

Publication: CNA Online

Date: 13 October 2024

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The system, particularly the Bukit Panjang line, has been plagued by numerous issues, with reliability problems a major concern. Renewal works are ongoing, but some of the system's quirks cannot be solved, experts say.



Office executive Mr Lau has lived in Yew Tee for 20 years, but he can count on one hand the number of times he has taken the Light Rail Transit (LRT) from Choa Chu Kang to Bukit Panjang.

When CNA TODAY met Mr Lau, who did not want to give his full name, on the platform at Choa Chu Kang LRT station on Oct 2, the 50-year-old was intently studying the Bukit Panjang LRT map.

"I avoid the (Bukit Panjang) LRT at all costs," Mr Lau said. "The cabins are small and cramped during peak hours, and the navigation is confusing."

Another commuter on the same platform was homemaker Putri Ayu, 33, a Bukit Panjang resident who uses the LRT almost every day.

But although she is a regular, she finds the rides "dreadful".

"The cabins smell damp, and the ventilation is poor. It's even worse during peak hours when the trains are packed," she said.

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It has been 25 years since the Bukit Panjang LRT (BPLRT), Singapore's first light-rail transit system, was rolled out. Subsequently, two more LRT lines were introduced, in Sengkang in 2003 and Punggol in 2005.

The idea was to offer an alternative feeder service and increase commuter convenience.

But the system, particularly BPLRT, has been plagued by numerous issues, with reliability problems a major concern. Uncomfortable rides are also a common grouse, as highlighted by Mr Lau and Ms Putri.

Frequent breakdowns and service disruptions have frustrated commuters over the years, leading to criticism of the system's design and suitability.

In 2016, as the BPLRT system neared the end of its 20-year lifespan, SMRT Trains managing director Lee Ling Wee said in a company blog said SMRT, which operates the BPLRT, and the Land Transport Authority (LTA) were looking at various options concerning its future, including the possibility of scrapping the network and returning to the use of buses.

"This is not far-fetched, as a fully loaded high-capacity bus like a double-decker can take 130 passengers, which is more than the 105-person capacity of a single Bombardier train," he wrote.

But LTA later said replacing the light rail system with an all-bus option was "not likely to be practical" due to road capacity.

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Then, in 2017, former transport minister Khaw Boon Wan famously said that the LRT system had been built as an “afterthought under political pressure”, and was in fact not well-suited to the hilly terrain of Bukit Panjang, contributing to its operational challenges.

“No LRT is designed that way, in such a masochistic manner, where you force yourself up and down, twist and turn,” he was quoted as saying.

Ultimately, it was announced that the problematic BPLRT would be overhauled rather than dismantled. The S\$344 million renewal project, which started in 2018 and is due to be completed in 2026, will have a new signalling and power rail system, as well as a refreshed fleet, among other upgrades.

The Sengkang and Punggol LRT lines are also getting improvements, albeit not as extensive as those for Bukit Panjang.

By 2027, the Sengkang and Punggol LRT systems will feature 25 new two-car trains to increase capacity. Recently, the Sengkang LRT platform layout has also been improved, and it now offers dedicated boarding areas for the system's four routes.

Previously, passengers had only two boarding locations and had to rely on overhead signs to determine whether the arriving LRT was an east-loop or west-loop service.

Although the authorities chose not to scrap the BPLRT, questions persist regarding the overall effectiveness, efficiency, and cost-effectiveness of the LRT system.

With no plans to expand the LRT network, is it worth it for Singapore to keep maintaining and upgrading the existing three lines even in the face of continued problems and complaints?

DIFFERENT EXPERIENCE AT SENGKANG-PUNGGOL LRT

To be fair, while the BPLRT has been dogged by reliability problems, commuters of Sengkang-Punggol LRT were not all critical of the service.

There were some who were satisfied and had no suggestions for improvements. But some readily shared grievances.

According to these commuters, both the Sengkang and Punggol LRT lines experience significant crowding during peak hours, creating space constraints on platforms that could lead to falls onto the tracks.

Confusion about platform navigation persists despite recent enhancements, they added. Passengers in Punggol continue to have only two boarding locations and rely on overhead signs to determine whether they are boarding the west or east loop.

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In Sengkang, congestion has increased due to population growth over the past decade, raising concerns among residents about the capacity of the LRT system to accommodate upcoming Build-To-Order (BTO) projects, such as in Fernvale.

Civil servant Li Jian Lun, 40, said his group chat, which comprises residents of the HDB block he lives in, has expressed worry about the increased usage of the LRT once the new BTO projects are completed.

"I don't know if LTA or (SBS Transit) will have any plans to increase capacity or frequency, but this is definitely a worry I hear from my neighbours," he said.

SBS Transit operates the Sengkang-Punggol LRT system.

In May, the Urban Redevelopment Authority (URA) announced plans for a new residential estate in Fernvale North on an 18.9ha site. According to The Straits Times, property analysts estimated the space could accommodate up to 10,000 new homes.

Concurrently, there are upcoming BTO projects in Sengkang, such as Fernvale Sails and Fernvale Oasis.

Sengkang GRC MP Jamus Lim noted that the frequency of train deployments is also a common complaint and the deployment of two-car versus one-car trains is also inconsistent.

"Commuters, understandably, expect an alternation between the two, especially during rush hour, but this is not always the case."

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In Punggol, dissatisfaction with one-car trains during peak hours is also a pressing issue, with residents hoping for a total shift to two-car trains for better capacity.

Outlet manager Alice Seah, 53, who lives near Cove LRT station, one stop from Punggol MRT station, said she is frustrated at how difficult it is to board the LRT in the mornings.

“Nobody can get in because the train is full. Some days, I have to take the opposite direction (towards Oasis and Damai) and waste about 15 minutes travelling one whole loop just to get to the MRT,” she said.



Pasir Ris-Punggol GRC MP Yeo Wan Ling said that in response to feedback from residents and grassroots leaders regarding peak hour demand, LTA has introduced alternating one- and two-carriage trains on the Punggol East loop.

Ms Yeo said that more two-carriage trains will be introduced to both Punggol East and Punggol West loop in phases in 2025, to supplement the current one-carriage trains.

BENEFITS AND LIMITATIONS

The point of an LRT system in any country is to plug the gap between trains and buses.

An LRT system tends to have higher capacity than buses, more automation, and often a dedicated right of way, said transport economist Walter Theseira.

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So an LRT system should be able to carry a larger number of passengers more reliably and faster during peak times compared to buses. But it shares the downside of rail — much higher infrastructure costs than a bus network and less flexibility.

“It's very expensive to modify an LRT system once it's in place, unlike a bus network, which can be easily adjusted to meet changing demand or new routes,” said Associate Professor Theseira, who teaches at the Singapore University of Social Sciences.

“LRT also locks you into a specific technology. When you design your system, switching to a new vehicle provider compatible with your existing infrastructure can be quite limited, unlike with buses, where you can simply introduce a new model without worrying about compatibility,” he added.



Assistant Professor Terence Fan from the Singapore Management University (SMU) said Singapore's use of elevated tracks for the LRT also presents a challenge as they are generally costlier.

Many light rail systems in other parts of the world operate at ground level.

“Singapore's elevated system makes it more challenging to expand or modify. If changes are needed, they require significant planning and construction, which can be complicated and costly,” he said.

And if a segment of the elevated system were to become obsolete, Dr Fan, who specialises in transport issues, said it would be quite an eyesore.

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“It would also be a huge reminder that we’ve built a white elephant, given the large structures involved.”

For BPLRT, existing infrastructure limitations in the area affected the placement of the LRT tracks and the optimal siting of stations back when it was built. As a result, the tracks were tightly squeezed between HDB blocks, often just 8 to 10m away from residents’ windows.



Rail alignment was consequently restricted to an elevated route that had to navigate around existing roads, leading to a design with "kinks and undulations", according to the Urban System Studies series by Singapore's Centre for Liveable Cities.

“It wasn’t well-integrated, and it was hard to estimate what the town would shape up to be,” said Dr Fan.

SINGAPORE'S FIRST LRT SYSTEM

Singapore introduced its first LRT system in Bukit Panjang in 1999 in response to residents’ demand for better transport connectivity.

At the time, the extension of the North-South Line (NSL) to this area was ruled out due to operational and financial concerns, primarily because of its low population density and location outside the central MRT alignment.

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As a result, the Bukit Panjang LRT (BPLRT) was established as a feeder service that operates small, driverless trains in a loop, linking to the NSL at a single connection point.

To create sufficient demand for the BPLRT while avoiding overlaps with bus services, 19 bus services were either withdrawn or re-routed to prevent redundancy with the new rail system.

The decision effectively eliminated the only alternative public transport option during service disruptions, resulting in the BPLRT's growing unpopularity among residents.

The LRT system faced significant teething problems from the outset, including reports of train delays of up to 40 minutes and malfunctioning ticketing machines caused by software issues.

Commuters also experienced bumpy rides on certain sections of the track, with instances of train doors opening while the trains were in motion.

A fatal incident on Jan 15, 2000, sparked significant safety concerns when a drunken man was killed while crossing the tracks at Jelapang station.

This was followed by a collision between two trains on Nov 19 that year due to an operational oversight, resulting in minor injuries for three passengers.

From its launch in 1999 until 2012, the BPLRT system experienced over 150 incidents, including the stalling of trains and wheels falling off.

Although the LRT was said to be retrofitted into the existing Bukit Panjang landscape, its implementation was several years in the making.

During a parliamentary session on Nov 1, 1994, then communications minister Mah Bow Tan announced a study on the implementation of an LRT system in Singapore, specifically as an internal feeder service for new towns.

A month later, he announced the government's plan to pilot LRT systems in Bukit Panjang and Buona Vista, with an estimated cost of around S\$300 million each.

In 1996, the Bukit Panjang LRT system was given the green light after the LTA study confirmed its potential viability, but the Buona Vista system was deemed economically unfeasible and the plan was cancelled.

Collapse

When the LRT system was later implemented in Sengkang and Punggol, Dr Fan said the development of the towns progressed much more quickly, resulting in a shorter duration for construction.

"Unlike BPLRT, there wasn't a significant gap between building the LRT stations and surrounding developments. With concurrent planning for buildings, amenities, and shops, the integration was smoother," he noted.

Still, Dr Fan noted that the challenges of working with elevated tracks remain: "Once constructed, extending the system becomes difficult, as adjustments require careful planning from the outset."

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In response to CNA TODAY's queries, an LTA spokesperson said it would continue to assess land transport needs and adopt suitable strategies to serve travel demand as demographics and land development evolve, while ensuring prudent resource use.

"Our existing LRT systems in Bukit Panjang, Sengkang and Punggol have served commuters well. We will continue enhancement works to ensure they remain effective and reliable."

The spokesperson explained that its integrated approach ensures efficient and cost-effective service across Singapore. This approach combines first- and last-mile connectivity from MRT stations with support from LRT, buses, cycling paths, and covered walkways.

WILL THE RENEWAL WORKS FIX THESE ISSUES?

As upgrading works on the BPLRT are on track to be completed in two years' time, commuters are already noticing some changes.

Two new third-generation LRT vehicles were introduced into service on Aug 1. All 19 new vehicles are expected to arrive by the end of 2025, ensuring the entire fleet will be updated by 2026.

These new vehicles come equipped with upgraded features, including new LCD monitors with route displays, brighter energy-efficient LED lighting, and an improved air-conditioning system that enhances cooling and air distribution.

There will also be a condition-monitoring system installed to oversee the health of key components such as doors, brakes and air-conditioning systems, as well as sensors to monitor the power rail conditions while travelling, allowing for earlier fault detection and repairs.

There are other ongoing enhancements:

- Four second-generation train cars have completed their upgrades and are in passenger service, with the remaining nine undergoing gradual upgrades and testing in the coming months

- The signalling system has been upgraded in phases since 2022

- The entire power supply system for the BPLRT has also been fully upgraded to increase capacity

- Refurbishment of the operations control centre to enhance overall operational management

Bukit Panjang SMC MP Liang Eng Hwa said that as the town's population continues to grow, the shorter intervals between trains and the full resumption of the BPLRT's dual-loop service will help transport more commuters and reduce overcrowding.

"Currently, the single-loop design is not well-connected. It allows travel in only one direction, which is quite poor," he said.

Due to the ongoing renewal works, the BPLRT operates a single-loop service from Petir station to Choa Chu Kang during off-peak hours, while the dual-loop service is deployed only during peak hours on weekday mornings and evenings, and on weekends during certain hours.

"Reliability is essential. The engineering must ensure the system operates smoothly, especially since the old system was quite dated and prone to breakdowns. With the new, upgraded system, I hope there will be significant improvements in reliability," said Mr Liang.

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Still, LTA should continue enhancing bus services, he added, particularly service 976, which runs parallel to the LRT and serves as a backup for commuters.

The service frequency for 976 during peak hours is between 10 and 15 minutes, while off-peak wait times can extend up to 18 minutes.

For the Sengkang-Punggol LRT, other than the dedicated boarding locations for different train routes on the Sengkang platform, there are several more changes anticipated:

- 25 new two-car trains will be delivered progressively from the end of this year
- Depot expansion works are set to start by the end of this year, aiming to grow the 3.5ha Sengkang-Punggol LRT depot to 11.1ha by 2027



In Punggol, the Teck Lee LRT station opened on Aug 15 to serve the Singapore Institute of Technology and the Punggol Digital District.

Associate Professor Lim, the Sengkang GRC MP, and Ms Yeo, the Pasir Ris-Punggol GRC MP, agreed that the LRT is an essential mode of transport in Sengkang and Punggol. Still, one longstanding concern has been the difficulty of getting onto trains during the morning rush hour.

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Assoc Prof Lim added that he and his fellow MPs are in regular discussions with LTA to better understand the challenges on the management side.

Ms Yeo said LTA has been receptive to their feedback and has taken steps to address waiting times before the arrival of the new trains.

“They shortened the wait time between trains to three minutes throughout the day. During peak hours, trains alternate between one-carriage and two-carriage setups on the east loop.”

Asked by CNA TODAY if the ongoing works would be sufficient to improve the LRT's comfort levels and reduce comparisons with other transport options, Dr Fan of SMU said that in theory, it is possible, especially if there is a commitment to investing in major improvements, as seen in the BPLRT.

But some existing challenges cannot be fixed.

“Unlike LRT systems in other cities, which often operate on longer, straighter tracks, Singapore's LRT needs to navigate tight corners,” he noted.

“This design leads to swaying during turns, making rides feel less stable, especially at varying speeds and accelerations.”

Dr Fan added that LRT systems in cities like Melbourne, Australia or Copenhagen, Denmark manage smoother rides due to less frequent turns and more advanced technology.

“As a result, commuters in these cities may not distinguish between light rail and other forms of transit, as their experiences are more comfortable.”

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SHOULD THE LRT GO?

Though the complaints may be many, ridership on the LRT has increased steadily over the years.

In 2023, the LRT had an average daily ridership of 202,000, up from 150,000 in 2015. At its peak in 2019, the record high was 208,000. This figure subsequently dropped below 200,000 during the pandemic period.

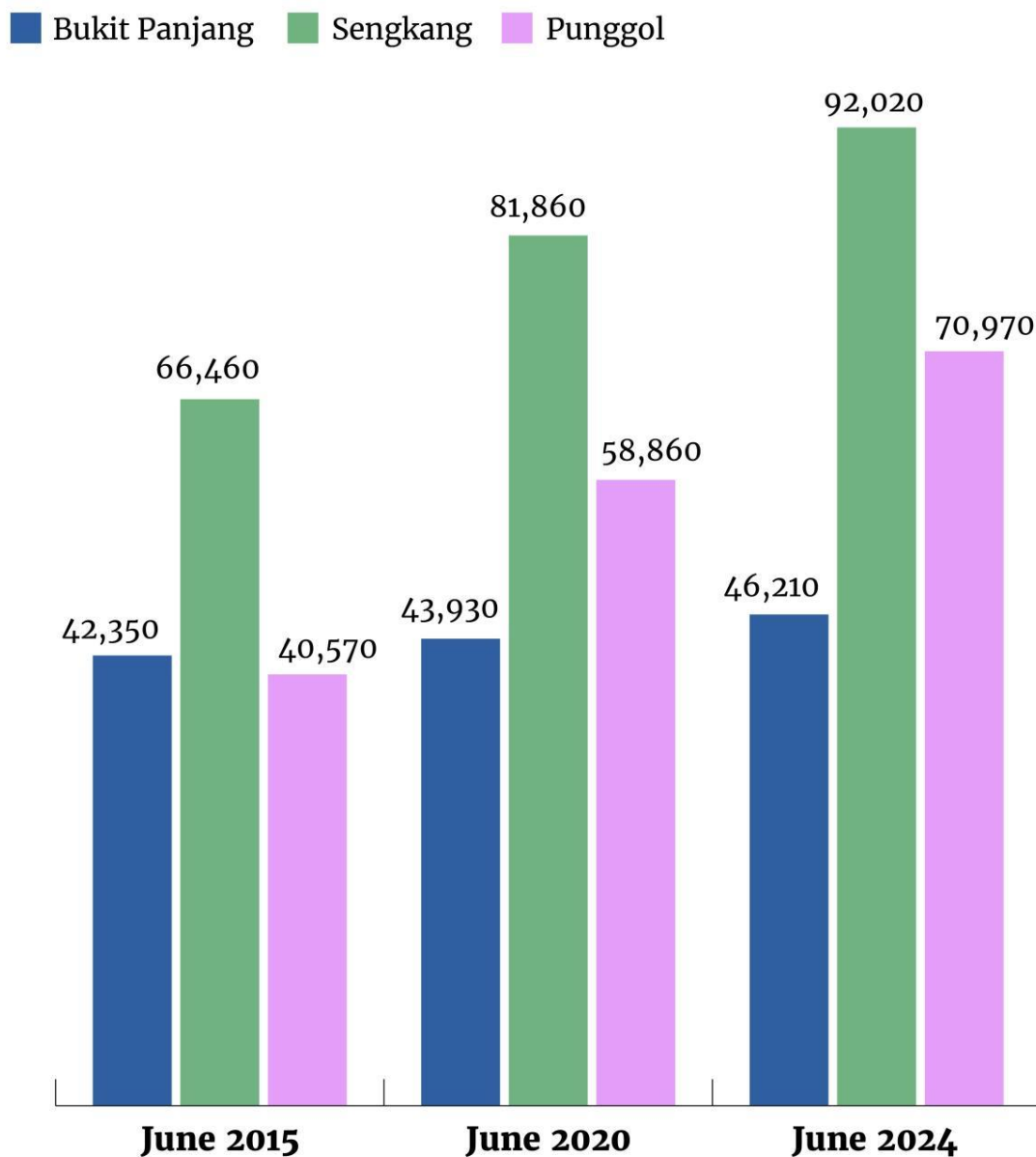
Dr Fan said barring the Covid-19 period, the growth in ridership from 2015 to 2019 of over 30 per cent is “great by any measure.”

The maturation of nearby estates likely contributed. According to Singstat, the number of homes in Bukit Panjang rose from 42,350 in 2015 to 46,210 in June 2024.

Sengkang’s numbers soared from 66,460 to 92,020 within the same period. Punggol, too, saw a drastic increase from 40,570 to 70,970.

LRT ridership numbers have not risen as sharply as the number of homes, but Assoc Prof Theseira said this is likely due to an overall shift in travel patterns due to flexible work arrangements that emerged post-pandemic.

No. of residential dwellings in Bukit Panjang, Sengkang and Punggol



Infographic: Samuel Woo

Source: SingStat



Furthermore, Mr Liang, the Bukit Panjang MP, pointed out that the LRT serves an important purpose: If it were to be scrapped, authorities would have to add significantly more buses onto the roads, which in turn would lead to more road congestion.

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Nonetheless, the government has not announced plans to expand the LRT network beyond the existing three, which raises the question of whether it is worth it for Singapore to continue maintaining and upgrading such a limited transport system.

There are good reasons why there is hesitancy around expanding the LRT, said Assoc Prof Theseira. The point of the LRT is to fill the gap between buses and heavy rail, offering an upgrade over buses without the full cost of heavy rail.

"But in reality, this sweet spot is very narrow. If you miscalculate with LRT, it's a mistake that can haunt you for 20 or 30 years. You're making a large, long-term bet," he said.

"In contrast, if you make the wrong decision with buses, it's much easier to... buy more buses or adjust routes within months at a minimal cost."

Another possible reason no new LRT lines have been built is that Singapore started expanding its MRT network with more medium-capacity lines, such as the Downtown Line and Circle Line, in recent years, said Dr Fan.

These lines, which are shorter in total length compared with high-capacity MRT systems like the North-South Line, suggest that a less-dense version of the MRT system could operate with smaller train cars if necessary, he said.

But he is hesitant to suggest that such developments mean Singapore should consider scrapping the LRT system altogether.

Although he is not privy to the details or considerations behind such a decision, Dr Fan said in general, once the LRT infrastructure is established, the ongoing operational costs tend to be relatively low.

He added that for certain track lengths and number of passengers, light-rail systems can be more cost-effective than buses when considering the cost per passenger-kilometre.

"LTA may have deemed these costs reasonable, considering that the infrastructure expenses have already been incurred," Dr Fan said.

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Mr Saktiandi Supaat, chairperson of the Government Parliamentary Committee for Transport, told CNA TODAY that the LRT is part of a suite of transport services.

Despite the LRT's limitations, he stressed that Singapore should not dismiss any potential transport solutions, as the ultimate goal is to provide transport services that connect Singaporeans efficiently and seamlessly across the island.

"Whatever transport options we explore in the future, or when studying other countries' experiences, we must consider how it applies to Singapore's unique context," he said.

"We have compact, high-density public housing, and while we can learn from others, our solutions must be tailored to fit Singapore's specific needs," said Mr Saktiandi, who is also Bishan-Toa Payoh GRC MP.

Source: TODAY