CITY RAIL INFRASTRUCTURE FUNDING:

International background and policy options for funding transit

Dr Chris Hale

Independent Transport Expert
on behalf of
City of Melbourne
May 2014
chris@haleinfra.com

Executive Summary

This report comprises a scoping review of potential innovations for the funding of major urban mass transit projects in Australian cities, and in particular:

An investigation of new, alternative or unfamiliar transit project funding mechanisms - conceptually, and with respect to important international reference cases.

In part one, by way of introduction, the strategic context for urban rail investment decisions is reviewed. We find a number of push factors towards higher rates of transit investment and project implementation in Australian cities. For Melbourne, we recognise the increased rate of project development work for rail across: airport link; Doncaster rail; Rowville rail; Melbourne Metro One; and the Dandenong corridor. It is suggested that without substantive innovations in project funding, these much-needed projects are likely to struggle for delivery progress as a suite. By contrast, leading international jurisdictions have already made the connection between a need to deliver more projects, and a need for funding innovations.

The basic options available for acceleration of urban mass transit investment in Melbourne and other Australian cities include, but are not limited to: ticket levies, joint development (or TOD) related revenues, benefit assessment districts, and tax increment finance analysis. Each of these options connects with its own set of beneficiaries and rationales, and some are capable of providing a larger contribution to project funding than others. Any move into genuine project funding innovation will require detailed policy work on these mechanisms, and the goodwill of a substantial number of important public, private and community stakeholders.

Value capture theory is now well-developed, and it rests ultimately on the recognition that major urban rail exercises, especially those serving the CBD and inner city, generate profound economic benefits. Traditionally though, Australian jurisdictions have done little to convert these broad-based benefits that accrue to the economy as a whole into a specific cash flow stream to assist with project delivery. Beyond the familiar benefits to passengers in the form of travel time savings and improved journeys, economic value is said to accrue across 'wider' areas such as: agglomeration impacts – where firms are able to communicate and collaborate together more effectively; the removal of the job-capping constraints imposed by overloaded commuter rail systems; support for worker's move into more productive jobs (with assistance of new urban transit access); opportunities in real estate development; and value increases to real property (after improved accessibility).There is some confusion in industry and policy circles about the definition of value capture, but ultimately – **value capture is achieved where some portion of the economic benefits from improved rail accessibility is actively captured through new mechanisms that boost the pool of funds available for project delivery, hence allowing those economic benefits to be realised**. Value capture in practice is *an active and progressive policy initiative* – and any suggestion that 'passive' value capture is possible is misleading.

Part three reviews the concept of 'benefit assessment districts' – mobilising two quite different examples from London and Los Angeles. In London, a so-called 'business rate supplement' has been enacted across the entirety of the Greater London Authority area. This initiative is delivering some 26% of the funds required for the Crossrail project. Los Angeles has enacted (and voted for) a sales tax that is set to cover some 73% of their comprehensive "30-10" transport infrastructure strategy. While the Los Angeles approach is not specifically recommended for Australian conditions, it does provide an interesting example of broad-based

levies tapping-in to enhanced productivity and turnover as a result of transit investment. Part three provides the suggestion that Australian cities should focus any capture efforts onto property value impacts associated with new rail initiatives. As an example, a levy of around 1/10th of a projected 10% property value gain arising from enhanced accessibility might be acceptable and worth actively considering. This amount could be spread and levied over many years rather than as a once-off, up-front transaction.

In part four, opportunities associated with ticket surcharging are reviewed (perhaps especially for those travelers directly affected by transit project improvements). In the final analysis, this is suggested to be one of the strongest opportunities for project funding – and concords with an efficient and ethical approach to project resourcing whereby direct beneficiaries make a direct contribution. A levy of some 70c on around 350,000 trips a day would (all things being equal) gross an additional $89.4 million annually – or a present value of some $1.28 billion. Such revenues raised would appear to be roughly in proportion to the economic benefits delivered if affected passengers were to save 3 minutes on average per trip.

Part five reviews infrastructure funding opportunities arising from potential Transit Oriented Development rights associated with development of new transit stations or re-zonings in the precinct surrounding those stations. Direct development activity and the granting of new development rights is not to be confused with those broader 'increases in property value' addressed in part 3. The part 5 discussions suggest that Australian cities could consider a point-of-property-sale mechanism – structured to levy around 10% of the value of windfall land value gains that arise from the granting of new development rights after rezoning in the localised catchment areas of new transit stations (sitting on enhanced transit corridors).

In part six, a rationale for Tax Increment Financing (TIF) analysis is put forward. TIF is an accounting-based estimate of likely taxation revenue increases resulting from enhanced economic activity due to major infrastructure improvements. It is suggested that a taxation-raising entity such as the Australian Federal Government should actively consider funding major infrastructure projects at least to the level at which new taxation revenue is greater than the funds requested. The part 6 discussion reviews similar dynamics observed in London's Crossrail.

Nuances and considerations for implementation are addressed in part 7. Both the benefit levy and a ticket surcharge are suggested to be best-placed if levied over a period of, say, 15-20 years – set against repayment of up-front project level borrowing. Several other options for re-couping development rights are offered beyond those specifically addressed in part 5, including: bundling of rights with station delivery contracts; or direct involvement in development by government stakeholders. Any Federal grant under a TIF umbrella could take place either as a once-off amount, or spread over several years. A continued substantive reliance on State Government for project funding is discussed - underlining the State's primary project stewardship role. Innovations in project governance in the form of a 'joint powers authority' are suggested for consideration.

Recommendations focus on the vital importance of genuine engagement with alternative funding sources for mass transit as a path toward breaking the decades-long transit infrastructure deadlock in Australian cities. Further investigations and policy discussions should ensue – because advanced value capture mechanisms can effectively balance the needs of taxpayers against the personal benefits of a smaller and more specific pool of direct project beneficiaries.

Contents

1. Introduction – strategic context for contemporary rail investment

Australian cities saw a lengthy hiatus in mass transit investment during the postwar and late 20th century periods, through till the early years of the 21st century. But a range of factors are currently pushing in the direction of an increased rate of investment, even if the full impacts of any prospective transit development program are yet to be seen. These push factors include (Hale & Eagleson 2013):

- a softening in the rate of private vehicle usage per capita, and a discernible increase in per capita transit usage
- ongoing growth in population
- ongoing increases in white collar and service jobs
- increasing concentration of those jobs in central and especially CBD areas of major cities in Australia – reinforcing the current and future role for our 'radial-style' CBD-centric rail systems in overall commute patterns
- stronger recognition and understanding of the unique contribution that mass transit infrastructure can make to urban economic development and livability
- high rates of recent mass transit project implementation in international competitor cities, and to some degree across Australian cities beyond Melbourne (like Brisbane and Sydney)

In response to these shifts, the Victorian Government has undertaken a much-increased rate of project development work and business case analysis in recent times for mooted mass transit enhancements. These include projects such as (PTV 2012): an Airport link; a Doncaster corridor rail service; the prospective Rowville rail corridor; capacity upgrades to the Dandenong corridor; and perhaps most importantly – the so-called Melbourne Metro One project. At the outset, it should be acknowledged that these projects appear all to be desired and 'needed' by the community in any sensible medium-to-long-term economic development program for Melbourne and Victoria. Each are major investments in their own right though. It is difficult to chart a meaningful pathway for implementation for the individual projects, let alone delivery of all 4-5 projects as a suite, without a reasonable level of innovation and updating to the accepted project funding model (see Miller & Hale 2011; Hale 2013).

The track record of the past 30 years would suggest that a total reliance on state government consolidated revenue funding for large-scale mass transit is unlikely to deliver new stations and corridors at a rate sufficient to meet expectations among the community and business.

Parameters for investigation and discussion in this report

A broad-ranging public discussion has unfolded around the future of the so-called Melbourne Metro One rail tunnel traversing the centre of Melbourne. But unfortunately, this discussion has not included an open tabling of the full range of options available for funding and financing this crucial piece of transit infrastructure. History, in the form of the Melbourne Loop and other projects, suggests that a blend of funding sources is needed to deliver major rail infrastructure exercises of this scale.

Current international mega-project examples like *Crossrail* (London), or *LA 30-10* (a Los Angeles light rail and transport suite) would, by definition, not be proceeding without application of a

range of important funding innovations (GLA 2010; LA CMTA 2010). The Gold Coast light rail project is another interesting current example, in which a three-tiered government funding formula has been enacted (GCRT 2012; Hale 2013). Mass transit infrastructure funding is evolving rapidly in Australia and internationally. This offers a range of opportunities for better projects and accelerated delivery – but community, industry and even public sector policy understanding and knowledge lags considerably at this time.

The options available for acceleration of underground rail investment in Melbourne may include, but are not limited to:

- benefit assessment districts
- ticket levies
- joint development (or TOD) related revenues
- and the investment certainty provided to government by tax increment finance analysis

Each of these mechanisms addresses a different set of beneficiaries and drivers, and hence they offer varied scope for meaningful contribution within any specific project example. They also imply or demand a range of supportive revenue collection, analytical and governance methods – with substantive policy implications.

As such, this investigation will attempt to outline and describe these mechanisms conceptually, and with respect to important international reference cases.

The stakeholder landscape for urban rail investment in Victoria

Public Transport Victoria (PTV) is the lead capability for addressing mass transit questions in the Victorian context, but by no means the only stakeholder in major project scenarios. Other key stakeholders would need to be actively involved in any move toward adoption of unfamiliar or innovative funding options and scenarios.

Meaningful enhancement to the transit project financing capability can presumably only arise as a partnership or understanding between stakeholders such as: local governments; Department of Transport, Planning and Local Infrastructure (DTPLI); Department of Treasury and Finance, Victoria; Metro Trains Melbourne (MTM); the Federal Government; and above all – the active involvement and understanding of *every major beneficiary or beneficiary group* is required.

2. Value Capture Basics – and the economics of transit investment

Concepts such as 'value capture' are still largely unfamiliar in the Australian policy and infrastructure context. From the outset it should be recognised that any 'capture' opportunity rests on a platform of substantive economic value - delivered by well-conceived and well-located mass transit infrastructure (Miller & Hale 2011; GLA 2010; Banister & Thurstain-Goodwin 2011). The economic impacts of effective mass transit are diverse and profound. They obviously include travel time savings to passengers, along with other benefits such as increased passenger-movement *capacity* and passenger comfort. But these transport-related "user-centric" benefits then trigger a further round of knock-on economic effects (Banister & Thurstain-Goodwin 2011).

Economic Stimulus

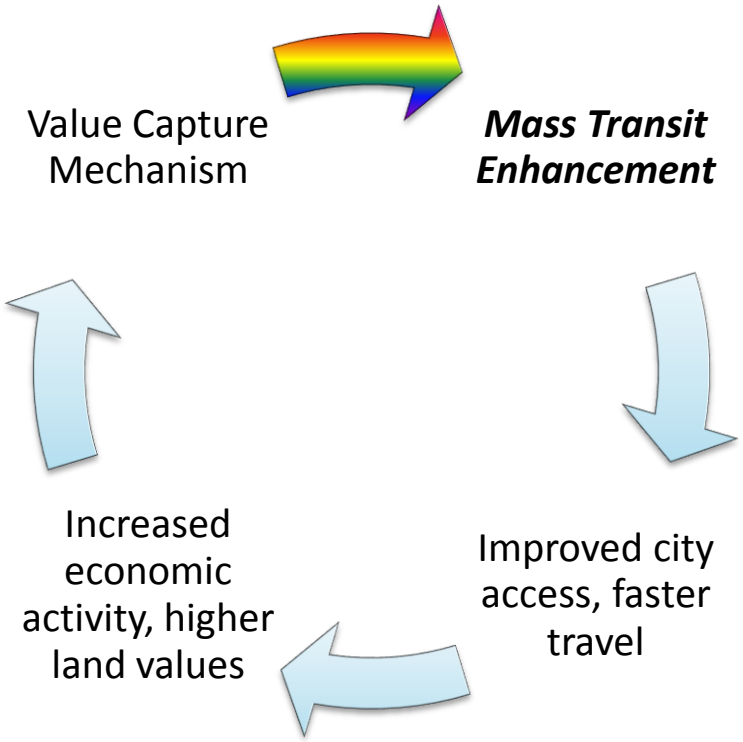
The increase of access to CBD jobs markets is said (and observed) to increase the pool of available staff for businesses, and hence it provides a platform for white collar service industries to continue expanding staff rosters as required. Without the introduction of new mass transit capacity, the ability for workers to access the city during the morning peak reaches a practical limit at some point (and any considered observation would suggest that Melbourne has probably already reached that point). In this manner, effective mass transit enhancement is said to unleash opportunities for ongoing white collar jobs creation by removing caps on practical CBD access (see Colin Buchanan & Volterra 2007 for discussion in London).

A further stimulus to CBD jobs creation is also said to arise as ever more firms cluster in a CBD or similar environment (supported by daily mass transit access from residential catchments and the suburbs) (ibid; Banister & Thurstain-Goodwin 2011). As more and more businesses and business people are located in close proximity, opportunities grow for both scheduled and casual interactions with peers and potential partners. Ideas are swapped, new innovations exchanged, and deals emerge. Some analyses even suggest that better transit access induces people to shift from lower-paid jobs into better jobs with better pay (Banister & Thurstain-Goodwin 2011). Ready access to the big pool of diverse jobs in the CBD is much better than isolation in localised suburban jobs markets, no-matter what the skills or starting-point of the job-seeker. Grand words such as 'agglomeration' are used to describe these impacts and effects – but this concept should not be seen only as obscure technical jargon for economists. The concept of agglomeration lies at the very core of cities and city-based economies.

These various and inter-related spurs to business activity, unleashed by enhanced transit access, produce flow-on effects in areas such as property values and property development in the inner-city or close to rail stations. The before-and-after image of Melbourne prior to the loop and then as a much greater city in the 21st century is a potent reminder of these realities, should anyone doubt them. Without the loop, transit access to the Melbourne CBD would be unworkable, and it is extremely doubtful that anywhere near the current level of business activity or office accommodation would have occurred or been possible without that wise enabling investment.

Economics and Finance – what's the difference in a project scenario…?
Many laypeople are confused by specialist's reference to 'economics' and 'finance' – presuming these to be one and the same. But economics refers ultimately to large-scale, broad-based turnover and activity in the economy as a whole. Finance refers to cashflow and the availability of hard currency at a micro, programmatic, or project level. Mass transit investment in the urban core unleashes profound and wide-ranging economic impacts into the regional and national scale economy (ibid). Usually the effects of transit projects are measured under a traditional 'welfare economics' approach that focuses only on increases or decreases in overall economic activity, or direct value to transport users as a large group. Travel time savings have a value to passengers that can be estimated. Agglomeration and productivity-related effects are a 'wider benefit' to the economy, and are measureable or estimable (ibid). But traditionally in Australia, our interest in the benefits of transport projects has ceased after their estimation and usage as a support-tool for government decisions (Hale 2013).

Capturing Value – converting economic benefits into cashflows
More advanced international approaches to the economic impacts and benefits of mass transit projects have actively sought to obtain some portion of new cashflows resulting from positive economic impacts, and then to mobilise that resource into the funding stream for the project itself (see US GAO 2010; Brookings Institute & Reconnecting America 2009). This is the classic concept of "value capture".



Some mainstream value capture techniques include (Miller & Hale 2011): Benefit Assessment Districts (BADs); Ticket Surcharging; TOD or development rights; and Tax Increment Financing (TIF) analysis. In the discussion that follows, the potential for their application in Melbourne will be reviewed with respect to international precedent and basic policy requirements.

3. Benefit Assessment Districts

The concept of a Benefit Assessment District (BAD) or levy rests on five inter-related theoretical, practical and policy understandings, namely that:

- Major enhancements to mass transit access at a particular location create substantive uplifts in localised real estate values, and support growth in local business turnover
- Property owners are major beneficiaries of such value uplifts, and this benefit comes as an unearned windfall (usually) (see Colin Buchanan & Volterra 2007; Banister & Thurstain-Goodwin)
- The public sector and taxpayers are the main source of funding for transit infrastructure producing positive property value increments and increased business activity, but taxpayers do not usually have access to those economic benefits as a cost-offset
- This disjuncture between project costs and project beneficiaries is both 'unfair and inequitable' (to some degree) and also *a practical limitation on the ability to resource transit project implementation* effectively
- One result is that fewer transit projects get built, hence prospective property value increases and positive economic impacts lay un-realised by property owners and businesses. Property owners and businesses are therefore paradoxically some of the biggest 'losers' from the disjuncture between transit's potential for value creation, and its poverty in the realm of project funding

Thankfully, international experience has demonstrated a pathway to move beyond the frustrating and self-defeating outcomes described above. A formula can usually be found whereby property owners or businesses forgo some small amount of unearned value increment in order to partially fund a value-generating transit investment (see GLA 2010). The actual realisation of the transit project then provides those property owners and/or businesses with a much larger value uplift compared to what they forego as a portion of that unearned windfall.

Although unfamiliar in the Australian context, this concept can provide a genuine win-win scenario for property owners (or businesses) and transit investment stakeholders alike. The main requirements include; policy understanding, trust, and co-operative implementation of an actual benefit assessment mechanism.

Property value uplifts from major transit enhancements are generally, conservatively, and consistently measured to be in the range of 15-20% of the value of affected properties.
(see TCRP 2004, ch9)

London's Crossrail mega-project is currently in construction phases. It provides an excellent international touchstone regarding the techniques and opportunities associated with benefit assessment districts – which in the Crossrail case have been actioned as a 'business rate supplement' created and sustained by the Greater London Authority (GLA). Greater London Authority (2010, p15) reported that:

"*The bulk of London's funding is to be financed by borrowing which will be repaid from a business rate supplement charged by the GLA and revenue to TfL from fares once the railway is operational. The Mayor ... announced details of the new business rate supplement (BRS) which is intended to provide £4.1 billion of the project costs. The BRS will finance and ultimately repay £3.5 billion worth of borrowing and a further £0.6 billion from the BRS will directly*

fund construction. The GLA expects the BRS will run for a period of between 24 and 31 years until the borrowing is repaid. It is estimated that £8.1 billion will need to be collected through the Crossrail BRS over its lifetime once financing costs are included (the cost of interest on the borrowing is estimated at £4 billion). The BRS will be charged at 2 pence in the pound from 1 April 2010 for all business properties in London with a rateable value above £55,000."

Any variety of permutations is possible, but extrapolation from the London Business Rate Supplement suggests that in Melbourne or other Australian cities, **a Benefit Assessment District or levy could conceivably provide somewhere up to 26% the cost of project delivery** in a roughly similar urban core transit enhancement scenario.

Table 1. Sources of Crossrail Funding

(£ million) (GLA 2010, p15)

GLA funds	4,103
Developer contributions	600
Transport for London (TfL)	2,556
Sale of real estate	545
GLA Group Total	**7,804**
Department for Transport	5,519
Network Rail	2,300
Other	200
Total Crossrail Funding	**15,824**

Los Angeles is currently pursuing a major suite of rail and other mass transit projects under the "30-10" rubric. Project funding for this suite includes the "Measure R" sales tax – levied across retail sales within the beneficiary zone. **Measure R is projected to deliver some 73% of total project costs** for the nearly $US 19 billion of mass transit projects arising out of 30-10 (LA CMTA 2010b). The 30-10 transit investment program is financed by a 'transit bonds' initiative, to be largely repaid by revenues arising from the sales tax – with the assistance of other contributions (local, state and federal) (see LA CMTA 2010a).

While the LA Metropolitan Transit Commission is not specific about the economic benefits against which the sales tax is levied, they do seem to be asserting that broad-based economic opportunities (especially those to retail businesses) are in line with the costs of the sales tax (and the funding demands of the projects it funds, for that matter). Local voters also apparently approve of this rationale, given the majority voted in favour of the Measure R sales tax.

Although the London and Los Angeles business-based mechanisms are quite different, they both point in the direction of meaningful transit funding innovations based on the economic value that enhanced accessibility offers to businesses and property owners. Given the successes of large-scale project implementation demonstrated in these two jurisdictions, Australian locations like Melbourne would be well-served in investigating the potential for locally-responsive applications of similar benefit levy approaches.

4. Ticket Surcharges

The politics of ticket pricing has become fraught in Melbourne in recent times. But in looking at past examples of actual project implementation such as the Melbourne Loop, it becomes apparent that any wide-ranging and open-minded inquiry into potential non-traditional funding options would need to consider the potential of a ticket surcharge.

As with our previous example, beneficiaries may need to be willing to contribute through measures such as a ticket surcharge, otherwise the funds for project implementation may fall short, and any potential benefits would remain un-realised to passengers. The economics of ticket surcharging rests on the value of time savings and convenience that accrues directly to commuters and passengers, especially those utilising the new infrastructure and services (Banister & Thurstain-Goodwin 2011). Ticket surcharging is a classic 'user-pays' scenario and has strong ethical and practical underpinnings regardless of the vagaries of public politics on ticket pricing at any given moment in time.

Certain aspects are important to consider when engaging with the potential for ticket surcharging to underpin future mass transit investment in any specific location. We need to identify firstly the scope of the beneficiary group, and some sense of the scale of benefits they receive. We need to consider their willingness and readiness to pay a nominal charge – hence we need to consider what that charge might actually be. And finally, we need to identify whether a nominal charge that doesn't create major commuter backlash could ever make a meaningful contribution to the overall costs of building the project in question.

Table 2 below engages with the basic question of the benefits to passengers arising from various scenarios of travel time saving. Time savings are one of the most traditional and important components of economic benefit arising from transport projects. An indicative estimate of travel time savings (and their value) offers us a reasonable picture of the benefit accruing to passengers as a distinct beneficiary group. Taken a step further, it might also indicate to us a sense of both willingness and readiness to pay, on the one hand, and the scope of this beneficiary pool as a source of 'alternative funds' for major projects, on the other.

Table 2. Indicative Value to Passengers according to travel time saving scenarios

No. of impacted passengers (daily)	*Travel time saving scenarios (averaged) for passengers using renewed rail infrastructure*	*Estimated annual value of passenger time savings*	*Present Value (PV) estimate of time savings in perpetuity*
380,000	2 minutes	**$62.4 million**	$891.6 m
380,000	3 min	**$93.6 m**	$1.34 billion
380,000	4 min	**$ 124.8 m**	$ 1.78 b
380,000	5 min	**$ 156 m**	$ 2.29 b

Assumptions in-brief: Discount rate 7%. Value of time $13.50

Precedent exists in Australia for ticket surcharges as a partial funding mechanism. Particularly the ticket surcharge associated with the development of the Melbourne Loop during the 1970s and 1980s. With the passage of time specific figures have become difficult to ascertain, and estimates range. Eddington (2008, p52) quoted the loop surcharge at around 2% of average ticket prices – although this figure seems not to match-up against the roughly 5.5% of total project costs contributed by VicRail on a yearly basis during construction.

More recently, Translink in Southeast Queensland implemented a series of fare hikes over several years for the purpose of generally improving transit resources. These hikes coincided with offsetting service improvements, but the general revenue-raising impact and potential seen in this case study is worth discussing. For these purposes we will look at quarter 2 and quarter 3 of the 2011-12 financial year (Translink 2012a and 2012b). Quarter 3 (at first of January) saw the introduction of a roughly **9% fare hike**. Firstly, Translink experienced a *growth in ridership* between those two quarters of some 1.5%. And though this may be linked partly to the service improvements delivered, it belies the commonly held notion that fare rises always decrease ridership.

The gross revenue impact of Translink's 19c (or 9%) fare rise between the two quarters appeared to be a quarterly increase of some 11% in total revenue (which factors-in ridership growth in addition to growth in revenue per ticket sold). This provided some $ 9.2m in increased fare revenue during the second of the two quarters. If sustained, this would equate to an annual rise of around $36.8m in gross fare revenues from a 19c per ticket fare rise. One could reasonably argue on this basis (under a sustaining of similar fare elasticity outcomes) that a full 95c ticket rise could (or may) generate in the order of $184m in annual gross fare revenue increases (from a daily system-wide ridership of just under 700,000 trips). Translink did not hypothecate these revenues to capital projects per se – with a large portion simply going toward an improvement in transit cost recovery in a ridership growth environment. But stepping outside of case study specifics, it would appear reasonable to suggest that an organisation such as Translink (and/or other major transit organisations) could consider *a fare increase purely for hypothecation into infrastructure investment opportunities*. In broad terms this scenario could be broken down and re-constituted as following in table 3 (under a continued assumption of no fare elasticity effects in a context of ongoing transit ridership):

Table 3. General Scenarios of Fare Increase and Gross Revenue according to Passenger Volume

Affected passengers/trips (daily)	Fare increase	Annual Gross Revenue increase (approx)	Present Value of increased revenues (approx)
350,000	20c	$25.5m	$364m
350,000	70c	$89.4m	$1.28b
350,000	$1.00	$127.5m	$1.82b
700,000	20c	$51.1m	$728m
700,000	70c	$178.8m	$2.56b
700,000	$1.00	$255m	$3.64b

Assumptions in-brief: discount rate 7%, no net price elasticity effects under rising ridership and improved service

Although these scenarios and the projection of "no negative fare elasticity effects" are reasonably challenging arguments to make, they rest ultimately on the important difference between fare rises for their own sake, versus fare rises coupled to improved transit service in rising ridership markets. Translink's time series experience between the two quarters of 2011-12 FY would demonstrate that this assumption is a reasonable one to make in a context of early-stage broad-based projections. The point of Table 2. does not rest with its specifics – but rather with the general picture it provides for the broad quantum of additional revenues available through a ticket surcharging approach in Australian conditions.

With respect to then-current plans to develop the so-called "Cross River Rail" project as a $7 billion suite of rail tunnel investments and new stations, it may be fair to suggest that a $1 surcharge could have been considered – to be levied across the roughly 180,000 daily trips occurring on the Queensland Rail passenger network. Such a mechanism may have been able to generate some 13% of project capital costs (at around $940m in present value revenues).

In short, on the basis of these calculations, projections and arguments, it may be reasonable to suggest that **a ticket surcharge** could potentially cover somewhere between **10% and 15% of project costs for major urban mass transit infrastructure programs**. Moreover, ticket surcharging is ethical and efficient, in that it engages with the willingness and readiness to pay of passengers as an important direct beneficiary group in transit investment scenarios.

Picture: London Underground, C Hale 2007. European and UK transit stakeholders see cost recovery through fares as crucial. Fare structure is one of the most obvious, important and "fair" mechanisms of resourcing high quality transit service provision.

5. TOD and Development Rights

The concept of transit oriented development (TOD) integrating financially with rail infrastructure delivery has a long history in both theory and practice. More recently, its practice has largely been confined to Asian jurisdictions such as Hong Kong, Singapore and in Japanese cities (Cervero & Murakami 2009), while Australia has focused its interest into flowery planning rhetoric. Nonetheless, any major renewal program for mass transit infrastructure in Australian cities will need to rely on some level of cash contribution from TOD-related or direct property sources as part of a broader mix of funding innovations.

From the outset, we should understand the important difference between "land value increases as a result of improved access" (as per part 3) versus "development rights" associated directly with new transit initiatives at a precinct scale. This chapter addresses the latter.

Table 4 provides an overview of the penetration of direct property plays into the profitable business model of MTR in Hong Kong. There are several important nuances at work in Hong Kong. Firstly, much of MTR's property-related opportunity arises from land grants that are made by the Hong Kong Special Administrative Region government to MTR for the purposes of integrated rail/development outcomes. Secondly, MTR retains the entirety of re-zoning windfalls after those granted lands are re-zoned for far higher and better uses. These re-zoning plays centre around the reality that such high densities and intensities of development could not occur along the self-same corridors in the absence of high quality mass transit services. MTR as a whole then becomes a strongly profitable organisation. Large slices of its corporate profit come from direct property activities, while the rail infrastructure and service aspect is often described as being a roughly "break-even" financial endeavor. While the specific formula applied in Hong Kong is not directly applicable in Australian circumstances, interested parties are strongly advised to consider each of the elements of integrated rail/property strategy described above – as many of these aspects could be workable in some locally-responsive formula. Certainly, it is difficult to foresee a pathway of more robust transit infrastructure implementation and integrated development in Australia that takes place without locally-sensible adaptations of this proven formula.

Table 4. Hong Kong MTR Corporation – TOD-related key performance indicators 2013

Property-related revenues as proportion of all revenue	*Property Development Profit (HK market)*	*"Station Commercial" revenue 2013*	*Retail property held*	*Office property held*
21.6%	**$AUD 250m**	**18% of total organizational revenues (in HK)**	**213,000 sqm**	**14,000 sqm**

Source: MTR (2014)

London's Crossrail project has proven something of a path-breaker in the Anglo world, featuring a target of 7% of rail infrastructure costs recouped through TOD-style direct property measures (author's estimate from GLA 2010, p15).

Beyond international touchstone examples, several important considerations face us in formulating a workable and proportionate localised value capture mechanism for Australian cities, based on sensible treatment of land re-zoning windfalls:

- The understanding that full realisation of land value uplift is largely dependent on delivery of the mass transit enhancement (otherwise the property market at that location will likely remain insufficiently robust to accommodate the full scale of newly-zoned development opportunity)
- That any levy could presumably be actioned *over time* – either on a recurring or annualised basis, or in some form of point-of-sale recouping, rather than as an up-front once-off fee
- That "land value" requires risk and holding cost margins to enable development to actually occur, hence the very concept of a "full" windfall figure is itself problematic. This means that transit infrastructure stakeholders should tread carefully and lightly in accessing any windfall gains through a value capture mechanism

Nevertheless, land owners involved in TOD-style rezoning opportunities are faced with a stark but hopeful set of choices. Local or state government can sit on its hands, or they could simply not re-zone transit-adjacent land to full capacity due to lack of the transport infrastructure necessary to service full redevelopment of the precinct. Alternatively, some level of re-couping of windfall gain could be considered by landholders, at a rate well below the full windfall value - in the interests of supporting the value-adding transit infrastructure delivery, securing the rezoning, and accessing the windfall gain and its associated development opportunities. Thus the quantum of levy and the timing and nature of the re-couping mechanism become crucial questions. For the purposes of advancing policy discussion, one potential approach available from the many is put forward here:

It is suggested that a **point-of-property-sale** mechanism could be considered in Australian scenarios. Under this approach, the levy only falls at the time of "end-sale" to buyers (or holders) of newly-developed residential, commercial and retail properties in the TOD precinct after those developments are constructed. In this scenario, land could be traded and held prior to development in full knowledge that end-purchase price would include a levy (which would presumably marginally soften the land value and/or the pre-development land trade price to a level equivalent to the levy). But no levy would be directly or immediately enacted *on land* from the perspective of current landholders or incoming developers.

As per the part 3 scenario around the broader issue of property value increases according to enhanced transit access - it is suggested that **a levy on 10% of windfall gains** would presumably be bearable, manageable and acceptable to property owners in any major precinct-scale rezoning case (especially where land owners are aware they retain the vast bulk of the windfall).

As with many of the concepts advanced in this paper, some more sophisticated and up-to-date governance arrangement is presumably required – one capable of managing rezoning levy cashflows over an extended period, and folding those flows back into an infrastructure borrowing and equity position. Further detail is provided in parts 7 and 8 around the "Joint Powers Authority" structure that has been utilised in the United States recently to handle complex financial, project and administrative issues in similar integrated mega-projects (see TJPA 2011a; 2011b; Hale 2013).

6. Tax Increment Financing analysis & national funding

As with the other resourcing streams already discussed in this paper, the idea of Federal Government funding support for new mass transit initiatives seemingly flies in the face of accepted current practice. Recent injunctions from Federal Government against urban rail investment may in themselves be a major stumbling block preventing more nuanced discussion among stakeholders. But as with so many fields of public policy, today's categorical refusal eventually becomes tomorrow's mainstream policy (and vice versa). In the grand scheme of things there is little to prevent sensible analysis and discussion of the drivers and rationales that might lend support to a logic of federal funding for transit investment. In this section we engage with precisely this opportunity.

Tax increment financing (TIF) analysis is another 'value capture' or 'innovative financing' staple that has become accepted in jurisdictions such as the US (see US GAO 2010; Miller & Hale 2011), but for which understandings and knowledge are poor in Australia. A definitive clarification is therefore useful from the outset:

Tax Increment Financing is an accounting-based estimation of likely increases in taxation revenue arising from the positive economic impacts that new transit initiatives will deliver. It involves no alteration to taxes and charges per se.

TIF is mobilized at times to provide a degree of certainty around future payment streams for any up-front project delivery or borrowing. The positive economic impacts and resultant taxation effects of quality transit investments obviously only flow after the enhancement is operational – hence up-front funding commitments or borrowing programs can be a useful way to unleash those benefits, provided the project meets economic impact hurdles, and provided any payments over time can be accommodated into budget circumstance into the future. Where positive economic impacts are projected to be substantial, it absolutely makes sense to run the ruler across any likely taxation flows - because otherwise, decent and economically beneficial infrastructure investment options may lay un-realised due to a lack of sensible and justifiable government participation. There is also the question of whether project participation may indeed be *revenue positive* after the balance of project funding and taxation impacts are considered in the aggregate for a stakeholder such as Federal Government.

In the Australian context, transport policy stakeholders are therefore genuinely interested to see the application of TIF analyses - to avoid outcomes in which needed transport improvements go unfunded, even where they can produce meaningful economic and hence taxation impacts. At the very least, we would be concerned if projects accepted by the community at-large were not funded up to a point at which the balance of costs and taxation flows remained positive for any particular government stakeholder.

London's Crossrail project again provides an important contemporary reference point for tax increment financing, the taxation revenue impacts of major urban rail projects, and the very rationale for National government involvement in urban mass transit.

In table 5 below we observe that UK government has been able to leverage the projected positive taxation revenue impacts arising from the Crossrail project (some £ 7.6 billion) into a roughly equivalent level of up-front project funding (at £ 8 billion). This commitment has clearly

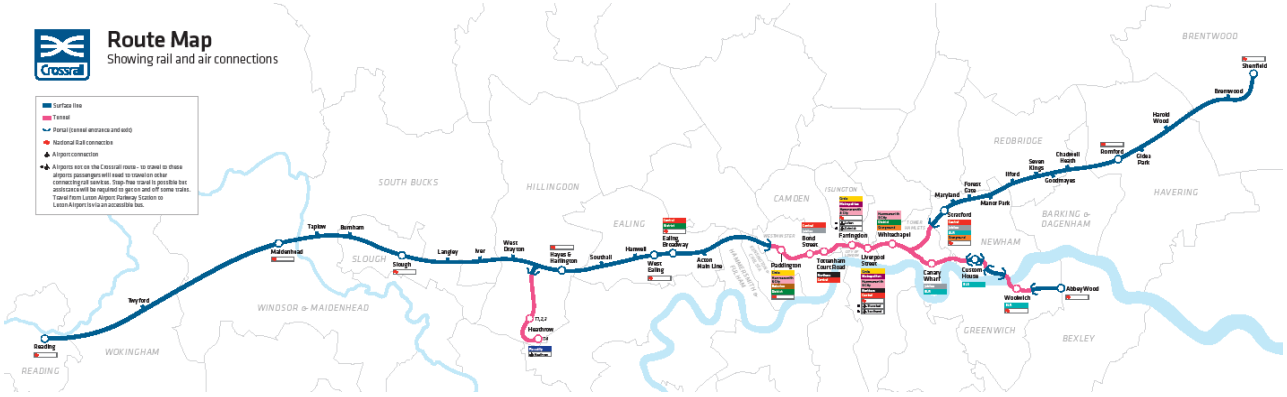
been founded on a detailed and robust base of TIF *analysis* – and UK government is not altering taxes or charges in any way.

Table 5. London Crossrail – Economic Benefits and Taxation Impacts

Project Cost*	Traditional BCR ratio**	BCR including wider economic benefits (WEBS)**	Estimated net increase in economic turnover (traditional impacts + WEBs)***	Tax revenue at 30% tax-take assumption****	UK Central Govt funding commitment*
£ 15.8 b	**1.8**	**2.6**	**£ 25.3 b**	**£ 7.6 b**	**£ 8 b**

*Sources: GLA (2010, esp p15); ** Banister & Thurstain-Goodwin (2011); *** Researcher's estimate based on publically available info; **** Colin Buchanan & Volterra (2007, p25)

The implication beyond the UK from this case study is clear – ***that there is usually a strong quantitative, cashflow-based rationale for National Governments to actively analyse and consider part-funding urban mass transit projects.*** At the very least, national governments should consider investments up to the level of projected positive taxation revenues.



Picture: Crossrail route map.

Such a large endeavor has demanded funding, analytical and policy innovations at various levels of government in the UK.

7. Implementation Opportunities

Through reviews of international case studies and the relevant theory base in transport economics, we have identified the possibility that alternative or unfamiliar funding sources may contribute substantively toward any effort at building major urban transit projects in Australian cities. This penultimate chapter focuses on implementation concepts, potential packages, policy nuances and practical challenges.

Benefit levy

The practical ability to activate a benefit levy of the type raised and dissected in chapter 3 would rest on several understandings. Firstly, any levy should be set at some small fraction of a conservative estimate of likely property value impacts. A levy of a round 1/10th of a 10% value increase to affected properties appears sensible and workable (for example). This would imply that affected properties generate a windfall in the order of $9 for every dollar contributed via a levy. In practical terms, it is suggested that any levy should be raised across a lengthy draw-down period, rather than as a once-off imposition. This also connects somewhat with the idea that project benefits only arise after the transit infrastructure is opened, but those benefits then accrue continuously into the future for affected properties and locations. Implementation of a benefit levy or similar in Australian jurisdictions would also need to pay regard to existing property-based taxes and charges. While the two issues (existing property charges, and new economic impacts from levies funding transit) are not connected as such, a sense of proportionality, acceptability, and 'impact minimisation' is important in any new scheme.

Ticket surcharge

The ticket surcharging option in chapter 4 likewise rests on several important assumptions, but overall a seemingly workable and practical scenario is presented. As a broad indicator - a 70c per-trip surcharge levied from some 350,000 passengers daily would contribute around $90 million a year, or some $1.3b in present value revenues (complexities of demand and value-of-time discounting aside). Such an arrangement could run for somewhere between 15 and 25 years, escalating with inflation. From the outset, as with the benefit levy, a surcharge could only begin functioning presumably *after* the new stations open, when the benefits begin flowing to passenger beneficiaries. In project implementation terms, the greatest cost draw-downs occur during construction, however. Any actual implementation and capture of a surcharging revenue stream invariably extends well beyond the beginning of construction (perhaps several decades), and so project level financing issues would need further investigation. In simple terms, the project principal would invariably need to borrow or fund against the projected ticket surcharge revenue stream to begin construction (as with the benefit levy). Regardless of policy vagaries around ticket pricing at the current time, ticket surcharges are an efficient and ethical means of involving direct beneficiaries (passengers) in contributing to project cost. Existing smart card technologies provide a sound platform for any surcharge effort.

TOD rights & direct property options

Perhaps widest diversity of potential approaches lies in the area of TOD development. Several strategies are mainstream internationally. The direct sale or auctioning of development rights (in the form of floor space allowances at, above or adjacent to new stations) to developers is common and practical. Common also is the packaging of station delivery contracts with development rights. In this approach, developers successful in a tender process are required to deliver a station (according to agreed specifications) in return for development rights of equal or greater value. Any difference between station cost and the value of development rights

awarded can also be built into an 'availability payment' into the future (although this adds-to rather than diminishes overall costs). A third, also common, approach is for the delivery agency or project principal to act as a real estate developer as they create the new stations – hence directly re-couping any development margins available (as per the Hong Kong model). There is at times a cultural perception problem militating against state-owned enterprises or departments acting in a development role in Australia, but this approach is common and successful overseas, and in actual fact has frequently occurred in some form or other in Australian infrastructure contexts. In chapter five, however, we focused on a re-couping of the value of new redevelopment provided through re-zoning as the main TOD-based contribution. An end-point-of-sale mechanism was tabled - and appropriate implementation contingencies would be required. This presumably would include a front-loaded borrowing package within a governance regime that then provides for levy collection and loan repayment over time.

Federal funds with support of TIF

In practical terms, TIF approaches in support of Federal contributions to project delivery require no major alteration to practice or policy. The TIF analysis would simply sit alongside the Federal Government's review of the mainstream business case for infrastructure projects. Government still needs to compare the costs and benefits of investing in an urban mass transit project against the costs and benefits of supporting other competing projects or initiatives – so TIF provides no guarantees of funding per se. As previously discussed however, a body of evidence suggests the superiority of urban rail projects serving the CBD core in economic terms - for the simple reason that they serve our greatest concentrations of economic activity. Any project contribution backed by TIF analysis presumably takes the form of either a once-off up-front grant, or several years of grant funding through the construction cycle of a given project.

State funding from consolidated revenue

The very purpose of identifying and pursuing 'alternative' streams of project funding is to free-up State governments in Australia to be able to more readily commit to specific projects, or indeed to be able to see a wider array of projects implemented from the existing funding base. As such, the analysis contained in this paper fundamentally projects a diminishment and easing of the funding commitment required from State government to see major urban transit projects delivered. But State would still be assumed to contribute the bulk of project costs (40% to 75% perhaps) even under a very robust 'innovative funding' scenario. The 'internal' benefit/cost outlook from the State perspective improves markedly however with alternative funding streams incorporated – because the same level of infrastructure investment and economic benefit arises out of a smaller State commitment. The bottom line is that State remains the largest and most firmly engaged stakeholder, hence any pathway to alternative funding models places great reliance on new efforts and policy stewardship from the State.

Project governance and financial structuring

State Government ordinarily needs to act as project principal and project steward. More recently in the United States - the concept of 'joint powers authorities' (JPAs) has strongly emerged as a preferred delivery and governance entity for major projects (see Hale 2013; TJPA 2011a; 2011b). A joint powers vehicle combines the resources of the largest and most prominent public and private stakeholders into an equity-based legal partnership with project delivery as its aim. Major stakeholders invariably provide representatives onto the JPA board. The JPA then dexterously addresses all project contingencies as they arise, including; borrowing, repayments and administration of levies. The substantive funding innovations described in this paper would benefit from an updated project governance approach such as a JPA.

8. Recommendations

Addressing the prospects for new urban rail projects in Australian cities, this report has initially been undertaken as:

An investigation of new, alternative or unfamiliar transit project funding mechanisms - conceptually, and with respect to important international reference cases.

The background for urban rail projects in Melbourne and other Australian cities is one of ever-increasing passenger demand, but a weak track record over several decades in infrastructure delivery (Hale & Eagleson 2013). Thus, from the outset, any status quo changing project may need to change the status quo on project funding approaches. A variety of major projects internationally, including Crossrail in London, have demonstrated this dictum.

Value capture approaches rest on a solid base of economic value that is generated by major urban rail projects, but all-too-often simply forgone as part of the potential project funding mix. Any advanced value capture effort involves a recycling of some portion of that windfall economic value directly back into the funding pool for the proposed project. A diversity of value capture mechanisms exist, but this particular paper has emphasised four that involve reasonable prospects of application in Australia, namely: a benefit assessment district or levy; a ticket surcharge; a pursuit of TOD development rights revenue; and the mobilisation of tax increment financing analysis to clarify the revenue position of Federal Government, potentially improving its willingness to actively contribute to transit project delivery. On these grounds, the following core recommendations are made to stakeholders with an interest in better funding options for Australian transit projects:

- That generationally transformative programs of urban transit delivery are unlikely to be delivered without some level of 'innovative' or non-traditional funding. Over-reliance on State consolidated revenue funding has proven problematic over many decades. Hence – new and non-traditional sources of funding must now be actively sought-out, considered and enacted

- All four of the mechanisms analysed in this paper seem at face value to offer substantive opportunities, especially as a suite of mechanisms in some combination. Project funds for mass transit in the order of 25-50% of project cost should be attainable from non-traditional sources working in combination

- State and other stakeholders should combine their resources for further analytical investigation of a 25-50% 'alternative funds' scenario for major urban transit initiatives. Such investigations should occur in the public domain - so that the public, taxpayers and beneficiaries are introduced to the potential, rationale, benefits and challenges involved in this prospective change of approach

- The investigation should include a diversity of scenarios beyond those outlined in this paper. Variations in the rate of value capture re-couping, and the pool of beneficiaries involved should be actively considered

- The mechanisms outlined in this paper are all *efficient and ethical* – in that they provide a user-pays element that involves direct beneficiaries in contributing partially to project outcomes from which they derive substantial personal gain. This of itself would be a useful change to future transport policy and funding scenarios, compared to the current scenario in which all taxpayers, citizens and businesses support projects 'equally', regardless of the direct benefit they receive from the investment

- But policy and implementation for value capture should not be heavy-handed or over-zealous toward direct beneficiaries. Levies and charges should only be introduced up to a level at which said beneficiaries are by-and-large comfortable. Value capture should rest on a win-win scenario in which beneficiaries are supportive in the main, due to their hope of making a small contribution toward realising a greater personal gain. But beneficiaries should also be well aware that a failure to actively contribute is quite likely to result in a failure to achieve project delivery, hence the loss of prospective personal benefits

- The extent of direct benefit to key beneficiaries should be analysed from the outset to initially understand the scope and scale of such personalised benefits. From there, the initial benefit scoping also assists to develop a short-list of practical options for re-couping a portion of benefits, in the mutual interests of project implementation for the realisation of those benefits

- New approaches to project governance such as joint powers authorities may assist to progress urban transit mega-projects, because they recognise, accommodate and facilitate the inherently multi-stakeholder nature of such large-scale exercises. These options should be investigated and considered further in Australian jurisdictions

The application of value capture and other innovative funding mechanisms has been demonstrated via the case studies, reference sources, and theories addressed in this paper to hold, if nothing else, substantial promise. A clear rationale exists for further analysis and policy discussion on these grounds. Broad figures identified in this paper also indicate to us the approximate scale of funding opportunity – and this provides a further rationale for ongoing consideration and study.

It also seems clear that Australian cities face the choice of moving toward greater capabilities to deliver new infrastructure with the aid of beneficiary finance, versus an ongoing dismissal of these options and a continuation of the lackluster infrastructure delivery outcomes seen over recent decades. Innovations employed in programs such as London's Crossrail and LA 30-10 demonstrate that getting real about project delivery means getting serious about alternative funding methods. This paper is commended to readers as a spur to further policy discussion and in the hope of a more robust future for mass transit delivery in Australian cities – especially due to the clear economic benefits that better urban transit can unleash.

9. Bibliography

Banister, D and Thurstain-Goodwin, M (2011) *Quantification of the non-transport benefits from rail investment* Journal of Transport Geography

The Brookings Institution & Reconnecting America (2009) *Value Capture and Tax-increment Financing Options for Streetcar Construction* Washington, DC: The Brookings Institution & Reconnecting America

Cervero, R and Murakami, J (2009) *Rail and Property Development in Hong Kong: Experiences and Extensions* Urban Studies

City of Melbourne (2013) *Annual Plan & Budget 2013-2014* Melbourne, VIC: City of Melbourne

Colin Buchanan & Volterra (2007) *The Economic Benefits of Crossrail* London: Colin Buchanan & Volterra

DOT – Department of Transport, Victoria (2010) *Melbourne Metro One Business Case – draft public transport patronage forecasts* Melbourne, VIC: Department of Transport, Victoria

Eddington, R (2009) *Investing in Transport - East West Link Needs* Melbourne, VIC: Department of Premier & Cabinet

GCRT - Gold Coast Rapid Transit Project (2011) *Gold Coast Rapid Transit – making a good project a great project* Gold Coast, QLD: Department of Transport and Main Roads, QLD

GLA - Greater London Authority, London Assembly – Transport Committee (2010) *Light at the End of the Tunnel – the construction of Crossrail* London: GLA

Hale, C (2013) *Mass Transit Project Financing – new & alternative approaches* Rio: World Conference of Transport Research

Hale, C and Eagleson, S (2013) *Passenger Rail in Melbourne – new challenges in a new century* Australian Planner

IA – Infrastructure Australia (2013) *2012-13 Assessment Brief – Melbourne Metro One* Sydney, NSW: Infrastructure Australia

LA CMTA – Los Angeles County Metropolitan Transportation Authority (2010a) *Metro's 30-10 Initiative* Los Angeles, CA: LA CMTA

LA CMTA – Los Angeles County Metropolitan Transportation Authority (2010b) *Proposed One-Half Cent Sales Tax for Transportation: Outline of Expenditure Categories* Los Angeles, CA: LA CMTA

Miller, M & Hale, C (2011) *Innovative Finance for New Rail Infrastructure* Adelaide, SA: ATRF

MTR (2014) *Creating Value Driving Growth – annual report 2013* Hong Kong: MTR

PTV – Public Transport Victoria (2012) *Network Development Plan – Metropolitan Rail* Melbourne, VIC: PTV

TCRP - Transit Co-operative Research Program (2004) *Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects TCRP Report 102* Washington, DC: Transportation Research Board

TJPA - Transbay Joint Powers Authority (2011a) *Building the First Modern Multi-modal Transportation Station in the United States (Transbay Transit Centre fact sheet, January 2011)* San Fransisco, CA: TJPA

TJPA - Transbay Joint Powers Authority (2011b) *Independent Auditor's Reports, Management's Discussion and Analysis, Basic Financial Statements and Other Supplementary Information for the year ended June 30, 2011* San Fransisco, CA: TJPA

Translink Transit Authority (2012a) *Translink Tracker 2011-2012 Q3* Brisbane, QLD: Translink

Translink Transit Authority (2012b) *Translink Tracker 2011-2012 Q3* Brisbane, QLD: Translink

US GAO – United States Government Accountability Office (2010) *Report code GAO-10-781: Public Transportation – Federal role in value capture strategies for transit is limited, but additional guidance could help clarify policies* Washington, DC: US GAO

10. Abbreviations

BAD
Benefit Assessment District

BCR
Benefit Cost Ratio

DTPLI
Department of Transport, Planning and Local Infrastructure - Victoria

GLA
Greater London Authority

IA
Infrastructure Australia

JPA
Joint Powers Authority – a new type of project governance vehicle

LA
Los Angeles, California

MM1
Melbourne Metro One (rail infrastructure project proposal and related planning studies)

MTM
Metro Trains Melbourne (train operating company)

MTR
Formerly 'mass transit rail corporation of Kong Kong' – but now known simply as 'MTR'

PTV
Public Transport Victoria (a state government agency)

PV
Present Value: the estimated value at "year zero" of projected positive cashflows into the future, according to an agreed "discount rate" for adjusting value of time (based usually on prevailing bank interest rates)

TIF
Tax Increment Finance

TOD
Transit Oriented Development

WEBs
Wider Economic Benefits (a category of economic benefits arising from infrastructure projects)