

# **The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges**

## **Abstract**

This paper examines whether the structure of metropolitan housing markets will impede metropolitan policies to improve the greenhouse gas performance and reduce transport energy dependence. With climate change and higher transport energy prices becoming pressing policy issues increasing attention is being directed to the capacity of metropolitan planning to overcome these challenges. For the past two decades Australian metropolitan plans have focused on urban consolidation as means of reducing transport energy demand. Transport energy dependence is highest in middle and fringe suburban areas. But the structure of urban housing markets means the capacity of current Australian urban planning policies to achieve consolidation objectives in middle and outer areas is highly restricted, especially if the delivery of density gains is delegated to the private sector.

The paper contends that current planning policies which rely on urban consolidation therefore have limited potential to produce significant transport emissions reductions. Such policies also risk generating socially inequitable distributional outcomes given higher transport fuel costs from an emissions trading scheme or higher global oil prices.

The paper calls for a rethink of current metropolitan transport, urban planning and housing supply models to achieve reductions in transport energy dependence in the middle and outer suburban areas of Australian cities.

## **Introduction - Housing and Urban Structure in Australian cities**

One of urban consolidation's key academic proponents recently warned of dire consequences from carbon pricing and higher oil prices saying that "It will mean a new residential abandonment in car-dependent suburbs. There will be wealthy eco-claves surrounded by Mad Max suburbs" (Peter Newman, cited in Campion 2008). Implicit in this dystopian view is the recognition that current rates of urban consolidation and the distribution of higher density development will not be able to ensure that the effects of higher fuel prices are equitably shared among suburban households. This observation in turn implies the need to begin re-examining urban consolidation policy and asking whether new approaches to Australian urban planning are required. Clearly a new assessment of urban consolidation is needed. What might this involve? For a start, we need to establish whether urban consolidation is able to meet the objectives that many Australian urban plans expect of it.

During the past two decades Australia's urban planners have sought to engineer a dramatic transformation in the form and structure of our cities. The past six years have seen the rollout of metropolitan strategies that seek to re-shape Australian cities to meet new and challenging economic, social and economic problems

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

Each of Australia's major capital cities has produced a metropolitan plan with urban structure forming a critical component. These strategies have all included similar policy elements including constraints on metropolitan expansion and increased housing and land-use activity densities. The plans largely promote urban consolidation in continuity with previous policies.

In an important 2006 article Forster (2006) reminded us that that most of these recent urban policy prescriptions (which typically include large housing components) have been rolled out in the absence of serious contemplation of the urban structural forces driving the transformation of our housing and urban systems.

The result, Forster argues is a mismatch between the urban processes operating within cities and our recent metropolitan planning strategies. Forster bases his argument on a large volume of urban scholarship which, he explains, shows that quite contrary urban processes and patterns are operating in Australian cities to those presumed by policy makers. Two examples are worth reciting here.

The evidence, Forster suggests, indicates that urban journeys, especially those between housing and employment sites are becoming more dispersed and car dependent yet most current metropolitan plans assume increasing use of public transport based around high density activity concentrations. In housing, Forster argues, there is scant evidence to suggest that Australia's urban households wish to abandon the post-WWII 'dream' of home ownership (consummated in a detached suburban dwelling) yet urban housing policies assume increasing numbers of renter households filling high density dwellings. The result of this divergence between policy and the trajectory of urban change, Forster suggests, is:

*...[T]he existence of parallel urban universes: one occupied by metropolitan planning authorities and their containment-consolidation-centres consensus; the other by the realities of the increasingly complex, dispersed, residentially differentiated suburban metropolitan areas most Australians live in.*

### **New Challenges for Housing and Urban Policy**

The charge that urban policy has failed to fully grasp the import of urban change processes demands greater investigation given the emergence of two new and pressing strategic urban problems which signal an urgent need for a drastic reduction in urban environmental consumption and resource dependency. The first major challenge is climate change. There is mounting evidence that cities are the engines of global warming due to their enormous concentration of energy and emissions intensive activities, including housing. Any attempt to mitigate global climate change through emissions reduction will need to place urbanisation as a key focus of attention.

The second strategic issue is petroleum security. Global oil prices have risen from approximately US\$25 in 2004 to over US\$128 by mid-2008. In turn petrol prices in Australian cities have also risen markedly, from around 85 cents per litre in early-2004 to over \$1.50 per litre by mid-2008. Concern is rapidly growing over the long term trajectory of energy costs due to rising global demand, supply constraints and fears of

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

depleting oil reserves. Australian cities desperately need to reduce their petroleum consumption.

These problems pose a challenge for urban policy in enabling Australia's cities to weather the climate change storm and ensure they are not left high and dry by the ebbing petroleum tide. This paper argues that the planning policies that Forster described – containment, consolidation and centres – need thoughtful reflection to assess whether they are adequate to the task of reshaping Australia's urban systems to achieve environmental sustainability and resource dependency.

Crucially, the paper argues that current metropolitan policies fail to fully comprehend the structure of Australian housing markets and their effects on urban form and structure. This failure limits their capacity to achieve the kinds of changes they seek at a rate, or in the locations, where emissions mitigation and energy vulnerability adaptation are needed most. The present paper expands this argument to show that the urban consolidation components of current Australian metropolitan planning schemes are acting in the wrong places and at the wrong time.

The remainder of this paper seeks to achieve three objectives. First it sets out the nature of our urban environmental and resource dependence problem and its root in our transport systems. Next, the paper reviews current land-use policies to examine how their intended role in shaping transport and urban patterns exceeds their actual capacity to modify urban form and structure. The paper then considers how housing markets interact with urban form and structure to impede the achievement of both urban consolidation and its underlying objectives. The paper concludes by arguing that a new conception of Australian urban housing and transport relationships and new models of planning are required to meet our environmental challenge and deliver resource resilience.

### **Transport systems and strategic challenges**

Transport currently accounts for approximately 14 percent of Australia's greenhouse emissions with 54 percent of this figure attributable to private motor cars (Garnaut Climate Change Review 2008). Demand for travel in Australian cities is growing rapidly. In South East Queensland – Australia's fastest growing urban region – travel demand is expected to increase by 50 per cent by 2026 (Office of Urban Management 2005). Given that cars are used for 80 per cent of current travel in SEQ (Queensland Transport 2005) this growth implies a similar increase in transport emissions. Similar patterns are found in other Australian cities – the recent Eddington Report (2008) predicts an 80 per cent growth in travel demand across Melbourne by 2030.

Levels of car use, and in turn levels of fuel demand for urban travel are presently highly differentiated in Australian cities. In general there is a distinction between inner, middle and outer suburban zones with the inner being typified by relatively modest rates of car use and relatively high levels of public transport use, walking and cycling. By comparison outer suburban zones are highly car dependent and public transport, walking and cycling are used for only a small proportion of trips.

These spatial transport patterns are demonstrated by Sydney household travel survey data (Table 1). Thus for example, inner eastern Sydney residents use cars for a lower

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

proportion of trips and travel shorter distances than those in the middle suburbs. Residents of outer suburban areas travel further and use cars for a higher proportion of trips than those in middle and outer suburban zones. The result is a wide discrepancy in the likely spatial distribution of adverse socio-economic effects from higher fuel prices. Those in the highly car dependent outer suburbs would face a greater relative cost impact than those in more central zones.

Part of the reason for these differences is the historical discrepancy in the quality of public transport services in outer suburban zones. Public transport services are generally of modest to good quality in inner and middle suburban areas, especially those developed prior to WWII. Governments were reluctant to supply public transport infrastructure to the dispersed areas of suburban housing that expanded rapidly after WWII with the result that the automobile became the dominant travel mode. Despite a shift in planning rhetoric over recent years public transport services in the outer suburbs remain poor. The result is effectively a spatial market failure in the supply of non-automobile transport modes.

This spatial market failure in public transport provision coincides with marked patterns of urban socio-spatial distribution in Australian cities (Badcock 1994; Maher 1994; Burnley, Murphy et al. 1997). In general, outer suburban zones tend to be populated by lower socio-economic status groups compared to middle and central areas. High levels of car dependence, and the costs associated with ownership and operation of motor vehicles has long been recognised by social scientists as contributing to relative disadvantage among outer suburban residents. This pattern has been described most clearly in Dodson and Sipe's (2005; 2007; 2008) work on the socio-economic vulnerability of households to rising fuel prices in Australian cities (Figure 2; higher index scores indicate higher vulnerability).

**Table 1: Household travel indicators by sub-region, Sydney, 1991-2001.**

Travel Indicator	Area								Total Syd. SD
	Inner/ East	North East	South East	Inner/ Central West	North West	South West	Outer West	Central Coast	
Average number of trips per person	3.85	4.01	3.81	3.42	3.36	3.31	3.99	4.16	3.74
Private vehicle mode share (all trips) (%)	48.7	67.9	72.3	64.6	80.1	78.7	79.7	77.3	70.0
Private vehicle mode share JTW (%)	49.2	65.2	69.0	64.4	76.8	75.6	77.5	77.3	67.6
Average trip length (km)	5.7	8.2	8.4	8.0	11.8	11.9	13.7	12.8	9.5
Daily VKT per person (km)	10.1	17.9	17.6	14.1	23.2	24.0	33.3	30.1	20.0
Change in VKT per person (%)	-9.9	0.3	9.1	6.0	4.7	23.6	22.8	19.0	11.6

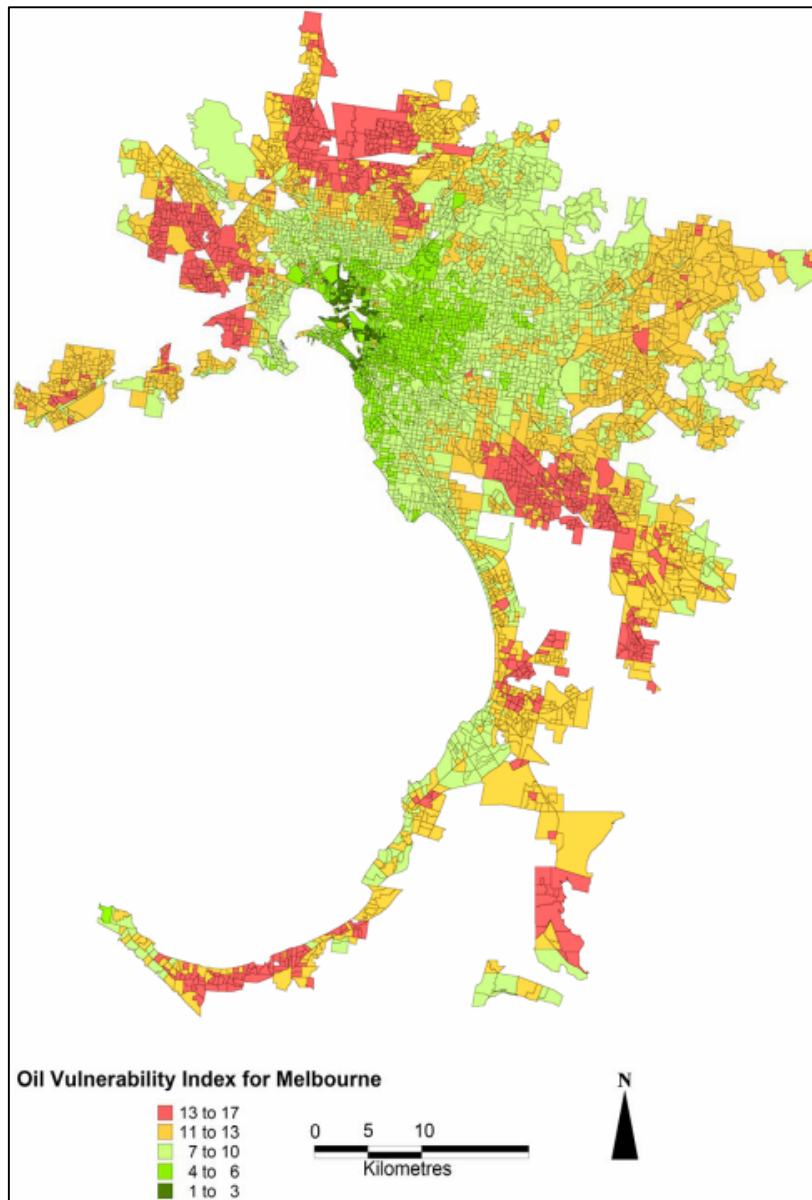
(Source: DIPNR (2003))

The Australian Government Garnaut Review of Climate Change has already signalled that transport emissions will be targeted in any greenhouse emissions abatement regime. The recently released issues paper on transport and the built environment indicates that greenhouse gas emissions abatement will likely proceed via an emissions trading scheme involving competitive auctioning of deliberately constrained emissions permits. This will inevitably involve increases to the cost of carbon emissions, including those from transport.

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

In the case of transport this will most likely be transmitted through higher fuel prices. Fuel price rises are like in any case, given the changing global energy supply context which is signified most dramatically by rapidly increasing oil prices. Australian oil vulnerability research suggests that increasing the cost of petrol will have socially regressive effects if it is not accompanied by appropriate policies to reduce the socio-economic impacts of higher transport fuel costs.

**Figure 1: Distribution of household socio-economic exposure to adverse impacts of rising transport fuel prices, Melbourne.**



(Source: Dodson and Sipe (2005, p. 21)).

In this context it is worth noting Lenzen et al's (2004) work on total household carbon emissions which include transport, embodied and operational energy. This work demonstrates that by far the greatest carbon emitters are households in central and inner areas of Australian cities whose higher general consumption patterns contribute to higher levels of carbon release.

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

What policies might be needed to overcome any socially regressive impacts of a higher carbon price on the cost of urban transport for lower socio-economic status middle and outer-suburban residents?

## **Urban Housing and Planning Policies**

The main approach to reducing urban transport emissions that has been pursued in Australian urban plans over the past three decades has been urban consolidation. For almost three decades Australia's urban planners have sought to relax planning regulation to permit higher density housing and mixed use development within urban areas. Reducing transport energy demand from urban transport by increasing urban densities has been one of the focal objectives of urban consolidation policy. The assumption is that higher urban densities, including for housing, will serve to concentrate presently dispersed demand for public transport and make this travel mode more economically viable, with the result that emissions from transport will be reduced.

This view has proven highly contentious in the Australian context and with only limited scientific consensus on this question (Troy 1996; Searle 2004; Gray and Gleeson 2007; Rickwood, Glazebrook et al. 2008). For example, Newman and Kenworthy (1999) have argued in favour of higher urban densities to reduce automobile dependence. Mees (2000) by comparison has demonstrated that that housing density is less important in determining public transport use than the quality of public transport supply.

Two phases in urban consolidation since the 1970s can be observed in Australian cities. The first phase, from the mid-1970s to the late-1990s involved simple relaxation of planning regulation of the location of multi-unit housing and more permissive regulation of building heights and bulk. Such policies 'wasted' much of the presumed effect of consolidation by failing to ensure that development was coordinated and focused at public transport nodes. Recent consolidation policies have shifted from a blanket relaxation of regulations controlling urban density to an approach which seeks to focus higher density development around public transport nodes. Such an approach is exemplified by the 'activity centres' and 'transit oriented development' found in recent Australian metropolitan plans. Although such schemes rarely refer to such measures as directly intended to reduce greenhouse gas emissions, such expectation is implicit in the plans.

This paper contends that such an approach will likely fail to achieve objectives relating to reductions in transport emissions and oil dependence because it fails to accurately understand the housing market patterns and processes underpinning the structure and form of the Australian city. This risk of failure has significant implications for the achievement of lower levels of transport carbon emissions and, in turn, for the socially equitable distribution of the costs of carbon abatement.

Two influences are particularly important. The first influence is the distribution of demand for public transport relative to private motor vehicles and the role of transport infrastructure and services in shaping this demand. The second influence is role of housing markets in directing investment into higher density residential development. Together these two influences limit the capacity of urban consolidation policies to achieve significant reductions in urban transport greenhouse emissions. A new approach to urban transport and housing is needed.

## **Housing Markets and Consolidation Failure**

But can contemporary urban consolidation policy realise the objective of reducing urban transport greenhouse emissions by reducing automobile travel? More importantly, can urban consolidation reduce automobile travel in those areas where it is currently high – the middle and outer suburban areas of Australian cities? This paper is sceptical of that possibility because the processes used to achieve urban consolidation – namely reliance on private housing markets. It appears that the structure of Australian urban land markets reduces the potency of urban consolidation in reducing demand for higher density development in outer areas. In turn this reduces the capacity of urban consolidation to limit automobile use in these areas.

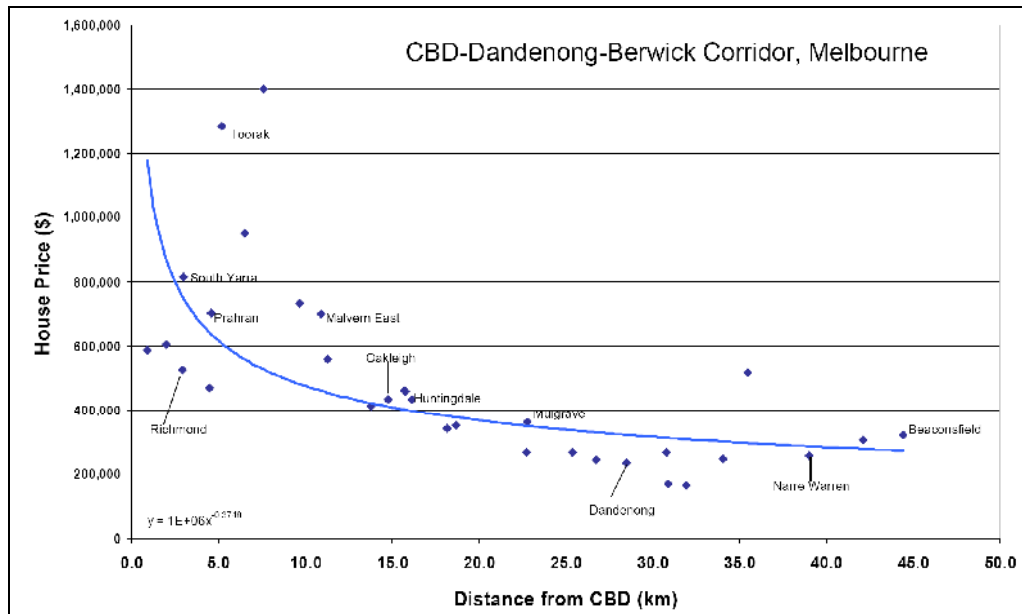
Housing markets are particularly critical to consolidation programs because price signals transmitted through housing markets indicate where private investors should undertake new housing development. Land and housing markets in Australia's major cities display marked distance-decay gradients such that land prices are high in central and inner city zones and decline with increasing distance from the city centre. Thus, for example, in Melbourne's CBD-Dandenong-Berwick corridor high prices in central areas such as Prahran and Toorak give way to relatively modest values in middle and outer zones such as Dandenong and Beaconsfield (Figure 2).

Development of higher density housing makes economic sense in central and inner zones because the elevated land prices signal greater demand for housing in these areas which in turn justifies the additional expense and risk of constructing multi-unit dwellings.

But because of the land price distance-decay gradient the economic rationale for higher density development is much weaker in middle and outer suburban zones. In these areas the limited higher density development that does occur tends to concentrate tightly around specific nodes, such as individual retail centres or rail nodes. Hence in Sydney Liverpool and Parramatta exhibit historic concentrations of higher density housing around their rail nodes, despite being 20 km from the CBD, in contrast to the dispersed car-dependent suburbs of the immediately surrounding sub-region (Figure 3).

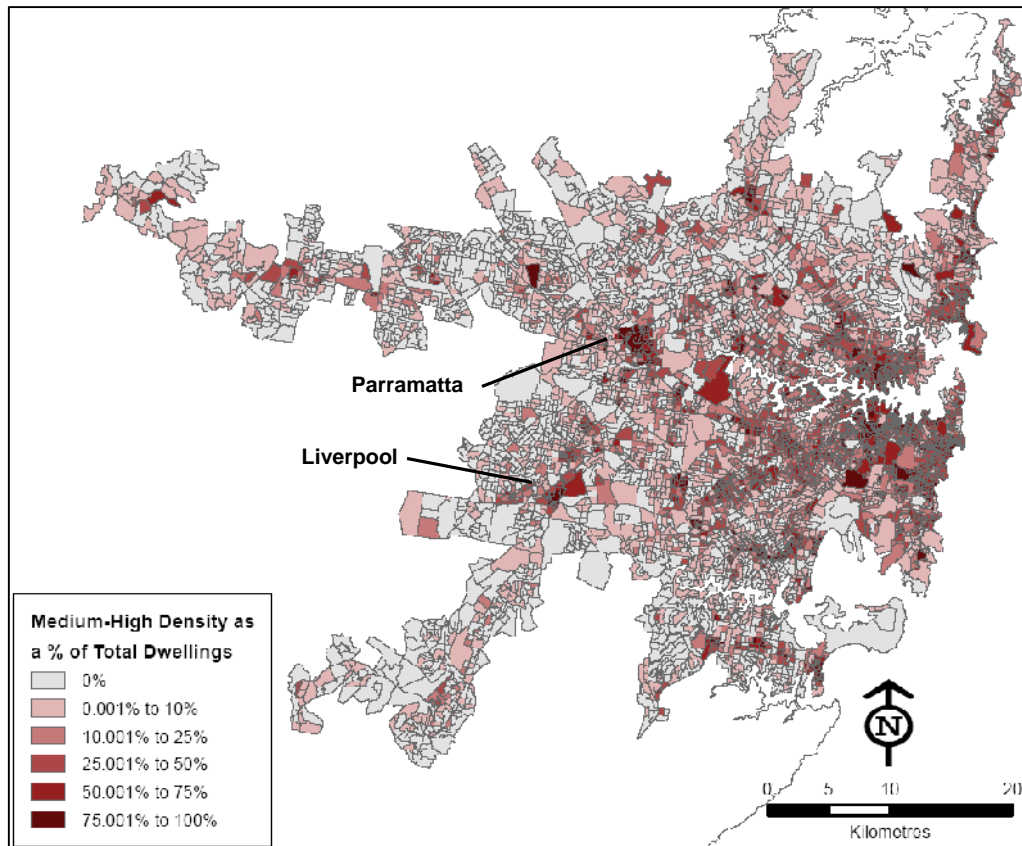
The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

**Figure 2: Urban house price gradient in the CBD-Dandenong-Berwick corridor, Melbourne.**



(Source: Victorian Valuer General Data, 2007)

**Figure 3: Distribution of multi-unit dwellings in Sydney, 2006.**



(Source: ABS Census data 2006)

Most middle and outer suburban zones in Australian cities lack significant nodal concentration like that seen in Sydney. Consolidation policies will have little effect on

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

residential densities in these areas because the prices generated in such sub-regional land markets will be insufficient to motivate the investment in significantly higher density housing by private market actors.

To make matters worse, housing markets are subject to periodic private investment cycles in which prolonged downturns in construction can occur. Given that the middle and outer suburbs are also the areas where transport greenhouse emissions are highest current attempts to reduce transport greenhouse emissions through urban consolidation will not have significant impact in such places. Worse still, the poor supply of public transport in such zones means that households in these areas, who tend to be socio-economically less well off in general, will face greater exposure to rising transport fuel costs.

The urgency of climate mitigation is too great to rely on medium and long run housing market cycles to generate the level of new nodally concentrated suburban stock that is sufficient to produce significant emissions reduction through public transport (even if the density-transport relationship on which such policies are predicated could finally be proven). Not only is urban consolidation, as currently deployed, too indirect and therefore unable to meet the temporal imperatives for climate mitigation its dependence on housing market cycles means it is also unable to meet the locational imperatives. Continued pursuit of such policy only exacerbates the challenge of reducing suburban transport emissions because it distracts from alternative means of reducing suburban car(bon) dependence.

### **Mad Max on a train?**

A significant body of literature has recognised that the quality of public transport supply in urban sub-regions is a key determinant of public transport demand. For example the European Union's *Hi-Trans* guidelines (Nielsen 2005) for public transport network planning state that higher demand is generated when services operate at less than ten minute intervals because the effective cost to passengers of waiting times and informational costs, such as consulting timetables, decline. Mees (2000) has used the cases of Toronto and Zurich to demonstrate that when rolled out across a metropolitan system of integrated public transport lines such service frequencies generate a 'network' effect whereby the increasing ease of public transport use (i.e. declining cost to the user) produces rising demand for travel by public transport.

An appreciation of the 'network' character of high quality public transport appears implicit in some of the conceptual work underpinning urban consolidation policy. For example, Newman and Kenworthy's (Newman and Kenworthy 1999, p. 185) 'network city' schematic (Figure 4) suggests a constellation of high density nodes linked by a web of high quality intersecting public transport lines. This general approach seems to be the basis for much of the Activity Centre and Transit Oriented Development planning that has been included in recent Australian metropolitan plans.

Despite these concentration planning components nodal intensification in Australian cities has so far not been accompanied by significant investment in public transport service frequencies nor similar comprehensive investment in service coordination and integration to create a system capable of generating the 'network effect'. Continuing spatial market failures in the supply of public transport networks to middle and outer suburban zones of

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

Australian cities are limiting growth in public transport use because services do not satisfy the travel needs of residents. These deficits and the limits they place on travel choice will inevitably impede attempts to reduce private motor vehicle emissions from such areas via carbon pricing. This will also likely lead to adverse social outcomes from rising fuel prices. Clearly a new emphasis on public transport investment is necessary to support alternative travel behaviour in the outer suburbs of Australian cities.

Newman has already acknowledged that rail, not consolidation, will save our suburbs from the harsh effects of car(bon) restraint. We need to get Mad Max out of his pursuit special and onto a train.

A major investment program is needed to redress spatial market failure in suburban public transport networks in Australian cities. State governments have a poor record of such investment and display considerable reluctance to invest in public transport. This is despite large budgets being spent on transport investment generally; most current transport investment is directed towards aiding private motor vehicle travel through major roads, such as tunnels, freeways and tollways.

The federal government also expends large sums to supply new road capacity, having programmed \$12.3 billion during 2004-2009 for major road infrastructure under the Auslink scheme, including a number of urban road projects, but none for public transport.

### **Re-constructing urban consolidation policy**

Not only do Australia's metropolitan plans need to address the deficits in transport infrastructure across the vast middle and outer suburban zones of our cities they also need to re-think the strategy of urban consolidation and its spatial application. The housing market processes described above currently allocate investment in higher density housing to inner urban zones. Yet these are the areas where public transport use is already very high. Adding further population in these areas will certainly help to concentrate demand for public transport, but it does little for those in conventional low density suburbia beyond the inner city who face the greatest eco-social risks from carbon regulation and pricing. This recognition implies that the housing units produced through current higher density development are being locationally 'wasted' on the parts of Australian cities where the problems that consolidation is intended to address are least prominent (and current science is ambivalent on the capacity of consolidation to achieve environmental and socio-economic objectives).

It makes little sense to continue to concentrate 20 or 30 storey residential apartment towers within a relatively small and socially exclusive central zone where the average density is already high when such vast areas beyond this area remain at very low densities. Even Newman and Kenworthy's (1999) 'network city' model implies that higher density nodes must be spread among the suburbs.

A further demonstration of this problem is provided by the distribution of densities within European cities which are typically held up as exemplars of dense urbanisation. Few European cities encourage very high densities in their cores accompanied by low density among surrounding suburbs (despite the efforts of Le Corbusier). Intra-metropolitan densities in European cities tend to be much more uniform with 5 to 6 storey housing and

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

similar development spread evenly across the city. Yet as this paper has demonstrated leaving the task of densifying the suburbs to private housing markets, as Australian cities have done, won't achieve this outcome.

If private housing markets can't provide the densification needed in the right place at the right time in Australian cities under the current regulatory regime, to meet our car(bon) challenge, perhaps it is time to change the basis for this form of regulation. If we want to maximise the gains from increased densities we probably ought to limit inner city high rise development in favour of greater volumes of moderate density development in suburban locations.

This view gains further support from the evidence on the energy consumption of different dwelling forms. Very high density housing tends to produce higher energy demand (and thus higher carbon impact) than medium density housing. The optimum balance between residential density and operational energy demand seems to be achieved through semi-detached dwelling types with low-rise up to three storeys the next best (Rickwood, Glazebrook et al. 2008).

Such moderate development scale provides far less of a contrast to conventional detached single-storey suburban zones than 20 or 30 storey apartment blocks and is therefore less likely to arouse the NIMBY ire of suburban preservationists. Development up to three storeys also has less of a planning impact in bulk and height terms than medium and high-rise housing. Given standard plot and height ratios it may prove easier from a planning perspective to achieve a broader spread of townhouses and three-storey walk-up housing across a wider set of suburban locations than relying on very high buildings in central city zones to provide the pan-metropolitan density gains anticipated by our metropolitan plans.

## Conclusions

Current approaches to reducing the level of greenhouse gas emissions from urban transport emphasise the intensification of the built environment through urban consolidation. This paper has demonstrated that the areas where transport greenhouse emissions are greatest are also the areas where urban consolidation is least likely to be viable due to housing market processes. This means that current planning policies are woefully inadequate in meeting the challenge of reducing urban greenhouse emissions from transport.

The paper has also demonstrated that there is significant market failure in the supply of public transport in many middle and outer sub-regions of Australian cities. This spatial market failure coincides with zones of high relative social disadvantage.

If climate mitigation policies are to avoid socially inequitable effects through higher carbon prices they must be accompanied by an extensive program of investment in public transport infrastructure and services, including comprehensive network planning along European *Hi-Trans* principles. This can efficiently be achieved without significant additional expense to governments by re-allocating funds within existing federal and state urban transport budgets to emphasise investment in public transport infrastructure and services over roads.

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

Finally, given Forster's caution on the question of urban structure, we need to be far more attentive to the distribution and scale of densification within Australian cities. Delegating decisions about the location of higher density development to the private sector risks becoming caught in the housing market traps described above.

If governments are to continue to pursue urban consolidation policies in Australian cities, they must begin taking urban consolidation much more seriously as a policy instrument, including more intensively interrogating its capacities and effects.

It may be that planners need to give serious consideration to restricting very high density development (or any redevelopment) in central city zones by setting building heights far below current permissible levels in favour of encouraging a more modest scale of densification more evenly distributed throughout the middle and outer suburbs, especially at the many under-utilised suburban transit nodes.

Mad Max may not make it into a downtown high rise 'eco-clave' but perhaps he might find a reasonable three-storey walk-up near a train line offers him and his fellow suburbanites a less disruptive alternative than outback barbarism .

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

## References

- Badcock, B. (1994). "'Stressed-out' Communities: 'Out-of-sight, out-of-mind'?" Urban Policy and Research **12**(3): 191-197.
- Burnley, I., P. Murphy, et al. (1997). "Selecting Suburbia: Residential Relocation to Outer Sydney." Urban Studies **34**(7): 1109-1127.
- Campion, V. (2008). Transport crisis turns west into wasteland. Daily Telegraph. Sydney.
- DIPNR (2003). Regional Transport Indicators for Sydney. Sydney, Transport and Population Data Centre, NSW Government.
- Dodson, J. and N. Sipe (2005). Oil Vulnerability in the Australian City. Urban Research Program Research Papers No.6. Brisbane, Urban Research Program, Griffith University.
- Dodson, J. and N. Sipe (2007). "Oil vulnerability in the Australian city: Assessing socio-economic risks from higher urban fuel prices." Urban Studies **44**(March): 37-62.
- Dodson, J. and N. Sipe (2008). "Shocking the Suburbs: Urban Location, Homeownership and Oil Vulnerability in the Australian City." Housing Studies **23**(3): 377-401
- Eddington, R. (2008). East West Link Needs Assessment final report. Melbourne, Department of Infrastructure.
- Forster, C. (2006). "The Challenge of Change: Australian Cities and Urban Planning in the New Millennium." Geographical Research **44**(2): 173-182.
- Garnaut Climate Change Review (2008). Transport, Planning and the Built Environment - Issues Paper 5 Melbourne, Australian Government.
- Gray, R. and B. Gleeson (2007). Energy Demands of Urban Living: What Role for Planning? 3rd National Conference on the State of Australian Cities, 28-30 November, University of South Australia, Adelaide, University of South Australia and Adelaide University.
- Lenzen, M., C. Dey, et al. (2004). "Energy requirements of Sydney households." Ecological Economics **49**: 375-399.
- Maher, C. (1994). "Residential mobility, locational disadvantage and spatial inequality in Australian Cities." Urban Policy and Research **12**(3): 185-191.
- Mees, P. (2000). A Very Public Solution: Transport in the Dispersed City. Melbourne, Melbourne University Press.
- Newman, P. and J. Kenworthy (1999). Sustainability and Cities: Overcoming Automobile Dependence. Washington, Island Press.
- Nielsen, G. (2005). HiTrans: Planning the Networks. Stavanger, Norway, European Union Interreg III and HiTrans.
- Office of Urban Management (2005). South East Queensland Regional Plan 2005-2006. Brisbane, Office of Urban Management, Queensland Government.

The wrong place at the wrong time: why the structure of housing markets means urban consolidation cannot equitably solve our urban planning challenges

Queensland Transport (2005). Smart Travel Choices for South East Queensland: A Transport Green Paper. Brisbane, Queensland Government.

Rickwood, P., G. Glazebrook, et al. (2008). "Urban Structure and Energy—A Review " Urban Policy and Research **26**(1): 57 - 81

Searle, G. (2004). "The Limits to Urban Consolidation." Australian Planner **41**(1): 42-48.

Troy, P. (1996). The Perils of Urban Consolidation: a discussion of Australian housing and urban development policies. Sydney, Federation Press.