

## Regulating Public Transport Fares in Singapore – What Can We Afford?

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**Abstract:** The setting of public transport fares has to strike a balance between commuters' interests – particularly fare affordability – and the financial viability of public transport operators. Singapore adopted a formula-based approach to reviewing fares, while the fare formula itself was tweaked over the years to reflect the cost components of public transport more accurately. On the other hand, even if operating costs had risen, fare increases tended to create unhappiness among the public, especially if service levels were perceived to have deteriorated. This case study aims to provide an understanding of how Singapore managed public transport fares within the context of structural and regulatory changes in the public transport sector. It would also examine the issue of fare affordability for commuters and budget affordability for the government, as well as how public transport service standards were addressed. The case study would also look at the role of the fare review mechanism in light of recent changes in the bus and rail models.

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### Introduction

The Public Transport Council (PTC) set up in 1987, together with the Land Transport Authority (LTA)<sup>1</sup>, was responsible for regulating various aspects of the public transport sector in Singapore. The government started to review the fare structures for the Mass Rapid Transit (MRT) and bus services when the MRT system was launched in 1987 to encourage ridership on the MRT and build up its operating viability.<sup>2</sup>

Under the financing framework set out in LTA's 1996 landmark land transport white paper, the government invested in transport infrastructure, such as roads, rails, MRT stations, bus interchanges and bus stops; commuters paid for operating costs; and public transport operators (PTO) – SMRT and SBS Transit – ran public transport services efficiently, subjected to regulated fares and service standards.<sup>3</sup> In this way, public transport services were expected to operate largely without direct subsidies from the government.

In particular, the setting of public transport fares – an issue that could be politically sensitive – came under the oversight of an independent PTC, away from the government's direct control. The principle was for fares to be determined by market forces and cost factors as much as possible, while the PTC acted as “a watchdog on behalf of the public”.<sup>4</sup> In short, the PTC had the task of striking a balance between commuters' interests – particularly fare affordability – and the financial viability of the PTOs.

### Introducing a fare review mechanism

The process and method of reviewing public transport fares had changed significantly over time. Prior to the formation of the PTC, changes in bus fares were approved on an ad hoc basis by the ministry responsible for transport matters.<sup>5</sup> An independent PTC formed under the Public Transport Council Act in 1987 replaced the Bus Services Licensing Authority (BSLA) whose primary function was to licence bus routes. The government also broadened the decision-making process in fare regulation by introducing members of the public, such as representatives from grassroots organisations, into the PTC. Besides approving bus routes, its scope was expanded to include regulating bus and rail fares, as well as bus service standards. The PTOs would submit yearly applications to revise fares, which were evaluated by the PTC.

Improvements in technology that enabled the implementation of Singapore's first integrated fare structure for bus and rail, also played a part by allowing fare adjustments to be more flexible. The introduction of stored value magnetic farecard technology in 1991, and subsequently a contactless stored value card, allowed one farecard to be used on both buses and trains. Before this, a commuter had to pay separate boarding charges (transfer penalty) with each transfer between bus and rail or between bus services. With the use of the same farecard between transfers, a commuter could also enjoy a fixed transfer rebate with each transfer within a

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<sup>1</sup> LTA was established in 1995 through the merger of four public sector entities, namely Registry of Vehicles, Mass Rapid Transit Corporation, Roads & Transportation Division of the Public Works Department, and Land Transportation Division of the Ministry of Communications.

<sup>2</sup> Looi, Teik Soon and Tan, Kim Hong. “Singapore's case of institutional arrangement for fare affordability.” Paper presented at 11<sup>th</sup> Conference on Competition and Ownership in Land Transport, Delft, the Netherlands, September 20–25, 2009, p 5.

<sup>3</sup> Land Transport Authority (LTA). “White Paper – A World Class Land Transport System.” Singapore: Land Transport Authority, 1996.

<sup>4</sup> Singapore Parliamentary Report. “Public Transport Council Bill.” Vol. 49, cols 1394-1395, July 28, 1987.

<sup>5</sup> Looi, Teik Soon and Tan, Kim Hong. “Singapore's case of institutional arrangement for fare affordability.” Paper presented at 11<sup>th</sup> Conference on Competition and Ownership in Land Transport, Delft, the Netherlands, September 20–25, 2009.

permissible time limit. To encourage commuters to switch to more efficient cashless payments, fare payments using cash were typically higher.

Against a backdrop of only one across-the-board bus fare increase between 1981 and 1990<sup>6</sup>, the bus and rail sector saw several fare adjustments over the next two decades. In 1998, the PTC adopted a price-cap model, marking the start of a more transparent and predictable formula-based process of reviewing fares. The fare review mechanism had to address two conflicting objectives between allowing the PTOs to recover operating costs and plan for growth, and ensuring that fares remained affordable to commuters. Commonly used to regulate monopolies such as utilities, the price-cap model stemmed from the 1996 Cost Review Committee's<sup>7</sup> recommendations to keep fare increments small and regular, and avoid sudden spikes.

To the public, the fare adjustment formula introduced in 1998 was simplified as  $CPI + X$ , which set a yearly ceiling on fare adjustments. The formula was based on objective and measurable indicators tied to macroeconomic conditions, such as annual inflation rate changes reflected by the Consumer Price Index (CPI), and a composite of changes in wages and productivity represented as "X".<sup>8</sup> "X" was intended to compensate the PTOs for net cost increases beyond that of general inflation and wages after considering productivity improvements. Moreover, adjustments to the fare within the cap were not automatic. They were determined by the PTC, which would consider other relevant factors such as the PTOs' profitability and general economic conditions. However, the derivation of "X" was not made public and was instead determined in advance, based on historical changes in the national average wage and labour productivity. It was set at 2 percent for 1998-2000, and 1.5 percent for 2001-2005.<sup>9</sup>

The price-cap formula was put to the test in 2001. News surfaced in mid-2001 that the PTOs had applied to the PTC for another fare increase. The proposed fare increases coincided with a sharp slowdown in the US economy and a slump in the global electronics industry, which saw the Singapore economy suffer a sharp contraction of -1 percent, compared to 8.9 percent growth in 2000.<sup>10</sup> There had also been five fare rises in the preceding decade, although the increases were below the maximum allowed under the price cap formula. Coupled with an impending hike in the Goods and Services Tax (GST) and other cost increases, news of another potential fare increase was thus hard for the public to swallow and prompted heated political debate.

Although it was not designed as such, the fare adjustment formula of  $CPI + X$  appeared to the public to be a cost-plus formula where cost increases were simply passed to commuters, giving profitable PTOs little incentive to be more cost efficient. In particular, the "X" component was seen as opaque and unresponsive to changing economic conditions. The fact that the PTOs reported healthy profits that year also did little to dispel

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<sup>6</sup> LTA. "White Paper: A World Class Land Transport System." Singapore: Land Transport Authority, 1996, 58.

<sup>7</sup> The Cost Review Committee was set up by the government to review cost increases in the four areas of health care, housing, education and transport, and their impacts.

<sup>8</sup> Mathematically, Fare Adjustment Cap =  $0.5\Delta CPI + 0.5\Delta WI - 0.5(0.5\Delta Pn)$ , where  $\Delta CPI$  is change in Consumer Price Index over preceding year,  $\Delta WI$  is change in national annual average monthly earnings over preceding year (adjusted for any change in the employer's CPF contribution rate), and  $\Delta Pn$  is change in national labour productivity (value added per unit of labour) over preceding year. Committee on the Fare Review Mechanism. "Report of the Committee on the Fare Review Mechanism." February, 2005.

<sup>9</sup> Looi Teik Soon and Tan Kim Hong. "Striking a Fare Deal - Singapore's Experience in Introducing a Fare Review Mechanism." Paper presented at World Conference on Transport Research, University of California, Berkeley, USA, June, 2007, 46. Accessed <https://www.lta.gov.sg/itaacademy/doc/WCTR%20Striking%20A%20Fare%20Deal.pdf>

<sup>10</sup> Data.gov.sg. "Contribution To Growth In Gross Domestic Product At 2010 Market Prices, By Industry (SSIC 2015), Annual" Retrieved from [https://data.gov.sg/dataset/contribution-to-growth-in-gross-domestic-product-at-2010-market-prices-by-industry-annual?resource\\_id=3bb4ec7c-25fc-4eb2-873d-5e27e0979ae7](https://data.gov.sg/dataset/contribution-to-growth-in-gross-domestic-product-at-2010-market-prices-by-industry-annual?resource_id=3bb4ec7c-25fc-4eb2-873d-5e27e0979ae7)

the public's impression.<sup>11</sup> On the other hand, the PTOs blamed higher costs on rising manpower expenses, Electronic Road Pricing (ERP) charges<sup>12</sup>, higher fuel and utility charges, as well as service improvements.<sup>13</sup> In response, the PTC rejected an overall increase in fares that year, although it allowed a ten-cent rise in feeder bus services to match the minimum fare on trunk services.<sup>14</sup>

The following year, a similar scene played out again with the PTOs requesting for fare increases, amid a still-anaemic economy. The public furore it generated was no less intense, and the fare hike was again hotly debated in parliament. However, there was no respite this time as the PTC announced that bus and train fares would increase all-round by between three and ten cents. Monthly concession fees were also raised for students, and National Service men. One of the justifications was the principle of keeping fare revisions small and regular; the government deemed it "better (to increase) a bit now than a whole lot later".<sup>15</sup>

At around the same time, the public transport industry was also undergoing restructuring. For several years, bus services were run by SBS Transit and Trans-Island Bus Services (TIBS) Ltd, while SMRT monopolised the MRT system. By the early 2000s however, a duopoly in bus and rail emerged between SMRT and SBS Transit which became multi-modal transport players. SBS Transit won the licence to operate the Northeast MRT Line in 2000, while SMRT acquired TIBS in 2001. This injected some competition into the operation of new MRT lines that were being developed.

### **A turning point in fare review**

Nevertheless, public transport fare regulation had reached a turning point in Singapore. In response to the public outcry in the early 2000s, the government convened a separate committee in 2004 to evaluate the fare review mechanism and make recommendations to the PTC. Led by the chairman of the Government Parliamentary Committee (GPC) for Transport, the Committee on the Fare Review Mechanism (CFRM) comprised of representatives from the PTC, the Consumers Association of Singapore (CASE), academia and the National Trades Union Congress (NTUC).

In its review, the committee referred to the public transport financing principles outlined in LTA's 1996 land transport white paper. Fares had to be realistic and revised periodically in response to justifiable cost increases; operating revenue should cover operating costs; and asset replacement should be sustainable. It also gathered feedback and suggestions from the PTOs, sector experts in academia and professional groups, as well as from grassroots organisations and student unions. The replacement of the magnetic card system with the LTA-owned ez-link contactless smart card system in 2002, also meant that LTA and PTC could directly collect data on the use of buses and trains, instead of relying on the PTOs' submissions.

While retaining the price-cap approach, the CFRM proposed to restructure the fare adjustment formula as *Price Index – Productivity Extraction*.<sup>16</sup> The intention was to make the fare adjustment formula more responsive and transparent by separating productivity from wage costs and other cost components, which

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<sup>11</sup> "NTUC, Case question hikes." *The Straits Times*, May 31, 2001.

<sup>12</sup> ERP is a pay-as-you-use system to manage road congestion in Singapore.

<sup>13</sup> "Proposals for hikes result of rising costs." *The Straits Times*, June 6, 2001.

<sup>14</sup> "Feeder fares up 10 cents." *The Straits Times*, June 6, 2001.

<sup>15</sup> "Fare hikes: A question of timing." *The Straits Times*, July 10, 2002.

<sup>16</sup> Mathematically, the proposed Fare Adjustment Cap =  $0.5\Delta\text{CPI} + 0.5\Delta\text{WI} - 0.3\%$ . Committee on the Fare Review Mechanism. "Report of the Committee on the Fare Review Mechanism." February, 2005.

had been lumped together into “X” in the earlier formula. The revised price index was composed of 50 percent of the change in the CPI and 50 percent of the change in the wage index (pegged to national average monthly earnings) over the preceding year. Other cost components, such as maintenance, depreciation, fuel and energy were reflected by changes in the CPI.

To safeguard commuters and ensure the PTOs continued to deploy labour productively, the formula set an explicit benchmark for annual productivity gains expected of the PTOs by deducting a pre-set productivity rate. The previous formula of  $CPI + X$  had taken in the prevailing productivity rate, without . The productivity extraction was set in advance at 0.3 percent for 2005-2008. This was pegged to the PTOs’ historical average annual labour productivity gains (based on value-added per worker) of about 0.6 percent between 1997 and 2002,<sup>17</sup> shared equally between the PTOs and commuters. In this way, the PTOs could still enjoy some upside from productivity gains and be incentivised to improve productivity. The CFRM also recommended that the PTC review the price index and productivity extraction every three years.

Another change recommended by the CFRM was to give the PTC the power to initiate fare adjustments based on the formula, particularly downward adjustments in the form of fare rebates or reductions, rather than wait for applications by the PTOs.<sup>18</sup> At the same time, the PTC would retain the flexibility to vary or reject fare adjustments under extenuating circumstances, such as adverse economic conditions, or a significant deterioration in fare affordability. Moreover, the PTC would benchmark the PTOs’ yearly Return on Total Assets (ROTA) against that of industries with a similar risk profile, as a reality check to prevent fare increases from leading to excessive profits for PTOs. The CFRM’s recommendations which were released in March 2005, were accepted by the government. That year, commuters saw an overall fare increase of 2.4 percent, the maximum allowed under the new fare adjustment formula.<sup>19</sup> The public transport fare adjustments implemented since 2005 are shown in *Exhibits 1* and *2*.

Three years later in 2008, the fare adjustment formula was reviewed again, as recommended by the CFRM. While the PTC retained the relative weights for both the CPI and wage index components, the productivity extraction in the fare adjustment formula was raised from 0.3 percent to 1.5 percent.<sup>20</sup> The PTOs had achieved a higher average productivity gain of 3 percent over the preceding 5 years (2003-2007), which would be shared equally with commuters. The PTC also extended the validity period of the fare adjustment formula to five years to give commuters and the PTOs more certainty.

The fare structure itself changed in July 2010 with the introduction of a distance-based fare regime, which replaced the fixed transfer rebate that had been in place. Under this regime, commuters would be charged fares based on the total distance travelled in a journey, without incurring a transfer penalty when they switched between buses or between the bus and rail. Hence commuters travelling the same distance on the same type of service would pay the same amount, regardless of the number of transfers made.

### **Closer tracking of cost components**

In 2012, another Fare Review Mechanism Committee (FRMC) was convened and released its report in November 2013. The committee retained the *Price Index – Productivity Extraction* model, but tweaked the

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<sup>17</sup> Looi Teik Soon and Tan Kim Hong. “Instituting Fare Regulation”. *Journeys*, 3, November 3, 2009, 46.

<sup>18</sup> Singapore Parliamentary Report. “Public Transport Council (Amendment) Bill.” Vol. 80, cols 1547-1548, October 17, 2005.

<sup>19</sup> “Public transport operators’ annual revenue to go up by \$13-\$14m.” *The Business Times*, May 31, 2005.

<sup>20</sup> Looi Teik Soon and Tan Kim Hong. “Instituting Fare Regulation”. *Journeys*, 3, November 3, 2009, 47.

price index to track the PTOs' cost components more closely. In addition to the wage index, the new price index  $0.4cCPI + 0.4WI + 0.2EI$ , replaced the general CPI with core CPI (which excluded costs of housing and private transport), and incorporated a new energy index to track electricity and diesel costs for trains and buses. Based on the historical productivity of the PTOs between 2007 and 2011, the productivity extraction was also adjusted to 0.5 percent for 2013 to 2017.

Compared to 2005, the volatility of energy prices in recent years had resulted in energy costs going up by between 40 and 110 percent for the PTOs in 2011, accounting for a larger proportion of total costs.<sup>21</sup> Compared to the previous formula, incorporating an energy index resulted in fare reductions between 2014 and 2016, as energy prices fell significantly between 2014 and 2016. With the energy index in place, the FRMC suggested that the PTC review the need for the Fuel Equalisation Fund –funded by the PTOs' yearly contributions – to offset sharp and transient spikes in fuel and electricity prices.

Another change was the introduction of a roll-over mechanism to allow the PTC some flexibility to roll-over the fare adjustment quantum not granted at each fare review exercise to the next exercise. The monitoring of the PTOs' ROTA was also removed. Under the 2008 Land Transport Masterplan, the PTOs were expected to become more asset-light, as the government gradually took over the responsibility of investing in, and replacing operating assets under the New Rail Financing Framework. The new fare review mechanism came into effect from 2013 to 2017. With this new formula, the maximum fare increase allowed in 2013 worked out to be 6.6 percent, although the actual adjustment implemented by the PTC was only 3.2 percent.

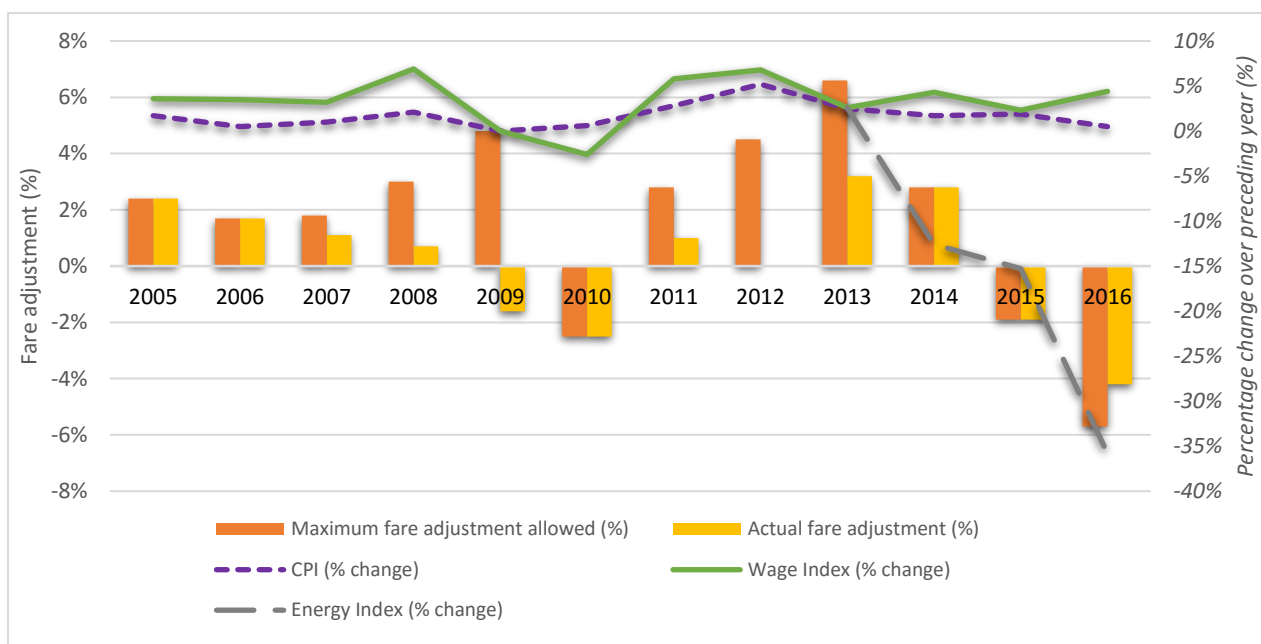
More recently in 2016, bus and train fares were reduced by an overall 4.2 percent for adult fares, even though the formula allowed for a maximum negative fare adjustment of 5.7 percent. The remaining -1.5 percent was rolled over to the following year. The LTA also announced in October 2016 that the public transport fare structure would be further simplified. In particular, a truly distance-based rail fare structure came into effect; commuters would be charged based on the route with the shortest distance route between starting entry and exit station sending points, rather than the distance of the fastest route, as had been the case. The higher fares charged for trips made on train lines below ground – which incurred higher operating costs – were also lowered to be the same as that for above-ground lines. With this, the fare structure between bus and rail for all rail lines became fully integrated uniform as commuters would pay the lowest fare regardless of the route taken or modes of travel within the rail network.

Under the formula-based approach, the public transport sector saw fare adjustments – both upwards and downwards – almost every year. Fare changes were generally within a few cents for commuters using contactless farecards. The PTC had at times deviated from the fare adjustment allowed under the formula, when faced with extenuating circumstances. For example, the PTC rejected the PTOs' application in 2007 to raise rail fares, as the "rail industry had done very well in the last year (2006)" on the basis of their ROTAs. During the height of the global financial crisis, the fare increase was smaller than the maximum fare adjustment allowed in 2008, while fares were reduced in 2009. The PTC also exercised greater flexibility from 2013 onwards by deferring some quantum of fare adjustments to subsequent years, as intended under the new fare review mechanism.

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<sup>21</sup> Fare Review Mechanism Committee. "Affordable Fares, Sustainable Transport – The Fare Review Mechanism Committee Report." 2013.

**Exhibit 1: Public transport fare adjustments, 2005-2016**



Source: Public Transport Council (PTC). News releases, various years; Fare Review Mechanism Committee. “Affordable Fares, Sustainable Transport – The Fare Review Mechanism Committee Report.” 2013.

**Exhibit 2: Detailed breakdown of public transport fare adjustments, 2005-2016**

| Year              | CPI (% change) | Wage Index (% change) | Energy Index (% change) | Productivity Extraction (%) | Maximum fare adjustment allowed (%) | Actual fare adjustment (%)      |
|-------------------|----------------|-----------------------|-------------------------|-----------------------------|-------------------------------------|---------------------------------|
| 2005 <sup>a</sup> | 1.70%          | 3.60%                 | NA                      | 0.30%                       | 2.40%                               | 2.40%                           |
| 2006              | 0.50%          | 3.50%                 | NA                      | 0.30%                       | 1.70%                               | 1.70%                           |
| 2007              | 1.00%          | 3.20%                 | NA                      | 0.30%                       | 1.80%                               | 1.10% <sup>b</sup>              |
| 2008              | 2.10%          | 6.90%                 | NA                      | 1.50%                       | 3.00%                               | 0.70%                           |
| 2009              | NA             | NA                    | NA                      | 1.50%                       | 4.80%                               | -1.60% <sup>c</sup>             |
| 2010              | 0.60%          | -2.60%                | NA                      | 1.50%                       | -2.50%                              | -2.50%                          |
| 2011              | 2.80%          | 5.80%                 | NA                      | 1.50%                       | 2.80%                               | 1.00%                           |
| 2012              | 5.20%          | 6.80%                 | NA                      | 1.50%                       | 4.50%                               | Nil <sup>d</sup>                |
| 2013 <sup>a</sup> | 2.50%          | 2.60%                 | 2.60%                   | 0.50%                       | 6.60% <sup>e</sup>                  | 3.20%<br>(3.40%) <sup>f</sup>   |
| 2014              | 1.70%          | 4.30%                 | -12.60%                 | 0.50%                       | 2.80% <sup>g</sup>                  | 2.80%                           |
| 2015              | 1.90%          | 2.30%                 | -15.30%                 | 0.50%                       | -1.90%                              | -1.90%                          |
| 2016              | 0.50%          | 4.40%                 | -35.80%                 | 0.50%                       | -5.70%                              | -4.20%<br>(-1.50%) <sup>f</sup> |

Source: Public Transport Council (PTC). News releases, various years; Fare Review Mechanism Committee. “Affordable Fares, Sustainable Transport – The Fare Review Mechanism Committee Report.” 2013.

Notes:

<sup>a</sup> New fare adjustment formula/mechanism implemented.

<sup>b</sup> Applied to bus fares only.

<sup>c</sup> Excluded 3% fare rebate offered by PTOs which expired 3 July 2010.

<sup>d</sup> Deferred pending report of 2013 Fare Mechanism Review Committee.

<sup>e</sup> Combined maximum fare adjustments of 4.5% for 2012 (which was deferred) and 2.1% for 2013.

<sup>f</sup> Remaining “unused” quantum of fare adjustment that could be rolled over to the next year.

<sup>g</sup> Combined remaining fare adjustment of 3.4% carried over from 2013 and fare adjustment of -0.6% for 2014.

## Affordability for commuters

The PTC and fare review mechanism committees made affordability of public transport to commuters a key priority. The high cost of private vehicles in Singapore meant that commuters had few alternatives outside of public transport, although the entry of on-demand transport platforms such as Uber and Grab provided additional options. With a fare adjustment formula that compensated the PTOs for costs changes, there was a risk that the operators could get by with inefficient cost structures, and rely instead on ever-increasing fares. Fares could then spiral upwards and become unaffordable for commuters. In the absence of a competitive market with multiple service providers, commuters had to be protected from inefficient PTOs. The PTC also acted as a bulwark against potential price gouging by the PTOs, especially during times of economic crisis.

The approach in Singapore was to extract some efficiency gains upfront from the PTOs through a productivity extraction component in the fare adjustment formula. Productivity gains were shared equally between commuters and PTOs to incentivise the latter to raise productivity. However the productivity extraction was based on the PTOs' historical annual labour productivity rates, and fixed throughout the validity period of the fare formula, making it a relatively inflexible tool.

Discussions on affordability also centred on two considerations – affordable to whom, and what to measure. Public transport affordability was measured by expenditure on public transport fares on buses and trains as a proportion of household income. The 2005 CFRM recommended monitoring public transport affordability for an average public transport user, represented by a characteristic household in the 20<sup>th</sup> to 40<sup>th</sup> income percentile group, with two working adults and two school-going children.<sup>22</sup> The characteristic family was assumed to have a certain weekday travel pattern on bus and rail. Public transport affordability was also to be tracked yearly, rather than based solely on data from the 5-yearly Household Expenditure Survey (HES) conducted by the Department of Statistics (DOS). The CFRM concluded that public transport affordability had improved from 1988 to 2003.<sup>23</sup>

The 2013 FRMC proposed tracking public transport fare affordability not only for the average public transport user represented by the second quintile group (20<sup>th</sup> to 40<sup>th</sup> percentile) by household income, but also the lower income group as represented by the second decile (10<sup>th</sup> to 20<sup>th</sup> percentile). The committee recommended dropping the use of a characteristic family in favour of actual public transport expenditure and household income data from the HES. Data for intervening years could be extrapolated by adjusting public transport expenditure based on actual fare adjustments granted by the PTC, while the household income changes could be calculated using year-on-year mean national wage growth data collated by DOS. In addition, the data excluded expenditure on taxis.

Between 2003 and 2015, fare affordability – whether measured using a characteristic household, or by second quintile and second decile household income groups – had improved (*Exhibit 3*). Measuring affordability based on a characteristic household tended to overestimate the proportion of actual expenditure on public transport, as compared to second decile group, although the difference narrowed from 2008 onwards.

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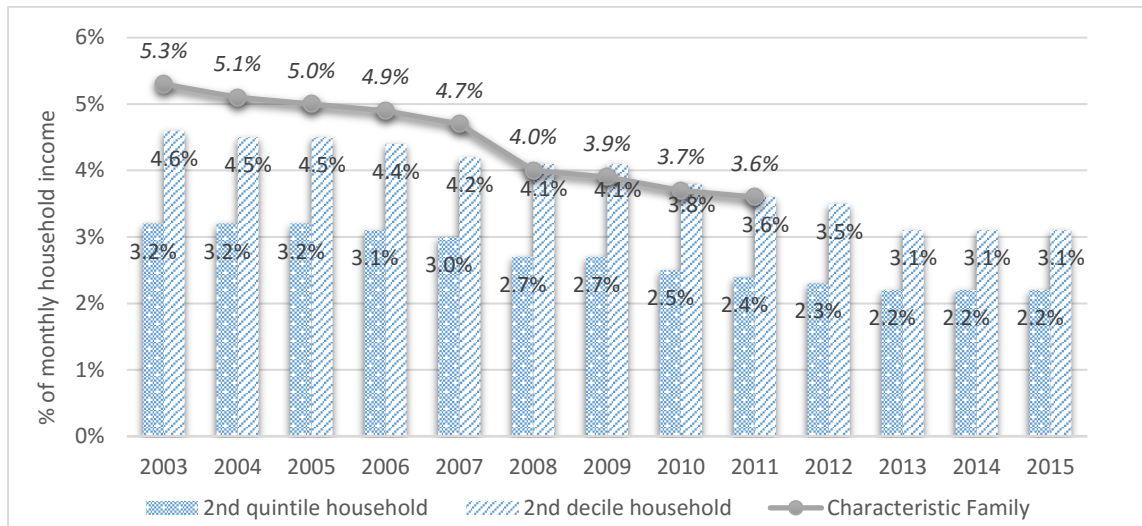
<sup>22</sup> For details on assumptions on the characteristic household profile and travel patterns, see Committee on the Fare Review Mechanism. "Report of the Committee on the Fare Review Mechanism." February, 2005, pp 52-54.

<sup>23</sup> Committee on the Fare Review Mechanism. "Report of the Committee on the Fare Review Mechanism." February, 2005, p 23.



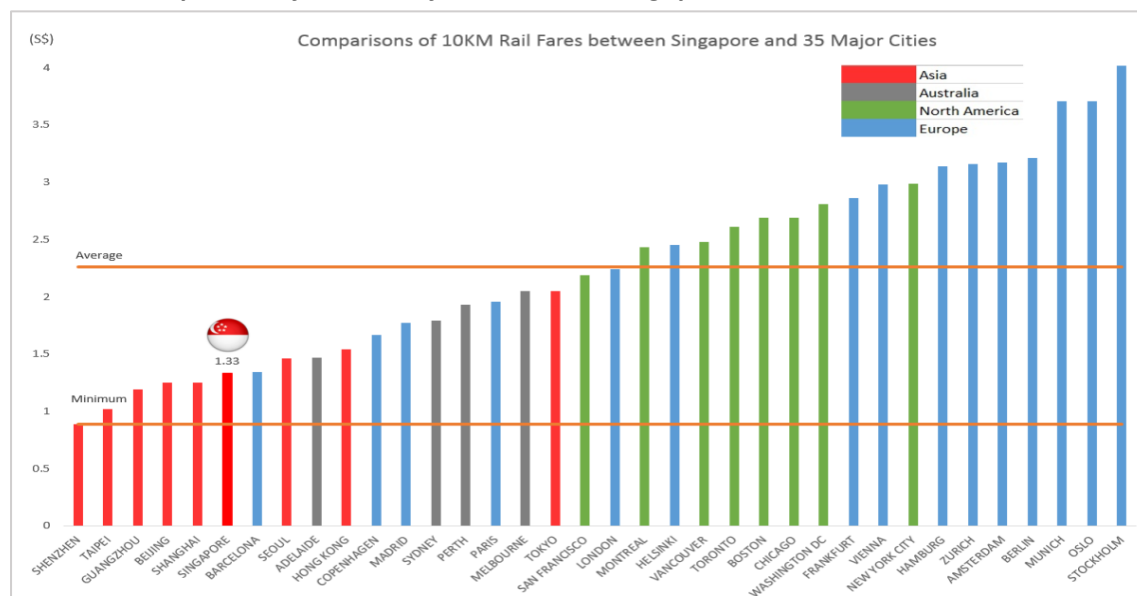
Another measure of public transport affordability was to compare fares across cities. A study commissioned by the PTC in 2016 revealed that Singapore had one of the lowest rail fares among 35 cities in Asia, Australia, North America and Europe (*Exhibit 4*). Based on purchasing power parity, a 10-km trip – the average distance travelled by commuters in Singapore – on the MRT cost \$1.33.<sup>24</sup> Shenzhen offered the lowest fare of \$0.89 over the same distance, while the flat rate of \$4.02 charged by Stockholm was the priciest. Within Asia, the rail fare in Singapore was less than that in Seoul, Hong Kong, and Tokyo.

**Exhibit 3: Public transport fare affordability (monthly expenditure on public transport as percentage of household income), 2003-2015**



Source: Public Transport Council (PTC). News releases, various years.

**Exhibit 4: Comparison of 10km rail fares between Singapore and 35 cities**



Source: PTC Blog. Comparison of Rail Fares between Singapore and 35 Major Cities, December 5, 2016. Retrieved from <https://ptcsq.wordpress.com/2016/12/05/comparison-of-rail-fares-between-singapore-and-35-major-cities/>

Note: Adjusted for Purchasing Power Parity (PPP), except for Taipei where an official PPP conversion factor was not available and fares were converted to Singapore dollar using prevailing exchange rate.

<sup>24</sup> Chua, Vincent CH. "Comparison of rail fares between Singapore and 35 major cities around the world." December 28, 2016.

Concessionary fares offered by the PTOs were also available to help cushion fare increases. Specific groups such as full-time students and senior citizens were already entitled to purchase monthly concessionary passes for unlimited bus and MRT rides for that month. Additional concessionary fares funded by the government were introduced in 2014 for low-income working adults under the Workfare Income Supplement Scheme<sup>25</sup> and people with disabilities.

Another example of financial support was the Public Transport Fund launched in 2004 by the Community Development Councils,<sup>26</sup> NTUC Club<sup>27</sup> and Singapore Labour Foundation. Drawing from the fund, public transport vouchers were issued to the needy to help them cope with fare increases. Of the initial funding of \$6 million, SMRT and SBS Transit contributed \$1 million each.<sup>28</sup> Nevertheless the PTOs' contributions to the fund were voluntary, and the fund drew largely from public funding, with the government periodically topping it up.

Following the 2013 FRMC's recommendations, the PTOs' contributions to the Public Transport Fund were made mandatory, and could range from 20 to 50 percent of the expected increase in fare revenue from the fare adjustment granted. The actual contribution would be determined during the annual fare review exercise, although a more profitable PTO could expect to fork out more. Financial penalties imposed on the PTOs for service lapses were also channelled back to the fund. For example, the \$2 million fine that LTA handed out to SMRT for two major MRT service disruptions in December 2011 was donated to the fund.<sup>29</sup> In 2014, SBS Transit and SMRT contributed \$5.5 million and \$8 million respectively to the Public Transport Fund, while \$7.5 million was drawn down the following year for 250,000 public transport vouchers. The PTOs did not have to contribute in 2015 and 2016 when fares were reduced.

### **Affordability to government**

While fares had become more affordable to the public over the years, another crucial facet was affordability to the government in terms of financial sustainability of the public transport system. An appropriate financing framework for public transport, including the pricing of fares, would keep the PTOs' operations financially viable, while inducing them to be cost efficient within the required service standards. Government subsidies to keep public transport operating could then be minimised. The government had spent several years studying the MRT system in the 1980s, in part because it was wary of being saddled with a system that required large subsidies to continue operating. A former senior civil servant, Ngiam Tong Dow recalled that "the then PM (prime minister) Lee Kuan Yew urged his Cabinet to set MRT fares at levels much higher than bus fares. He made the point that if initial fares are not set at fair economic value – for a superior service to command a premium vis-à-vis bus fares – we would be stuck with uneconomic fares forever."<sup>30</sup>

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<sup>25</sup> The Workfare Income Supplement (WIS) introduced in 2007 as a permanent feature of Singapore's social security system to provide cash and CPF payouts to older lower-wage workers and persons with disabilities (PWDs) who work.

<sup>26</sup> Community Development Councils was established by the government in 1997 to build a tightly-knit, compassionate and self-reliant community in Singapore.

<sup>27</sup> NTUC Club is the entertainment and leisure arm of the National Trades Union Congress (NTUC), a national confederation of trade unions as well as a network of professional associations and partners across all sectors in Singapore.

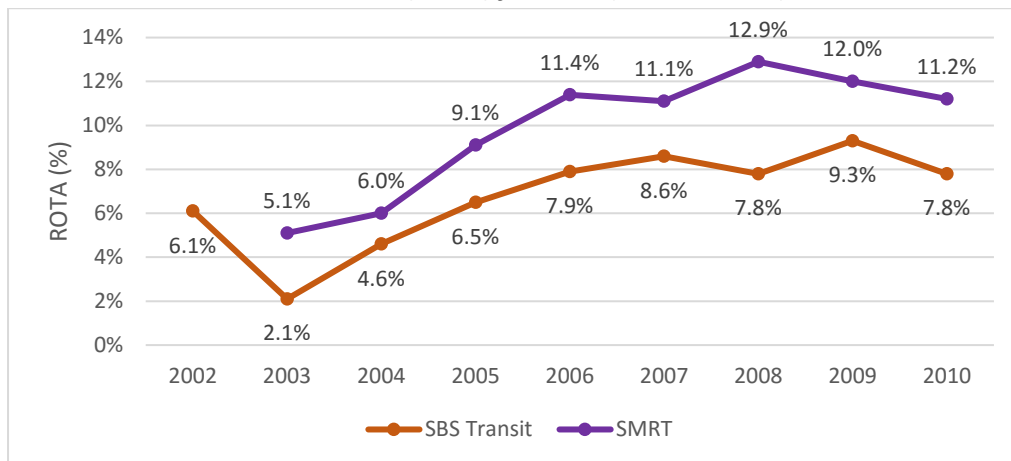
<sup>28</sup> "Up to \$300 transport aid for needy kids." *The Straits Times*, September 9, 2003.

<sup>29</sup> "SMRT fined S\$2m for December train disruptions." *Channel NewsAsia*, July 16, 2012.

<sup>30</sup> Ngiam, Tong Dow. "Success and Failures of Public Policy: The Singapore Experience, 1960-2000," in *A Mandarin and the Making of Public Policy: Reflections of Ngiam Tong Dow*, ed. Simon S. C. Tay (Singapore: NUS Press, 2006), 151.

In Singapore, the PTOs appeared to register healthy ROTAs – a measure of how profitably assets were being deployed – across bus and rail between 2003 and 2010 (*Exhibit 5*), despite their bus operations running at a loss for some years. Except in 2007, the PTC had generally deemed the rates acceptable after benchmarking them against ROTAs of companies in similar industries or risk profiles in Singapore and overseas. These included Singapore’s SingPost and Sembcorp Industries, Hong Kong’s Kowloon Motor Bus Holdings and Mass Transit Railway Corporation, and London’s Stagecoach Group. The creation of multi-modal transport companies operating both bus and rail services in the early 2000s also allowed SBS Transit and SMRT<sup>31</sup> to diversify revenue risks across the group. The PTC ceased tracking the PTOs’ ROTAs after 2010, as the public transport sector moved towards an asset-light regime.

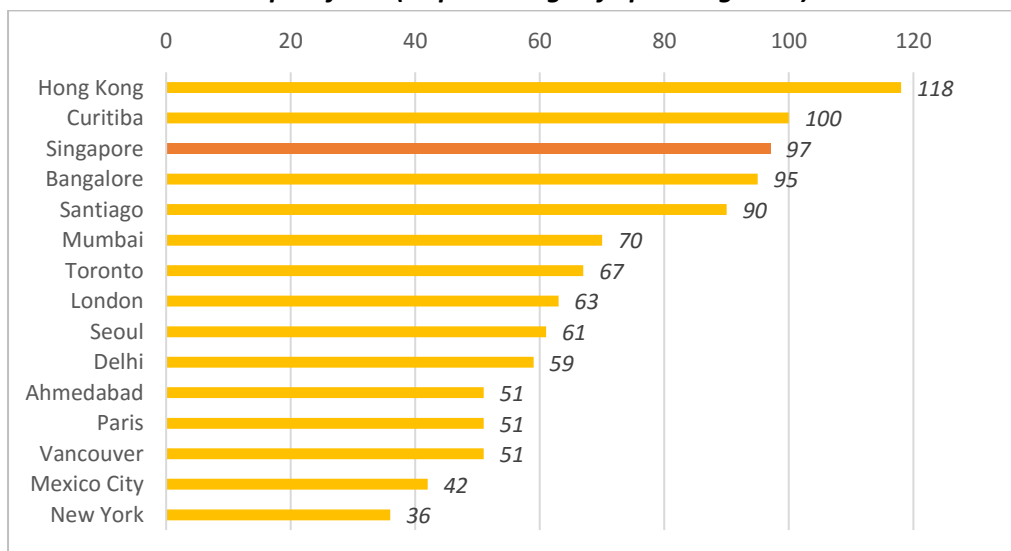
**Exhibit 5: Return on Total Assets (ROTA) for PTOs (bus and train)**



Source: Public Transport Council (PTC). News releases, various years.

Note: ROTA equals net profits after tax divided by average of total assets as at end of previous and current financial years. ROTA figures were based on PTOs’ proforma statements submitted to the PTC. With the implementation of a new fare review mechanism in 2013, the PTC ceased reporting the PTOs’ ROTAs after 2010.

**Exhibit 6: Public transport fares (as percentage of operating costs) in various cities**

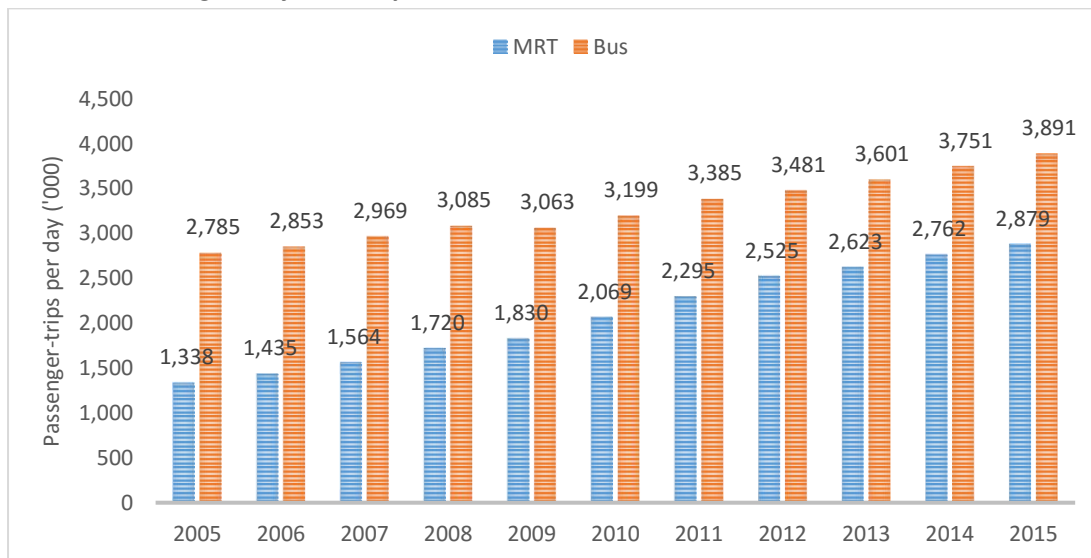


Source: Adapted from World Bank. *Planning, connecting, and financing cities—now: priorities for city leaders*. Washington, DC: World Bank, 2013, p 30.

Another measure of affordability to the government was to look at the farebox recovery ratio – the proportion of operating costs recovered from public transport fares paid by commuters - which measured the financial viability of a PTO without subsidy. Recovering operating costs from farebox revenues was a perennial challenge for many cities. A World Bank study in 2013 found that the farebox recovery ratio varied greatly across cities, but typically fell short of operating costs (*Exhibit 6*).<sup>32</sup> There were only a few notable exceptions such as Hong Kong and Curitiba, with Singapore achieving the third highest farebox recovery ratio of 97 percent among the cities surveyed. At the other end of the scale, New York recovered only 36 cents for every dollar of operating cost, while most cities managed a farebox recovery ratio of between 50 and 70 percent.

The World Bank study pointed out that even after fares were delinked from operating costs, public transport operators would need assurance that their costs would be compensated, such as through gross cost contracts. In turn, regulators had to put in place an appropriate mechanism such as competitive tendering to ensure that PTOs operated efficiently, rather than simply pass on costs increases to the government. Since raising fares to recover more costs could reduce ridership, governments would have to fill the gap from other sources, such as tax revenues.

**Exhibit 7: Average daily ridership on bus and MRT, 2005-2015**



Source: Land Transport Authority. *Land Transport Statistics in Brief, various years.*

In Singapore, changes to the financing models for public transport were also afoot in recent years. The aim was to raise service standards and make the industry more responsive to commuter needs, which the PTOs were perceived to have neglected in recent years. The situation was exacerbated by growing demand for public transport as the population increased (*Exhibit 7*). Average daily ridership on MRT and bus was 1.33 million and 2.78 million respectively in 2005. By 2015, MRT passenger-rides had more than doubled to 2.89 million a day, while daily bus passenger-rides had risen by a third to 3.89 million.

By the end of 2016, the bus industry completed its transition to a government bus contracting model which was first announced in May 2014. LTA would contract bus operators under a gross cost model to operate bus services through a competitive tendering process, subjected to certain service standards. Bus operators would be paid fees to operate the services. The government would retain the fare revenues, own the bus

<sup>32</sup> World Bank. *Planning, connecting, and financing cities—now: priorities for city leaders.* Washington, DC: World Bank, 2013, p 30.

infrastructure and operating assets, and set routes and bus service standards. The PTC would continue to decide on fare adjustments, while the government would subsidise any shortfall between fare revenues collected and the cost of delivering the services. Government subsidies for bus contracting would amount to \$3.5 to \$4 billion over the next five years.<sup>33</sup> The new contracting model attracted new players into the industry, such as Australia's Tower Transit and UK's Go-Ahead.

Similarly, the rail industry was transiting to the NRFF which was first announced in 2008. The Downtown Line operated by SBS Transit was the first to come under the new financing framework in 2011. LTA concluded negotiations with SMRT for the North-South and East-West Lines, the Circle Line and the Bukit Panjang Light Rail Transit in July 2016. Under the new framework, rail operating assets such as trains and signalling systems would be owned by LTA. The cost of renewing, upgrading and expanding operating assets for the next five years was expected to exceed \$4 billion.<sup>34</sup> Rail operators would continue to collect fare revenues, and pay an annual licence charge – channelled to LTA's Railway Sinking Fund – for the right to operate, and responsibility to maintain the MRT lines. The licence charge was structured with a cap and collar to keep the Earnings before Interest and Taxes (EBIT) margin for rail operators at about 5 percent. Similarly, the PTC would determine adjustments to rail fares.

The new financing models led to a rebalancing of risks between the government and the PTOs. The government would be directly exposed to revenue risk and take on the responsibility of upgrading and replacing operating assets. On the other hand, the PTOs faced less revenue risk, but any revenue upside was also capped.

### Addressing service standards

Although the PTC had considered including service quality as a factor in fare adjustments and the fare review mechanism, the government eventually decided that service quality would be better addressed under a separate framework for bus and rail services. The FRMC stated in 2013 that, "it is of the view that service quality, though important, cannot be addressed solely through the fare adjustment formula given the inherent tension between service quality and costs."<sup>35</sup> The PTC echoed the FRMC's view that "this (was) a better approach to ensuring that the operators pay serious attention to service quality, and have the resources to do so".<sup>36</sup> In other words, if lapses in service quality translated consistently into lower fares and revenues, the PTOs could end up being financially too weak to fulfil even basic service standards.

This approach meant that the fare review mechanism would be kept focused primarily on cost changes, and gave the PTOs flexibility to improve cost efficiency within the prescribed fares and service standards. With regulated fares and a pre-determined productivity extraction in the fare adjustment formula, the PTOs could

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<sup>33</sup> Ministry of Transport. "Written Reply by Minister for Transport Khaw Boon Wan to Parliamentary Question on the Possibility of a Fare Reduction with the New Operating Models for Public Transport", September 13, 2016. Retrieved from <https://www.mot.gov.sg/News-Centre/News/2016/Written-Reply-by-Minister-for-Transport-Khaw-Boon-Wan-to-Parliamentary-Question-on-the-Possibility-of-a-Fare-Reduction-with-the-New-Operating-Models-for-Public-Transport/>

<sup>34</sup> Ministry of Transport. "Written Reply by Minister for Transport Khaw Boon Wan to Parliamentary Question on the Possibility of a Fare Reduction with the New Operating Models for Public Transport", September 13, 2016. Retrieved from <https://www.mot.gov.sg/News-Centre/News/2016/Written-Reply-by-Minister-for-Transport-Khaw-Boon-Wan-to-Parliamentary-Question-on-the-Possibility-of-a-Fare-Reduction-with-the-New-Operating-Models-for-Public-Transport/>

<sup>35</sup> Fare Review Mechanism Committee. "Affordable Fares, Sustainable Transport – The Fare Review Mechanism Committee Report." 2013, p 69.

<sup>36</sup> "Why services shouldn't drive fares." *My Paper*, January 24, 2014.

not easily pass on higher costs from more stringent service standards to commuters. On the flipside, PTOs had little incentive to raise service quality – which usually involve higher costs – unilaterally.

Instead, service quality, which encompassed frequency and reliability, was addressed by setting standards and penalties. The Bus Quality of Service Standards, which covered both operating performance and service provision standards, was tightened over the years. With the implementation of the bus contracting model, LTA took over the regulation of bus operators from the PTC in January 2016. Services standards were revised to focus on the operation of scheduled mileage and accident rates. Financial penalties ranged from \$20,000 per month for each non-compliant route to \$100,000 per month for each non-compliant standard. Rail services standards were set out by LTA under the Rail Operating Performance Standards, which were tightened in terms of frequency and number of delays, following the MRT breakdowns in 2011. The maximum penalty was also raised to up to \$1 million or 10 per cent of the rail operator's annual fare revenue from the respective rail line, whichever was higher.

Although the government had a longer-term objective of keeping the public transport system financially sustainable, commuters did not necessarily delink fare increases from service standards. This was especially so in the face of more frequent MRT breakdowns, and overcrowded and unreliable buses. Given that the public transport industry was essentially organised along geographical lines between the two PTOs, commuters could not easily switch from one mode of public transport to another, limiting the extent of competition between the two PTOs. Moreover, the PTOs were perceived to be enjoying overall healthy bottom lines, even though the profitability of their bus and MRT operations fluctuated.

A typical comment from a commuter was – “I can understand if fares go up when the system works well. But why should I pay more when I can't even get onto the trains during peak hours? I have to wait for like three or four fully packed trains before I can board one.”<sup>37</sup>

Worsening public transport services surfaced as a bugbear with voters in the 2011 general election.<sup>38</sup> Things came to a head when the North-South MRT line operated by SMRT suffered two unprecedented major breakdowns on December 15 and 17 in 2011. The service disruptions, which lasted several hours, saw some passengers trapped in stalled trains and left tens of thousands of commuters stranded. The MRT network would continue to be affected by numerous service delays and disruptions in the following years. The incidents prompted LTA to tighten its regulation of rail services.<sup>39</sup>

Alongside existing plans to expand the MRT network to 360 km by 2030, the government and SMRT embarked on several initiatives and investments bring the rail system back on track. The signalling system was upgraded in phases for the North-South and East-West Lines (NSEWL). The timber sleepers<sup>40</sup> were replaced with concrete ones between 2012 and 2016, while the replacement works for the third rail<sup>41</sup> started in mid-2015. Some 57 new trains were also added progressively to the NSEWL fleet. The first-generation trains would also

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<sup>37</sup> 'Still a squeeze, so why raise fares?' *The New Paper*, August 6, 2011.

<sup>38</sup> "What's getting voters fired up." *The Straits Times*, May 7, 2011.

<sup>39</sup> The government launched a public inquiry into the causes of the incidents, and it led LTA to strengthen its regulatory framework of the rail industry in four areas, namely maintenance of rail assets; incident management; operating performance standards and penalty framework.

<sup>40</sup> Sleepers help to hold the tracks in place.

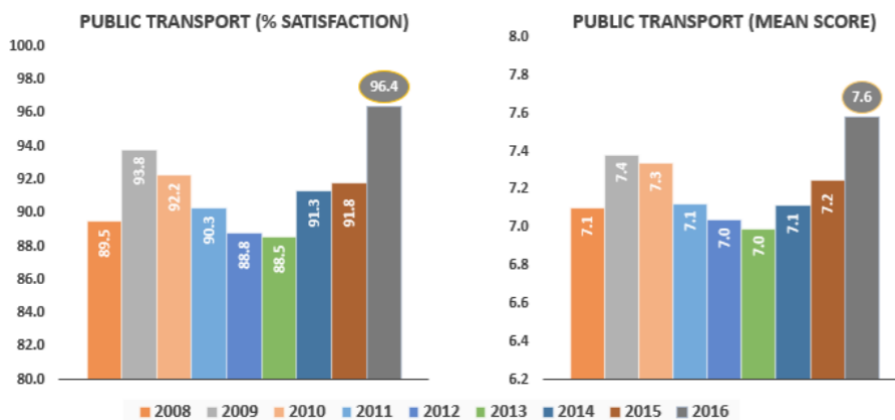
<sup>41</sup> The third rail supplies electrical power to trains.

be replaced. The bill was hefty. The cost of upgrading, renewal and expansion of existing rail assets would exceed \$4 billion over the next five years, on top of \$20 billion for new rail lines.<sup>42</sup>

To speed up improvements to bus services that the PTOs were reluctant to invest in, the government also spent \$1.1 billion to roll out a one-off Bus Services Enhancement Programme (BSEP) launched in 2012. The government took pains to clarify that the funding under the BSEP was based on costs and carefully calibrated to avoid padding the profits of the PTOs.<sup>43</sup> Together with 250 buses funded by the SBS Transit and SMRT, some 1,000 government-funded buses would be progressively introduced to the fleets operated by the two bus operators over a five-year period. This allowed new routes to be added, cut waiting times and reduced crowding. By the BSEP’s fourth year, LTA had deployed about 820 buses. This resulted in 85 percent reduction in the number of crowded services, the additional of 65 new routes, and improved capacity or frequency for 60 percent of existing bus services.<sup>44</sup>

Commuters’ dissatisfaction with buses and trains were reflected in the annual Public Transport Customer Satisfaction Survey conducted by LTA and later PTC. The survey covered various aspects of public transport, such as safety and security, waiting times, reliability, comfort, service information and customer service. However satisfaction levels started to improve after 2012 and 2013, when the government took steps to rectify the deterioration in public transport services (*Exhibit 8*).

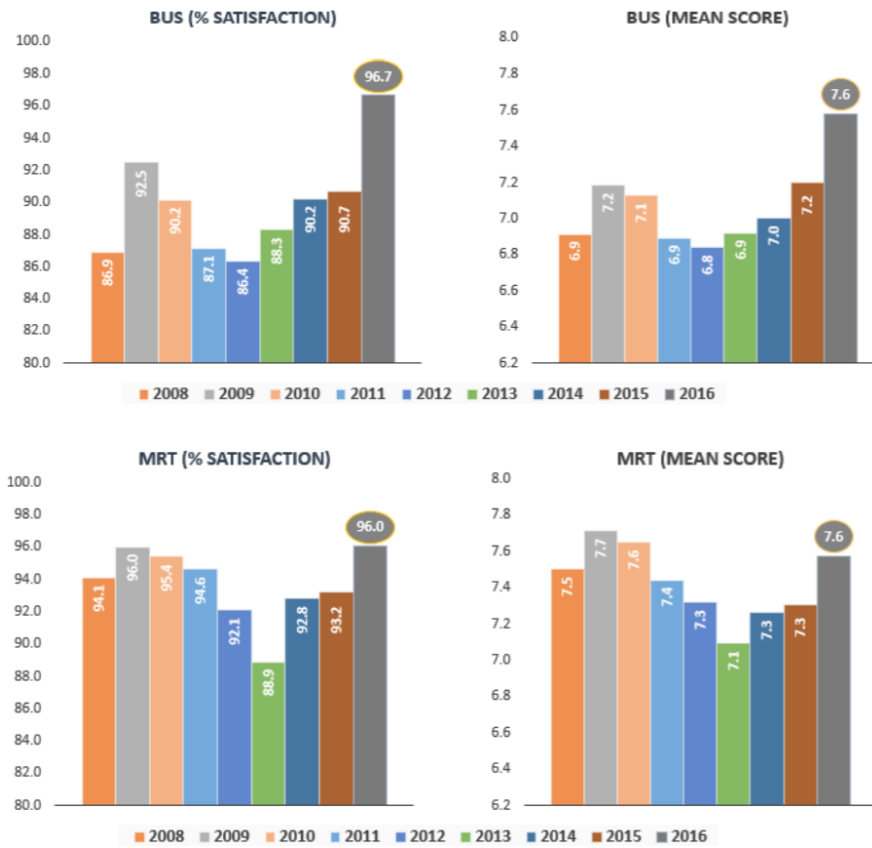
**Exhibit 8: Percentage satisfaction and mean score for overall public transport, bus and MRT (Public Transport Customer Satisfaction Survey)**



<sup>42</sup> Pang, Kin Keong. “Speech at the Third Joint Forum on Infrastructure Maintenance”, January 12, 2017. Retrieved from <https://www.mot.gov.sg/News-Centre/News/2017/Speech-by-Permanent-Secretary-Pang-Kin-Keong-at-the-Third-Joint-Forum-on-Infrastructure-Maintenance-on-12-January-2017/>

<sup>43</sup> Ministry of Transport. “Speech (Part 1 - Public Transport) by Lui Tuck Yew, Minister for Transport, for COS 2012”, March 7, 2012. Retrieved from [https://www.mot.gov.sg/News-Centre/News/2012/Speech-\(Part-1---Public-Transport\)-by-Mr-Lui-Tuck-Yew,-Minister-for-Transport,-for-COS-2012/](https://www.mot.gov.sg/News-Centre/News/2012/Speech-(Part-1---Public-Transport)-by-Mr-Lui-Tuck-Yew,-Minister-for-Transport,-for-COS-2012/)

<sup>44</sup> LTA. “Joint news release by LTA, SBS Transit and SMRT; Bus Service Enhancement programme (BSEP) 4<sup>th</sup> Year Report”, October 14, 2016.



Source: Public Transport Council (PTC). Commuter satisfaction with public transport continues to improve (news release), February 6, 2017.

### New public transport landscape

The public transport landscape saw several changes in recent years. Under the new operating and financing models for bus and train, the PTOs were expected to be asset-light and more cost efficient in providing public transport services. The bus contracting model meant that bus operators no longer had to apply to the PTC for fare changes. Under the NRFF, LTA would share operating revenue fluctuations with rail operators via a flexible licence fee paid by the latter, while rail operators would continue to apply for fare changes. On the other hand, the government had incurred hefty expenditures to boost public transport in recent years.

The PTC also went through organisational changes. Although the PTC retained its role in fare regulation, it no longer directly regulated bus services. With the bus contracting model implemented, its regulatory role for the bus industry was transferred to the LTA, which had already taken over the role of basic bus network planning from bus operators in 2009. Instead, the PTC took on a new role of being an independent adviser to the government on public transport matters.<sup>45</sup>

With farebox revenues accruing directly to the government, it could face popular pressure to continue subsidising public transport operations and keep fares low, even if costs were rising. London for example, adopted a similar formula-driven approach to fare setting by adjusting public transit fares each year to at least keep pace with inflation measured by the Retail Prices Index. In November 2016 however, the London mayor announced that to maintain fare affordability, fares on public transit services managed by Transport for

<sup>45</sup> “Public Transport Council takes on advisory role to Government.” *Channel NewsAsia*, January 22, 2016.



London, such as fares for buses, trams, single pay as you go fares and paper single tickets on Tube services, would be frozen for four years from January 2017 onwards.<sup>46</sup>

With the validity of the existing fare formula and review mechanism ending in 2017, the PTC has embarked on a review of the fare formula and mechanism, which would be completed by the first quarter of 2018. Ahead of the review, Minister for Transport, Khaw Boon Wan said that the government had to ensure that the fiscal burden – which had increased with new capital investments in public transport – did not become “too excessive for taxpayers”.<sup>47</sup> He also warned that taxpayers had been subsidising more and more of operating costs over the years, a departure from the government’s long-held principle that commuters should cover operating costs through fares. In particular, existing bus fares would not be enough to cover operating costs under the bus contracting model. Similarly, the PTC Chairman, Richard Magnus emphasized that service improvements “come at a cost”, and that there had to be “equitable cost sharing” among commuters, taxpayers and PTOs.<sup>48</sup>

Short of new revenue streams being created, any shortfalls between the farebox revenues and operating costs would have to be met by either taxpayer-funded government revenues, or higher fares paid by commuters, or a combination of both. Fare affordability would also play a role in nudging the public transport share of peak hour travel – which stood at 63 percent in 2012<sup>49</sup> – closer towards the 2030 target of 75 percent set out in the Land Transport Master Plan 2013. The government, commuters and the PTOs would continue to negotiate a balance between the wallets of taxpayers and commuters, as well as between fare reviews and service quality.

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<sup>46</sup> Mayor of London. “Freezing Transport for London fares in 2017.” Retrieved from <https://www.london.gov.uk/what-we-do/transport/freezing-transport-london-fares-2017>

<sup>47</sup> “Parliament: Bus, train commuters should share cost of better service, says Khaw Boon Wan.” *The Straits Times*, March 8, 2017.

<sup>48</sup> PTC Blogpost. “PTC to Consult Widely on New Fare Formula.” April 5, 2017. Retrieved <https://ptcsg.wordpress.com/2017/04/05/ptc-to-consult-widely-on-new-fare-formula/>

<sup>49</sup> LTA. “News Release – Household Interview Travel Survey 2012: Public Transport Mode Share Rises to 63%.” October 7, 2013. Retrieved from <https://www.lta.gov.sg/apps/news/page.aspx?c=2&id=1b6b1e1e-f727-43bb-8688-f589056ad1c4>