Transportation Systems

AIRPORT RAIL LINK - BANGKOK

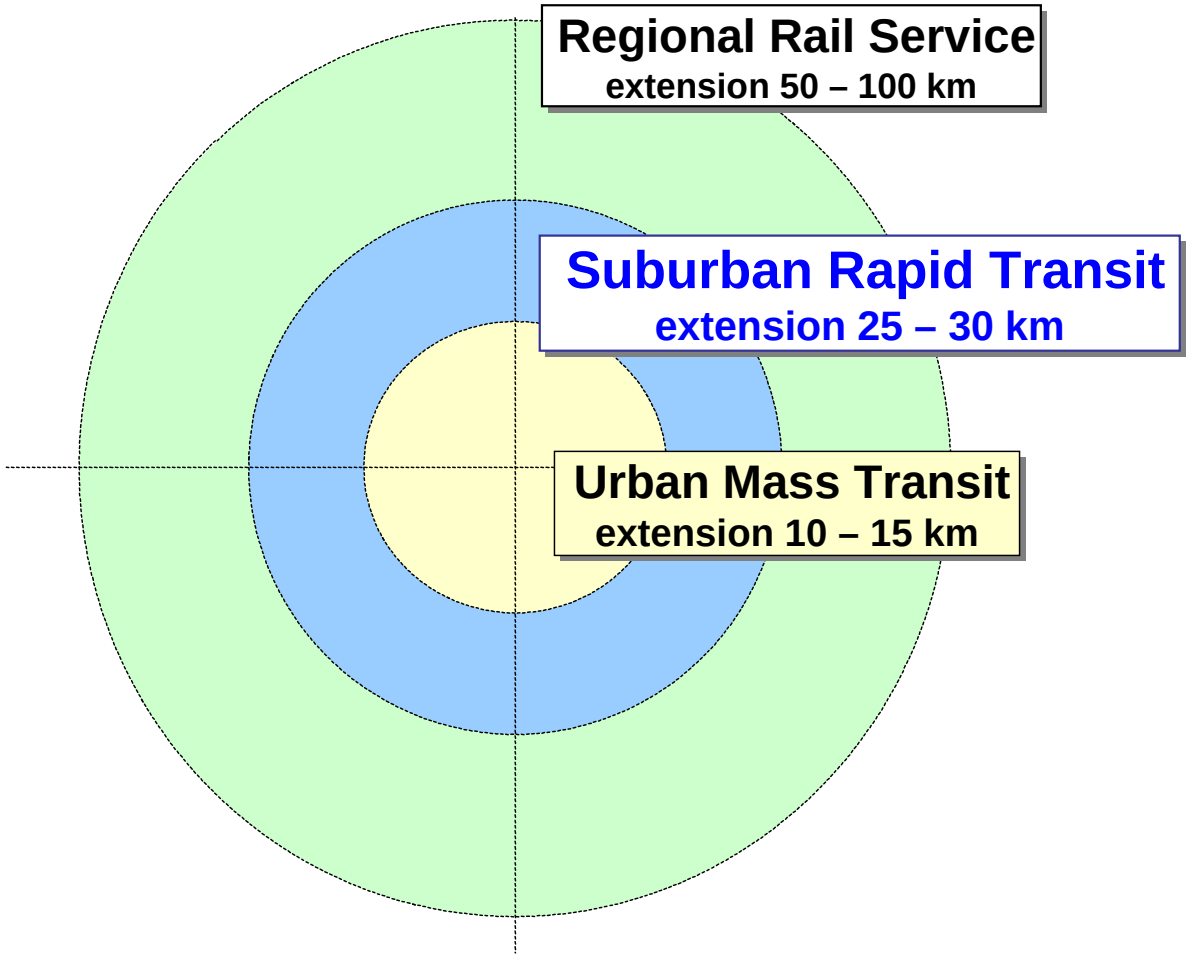
Integrated Public Transit System for Metropolitan Regions

- Regional Rail Service
- Suburban Rapid Transit
- Urban Mass Transit
  - Metro
  - Light Rail Transit
- Bus Transit
- Park-and-Ride

Examples in other Metropolitan Regions:

- **London**
- **Paris**
- **Berlin**

Rail Services in Bangkok Metropolitan Region



headway in peak:	30 min
station spacing:	10 km
travel distance:	25 km

headway in peak:	10 min
station spacing:	3 km
travel distance:	10 km

headway in peak:	<5 min
station spacing:	1 km
travel distance:	3 km

Rail Services in Bangkok Metropolitan Region

Regional and Intercity Rail Services:

- SRT

Suburban Rapid Transit:

- **Second Bangkok International Airport Rail Link (ARL)**
  - **SA Express**
  - **SA City Line**

SA = Suvarnabhumi Airport

Urban Mass Transit:

- BTS and MRTA

Airport Rail Link in BMR

The implementation of the

Airport Rail Link (ARL)

to the new Suvarnabhumi Airport

is the first step to a

Suburban Rapid Transit System

in Bangkok Metropolitan Region (BMR).

Integrated Rail Network

World wide railway experience has proven,

that Suburban Rapid Transit

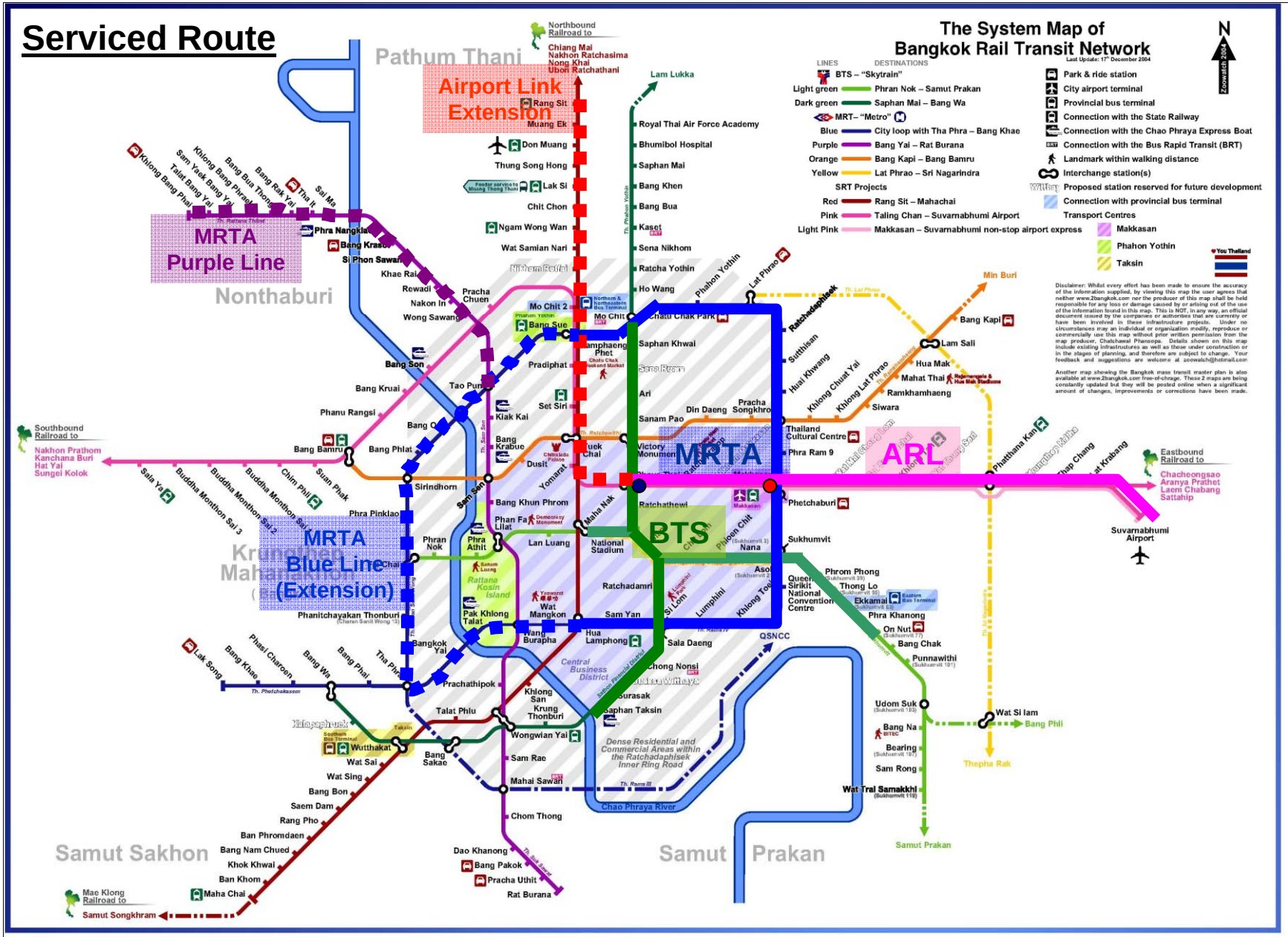
should

be operated on designated tracks

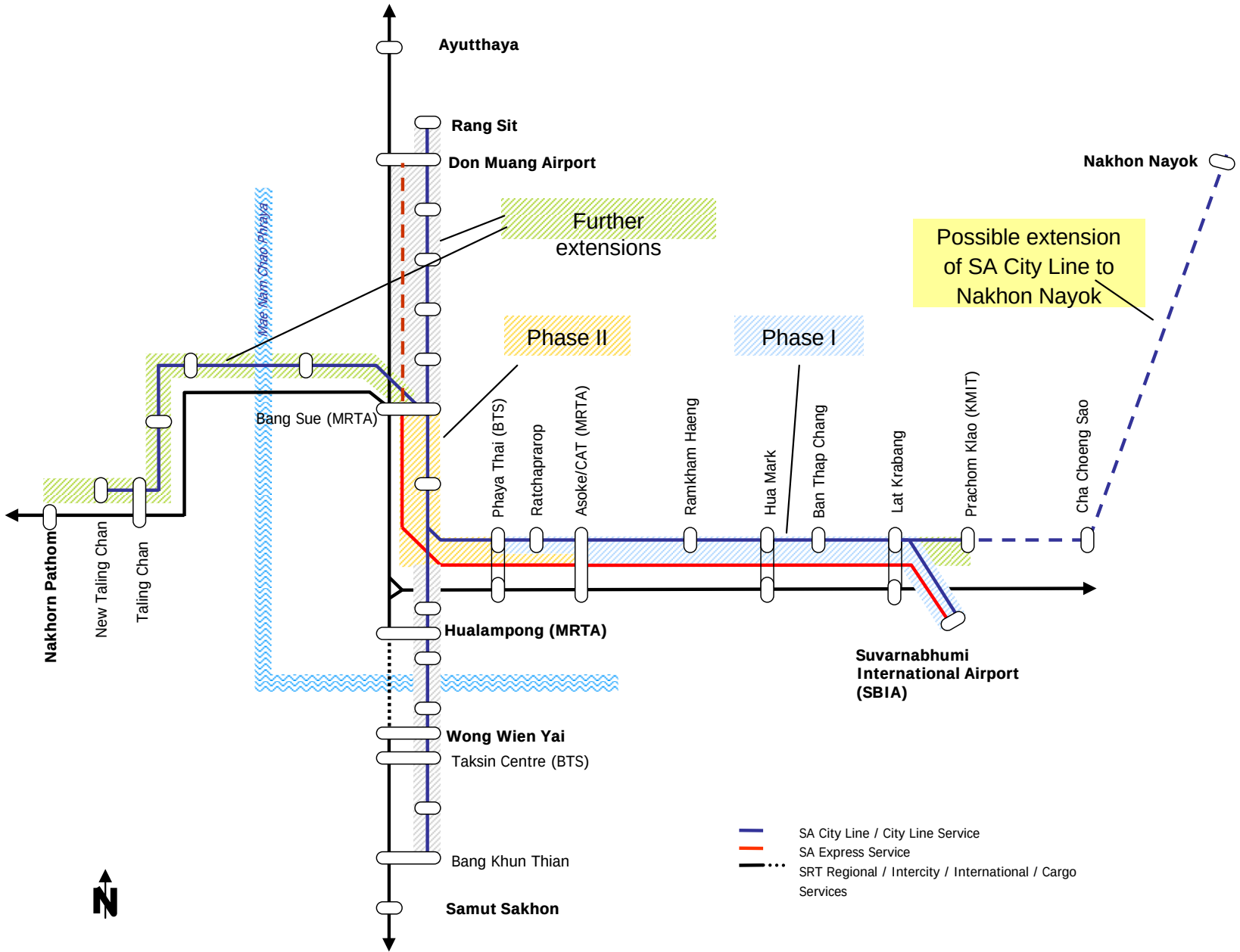
to avoid delays

caused by regional and intercity traffic !

Rail Network Master Plan in Bangkok

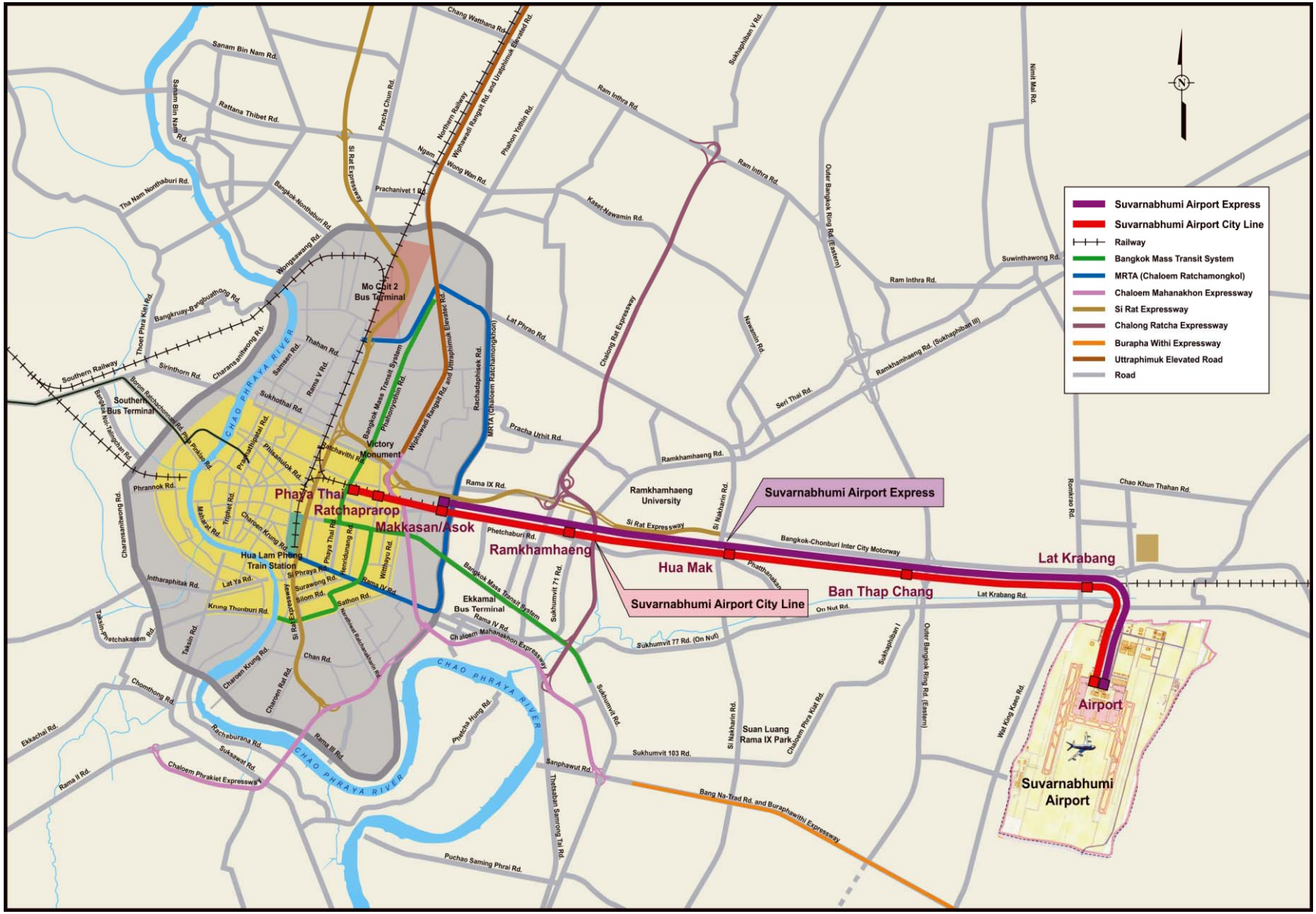


Airport Rail Link (SA Express / SA City Line)
Backbone of the Suburban Rapid Transit (future network)



Transportation Systems

Suvarnabhumi Airport Rail Link and City Air Terminal



The purpose of the ARL System is twofold

- To provide a fast rail link between the central city area to the new Suvarnabhumi Airport (SA)
- To provide a suburban rapid transit service for the commuters in the eastern corridor of Bangkok Metropolitan Region (BMR)

The ARL will operate on dedicated tracks within the eastern Red Line corridor of the State Railway of Thailand (SRT) parallel to the existing SRT rail services with passenger and freight trains. There will be several SRT stations for regional train services.

Project Information

The initial stage of the ARL will be opened in 2007. In the second stage, the ARL System with the two services will be extended to Bang Sue, Bangkok's future main station. Further extensions within this corridor in northern direction to Don Muang/Rangsit and to the South in direction of Hua Lumpong are possible. An extension of the SA City Air Line further east to Prachom Klao is also in discussion. With the future extension of Suvarnabhumi Airport, the system may also be extended to an additional, second airport terminal further south.

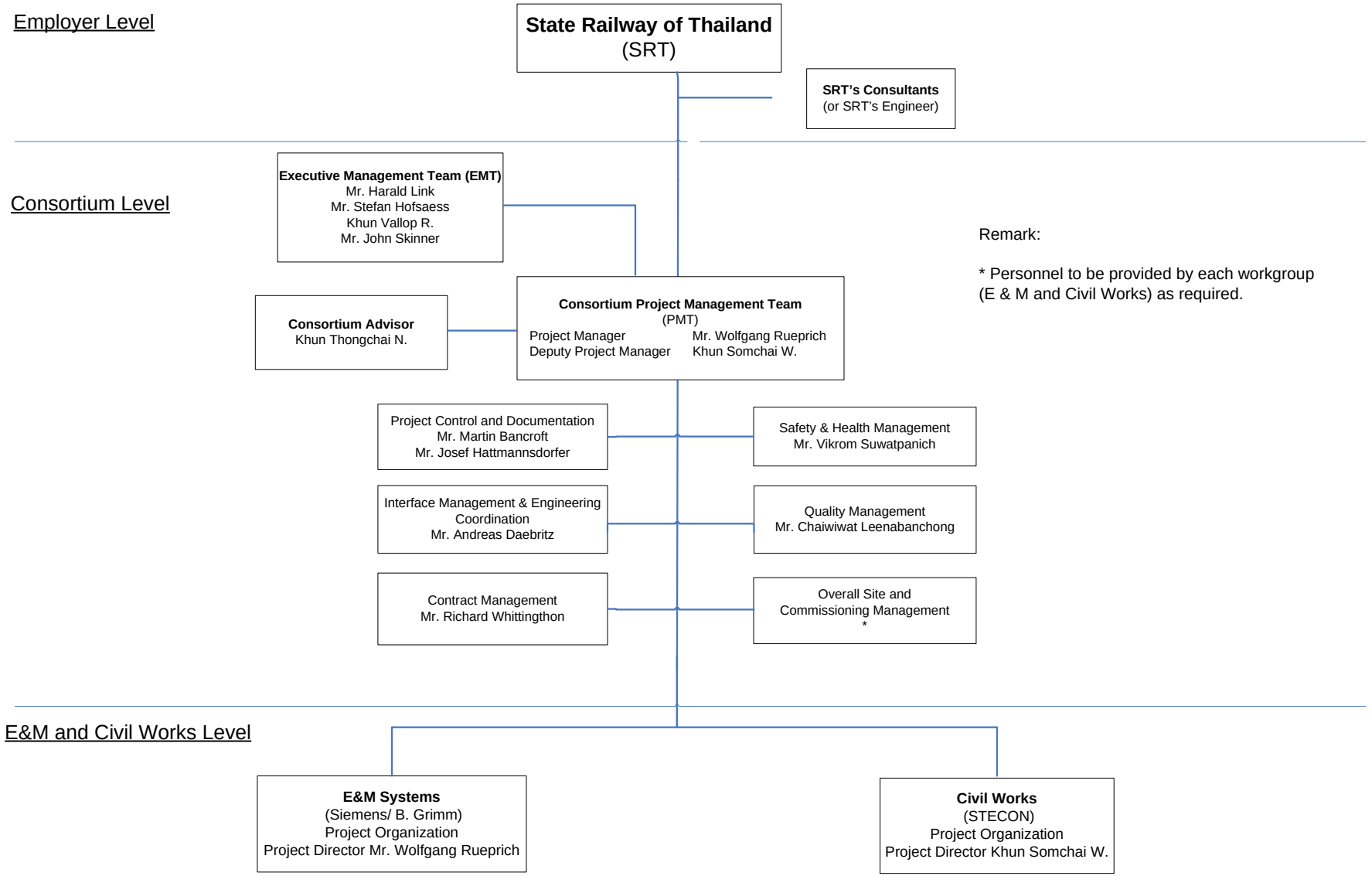
Project Information

Client / Employer:	State Railway of Thailand (SRT)
Employer Representative:	Construction Supervision Consultant (CSC) consists of 7 companies - Asian Engineering Consultants (AEC) - Thai Engineering Consultants (TEC) - Pacific Consultants International - Chotichinda Mouchel Consultants - DE-Consult Deutsche Eisenbahn Consulting - Wisit Engineering Consultants - Design Concept
Contract Type:	Turnkey Project
Employee:	Part I: Civil, Architectural and Building Services (Civil Works) - Sino-Thai Engineering & Construction Public Co., Ltd. Part II: Railway Systems and CAT Facilities (E&M Works) - B.Grimm International Limited - Siemens Aktiengesellschaft - Siemens Limited - B.Grimm MBM Hong Kong Limited

Project Information

Total Track length (double Track)	approx. 28.8 km.
Services	SA Express (Makkasan/Asoke – Suvarnbhumi Airport Terminal) SA City Line (Phayathai – Suvarnbhumi Airport Terminal)
Track Gauge	Standard Gauge (1.435)
Number of Stations	2 SA Express Stations 8 SA City Line Stations
Maximum Speed	Main Line: 160 km/h Depot Area: 25 km/h Washing Plant: 5 km/h
Trip Times (approx.)	15 min. for SA Express (05:00 – 01:00 hours) 30 min. for SA City Line (00:00 – 24:00 hours)
Traction Power Supply	25 kV AC, Overhead Catenary System

Project Organization



Significant Milestones

Tender Documents:	August 2004
Submission of bidding doc.:	18th November 2004
Date of Signature:	20th January 2005
Notice to Proceed:	18th February 2005
Contract Day 1:	19th February 2005
Contract Day 900:	7th August 2007
Contract Day 990:	5th November 2007

Scope of E&M Works

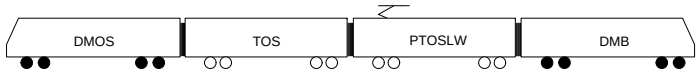
Siemens Supplies

- Trackwork
- 4 x 4-car-trains (Express) + 5 x 3-car-trains (City line)
- Train Control and Signaling System
- Electric Power System
- Communication Systems
- Automatic Fare Collection
- Railway E&M System (PSD, TVS, TFF, TLS)
- Depot and Workshop Equipment
- Check in Facilities and Baggage Handling System
- Project Management
- Engineering, Operations Concept
- Installation and Commissioning
- Overall System Integration of all E&M Systems
- Training

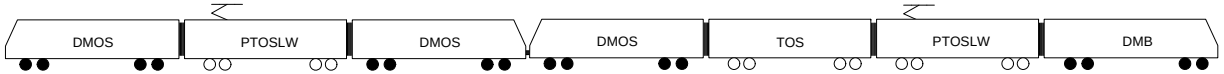
Proposed train configuration - SA Express

Proposed Train configuration - SA Express

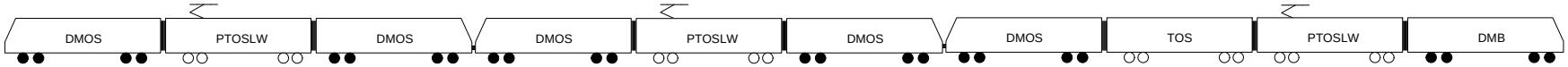
Year: 2007 to 2011



Year: 2012 to 2021



Year: 2022 to 2037

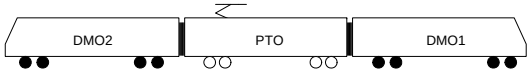


DMOS	Driving Motor Open Standard
PTOSLW	Pantograph Trailer Open Standard Lavatory Wheelchair
TOS	Trailer Open Standard
DMB	Driving Motor Baggage
○○	Trailer Bogie
●●	Motor Bogie

Proposed train configuration - SA City Line

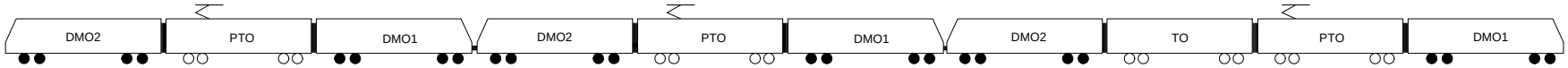
Proposed Train Configuration - SA CityLine

Year: 2007 to 2011



Year: 2012 to 2021

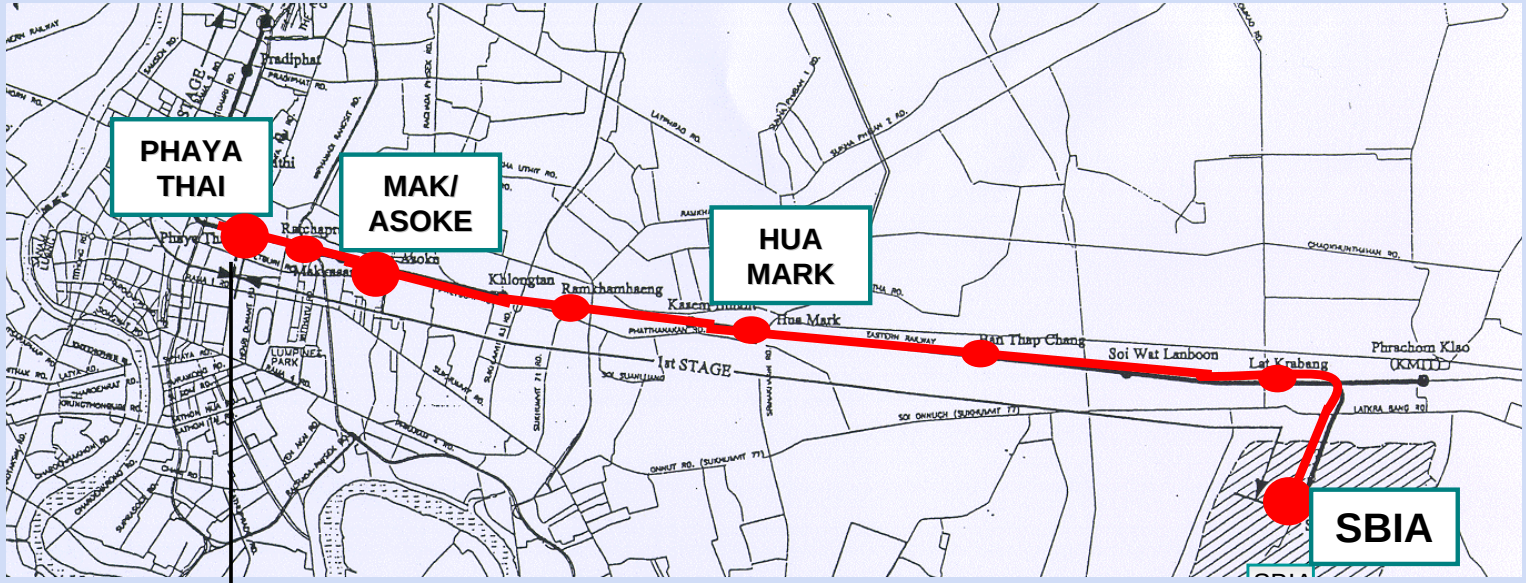
Year: 2022 to 2037

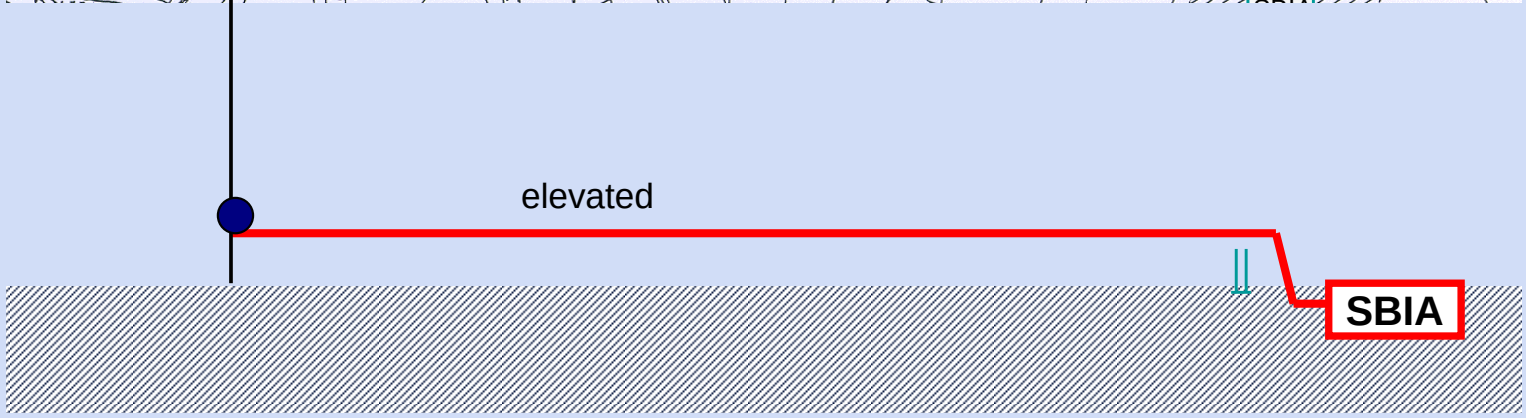


DMO2	Driving Motor Open 2
PTO	Pantograph Trailer Open
TO	Trailer Open
DMO1	Driving Motor Open 1
○○	Trailer Bogie
●●	Motor Bogie

Alignment

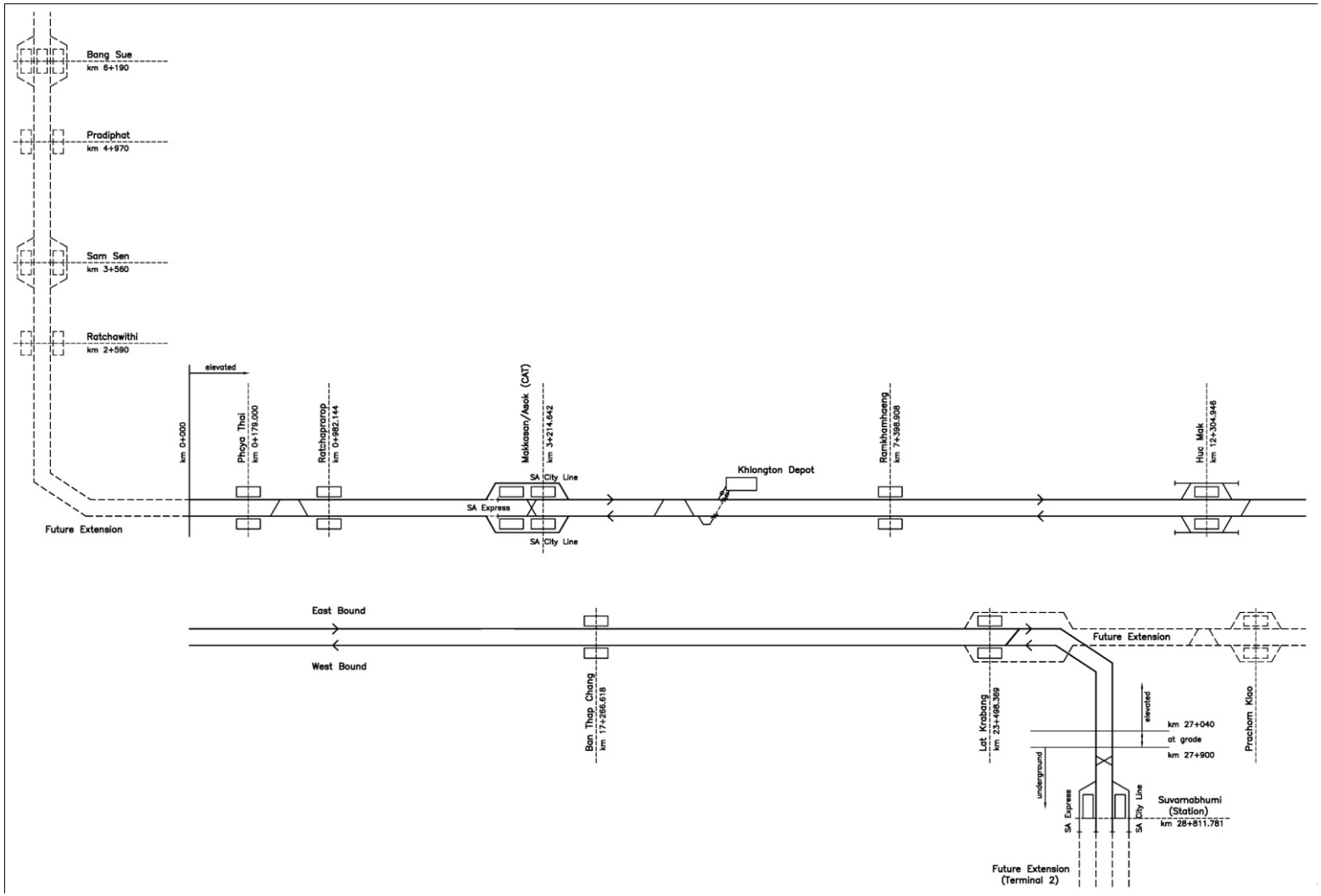
Horizontal Alignment



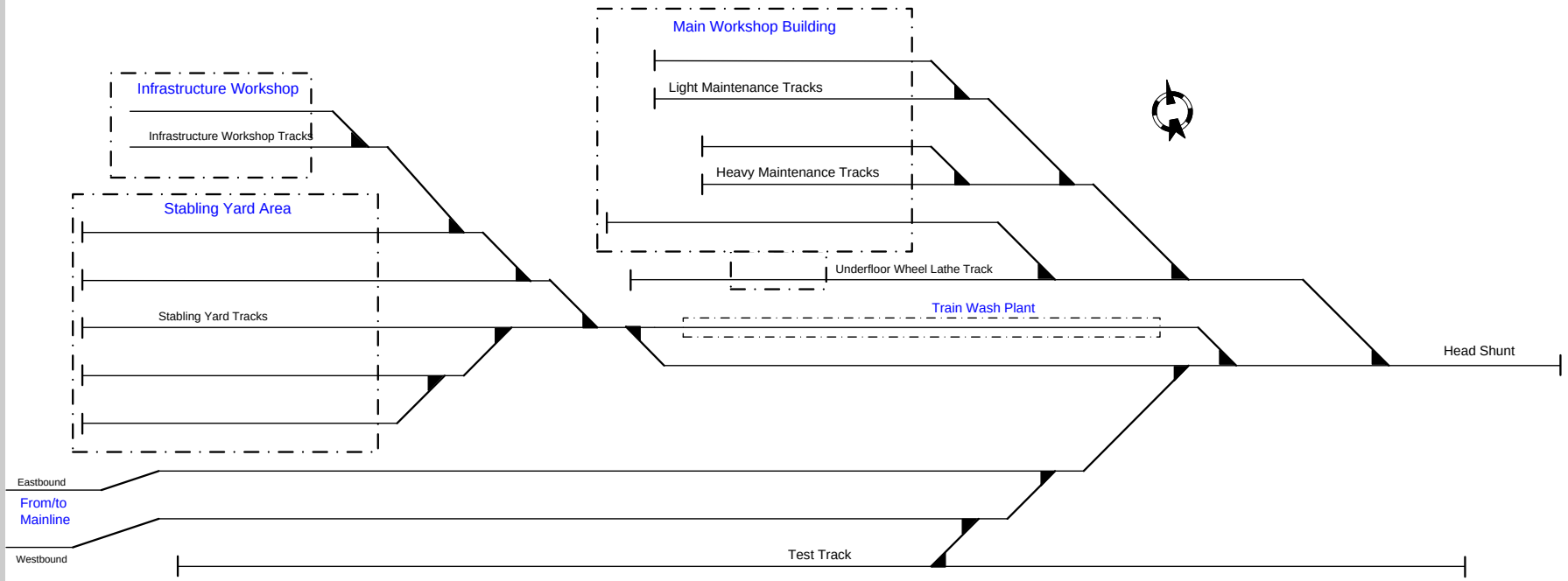


Vertical Alignment

Schematic Track Layout Mainline



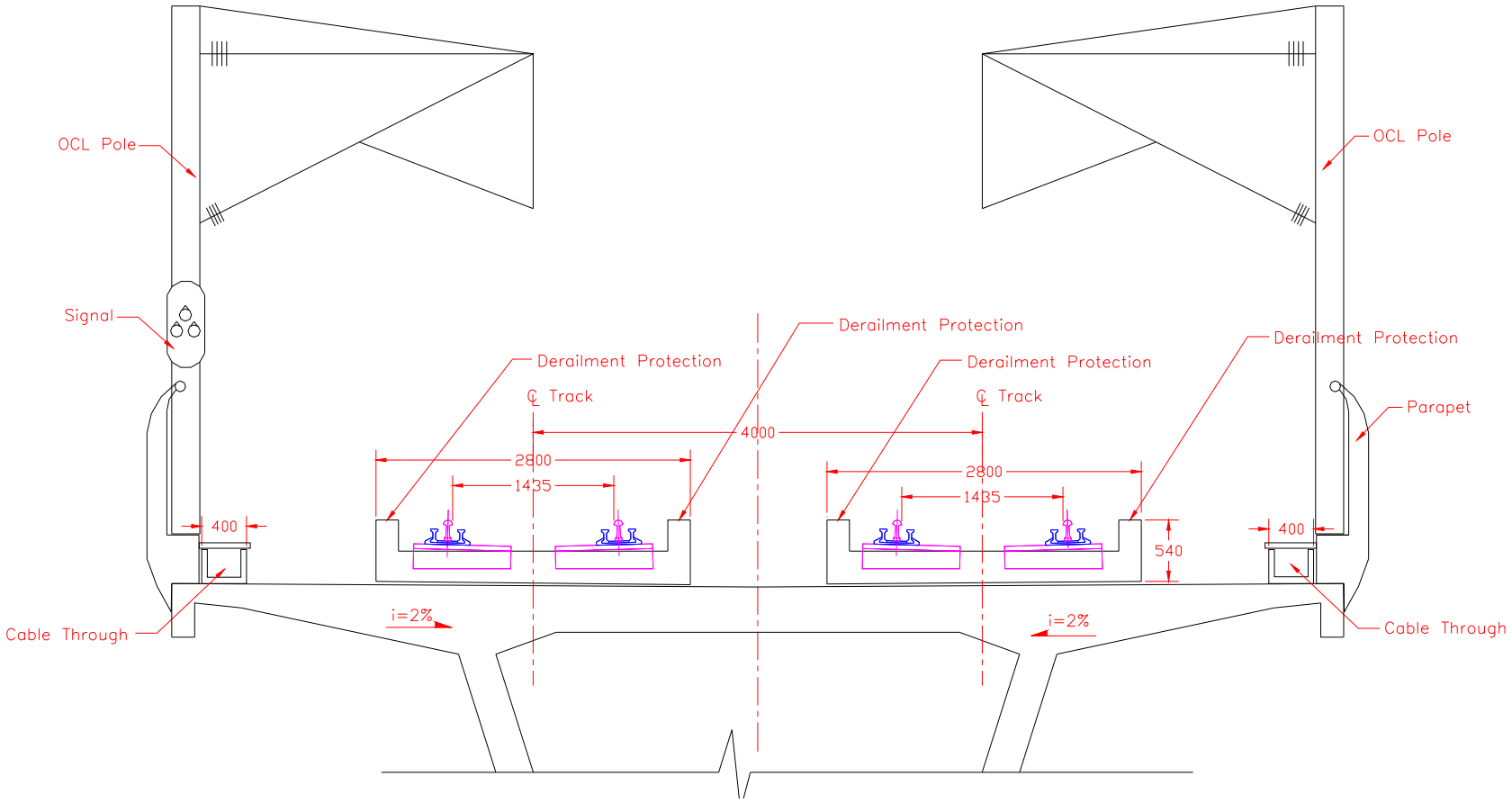
Schematic Track Layout Depot



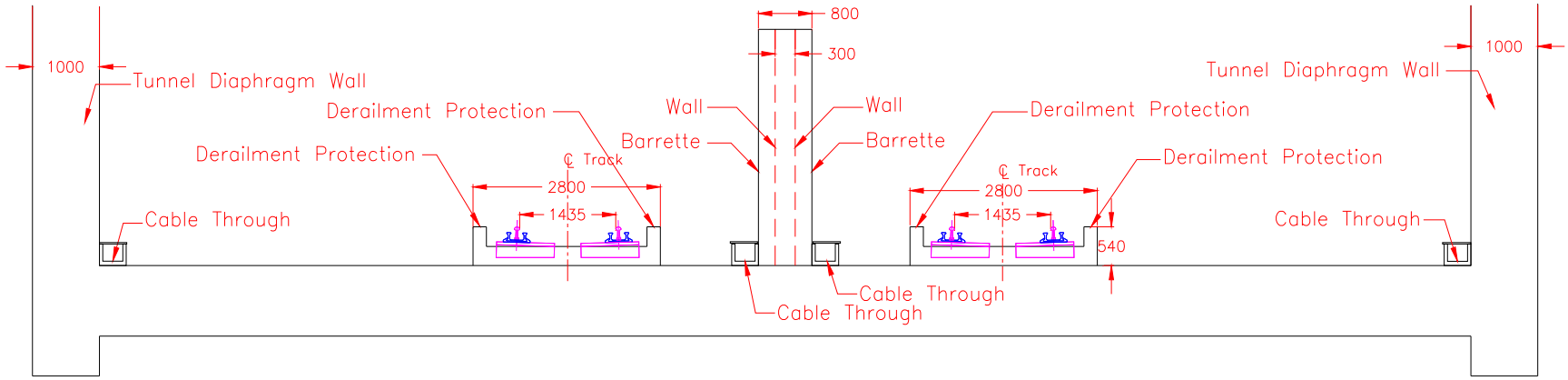
Legend:

- Track
- Buffer Stop
- Turnout

Cross Section of Double Block Track (DBT)



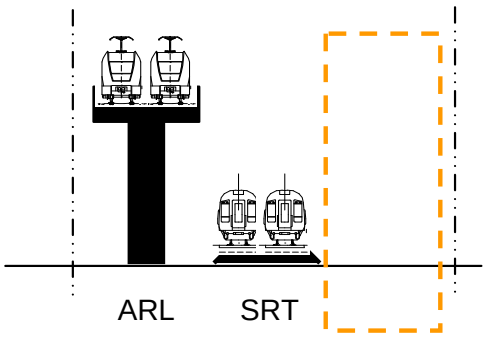
Cross Section of Track Section in Tunnel



Preferred Alignment Option

The **Preferred Option** presents the utmost balance,

in the nature of a Stand Alone Project:



Stage 1

1. Efficient planning for SRT corridor keeps options for **future development** open, e.g. modernisation of existing SRT tracks, additional track for High Speed etc.

2. Shortest possible **construction time** for ARL Civil Works

3. Least investment in Civil Works, therefore recommendable from the **financing** point of view