

Public Private Partnerships for Operation and Maintenance (O&M)



DEPARTMENT OF HIGHWAYS
MINISTRY OF TRANSPORT
THAILAND



Public-Private Partnerships
for Highway Investment and Management

Information for Pre-Tender Announcement
31st January 2018

M6 Bang Pa-In – Nakhon Ratchasima

M81 Bang Yai – Kanchanaburi



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Morning Session 1:

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■ Scope of Works : Mr.Seksit

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■ Contract Principles and Highlights : Mr. Weerawong

Noted: This information is only of an indicative and preliminary nature, and will be replaced by information contained in the Request for Proposal (RFP).



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Afternoon Session 3:

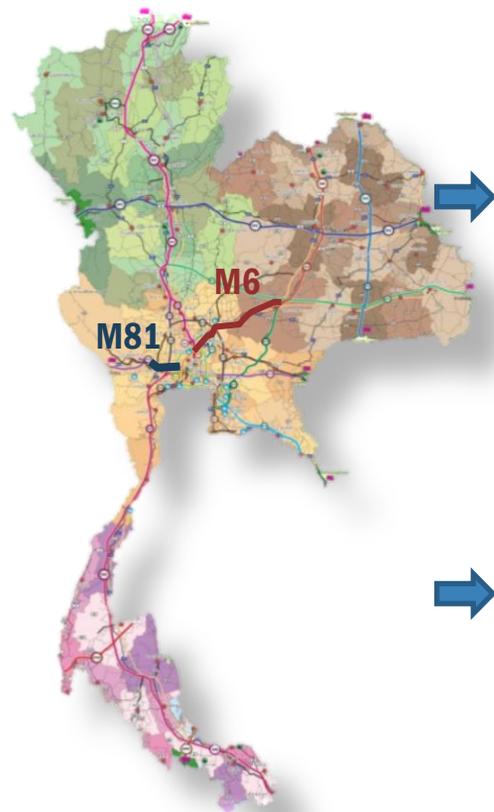
- Outline Specifications : Mr.Seksit**
- Qualifications : Mr.Thanakorn**
- AP Mechanism : Mr.Thunyaboon**
- KPI : Mr.Thanakorn**
- Draft Contract : Mr.Banpot**

Noted: This information is only of an indicative and preliminary nature, and will be replaced by information contained in the Request for Proposal (RFP).

SESSION 1

- ✓ **Project Background**
- **Scope of Works**

Master plan of Intercity Motorway in Thailand



M2	Tak-Mukdahan	704 km.
M3	Surin – Bueng Kan	465 km.
M4	Nakhon Sawan – Ubon Ratchathani	610 km.
M5	Uttraphimuk Elevated Tollway – Bang Pa-In– Chiang Rai (Mae Sai/Chiang Khong Checkpoints)	853 km.
M6	Bang Pa-In – Nong Khai	540 km.
M7	Bangkok – Ban Chang	153 km.
M8	Nakhon Pathom – Narathiwat (Su-ngai Kolok Checkpoint)	1,103 km.
M9	Kanchanaphisek Road (Second Outer Ring Road)	165 km.
M51	Chiang Mai – Lampang (Chae Hom District)	53 km.
M52	Suphan Buri – Chai Nat	42 km.
M53	Kanchanaphisek (Western Section) – Bang Pa Han	48 km.
M61	Chon Buri – (Laem Chabang Port) – Nakhon Ratchasima	288 km.
M62	Kanchanaphisek Road (Eastern Section) – Saraburi	78 km.
M71	Kanchanaphisek Road (Eastern Section) – Sa Kaeo (Aranyaprathet Checkpoint)	204 km.
M72	Chonburi – Trat	216 km.
M81	Bang Yai – Kanchanaburi (Pu Nam Ron Checkpoint)	164 km.
M82	Kanchanaphisek Road (Western Section) – Pak Tho	74 km.
M83	Surat Thani – PhuKet	191 km.
M84	Songkhla – Thailand – Malaysia Border (Sadao Checkpoint)	95 km.
M91	Third Outer Ring Road	254 km.
M92	Chonburi – Saraburi –Nakhon Pathom	312 km.
		Total 6,612 km.

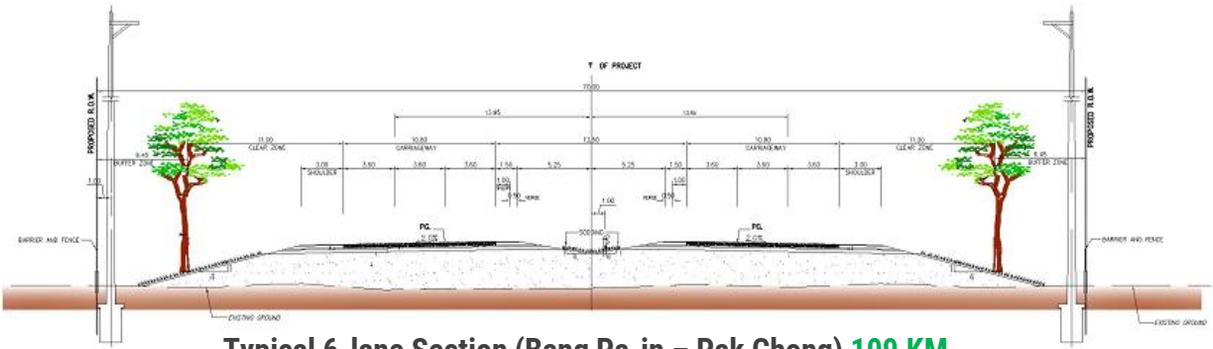
Project Description

Project Description

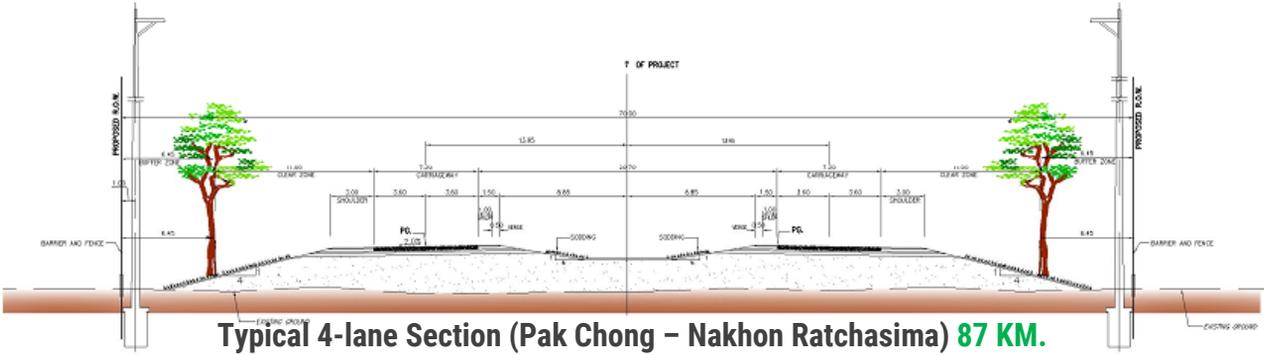
Beginning	North Outer-Ring, Bang Pa-In, Ayutthaya
Ending	Bypass, Nakhon Ratchasima
Distance	196 km.
Traffic Lanes	6 Lanes (Bang Pa-In – Pak Chong) 4 Lanes (Pak Chong – Nakhon Ratchasima)
Pavement	Concrete
Interchanges	10
Toll Plaza	9
Rest Area	8
Capital	84.6 Billion Baht/ 2.64 Billion USD
Contracts	1 – 40 Civil
	41 System Installation + O&M 42 Rest Area



Typical Section

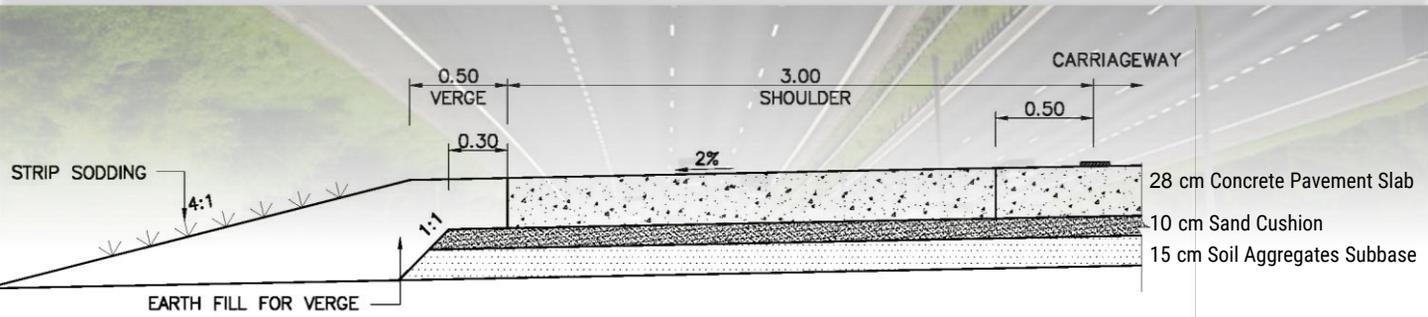


Typical 6-lane Section (Bang Pa-in – Pak Chong) 109 KM.

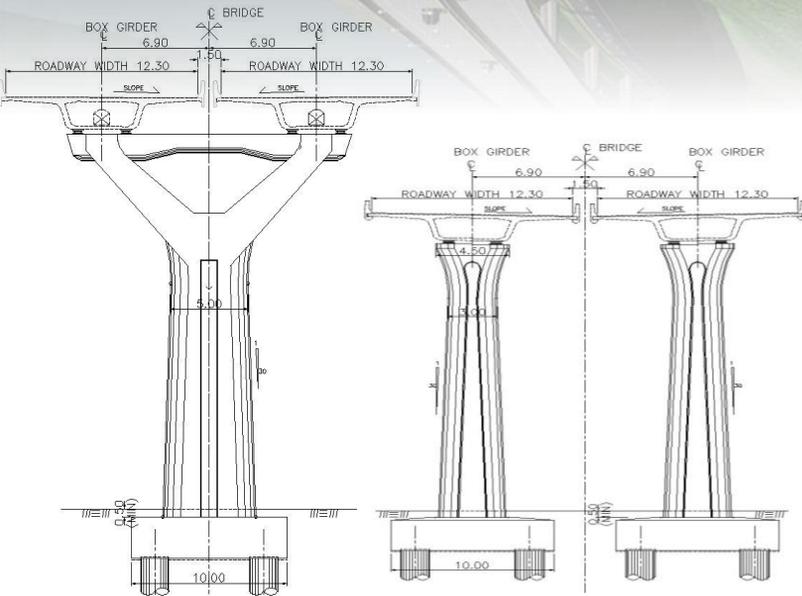


Typical 4-lane Section (Pak Chong – Nakhon Ratchasima) 87 KM.

Typical Section



Compacted Subgrade Lab CBR 4% Min



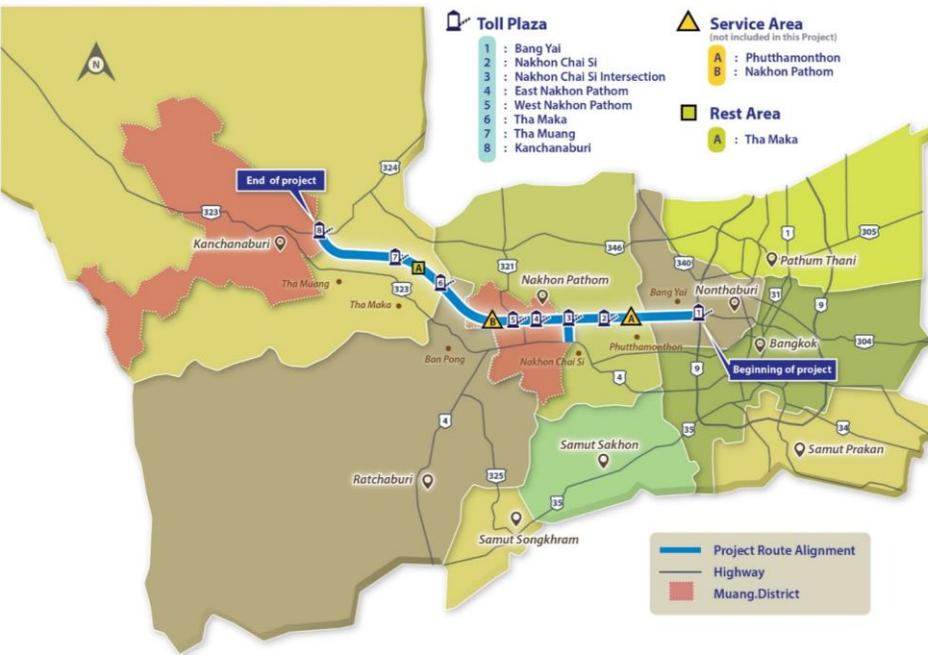
Toll Plaza And Control Buildings



For Demonstration Only

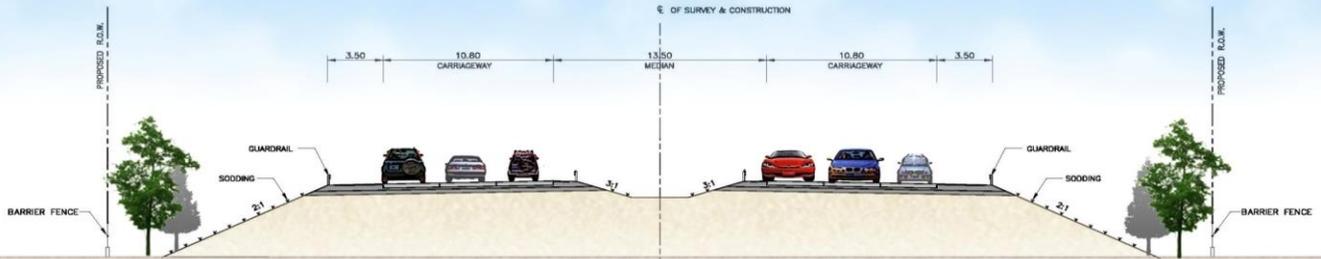
Project Description

M81 Bang Yai - Kanchanaburi Motorway

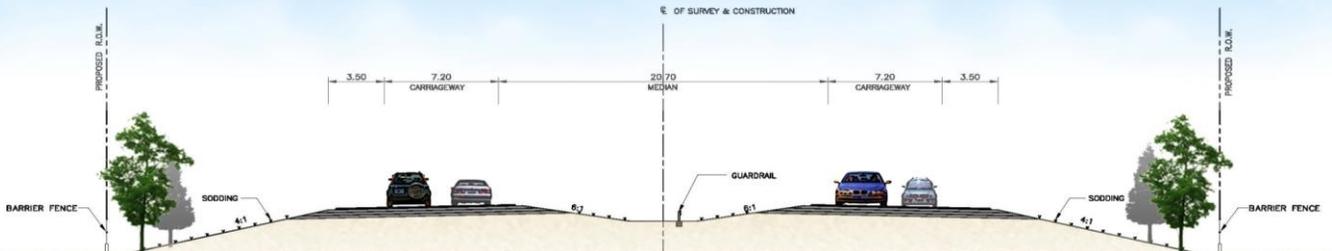


Project Description	
Beginning	West Outer-Ring, Rattana Thibet Rd. Nonthaburi
Ending	Highway No.324, Kanchanaburi
Distance	96 km.
Traffic Lanes	6 Lanes (Bang Yai – Nakhon Pathom) 4 Lanes (Nakhon Pathom – Kanchanaburi)
Pavement	Asphaltic Concrete
Interchanges	8
Toll Plazas	8
Rest Areas	3
Capital	55.6 Billion Baht/ 1.74 Billion USD
Contract	1 – 25 Civil 26 System Installation + O&M 27 Rest Area

Typical Section

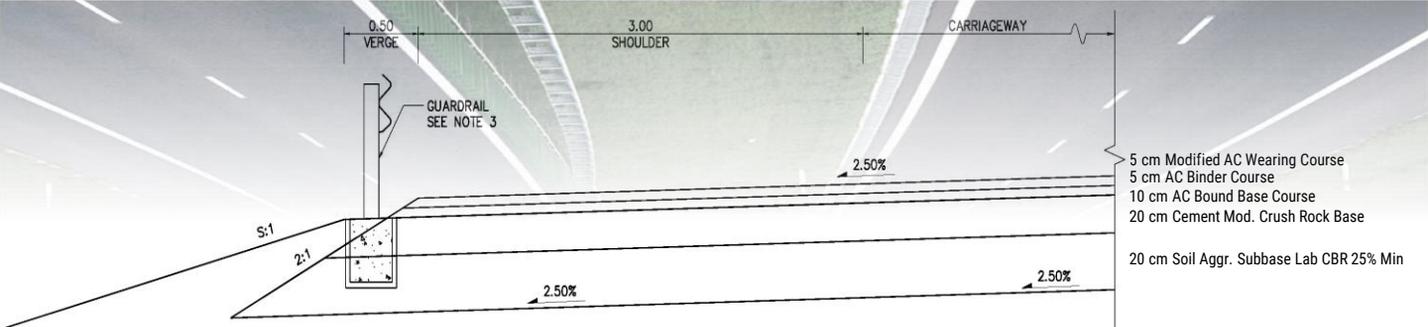


Typical 6-Lane Section (Bang Yai – Nakhon Pathom) 47 KM.



Typical 4-Lane Section (Nakhon Pathom – Kanchanaburi) 49 KM.

Typical Section



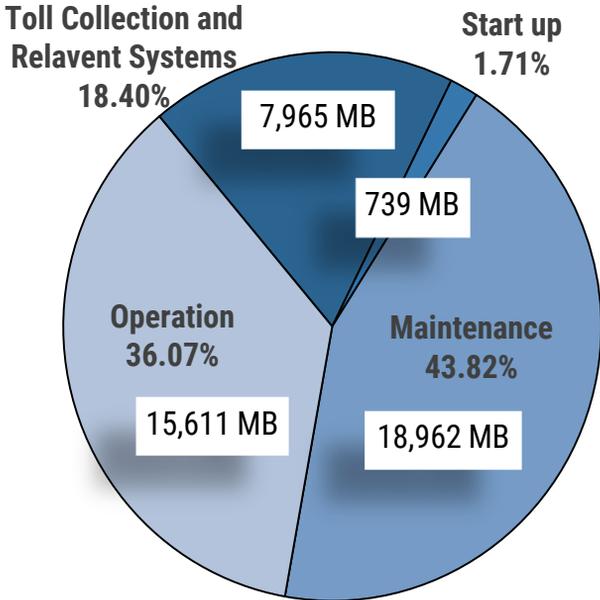
Sand Embankment Lab CBR 10% Min

Toll Plaza And Control Buildings

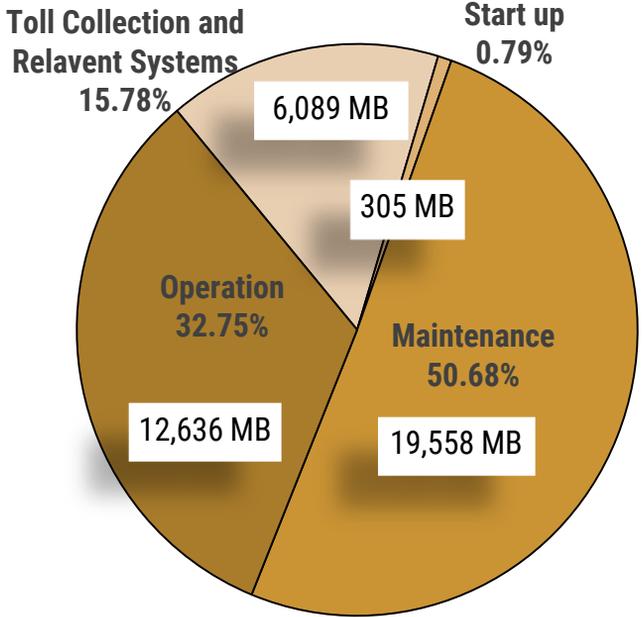


For Demonstration Only

Investment and O&M Costs from PPP Report



M6 **Bang Pa-In – Nakhon Ratchasima**



M81 **Bang Yai – Kanchanaburi**

Project Costs

Investment Cost

Earthwork, Subbase and base courses, Surface courses, Structure, Drainage, Traffic, Roadway lighting and landscaping, Toll collection system, Traffic management and control system, Communication Network, Power distribution & Others



Start-up Cost

Central offices buildings, Maintenance units, Operation and Maintenance Center

Operation Cost

Toll collection, Traffic facilitation, Traffic management and control, Weight station and service patrol units, Operation management, Administration, Office supplies & Utilities

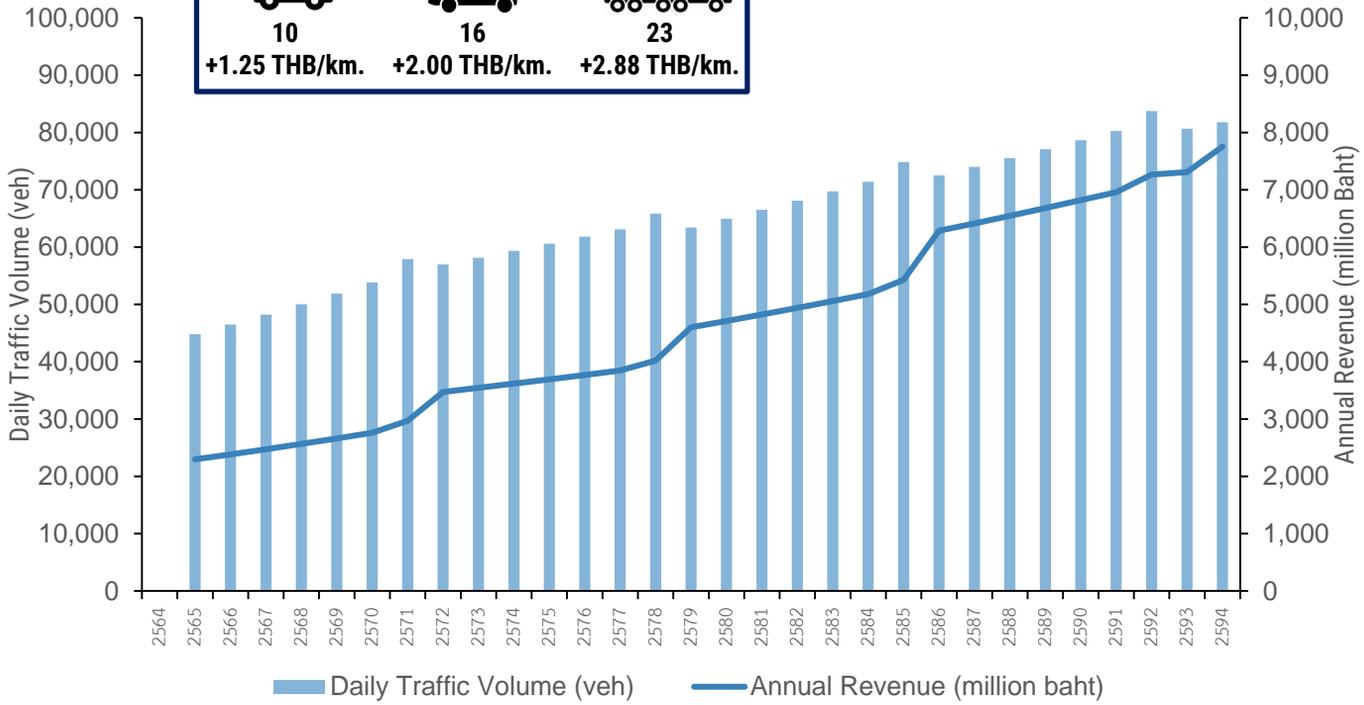


Maintenance Cost

Toll collection, Weight station, Communication system, Rescue Unit, Buildings, Structure and pavement, Road marking and signage, Landscape, Emergency maintenance & Safety works

M6 Traffic and Revenue Forecast

		
10	16	23
+1.25 THB/km.	+2.00 THB/km.	+2.88 THB/km.



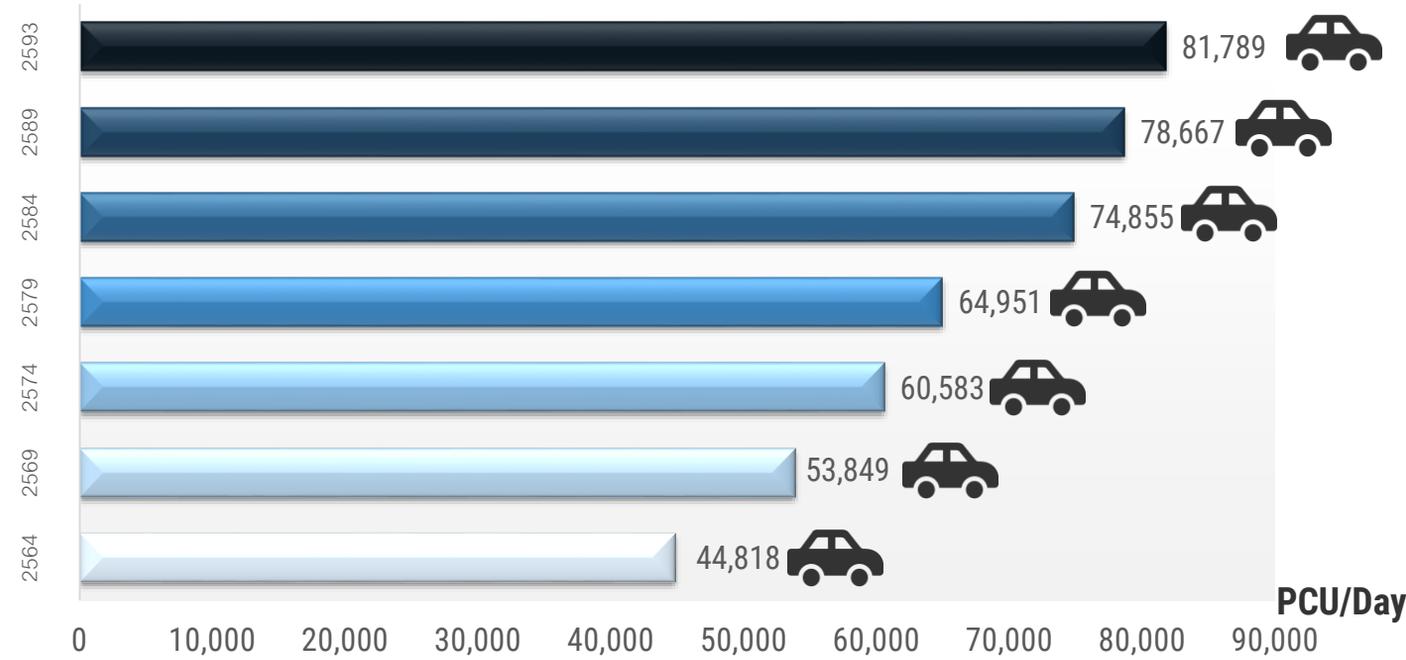
- CPI price Index
- Escalate every 7 year
- Round down multiple of THB 5.0

M6 Traffic Volume Forecast

Year	Average Traffic on Ramp (vehicles/day)				Avg. Trip Length (KM.)
	4-wheel	6-wheel	>6-wheel	Total	
2564	38,688	1,852	4,278	44,818	105.2
2569	46,484	2,225	5,140	53,849	104.2
2574	52,296	2,503	5,783	60,583	103.4
2579	56,068	2,684	6,200	64,951	102.9
2584	64,641	3,086	7,128	74,855	102.2
2589	67,908	3,251	7,509	78,667	101.6
2593	70,697	3,349	7,743	81,789	100.8

M6 Traffic Volume Forecasting

Year



M6 Project Revenue Forecast



10 Baht + 1.25 Baht/km.

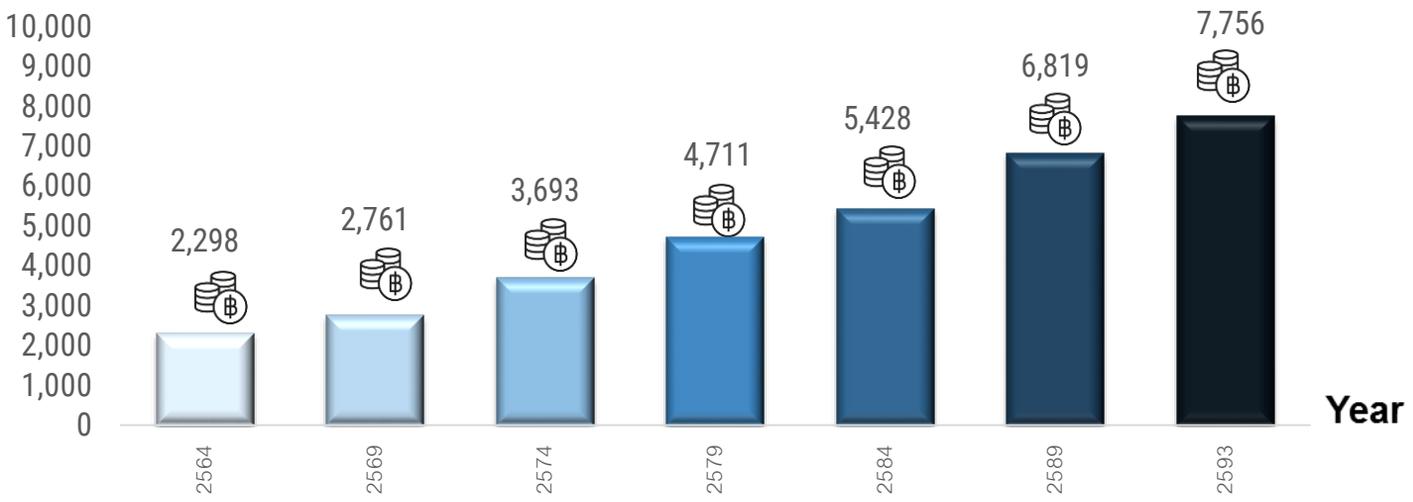


16 Baht + 2.00 Baht/km.



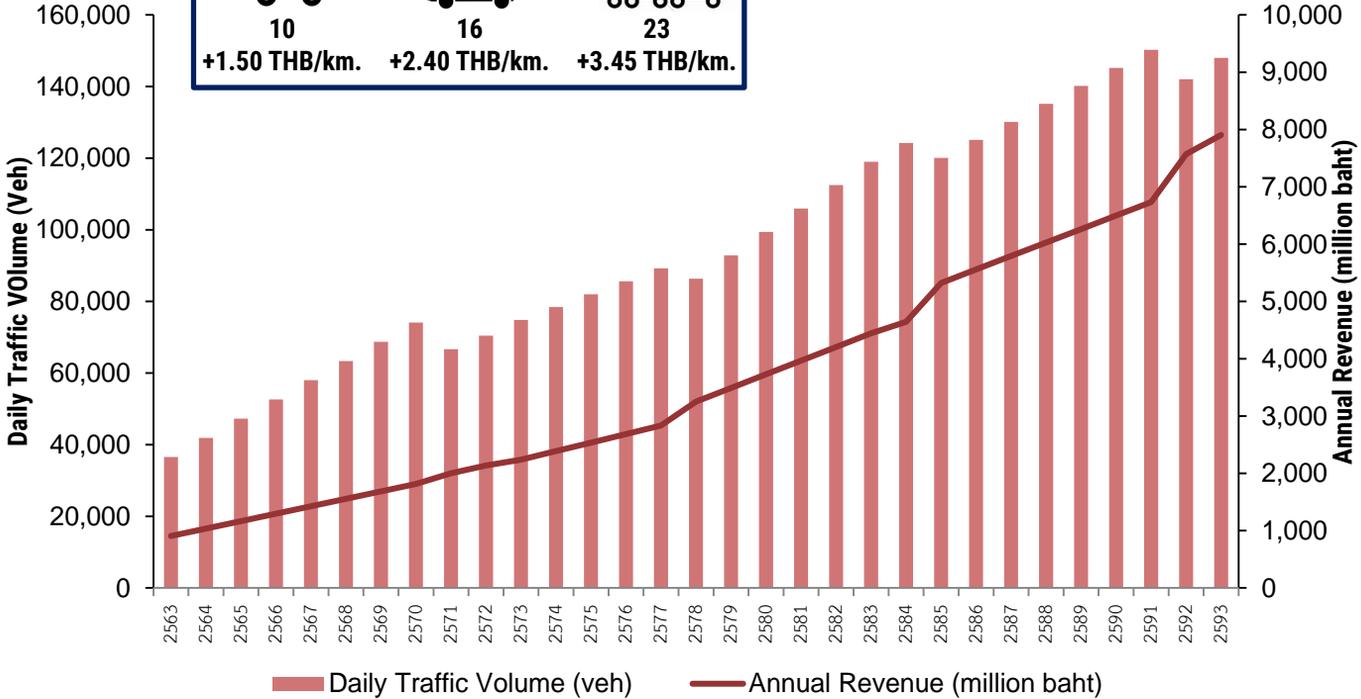
23 Baht + 2.88 Baht/km.

Million Baht



M81 Traffic and Revenue Forecast

		
10	16	23
+1.50 THB/km.	+2.40 THB/km.	+3.45 THB/km.

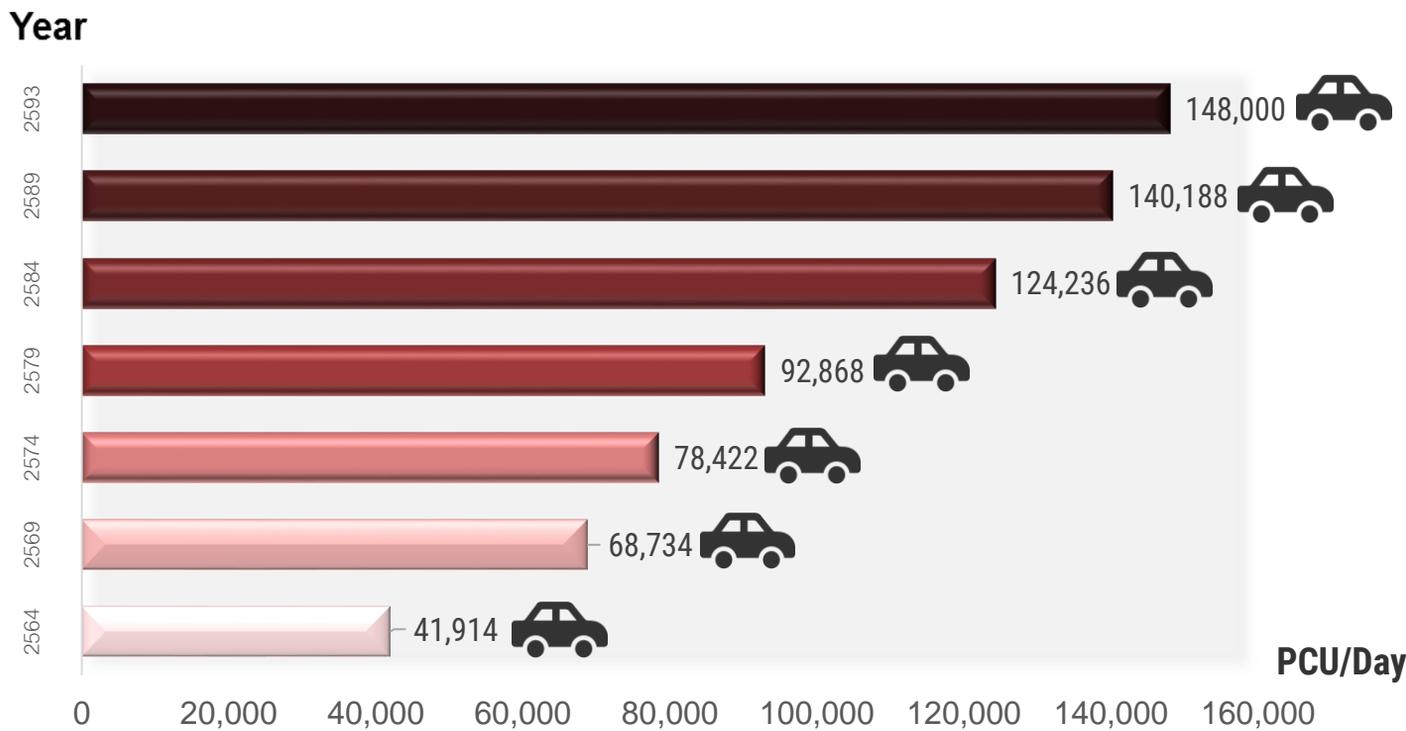


- CPI price Index
- Escalate every 7 year
- Round down multiple of THB 5.0

M81 Traffic Volume Forecasting

Year	Average Traffic on Ramp (vehicles/day)				Avg. Trip Length (KM.)
	4-wheel	6-wheel	>6-wheel	Total	
2564	36,064	988	4,862	41,914	37.3
2569	59,184	1,628	7,922	68,734	32.8
2574	67,450	1,862	9,110	78,422	33.3
2579	79,874	2,202	10,792	92,868	36.0
2584	106,896	2,934	14,406	124,236	35.8
2589	120,612	3,312	16,264	140,188	35.8
2593	127,360	3,490	17,150	148,000	35.8

M81 Traffic Volume Forecasting



M81 Project Revenue Forecasting



10 Baht + 1.50 Baht/km.

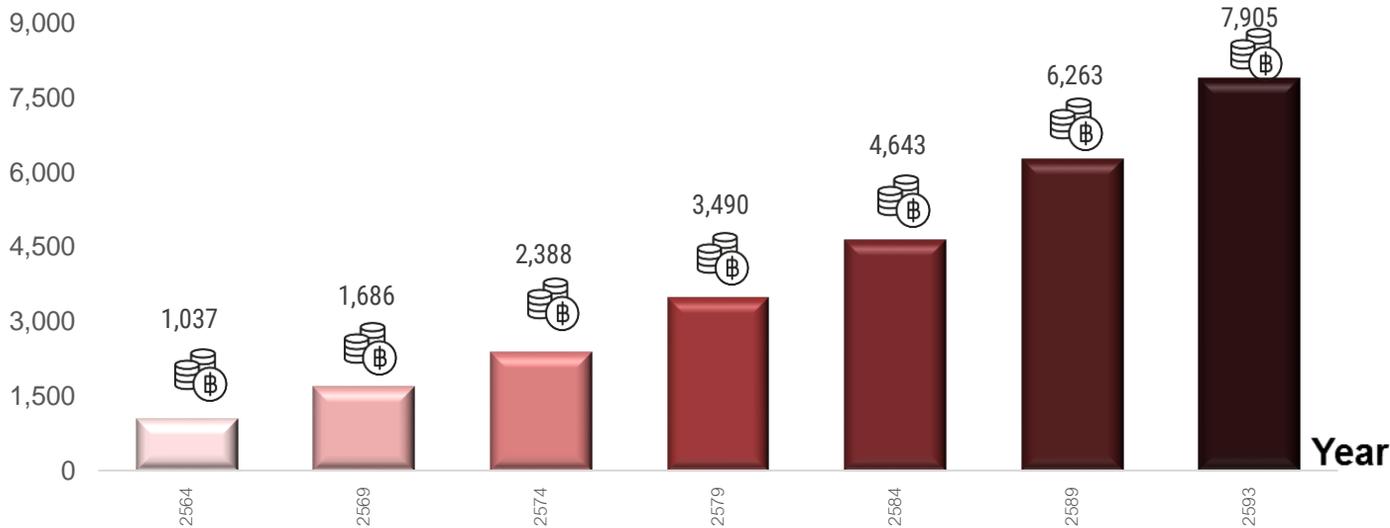


16 Baht + 2.40 Baht/km.



23 Baht + 3.45 Baht/km.

Million Baht



PPP Gross Cost Scheme

On 22 August 2017, the Cabinet agreed upon a resolution to approve the implementation of the public private partnership for operation and maintenance (O&M).

Private parties will participate in the investment based on the PPP Gross Cost Scheme or Design Build Finance Operate Maintain (DBFOM) project delivery, which comprises installing motorway system components and related facilities, performing route operations and maintenance.

With the PPP Gross Cost Scheme, all toll revenues shall accrue to the public sector while the private party shall be remunerated for its performance of route operation and maintenance, plus scheduled repayment of the facility costs according to pre-defined terms and conditions.

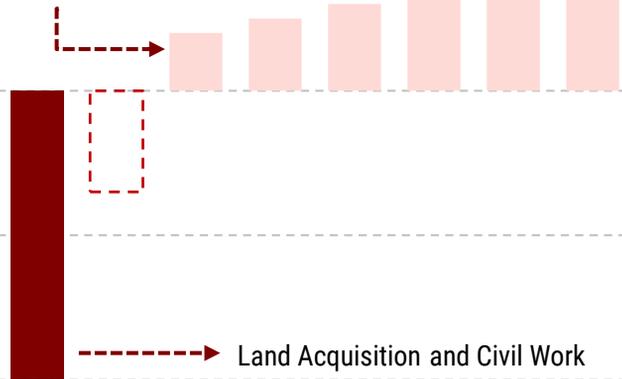


Partnership

PPP Scheme

Public

Operating Revenue



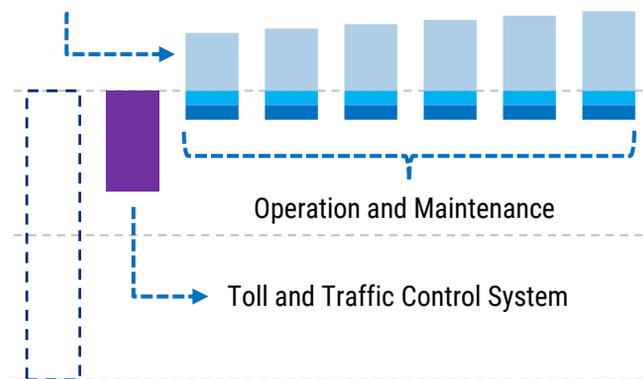
Land Acquisition and Civil Work

Public Sector

- Finance and acquire land
- Finance and construct civil work
- Receive Operating revenue

Private

Availability Payment from public sector



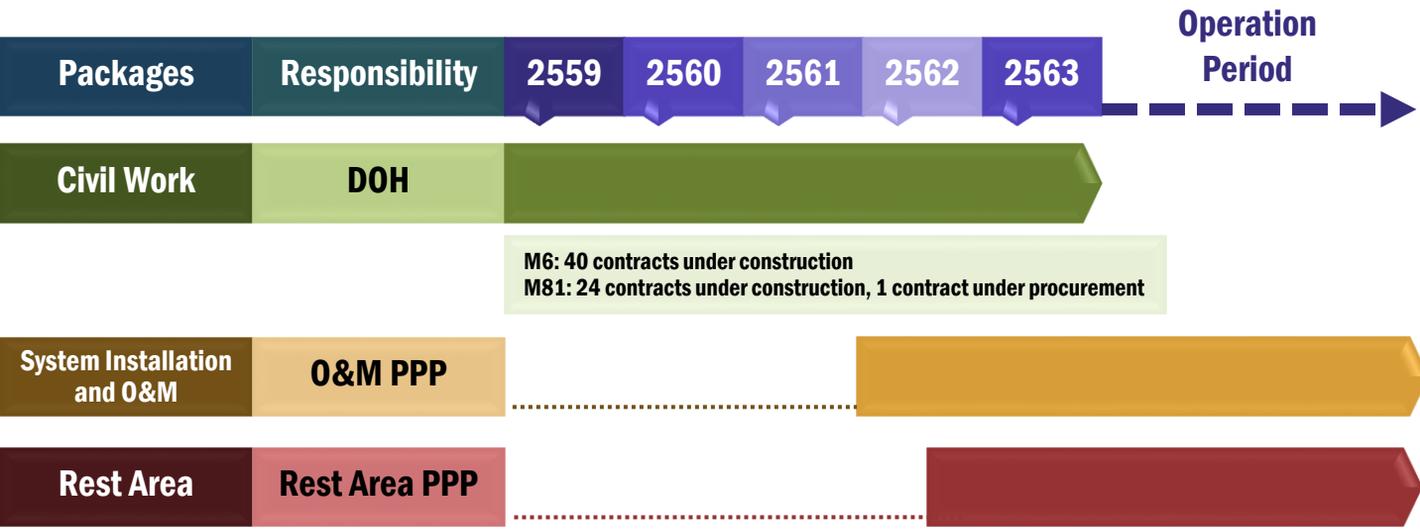
Operation and Maintenance

Toll and Traffic Control System

Private Sector

- Finance and construct toll and traffic control system
- Provide O&M service
- Receive Availability Payment from public sector

Project Status and Implementation Plan



SESSION 1

- **Project Background**
- ✓ **Scope of Works**

RESPONSIBILITIES OF GOVERNMENT AND PRIVATE SECTOR

Phase I



1. Finance and Construction of Civil work.



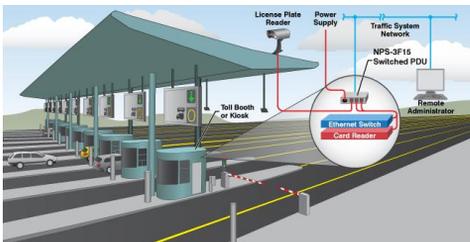
Phase II



1. Operation maintenance of the entire project, including the civil work constructed by the DOH, and motorway system facilities financed and installed by the private party.



1. Design, Finance, and Construction of System Work and other related Components.
2. Design and Construction of additional civil works to supplement the motorway system



1. Monitoring and regulation
2. Make Availability Payment to Private Sector



Project Information

Number of Road Crossing

	Overpass (Location)	Underpass (Location)
M6	12	31
M81	10	22

Total Length of Bridge and At-Grade Road

	Bridge along main road(KM)	At grade road(KM)	Total length(KM)
M6	40	156	196
M81	37	59	96

SCOPE OF WORK

Phase 1

Design and Construction

- Toll Collection System
- Traffic Management and Control System
- Other Infrastructures

Phase 2

Operation and Maintenance

Toll Collection System

Toll Plaza



Electronic Toll Collection

Manual Toll Collection



Limit of Toll Plaza Construction



Traffic Management and Control System



Traffic Control Facility and System



Traffic Management System



Traffic Information and Incident Detection System



Traffic Incident Management



Communication and Emergency Call System



Service Patrol

Toll Collection System

Toll Collection System : Closed System – Distance-Based

Toll Collection Type :

- Electronic Toll Collection (ETC)
- Manual Toll Collection (MTC)



Toll Plaza

Toll Plaza – Entrance Side :

Toll Plaza at Main Line

- ETC MLFF w/o Barrier
- MTC

Toll Plaza at Interchange

- ETC SLFF or MLFF w/o Barrier
- MTC



Toll Plaza –Exit Side :

Toll Plaza at Main Line

- ETC with Barrier
- MTC

Toll Plaza at Interchange

- ETC with Barrier
- MTC



Toll Collection System

Electronic Toll Collection (ETC) Technology

Hybrid (DSRC & RFID)



Toll Collection System

- Postpaid for RFID
- Prepaid for RFID (Optional)



Toll Collection System

Electronic Toll Collection (ETC)

- ETC Lane for all vehicle types allowed (including trucks)



Toll Collection System

Manual Toll Collection (MTC)

Manual



Automatic Ticket Dispenser (ATD)



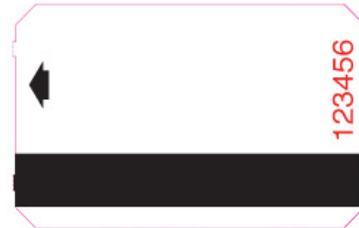
Toll Collection System

Manual Toll Collection, Transit Card

Smart Card



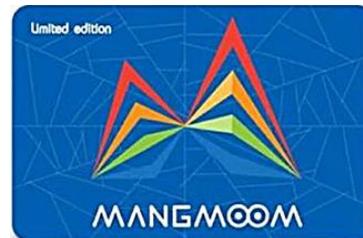
Magnetic Ticket



Paper Ticket



MANGMOOM Card



**** Future cooperate with relevant agencies**

Toll Management and Supervision System

- Finance and Customer Management
- Customer Service Management
- Toll Charging
- System Management
- Back Office Sub-System
- Data Analytic and Reporting
- Internal and External Integration
- Interoperability

■ Traffic Control Facility and System

- Traffic Operation Center
- Traffic Information
- Traffic Equipment
- Traffic Management System

Traffic Management System

- Speed Harmonization
- Queue Warning
- Construction Site Management
- Dynamic Traveler Information
- Automated Enforcement
- Traffic Monitoring

Traffic Management System

Speed Harmonization



Construction Site Management

Traffic Management System

Dynamic Traveler Information



Automated Enforcement

Traffic Monitoring



■ Traffic Information and Incident Detection System

- Traffic CCTV
- Traffic Data Collection System
- Traffic Information
- Call Center

Traffic Information and Incident Detection System



Communication and Emergency Call System

- Communication System
- Emergency Call System



Traffic Incident Management

- Incident Detection and Verification
- Traveler Information
- Traffic Policing System
- Motorist Assistance and Debris Removal
- Traffic Control and Scene Management
- Traffic Incident Clearance
- Full Function Service Patrol

Vehicle Weigh Control Facilities

- Static
- Weigh in Motion (WIM)



Complaint System

- Complaint Management
- Complaint Center

Central Control Building

M6 : Location – Pak Chong

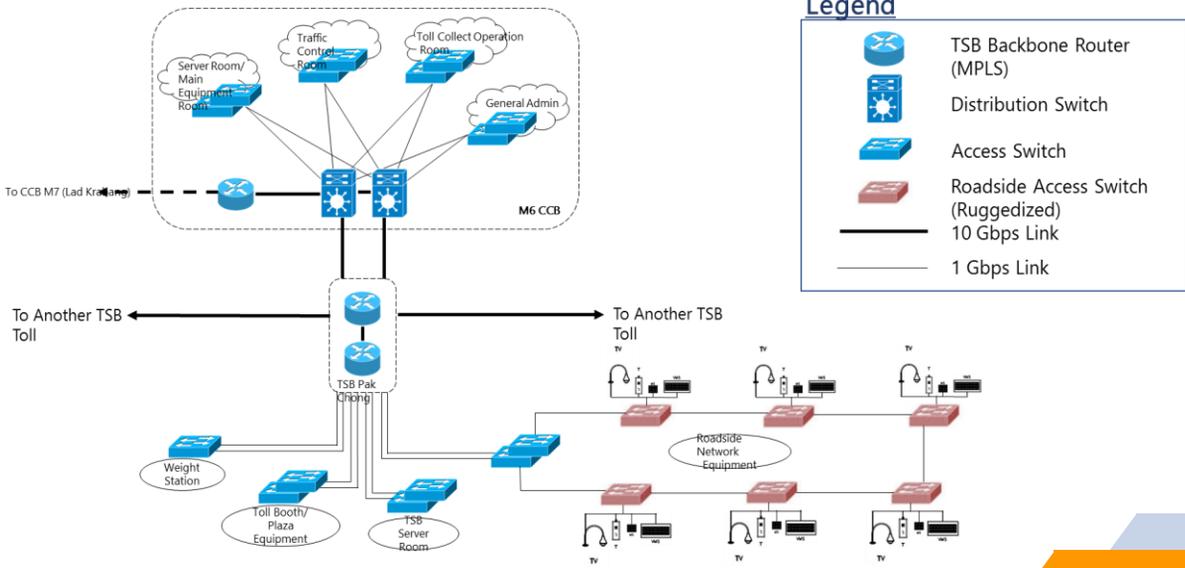
M81 : Location – Bang Yai

Minimum Functional Requirement :

- Traffic operation center
- Main server room for Traffic Management control system
- Control room for Toll collection system
- Main server room for Toll collection system
- Complaint Counter

Communication Network

- Backbone Network
- Access Network
- Roadside Network
- Network Management
- Cyber Security Management
- Redundant



Main Road : Overhead or Underground
Interchange : Underground Only

Other Infrastructures

Transmission and Distribution for Power & Communication System

- Power Transmission
- Power Distribution System
- Redundant
- Communication Cable

Overhead or
Underground →



Underground →



■ Roadwork Facilities and Incidental

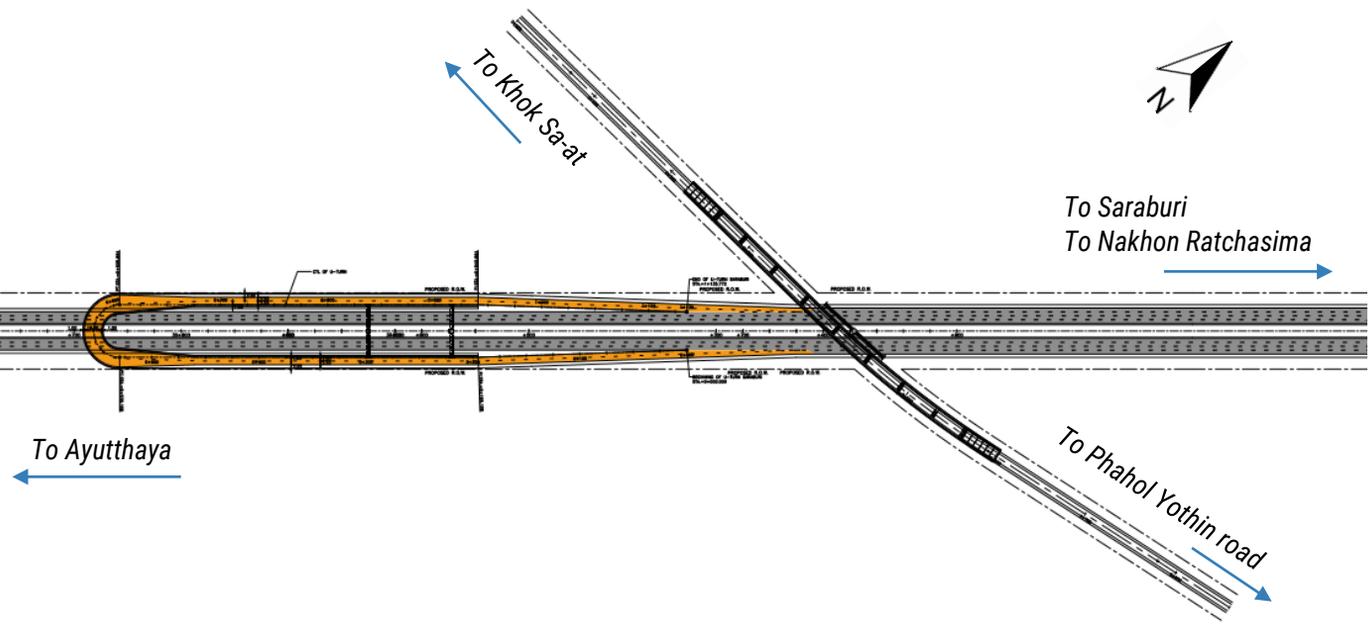
- U-Turn Overpass at Saraburi Interchange (M6)
- U-Turn Overpass at Nakhon Chai Si Junction (M81)
- Guardrail
- Noise Barrier
- Fence
- Safety Net
- Impact Attenuator
- Glare Screen
- Landscape
- Buffer Zone

U-Turn overpass

- Saraburi Interchange (M6)
- Nakhon Chai Si Junction (M81)



U-Turn overpass at Saraburi Interchange



Additional Traffic sign

❑ Traffic signs



❑ Exit No. signs



❑ Road markings



Other Infrastructures

- Guardrails



- Glare screens



- Impact attenuators



Other Infrastructures

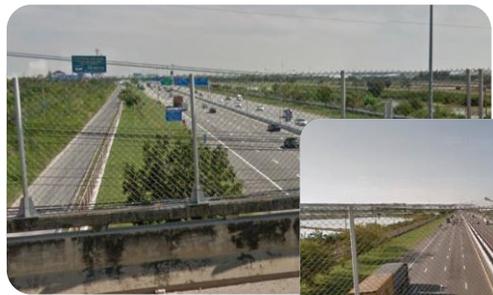
☐ Noise barriers



☐ Fence



☐ Safety Net

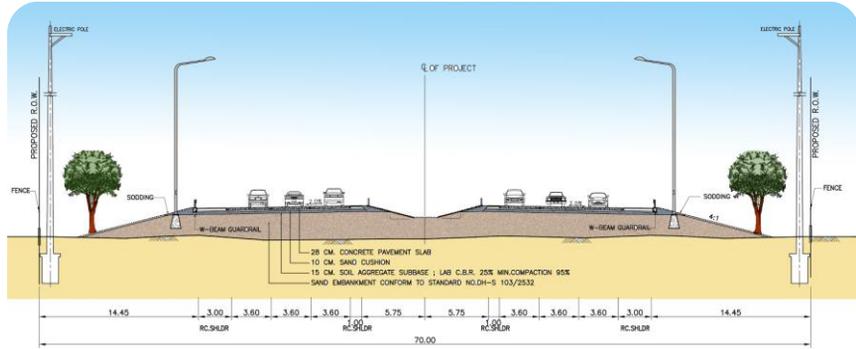


Other Infrastructures

- Landscape work
 - Interchange



- Buffer Zone at KM.82 on M6 Area 285 Rai



MW6-TYPICAL SECTION

Other Infrastructures

❑ Street Lighting at Toll Plaza



Other Infrastructures

- ❑ High Voltage Transmission Line Connection
- ❑ Water work



- Agency Building

- DOH's Office
- Highway Police Station

- Operation and Maintenance Building

- Operation and Maintenance Center
- Service Patrol Unit
- Maintenance Warehouse

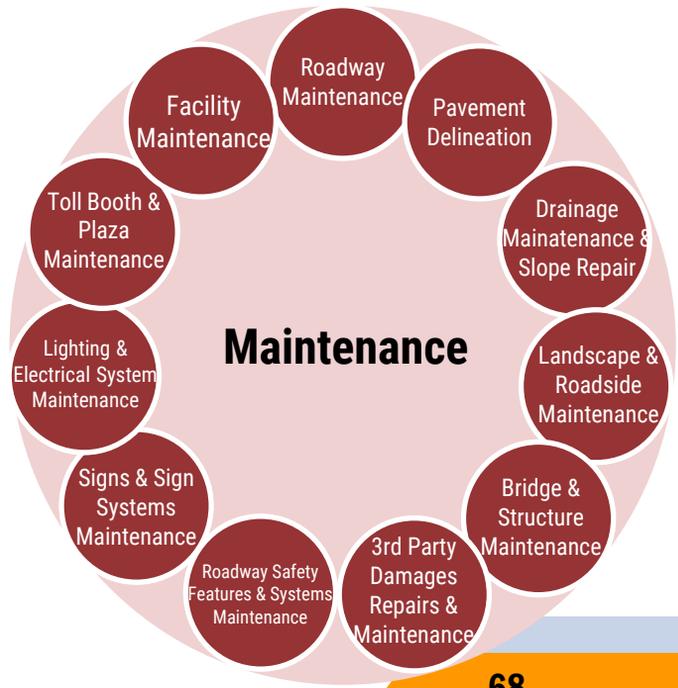
Scope of O&M works



1. Monitoring and Regulation
2. Make Availability Payment to Private Sector, refer to their performance evaluated by KPI



1. Operate Intercity Motorway and accrue toll revenue to the public sector.
2. Maintenance Civil Work and Systems



SESSION 2

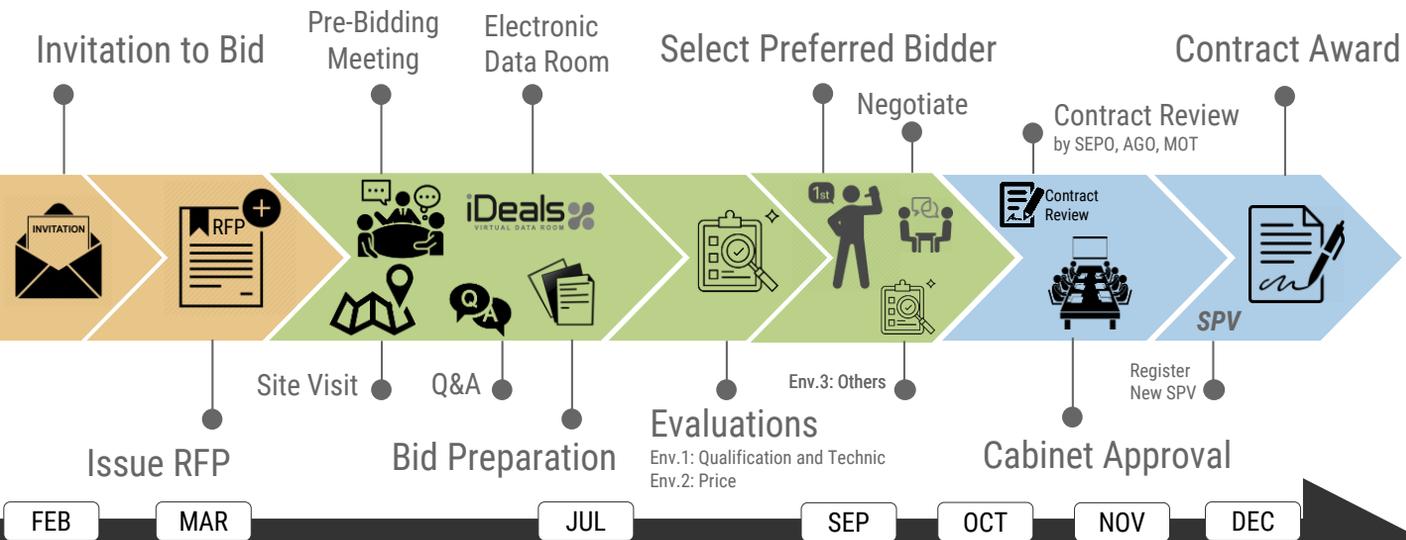
- ✓ **Tender Process**
- **Contract Principles and Highlights**

Procurement Process

Pre-Procurement

Documents Evaluation

Close Out



Eligibility



- All Nationality
- Juristic person registered ≥ 3 years
- Foreign juristic person shall associate with Thai juristic persons
 - Thai lead firm shareholding $\geq 35\%$
 - Combined shareholding of Thai juristic persons $\geq 51\%$

Firm	Bidder A	Bidder B	Bidder C
Thai	35%	30	35
Thai	20%	30	15
Foreign	45%	40	50

✓ ✗ ✗

Historical Contract Non-Performance

Financial Situation

Experience

Past performance



No Conflict of Interest

- 1) Management Relationship (manager, managing partner, managing director, executive or person authorized to manage the business)
- 2) Capital Relationship (major shareholder $\geq 25\%$)
- 3) Cross Relationship between 1) and 2)
- 4) Holding of position or being a shareholding as spouse or minor of the person in (1), (2), or (3)



Local bank or local branch of a foreign bank



Waiver of Immunity of refuse being taken to Thai court.

Eligibility

Historical Contract Non-Performance



Litigation

- Litigation history last 5 years
- Pending Litigation
- Litigation History

Financial Situation

Experience

Past performance



Shall not be named in the Official List of Work Abandoners

Eligibility

Historical Contract
Non-Performance

Financial Situation



Average net worth for the last 3 years shall be positive

Experience



Line of credit shall be cover investment cost until bidder will be received AP

Past performance

Eligibility

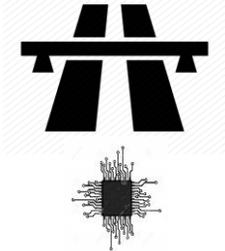
Historical Contract Non-Performance

Financial Situation

Experience

Past performance

Construction and Procurement or Installation of System



- Construction works of Road or Bridge or Elevated structure and;
- Procurement and/or installation in **toll road** or **rail mass transit system** with
 - Toll/Fare collection system and;
 - Traffic control system

Operation & Maintenance



- Operation and Maintenance of **toll road** or **rail mass transit system** with
 - Toll/fare collection system management and;
 - Traffic control system management
- Maintenance or Rehabilitation/Reconstruction of Road or Bridge or Elevated structure

Eligibility

Historical Contract
Non-Performance

Financial Situation

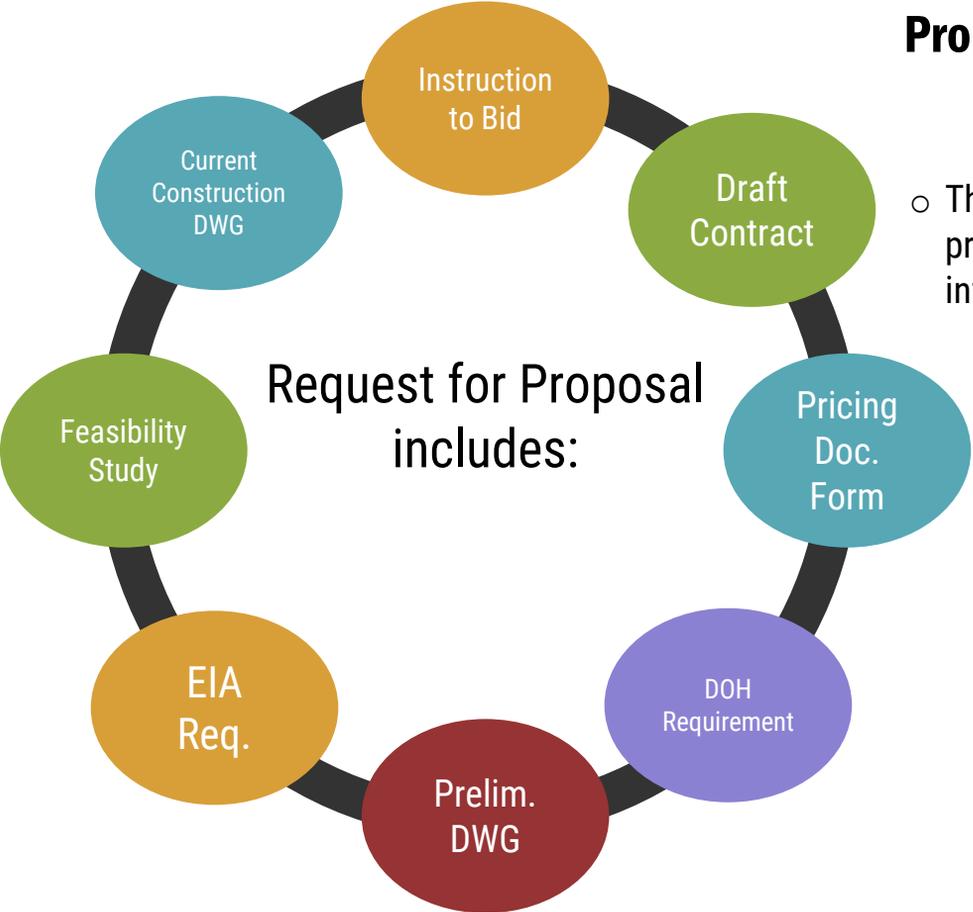
Experience

Past performance



All past performance will be considered on conditions as follows;

- Number of contract
- Year of completed project
- Local or abroad project.
- Project Owner was government or state enterprise..
- Allow to propose the passed experiences based on Joint Ventures or Consortium contract.
- Certificate of Work and Copy of Contract issued by project owner.
- Sub-Contractor/Supplier list



Proposal Documents

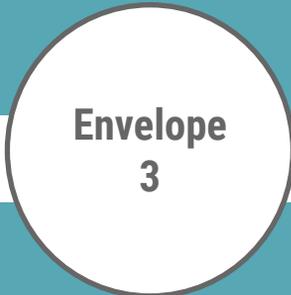
- The proposal shall be prepared by using all information provided in RFP.



Qualification
&
Technical Proposal

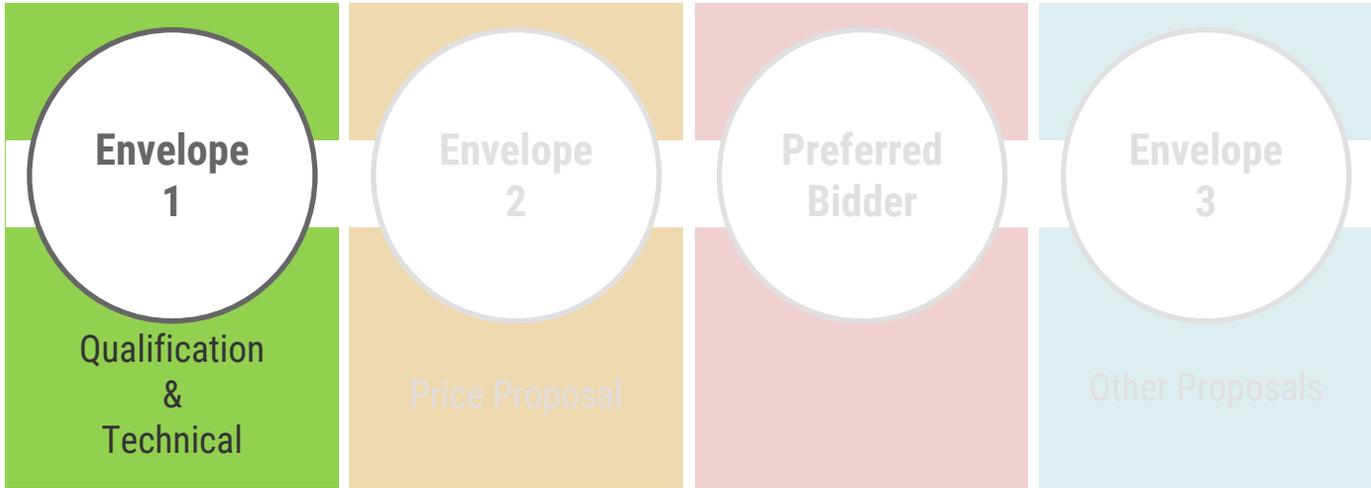


Price Proposal



Other Proposals





Step 1

Pass/Fail

- Eligibility
- Historical Contract Non-Performance
- Financial Situation
- Experience
- Past performance

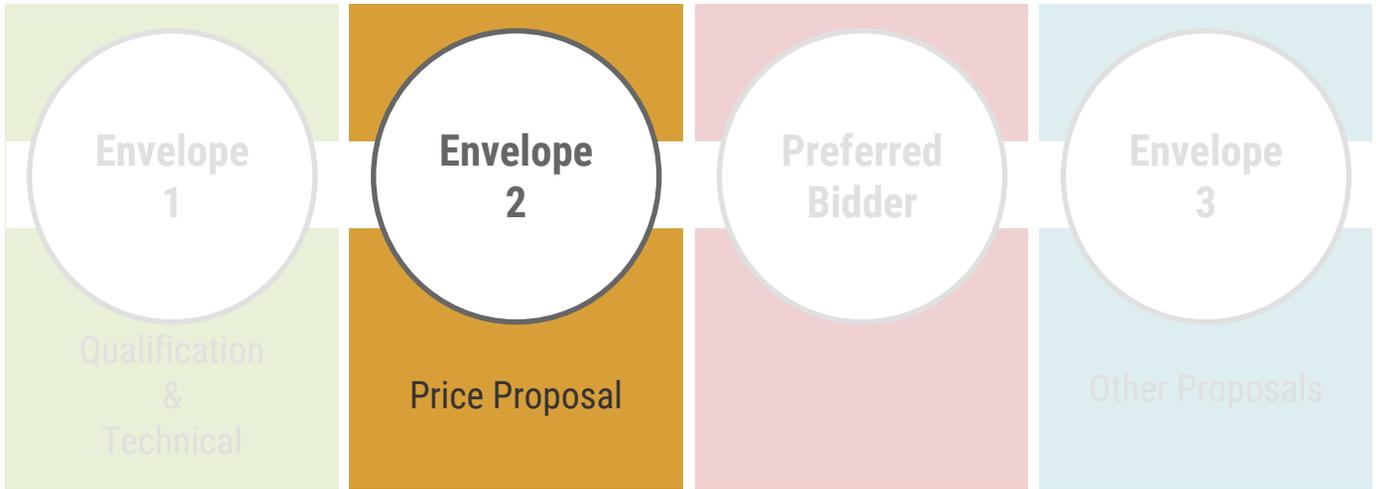
Step 2

Each of the Bidders shall obtain \geq [75%] of the total scores

Total scores of technical proposal is 100 points

- Project Management
- Methodology of Design Construction and O&M
- Quality
- Safety
- Technology transfer

Evaluation Criteria



Step 1

The documents shall consist of the following:

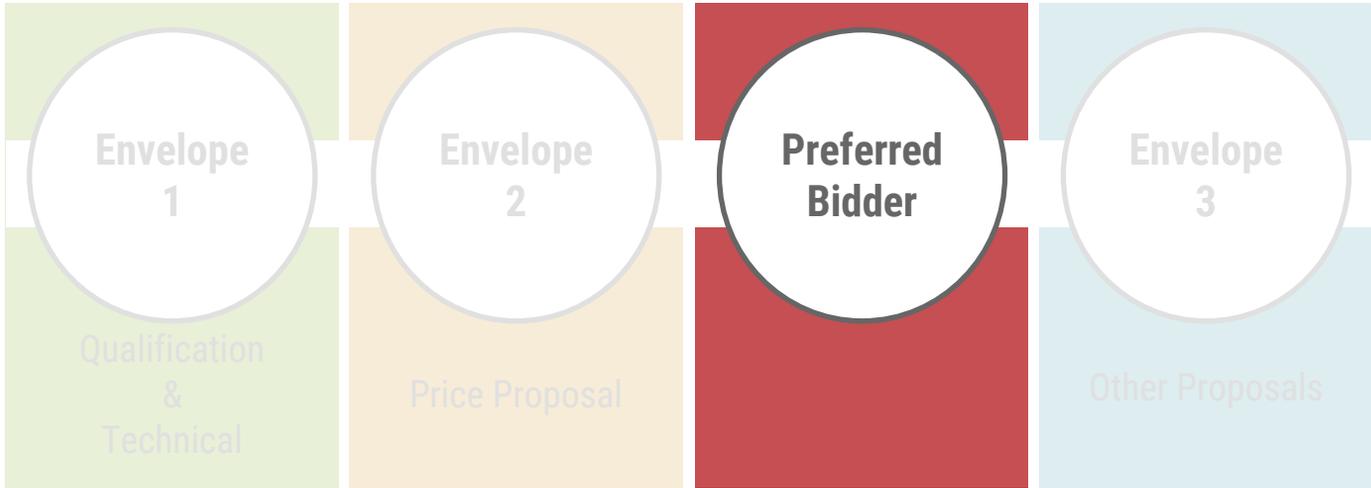
- Bills of Quantities
- Business and Financial Feasibility
- Schedule of available payment (AP)

Step 2

Total scores of Price is 100 points:

The bidder, who proposes the lowest present value of AP, will obtain maximum scores.

Evaluation Criteria



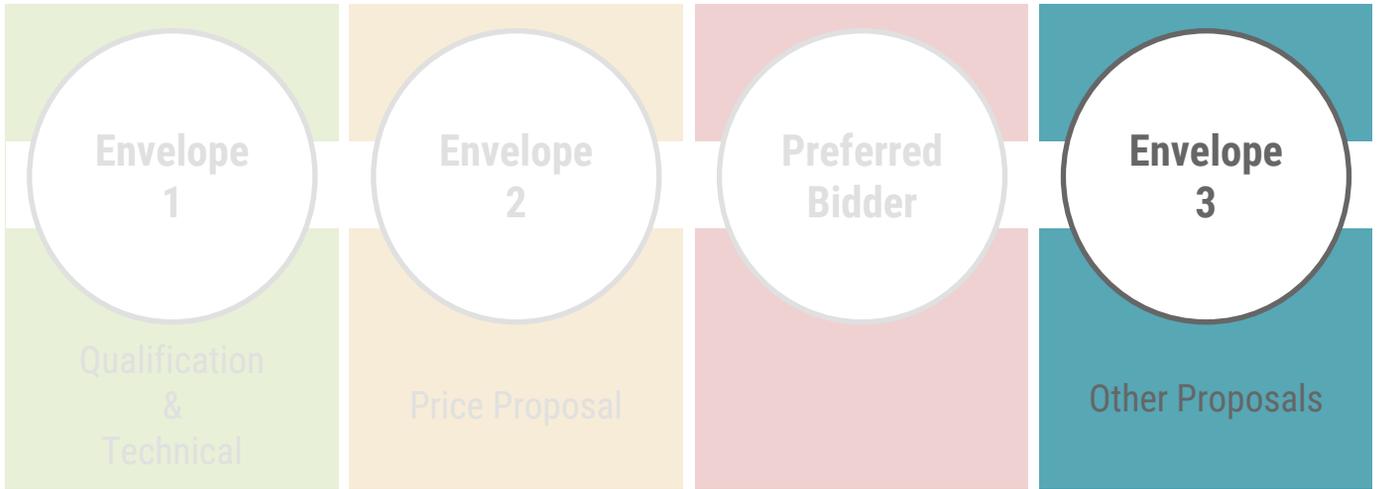
Step 1 Weighting of Criteria

Rated Category and Feature	Percentage weighting
Technical score	[x]%
Price score	[100-x]%
Total	100%

Step 2

Ranking	Bidder	Total score
1st	Firm A	95
2nd	Firm B	90
3rd	Firm C	80

Evaluated Proposal Score
 = (Technical score x [x]%) + (Price score x [100-x]%)



Preferred Bidder

Consideration of Envelope 3: Proposal of Open Road Tolling (ORT) system for Exit Toll Plaza

Bidders shall submit the proposals of ORT system for Exit Toll Plaza within 5 years from the opening year, which consist of Technical Proposal and Price Proposal.

The DOH reserves the right to determine whether Envelope 3 will be considered. In case of consideration, only the Envelope 3 of the preferred bidder will be considered.



Qualification of Special Purpose Vehicle (SPV)



- The Successful Bidder shall be registered as a new Thai juristic entity.
- The Successful Bidder shall provide suretyship or guarantee the performance of the newly established firm.
- The newly established Thai juristic entity should have and maintain a paid-up registered capital not more than 2.5 debt to equity ratio (D/E ratio) throughout the contract period.
- Changing of the members and their percentage of shareholding;
 - Phase 1 No changing of the members and their percentage of shareholding
 - Phase 2 Change of the members and their percentage of shareholding shall be made upon approval of the DOH only.

SESSION 2

- **Tender Process**
- ✓ **Contract Principles and Highlights**

Contract Principles and Highlights

