

DELIVERING TODS:
TRANSIT-ORIENTED DEVELOPMENT
ZONING, CONTRACTING, ENGAGEMENT
AND GOVERNANCE

Peter Newman, Mark Bachels, Brian McMahon, Jan Scheurer and Mzingisi Mqhum





Across Australia, and indeed the world, there is a movement to build transit-oriented developments (TODs). However, they are proving extremely hard to deliver. The delivery process usually fails because town planning schemes (and policies) are not adequately adapted to an assumption of reducing car dependence, contracting arrangements are not able to provide the land use-transport link through the private sector, community processes are inadequate and there is a lack of governance for delivery. This paper will provide a model for how each of these aspects could be improved.

Benefits offered by TODs

TODs deliver travel choice

The proximity of transit infrastructure and services to homes, jobs, shops, schools and universities, special events and other daily activities makes everyday travel easier and faster. By bringing more people together at station areas, more frequent transit service is also supported.

TODs promote healthy lifestyles

TOD planning gives special emphasis to walking and biking. Active travel is a key factor in achieving a sustainable and healthy community. In fact, Mayor Sam Adams of Portland, Oregon, often notes in regard to TODs that 'success is the trip not taken'. In some TODs, approximately one-third of trips are made on foot.

TODs can make households more affordable

By clustering a mix of uses within walking distance of stations, TODs can reduce reliance on private cars, significantly reducing living costs. The cost of owning and operating a car consumes a large portion of the typical family's income. By providing travel choices, TODs can free up income for other household needs.

TODs benefit those who cannot or choose not to drive

By creating a network of connected centres, more travel options will be available to a broader population. In the United States, recent research has shown that TOD residents are half as likely to own a car as the general population.

TODs make more efficient use of land

The denser and more compact development pattern resulting from TODs frees up land currently dedicated to moving and parking cars. It also reduces fuel consumption and air pollution, generates fewer car trips and induces a smaller carbon footprint. In fact, it is usually desirable for TOD projects to limit car-parking space requirements, freeing up finances and land for other uses.

TODs create a green dividend

In addition to reduced car dependence, TODs facilitate a broader mix of land uses within a convenient walking distance, making it quicker to reach destinations by non-mechanised transit. This significantly reduces transport-related greenhouse gas emissions, as well as providing other environmental benefits, such as reducing local vehicle emissions, and overall reducing sprawl and consumption of land available for other purposes, like growing our food.

TODs create more vibrant neighbourhoods

TOD neighbourhoods accommodate a broader mix of uses and a broader range of lifestyles. More and more people, such as 'empty-nesters' or 'urban adventurers' are seeking lifestyles that differ from the traditional single-family home on a quarter-acre block. Mixed-use TODs provide a vibrant community village.

TODs and associated urban infill relieve pressure on the urban fringes

The use of infill, mixed-use projects and increased densities can significantly relieve pressures at the urban fringes. TODs significantly contribute to urban renewal and in many Australian cities are now part of the planning lexicon.

TODs can be, in part, self-funding via value capture mechanisms

There is no longer any surprise that the effect of transit on land value is considerable. Governments around the globe recognise that an address near a transit station is a good one. Land zoned for higher density residential use or mixed use and with convenient access to transit has a higher land value than conventional developments. The tool for government sharing in the potential uplift in property values is commonly known as 'value capture.'

Why TODs?

Transit-oriented developments (TODs) are happening across the world, especially in highly car-dependent cities like Australian and US cities (Curtis, Renne & Bertolini 2009). The household economics of this approach have been assessed by Parsons Brinckerhoff's PlaceMaking group, which has found around 50% less car use per household by those who live in a TOD, and the residents save around 20% on household income as they need one less car per household (data collated and presented by Center for Transit Oriented Development 2004). In Australia a similar calculation showed that, for an average household with one less car, this would save some \$750,000 in superannuation over a lifetime for an average household with one less car.

The value of TODs is that they save governments substantial money through infrastructure and transport costs, as well as providing greenhouse and health benefits (Trubka, Newman & Bilsborough 2008). Fundamentally, TODs are able to overcome car dependence, an issue that confronts every city in the world (Newman & Kenworthy 1989, 1999). Despite the promise of New Urbanism to modify greenfield developments into less car dependence, the evidence for success is not good (Falconer, Newman & Giles Corti 2009). However, the evidence about TODs is much better (Curtis, Renne & Bertolini, 2009).

In all Australian cities there is a strategic plan that sets out why the city would like to build centres around transit stations, where the city would like these to be and, in most cases, when they would like to see increased numbers of residents and jobs in those centres. In addition there are numerous recent Australian Government initiatives regarding the importance of planning in our cities to meet future population growth and improving integrated infrastructure delivery, including development of centres and transit investment.¹

But so often proposed TOD projects strike trouble in delivery.

Why TODs fail to be delivered

The TOD delivery process fails for many reasons:

- (1) **Town planning schemes are not adequately adapted to reduce car dependence.** GB Arrington from PB PlaceMaking has found this a problem in nearly every single TOD he has worked on across the USA and Australia. He says, 'Every TOD is illegal.' This is because they are not consistent with town planning scheme codes and traffic engineering standards. These codes have been devised to adequately build suburbs and shopping areas on the assumption of car dependence — that is, that each dwelling or building will be serviced by car use alone. This assumption means that buildings and road spaces are required to accommodate the car rather than being designed around a transit station and walkable linkages across the centre.
- (2) **Contracting arrangements are not able to provide the land use — transport link between government agencies and through the private sector.** The power of TODs is that they can be built in close cooperation with the private sector so that transit systems can not only be made to work better but indeed help to pay for the transit system. This close synergy is being demonstrated today in most US cities, and it is a requirement of Infrastructure Australia to create public–private partnerships (PPPs) around the urban rail projects they have funded (\$4.6 billion in 2009). These projects require equity arrangements to enable funding. Thus, contractual arrangements are needed that enable transit systems to be built requiring integration between transit operators, land developers, financiers and the three levels of government. This is a challenge for everyone as it is new territory.

¹ Refer Prime Minister Rudd's recent speeches on population growth and the need for improved infrastructure (e.g. <http://www.pm.gov.au/node/6282>), and a report from Infrastructure Australia on the State of Australian Cities 2010 (Major Cities Unit).

- (3) **Community processes are inadequate.** The community is not happy about car dependence and likes the idea of TODs, but it is usually not so keen when it comes to having a TOD nearby. Ideas about density, traffic congestion and intense urban activity generate fear of reduced real estate values and loss of amenity, and increased crime and noise, rather than the opportunity to be part of a village and an exciting and visually appealing city-building process. In Melbourne this led to a reaction that stopped most of the state government's TOD plans, and finally this meant that local government's powers in these areas were stripped away.
- (4) **Land assembly in station precincts is too difficult.** A major challenge for private-sector development in assuring commercial viability, particularly in existing urban areas, is assembly of disparate parcels of land to ensure adequate size and scale for development around transit. Aside from inconsistent and somewhat random government intervention, at present there is a lack of incentives or consistent mechanisms for land assembly for successful TOD delivery.
- (5) **Governance for delivering TODS is haphazard.** Lastly, without vehicles for integrated planning and delivery, TODs are currently left 'to fend for themselves', in often discrete and haphazard governance processes. A more holistic governance approach is required between councils, state government agencies and funding authorities to ensure more accountable and responsive governance arrangements are established that ensure TODs receive greater priority in planning, delivery and approval. Without a concerted and integrated effort across all urban areas of Australia, the same random and inefficient process will continue, making greenfield suburban sprawl the undesirable but default 'winner' in meeting our future population growth targets.

Is there not a better way? Can we not create TODs without these problems?

Delivering TODs

TOD zoning

The first step in creating a TOD is getting it through a town planning scheme (TPS). Most TPSs have been set up to deliver car-dependent suburbs and shopping centres. Across Australia, the USA, Canada and New Zealand, the suburbs we build look almost identical. This is not by chance; it is due to the requirements that are set in TPSs that have been copied by planners across the English-speaking world.

To deliver a TOD requires a new, separate and distinct zoning. This will enable any new TOD to be immediately recognised. With improved TOD zoning, any group of developers attempting to formulate a TOD will not have to go to the local council and seek a political decision to over-ride the 'normal' TPS; it will be normal to have a TOD. For state and federal governments seeking to develop cities by using TODs, the provision of TODs in a TPS and within the development and zoning codes will enable decision makers to see whether they are being serious at the local level. Too often the local authority agrees in theory but in practice does not allow TODs.

Improving the process

How do you enable a cumbersome and ill-fitting statutory planning framework to include TODs? In some cases local TPSs will not allow mixed-use developments or will require high car-parking rates that would undermine the principles of a good TOD. Mostly they would not accept the densities which are seen as necessary. Thus, often TODs are, strictly, illegal but can be accepted by political intervention; they are not able to be accepted 'as of right'. Improving our planning schemes by introducing TOD zoning is therefore critical.

While state-sponsored regional planning frameworks are generally supportive of TODs, there is no example of an explicit TOD zoning district set forth in Australia in the state model codes.

In Denver, Colorado, a Transit Oriented Development Strategic Plan was adopted in 2006 to guide land use planning, development and delivery, to better support Denver's massive investment in a new transit system — a new metro system of 119 miles (190 km) and 70 new stations. The FastTracks metro system will aim to fundamentally reshape growth patterns in the region and the Denver TOD Strategic Plan is a key tool in that process. The TOD Strategic Plan is being used by city council, the Planning Board, the Mayor's administration, management, staff and others to:

- define priorities for choosing where city resources should be directed in the short and long term
- identify effective implementation tools and strategies for TOD
- ensure close coordination among city departments, staff and others as they undertake planning and implementation activities related to transit and transit-oriented development.

A visionary zoning reform in Australia is required to have a lasting impact on the delivery of TODs. The lack of TOD-friendly zoning is not a new problem but one which continues to undermine the ability to transform our urban areas into more sustainable cities. Even in the USA, Jeer (1994) identified over a decade ago that alternative zoning techniques are required to achieve TOD. TOD-supportive planning schemes can serve as a blueprint for sustainable development if a new, separate zoning approach and distinct zoning codes are implemented.

Implementation of TODs is often the responsibility of local government but based on model TPSs established by state governments. In areas where TODs are desirable as a state-level policy objective, such as those identified by the Western Australia Planning Commission (WAPC) and South Australia

Department of Planning and Local Government (DPLG), the responsibility for zoning currently remains with the local government. Queensland refers both the mapping and adoption of supportive zoning to the local governments.

Placing responsibility for delivery of TODs on local councils is counterproductive. Many councils face financial and technical resource limitations (Khan & Bajraccharya 2007). Negative community perceptions about density and mixed use lead to tremendous political pressure against TODs, placing local councils at odds with the desired state policies (Quality Growth Alliance 2009). Bajraccharya (2005) also noted the impediment created by the amalgamation of councils requiring a state review of planning legislation created by the combined super-councils in Queensland.

Planning legislation in Western Australia (WA) requires local governments to prepare a TPS for the entire council based on the Western Australia Planning Commission's model scheme text (MST). The TPS establishes the policies to determine planning approvals, identifies and maps the suite of zoning districts, and includes a table of land uses and densities by zoning district. The MST is accompanied by the Planning Schemes Manual which identifies the potential zoning districts for possible inclusion in the TPS based on the MST. While the MST does not require standardised zones, the suggested categories of zones do not explicitly include a TOD zone.

Existing model districts, such as the activity centres and mixed-use zones, could be theoretically adapted via the scheme requirements (e.g. setbacks), but few councils have explicitly sought to create TOD-focused scheme requirements in their zones. Carey & Low (2009) noted a significant 'implementation gap' in their systematic review of the policies and outcomes for the integration of land use and transport in 69 local councils in WA.

In some locations in WA, TODs have been the result of an alternative governance model of a development authority (e.g. Subiaco Redevelopment Authority and East Perth Redevelopment Authority — see 'Case study: East Perth and Subiaco TODs' and Figure F-2) in lieu of the conventional town planning process. However, the burden clearly falls to the individual local governments to craft TOD-supportive zoning.



The South East Queensland Regional Plan 2009 (SEQRP) expresses a number of TOD principles and outlines high-level TOD typologies, yet gives local councils responsibility for identifying appropriate policies and locations for TOD when preparing their local plans. Under this approach, the SEQRP identifies activity centres (where prospective TODs could go) but does not provide specific guidance about scale, intensity or mix of uses, and instead relies upon the local councils to develop these details in the local plans.

The WA and SEQ approaches utilise the statutory regional planning framework combined with local planning schemes to provide policy support for TODs. The resultant approval framework and multiple levels of assessment inadvertently discourage the creation of TODs. An alternative approach, currently under development by the South Australia Department of Planning and Local Government may prove more useful (see 'Case study: South Australia').

In addition a case study from Austin Texas, which expedites approvals for TODs in planning schemes.

Case study: South Australia

The Plan for Greater Adelaide (Draft 2009) supports the creation of TODs and transit corridors aimed at promoting greater infill development. As important as these objectives is the proposal to ease the creation of TODs and infill by altering the conventional development approval process. Under this approach, in designated areas of state significance, structure plans will be prepared by the state to set the land use priorities and directions for large areas such as the transit corridors. The large-area plans will establish the key land use objective, permissible uses, and design principles and guidelines. The desired locations for TODs within the corridors will also be identified. The structure plans will be a precursor to changing local council development plans to facilitate the development of TODs.

In designated areas of state significance, precinct requirements for areas such as TODs will also be created by the state government. These will be the provisions that developers are required to address in development applications. Precinct requirements might include detailed design parameters of the area, numbers of dwellings and densities, urban design requirements, detailed designs and elevations for large buildings and transport linkages. The development application

will include a precinct plan which responds to the required outcomes of the structure plan and precinct requirements. Compliant projects will be eligible for approval, avoiding the need to amend local council development plans.

While the actual provisions of this approach are in formation at this time, the intent is to resolve the major policy and zoning issues and main objectives and outcomes for an area early in the planning process, thus facilitate greater use of complying development provisions in the development plan. This approach aims to speed up the land development process and give certainty to investors about the types of activities that are allowed in an area.

The process for fostering TODs may also be improved through the Department of Planning and Local Government's Better Planning Library, which provides the template for local council development plans and zoning schemes. While the details have not yet been set forth, the possibility exists to create and incorporate an explicit zone for TODs rather than relying on the ad hoc adaption of activity centre and mixed-use zones. In turn, this would enable proactive local councils to more easily set forth development plans that support the desired state policies.

Case study: Expedited development approvals for affordable TODs in Austin, Texas

Expedited permitting is akin to a zoning incentive that accelerates a development through the development application process in return for meeting certain use or design considerations. In Austin, Texas, the city created a special program to promote affordable TOD, called the SMART (safe, mixed-income, accessible, reasonably priced, transit-oriented) Housing program, which provides projects incorporating at least 10% affordable homes with development fee waivers and expedited development reviews. In this case, affordability is defined as affordable to households earning 80% or less of average monthly income. Between 2000 and 2006 the program produced over 4,000 single-family and multi-family units,

including nearly 3,000 reasonably priced units, with an average assessment completion time approximately half the time of conventional reviews. The city has brought together many city departments to both fund the fee waivers and consider the impact of zoning and other regulatory processes on affordability. Among the fees waived are zoning, site plan, subdivision, building permit, construction inspection and capital recovery fees. During the first three fiscal years of the program, the City of Austin waived over \$3.5 million in fees for SMART Housing developments, with waivers done on a sliding scale – from 25% fee waivers for 10% reasonably priced units up to 100% fee waivers for 40% reasonably priced units. For more information, see <http://www.ci.austin.tx.us/ahfc/smart.htm>

Best practice zoning principles for TOD

Necessary components or general principles of TOD zoning are:

- no density or height limits
- mixed use
- an affordable-housing component
- permeability and pedestrian design
- reduced parking
- green components.

(1) No density or height limits. The goal of this is to enable as much activity as possible in the centre. Developers should be able to determine appropriate heights in discussion with councils and financiers, but the standards need not be set before the project economics is done, which is the problem with most TODs now.

Many conventional TPSs specify maximum densities and/or height limits, and this principle has been transferred to some early TOD examples, such as in Perth. While maximum allowable densities were increased over conventional practice to enable TOD outcomes, it was found that the sites in question were not always developed to these densities. In Clarkson, the terminus of Perth's northern rail line, a yield of only around 40–45 dwelling units per hectare was achieved in the TOD precinct despite a planning scheme that permitted up to 80 dwelling units per hectare (Johnson 2008).

Such shortfalls have motivated a call to include minimum rather than maximum density requirements in future TOD planning schemes (Johnson 2008), especially in suburban greenfield locations such as Clarkson where the dominant subregional development pattern is low-density housing.

The removal of height limits from planning schemes further contributes to facilitating increased density, but it also poses additional challenges. Firstly, high-rise building proposals, particularly in established areas otherwise characterised by relatively uniform, low-rise development, tend to raise residents' concerns about 'inappropriate redevelopment' (Lewis 1999) and thus have the potential to delay or unravel TOD projects in the political arena (Dovey, Woodcock & Wood 2009a). While such concerns

and the associated political resistance sometimes bear an element of outright hostility to any physical or social change (Dovey, Woodcock & Wood 2009b), it is frequently also driven by real and tangible threats to urban amenity, such as overshadowing and microclimatic effects, and the impacts of increased traffic and parking where these are not sufficiently addressed as part of the densification agenda (Woodcock et al., 2009).

Secondly, a lack of prescription in building height has been identified as an encouraging factor for property speculation, to the detriment of actual construction (Woodcock et al., 2009a). In Melbourne's performance-based system of planning control where density or height limits are no longer mandated (Buxton & Tieman 2005; Dovey, Woodcock & Wood 2009b), an open height limit prompts some developers to submit ambit claims for out-of-scale development which, even after some subsequent trimming by the planning tribunal, provide the proponents with higher capital gains for selling the property, including its favourable planning approval, rather than developing it. As a somewhat paradoxical result of this trend, the take-up of densification projects in Melbourne's established, transit-oriented suburbs such as Brunswick trails significantly behind the policy intention (Woodcock et al. 2009).

Thirdly, open height limits and consequently a relative lack of constraints to the number of high-density apartments subject to planning approval may contribute to a real or perceived oversupply of a specific housing product in a given area, thus reducing investor confidence in its commercial viability. As a result, the take-up rate for actual construction of densification projects may drop below the level that would have been likely if greater planning constraints, including height limits, had been in place (Woodcock et al. 2009).

To overcome these shortfalls, Adams et al. (2009) recommend that planning schemes in TODs should identify an appropriate height limit (four to eight storeys are considered suitable for Melbourne's activity corridors) as an as-of-right development standard. Woodcock et al. (2009) further suggest that planning permits in TODs should be non-transferable in order to discourage speculation in densification precincts and instead encourage their speedy implementation.

In order for a city to increase the proportion of its population having easy access to public transport — a policy goal that few would dispute — there will probably need to be a lot more TODs, with considerably more density than four to eight storeys in some of them. Thus the problems in Melbourne that have led to this kind of suggested restriction would probably be avoided and attempts to improve designs and community concerns should be addressed rather than restricting densities and heights unnecessarily.

- (2) Mixed use.** The best TODs have plenty of activities for locals to walk to, as well as having a good transit service. Both are achievable when density and mix are enabled.

Mixed use can be achieved in a vertical or horizontal fashion. A vertical mix means that different functions (residential, offices, retail, services etc.) are accommodated within the same building. A horizontal mix means that these functions each occupy separate buildings, which are in turn mixed into a finely grained built pattern at a neighbourhood scale. Both forms of mixed use have a place in TODs, but they are not necessarily equally attractive to the regional development industry. Some developers are accustomed to realising economies of scale by erecting large monofunctional structures on consolidated sites, a trend that should be resisted in TODs. Conversely, a critical mass of small-scale developers capable of delivering a variety of building types and uses across small sites within a reasonable timeframe may not exist or be sufficiently capitalised everywhere. These circumstances are likely to vary from one TOD project to the next, highlighting that there is no one-size-fits-all regulatory approach to encouraging the best mix of uses.

However, one overarching regulatory element of encouraging mixed use in a TOD, as well as a pedestrian-friendly public realm, is a requirement for active street frontages throughout the precinct

(Whyte 1988; Gehl 2001; Carmona et al. 2003). In vertically mixed buildings, this means that ground floors are retail capable — that is, offering an active interface with the public realm. In residential or office buildings, this requires an uninterrupted sightline from the buildings into the streets to provide passive surveillance. Adams et al. (2009) recommend that a minimum of 80% of the street frontage of any building in a TOD should fit this definition.

Further regulation may be required to encourage particular land uses in a TOD, depending on the market environment in the region and at the time of implementation. Where the office market is slower than the residential market, as was the case in Perth's Subiaco (Howe, Glass & Curtis 2009), a mandatory minimum proportion of non-residential space can help provide functional diversity, which was the approach taken in that example. A sluggish residential market could be supported by a reverse requirement, and/or government investment in affordable housing schemes (see item 3 'An affordable housing component'). It is essential, however, that the regulating authority has the capacity to target and continuously revise its approach to such market fluctuations, as well as to changing community expectations. The Redevelopment Authority in charge of Subiaco's transformation appeared to be well placed to engage in such a process and facilitate good outcomes.

- (3) An affordable housing component.** This could be 15% based on housing association and/or state housing that guarantees affordability in perpetuity.

Affordable housing in TODs is regarded as a contribution to counteracting the social-spatial polarisation occurring in cities (Randolph 2004), and to allow a greater proportion of low-income earners to live in areas with high accessibility, which is often critical to social and labour market participation. It also represents a form of value capture in the context of above-average property price gains often associated with the implementation of TODs. The most common mechanism for the inclusion of affordable (or special-needs) housing in English-speaking developed countries is mandatory developer contributions for a specified proportion of affordable dwelling units, also known as inclusionary zoning regimes (Gurran et al. 2008). In continental Europe, outright social housing programs in the rental sector and the dominance of owner-developers in the homeowner sector play a greater role (Lawson & Milligan 2008; Massot 2007). In Freiburg's most well-known TOD of Vauban, such owner-developers formed numerous cooperatives to construct apartment buildings and thus save on most costs otherwise associated with profits to commercial developers (Scheurer & Newman 2009).



(4) Permeability and pedestrian design. Creating the village precinct necessary for successful TODs requires designing for the pedestrian. Walkable catchments, slower traffic, more permeable and better connected streets are critical for making centres active, community-friendly places. Integrating transport networks with civic spaces, retail, office and housing reduces car dependence, activates streets with more walking and cycling, and thus increases foot traffic for both retail and civic spaces.

Streets can be designed to favour pedestrians and cyclists, and wherever this is done centres and cities are invariably surprised at how much more attractive and business-friendly they become (Gehl & Gemzoe 2000; Gehl et al. 2006).

Sustainable mobility management is about 'streets not roads'; the streets are used for a multiplicity of purposes, not just maximising vehicle flow. The emphasis is on achieving efficiency by maximising people movement, not car movement, and on achieving a high level of amenity and safety for all street users. This policy also picks up on the concept of integration of transport facilities as public space. One of the ways that United States and European cities are approaching this is through what are called 'complete streets' or, in the United Kingdom, 'naked streets'. This new movement aims to create streets where mobility is managed to favour public transport, walking and cycling, as well as lower speed traffic. The policy often includes removing all large signs for drivers, which means they automatically slow down. In Kensington High Road in London the traffic accident rate has halved because of this.

Copenhagen, Portland, Toronto, Vancouver and Zurich in recent times have all built much more with cycleways, pedestrian facilities and traffic calming. As a result the associated urban development land usage has begun to emerge that reflects these more human qualities. All these cities had citizen groups that pushed for a different, less car-oriented city, and a political process was worked through to achieve their innovations. They usually did not foresee this outcome but it has now made these cities much more aware of the need to build integrated development, including knowledge economy strategies around sustainable transport (Newman & Kenworthy 1999).

Freeways have blighted the centres of many cities and today there are cities that are trying to remove them. San Francisco removed the Embarcadero Freeway from its waterfront district in the 1990s after the Loma Prieta earthquake. It took three ballots before consensus was reached, but the freeway has been rebuilt as a friendlier tree-lined boulevard involving pedestrian and cycle spaces. As in all cases where traffic capacity is reduced, the city has not found it difficult to ensure adequate transport, because most of the traffic just disappears. Regeneration of the land uses in the area has followed this change of transportation philosophy, including a number of successful TODs built along the new light-rail transit line (Gordon 2005). Another great example is in Seoul, which removed from its centre a large freeway that had been built over a major river. A five-year program entailed dismantling the freeway, rehabilitating the river, restoring a historical bridge, restoring and rehabilitating the river foreshores as a public park, restoring adjacent buildings and extending the underground rail system to help replace the traffic. The project has been very symbolic, as the river is a spiritual source of life for the city. Now other car-saturated Asian cities are planning to replace their central-city freeways (<http://www.metro.seoul.kr/kor2000/chungaehome/en/seoul/2sub.htm/>).

What these projects have shown and encouraged is to 'think of transportation as public space' (Burwell 2005). With this changed approach to city planning, the small-scale systems of pedestrian movement and cycling become much more important. Pedestrian strategies enable each centre in a city to give priority to the most fundamental of human interactions: the walking-based face-to-face contact that gives human life to a city and, in the process, reduces its ecological footprint.

Cycle-oriented strategies can be combined with the development of greenways that improve the green agenda and lower the ecological footprint. Enough demonstrations now exist to show that pedestrian and bicycle strategies work dramatically to improve city economies and to integrate the

green and brown agendas. Pedestrian and bicycle strategies in Copenhagen, most Australian cities, London, New York, San Francisco and Bogota, as well as the dramatic changes in Paris with the Velib bicycle scheme and the growing awareness that these strategies work in developing country cities as well, are all testament to this new approach to cities including successful centre and transit-oriented developments (Newman & Kenworthy 2007).

- (5) Reduced parking.** One space per unit is the growing standard in the USA (Shoup 2005). TOD dwellers and users, on average, are characterised by lower car use and ownership than their counterparts in conventional urban areas (Friedman, Gordon & Peers 1995). However, translating this finding into lower car-parking requirements has been a slow process, as exemplified by Perth's Subiaco (see 'Case study: East Perth and Subiaco TODs') where after much deliberation, a conventional standard for car-parking provision was adopted (Howe, Glass & Curtis 2009). Such practice, however, leads to spatial and functional conflicts where large amounts of car parking as well as entry/exit points to multistorey garages need to be accommodated in a high-density environment, and where the associated volume of vehicle traffic impacts on the amenity of the streetscape for pedestrians and stationary users.

As with zoning standards for maximum density (elaborated above), it is arguable that the conventional practice of mandating a minimum of parking spaces per dwelling, or proportional to floor area of office space, is not a suitable approach for TODs (Shoup 2005). Instead, maximum levels of parking provision should be stipulated, coupled with incentives to compensate for the shortfall, such as the provision of car-sharing vehicles, quality improvements to the public realm and boosts to public transport service standards. Since lower parking provision reduces construction costs, such measures could be funded as part of a value capture package through developer contributions. They will also contribute to enhancing housing affordability (Scheurer 2001).

Woodcock, Dovey & Wollan (2009) strongly advise that parking standards in transit-oriented neighbourhoods be reduced, for all the abovementioned reasons and in order to discourage the take-up of 'drive in, drive out' lifestyles by new residents, who are otherwise able to accommodate and access their (multiple) vehicle(s) with such ease and at no specific cost that they forego the opportunity to adapt their mobility behaviour to the superior conditions for walking, cycling and public transport. In Melbourne's Brunswick, this group has been found to engage least with local community networks, contributing to resistance against densification projects among more established residents (Woodcock, Dovey & Wollan 2009).

In Freiburg-Vauban, a market-based approach to parking management has been taken. The sale or lease of housing units and parking spaces has been completely separated, with the physical provision of off-street parking as part of residential structures actually banned in about half the development. Instead, car-owning residents are obliged to purchase or rent a parking space in one of two multistorey garages at the edge of the precinct, at a greater distance on foot from most houses than the nearest tram stop. The explicit cost of these facilities works as a powerful disincentive to car ownership, with nearly half of all households not owning a vehicle at all and the number of multiple-car-owning families having dropped to zero (Scheurer & Newman 2009). It also improves housing affordability for non-car owners.

- (6) Green components.** TODs need to provide incentives and development patterns that achieve far greater sustainability outcomes, including reductions in energy and water use, and in greenhouse gas emissions. The green component could be five or six green-star-rated buildings, though increasingly there will be a carbon standard for the whole development to meet. Some TODs should have smart grids with electric plug-ins and renewables associated with the development (Went, James & Newman 2008). Water-sensitive urban design (WSUD) and water cycle management should be elements of any future development.

These green centres need to be walkable, dense and mixed, as outlined in other sections of this report, providing the human basis of an interactive centre of innovation. They need to be smart, with a smart grid and smart metering to enable the latest in feedback and control systems for clever digital management. And most of all they need to be models of renewable development, with green buildings and green infrastructure as these will enable them to display the 21st century technologies that can enable them to set the standard for urban development in the next 50 years. As discussed below and demonstrated across the world, this can also save money.

Most power and water systems for cities over the past 100 years have become bigger and more centralised. While newer forms of power and water are increasingly smaller scale, they are often still fitted into cities as though they were large-scale. The movement that tries to see how these new technologies can be fitted into cities and decentralised across grids is called 'distributed power and distributed water systems' (Droege 2006).

Water-sensitive urban design should be incorporated in TODs to use the complete water cycle more efficiently — that is, using rain and local water sources like groundwater to feed into the system and then to recycle greywater locally and blackwater regionally, thus ensuring that there are significant reductions in water use. This system can enable the green agenda to become central to the infrastructure management of a city. Stormwater recycling can involve swales and artificial wetlands that can become important habitats in the city. Greywater can similarly be recycled to irrigate green parks and gardens, and regional blackwater recycling can be tied into regional ecosystems. All these initiatives require 'smart' control systems to fit them into a city grid and new skills among town planners and engineers, who are presently used to water and energy management being a centralised function rather than a local planning issue (Benedict & McMahon 2006).

Renewable low-carbon TODs should aim to develop more decentralised energy production systems, where production is more on a neighbourhood scale and both line losses and power shedding can be avoided. Whether from a wind turbine, a small-biomass combined heat-and-power plant (as in London's new distributed energy model) or a rooftop photovoltaic system, renewable energy is produced closer to where it is consumed and, indeed, often directly by those who consume it. This distributed generation offers a number of benefits, including energy savings, due to the ability to better control power production, lower vulnerability and greater resilience in the face of natural and human-made disaster (including terrorist attacks). A number of such small-scale energy systems are being developed to make centres and cities more resilient in the future (Sawin & Hughes 2007).

There are now many cities that are able to demonstrate small-scale local water systems that are very effective. The new Armstrong Creek project in Melbourne has been studied in detail by Sustainability Victoria as a model for distributed, green infrastructure. It was shown to save \$500 million net present value over 10 years compared to a business-as-usual approach to infrastructure (Sustainability Victoria 2009).

Biophilic centres also need to be explored; these use landscaping to enhance every building, using green roofs, green walls and water-sensitive urban design to 'aircondition' the whole urban area. This concept developed in cities such as Chicago, Toronto and Singapore that were finding that the urban heat island effect and global warming were impacting on their citizens; they decided to use natural systems to help cool their cities (see 'Case study: Green TODs in Toronto and Malmö').

Table F-1: TOD typologies for the Denver TOD Strategic Plan

TOD typology	Desired land use mix	Desired housing types	Commercial/employment types	Proposed scale	Transit system function
Downtown	Office retail, residential, entertainment and civic uses	Multi-family and loft	Prime office and shopping location	5 stories and above	Intermodal facility/transit hub. Major regional destination with high-quality feeder bus/streetcar connections
Major urban centre	Office, retail, residential, entertainment	Multi-family and townhouse	Employment emphasis with more than 25,000 m ² office and 5,000 m ² retail	5 stories and above	Subregional destination. Some park-and-ride. Linked with district circulator transit and express feeder bus.
Urban centre	Office, retail, residential	Multi-family and townhouse	Limited office. Less than 2,500 m ² office. More than 5,000 m ² retail.	3 stories and above	Subregional destination. Some park-and-ride. Linked with district circulator transit and express feeder bus.
Urban neighbourhood	Residential, neighbourhood retail	Multi-family townhouse, small-lot single-family	Local serving retail. No more than 5,000 m ²	2–7 stories	Neighbourhood walk-up station. Very small park-and-ride, if any. Local bus connections.
Commuter town centre	Office, retail, residential	Multi-family townhouse, small-lot single-family	Local and commuter serving no more than 2,500 m ²	2–7 stories	Capture station for in-bound commuters. Large park-and-ride with local and express bus connections.

TOD typology	Desired land use mix	Desired housing types	Commercial/employment types	Proposed scale	Transit system function
Main street	Residential, neighbourhood retail	Multi-family	Main street retail infill	2–7 stories	Bus or street car corridors. District circulator or feeder transit service. Walk-up stops. No transit parking.
Campus/special events station	University campus, sporting facilities	Limited multi-family	Limited office/retail	Varies	Large commuter destination. Large parking reservoirs but not necessarily for transit.

Case study: Green TODs in Toronto and Malmö

In Toronto, communities have formed ‘buying cooperatives’ to pool buying power to negotiate special reduced prices from local photovoltaic companies that had offered an incentive to buy solar photovoltaic panels. The first cooperative was the Riverdale Initiative for Solar Energy. In this initiative, 75 residents joined together to purchase rooftop photovoltaic systems, resulting in savings of about 15% in their purchase cost. This then spread across the city. The Toronto example suggests the merits of combining bottom-up neighbourhood approaches with top-down incentives and encouragement. This support for small-scale distributed production — offered through what are commonly referred to as standard offer contracts (often referred to as feed-in tariffs in Europe) — has been extremely successful in Europe, where they are now common. The same can be done with new technologies for water and waste, such as rainwater tanks and greywater recycling.

Another example is the redevelopment of the Western Harbour in Malmö, Sweden. Here the goal was to achieve distributed power and water systems from local sources. This urban district now has 100% renewable power from rooftop solar panels and an innovative stormwater management system that recycles water into green courtyards and green rooftops. The project involves local government in the management and demonstrates that a clear plan helps to drive innovations in distributed systems (City of Malmö 2005).

Distributed infrastructure is beginning to be demonstrated in cities across the globe. Utilities are beginning to work with city planners to develop models for carrying out local energy and water planning through community-based approaches and local management. Such models need to be thought through and applied along the Knowledge Arc.

With the practices described above, it is possible to enable a TOD to have special accelerated development rights (e.g. as applied in Austin — see ‘Case study: Expedited development approvals for affordable TODs in Austin, Texas’); these are what the TPS and strategic planners are most hoping to enable.

Some of these principles were used in developing TOD typologies for planning the new FastTracks rail and stations in Denver (see 'Case study: Using TOD typologies to guide TOD and station planning', Table F-1 and Figure F-1).

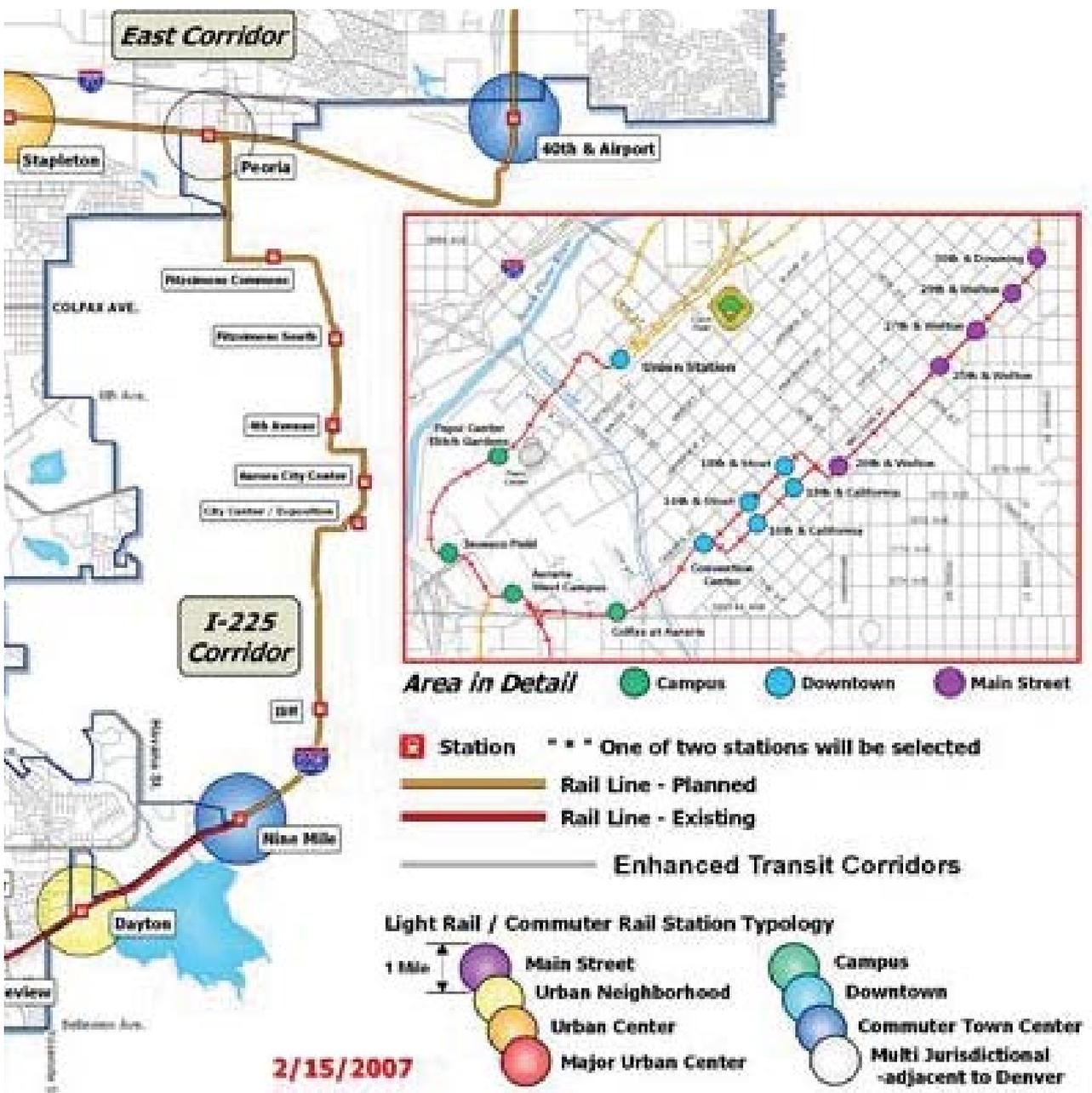
Case study: Using TOD typologies to guide TOD and station planning

As applied in the Denver TOD Strategic Plan (2006), a TOD typology serves two important functions. First, the place types provide enough detail so that if development proposals are submitted to the city prior to completion of a detailed station area plan, there is some basis

for evaluating the proposal to determine its appropriateness, given the general vision. Second, the place types provide the starting point for the station area planning process so that all of the participants in the planning process have a shared global vision from which they can work on developing the specifics of the plan itself, including an appropriate implementation strategy.

The TOD typologies were used in corridor planning and TOD station area planning as shown in Figure F-1.

Figure F-1: Denver Station area typologies



Case study: East Perth and Subiaco TODs

The two best TODs in Perth were both developed through a statutory authority (the East Perth Redevelopment Authority) that was given full planning powers over the sites and the ability to fund the preliminary infrastructure. They were not given a TOD zoning as such, but instead a structure plan was produced for each area with clear guidelines that set out what developers were required to achieve. These had strong design guidelines to ensure a quality and coherent design. The result is two TODs that have changed the perceptions of the development industry and the general public about the value of mixed-use, medium-density development in Perth. The WA Government was able to collect hundreds of millions of dollars in return for the development; the land at Subiaco, for example, increased in value five times in a few years and changed the nature of Subiaco. The patronage at the Subiaco station increased by 100% in the year that the TOD was opened, with its new station built as part

of the development. The guidelines could have been adapted for any other TOD in Perth but that has not happened, as the statutory planning system is shaped by a model town planning scheme that has no TOD zoning category. This will need to change if TODs are to become mainstream, not just on government projects on government land as in East Perth and Subiaco.

Figure F-2: East Perth TOD



Case study: Vancouver TODs

The City of Vancouver has around 20 TODs that have all been built in association with their Skytrain light-rail service. These have been done in partnership with the strategic planning agency (Greater Vancouver Regional Planning District), the City of Vancouver, private developers and the local community. The zoning of the areas around stations is highly contained so that high density is kept to the walking distance radius around stations (see photo of Joyce Collingwood station in Figure F-3 and the clear distinction between high-rise areas and surrounding low-rise suburbs). The process of building a TOD began well before the sky train came to most areas partially stimulated by a clear set of guidelines given to developers, including the need to provide affordable housing in up to 15% of the development and including requirements that 5% of the value of the development would need to be used for social infrastructure. This money was directed into the projects that the local community saw as being its highest ‘community’ priority, including street landscaping, cycleways, child care centres and even an art house cinema (see Figure F-4). The success of the Vancouver zoning system is also a reflection on its success in being able to deliver good contracts and to engage the community in a positive way.

Figure F-3: Joyce Collingwood TOD, Vancouver



Figure F-4: Social infrastructure at Coal Harbour TOD, Vancouver, delivered through the 5% social infrastructure requirement (community centre at the left and landscaped boardwalk were built with these funds)



TOD contracting

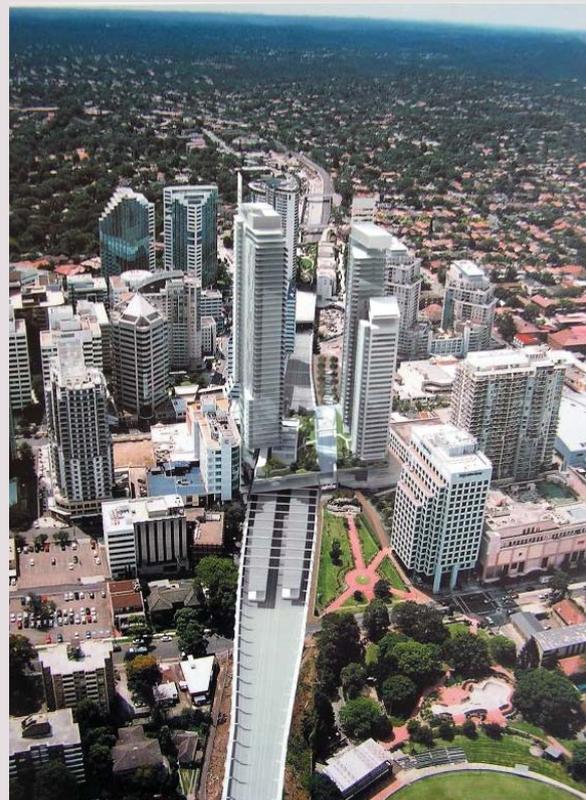
Jenkins, Fleming and Garling (2009) outline a transit funding model based on recognising the value of transit and hence how to achieve its funding. The authors suggest that there are a range of beneficiaries from a transit system and if these are quantified then the true value of a transit system usually far outweighs its costs. The beneficiaries include the transit users (unlike a road system these are often a minor part of the value), land owners, tenants and developers (receiving between 20% and 100% of the ultimate cost of building a transit system), road users (e.g. 43% of the value of the City Rail system in NSW flows to road users through reduced congestion), and national and regional economies (including social and environmental benefits, which is why governments fund the major part of the transit system in most cities). After funding is achieved, contracts need to be drawn up that can adequately express this value. For TODs, contracts need to be created that tap into the land value associated with the transit system (and not just with the station area land). When this is done a mutually beneficial relationship is established.

TODs are ideal to develop as public-private partnerships (PPPs), with the land component being tied into the funding and operational aspects of the TOD. This is increasingly the way that TODs and transit are being funded in the USA and is the approach being taken by Infrastructure Australia. One TOD at Chatswood was built using 'value transfer PPP' (Blake Dawson 2008) (see 'Case study: Chatswood value transfer PPP'). However experience in delivering TOD contracts like this is not extensive in Australia.

Case study: Chatswood value transfer PPP

There can be a significant source of funding for required rail infrastructure through using value transfer PPPs, as in the very successful Chatswood Transport Interchange PPP. This has created a new railway station and bus interchange along with a retail and residential complex that makes a small city around and over the station. It was created by selling the air rights over the station in exchange for the developer creating the station, bus plaza and pedestrian precinct around the station. The air rights were used to build two 50-storey apartment blocks that were sold off the plan (see Figure F-5).

Figure F-5: Chatswood TOD showing PPP developments over the station.



There is a need to create performance contracts with public financing instruments, as in other PPPs, but there is a culture of transit operators wanting to be independent from land use and from the rigours of PPPs and just to rely on public funds. However when this happens TODs are rarely achieved.

On the other hand it is not good if a TOD is built as the main focus and a transit operator is not provided with walkable station surrounds or with a system that enables all modes to link seamlessly into the transit system. The solution to this would seem to be alliance contracting with its ability to bring together all the key stakeholders (see ‘Case study: Joint development — highest and best transit use’). This is the approach being taken by the Gold Coast City Council for its new light rail transit system, which will be built in combination with TODs but with the potential operator being the main contractor.

The main delivery mechanism in contracting is to establish that a TOD can increase the value, and hence yield, from a development. This concept is set out in the figures below. Figure F-6 shows that a normal TOD is likely to be seen by a developer as having a ‘yield gap’ compared to a normal greenfield development; this is perceived to be lower in potential profit due to the complexities, extra amenity requirements and length of time for build out that would be seen as associated with such projects.

Thus, the extra ‘TOD uplift’ that is found to be associated with a TOD (see Figure F-7) enables the developer to, in fact, produce a much higher yield than would normally be found.

The importance of recognising this TOD uplift is that governments can be confident that they can proceed with contracts that require TODs, and private developers can be confident that they will achieve good returns. In Portland the Metro will provide grants to developers that can demonstrate that they will increase transit patronage through their development. Part of the grant is to provide help in calculating the TOD uplift associated with the development that a developer can then take to its financier to ensure it receives the necessary funds to enable the TOD to proceed. This is the benefit of partnership processes associated with TODs.

Figure F-6: Perceived yield gap associated with TODs

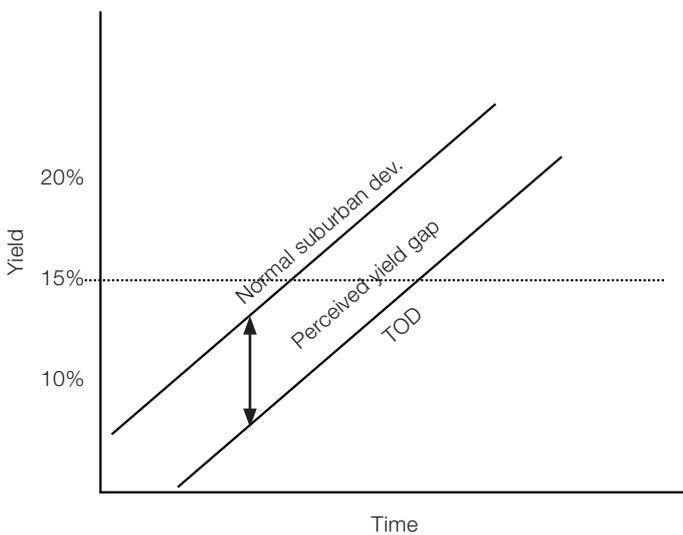
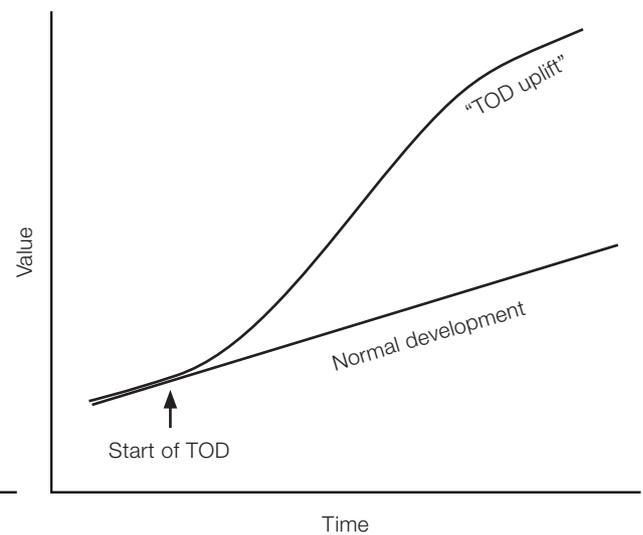


Figure F-7: Actual TOD uplift associated with TODs that can enable project



The market uplift or premium for TODs is reasonably strong (see Table F-2), and there is a strong proven market for TODs, where research from the USA shows stronger returns across a number of development markets (Center for Transit Oriented Development 2008).

Case study: Joint development — highest and best transit use

Joint development is a technique being used in the USA for providing a more flexible and balanced approach to TOD planning and investment, but with potential for application elsewhere.

Joint development is an income-producing real estate project on land owned by transit agencies involving another party, most often a private developer. It generally is a subarea of a larger TOD. In the USA, it specifically refers to lands in which the Federal Transit Administration (FTA) has an interest or has, as a third party, provided funds for acquisition.

In 1997, the FTA revised its rules to improve the opportunities for joint development and TODs. The guidelines now permit transit agencies to sell land purchased by federal grants, such as park-and-ride lots, and to reinvest the funds in transit projects. Prior to 1997, the proceeds were required to be returned to the FTA.

The new guidelines encourage transit agencies to undertake transit-oriented joint development projects either under property acquired from previous or new grants. In response, transit agencies in several metropolitan areas, including Washington DC, Portland, San Francisco, Atlanta, Los Angeles and San Diego, aggressively use joint development to foster growth in TODs and ridership.

The proceeds from the sale or lease of the land can be used in a variety of ways. One option is to invest in a transportation project that enhances economic development or incorporates private investment, including commercial and residential development. The funds can be used for improving pedestrian and bicycle access to a transit facility or the renovation and improvement of historic transportation facilities.

By allowing transit agencies to direct the sale proceeds to eligible projects, the federal government is effectively investing in TODs as long as certain conditions are met — for example, the transit agency must retain control over the joint development. In addition, the funds must be used to help shape the community that is being served by the transit system.

Eligible projects for spending the proceeds are related either physically or functionally to transit. Physically related projects include those built on air rights over a station or built within or adjacent to transit facilities. Functionally related projects are those linked by activity and use to transit services or facilities, or that provide a benefit to the public and enhance use of or access to transit. Functional relationships do not extend beyond the distance most people can reasonably be expected to walk to use a transit service (i.e. 800 m from the centre of a transit facility). However, this can be negotiated on a case-by-case basis with the FTA.

Agencies are required to negotiate a fair and equitable return in the form of cash and other benefits. The payment can be one-time or ongoing revenue, but it must equal or exceed the fair market value of the property. Importantly, the provision allows transit agencies to make sales to developers based not on the 'highest and best use' according to revenue returns, but on the 'highest and best transit use'. Thus, projects which offer the highest payback in terms of ridership or another benefit can be developed. In either case, the valuer is to take into account the local transportation, land use and economic development plans, and FTA concurrence with the final transfer value is required.

A property's highest and best use is the use that results in the highest expected selling price. The valuation relies on what is reasonably saleable, legally viable, physically possible and financially feasible. By contrast, highest and best transit use recognises that value to government is not in the selling price alone. Instead, financial return is balanced with other benefits — such as increasing ridership, strengthening connections between trips or reducing trip durations — that improve the value of the development to transit.

The concept of highest and best transit use warrants use in Australia to foster TODs. At the state level, treasuries typically seek the highest immediate payback on the sale or lease of state-owned lands. Undeveloped, state-owned properties, as well as lands to be acquired with state funds, within potential TODs are generally sold based on this philosophy. In turn, the resultant development underperforms in terms of TOD benefits.

Federal investments in infrastructure can also require grantees to demonstrate a resulting highest and best transit use. In lieu of limiting federal funding to building infrastructure, funding eligibility could be extended to acquiring and jointly

developing land around transit stops as TODs. If the federal government requires equity in the project, the highest and best transit use principle could be applied to ensure the desired outcomes.

Table F-2: TOD property uplift, USA

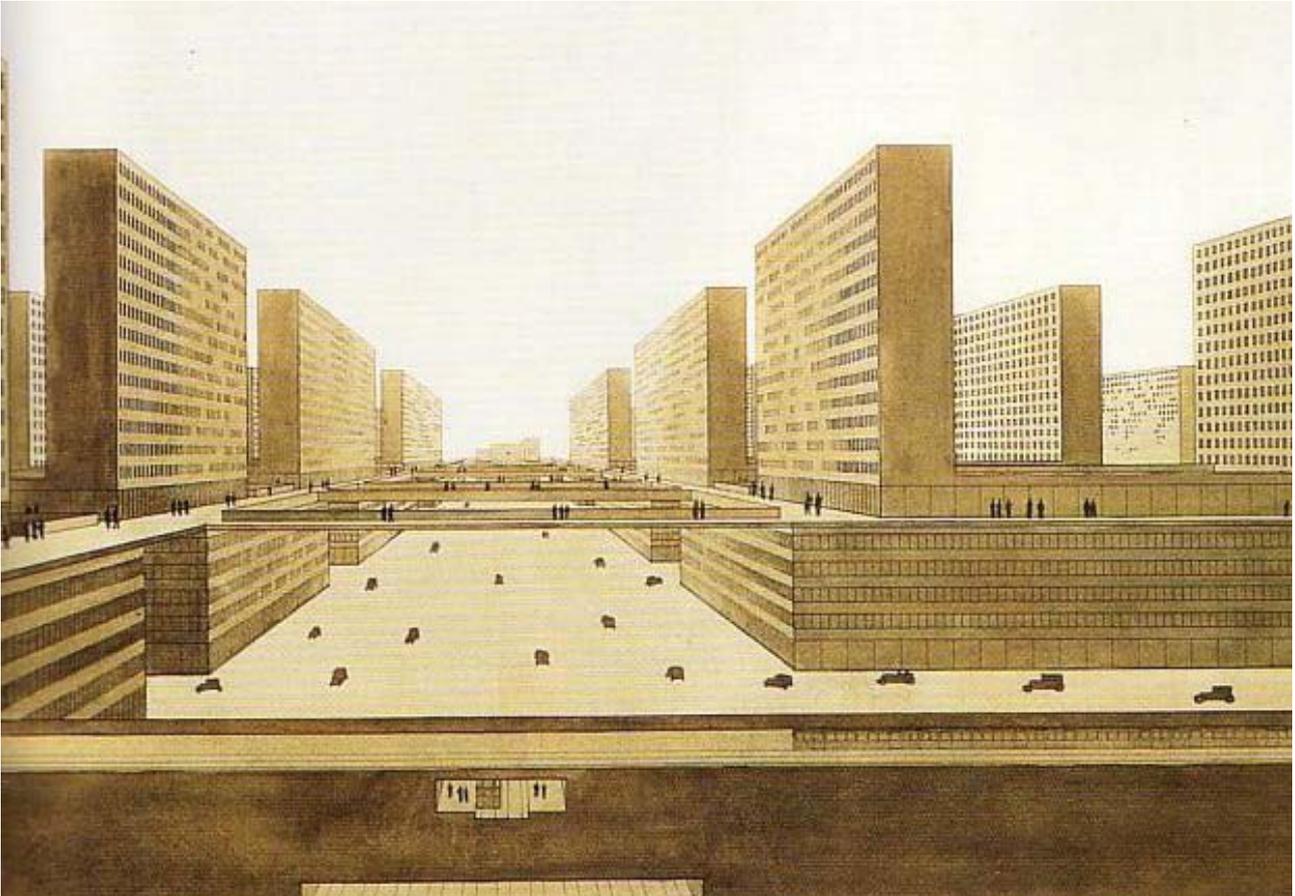
Range of TOD property uplift or premiums		
Land uses	Low range	High range
Single-family Residential	+2% w/in 200 ft of station (San Diego Trolley 1992)	+32% w/in 100 ft of station (St Louis MetroLink Light Rail 2004)
Condominium	+2% w/in 2,640 ft of station (San Diego Trolley 2001)	+18% w/in 2,640 ft of station (San Diego Trolley 2001)
Apartment	+0% to 4% w/in 2,640 ft of station (San Diego Trolley 2001)	+45% w/in 1,320 ft of station (VTA Light Rail 2004)
Office	+9% w/in 300 ft of station (Washington Metrorail 1981)	+120% w/in 1,320 ft of station (VTA Light Rail 2004)
Retail	+1% w/in 500 ft of station (BART 1978)	+167% w/in 200 ft of station (San Diego Trolley 2004)

Finally, TOD contracting needs government agency collaboration. TODs often require more than one agency, either in infrastructure design and delivery or in the approvals process. The complexity of agency requirements, and often lack of agency collaboration, often makes successful TOD delivery either too difficult or too time consuming, thus reducing private-sector interest. To improve this, contract arrangements need to be put in place that ensure agency-to-agency collaboration, including a more streamline government delivery mechanism for TODs.

TOD engagement

A necessary step in delivering a TOD is to bring the public along on the journey. This must be enabled through a public engagement process as most of the public still believe that a TOD is likely to be a high-density block of flats, such as in Figure F-8.

Figure F-8: The public's frequent perception of a TOD



Birrell et al. (2005) were strongly opposed to the Melbourne 2030 Plan with its Transit Cities around rail stations. However, the public opposition that developed was mostly based on ignorance and fear (see Newman 2005 for a response to the Melbourne anti-TOD campaign).

In order to break this kind of log-jam that can sweep away even the best urban policy, it is necessary to engage the public from the beginning, to enable them to sit in the seat of the planners and understand all the trade-offs, benefits and opportunities. This will inevitably involve deliberative processes (see Hartz-Karp & Newman 2006).

As shown in Table F-3, there is a spectrum of public participation.

Table F-3: IPA2 Spectrum of public participation

	Inform	Consult	Involve	Collaborate	Empower
Example tools	Fact sheets	Public comment	Workshops	Citizen advisory committees	Citizen juries
	Websites	Focus groups	Deliberate polling	Census building	Ballots
	Open houses	Surveys		Participatory decision making	Delegated decisions
		Public meetings			

As with most projects which involve change, TODs often involve a degree of perceived threat unless there are clear, identified community benefits. Achieving greater public participation will usually deter a NIMBY (not in my backyard) response and instead enable projects to contribute significantly to the long term welfare of the local community.

It is best if the public are integrated into the other planning processes, as occurs in Vancouver (see ‘Case study: Vancouver TODs’ and Figures F-3 and F-4). In Vancouver the town-planning process requires, for TODs, a 5% contribution from the developer for social infrastructure (e.g. child care centres, open-space landscaping, cycleways) that is decided by the local community in consultation with the council. Such developer contributions need to be tied to the development to ensure monies collected are spent on the development and not absorbed in to a larger government fund, thus ensuring local needs are met.

In Christchurch, New Zealand, there was significant ‘collaboration and empowerment with the creation of an advisory group in the design and delivery of a new public transport system, including a new central-city TOD and bus interchange. Most TODs can easily stand up to public scrutiny, but they are best enabled through processes that can visualise their architecture and their design at ground level and which can clearly show a local benefit.



Case study: Varsity Station Village

The Varsity Station Village project illustrates some of the best practices in engaging and communicating to the public about a TOD. The Gold Coast project will transform an old tip site previously earmarked for industrial development, next to a freeway. With the extension of the railway the project will deliver a vibrant and attractive urban village (Queensland Transport 2009) (see Figure F-9).

Both the public and the development industry were involved in the design plan, which was based on the principles of TOD, from the very beginning. The Varsity Station Village project team undertook a range of consultation activities that generated community interest, with large volumes of responses, enquiries, attendance at community displays and visitors to the project website. As a result, the Varsity Station Village Master Plan collated submissions and took into consideration the feedback from the community mainly on access for pedestrians; parks and public

space; traffic flow; parking; and the mix and types of activities.

The process was started well before the train line extension, thus enabling the ideas to be fed into the design process and community ownership to be achieved.

Figure F-9: Varsity Station Village Master Plan (Source: Queensland Government Transport 2009)



Case study: Christchurch Bus Xchange TOD

In the late 1990s the Canterbury Regional Council and Christchurch City Council established a Public Transport (PT) Advisory Group, made up of approximately 20 members representing key agencies, interest groups, users and non-users. The PT Advisory Group established an overall public transport strategy for Christchurch, identifying a number of strategic improvements.

As part of the redevelopment of a major city centre retail development (known as The Crossing), an opportunity arose for the integration of a new city centre bus interchange within the mixed-use CBD shopping centre.

The Christchurch Bus Xchange involved successful public engagement and governance between multiple agencies and the developer to produce a modern bus station, integrated with two floors of retail; a new primary school was located on the levels three and four of the development; an over-street bridge was built to better integrate with a major department store across the main street; and short-term car parking was built to better support the enhanced retail activity. The project also required significant investment in smart-card ticketing and real-time information systems, which galvanised system-wide major investments. Patronage since the Bus Xchange development (and a number of other projects) has more than doubled throughout the system.

The Bus Xchange set new standards for the quality of public transport passenger facilities, particularly in the off-street component, with carpeted, airconditioned waiting lounges separated from buses and real-time passenger information; the Bus Xchange also directly connects at numerous points to the surrounding retail. Thus, the Bus Xchange has been the subject of international interest since its opening.

The public engagement side was critical to success of the project as the long-standing public transport advisory group was used in both leveraging approval for the project, identifying and designing into the project social/community benefits (e.g. the schools) and with achieving significant additional council funding and regulatory approval. In addition, the group was used in detailed design review of the actual facility during the design process, to ensure legibility throughout the mixed-use development, as well as design safety.

This was a rare example of a successful public-private partnership and this, in our view, is because all the players could see the benefits of integrating public transport with a major city centre revitalisation project. In this case, the developer was an active champion of the bus interchange and an initiator of its integration with the retail development. In competing with the growth of suburban shopping malls, improving public transport access to city centre retail developments was recognised as an important contributor to success, particularly where car-parking provision is constrained.

Integration with the primary central city retail contributed to high-quality passenger facilities. Because the Bus Xchange was seen as part of The Crossing development. This encouraged the use of high-quality passenger seating and fit-out. The airport-quality look and feel of the passenger lounges is one of the immediate positive public impressions, and consistent finishes and signage between public spaces also contribute to a sense of integration (see Figure F-10).

The Bus Xchange, although primarily designed as a bus passenger facility, applied TOD principles to ensure integration with the retail redevelopment (see Figure F-11). The successful integrated planning directly catalysed additional mixed uses in the development.



Figure F-10: Interior of Christchurch Bus Xchange passenger lounge



Figure F-11: Christchurch Bus Xchange, Lichfield Street

Land assembly in station precincts

A major challenge for private-sector development in assuring commercial viability, particularly in existing urban areas, is assembly of disparate parcels of land to ensure adequate size and scale for viable development around transit. Aside from what is generally inconsistent government intervention across Australia, at present there is a lack of incentives or consistent mechanisms for private-sector land assembly in TOD precincts.

There are numerous site-specific examples of government intervention, where redevelopment authorities established both land assembly and government agency integration to ensure greater commercial viability to redevelopment areas around public transport (e.g. Subiaco and East Perth). However, without a more consistent mechanism and incentives for land assembly, to amalgamate sites as well as reduce the uncertainty of long-term holding costs, the private sector is often reluctant to take on the challenges of major TOD area redevelopment. From our experience, it tends to be the 'boutique' developer who is willing, passionate and sufficiently persevering to take on such challenges in the face of numerous obstacles. Instead, most 'traditional' developers are attracted to the concept of transit-oriented development, but in inner-city areas they often shy away from the prospective land amalgamation and development risks. To truly galvanise the significant opportunities around transit stations and along transit corridors in Australia, an improved land amalgamation incentive and process needs to be developed.

Although not explored in detail in this paper, land assembly incentives could occur through a combination of such measures as:

- zoning policies which encourage site amalgamation (e.g. bonus development incentives, increasing plot ratios), also known as progressive zoning in the USA
- facilitating site amalgamation via a convenor or facilitator for an area (this is sometimes led by government agencies in lieu of private sector integration)
- faster development approvals for amalgamated, good-quality TOD projects
- infrastructure delivery programs, including transit investment that is integrated (and funded and committed) to delivery with increasing density in TOD locations
- financing incentives, where developer financing arrangements could be more amenable to amalgamated sites in TODs
- improving home loans for residential developments in TODs that have lower transportation costs and can therefore pay more (and borrow more) toward housing costs; in the USA, these are known as location efficient mortgages.

Governance for delivering TODs

The obvious conclusion from the above four areas of delivery is the need for a governance system to enable these to happen. Most governance systems at local government and state government level are not suited to enable the strategic and statutory land use planning, the transit operations, the public-private contracting and the community engagement processes to be integrated. Thus a separate body needs to be created that has a built-in process to enable this integration.

Without improved governance vehicles for integrated planning and delivery, TODs are currently left to fend for themselves, in often discrete and haphazard governance processes. A more holistic governance approach is required between councils, state government agencies and funding authorities to ensure more accountable and responsive governance arrangements are established that ensure TODs receive greater priority in planning, delivery and approval. Without a concerted and integrated effort across all urban areas of Australia, the same random and inefficient process will continue, making greenfield suburban sprawl the undesirable but default 'winner' in meeting our future population growth targets.

State governments can create a separate organisation with statutory powers, like a Redevelopment Authority, which was used to create Subiaco and East Perth in Western Australia. Planning authorities can also set up special powers around a TOD that can enable them to be subject to state powers alone, such as in Melbourne's Transit Cities projects. This allows teams of people to focus on the TOD and then hand back to the local area after the TODs are completed. Partnerships can be established through the contract-alliancing process that can provide a public-private partnership group with the powers to do all the necessary work, including the design, community engagement and delivery. The next phase of the Gold Coast Light Rail project includes elements of all these governance processes, as it has a Queensland Government team that has been working together with the Gold Coast City Council on all the design and planning, including its major financing; this group will now enable an alliance contract to be created, with an operator, engineer and developer consortium to take the project to the next stage.

However, setting up a separate organisation for each area or project would defeat the purpose of making TOD delivery easier. A more holistic approach would be to have an agency, which is in charge of integrated agency collaboration for TODs across the city, lending its authority and ability to pull disparate state and local agencies into a more integrated platform for supporting delivery of TODs.

The key issue is that of integration, and if this is not happening, then TODs are not going to be delivered. Improving governance is a precursor to successful delivery of TODs, as a good governance model will directly assist in improving town planning, contracting, community engagement and land amalgamation challenges facing most TODs.

Case study: Vauban — a PPCP

In Freiburg, Germany, a TOD has been built in a redeveloped military base called Vauban. The TOD is home to 5,000 residents and features perhaps the best example of green technologies, such as solar housing, 100% renewable energy for electricity, water-sensitive design, and a car-free approach based on light rail and bicycles being allowed into the development whilst cars are discouraged through a variety of means. The result has been a highly popular development, as families have been attracted to the site due to its car-free safety. Children can be seen running through the area with a freedom rarely seen in a car-dependent suburb (see Figures F-12 and F-13).

The significance in terms of community engagement and governance is that it was a PPCP — a public-private community partnership. The local government was keen to see the site redeveloped using community values associated with green technologies and design but did not know how best to do it. The Forum Vauban, a community association, was contracted by the city to lead resident participation, the elaboration of sustainability goals and public relations work. They were able to establish a range of funds that the local government alone could not have done in order to establish the project as a demonstration. Private-sector involvement followed as each phase was put out to tender. The real benefit was that the community drove the development, as they had such a large stake in the outcome. Similar projects are beginning to happen through community housing associations that are able to tap local community values and enable affordable housing to be part of the TOD.

Figure F-12: Vauban TOD in Freiburg, built as a public-private community partnership



Figure F-13: TOD freedom for children in Vauban



Conclusions

TODs are an important part of urban policy. They are, however, not being delivered at anything like the rate city and state governments and strategic planners had hoped.

The resultant threat is that continued suburban sprawl with its commensurate impacts and costs will continue to dominate our cities. Conversely, improvements in integrated TOD delivery can significantly improve the performance of our cities to meet the challenges of the 21st century.

Although improving delivery of TODs should not be considered a panacea or saviour for city development, making it easier for successful TODs throughout Australia can meet a significant proportion of future development needs in both existing urban areas and new greenfield developments. Reducing car dependence, improving quality of life, delivering more sustainable communities, and making more efficient infrastructure investments can all be part of successful transit-oriented development.

There are a number of actions required which this paper explores, including improvements in TOD:

- zoning and planning
- contracting
- engagement
- land amalgamation
- governance.

The process of delivery now needs some clear demonstrations based on this new approach. Importantly, improving governance is a precursor to successful delivery of TODs, as a good governance model will directly assist in improving town planning, contracting, community engagement and land amalgamation challenges facing most TODs.

References

- Adams, R, Eagleson, S et al. 2009, *Transforming Australian cities for a more financially viable and sustainable future*, Transportation and Urban Design, City of Melbourne, Melbourne, Victoria.
- Bachels, M, Smith, B et al. 2006, 'Christchurch — applying world's best practice in sustainable public transport in our backyard', Australian Institute of Traffic Planning and Management National Conference, Melbourne, 3–4 August.
- Benedict, M & MacMahon, E 2006, *Green infrastructure: linking landscapes and communities*, Island Press, Washington, DC.
- Birrell, B, O'Connor, Rapson, V & Healy, P 2005, *Melbourne 2030: planning rhetoric vs urban reality*, Monash University Press, Melbourne.
- Blake Dawson 2008, 'The new world of value transfer PPPs', *Infrastructure: Policy, Finance and Investment*, May, pp. 12–13.
- Burwell, D 2005, 'Way to go! Three simple rules to make transportation a positive force in the public realm', *Making places*, viewed June 2010, <www.pps.org>.
- Buxton, M & Tieman, G 2005, 'Patterns of urban consolidation in Melbourne: planning policy and the growth of medium-density housing', *Urban Policy and Research*, vol. 23, no. 2.
- Carmona, M, Heath, T, Oc, T & Tiesdell, S 2003, Public places, urban spaces. *The dimensions of urban design*, Architectural Press, Oxford, UK.
- City and County of Denver 2006, Transit-oriented Development Strategic Plan, City and County of Denver Department of Planning and Development.
- City of Malmo 2005, 'Sustainable city of tomorrow: experience of a Swedish housing exposition', Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning, Stockholm.
- Center for Transit Oriented Development 2004, *Hidden in plain sight: capturing the demand for housing near transit*, report for Federal Government, Center for TOD, Oakland, California.
- Curtis, C & Low, N 2009, 'The implementation gap in land use transport integration: a case of path dependence?', Conference of Future Urban Transport, Volvo Research and Education Foundations, Goterborg, Sweden, 19–21 April.
- Curtis, C, Renne, J & Bertolini J (eds) 2009, *Transit oriented development: making it happen*, Ashgate Publishers, London.
- Dovey, K, Woodcock, I & Wood, S 2009a, 'Understanding neighbourhood character: the case of Camberwell', *Australian Planner*, vol. 46, no. 3.
- Dovey, K, Woodcock, I & Wood, S 2009b, 'A test of character: regulating place-identity in inner-city Melbourne', *Urban Studies*, vol. 46, no. 12.
- Falconer, R, Newman, P & Giles-Corti, B 2010, 'Is practice aligned with the principles? Implementing New Urbanism in Perth, Western Australia', transport policy, in press.
- Friedman, B, Gordon, S & Peers, J 1995, 'Effect of neotraditional neighbourhood design on travel characteristics', *Transportation Research Record*, no. 1466.
- Gehl, J & L Gemzoe, L 2000, *New city spaces*, Danish Architectural Press, Copenhagen, Denmark.
- Gehl, J 2001, *Life between buildings: using public space*, 5th edn, Danish Architectural Press, Copenhagen, Denmark.
- Gehl, J and L Gemzoe, L et al. 2006, *New city life*, Danish Architectural Press, Copenhagen, Denmark.

- Gordon, R 2005, 'Boulevard of dreams', *SFGate*, 8 September, www.sfgate.com.
- Gurran, N, Ruming, K, Randolph, B & Quintal, D 2008, 'Planning, government charges, and the cost of land and housing', Positioning Paper No. 109, Australian Housing and Urban Research Institute, UNSW-UWS Research Centre, Sydney.
- Hartz-Karp, J & Newman, PWG 2006, 'The participative route to sustainability', in S Paulin (ed.), *Communities doing it for themselves: creating space for sustainability*, University of Western Australia Press, Perth.
- Howe, A, Glass, G & Curtis, C 2009, 'Retrofitting TOD and managing the impacts: the case of Subi Centro', in C Curtis, J Renne & J Bertolini (eds), *Transit oriented development: making it happen*, Ashgate, London, UK.
- Jeer, Sanjay 1994, 'Zoning for transit: a new orientation', *Zoning News*, September 1994.
- Jenkins, M, Fleming, D & Garling, R 2009, 'Transit value and funding', discussion paper, Parsons Brinckerhoff, Sydney.
- Johnson, C 2008, 'Greenfield Transit-Oriented Development in Clarkson', guided field trip, Urban Design for Sustainability short course, Curtin University Sustainability Policy Institute and Urban Design Centre of Western Australia, Perth, WA, 21–24 April.
- Khan, S & Bajraharya, B 2007, 'Governance and implementation challenges for transit oriented developments: findings from a comparison of south east Queensland and Perth region', SOAC ISBN 978-0-646-48194-1.
- Lawson, J & Milligan, V 2008, *International trends in housing and policy response*, Australian Housing and Urban Research Institute, Sydney Research Centre, NSW.
- Lewis, M 1999, *Suburban backlash: the battle for the world's most liveable city*, Bloomings, Hawthorn, Victoria.
- Massot, A 2007, *La situation du logement dans six pays d'Europe. Allemagne, Espagne, France, Italie, Pays-Bas, Royaume-Uni*, Institut d'Aménagement et d'Urbanisme de la Région d'Île-de-France, Paris, France.
- Newman, PWG & Kenworthy, JR 1989, *Cities and automobile dependence: an international sourcebook*, Gower, Aldershot.
- Newman, PWG & Kenworthy, JR 1999, *Sustainability and cities*, Island Press, Washington, DC.
- Newman, P 2005, 'Pipe dreams and idealogues: values and planning', *People and Place*, vol. 13, no. 3, pp. 41–53.
- Newman, P & Kenworthy, J 2007, 'Green urban transport', *State of the World 2007*, Worldwatch Institute, Washington, DC.
- Newman, P 2009, 'Planning for transit oriented development: strategic principles', in C Curtis, J Renne & J Bertolini (eds), *Transit oriented development: making it happen*, Ashgate Publishers, London.
- Randolph, B 2004, 'The changing Australian city: new patterns, new policies and new research needs', *Urban Policy and Research*, vol. 22, no. 4.
- Queensland Government 2009, *Varsity Station Village — a transit oriented development Community Master Plan*, Queensland Transport.
- Sawin, JL & Hughes, K 2007, 'Energizing cities', *State of the World 2007*, Worldwatch Institute, Washington, DC, pp. 90–107.
- Scheurer, J 2001, *Urban ecology, innovations in housing policy and the future of cities: towards sustainability in neighbourhood communities*, PhD thesis, Murdoch University, Perth, WA.

Scheurer, J & Newman, P 2009, 'Vauban: a European model bridging the green and brown agendas', Global Report on *Human Settlements*, UN-Habitat.

Shoup, D 2005, *The high cost of free parking*, Planners Press, Chicago.

Trubka, R, Newman, P & Billsborough, D 2008, 'Assessing the costs of urban development in Australian cities', discussion paper, PB-CUSP, www.sustainability.curtin.edu.au/publication

Went, A, James, W & Newman, P 2008, 'Renewable transport: how renewable energy and electric vehicles using vehicle-to grid-technology can make carbon-free urban development', discussion paper 2008/1, CUSP, Fremantle, WA.

Whyte, WH 1988, *City. Rediscovering the centre*, Doubleday, New York.

Woodcock, I, Dovey, K, Wollan, S & Robertson, I 2009a, 'Speculation or resistance? The limits to compact city policy', 4th State of Australian Cities Conference, Perth, WA, 24–27 November.

Woodcock, I, Dovey, K & Wollan, S 2009b, 'Not in my republic: resident opposition to intensification in inner-city Melbourne', 4th State of Australian Cities Conference, Perth, WA, 24–27 November.