Transport Oriented Urban Transformation: Contribution to urban futures

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Executive Summary

Recent experience shows that action to improve the efficiency and outcomes of city transport systems, linked to well-planned urban development, can deliver substantial economic, social and environmental benefits to the community and to government.

The Australian Capital Territory Government is implementing a strategy of developing Canberra’s inner north transport corridor in conjunction with a decision to commence construction of the first stage of a light rail network between Civic and Gungahlin. The principal objective of this report is to review the experiences of other Australian cities (also citing some international case studies) and to note and review the policy objectives and, where implemented, urban outcomes in terms of land use change and measurable community benefits.

This background paper draws upon recent academic literature on transformative inner urban development considerations and provides an analysis of best practice via desktop review of comparable case studies of inner urban transformation.

The paper highlights key learnings and exemplars of best practice drawn from the case studies. The conceptual framework is urban planning and design, with the substantive analysis contextualised by a triple bottom line framework.

The urban form of an established city is principally an outcome of its development history - when the city was established, or more correctly, when it proceeded through its major growth phase – and the form of transportation that was dominant at that time. Most European cities, for example, have been in existence for centuries, if not millennia, and have a compact core most suitable for pedestrians and unsuitable for motor vehicle use. Conversely, many American and Australian cities grew rapidly in the post-Second-World-War period, aided by rapidly expanding populations, increasing motor vehicle availability and use, and cheap petroleum.

In the last three decades numerous cities around the world have realised the need to address the financial, social and environmental problems manifested with expanding urban areas and established policies to mitigate the effects of growing populations, rural migration, urban sprawl and car dependence. This has been undertaken through informed and deliberate governance strategies to improve and enhance access and mobility, population health and environmental and a response to climate change mitigation and adaptation.

This study examines a number of international case studies including New York, Singapore, Portland, Stockholm, Freiburg and Bergen, together with six Australia cites, namely Sydney, Melbourne, Brisbane, Perth, Adelaide and the Gold Coast. Those Australian cities chosen are included for the following reasons:

<table>
<thead>
<tr>
<th>Case Study City</th>
<th>Reason for inclusion as Case Study</th>
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<tr>
<td>National Perspective</td>
<td>work of Council of Australian Governments (COAG) and the former Major Cities Unit</td>
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<tr>
<td>Perth</td>
<td>two decades of significant policy development related to transit corridors and transit-oriented development high level of infrastructure funding for capital works related to extending suburban rail network</td>
</tr>
<tr>
<td>City</td>
<td>Infrastructure/Policy Details</td>
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<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sydney</td>
<td>the City of Sydney’s solid green agenda with proportion of low carbon outcomes, including transport, green buildings, cycling policy</td>
</tr>
<tr>
<td>Melbourne</td>
<td>a long-established and well utilised tram network</td>
</tr>
<tr>
<td></td>
<td>two decades of intense residential development in city and surrounds</td>
</tr>
<tr>
<td></td>
<td>current work to intensify development along transport corridors</td>
</tr>
<tr>
<td>Brisbane</td>
<td>significant recent funding for an integrated transport network, especially busways</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>light rail network recently completed</td>
</tr>
<tr>
<td>Adelaide</td>
<td>highly regarded planning governance for inner city</td>
</tr>
<tr>
<td></td>
<td>established tram network to/from Glenelg</td>
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These cities, and numerous others around the world, have realised benefits from aligning land-use policy with transport policy so that high quality urban transit systems integrate with supportive rezoning of land adjacent to transport corridors or in and around transit development nodes.

Economic and financial benefits also include rapid and sustained economic growth and employment and increased property investment.

A number of research learnings are affirmed in Section 5 of this report. Key amongst them is the alignment and integration of land use policy and transport policy to shift planning vision from a designation of land use and development focus to enabling the realisation of the community’s needs and day-to-day functions. Also stressed is the need to maintain strong institutional and governance structures for the successful implementation of urban reframing policies that impact city mobility.

The key research learning of the report are:

**Research Learning 1**
Urban consolidation, underpinned by public transit and revitalisation of land with mixed-use developments, brings with it triple bottom line (social, environmental and economic) benefits to the city.

**Research Learning 2**
Developing public transport orientated growth and creating compact and walkable neighbourhoods can reduce car distances travelled, lower traffic congestion and emissions, provide significant health benefits and stimulate increased productivity.

**Research Learning 3**
Increases in land value may provide a revenue source opportunity to return a significant proportion of the cost of public transport developments adjacent to transport oriented developments.

**Research Learning 4**
Containing the extent of greenfield urban development can assist in minimising household transport expenditure and in the protection of fringe real estate values.

**Research Learning 5**
Transit oriented urban renewal provides the opportunity to plan for and invest in the integration of affordable housing and social housing, infrastructure and services.
Research Learning 6
With the transport sector accounting for nearly 25% of greenhouse gas emissions in metropolitan areas worldwide creation of less car dependent urban forms is an essential governance and policy response to climate change mitigation and adaptation.

Research Learning 7
It will be of value to establish research based monitoring and review of social, environmental and economic outcomes and performance targets of transport infrastructure and related transit oriented development.

The redevelopment of inner urban areas will continue regardless of planning and urban design. The real opportunity presented, and challenge to be met, is to work with the community, planners and design professionals, and with government to help shape that process in a way that will transform an inner urban setting to one that can adapt with change and simultaneously provide a liveable environment for all its users — residents, workers and visitors.
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1.0 Introduction

Globally, four major trends characterise urban forms. The first of these is urbanisation which is a function of both people moving from regional and rural areas to cities; and immigrants choosing cities as destinations. It is common for urban centres to be seen as attractive, lively places to live and work, and as centres of intellectual and creative capacity (Hollis 2014, Glaeser, 2011, Birch 2009).

Second, a high-tech global economy has been a driver of recent economic expansion and provides new opportunities in cities and suburbs (Glaeser, 2011). The third is recognition that there is a need to diversify land uses and build more solid revenue bases, and the need to create urban centres that deal with the growing problem of traffic congestion (UN Habitat 2013, OECD 2012). The fourth is a trend towards increased investment in mass transit and urban transit opportunities (AECOM 2012).

The convergence of these trends creates the realisation that a substantial market exists for new forms of walkable, mixed-use urban development around new light rail, rail or rapid bus interchanges (Belzer, Autler et al. 2002).

Continuing and growing rural migration to cities, the prevalence of global city networks and the continuing expansion of urban sprawl have focused the attention of many of the world’s planning strategists on establishing policy to alleviate the negative impacts of urbanisation (UN Habitat 2007). Furthermore the pursuit of environmental, economic and social sustainability by governments, communities and industry continues to develop at pace. This has been occurring concurrently with renewed interest in cities and the consequent transformation in urban living.

In terms of land use and construction, brownfield redevelopments, infill housing, intensification and transit-oriented developments (TODs) are guiding urban strategic planning in many cities. In addition, the desire for sustainable transport solutions continues in response to environmental degradation, the impact of climate change and the depletion of fossil fuels, largely oil.

To address these issues, many cities around the world, including a number in Australia, are implementing innovative transport and transit policies, many of which have consequent beneficial effects in terms of urban form and population.

Alternative methods of transportation — including walking, cycling, car-sharing, para-transit (for people with disabilities) and public transport — are increasing in popularity and growing as a proportion of modal splits. Moreover, transportation planners are seeking ways of linking land use, urban form and building design with urban and regional transport infrastructure to move people efficiently and affordably (UN Habitat 2013a).

The Australian Capital Territory Government is implementing a strategy of developing Canberra’s inner north transport corridor in conjunction with a decision to commence construction of the first stage of a light rail network. The principle objective of this report, therefore, is to review, without direct reference to Canberra, the experiences of other Australian cities (also citing some international exemplars) and to note and review the policy objectives and, where implemented, urban outcomes in terms of land use change and measurable community benefits.

In 2011 the Council of Australian Governments (COAG) requested a review of the strategic planning systems of Australia’s capital cities — knowing how important cities are to the growth, productivity, sustainability and liveability of the Australian community; and given population growth and changing
demographics. The COAG Reform Council report (COAG 2012) in completing its review noted key areas for further effort in the strategic planning of Australian capital cities. Inter alia, these included:

- “putting more emphasis on public transport to combat congestion and address social inclusion by integrating transport planning with land use decisions
- improving project and cost-benefit analysis frameworks so they take better account of externalities and do not unduly discount future benefits” (p2).

In addition to this policy framework, the OECD review of compact city policy (2012), which involved five in-depth policy case studies—Melbourne (Australia), Vancouver (Canada), Paris (France), Toyama (Japan) and Portland (United States)—provides a useful good-practice critique to this report. The indicators of compactness can include: density, proximity, public transport systems, and accessibility to local services and jobs. The UN Habitat report on planning and design of urban transport systems (2013a) builds on this, highlighting global best-practice and guiding recommendations for sustainable urban futures.

The OECD notes that:

“the volume and spatial distribution of urban land in a metropolitan area indicate the proximity of urban development. Trips using public transport and proximity to public transport can indicate how urban areas are linked by public transport systems. Matching local services and homes indicates the accessibility of local services in a neighbourhood. In particular, an innovative indicator in comparison with traditional population density measures is population density on urban land, which can provide more accurate information on how intensively urban land is used” (p112).

Overall, this background paper provides an insight into leading practice via a desktop review of a range of case studies of inner urban transformation.
2.0 Inner Urban Areas

The city is under transformative pressure from globalisation, neoliberalism, sustainable development, economic competitiveness, city branding, economic reform and demographic change. All these pressures are reshaping city governance structures and the development and implementation of planning policy. The classical definition of the city (city beautiful, city efficient, city radical) is also being transformed as a result of emerging issues such as smart growth, the smart city, the green city, community and the healthy city, and Glocal-ization (Inayatullah 2011). It is also recognised that in transformation of the city, and urban dynamics, the change is often discontinuous and lumpy (Batty 2012).

Indeed, “urban regeneration has come under considerable scrutiny as one of the core mechanisms for delivering sustainable urban development” (Turcu 2012) and since 2000 the OECD has utilised the term ‘urban renaissance’ to encapsulate a vitality and innovation agenda in urban renewal at a metropolitan scale. It is noted that terms ‘urban renewal’, ‘urban regeneration’, ‘urban redevelopment’ and ‘urban rehabilitation’ are often used interchangeably in the context of inner urban area transformation project (Zheng et al. 2014, p272).

2.1 Strategic planning

Strategic planning presents a paradox: charting a course between regulation and control of urban form and function can inhibit innovation and individual creativity. The transition of strategic planning from command and control blueprints predicated on utopian social outcomes has, in the last century, given way to a more strategic vision and a desire for planning outcomes focused on procedural administration (Albrechts 2006, Gurran 2007, Talen 2012).

The debate on urban form remains between the compact verticality of Le Corbusier, the horizontal expansionism envisaged in Howard’s garden city based on rail and in Frank Lloyd Wright’s motor city (Fishman 1982; Hollis 2014). This debate has also come to recognise the important role that transportation has in the sprawl of cities (UN Habitat 2013a).

The city is a place for the production and exchange of goods and services. The extension, expansion, diversification and maintaining of the critical networks for this commerce are considered paramount (Prosser and Yarwood 2006, p127). Building on the economic powerhouse of cities, Glaeser (2011, p85-86) recognises the power of transportation to shape cities; he notes also that social segregation in central areas can reinforce divisions of wealth in favour of the rich where a single transportation mode dominates. In planning and design for sustainable urban mobility it is acknowledged that transportation has “accelerated the dispersal of economic activities, unleashing low density, discontinuous patterns of urban growth” (UN Habitat 2013a, p79).

The Council of Australian Governments’ review of strategic planning of capital cities, in reiterating the importance of cities, sought to “ensure Australian cities are globally competitive, productive, sustainable, liveable and socially inclusive and are well placed to meet future challenges and growth” (COAG 2009, p20).

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2 Le Corbusier, 1933, *The Radiant City*.
3 Ebenezer Howard, 1898, *To-morrow: A peaceful path to real reform*. 
In linking strategic planning to productivity and investment (COAG 2011), key policy issues were considered to be those concerning the future competitiveness, productivity, sustainability and liveability of capital cities; further that the issues at the heart of strategic planning—the shape of the city, the types and locations of housing, what infrastructure to build and where—are subject to political contest (p28).

Strategic decisions on planned urban transformation and allied corridor redevelopment need to be based on a whole of network assessment. This is particularly relevant in the case of public transport networks’ operability and new network construction phasing.

2.2 Strategic urban outcomes

If cities are to be successful, then sustainable and liveability strategies to achieve this are likely to rotate around mixed-use, density, connectivity, high quality public realm, local character and adaptability (Adams 2009, p211). Foremost among the short and medium term strategies are those that focus on development corridors. Drawing on the lessons of Melbourne 2030, strategic urban outcomes can be best achieved through collaborative and informed community participation underpinning integrated design—as Melbourne 2030 states: the success of high-density corridors “will rely on clear communication and a widely understood implementation strategy” (p212).

The OECD, in reviewing compact city policy (2012), found that “by 2050, 70 per cent of the world’s population—and 86 percent in OECD countries—will live in urban areas, and that land consumption for built-up areas will increase more rapidly than the population” (p19). Applying the Australian Bureau of Statistics definition to cities, the State of Australian Cities Report (2012) found that 77.3 per cent of the population lived in 18 major cities, up from 75.9 per cent in 2001 and that 40 per cent of the population live in just two cities (2013).

Population then is a significant driver of city growth, sustainability and urban regeneration policy. Policy for compact cities should form part of a national urban policy. The Australian National Urban Policy (p21) recognises this through response to infill development and affordable housing choice (Australian Government 2011, p61).

In accommodating growth, a city’s transportation networks, and in particular mass transit, need to be considered in the context of the “entire multi-modal spectrum of trains, trams, buses, taxis, bikes, autos, electric carts, ferries, trucks, aeroplanes, jets, supersonics and so on, not forgetting facilities for pedestrians” (Glaeser2011,p128). The basis for this consideration can include household vehicle ownership growth, private vehicle trips, car-pooling usage, trips to work, rush hour trips and average travel time to work. However, suburbanisation occurs regardless of the transportation system and similarly retail growth follows population rather than a transport network.

The nature of urban transformation through development corridor projects, such as the Irish corridor,4 is interdisciplinary and involves “economics, economic development and business, spatial planning, land management and utilization, transportation, landscape and urban design, community development and politics, as well as governance and institutional development” (Glaeser 2011, p129).

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In addressing compact city policy the OECD (2012) advocates urban design responses to improve quality of life and diversity to sustain “the centrifugal power of a metropolitan area”. Attractiveness of the urban centre, public parks and green spaces is seen as an essential element of a compact city (p23). However, alongside positive contributions to the urban form, adverse impacts of compactness are acknowledged and include the need to suppress traffic congestion, provide affordable housing, promote high quality urban design and investment in the public realm and foster a sense of place (p23). What is evident is that, in pursuing the goal of compactness, governance tools of accountability, transparency, and reporting are required to measure progress towards any economic, social and environmental outcomes of the vision.

Human scale, as Gael (2010) reiterates, provides an alternative proposition for inner city development that follows in the artistic enterprise traditions of Sitte who suggests the focus is on “life, space, buildings—in that order”(p193-198). Inner city development must focus on the human dimension and seek to ensure people assemble and integrate in built up areas such that transportation gives priority to pedestrians (p234-235).

2.3 Urban policy

It is acknowledged that “Australian cities have sprawled further and faster than any other cities in the world” (Newman 1992, p285) and consequentially resolving the design and operation of our cities is critical (Adams 2009, p 209). This Australian sprawl reflects a car dependant society that underutilises public transport and has direct correlation to urban density and spatial form (see Figure 1).

![Figure 1 Density, public transport and car ownership](source: Cervero 1996)

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5 Camillo Sitte, 1889, *City planning according to artistic principles*, Vienna, (trans), Dover Publishing, UK.
Urban regeneration projects, typically infill policy aiming at 50 per cent to 70 per cent of new development, fall into what Newton and Glackin (2014) define as either brownfield or greyfield development opportunities. While redevelopment of brownfield sites, land that was previously used for industrial or commercial uses, greyfield sites usually have no need for site remediation and lie between the inner city and CBD district and more recently developed greenfield suburbs. They generally have greater access to employment, public transport and services and are comprised of large tracts of undercapitalised real estate assets that are individually owned and occupied (p5).

Recent work on urban transformation has identified economic relationships between density and travel distance that have implications for urban policy and city form.

![Figure 2 Urban public transport and spatial form outcomes](source)

The view that policy-directed development areas drive a greater rate of infill is not borne out in Australia’s largest cities at present. It is the socio-economic status of the suburb rather than its zoning that directs apartment development (Rowley and Phibbs 2012; Newton and Glackin 2014). Newton and Glackin’s analysis of public transport connectivity linked with development zoned opportunity noted “a more striking finding was the absence of any real difference in the rate of housing redevelopment between those zones with medium public transport access and those with little or none” (2014, p15).
2.4 Urban design

The importance of design in the built environment cannot be understated. The relationship between our buildings and our urban spaces and the people who use them is fundamental to providing the vitality that successful and sustainable cities demand. Sustainable design through architecture and urban planning creates an optimum framework for urban living, while at the same time creating cultural and economic assets for people, business and the community.

The urban realm contributes to the lives of individuals and the community as a whole, and conversely, activity, movement and the life of people are inherent in creating and enriching the city. Civic vitality is a combination of experiences including work, recreation, relaxation, safety and ease of access in the city and informs both the form and function of architecture and the open public spaces. Identity and legibility are important drivers in facilitating urban vitality while accessibility drives urban mobility.

In planning for urban mobility high-capacity public transport systems are strategic in shaping urban form, promoting higher densities as well as mixed and accessible land use. Canberra already has a form of bus rapid transit (BRT) however it is important to distinguish scale between modes of public transport as “Metro, light rail and BRT are all intended to provide fast, comfortable and cost-effective urban mobility in medium- to high demand corridors” (UN Habitat 2013a). While metro systems are preferred for large cities, where demands justifies high capital costs associated with the investment, light rail is defined by “systems whose role and performance lie between a conventional bus service and a metro” (2013a, p39).

Spatial consequence of existing city form also direct responses to appropriate transportation networks. Transport corridors present a number of challenges (Figure 3 below) such as where the number and placement of transit stops induce new growth they also lead to reduced travel times while limited stops constrain land development while promoting travel speed.

Figure 3 Accessibility and mobility trade-offs along corridors
Source: UN Habitat 2013a
The corridors also promote spatial opportunities to form a network of TOD’s that (quote) referred to as a ‘string of pearls concept’ (Figure 4) where each TOD is connected by light rail or Metro lines.

![TOD Networks](source.png)

**Figure 4 TOD Networks**  
*Source: UN Habitat 2013a*

### 2.5 Sustainable urban futures

The following four sections present a quadruple bottom line examination of economic, social, environmental and governance considerations of transport-oriented urban redevelopment. This is followed by a narrative on related considerations, including environmental, social and governance considerations.

#### 2.5.1 Economic considerations

This section deals with issues related to economics and discusses impacts and outcomes on property value and return, land use, employment and productivity and how this affects choice, liveability and transport behaviour.

**Economic stimulus as a driver of innovation**

There are four socioeconomic trends that are driving new urban typologies around the world and these are having an impact on the supply and demand framework for Australian cities. The first is the renewed interest in the city centre as a desirable place to live, the second is the technological changes that are improving our connect ability and third is the realisation that there needs to be more diversity in our urban structures while the need to deal with traffic congestion and implement mass transit options is a close fourth trend (Birch 2009).

The following describes six performance areas for transformation associated with improved access to public transport and more diversified development opportunities.
1 *Location efficiency*: according to Belzer there is significant evidence to show that, on average, residents of denser urban neighbourhoods own fewer cars, drive less, and walk and use public transport more than residents of suburban areas. This performance criterion can be described as location efficiency, whereby the location permits households to take advantages of the characteristics of the neighbourhood and spend less on transportation by either driving less or owning fewer cars. Location efficient neighbourhoods can provide a number of outcomes including;

- improved alternative transport choices, improved public transport use
- improved public transport connections to the rest of the city
- reduced car use and car ownership
- reduce transport costs to households and individuals
- improved retail development (quantity, quality and diversity) to satisfy residential as well as workers’ needs, and
- a ‘live where you live’ approach that allows people to live, work and shop in the locality.

2 *Value capture*: parking is a significant but generally under recognised component of high spending on transportation. According to Belzer (p10) experience in the United States indicates that average household spending on motor vehicles can be reduced by between 10 per cent and 15 per cent in some areas, reducing the spend on motor vehicle transport from 13.2 per cent of gross regional product to 8.1 per cent (Belzer, Autler et al. 2002). This reduced expenditure on private transport can lead to families being able to purchase homes or purchase larger or more suitable homes. Provided planning rules are altered so that additional car parking is not required for homes that will no longer be using vehicles as much, this can lead to significant savings in the cost of residential, commercial and civic infrastructure/building development. These savings can be captured by households, developers, and local governments, to invest in assets like housing (Belzer p11).

3 *Liveability*: increasingly viewed as closely connected to economic development, liveability indexes focus on quality of life criteria and healthy communities that are closely related to land use and transportation issues.

While there are a range of liveability factor assessment tools⁶ achievable measures of liveability include improved air quality, improved mobility, decreased congestion, decreased commuter pressures, opportunities to access retail, recreation and cultural opportunities, increased discretionary time, improved economic health and improved public health (more personal mobility, less traffic accidents). Achieving urban transformation associated with inner urban public transport improvements requires new development associated with urban centres to be transport-oriented rather than transport-associated. It is important to recognise that the urban development formats chosen for inner urban transformation areas focus on creating opportunities to use alternative transport modes and inhibit the introduction of the private motor vehicle. Forcing people to consider the public transport or other alternative modes of transport is essential for success.

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⁶ [https://www.fhwa.dot.gov/livability/state_of_the_practice_summary/research03.cfm](https://www.fhwa.dot.gov/livability/state_of_the_practice_summary/research03.cfm)
4 **Financial return**: there is significant evidence to suggest that a light rail can lead to rent premiums in surrounding commercial properties and high potential returns which can be used as incentives for developers to capture public benefit (AECOM 2012, UN Habitat 2013a). It is possible to evaluate the financial returns from light rail in terms of higher tax revenues, the potential for ground lease and joint-venture developments at stations, high returns on investments for developers and shorter and more predictable commute times for employers and employees. Increases in land value may provide a revenue source opportunity to return a significant proportion of the cost of public transport developments adjacent to transport oriented developments.

5 **Choice**: standard suburban development provides a lack of choice to residents, commercial and retail operators. Lot layout, house style and size, shopping centre arrangements and the relationship between suburban and commercial centres separated by zoning arrangements do not suit a proportion of the population: people who have mobility issues, the aged, the very young, the infirm and people with disabilities can be significantly disadvantaged (Cowell 2013). Inner urban transformations oriented to maximise the use of public transport can provide a wide range of residential opportunities not available in the suburbs. No particular housing type needs to dominate urban transformation areas, a wide range of housing styles and locations can be organised in a relatively tight space. Enhanced choice might entail: diversity of housing styles that reflects family structures, a diversity of retail types, a diversity of transportation choices and options for affordable housing (especially if land that would have been set aside for car parking spaces is used for residential opportunities).

6 **Efficient regional land use patterns**: cities in America, Europe and Australia consume agricultural land and continue to demand the extension of infrastructure and services away from town centres to provide for a range of citizens needs in an inefficient and ineffective manner. More efficient land-use systems channel growth to places that better suit us, reduce the frustration that is created by sprawl and its consequences and provide opportunities for a co-ordinated set of land use policies and transportation investment options. Benefits that can be expected from urban transformation include: less loss of farmland and open space, more suitable regional and sub-regional balance between jobs and housing, shorter commutes, less traffic congestion and the development of transport nodes that can serve as destinations as well as origins (Belzer, Autler et al. 2002).

Achieving positive outcomes requires a number of risks to be managed. It is important that the introduction of new transit systems and denser urban development adjacent to each other is billed as transit-oriented-development not transit-adjacent-development. Development that is adjacent and still has a car-oriented approach can lead to the reduction of financial gain or failure of the project to achieve its goals. It is imperative that a wide range of housing choice is included in any future development options—diversity not just density is a key to making the locality liveable.

The public transport system should be part of a cohesive regional system, not an isolated singular development. There should be a clear vision about the outcomes and expectations, and the development needs to deal fairly with the tension between node and place. Planners need to have clear codes for place-making arrangements and to date these have not been uniformly or successfully approached in Australia. The ownership of transport hub infrastructure, and its future
management, needs to be clearly managed so that station use is not singularly a transport mode but also as a mixed-use commercial opportunity. It is important to create a typology of places for each node/place.

An essential criterion in the success of transport-oriented development is disengaging parking from land use. Transit-oriented development does not preclude car use, which will continue in regular use with an ongoing need for allocated car-parking. Less parking, however, will be required than in other non-transit locations which is considered both an environmental benefit and a financial advantage in adjacent residential and commercial developments.

Coordination of inter-agency operators and approval authorities is essential to ensure a consistent approach, which can be achieved through the creation of a city manager providing central control or a single agency to manage development (Acemoglu and Robinson 2012). Urban infill related to transport modes, as opposed to adjacent to, is a relatively new experience; and is predominantly an experimental direction in modern planning with some significant successes, and some spectacular failures. Most of the failures seem to be where development is transport-adjacent rather than transport-oriented (Belzer, Autler et al. 2002).

**Employment and productivity**
The productivity benefits from consolidation, linked with learning through knowledge sharing and specialisation (creativity), are considered integral to skilled cities. The OECD (Ahrend et al. 2014) notes that while skilled cities increase the productivity of the unskilled workers (p11), such externalities are industry specific and consequentially spatially related. Challenging the move towards mixed-use policies is the evidence that traditionally segregated land use zoning, which clusters industries, has some beneficial impact on productivity through the economic and spatial proximity of like industry.

**Property impacts**
Of particular interest to stakeholders in government, the planning and design professions, the development industry and the community are land and property issues. These are likely to include:

- upward projected change in the value, of land and assessment for rates, of transformation areas offset against real decreases in values for areas not subject to transformation projects
- urban density/intensity goals and limitations including height of building limitations at setback distance from corridors
- changing land use structures through transition to mixed-use zoning, and a wider choice and mix of housing typology
- opportunities for revitalisation of the existing architectural fabric of the city, and
- potential impact on, or opportunity for, listed items of heritage significance.

It can be generally be expected that commercial and residential property prices within 200 m to 500 m of a mass rapid transit route can increase in the range of 15% to 25% subject to on the location of the property to the stations compared to properties 1.5 km away. This is comparable to European

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7 Nations fail because of the focus and direction of the governments of the nations. When governments govern in their own interest or in the interest of one sector of either the economy or the nation, other sectors suffer. To be successful countries need a government that will make decisions in the broader interest of the people, the movement of capital and provide security for property rights and fairness in the process of assigning rights to intellectual and physical property.
cities where premiums for office space are 23% higher when compared to 8.9% for residential accommodation in close proximity to stations (AECOM 2012).

Transport is widely recognised as one of the biggest household expenses (after housing and food), particularly for residents of the outer suburbs of cities. Containing the extent of greenfield urban development can assist not only in minimising household transport expenditure but also in the protection of fringe real estate values. Cortright, in a 2008 study, examined the geographic variation of house price declines in the USA and found that, although “prices were declining everywhere as of 2008, the magnitude of decline was considerably greater for neighbourhoods that were distant from the urban core”. Cortright attributes much of the decline to the rise in fuel prices between 2004 and 2008. Cheap fuel prior to this exacerbated the spread of the housing frontiers of many American cities, not to negate, of course, the easy availability of housing funding at this time and the resultant onset of the global financial crisis. However, Troy (2012, p8) points out that:

“When looking at the overall health of the regional housing market, metropolitan areas with more ‘vital’ urban cores were found to have fared better in the housing downturn than those without (‘vitality’ was defined as a high spatial concentration of people with advanced educational levels within the core relative to the periphery). In other words, metropolitan areas where differences between the core and periphery are modest (like Phoenix and Las Vegas) experienced steeper declines in housing prices and greater foreclosure rates overall than those areas with defined centers and clear density gradients (like New York and Portland Oregon).”

A concern regarding inner city transformational projects, where such projects are primarily residential intensification in focus, is the potential for these to capture the existing market growth to the detriment of other development sites and strategic land release and development projects. Mydral (1957) referred to this as “backwash and spread” where potential risk of devolving economic activity to growth nodes (spread) results in mobility away from less accessible areas (backwash) (Chapman et al. 2003, p187) and is likely to be an unintended consequence on other established commercial, retail and residential parts of a city, potentially draining development interest and activity.

**Factors of Economic Growth**

<table>
<thead>
<tr>
<th>The drivers</th>
<th>Key elements</th>
<th>Outcomes/Benefits</th>
<th>Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location efficiency—the location permits households to take advantages of the characteristics of the neighbourhood</td>
<td>On average, residents of denser urban neighbourhoods own fewer cars, drive less, and walk and use public transport more than residents of suburban areas. Location efficient neighbourhoods can provide a number of outcomes including; shop in the locality.</td>
<td>• alternative transport choices  • improved public transport use  • improved public transport connections  • reduced car use and car ownership  • reduce transport costs  • improved retail development (quantity, quality and diversity) to satisfy residential as well as workers’ needs  • a live-where-you-live approach that allows people to live, work and shop in the locality</td>
<td>• continued and increased congestion as residential areas and workplaces are unaligned</td>
</tr>
<tr>
<td>The drivers</td>
<td>Key elements</td>
<td>Outcomes/Benefits</td>
<td>Risks</td>
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<tr>
<td><strong>Value capture</strong> — parking is a significant but generally under-recognised component of high spending on transportation. According to Belzer experience in the USA indicates that average household spending on motor vehicles can be reduced by 10% - 15% in some areas, reducing the cost of motor vehicle transport from 13.2% of gross regional product to 8.1% (Belzer, Autler et al. 2002).</td>
<td>Reduced expenditure on private transport can lead to families being able to purchase homes or purchase larger or more suitable homes. Provided planning rules are altered so that additional car parking is not required for homes that will no longer be using vehicles as much, this can lead to significant savings in the cost of residential, commercial and civic infrastructure/building development.</td>
<td>• savings captured by households, developers, and local governments, to invest in assets like housing (Belzer p11).</td>
<td>• greater financial costs to community such as from parking or increased issues of inequity, • higher cost of service delivery as investment in service infrastructure is required further from town centres</td>
</tr>
<tr>
<td><strong>Liveability</strong> — quality of life criteria that closely relate to land use and transportation issues</td>
<td>Urban transformation associated with inner urban public transport infrastructure requires new development in urban centres to be transport-oriented rather than transport-associated.</td>
<td>• improved air quality, • improved mobility, • decreased congestion and commuter pressures, • opportunities to access retail, recreation and cultural opportunities, • increased discretionary time, • improved economic and public health (more personal mobility, less traffic accidents).</td>
<td></td>
</tr>
<tr>
<td><strong>Financial return</strong> — Savings captured from the lesser requirement related to greenfield (fringe) development infrastructure and the increase of land value in transport oriented development can be returned as a significant proportion of the cost of public transport.</td>
<td>Light rail can lead to rent premiums in surrounding commercial properties and high potential returns which can be used as incentives for developers to capture public benefit (AECOM 2012, UN Habitat 2013a). Thresholds for lease purpose clause change charge (betterment tax) can be reconsidered and reset to respond to access to fixed transit.</td>
<td>Evaluate financial returns from light rail in terms of • higher land tax revenues, • the potential for ground lease and joint-venture developments at stations, • high returns on investments for developers • shorter and more predictable commute times for employers and employees. • less expenditure on capital works infrastructure in new fringe suburb development</td>
<td>• impact on land values in other existing parts of city</td>
</tr>
<tr>
<td><strong>Choice</strong> — Inner urban transformations oriented to maximise the use of public transport can provide a wider range of lifestyle choices and residential opportunities not available in the suburbs</td>
<td>Standard suburban development provides a lack of choice to residents, commercial and retail operators</td>
<td>• greater diversity of housing styles that reflects family structures, • a diversity of retail types, • a diversity of transportation choices • options for affordable housing</td>
<td></td>
</tr>
<tr>
<td><strong>Efficient regional land use patterns</strong> — urban and regional interface</td>
<td>Urban sprawl consumes agricultural land and continues to demand the extension of infrastructure and services away from town centres.</td>
<td>• less loss of farmland and open space, • more suitable regional and sub-regional balance between jobs and housing, • shorter commutes,</td>
<td></td>
</tr>
</tbody>
</table>
The drivers | Key elements | Outcomes/Benefits | Risks |
---|---|---|---|
More efficient land-use systems | More efficient land-use systems channel growth to more appropriate places and provide opportunities for a co-ordinated set of land use policies and transportation investment options. | • less traffic congestion  
• development of transport nodes that can serve as destinations as well as origins | |

Employment and productivity | Of benefit to both employers and employees | • The productivity benefits from consolidation, linked with learning through knowledge sharing and specialisation (creativity), are considered integral to skilled cities. | |

Property impacts | Of particular interest to stakeholders in government, the planning and design professions, the development industry and the community are land and property issues. | • upward projected change in the value, of land & assessment for rates,  
• urban density goals achieved  
• height of building limitations achieved at setback distance from corridors  
• changing land use through transition to mixed-use zoning  
• wider choice and mix of housing typology  
• opportunities for revitalisation of the existing architectural fabric of the city. | • potential impact on, (or opportunity for), listed items of heritage significance. |

Table 1 Factors of economic growth

2.5.2 Social considerations

This section discusses social considerations, such as access to services, including local retail and schools, opportunity for place making, community engagement and health issues.

Davidson et al. (2012) recognise both the opportunity that urban renewal can provide to integrate affordable housing with planning, housing, social infrastructure and investment, and the risks this brings regarding displacement as neighbourhoods redevelop. They also noted that this in turn raises concerns regarding investment and governance of planning processes to ensure certainty and consistency for the developer while minimising risks to land values and associated development costs (p8).

Recent research by Pinnegar and Randolph (2012) into Sydney’s growth and the compact city policy supports the view that “sustainability in the city centre context appears best served by a majority of young adult residents, ameliorated by a sizeable proportion of older adults, and an absence of households with children” (Bromley, Tallon and Thomas 2005). People who choose inner city lifestyle do so for a range of factors such as availability of, and proximity to work, type of lifestyle, financial outgoings, and not simply as a preference for apartment living (Goodchild 2013).

Urban renewal can be understood as planning processes (sub-systems) involved in town planning such as land, housing, infrastructure, heritage and transportation for which urban design serves to
address these complex issues (Figure 5) or in the context of social framing (Figure 6) (Zheng et al. 2012, p274).

**Figure 5 Planning sub system in urban renewal**
*Source: Zheng et al. 2014.*

The sustainable development policy framing of urban renewal supports land uses as resource re-use and adaptive re-use with regard to existing architectural conservation, however, refurbishment provides a cheaper, faster, less disruptive approach compared with demolition and redevelopment (Turcu 2012).

A second categorisation of interest falls to the social framing of renewal (see Figure 6 below) and the role of stakeholders and engagement.

**Figure 6 Social sub-system in urban renewal**
*Source: Zheng et al. 2014.*
The potential for urban renewal to marginalize the poor in inner city areas and the changing role of public authorities, local government and the community has led to the development of a framework that is sensitive to the challenges of transformation. The five cornerstones of this framework are:

i. defining a greater role for the corporate sector, non-government organisations, community based organisations and citizens to participate as public authorities and local governments move away from prescriptive roles to be facilitators of the urbanization process,

ii. identifying opportunities for new partnerships between public and private sector organisations,

iii. addressing the challenge of on-site upgrading and rehabilitation in the face of competition demands for land in environmental risk areas

iv. addressing adverse impacts of climate change and episodic events such as global economic crisis, disasters and terrorist threats, and

v. meeting the challenges of strategically managing renewal given existing urban planning processes and urban institutional capacities (ADB, 2011).

2.5.3 Responding to climate change

This section deals with issues related to responding climate change and other environmental concerns.

Planning systems are not well equipped to encourage or regulate the retrofitting of the existing built environment for a climate adapted future. Infrastructure assets, particularly road, rail, water, sewerage and power supply investments, need to be subject to vulnerability assessments beyond that of thermal stress. While climate change modelling of temperature effects have focused on numbers of days above 35°C and consequences for infrastructure, ecosystems and the community, it is now recognised that health effects on the community are frequently apparent at much lower temperatures. The health impacts affect the distribution and changing frequency of health problems and in particular those of low-income communities. The direct impacts of extreme weather events such as heatwaves, bushfires, floods and storms are apparent. However, indirect health impacts of these events arise from resultant changes to physical and biological systems to climate induced stress, such as increased aeroallergens. These impacts along with motor vehicle emissions can have air quality impacts on health, and cumulatively affect mental health and wellbeing. A key consideration in responding to climate change is an adaptive decision making process that understands the probabilities and risks in locating future urban development in the context of climate change. Norman et al (2006), in a study based on Toronto, Canada, show that high density areas have emissions per person of 3,300 kg CO2-e per annum compared to 8,700 per person in low density areas.

With the transport sector accounting for nearly 25% of greenhouse gas emissions in metropolitan areas worldwide, creation of less car dependant urban forms is an essential policy response to climate change. Stopping sprawl, promoting public transport orientated growth and creating compact and walkable neighbourhoods that reduce vehicle distances travelled such as through low emission land-use activities are seen by policy makers as key planning responses (OECD 2012, UN Habitat 2013a).

Changing urban density from low density suburban sprawl to medium density through residential design can have significant reductions in energy consumption. However, spatial form is not the sole driver; others include distribution of population and employment densities. At issue then is where
people live, work, shop and socialise defines travel origin and destinations and thus length of travel and energy consumption. Figure 7 below indicates a distinct trend regarding American, European and Asian city energy consumption and density irrespective of urban form. Australian cities tend towards being closer to US cities in terms of densities and European cities in terms of consumption.

![Figure 7 Transport energy use and urban density](source)

Source: UN Habitat 2013a, Newman and Kenworthy 2011

2.5.4 Governance

This section deals with issues related to governance and implementation.

The OECD working paper (2014) on what makes cities more productive also recognises the lack of empirical evidence regarding governance structures and how this can affect urban outcomes that enhance productivity. What is recognised is that governance failures in the urban space result from the fact that administrative boundaries rarely coincide with economic activity. In addition, problems arise in coordination, not only across different levels of government, but also horizontally where numerous local governments function (p11).

Cities are not just complex adaptive social-ecological systems, they are also spatial systems. The greatest challenge in planning a complex system like a city is the unknowability of the current state because a city is an open and therefore not finite entity. And finally there is no optimal knowable
future state. A city is a networked complex system that traverses a three-dimensional space—
evolutionary, spatial and temporal (Desouza and Flanery 2013). Cities can be segmented into
physical and social spheres. The social spheres include individuals, institutions and activities, while
the physical sphere includes resources and processes. To manage cities, governments need to build
trust and guide or lead rather than direct.

In the past government processes have been about design and control, vision building and
regulation, separation of land uses and the formation of rules regarding urban form. Governance will
require a change of direction to a process of collaboration, innovation and delivery in a more
integrated and governance oriented rather than government centred format. Planning will require
greater flexibility, the design process will require more adaptability and the management process
will need to become agile (Desouza and Flanery 2013; Hollis, 2014).

If government is to become more centred on delivery through the people and for the people, it will
need to come to terms with the changing relationship between state and society through to
managing the details of local community. There will need to be clarity as to who governs and who is
governed and how non-state actors network rather than relate to a hierarchical structure of
command and control. How are we to be governed if things are to become more flexible?

Government has been traditionally a sovereignty issue characterised by top-down, centralised views
of government while governance is more about process, coordination and policy delivery through
negotiation and less stability. The move from sovereign to post sovereign states with a centreless
society, as described by Peter Shergold (Shergold, 2008), indicates a future where decisions are a
fragmented mix of government, markets and networks. “The exercise of power is more diffuse and
opaque”, services are more partnership-delivered and legislative and statutory requirements are
replaced with policy-making processes. The challenge of addressing the tension between
strategically planned growth and organic growth is constant.

Governance networks are complex and require horizontal networks to be pluralistic and negotiated.
Multilevel governance is reconfiguring territory and space as an entity. A cross-section of
government intervention requires transnational to national to regional and finally local
interpretation by government across spheres of influence in formats not previously encountered. A
modern analysis of social networks leads to a conclusion that there is an emergence of cliques within
networked arrangements. Much of the relationship works well within a network hub but not so well
between network hubs. In the 1990s it was a well understood federal layered cake approach with
responsibilities at a multifunctional level. More recently the political model looks more like a marble
cake with vast jurisdictional influence at the state and local level. Examples of governance changes
include relationships with the wine industry and government, the forestry industry across the world
and the C40-climate change networks that have established themselves locally rather than
nationally. In all of these examples traditional government jurisdictional boundaries have given way
to allow international and sub-national interests to interrelate more directly.

One of the questions to be considered is: what is governed under the governance heading that was
not governed under the government framework? The emerging governance framework is more
about persuasion than regulation and consequently it requires collaborative and collective action to
solve problems in the areas of health, environment, security and market development. This is
particularly significant where cities are looking to change from low-density spread systems based on
individual movement capacity to higher density, compact collaborative and community oriented
entities with communal or mass-transit systems. To become more competitive, cities need to move from prescriptive control systems to more agile, more intuitive, collaborative and innovative systems that are inclusive and deliver high capacity. Modern governments will necessarily need to become participatory, deliberative and reflexive, providing a central place for the development of the new narrative in an adaptive and community-based framework (Muelman2008, p73).
3.0 International experience

Bertaud et al. (2011) discuss two cities that maintain very high ratio of transit trips, notably Singapore with 52.4 percent of total commuting trips and New York City with 36 percent; and further, that both performances are noteworthy because each city has a high-income population. This is intriguing, they claim, because logic would suggest that higher-income households are less likely to use transit than lower income ones. But the authors argue that the high ratio of transit trips is a direct result of a deliberate policy of spatial concentration and diversification of land use. Although both these global cities, each with an international financial role, are many times the population size of Canberra, a reference here is relevant in terms of outlining the planning policy governance of each city that keeps this transit ratio high for the social and environmental well-being of each city.

Portland Oregon, which is also reviewed here, has been widely regarded as a success story with its city centre enlivened by the implementation of urban development policies focused on intensification and the promotion and of public transport over car dependence. But outside its city and county growth boundary, adjacent jurisdictions have allowed the proliferation low density urban growth. Three European cities, Stockholm, Freiberg and Bergen, are also cited here; the first two have several decades of experience with successfully implemented transit-oriented planning policies and light rail systems in place. Bergen is a more recently constructed line in two stages with a third currently under construction.

3.1 New York, USA

New York’s Department of City Planning promotes strategic growth, transit-oriented development, and sustainable communities in the city. The relevant City Plan is encompassed in PlaNYC which was released in 2007 and which aims to strengthen its economy, combat climate change, and enhance the quality of life for all residents.

New York’s most striking demographic feature is its high number of jobs concentrated in Manhattan, which was originally, and continues to be, driven by high market demand for floor space. The Midtown District has an astonishing density of 2160 jobs per hectare which is claimed to be “extremely intellectually fertile, innovative, and productive, in spite of the management problems it poses for providing services in such a dense area” (Bertard et al.2011, p114). High floor area ratios have been adjusted over time to meet demand as the Mid-Town and Down Town areas of Manhattan expanded, but the city has also allowed a mix of zoning for other commercial activities, theatres and housing. It has been thus found that mixed land use favours transit as it generates trips outside traditional commuter peaks.

In summary, the authors note the following initiatives taken in New York City that have contributed to a high share of transit use, and as a consequence a lower greenhouse gas emission per capita.

- “high floor area ratio responding to market demand
- mixed land use in the CBD
- encouraging amenities in or close to the CBD including museums, theatres and universities
- providing the majority of parking off the street in privately operated parking areas charging market price, but also specially taxed by the municipality; a complementary strategy is progressive removal of most on-street parking except for loading and unloading
3.2 Singapore

Singapore is also a highly dense and compact city, located on a land area of only approximately 700 square kilometres with a population of five million. Singapore’s approach is markedly different to that of New York in that it has, through comprehensive planning, expanded its downtown and redistributed its population through the city-state. Transport infrastructure and land use policy are closely linked with emphasis on transit-oriented development, a compact urban structure, vigorous restraint of private car ownership and usage, and a strong commitment to public transport.

At the residential neighbourhood level, new towns have been established with a selection of amenities and services that can be easily reached within a few minutes’ walk. Public housing towns where up to 80 percent of the population resides are inter-connected with easy access to the city by public transport, principally mass rapid transit. New growth centres have been planned in the regions in immediate proximity to transit corridors to provide concentrated nodes of employment.

At the policy level, strong deterrents have been implemented to dissuade private car use, including high vehicle and fuel taxation measures and parking management, a vehicle quota systems and congestion pricing. In addition, mode shift strategies have been promulgated to improve public transport and car-sharing uptake (Bertard et al. 2011, p116).

3.3 Portland, USA

Portland, Oregan, has been described as transit success story in a city that was not initially dense enough to consider rail viable (Newman et al. 2009). In the post-war era, the city was confronted and shaped by car use and, following successful community-led campaigns, chose to reject freeway proposals and build a rail system that would “provide better options for their future” (Newman et al. 2009, p111).

Portland’s light rail system began service in 1986 and now consists of four separate lines connecting the downtown area with its suburban area and airport. There are over 80 stations on over 80 kilometres of line and the network carries between 125,000 and 135,000 passengers each week. Evidence in published literature of economic benefits for Portland is mixed, however, Calthorpe documents Portland’s Eastside and Westside lines have attracted over $US2.4 billion in investment within walking distance of their light rail stations and that the streetcar line through the successful Pearl District has attracted $US2.3 billion in private investments (Calthorpe 2011, p88).

The formation of an urban growth boundary was instrumental to Portland’s efforts to minimise the effects of urban sprawl, however, outside the central core of the city in adjacent counties the situation seems less beneficial with a business-as-usual regime in place.

In 1973 overarching legislation was passed that required all cities and counties to implement wide-ranging planning goals including the adoption of urban growth boundaries to constrain future development. In 1978, the greater Portland area, consisting of three neighbouring counties, agreed to a regional governance regime with statutory responsibility for both land-use and transportaion planning. It is clear that this policy of containment has had an impact in focusing central development, increasing residential density and reducing sprawl (Song and Knapp 2004, AECOM 2012, UN Habitat 2013a). However, the urban growth boundary was seen to divert growth to the
adjacent Clark County because its growth controls were more lax. It became apparent that this so-called development leakage was difficult to control without regional governance and political steadfastness to not expand the growth boundary as a result of community and developer pressure. Oregon’s Measure 37 \(^8\) in 2004 can be seen as a backlash to centralised planning as it required the state to either compensate landowners for lost development opportunities due to land use restrictions related to the growth boundary, or forgo enforcement of those restrictions (Troy 2012, p261).

### 3.4 Stockholm, Sweden

The Stockholm Metro was commenced in 1950, substantially completed in 1975 with some supplementary completion work undertaken in the early 1990s. Despite this relatively late start, Stockholm can claim to be a totally transit-oriented city with as much as two-thirds of all trips to the central city area undertaken by transit. (Troy 2012, p 138). Contributing to this outcome, like that of many other European cities, are centuries of pre-automobile history that has given the city a legacy of a compactness and centrality unsuitable to vehicle use. Yet, in the post war era when there was a proliferation of car ownership, a plan was devised to introduce not only a large scale rail transit system but also an integrated land-use plan based on Ebenezer Howard’s model of satellite town centres which allowed the right balance of uses and densities in both the centre and the satellites. The result today is that about 90 percent of the population of metropolitan Stockholm lives less than half a kilometre from a public transit route.

Although it has a population of about five times the size, Stockholm is an excellent model for Canberra (polycentric town centres) with multi-directional travel patterns. It exhibits how a cost-effective transport system can be achieved through implementing land-use policies of high urban densities and a high proportion of employment and retail activities concentrated in these centres.

### 3.5 Freiburg, Germany

The City of Freiburg is highly regarded internationally for its environmental and sustainable planning and development regime, and its extensive use of solar and other sources of renewable energy. Investment in transport infrastructure in Freiburg has resulted in a transformational impact on modal choice (Buehler and Pucher, 2011).

In 1969, Freiburg developed an urban transport policy that sought to ensure a high level of access and mobility that did not hinder urban development or encroach upon nature and the environment. It is a policy which gives preference to environmentally-friendly modes of movement including pedestrian traffic, cycling, and local public transport. Between 1982 and 1999, the contribution of cycling to the city’s volume of traffic increased from 15 to 28 percent. At the same time, public transport use increased from 11 to 18 percent. Compared with other major cities in Germany today, Freiburg has the lowest motor vehicle density, with 423 motor vehicles per 1000 people. The city centre was closed to car traffic and cleared for pedestrians in 1973 and in 1983 the first new tram route was opened (Freiburg Green City). The city owns its light rail network.

Since the 1980s land-use planning has centred development on public transport nodes, including the recent light rail lines. More recently land-use planning has encouraged high density developments

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\(^8\) Oregon Property Land Use, Measure 37 (2004), requires state and local governments to either waive land use regulations or compensate landowners when a regulation reduces a property’s fair market value. [http://oregonexplorer.info/landuse/Measure37](http://oregonexplorer.info/landuse/Measure37)
around public transport stops. Importantly, these policies have been supported by economic success and widespread political support for sustainability.

Freiburg’s most recent land-use and transport plans (2008) were developed simultaneously. The earlier goals of reducing car-use are reiterated, but there is greater emphasis on prohibiting car-dependent developments and actively supporting car-free neighbourhoods. There is a focus on compact development along light rail routes, strengthening local neighbourhood commercial and service centres, and mixing housing with retail, restaurants, offices, schools, and other non-residential land uses. Central development is explicitly preferred to fringe development (AECOM 2012).

3.6 Bergen, Norway

A 13.4 kilometres light rail project in Bergen has been constructed in two stages completed in 2010 and 2013 with a third stage to complete the route to its airport currently under construction for completion in 2016. Further stages are in the planning stages. Once completed the line from the city centre to the airport will be 21.2 kilometres in length with 27 stops. The project has been funded by a toll on local road users.

Bergen is a city slightly smaller than Canberra with 260,000 residents. It is a compact city but with ribbon development growth along some valleys corridors. The principal objectives of its light rail implementation were related to addressing car dependence and traffic congestion - to decrease the growth in traffic, to replace the greatest part of the growth in traffic with public transport, reduce the environmental issues caused by traffic, shield the city centre from unwanted pressure from traffic, build a coherent pedestrian and bicycle road system and reduce the number of traffic accidents. (Bybanen Bergen Light Rail)


4.0 Australian Policy Framework and Leading Practice

This section provides a synthesis on best-practice on inner urban transport transformation in Australia. Presented here is a background of the relevant spatial planning and transport planning policy documents in several cities. Not all Australian cities have been included in this overview; those chosen are included for the following reasons:

<table>
<thead>
<tr>
<th>Case Study City</th>
<th>Reson for inclusion as Case Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Perspective</td>
<td>work of Council of Australian Governments (COAG) and the former Major Cities Unit</td>
</tr>
<tr>
<td>Perth</td>
<td>two decades of significant policy development related to transit corridors and transit-oriented development</td>
</tr>
<tr>
<td></td>
<td>high level of infrastructure funding for capital works related to extending suburban rail network</td>
</tr>
<tr>
<td>Sydney</td>
<td>the City of Sydney’s solid green agenda with proportion of low carbon outcomes, including transport, green buildings, cycling policy</td>
</tr>
<tr>
<td>Melbourne</td>
<td>a long-established and well utilised tram network</td>
</tr>
<tr>
<td></td>
<td>two decades of intense residential development in city and surrounds</td>
</tr>
<tr>
<td></td>
<td>current work to intensify development along transport corridors</td>
</tr>
<tr>
<td>Brisbane</td>
<td>significant recent funding for an integrated transport network, especially busways</td>
</tr>
<tr>
<td>Gold Coast</td>
<td>light rail network recently completed</td>
</tr>
<tr>
<td>Adelaide</td>
<td>highly regarded planning governance for inner city</td>
</tr>
<tr>
<td></td>
<td>established tram network to/from Glenelg</td>
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</tbody>
</table>

Commentary on tram and light rail transit in Australia generally is appropriate to present at this point to summarise some historical background and the urban corridor land-use legacy evident in Australian cities where trams have at some time existed.

“For the first half of the 20th century, extensive tram systems were a primary mode of transport in all Australian state capitals and a number of larger regional cities. However, from the mid-1950s to the late 1960s, tram systems in all Australian cities except for Melbourne were dismantled, leaving Melbourne with the most extensive network in the world. However, much of the legacy in terms of urban morphology associated with tram corridors has endured, and in some cities trams are now returning. Whereas rail systems move large numbers of people across the metropolis between its regions, trams primarily move people within metropolitan regions. Trams are a medium-capacity street-based form of transit along whose routes extended retail strips have tended to develop rather than the nodal clustering associated with suburban rail systems” (Woodcock et al. 2013).
4.1 National policy framework

With the release of “Our Cities, Our Future” (2011), the Australian Government established a National urban policy to guide the improvement in the productivity, sustainability and liveability of major Australian cities.

Also in 2011, COAG requested the COAG Reform Council to independently review the strategic planning systems of Australia’s capital cities against nine criteria and report back by the end of 2011. The recommendations are set out in “Review of capital city strategic planning systems”

Both the policy document and the COAG Reform Council findings and recommendations were supplemented in 2012 and 2013 by State of Australian Cities reports. This report focused on 18 major cities with populations greater than 100,000, and also examined 25 smaller regional cities with populations between 30,000 and 100,000. The report aimed to share evidence of evolving progress in key areas such as how well the subject cities are prepared for climate change, population growth and housing, traffic congestion, building design, urban design and green urbanism.

Insights

This national analysis incorporated a more city-specific overview which revealed a number of developing trends. These include:

- Australian cities are at a watershed point, with changing assumptions for city shape and development requiring new approaches to strategic planning.
- Further work is needed on the institutional arrangements to deliver integration of land use, economic development and transport. Within this, a particular focus is useful on public transport systems.
- There is value in repeated assessment of progress against consistent criteria.

4.2 Perth

There are two recent key documents from Western Australia.

Planning Policy
- Directions 2031 and Beyond – Metropolitan Planning Beyond the Horizon.

Transport Policy

The story of Perth’s journey to greater acceptance of public transport is well known. In the last two decades the rail network has been fully electrified and expanded from 66 kilometres to 169 kilometres. The work of Professor Peter Newman (2009) of Murdoch and Curtin Universities has been instrumental in the significant commitment to and investment in expanding the network. The Kwinana Freeway was commenced in the 1950s and established Perth as a car-dominated city. In subsequent decades the freeway was adapted to cater for public transport, with the introduction of bus priority measures in 1987. In 2007, the Mandurah railway line opened, having been constructed in the Kwinana Freeway median strip. The work was a successful collaboration of the mutual interests of the WA Department of Transport and the WA Planning Commission with planning and implementation support of Professor Newman. Patronage has consequentially increased...
dramatically, and the network is now nationally and internationally regarded as an exemplar of public transport excellence.

*Directions 2031 and Beyond* acknowledges the benefits of a more consolidated city while working from historic patterns of urban growth, yet it addresses urban growth and protection of natural ecosystems. It examines a future city framework that “provides for different lifestyle choices, vibrant nodes for economic and social activity and a more sustainable urban transport network”.

Transport infrastructure is addressed but is more comprehensively examined in the later second document, *Public Transport for Perth in 2031*.

WA planners envisage a need to double the capacity of Perth’s public transport system by 2031, and this document’s proposal is to see public transport become the preferred choice of travel to Perth’s strategic centres and along growth corridors.

**Insights**

- The Government and urban planners of WA have planned, and continue to implement, light rail transit and mass rapid transit strategies that integrate transit, land-use and development and fit-for-purpose governance arrangements. Transit design is providing Transit-oriented Development (TOD) opportunities and the ability of any new LRT system to underpin urban consolidation.
- The rapid acceptance and strong use of the Mandurah railway is an example that demonstrates a demand-pull for public transport.

### 4.3 Sydney

Key documents for NSW and central Sydney include:

**Planning Policy**

- Metropolitan Plan for Sydney 2036.
- NSW 2021 – a plan to make NSW Number One.
- Sustainable Sydney 2030 – A Vision

**Transport Policy**

- NSW Long Term Transport Master Plan.
- Sydney City Centre Access Strategy.
- Connecting Our City – Transport Strategies and Actions.
- Draft Walking Strategy and Action Plan

*NSW 2021* was released in September 2011. It is the NSW Government’s 10-year strategic plan to address economy building, service delivery and infrastructure development. It establishes new community and environmental goals. The relevant planning policy document is the *Metropolitan Plan for Sydney* which was released in 2010, but is currently being restructured to align with NSW 2021.

Current transport planning policy is set out in the *NSW Long Term Transport Master Plan*, which is a comprehensive integrated strategy for all modes of transport across NSW. It was released in December 2012.
For central Sydney, the City of Sydney is working with the NSW Government to develop strategies for future transport connectivity and patronage. The relevant document is Connecting Our City, which sets out priorities for major transport infrastructure:

“Of the short term priorities, the transformation of George Street and introduction of light rail is the most critical to addressing transport in Sydney along with further improvements for pedestrians and cyclists. Medium term priorities include upgrades to key interchanges, improved pedestrian, light rail and ferry connections to Barangaroo, light rail links to Green Square and the south east and a second harbour heavy rail crossing.”

This led to the release in December 2013 by the NSW Government of the document Sydney City Centre Access Strategy, a companion document to the NSW Long Term Transport Master Plan.

Sustainable Sydney 2030 – A Vision is the policy document of the Sydney City Council first released in 2008. It provides a set of goals for the city to help make central Sydney as “green, global and connected as possible by 2030”. A central Sydney light rail upgrade was heavily promoted but not taken up by the NSW Government until 2014.

Another highlight of the document was its emphasis on walkability as a key building block of future urban forms. The Vision had an objective to develop the City’s “villages” based on the belief that residents within a 300 metres walking distance of a local centre should be encouraged to walk to that centre. This objective determined the currently planned city light rail route and was also expressed in the completion of a Draft Walking Strategy and Action Plan, expected to become policy later this year (City of Sydney). A further result was a planned increase in residential densities proposed in the City’s recently amended planning scheme.

Insights

- Sydney has by far the highest public transport usage rates and mode shares of Australia’s cities, largely a result of the city’s well-patronised rail network. But the systems are complex and integration and connectivity of modes are largely uncoordinated.
- Assessment of Sydney’s inner city planning and transport policies is made even more complex due to the apparent overlapping of roles of the NSW Government, which manages Sydney’s public transport network (trains and buses in the main, state-run ferries, with some privately operated light rail), and the City of Sydney which is implementing a wider sustainable and environmental agenda. The wider City of Sydney agenda relates inter alia to environmental performance of the built environment, multi-modal transportation (including walking and cycling access to the city centre) and planning for a major future expansion of inner-city light rail.
- The Metropolitan Strategy for Sydney deals with a much wider agenda of issues related to Greater Metropolitan Sydney such as freight movements and airport planning, however, it does make the point that 70 percent of all new residential development should occur in established areas.
- The discussion in this section has focused on central Sydney defined by the City of Sydney local government area. Beyond that area two light rail projects are briefly noted. The first is the inner west line from Central Railway via Darling Harbour to Lilyfield and its recently opened (March 2014) now strongly used extension to Dulwich Hill (NSW Government, 2014). The second is the proposed south-east line from Circular Quay to Randwick and Kingsford.
which has community and bipartisan local government support. It is understood a contract for
this project will be let in late 2014. The CBD and South East Light Rail project is due to be

4.4 Melbourne
Key documents for Melbourne include:

Planning Policy
• Melbourne 2030 – Planning for Sustainable Growth, Department of Infrastructure, State of
  Victoria, Melbourne 2002
• Melbourne 2030 A Planning Update - Melbourne @ 5 million.

Transport Policy
• Transforming Australian Cities For a More Financially Viable And Sustainable Future.
• The Transport Integration Act 2010 is the prime transport statute in Victoria, and replaced
  major parts of the former Transport Act 1983.

The Transforming Australian Cities study was jointly commissioned by the Victorian Department of
Transport and the City of Melbourne to establish the potential to transform metropolitan
Melbourne to meet a projected population of eight million by 2050.

It references earlier studies, namely the Victorian Government’s Melbourne 2030 Strategy and the
more recent Melbourne @ 5 Million, which were both based on activity centre or transport
orientated design principles which are claimed to be widely regarded as both important and
necessary strategies to meet the future needs of metropolitan Melbourne.

Transforming Australian Cities’ primary focus is to more directly investigate the potential of
Melbourne’s tram and bus corridors to accommodate a significant proportion of Melbourne’s future
growth. Concurrently, it seeks the mutually beneficial outcomes of addressing the aspirations and
needs of the greater population and enhancing the performance of existing public transport
infrastructure.

The Transport Integration Act 2010 generally seeks to unify all transport stakeholders in Victoria to
ensure that transport and land use agencies collaborate in achieving the common goal of an
integrated and sustainable transport system.

Insights
• Many recent urban planning initiatives of the City of Melbourne are well known (Adams,
  2009). This has included the intensification of tramway corridors, placing the more dense
developments immediately adjacent to the tram routes. Promoting a preference for code
compliant development proposals these strategies aim to facilitate (or fast-track) a quicker
approval process and a highly-prescriptive design outcome to achieve the city’s low carbon
objectives.
• These strategies permit a compelling argument to be made in a complex discussion, claiming
the likelihood of a smaller incidence of merit based development applications which may be
held up indeterminately through local objection and the third-party appeals’ process. But
the other side of this argument would claim that the city is sacrificing a better architectural
and urban design quality for the sake of expediency; that diverse and vibrant urban
outcomes can be achieved only through excellence in design vision and practice.
4.5 Brisbane

Key documents for Brisbane include:

Planning Policy
- South East Queensland Infrastructure Plan and Program 2010–2031 (SEQIPP).
- Brisbane City Plan 2000.

Transport Policy
- Brisbane Active Transport Strategy 2012-2026.
- Brisbane City Council Transport Plan for Brisbane 2008 – 2026.

The South East Queensland Infrastructure Plan and Program 2010–2031 (SEQIPP) was a policy document of Queensland Department of Infrastructure and Planning and outlined estimated infrastructure investment across SEQ to 2031. It purported to provide a long-term commitment to infrastructure delivery in SEQ. First released in 2005, the Plan was updated annually until 2011 when it was incorporated into the state-wide Queensland Infrastructure Plan.

Regional Plans now inform local-level planning, while the Brisbane City Plan 2000 directs all construction and development in the Brisbane City Council area.

The current transport planning strategy for central Brisbane is set out in Brisbane Active Transport Strategy 2012-2026.

Insights
- Brisbane planners have long recognised the problems stemming from the city’s low suburban density, problems of sprawl and car-dependence. These issues have been addressed for reasons other than peak oil prices. Local and regional planning has successfully incorporated principles of transport oriented development, which aims to promote mixed residential and employment zones and higher patronage of public transport. The mixed mode public transport options (bus rapid transit and rail) are well patronised, but the results are at best still mixed, as economic structures and traditional housing options and choices are working against sustainable planning initiatives (Suzuki et al. 2010,p215).
- Brisbane’s buses play a major role within its public transport network and now carry more passengers per day on average than the region’s train network.

4.6 Gold Coast

Key documents for Gold Coast include:

Planning Policy
- Our Living City – Gold Coast Planning Scheme 2003 - Version 1.2 Amended November 2011.
- Draft City Plan 2015.

Transport Policy
- Gold Coast City Transport Strategy 2031.

The Gold Coast Planning Scheme 2003 (as amended 2011) is the current planning tool for the Gold Coast. The Council is in the process of creating a new City Plan 2015 to guide the future development of the Gold Coast. This document is currently available for public consultation and comment.
The relevant strategic transport plan is *Gold Coast City Transport Strategy 2031*, Gold Coast City Council’s “blueprint for the city’s transport network over the next 20 years, with a focus on the years leading up to the 2018 Commonwealth Games”. Although the plan acknowledges a likelihood of increased car usage in the next two decades, it seeks to enhance active and public transport options and patronage. The plan establishes a series of objectives under the following headings:

- integrated transport and land use
- car parking
- public transport
- active transport
- roads and freight
- travel behaviour change.

An early outcome of the plan is a light rail transit system known as GoldLinQ, recently completed construction with the first 16-station, 13 kilometres section between Griffith University and Broadbeach operational in June 2014.

**Insights**

- With the recent completion of its light rail project, it will be valuable to review any monitoring of the targets that have been set out in the Gold Coast’s transport policy documents prior to the next iteration of the strategy in 2018. The Council has committed to monitor targets through “regular system measurements, including the national census, accident reports, traffic counts, travel time surveys, annual public transport patronage, customer and user satisfaction surveys and other methods”. It is hoped that some valuable insights related to changes to land use and travel behaviour can be extracted from this research.
- Anecdotal evidence from the first few weeks of use of its light rail is emerging that confirms early acceptance, high patronage and strong community support for the built outcome (Gold Coast Bulletin 2014a, 2014b).

### 4.7 Adelaide

Key documents for Adelaide include:

**Planning Policy**

- 30-Year Plan for Greater Adelaide.

**Transport Policy**

- Building a Stronger South Australia - Integrated Transport and Land Use Plan.

*30-Year Plan for Greater Adelaide* is the policy document for metropolitan Adelaide, together with the surrounding hills, coast and hinterland that was released in February 2010.

The relevant draft planning policy is set out in the *Integrated Transport and Landscape Plan* which was released for public comment on October 2013.

**Insights**

Planning policy in South Australia over the last decade and more, and culminating in the latest draft policy document (noted above) has proposed that public transport services be increasingly better integrated with land use. This has been developed through:
• Ensuring that urban planning integrates public transport in tandem rather than as an adjunct process

• Working collaboratively with local government to promote public transport in neighbourhood and regional planning, to improve urban neighbourhoods in terms of layout, design and accessibility to public transport and in encouraging urban population intensity in close proximity to transport node points

• Seeking consideration of public transport when assessing development design proposals

• Using public transport opportunities to enhance and drive outer suburb regeneration, and

• Consideration of a requirement for land developers to part-fund the establishment of public transport services in new developments.
5.0 Opportunities and Risks

The above discussion has considered some of the key characteristics of inner urban development with some insights through discussion of international and national experience. A triple bottom line approach has been adopted to frame the discussion and is indicative of leading practice in approaches to inner urban transformation. The importance of the institutional and governance arrangements is a matter of concern as cities continue to expand and grow in complexity.

It is of note that there is appears to be few research studies based on measurable findings that quantify the benefits of transport oriented development in Australian cities. Notwithstanding, the following risks and opportunities have been identified which could usefully assist in informing key considerations in future inner urban development in Canberra.

5.1 Key risks

1. Consolidating an existing urban footprint with increased density but without establishing a triple bottom line framework that integrates social, environmental and economic considerations.
2. Not critically considering, applying or adapting sustainability lessons from other cities.
3. Not critically considering at an early stage the impact of long-term influences such as climate change and demographic change.
4. Governance measures and policy not sufficiently considered and incorporated as components of an effective implementation plan.
5. Lack of community consultation that is required to bring the community along with plans for increasing density.
6. Increased urban density undertaken at a high cost of biodiversity and open space loss.

5.2 Key opportunities

1. Rehabilitation and revitalisation of an inner urban core that will benefit from new investment in public place and amenity.
2. Better connectivity of people and places and a more integrated approach to commerce and activity through mixed land-use activity and transit oriented development.
3. A more strategic planning and design methodology for open space provision, biodiversity enhancement and community garden provision to provide attractive, healthy and liveable landscape environments for medium density living.
4. Planning for ‘active living’ with emphasis on a healthy city encompassing walkability, cycling and active living opportunities throughout inner urban environments.
5. Design and construction of the built environment incorporating green building principles for a zero carbon and climate resilient future.

The redevelopment of inner urban areas will continue regardless of planning and urban design. The real opportunity presented, and challenge to be met, is to work with the community, planners and design professionals, and with government to help shape that process in a way that will transform an inner urban setting to one that can adapt with change and simultaneously provide a liveable environment for all its users — residents, workers and visitors.
The above risks and opportunities provide a good basis for ongoing consideration. In summary we have identified the following seven research learnings:

**Research Learning 1**  
Urban consolidation, underpinned by public transit and revitalisation of land with mixed-use developments, brings with it triple bottom line (social, environmental and economic) benefits to the city.

**Research Learning 2**  
Developing public transport orientated growth and creating compact and walkable neighbourhoods can reduce car distances travelled, lower traffic congestion and emissions, provide significant health benefits and stimulate increased productivity.

**Research Learning 3**  
Increases in land value may provide a revenue source opportunity to return a significant proportion of the cost of public transport developments adjacent to transport orientated developments.

**Research Learning 4**  
Containing the extent of greenfield urban development can assist in minimising household transport expenditure and in the protection of fringe real estate values.

**Research Learning 5**  
Transit orientated urban renewal provides the opportunity to plan for and invest in the integration of affordable housing and social housing, infrastructure and services.

**Research Learning 6**  
With the transport sector accounting for nearly 25% of greenhouse gas emissions in metropolitan areas worldwide creation of less car dependant urban forms is an essential governance and policy response to climate change mitigation and adaptation.

**Research Learning 7**  
It will be of value to establish research based monitoring and review of social, environmental and economic outcomes and performance targets of transport infrastructure and related transit orientated development.
6.0 Conclusion

The benefits of containing suburban fringe growth and containing and concentrating urban development in city and town centres are being more widely recognised and appreciated by both planning and social strategists and in popular understanding. This report has endeavoured to provide a deeper understanding of the specific benefits of aligning the principles of land-use planning with a transport-oriented approach to urban transformation.

The report discusses some of the key examples of transport-oriented development within Australia and internationally. It has highlighted some of the key risks and opportunities to be considered in developing and implementing inner urban transformation that could be considered in the ACT context. Overall recent experience has been positive for inner urban communities, provided a triple bottom line approach is taken considering economic, social and environmental factors and there is a process for meaningful community engagement in sustainability solutions.

We note that the combined challenge of car dependence and traffic congestion is a regularly recurring theme observed in current literature and in the policy responses of the chosen exemplar national and international cities. A compelling case emerges from this evidence, and is represented here, for the enabling and development of public transport orientated urban growth and the creation of more compact and walkable neighbourhoods that can reduce car distances travelled, lower traffic congestion and emissions.

The potential benefits stemming from increased productivity are noted here, as are the potential increases in value of land immediately adjacent to public transport corridors and node points. This increase in land value may provide a revenue source opportunity to return a significant proportion of the cost of public transport developments to both government and the community. It was observed too that these financial benefits are not localised to the bespoke transport corridor. Through concurrent urban containment policies savings can be captured for the benefit of the wider city with recouped infrastructure savings, minimisation of household transport expenditure and in the protection of fringe real estate values.

The need for a strong governance regime in decision making is a key finding. With the transport sector accounting for nearly 25% of greenhouse gas emissions in metropolitan areas worldwide creation of less car dependant urban forms is an essential governance and policy response to climate change mitigation and adaptation.

The next steps should involve ongoing analysis and research to monitor and map the effects and the benefits of changes brought about by urban development decisions taken along Canberra’s initial stage light rail corridor. It will be of value to establish this research-based monitoring to review social, environmental and economic outcomes and performance targets of transport infrastructure and related transit oriented development. Good baseline data and information is essential so that the future benefits of any investment in fixed public transport systems can be quantified and assessed.

Partnerships between institutions and collaboration between academics, professionals and communities will be critical to a better understanding of the contribution to urban futures through transit-oriented urban transformation.
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