

【Thailand】

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Park-and-Ride and barrier-free facilities around the Khu Khot Station, the northernmost station on the BTS Sukhumvit Line in Bangkok, Thailand

Yukio Yamashita (Mr.), Senior Researcher and Senior Director, JTTRI-AIRO

Keiichi Sakai (Mr.), Researcher, JTTRI-AIRO

1. Introduction

Bangkok's urban railways, as of July 2021, are (1) Bangkok Mass Transit System Public Company Limited (BTSC), (2) Bangkok Expressway and Metro Public Company Limited (BEM), and (3) State Railway of Thailand Electrified Train Company Limited (SRTET).

As of July 2012, BTSC operates 3 lines as the BTS Sukhumvit Line, Silom Line and Gold Line, BEM operates 2 lines as the MRT Blue Line and Purple Line, and SRTET operates 1 line as the Airport Rail Link.

Yet, the owner of the BTS facilities for the sections that opened in 1999 (from Mo Chit (N8) to On Nut (E9) on the Sukhumvit Line and from National Stadium (W1) to Saphan Taksin (S6)^{Note 1,2)} on the Silom Line) is BTSC, but the owner of extended sections¹⁾²⁾ is the Bangkok Metropolitan Administration (BMA). On the other hand, the Blue Line and Purple Line of MRT are owned by the Mass Rapid Transit Authority of Thailand (MRTA), and the Airport Rail Link is owned by the State Railway of Thailand (SRT)^{Note 3)}. (Table-1).

As we had the opportunity to explore the northernmost station, Khu Khot (N24) on the Sukhumvit Line operated by BTS, and its vicinity, we report the situation.

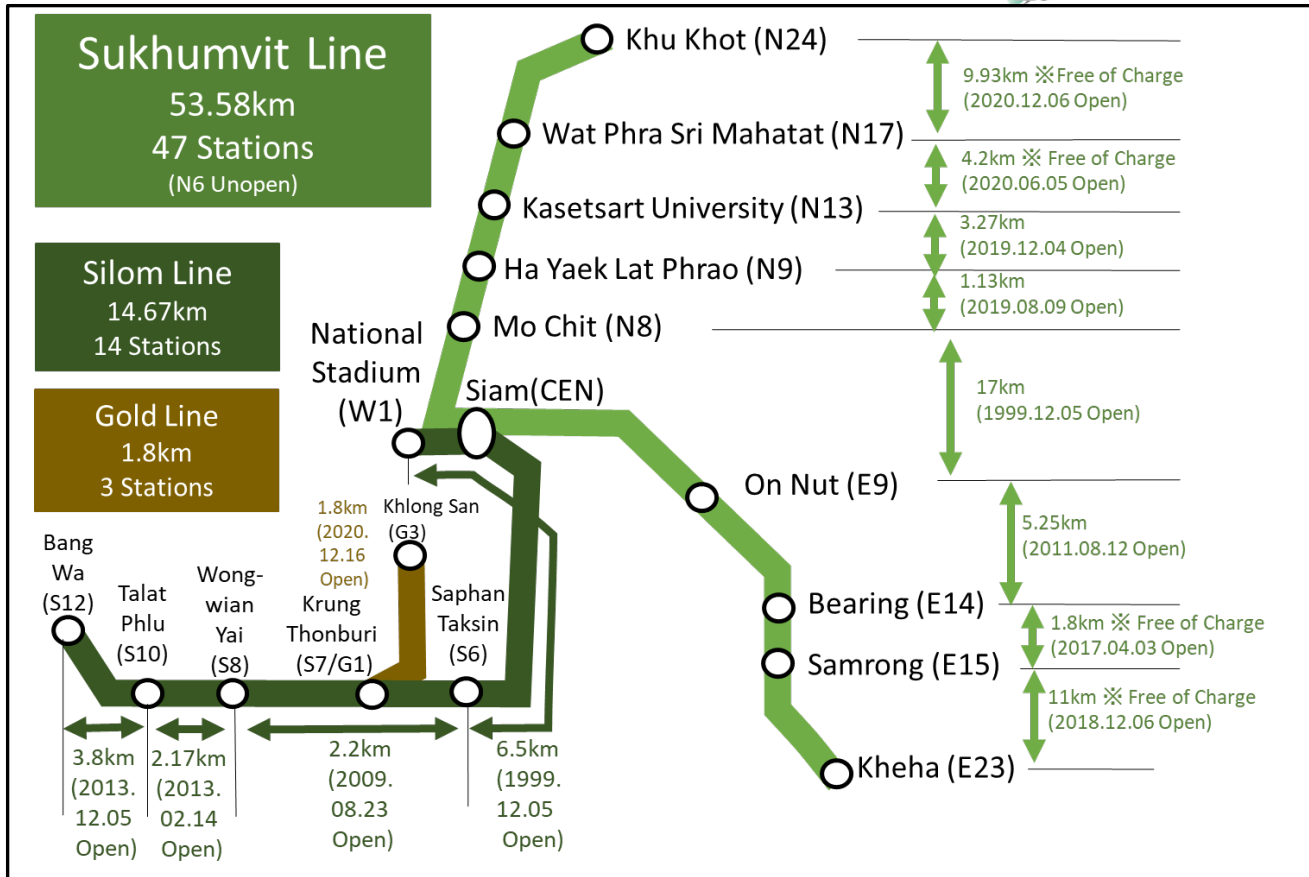
2. BTS Sukhumvit Line and Khu Khot Station

The Sukhumvit Line was firstly opened from Mo Chit Station (N8) to On Nut Station (E9) with 17 stations at December 1999, and has been extended to the southeast and to north by 7 times expansions. Then, as of July 2021, it operates from Kheha Station (E23) which is the southeastern-most station, to Khu Khot Station (N24) which is the northernmost, and its distance is about 53.6 km⁴⁾⁵⁾ with 47stations. The most recently opened section is from Wat Phra Sri Mahathat station to Kukot station in the northside part, which is opened in December 2020. The Khu Khot station is a new station and our visit was only six months after its opening. Furthermore, the sections of northern part and southeastern part were developed at or after 2017, the fare of these two sections is free of charge at

Table-1 List of railroad lines in Bangkok Metropolitan Area (as of July 1, 2021)

Name	Management Company	Facility Owner	business plan (policy)
BTS	BTSC (Bangkok Mass Transit System Public Company Limited)	Opening section in 1999: BTSC Subsequent extension section: Bangkok Metropolitan Administration (BMA: Bangkok Metropolitan Administration)	3 routes Sukhumvit Line Silom Line Gold Line
MRT	BEM (Bangkok Expressway and Metro Public Company Limited)	Thai High Speed Traffic Authority (MRTA: Mass Rapid Transit Authority of Thailand)	2 routes Blue Line Purple Line
Airport Rail Link	SRTET (State Railway of Thailand Electrified Train Company Limited) ^{Note 3)}	State Railway of Thailand (SRT: State Railway of Thailand)	1 route Airport Rail Link

Source: Compiled by the ASEAN-India Regional Office of the Transport Research Institute based on literature¹⁾, press information²⁾, and the websites of BTSC⁴⁾, BEM⁵⁾, MRTA⁶⁾, and SRTET.⁸⁾



Source: Compiled by the ASEAN-India Regional Office of the Transport Research Institute, based on ⁴⁾⁵⁾¹⁰⁾ the BTS website.

Figure 1: BTS route map and summary of open sections (as of July 1, 2021)

present (Figure 1¹⁰⁾.

3. Area around Khu Khot Station

3.1 Station area and related facilities

Near the exit of the station, there is a waiting space for buses and general vehicles (Photo-1). It is like a small bus terminal that constitutes a station square in Japan. However, cabs and motorcycle cabs are not waiting for passengers in that space, but on the main road near the exit of the station (Photo-2).

There are almost no houses in the vicinity of the station, and there is only the local police station nearby. In addition to the police station, what attracts people's attention around the station are the Park-and-Ride facilities (P&R facilities) where people can park their cars and bicycles (Photo-3).

The P&R facility is a 6 stories building which has multi-story parking garage with a parking capacity of 781 cars ¹¹⁾(Photo-4). It is open from 05:00 to 01:00 in accordance with BTS service hours¹¹⁾. There is a barrier-free parking space near the entrance and exit of the each level (Photo-5), and wheelchair users can use the elevator



Photo-1: Buses and P&R facilities between the station and P&R facilities, stand-by space for general vehicles



Photo 2: Cabs waiting near the exit



Photo-3: The P&R building beside the Khu Khot Station



Photo-4: Interior of the P&R facility

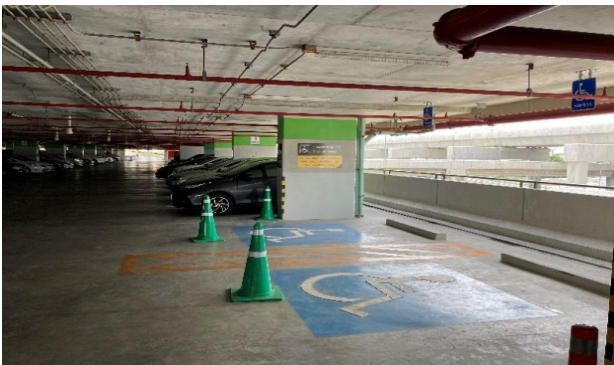


Photo-5: The closest point to the station
Parking space for people with disabilities



Photo-6: High-rise residential buildings seen from the platform at Khu Khot station

to move between the station and the P&R facility.

The P&R facility allows people to enter from the main road that runs under the Sukhumvit Line. Because the day of our visit was a holiday and the number of people was low due to the COVID-19 pandemic, the parking lot was not full, but there were many vehicles parked in the parking space up to the 2nd floor. From the platform of Khu Khot station, we could see a district with high-rise residential buildings (Photo-6), so we could imagine that people from these residential buildings came to Khu Khot station by car or motorcycle, parked them at the P&R facility, and then used the Sukhumvit Line.

In the case of Khu Khot station, there is no passenger demand around the station that can be reached on foot, so it is believed that the P&R facilities were built in advance with the intention of targeting passenger demand in areas that are some distance from the station. In addition, there are 7 P&R facilities around¹¹⁾ on the Sukhumvit Line, including Khu Khot station, and 2 of them on the Silom Line, 9 P&R facilities in total.

3. 2 Status of barrier-free accessibility at Khu Khot station building

The station is a 3 multi-storied building on the main road, with stairs, escalators, or elevators leading from the ground to the ticket gate floor on the 2nd floor, and then through the ticket gate to the platform on the 3rd floor to board the train. There are 2 staircases, one on each side of the main road, so there are 4 staircases in total, that serve as entrances to the station building. 1 escalator is located on

both sides of the station building along the main road, and 1 elevator is located on both sides as well. Many of the newer stations on the Sukhumvit Line have this kind of structure, and we acknowledged that the idea of barrier-free is being adopted.

3.3 Approach to the station from the sidewalk and flood control

The sidewalks are equipped with stairs, escalators, and elevators to go up to the station building, and barrier-free measures have been taken. On the other hand, with the

installation of these barrier-free facilities, some parts of the sidewalks have become narrower, which hinders pedestrian traffic flow (Photo-7, Photo-8).

From another point of view, the escalators and elevators have been raised from the ground at the entrances of many urban railroad stations in Bangkok, including Khu Khot Station, in the same way that Japanese subways have installed flood prevention boards to prevent flooding. It is based on Bangkok's experience of suffering from large-scale flooding (Photo-9, Photo-10). Similarly, at the entrances to many urban railway stations, including Khu Khot station,



Photo-7: Stairs on the sidewalk



Photo-8: Elevator on the sidewalk



Photo-9 (left), Photo-10 (right): Raised escalators, elevators and stairs between the station and the P&R facility.

escalators and elevators have been raised from the ground to prevent flooding (Photo-9, Photo-10).

In Thailand, unlike Japan, it often rains heavily in a short period of time, and roads are frequently flooded. Therefore, when developing infrastructure, it is necessary to take into account these differences in the environment, rather than simply applying the same measures as in Japan.

4. Conclusion

In this exploration, we were able to check the site for innovations to improve connectivity in the station and its surrounding areas.

In Japan, bicycle and motorcycle parking facilities are provided around stations on urban rail lines, and P&R facilities for automobiles are located in the suburbs. Overseas, there are also examples of large-scale P&R facilities at urban railroad stations in Taipei and at Taiwan High Speed Rail stations. P&R facilities are expected to play an important role in expanding station coverage and encouraging railway use, especially in Southeast Asia and other areas where urban railroads are being developed.

The installation of barrier-free facilities also has the effect of improving the convenience of railways for people with physical disabilities, but it is difficult to simply install the facilities in accordance with the standards, as it may have the effect of blocking pedestrian traffic on sidewalks. As far as the current situation is concerned, it is thought that there are issues to be solved in the advance coordination among the parties concerned, such as coordination at the planning stage and site confirmation.

We are conducting research on railways development and area development along railway lines, and we will continue to work to ensure that the results of this research contribute to the development of urban railways^{Note 4}, including future line extensions. We would also like to continue our efforts to conduct research and provide information that takes into account the different environment from Japan, including local customs and climate.

Annotation

- (Note 1) The names of railroad lines and stations in this report are based on the English notation converted into Japanese idiomatic expressions, which do not necessarily correspond to the local pronunciation.
- (Note 2) In the BTS and MRT, stations are numbered to improve convenience for users. For example, on the Sukhumvit Line, the starting point (CEN) is Siam Station in the center of the line, and the symbols N1 to N24 are assigned to the north direction, and E1 to E23 to the southeast direction. The station at N6 has not yet been opened.
- (Note 3) SRT is scheduled to hand over the operating rights of ARL to a consortium led by CP Group (a major Thai conglomerate) for 10.671 billion baht by October 24, 2021, and the new company is scheduled³⁾ to start operations the following October 25.
- (Note 4) The Sukhumvit Line is planned to be extended from the current northernmost station, Khu Khot (N24), to four stations further north, but the timing of construction has not yet been determined.

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