



# TICKET TO RIDE: REFORMING FARES AND TICKETING FOR SUSTAINABLE PUBLIC TRANSPORT

December 2016



In partnership with



## TOURISM & TRANSPORT FORUM

The Tourism & Transport Forum (TTF) is a national, member-funded CEO forum advocating the public policy interests of leading corporations and institutions in the Australian tourism, transport and aviation sectors.

TTF is the only national multi-modal transport advocacy group in Australia and is committed to improving the quality of passenger transport across the country. Our key transport policy goals are to promote:

- the importance of investment by state and federal governments in transport infrastructure;
- the role of the private sector in the delivery of public transport services, particularly through franchising; and
- best practice in customer service, particularly through the use of new technology.

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# 1 INTRODUCTION

The advent of smartcard ticketing in the late 1990s offered the potential for large scale fares and ticketing policy reform.

Observed progress has been slow in Australia which reflects the range of difficult policy trade-offs associated with such reform.

This report seeks to explore these policy trade-offs and associated customer behaviour to allow fares and ticketing policy reform to play its role in maximising the social return on public transport.

## 1.1 SETTING THE SCENE

At the end of the 1990s, there was an expectation that the roll out of first generation smartcard ticketing systems would see an acceleration of fare reform in an environment where “everything is possible”. In practice, this has not been the case for fare structures. We have seen relatively limited reform with most jurisdictions maintaining long held historical positions from flat fares (e.g. Adelaide and Canberra) to distance-based fares (e.g. Brisbane, Perth and Sydney).

Over the same period, cost pressures have grown markedly and farebox cost recovery has generally declined in all Australian cities, with 20% to 30% being commonplace at present. In this report we explore the context for this decline. In essence, multiple structural and policy objectives that combine to define fares policy are often poorly understood and cannot all be satisfied simultaneously. The most obvious trade-off is between patronage growth and revenue growth – lower fares will encourage some new customers but not necessarily enough to have a positive impact on total farebox revenue.

A better understanding of these policy trade-offs, and of customer behaviours, is required before fares and ticketing can be truly used to maximise the social return on investment in public transport.

## 1.2 HOW THIS REPORT CONTRIBUTES

This report will help to build a greater understanding of the historical impact of fares and ticketing policy on customer behaviour and identify the associated trade-offs under each policy setting and the impact of emerging policy settings/fare mechanisms.

## 1.3 STRUCTURE OF THIS REPORT

**Section 2** explores how cities establish their fares and ticketing policies and some of the core challenges faced in meeting sometimes conflicting objectives.

**Section 3** explores current fare structure settings, trends observed internationally and potential drivers of future reform.

**Section 4** examines the alignment of fare products and customer segments and potential reforms to better meet customer needs.

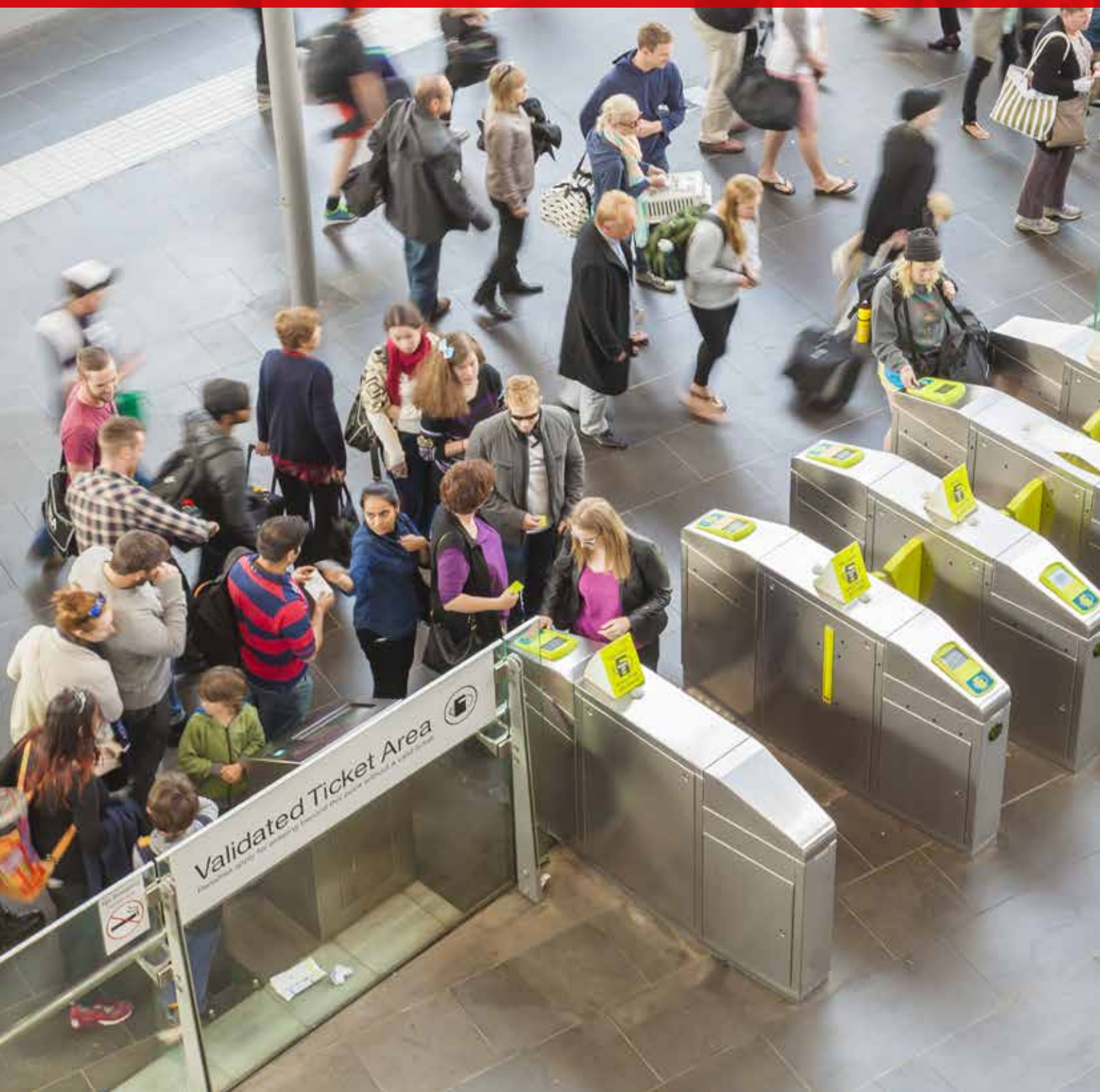
**Section 5** considers variations in fare levels according to a range of criteria including customer type, time-of-day, origin and destination and frequency of travel and identifies potential areas of reform.

Finally, **Section 6** addresses current and emerging trends in fare media and payment channels.

The focus on this paper is principally on metropolitan areas. This is because benchmark observations from external jurisdictions are generally much more widely available for metropolitan areas rather than regional, and because the large majority of public transport usage in Australia is concentrated on metropolitan areas.



## 2 THE POLICY CONTEXT AND CHALLENGES



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No Australian jurisdiction has clearly articulated its objectives for its urban public transport system in a holistic manner.

Where policy has been clearly defined, it has been limited to defining a medium term pricing path to provide planning certainty but no Australian jurisdiction has adopted the transparent, albeit mechanistic approach, adopted in Singapore and Hong Kong to drive annual fare changes.

A number of policy challenges can be identified including historically low levels of farebox cost recovery (in the 20% to 30% range), pressure for fares integration and simplification to improve fare system efficiency, social equity and fare system governance.

### 2.1 FARE POLICY OBJECTIVES

Choosing a fare policy has deep implications from an economic, social, financial and environmental perspective. Policy can be designed to meet a number of such different objectives (as shown in Figure 1 below).

Consideration of each of these factors is a crucial input to fares policy design, including developing an understanding of the relationship between each objective and associated fare system lever(s). Achieving this level of transparency will provide clarity where trade-offs are being made and support a clear and consistent approach to policy making.

#### Choosing a policy direction

Extensive consultation with all key stakeholders including government, service providers, customers and potential customers is a highly desirable input to the development of policy objectives and associated evaluation criteria for assessing competing options.

A successful fares system will be based on a good understanding of customers and their behaviour, and will be balanced by the commercial reality of the need to contribute appropriately to the recovery of the costs of public transport service delivery. In this context, it is imperative that transport agencies have a robust understanding of fare elasticities (i.e. “willingness to pay”) across all market segments. This ensures that policy formulation is evidence-based and the dialogue with all stakeholders can proceed on this basis.

#### Fare policy in Australia

Whilst fare policy may be articulated internally (that is, at a departmental level), we are unaware of any public statements of overarching fare policy, or policy objectives, made by Australian states or jurisdictions.

From time-to-time, there have been attempts by Australian State Governments to provide planning certainty with respect to fare levels by committing to medium-term pricing paths (e.g. Sydney and South East Queensland). Transport for London has adopted a similar approach by committing to real fare growth to support network modernisation and the need for services to meet forecast growth in demand. Rather than define specific pricing paths, both Singapore (see below) and Hong Kong have transparent mechanistic formulas that drive annual fare increases capturing factors such as changes in inflation, wages, energy costs and the productivity of public transport service delivery. Whilst such transparency is a key strength, it does inherently limit flexibility in fares policy setting.

**Figure 1: Illustration of selected fare system objectives**



## CASE STUDY: SINGAPORE

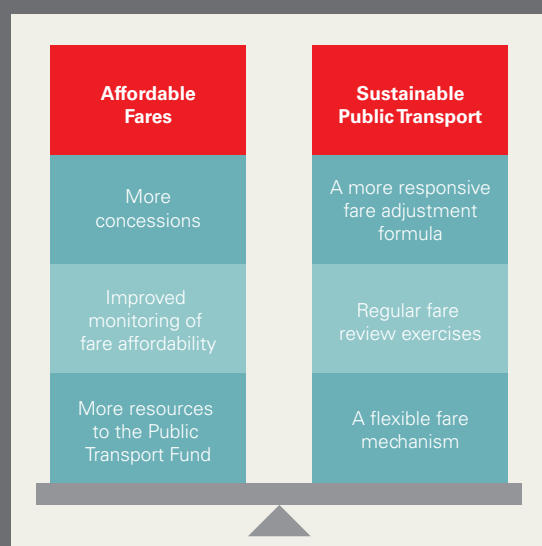
Singapore's Fare Review Mechanism Committee was set up in 2012 to "ensure that fares remain affordable for the various commuter groups, while safeguarding the long-term financial sustainability of the public transport system".<sup>1</sup> Using focus group discussions with stakeholders, as well as a quantitative household survey, the committee made several recommendations, including:

- Provide more concessions (to help specific groups of commuters with affordability)
- Improve monitoring of fare affordability (track a wider range of households)
- Adjust fares regularly (annual reviews so the changes in fares can keep pace with cost changes)

The overall balance of the policy objectives is shown in Figure 2.

The 2013 review of how fares were set recommended that the formulae be adjusted to reflect the consumer price index, the wage index, and an energy index designed to track the operating costs of buses and trains. An adjustment is also made for the productivity gains made by public transport operators.

**Figure 2: Balance of policy objectives in Singapore**



## Recommendation 1:

*Fares policy should be better articulated in Australian jurisdictions. This includes making clear what the objectives of fares policy are, and any trade-offs that are being made in setting the policy*

1. "AFFORDABLE FARES, SUSTAINABLE PUBLIC TRANSPORT - The Fare Review Mechanism Committee Report"  
<http://www.mot.gov.sg/news/FRMC%20Report%201%20Nov.pdf>



## 2.2 CHALLENGES IN DELIVERING FARE POLICY OBJECTIVES

### 2.2.1 Fare setting and cost recovery

The interaction of fare levels, patronage and the costs of public transport service delivery is reflected in observed farebox cost recovery. TTF recently highlighted estimated farebox cost recovery rates for four Australian cities – Sydney, Melbourne, Brisbane and Perth in FY2013. This demonstrated that recovery rates were as low as 22% and no higher than 30%. This reflected estimated operating expenses of \$10.4 billion and farebox revenue of \$2.4 billion, implying an overall annual subsidy of \$8.0 billion per annum.

Whilst few jurisdictions operate public transport at 100 per cent farebox cost recovery (or at a profit), most raise much higher farebox revenue (as a percentage of operating costs) than Australian jurisdictions (see Figure 4 below). Although longer term trend data is not available, it is understood that farebox cost recovery in a number of Australian cities has fallen significantly over the past decade or so, reflecting a combination of movements in operating costs and fare levels.

Figure 4 also indicates that farebox cost recovery is not just a function of higher population density. For example, Wellington, Dunedin and Chicago achieve higher farebox cost recovery despite having a similar population density to Melbourne and Sydney. Even within Australia, the highest rate of cost recovery is achieved in Perth, compared to the denser metropolitan areas of Sydney and Melbourne.

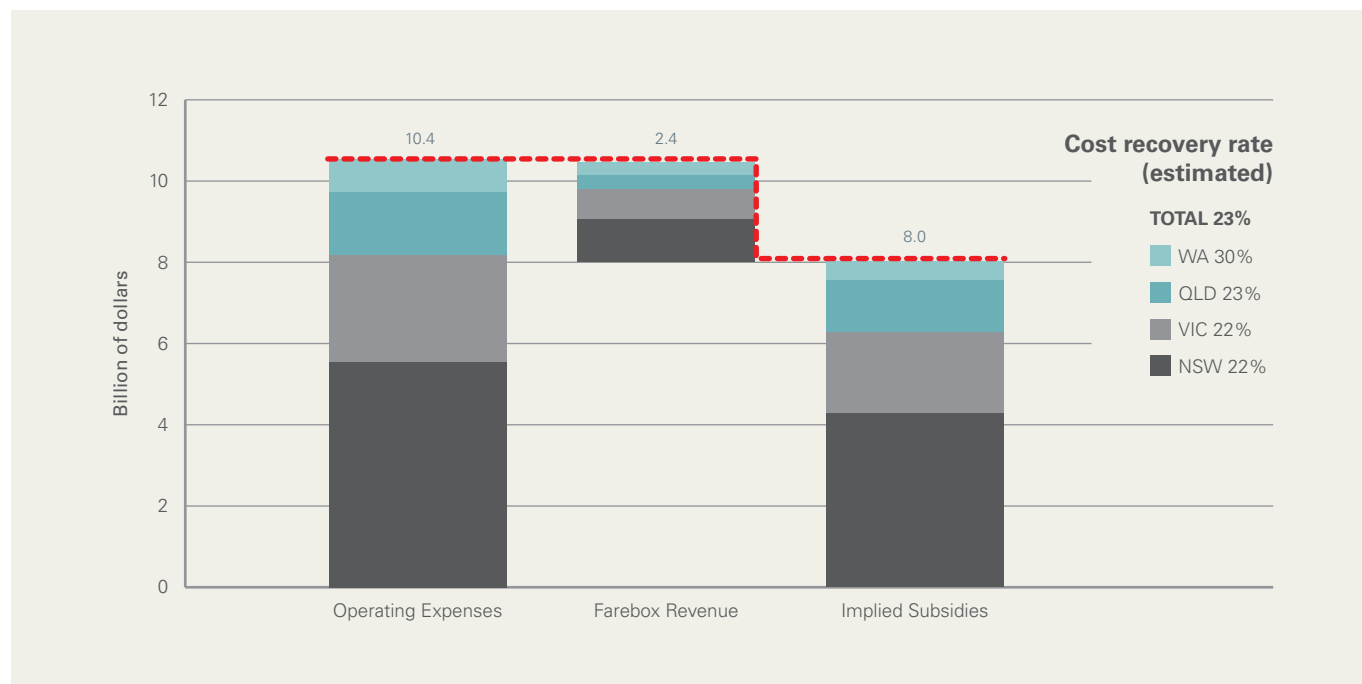
One of the challenges in addressing this issue is the extent to which patronage may suffer as a result of attempts to improve farebox cost recovery. However, there seems to be little doubt that fare levels across Australian jurisdictions are at an unsustainably low level and the balance between user pays and government subsidy needs to be addressed.

Queensland provides perhaps the only recent Australian example of a concerted attempt to improve farebox cost recovery through fare increases.



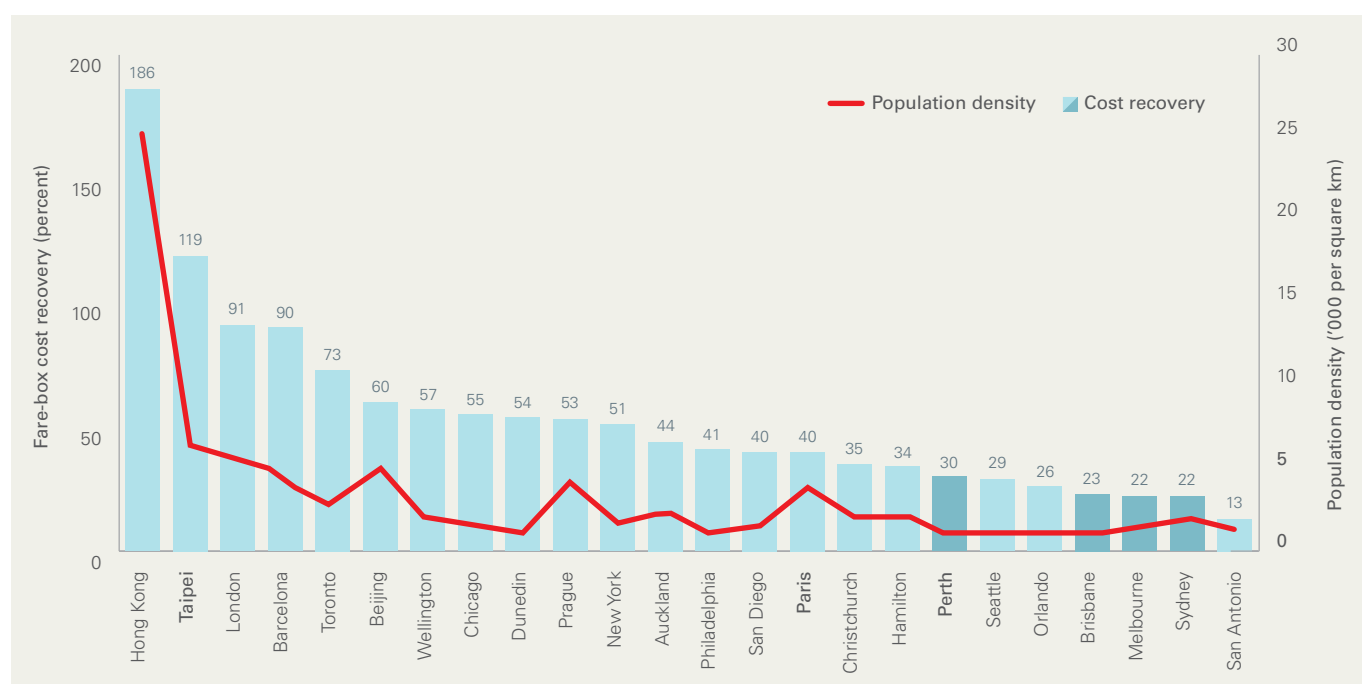


**Figure 3: Cost recovery rates in Australia (estimated) – FY2013**



Source: Public Transport Barometer, July 2015 (<http://www.ttf.org.au/wp-content/uploads/2016/06/TTF-LEK-Public-Transport-Barometer-2015.pdf>)

**Figure 4: Benchmarked cost recovery rates**



Source: Public Transport Barometer, July 2015 (<http://www.ttf.org.au/wp-content/uploads/2016/06/TTF-LEK-Public-Transport-Barometer-2015.pdf>)



## CASE STUDY: QUEENSLAND EXPERIENCE OF REAL FARES INCREASES

Fares in Queensland have experienced a change in direction over recent years. Following the 2009 election, a five year fare strategy was launched to build the public transport network and increase farebox cost recovery from 25% to 30%. To achieve this, a substantial series of real fares increases was planned. Individual *go* card fares were planned to rise by 16% to 21%, and paper tickets by 13% to 42%. This was in contrast to previous fare increases which had been in line with CPI (roughly 4% at that time)<sup>2</sup>.

Average fares increases of 15% were introduced in each of January 2010<sup>3</sup>, January 2011<sup>4</sup> and January 2012<sup>5</sup>. During this period, there were some issues with data reporting<sup>6</sup> and the 2011 Brisbane floods impacted the consistency of services. Nonetheless, it is clear that (as would be expected) patronage was affected by the fare increases. Patronage fell in every year up to and including 2011-12. By 2012, Translink reported that satisfaction with public transport affordability had dropped to its *“lowest ever rating – an indication that cost of living pressures were impacting our customers*

*more than ever”*<sup>7</sup>. The plan for a 15% increase in fares in January 2013 was dropped in place of a 7.5% increase; still above inflation but intended to *“provide fare relief for customers”*. Patronage fell by a further 1.5% from 2011-12 to 2012-13. Fares rose by a further 7.5% in January 2014; patronage grew by 0.1% year on year<sup>8</sup>.

Whilst patronage clearly suffered as a result of the fares increases, the scale of the decline was not perhaps as marked as might be expected from the cumulative fare increases experienced. The introduction of free travel after making nine *go* card journeys in a week may have been a factor in generating patronage for some customers during this period. However it is not clear that the cost recovery objective was actually being met; average subsidy per trip increased steadily over this period<sup>10</sup>.

The fares increases came to an end in November 2014 with an across the board cut of 5%<sup>11</sup>. This was followed up by a fare freeze in January 2015<sup>12</sup>.

2. Communication strategy – 2010 fare change (Translink)

3. <http://www.brisbanetimes.com.au/queensland/commuters-abandon-public-transport-after-fares-hike-20111114-1nfgi.html>

4. <http://translink.com.au/sites/default/files/assets/resources/about-translink/reporting-and-publications/2010-11-annual-report.pdf>

5. <http://translink.com.au/sites/default/files/assets/resources/about-translink/reporting-and-publications/2011-12-annual-report.docx>

6. <http://translink.com.au/sites/default/files/assets/resources/about-translink/reporting-and-publications/2011-dec-train-patronage-report.pdf>

7. Translink Annual Report 2011–12

8. Comparison of Translink Annual Report 2011-12 and DTMR Annual Report 2012-13

9. Comparison of DTMR Annual Reports for 2012-13 and 2013-14

10. Comparison of Translink Annual Report for 2010-11 and DTMR Annual Report for 2013-14

11. <http://www.abc.net.au/news/2014-09-21/public-transport-fares-to-get-cheaper-in-queensland/5758504>

12. <http://translink.com.au/about-translink/reporting-and-publications/media-releases/details/3481>



## CASE STUDY: FARES TRANSPARENCY IN LONDON

There is a clear and transparent approach taken to setting fares in London. Whilst fare rises are implemented early in January, the announcement of the fare change (by product and zone) is made between 1-3 months prior to that date<sup>13</sup>. The announcement will typically describe the size of the fare change with reference to inflation (i.e., fares are described in real and nominal terms). The overall (average) fare change is also provided, and sometimes the net increase that is expected in farebox income is also quoted. The announcement will usually make explicit linkage between the planned fares changes and the program of works / improvements that the additional income is intended to support.<sup>14</sup>

### *Recommendation 2:*

*Fares policy, and particular fare changes, should make clear linkages between the outputs that the fare changes are intended to support, especially in the case of above inflation fare increases. This would improve transparency and support a more mature discussion about the role that fares play in delivering (and improving) services.*

### *Recommendation 3:*

*Fares policy should be independent of the political cycle wherever possible, to ensure that continuity of policy objectives can be achieved free of political influence. There seems to be little doubt that fare levels across Australian jurisdictions are at an unsustainably low level and the balance between user pays and government subsidy needs to be addressed.*

13. <https://tfl.gov.uk/info-for/media/press-releases/2011/september/mayor-confirms-fares-increase-for-2012-to-support-unprecedented-and-pound12bn-investment-in-londons-transport-network>

14. £43m additional income per annum quoted in <https://tfl.gov.uk/info-for/media/press-releases/2015/november/mayor-announces-real-terms-fares-freeze-and-extends-free-travel-for-children>

## 2.2.2 Fares integration and simplification







### What do we mean by integration and simplification?

Two terms are often used interchangeably when considering the ease with which customers comprehend a fares system – these are ‘**integration**’ and ‘**simplification**’.

**Simplification** aims to create a fares structure that is easy for customers to understand. Generally, this involves a reduction in the number of fares charged, and/or reducing the number of fare products available. Customers generally better understand what they are likely to be charged when they travel.

**Integration** of fares and ticketing offers the customer the opportunity to travel across multiple modes of transport using only one common form of media. Integration may incorporate separate fares structures for different modes, meaning the actual tariff charged is reflective of the number of modes travelled upon (e.g. Sydney), or use common fares that represent the total journey rather than the number of modes used (e.g. Melbourne). It is notable that Sydney is the only major city where fares are not fully integrated across modes, although a “transfer discount” has been introduced from September 2016 that will remove the existing significant financial disincentive to use multiple modes to complete a journey (see Section 3.2.2).

**Figure 5: Integration in Sydney and Melbourne as at July 2016**

	Ticket integration	Fare integration
City	Sydney	Melbourne
System		
Example Journey	 + 	 + 
Fare Calculation	Total fare = train fare + bus fare	Single fare for total journey

Whilst fares integration represents a form of simplification, we treat these concepts separately as far as possible in this report.

Customers typically prefer a direct service that avoids the need to transfer. There is little doubt that journeys that require significant interchanging between public transport services and/or modes should support fares integration and thereby avoid the payment of multiple “flagfalls”, particularly as customers typically prefer a direct service that avoids the need to transfer between modes and/or services.

## 2.2.3 Efficiency and social equity

Efficiency and social equity are directly linked to the type of fare structure adopted, and in particular, the strength of the relationship between fare levels and distance travelled. At one extreme, a ‘flat’ fare structure establishes a single fare regardless of the distance travel, while a point-to-point distance-based fare structure establishes a unique fare for each station or stop pair.

From an economic efficiency perspective, it can be argued that higher fares should be charged to cover the higher operating costs associated with longer trips such that customers travelling longer distances are not cross-subsidised by those travelling shorter distances. Although sound as a principle, its application is complicated by issues pertaining to cost allocation (i.e. fixed versus variable) and time frame (i.e. short versus long-run).

In addition, it is often claimed that passenger using higher cost (i.e. long distance) services are less price sensitive than those using making shorter trips and hence revenue raising efficiency (i.e. maximising patronage for a given farebox revenue target) dictates that those travelling longer distances pay higher fares. In general, we would expect the short-distance market to be most responsive to fare levels given the range of options available including active transport. However, there is no consistent evidence of customers being less responsive to fare increases over longer distances. In fact, to the contrary, income constraints would suggest that fare elasticities might actually increase once a “threshold” fare level is exceeded as customers find public transport increasingly unaffordable.

From a “benefit” equity perspective, it can be argued that customers perceive that a fare structure that establishes a strong relationship between the distance travelled and the fare paid is fundamentally “fair”. In addition, the multiple fare levels established by increasingly granular distance-based structures provides greater opportunity to manage/target the magnitude and impacts of fare changes.



In some cases, it also needs to be recognised that issues such as housing affordability dictate that those from lower socio-economic groups tend to reside on the urban fringe and may have lower levels of public transport service and need to travel further on average. This might need to be reflected in a weaker relationship between fare levels and distance travelled. That is, the implied fare per kilometre progressively declines over longer distances.

#### **2.2.4 Fare system governance**

On a year-to-year basis, the primary governance issue is the approach and timing to the development and implementation of fare changes (i.e. typically product introduction or withdrawal, changes to fare levels).

With the exception of New South Wales, such matters are solely the domain of the relevant Government Department with responsibility for the delivery of public transport services. Fare changes are often implemented in early January to allow changes to “bed in” before commuters return to work following the Christmas/New Year period.

In New South Wales, IPART determines the maximum prices that may be charged by all public transport operators in New South Wales. In accordance with legislation, IPART adopts a relatively prescriptive approach to the fares determinations that considers, among other things, the cost of service delivery, protection of consumers from the abuse of monopoly power in terms of prices, pricing policy and service standards and the need for greater efficiency in the supply of services so as to reduce costs for the benefit of consumers and taxpayers. The process also provides for submissions to be prepared and submitted by interested parties and participation in public hearings. While the independence and transparency of the NSW process to fare setting is an undoubted strength, it does not necessarily provide the same degree of policy flexibility that exists in other jurisdictions by virtue of its prescriptive approach.

A related question is that of the role of the private sector in setting fares. As described above, fares will typically be set by government or a regulatory body. Whilst that represents a robust approach which is widely adopted worldwide, there is a need to ensure that the fares policy set is consistent with contractual obligations which private operators might have been signed up to. For example, if a private contractor is obliged to use all reasonable efforts to increase patronage and is incentivised to do so, then a fares policy associated with significant fare increases would make achievement of the patronage targets particularly difficult.

Similarly, ticketing can potentially act as an unintentional barrier to new market entrants. If a well-established, integrated ticketing solution is not offered to new entrants or private operators, then customers may find that separately priced trips prove less attractive, or that the need for a separate ticket / product is a disincentive to travel with the new operator.

#### **Recommendation 4:**

*Franchise obligations should be made with appropriate consideration of fares policy, and in particular, consistency between future fares policy plans and future patronage / revenue obligations of operators would be desirable. Ticketing systems and architecture should be offered universally across a jurisdiction wherever possible, such that the lack of that system is not a disincentive to travel on any particular operator.*

# 3 FARE STRUCTURE



# 3 FARE STRUCTURE

All of the popular fare structures observed globally (i.e. flat, distance-based and zonal) are represented in major Australian cities.

System size is not a predictor of fare structure with Perth's zone system establishing a far more granular relationship with distance-travelled compared to Melbourne for example.

No strong policy direction is evident in Australia over the past decade apart from Melbourne making a number of step changes towards a flatter fare structure.

At a global level, there has been a general trend towards fare structure simplification and integration with a view to unlocking the associated marketing benefits and allowing customers to change modes or services without financial penalty.

Although the concept of free fares has continued to attract attention, there is no compelling case for system wide free fare structures. On a case-by-case basis, there may be a rationale for free fare for certain segments or customers.

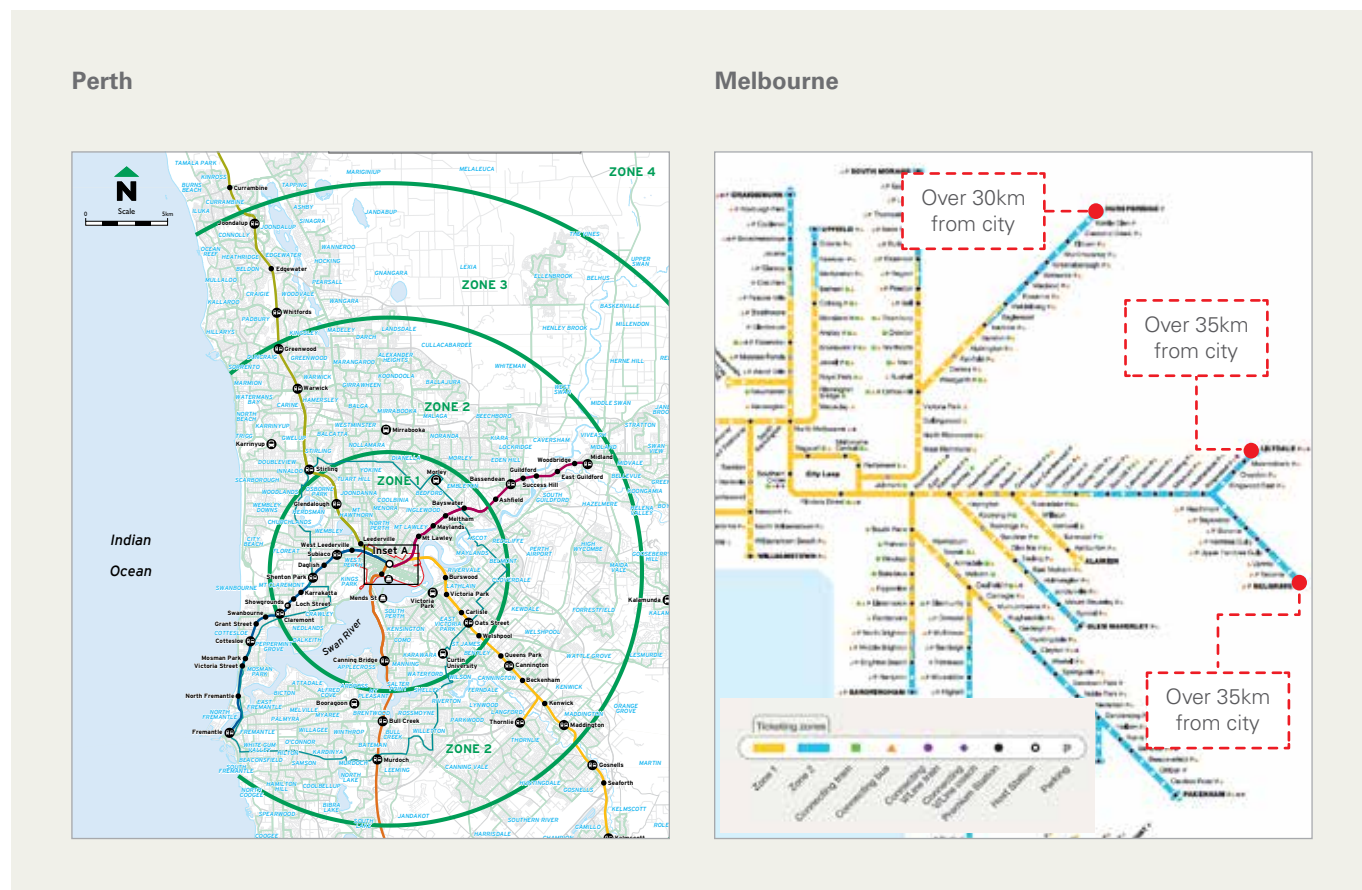
## CURRENT STATE

From a fare structure perspective, the key consideration is the strength of the relationship between fare levels and distance-travelled. At one extreme, a flat fare structure establishes no relationship between the fare paid and distance travelled, while zonal and distance-based structures can impose a progressively stronger relationship between fare levels and distance travelled. At the other extreme, a unique fare can be established for each station or stop pair.

All of the popular fare structures observed globally (i.e. flat, distance-based and zonal) are represented in major Australian cities. Some smaller systems (e.g. Adelaide and Canberra) maintain flat fares systems, whereas larger systems (e.g. Sydney and South East Queensland) have retained more complex fares structures. However, system size is not a predictor of fare structure settings, with Perth's system containing many more fare zones than Melbourne for example. Figure 6 demonstrates this, with Perth fare zones increasing in 5-10 Km bands, whilst a trip of over 35 Km in Melbourne will only traverse two zones.



**Figure 6: Comparison of Perth and Melbourne distances and fare zones**

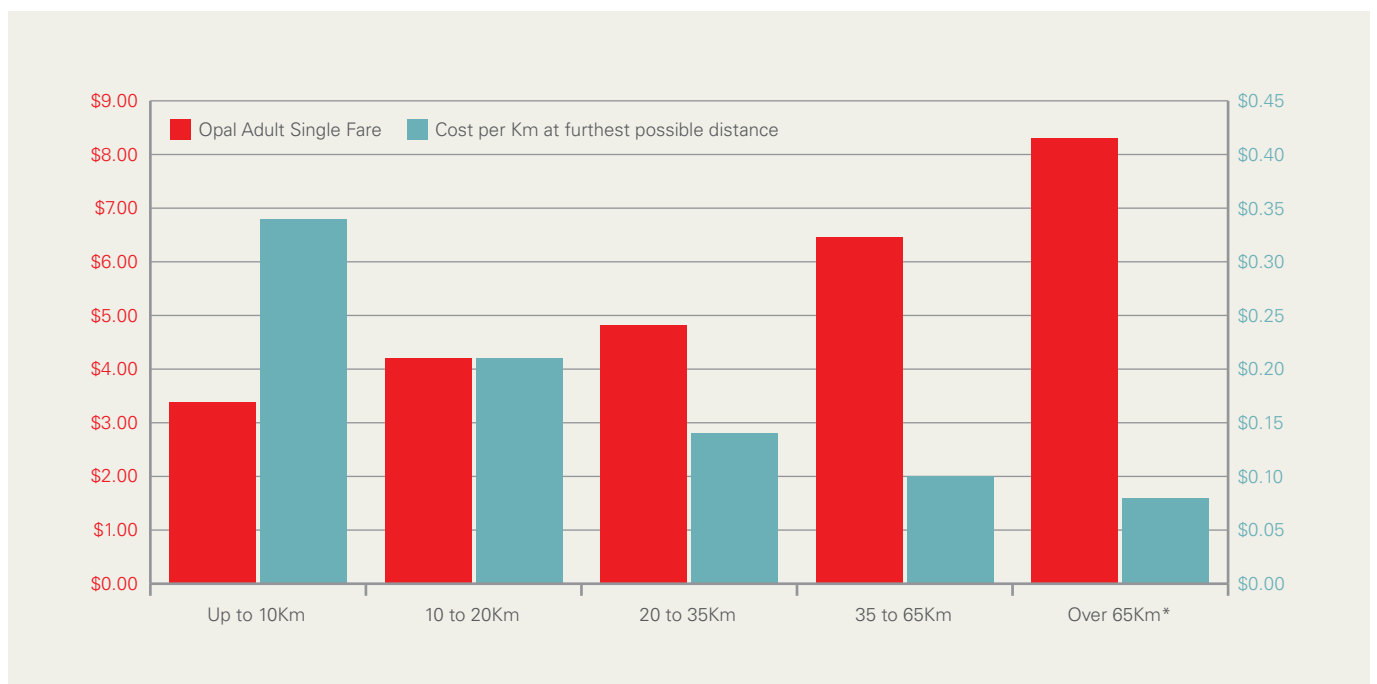


In summary, there is no dominant structure and where distance-based structures have been maintained, there is typically a strong “taper” in the relationship between distance and fare levels (i.e. fares continue to increase over longer distances but at a slower rate). This is particularly evident in Sydney rail fares. Figure 7 below shows how the cost per kilometre falls as the distance travelled increases.





**Figure 7: Sydney Opal fares implied per Km, as at July 2016**



(\*) For distances over 65Km, assumes 100 Km as maximum distance possible  
 Source: Opal Card Website, as at July 2016

## 3.1 OBSERVED TRENDS

### 3.1.1 Australia

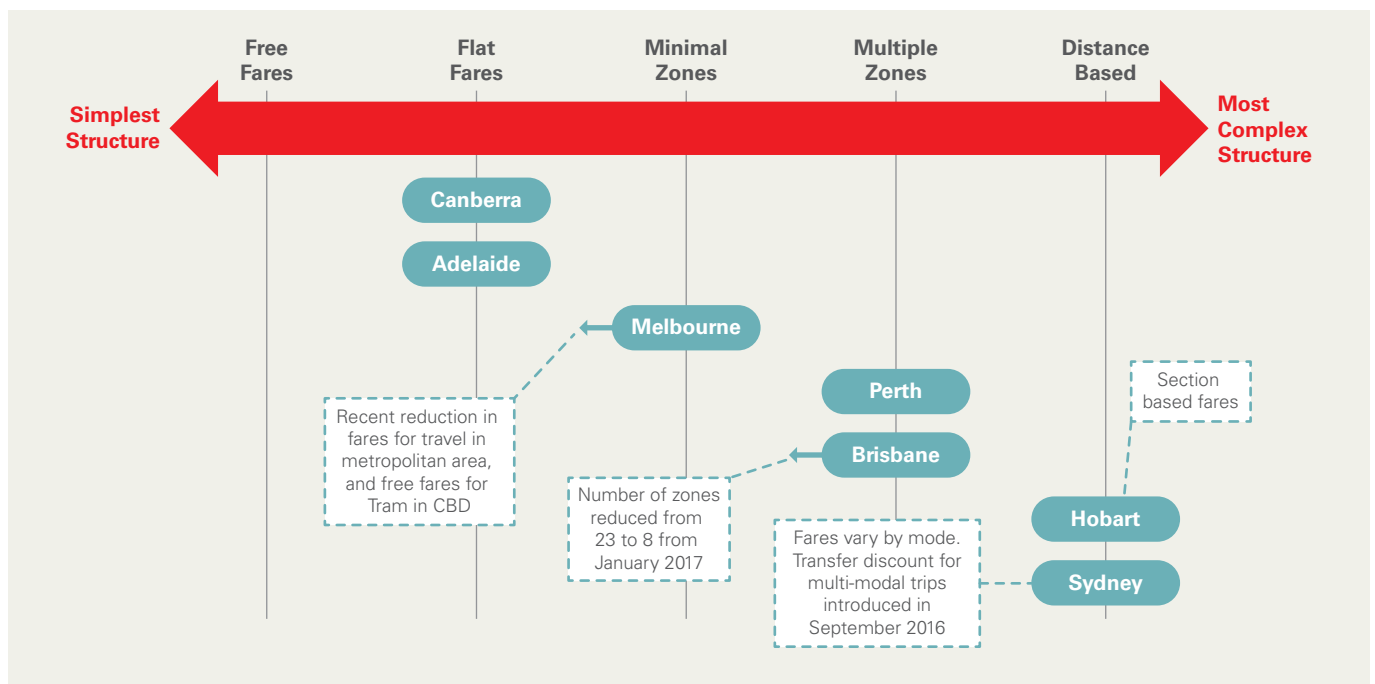
From an Australian perspective, no strong policy trend is evident in policy reforms implemented over the past decade. Two smaller Australian cities (i.e. Newcastle and Canberra in 2002<sup>15</sup>) have moved to flat fare structures. On the other hand, full fares integration was achieved in South East Queensland in 2004 via the extension of the concentric ring model employed by Brisbane Transport for its bus operations (see case study below). This has maintained a strong relationship between fare levels and distance travelled, with 23 zones defined between the Sunshine and Gold Coast. This relationship between fare levels and distance travelled will be reduced somewhat in South East Queensland from January 2017, with the introduction of a new 8 zone model.

This lack of consistent policy direction is also evident in recent changes for Sydney and Melbourne, with the former retaining distance based fares, but with Melbourne making initial steps towards a flatter fares structure (with the effective abolition of the Zone 1+2 fare). Figure 8 below demonstrates the relative breadth of policy approach to fare structures in major Australian cities.

### CASE STUDY: SOUTH EAST QUEENSLAND FARES INTEGRATION

In 2004, the newly established TransLink authority introduced the full integration of fares and ticketing for public transport services in South East Queensland. These fares and ticketing changes were implemented in conjunction with improvements to service levels, service quality and marketing efforts. The *combined* impact of these changes, in addition to exogenous factors (e.g. population, fuel prices, road congestion) resulted in patronage growth in 2005/06 of 12%. Detailed analysis<sup>16</sup> of the impacts of each of these factors suggested that the 'integration effect' represented 3.5% of the total increase of 12% in 2005/06.

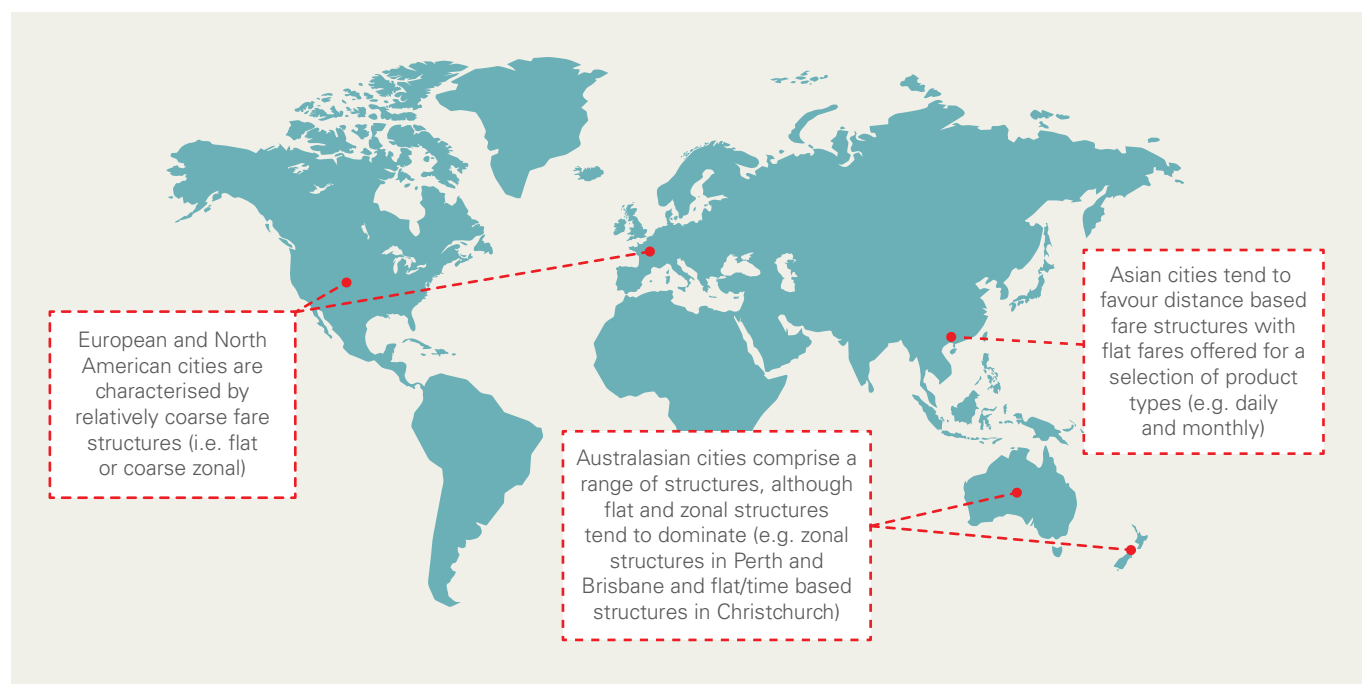
**Figure 8: Summary of fares structures in Australia**



15. <http://www.icrc.act.gov.au/wp-content/uploads/2013/02/finaldeterminationactionpricing2003-2006cw.pdf>

16. Streeting, M. and Barlow, R., Understanding Key Drivers of Public Transport Patronage Growth - Recent South East Queensland Experience, 2007

**Figure 9: Complexity of fares structures globally**



Source: Fares Policy Reform in the Smartcard Era, Streeting & Hobbs (UITP)

### 3.1.2 International trends

#### Trends in simplification

The global trend for fares structure is toward simplification, through the introduction of zone based or flat fare structures<sup>17</sup>. This is particularly noteworthy given that the introduction of “touch in – touch out” smartcard ticketing systems from the late 1990s increased the ability to support relatively complex distance-based fares structures. However the use of more complex distance-based fare structures is generally limited to systems in Asia<sup>18</sup>.

Although it is difficult to ignore the obvious impact fare levels have on farebox cost recovery, international evidence also suggests that it is the more commercially oriented transit operators who have tended to maintain distance-based fare structures rather than embrace customer friendly fare simplification initiatives.

The main benefit of simplification is reducing customer confusion around the fare structure. Such confusion can be a barrier to travel, both for non-users and for making new or unfamiliar journeys; simplifying the fare structure can thus create a greater willingness to travel (and increase public transport patronage). Simplification also has the potential to drive operational benefits (such as improved bus dwell times through eliminated need for touching off under a flat fare structure).

The downside of simplification is a reduced ability to target specific customer groups according to their willingness and ability to pay. From an economic standpoint it can be argued that the fare charged should be reflective of willingness to pay and/or the cost to provide each service, e.g. higher fares for longer journeys.

17. EMTA, Study on electronic ticketing in public transport, 2008

18. Fare Policy Reform in the Smart Card Era, UITP

The overall trend to simplification suggests many authorities believe the ‘marketing’ benefits of simplification in dense urban networks outweighs the benefits of finely targeted fares. Separating the simplification impacts from other effects (such as patronage growth through lower fares or the impact of service changes implemented at the same time) can be difficult.

### Trends in integration

The simplification of fares structures often includes fares integration across available public transport modes. Table 1 offers a further selection of case study examples where fares integration benefits have been realised, though it is noted that these benefits are often combined together with simplification benefits and/or service improvements. Significant increases in patronage have generally occurred as a result of these integration initiatives.

## CASE STUDY: LONDON BUSES.

In 1997, the number of fare zones was reduced from six to two; the short term estimate of the trips generated by this initiative was an additional 1.5%. A further simplification to a single flat fare took place in 2000. TfL quoted “evidence of a pure ‘simplification effect’”. That is, new journeys appeared to be made merely because the new fare structure is easier to understand<sup>19</sup>. There is evidence in the UK that the long term elasticity is twice that of the short term<sup>20</sup>; this implies the long term simplification effect would be of the order of a 3% uplift in trips.

**Table 1: Examples of integration initiatives and impacts**

CITY	INITIATIVE	PATRONAGE IMPACT
<b>New York City, USA</b> Population 8.4m	Introduced integrated fares in 1998 following implementation of integrated ticketing in 1996	40% increase (bus) 17% increase (subway/rail) <sup>21</sup>
<b>London, UK</b> Population 8.3m	Introduction of Travelcard (multi-modal ticket)	10% increase (Tube) 16% increase (bus) <sup>22</sup>
<b>Freiburg, Germany</b> Population 216,000	The introduction of low cost, multi-modal travel cards with wide regional validity and fare capping	7.5% growth p.a. (1983-95) (price and simplification effects combined) <sup>23</sup>
<b>Zurich, Switzerland</b> Population 360,000 (Wider pop 1.4m)	Introduction of integrated fares and ticketing, zonal fares (c. 1990)	12% increase (system wide) <sup>24</sup>

### Perception gaps – what are they?

Research into the barriers to public transport usage reveals that whilst there are many ‘rejecters’ of public transport, there are also many who are willing to use public transport - if the barriers to use that they perceive can be removed or reduced. Beyond service access, frequency and quality, these barriers extend to customers’ understanding of the fares system. For example, research carried out in Manchester testing customers’ understanding of fares for a number of specified point-to-point trips revealed that 46% of respondents overestimated fares by an average of 42%<sup>25</sup>.

Tangible barriers to travel such as service frequency can be addressed by running more services; however perception gaps (referred to as “soft barriers”) may be addressed by simplifying the information presented to customers and improving the way in which these messages are delivered (using clear and consistent messages). This does not necessarily imply that the service offering (or components of it) need to change, rather the way that it is conveyed to customers.

19. Transport for London, Effects of the 2000 Fares Revision on Bus Passenger Travel, 2001

20. The demand for public transport” a practical guide (TRL, Table 6.55), London Underground Research note U1

21. Booz Allen Hamilton, The Impact of Fares and Ticketing Integration on patronage International Case Studies

22. The Demand for Travel and for Travelcards on London Regional Transport (Journal of Transport Economics and Policy), Jan 1991

23. Fitzroy, F. & Smith, I., Public transport demand in Freiburg: why did patronage double in a decade?, 1998

24. Booz Allen Hamilton Report, Integrated Fare System for South East Queensland, 2000

25. Goulcher and King, GMPTE Fares Research, November 2008



## CASE STUDY: LONDON FARES.

In the late 1990s research showed that a large proportion of potential customers believed that fares were higher than that actually offered, with around 40% of respondents believing the fare to be higher by an average of around 40%.<sup>26</sup> Tariffs finely segmented by distance or origin and destination or by time of day were assessed as sensible in theory, but lacked an understanding of consumers' perceptions and motivations. In fact, a more sophisticated approach combining a simple basic tariff, widely marketed, with carefully targeted discounts to certain segments (families, young people) was adopted. Marketing campaigns to close the perception gaps were launched off the public transport systems to target non-users, using radio and street-side posters. As a key part of a wider package of works to simplify the system, this led to net increases of 5% in patronage and 16% in revenue<sup>27</sup>.

## 3.2 FUTURE POLICY REFORM

### 3.2.1 Efficiency and social equity

The motivation for distance based pricing is typically based on allocative efficiency (setting fares in accordance with elasticity levels), technical efficiency (setting fares to better match the costs of service provision) and social equity (to the extent that it is fairer to charge customers more for travelling longer distances). However there is no universally compelling rationale on either economic efficiency or equity criteria that supports the retention or adoption of a specific fare structure over another.

While the "benefit" equity argument is perhaps the strongest one in terms of supporting distance-based pricing, together with the enhanced capacity to manage fare increases spatially, the potentially regressive nature of distance-based pricing suggest that some moderation of fares against distance (i.e. higher absolute fares but a reduction in average fares per kilometre) will generally be appropriate.

In addition, fare elasticity evidence needs to be assessed on a case-by-case basis. This will reveal customer attitudes (through willingness to pay) and enables the development of the most appropriate structure for that jurisdiction.

### 3.2.2 Fares integration

Before the advent of smartcard ticketing systems, full fares integration (i.e. the same fare being payable for a given origin-destination pair regardless of the number and mix of service used) was the only means available of delivering the customer a "seamless" travel experience using a single ticket. Melbourne, Perth and South East Queensland all migrated to full fares integration before the roll out of their

respective smartcard systems. On the other hand, seamless travel was only achieved in Sydney with the completion of the Opal smartcard roll out in late 2014. Sydney will move a step closer to fares integration from September 2016 with a introduction of a \$2 adult 'transfer discount' where multiple modes are used to complete a journey and the transfer is within 60 minutes of alighting the previous mode.

There would seem to be little doubt that a service delivery model that requires significant interchanging between services and/or modes should support fares integration and thereby avoid the payment of multiple "flagfalls", particularly as customers typically prefer a direct service that avoids the need to transfer.

Historically, the biggest barrier to partial or full fares integration across services and/or modes has been the development of sustainable farebox revenue sharing models (i.e. to allocate revenue between services and operators) and the often wide variation in the costs of service provision across modes.

The need for farebox revenue sharing mechanisms has largely become a "non-issue" as Australian cities have progressively migrated from net to gross cost service contracts where Government typically retains all farebox revenue risk. For example, the introduction of gross cost service contracts in the mid-2000s was a key enabler of integrated fares in South East Queensland. An exception is Melbourne, where Metro Trains and Yarra Trams hold revenue risk, sharing 70% of the total metropolitan farebox revenue.

26. Adam Goulcher, former director of London Underground

27. Adam Goulcher, former director of London Underground

Material differences in the cost of service provision between modes can also be a barrier to fares integration, particularly where farebox cost recovery is a key policy driver. In the Australian context, ferry services provide the most extreme example of operating cost differentials compared to other public transport modes. All ferry services provided by Brisbane Transport on the Brisbane River operate under full fares integration, while all Sydney Ferries services provided on Sydney Harbour are provided with integrated ticketing (i.e. via Opal) but without fares integration (i.e. ferry fares are substantially higher than those applicable to other modes).

### 3.2.3 Simplification

In principle, there is a strong case for the simplification of the customer proposition around fares. Whilst this can be achieved through the flattening of fares (a reduction of the number of fares charged), we concluded that the case for change could only be made on a case-by-case basis. Better marketing of the overall proposition (to remove perception gaps) will likely also be beneficial (see case study below) by removing barriers to public transport usage and helping to grow the market.

### 3.2.4 Variation of fare by mode or service type

There is a trade-off to be made between the simplicity benefits associated with common fares across modes (as is currently done in Melbourne and Brisbane), and offering modal specific prices to align with the costs of service provision and the associated customer willingness to pay (broadly the approach currently taken by Sydney).

Customers who transfer between services to complete their journey perceive transfers as being inconvenient. This is often referred to as a “transfer penalty”, typically encompassing both the time penalty of waiting for a connecting service and any additional fare payable. It is estimated that the waiting time component of the transfer penalty is perceived by the passenger as 1.5-2 times the actual waiting time<sup>28</sup>. If service integration and optimisation is an objective, then ensuring that there are no price penalties for transfers should be one of the primary objectives of fares policy (i.e. meeting mobility needs on a “mode agnostic” basis). Significantly, as discussed in Section 3.2.2, Sydney will introduce a “transfer discount” from September 2016 as a means of supporting multi-modal travel without moving to full fares integration.

## CASE STUDY: MELBOURNE FARES

A 2011 study conducted for Metlink focussed on customer perceptions of travel at the weekend. At the time, weekend fares were capped at \$3, however 62% of users in the study overestimated the fare by 135% (i.e., thought that the daily price would be \$7.06). An even higher proportion (78%) of near market users in the study overestimated the weekend public transport fare for Melbourne by an average of almost 90% of the weekend myki fare.

## CASE STUDY: REMOVAL OF PRICE DIFFERENTIALS ACROSS MODES

Singapore provides one example of a move to distance based pricing with a single boarding charge, which was fully implemented in mid-2010 as a means of ensuring price was totally removed as a driver of public transport service choice. LTA recognised that transfers are an integral part of the success of their system and that the previous fares structure discouraged people from making transfers to complete their journey<sup>29</sup>. The current distance-based fares structure now provides customers with more flexibility in the choice of routes to complete their journey. Customers took advantage of these changes, with overall system patronage and farebox revenue increasing, and approximately 72% of commuters saving on their journey costs<sup>30</sup>.

28. Reed, TB, Reduction in the Burden of Waiting for Public Transit Due to Real-Time Schedule Information: A Conjoint Analysis Study, Seattle, 1995; also ATC Volume 4 (Table 1.6.1)

29. <http://www.mot.gov.sg/About-MOT/Land-Transport/Public-Transport/Fares—Payment-Systems/>

30. Ministry of Transport - Written Answer to Question on Distance-Based Fare System (Impact on-Travel and Operators Revenue), 2012

### 3.2.5 Free fares

Making public transport free can be employed in an attempt to induce a significant increase in patronage, incentivise modal shift, particularly from car users, and attract new users to public transport. This obviously comes at the cost of surrendering farebox revenue.

#### Potential benefits of free fares schemes

Advocates of a free fares scheme would highlight five main areas of benefit:

- The removal of the need to pay fares, even on limited services, can potentially reduce the costs associated with collection and administration of fares, as well as costs related to enforcement of fare compliance;
- The introduction of free fares can potentially improve vehicle loading/unloading times by removing the need for any ticket interaction at entry/exit. However, if patronage increases are significant, these time savings per passenger may be eroded;
- Greater social inclusion through the reduction of cost barriers to travel;
- Simplification of public transport by removing customers' need to comprehend fare rules and ticket purchase procedures; and
- Free fares can induce significant shifts to public transport from private car travel, reducing road network congestion and emissions, as well as improving public health through increased walking to/from public transport services.

#### Potential disbenefits of free fares

The largest downside to free fares is the dramatic effect that this can have on farebox revenue. This would likely lead to a need for additional government subsidy to support the public transport system. UITP analysis<sup>31</sup> has shown that a 10% improvement in service levels can generate a 5% increase in patronage, versus a 3% rise in patronage for a 10% decrease in fares, suggesting that the revenue foregone through introducing free fares may be better spent on improvements to services.

Limited free fares schemes risk adding more complexity into a city's fares system, with customers required to understand the specific services, times or areas where payment is not required. This confusion may add to incidences of inadvertent fare evasion.

If significant patronage increases are experienced as a result of introducing free fares, there is a risk that the services included in the scheme may become overcrowded, affecting both customer satisfaction and service reliability/on-time running.

Overall, we see no compelling case for system wide free fares structures. On a case-by-case basis, there may be a rationale for free fares for certain segments or customers.

31. UITP, Better Public Transport Fare Policy for More Resilient Funding, 2014



# 4 PRODUCTS AND CUSTOMER SEGMENTS





## 4 PRODUCTS AND CUSTOMER SEGMENTS

The introduction of smartcard ticketing has seen the progressive demise of most traditional product concepts, with Australian cities global leaders in moving to a “product free” world.

Fare capping (trips or value) is now the preferred means of rewarding regular customers, although the approach adopted by major Australian cities varies significantly. Sydney is unique in that fare caps are available on both a value and trip basis – other Australian cities adopt to one or the other approach.

Australian jurisdictions offer a range of off-peak and weekend discounts, including free fares in the early AM (Melbourne).

Even where smartcard systems are well established and card takeup among users is high, all major cities apart from Melbourne still offer a “distress” single cash single ticket option for irregular customers and tourists. Given the high costs of supporting cash fare payment, such fares are typically only available at a significant premium to equivalent smartcard fares.

Specific tourist products are very limited and arguably the only clearly successful tourist product in the Australian market is the “go-explore” daily product introduced by Translink for the G:Link tram on the Gold Coast. The near term introduction of open payment models using contactless debit and credit cards will be of significant value to the tourist market.

### 4.1 CURRENT STATE

#### 4.1.1 Core products offered to customers

The single fare continues to underpin all public transport systems in Australia’s major cities. In the smartcard era, the role of the single fare has increasingly focussed around the irregular public transport customer, including both residents and non-residents, notably tourists. There is also evidence that many public transport customers from lower socio-economic groups continue to rely on single fares because they are unwilling or unable to justify holding funds on a smartcard.

The single fare is inexorably linked with the goal of a cashless fare collection system, while at the same time supporting access to public transport services. Major Australian cities have pursued vastly different strategies in this regard. Melbourne does not support the purchase of a single fare on any mode. Sydney has and will continue to support single fare purchase on heavy rail, light rail, ferry and some bus services, while Brisbane supports single fare purchases on all modes, albeit at a very significant premium to an equivalent smartcard fare.

The introduction of smartcard ticketing across major Australian cities has seen the progressive demise of many traditional product concepts such as daily/return fares, multi-ride tickets, weekly passes, monthly passes and annual passes. Major Australian cities have been global leaders in moving to a “product free world”. In contrast, major international cities, including London and Paris, have retained legacy product concepts despite achieving high levels of smartcard take-up.

The introduction of fare capping on the back of smartcard ticketing has served to preserve and/or enhance the benefits that formerly accrued to weekly and longer term period pass holders. That is, the frequent, loyal public transport customers continue to be rewarded with free or discounted travel, typically in off-peak periods where the costs of meeting additional demand are lowest (i.e. weekends and weekday evenings). However, customers also avoid the limitations of traditional product concepts where an upfront decision to purchase (say) a weekly ticket was based on the expectation of five days of commuting and some additional non-commuting trips. In an environment of greater employment flexibility (e.g. working from home, greater off-peak travel), the value proposition of such rigid traditional product concepts has inevitably been diluted for many customer groups.

#### **4.1.2 Tourist market and occasional users**

The delivery of ticketing services to occasional users has traditionally presented a greater challenge to transit operators than regular users. Regular users typically have a sound knowledge of the ticketing system and well-defined patterns of travel making it easier to support their needs. Conversely, the delivery of ticketing options for occasional users is often difficult and cost ineffective.

Occasional users present public transport authorities with different needs to those of regular users. The needs of the occasional user can easily be overlooked by policy makers, who often focus disproportionately on the needs of perceived ‘core’ markets (e.g. commuters). At the same time, the average fare paid by the occasional user is typically considerably greater than the average fare paid by most regular users. Therefore, it is in the best financial interest of public transport authorities to attract greater numbers of occasional users.

But catering for the occasional user is not straightforward. Occasional users may lack familiarity with the ticketing system and its procedures and in some cases they may be attempting to overcome language barriers. Accordingly, the core ticketing system requirements for servicing the occasional user can be summarised as follows<sup>32</sup>:

- Simple, easily understood and intuitive – no barriers to usage are presented
- Accessible – ideally allowing the ticketing solution to be used in other markets or via a common media (such as contactless credit cards)
- Cost effective – ticketing solution does not cost the operator more

On the question of accessibility, public transport authorities from a selection of states did work together in the early 2000s to develop a common interoperable standard for smartcard ticketing in Australia - called the Australian Transport Interoperability Protocol (ATIP), but with no tangible evidence of these standards being applied in jurisdictions. The emergence of new open payment solutions (e.g. using contactless debit or credit cards) are likely to address the interoperability issue in the near-term in our major cities.

Similarly, previous attempts to offer seniors full fares reciprocity across Australian states have been unsuccessful due to lack of agreement over funding.

#### **4.1.3 Temporal pricing**

Temporal pricing is as simple as offering different prices across time periods and/or days of the week for the same travel. Typically this might be via offering discounted fares outside of peak times. Smartcard ticketing technology enables off-peak fares to be automatically adjusted without the need to purchase a separate fare product in advance; as such, this media is most commonly associated with prices that vary with time.

Varying fares by time of day can have two main objectives:

- alter the behaviour of existing customers by helping to manage or spread demand at the peak periods; and
- attract new customers at those times when excess capacity is available.

32. SERVING THE OCCASIONAL USER IN A SMARTCARD ENVIRONMENT – AN AUSTRALASIAN PERSPECTIVE (Streeting et al)

The overall costs of providing public transport services are generally driven by providing sufficiently high levels of service to meet demand during peak travel periods, with lower levels of service generally provided in off peak periods. From an economic standpoint it can be argued that customers would and/or should pay fares that reflect the quality of the service being provided at various times of the day or week. In addition to the objectives mentioned above, time-of-day pricing can also aim to improve social equity, particularly to reduce the financial burden on transit dependent passengers<sup>33</sup>. This passenger segment may include those without private transport options (including those too young to drive), the elderly, and persons with lower incomes. Typically these passengers take a higher proportion of non-work trips, which are more likely to occur during off-peak hours.

### How is temporal pricing applied in Australia?

Table 2 shows that most public transport networks in Australia offer at least one form of time-of-day pricing, the most popular being discounts for travel during weekday off-peak periods and reduced fare caps for travel on weekends. However a range of approaches are taken, including:

- Free fares for some modes at certain times of day , but no reduction in fares between the peaks (Melbourne)
- Reduction in weekday fares at all times bar the morning and evening peak and a Sunday fare cap (Sydney)
- Reduction in weekday fares between the morning and evening peaks and after the evening peak (Canberra, South East Queensland)
- Reduction in weekday fares between the peaks (Adelaide)
- Capped fares if first boarding is after the morning peak (Perth, Hobart)

**Table 2: Temporal pricing schemes in Australia, as at July 2016**

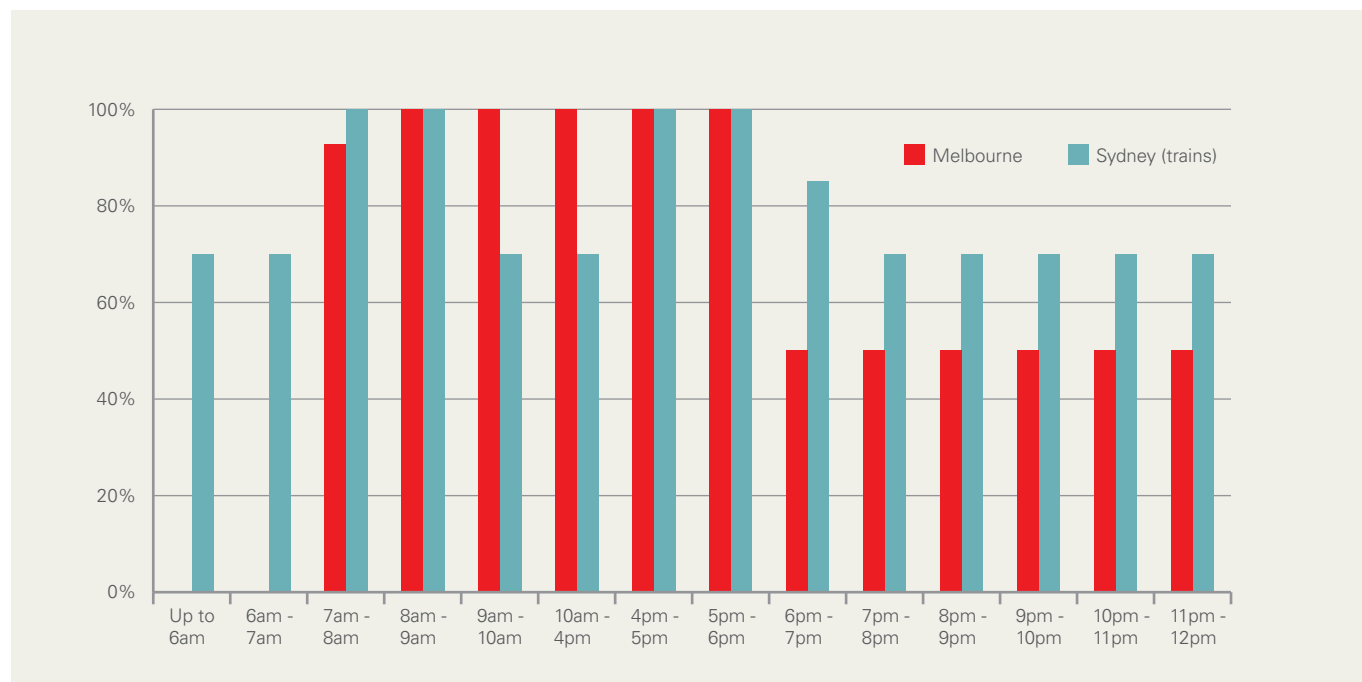
CITY / JURISDICTION	OFF-PEAK DISCOUNTS (VS PEAK)	WEEKEND DISCOUNTS (VS WEEKDAY)
Melbourne	100% i.e. free fares (pre-0715, Trains) Capped at 50% of daily fare (post-1800 if no travel made prior to 1800). No other off-peak fares	23% (\$6.00 cap vs. \$7.80 weekday cap) 100% for seniors (free weekend travel)
Perth	\$12.40 cap (if first boarding after 0900)	\$12.40 cap
Sydney	30% (Sydney trains outside 0700-0900 and 1600-1830, Intercity trains outside 0600-0800 and 1600-1830) <sup>34</sup>	83% (\$2.50 Sunday cap vs \$15 weekday cap)
Adelaide	23-45% (0901-1500)	No discount on Saturday 23-45% discount on peak (on Sunday)
South East Queensland	20% (0830-1530 and 1900-0300 in the next day)	20%
Hobart	50% (\$4.50 daily cap if first boarding after 0900 vs. \$9.00 daily cap)	50% (\$4.50 cap vs. \$9.00 weekday cap)
Canberra	Up to 20% (\$2.37 vs. \$2.98 per trip, 0900-1630 and after 1800)	Up to 40% (\$5.45 cap vs. \$9.00 weekday cap)

Source: Public transport authority websites, as at July 2016

33. Smith, M. J., Public Transit and the Time-Based Fare Structure: Examining the Merits of Peak Pricing for Transit

34. It is noted that the IPART draft report on fares recommends that the discount be increased from 30% to 40% to better reflect the lower costs of providing off-peak rail services

**Figure 10: Price variation by time of day (peak fare = 100%), as at July 2016**



Source: Public transport authority websites, as at July 2016

The differing approaches of Melbourne and Sydney are highlighted in Figure 10 above. Fares in Sydney have more variation, although Melbourne offers the deepest discount (100% on trains pre 0715; i.e., trains are free at this time). Results from Melbourne indicate that 10% of passengers accessing free fares prior to 0710 using the Early Bird ticket were new public transport users, while 23% had shifted from travelling in the peak, and the remaining 67% were existing pre-peak passengers<sup>35</sup>. Melbourne does offer reduced fares after 1800, but only if no travel has been made that day prior to 1800.



35. Currie, G., Quick and Effective Solution to Rail Overcrowding: Free Early Bird Ticket Experience in Melbourne, Australia

## 4.2 OBSERVED TRENDS

### 4.2.1 Core products offered to customers

The introduction of smartcard ticketing often coincides with a review of that system's fares structure. In some instances more complex structures have been introduced, recognising that customers no longer need to have the capacity to readily calculate their fare. Conversely, in other cases, the fare structure has been simplified to help ease the transition to a new system in light of an already changing fares collection process.

In Australia, the approach of fares structure and product simplification has been favoured. In Sydney, the benefits arising from the removal of longer term periodical products were anticipated to include passengers only paying for the travel they use<sup>36</sup>, addressing identified barriers to product purchase such as significant financial outlay and passengers' uncertainty about their future travel plans. Changes to the employment landscape, including flexible working arrangements and the increasing proportion of part time employees, also mean that traditional fares products

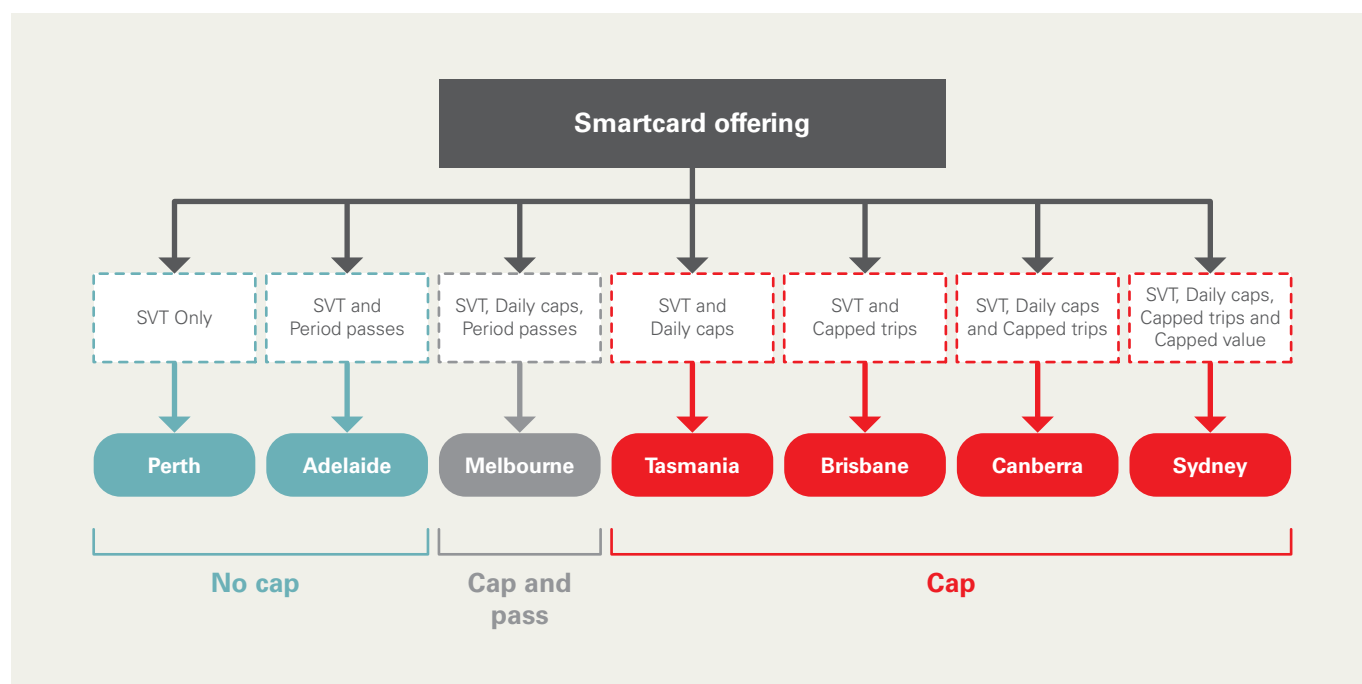
may not provide the best option for many travellers, whereas fare capping can often provide a superior customer value proposition.

It is recognised that some passengers who previously used longer term products may end up paying more if these products are removed. However, given that these customers are already frequent public transport users their sensitivity to price may be a less significant factor in their travel choice, meaning that the price elasticity/impact on patronage would be lower. The overall fares structure changes would aim to have any patronage decrease from past users outweighed by an increase in use from other existing and new passengers.

#### The different product sets used in Australia

Figure 11 shows how Australia takes a wide range of approaches to smartcard product sets, with most states providing a unique combination leveraging stored value travel (SVT) and fare capping concepts.

**Figure 11: Use of Stored Value Tickets (SVT), passes and caps in Australia**



Source: Public transport authority websites, as at July 2016

36. <http://www.transportnsw.info/resources/documents/some-paper-tickets-are-being-retired.pdf>



There are two basic ways in which capping is used to either replicate or replace traditional fare products:

- **Capped value**, where there is a set maximum amount a passenger will pay for travel over a defined period, typically daily, weekly, monthly, or a combination of these. Melbourne and Perth provide examples of fares being capped over even shorter timeframes (2 to 3 hours) according to the fare zones used; and
- **Capped trips**, where passengers receive free or discounted travel after completing a defined number of paid journeys within a defined period, usually a week or a month. Sydney and South East Queensland provide examples of weekly trip caps, while Canberra has implemented a monthly cap on paid trips.

It is notable that Sydney offers both capped value and capped trips.

### Capped value

Capped value schemes offer customers the assurance that they will not pay more than a certain amount for their public transport use over a certain period of time. The simplest traditional form of fare capping is providing free transfers between services within a set time period, such that customers pay a single fare for a journey comprising multiple individual trips. Smartcard systems allow a customer's travel patterns and spending to be tracked over a day, a week, or a month, and for a cap on spending to be applied to one or more of these time periods. Theoretically, this practice could be extended to cap travel costs over a year.

Fare capping applied over shorter time periods will benefit a larger proportion of the market, including infrequent customers, enticing customers to make multiple journeys rather than just a single trip. As the cap period increases, travellers are rewarded for more frequent use of the system, accessing free travel for the remainder of the period once they have reached the cap. Of the jurisdictions offering daily fare capping, Melbourne, Canberra and Hobart offer no other type of value cap, whilst Sydney also offers capped value over a longer period.

**Table 3: Capped value schemes in Australia, as at July 2016**

CITY	PTA / SMARTCARD	VALUE CAP (*)	
		WEEKDAY	WEEKLY
Melbourne	PTV / myki	\$7.80	N/A
Sydney	TfNSW / Opal	\$15.00	\$60.00
Canberra	TfC / MyWay	\$9.00	N/A
Hobart	Metro Tas / Green Card	\$9.00	N/A

(\*) Full fares

Source: Public transport authority websites, as at July 2016

**Daily capping - Melbourne:** Fares under the myki ticketing system are capped over a 2 hour period and over a day, according to the zones in which a passenger has travelled. Once a passenger has made a trip, they are entitled to unlimited trips within a 2 hour period in that zone(s). The daily cap is twice the value of the 2 hour cap; hence a passenger need only make a minimum of two trips to reach the daily cap. Passengers travelling exclusively in Zone 2 pay a lower cap.

**Daily and weekly capping - Sydney:** The Opal ticketing system applies fares value caps on both a daily and weekly basis. Sydney's current fare structure involves separate fares being charged for travel on trains, buses, ferries and light rail, with the cost of a single full fare ranging from \$2.40 for the shortest bus fare, to \$8.80 for the longest train fare. This means that to reach the daily \$15 cap, passengers need to make as few as two journeys, or four times this amount to reach the \$60 weekly cap.

### Capped trips

Capped trips schemes offer customers either discounted or free travel once they make a certain number of trips within a defined time period. These schemes typically aim to encourage and reward existing customers for more frequent use of public transport, with trip caps generally applied over a week (Sydney and South East Queensland) or month long period (Canberra).

**Table 4: Capped trips schemes in Australia, as at July 2016**

CITY	PTA / SMARTCARD	TRIPS CAP	
		WEEKLY	MONTHLY
South East Queensland	Translink / <i>go</i> card	9 journeys, then free	N/A
Sydney	TfNSW / Opal	8 journeys, then free	N/A
Canberra	TfC / MyWay	N/A	40 journeys, then free

Source: Public transport authority websites, as at July 2016

The message to customers under this type of scheme may be easier to understand, as the examples in the capped fares section show that there can be variation in the number of trips required before a value cap is reached. Under a capped trips scheme, customers will still need to understand what is considered to be a paid trip – whether it is a single trip on a service, or a single journey that may comprise multiple trips and transfers within a defined time window.

**South East Queensland:** Translink’s *go* card currently provides customers with free travel once they make nine paid journeys in a week (set as Monday to Sunday). Translink makes the distinction between a “journey” and “trip”, with a journey comprising any number of individual trips made within a 3.5 hour period, with a maximum of one hour to transfer between each service.

From January 2017, a less generous capping scheme will be introduced (i.e. 8 journeys and then a 50% discount for the rest of the week). This represents a partial move back to the original *go* card capping regime (10% journeys and a 50% discount).

The Queensland Government has suggested that the combination of lower fares and the tightening of incentives via capping will still leave 93% of customer better off<sup>37</sup>.

**Sydney:** In addition to the capped value scheme previously described, Sydney’s Opal fare system also provides a capped trips scheme where customers currently receive free travel once they make eight paid journeys within a week (set as Monday to Sunday). Similar to Queensland, a journey may consist of multiple individual trips if each transfer between services is made within one hour. It has been reported that some Opal passengers have taken advantage of this fare rule by making cheap journeys in the middle of the day in order to reach their trip cap sooner and ultimately pay less for their travel over the entire week<sup>38</sup>.

In September 2016, Sydney will move to the same trip capping regime to be introduced in South East Queensland (i.e. 8 journeys and then a 50% discount for the rest of the week). The NSW Government has suggested that around 70% of customers are not currently reaching the reward and hence do not receive any benefit<sup>39</sup>.

#### Do products sit alongside these new innovations?

While there has been a trend toward providing capped fares and trips, some systems have retained traditional fare products. In some instances the number of different products may have been reduced. Customers who continue to travel using products or passes, paying in advance for travel over a week or longer period, can reasonably be expected to be frequent, loyal customers.

In Australia, only Melbourne and Adelaide have retained the option to purchase longer term fare products, which are loaded onto a user’s smartcard. The maximum time over which Melbourne’s myki system applies a fares cap is one day, hence the weekly “myki pass” and other products do not compete against an equivalent cap. A customer would need to make five weekdays’ worth of travel before paying the cost of a weekly pass. Monthly passes are available for a minimum of 28 days, with a passenger needing to make 17.5 weekdays’ travel before realising the benefits of this product.

Despite having the Metrocard smartcard, Adelaide’s fare structure does not provide any form of capping. The Metrocard 28-Day Pass provides better value for the customer once they make a minimum of 35 “peak” journeys.

37. QLD Government Response to the SEQ Fares Review, retrieved 14 July 2016

38. <http://www.smh.com.au/nsw/transport-minister-backs-commuters-who-beat-the-opal-man-20140908-10dv5f.html>

39. Opal Card Fare Freeze and Weekly Travel Reward Reform, Media Release, Andrew Constance, Minister for Transport and Infrastructure, 18 May 2016.

### Single tickets

Melbourne's myki ticketing system is the only system that does not support a single ticket. All passengers are required to purchase a smartcard and either add value or a pass prior to travelling. During the initial roll-out of the system, short-term disposable smartcards were available for use on regional bus networks, however these were not introduced to services in metropolitan Melbourne, and were eventually phased out from all services. The decision to discontinue this option was cited as part of a broader attempt to reduce the complexity of the project to provide a more reliable ticketing system<sup>40</sup>.

#### 4.2.2 Tourist markets and occasional users

Many cities offer tourist or visitor products that cater for short term users of the system. These are intended to be simple, easily understood and intuitive. A common approach is not taken across Australian jurisdictions, with variation in the approach to fare rules, media, and sales strategies.

**South East Queensland:** Translink provides a *go* card visitor information pack, detailing how to use the card, how to top-up, how to obtain refunds<sup>41</sup>, and a map of Brisbane. Alternatively, the "seeQ" card provides unlimited travel for three or five consecutive days (including two journeys on Airtrain) for \$79-\$129<sup>42</sup> (full fare). However, depending on the number and length of journeys made, a regular *go* card may be cheaper.

Visitors to the Gold Coast can obtain a "go explore" card and load \$10 per day (full fare), for unlimited travel on Gold Coast buses and the G:Link tram<sup>43</sup>. Gold Coast visitors can also purchase tickets from Gold Coast Tourist Shuttle, whose tickets are valid for travel on Translink Gold Coast buses. These passes are available for 3, 5, 7 or 10 days, ranging from \$59 (3 days, excluding airport transfer) to \$149 (10 days, including airport transfer)<sup>44</sup>.

It is understood that sales of the "seeQ" product are modest. On the other hand, the "go-explore" product has proved extremely popular with tourists.

**Sydney:** Visitors may acquire a free Opal card and leverage the daily and weekly travel caps. Additional charges apply for travel to/from airport stations. Unused Opal credit can be refunded by submitting the card and a claim form, however refunds are only processed to an Australian bank account or via cheque sent to an Australian address.

**Melbourne:** There is a "myki Visitor Value Pack" solution marketed directly at visitors. This contains discount offers, which may be of interest to the visitor. A non-refundable charge of \$6 is still made for the myki card<sup>45</sup>. International visitors can receive an on-the-spot refund on unused credit with proof of international residence, however visitors from within Australia are bound by the same refund requirements as regular users, requiring submission of a refund application.

**London:** The "Visitor Oyster card" allows visitors to purchase an Oyster card prior to their arrival. The card costs £3 (non-refundable), compared to the regular Oyster cost of £5 (refundable)<sup>46</sup>. Visitors may also purchase a Travelcard product (either a one-day or seven day pass). Unused travel credit may be refunded in a similar fashion to a regular Oyster card<sup>47</sup>. The Visitor Oyster card has the same capping rules as a regular Oyster card, and provides discounts for travel on some tourist services. External offers and promotions are provided.

**Singapore:** The EZ Link Singapore Tourist Pass provides visitors with one, two or three days' of unlimited travel on the bus, MRT and LRT services<sup>48</sup>. There is a SG\$10 card deposit, refundable at selected MRT stations. Travel may potentially be cheaper by using a regular EZ Link card, however Singapore's fares system is complex – the tourist pass avoids this barrier. The Singapore Tourist Pass Plus ticket is another option, which also includes one day's travel on each of Bubble Jet Boat sightseeing tours and FUNVEE Bus Tour services. The Tourist Pass Plus is available from limited outlets and has no refundable components.

40. <http://web.archive.org/web/20110628002406/http://www.premier.vic.gov.au/media-centre/media-releases/1195-fixing-myki-to-get-victorias-transport-ticketing-system-back-on-track-.html>

41. <http://translink.com.au/sites/default/files/assets/resources/tickets-and-fares/visitor-information/visitor-pack-brisbane.pdf>

42. <http://translink.com.au/tickets-and-fares/seeq-card>

43. [http://translink.com.au/goexplore?utm\\_source=translink-gc&utm\\_medium=primary-tile&utm\\_content=%2410-go-explore&utm\\_campaign=go-explore](http://translink.com.au/goexplore?utm_source=translink-gc&utm_medium=primary-tile&utm_content=%2410-go-explore&utm_campaign=go-explore)

44. <http://gcshuttle.com.au/freedom-pass/>

45. <http://ptv.vic.gov.au/tickets/myki/myki-visitor-value-pack/>

46. <http://www.tfl.gov.uk/travel-information/visiting-london/visitor-oyster-card>

47. <http://www.tfl.gov.uk/fares-and-payments/replacements-and-refunds/oyster-refunds-and-replacements>

48. <http://ezlink.com.sg/singapore-tourist-pass>

**Amsterdam:** GVB unlimited travel day tickets (€7.50) and multi-day tickets (up to €32) are available as either a disposable smartcard or as a product on an OV-chipkaart<sup>49</sup>. The “I amsterdam City Card” provides unlimited use of GVB services for one, two or three days and includes free / discounted fees at selected tourist attractions and services<sup>50</sup>. The Amsterdam & Region Day Ticket can be purchased for €13.50 or added to an ‘I amsterdam’ City Card for €10, for travel on services that extend beyond Amsterdam. Visitors travelling to/from Amsterdam Airport (Schiphol) may purchase an Amsterdam Travel Ticket, valid for one, two or three days<sup>51</sup>.

#### 4.2.3 Temporal pricing

In January 2015, London Underground scrapped their off-peak cap – passengers can still access off-peak fares, but are now bound by the regular cap. The removal of the off-peak cap

coincided with a reduction in the regular daily fares cap, with the intention of these changes combining to be revenue-neutral<sup>52</sup>. Passengers who make a combination of peak and off-peak journeys are now bound by the peak fares cap; however they may continue to pay less than this amount if all journeys are taken during the off-peak. This amendment to the fare rules means that passengers are encouraged to avoid both the morning and evening peak periods, whereas previously passengers could access discounted travel in the evening peak if they had not travelled in the morning peak.

Table 5 provides some examples of cities across the world that also offer peak/off-peak differential pricing, with discounts generally ranging from 8% - 53%, with Singapore providing an example of free fares for early morning travellers.

**Table 5: Temporal pricing schemes internationally**

CITY / JURISDICTION	OFF-PEAK DISCOUNTS (VS PEAK)	WEEKEND DISCOUNTS (VS WEEKDAY)
Washington, D.C.	18-39% (0930-1500 and after 1900) <sup>53</sup>	18-39% (until midnight, then full fares until close)
Los Angeles	53% (Local fares, seniors only, 0900-1500 and after 0700) <sup>54</sup> 30% (Silver line/Express bus, seniors only, 0900-1500 and after 1900) <sup>55</sup>	53% (Local fares, seniors only) 30% (Silver line/Express bus, seniors only)
Vancouver	Up to 50% (\$2.75 max fare after 1830) <sup>56</sup>	Up to 50% (\$2.75 max fare)
Singapore	100% (free exit at central MRT stations prior to 0745) <sup>57</sup> SG\$0.50 (exit at central MRT stations between 0745-0800) <sup>57</sup>	
Santiago, Chile	8-15% (0630-0700, 0900-1800, 2000-2045) ("Normal" vs. "Rush Hour" fares) 11-15% (0600-0630, 2045-2300) ("Low" vs. "Rush Hour" fares) <sup>58</sup>	8-15% ("Normal" vs. "Rush Hour" fares)

49. <http://en.gvb.nl/gvb-dag-meerdagenkaart>

50. <http://www.iamsterdam.com/en/visiting/i-amsterdam-city-card/benefits-of-the-i-amsterdam-city-card>

51. <https://www.ns.nl/producten/en/uitleg-overige-producten/p/amsterdam-travel-ticket>

52. [https://www.london.gov.uk/sites/default/files/MD1418%202015%20Fares%20for%20submission%20\(signed\)%20PDF.pdf](https://www.london.gov.uk/sites/default/files/MD1418%202015%20Fares%20for%20submission%20(signed)%20PDF.pdf)

53. <http://www.wmata.com/fares/?forcedesktop=1>

54. <https://www.metro.net/riding/fares/#off-peak>

55. <https://www.metro.net/projects/silverline/>

56. <http://www.translink.ca/en/Fares-and-Passes/Single-Fares.aspx>

57. <http://www.lta.gov.sg/content/ltaweb/en/public-transport/mrt-and-lrt-trains/travel-smart/for-commuters.html>

58. <http://www.metrosantiago.cl/guia-viajero/tarifas/en>

## CASE STUDIES OF SUCCESSFUL OR UNIQUE TEMPORAL PRICING SCHEMES IN OTHER CITIES

**London:** Research conducted relating to differential pricing in London confirmed that passengers making longer journeys are less sensitive to price (i.e. lower elasticity)<sup>59</sup>. This change in elasticity has been attributed to a relative drop in competition from alternative modes. This research informed price setting, whereby London's approach to peak pricing involves the size of the peak-period premium rising with distance travelled. For example, a Zone 1-2 peak single has a 21% premium versus the off-peak fare, with the differential increasing to 28% for a Zone 1-4 trip, and a further increase to 42% for a Zone 1-9 trip. Additional research of peak versus off-peak fare differentials in London showed that a 10-30% increase in peak fares could reduce demand for these services by 4-11%. Passenger surveys in 2007 showed that passengers with lower incomes were less likely to have flexible working arrangements that would allow them to access discounted fares outside of peak times<sup>60</sup>.

**Singapore:** LTA introduced free pre-peak travel on its MRT rail network in 2013. Passengers exiting the system at any of the 18 designated inner city stations prior to 0745 are not charged a fare, while those exiting between 0745 and 0800 receive a SGD 50 cent discount. The scheme was extended in May 2014, with analysis to that date revealing that 7% of passengers had shifted their travel from the peak period<sup>61</sup>. This means that for every train commuter who travels in the pre-peak hour of 0700 to 0800, there are now 2.1 travellers who travel in the peak hour of 0800 to 0900, compared to 2.7 before the Free Pre-peak Travel scheme.

The ability to access free early travel is limited, including those who have flexible working arrangements or those who commence work at earlier hours (e.g. tradespeople). LTA surveyed passengers who continued to travel in the peak, with two thirds of respondents stating they had not shifted their travel because they did not have flexible working arrangements.

### *Recommendation 5:*

*Whilst the offering of off-peak fares is welcome for those customers whose travel is discretionary in nature (including tourists), careful consideration needs to be given to the level of discount offered as well as the timing of the discount. This is particularly the case where the aspiration is for fares to be used as a demand management tool*

59. London Underground Research note U(31), Disaggregation of Underground Fare and Service Elasticities'

60. Faber Maunsell | AECOM, Demand Management Techniques – Peak Spreading (2007)

61. Land Transport Authority Press Release: Extension of Free Pre-Peak Travel by One Year (at: [http://www.lta.gov.sg/apps/news/page.aspx?c=2&id=e96f7b3a-67dd-4588-9fd9-d115472cf9b0#\\_ftn1](http://www.lta.gov.sg/apps/news/page.aspx?c=2&id=e96f7b3a-67dd-4588-9fd9-d115472cf9b0#_ftn1) )





## 4.3 FUTURE POLICY REFORM

### 4.3.1 Core products offered to customers

Only Melbourne and Adelaide have retained the option to purchase longer term periodicals (in both cases a monthly pass is available), which are loaded onto a customer's smartcard.

Given the transaction cost of purchasing and loading a fare product, it is difficult to see the rationale for sustaining such fare products, particularly when the value delivered by such products can be straightforwardly delivered via fare capping, which is extensively used in Sydney, South East Queensland and Canberra.

Our investigations have shown that even where smartcard systems are well established and card uptake among users is high, the vast majority of operators still offer a "distress" single ticket option for irregular travellers and tourists. The customer proposition in Melbourne is relatively weak in this regard, especially in the context of the initial cost of myki being non-refundable.

### 4.3.2 Products – tourists and occasional users

The examples of tourist specific products identified suggest no great commonality of features, beyond the offering of promotional / discount offers targeted at tourists and visitors.

As shown in some of our examples, a regular (i.e. commuter) product may be cheaper for the tourist market (this will be especially relevant if the promotional / discount offers provided are of limited interest to particular visitors).

With this in mind, there may be a case for focussing on simplifying the existing (core) product offering and marketing this to all users, with a reduced focus on products and third-party offers specifically focussed at tourists and occasional users. Simplification (including reducing the number of products offered) would have potential benefits for all current and potential users of the public transport system.

5 FARE LEVELS



## 5 FARE LEVELS

Although both international and interstate comparisons are difficult to make, relative to minimum wage levels, Australian fare levels would appear to be relatively low compared to many international cities, notably London. There are significant variations in fare levels across Australian cities with South East Queensland and Sydney at the higher end and Canberra and Hobart at the lower end of the range, again based on the relativity between minimum wage levels and the fare for the average trip length in each jurisdiction.

Variations in fare levels according to origin and destination tend to be relatively unsophisticated in Australian cities, with examples restricted to airport rail stations in Sydney and Brisbane. This would appear to be an area of untapped opportunity for all Australian jurisdictions.

The application of time-of-pricing is tied to reduced early AM and inter-peak fares relative to morning and evening peak fares. These discounts typically range from 20% to 30% relative to standard smartcard fares. Melbourne offers free early AM travel before 0700. The Melbourne “early bird” scheme has had only limited success in shifting customers out of the morning peak, which is a reflection of prevailing fare elasticities.

Over time it might be expected that a combination of time-of-day/origin-destination pricing could attract attention as a potential means of managing peak period demand, particularly for our busiest CBD stations.

There is relative uniformity across Australian cities in terms of concession availability and associated discounts, with discounts typically ranging from 35% to 70%.

### 5.1 CURRENT STATE

There are multiple dimensions that need to be addressed in any discussion of fare levels including the “headline” fare level, variations in fare levels according to trip origin and destination, time-of-day and variations according to customer type.

In addition, it is necessary to consider the positioning of public transport fare levels against the private car alternative. Given the market failure inherent with the use of the private car tied to both congestion and pollution costs, consideration can also be given to “socially optimal public transport fares” that have the effect of optimising the use of both private cars and public transport. This has been, and continues to be, a key consideration for IPART (for example) in developing its recommendations for Sydney public transport fares.

#### **Overall level of fares and affordability**

There are many different ways in which the affordability of public transport fares can be measured. This will generally rely on a quantifiable metric, given that customers will generally always consider fares to be expensive if they are asked as part of a survey.

Comparison across jurisdictions is complicated by factors including service quality (for example, the number of services per hour), currency levels and exchange rates, and different travel patterns, fare structures and products.

A recent report<sup>62</sup> attempted to normalise fares by comparing them to the minimum wage in that jurisdiction. This approach has many merits and should produce a reasonable comparison, but even this metric is open to interpretation (for example, the minimum wage applied to the London data is the UK minimum wage, yet London earnings are far higher than the rest of the UK)<sup>63</sup>.

Table 6 demonstrates this affordability of fares, comparing the results for Australia against a number of global peers based on average trip lengths in each jurisdiction. It shows that:

- London tube fares present as a significant outlier compared to the other cities/modes in the sample; and
- There is relatively wide variation across Australian cities with persons on the minimum wage being required to work 50% - 90% longer in South East Queensland and Sydney to pay for an average fare compared to the likes of Canberra and Hobart.

#### 5.1.1 Variation in fare according to origin and destination

Variations in fare levels according to journey origin and destination continue to be relatively unsophisticated in major Australian cities. With the exception of airport stations the only variation in fares according to journey origin and destination reflects the overarching fare structure (i.e. where distance-based or zonal structures are in place).

#### 5.1.2 Variation in fare according to time of day

The application of public transport time-of-day pricing in Australian cities has been tied to reducing early AM or inter-peak fares relative to fares charged during the morning and evening peaks. The introduction of discounted or free early AM fares has been directed at securing trips that would otherwise have been made during the morning peak.

Sydney offers a significant off-peak discount for trains, but no discount at all for off-peak travel on other modes. All other cities apply the same level of discount across all modes (there are minor exceptions in Melbourne<sup>64</sup> where travel before 0700 on trains is free of charge, and where trips made after 6pm – where no other travel has been made that day – are capped at the 2 hour fare).

**Table 6 - Affordability of public transport fares**

RANK	CITY	MINUTES REQUIRED
1	London (Tube)	86.77
2	Auckland	39.05
3	Berlin	38.12
4	Tokyo	33.46
5	New York	32.91
6	Chicago (Train)	32.73
7	Portland	32.43
8	Vancouver	32.2
9	Toronto	30.55
10	South East Queensland	30.19
11	Glasgow	29.54
12	Sydney (Bus)	29.16
13	Chicago (Bus)	29.09
14	London (Bus)	27.69
15	Sydney (Train)	27.21
16	Paris (Bus)	25.18
17	Jakarta	24.89
18	Seoul	24.73
19	Melbourne	24.36
20	Perth	24.23
21	Los Angeles	23.33
22	Paris (Metro)	22.67
23	Adelaide	21.97
24	Darwin	19.44
25	Canberra	18.86
26	Hobart	16.07
27	Wellington	13.51
28	Beijing (Rail)	10.65
29	Beijing (Bus)	10.65

Source: See footnote 62

62. <http://ninesquared.com.au/wp-content/uploads/2015/10/2015-Fare-Benchmarking-Final-Report.pdf>

63. <http://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/2015provisionalresults> - "In April 2015, London topped the regional list for median earnings for full-time employees, at £660 per week. Employees here earned £108 more per week than the next highest, the South East (£552), and £132 more than the median for the whole of the UK (£528)"

64. Metropolitan Melbourne offers no variation in fares by time of day, though regional travel (such as V/Line) does



Where a discount is offered, it is generally between 20% (Brisbane and Canberra) and 30% (Sydney Trains). The notable exception is Adelaide where the discount is 45%.

The rationale for inter-peak discounts has been to increase the attractiveness of using public transport where significant excess capacity exists and hence the incremental cost of carrying an additional customer is effectively zero. The success of such pricing lies in customers re-timing their trips away from the morning or evening peak or entirely new trips being undertaken in off-peak periods.

Melbourne's "early bird" scheme offering free travel before 0715 has only had limited success in shifting customers out of the morning peak (studies have suggested that peak demand reduced by 1.2% to 1.5%<sup>65</sup>). Whilst 50% of customers stated that they would consider travelling earlier and 20% travelling later, most would only shift by a maximum of 30 minutes. In this context, the cut-off for free travel at 0715 may well be too early to shift significant numbers from the morning peak. This accords with our recommendation made in section 4.2.3.

### 5.1.3 Variation in fare according to frequency of travel

As discussed in section 4 there is extensive use of capping applied to smartcard travel in Australia. However, only Sydney Trains and Brisbane offer a trip cap that attempts to replicate traditional commuter periodical products. Based on 10 peak trips per week, Brisbane offers a discount of 10% compared to standard fares (i.e. "9 and free"), while the effective discount in Sydney was 20% as at July 2016 (i.e. "8 and free"). Significantly, both jurisdictions have recently announced plans to move to a proposition of a 50% discount after 8 journeys are completed (see Section 4.2.1).

Melbourne still offers period products such as weekly, monthly and annual passes via products loaded onto myki.

### 5.1.4 Variation in fare according to concession type

All Australian cities support a range of concession discounts to support the mobility needs of the transport disadvantaged, as described in Table 7 below.

**Table 7 - Concession discounts offered by jurisdiction, as at July 2016**

JURISDICTION	DETAILS OF DISCOUNT OFFERED
Sydney Melbourne Brisbane / South East Queensland	All offer 50% discount on the Full Fare (for Students, Seniors, Concessions)
Perth	<ul style="list-style-type: none"> <li>Between 60% discount for Seniors, Children</li> <li>Flat fare of 60c brings discount between 62% and 94% for Students</li> </ul>
Adelaide	<ul style="list-style-type: none"> <li>Between 100% (free off-peak) and 51% discount for Seniors</li> <li>Between 9% and 51% discount for school age Children</li> <li>Between 39% and 67% discount for Students</li> </ul>
Hobart	<ul style="list-style-type: none"> <li>Between 31% and 67% discount for Adult Concession</li> <li>Between 50% and 76% discount for Child/Student concession</li> </ul>

Source: Public transport authority websites, as at July 2016

There is a relatively broad consensus around the discount on fares being in the range of 30% to 70%, with a small number of outliers. By offering a flat fare of 60c for all Student trips, Perth offers a generous discount of almost 100% on the highest 9 zone fare of \$12.40.

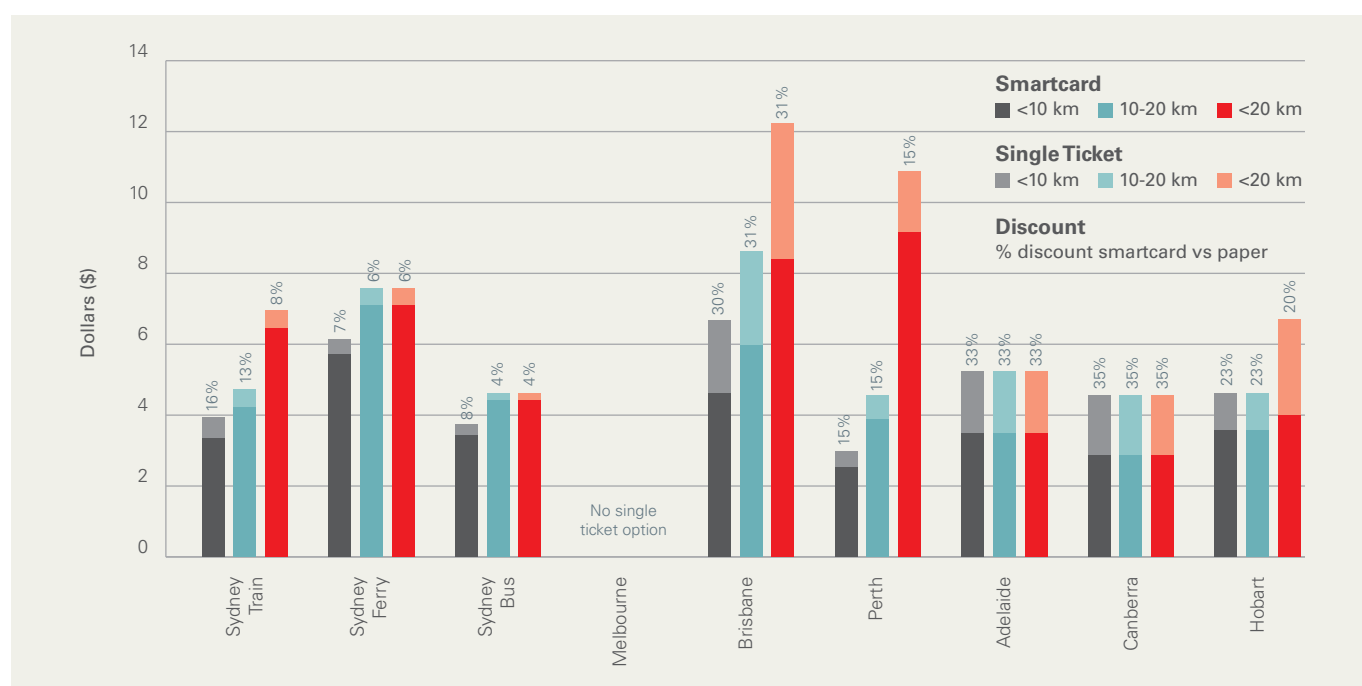
Adelaide combines time-of-day effects with concession discounts with the aim of inducing additional demand outside of the peaks. The Seniors Metrocard costs \$1.75 in the peak (a discount of 51%) but is offered free in the inter-peak (0901 – 1500 Monday to Friday) and on Sundays.

65. Transportation Research Record: Journal of the Transportation Research Board, No. 2146

### 5.1.5 Variation in fare by media

In all Australian jurisdictions where more than one media is offered, this is used to offer a pricing discount for smartcard when compared to paper tickets. In Sydney, the level of discount varies by the distance travelled, as shown in Figure 12 below.

**Figure 12 - Discounting on smartcard fares, as at July 2016**



Note: No single paper ticket option in Melbourne Metropolitan region  
Source: Public transport authority websites, as at July 2016

### 5.1.6 Other variations in fare

Apart from concessions, the only public transport pricing policy clearly targeted at a specific market segment is that associated with the use of airport stations at Sydney and Brisbane Airports. In both cases, a premium pricing model was an integral component of the strategy to support the delivery of the infrastructure under a private – public partnership model.

At Sydney, agreement was made in 2014 between NSW government and Airport Link that Opal would be accepted for travel to the airport, and that fares would be capped for those travelling to the airport more than once a week. This meant that whilst a premium pricing model still exists, significant fare reductions are now possible for commuters to and from the airport<sup>66</sup>.

In Brisbane, the premium pricing model is tempered by the ability to reduce the fare through advance booking. A number of pre-travel discounts are available, as shown in Table 8 below.

**Table 8 - Brisbane Airtrain fares, as at July 2016**

	ONE-WAY FARE	% DISCOUNT
Full Adult Fare	\$17.50	N/A
Online Fare (on day or day before travel)	\$16.62	5%
Online Fare (2 to 6 days before travel)	\$15.75	10%
Online Fare (7 or more days before travel)	\$14.87	15%

Source: Brisbane Airtrain websites, as at July 2016

66. <http://www.transport.nsw.gov.au/media-releases/nsw-government-signs-10-million-agreement-ensuring-regular-airport-customers-can-save>

Melbourne has no train connection to the airport but does have the dedicated Skybus offering. This is marketed as a premium bus offering, with regular departures, a new fleet (including the recent launch of double deckers), and free WiFi. A single fare between Southern Cross and the airport costs \$19. Whilst Skybus is not integrated with myki or directly comparable, as a reference point, the myki fare for the equivalent journey would be \$3.90. From a marketing perspective, Skybus fares are “about a third of the cost of a taxi<sup>67</sup>”.



67. <https://www.skybus.com.au/skybus-express-service/>



## CASE STUDY: PTV COMMUTER CLUB

PTV offers a 10% saving on annual myki passes when they are procured through its ‘myki Commuter Club’ program. This allows organisations to buy the passes (on behalf of their staff or members) at the discounted rate and then pass on to the end customer. The program is not open to individuals and the onus is on the organisation to reach out to PTV (after signing up a minimum of 10 staff) to set up an agreement.

There is some flexibility in how the Commuter Club myki is paid for, with options including salary packaging and one-off payment. However the organisation can also choose whether they pass on all or part of the discount, and some organisations may deduct a handling fee. For new users, Commuter Club is additionally attractive through the waiver of the normal \$6 card fee.

Clearly the commuter club has the potential to generate new users to public transport through the sizable fare discount (on what is already, on a per day basis, the cheapest product for regular users) and / or additional trips through generation associated with placing an annual pass in the hands of customers who might otherwise pay purely for the trips they intended to take.

### 5.1.7 Fare elasticities

Fares structures, and more commonly fares themselves, are not static. Fares may be regularly increased to reflect changes in inflation and operating costs, or reduced in an attempt to elicit a rise in patronage. Fare structures may be reviewed to reflect a change in fares policy, for example to improve farebox cost recovery or provide a more equitable structure. Authorities responsible for setting fares need an understanding of how customers will react to changes in fares. The most common way of predicting such changes in patronage is achieved through applying fares elasticities to the proposed fare changes.

Ideally, fares elasticities should be calculated in detail (by mode, distance, customer segment, etc.) to reflect the unique conditions in each jurisdiction. There are a number of reasons why this is not always the case, including:

- Complexity – accurately reflecting the variations in fare elasticities across each component of the fares structure is not a straightforward task to do properly; and
- Cost – the time and labour required to undertake extensive primary research can be a prohibitive factor.
- Naturally, there is a temptation to simplify the task of determining fares elasticities, with one such option being to use external benchmarks. These may be appropriate to a degree, but a number of factors must be properly considered if this approach is adopted, including but not limited to:
  - Modal competition – this can be very city specific, with the biggest competition coming from private car travel which is influenced by levels of car ownership, congestion levels, and car ownership costs;
  - Spatial variation – the density of city's population and intensity of employment/ activity centres; and
  - Overall cultural attitudes to public transport – this can be in comparison to private travel options and even across public transport modes, e.g. different perceptions of rail versus bus services.

A potential source of benchmark elasticity information comes via the Australian Transport Council (ATC)<sup>68</sup>. These are general, high level indicators and are now somewhat dated (last published in 2006). As such, they may not fully reflect the current economic landscape and public attitudes.

## 5.2 OBSERVED TRENDS

### 5.2.1 Variation in fare according to origin and destination

Hong Kong MTR fares provide an example of the way in which fare levels can be managed on an origin-destination basis to reflect the competitive positioning of public transport and, implicitly, prevailing fare elasticities. Line based pricing is used, recognising the willingness and ability of passengers to pay based on different journeys, service quality, economic conditions, and competition from alternative modes.

### 5.2.2 Variation in fare according to time of day

Many jurisdictions vary fare by time of day (typically via a peak / off-peak differential), generally ranging from a 20% to 50% discount.

As well as smart discounts (e.g., reduced fares via SVT), there are a number of different ways in which the discount can be delivered. In Berlin, two different off-peak products are offered:

- The monthly '10-Uhr-Karte' can be used between 10:00 and 03:00 the following day on Monday to Friday, and all day on Saturdays, Sundays and public holidays.
- The 'Freizeitkarte' allows existing annual pass holders and students (with a minimum of ten months ticket validity) to access the VBB overall network (includes Berlin and Brandenburg areas). The ticket is valid between 14:00 and 03:00 the following day (Monday to Friday) and all day on Saturdays, Sundays and public holidays.
- Tokyo's Metro offers off-peak discounts based on a multi-ride system:
  - A book of 12 tickets for the price of 10 (i.e. 17% discount) is available to customers travelling between 10:00 and 16:00 on Tokyo's Metro
  - A greater discount (14 tickets for the price of 10 i.e. 29% discount) is offered to passengers travelling on weekends

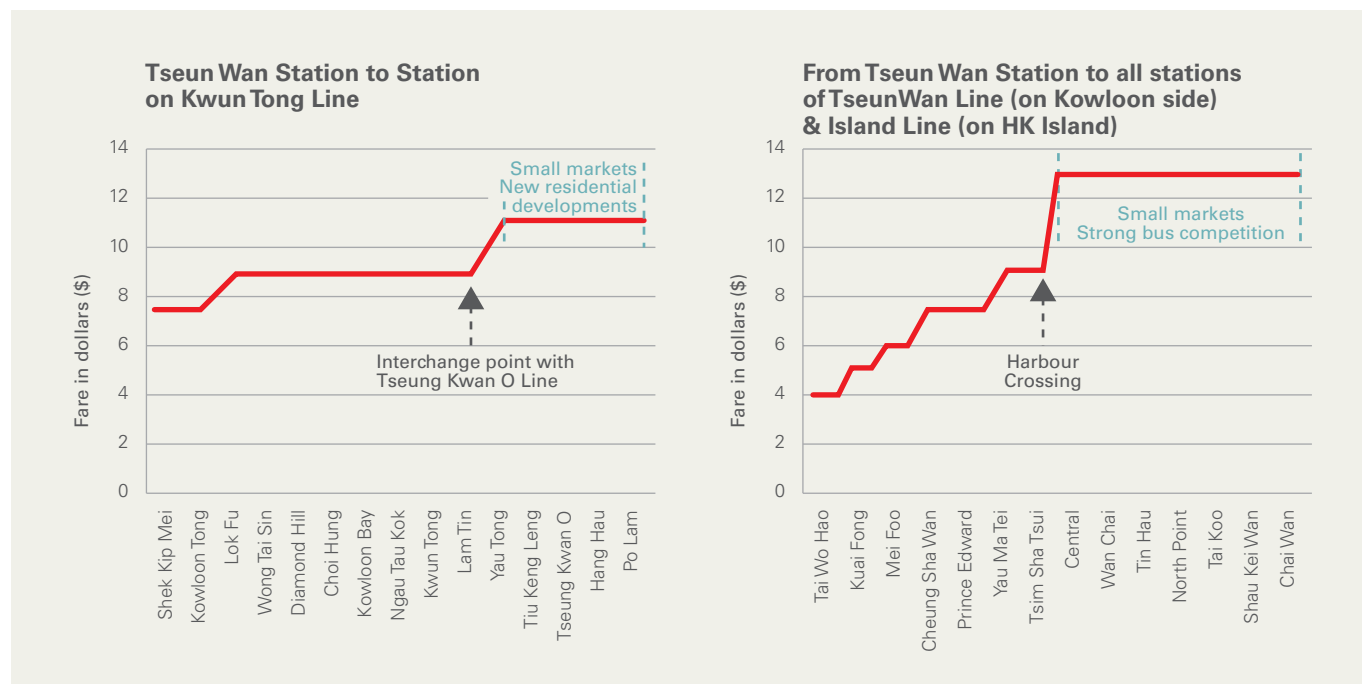
### 5.2.3 Variation in fare according to frequency of travel

Capped fares are offered at a relatively limited number of jurisdictions outside of Australia.

68. [http://www.transportinfrastructurecouncil.gov.au/publications/files/National\\_Guidelines\\_Volume\\_4.pdf](http://www.transportinfrastructurecouncil.gov.au/publications/files/National_Guidelines_Volume_4.pdf)



**Figure 13 - Illustration of price discrimination in Hong Kong**



Source: PwC analysis

**Table 9 - Capped fares outside of Australia**

CITY	MODE / OPERATOR	DAILY	WEEKLY	MONTHLY
London	Metro/TfL	Daily capping provides 7% discount on paper product	Caps at the same price as a 7 day weekly Travelcard <sup>69</sup>	N/A
Dublin	Luas/TfL	Capped at AU\$9.50 <sup>70</sup>	Capped at AU \$34.90 <sup>70</sup>	N/A

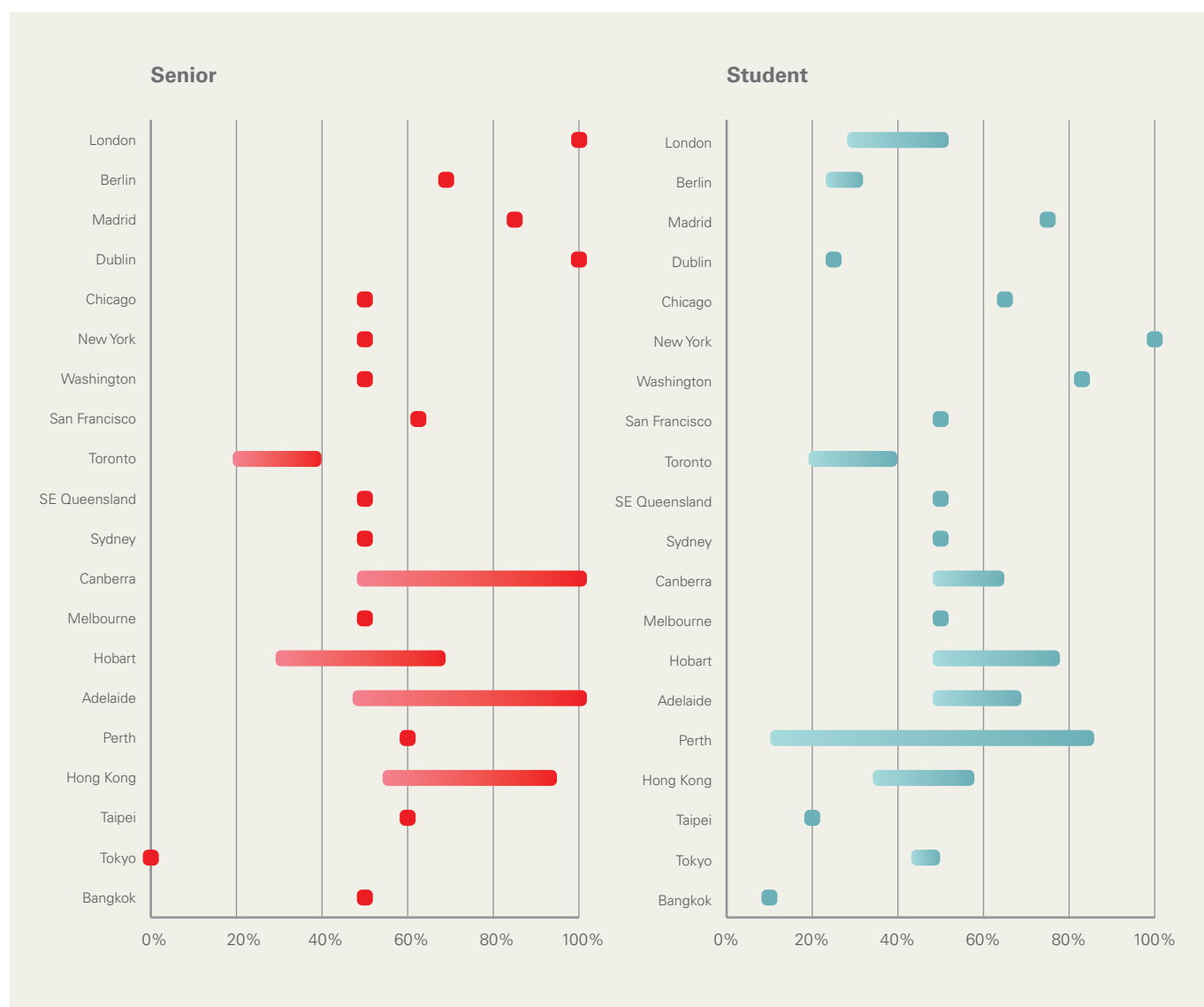
69. Only available for EMV payments, caps on a Monday – Sunday week, for travel involving zone 1 (<https://tfl.gov.uk/fares-and-payments/contactless/is-contactless-for-me>)

70. <https://www.luas.ie/leap-card-fares.html>; exchange rate from xe.com as at 20/08/2016

#### 5.2.4 Variation in fare according to concession type

The majority of operators offer discount for concession holders. There is, however a very wide range – from those operators who do not offer a discount (0%), to those offering free fares (100%). Figure 14 below shows that there is a degree of uniformity around 50% as the discount level offered for concessions, by comparing the discount rate of Australian jurisdictions with international benchmarks.

**Figure 14 - Level of discount offered for senior and student concessions**



Source: Operator websites

5.2.5 Other variations in fare

The premium pricing approach discussed above for airport services is relatively common in other jurisdictions. One major difference is that generally in other jurisdictions there are competing (slower) modes that the customer can choose to take if they are not prepared to pay the premium associated with the quicker service. Table 10 below provides a selection of comparators from the United Kingdom.

Table 10 - Price differential of airport services in the United Kingdom

AIRPORT	REGULAR SERVICE AND COST	PREMIUM SERVICE AND COST	PRICE DISCOUNT OF REGULAR SERVICE VS PREMIUM
London Heathrow	London Underground £5.10 to Zone 1 with Oyster (peak single)	Heathrow Express £21.50 for single to Paddington (from ticket office or machine)	76% cheaper
London Gatwick	Southern to London Victoria £15.30 (Anytime Day Single)	Gatwick Express £19.90 to London Victoria	23% cheaper
London Stansted Airport	National Express coach / £12.00 single to London Victoria Coach Station	Stansted Express £19.00 to London Liverpool Street (Standard Class Single)	37% cheaper

5.2.6 Fare elasticities

As suggested above insight from external jurisdictions can sometimes be of limited value, because of the way that elasticities reflect the specific circumstances of the jurisdiction that they relate to (for example, the number and quality of competing modes and the level of service quality).

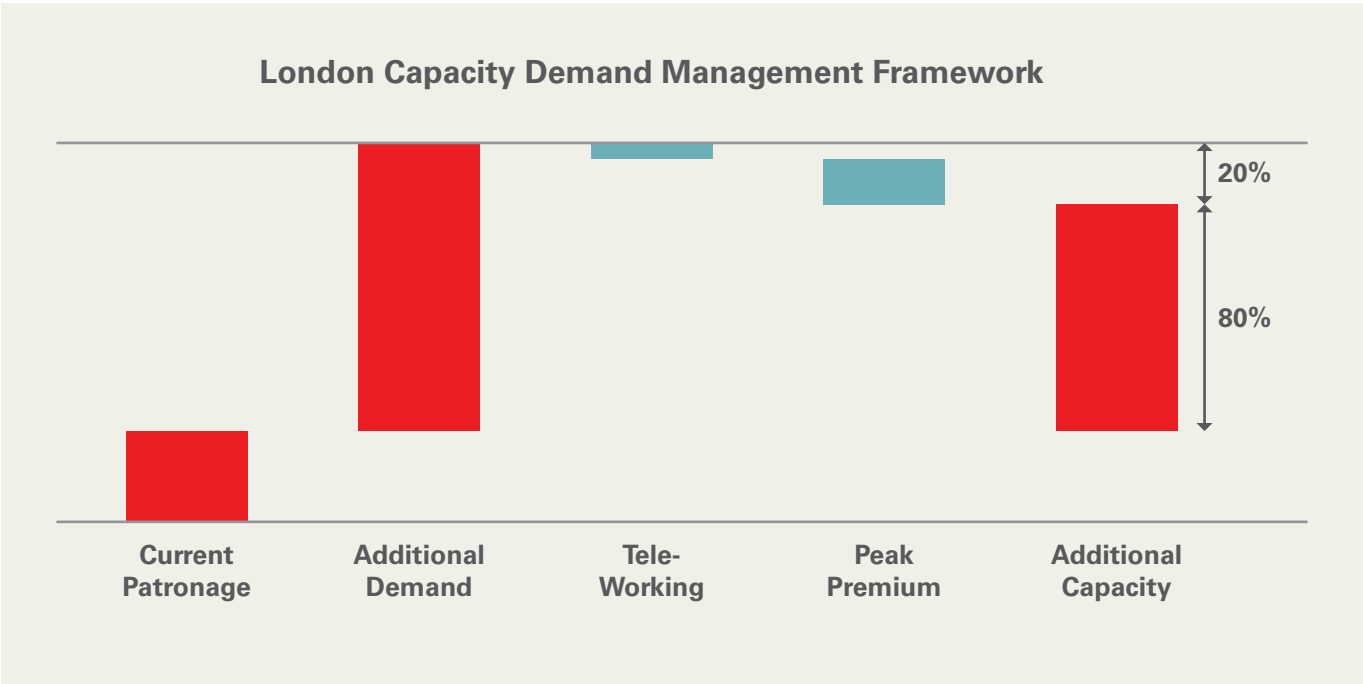


5.3 FUTURE POLICY REFORM

Where pricing differentials are used in Australia, it is through a discounted off-peak (rather than an increased, or premium priced, peak period). Over time, it might be expected that a combination of time of day/origin-destination pricing could attract attention as (for example) a potential means of managing peak period demand at Australia’s busiest CBD stations – as opposed to a coarse peak – off peak pricing model that it not specifically targeted at public transport service or infrastructure pinch points.

In London, a time-of-day differential has been achieved by applying a peak period surcharge (see Figure 15 below).

Figure 15 - London Underground pricing differentials



Source: PwC analysis

Peak pricing has been used as a way to help solve endemic capacity problems in London. Stated preference research revealed that a 25% peak premium could reduce peak hour demand by 4% for short-distance rail commuting. Peak pricing varies by types of market, including journey purpose (commuting, business, and leisure), income, occupation and journey distance. Switching travel practices requires there to be capacity in shoulder peak.

## 6 MEDIA, TECHNOLOGY AND SALES CHANNELS





# 6 THE POLICY CONTEXT AND CHALLENGES

## 6.1 CURRENT STATE

### 6.1.1 Media

Of Australian jurisdictions using smartcard technology, all bar Melbourne offer an additional alternative media (either paper or magnetic stripe). However, it should be noted that Sydney withdrew all remaining magnetic stripe tickets from the 1st of August 2016. Unlike Melbourne, however, it will be possible to purchase a single trip Opal ticket as a “last resort” for infrequent public transport customers.

**Table 11 - Media offered in Australian smartcard jurisdictions**

JURISDICTION	PAPER	MAGNETIC STRIPE	SMARTCARD
Sydney	×	×	✓
Melbourne	×	×	✓
Brisbane / South East Queensland	✓	×	✓
Perth	✓	×	✓
Adelaide	×	✓	✓
Hobart	✓	×	✓

### 6.1.2 Channels and channel strategies

In the context of public transport fares and ticketing, channels are usually grouped into two categories:

- On-system – the customer must interact with the physical transport environment (ticket office sales and ticket vending machines (TVMs), driver interaction on buses)
- Off-system – any means by which the customer can procure travel without interacting with the physical transport environment (third party retailers, online sales, auto-top (where value is added to a smartcard when credit drops below a certain level), telephone sales, postal sales, etc.)

Use of off-system sales has major benefits for both customers and transport operators. For customers, they are able to eliminate time spent queuing for tickets / products at the station, and off-system sales are generally associated with improved ability to manage the transaction at their convenience (that is, they are in control of where and when they purchase transport). Off-system channels are typically associated with other benefits such as an improved ability to access information both about the transport system (e.g., travel alerts) as well as about their own travel (trip history, fare balance on SVT, expiry date of products, etc.).

For transport operators, moving transactions off-system can also improve the customer experience by reducing the amount of time they spend on the system to pay for and complete their journey, including reduced queues for those who continue to make purchases on-system. Off-system channels are cheaper to operate and therefore offer the potential for cost savings. Table 12 summarises the sales channels offered by jurisdiction in Australia.

Given these benefits, the use of price differentials to influence customers’ choice of ticket media, e.g. higher prices for single tickets to drive smartcard take-up, is commonplace among ticketing systems. A similar approach may also be adapted to influence customers’ choice of sales channel, offering discounts/additional travel credit for the use of off-system channels. While there are relatively few examples of this practice, Australia provides two of the leading examples in Perth and Canberra.

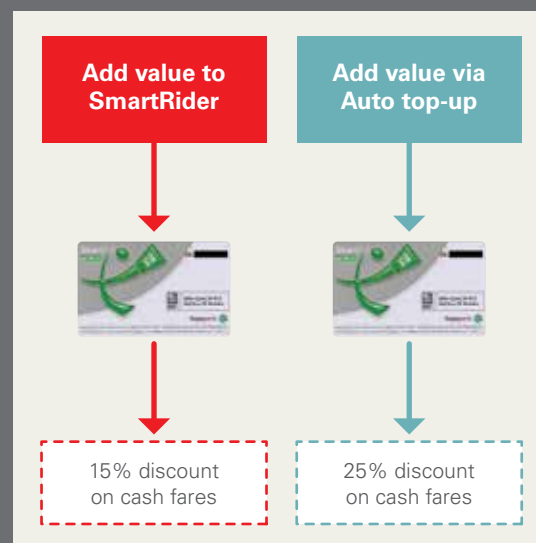
**Table 12 – Sales channels offered by jurisdiction**

JURISDICTION	ON-SYSTEM CHANNELS	OFF-SYSTEM CHANNELS
Sydney	<ul style="list-style-type: none"> <li>• Ticket offices (stations, ferry wharves)</li> <li>• TVMs</li> <li>• On board (Bus, Ferry, Light Rail)</li> </ul>	<ul style="list-style-type: none"> <li>• Opal website</li> <li>• Auto top-up</li> <li>• Third party (Opal retailers)</li> <li>• Opal kiosks</li> <li>• Call centre</li> </ul>
Melbourne	<ul style="list-style-type: none"> <li>• Ticket offices (stations)</li> <li>• TVMs</li> </ul>	<ul style="list-style-type: none"> <li>• Third party (7-11)</li> <li>• Myki website</li> <li>• Auto top-up</li> <li>• Call centre</li> </ul>
Brisbane / South East Queensland	<ul style="list-style-type: none"> <li>• Ticket office (stations, G Link, busway stations)</li> <li>• TVMs</li> <li>• On board (buses exc. Brisbane Transport, Brisbane City Council Ferries)</li> </ul>	<ul style="list-style-type: none"> <li>• gocard website</li> <li>• Auto top-up</li> <li>• Third party (7-11 and selected newsagents)</li> <li>• Call centre</li> </ul>
Perth	<ul style="list-style-type: none"> <li>• TVMs at some stations</li> <li>• On board (buses and ferries)</li> </ul>	<ul style="list-style-type: none"> <li>• Auto top-up</li> <li>• Third party (authorised retail outlets)</li> <li>• Transperth info centres</li> <li>• BPAY</li> </ul>
Adelaide	<ul style="list-style-type: none"> <li>• TVMs</li> <li>• On board</li> </ul>	<ul style="list-style-type: none"> <li>• Infocentres</li> <li>• Third party (Metrocard agents)</li> <li>• Call centre</li> <li>• Online</li> <li>• Auto top-up</li> </ul>
Hobart	<ul style="list-style-type: none"> <li>• On board</li> </ul>	<ul style="list-style-type: none"> <li>• Metro shop or depots</li> <li>• Third party (Greencard agents)</li> <li>• Call centre</li> <li>• Online</li> <li>• Auto top-up</li> </ul>

## CASE STUDY: CHANNEL INCENTIVES IN PERTH

Passengers in Perth who use the SmartRider smartcard receive a 15% discount on standard cash fares. Transperth customers who set up autoload, adding value from a credit card/bank account when their travel credit falls below a set threshold, receive a 25% discount on standard cash fares (broadly a 12% discount from standard SmartRider fares)<sup>71</sup>.

**Figure 16: Price incentives in Perth**



71. <http://www.transperth.wa.gov.au/tickets-fares/fares>

## CASE STUDY: CHANNEL INCENTIVES IN CANBERRA

In Canberra, autoload and BPAY are offered at a 5% discount to customers using BPAY and autoload. Incentivising these lower cost channels will offer operational benefits as well as reducing customer queue and transaction times.

### Cost of media

In a smartcard system, offering fully functional, long-life smartcards to occasional users can be costly. These costs can be offset if the user is incentivised to retain and re-use the card via a refundable deposit, or through a non-refundable charge.

**Table 13 – Smartcard cost – Australian cities and a selection of comparators**

	CITY	MODE / OPERATOR	INITIAL CARD DEPOSIT (IN AU\$) <sup>1</sup>	REFUND (IN AU\$) <sup>1</sup>	NET CARD COST (IN AU\$) <sup>1</sup>
Europe	London	Metro/TfL	9.31	9.31	0.00
	Paris	All modes/RATP	7.19	0.00	7.19
	Berlin	All modes/BVG	0.00	0.00	0.00
North America	Chicago	Metro/CTA	5.56	5.56	0.00
	New York	Metro/MTA	1.11	0.00	1.11
	Washington	Metro /WMATA	2.22	0.00	2.22
	San Francisco	Metro/BART	3.33	0.00	3.33
	Vancouver	SkyTrain/Transitlink	6.03	6.03	0.00
Australia	SE Queensland	All modes/Translink	10.00	10.00	0.00
	Sydney	All modes/ TfNSW	0.00	0.00	0.00
	Canberra	ACTION Bus/TfC	5.00	0.00	5.00
	Melbourne	All modes/PTV	6.00	0.00	6.00
	Hobart	Bus/Metro Tas	5.00	0.00	5.00
	Adelaide	All modes/Adelaide Metro	5.00	0.00	5.00
	Perth	All modes/ Transperth	10.00	0.00	10.00
Asia	Singapore	Metro/SMRT	4.48	0.00	4.48
	Hong Kong	Metro/MTR	6.63	2.21	4.42
	Tokyo	Metro/Tokyo Metro	5.18	5.18	0.00
	Bangkok	Metro/Bangkok Metro	2.82	2.82	0.00

Note: (1) AU\$ exchange rate is provided by xe.com on 16 September 2014.

Source: PwC Analysis

Many Australian cities have chosen the approach of a non-refundable deposit (a notable exception is Sydney, where a new Opal card comes at no cost). Where the deposit is non-refundable, in general the smartcard systems are offered alongside legacy magnetic stripe or paper ticketing systems (as discussed in section 6.1.1). This “combined technologies” approach has the potential to create confusion in the market and can limit other significant benefits of smartcards (speed, ease of use, management data) to only a small proportion of the market, but it does offer customers a choice compared to the sunk cost of smartcard. Melbourne is the notable exception – as per Table 13, myki has a non-refundable charge, and no alternative media is offered.

### New payment channels

New and emerging technologies bring additional opportunities for fare payment options. Customer expectations constantly change and increase with each new innovation, which is not just limited to the fares and ticketing space. Over 65% of Australians have a Smartphone and their use has increased rapidly in recent years<sup>72</sup>. One need only board a public transport service and observe the proportion of passengers using their mobile phones to recognise that this technology provides a great opportunity for both fare payments and real-time customer information.

Cashless transactions are also growing in popularity. EMV (Europay, MasterCard, and Visa) is the global standard for processing these payment transactions. Contactless cards utilising EMV standards (such as PayPass and PayWave) are becoming increasingly popular in Australia<sup>73</sup>.

A potential drawback of cashless systems is the need to manage the revenue risks associated with third party cards not capable of charging fares at the device in real time. EMV cards are read-only, hence all fare processing must be performed in the back office as part of regular reconciliation procedures – typically at the end of day. This read-only limitation also means that the device and system cannot establish, in real-time, whether the cardholder’s account has sufficient funds to pay their fare. This ‘first ride risk’ necessitates establishing a method of managing revenue risks (if material) between the operator and card issuer that will need to carefully consider a range of policy settings.

Depending on the fare structures that apply in a particular city, the contactless card customer may be required to pay a higher/default fare as a consequence of not having pre-purchased a ticket. As these cards do not contain personal travel information, users typically pay the full-fare rate regardless of their concession entitlement status.



### CASE STUDY: SYDNEY OPEN PAYMENT TRIALS.

In April 2016, TfNSW announced that trials of open payment systems (contactless payment with credit and debit cards) would begin in 2017. The trial would be a first for the southern hemisphere, and will provide a valuable test case for other Australian cities which may have been contemplating new payment channels. Open payments would continue to operate alongside Opal, as an enhancement to the system rather than a replacement.

72. <http://think.withgoogle.com/mobileplanet/en/>

73. Reserve Bank of Australia, The Changing Way We Pay: Trends in Consumer Payments, June 2014



### 6.1.3 Means of payment

Whilst the majority of payment mechanisms are welcomed by operators, the removal of cash as a payment option has obvious benefits. These include reduced costs of cash handling and banking, the elimination of the need to carry a float or for ticket machines to provide exact change, as well as a reduction in the potential for fraudulent activity associated with cash handling. Typically, it would also be expected that non-cash transactions would be quicker than cash, with knock-on benefits associated with reduced boarding times (especially for buses).

No Australian jurisdiction has completely removed cash as a payment option, although some limitations have been introduced. In Sydney, buses in the CBD are pre-pay only from 7am to 7pm, Monday to Friday, and some routes pre-pay only at all times.

In Melbourne, a customer must have a valid myki card before they can board a bus. However, top-ups are allowed on the bus (to a minimum value of \$1) via cash. Thus, despite the smartcard nature of myki, cash payments can still be a regular feature of bus travel.

## 6.2 OBSERVED TRENDS

### 6.2.1 Withdrawal of legacy media

As previously noted, Melbourne withdrew all legacy media when introducing myki. By contrast, the launch of Opal in Sydney was not associated with any initial removal of legacy media. By September 2014, Opal had been in place 18 months and at that point TfNSW announced a programme of retiring old paper tickets. This would allow further modernisation of the transport network<sup>74</sup>.

### 6.2.2 Channels and channel strategies

#### Examples of channel incentives

New York City's Metropolitan Transit Authority (MTA) offers MetroCard customers an 11% bonus on travel credit when they add a minimum of \$5.50 using their auto top-up function, "EasyPay"<sup>75</sup>. Beyond the auto top-up bonus, customers are encouraged to pre-purchase tickets through the application of a \$1 surcharge to purchase a new MetroCard at subway stations, but there is no charge to purchase a new card from off-system retailers<sup>76</sup>.

San Francisco's Bay Area Rapid Transit (BART) system's Clipper card gives customers access to a 6.25% discount on High Value Discount (HVD) tickets by using autoloan and a limited number of off-system programs. The HVD product is only available in denominations of \$48 (discounted to \$45) or \$64 (discounted to \$60), hence, the HVD is both a channel incentive and a top-up value incentive<sup>77</sup>.

74. See footnote 36

75. <http://web.mta.info/metrocard/EasyPayXpress.htm>

76. <http://web.mta.info/metrocard/mcCombinationValue.htm>

77. <https://www.clippercard.com/ClipperWeb/bart/faq.do>



**Table 14: London examples of changes to ticket office and TVM functions**

	WHAT CUSTOMERS DO IN THE FUTURE	WHAT CUSTOMERS DO NOW
<b>Find best value way to pay</b>	<ul style="list-style-type: none"> <li>• Staff with handheld device</li> <li>• Ticket machine</li> <li>• TfL website</li> <li>• Fares poster in ticket hall</li> </ul>	<ul style="list-style-type: none"> <li>• Ticket office</li> <li>• TfL website</li> <li>• Fares poster in ticket hall</li> </ul>
<b>Buy multiple Oyster cards in one transaction (via anAFM or MFM)</b>	<ul style="list-style-type: none"> <li>• Ticket machine (up to five oyster cards)</li> <li>• Visitor Information Centre (six or more)</li> </ul>	<ul style="list-style-type: none"> <li>• Ticket office</li> <li>• Ticket machine (multiple transactions)</li> </ul>
<b>Buy a paper ticket (single journey/day Travelcard)</b>	<ul style="list-style-type: none"> <li>• Ticket machine self service</li> </ul>	<ul style="list-style-type: none"> <li>• Ticket office</li> <li>• Ticket machine self service</li> </ul>
<b>Buy weekly or monthly Travelcard on Oyster (without registration)</b>	<ul style="list-style-type: none"> <li>• Ticket machine self service</li> <li>• TfL website</li> </ul>	<ul style="list-style-type: none"> <li>• Ticket office</li> <li>• TfL website</li> </ul>
<b>Buy journey extension</b>	<ul style="list-style-type: none"> <li>• Ticket machine self service</li> </ul>	<ul style="list-style-type: none"> <li>• Ticket office</li> </ul>
<b>Buy Network Rail paper season tickets</b>	<ul style="list-style-type: none"> <li>• NR ticket office</li> <li>• NR online</li> </ul>	<ul style="list-style-type: none"> <li>• NR ticket office</li> <li>• NR ticket office</li> <li>• NR online</li> </ul>
<b>Pay with company cheque</b>	<ul style="list-style-type: none"> <li>• Jan 2015 onwards - TfL no longer accepts cheques, refer customers to TfL website</li> </ul>	<ul style="list-style-type: none"> <li>• Ticket office</li> </ul>

### Retention of face-to-face channels

There will nearly always be a need to retain some level of face-to-face sales channels to cater for complex transactions or for those who are uncomfortable with/unable to use alternative channels. Operators will still seek ways to minimise this on-system demand; one way has been to increase the attractiveness of TVMs.

Many operators have tried to encourage use of TVMs to perform transactions that have traditionally been carried out via face-to-face channels. London is currently overhauling the functionality of its TVMs<sup>78</sup>, in order to reduce demand at ticket office windows, in combination with limiting the types of transactions available at the ticket office. Table 14 shows that purchasing paper tickets, buying multiple Oyster cards, or adding a weekly/monthly pass will be moved from the ticket office to TVMs. Additional functions, including cancelling a lost Oyster, adding discount entitlements, and resolving incorrectly charged journeys, will also be possible at TVMs (though assistance from a staff member is required).

Whilst TVMs can be improved to provide greater functionality, their use to reduce demand on other channels is by no means a panacea. Many customers will continue to prefer face-to-face channels. A 2010 study<sup>79</sup> into TVMs on London's regional rail network identified four key barriers to use of TVMs/automated channels over utilising the ticket office:

- Even those who were the most capable were not always confident enough to buy a ticket from a TVM;
- Many feel the need to ask questions about the journey, especially one that is unfamiliar or complex;
- Most passengers do not know enough about ticket types or restrictions that apply to make informed decisions (and find rail "terminology" around, say, peak and off-peak to be confusing and prefer to check at the ticket window); and
- Specific issues apply to various disability groups that will require further consideration.

78. <https://fitforthefuture.tfl.gov.uk/wp-content/uploads/2015/02/Ticketing-changes-guide-for-ipads.pdf>

79. Ticket Vending Machine Usability Qualitative Research Report of Findings, July 2010

### 6.2.3 Means of payment – the removal of cash

**London** - Since the introduction of the Oyster card in 2003 and the launch of contactless payment cards on London buses (see also section 6.2.4 below), cash fares have fallen to around 1% of total bus journeys in 2013. With such low levels of cash being used, TfL went to public consultation to ask for people's views on going cashless. Cost savings (estimated at around \$50m p/a from 2019/20) were the primary reason for investigating cashless<sup>80</sup>.

TfL undertook an extensive consultation and advertising programme prior to implementing its cashless solution. Campaigns were launched across a variety of media, including direct emails to 1.5 million registered bus users. Approximately two-thirds of survey respondents did not agree with the proposal, with key concerns related to contactless payments, catering for tourists and irregular travellers. TfL responded to passenger concerns by gradually introducing the scheme, allowing "one more journey" to help people to complete their travel if they fall into a negative travel credit, and ensuring that passengers are catered for in emergencies.

The impact on elderly customers of going cashless was expected to be negligible, given a wide ranging free travel scheme on Oyster for seniors is already in place.

### 6.2.4 New payment channels

**London** – TfL introduced the option for paying by contactless payment card on buses in 2012, and on the underground in 2014. By December 2015, contactless payment cards were used to pay for roughly 9m trips per month on bus / tram, 14m on the underground. More than 25% of all pay as you go customers now use contactless payment, and over 350 million contactless journeys have now been made using cards from more than 80 countries<sup>81</sup>. The success of the scheme means that one in ten contactless transactions in the UK are made on TfL's services, making TfL one of the largest contactless merchants worldwide.

TfL has also introduced Apple Pay, and through partnership with MasterCard has incentivised its use. A series of

'MasterCard Mondays' have been offered, whereby customers using Apple Pay can travel for free for one day<sup>82</sup>.

Chicago launched its Ventra payment system in 2014, built on open standards to permit the use of Ventra cards, contactless debit/credit cards and mobile devices<sup>83</sup>. The interoperability of each of these options, and the ability to link to a customer's Ventra account mean that longer term passes can be loaded to an account and accessed when using a bank card or mobile device. However, contactless fares are offered at a price premium (costing \$2.25 on bus rather than the regular \$2 fare) if the user has not added value prior to boarding<sup>84</sup>. It is unclear what the take-up of contactless cards has been as a result of this.

In addition to the case studies presented above, other jurisdictions have started to look at incorporating NFC and mobile solutions into their fare payment systems. Whilst there is a groundswell of support for the benefits of such solutions, there are also barriers to successful implementation. Figure 17 provides highlights from some established and developing NFC and mobile solutions.

It is worth noting that the results from the Washington D.C. pilot (referred to in Figure 17) have now been evaluated<sup>85</sup>. Metro has abandoned the program because the public's response to it has been "tepid". There were barely enough customers willing to take part in the trials, and as such the concept is not popular enough with the public to justify a long-term investment in it.

### 6.2.5 Other innovations

Transport is obviously only one aspect of the lives of the customers we serve. Beyond the public transport network, customers interact with a myriad of other interfaces, payment devices, and payment methods. Where integration of transport payment methods with other transaction types is possible and done correctly, it brings potential simplicity benefits to customers and financial benefits to the transport operator. For these reasons, many operators have aspired to build this functionality when introducing smartcard; it offers obvious potential in a way that media such as magnetic stripe did not.

80. [https://consultations.tfl.gov.uk/buses/cashless/user\\_uploads/web-published-consultation-report-post-14july14.pdf-1](https://consultations.tfl.gov.uk/buses/cashless/user_uploads/web-published-consultation-report-post-14july14.pdf-1)

81. <https://tfl.gov.uk/info-for/media/press-releases/2016/march/pay-as-you-go-travel-with-contactless-and-oyster-extends-to-swanley>

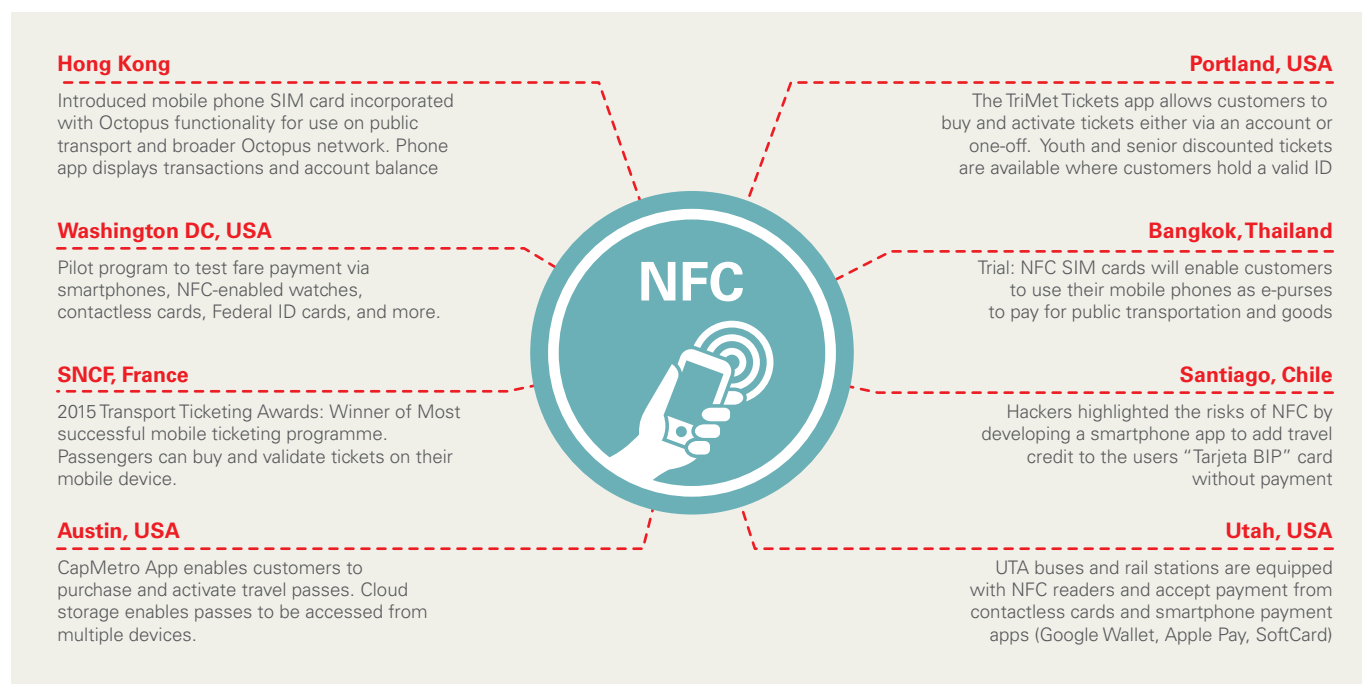
82. <http://www.mastercard.co.uk/applepay-fare-free-monday.html>

83. <http://www.transitchicago.com/ventra/>

84. <http://www.transitchicago.com/fares/>, as at 22nd April 2016

85. [https://www.washingtonpost.com/local/trafficandcommuting/metro-scrap-plan-for-high-tech-fare-paying-system/2016/04/14/eed44f54-0272-11e6-b823-707c79ce3504\\_story.html](https://www.washingtonpost.com/local/trafficandcommuting/metro-scrap-plan-for-high-tech-fare-paying-system/2016/04/14/eed44f54-0272-11e6-b823-707c79ce3504_story.html)

**Figure 17: Trends in NFC and mobile fare payment solutions**<sup>86,87,88,89,90,91,92,93,94</sup>



In practice, adoption has been very limited. Operators in many jurisdictions have suffered from cost blow outs or time delays with smartcard implementation and have chosen to forego broader integration in favour of focussing on their core offering. As these systems mature, there is renewed interest in looking again at the case for non-transport applications.

Application in Australia of non-fares functionality is limited and has tended to involve use of a passenger's public transport smartcard to pay for services beyond their journey, but still within the public transport environment. These are generally simpler to implement because they fall within jurisdiction controlled environment. An example is capability of Perth's SmartRider card to enable passengers to pay for parking at railway stations.

Similarly, Brisbane's *go* card can be used to access the CityCycle bike share services. To enable this function, users must sign up for a minimum three month subscription CityCycle account and link their *go* card to that account . Payment for bike hire is not drawn from the user's *go* card balance, this set-up simply allows the user to carry one card, rather than both their *go* card and CityCycle card.

It is notable that in both these examples these broader integrations represent recent system expansions that were not included as part of original system scope.

International systems provide some other examples of smartcards being used for applications outside the public transport environment.

86. Santiago: <http://securityaffairs.co/wordpress/29491/cyber-crime/chile-nfc-ticketing-hacked.html>

87. SNFC: <http://www.transport-ticketing.com/Content/2015-Award-Winners-Announced>

88. Bangkok: <http://www.finextra.com/news/fullstory.aspx?newsitemid=24603>

89. Utah: <http://www.rideuta.com/news/2014/11/apple-pay-on-uta/>

90. Austin: <http://www.capmetro.org/app/>

91. Washington: [http://www.wmata.com/about\\_metro/news/PressReleaseDetail.cfm?ReleaseID=5778](http://www.wmata.com/about_metro/news/PressReleaseDetail.cfm?ReleaseID=5778)

92. Portland: <http://trimet.org/mobiletickets/faq.htm>

93. Hong Kong: <http://www.octopus.com.hk/get-your-octopus/choose-your-octopus/mobile-sim/en/index.html>

94. <http://www.citycycle.com.au/How-does-it-work/Frequently-Asked-Questions/go-card#faq0>

## CASE STUDY: SINGAPORE

The EZ Link card and NETS FlashPay cards can be used for not only public transport fares payments, but also payment of other transport costs including taxi fares, car parking, and Electronic Road Pricing (ERP) tolls, as well as non-transport payments such as food, retail, and government services<sup>95,96</sup>. Extensive promotional activity and rebates are used to support usage on non-transport activities.

**Figure 18: Singapore NETS FlashPay non-transit rewards and rebates**



## CASE STUDY: SAN FRANCISCO

Customers with an EZ Rider card can use it to pay for parking at BART stations. Customers who have a Clipper card, used for travel on regional public transit services and most Bay Area transit services, can link this to their EZ Rider parking account. Payment for parking is made from the customer's EZ Rider account and does not affect their Clipper card balance<sup>97</sup> – the linking of accounts simply means the customer does not need to carry both an EZ Rider card and Clipper card.

## Integration with other public services

**Estonia:** Estonia has a highly-developed national ID card system. The mandatory national card serves as the digital access card for all of Estonia's secure e-services<sup>98</sup>. In addition to the standard public transport smartcard, Ühiskaart, Estonia's national electronic ID card can be used for travel on public transport services in the cities of Tallinn and Tartu. This same ID card is used for a wide variety of public services, including health services, voting, tax lodgement, and travel within the EU.

**Scotland:** The Young Scot card can be used to pay for discounted fares on buses, trains and ferries within Scotland. The card is used as proof of entitlement when buying tickets by presenting it at a rail station ticket office or scanning on the card reader on-board buses (note the card does not actually have value on it)<sup>99</sup>. The same card can be used to access other discounts retail, food and education purchases<sup>100</sup>.

## 6.3 FUTURE POLICY REFORM

### 6.3.1 Is there a future for single tickets?

Even where smartcard systems are well established and card uptake among users is high, the vast majority of operators still offer a "distress" single ticket option.

### Rationale for retaining single ticket options

Single tickets form part of an overall customer service offering to accommodate the immediate travel needs of the customer. Despite the convenience and price benefits for users associated with smartcards, there are times at which purchasing a single ticket may be a better option. This may be for infrequent travellers, short-term travellers such as tourists, or passengers who already own a smartcard but have forgotten to carry it with them.

### Implementation of single ticket options

The technology used by each system to provide single ticket options can vary widely from traditional paper tickets, to disposable smartcards, to facilitating fare payment via bank-issued contactless payment cards (as per section 6.1.2).

In order to maintain the perception that single tickets should be a last resort, the convenience of these tickets may be reduced by limiting their validity to either a single trip or

95. <http://ezlink.com.sg/use-your-ez-link-card/where-to-use>

96. <http://www.nets.com.sg/cards/flashpay-card>

97. <http://www.bart.gov/guide/parking>

98. <https://e-estonia.com/component/electronic-id-card/>

99. <http://www.transportscotland.gov.uk/young-scot-national-entitlement-card>

100. <http://www.youngscot.org/discounts>

single day, limiting the channels through which they are available (e.g. only from TVMs). The price rewards of using a smartcard over single tickets are commonly marketed as a discounted rate for smartcards. Some systems may market this price difference as a penalty, such as the Dutch OV-chipkaart, which applies a €1 surcharge for purchasing a single ticket.

### Removal of single ticket options

The most notable exception to the practice of providing single ticket options is Melbourne's myki ticketing system. All passengers are required to purchase a smartcard and either add value or a pass prior to travelling. During the initial roll-out of the system, short-term disposable smartcards were available for use on regional bus networks, however these were not introduced to services in metropolitan Melbourne, and were eventually phased out from all services. The decision to discontinue this option was cited as part of a broader attempt to reduce the complexity of the project to provide a more reliable ticketing system.<sup>101</sup>

### Disposable smartcards

Disposable smartcards are much less costly to produce than regular plastic smartcards, but traditionally have been more expensive than paper tickets. However, a range of new, disposable and much cheaper smartcards is now being introduced. Whilst these cards have a lower data capacity, less security and less durability than long-life cards, they are well suited to some sectors of the occasional user market where full smartcard functionality is not required. If cost of disposable smartcards and churn are perceived to be issues, solutions such as that employed in Singapore (where re-use is incentivised) are available, as shown in Figure 19 and Figure 20 opposite.

### 6.3.2 Cashless systems – can we get there?

The market penetration and increasing popularity of EMV and NFC / mobile device payments mean these potentially provide many opportunities for fares and ticketing, especially given the widespread acceptance already present in Australia (see section 6.1.2).

However none of these can be seen as a universal panacea. In the short term, public transport authorities will face a residual need for facilitating traditional payment methods to service those who do not have access to, or do not wish to adopt, these new technologies.

### 6.3.3 New payment channels

As discussed in section 6.1.2, Sydney is likely to be at the forefront of adopting new payment channels in the short term. We would expect that other states and jurisdictions will look on closely at the success of the 2017 trial, with a view to adopting themselves in the medium term.

**Figure 19 - Singapore disposable smartcard**



**Figure 20 - Deposit terms for Singapore disposable smartcard**

STANDARD TICKET	
<ul style="list-style-type: none"> <li>• The ticket holder can pay for a single/return trip at any General Ticketing Machine located in all MRT/LRT stations.</li> <li>• A trip is valid for use on the day of purchase during the MRT/LRT operating hours.</li> <li>• This ticket can be used for up to 6 times within 30 days from the day of purchase.</li> <li>• The ticket deposit of \$0.10 will be refunded from the travel fare on the 3rd trip.</li> <li>• A \$0.10 discount on the travel fare will be given on the 6th trip.</li> <li>• The unused trip can be refunded within three days from the day of purchase at the Passenger Service Centre in any MRT station.</li> <li>• There will be no refund or replacement for damaged or lost tickets.</li> <li>• The above conditions are subject to change without prior notice.</li> </ul>	

101. <http://web.archive.org/web/20110628002406/http://www.premier.vic.gov.au/media-centre/media-releases/1195-fixing-myki-to-get-victorias-transport-ticketing-system-back-on-track-.html>



The image is a collage of several photographs. The top half features a red semi-transparent banner with the word 'APPENDICES' in white, uppercase letters. Below the banner, there are multiple images of people's legs and feet. On the left, a person is wearing a red coat and black pants. In the center, a person is wearing black pants and black sneakers with white soles, standing on a light-colored tiled floor. On the right, a person is wearing black pants and black socks, standing on a light-colored tiled floor. The background includes a yellow door frame and a blue wall. The overall composition is a collage of images related to footwear and legwear.

# APPENDICES

# APPENDIX A

## AUSTRALIAN CITY PROFILE OVERVIEWS

### SYDNEY

**Table 15: Sydney public transport and ticketing overview**

SYSTEM OVERVIEW				
Modes Covered	Metro and Intercity Train	Ferry	Metro Bus	Light Rail
Annual Patronage	316.0m	15.4m	189.5m	3.9m
	524.8 million <sup>102</sup>			
Annual Fares Revenue	\$330.2 million			
Cost Recovery	22%			
FARES STRUCTURE				
Spatial	Distance based (bands)			
Modal	5 fare bands	2 fare bands	3 fare bands	
FARE PRODUCTS				
Single Fare	Up to three transfers between services / four trips per journey	Transfer only at Circular Quay	Up to three transfers between services / four trips per journey	
Daily Fare / Cap	Daily cap (\$15 Full Fare, \$7.50 Concession, \$2.50 Seniors)			
Period Product / Cap	<ul style="list-style-type: none"><li>Weekly fare cap (Monday to Sunday) (\$60 Full Fare, \$30 Concession)</li><li>Weekly trips cap (Monday to Sunday)(8 journeys, then free travel)</li></ul>			
FARE MEDIA				
Smartcard	Opal (MiFare DESFire EV1)			
Single Tickets	Disposable Smartcard (Single)	Disposable Smartcard (Single)	Disposable Smartcard (Single)	Disposable Smartcard (Single)
FARE LEVELS (AS AT JULY 2016)				
Smartcard Cost	\$0.00			
Full Fare “Single”	\$4.00 - \$8.80	\$6.20 - \$7.60	\$2.40 - \$4.70	\$3.80 - \$4.80
Concession Schemes	<ul style="list-style-type: none"><li>50% of Full Fare (Students, Seniors, Concessions)</li></ul>			
Temporal Pricing / Discounts	<ul style="list-style-type: none"><li>Off-peak 30% discount (Metro. outside 0700-0900 and 1600-1830, Intercity outside 0600-0800 and 1600-1830)</li></ul>			
	Sunday cap (\$2.50)			
Channel / Media Discounts	<ul style="list-style-type: none"><li>No discount schemes</li></ul>			
SALES CHANNELS				
On-system Channels	Ticket Office / Ferry Wharf, Ticket Vending Machines, On board (Bus, Ferry, Light Rail)			
Off-system Channels	Retail, Website, Call Centre, Opal kiosks			
Auto top-up	Yes			
FARES AND TICKETING REFORM				
Ticketing system	Opal introduced 2012-2014			
Fares Structure and Products	<ul style="list-style-type: none"><li>Period passes phased out as part of Opal roll-out (2014)</li><li>Fare distance bands consolidated (2010)</li><li>MyZone integrated magnetic stripe tickets (2010)</li></ul>			

102.TTF – L.E.K. Consulting Public Transport Barometer: A review of key public transport indicators for Australia, July 2015

## MELBOURNE (INCLUDING REGIONAL MYKI SERVICES)

**Table 16: Melbourne public transport and ticketing overview**

SYSTEM OVERVIEW					
Modes Covered	Metro Rail	Tram	Metro Bus	Regional Rail	Regional Bus
Annual Patronage	224.5m	177.8m	123.6m	13.0m	15.2m
	525.9 million (Metropolitan)			28.2 million (Regional)	
Annual Fares Revenue	\$435.185 million <sup>103</sup>				
Cost Recovery	22%				
FARES STRUCTURE					
Spatial	Zonal (2 zones)			Zonal (13 zones)	
Modal	Fares consistent across all modes			Fares consistent across all modes	
FARE PRODUCTS					
Single Fare	2 hour fare, all transfers included			2 hour fare, all transfers included (3 hours for travel in 6-11 zones, and 4 hours for travel in 12-13 zones)	
Daily Fare / Cap	Daily cap equivalent to 2x applicable 2 hour fare (i.e. most zones used in that day)				
Period Product / Cap	Weekly pass, 28-365 day passes				
FARE MEDIA					
Smartcard	myki (MiFare DESFire)				
Single Tickets	Not available				
FARE LEVELS (AS AT JULY 2016)					
Smartcard Cost	\$6.00 Full Fare (\$3.00 Concession), non-refundable				
Full Fare “Single”	\$3.90 – \$4.68			\$2.40 - \$30.00	
Concession Schemes	• 50% of Full Fare (Students, Seniors, Concessions)				
Temporal Pricing / Discounts	• “Early Bird” (Free train travel with exit before 0715) • Evening Cap (Max. 2-hour fare after 1800) • Weekend Daily Cap (\$6 Full Fare/Concession, Free travel for Seniors) • Public Holiday Cap (\$6 Full Fare/Concession, \$3.90 Seniors)			• 30% off-peak discount (excludes journeys arriving in Zone 1 before 0900 or departing Zone 1 between 1600-1800)	
Channel / Media Discounts	• No discount schemes				
SALES CHANNELS					
On-system Channels	Ticket Office, Ticket Vending Machines				
Off-system Channels	Third party retail, Website, Call Centre				
Auto top-up	Available for e-purse (“myki money”), not available for passes				
FARES AND TICKETING REFORM					
Ticketing system	myki introduced 2008-2010				
Fares Structure and Products	• Zone 1+2 fares capped at Zone 1 fare levels (2015) • Free tram zone (Melbourne CBD) (2015)				

103.TTF – L.E.K. Consulting Public Transport Barometer: A review of key public transport indicators for Australia, July 2015

## BRISBANE (AND SOUTH EAST QUEENSLAND)

**Table 17: Brisbane public transport and ticketing overview**

SYSTEM OVERVIEW				
Modes Covered	Train	Ferry	Bus	Light Rail
Annual Patronage	49.82m	7.44m	118.65m	6.18m
	182.1 million			
Annual Fares Revenue				
Cost Recovery	23%			
FARES STRUCTURE				
Spatial	Zonal (23 zones)			
Modal	Fares consistent across all modes			
FARE PRODUCTS				
Single Fare	Any number of individual trips made within a 3.5 hour period, with a maximum of one hour to transfer between each service			
Daily Fare / Cap	No maximum daily spend			
Period Product / Cap	Weekly trips cap (Monday to Sunday)(9 journeys, then free travel)			
FARE MEDIA				
Smartcard	go card (MiFare Classic)			
Single Tickets	Paper tickets (Single trip only)			
FARE LEVELS (AS AT JULY 2016)				
Smartcard Cost	\$10.00, fully refundable			
Full Fare “Single”	\$3.35 – \$21.35			
Concession Schemes	• 50% of Full Fare (Students, Seniors, Concessions)			
Temporal Pricing / Discounts	• 20% Off-peak discount (0830 to 1530 and 1900-0300 (next day) on weekdays, all day weekends and public holidays)			
Channel / Media Discounts	• 30% discount on go card fares versus single paper tickets			
SALES CHANNELS				
On-system Channels	Ticket Office (stations, G Link, busway stations), Ticket Vending Machines, On board (buses exc. Brisbane Transport, Brisbane City Council Ferries)			
Off-system Channels	Third party retail (7-11 and selected newsagents), Website, Call Centre			
Auto top-up	Yes			
FARES AND TICKETING REFORM				
Ticketing system	go card introduced 2008			
Fares Structure and Products				

## PERTH

**Table 18: Perth public transport and ticketing overview**

SYSTEM OVERVIEW			
Modes Covered	Train	Ferry	Bus
Annual Patronage	63.9m	0.43m	83.6m
	147.9 million		
Annual Fares Revenue	\$213.1 million <sup>104</sup>		
Cost Recovery	30%		
FARES STRUCTURE			
Spatial	Zonal (9 zones)		
Modal	Fares consistent across all modes		
FARE PRODUCTS			
Single Fare	<ul style="list-style-type: none"><li>• “2 Section” fare available for single mode journey under 3.2km</li><li>• 2 hour journey comprising any number of individual trips in up to 4 zones (3 hours if 5 or more zones)</li></ul>		
Daily Fare / Cap	No maximum daily spend (weekdays)		
Period Product / Cap	Not available		
FARE MEDIA			
Smartcard	SmartRider (MiFare Classic)		
Single Tickets	Paper tickets (Single trip only)		
FARE LEVELS (AS AT JULY 2016)			
Smartcard Cost	\$10.00, non-refundable		
Full Fare “Single”	\$2.10 – \$12.40		
Concession Schemes	<ul style="list-style-type: none"><li>• 60% discount for Seniors, Children</li><li>• 62% to 94% discount for Students</li></ul>		
Temporal Pricing / Discounts	<ul style="list-style-type: none"><li>• \$12.40 weekday off-peak cap (if first boarding before 0715 or after 0900)</li><li>• \$12.40 weekend cap</li></ul>		
Channel / Media Discounts	<ul style="list-style-type: none"><li>• 15% discount on SmartRider fares versus single paper tickets</li><li>• 25% discount on SmartRider fares when using auto top-up versus single paper tickets</li></ul>		
SALES CHANNELS			
On-system Channels	Ticket Vending Machines, on board (buses and ferries),		
Off-system Channels	Retail, BPAY, Transperth info centres		
Auto top-up	Yes		
FARES AND TICKETING REFORM			
Ticketing system	SmartRider introduced 2007		
Fares Structure and Products			

104. Public Transport Authority Annual Report 2013-14



## ADELAIDE

**Table 19: Adelaide public transport and ticketing overview**

SYSTEM OVERVIEW			
Modes Covered	Train	Tram	Bus
Annual Patronage	10.4m	2.6m	50.3m
	63.3 million		
Annual Fares Revenue			
Cost Recovery			
FARES STRUCTURE			
Spatial	Flat fares (with short-trip option)		
Modal	Fares consistent across all modes		
FARE PRODUCTS			
Single Fare	“2 Section” fare available for single mode journey (approx.. 3km, or two consecutive train stations) Single Trip: 2 hour journey comprising any number of individual trips		
Daily Fare / Cap	No maximum daily spend (weekdays)		
Period Product / Cap	28-Day Pass		
FARE MEDIA			
Smartcard	Metrocard (MiFare DESFire EV1)		
Single Tickets	Paper tickets (Single trip only)		
FARE LEVELS (AS AT JULY 2016)			
Smartcard Cost	\$5.00, non-refundable		
Full Fare “Single”	\$1.92 – \$3.54		
Concession Schemes	<ul style="list-style-type: none"><li>• 9% to 51% discount for Seniors, Children</li><li>• 39% to 67% discount for Students</li></ul>		
Temporal Pricing / Discounts	<ul style="list-style-type: none"><li>• 23% to 45% discount for off-peak travel (weekdays 0901-1500, all day Sunday /public holidays)</li><li>• Free travel for Seniors (weekdays before 0701, 0901-1500, after 1900, all weekend/public holidays)</li></ul>		
Channel / Media Discounts	<ul style="list-style-type: none"><li>• 33% discount on Metrocard fares versus regular singletrip paper tickets</li></ul>		
SALES CHANNELS			
On-system Channels	Ticket Vending Machines, on board		
Off-system Channels	Third party retail, Website, Call Centre, Infocentres		
Auto top-up	Yes		
FARES AND TICKETING REFORM			
Ticketing system	Metrocard launched 2012		
Fares Structure and Products			

## HOBART (INCLUDING LAUNCESTON AND BURNIE)

**Table 20: Tasmania metropolitan public transport and ticketing overview**

SYSTEM OVERVIEW	
Modes Covered	Bus
Annual Patronage	10.1 million
Annual Fares Revenue	\$10.4 million
Cost Recovery	30% <sup>105</sup>
FARES STRUCTURE	
Spatial	Section based fares (13 sections, 3 bands (1-4, 5-10, 11+))
Modal	Not applicable
FARE PRODUCTS	
Single Fare	Single trip comprises any number of individual trips within 90 minutes of initial boarding
Daily Fare / Cap	\$9.00 Daily Cap (Full fare)
Period Product / Cap	Not available
FARE MEDIA	
Smartcard	Greencard (MiFare DESFire EV1)
Single Tickets	Paper tickets (Single trip only)
FARE LEVELS (AS AT JULY 2016)	
Smartcard Cost	\$5.00, non-refundable
Full Fare "Single"	\$2.56 – \$5.36
Concession Schemes	<ul style="list-style-type: none"> <li>• 31% to 67% discount for Adult Concession</li> <li>• 50% to 76% discount for Child/Student concession</li> </ul>
Temporal Pricing / Discounts	• 50% discount on daily cap for off-peak travel (weekdays after 0900, Saturday, Sunday, public holidays)
Channel / Media Discounts	• 20% discount on Greencard fares versus single paper tickets
SALES CHANNELS	
On-system Channels	On board
Off-system Channels	Third party retail, Website, Call Centre, Metro shop / depots
Auto top-up	Yes
FARES AND TICKETING REFORM	
Ticketing system	Greencard launched 2009
Fares Structure and Products	

105. 2014 Investigation into the Pricing Policies of Metro Tasmania Pty Ltd

## CANBERRA

**Table 21: Canberra public transport and ticketing overview**

SYSTEM OVERVIEW	
Modes Covered	Bus
Annual Patronage	17.8 million
Annual Fares Revenue	\$24 million
Cost Recovery	16.2% <sup>106</sup>
FARES STRUCTURE	
Spatial	Flat fare
Modal	Not applicable
FARE PRODUCTS	
Single Fare	Single trip comprises any number of trips with transfer made within 90 minutes
Daily Fare / Cap	\$9.00 daily cap
Period Product / Cap	Monthly cap (calendar month) 40 paid trips
FARE MEDIA	
Smartcard	MyWay (MiFare Classic 1k)
Single Tickets	Paper tickets (Single trip only)
FARE LEVELS (AS AT JULY 2016)	
Smartcard Cost	\$5.00, non-refundable (\$0 for Seniors MyWay)
Full Fare "Single"	\$2.98
Concession Schemes	<ul style="list-style-type: none"> <li>• 50% discount for Seniors</li> <li>• 50% to 65% discount for Students</li> <li>• Free travel for Children and over 70s</li> </ul>
Temporal Pricing / Discounts	<ul style="list-style-type: none"> <li>• 20% discount (full fare) off-peak (weekdays 0900 – 1630, after 1800, all weekend/ public holidays)</li> <li>• \$5.45 weekend/public holiday cap for full fare</li> <li>• 4% discount (Concession) off-peak</li> <li>• \$2.02 weekend/public holiday cap for Students</li> </ul>
Channel / Media Discounts	<ul style="list-style-type: none"> <li>• 5% discount on MyWay fares when using auto top-up</li> </ul>
SALES CHANNELS	
On-system Channels	
Off-system Channels	Retail, Website, Call Centre
Auto top-up	Yes
FARES AND TICKETING REFORM	
Ticketing system	MyWay launched 2011
Fares Structure and Products	

106. Budget Statements, Territory and Municipal Services Directorate, ACTION 2015-16

# APPENDIX B

## AUSTRALIAN CITIES COMPARISONS

**Table 22: Product range**

CITY	MODE / OPERATOR	SINGLE	MULTI RIDE	PERIOD PASSES				OFF-PEAK (1)
				DAILY	WEEKLY	MONTHLY	ANNUAL	
Brisbane	All modes/Translink	✓			✓			
Sydney	myTrains/ TfNSW	✓		✓				✓
	myFerry/ TfNSW	✓		✓				
	myBus/TfNSW	✓		✓				
Canberra	ACTION Bus/TfC	✓		✓		✓		✓
Melbourne	All modes/PTV	✓		✓	✓	✓	✓	
Hobart	Bus/Metro	✓		✓				✓
Adelaide	All modes/Adelaide Metro	✓		✓				✓
Perth	Trains/Transperth	✓		✓				

Note: (1) The information provided in this table does not include weekend or public holiday products  
Source: PwC Analysis

**Table 23: Full Fares ratio to single full fare**

CITY	MODE / OPERATOR	MULTI RIDE	PERIOD PASSES					SINGLE OFF-PEAK
			DAILY	DAILY OFF-PEAK	WEEKLY	MONTHLY	ANNUAL	
Brisbane	All modes/ Translink	N/A	N/A	N/A	9.0	N/A	N/A	0.8
Sydney	Train/ TfNSW	N/A	1.8 - 4.4	N/A	7.2 - 8.0	N/A	N/A	0.7
	Ferry/ TfNSW	N/A	2.1 - 2.6	N/A	8.0	N/A	N/A	N/A
	Bus/ TfNSW	N/A	3.3 - 7.1	N/A	8.0	N/A	N/A	N/A
Canberra	ACTION Bus/TfC	N/A	3.0	N/A	N/A	40.0	N/A	0.8
Melbourne	Metropolitan / PTV	N/A	2.0	N/A	10.0	33.6 - 37.2	390.0	N/A
Hobart	Bus/Metro	N/A	1.7 - 3.5	1.0 to 1.8	N/A	N/A	N/A	N/A
Adelaide	All modes/ Adelaide Metro	N/A	2.8 - 5.2	N/A	N/A	34.4 - 63.4	N/A	0.5 - 0.8
Perth	All modes/ Transperth	N/A	1.2 - 6.9 <sup>(1)</sup>	1.2 to 6.9 <sup>(1)</sup>	N/A	N/A	N/A	N/A

Note: (1) Comparison of daily off-peak fare and peak fare with 15% SmartRider discount  
Source: PwC analysis

**Table 24: Fare capped products**

CITY	MODE / OPERATOR	MODE / OPERATOR		
		DAILY	WEEKLY	MONTHLY
Melbourne	All modes / PTV	Daily caps vary by zones traversed	N/A	N/A
Sydney	All modes/ TfNSW	Capped at AU\$15	Capped at AU\$60	N/A
Canberra	ACTION Bus/TfC	Capped at AU\$9.00 <sup>(1)</sup>	N/A	N/A
Hobart	Bus/Metro	Capped at AU\$10	N/A	N/A

Notes: (1) Weekday cap; \$5.45 at weekends / public holidays  
Source: PwC Analysis

**Table 25: Capped trips schemes in Australia**

CITY	PTA / SMARTCARD	TRIPS CAP	
		WEEKLY	MONTHLY
Brisbane	Translink / go card	9 journeys, then free <sup>(1)</sup>	N/A
Sydney	TfNSW / Opal	8 journeys, then 50% discount on fares	N/A
Canberra	TfC / MyWay	N/A	40 journeys, then free

Notes: (1) From January 2017, to be changed to 8 journeys, then 50% discount on fares  
Source: PwC Analysis

**Table 26: Concession discounts**

CITY	MODE / OPERATOR	CONCESSION TYPE		
		SENIORS	STUDENT	CHILD
Brisbane	All modes/Translink	50%	50%	50%
Sydney	All modes / TfNSW	50%	50%	50%
Canberra	Bus/TfC	50%	50% - 65%	100% (Free)
Melbourne	All modes/PTV	50%	50%	50%
Hobart	Bus/Metro	37% - 69%	53% - 79%	53% - 79%
Adelaide	All modes/Adelaide Metro	9% - 51%	39% - 67%	9% - 51%
Perth	All modes/Transperth	60%	62% - 94%	60%

Source: PwC Analysis



**Table 27: Family and group fare products**

CITY	MODE / OPERATOR	'FAMILY'	GROUP
Sydney	myTrains/ TfNSW myFerry/ TfNSW myBus/TfNSW	✓ Previously Family Funday Sunday – at least 1 adult + 1 child to qualify for \$2.50 per person for unlimited travel all day on Sunday. Now Opal offers \$2.50 cap to all (not charged if weekly cap limits already met)	N/A
Melbourne	All modes/PTV	V/Line (on paper ticket)	N/A
Perth	All modes/Transperth	✓ Family Rider gives a group of up to 7 people unlimited day travel (does not state that they need to be related)	

Source: PwC Analysis

**Table 28: Time dimension to transfers on single tickets**

CITY	TRANSFER TIME DIMENSION	DETAILS	TRANSFER PERIOD
Brisbane	Yes	goCard allows transfers up to 3 times across all zones. The journey must be completed within 360 minutes and the final trip of the journey must start within 210 minutes from the start of the first trip. There is a 60 minutes time limit between transfers. Paper ticket allows for unlimited transfers within 120 minutes for travel within 1 to 10 zones. For travel within 11 zones or more the time limit is 210 minutes. Return journeys are not permitted when using a single paper ticket.	goCard: 210 minutes Paper: 120 minutes (1-10 zones) 210 minutes (10+ zones)
Sydney	Yes	All transfers between modes are charged as separate trips but, within 60 minutes, count as 1 journey for capping. All transfers between the same mode, within 60 minutes, count as a single journey for capping purposes, and as only 1 fare.	60 minutes
Canberra	Yes	All transfers between modes and on the same mode are counted as part of the same single integrated fare if made within 90 minutes	90 minutes
Melbourne	Yes	All transfers between modes and on the same mode are counted as part of the same single integrated fare if made within 120 minutes	120 minutes
Hobart	Yes	All tickets allow free transfers within the sectional range of the ticket for up to 90 minutes from the time of the first boarding.	90 minutes
Adelaide	Yes	All transfers between modes and on the same mode are counted as part of the same single integrated fare if made within 120 minutes	120 minutes
Perth	Yes	For journeys up to 4 zones, transfers are allowed within 120 minutes from the time of initial boarding. For trips covering 5 to 9 zones, the time limit is 180 minutes.	120 minutes (1-4 zones) 180 minutes (5-9 zones)

Source: PwC Analysis

**Table 29: Smartcard cost**

CITY	MODE / OPERATOR	INITIAL CARD DEPOSIT (IN AU\$) <sup>1</sup>	REFUND (IN AU\$) <sup>1</sup>	NET CARD COST (IN AU\$) <sup>1</sup>
SE Queensland	All modes/Translink	10.00	10.00	0.00
Sydney	All modes/ TfNSW	0.00	0.00	0.00
Canberra	ACTION Bus/TfC	5.00	0.00	5.00
Melbourne	All modes/PTV	6.00	0.00	6.00
Hobart	Bus/Metro	5.00	0.00	5.00
Adelaide	All modes/Adelaide Metro	5.00	0.00	5.00
Perth	All modes/Transperth	10.00	0.00	10.00

Source: PwC Analysis

**Table 30: Channel incentives**

CITY	MODE / OPERATOR	AUTO TOP UP OR ONLINE TOP UP CAPABILITY	AUTO TOP UP OR ONLINE TOP UP CHANNEL INCENTIVE
Canberra	ACTION Bus/TfC	✓	5% discount on fares when using auto top up or BPAY
Perth	All modes/Transperth	✓	25% discount on cash fares when using auto top up, 15% otherwise

Source: PwC Analysis

# APPENDIX C

## OVERVIEW OF FARES SYSTEM DESIGN

### FARES SYSTEM DESIGN

A transit fare system comprises four components:

1. **Fare structure:** the spatial structure that supports the fare system (e.g. flat, distance-based, time-based, zonal);
2. **Fare products:** the range of tickets available (e.g. single, multi-ride, periodical) and associated business rules (e.g. concession availability, transfers, etc.);
3. **Fare levels:** the price of each fare product; and
4. **Fare media:** the technology used to process ticket transactions (e.g. paper tickets, tokens, magnetic stripe, smartcard).

We will consider each of these four areas in turn.

### FARE STRUCTURE

In essence, the fare structure establishes the strength of the relationship between fare levels and distance travelled. At one extreme, a 'flat' fare structure establishes a single fare regardless of the distance travel, while a point-to-point distance-based fare structure establishes a unique fare for each station or stop pair.

Table 31 below summarises the strengths and weaknesses of the core fare structures.

**Table 31: Core fare structures – strengths and weaknesses**

STRUCTURE	STRENGTHS	WEAKNESSES
Flat	<ul style="list-style-type: none"><li>• Simplicity</li><li>• Low ticket issuing costs</li><li>• No scope for overriding</li></ul>	<ul style="list-style-type: none"><li>• No relationship between fare and distance travelled</li><li>• Implicit cross-subsidisation between short and long-distance trips which distorts travel patterns</li></ul>
Distance-based	<ul style="list-style-type: none"><li>• Establishes strong relationship between fare and distance travelled</li><li>• Generally perceived to be 'fair'</li></ul>	<ul style="list-style-type: none"><li>• Transfers difficult but not impossible to handle</li><li>• Calculation of fare for irregular journeys difficult</li></ul>
Time-based	<ul style="list-style-type: none"><li>• Simplicity</li><li>• Facilitates straightforward transfers between services</li></ul>	<ul style="list-style-type: none"><li>• Late running and service cancellations may impact on ticket 'value'</li><li>• No direct relationship between fare and distance travelled</li></ul>
Zonal	<ul style="list-style-type: none"><li>• Broad relationship between fare and distance travelled</li><li>• Relatively easy to understand</li><li>• Facilitates straightforward transfers between services</li></ul>	<ul style="list-style-type: none"><li>• 'Boundary problems' (i.e. passengers travelling a short distance across a zonal boundary)</li></ul>

Source: PwC analysis

From a fare structure perspective, the availability of smartcard technology has provided the opportunity for all transit agencies to review the fare structure employed. Specifically, smartcard technology provides the opportunity to fully 'close' the fare collection system more cost effectively via the provision of ticket validators at all system entry and exit points.

The enhanced capacity to close the fare collection system in this way focuses attention on the desirability (from a policy perspective) of choosing between relatively simple coarse fare structures, to structures that establish a more highly differentiated relationship between fare levels and the distance travelled. This choice is partly a function of the degree to which simplification is a desirable objective; a simpler fares structure is easier for customers to understand and to be marketed. The principal policy arguments made in favour of differentiated fares (e.g. by trip length) focus on issues related to economic efficiency and equity<sup>107</sup>:

- From an economic efficiency perspective, it can be argued that higher fare should be charged to cover the higher operating costs associated with serving longer trips such that those travelling longer distances are not cross-subsidised by those travelling shorter distances;
- Also from an economic efficiency perspective, it is often claimed that passengers of higher cost (i.e. long distance) services are less price sensitive than those using lower cost services and hence revenue raising efficiency dictates that those travelling longer distances pay higher fares; and
- From an equity perspective, it can be argued that passengers perceive that a fare structure that establishes a strong relationship between the distance travelled and fare paid is fundamentally 'fair'. Conversely, it can be argued that it is more efficient for vehicle capacity to be utilised fully over longer distances by making travel more attractive to those travelling further, that such customers generally have fewer alternative modes to on which to travel.

## FARE PRODUCTS

### Overview

Three core fare product concepts have traditionally been employed by public transport operators. These are:

- **Single:** The most common product type offered by transport operators is the single ticket product designed to accommodate the immediate travel needs of the customer;
- **Period pass:** Typically, transport operators have also offered a range of passes for specified amounts of travel such as daily, weekly, monthly or annual products; and
- **Multi-ride:** Offers a discount versus singles for pre-purchase (typically 10 single trips) but does not require a commitment to travel frequently.

A summary description of the generic advantages and disadvantages of the three core fare products are provided in the following Table 32. The extent to which the three product types are appropriate must be considered in light of the policy objectives set out by the relevant transit operator. For example, period passes will typically reward more frequent users of the system (commuters) and help to reward loyalty of use. However, if such a pass comes with a high upfront cost of purchase, then it can be harder for those users with lower incomes to access these lower (average) fares per trip.

107. Transit Cooperative Research Program (2003) Fare policies, structures and technologies: update report 94 Washington DC: Transportation Research Board

**Table 32: Core fare products – advantages and disadvantages**

PRODUCT TYPE	DEFINITION	CUSTOMER PROPOSITION	OPERATOR BENEFITS	CUSTOMER DISADVANTAGES	OPERATOR DISADVANTAGES
Single	Ticket or value for use of single trip on day of travel	<ul style="list-style-type: none"> <li>• Minimum up-front outlay or commitment</li> <li>• Typically requires less knowledge of system or of what the most appropriate ticket/product is</li> </ul>	<ul style="list-style-type: none"> <li>• Often priced at premium</li> </ul>	<ul style="list-style-type: none"> <li>• No discounts for customer</li> <li>• No customer incentives for greater system use</li> <li>• Inconvenience of selling and purchasing ticket each time trip is made</li> </ul>	<ul style="list-style-type: none"> <li>• Additional ticketing selling costs</li> <li>• Reduced opportunity to develop customer loyalty</li> </ul>
Period Pass	Unlimited rides within specific origin/destinations within specific time period (e.g. daily, weekly, monthly, annual)	<ul style="list-style-type: none"> <li>• Unlimited rides within a specific period means level of effective discount increases as more trips are made</li> <li>• Better refund/replacement proposition – longer term passes easier can often be replaced if lost/stolen</li> <li>• Improved convenience compared to singles</li> </ul>	<ul style="list-style-type: none"> <li>• Can generate increased patronage and 'loyalty' among customers</li> <li>• Can generate more income (but it is very dependent on price)</li> <li>• Improved cash flow – revenue captured in advance</li> <li>• Reduced ticket selling costs</li> </ul>	<ul style="list-style-type: none"> <li>• Purchase price maybe too high for some passengers (e.g. lower income)</li> <li>• Customers may not be certain of travel patterns and that purchase of a product is appropriate (see sections 2.2.1 and 2.2.2 on caps and frequency discounts)</li> </ul>	<ul style="list-style-type: none"> <li>• Operators may experience revenue dilution as a result of: (a) customers generally taking more trips than the 'break-even' trip rate and (b) potential for customers to share passes (legally or illegally)</li> </ul>
Multi-ride	Multiple trips (usually 10) are pre-purchased at a discount rate	<ul style="list-style-type: none"> <li>• Convenience of purchase (i.e. a number of rides may be purchased at the one time)</li> <li>• (Usually) not time based – rides may be redeemed at customer's discretion</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced ticket selling costs</li> <li>• Reduced level of fraud or revenue dilution compared with period passes (i.e. no inherent benefit of 'sharing' ticket)</li> </ul>	<ul style="list-style-type: none"> <li>• Needs system of validation to decrement value (i.e. magnetic stripe or smartcard reader)</li> <li>• Up-front cost of ticket (typically equivalent to 10 trips) to achieve discounts may be prohibitive for low income earners</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced opportunity to generate loyalty compared to period products</li> </ul>

Source: PwC analysis



With the advent of smartcard ticketing, the features of the three core product types can actually be delivered in a number of different ways, as summarised in Table 33. In addition, whilst the dimensions that will apply in the fare structure are a quite separate choice (as discussed at length in section 2), those structural dimensions must be front of mind when the choice of products is being made.

**Table 33: Dimensions for product delivery**

PRODUCT TYPE	HOW PRODUCT IS DELIVERED	POLICY DIMENSIONS
Single	<ul style="list-style-type: none"><li>• As a specific purchased product</li><li>• Via Stored Value Travel / e-purse (uncapped)</li><li>• Via Stored Value Travel/ e-purse (capped)</li></ul>	<div>Policy is decided separately to products, but the policy dimensions help inform the choice of products:</div> <ul style="list-style-type: none"><li>• Temporal (time of day)</li><li>• Spatial (distance / location)</li></ul>
Period (including Daily)	<ul style="list-style-type: none"><li>• As a specific purchased product</li><li>• Via a \$ cap</li><li>• Via a trip frequency cap</li></ul>	
Multi-trip	<ul style="list-style-type: none"><li>• As a specific product (offering multiple separate trips)</li></ul>	

Source: PwC Analysis

## FARE LEVELS

Typically, the two factors that most heavily influence fare levels are:

- The level of cost recovery that the transit operator is trying to achieve (or the level of subsidy available to support cost recovery); and
- The willingness of customers to pay the fare (usually measured through the fare elasticity).

There are of course other policy objectives that are impacted by any fare level policy choice; increasing the level of farebox income and cost recovery will usually come at the expense of patronage.

The case studies in section 2 provide examples of how fare policy objectives are applied in Singapore and Hong Kong.

## FARE MEDIA

Historically, the core products outlined above were supported by a mix of paper, token and magnetic stripe fare media.

**Figure 20: Historic trends and benefits of fare media**

	Operators	Customers	Government
<b>70s-80s</b> Electro-Mechanical with Paper Tickets	<ul style="list-style-type: none"> <li>Productivity improvements</li> <li>Faster throughput</li> </ul>	<ul style="list-style-type: none"> <li>New sales channels</li> <li>Faster loading</li> </ul>	<ul style="list-style-type: none"> <li>Reduced subsidies</li> </ul>
<b>Mid 80s-90s</b> Magnetic Stripe Ticketing	<ul style="list-style-type: none"> <li>Productivity improvements</li> <li>Faster throughput</li> <li>MIS</li> <li>Reliability</li> </ul>	<ul style="list-style-type: none"> <li>New sales channels</li> <li>More product options</li> </ul>	<ul style="list-style-type: none"> <li>Reduced subsidies</li> <li>MIS</li> <li>Transit integration</li> </ul>
<b>Mid 90s-00s</b> Transit Smartcards	<ul style="list-style-type: none"> <li>Faster throughput</li> <li>MIS</li> <li><b>FARES FLEXIBILITY</b></li> <li>Non-transit apps</li> <li>Reliability</li> </ul>	<ul style="list-style-type: none"> <li><b>CONVENIENCE OF E-CASH</b></li> <li>NSW Sales and payment options</li> <li>"It's modern"</li> </ul>	<ul style="list-style-type: none"> <li>Non-transit apps</li> <li><b>TRANSIT INTEGRATION</b></li> <li>Fares flexibility</li> <li>MIS</li> </ul>
<b>Mid 00s &gt;</b> Emerging Electronic Payments (Banks & NFC)	<ul style="list-style-type: none"> <li>Multi-apps and sharing of costs</li> <li>Payment flexibility</li> </ul>	<ul style="list-style-type: none"> <li>Convenience</li> <li>Convergence</li> <li>Common payment</li> </ul>	<ul style="list-style-type: none"> <li>Convergence</li> <li>Cost sharing</li> <li>Market appeal</li> </ul>

As the use of smartcard media becomes the accepted norm in the majority of jurisdictions, its benefits are well known and have common acceptance with customers. Principally, smartcards provide the technical capacity to introduce wide ranging reforms that cannot be supported by traditional fare media, including:

- **Fare Structure:** the practicality of establishing distance-based fare structures is significantly greater;
- **Product Range:** the traditional 'ticket' concept is potentially redundant (in section 4.2.1 we discuss how fare capping has been applied in a number of Australian jurisdictions); and
- **Fare Levels:** facilitates flexible and transparent pricing arrangements (e.g. transfers).

In practice, few operators have chosen to embrace wide ranging change on the back of introducing smartcards, with the standard approach generally being to migrate the current fare structure to a new media. That is not to say that the flexibility offered by smartcard has not been embraced in new or modified offerings; rather that evolution rather than revolution has been in vogue.

The introduction of T-Money in Seoul was a notable exception to this, as shown in Figure 21 below.

**Figure 21: Seoul fare structure changes on the back of smartcard introduction**



Seoul is a notable example of increasing the complexity of its fares system, counter to the wider trend of simplifying fares (discussed in section 3.1.2). Whilst new fare media such as those discussed in section 6.2.4 are of growing interest, there remains significant opportunity for continued innovation particularly within smartcards.

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