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Striking A Fare Deal

Singapore's Experience in Introducing a Fare Review Mechanism

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ABSTRACT

In Singapore, public transport fares were regulated by the Public Transport Council (PTC). In 2005, a new fare review mechanism, which provided for greater clarity and was more responsive to prevailing economic conditions, was adopted and successfully implemented in 2005 and 2006. The new mechanism allowed the PTC to adjust fares depending on economic dynamics, and was designed to strike a fare deal that balanced the need to safeguard commuters' interests and for operators to remain financially viable. The experience demonstrated that a fare review mechanism could be designed to effectively combine the merits of an economic way of thinking and the demands of socio-political considerations.

1 INTRODUCTION

1.1 In Singapore, the provision of public transport was premised on the concept of a triumvirate partnership. The government provided the transport infrastructure, commuters paid for the service, while the operators extracted efficiency dividend within the regulated service standards and fares. As a result, public transport was operated on a commercial basis without direct

operating subsidy from the government. Fares for trains (or rapid transit systems (RTS)¹) and buses were regulated by the Public Transport Council (PTC)². Service provision was regulated by the PTC and the Land Transport Authority (LTA)³.

- 1.2 This paper sets out a practitioner's view of Singapore's experience in developing and implementing a new fare review mechanism. It looks at the practical aspects of "a transport policy in action" in policy development and implementation, and discusses the lessons learnt.

2 EVOLUTION OF FARE REGULATION

- 2.1 In 1997, the PTC decided to adopt the price-cap model for the regulation of public transport fares with effect from 1998. The fare adjustment cap formula adopted was "CPI + X", where CPI was the change in the Consumer Price Index over the preceding year and "X"⁴ was set ex ante for a number of years, taking into consideration the inflation rate, wage changes and national productivity gains. "X" was intended to compensate the operators for net cost (after considering wages and productivity) increases beyond inflation.

¹ RTS comprises both the mass rapid transit (or metro) systems and light rail systems.

² The PTC is an independent decision-making body mandated, by statute, to safeguard public interest by keeping bus and RTS fares affordable while securing the long-term financial viability of the public transport operators (PTOs).

³ The LTA is a statutory board that spearheads land transport developments in Singapore. It regulates RTS services while the PTC regulates bus services. For fare regulation, the LTA is the technical adviser to the PTC.

⁴ Due to the complexity in deriving "X", the actual derivation of "X" was not made public for expediency. The value of X was set at 2% for 1998 to 2000, and at 1.5% for 2001 to 2005.

- 2.2 The fare cap model was not meant to be automatic as it was reckoned that the public was not ready for automatic adjustment in public transport fares. As such, fare adjustments (within the cap) were determined and approved by the PTC based on operators' cost justifications.
- 2.3 In 2002, there was a heated political debate on the fare increase given as it coincided with the weak economic conditions then. The main unhappiness centred on the issues that the fare adjustment cap formula lacked transparency and was not responsive to economic conditions. There was also a perception that the formula favoured the public transport operators (PTOs), as optically, it looked like a cost-plus formula. This gave rise to a policy review for a new fare mechanism in 2004 undertaken by an appointed committee⁵.

3 POLICY DEVELOPMENT

- 3.1 In its review, the committee was guided by the government's overarching policy for the financing of the public transport system. This ensured that any proposed reforms to the fare adjustment mechanism were aligned with the government's policy objectives.
- 3.2 Various economic models on price regulation were considered. Practices of overseas transport authorities and other relevant industries, such as utilities, were studied. No evidence pointed to a single superior model for fare

⁵ Led by the chairman of the Government Parliamentary Committee (GPC) for Transport.

regulation. The price-cap model for the regulation of public transport fares was retained, as it provided incentives for the PTOs to be cost efficient and it was also the preferred model of various stakeholders⁶.

3.3 For any price-cap model, the challenge had always been in the determination of the appropriate price index and the level of productivity extraction. The committee studied the cost structure of the PTOs and found that the manpower cost was the largest component, constituting about half of the PTOs' total operating costs. The other half comprised maintenance, fuel and energy costs, depreciation expenses, and other operating expenses. Thus, wage changes were captured separately in the price index, while the rest of the cost items were accounted for using the Consumer Price Index (CPI). This separation would improve the responsiveness of the formula to CPI and wage changes. The result was the following price index for the fare adjustment cap formula:

$$\text{Price Index} = 0.5(\Delta\text{CPI}) + 0.5(\Delta\text{WI})$$

where ΔCPI is the change in Consumer Price Index over the preceding year, and ΔWI is the change in Wage Index, defined as the average monthly earnings (overall average by industry) adjusted for any change in employers' contribution to the government's central provident fund⁷.

⁶ Represented in the focus group hearings held by the committee.

⁷ This is compulsory saving fund in which both the employer and employee contribute a certain percentage of the monthly income for the employee's retirement use. A statutory board is mandated to administer the account and it can be used to fund employee's housing, healthcare, insurance and safe investments.

3.5 In setting the productivity⁸ extraction, there was a need to balance motivating the PTOs to be productive and allowing commuters a share of the productivity gains. If year-on-year productivity gains were fully extracted, the PTOs would be discouraged from maximising productivity gains, given that the greater the productivity gains achieved, the smaller the fare cap would be. It was thus decided that the extraction would be set and fixed for three years, based on the principle of equal sharing of the PTOs' past average annual productivity gains⁹ between the PTOs and commuters. The new fare adjustment cap formula was therefore:

$$\text{Fare Adjustment Cap} = \text{Price Index} - 0.3\%$$

3.6 The previous practice of relying on cost justifications gave the PTOs no incentive to reduce costs and improve efficiency. The reliance on cost justification blunt the price-cap mechanism and created unwanted confusion on the economic reasoning for fare regulation. The committee therefore recommended shifting from the cost justification practice to a more deterministic mechanism, in which the PTC intervened under two explicit circumstances:

- (i) when there were adverse economic conditions (in terms of GDP growth and unemployment rate); or
- (ii) when there was significant deterioration in the overall affordability of public transport fares.

⁸ Defined as the change in value added per unit of labour input.

⁹ For the period between 1997 and 2002, the average productivity gain was about 0.6%. Equal sharing would mean setting the extraction at half of 0.6%, i.e. 0.3%.

- 3.7 To further safeguard commuters' interests, the PTOs' Return-On-Total-Assets (ROTA)¹⁰ values would be benchmarked against companies in a similar industry and of comparable risks at the annual fare review exercise. This would serve as a reality check on the fare levels hitherto approved by the PTC.
- 3.8 Given that fare affordability was one of the key factors the PTC would consider in deciding whether to exercise its flexibility to vary or reject the fare adjustment quantum determined by the formula, a robust indicator to track affordability was needed.
- 3.9 Until the review, fare affordability had been monitored through the 5-yearly Household Expenditure Survey (HES)¹¹. The indicators used were:
- (i) Average monthly household expenditure on public transport as a percentage of the average monthly household income; and
 - (ii) Average monthly household expenditure on public transport as a proportion of total household expenditure.
- 3.10 To complement such indicators, the committee established a new public transport fare affordability indicator to allow the PTC to track the affordability trends more closely on an annual basis rather than relying on the 5-yearly HES findings. The new affordability indicator was computed based on the percentage of household expenditure on public transport by a

¹⁰ ROTA = Net Profit After Tax divided by Total Assets.

¹¹ Conducted by the Department of Statistics (DOS), Singapore.

representative household that reflected the average public transport users¹². The representative household was constructed using information on the household income, expenditure, and travel data collected by the HES and Household Interview Survey (HIS)¹³. This indicator was used to track, annually, the changes in public transport expenditure and income, and it would be validated every five years based on the latest HES and HIS results.

- 3.11 Recognising the need to address the concerns of the lower-income group, the committee recommended targeted assistance at those who needed it, through various government-community schemes, such as the public transport fund.

4 IMPLEMENTATION & OUTCOME

- 4.1 Since 2005, two rounds of fare revision had been successfully held using the new fare review mechanism. The average fare increase was 2.4% in 2005, and 1.7% in 2006. In absolute terms, the increases were small, ranging from one to three cents¹⁴ for users of contactless smart cards, and ten cents for cash fares, in 2005. The prices of concession passes remained unchanged. In 2006, the increase was the same, except for cash fares, which remained unchanged.

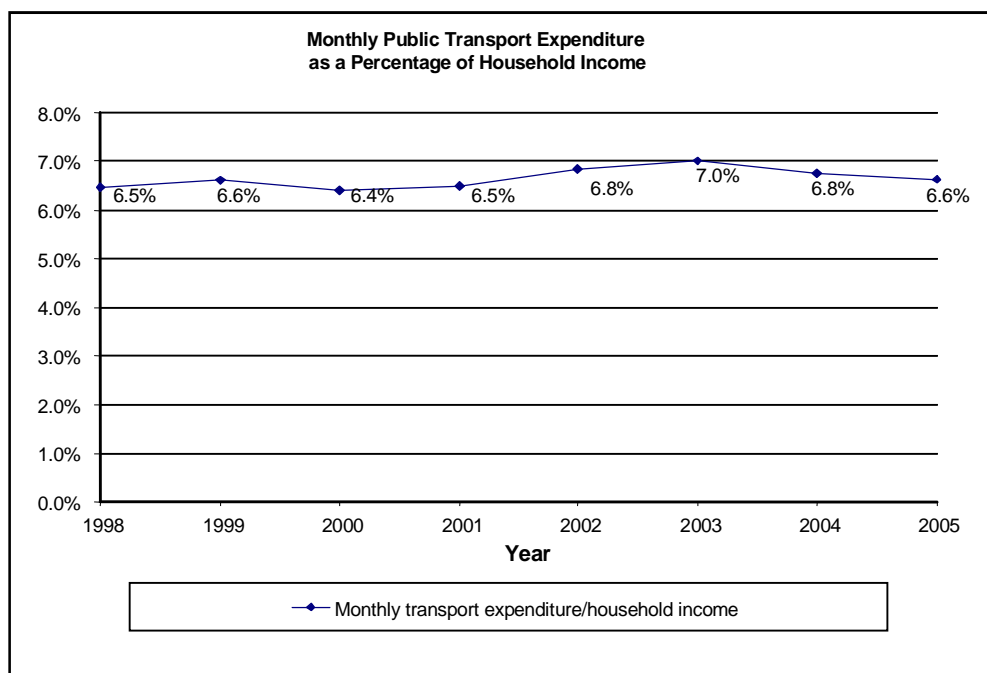
- 4.2 In both exercises, the PTC did not intervene to vary or reject the fare adjustment amounts determined by the fare adjustment cap formula, owing to

¹² They correspond to the second quintile of household income.

¹³ This is a regular comprehensive transport survey conducted by the LTA to ascertain changes in travel demand, pattern and preferences. The findings are used in transport modelling and planning.

favourable economic conditions and stability in the affordability indicator (See **Fig 1**). Moreover, the PTOs' ROTA values (See **Table 1**) were also deemed acceptable.

Fig 1: Affordability trend according to the affordability indicator



Notes: Fare revisions took place in 2000, 2001, 2002, 2005 and 2006.

Source: The PTC (Reference 3)

Table 1: ROTA of the two public transport operators (PTOs)

Operators	2003	2004	2005
SBS Transit (Bus & RTS operations)	2.1%	4.6%	6.5%
SMRT (Bus & RTS operations)	5.1%	6.0%	9.1%

Notes: ROTA = Net Profit After Tax divided by Total Assets. These values were computed using operators' proforma statements submitted to the PTC annually. The statements were prepared according to standardised asset depreciation as set by the PTC.

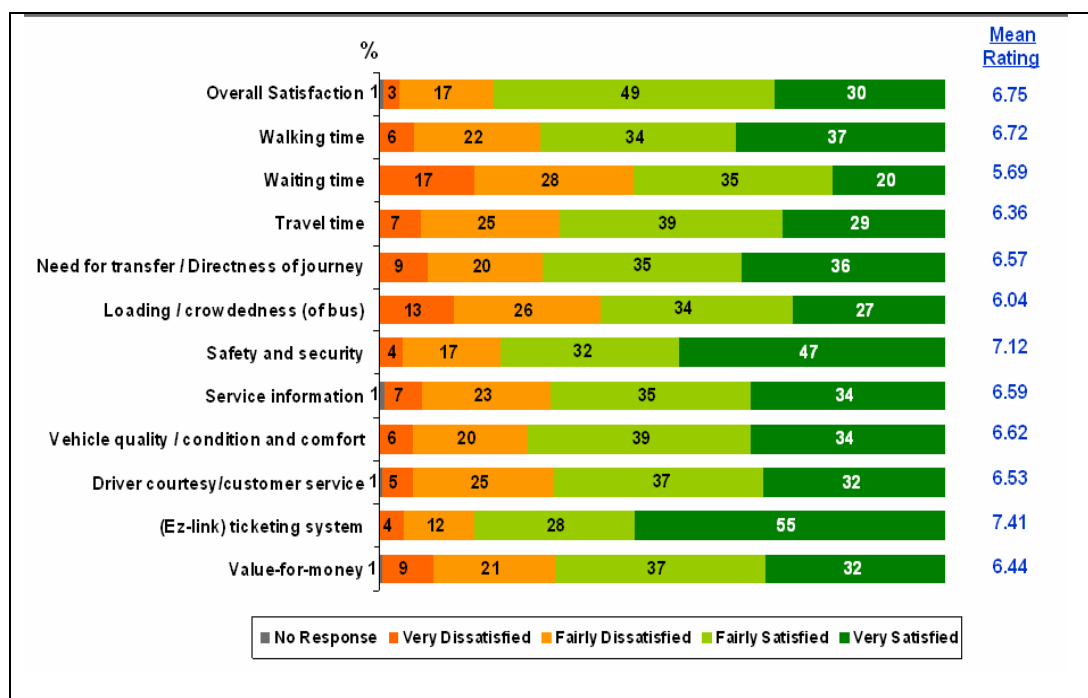
Source: The PTC (Reference 4)

¹⁴ Three Singapore cents is about two US cents.

- 4.3 Although the two fare increases were much higher than the average yearly fare increase of 0.7% given during the period 1998 to 2004 under the old “CPI+X” formula, the public outcry over the fare increases was muted. This was likely the result of greater clarity and responsiveness of the new formula to the changes in CPI and wages. The public might have also found it more acceptable for fare increases when economic conditions were favourable and there was no deterioration in the affordability of the public transport fares. Moreover, the affordability of the lower income households had been specifically addressed through a transport fund, where the PTOs contributed a portion of their revenue¹⁵ to help them cope with the fare increases.
- 4.4 One proxy indication of the outcome of the new fare review mechanism was reflected in the results of the bus passenger satisfaction survey carried out by the PTC in 2006 (which captured the effect of the fare revision exercise in 2005). On a 10-point scale, the average overall satisfaction rating rose from 6.4 in 2005 to 6.8 in 2006. Despite the higher fare increases, passenger rating on bus services being value-for-money improved from 6.1 in 2005 to 6.4 in 2006 (See **Fig 2** on the 2006 survey results).

¹⁵ The PTOs contributed to the pool of \$6mil (US\$4mil) transport fund in 2003 and the \$4.6mil (US\$3.1mil) transport fund in 2005. In 2006, they contributed \$1mil (US\$0.67mil) worth of transport vouchers.

Fig 2: Bus Passengers Satisfaction Survey Results 2006



Source: The PTC(Reference 2)

4.5 In the same 2006 survey, eight in ten commuters surveyed felt that their daily expenditure on bus and RTS fares was affordable, with the majority (66.2%) spending less than \$4.00¹⁶ a day.

4.6 In short, the new review mechanism was successfully implemented in 2005 and 2006. Fare increases were small and affordable to the majority of commuters. To cushion the impact of the fare increase, targeted help for the needy families were made available through government and community-led initiatives.

5 LESSONS LEARNT

5.1 Fare regulation or the exercise of an oversight on fare setting by the municipal agency was fairly common in other cities and countries. In Singapore, the ‘success’ of fare regulation could be attributed to two important enablers – a sound institutional framework and the adoption of technological advancement in ticketing system.

Enabler #1 – Institutional Framework

5.2 Regulation of public transport fares was concertedly institutionalised in 1987 when the PTC, introduced in preparation for the commencement of revenue service of the first RTS (or metro systems), was first established by statute. This effectively formalised a model that separated the regulation and delivery of public transport services functions.

5.3 It was envisaged then that public transport fares should be co-ordinated and regulated under a single entity. The critical concern then was how best to set the RTS fares (viz-a-viz bus fares) that would be sustainable for long term financial viability of the RTS operator as well as the existing bus operators. It was also felt that the setting up of an independent body with the statutory prerogative to decide on fares would be a more palatable approach than having a government department to do so.

¹⁶ S\$4.00 is about US\$2.60

- 5.4 In the statute, it was clearly enshrined that in considering the approval of fares, the PTC should take into account two explicit and challenging requirements: “(i) the need for the operators to remain financially viable, and (ii) the need for the public interests to be safeguarded.” In a bid to balance the two requirements in decision-making, members of the PTC were drawn from a wide cross-section of the society, including the labour unions, community organisations, media, academia, business enterprises and professionals¹⁷, representing varied interests and concerns.
- 5.5 Even with such an institutional framework in place, public reactions were not easy to be de-politicised, with persistent public calls for greater transparency and clarity of the decisions regarding fares made by the PTC. The existence and experiences of the PTC had well positioned it to be a ready vehicle to implement the new fare review mechanism that was not only more transparent to the public, but also allowed the PTC greater certainty and clarity in achieving its challenging mission. Had the PTC not been in place, the new fare review mechanism would have been differently designed and possibly taken a different course.

Enabler #2 – Adoption of ticketing technology

- 5.6 The first integrated ticketing system (using stored value magnetic card) on buses and RTS was launched in 1991. The technological limitation then was that fares had to be based on multiples of five-cent¹⁸ currency denomination. Also, unlike the RTS closed system that had fare-gate control, the bus system

¹⁷ Council members were appointed by the Minister for Transport.

was an open system based on entry process activated by commuters upon boarding.

5.7 In 2002, the magnetic card system was replaced by the contactless smart card (CSC) technology. Adoption of this technology for both buses and RTS was significant on two counts. Firstly, fare adjustment quantum could henceforth be made in multiple of the smallest currency denomination of one cent, providing greater flexibility in fare setting. This in turn rendered the distance-based fare adjustment quantum to be made more palatable to commuters. Secondly, the bus loading and ridership could be accurately determined as boarding and alighting points were captured by both entry and exit processors on buses, enabling rigorous impact analysis of possible fare adjustment options.

5.8 The adoption of CSC technology enabled the PTC and LTA to obtain vital information related to fares and ridership¹⁹. For the first time, the regulator could develop its own fare model and carry out independent impact analysis to check the submissions as claimed by the PTOs, reducing the problem of asymmetric information with regard to fares and pricing impact.

Five Key “Lessons”

5.9 Singapore’s experience in regulating fares was not unique. The fare cap model had been used elsewhere, though more commonly adopted in the

¹⁸ Five Singapore cents is about three US cents.

¹⁹ This is because information ownership remains vested with the LTA which is the CSC ticketing system developer. In the previous magnetic card ticketing system, the information ownership was

utility industry rather than in the public transport sector. Success stories of exploiting CSC ticketing technology were also common elsewhere. Nevertheless, having designed the policy shift and successfully carried it through for adoption and subsequent implementation since 2005, five key “lessons” could be derived from a practitioner’s viewpoint.

Pay attention to public messaging

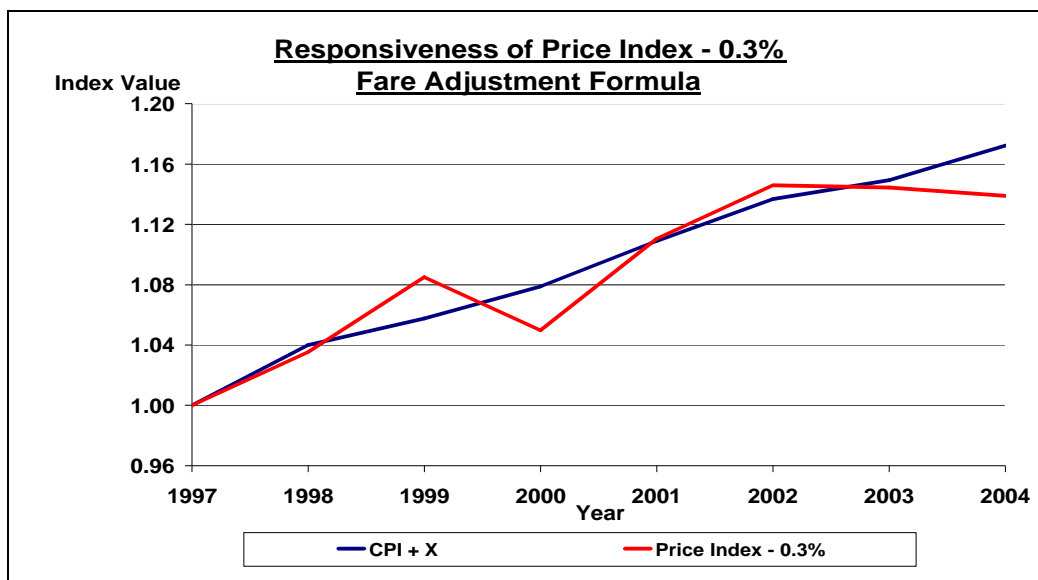
5.10 To the majority of common folks who relied heavily on public transport, the hard-nose explanation approach using economic reasoning alone would not suffice. The original intent was to present the policy shift from economic reasoning where the new formula would be more responsive to economic conditions, encourage efficiency, and it had an extraction component for commuters’ benefit. However, feedback received through consultation showed that the man-on-the-street would find it difficult to relate to such economic reasoning, and that there was a need to commit some tangible benefits that they could relate to.

5.11 A backward simulation was subsequently done using historical data to compare the effectiveness of the new formula viz. the old formula to optically show that the new formula was indeed more responsive to changes in economic conditions (see **Fig 3**). It was also publicly committed that the fares would be adjusted downwards if the formula yielded a negative value during weak economic conditions. This proved to be a persuasive selling

with the PTOs and both the PTC and LTA had to rely on them to provide the necessary information to evaluate pricing impact.

point and the public was receptive to the new formula when it was announced in 2005.

Fig 3: Responsiveness of Price Index - 0.3% vs CPI+X fare cap



Notes: General weak economic conditions in 1999-2000 and 2003-2004

Source: Report of the Committee on the Fare Review Mechanism (Reference 9)

Have a second lever – service quality standards

5.12 Given the commercially driven duopolistic industry structure and the absence of market contestability, the policy shift to a fare cap model could not be tenable without a commensurate regulatory oversight of service quality imposed on the operators²⁰. The need for a second regulatory lever was obvious for two reasons. First, with a built-in incentive for the operators to reduce costs and maximise revenue gains in the fare cap model, service quality might suffer unless there were some forms of minimum standards to safeguard public interest. Second, commuters would link fare adjustment with service quality and demand that value-for-money of services be ensured.

This was particularly so if fare adjustment was to be granted at close intervals without service improvements being felt or experienced on the ground.

5.13 Therefore, in tandem with the policy shift in fare regulation, the PTC tightened their regulatory oversight on basic bus services²¹. A new set of quality of service standards (QoS), including compliance with universal service obligations, for basic bus services was launched in 2006, just prior to the fare revision exercise. This proved to be positive move as, to a large extent, it took some public reactions off the fare adjustment issue.

Affordability is a perennial concern

5.14 A continual upward spiral in fare and basic bus service quality would invariably impose a heavier burden on lower income households, which were practically captive to public transport. With the already widening income gap, this quality-fare relation would become even more delicate, if nothing were to be done to ensure the affordability of public transport.

5.15 The availability of a ready affordability indicator proved to be crucial in the implementation of the new fare cap model in the 2005 and 2006 fare revision exercises, as the indicator could be used to show and check on the trend of fare affordability. However, as the indicator was pegged to households with income in the second quintile, the affordability for households in the lowest quintile remained unaddressed. To overcome this, the affordability for

²⁰ Arguably, the pros and cons of this approach can be contentious.

households in the lowest quintile was separately addressed through government and community-led initiatives, which helped to cushion the fare increases. This proved to be successful in making the annual fare increases more palatable to the lower income households.

Devise a reality check on profitability

5.16 Every fare adjustment tended to be accompanied by persistent public calls for the profitability of the operators to be controlled. This was not a surprising reaction considering the lack of contestability in the public transport industry. Since its inception, the PTC had been resisting adopting a rate-of-return model for fare review, mainly because of the difficulty in prescribing an acceptable or allowable rate-of-return and the lack of incentives for the commercial operators to contain costs. The committee also recognised such shortcomings. To address the profitability issue, the operators' return-on-total-assets (ROTA) reality check was used.

5.17 Even then, the comparison using ROTA values was not easy, as judgement calls by the PTC were needed to determine whether the ROTA values were deemed excessive or otherwise. Nonetheless, having a form of reality check on profitability had somewhat helped to alleviate the concern on profiteering by the operators. In any case, the fear of escalated run-away profitability was curbed, as the setting of productivity extraction in the fare cap adjustment formula every three years would allow the claw-back of the returns for sharing with commuters.

²¹ The RTS service was also tightened by the LTA, the licensing authority on RTS service.

Engage constructively

5.18 The policy review was mooted following the public outcry in the aftermath of the 2002 fare revision exercise. Appointing an independent committee to carry out the policy review and to debate its recommendations in the parliament was a considered move to allow greater participation in the review of policy. Recognizing that fare revisions had always been an emotionally charged issue, the consultation was done through three focus groups - the operators, experts and feedback groups - rather than a general public consultation exercise to avoid turning it into a huge public debate, which could possibly de-track the review. These focus group sessions proved to be useful as it gave the committee a more balanced view on the issues and concerns, and enabled the committee to engage the various stakeholders constructively.

5.19 This consultative approach showed stakeholders that their views were considered by the committee before arriving at its recommendations. It also gave the committee an opportunity to explain the various complex issues and considerations to secure better understanding and buy-in. Whilst the extent of engagement was limited, it was not lacking in views aired, preferences registered and suggestions heard.

6 CONCLUSION

6.1 Similar to many cities elsewhere, Singapore had been grappling with the emotive issue of public transport fare adjustment for decades. The fare cap

model was workable for regulating public transport fare, as shown by Singapore's experience. The fare cap formula could be defined using published information that could mimic the operators' structural cost changes. The productivity extraction component could be set up-front at 3-year intervals based on an equal sharing basis with the commuters. Appropriately defined as such, the fare cap formula could reduce the opportunity for information manipulation, introduce incentives for efficiency gains, and assure certainty. However, implementing a fare cap model was predicated on a broader institutional framework already put in place and supported by the application of an integrated ticketing system that could avail the regulator with crucial information on fares and ridership.

- 6.2 The new fare review mechanism was designed to strike a sustainable and publicly acceptable fare deal that would balance the need to safeguard commuters' interests and the need for operators to remain financially viable over the long term. In an industry structure where public transport was operated on a commercial basis (i.e. without direct operating subsidy) with limited market contestability, the mechanism should be designed to provide flexibility for the fare regulator to intervene to moderate the fare adjustment quantum under extenuating circumstances. It should also include a reality check on profitability, and the affordability of fares should be closely monitored by the regulator. In addition, service regulation should be strengthened to ensure that operators would not compromise on their basic obligations while being motivated to be cost efficient.

6.3 In summary, we have managed to implement a new fare review mechanism that effectively combined the merits of economic way of thinking and the demands of socio-political considerations.

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