# Who Owns the Rails?
## Rail Asset Ownership and Operational Accountability in Singapore and Hong Kong

### Introduction

For dense urban areas across Southeast Asia, the construction of modern rail mass transit systems was critically important, helping to address severe urban challenges such as traffic congestion, air pollution, noise, as well as the pressure to reduce carbon emissions.[1] There was a wide range of models for financing and operating urban rail mass transit systems in the region, with privately held and operated services coexisting alongside large, state-backed monopolies.[2] Since its inception, Singapore's Mass Rapid Transit (MRT) system has been defined by one main imperative – delivering high-quality, affordable mass rail public transport while simultaneously ensuring that the system remained economically viable without becoming a continual burden on public funds.[3] This dual mandate led to continuous policy experimentation.

Major milestones in Singapore's rail policy journey include the unprecedented decision to impose capital market discipline and efficiency by privatising and publicly listing the rail operator SMRT Corporation in 2000;[4] and the subsequent re-nationalisation of all rail operating assets under the New Rail Financing Framework (NRFF).[5]

This case study will examine the key features and incentive structures of these two rail models that Singapore tried. For comparison, this case study will also dive into the Hong Kong MTR corporation, which achieved long-term financial self-sufficiency through its integrated "Rail plus Property" (R+P) model – a framework that allowed it to capture land value improvements to fund infrastructure requirements.

### Early history of public transport in Singapore

#### *The chaotic early days*

The early history of public transport in Singapore – before comprehensive state intervention in the 1970s – was characterised by widespread fragmentation, dysfunction and poor service. The whole system was described as "edging towards chaos", with 1,500 buses – many of them old, badly maintained and dirty – operated by thirteen different companies. Profit-seeking private companies engaged in unfettered competition that left many locations underserved.[6] Chasing fares, bus drivers would race each other for

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[1] Roschlau, Michael W., "Nationalisation or privatisation: Policy and prospects for public transport in Southeast Asia." *Transportation Research Part A: General* 23, no. 6 (1989): 413-424.

[2] Ibid.

[3] Land Transport Authority, *White Paper: A World Class Land Transport System*, Singapore: Land Transport Authority, 1996.

[4] Plant, Jeremy F., Van R. Johnston, and Cristina E. Ciocirlan. Handbook of Transportation Policy and Administration. Edited by Jeremy Plant. 1st ed. Vol. 127. Boca Raton, Fla: Routledge, 2007.

[5] Land Transport Authority, *Land Transport Master Plan 2008*, 2008.

[6] Lee, Meiyu, "The Road to Nationalisation: Public Buses in Singapore," *BiblioAsia*, October 5, 2017, https://biblioasia.nlb.gov.sg/vol-13/issue-3/oct-dec-2017/roadtonationalisation/.

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passengers even as they themselves faced crippling competition from illegal "pirate taxis".[7] Crime and corruption ran rampant; pickpockets thrived in the crowded conditions and bus employees conspired to conduct widespread fare skimming (colloquially dubbed the "Squeeze").[8] Service interruptions due to labour strikes were also all too common.[9]

This abysmal state of public transport, coupled with rising national affluence, caused the population of privately owned cars to grow an average of 8.8% annually between 1962 and 1973, peaking at 15.4% in 1973. The rapid increase in the number of private vehicles caused acute road congestion and high road fatalities, with a 1970 study ranking Singapore second in Asia at 20 road deaths annually per 10,000 people, behind only Hong Kong's 33 per 10,000.[10]

Urgent action by the government was needed.

***Government intervention***

As early as 1956, a Commission of Inquiry (COI) had published the Hawkins Report that detailed all the problems with Singapore's public buses and recommended that the government consolidate and nationalise the whole system.[11] Subsequently, a 1970 white paper (*Reorganisation of the Motor Transport Service of Singapore*) outlined plans to amalgamate the existing bus companies.[12] In July 1973, they were merged into a single entity (Singapore Bus Service or SBS) with the primary objective of eliminating wasteful competition and service duplication.

However, SBS turned out to be merely a "paper unification", with former owners "dragging [their] feet" and continuing to operate "little fiefdoms". To solve this, in 1974 the government assembled a government team of officials (GTO) made up of civil servants to run SBS, effectively nationalising the company. The GTO found widespread management weakness, lack of controls, extensive corruption and poor accountability at all levels; and quickly instituted reforms. Other government departments provided assistance: for example, mechanics from the Singapore Armed Forces (SAF) mobilised to repair and maintain buses. This intervention drastically reduced the number of daily breakdowns from an average of 800 per day in 1974 to just 145 by 1976.[13]

**The start of mass rail in Singapore**

***The rail question***

The idea to build a mass rail public transit was seriously discussed in Singapore in the early 1970s. In 1967, land use planning studies had first suggested rail transit to support Singapore's future development.[14]

[7] Latif, Asad. "The Singapore MRT: Assessing Public Investment Alternatives," Case Unit, Master in Public Policy Programme, National University of Singapore, 1993.

[8] Lee, "The Road to Nationalisation".

[9] Ibid.

[10] Ibid.

[11] Singapore, Commission of Inquiry into the Public Passenger Transport System, *Report of the Commission of Inquiry into the Public Passenger Transport System of Singapore*, 1956.

[12] Transport Advisory Board, *Reorganization of the Motor Transport Service of Singapore*, 1970.

[13] Lee, "The Road to Nationalisation".

[14] Latif, "The Singapore MRT".

However, such a rail system would be very expensive – the largest project in post-independence Singapore.[15] There was fierce debate over whether to proceed with a rail network or just expand the existing bus system, with experts and leaders weighing on both sides of the "Great MRT Debate". While the 1981 Comprehensive Traffic Study concluded that an MRT system would best serve Singapore's growing needs, international experts in fact argued strongly in favour of an all-bus system.[16]

Ultimately, the rail option prevailed not only because buses were judged insufficient to accommodate Singapore's future population growth,[17] but also because it was thought to boost investor confidence and land values.[18, 19] The decision was made in May 1982 to go ahead with the MRT system at a cost of S$5 billion in 1982 prices. Construction began in October 1982, and the full 67km first-stage system of 42 stations across the North-South Line (NSL) and East-West Line (EWL) was finally completed in 1990, two years ahead of schedule and more than S$750 million (15%) below the S$5 billion projected cost.[20]

***The first operating model***

The initial model adopted for Singapore's rail system was heavily government-centric, particularly concerning the construction, ownership of major infrastructure and initial operation. To oversee the massive undertaking of building the MRT, the government established a special-purpose statutory board[21] – the Mass Rapid Transit Corporation (MRTC) – responsible for planning, engineering design and construction of the entire rail project. When the first stage of the train network started operations in 1987, MRTC leased the day-to-day operations of the rail system to a newly incorporated company – Singapore MRT (SMRT) – owned almost entirely[22] through the government holding company Temasek Holdings;[23] and run according to commercial principles.[24]

The core objective of this operating model was to ensure that the MRT system remained economically self-sufficient without becoming a drain on the public purse. This was achieved through a clear division of responsibility.

1. Government: capital costs. The government undertook significant capital expenditure by funding the long-term infrastructure, including the tunnels, viaducts and stations; while also paying for the initial set of trains and signalling systems. This contrasted with Bangkok, Thailand and Kuala Lumpur,

[15] Ibid.
[16] Chen, Emily, and Gan Xin Chen, "Governing Our Trains: Unpacking the New Rail Funding Framework." *MAJU*, March 12, 2025, https://www.maju.sg/post/governing-our-trains-unpacking-the-new-rail-funding-framework
[17] Chen and Chen, "Governing Our Trains".
[18] Plant, "Handbook of Transportation Policy".
[19] Latif, "The Singapore MRT".
[20] Ibid.
[21] An autonomous government agency established by an act of parliament to perform specific operational functions and reports to a government ministry, but enjoys greater flexibility than regular government departments.
[22] The LTA held one special "golden share" in SMRT when it was incorporated in 1987 to maintain ultimate government control and veto power over the strategic public transport company while allowing it to operate with private sector efficiency.
[23] A state-owned investment company incorporated under the Singapore Companies Act that manages a commercial investment portfolio on behalf of the government, operating independently from ministries while being wholly owned by the Minister for Finance.
[24] Plant, "Handbook of Transportation Policy".

Malaysia, where private consortia bore the construction costs and assumed ridership risks. Both of those rail systems eventually needed government bailouts.[25]

2. Operator: operating costs and replacement. The rail operator (ie SMRT) had to cover all operational and maintenance expenses through fare and other commercial revenue sources. Crucially, the government insisted that operator revenue also had to cover the costs of operating assets like the rolling stock (ie trains). Under the initial lease and operating agreement (LOA), SMRT not only had to pay an annual rental for the lease of the train fleet, but had to regularly top up an Assets Replacement Reserve (ARR). When a second set of operating assets is needed (estimated at 30 years), the ARR would be drawn down to repay the government for the historical cost of the first set, the logic being that the ARR should be sufficient to pay for the first set of assets that was "consumed".[26]

In 1995, MRTC was merged with the Registry of Vehicles, the Roads & Transportation Division of the Public Works Department and the Land Transportation division of the Ministry of Communications to form the Land Transport Authority (LTA) that would oversee all land transport developments.[27]

***Privatisation fever hits***

The launch of Singapore's MRT system happened within a broader global context in which governments were pushed to privatise State-Owned Enterprises (SOEs) under public choice theory, which argued that state ownership was inherently inefficient.[28] Privatisation – the transfer of ownership of a productive entity from the public sector to the private sector – was thought to instil commercial discipline and improve cost efficiency.[29]

The Singapore government explicitly embraced this agenda of state divestment when the 1985 Economic Committee – led by then-Minister of State for Trade and Industry and Minister of State for Defence (later Prime Minister) Lee Hsien Loong – advocated for reducing the government's role in business.[30] The 1986 Public Sector Divestment Committee (PSDC) was then appointed to formulate a divestment strategy for Government-Linked Companies (GLCs) and explore the privatisation of statutory boards. The goal for the process was robust and maximum privatisation where possible.[31]

While cities like London attempted to modernize its public transport system via public-private partnerships (PPPs) that separated infrastructure from operations, and Hong Kong achieved self-sufficiency through its "Rail plus Property" (R+P) model, Singapore pursued a Share Issue Privatisation (SIP) process instead.

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[25] Ibid.

[26] Phang, Sock Yong, and Jay H. Walder, *Singapore's Public Transport,* Public Policy Programme, National University of Singapore, 1999.

[27] Land Transport Authority, "The LTA Story," 15 March 2024, https://www.lta.gov.sg/content/ltagov/en/who_we_are/our_organisation/the_lta_story.html.

[28] Plant, "Handbook of Transportation Policy".

[29] Shirley, Mary M, "The What, Why, And How Of Privatization: A World Bank Perspective," Fordham Law Review 60, no. 6 (1992): S23-S26.

[30] Economic Committee, Ministry of Trade and Industry, *The Singapore Economy: New Directions*, 1986.

[31] Public Sector Divestment Committee, Report of the Public Sector Divestment Committee, 1987.

The decision to incorporate a private company to run the MRT was announced in June 1986. At the same time, the government also studied the possibility of allowing the public to participate in the ownership of the new private entity through a public listing.[32] The 1996 LTA White Paper *A World Class Land Transport System* reaffirmed the principle that public transport should not be a perpetual drain on the public purse.[33]

To prepare for the company's impending public listing, the LTA signed a 30-year License and Operating Agreement (LOA) with SMRT in 1998. Under this agreement, SMRT would purchase the MRT system's operating assets from the LTA at their net book value of S$1.2 billion, partially financed with a S$480 million grant from the LTA itself.

SMRT was successfully listed on the Singapore Exchange on 26 July 2000 when Temasek Holdings sold 33% of its ownership (or 492 million shares) for S$300 million (S$0.61 per share), becoming the world's first urban rail transit operator to go public.[34]

**Private rail model successes and failures**

***Darling dividend stock***

SMRT attracted international investor attention, bolstered by the management's promise of steady and above-par dividend policy, and the fact that LTA's S$480 million grant had effectively padded SMRT's finances. In August 2005, Temasek Holdings announced a further placement of 110 million shares at S$1.11 per share, reducing its stake to 55%.[35]

The company leveraged its status as a newly listed public entity to achieve significant financial returns for its shareholders. Between 2002 and 2011, SMRT's profit swelled substantially, increasing from S$56.8 million to S$161.1 million. This strong performance translated into lucrative returns, with SMRT consistently enjoying a Return on Equity (ROE) of above 20 per cent in most years, far surpassing the median ROE of approximately 9.5 per cent for Singapore-listed companies. SMRT paid out generous dividends that accounted for close to 80 per cent of its net income in some years. Total net dividends paid out between FY2003 and FY2011 amounted to 56.35 cents per share.[36, 37]

A critical element enabling this high profitability was the operator's focus on enhancing revenue through commercial ventures. SMRT successfully expanded its retail businesses within the MRT system, and non-fare sources such as advertising and rentals or leasing of commercial spaces contributed significantly to the operators' total earnings.[38] SMRT's success in tapping alternative commercial revenue streams lent credence to the belief that the rail system should and could operate without becoming a continual drain on public finances.

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[32] Ibid.

[33] LTA, Land Transport Authority. "A world class land transport system." In *White Paper presented to Parliament*, vol. 2. 1996.

[34] Plant, "Handbook of Transportation Policy".

[35] Ibid.

[36] Tan, Shin Bin, and Leong Ching. "The evolution of public transport policies in Singapore", 2013.

[37] Long, Tian Feng, Sivaranjani Suresh, and Tan Ngiap Joon. "Singapore's Mass Rapid Transit: Privatisation and Re-Nationalisation", 2020.

[38] Ibid.

***The privatised rail model hits a snag***

Unfortunately, the financial success achieved by SMRT masked underlying engineering and maintenance shortfalls. Increasing profitability came at the expense of necessary long-term investments, leading to inadequate preventive maintenance and a failure to improve infrastructure as ridership grew along with Singapore's population. The result was steady a decline in service levels that created a growing mismatch between high shareholder returns and poor service standards. By the 2010s, commuters' top complaints included long, unpredictable waiting times and severe overcrowding of trains and buses, suggesting that fundamental problems had accumulated.[39]

These underlying issues came to a head in unprecedented system-wide disruptions that began in December 2011. During evening rush hour on 15 December 2011, four trains stalled on the NSL after losing traction power. This initial 5-hour disruption was the worst in the MRT's 24-year history, affecting approximately 127,000 commuters. The incident even required passengers on one train to evacuate through train tracks and tunnel before they could be rescued. Worse still, backup power system on another stalled train failed prematurely and stranded passengers in suffocating darkness without ventilation.[40, 41] Undetected – and therefore unrectified – damage from the first incident caused a second, even more prolonged disruption just two days later on 17 December 2011, immobilising four more trains and affecting about 94,000 commuters over seven hours.[42]

**Crises of confidence**

***The Committee of Inquiry***

The two system-wide disruptions on 15 and 17 December 2011 sparked widespread public anger.[43] To restore commuter confidence, the government appointed a COI to investigate the causes and contributory factors of the disruptions, review the rail maintenance regime, and assess the effectiveness of incident management preparedness and processes used by the rail operators and the LTA.[44]

The COI found that the immediate cause of the stalled trains was damage to their CCD "shoes" due to a sagging "third rail" that provided electrical power. This sagging was in turn caused by a defective fastener. The COI concluded that the 15 December incident resulted from a series of unrectified contributory defects, none of which would have resulted in the disruption in isolation. Compounding this, the second incident on 17 December was found to be entirely preventable, being triggered by one or more "rogue trains" that had suffered undetected CCD shoe damage from the first incident and were subsequently put back into revenue service without proper inspection.[45]

The COI report revealed deep structural and cultural issues, apportioning culpability between both SMRT the operator and LTA the regulator. The COI agreed with expert testimony that SMRT's work procedures and

[39] Tan, Christopher, "It's Not Who Runs It, but How It Is Run," *The Straits Times*, July 22, 2011.
[40] Tan and Leong. "The evolution of public transport policies."
[41] Passengers on that train eventually smashed a window with a fire extinguisher for fresh air.
[42] Committee of Inquiry into the 15 and 17 December 2011 MRT Disruptions. *Report of the Committee of Inquiry into the 15 and 17 December 2011 MRT Disruptions*, Ministry of Transport, 2012.
[43] Mokhtar, Faris. "Public Anger Mounts over Train Disruptions." *Yahoo! News*, December 16, 2011. https://sg.news.yahoo.com/public-anger-mounts-over-train-disruptions.html.
[44] MOT, "COI Report".
[45] Ibid.

control mechanisms of the maintenance branches were "grossly inadequate", highlighting that material defects over time were "regrettably not identified and remedied under SMRT's maintenance regime." Specifically, maintenance protocols were lacking, as an annual inspection for the third rail required in the train manufacturer's maintenance manual had apparently not been carried out, and the failure to implement these checks meant the first incident on 15 December 2011 "could have been averted."[46]

More fundamentally, the COI agreed that SMRT's maintenance regime needed to be enhanced due to the increasing ridership and ageing of the NSL/EWL, recommending that SMRT move towards a "risk and reliability-based maintenance approach". The COI also noted that SMRT's incident response was primarily "skewed towards train safety and operations considerations", resulting in "insufficient attention to the well-being of passengers." The COI report recommended for SMRT to focus on the core business of train operations and suggested the company reposition itself principally as an engineering and operations company,[47] implying that there had been a misalignment of institutional priorities after privatisation.

As for LTA, the COI report also surfaced several problems with its role as the regulator.[48]

- Insufficient oversight of the rail maintenance regime: The COI said that the LTA needed to regularly review its regulatory regime, which had allowed maintenance deficiencies to persist at SMRT.
- Lack of clarity in roles and communications: There was a lack of clarity in the division of roles and responsibilities between SMRT and LTA, especially in crisis response; SMRT's ranking officer in its "command centre" during the 15 December disruption had not even been aware of the existence of LTA's Public Transport Crisis Management Team that was ostensibly in charge of the incident response.
- Inadequate emergency planning framework: There had been no coherent plan that articulated response strategies and the roles of various stakeholders and their co-ordination protocols during public transport emergencies. The resulting miscommunication caused unrepaired damage to trigger the second disruption on 17 December.

Given the complex division of responsibilities in a privatised rail model, it seemed that both SMRT and LTA had underestimated how much coordination and integration had been needed to ensure smooth rail operations and incident responses.

***Leadership changes amid persistent issues***

In the face of public discontent, SMRT CEO Saw Phaik Hwa resigned approximately a month after the 2011 disruptions. Saw, whose prior experience was in retail and not engineering,[49] had been seen as an odd pick to lead an engineering-heavy company providing an essential public good when she was appointed SMRT CEO in 2002, but her commercial experience did contribute to SMRT's strong financial performance before the 2011 disruptions.[50]

[46] Ibid.
[47] Ibid.
[48] Ibid.
[49] Saw had served as a regional president for the global travel retailer of luxury products DFS Group prior to her appointment as SMRT CEO.
[50] Sim, Royston. "How Systemic Are SMRT's Cultural Issues?" *The Straits Times*, November 7, 2017.

Desmond Kuek, a former Chief of Defence who took over as SMRT President and Group CEO in October 2012,[51] led efforts to enhance the SMRT's operational capabilities, including raising staff strength from 3,500 to 5,300 and nearly tripling the number of engineers to close to 500. SMRT also set up a Technology Management Office to push for predictive maintenance and condition monitoring.[52] Kuek's efforts included hiring several ex-military officers to bolster SMRT's leadership ranks,[53] and he pledged that SMRT would adopt a "zero-defect attitude".[54]

Unfortunately, high-profile rail failures persisted under Kuek's tenure despite these efforts, perhaps due to past technical debt.

- 13 February 13, 2013: An electrical short set fire to a cable near Newton MRT Station, disrupting train services for more than two hours and affecting 15,000 people.[55]
- 7 July 2015: The entire NSL and EWL were knocked offline for two hours after faulty insulation on the third rail tripped the power system, affecting 250,000 commuters.[56]
- 22 March 2016: Two trainees were struck and killed by an oncoming train while investigating faulty trackside equipment. SMRT was found guilty at trial and faulted for "systemic failures" on "many levels".[57]
- 7 October 2017: Train tunnels between Bishan and Braddell stations flooded from heavy rain, disrupting train service for 20 hours and affecting 200,000 commuters after SMRT technicians falsified maintenance records for water pumps.[58]
- 15 November 2017: Software failure caused a train collision at Joo Koon station on the EWL, injuring 28 people and disrupting train service for 2 hours.[59]

Following the 7 October 2017 tunnel flooding incident, Kuek issued a press statement in which he apologised to the commuting public and lay part of the blame for the incident on human errors caused by "deep-seated cultural issues" within SMRT that he had yet to "root out".[60]

[51] SMRT, "More about Desmond Kuek," 2012.
[52] Kuek, Desmond, "In Full: SMRT CEO Desmond Kuek on 'Deep-Seated Cultural Issues' behind History of Service Disruptions," *TODAY*, October 16, 2017.
[53] "SMRT CEO Desmond Kuek to Step Down: Report", *Yahoo News Singapore*, April 17, 2018.
[54] Sreedharan, Sumita, "SMRT Will Take a 'Zero-Defect Attitude,' Says CEO," *TODAY*, February 15, 2013.
[55] Ibid.
[56] SMRT, "Insulation of Third Rail Was Likely Cause of July 7 MRT Disruption: SMRT," *The Straits Times*, January 19, 2016, https://www.straitstimes.com/singapore/transport/insulation-of-third-rail-was-likely-cause-of-july-7-mrt-disruption-smrt.
[57] Chong, Elena, "SMRT Trains fined $400,000 for workplace safety lapse which resulted in two deaths," *The New Paper*, March 1, 2017.
[58] Land Transport Authority, "In Full: LTA's Investigation Report on the Oct 7 Tunnel Flooding", *TODAY*, December 5, 2017.
[59] SMRT, "Joo Koon Train Collision: 28 Hurt after Stalled Train Is Hit by Another One", *Straits Times*, November 15, 2017.
[60] Kuek, "In Full".

On 1 August 2018, Kuek was succeeded as SMRT CEO by Neo Kian Hong (also a former Chief of Defence).[61] Shortly after his appointment, Neo disputed Kuek's characterisation of "deep-seated cultural issues" at SMRT, asserting instead that "committed" people worked at SMRT.[62]

**The National Rail Financing Framework (NRFF)**

***Introduction of the NRFF***

Amid rapidly increasing travel demand, LTA's 2008 Land Transport Master Plan highlighted the need to quickly expand Singapore's rail system. To support this expansion, the document mooted the need for a new "sound financing framework" that would simultaneously be financially sustainable ("without the need for [public] operating subsidies") and affordable in terms of commuter fares.[63]

LTA recognised that profit-driven private operators could not always be incentivised to make costly long-term investments required for infrastructure maintenance and upgrades. Furthermore, while older lines were profitable, future rail lines were anticipated to be less financially attractive due to higher construction costs for underground sections and lower initial ridership, requiring a new funding model if rail expansion was to keep pace with travel demand. A new framework would rectify this situation by transferring the ownership of expensive rail assets (such as tracks, trains and signalling systems) back to the government, relieving private operators of the heavy capital expenditure and financial risk associated with long-term asset replacement and upgrading.[64]

There were three main versions of the NRFF.[65, 66]

- Version 1 (2011): Public transport operators collected fare revenue from commuters and paid a fixed license charge to the government for using operating assets like trains and signalling systems. Operators bore the financial risk should ridership fall below projections.
- Version 2 (2016): The government would bear the financial risk that operators were subjected to in Version 1 by absorbing the losses caused by low ridership. Conversely, operators had to pay a higher licence charge should ridership exceed projections.
- Version 3 (2020): This shifted *all* revenue risk from operators to the government. Instead of a license charge, the government collected all commuter fares and instead paid operators fixed fees to operate and maintain the rail lines.

At this point in Singapore's rail policy journey, the NRFF was a rational alternative to privatisation that represented a fundamental shift in philosophy. The NRFF was thought to address important issues, including:

- **Structural misalignment.** SMRT's goal of profit maximisation as a listed entity had conflicted with national transport objectives when it underinvested in infrastructure and rolling stock maintenance. Under the NRFF, the government would take on the long-term planning and lifecycle risk for rail assets, allowing "asset-light" operators to focus solely on operational reliability. To guard against monopoly, the NRFF also shortened rail operating licenses, reducing the tenure from the previous

[61] Lim, Adrian, "Desmond Kuek's Tenure at SMRT: A Detailed Look," *The Straits Times*, April 18, 2018.
[62] Abdullah, Zhaki, "No 'Deep-Seated Cultural Issues' at SMRT, Says Its New CEO Neo Kian Hong", *The Straits Times*, November 16, 2018.
[63] Land Transport Authority, *Land Transport Master Plan*, 2008.
[64] Chen and Chen, "Governing Our Trains".
[65] Chen and Chen, "Governing Our Trains".
[66] "New Rail Financing Framework (NRFF)", *Land Transport Guru*, October 1, 2016.

30–40 years to just 15 years and allowing the government to re-tender rail contracts more frequently. Moreover, this lack of lifecycle risk was thought to lower barriers to entry for new transport operators to compete with incumbents.[67]

- **Rail network underinvestment.** The framework set out in LTA's 1996 White Paper meant that the financial viability of new lines had been evaluated individually, resulting in an overly conservative approach to building new MRT lines and overcrowded trains. Under the NRFF, the government could assess the financial viability of the rail network *as a whole*, allowing the LTA to be more aggressive in planning and building new rail lines.

The first MRT line to be brought under the NRFF was the Downtown Line (DTL) in 2011, when the contract was awarded to SBS Transit.[68,69] Later on, after four years of negotiations, LTA reached an agreement with SMRT to place its lines (NSL, EWL, CCL, and Bukit Panjang LRT) under the same financing framework in 2016.

***SMRT's delisting***

With the transition of SMRT's train lines to the NRFF set to happen in 2016, preparations were made to delist the company. This move was deemed necessary to address the operational and financial complexities of rail maintenance after years of major disruptions and reliability failures.[70] Temasek said that delisting SMRT would "remove [...] distractions associated with the Company's listing requirements" and "[reinforce] its core skillsets in operations, engineering and maintenance",[71] suggesting that the market mechanism had in fact been detrimental to rail reliability under SMRT.

In close timing with the SMRT's delisting, LTA formally renationalised the rail assets (including trains and signalling systems) owned by SMRT at a cost of S$1.06 billion, thereby relieving the company of heavy renewal and replacement costs and allowing it to focus on operations and maintenance.[72]

This ended Singapore's 16-year experiment with SMRT as a listed entity.

**After the NRFF**

***Significant improvements in rail reliability***

Following the nationalisation of rail assets, the government embarked on a multi-year, multibillion-dollar effort to overhaul the network and restore public confidence. For the oldest NSL and EWL, this included a comprehensive renewal programme that replaced rail sleepers, the power-supplying third rail and the signalling system.[73] In 2017, then-Minister for Transport Khaw Boon Wan[74] revised his already aggressive

[67] Tan and Leong, "The evolution of public transport policies".

[68] SBS Transit, Singapore's second-largest public transport operator and ComfortDelGro subsidiary, operates the North East Line (NEL), DTL, Sengkang LRT, and Punggol LRT alongside extensive bus services, contrasting with SMRT's focus on NSL, EWL, Circle Line (CCL), and Thomson-East Coast Line (TEL).

[69] "SBS Transit Selected to Operate Downtown Line," *Railway Gazette International*, August 30, 2011.

[70] Long, Suresh and Tan, "Singapore's Mass Rapid Transit".

[71] Temasek Holdings, "Temasek and SMRT Jointly Undertake to Privatise SMRT," 20 July 2016.

[72] Long, Suresh and Tan, "Singapore's Mass Rapid Transit".

[73] Christopher Tan, "*S*ingapore's MRT Reliability Is at a High – Now to Keep It There", *The Straits Times*, November 28, 2019.

[74] Khaw, known for his track record of resolving major crises, had replaced Lui Tuck Yew in 2015 when the latter resigned in the wake of transport woes, especially the 2015 simultaneous disruption of the NSL and EWL. See Tan, Christopher, "Did Lui Tuck Yew Quit To Take The Rap?", *The Straits Times*, August 20, 2015.

2020 target for rail reliability from 800,000 to 1 million mean kilometres between failure (MKBF) for delays exceeding 5 minutes. Despite some major disruptions in the intervening years including those described above, the rail network surpassed Khaw's 1 million MKBF target ahead of schedule in 2019.[75] This was a remarkable, almost twenty-fold improvement from 2011's appalling 58,000 train-km.[76]

This momentum continued, with MKBF staying above 1 million after 2019 and reaching a peak of more than 2 million in 2022.[77]

***Reliability peaks in 2022***

Unfortunately, MKBF declined continuously after peaking at 2.089 million in 2022, falling to 1.6 million for the 12-month period between July 2024 and June 2025. This decline was caused by a series of disruptions, the most notable of which occurred on 25 September 2024, when the derailment of a first-generation MRT train caused extensive damage to 2.55 km of track and signalling equipment, shutting down train service to parts of western Singapore for six days and affecting 2.6 million passengers.[78]

**Continuing challenges with rail transit**

***Undermaintenance and the September 2024 train derailment***

Achieving alignment between the financial interests of rail operators and the public transport goals of the government remained challenging even in the post-NRFF era, as evidenced by SMRT's maintenance philosophies and operational decisions leading up to recent high-profile disruptions.

For example, in mid-2023 when the number of train disruptions was on the rise, SMRT chairman Seah Moon Meng cautioned against "overmaintenance" in an interview with *The Straits Times*, saying that chasing "ever-higher" MKBF numbers would not be cost effective. SMRT Group CEO Ngien Hoon Ping, who had led LTA for 4 years prior to SMRT, concurred with Seah by saying that the 1 million MKBF mark was "sufficient from a regulatory standpoint".[79]

Singapore's most severe rail service disruption would happen the following year after that interview. In September 2024, a first-generation MRT train manufactured by Kawasaki Heavy Industries (KHI) derailed, causing extensive infrastructure damage and disrupting train service for 2.6 million passengers over six days. The derailment was later attributed to overheating from degraded grease, which set fire to an axle box and caused the undercarriage of a train to fall out.[80]

It later emerged in the incident investigation by the Transport Safety Investigation Bureau (TSIB) that instead of following KHI maintenance guidelines that called for axle box overhauls every 500,000 km and visual inspections every three months, SMRT had extended these to 750,000 km and every six months respectively;

[75] Tan, Christopher, "Transport Minister Khaw Boon Wan Sets New Rail Reliability Target", *The Straits Times*, July 27, 2017.
[76] Tan, Christopher, "Singapore's MRT Reliability".
[77] Ministry of Transport Singapore, "Oral Reply by Acting Minister for Transport to Parliamentary Questions on Rail Reliability", September 22, 2025.
[78] Cheng, Kenneth, "SMRT to Be Fined $3m for Major East-West Line Disruption in September 2024", *The Straits Times*, June 3, 2025.
[79] Kok Yufeng, "'We don't want overmaintenance': SMRT chairman flags need to balance rail reliability with costs," Straits Times, June 19, 2023.
[80] Cheng, "SMRT to be fined".

and that the derailed train had logged 690,000 km since its last overhaul. SMRT had settled on this maintenance schedule even though the quality of the axle box was considered "no longer assured" once the overhaul interval exceeded 500,000 km. Moreover, the company had done so without detailed engineering and risk assessments. SMRT had also not been required to keep LTA informed when it implemented this extended maintenance regime.[81]

SMRT's immediate response to the incident pinned the blame for the derailment on external factors rather than its extended maintenance regime. SMRT Trains president Lam Sheau Kai blamed a "convergence of factors" caused by Covid-19 supply-chain disruptions, and said that similar "extremely rare, sudden and catastrophic" axle box failures had also caught other global metros off guard.[82]

LTA fined SMRT a "proportionate" S$3 million for the incident. In setting the fine, LTA took into account the costs that SMRT had borne from the provision of bridging bus and train services during the disruption, and the repair costs of damaged track infrastructure.[83] Even though such infrastructure was supposedly owned by LTA under the NRFF, SMRT would have been liable for causing such damage regardless of the fine.

This incident demonstrated the existence of continued tensions between rail reliability and cost pressures in the post-NRFF era even after SMRT's delisting, as well as the continuing difficulty of apportioning accountability for serious disruptions between the rail regulator and transport operator.

***Fare setting***

The 2024 derailment incident aside, transport fare setting was another area in which aligning incentives between operators and regulators proved challenging. In Singapore, public transport fares were determined by the Public Transport Council, which was tasked with keeping public transport fares affordable while maintaining the financial sustainability of the overall system.[84]

Facing calls for fare reviews to be linked to service levels and disruptions after the September 2024 derailment, then-Minister for Transport Chee Hong Tat said in parliament that the objective of fare review exercises was to ensure that fares kept pace with changes in operating costs; and that the LTA had other mechanisms to hold transport operators to account for service disruptions such as fines and the withholding of incentive payments. This refusal to tie fares to performance stood in contrast to other jurisdictions such as Sydney, which had held back fare increases more than once specifically due to service reliability issues.[85]

***Escalating government subsidies***

As discussed, early aspirations for Singapore's rail network had focused on building an extensive, reliable system that was economically self-sufficient without becoming a drain on the public purse. However, this ideal has proved unattainable in practice despite Singapore's experimentation with different institutional

[81] Land Transport Authority, *Findings of Investigation into the Train Derailment Incident on the East-West Line (EWL) on 25 September 2024,* June 3, 2025.
[82] Cheng, "SMRT to Be Fined $3m".
[83] Land Transport Authority, "LTA Completes Investigation into the Cause of East-West Line Service Disruption in September 2024," news release, June 2, 2025.
[84] Public Transport Council, "About PTC", Public Transport Council, accessed December 8, 2025, https://www.ptc.gov.sg/who-we-are/about-ptc/.
[85] Tan, Christopher, "It's Not Who Runs It".

structures and financing models. The NRFF finally enabled the government to make long-term investments in rail without being constrained by the financial concerns of private operators, and by the early 2020s the government had come around to the recognition that continuous – and escalating – government support would be needed to close the gap between cost and revenue in public transport, especially if adequate service standards were to be maintained.[86] By 2025, the government was providing more than S$2.2 billion in such support annually, which had helped delay some fare increases. This level of support worked out to an average of more than S$1 for every public transport commute.[87]

**Regional comparison: Hong Kong's MTR**

The challenges that Singapore faced in financing long-term asset renewal and upgrades led to the creation of the NRFF, which shifted the burden of heavy capital expenditure back onto the government. In contrast, the Hong Kong MTR Corporation (MTR) found a model of long-term financial self-sufficiency, which makes it a crucial comparative case. This unique financial sustainability was rooted in its integrated "Rail plus Property" (R+P) framework, wherein the government granted MTR exclusive rights to develop land near or above railway assets. This model allowed MTR to integrate railway construction and operation with property development and management, effectively using the value captured from rising real estate prices to fund its rail infrastructure and heavy operational costs. This approach resulted in a rail system in which the government was not required to offer subsidies, tax credits or loans to MTR for rail projects, standing in sharp contrast to Singapore's increasing reliance on public funding. MTR's vertical integration – consolidating responsibility for railway construction, operation, and property development within a single corporate entity – neatly sidestepped the challenge Singapore faced in establishing clear lines of accountability and managing the division of responsibilities between its rail regulator and transport operators.

***Early days***

Hong Kong, much like Singapore, was characterized by its geographical constraints and high population density, reaching approximately 6,300 people per square kilometre. Early on, public transport operations in Hong Kong relied predominantly on bus systems, with five private bus operators running state-granted territorial franchises. These conventional bus services were supplemented by minibuses used to relieve peak loads. Given the inherent limitations of road-based transport and the challenges posed by extreme density, the government ultimately determined that a high-capacity rail system was essential for urban mobility.[88]

The basic layout of Hong Kong's rail network was designed in the early 1970s. To realize this vision, the Hong Kong government established the Mass Transit Railway Corporation (MTRC) in 1975 as a statutory corporation wholly owned by the government. The MTRC was given full responsibility for financing, constructing and operating the rail transit system. Crucially, the MTRC did not receive any government subsidies other than land grants; and the corporation was required to achieve financial self-sufficiency through commercial means from the outset. MTR's first rail transit lines began operation under this framework in 1979.[89]

[86] Tan, Christopher, "Cost and Revenue in Public Transport Will Never Meet", *The Straits Times*, October 16, 2022.
[87] Ministry of Transport. "More Than $2.2 Billion Government Support for Public Transport", Press release, October 13, 2025.
[88] Ko, Stephen. *Development of Mass Transit Railway Systems in Hong Kong: Rail Plus Property Model of MTR Corporation*. SAGE Publications: SAGE Business Cases Originals, 2019.
[89] Plant, "Handbook of Transportation Policy".

***MTR's R+P operating model***

The long-term financial self-sufficiency of the MTR was rooted in its unique and highly successful R+P model, which integrated railway construction and operation with commercial property development and management. This integrated model allowed Hong Kong's rail transit system to be financially self-reliant.[90]

Under the R+P framework, the government, which was in charge of planning the rail transit system, would grant land development rights to MTR for land near or directly above railway stations and maintenance depots.[91] MTR, responsible for building and operating the rail system, would pay the government land premia based on the pre-railway market values and then partner with private developers to develop the real estate. MTR received a predetermined share of the profits from the developers, which could be structured as a share of total development profits, fixed lump sums, or a share of the commercial buildings constructed on the site. Additionally, MTR generated recurring incomes from property rental and management, as well as from station commercial activities such as advertising, retail space and parking facilities.[92]

The R+P model had several financial and operational advantages. MTR relied on property-derived revenues to fund the entirety of the rail system's heavy construction costs, ongoing operation expenses, and maintenance requirements. By generating sufficient revenue through property development, the Hong Kong government was not required to offer subsidies, tax credits or loans to MTR for rail projects. Funding for the rail network was also sustained over the long term with recurring revenue, enabling MTR to continue upgrading existing railway infrastructure and expand the network while keeping fares affordable.[93] Furthermore, the R+P framework encouraged integrated community development by incorporating residences, offices, shops and green spaces directly above and around railway stations, ensuring connectivity for residents.[94]

MTR's model of "super vertical integration"[95] – consolidating responsibility for railway construction, operation and property development within a single corporate entity – meant that there was internal alignment between long-term asset health (and operational stability) and corporate survival. This neatly sidestepped some of the challenges Singapore faced in apportioning responsibilities and accountability between its rail regulator and transport operators.

***Critical differences with Singapore***

While the R+P framework enabled MTR to achieve long-term financial self-sufficiency, it was not directly applicable to Singapore's context. The core conflict lay in Singapore's fundamental policy goal of maintaining strong control over land development in the service of broader national objectives. The Singaporean state's dominance over approximately 85% of its land area meant the state functions as the preeminent land developer and the arbiter of planning norms, utilizing entities like the Singapore Land Authority and the Urban Redevelopment Authority to manage and auction land leases and sales, thereby generating

[90] Ko, *Development of MTR.*

[91] Phang, Sock-Yong, "Lessons from the Underground: Mapping out Public-Private Partnerships across four MRT systems", *City Perspectives*, May 7, 2024.

[92] Ibid.

[93] Ibid.

[94] Ibid.

[95] Phang, "Lessons from the Underground".

substantial revenue for the state's coffers. Handing over exclusive property development rights to a rail operator would go against this philosophy.[96]

Nevertheless, the underlying *principle* of the R+P model – that the value appreciation created by rail infrastructure investment should be captured to sustain the rail system – was also applied in Singapore, but through the mechanism of government subsidies instead. In the Hong Kong model, MTR internally captured this financial upside to maintain the system's financial self-reliance. In contrast, the Singaporean government captured this upside via land sales and leases facilitated by the URA and SLA, channelling that revenue into the national budget. The government then tapped on public funds to finance the rail network's heavy capital expenditures and provide subsidies to cover operating and asset replacement shortfalls.

However, this model of government subsidy meant that Singapore could not achieve its original goal of standalone financial self-sufficiency for the rail system.

**Lessons for policymakers**

Singapore's rail policy journey offered several universal lessons for urban rail governance.

***Maintenance is Safety-Critical***

In a complex system like rail where even the smallest component like axle grease can cause derailment, short-term savings may only show up as severe disruptions in the long term. Rail operators need to be held accountable to rigorous maintenance frameworks with stringent engineering standards and risk assessments.

***The Subsidy Reality***

Full operating cost recovery in public transport – especially rail – is a global rarity. After decades of trying, Singapore has come around to the necessity of ongoing government subsidies for public transport, even as it still tried to instil cost discipline in transport operators through competitive tenders for operating contracts.

***Contestability over Monopoly***

To avoid creating monopolies in public transport, governments should use shorter operating licences to maintain the threat of replacement, which would encourage operators to stay nimble and efficient.

**Conclusion**

In building up its rail network, Singapore continually pursued the twin goals of creating a high-capacity, reliable MRT system and financial sustainability. There was constant policy experimentation in search of the right model. The privatisation and public listing of SMRT in the 2000s inadvertently created a structural misalignment where the pursuit of commercial returns led to inadequate long-term maintenance and subsequent deterioration of rail infrastructure, leading to a policy reset following severe reliability failures. Singapore pivoted by creating the NRFF and effectively re-nationalising all rail operating assets, successfully restoring system reliability by shifting the substantial financial burden of infrastructure renewal and replacement back to the state. The NRFF also resulted in a significant improvement to rail reliability, although recent high-profile disruptions show that challenges remained.

[96] Shatkin, Gavin. "Reinterpreting the Meaning of the 'Singapore Model': State Capitalism and Urban Planning", *International Journal of Urban and Regional Research* 38, no. 1 (2014): 116-137.

Ultimately, this strategy – where the state shoulders the financial burden to guarantee reliability – reflected a governance model optimized for Singapore's unique political and economic context. Unlike alternative self-funding structures, such as the Hong Kong MTR Corporation's integrated "Rail plus Property" approach, the NRFF ensured high service standards deemed essential for this city state, aligning rail transit needs with other policy goals.