COMPACT CITY VISIONS FOR MELBOURNE
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Abstract

The metropolitan planning strategy 'Melbourne 2030' was released in 2002 as a major step towards a low-carbon city and a counter to urban sprawl; it provides for intensification of land-use within an urban growth boundary focused on activity centres and transit-oriented development. It is now widely acknowledged that this policy has not been implemented and the growth boundary has been expanded substantially. A primary reason for this failure is the government’s fear of electoral backlash if Melbourne’s much-loved urban ‘character’ is transformed. There has been a lack of both capacity modeling to show how the existing fabric can be densified, and of realistic urban design visions that might stimulate the electorate’s imagination. This paper seeks to quantify the capacities for compact growth and to use these measures as frameworks for understanding the urban design opportunities embodied in such responses to climate change. Using a combination of GIS mapping and digital modeling tools, scenarios based on transit-related planning principles and urban design criteria are explored as a basis for understanding resident responses. The key finding of this study is that Melbourne does not need a particularly radical change to its built form in order to achieve substantial increases in density. Modest height limits of 4-5 storeys along transit lines are easily enough to accommodate the projected growth. If height controls can be properly enforced then this can be done democratically and without an electoral backlash. The political paranoia that paralyzes implementation of Melbourne 2030 is unnecessary.
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INTRODUCTION

If the metropolitan strategy Melbourne 2030 were realized, what would it look and feel like as a place to live? What choices do residents have about the future appearance of the streets they live, shop and socialize in? If there were realistic visions to choose from that would satisfy the aspirations of the strategic plan, what would people choose and why? Melbourne 2030 suggests that a compact city is a ‘great place to be’ but it suffers from a lack of realistic vision about such a place or how it might be realized. The current practice of maintaining a supply of greenfield land on the urban fringe has ensured that the policy has not been implemented. The focus in this paper is on the production of possible streetscape visions that can be used to test community acceptance of intensified development. Debates about intensification have tended to be conducted in the media through a simplistic opposition between NIMBYs and progressives, as if this were a disagreement about known outcomes. This paper is premised on the view that such debate cannot begin until the outcomes are explored. If containment of horizontal expansion is necessary to achieve a more sustainable urban form, then urban design simulations are a necessary precondition to implementation.

BACKGROUND
Part of any planning process in a democratic society involves negotiation based on informed decision-making. Whether the decisions are those of the State executive to approve a strategic plan or of various other stakeholders participating in consultations and responding to drafts of the strategy-in-process, there must be some shared basis for understanding the implications of what is at stake. Most strategic policy-making relies on words to communicate the agenda, issues and policy. In the case of metropolitan strategic plans such as Melbourne 2030, a primary sphere of concern is the changing physical form of the city at a range of scales. Comprehending the complexities of such morphological issues requires far more than words, yet images are not often given much prominence in such processes. In the absence of realistic visions, community perceptions of higher densities are prejudiced by the precedents of the recent past – often poorly designed, over-scaled and un-integrated. In 1999 a major resident backlash against higher density development in the suburbs of Melbourne played a key role in delivering power to the current Labor government – the paranoia over these events still persists in the upper levels of state government and is a major contributor to failures to implement Melbourne 2030 policy.

The paradox is that urban design issues, particularly the fear of high-density development, play a key role without any realistic urban design vision being put forth by the State or development industry. Resident concerns are primarily focused on the character of urban places, their look and feel, and the way they work in both social and functional terms. While the Melbourne 2030 policy documents contain many words and images that gesture towards the affective dimensions of place, they do not inform debate about the local streetscape outcomes. Indeed, the state government has
been keen to remain at a distance and leave the detailed structure plans (and any backlash) to local government.

Seven years into the implementation of Melbourne 2030, a quarter of its trajectory, not only has there been very limited intensification of activity centres in established suburbs, but there have been few urban design visions that might engage the public imagination or that of the development industry. Our review of local structure plans in March 2009 reveals that most illustrations are in the form of planning maps with very few 3-dimensional images. While metropolitan-scale scenario visioning is not new, it has tended to be based on two extremes: On the one-hand is a tabula-rasa approach that assumes future planning regimes could be so different that a singular vision might be imposed from above. In such cases, engagement with the texture of everyday urban spaces or detailed planning and design process is minimal and the vision is rarely implemented to any degree. On the other hand, scenarios may be driven by charette-style processes that take as their raw material current aspirations of residents and other stakeholders. However these do not necessarily consider what other options might be available for trade-offs between local aspirations and metropolitan-scale considerations. While the initial consultations for Melbourne 2030 were reasonably extensive, they did not deal with detailed visions. The initial community support for the policy was based on promises to protect neighbourhood character by confining densification to activity centres. While the lack of vision and action has kept any backlash at bay, the policy is now widely regarded as hype. A major policy review in 2007 politely suggested that the policy was sound and should be implemented.
The imperatives for change, however, have intensified and one LGA (the City of Melbourne, hereafter CoM) has stepped into this vacuum with a notable attempt to pursue a particular intensification scenario focused primarily on tram corridors and bus routes. The CoM project has some methodological parallels with aspects of our research, and has received a wide airing in the broadsheet press and industry fora as well as forming the basis of localised studies funded by the State. The primary aim of this work has been to operationalize one model of intensification rather than understanding community attitudes towards it. Our project explores the potential of latent intensification capacity implied by Melbourne 2030’s focus on activity centres combined with several types of transit corridor development, then illustrates the possible variations in key streetscapes that might result, with a view to understanding community perceptions of the differences between them and their relative desirability.

Released in 2002, the metropolitan strategy Melbourne 2030 sought to accommodate an extra million people by 2030 and make the city more sustainable. Though not without its critics, the strategy received support from many in the planning and design community as well as the powerful metro-wide residents’ advocacy group Save Our Suburbs. This broad-based acclaim was due to three key principles: the imposition of an Urban Growth Boundary (UGB) to limit horizontal expansion; the containment of higher-density development in a network of activity centres; and significant improvements to public transport to integrate this network. This appeared to be a winning strategy that served the interests of better social integration, a greener city and protection of neighbourhood character. In late 2008, Melbourne 2030 was updated with the release of Melbourne @ 5 Million, which adopted the prediction that Melbourne’s population would grow faster than originally estimated. The hierarchy of
activity centres was revised to elevate six suburban Principal Activity Centres to Central Activities Districts. Based on these documents, Melbourne will require an additional 600,000 new dwellings in the next 20 years and this forms the basis of our modeling. The question of course is how such an increase is to be distributed across the metropolitan area – where is the capacity?

The fundamental question here is that of how a major increase of population is to be distributed across the existing metropolis. While there is currently a lack of planning tools to direct development into activity centres (Mees 2003), the policy of maintaining a ‘15-20 year supply of land’ has resulted in a number of UGB extensions, depriving the market of incentives to intensify the existing built up area in innovative ways. Our aim therefore is to propose a series of principles that would offer the possibility of much more explicit policies for managing new development within the existing built-up area to achieve a more compact, sustainable, liveable and resilient city (Newman, Beatley and Boyer 2009). In what follows, we outline the capacity study methodology, the development of intensification scenarios and a limited selection of urban design visions for a range of streetscape types. There are many implementation issues that would result from this approach yet lie outside the scope of this paper; some of them will be discussed in the conclusion.

CAPACITY MODELING AND URBAN DESIGN VISIONS

In line with contemporary principles of transit-oriented development embodied in the spirit of Melbourne 2030, we determined that nominated activity centres and the
existing public transport network would be the focus of intensification. Capacity modeling was used to generate urban design visions through three main steps. First we mapped and quantified all land parcels available for intensified development. We then calculated the required average residential densities for a range of take-up rates over time. Finally we modeled a number of urban design envelopes and outcomes that would achieve these required densities at different take-up rates. The ultimate aim here is to use such simulations to generate resident feedback.

The primary aim of the first stage of the project was to quantify transit-oriented development capacities within the growth boundary. All land parcels falling within nominated Activity Centres or contiguous with major transit lines were mapped and quantified. Boundary information from structure plans was added from each Local Government area for the main activity centres within their jurisdiction. In relation to rail, railway easements, stations, marshalling yards and associated parking and immediately adjacent (usually private) land were selected. In the case of tram and bus transport, land parcels with a frontage to a transit route were selected. The standard planning practice of using radii of 400m and 800m for tram/bus and rail catchments to define the location of higher-density housing was rejected as this would cover a very significant proportion of the suburban hinterlands of inner and middle Melbourne and transgress a primary criterion of Melbourne 2030 of protecting ordinary suburban streets. Due to the paucity of publicly-available information on bus routes, we decided at this stage to confine this capacity modeling to a single route, the only significant orbital bus route in the city that links activity centres and rail lines into a network. Cadastral and planning scheme information were set up in a GIS database enabling the calculation of the total area of a given set of land parcels in relation to specified combinations of land use zones and overlays. Thus we could calculate the land areas
within our primary categories of activity centres plus tram, rail, and bus routes. This modeling produced a gross figure of about 22,000 Ha as illustrated in Figure 1.

The next step involved ‘sieving-out’ those land parcels whose combination of zoning and overlay controls would make them subject to limited potential for development. Land zoned for public open space, other public uses and industry were the first to be sieved-out. Another primary exclusion was land covered by heritage overlays on buildings and precincts. We also excluded land parcels constrained by overlays for qualities such as neighbourhood character, significant landscape, vegetation protection and environmental significance. While limited development is permitted in these zones we regarded the effects on density increases as insignificant.

Although the single largest component of selected land was associated with rail corridors, this land will be difficult to develop over the 2030 time frame for a range of reasons. First, while railway stations often have large parcels of public land (generally carpark) that are ripe for redevelopment, the corporatization of the public sector has left most of this land under the control of a state-owned agency (VicTrack) which has neither the urban design and development expertise nor the incentive to develop it in a sustainable and integrated manner. Despite repeated calls for a metropolitan planning agency, transport planning remains in an entirely separate department of the state bureaucracy from urban planning. It follows that there is little chance to effectively develop railway land until these territorial and governance issues are resolved.
Second, much of the land contiguous with rail corridors (such as residential land backing onto railway easements) is difficult to redevelop without major long-term investment (such as burying railway lines). The rail corridors are crossed by a large number of dangerous level-crossings which need to be eliminated in any redevelopment because increases in train frequency will render them even more dangerous and exacerbate traffic bottlenecks. Even where train lines are in trenches, decking over is expensive and a range of technical and safety issues related to enclosing trains in tunnels significantly complicate matters.

Third, the highly uneven geography of the rail corridors makes them unsuited to standardized as-of-right’ development controls. Within the 2030 timeframe rail corridor development is likely to be confined to one-off projects in key locations where the conditions outlined above do not severely inhibit development. These factors are very difficult to model, but for all of these reasons we have discounted 90% of land along railway corridors. This is not to suggest that these parcels cannot or should not be redeveloped over a longer time frame as the state resumes integrated urban planning and as infrastructure funding becomes available.

After these sieving processes, the total capacity was reduced to a figure of 6,300 Ha of which 4,200 Ha are within activity centres, 1,300 Ha is adjacent to tram routes, 950 Ha associated with rail and 600 Ha adjacent to the orbital bus (these figures total more than 100% due to overlaps). Using this figure, the average increase in net residential densities that would be required to produce 600,000 new dwellings on this land area associated with different take-up rates are shown in table 1. It shows that if these land parcels were all redeveloped (100% take-up) then their required average net residential density would be ~95 DU/Ha. At a 40% to 80% take-up rate (a much more likely assumption) this average net density required to achieve the target would
range from about 100-250 DU/Ha. A key finding here is that land in activity centres is 57% of the total, illustrating the strategic importance of intensification within them. Land associated with tramways accounts for 18%, while the remaining 25% is contributed by land associated with rail (15%) and the one orbital bus (10%).

The global figures we have used for our modeling exercise are based on required increases in residential density. Most of the land parcels we have included along transit lines have an existing residential density that ranges from 0-15 DU/Ha, with some very small pockets of much higher densities in the inner-city. Within the resources of the current project, these existing densities are impossible to quantify accurately at the metropolitan scale within the scope of the current project, but we have presumed that they average under 10 DU/Ha and the difference they will make to the overall figures is insignificant. An assumption is that sites that have already been developed at greater than average suburban densities within Activity Centres and along transit corridors represent a tiny proportion of the selected land area and will have minimal impact on the global figures. Many land parcels within major Activity Centres are already developed at higher than suburban densities, and future densities in such locations are expected to be substantially higher than average; for our purposes here we have presumed that the increases in density will approximate the required metropolitan average.

Current planning policy generally allows as-of-right development of up to 3-storeys in a large proportion of the land parcels selected by this process. While some commercial strips along tram routes are developed at this scale, the space above shops
is rarely used effectively for housing. As part of this study we surveyed and measured the net densities of a range of market-led housing recently constructed along existing transit lines. While a range of development densities and heights were found, the densities of 100-300 DU/Ha required to achieve the Melbourne 2030 targets were generally found to be in the range of 3 to 5 storeys.

**URBAN DESIGN VISIONS**

In order to turn these densities into visions we have developed a series of scenarios on one tram line based on three key parameters - height limits, setbacks and take-up rates. From other work on residents’ understandings of urban change (Dovey et al 2009a, b, 2008, 2006; Wood et al 2006; Woodcock et al 2008), among a complex mix of issues, residents are particularly sensitive to height limits because they mediate issues of urban character as well as overlooking and overshadowing. The key urban design variable we are simulating here is the visual impact of potential new buildings within different envelope controls on streetscapes. There are many other issues of great concern to residents that lie outside the scope of this paper; they include pedestrian-friendly frontages, architectural design quality and the loss of solar energy and privacy at the rear interface with the residential neighbourhood. Building setbacks above about 3-storeys have a capacity to maintain the characteristically open feeling of Melbourne streetscapes where desirable. The visual impact will also vary according to the continuous or discontinuous development produced by different take-up rates. While these effects could be represented in a variety of ways, including with animations, some preliminary pictorial simulations have been produced from this capacity modeling and are shown in Figures below. Figure 2 shows a sample of one
way of making simple simulations of a typical mixed-use streetscape at 4, 6 and 8 storeys respectively, with a commercial ground floor and residential above. The modeling is based on an existing tram-based commercial street in an inner Melbourne Major Activity Centre whose axis is oriented east-west. It illustrates in a very direct way how changes in the volume of buildings affect the streetscape in terms of its rhythm, skyline and shadows as the take-up rate is set at 20 and 60 percent without a setback of the upper storeys. The lower the height-limit, the greater the required take-up rates to achieve the same density. Figure 2 repeats each of these scenarios but with a 7-metre setback above the existing building profile. The next phase of this study will involve testing a range of such streetscape simulations with focus groups of residents in metropolitan Melbourne to better understand how residents might perceive the differences between the urban character effects of different heights, setbacks and take-up rates, to foster broader discussion.

DISCUSSION

This paper presents work in progress on one dimension of urban intensification. Our key concern has been to model the capacities for a more compact city and then to begin the task of simulating some possible urban design outcomes that are consistent with such modelling. Bulk, height and setback are not the only issues at stake in urban design, however, they are crucial issues for residents. The detailed design quality and streetscape livability are high priority urban design issues but they are not
simulated here because our interest lies in testing the three key parameters rather than designing or promoting particular visions. Similarly, we have not modeled the rear interface of these scenarios with their residential hinterland, an issue of crucial importance for residents and an important area for future research. Vehicular access will also be a key challenge for implementation. In many locations the maintenance of a vital public realm will require rear vehicular access, limiting the take-up rates on those sites without rear access. However, initiatives to reduce or omit requirements for off-street parking associated with higher-density housing are also clearly on the agenda to reduce car-dependency and promote a more walkable public realm. We will conclude with discussion of a series of issues with regard to implementation that we cannot address within the scope of this paper.

**Take-up Rates and Height Control**

This modeling and visioning exercise suggests that a key relationship is that between development envelopes and market take-up rates. If height limits are set high (6-8+ storeys) then market-take-up rates will be low and would likely result in streetscapes with sharp juxtapositions of building height. Some Activity Centres and parts of transit corridors will be in high demand and almost built-out while other less popular places may remain relatively unchanged. Some places will attract a few tall buildings with fabulous views on profitable sites, monopolizing the apartment market in that location. This is apparent in some parts of Melbourne where surrounding neighbourhoods are overshadowed and overlooked. If lower height limits are enforced then higher market take-up rates will produce more continuous streetscapes with greater protection of privacy and amenity, and greater potential for electoral support.
Lower height limits would lead to a more widespread distribution of new development with higher take-up rates and a greater diversity of housing choices in a wider range of suburbs, rather than market-led over-concentrations in a limited number of places that dramatically transform their character. Other issues that are ameliorated by lower height limits include a much easier accommodation of parking and traffic planning, lower production of blank walls at ground level and more widely distributed and better integrated affordable housing. However, there is no suggestion at this point that lower or higher height limits should be imposed, nor do we express a preference for coherent and uniform development. It is the relationship that these parameters have with other factors that needs to be better understood if planning controls, democratic governance and resident preferences are to be aligned in the interests of sustainable urbanism. Different urban futures need to be debated by communities at a metropolitan scale, with the trade-offs made visible through realistic imagery backed by meaningful figures for what these images imply. Five key issues warrant further investigation:

**Grain-size**

The relationship between grain-size and tenure structure within Activity Centres and transit corridors is complex. Fragmented tenure structure and large numbers of small lots tend to inhibit larger-scale development, confining taller developments to the limited supply of large lots unless major site consolidations can be facilitated. As evidenced by current forms of development, such site consolidations can dramatically transform urban character through increasing grain-size with its flow-on effects on the mix of landuses, street interfaces, and rent levels. Lower height limits would favour
smaller lot sizes and produce a greater number of new developments, a greater
diversity of property ownership and of architectural expression more responsive to
local character. Our fieldwork indicates that small segments of the development
industry are already beginning to tackle this kind of intensification, while economic
modeling carried out for the state government on tram corridors in Melbourne’s inner
north suggests small-lot, low-rise intensification is viable within current market
conditions.

**The Profit Gap?**

One key issue that impacts upon these scenarios is that housing developments of 4-8
storeys are widely perceived within the development industry as unprofitable under
current building regulations and industry practices. There are a variety of reasons for
this including the requirements for elevators and for unionized labour – this is a topic
that is urgently in need of more detailed research. In some locations this has produced
a syndrome of inserting more profitable 8-10 storey buildings into 2-3 storey
neighbourhoods. This is largely a local phenomenon because developers have been
continuously supplied with easy profits on the urban fringe accompanied by a lack of
market incentive to innovate in established suburbs.

**As-of-right Development**

The current planning system is performance-based and building heights are decided
on a site-by-site basis in the planning tribunal VCAT. The Melbourne 2030
framework is regularly used in VCAT to justify overruling local government planning
controls yet without any reference to metropolitan capacity. Tall buildings are inserted into low-rise neighbourhoods on the basis that Melbourne 2030 demands it - our modeling suggests this is demand is misconstrued. A capacity-based intensification policy would provide a much-needed grounding for decisions that are widely perceived as undemocratic and somewhat out of control. If the State is to gain control over planning outcomes, there is a strong case to abandon ‘site-by-site’ planning and move towards ‘as-of-right’ development controls within stricter height limits.

**Democratic Governance**

A key finding of this study is that Melbourne does not need a particularly radical change to its built form in order to achieve a much higher population within a sustainable growth boundary. Our capacity modeling suggests that modest height limit within Activity Centres and of 4-5 storeys along transit corridors will easily be enough to accommodate the Melbourne 2030 and Melbourne @ 5 million population growth projections. We further suggest that this can be done democratically and with the support of local residents if the urban design outcomes are realistically modeled so that knee-jerk consultation in reaction to opportunistic development proposals is avoided. The political paranoia that has paralyzed sustainable strategic planning for Melbourne’s future is unnecessary.

We have demonstrated that the population targets in Melbourne 2030 could be met with modest increases in density and height and that significant height disjunctions between existing and new buildings is not necessary; such intensification would only directly affect about 7% of the current built-up area and protect the character of most
suburban streets. The scenarios outlined in this paper are based on the imperative to reverse current trends that have seen development polarized into ~80% on the fringe and 20% in the centre and inner-city, with little in any of the significant Activity Centres, or directly related to transit corridors. Distributed forms of low-to-medium-rise intensification geared to activity centres linked by well-serviced public transit networks represent Melbourne’s best chance of joining the civilized club of low-carbon cities.

Further Scenarios

The principles outlined in this paper could be used to pose a broader series of scenarios. For example, what are the urban design prospects if new development were to be confined to tram and bus corridors only? What if development were to be limited to air-rights development over under-grounded railway lines (removing hundreds of level-crossings)? What if it were only to occur through redevelopment of the 200 or so stations on the railway system? There are many ways of distributing 600,000 additional dwellings within the existing built-up area without encroaching on productive farmland or areas of environmental significance on the urban fringe and condemning the majority of new Melburnians to car-dependent lifestyles. These scenarios would all promise interesting challenges to produce innovative forms of housing and urban design rather than the market-led and vision-impaired status-quo.

Australian cities are at a renewal point in relation to the crisis of climate change. To be socially sustainable this means addressing the imperative of a low-carbon future within the framework of a low-density suburban fabric - developing lines and points of intensification that will make low-emission transport possible while building new
amenity throughout the city. The challenge is to bring crisis and opportunity together. Many of the presumptions we have made here are uncertain: the long-term viability and value of heritage and other zoning overlays, the prospect of a metropolitan planning agency, Melbourne’s population projections and Australia’s carbon reduction targets are all uncertain. Likewise nothing we have modelled here is certain: the capacities for redevelopment, the height limits to be imposed, the take-up rates or the urban design outcomes. Cities are complex socio-spatial eco-systems that embody endemic uncertainty. Rather than eliminating uncertainty, the task is to incorporate this uncertainty into our understanding. The goal is not a rigid model of a city but flexible modeling for a resilient city (Newman, Beatley and Boyer 2009) with an understanding of key parameters that may be at stake. It is not just the form of the city that must be sustainable but also the process of change. Physical forms can change much more quickly and easily than social systems that are fundamentally conservative. Many of the objections that residents have to increasing urban density are based in a desire to retain a sense of place or urban character. While such a phenomenon can be seen as a surface effect, when you scratch beneath this surface you find social values. The opportunity we have outlined here is to move towards a low-carbon future in a manner that is at once radically transformative, creative and incremental.

Acknowledgements: This paper draws on research funded by a Linkage Grant (Ref. LP 0669652) from the Australian Research Council, the Victorian Department of Planning and Community Development and the cities of Melbourne, Moreland and Yarra.
ENDNOTES

i A high profile example of this approach is the work of MVRDV (1998, 2005). A local variant is the Boomtown 2050 work by Richard Weller (2009). The work of ARM on Melbourne Docklands (Dovey 2005: 140-44) is also of this kind.

ii A particularly notable example of this approach is the plan for Vancouver (Condon and Teed 2006)


iv This approach formed the basis of the urban design workshop of the DCA infrastructure summit in November 2008. See Adams, R. (Chair), Loader, C., Crombie, D., Dalton, T., Dovey, K., Faubel, M. at al (2008), and City of Melbourne (2009)

v Department of Planning and Community Development / SGS Economics and Planning (2009), Residential Intensification in Tramway Corridors: Planning, Urban Design and Market Feasibility Study

vi Footscray, Broadmeadows, Ringwood, Box Hill, Dandenong and Frankston

vii All cadastral information was provided by University through arrangements with the Department of Planning and Community Development.

viii This covered all centres with the designation of ‘Central Activities District’, ‘Specialised Activity Centre’, ‘Principal Activity Centre’ and ‘Major Activity Centre’. Although many activity centres had not been fully adopted at the time of writing, detailed structure planning was under way for about 75% of centres and
reasonably well-progressed for most of the remainder. There were 3 centres for which information was ill-defined and the impact of this on the accuracy of the calculations is minimal.

ix Orbital bus route 904. Other orbital routes have been proposed and would represent significant future opportunity to extend the network.

x Within the total, 4,356 Ha of land parcels were adjacent to tram routes, 10,055 Ha associated with the railway corridors, 2,000 Ha were adjacent to the orbital bus and 7,552 Ha were in activity centres. Due to overlaps between land in different categories, the total area is less than the sum of its components.

xi Parcels were excluded from analysis if they fell within the following zones: Public Conservation Zone, Public Park Zone, Public Use, Special Use, Commonwealth Land, Industrial Use, Low Density or Rural Residential, Urban Floodway and Green Wedge zones. Parcels were excluded from the remaining zones if the following overlays applied: Heritage, Neighbourhood Character, Environmental Significance, Significant Landscape or Vegetation Protection.

xii During 2010, The Department of Planning and Community Development will conduct a detailed capacity audit of all land within the Melbourne metropolitan area to allow assessment of its potential for higher-density housing. This resource-intensive exercise, in partnership with local governments will provide a much-needed database to refine the kind of modeling described in this paper.

xiii Department of Planning and Community Development / SGS Economics and Planning (2009)
This is effectively the scenario explored by the City of Melbourne (2009)
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LIST OF FIGURES

FIGURE 1. Land-parcel selection for capacity modeling: Activity centres, tram, rail and orbital bus route corridors
TABLE 1. Average Net Residential Densities and take-up rates to accommodate 600,000 dwellings

Table 1: Average Increase in Net Residential Densities Required

Overall Area: 6300 Ha

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<thead>
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<th>Take-Up</th>
<th>Average Increase Required</th>
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<td>20%</td>
<td>476 DU/Ha</td>
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FIGURE 2. Streetscape visualization of various take-up rates for 4 and 6 storey development, without and with a 7m setback above existing building profile