15. INTEGRATED TRANSIT ORIENTED DEVELOPMENT: IS IT APPROPRIATE FOR PERTH?

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Perth is a low density, dispersed city in which urban planning over the last 60 years has revolved around car based accessibility. While at times, public transport, walking and cycling have received substantial funding input enabling significant and important improvements in their network infrastructure, Perth’s settlement pattern does little to support the use of non-car transport. Integrated transit oriented development (TOD) is proposed as a way to achieve greater variety in the city’s urban form through higher development density, mixed land use and integration of public transport. Implicitly, the intention is to increase housing diversity in strategic locations and via consolidation, reduce growth pressures on the urban fringe. More overtly, TOD supporters promote the transport benefits, including less car use, shorter journeys and more travel by public transport, walking and cycling.

Over the last few years a small body of literature (Lund 2006, Dittmar, Belzer & Autler 2004, Centre for Transit Oriented Development 2004) has emerged arguing that market demand for living in TOD precincts is growing. This literature typically claims that as public awareness of integrated TOD increases, consumers actively seek this development product for the variety of housing, availability of public transport, proximity to shops and services and the urban lifestyle that integrated TOD precincts purportedly offer. Most of the work at the heart of these arguments arises from TOD in the United States and therefore the transferability of findings to a Western Australian context is questionable. At the same time, a litany of work has documented the Perth community’s opposition to high density housing and the enduring preference for the suburban way of life and car-oriented travel patterns (Office of Policy and Planning 2000, Newman & Kenworthy 1999, Shaw and Houghton 1991).

Achieving a mix of land uses, increased density and greater accessibility around public transport interchanges is a Western Australian state policy focus (DPI 2005), yet this policy is triggered only when a development is proposed within 800 m of a train station. In the absence of suitable land parcels or development incentives many stations have failed to attract substantial new construction. Instead station-based commercial areas have suffered from a slow bleed of business to nearby car-oriented retail centres and residential development remains mostly detached dwellings from the 1900-1950 era. Integrated TOD is proposed as a means to attract new commercial and a diversity of housing development into train station precincts, particularly in the outer suburbs where variety in the urban form is greatly needed but, to date, least likely to occur.

International examples of successful transit precincts indicate that a range of land uses in both vertical and horizontal arrangements is necessary to create stations that function as both ‘origin’ and ‘destination’ trip makers. Attracting and retaining a cluster of diverse activities that operate over the day and early evening has wide-reaching implications. Broadening the functionality of the precinct enhances safety and security outside of traditional business hours (Cozens & Hillier 2008) while at the same time enlarging market catchment. Integrated TOD precincts will need to perform the same (but improved) role that local shopping centres presently do, becoming a commercial and social destination in their own right, with transport as a secondary function. Planning for these precincts therefore needs to shift the focus from transport integrated with land uses to planning for self-sustaining mixed use centres with an integrated train station or transport interchange. In other words the transport is a complementary not primary focus of integrated TOD precincts.

This chapter aims to contribute some evidence to the claims by integrated TOD proponents about the willingness of people to embrace a transit focused, urban as opposed to suburban, lifestyle. We assess whether business variety and viability can be achieved, as evidence to date indicates that transit is not a critical feature driving business location. Some discussion of the constraints to the achievement of self-sustaining integrated TOD communities in Perth is presented, bridging the theory-practice gap that presently exists in Perth. As part of this discussion, current settlement patterns, changing household structures, the provision of infrastructure, and lifestyle trends in Western Australia will be reviewed. We conclude with suggestions for some planning reforms and new planning initiatives to achieve higher housing density and greater business diversity for integrated TOD in the Perth metropolitan area.

The Rationale for TOD in Perth

In 2004 the state government’s Dialogue with the City, a metropolitan wide consultation with Perth residents, provided a clear illustration of the community’s desire for less car-oriented sprawl, more urban places with a wider choice of housing and a greater focus on activity nodes in proximity to residences. With this in mind, strategies to enhance transport efficiency and efficiency which also address accessibility, liveability and affordability are present. One such strategy is TOD, which proposes integration of land uses around stations and interchanges on the public transport network to produce relatively denser, mixed use precincts. This urban form is coupled with reduced emphasis on motor vehicles both for intra and inter-regional travel, encouraging greater use of public transport and active transport, where feasible (Newman et al. 2008).

Perth has long been, and continues to be, a metropolis of zones, with land uses separated into homogenous suburbs and centres interconnected by major
roads. Achieving a mix of land uses in commercial centres is a state policy focus and despite some complexities of compatible uses, increasingly mixed use is appearing at centres in the inner and middle suburbs. Beyond these locations mixed use, particularly vertical mixing, is a rarity. TOD provides a focus for mixed use and higher density development, particularly in the outer suburbs where this variety is greatly needed but least likely to occur. At strategic locations along Perth’s rail network, mixed use is considered one way to balance peak passenger flows and reduce some of the homogeneity in suburban areas.

Perth has an extensive radial rail network as Figure 1 shows, with five operational passenger lines. Three of the lines, Midland, Fremantle and Armadale, offer potential to retrofit TOD, while the new south-west line has TOD being planned mostly at greenfield stations. Each of the Midland, Fremantle and Armadale train lines are at-grade with station spacing of approximately one kilometre. The three lines were opened in 1881 and much of the development within at least the first two to four hundred metres of stations occurred prior to the car becoming a ubiquitous feature of daily life. The walk from train stations to home is through areas predominantly characterised by low density residential development comprising single detached homes. Some stations in the inner and middle suburbs underwent incremental density increases during the 1960s and 70s when state government public housing towers were erected and later during the 1980s, when pockets of medium density housing were created as battleaxe subdivisions or green title rear laneway frontage lots.

Over time the commercial buildings clustered adjacent to most stations experienced incremental demolition and construction of surface car parking, fragmenting the compactness of the urban form. Many stations, particularly on the Midland and Armadale lines, failed to attract substantial new commercial development or office development, despite decentralisation being favoured since the 1970s. Notwithstanding that, train stations along the three lines have an urban morphology that accords with many TOD principles, providing a walkable, connective residential environment proximate to a small range of retail and service uses clustered near the train stations. It is these structural qualities that make TOD a possibility at some of Perth’s suburban rail stations.

In addition to a selectively suitable urban morphology, a range of social pressures exist that warrant the pursuit of integrated TOD as a means to deliver urban rather than suburban development. Some of the critical issues are discussed briefly to provide a context for our research findings in the latter part of this chapter.

**Perth’s Housing Stock**

Beyond the city centre, housing patterns have changed little since early settlement. The first spatial plan for Perth declared, "there is probably sufficient land to enable present housing densities to be continued …" (Stephenson and Hepburn 1955: 83); subsequent strategic growth plans embedded this philosophy, orienting development to an outward expansion of the metropolitan area that per net hectare has produced an average site density of 12.7 dwellings (DPI 2004a: 1). By the late 1970s, and pursued with greater purpose from the mid 1980s, smaller residential lot sizes assisted to raise the developed density in mostly state government subdivisions (Hedgcock & Hibbs 1992). Since then smaller lots have grown increasingly important as a tool to address affordability constraints and meet state planning policy requirements for higher densities around commercial centres and public transport routes. Recent analysis found small lots of around 250–450 m² are appreciating more rapidly than traditional lots of 600–800 m², driven by strong demand (Holling, Brunner & Haslam McKenzie 2006). This is not a new trend in Perth; identified by the Australian Institute of Urban Studies in 1983 it suggests that still, despite affordability pressures, consumers continue to seek a small slice of the suburban dream where a detached dwelling and images of family life are all pervasive.
While smaller lots are used to achieve higher zoned densities in residential subdivisions, this practice has not resulted in greater housing diversity. More Perth households are living in detached dwellings, 85 per cent in 2005, up from 80 per cent in 1998 (ABS 2005, 1998), and housing diversity is declining as the bulk of new residential lots created are for single dwellings (Metropolitan Development Program, various years). For a number of decades the Western Australian government has had a ‘significant influence’ on housing outcomes via the Town Planning Board35 and its role in the control of residential subdivision (Australian Institute of Urban Studies 1983: 56). Successive governments have avoided using this lever to manage housing outcomes in Perth, sensitive perhaps to the political implications that may arise from challenging an important domestic industry and its business-as-usual approach. The influence of this industry on the urban morphology of Perth is immense due to the process for determining new urban land and its future developed density. Surveyed annually as part of the state’s urban land release program, developers are questioned regarding development timing, subdivision patterns and servicing requirements for their land parcels. This information is clarified with local government to ascertain any probable impediments before feeding it into the Metropolitan Development Program (MDP). On the basis of the MDP, land is rezoned from urban deferred to urban which, in effect, is an expression of profit maximising strategies by the development industry, seeking to increase land values rather than pursue objectives for good city form and function.

Not unsurprisingly then, much of the new home construction is stand-alone housing (see Figure 2). The momentum in Western Australia’s economy has kept an upward trajectory of housing construction since 2001, although other residential activity remains below the level of the late 1980s and mid 1990s.

Western Australian’s housing sector has been experiencing a boom since around 2001 so it is noteworthy that affordability pressures are yet to impact on the type of dwelling constructed, and indeed may only achieve a marginal change even if construction costs continue to rise. In Western Australia much of the new homes sector is dominated by project homes, where a buyer has a limited number of home designs available for a particular lot size. This production arrangement produces significant efficiencies in the building industry; simple house designs are quick to construct, require relatively limited trade skill with volume efficiencies that multi-residential or group dwellings cannot match. If greater housing variety is to be achieved in Perth, particularly in TODs, affordability pressures will not be the catalyst in the near future.

Changing household size and composition
Over the last 25 years the size of families in Perth has been steadily declining from an average household of 3.8 people to one of 2.5 people in 2006 (ABS 2006c). More people are living alone, and it is a trend not confined just to the elderly. Many women and men are remaining single for longer, placing greater emphasis on career and lifestyle, while divorce and relationship breakdown contribute further to one person households (AMP-NATSEM 2007). Single and two person households comprised over 59 per cent of Perth households in 2006 (ABS 2006c). Many of these households are ideally suited to smaller dwellings in more compact arrangements, and for a sizeable proportion, smaller homes with less onerous maintenance requirements are an attractive option. There is growing evidence of smaller households, including couple and single person households, choosing inner city and near city residential locations, forming part of a contemporary ‘back to the city’ movement (Hinshaw 2007, Glaser & Shapiro 2003, Moss 1997).

Generation X comprises a not unsubstantial part of the population returning to city living, and the consequence is that some cities are now increasingly finding families with young children residing in the city. Professional Gen X couples moving into the family formation stage of life have been unwilling to relocate to the suburbs and forgo the convenience, amenities and opportunities of city living once children arrive (McCarthy 2007, Lipton 2006). In Perth these trends are yet to noticeably emerge, however it is not without justification to forecast that the future will bring such change; our research findings point to strong interest in TOD from professional couples with young children.

The Influence of Lifestyle
Although Perth homeowners have been generally averse to increased housing densities, there is market evidence, borne out by research conducted in Perth (Holling, Haslam McKenzie & Affleck 2007, Real Estate Institute of Western Australia 2007), to suggest that medium and higher density is being embraced.
by some cohorts of the housing market. Housing demand has been increasingly driven by household rather than population growth since the early 1990s.

This is due to an increase in separations and divorce as well as an increase in independent ageing populations. Further household demand in Perth has arisen from the population influx associated with the resources boom (ABS 2008c, 2006a). A segment of the 'empty nesters' are seeking to downsize from the family home (Hamilton & Hamilton 2006, Sweeney Research 2006). They have no desire to compromise their living space or lifestyle, but they are keen to shed onerous responsibilities such as tending a garden and maintaining a swimming pool. This cohort tends to be relatively affluent and they will pay the amount of money they need to pay in order to live where they want. As a consequence, residence in Perth city, in mostly medium and high density dwellings, has grown by 80 per cent since 1997 and is forecast to grow more strongly in the next decade. Market evidence suggests that in Perth young singles and couples, generally without children or with very young children, want to live somewhere that is convenient to work and social activities. In his research, Temov (2007) showed that 18 to 30 year olds in Perth are more inclined to compromise on lot and building size in order to maintain location, in particular proximity to town centres, education precincts and areas well-serviced by public transport.

Demand for Transit Oriented Development in Perth

In an effort to minimise congestion and achieve a mix of land uses, increased density and greater accessibility, particularly around public transport interchanges, the Western Australian government, through its Liveable Neighbourhoods policy, has considered different ways of enhancing walkability, public transport access and the development of efficient urban environments. Opinion survey research conducted for Western Australia's 2004 Dialogue with the City suggested that the demand for more housing density is quantitatively significant. Demographic trends and the rising cost of mobility and housing in Perth over the last decade are likely to reinforce this finding. These issues are shaping plans for TOD and for the design of associated housing developments, including affordable housing. Recent and current developments marketed as TOD, such as Subiaco and Wellard Village, have shown evidence of strong market appeal. Others, like East Perth, Midland and Leederville, have also had strong sales without being marketed as TODs. There was clearly a need to quantify the extent of demand for different types of housing within a TOD precinct and to understand its nature, in particular the socio-demographic segments in which it is occurring, and how it might change in future. Encouragement and facilitation of transit oriented development is a major part of the state government's Network City strategy, for both new and existing urban development. An objective of the strategy is that 60 per cent of new dwelling units in the Perth region be located in the existing built-up area.

Research was commissioned by two government agencies, LandCorp (the Western Australian Land Commission) and the Western Australian Department of Housing and Works, with the Department for Planning and Infrastructure taking an active interest in the outcomes. The purpose of the research was to test Perth's market demand for residing in TOD precincts and to assist planning and policy making regarding housing density and land use mix. With the Western Australian property and land market experiencing sustained strong growth, housing affordability is high on the government's agenda. Some of the issues with housing affordability in TOD were also investigated, as the corollary of good accessibility, services and facilities is higher land and property prices.

As the principal researchers we designed an online survey to measure the demand for TOD and this was sent to more than 6000 potential respondents. Over one thousand (1132) responses were received, a response rate of 18.4 per cent, which provided validity to the results with a 95 per cent confidence level and +/-3 per cent margin of error. In addition, industry interviews were conducted with real estate agents, peak industry representatives and developers to understand the process of designing transport oriented development. We were keen to understand the issues that the development industry consider important when devising a TOD. These included: who the industry perceived to be their stakeholders, what product mix was being
demanded, the factors that affect lot mix and dwelling type, the development costs of TOD, ways to provide affordable housing, current car provision standards and concessions and the incentives and disincentives to TOD. Two focus groups with community representatives, one from a TOD precinct and the other from housing near a typical Perth train station, were held towards the end of the project to explore issues in greater depth and to compare survey results with the lived experience in a TOD.

The results from the research project showed that the concept of TOD is not well understood in Perth. Most firms developing and selling cottage and small lots (200–400 m²) near transit are not using public transport as a positive product differentiator. Practitioner interviews, subsequently supported by the survey results, suggested that the average Perth homebuyer cannot differentiate between a house which is simply near a train station and a house in a TOD precinct designed specifically to facilitate integration of land use, mixed use development and transit. Notwithstanding their uncertain understanding of TOD, 61 per cent of survey respondents claimed they would consider living in a TOD precinct after they had been asked to view an illustration (see Figure 3) and a short paragraph explaining the concept of TOD.

The government intends to redevelop land around some of Perth's train stations to create precincts known as transit oriented development (TOD). These TOD precincts would extend about 800 m from the train station and could include a range of shops, activities and services with a variety of housing. The first 400 m (about a five minute walk) from the train station might comprise medium to high density living and a mixture of activities within buildings, which might include shops, offices and residential. The area between 400 m and 800 m (about a ten minute walk) from the train station is likely to be medium to low density housing with some open space.

The pictures left illustrate a TOD precinct.

The survey differentiated between respondents who were likely to understand the merits of TOD and those who were not by asking whether people lived within 800 m of a train station and if they used trains for work and non-work purposes. The results showed that approximately 28 per cent of households whose present lifestyles did not appear to predispose them to transit-based housing were interested in living in a transit oriented development precinct. Of those respondents who were familiar with the advantages of proximity to TOD, some expressed their negative experience of peak period train use (overcrowding, poor linkages with other public transport networks such as bus services and security concerns on trains at night), citing it as a disincentive to living in a TOD precincts.

TOD appeals primarily to a youthful demographic cohort; of the respondents who indicated they would like to live in a TOD location, 70 per cent were aged between 25 and 54 years. Particularly notable were the 18–34 year old group, of whom a greater percentage expressed a preference for TOD than those who would choose not to live in a TOD precinct, thus supporting the work undertaken by Tenove (2007). Almost one quarter of households in the 25–54 age bracket indicated they would be willing to live in a transit oriented development. Unlike TOD trends from overseas, where the majority of TOD residents are households without children, the results from this research showed that 48 per cent of those would live in transit oriented development were households with children. This figure comprised single-parent and couple households with young children, households with teenage children and households with resident adult children. This finding was borne out in the interviews and further disaggregation of the survey results for households that would like to live in TOD found the highest level of interest came from young families (adults in the 35–44 age demographic in households with children).

Income was an influential variable in whether households were interested in TOD living. The wealthiest households demonstrated the highest level of interest (32 per cent), most likely related to a number of factors. Interviews with developers selling TOD revealed that dual income, professional households are attracted to the product due to lifestyle factors and for investment reasons. These households recognise the short and long-term advantages of proximity to public transport, as well as having a range of commercial and community facilities near to their residence.

To gain an insight into why people may be motivated to reside in transit oriented precincts, survey respondents were asked to rank by relative importance six attributes commonly ascribed to TOD:
• proximity to public transport
• more affordable housing to buy or rent
• proximity to shops and services
• a wider variety of housing
• reduced need for a car; and
• cheaper housing finance.

The largest proportion of respondents (38 per cent) ranked ‘more affordable housing to buy or rent’ as the most important factor. This result may have been influenced by recent boom conditions in the Perth property market. Yet contrasting with this popular perception, TOD locations or locations with transport interchanges, attract an ‘accessibility premium’ as documented by much international research. The only TOD development in Perth, situated in the affluent suburb of Subiaco, has proven that the market highly values accessibility.

Proximity to public transport was the second most important attribute of TOD, while proximity to shops and services was most frequently ranked third. The attraction of walking to destinations featured repeatedly in the focus group commentary, although participants were not directly asked about their travel behaviour until the end of the session. Participants spoke frequently of walking to local destinations during their leisure time while some noted they had become more sociable, going out more because shops and entertainment activities were nearby.

Our research found there was some apprehension regarding living in a TOD. Concerns about train noise, vibration and commuters parking in residential streets were common, while higher densities involved anxieties regarding privacy. For residents already living in a TOD location, the focus group and interviews showed there was disenchantment with integrated public transport services which worked against a car-free lifestyle. In Subiaco, limitations on residents’ ability to travel locally have highlighted a deficiency in local transport services for accessing nearby destinations. The bus system is not well integrated with the train service, and bus services do not connect with destinations that residents require, such as supermarkets or childcare. Residents without cars noted the difficulty of evening travel to destinations beyond a walking distance.

TOD, particularly around passenger rail stations, provides an ideal opportunity to reduce standards for car parking provision for all land uses. The survey results showed that, overall, middle income households appear less willing to forego car ownership—a conclusion supported by the proportion of households (35 per cent) that consider two private cars an important feature of their TOD home. Housing which caters to older, lower income households is most suitable to greater reductions in car parking provision. These households would receive the largest redistributive benefit from lower housing and transport costs, yet are the households least likely to be attracted to TOD living. The high correlation between levels of car ownership and household income also indicates a need for caution on major parking reductions in Perth TOD precincts. With the present difficulties of providing bus services that meet residents’ local travel requirements, avenues for reducing car parking slowly over time bear investigating until Perth TODs have adequate local and regional transit services that meet the journey needs of residents.

Increasing or rerouting bus services within a TOD to better serve local travel needs would in many instances increase the cost of service provision, lengthen journey times, and potentially decrease the level of service beyond the TOD, affecting those groups dependent on public transport. The challenges revolve around economies of scale and ensuring that more people use buses throughout the day and night. However, while services are intermittent outside peak periods and public transport is perceived to be dangerous, especially at night, policy makers have much work to do to promote greater use of the public transport system in non-peak periods.

The largest demand for TOD living came from households currently residing in medium and high density dwellings. The proportion of households that would choose not to reside in transit oriented development is inversely proportional to their current density; in other words, those households presently residing in densities higher than a detached dwelling are more inclined to live in TOD. There is, however, evidence of a strong preference for suburban style housing close to transit. A back yard was important for 62 per cent of respondents who indicated an interest in a TOD home, while 49 per cent desired private car parking for two cars. A front garden was an important characteristic for 33 per cent of respondents. Reasonably strong demand for three and four bedroom dwellings (46 per cent and 24 per cent respectively) and two bathrooms (58 per cent) reveals an enduring preference for larger dwellings.

To test TOD consumers’ willingness to compromise certain elements of housing for greater affordability, they were asked to indicate acceptable cost-saving approaches to dwelling design. Over half of the survey respondents found medium density dwellings such as villas an acceptable solution to affordability constraints. However only a small proportion were interested in higher density housing or lower cost building materials such as weatherboard. A reasonably strong preference existed for smaller lots and a smaller house, most likely reflecting a core of households committed to detached dwellings. Working to establish a 'cottage industry' in the multi-residential sector, particularly within transit oriented development projects,
would be one component in a suite of measures to achieve more affordable housing in TOD.

Business Activity Centres and Transit Oriented Development

Research from elsewhere, particularly the US, demonstrates there must be a mix of land uses within the TOD precincts, especially residential and retail enterprises, but also where possible office, medical, educational, civic and recreational space. The retail and service mix is a key feature of TOD, but there has been scant research into the optimum mix that enhances the livability of TOD precincts. Focus group and interview feedback conducted in Perth by the authors suggests that easy access to shops, entertainment and services was a consistently prominent feature in participants’ responses to questions on location choices, lifestyle and satisfaction with residential location. However, few locations in the Perth metropolitan area have sufficient population density or number and diversity of businesses to maintain activity over 16 or 18-hour days, and the current planning approach to entertainment/mixed use precincts is limited in scope.

Subsequent research (Holling & Haslam McKenzie 2008) regarding decisions taken by Perth small and medium enterprise owners showed that there was limited systematic decision making with regard to situating a business in or near a TOD. As was the case with people making housing decisions around TOD, few businesses interviewed for the research understood the concept of TOD or that a distinctive feature of it is accessibility to public transport and the de-emphasis on car ownership. This research found that accessibility is an important factor when business owners are choosing their business location but the most critical determinant was good road access (McQuaid et al. 2004). Few, if any, businesses were willing to select a site with restricted or difficult access by road. Motor vehicles remain the prime mode of transport for goods, labour, customers and clients, and good accessibility reduces travel cost to business, staff and customers.

Bertolini and Spit (1998) found a number of factors which could assist with the selection of appropriate sites for future mixed use TOD precincts, and contribute to achieving the quantity of development necessary for establishing a self-sustaining economic hub. These factors include the quality and connectivity of local and regional transport networks and the proximity of the station to the city or urban centre, thus encouraging high flows of people through the mixed use TOD precinct. The degree to which local leadership advocates and supports integrated planning and mixed use land uses, and hence the implementation of supportive planning and investment guidelines which facilitate public investment, have also been identified as critically important. Overt advocacy by way of the planning system is likely to encourage proactive public-private partnerships for large-scale investment in building and construction projects, bolstering the viability and busyness of the centre (Bertolini & Spit 1998).

In addition to these macro factors, a wide range of micro elements need to be in place before a TOD location will attract businesses and offer an environment competitive with non-TOD activity centres in the middle or fringe suburbs. How these elements are integrated into a precinct so as to maintain walkability and amenity still requires further consideration and research.

A broader functional mix of land uses is necessary than is currently occurring at some greenfield TOD sites. Research indicates that this mix should be complementary rather than parallel to that of the Perth CBD, create an identifiable ‘theme’ for the locality while also providing the necessary goods and services to meet daily needs of local workers and residents. Furthermore, a short link to the CBD still remains desirable for many firms in TOD activity centres. The continuing dominance of Perth CBD as the business hub for government, legal functions, finance, mining and other tertiary sectors is likely to sustain the desirability of inner suburb TODs (over middle and outer suburban areas) for office development in the foreseeable future. There is however, an opportunity in the current economic climate for government authorities to provide the necessary conditions that will facilitate the successful implementation of such planning projects, particularly as demographic changes, high petrol and housing prices are encouraging people to access services and change lifestyle practices in line with greater environmental awareness.

In conclusion, our research assessing TOD and its potential for affordable housing has identified a number of contradictions. The sale of land around future railway stations along the new Perth to Mandurah railway line clearly indicates that TOD attracts a real estate premium, which contradicts some of the government principles driving TOD. Easy access to public transport meets the needs of a segment of the population who are either dependent on social security, have health issues that prevent the use of a car or are in a socioeconomic bracket which cannot afford multiple car ownership. However, property sales data clearly shows that proximity to TOD drives up housing prices. There is pressure on government and developers to meet the identifiable need for medium to high density affordable housing with close proximity to public transport hubs and to develop innovative housing and urban plans to maximise affordability, accessibility and liveability around TOD nodes.

Further, for TOD to offer more affordable housing options, it is important that public transport is accessible for much of the day and night and that services are linked to optimise travel efficiency for consumers so that car dependency is eliminated. Our research has shown that despite the accessibility of housing to public transport in a TOD precinct, there remains a high demand for parking. The nature of Perth’s dispersed employment and activity centres,
in conjunction with a car-oriented urban form, will continue to work against
transit oriented development.

Future TOD design, if incorporating significantly reduced car parking for
residents, or car-free housing, should give strong consideration to improving
the provision and co-ordination of public transport services. Secondly, rather
than attracting a high proportion of residents who are more dependent on
public transport, such as people on low incomes or those who for a variety
of other reason are prevented from owning their own vehicle, the trend in Perth
is for TOD locations to attract a market premium which excludes those seeking
more affordable housing. Incentives must be introduced to change this trend.
Thirdly, despite the average Perth home buyer stating an aversion to housing
density, this research showed that with careful explanation of the meaning of
housing density, there is a demand for a range of housing types with higher
densities in a TOD location. Rather than the market being limited to singles or
couples without children, our research showed that there is a demand from a
wide variety of age cohorts and household types, which include families.

Within planning and development spheres, a knowledge gap remains as
to the type, number and arrangement of land uses that will create a viable
commercial station centre. As TOD development does not accord with the
typical car-oriented configuration and mode of doing business, it is unclear
what type of business will be attracted to such a location. The lack of prior
research supporting the competitive advantage of TOD could be detrimental
to convincing government and industry of this potent business location and
therefore fail to generate strong commercial cores required to improve the
self-sufficiency of such developments. Strong leadership is now required to
conceive and promote the development of integrated TOD in Perth.

16. APPROACHES TO ARTERIAL ROAD DESIGN IN PERTH —
THE CHALLENGES AHEAD
REENA TIMWARI AND CAREY CURTIS

The current metropolitan planning strategy for the Perth and Peel regions
establishes a new approach to the future development and management of the
existing arterial road network by introducing the concept of ‘activity corridors’.
Existing arterial roads were conceived around a primarily vehicular traffic
function whereby land use activity was segregated to enable greater efficiency,
reflecting an expert-based modernist planning approach. Activity corridors,
on the other hand, are conceived around the principles of accessibility by all
modes, together with a role for the street as a social space. This approach
arises as a critique of the social, environmental and aesthetic consequences of
planning and finds its beginning in 1990s, in a post-modern era marked by
increased citizen participation.

Our chapter examines what the design drivers for arterial roads have been and
how has these have resulted in different approaches over time. Given a new
post-modern context, we consider the challenges ahead for arterial road design
in Perth. First we set the context by drawing on the literature and examples of
international and national practice to show how approaches to urban road
planning were originally conceived and how practice has now evolved on the
basis of a new paradigm. Then we examine the development of arterial roads
in Perth vis-à-vis the changing design approaches for arterials from 1955 to
the present time.

The Context — International and National
The modernist approach to planning was to maximize efficiency with the
belief that:

- spatial rationalities should be imposed on the external world in
  order to maximize individual liberty and welfare, it took efficiency
  and function (and hence the image of the metropolis as a well-oiled
  machine) as its central motif (Harvey 1989: 270–71).

Planning revolved around the idea of an efficient road network built around the
car. Hall notes that car transport totally changed the structure of cities. There
emerged multiple centres — airports, shopping centres, strip roads, business
parks and suburban estates — creating a dispersed urban morphology (Hall
1988). Streets and squares lost their role as grounds for social interaction and
the design emphasis focused on achieving efficiency in movement of people
and goods. Streets were seen as traffic conduits providing efficient linkages to
homogenous places with no sense of place or identity. Ley describes it thus: