cost/Cubic Foot (USD)	Cost/Sq Foot (USD)
A	Good	Partial walls, brick or concrete, ornamentation	Unfinished, except good office and service area	*Reading-level lighting, restrooms and service plumbing	None	740.56	4.91	68.80
	Average	Partial walls, brick, block, concrete, little trim	Unfinished, small office and service area	*Low-level lighting, drains, minimum restroom for office	None	569.20	3.78	52.88
B	Good	Partial walls, brick or concrete, ornamentation	Unfinished, except good office and service area	*Reading-level lighting, restrooms and service plumbing	None	696.75	4.62	64.73

Class	Type	Exterior Walls	Interior Finish	Lighting, Plumbing and Mechanical	Heat	Cost/Sq Metre (USD)	Cost/Cubic Foot (USD)	Cost/Sq Foot (USD)
	Average	Partial walls, brick, block, concrete, plain finish	Unfinished, small office and service area	*Low-level lighting, drains, minimum restroom for office	None	540.89	3.59	50.25
	Low cost	Low parapets, precast frame and floors, minimum finish	Unfinished, minimum extras	*Minimum lighting and plumbing	None	421.63	2.80	39.17
S	Low cost	Demountable type, exposed steel frame	Unfinished, some masonry shear walls, minimum extras	Low-level lighting, drains, minimum personnel plumbing	None	394.72	2.62	36.67
	Cheap	Demountable type, exposed steel frame, cable rails	Unfinished, no extras	Minimum lighting, drains only	None	309.68	2.06	28.77

Notes:

Elevators

Parking structure buildings with elevators included in the base costs are marked with an asterisk*. If none are found, deduct the following from the base costs for buildings on this page which are so marked.

Grade	Cost/Sq Metre ($)	Cost/Sq Foot ($)
Good	27.13	2.52
Average	18.19	1.69
Low cost	13.24	1.23

General Information – Parking Structures

The following are based on a cost per space and average area per space. The median number of stories is 4, with 5 levels of parking and a range from 1 to 9 stories.

Area per Space					
Low		Average		High	
Sq Metre	Sq Foot	Sq Metre	Sq Foot	Sq Metre	Sq Foot
28.8	310	32.5	350	40.9	440

Cost per Space (USD)		
Low	Average	High
9,900	14,500	21,500

Appendix E – Questionnaire sent to Siam Commercial Bank

Questions for SCB

Overall view on the potential healthcare PPP project:

1. From the lender's perspective, would you consider funding of the PPP project in social infrastructure sector (hospital or medical centre)?

2. Based on the preliminary information below, please advise what issues you would consider relevant for assessment of the project bankability:

Project A -Greenfield mid-size general hospital:

Project value: approximately Baht 500 million

Private partner's scope: design, construct and maintain hospital facility

Public sector scope: provision of medical services

Source of project revenue: availability payment from the government after hospital is operational

Project B – Specialized Medical Excellence center:

Project value: more than Baht 1 billion

Private partner's scope: design, construct and maintain hospital facility. Option to participate in provision of medical services (TBD)

Public sector scope: provision of medical services

Source of project revenue: cash flow from hospital operation with additional funding provided by the government (TBD)

3. Has SCB financed PPP projects in the past?

4. Would you consider funding of several smaller project of similar nature under a single PPP contract (ie. bundling rural public hospital facilities of similar size in different areas) as compared to a single project?

5. How do you assess current interest of private investors and lenders to participate in Thai PPP project?

Funding structure:

6. What would be the minimum equity investment? Are there any other mandatory requirements for private investor?

7. What facility and tenor could be available if PPP contract is signed for 15-20 years?

8. Is there a minimum / maximum funding amount?

9. Please advise on standard fees structure (arrangement and commitment), rate structure and current margins.

10. What is the minimum ADSCR if project is funded by the government?

11. What is the minimum ADSCR if funding repayment is linked to operational cash flow/commercial revenue?

12. What are the main risks when lending to PPP project funded by the government?

13. What would be your required security, if any?

14. When financing the PPP project, what would be your view upon having the government budget on availability payment subjected to Cabinet's approval on an annual basis given the PPP contract has received prior Cabinet's approval?

Appendix F: Medical Excellence Center preliminary financial projections

Figures in Baht 'mil	NPV	Total	1	2	3	4	5	6	7	8	9	10	11
Revenue													
Clinical revenue													
Inpatients	1,747	5,355	-	-	210	215	220	226	231	237	243	249	255
Outpatients	5,819	18,966	-	-	601	629	657	687	719	751	785	821	859
Total Clinical Revenue	7,566	24,321	-	-	811	844	878	913	950	988	1,029	1,070	1,114
Non-Clinical Revenue	1,513	4,864	-	-	162	169	176	183	190	198	206	214	223
Total Revenue	**9,080**	**29.185**	-	-	973	1,012	1,053	1,096	1,140	1,186	1,234	1,284	1,377
Operating Expenses	**(7,945)**	**(25,537)**	-	-	(852)	(886)	(921)	(959)	(997)	(1,038)	(1,080)	(1,124)	(1,170)
EBITDA	**1,135**	**3,648**	-	-	**122**	**127**	**132**	**137**	**142**	**148**	**154**	**161**	**167**
			-	-									
Profit for the Year	**1,135**	**3,648**			**122**	**127**	**132**	**137**	**142**	**148**	**154**	**161**	**167**

Figures in Baht 'mil	NPV	Total	12	13	14	15	16	17	18	19	20	21	22
Revenue													
Clinical revenue													
Inpatients	1,747	5,355	262	268	275	282	289	296	304	311	319	327	335
Outpatients	5,819	18,966	898	938	981	1,026	1,072	1,121	1,172	1,266	1,281	1,340	1,401
Total Clinical Revenue	7,566	24,321	1,159	1,207	1,256	1,308	1,361	1,417	1,476	1,537	1,600	1,667	1,736
Non-Clinical Revenue	1,513	4,864	232	241	251	262	272	283	295	307	320	333	347
Total Revenue	**9,080**	**29.185**	1,391	1,448	1,507	1,569	1,634	1,701	1,771	1,844	1,920	2,000	2,083
Operating Expenses	**(7,945)**	**(25,537)**	(1,217)	(1,267)	(1,319)	(1,373)	(1,429)	(1,488)	(1,550)	(1,614)	(1,680)	(1,750)	(1,823)
EBITDA	**1,135**	**3,648**	**174**	**181**	**188**	**196**	**204**	**213**	**221**	**231**	**240**	**250**	**260**
Profit for the Year	**1,135**	**3,648**	**174**	**181**	**188**	**196**	**204**	**213**	**221**	**231**	**240**	**250**	**260**

Key Assumptions:

Inpatients:

Total no. of beds in service: 200 beds
Average length of stay per admission: 3 days
Average occupancy rate: 80%
Inpatient charge per day: Baht 10,000

Outpatients:

Number of outpatients per day: 1,500
Percentage annual growth: 2%
Outpatient charge per day: Baht 1,000

Profit Margin: 10%

Note: The financial projection is for illustration only. The key assumptions above are preliminary as no detailed information / inputs were provided in order to compute the financial forecast.

Appendix G – Reports, presentations and workshops materials

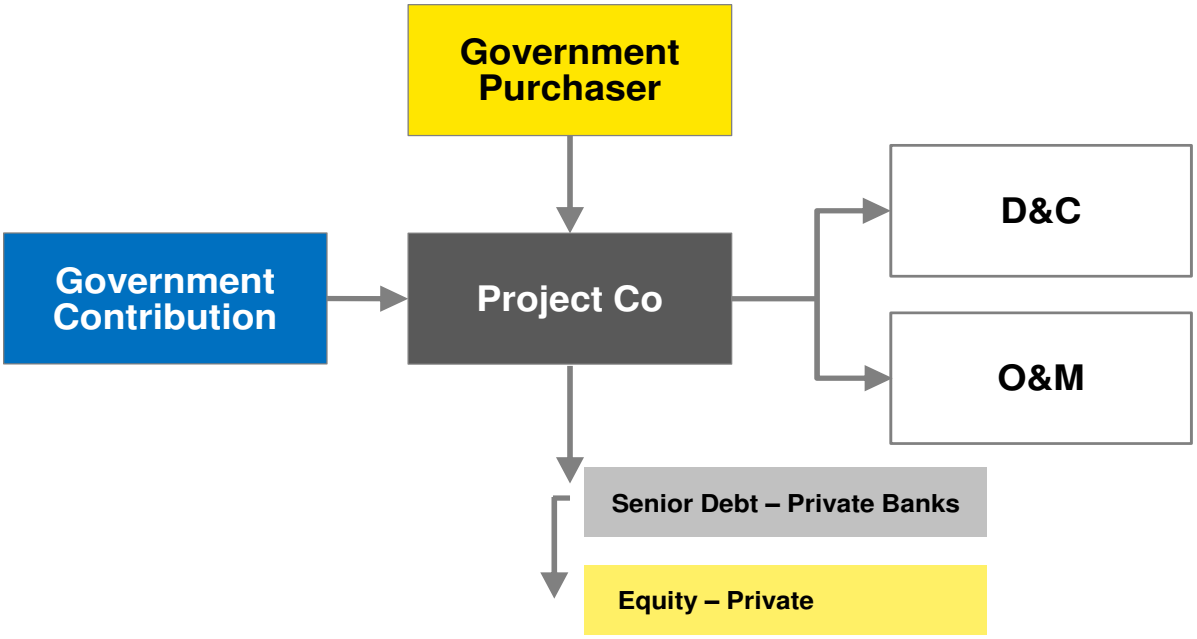
No	Subject	Date
Reports		
1	Inception Report	July 2014
2	Mid-Term Report	June 2015
Meetings and presentations		
3	Training Workshop for MoPH PPP in the Health Sector	28 August 2014
4	Inception Report Presentation	29 August 2014
5	Introductory Meeting with Ministry of Education	7 November 2014
6	MoPH Working Group Session	4 December 2014
7	Education Sector Workshop	16 January 2015
8	Interim Report Discussion with ADB	5 March 2015
9	MoPH PPP Workshop	7 April 2015
10	ADB / MoPH Working Session	27 May 2015
11	Update Meeting with ADB / MoPH	8 June 2015
12	Revised Work Plan Meeting with MoPH	1 July 2015
13	Legal briefing (SPI)	21 July 2015
14	Meeting with MoPH: MoPH PPP Unit website content	August 2015
15	Update Meeting with ADB	28 August 2015
16	Project Update: Simulation Study Options	4 September 2015
17	Discussion with SEPO	9 September 2015
18	Discussion with Bureau of the Budget	10 September 2015
19	Update meeting with DMS	30 September 2015
20	Update meeting and workshop preparation with ADB/MoPH	1 October 2015
21	Meeting with Construction Companies	15 October 2015
22	Final Report presentation	November 2015
Workshop materials		
23	Workshop material Session 1	24th /25th November 2015
24	Workshop material Session 2	30th November / 1st December 2015

Appendix H – Global Health PPP case studies

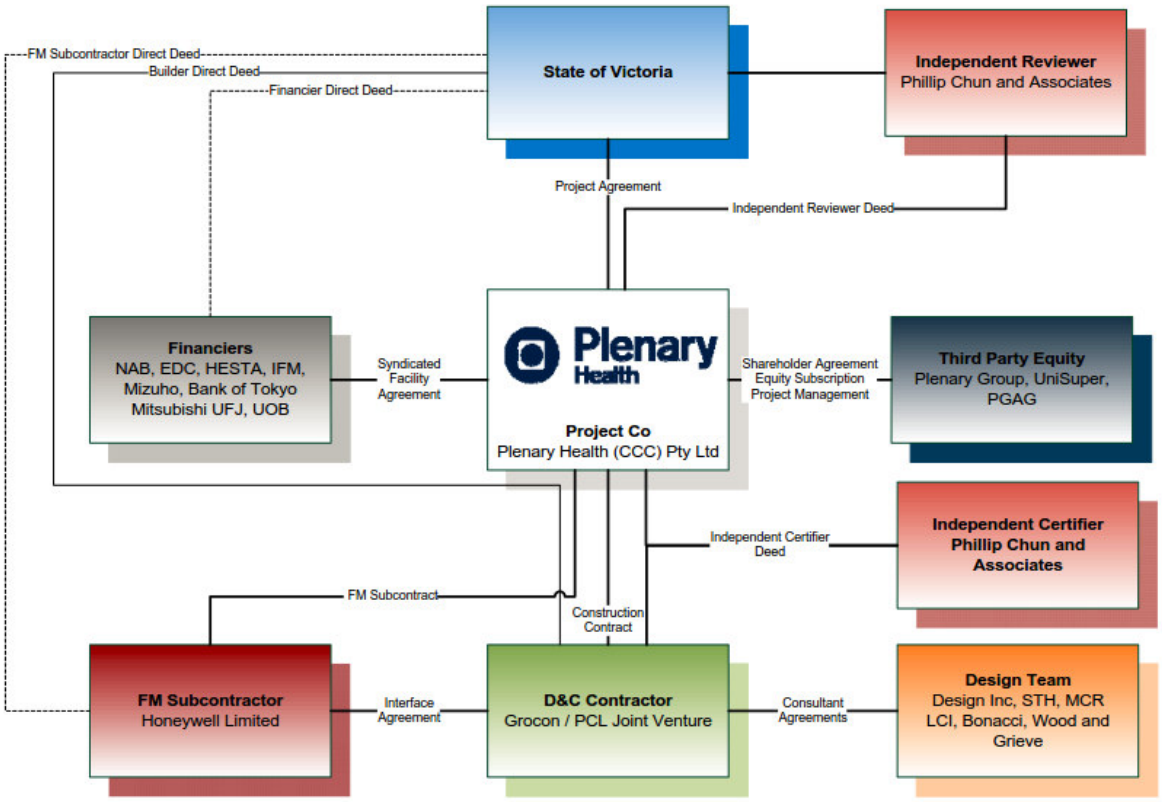
Victorian Comprehensive Cancer Centre (VCCC)

Victorian Comprehensive Cancer Centre	
Deal Value	1.2B USD (26% Debt / 74% Equity)
Financing Partners	State / Local Government for Equity and Banking Consortium for Debt
PPP Arrangement	• Design and Construction of the Facility • Service delivery over the Concession Period • Further Expansion of the Facilities
Why PPP Was Chosen	• Better Value for Money • Alignment with Government Policy • Private Sector Efficiency • Risk Sharing
Transferred Risks	• Site Risks • D&C Risk • Commissioning • Operational • Tax • Finance Risk
Innovation Achieved	• Optimised Asset Utilisation • Commercialisation of core public services
Payment Mechanism	Payments on a monthly basis, based on the actual design and construction completed. Service payments made for the cost of construction, delivering the service, interest service, and equity return

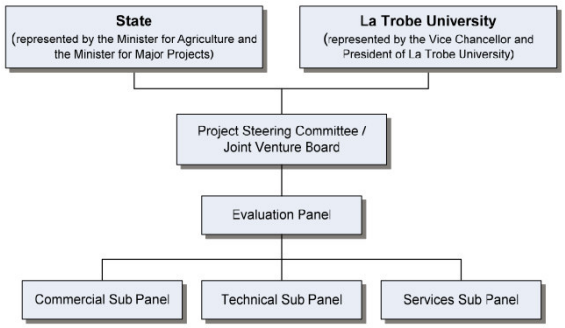
Government contribution:



PPP contractual structure

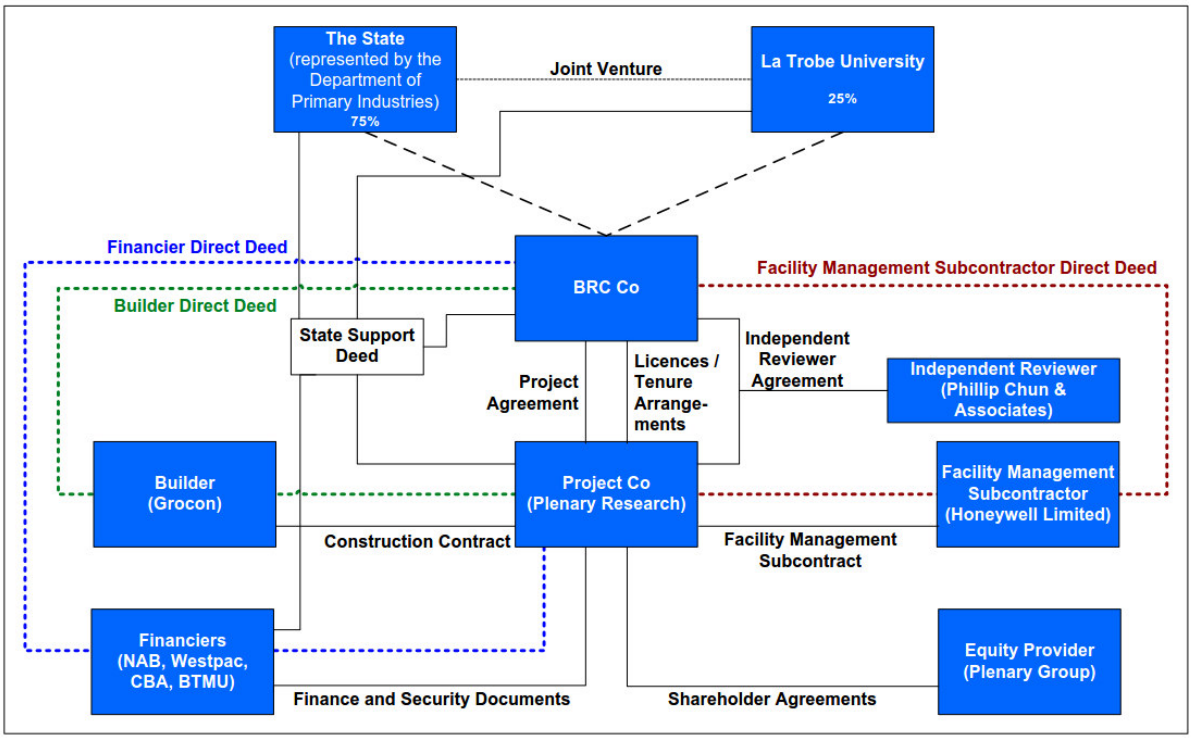


Biosciences Research Lab



Biosciences Research Lab	
Deal Value	0.2B USD
Financing Partners	Banking Consortium for Debt
PPP Arrangement	• Design and Construction of the Facility • Service delivery over the Concession Period • Financing of the Project
Why PPP Was Chosen	• Whole of Life Efficiencies • Improved Asset Quality • Scientific interface • Risk Sharing • Design Innovation
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Accreditation Risk • Operational • Tax • Finance Risk
Innovation Achieved	• Collaborative Science Support • Commercialisation of services • New opportunities to access research funding
Payment Mechanism	Payments to be made over the operating phase of the project in the form of a QSP, with an allowance for the capital cost and facilities maintenance.

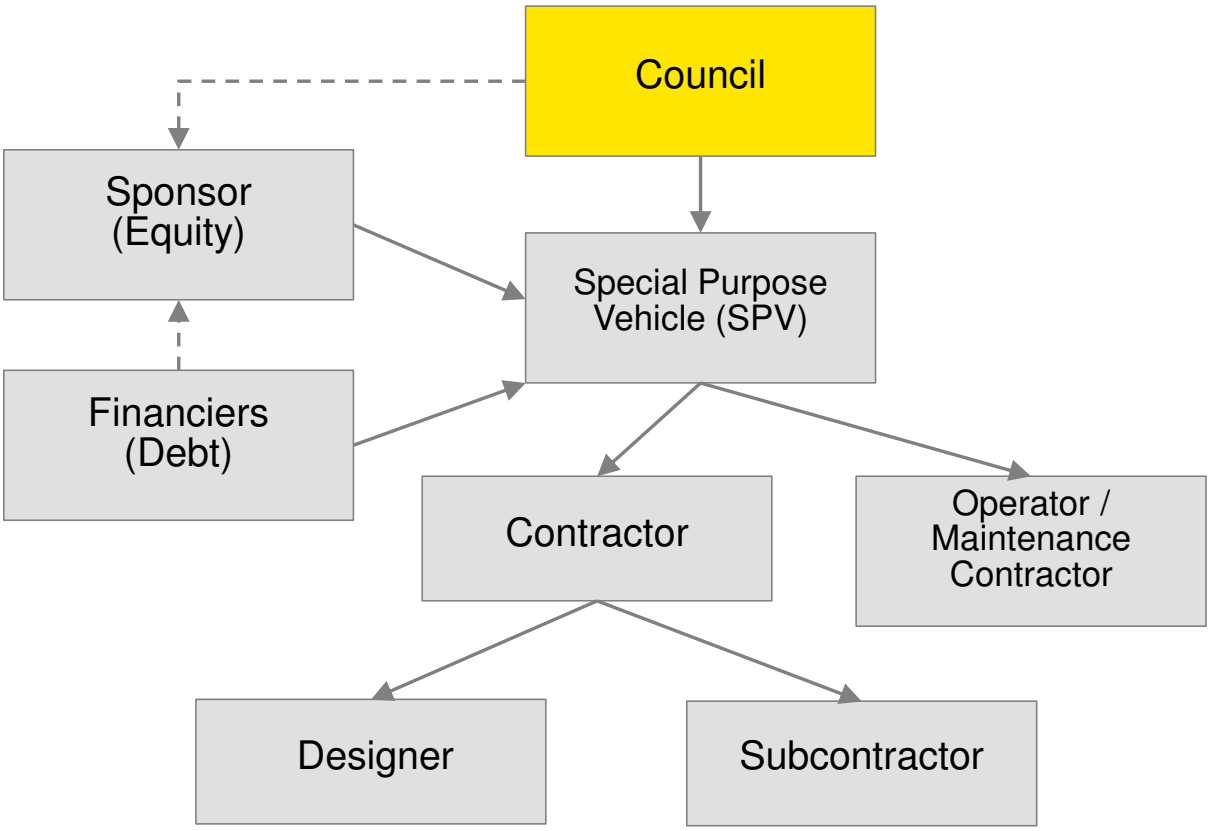
PPP contractual structure



New Royal Adelaide Hospital

New Royal Adelaide Hospital	
Deal Value	2.7B USD
Financing Partners	Banking Consortium for Debt / PPP Consortium, Bank Group for Equity.
PPP Arrangement	• Design and Construction of the Facility • Service delivery over the Concession Period • Contracting out of Hospital Services to sub contractors
Why PPP Was Chosen	• Whole of Life Efficiencies • Improved Asset Quality • Risk Sharing • Design Innovation
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Operational • Tax • Finance Risk
Innovation Achieved	• ICT integration • Robotics • Patient Support Services
Payment Mechanism	Payments to be made over the operating phase of the project in the form of a QSP, with an allowance for the capital cost and facilities maintenance.

PPP contractual structure

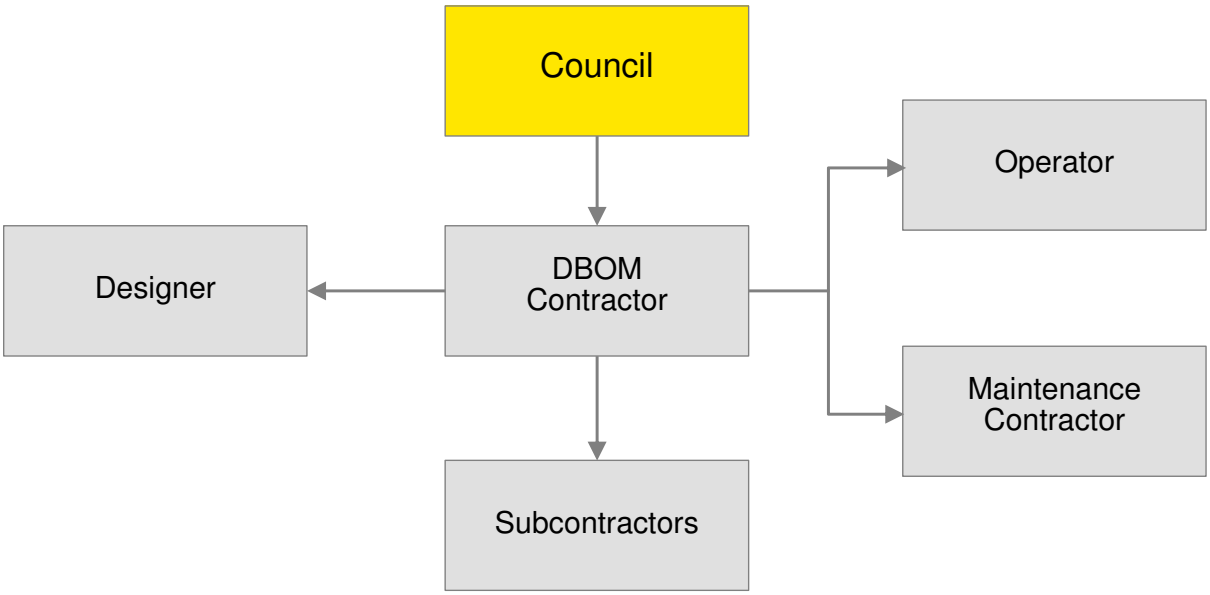


Midland Hospital

Midland Health Centre	
Deal Value	0.4B AUD (Construction)– Government Funding
Financing Partners	State and Commonwealth Funding
PPP Arrangement	• Design and Construction of the Facility • Transfer of patients from existing facilities • Service delivery over the Concession Period • Clinical Service delivery
Why PPP Was Chosen	• Whole of Life Efficiencies • Improved Maintenance • Speed of Project Delivery • Risk Sharing • Maximisation of service quality
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Accreditation Risk • Operational • Tax • Finance Risk
Innovation Achieved	• Improved medical service such as cardiology • Expanded medical facilities and patient beds
Payment Mechanism	Payments to be made over the operating phase of the project in the form of a QSP, with an allowance for the capital cost and facilities maintenance.

PPP contractual structure

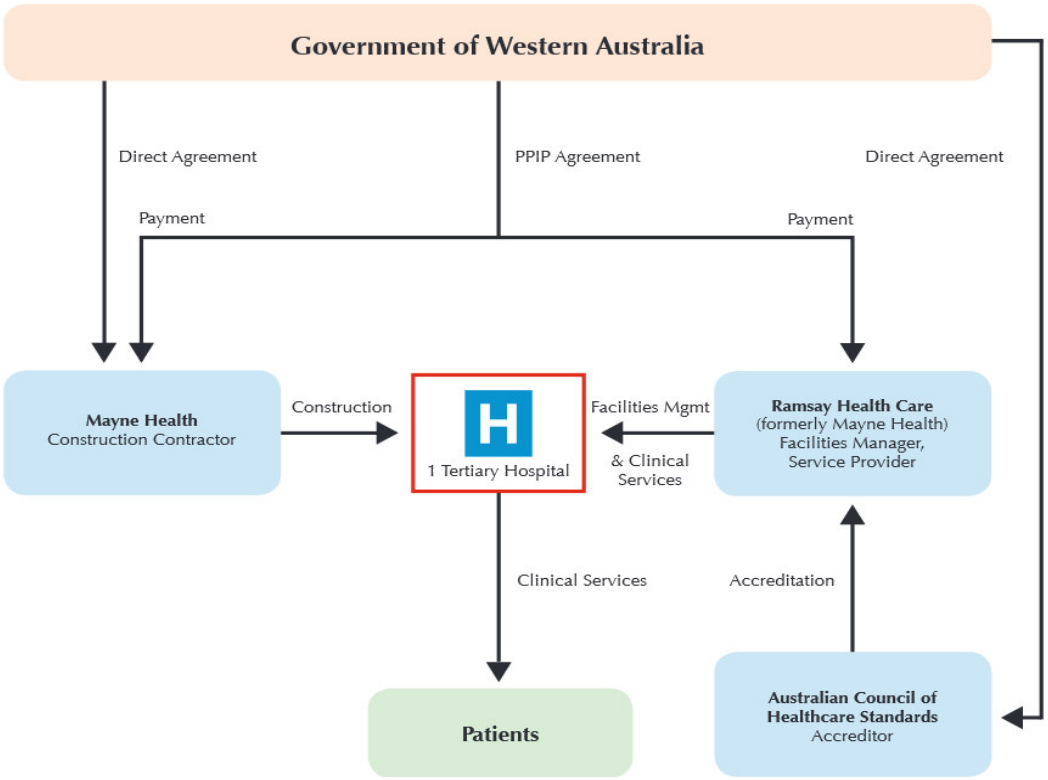
Yea



Joondalup Health Campus

Joondalup Health Campus	
Deal Value	0.2B AUD
Financing Partners	State and Commonwealth Funding with private equity
PPP Arrangement	• Design and Construction of the Facility • Service delivery over the Concession Period • Clinical Service delivery
Why PPP Was Chosen	• Whole of Life Efficiencies • Improved Maintenance • Speed of Project Delivery • Risk Sharing • Maximisation of service quality
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Accreditation Risk • Operational • Tax • Finance Risk
Innovation Achieved	• Improved medical service such as dialysis
Payment Mechanism	Payments to be made over the operating phase of the project in the form of a QSP, with an allowance for the capital cost and facilities maintenance.

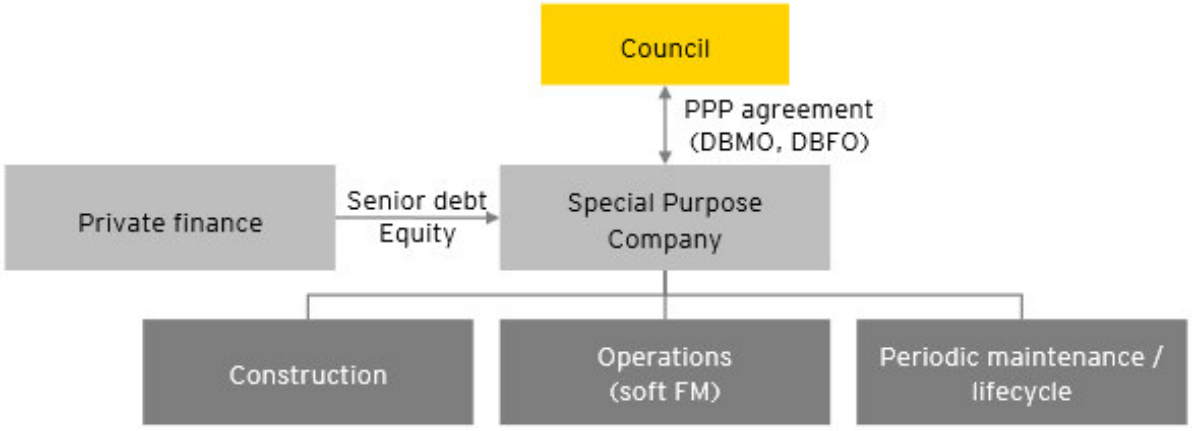
PPP contractual structure



Northern Beaches Hospital

Northern Beaches Hospital	
Deal Value	Estimated 0.4B USD
Financing Partners	TBC
PPP Arrangement	• Design and Construction of the Facility • Service delivery over the Concession Period • Contracting out of Hospital Services to sub contractors
Why PPP Was Chosen	• Whole of Life Efficiencies • Speed of Delivery • Continued investment over concession period • Risk Sharing • Design Innovation
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Operational • Tax • Finance Risk
Innovation Achieved	• Improved infrastructure and health access • Improved and Expanded mental facility
Payment Mechanism	Payments to be made over the operating phase of the project in the form of a QSP, with an allowance for the capital cost and facilities maintenance.

Expected PPP model (project is in progress)



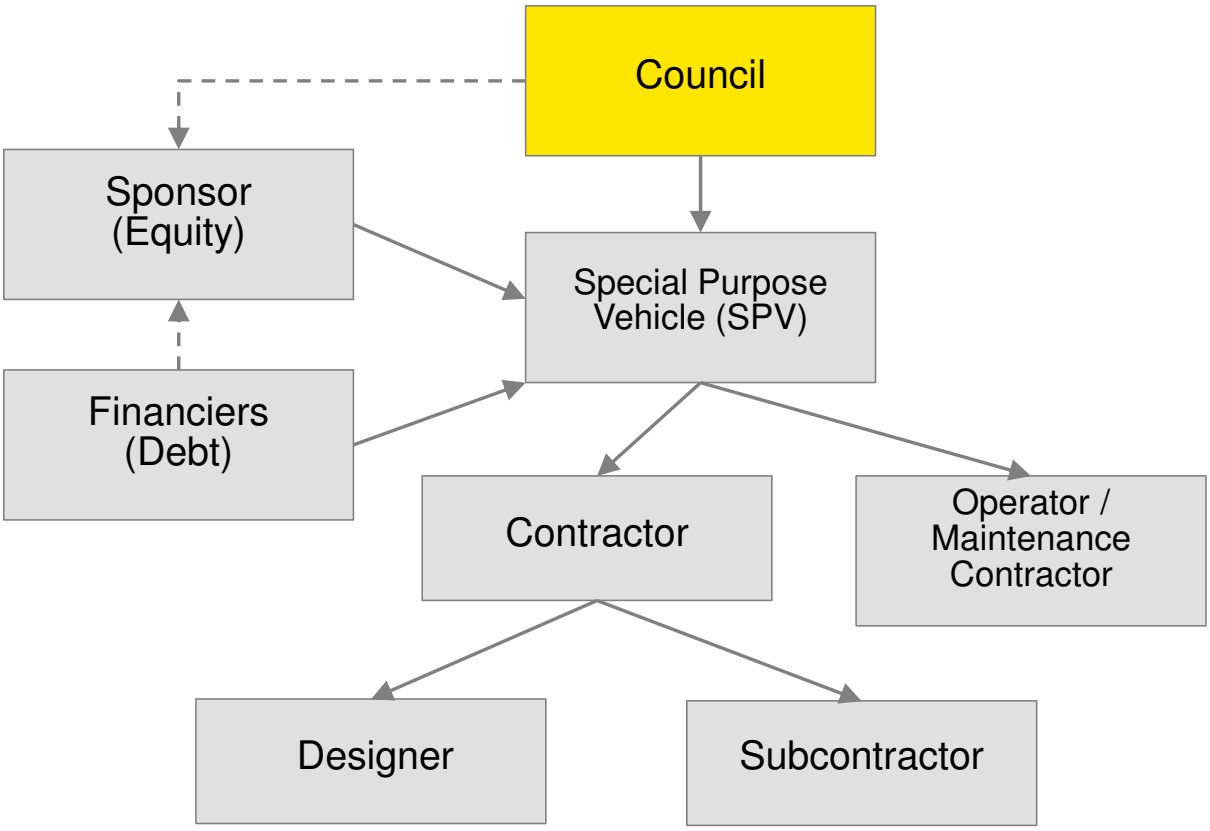
Northern Beaches

- 2 Bidders – Healthscope and Ramsey
- Successful Bidder to be announced late 2014

Queen Elizabeth II Medical Centre Car Parking

QE II MC Car Parking	
Deal Value	0.2B USD
Financing Partners	Fully funded by the private sector.
PPP Arrangement	• Design and Construction of the Facility • Service delivery over the Concession Period
Why PPP Was Chosen	• Value for Money • Speed of Delivery • Risk Sharing • Design Innovation
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Operational • Tax • Finance Risk
Innovation Achieved	• Modern parking equipment – Microchip windscreen stickers • Duel Commercial Use – Childcare Centre attached
Payment Mechanism	Payments to be made over the operating phase of the project in the form of a QSP, with an allowance for the capital cost and facilities maintenance.

PPP contractual structure



Royal Ottawa Mental Health Hospital

Why PPP was chosen

- Renovation of the existing facility would cost more than a new facility
- Positive experience with FM outsourcing
- Traditional funding approach was unable to provide timely solution, as government could not bridge the funding gap
- Project scope was large enough to be attractive to private sector development and operations
- Realization that the private sector is better positioned to manage risks and deliver project on time and on budget

First PPP in Canadian health sector	
Deal Value	150M CAD
Financing Partners	Fully funded by the private sector Senior Lenders provided 127M CAD
PPP Arrangement	• Design and Construction of the Facility • Facilities management services including building management, cleaning, linen and laundry, grounds maintenance and snow removal
Why PPP Was Chosen	• Whole life • Certainty of delivery and budget • Risk Sharing • Design Innovation
Transferred Risks	• Planning Risk • D&C Risk • Commissioning • Maintenance • Finance Risk
Payment Mechanism	Payments to be made over the operating phase of the project in the form of AP, with an allowance for the operating costs and facilities maintenance.