Construction Supervision of Mass Transit System Project in Bangkok

The Commuter Train System (Red Line) Project

Bang Sue-Rangsit Section
The development of the Rail Mass Train System is an effective measure for solving the chronic congested traffic in Bangkok and its perimeters. The State Railway of Thailand (SRT), one of the entities actively involved in the development of rail transport network, has launched the construction of the Mass Transit System (Red Line) as the key connection between the central business district and the four compass points of suburban areas.

The Red Line Mass Transit System Project (Bang Sue-Rangsit Section) is a project under the Mass Rapid Transit Master Plan in Bangkok Metropolitan Region (M-MAP) approved by the Cabinet on 22 May 2007 with a budget allocation of 59,888 million baht and a loan granted by the Japan International Cooperation Agency (JICA). From bidding, Contracts I and II are the responsibility of two civil work contractors tasked with the construction supervision and project management consultancies. The project was commenced on 4 March 2013, and will take a total period of four years.

Mass Transit System Project (Red Line) with state-of-the-art electric trains is destined to provide excellent services to passengers in a fast, safe and timely manner. Designed to serve passengers more efficiently, the project will not only facilitate development in suburban regions, but also mitigate the density of urban fabric.

The components of the Mass Transit System Networks operated by the State Railway of Thailand are:

1. The Dark Red Line (Thammasat University Rangsit Campus-Mahachai) will serve passengers travelling from northern to southern Bangkok and vice versa, with a total length of 80.5 km.
2. The Light Red Line (Salaya-Hua Mak) will run from the east to the west of Bangkok, with a total length of 54 km. At present, the construction of Bang Sue-Taling Chan (total length of 15.26 km) has been completed. This route is covered by diesel trains.
3. The Airport Rail Link (Don Muang-Suvarnabhumi) is addressed by electric trains, serving passengers from Don Muang Airport to Suvarnabhumi Airport, at a total length of 50.3 km. Currently, the route from Phaya Thai-Makkasan-Suvarnabhumi is functioning, with a total length of 28 km.
10 Routes of Mass Rapid Transit Network being expedited according to the Cabinet Resolution

Existing Networks
Total length of 79.5 km.

- Bang Sue – Don Muang (30.5 km)
- Saphan Mai – Pathum Thani (32 km)
- National Stadium – Hua Lamphong (7 km)
- Samut Prakan – Bang Pu (7 km)
- Phaya Thai – Saphan Mai (38 km)

Future Routes to be Opened in 2016
Total length of 250.4 km.

- Bang Sue – Khae Rai (34.5 km)
- Lat Phrao – Pattanakarn (12.6 km)
- Bearing – Samut Prakan (12.8 km)
- Taksin – Bang Wa (5.3 km)
- Bang Yai – Bang Sue (23 km)
- Khae Rai – Min Buri (34.5 km)

Future Routes to be Opened in 2017
Total length of 369.5 km.

- Bang Sue – Hua Lamphong (6.5 km)
- Bang Sue – Phaya Thai – Makkasan (9 km)
- Makkasan – Hua Mak (10 km)
- Don Muang – Bang Sue – Phaya Thai (21.8 km)
- Saphan Mai – Khu Khot (7 km)
- Bang Sue – Tha Phra (13 km)
- Hua Lamphong – Bang Kae (14 km)
- Thailand Cultural Center – Bang Kapi (9 km)
- Bang Kapi – Min Buri (11 km)
- Pattanakarn – Samrong (17.8 km)

Future Routes to be Opened after 2019
Total length of 464 km.

- Hua Lamphong – Bang Bon (18 km)
- Bang Bon – Mahachai (20 km)
- Khu Khot – Lam Luk Ka (6.5 km)
- Samut Prakan – Bang Pu (17 km)

10 Routes of Mass Rapid Transit Network being expedited according to the Cabinet Resolution
The alignment starts at Pradiphat T-junction, which is 1.8 km south of Bang Sue Station. It runs along the northern railway right of way, passing Chatuchak, Bang Khen, Lak Si, Don Muang, to Rangsit Station, in Pathum Thani Province, with a total length of 26.3 km. In the future, the route will be extended to Thammasat University Rangsit Campus.

Out of 26.3 km, the route is elevated from Bang Sue area (at 6+000 km) to Don Muang (at 25+232 km), a length of 19.2 km. From Don Muang Station (at 25+232 km) to Rangsit (32+350 km) it is an at-grade railroad and lined with fences, a length of 7.1 km. This section is operated by gauge-railway track and is connected to the existing northern railway.
Ten Stations

1. Bang Sue Grand Station
   (at 7+800 km) located in the compound of Bang Sue Junction, on Terd Damri Road.

2. Chatuchak Station
   (at 10+275 km) located at Kamphaeng Phet 2 and Kamphaeng Phet 6 roads, near the housing project for State Railway employees at Km 11.

3. Thung Song Hong
   (at 14+750 km) located at Kamphaeng Phet 6 and Vibhavadi Rangsit roads, near the Canine and Mounted Police Sub-Division.

4. Bang Khen Station
   (at 13+281 km) located at Bang Khen intersection on Kamphaeng Phet 6 Road, crossing Ngamwongwan Road, opposite Kaset Sart University on Vibhavadi Rangsit Road.

5. Lak Si Station
   (at 17+943 km) located at Kamphaeng Phet 6 Road, north of Lak Si intersection, opposite the IT Square Building, on Chaengwattana Road.

6. Kan Kheha Station
   (at 19+500 km) located at Kamphaeng Phet 6 and Vibhavadi Rangsit roads, near the Don Muang National Housing Project.

7. Don Muang Station
   (at 21+525 km) located opposite the Passenger Terminal Building of Don Muang Airport, at Kamphaeng Phet 6 and Vibhavadi Rangsit roads, and near Don Muang Railway Station.

8. Rangsit Station
   (at 30+347 km) located at the Rangsit-Prathum Thani and Kamphaeng Phet 6 roads, near the Rattanakosin 200 Years Village.

9. Wat Samian Nari Station
   (at 12+340 km) located in the middle of Chatuchak and Bang Khen stations, on Kamphaeng Phet 6 Road and opposite Wat Samian Nari.

10. Lak Hok Station
    (at 27+577 km) located in the middle of Don Muang and Rangsit stations, on Kamphaeng Phet 6 Road, connecting to Eaktaksin and Phaholyothin roads, near Muang Eak Village.
The Bang Sue Grand Station: The Center of the Rail-based Transport System of Thailand

The Bang Sue Grand Station or Phaholyothin Transportation Center is the starting point of the Mass Transit System Project (Red Line) (Bang Sue-Rangsit Section), and serves as the hub for the national rail mass transit system; it provides linkage to the existing northern, eastern, and southern railway routes as well as the future Red Line commuter train and the Suvarnabhumi-Don Muang Airport electric railway line (Airport Rail Link), and the future high-speed rail project. The Bang Sue Grand Station has the following main features:

The basement zone serves as parking space for 1,600 vehicles, and is connected to a hall leading to the ticket hall on the ground floor and a passageway to the MRT Bang Sue Station (MRTA).

The ground floor:
- Passenger terminal
- Mezzanine with a train control and signaling system and a VIP area
- Ticket hall and passageway to the MRT Bang Sue Station (MRTA)
- Retail space

The second floor has 12 center platforms for long-distance trains.

The third floor has 12 center platforms for Commuter Train lines. In the initial stage, four platforms will be in operation.
Types of Stations

Stations connected to the Bang Sue-Rangsit route are designed for different purposes.

**Type 1**

- Elevated stations to serve Commuter Train lines namely Chatuchak, Wat Samian Nari (future project), Bang Khen, Thung Song Hong, Lak Si, and Kan Kheha stations.
- **Ground floor:** Drop off & pick up area
- **Second floor:** Ticket office and passenger concourse connecting to the platform
- **Third floor:** Side platforms for Commuter Train lines

**Type 2**

- Elevated station to serve both suburban routes and long-distance lines, namely Don Muang Station.
- **Ground floor:** Drop off & pick up area
- **Second floor:** Ticket office and passenger concourse connecting to the platforms of suburban and long-distance routes
- **Third floor:** Center platforms for long-distance trains
- **Fourth Floor:** Center platforms for Commuter Trains

**Type 3**

- Elevated stations to serve suburban trains, with at-grade platforms for long-distance routes, namely Rangsit Station.
- **Ground floor:** Center platforms for long-distance routes and drop off & pick up area
- **Second floor:** Ticket hall and passenger concourse heading to platforms of long-distance and suburban routes
- **Third floor:** Center platforms for suburban routes
Local roads are designed to have four lanes to relieve traffic congestion in areas including:
- Bang Sue-Lak Si, left of the existing railway
- Lak Si-Don Muang, middle of the new and existing railway
- Don Muang-Rangsit, left of the existing railway

Flyovers have been built over the local road that runs across the Prempracha Village and near Soi Phaholyothin 87.
Benefits of the Project

- Reduce traffic congestion at eight intersections where the railways cross the roads and cut the accident rate down to zero.
- Increase the capacity of northern and northeastern railways.
- Enhance the capacity of the Commuter Train routes to help reduce the consumption of fuels and improve the quality of the environment.
- Attract many more people to use the railway system. It is expected that the Rangsit-Bang Sue line will serve 300,000 passengers/day. Further, after the Bang Sue section extends to Baan Pachi Junction in the future, the project is expected to serve 450,000 passengers/day.
**Contract 1:** Civil Works for Bang Sue Grand Station and Depot
- Construction of Bang Sue Grand Station and Chatuchak Station with building services
- Construction of an elevated railway at 6+600 km to 12+201.700 km
- Construction of a commuter train depot, long-distance depot, stabling yards as well as other related train operation control building
- Construction of roads, flyovers and drainage system

**Contract 2:** Civil Works for Bang Sue-Rangsit
- Construction of six stations with building services along railway (Bang Khen, Thung Song Hong, Lak Si, Kan Kheha, Don Muang, and Rangsit)
- Construction of an elevated railway at 12+201.700 km to 25+232 km and at-grade railway at 25+323 to 32+350 km
- Construction of local roads, U-turn bridges, drainage system
- Foundation works and basic structures for future construction of Wat Samian Nari Station and Lak Hok Station

**Contract 3**
- Procurement of rolling stock
- Track works
- Electrification system
- Train control and signaling systems
- Communication system
- Security system and operation automation
- System integration and test run

Construction timeframe: 48 Months (1440 Days)
**Contract 3:** Electrical and Mechanical systems for Electric Trains running from Bang Sue to Rangsit

- Track works in meter gauge
- Electrification system
- Train control and signaling system
- Communication system
- Ticketing system
- Depot facilities and equipment
- Control access security system (CASS), operation automation and information technology system (OA&IT)
- Bulk substation and auto-transformer
- Removal, immunization, modification and/or relocation of existing tracks, level crossings and signaling/communications
- Procurement of rolling stock and fitting of ATP to the employer’s existing rolling stock
- Provision of Mass Transit Rail Authority Advice and Assistance Group
State Railway of Thailand

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