Understanding the design 'trade offs': implications of the proposed affordable housing policy

Advice paper for Minister for Housing
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City Infrastructure

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Background

In June 2023, the NSW Government announced that housing developments with a capital investment over $75m and an allocation of 15% of the total gross floor area to affordable housing, will gain access to the State Significant Development (SSD) planning approval pathway. These developments will also gain 30% floor space ratio boost and 30% height bonus above local environmental plans.[1]

Like other major metropolitan centres globally, providing sufficient affordable housing is a pressing need as well as a significant challenge. Such a complex issue requires several strategies, financial, social, as well as accompanying metropolitan and local planning strategies to support higher order policies.

This research was undertaken for the Minister for Housing and Homelessness and team around the enabling of more affordable and social housing on government and non-government owned land, ensuring amenity and performance of the housing delivered and understanding potential 'trade-offs'. Both economic and design (amenity).

Purpose

The purpose of this paper is to analyse opportunities to provide housing uplift, examining the physical amenity and economic implications and potential trade-off's.

This examination is intended to inform financial and future research so that higher level decisions and policy recommendations are made cognisant of physical design and amenity consequences as well as economic considerations.

The paper identifies physical opportunities for density uplift, examining potential benefits and challenges with respect to maintaining and potentially improving amenity for the residents. It also includes an analysis of the economics driving delivery of affordable housing under the New South Wales planning system, a review of feasibility of development, and the ability to generate a risk appropriate return based on several assumptions.

Structure of this paper

This paper is in three parts:
Part 1: Urban design and amenity considerations
Part 2: Economic considerations
Briefing notes

Acknowledgement of Stakeholders

The Institute would like to thank those who contributed their time and insights to this project in particular Astrolabe Group, Philip Graus, LAHC and the Minister for Housing and team

1 https://www.planning.nsw.gov.au/news/new-planning-rules-mean-more-affordable-housing

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Acknowledgement of Country

We acknowledge the Bidjigal, the Traditional Custodians of the land on which the Cities Institute is located, and pay our respects to Elders, past and present.

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Introduction

This analysis identifies opportunities to provide housing uplift, examining the physical amenity implications and potential trade-off's. This examination is intended to inform financial and future research so that higher level decisions and policy recommendations are made cognisant of physical design and amenity consequences.

This part of the report sets out the architectural and urban design opportunities to create additional affordable housing. It identifies physical opportunities for density uplift, examining potential benefits and challenges with respect to maintaining and potentially improving amenity for the residents.

It addresses:

1. Relevant New South Wales design and amenity performance standards for new apartments
2. Opportunities for uplift and an appraisal of planning changes and trade-offs in optimising the amount of housing built
3. Considerations common to a number of precinct and individual lot case studies, developing base and uplift scenarios for three typical apartment buildings; three, six, and nine storeys, uplifted to four, eight, and twelve respectively
4. An appraisal of trade offs
5. A summary of findings
6. Recommendations for future research

It is noted that the scope of the report does not include a number of externalities or cumulative impacts on amenity or achieving housing uplift as follows:

> Developments located close to noise or pollution sources such as busy roads, rail lines
> Community and other stakeholder concerns
> Cumulative impacts of multiple developments on traffic generation or existing social infrastructure including open space, social infrastructure, or transport

Amenity standards

The range of New South Wales standards relating to amenity and performance benchmarks are as follows:

> The *NSW Apartment Design Guide* is the most comprehensive and broadly accepted guideline for apartment buildings greater than four storeys. It also covers urban context and provides a high amenity standards with respect to surrounding buildings. The accompanying State Environmental Planning Policy (SEPP 65) proves statutory weight within New South Wales.

> The *NSW Medium Density Design Guide* has limited relevance, applying to medium density developments up to four storeys, complementing the *NSW Apartment Design Guide*. Initial enquiries suggest that this development type may not be viable for affordable housing achieved through uplift, except as part of a larger precinct.

> The Government Architect NSW *Open Space for Recreation Guide* provides open space guidance for precinct scale sites.

Table 1 tabulates NSW housing amenity design codes and guidelines, highlighting dwelling types relevant to each, the applicable scale of urban development from lot to precinct, key amenity issues addressed, and level of relevance to this study. The GANSW *Open Space for Recreation Guide* is included here as it provides advice relevant to precinct scale development. The analysis confirms that the *NSW Apartment Design Guide* most fully addresses the relevant amenity criteria.

Other guides including the *Growth Centres Development Code*, the Urban Design Advisory Service - *Guidelines for infill development-Seniors Living*, and *Boarding House Regulation 2013* have been reviewed and found to be of little relevance. The first two apply to very low-density development and the third to a share housing format.

Figure 1. Lachlans Line

Standard	Housing types covered	Development type	Amenity areas	Relevance
NSW Apartment Design Guide	Apartment buildings greater than four storeys Basic mixed use	Focus on individual building and immediate context	Contextual 'fit' Solar and daylight Natural ventilation Apartment layout quality Private open space/ balconies Acoustic privacy Noise and pollution mitigation Communal spaces quality Sustainability/ cost savings	High - Focus on apartments. Standards applied widely
NSW Medium Density Design Guide	Medium density buildings up to three/ four storeys	Building and block		Moderate - This density less likely to be viable
GANSW Open Space for Recreation Guide		Precinct	Open space types - performance criteria and indicators	Moderate - relevant to precinct scale developments
Growth Centres Development Code	Multi-family dwellings, medium density and apartments	Building, block, and precinct		Low - precinct standards including open space and community facilities
Urban Design Advisory Service- Guidelines for infill development - Seniors Living	Low rise medium density Seniors up to three storeys 10 metres	Block		Low - seniors specific guidelines
Boarding House Regulation 2013	Shared dwellings	Building	Resident population limits Bedroom sizes Light and ventilation	Low - specific to share housing type

Table 1. NSW housing standards - high level overview

The NSW Apartment Design Guide

Table 2 below sets out relevant standards within the *NSW Apartment Design Guide* and potential amenity implications. The tabulated amenity standards can be grouped as follows:

Parts	Relevant standards
1. Context	Apartment types
	Character and context
	Precincts and sites
2. Primary controls	Building envelope
	Building height
	Floor space ratio
	Building depth
	Building separation
	Street setbacks
	Side and rear setbacks
3. Siting guidelines	Orientation
	Public domain interface
	Communal and public open space
	Deep soil
	Visual privacy
	Pedestrian access
4. Building design standards	Amenity
	• Solar and daylight access
	• Natural ventilation
	• Ceiling heights
	• Apartment size and layout
	• Private open space and balconies
	• Common circulation and spaces
	• Storage
	• Acoustic privacy
	• Noise and pollution
	Configuration
	• Apartment mix
	• Ground floor apartments
	• Landscape design
	• Universal design
	• Mixed use

Table 2. *NSW Apartment Design Guide* structure and contents

Uplift opportunities

Purpose

Identify opportunities for uplift which benefit occupant wellbeing in new and renewal housing developments at both precinct and individual building scale. Appraise proposed planning changes for affordable housing.

Opportunities

Opportunities for achieving housing uplift vary with respect to the scale of the development, proximity to transport and services, and urban context.

Housing and mixed-use projects can vary in scale from an individual lot, a block, to a precinct. The size of a precinct can vary widely, typically 5 - 20 hectares. A typical urban block can vary in size from half a hectare to two hectares. An individual lot capable of accommodating a 5 - 8 storey apartment building is typically around 1,500 - 2,500 m^2.

The larger the scale of project, the more opportunity and flexibility there is to configure the site to take advantage of amenity such as solar access, outlook, open space and connections to other places. At the precinct scale the height and bulk of individual buildings can be distributed and spaced within the precinct to optimise amenity and minimise adverse impacts within and around the site.

At the block scale, corner sites and street frontages are less constrained with respect to building separation required to maintain solar access, visual and acoustic privacy between adjoining buildings. Depending on the block orientation and context, these amenity factors may still constrain uplift. 'Transition blocks' within or adjacent to centres and transport may be suitable for wholesale redevelopment and could be up zoned as part of a larger precinct, accompanied by enabling planning controls.

At the individual lot level, opportunities for uplift are more dependant on the characteristics of the lot. These include lot size, configuration, and location. A lot needs to be large enough to accommodate a viable building footprint, an efficient basement carpark, common open space and setbacks. Corner lots and lots facing wider streets or open space may be less constrained by setbacks.

Table 3 on the next page sets out a holistic overview of opportunities that can be methodically investigated as part of the process, ensuring that opportunities are fully and appropriately explored for the various sites and locations considered. Such an approach does not necessarily replace current government policies such as SEPP 65, Better Placed, or other policies, rather it provides a series of considerations that integrate density and amenity considerations, and opportunities.

Development type/ scale	Dwelling types	Other elements	Built form opportunities	Open space opportunities	Other opportunities
Precinct	Diverse mix of high and medium rise apartments, low rise terraces	Potentially streets, public or common open space, local retail, community facilities	Large sites allow significant flexibility in configuring height and density including uplift through master planning	Sharing open space, consolidating with adjoining, multiple use spaces, recreational facilities within buildings, co location with schools	Diverse mixture of housing tenures and building types; market, affordable, social. Development partnerships, CHP, developers, financial institutions Ability to subdivide sites, sell off private housing component (refer Lachlan's Line - Landcom/ CHP partnership)
Block	Mix dependant on location/ context	Potentially common open space, ground level mixed use	Block sites allow some flexibility in configuring height and density including uplift through building placement	Potentially consolidating with adjoining, multiple use spaces, recreational facilities within buildings	Mixture of housing tenures and some building types; market, affordable, social depending on block size. Development partnerships, CHP, developers, financial institutions depending on block size
Individual building	Generally, apartments, high or medium depending on location/ context	Potentially common area/s, ground level mixed use	Less flexibility, uplift dependent on location and context	Identify sites close to existing open space and other amenity infrastructure Locating open spaces within building/ roof area	Potential for some tenure mix; market and affordable

Table 3. Uplift opportunities

Figure 2. Apartment Design Guide

Understanding the potential of different site conditions

Landcom is the NSW Government owned land and property development organisation. It supplies housing sites and delivers master planned communities with a focus on expanding the stock of affordable and diverse housing.

Figure 3. Victoria park, Zetland

The following Landcom examples illustrate a range of approaches to holistic site planning, potentially providing uplift opportunities and maintaining residential and public domain amenity.

Each project includes significant high amenity open space amenity and is generally adjacent to a higher density sub precinct. As noted in the analysis throughout this report, this relationship is critical in achieving both uplift and a high level of amenity. The majority of precincts are located in close proximity to transit.

Site example 1: Glenfield

Glenfield is located 15 kilometres north of Campbelltown. The precinct was identified for housing uplift in 2005 in Greater Macarthur 2040 which elevated its centres status, leveraging the adjoining rail station, and 70-hectare school. 30 hectares of public open space provides significant amenity. The precinct plan envisages 7,000 dwellings and 2,900 local jobs.

Figure 4. Glenfield Structure Plan

Site example 1: Glenfield (continued)

Figure 5. Glenfield Town Centre plan

Site example 2: Edmondson Park Town Centre North

The Edmondson Park Town Centre North is located in South West Sydney the Liverpool and Local Government Area. The centre is adjacent to the Edmondson Park train station. The precinct includes high and medium density apartments adjacent to the station, and major park respectively, as well as terraces adjacent to the medium density area. The precinct includes 3,300 dwellings. While the highest individual block FSR is 4:1, the precinct density is 0.86:1, reflecting the diverse housing mix and quantum of public open space as well as common open space associated with the apartments.

Figure 6. Edmondson Park Town Centre North

Site example 3: Wentworth Point - Lots 1 & 2

Wentworth Point Lots 1 & 2 are located on the north east of the Wentworth Point peninsula. The site is connected to the Rhodes rail station by a bus and cycle only bridge. The proposed Stage 2 Parramatta Light Rail is planned to provide additional public transport access. The Planning Proposal sits on a 6.9-hectare site which includes the two development lots, public park (34% of the site) and a new school. The open space is consistent with the GANSW draft *Greener Spaces Design Guide*. The lots include 9 - 27 storey apartments, each with common open space.

Figure 7. Lots 1 & 2, Wentworth Point

Site example 4: Macarthur Gardens North

Macarthur Gardens is located in Sydney's South West. It includes 1,250 dwellings, including apartments up to nine storeys, with a minimum of 10% affordable housing. Connections to Macarthur rail station, WSU and TAFE. The precinct achieves 53% tree canopy and central park. The overall dwelling density is 67. dwellings per hectare.

Figure 8. Macarthur Gardens North

Site example 5: Rooty Hill feasibility study

This case study examines the impact of increasing height and yield by 30% in compliance with the ADG. The additional height is dependant on a minor Clause 4.6 height variation. The intention is to calculate land values. The plan diagrams illustrate base and uplift scenarios. Each site includes 20% common open space.

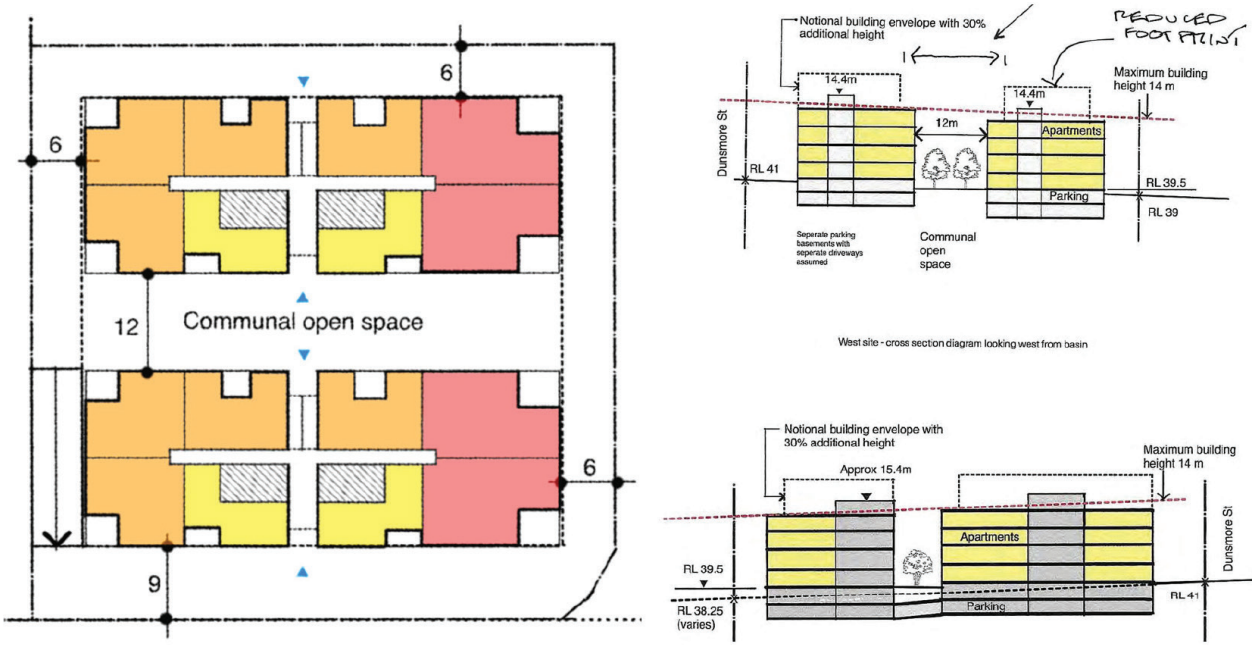

Figure 9. Rooty Hill feasibility study

Understanding how density can be achieved in different ways

A typical 2,000 square metre site on a block adjacent to the Blacktown town centre was selected as a base case for the following three case studies, examining how density uplifts can be achieved in the case of a nine, six and three storey base case building. The selected site is located in a transitional area close to transport, capable of being up zoned as part of a comprehensively renewed precinct, providing the opportunity to achieve an uplift, either minimising or improving amenity, taking advantage of its location.

Working at the block level provide opportunities to identify 'opportunity sites' such as corners, sites on wider roads, south side blocks where setback and overshadowing constraints are significantly reduced without impacting amenity.

CASE STUDY 1
Nine storey (base case) apartment building adapted from Blacktown (10-14 Gordon Street), site area increased to 2,800m²

Site

Site area: 2,800sqm
FSR (base case): 2.3:1
GFA (base case): 6,350sqm
FSR (with 30% uplift): 3:1
GFA (with 30% uplift): 9,525sqm

GFA

Building height: nine storeys X 3.1m per level (ignore roof plant, parapets) = 28m
30% additional height: 28 X 1.3 = 36.4m
@ 3.1m/ level: 11.7 levels (assume 12, with reduced upper-level footprints)

Assumptions

From a review of the drawings the following assumptions are made:

> Assume a larger site to achieve sufficient footprint, appropriate FSR, sufficient basement area and common areas
> Assume a corner site so ADG setbacks only two sides
> Maintain ADG setbacks adjacent to other lots, over four levels 9 metre setbacks
> Assume lots on south side of blocks to reduce overshadowing impacts

Areas comparison as follows:

Level	GFA base case (m²)	GFA uplift (m²)	
G	790	790 + 130	920
1	815	815 + 130	945
2	815	815 + 130	945
3	815	815 + 130	945
4	720	720 + 130	850
5	720	720 + 130	850
6	720	720 + 40	760
7	720	720 + 50	760
8	240	720 + 50	760
9	–	720 + 50	760
10	–	720 + 50	760
11	–	350	350
Total	**6,355**		**9,600***

* potential to achieve in excess of 30% uplift within allowable footprint

Apartment mix

Type	Size (approx. m²)	Rate	Base case	Uplift
Studio / 1 bed	58	15%	12 off	15 off
2 bed	75	70%	54 off	71 off
3 bed	95	15%	9 off	12 off
Total			**75 off**	**98 off**

Common Open Space/ Landscape area/ ramp area (base case and uplift)

Common area: 500m² at grade, + 200m² (roof terrace)
Landscape area: 1,000m² (including at grade common area noted above and deep soil of 300m²)
Ramp area: 28m²

Car Parking

Note that RMS standards are lower than Council DCP. The DA assumed the higher DCP number assuming market. I've also assumed the higher DCP number and basement area for this exercise for the base case. I've assumed the lower RMS number for the uplift. Alternatively, an additional basement level could be provided. All of this assumes same rate for affordable housing (which could be lowered?)

> Base case:
  - DCP rate: 1sp/1 bed, 1sp/2 bed, 2 sp/3 bed, 0.4 visitor - 84 spaces
  - RMS rate: 65 spaces
  - Total 65 spaces provided (@35m²/car)
  - Car park area (all basement) 2,000m² (two levels)

> Uplift case:
  – DCP rate: 1sp/ 1 bed, 1sp/ 2 bed, 2 sp/3 bed, 0.4 visitor - 109 spaces
  – RMS rate: 85 spaces
  – Total spaces provided 85 (@35m^2/car)
  – Car park area (all basement) 3,000 (3 levels)

Infrastructure Area

> None - single lot

Amenity Issues

> Solar access: potential overshadowing to adjoining properties, public open space and streets
> Streetscape/ context - reduced street setback
> Potential car parking impacts:
  – Adopt lower RMS rates to avoid fourth basement?

CASE STUDY 2
Six storey (base case) apartment building Blacktown (10-14 Gordon Street)

Site

Site area: 2,090m^2
FSR achieved base case 2:1 - 4,235m^2 GFA
30% uplift FSR 2.6:1 - 5,500m^2 GFA

GFA

Building height: six storeys X 3.1m per level (ignore roof plant, parapets) - 18.6 metres
30% additional height - 18.6 X 1.3 - 24.18 @ 3.1m/ level - 7.8 levels (assume 8)

From a review of the drawings the following assumptions are made:

> maintain ADG setbacks, over four levels 9 metre setbacks
> reduce street setback to gain additional GFA
> reduce upper two levels to reduce overshadowing impact (to a degree)

Areas comparison as follows:

Level	GFA base case (m^2)	GFA uplift (m^2)	
G	790	790 + 110	900
1	815	815 + 110	925
2	815	815 + 110	925

Level	GFA base case (m²)	GFA uplift (m²)	
3	815	815 + 110	925
4	600	600 + 60	660
5	400	400 + 50	450
6	–	360	360
7	–	360	360
Total	**4,235**		**5,505**

Apartment mix

Type	Size (approx. m²)	Rate	Base case	Uplift
Studio / 1 bed	58	15%	8 off	10 off
2 bed	75	70%	36 off	47
3 bed	95	15%	6 off	8
Total			**75 off**	**98 off**

Common Open Space/ Landscape area/ ramp area (base case and uplift)

Common area: 350m^2 at grade, + 150m^2 (roof terrace)
Landscape area: 700m^2 (including at grade common area noted above and deep soil of 200m^2)
Ramp area: 28m^2

Car Parking

Note that RMS standards are lower than Council DCP. The DA assumed the higher DCP number assuming market. For the purposes of this analysis, the higher DCP number and basement area has been used for the base case scenario and the lower RMS number assumed for for the uplift scenario. Alternatively, a part third basement of 600m^2 could be provided. All of this assumes the same rate for affordable housing.

Base case:

> DCP rate: 1sp/ 1 bed, 1sp/ 2 bed, 2 sp/3 bed, 0.4 visitor - 56 spaces
> RMS rate: 43 spaces
> Total 58 spaces provided (@35m^2/car)
> Car park area (all basement) 2,000m^2 (two levels)

Uplift case:

> DCP rate: 1sp/ 1 bed, 1sp/ 2 bed, 2 sp/3 bed, 0.4 visitor - 73 spaces
> RMS rate: 56 spaces
> Total 58 spaces provided (@35m^2/car)
> Car park area (all basement) 2,000m^2

Infrastructure Area

> none - single lot

Amenity Issues

> Solar access: potential overshadowing to adjoining properties to the south (blocks to south more potential) - upper levels further setback
> Streetscape/ context - reduced street setback
> Potentially reduced common area
> Potential car parking impacts:
  – Adopt lower RMS rates to avoid third basement?
  – Adopt parking rates somewhere between to accommodate uplift

CASE STUDY 3
Three storey (base case) apartment building adapted from Blacktown (10-14 Gordon Street)

Site

Site area: 2,090m^2
FSR achieved base case 1.2:1 : 2,420m^2 GFA
30% uplift FSR 1.6:1 : 3,150m^2 GFA

GFA

Building height: three storeys X 3.1m per level (ignore roof plant, parapets) - 9.3 metres
30% additional height - 9.3m X 1.3 - 12.1m @ 3.1m/ level - 3.9 levels (assume 4)

From a review of the drawings the following assumptions are made:

> maintain ADG setbacks, 6 metres separation, no further setback

Areas comparison as follows:

Level	GFA base case (m^2)	GFA uplift (m^2)
G	790	790
1	815	815
2	815	815
3	–	730
Total	**2,420**	**3,150**

Apartment mix

Type	Size (approx. m²)	Rate	Base case	Uplift
Studio / 1 bed	58	15%	6 off	8 off
2 bed	75	70%	21 off	27 off
3 bed	95	15%	3 off	4 off
Total			**75 off**	**98 off**

Common Open Space/ Landscape area/ ramp area

Common area: 350m^2 at grade, delete roof terrace - assume all at grade
Landscape area: 700m^2 (including at grade common area noted above and deep soil of 200m^2)
Ramp area: 28m^2

Car Parking

Note that RMS standards are lower than Council DCP.

> DCP rate: 1sp/1 bed, 1sp/2 bed, 2 sp/3 bed, 0.4 visitor - 34 spaces (needs a partial second basement level)
> RMS rate: 26 spaces (single basement level)
> Car park area (all basement) 1, 000m^2 per level

Infrastructure Area

> None - single lot

Amenity Issues

> Solar access: potential minor overshadowing to adjoining properties to the south (blocks to south more potential
> Potential car parking impacts:
  – Adopt lower RMS rates to avoid second basement for uplift scenario (can accommodate 30 cars in a single basement of 1,000m^2)

Appraisal of proposed planning changes and trade offs

As noted above, there are a sliding scale of opportunities depending on site size, configuration, and location. There are also a number of constraints that may result in the uplift of 30% additional height and floorspace not being achievable without amenity trade-offs if the above opportunities are not available.

A 30% height uplift may not achieve a floorspace uplift without trade-offs for a number of reasons:

- A 30% increase in height may be insufficient to increase the required number of floors whilst maintaining the same floor to floor height as the base case, unless the existing height limit includes additional accommodates roof plan and the like.
- For a six-storey building to increase to 8, an increase of 1/3 not 1.3 is required.
- **Example:** a six-storey building with a floor-to-floor height of 3.1 metre, and one metre parapet would be 19.6 metres. Adding 30% yields 25.5 metres. This equates to 7.9 storeys, not 8.
- **Example:** a nine-storey building with a floor-to-floor height of 3.1 metre, and one metre parapet would be 28.9metres. Adding 30% height yields 37.57 metres. This equates to 11.8 storeys, not 12. A 33% uplift (one third) would be needed to get a more logical height uplift.

Potential trade off: Reduce floor to floor heights, reducing ambient light or requiring bulkheads (potential ADG non-compliance)

- Apartment building levels above four storeys require an additional three metre setback under the *NSW Apartment Design Guide*. Such a building, with say adjoining lots to the rear and both sides, would need to reduce its footprint by three metres on each those three sides.

Potential trade off: reduce required setbacks, potentially reducing acoustic and visual privacy, and solar access to the apartment and overshadowing adjoining buildings (potential ADG non- compliance). Alternatively trade off may be to restrict the range of sites suitable for uplift.

- Additional floors may increase overshadowing to adjoining buildings, or public open space, requiring further setbacks or less additional floors.

Potential trade off: reduce the set backs of upper levels, overshadowing adjoining buildings (potential ADG non- compliance). Alternatively trade off may be to restrict the range of sites suitable for uplift.

Parts	Relevant standards	Potential amenity trade offs for noncompliance
1. Context	Apartment types	mismatch with adjoining apt types
	Character and context	mismatch with local character
	Precincts and sites	amenity impacts on adjoining sites precinct replanning required
2. Primary controls	Building envelope	overly bulky appearance
	Building height	potential overshading neighbours/ privacy
	Floor space ratio	exceeds site capacity, car parking area insufficient
	Building depth	lower residential amenity - light/ ventilation
	Building separation	lower residential amenity - light/ ventilation/privacy
	Street setbacks	insufficient space for landscape/ entry quality/ safety
	Side and rear setbacks	insufficient space for landscape - light/ ventilation/privacy
3. Siting guidelines	Orientation	less natural light
	Public domain interface	less privacy/safety
	Communal and public open space	less area for recreation/ socialising
	Deep soil	compromised landscape quality
	Visual privacy	less privacy
	Pedestrian access	lack of safety/ entry identity (front door)

Table 4. Potential amenity trade offs

Implications of housing design on health and wellbeing

The feasibility of building is only one side of the housing story. Another aspect is the types of buildings being built and the impact of poor building design on the mental health and wellbeing of its residents. Buildings are generally difficult and expensive to retrofit once built and sold, causing a rising concern of its effect on not only its current residents, but future generations.[14]

"While there are many factors that shape mental health and wellbeing, buildings with insufficient space, restrictive layouts, and poor acoustic and visual privacy, can negatively impact our quality of life, anxiety and stress."[15]

The High Life study by RMIT sought to understand the implications of apartment design policy, design and location of apartment buildings on the health and wellbeing of its residents.[16] The study used a sample of buildings across Sydney, Melbourne and Perth. It found that in Sydney, buildings implemented 57% of the policy requirements compared to 55% in Perth and 40% in Melbourne.

The top common priority features regarded when choosing apartments to live in were noted to be affordability and aesthetics across each of the study cities (Table 8). Comparisons were also made between areas of advantage and disadvantage. It found building safety and security ranked highly as key priorities regardless of disadvantage followed by natural light (Table 9).

Rank	Sydney	Perth	Melbourne
1	Aesthetics	Affordability	Affordability
2	Natural light	Aesthetics	Aesthetics
3	Apartment floorplan/layout	Apartment size	Close to shops
4	Affordability	Apartment/building security	Close to public transport
5	Apartment size	Car parking space	Natural light

Table 8. Reasons for selecting apartments.

Rank	High disadvantage	Mid disadvantage	Low disadvantage
1	Building safety/security	Building safety/security	Building safety/security
2	Natural light	Natural light	Natural light
3	Balcony/courtyard space	Storage	Natural ventilation
4	Natural ventilation	Natural ventilation	Thermal comfort control
5	Storage	Thermal comfort control	Balcony/courtyard space

Table 9. Priority features by area disadvantage

Buildings with lower performance against policy requirements were generally larger complexes with multiple buildings. Those with a higher performance had the following common features contributing to increased mental wellbeing.

14 https://www.rmit.edu.au/news/all-news/2018/jul/apartment-design-mental-health

15 https://www.rmit.edu.au/news/all-news/2018/jul/apartment-design-mental-health

16 https://cur.org.au/cms/wp-content/uploads/2023/09/designing-the-high-life-report.pdf

Solar, daylight and natural ventilation	Apartments with multiple windows and balconies
	Apartments with ratio between living room window to open plan floor area is over 10%
Indoor and private outdoor space	Apartments with main bedrooms over 10sqm and additional bedrooms over 9sqm
	Apartments with dedicated laundry rooms and external private storage
	Apartments that meet minimum balcony and courtyard size requirements
Acoustic and visual privacy	Apartments where bedrooms don't open into external circulation spaces
	Apartments with less than 50% of bedrooms are accessible from living area
Circulation space	Apartments that meet minimum corridor width requirements
	Apartments located on floors with less than 12 units
Communal open space	Apartments with larger communal open space
	Apartments with less hardscaped communal open space
	Apartments with grassed communal open space
Parking including visitor and resident parking	Apartments with an allocated car parking space
	Apartments with higher number of visitor parking
Apartment mix	Apartments with 3-4 bedrooms
	Apartments that are two-storey
	Apartments with courtyards or terraces

Table 10. Design requirements associated with good mental health

Market developers are unlikely to take up the planning bonus as the cost of building the base case, already outweighs the return on investment in the current Blacktown's housing market. While the addition of the planning bonus increases cost to build, it also increases the feasibility. However, it still would not meet the requirements for the return on investment required for the market developer. The financial viability would only be met with substantially more GFA.

A further incentive or provision is required to better incentivise developers to build affordable housing, otherwise sustainable, affordable and universal housing will not be feasible in areas in need of new housing. In addition, further investigation must be considered to understand the impact of the building's design on resident mental health. There must be a balance found between the cost building and design costs that have positive impacts on resident wellbeing.

Figure 11. Blackwattle Apartments, Glebe, City West Housing

Conclusions

Figure 10. Joynton Avenue, Zetland

The *NSW Apartment Design Guide* (SEPP 65) provides the most comprehensive and appropriate amenity standards for new apartment buildings. They are in common use and generally accepted by industry, the professions, and authorities.

Opportunities for uplift are identified at three scales of development:

> At the precinct scale (5 - 20 hectares) a diverse mix of building types, forms, heights, and amenities such as open space and other facilities can be configured with considerable flexibility, creating an optimal outcome.

> At the block scale (half to 3 hectares), opportunities, particularly in 'transition' sites adjacent to centres and rail stations, have the potential to be comprehensively redeveloped optimising individual lot outcomes with respect to uplift and amenity.

> At the individual lot scale (1,500 to 2,500 m^2 commonly), uplift opportunities are highly dependant and lot location and configuration. Corner sites, sites on wider road frontage, sites not immediately north of an adjacent lot present opportunities to minimise setbacks and stepping to avoid overshadowing, or creating privacy issues for adjoining buildings.

The appraisal of planning changes and potential trade-offs finds that a 30% height uplift may not achieve a floorspace uplift without trade offs for a number of reasons:

> A 30% increase in height is potentially insufficient to increase the required number of floors, while maintaining the same floor to floor height as the base case. For a six-storey building to increase to eight, an increase of 1/3 not 1.3 is required. A 1/3 uplift would be needed to get a more logical height uplift.
Trade off: Reduce floor to floor heights, reducing ambient light or requiring lower bulkheads (potential ADG non-compliance)

> Apartment buildings levels above four storeys require an additional three metre setback under the Apartment Design Guide. Such a building, with say adjoining lots to the rear and both sides, would need to reduce its footprint by three metres on each those three sides.
Trade off: reduce required setbacks, potentially reducing acoustic and visual privacy, and solar access to the apartment and overshadowing adjoining buildings (potential ADG non- compliance)

- Additional floors may increase overshadowing to adjoining buildings, or public open space, requiring further setbacks or less additional floors. ***Trade off: reduce stepping back upper levels, overshadowing adjoining buildings (potential ADG non- compliance)***

The development of a number of case studies identified how density uplifts can be achieved in practice on a single site. Initial findings were:

- A typical 2,000 square metre site on a block adjacent to town centre currently approved at six storeys could be increased by 30% floorspace (a 33% height uplift was used to round off the number of floors to achieve a 12-storey building) as follows:
  - a 2,100m^2 site assumed
  - ADG required setbacks maintained
  - reduced street setback to increase base footprint area
  - increased upper-level setbacks (beyond ADG) to minimise overshadowing
  - common open space areas maintained
  - reduced RMS rather than council DCP parking rate kept basement to two levels
- The same typical site could accommodate a three-storey base case increased by 30% floorspace (a 33% height uplift was used to round off the number of additional floors achieving a four-storey building) as follows:
  - a reduced 1,500m^2 site was assumed, to reduce land cost
  - required setbacks maintained, no upper-level setback required by the ADG
  - reduced street setback to increase base footprint area
  - common open space areas reduced in pro rata
  - reduced RMS rather than council DCP parking rate kept basement to one level
- The same typical site could accommodate a six-storey base case increased by 30% floorspace (a 33% height uplift was used to round off the number of additional floors achieving a nine-storey building) as follows:
  - assumed an increase in site size to 2,800m^2, to accommodate additional open space required, increased carpark basement, and setbacks
  - assumed a corner site to reduce setbacks on two sides
  - reduced street setback to increase base footprint area
  - common open space areas increased in pro rata (include roof terrace area)
  - reduced RMS rather than council DCP parking rate requires a three-level basement

Increasing the scale of development to the block level provides opportunities to identify 'opportunity sites' such as corners, sites on wider roads, south side blocks where setback and overshadowing constraints are significantly reduced without impacting amenity.

A number of Landcom precinct scale sites were reviewed to analyse the potential for uplift at this larger scale of development. Initial findings were:

- Each precinct was appropriately located near a local or town centre close to transport providing a high level of accessibility as well as open space.
- The size of the sites provided the opportunity for a diverse range of housing and built form types.
- Overall site base case yield could be increased by 30% with minimal or no amenity impact.
- Uplifts could be achieved with medium and higher rise buildings within the precinct.

Part 2
Economic Considerations

Purpose

In June 2023, the NSW Government announced that housing developments with a capital investment over $75m and an allocation of 15% of the total gross floor area to affordable housing, will gain access to the State Significant Development (SSD) planning approval pathway. These developments will also gain 30% floor space ratio boost and 30% height bonus above local environmental plans.[1]

The purpose of this briefing paper is to analyse the delivery of affordable housing under the New South Wales planning system, review the feasibility of development, and the ability to generate a risk appropriate return based on several assumptions.

To inform the briefing note a feasibility model was developed utilising a reference site within the Blacktown Local Government Area (LGA). This is the same site used in Part 1 of this paper. The model includes construction under current market conditions while taking into account sensitivities to construction costs, the market's ability to pay, and the option to utilise the new planning bonus (additional Floor Space) where affordable housing is provided.

1 https://www.planning.nsw.gov.au/news/new-planning-rules-mean-more-affordable-housing

About the site

The reference case used for this paper is a residential flat building located at *10-14 Gordon Street, Blacktown NSW 2148*. It is located in a well-serviced transport hub within a 15-minute walk from Blacktown station (7-minute drive). The local amenity includes public green spaces within a 5-minute walk and a large shopping centre within a 7-minute drive. Noting that the reference case has already been built, the feasibility study below explores the costs and considerations if it were to be built today for 3 different development schemes (3, 6 and 9 storeys).

Figure 12. Location of reference site[2]

2 https://www.realestate.com.au/property-apartment-nsw-blacktown-140488439

Feasibility considerations from stakeholders

As part of building the model and informing the assumptions used in the model, a number of key stakeholders were engaged to understand their considerations. These considerations impact the feasibility of each of the three development schemes.

Market Developer

Based on discussions with private and public market developers, a minimum of 17% margin on cost is the accepted return expected by developers to consider working with a Community Housing Provider.

Community Housing Provider (CHP)

Discussions with St George Community Housing (SGCH), a tier 1 CHP, found a minimum of 200 affordable dwellings were required to consider working with a market developer to deliver affordable homes. This figure may vary across different tiers of CHPs depending on size and capabilities.

SGCH also indicated the average discount given for affordable housing dwellings is $500 per sqm. The current market supply is skewed toward 2-bedroom, 2-bathroom homes. While the preference for CHPs is to purchase homes at the cheapest cost (2-bedroom, 1 bath), the current market supply of an additional bathroom adds approximately $50,000 to the market value. Conversely, if affordable homes are integrated with market homes, it would cost more for the developer to customise floor plans for affordable housing. In summary, reducing bathrooms for affordable housing to 1 will be cheaper for CHPs to buy but will cost market developers more to build.

Affordable Housing Tenant

Median weekly household income in Blacktown is $2,107[3]. Using a standard 30% of income for rent, the average person could afford to pay up to $632.1 per week. While there is no nationally recognised definition of affordable housing eligibility, we have, for modelling purposes, assumed an affordable housing occupant can afford up to $442.47 per week on rent.

3 https://abs.gov.au/census/find-census-data/quickstats/2021/LGA10750

Assumptions

The table below outlines the sources and reasoning for each of the figures used in the feasibility study.

Assumptions	
Gross Floor Area (GFA)	An average GFA of 81-85m² per dwelling with approximately 1 parking spot per dwelling and a guest parking allocation across the development.
Universal and sustainability costs	An estimated $6,000 per sqm is used based on silver level Liveable Housing Design (LHD) and 7 star NatHERS for all affordable housing developments An additional 5% or $25,000 can be added per dwelling for gold or premium level LHD.
Professional and legal services costs	Uses average costs informed by discussions with private and public market developers.
Land and acquisition costs	Utilises an estimated cost to buy the 3 parcels of land, where the reference case was developed. This was informed by previous sales history and an applied pricing index. References: • 8 Gordon Street 2022 Valuation – Valuer General: Spatial Service | Department of Customer Service, Valuer General, Property NSW. • 10-14 Gordon Street, Valuation calculated based on per square meter cost of 8 Gordon Street. • 12 Gordon Street – Sold June 28, 2018 for $1,170,000[4] • 10-14 Gordon Street, each block approximated using the sold value of 12 so 3x 1.17 mil with a 23% price increase.
Indicative Sale Prices	Uses sale price of a unit from private treaty as of 8 Sep 2023[5]
Infrastructure contributions	Indicative per dwelling assumption calculated from the DA (2022) indexation rates applied in accordance with the applicable Blacktown City Council Contribution Plan. *The new Housing and Productivity Contributions has not been factored but will take effect in October 2023[6].*

Table 5. Assumptions used and where they were sourced

4 https://www.realestate.com.au/property/12-gordon-st-blacktown-nsw-2148/

5 https://www.domain.com.au/207-10-14-gordon-street-blacktown-nsw-2148-201866718

6 https://www.planning.nsw.gov.au/policy-and-legislation/infrastructure/infrastructure-funding/improving-the-infrastructure-contributions-system

Universal Housing

Landcom defines universal housing as homes that are practical, flexible and meets the needs of people at different ages and abilities over time.[7] These homes are designed with the aim of servicing most people over their lifetime without the need to adapt or specialise design. It offers design features such as that can be modified later to meet future needs of occupants.

As Australia's population ages, universal housing becomes increasingly important to reduce the risk of trips and falls and avoid the use of stairs. In a survey conducted by Australian Housing Aspirations showed that 26% of older respondents (aged 55+) had downsized with a further 29% considering downsizing[8].

Universal housing also offers benefits to people living with a disability. While physical disabilities are prevalent among all age groups, it increases with age.[9] Universal housing aims to embed inclusive designs that benefit all occupants such as wider door frames and access to the front door with no steps for wheelchairs.

The feasibility study reflects St George Community Housing's (SGCH) use of the silver level Liveable Housing Design (LHD). It incorporates 7 core liveable housing design elements that reduces the cost of modifying features if required.[10]

SGCH estimates the cost of a silver level LHD at $6,000 per sqm and is included in construction costs. A further 5% or $25,000 can be added to construction costs if including a gold or platinum level LHD to reflect the additional GFA required for higher level design requirements.

Sustainability

The Nationwide Housing Energy Rating Scheme (NatHERS) provides energy ratings for new homes. It helps create energy efficient and resilient homes that cost less to run and maintain.[11] The updates to the National Construction Code (NCC) energy efficiency requirements from a 6 to 7-star NatHERS rating, prove that occupants can save an average of $183 on energy bills each year. SGCH maintains a 7-star rating for all affordable housing developments.

Despite the benefits of energy efficiency and cost savings, an argument can be raised that having an energy efficient home is a hurdle to affordability. Sustainability measures add to the upfront purchase price of homes and while there may be operational savings, it creates a barrier for those unable to raise a deposit to spend more upfront to access whole-of-life benefits.

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7 https://universaldesignaustralia.net.au/wp-content/uploads/2015/05/Landcom-Guidelines.pdf

8 https://www.ahuri.edu.au/sites/default/files/migration/documents/AHURI-Final-Report-325-Effective-downsizing-options-for-older-Australians.pdf

9 https://www.aihw.gov.au/reports/disability/people-with-disability-in-australia/contents/people-with-disability/prevalence-of-disability#dis_type

10 https://livablehousingaustralia.org.au/lha-silver/

11 https://www.nathers.gov.au/

A study undertaken by UNSW and RMIT[12] found that apartment blocks that met sustainability standards were focused more on expensive stock meaning to create affordable homes, sustainability becomes the trade-off.

Feasibility Findings

Scenarios were run on building a 3, 6 and 9 storey development on the reference site in Blacktown to demonstrate the commercial feasibility of development. Inputs and outputs of the feasibility model are summarised in Table 6 .

1. For each scheme, universal, sustainable and affordable homes were not found to be feasible in the current Blacktown market. For affordable housing to be feasible, the cost of land must significantly decrease or the sale price of the market homes must appreciate, to offset the reduction in the sale price of affordable homes. A more robust policy process would have defined and evaluated multiple options to demonstrate that the proposed settings are the best way to deliver the intent of the policy. At this stage, limited details on options analysed have been released – we suggest the following considerations be included in any future options analysis.
   a. Sensitivity analysis on whether differential affordable housing rates (across locations) will produce additional affordable housing.
   b. Potential for transferable inclusionary zoning requirements to provide flexibility and improve feasibility.
   c. Impact of pursuing non-permanent transfer policies on the overall provision of Social and affordable housing.
2. The feasibility model found that increasing the number of homes being developed, reduced the cost of land per dwelling through economies of scale.
3. The main barrier to the participation of market developers is the 17% margin on cost required to utilise the planning bonus. All schemes result in the development being delivered at a financial loss, with the smallest percentage loss being for the 9 storey building. Initiatives that reduce the cost of construction should be pursued as this will improve feasibility fundamentals.

12 https://www.ahuri.edu.au/research/final-reports/400

Comparison of costs and margins

Interventions	3 Storey	6 Storey	9 Storey
Base case	Cost to supply: $671,351 Land cost per unit: $143,813 Estimated sale price (current market): $562,500 Margin on cost: -26% Sale price increase required to meet investment hurdles: 57%	Cost to supply: $626,746 Land cost per unit: $86,288 Estimated sale price (current market): $562,500 Margin on cost: -20% Sale price increase required to meet investment hurdles: 52%	Cost to supply: $626,746 Land cost per unit: $86,288 Estimated sale price (current market): $562,500 Margin on cost: -20% Sale price increase required to meet investment hurdles: 52%
Planning bonus (30/15) Note: the estimated CHP purchase price is based on the net present value of future cash flows. This figure is influenced by rental receipts and operating expenses.	Cost to supply market stock: $660,930 Land cost per unit: $110,625 Estimated CHP purchase price (ex HAFF): $222,700 Margin on cost: -28%	Cost to supply market stock: $605,973 Land cost per unit: $66,375 Estimated CHP purchase price (ex HAFF): $222,700 Margin on cost: -20%	Cost to supply market stock: $579,791 Land cost per unit: $44,250 Estimated CHP purchase price (ex HAFF): $222,700 Margin on cost: -16%
Universal housing (Silver LHD included in construction cost)	Addition 5% on construction for Gold/Platinum $25K	Addition 5% on construction for Gold/Platinum $25K	Addition 5% on construction for Gold/Platinum $25K
Sustainability mandates	Included in construction cost	Included in construction cost	Included in construction cost
Median household income (Blacktown)	$2,107	$2,107	$2,107
Assumed Average Rent	$400	$400	$400
Household income required (to afford rent)	$1333 (after tax) $91,350 per year (before tax)	$1333 (after tax) $91,350 per year (before tax)	$1333 (after tax) $91,350 per year (before tax)

Table 6. Feasibility summary

Location Analysis

Using common assumptions for construction scope and cost, the table below demonstrates how the margin on cost and, therefore the feasibility of the build increases in developments where location and proximity to premium amenity are highly valued. This corresponds to a sale price that is significantly higher while the cost to supply is only marginally higher due to land prices in those areas.

Note that an amount of $15,338 has been selected to represent state and local levies in the model (as part of infrastructure costs). The actual levy payable will vary between locations based on local policies. The selection is modest, and likely to be larger in most cases. This modest amount is adequate for modelling purposes however, developments that are only just meeting investment hurdles may not be viable with more accurate or current information.

The analysis in Table 7 demonstrated a divide of feasible builds between areas of higher amenity (closer to the coast and proximity to economic centres) and areas with lower amenity value for example Sydney North and East.

Land value

For this analysis, lots of approximately 2,000 square metres of land were selected and the 2022 Valuer Generals land value was used to represent the intrinsic value of the block. It is important to note that these values do not represent the final acquisition cost of the land due to market movements, demand and other capital improvements. In practice, the market adjusts land values upward to transfer some of the windfall developer margin to the landowner. While we have low levels of confidence in the currency of these valuations, they are adequate as an input for modelling a comparative analysis between places.

Sale price and rent

The sale prices are indicative of a 2-bedroom unit in each location. These prices were sourced from RealEstate.com with sales prices from the last 3 months. The median rental figures are informed by rent data from June quarter 2023.[13]

13 https://www.facs.nsw.gov.au/resources/statistics/rent-and-sales/dashboard)

	Blacktown	Liverpool	Chatswood	Hurstville	North Sydney
Indicative land value	$5,030,000	$8,120,000	$13,700,00	$4,700,000	$13,500,000
Sale price for 2-bedroom unit	$570,000	$628,000	$1,285,000	$868,000	$2,427,000
Median rent for 2-bedroom unit	$510	$560	$800	$620	$720
Base Margin on Cost	3 storey: -26% 6 storey: -21% 9 storey: -17%	3 storey: -30% 6 storey: -21% 9 storey: -14%	3 storey: 15% 6 storey: 39% 9 storey: 57%	3 storey: 14% 6 storey: 22% 9 storey: 28%	3 storey: 120% 6 storey: 164% 9 storey: 198%
Planning bonus Margin on Cost	3 storey: -29% 6 storey: -25% 9 storey: -22%	3 storey: -30% 6 storey: -24% 9 storey: -18%	3 storey: 16% 6 storey: 35% 9 storey: 49%	3 storey: 9% 6 storey: 13% 9 storey: 18%	3 storey: 115% 6 storey: 150% 9 storey: 176%

Table 7. Location analysis

Briefing notes

Considerations

Design

A 30% increase in height may be insufficient to increase the required number of floors, whilst maintaining appropriate building setbacks designed to maintain urban amenity.

A 30% height uplift may not achieve a floorspace uplift without trade-offs.

At the precinct scale (5 - 20 hectares) the opportunity to develop a diverse mix of building types, forms, heights, and amenities such as open space and other facilities can be configured with considerable flexibility, creating an optimal outcome minimising negative outcomes.

At the block scale (half to 3 hectares), opportunities are more limited, often relying on 'transition' sites adjacent to centres and rail stations, to be comprehensively redeveloped to optimise centre site outcomes with respect to uplift and not adversely impacting amenity.

At the individual lot scale (1,500 to 2,500 m^2 commonly), uplift opportunities are highly dependant on lot location and configuration. Corner sites, sites on wider road frontage, sites not immediately north of an adjacent lot present opportunities to minimise setbacks and stepping to avoid overshadowing, or creating privacy issues for adjoining buildings.

While the ADG sets out case study examples, there is a lack of comprehensive residential and mixed-use precinct best practice case studies that include metrics and principles for precinct and block structure, including open space.

There are a number of mismatches between strategic planning documents and Code SEPPs in particular. This negatively impacts outcomes and is confusing.

Economic

Market developers are unlikely to take up the planning bonus as the cost of building the base case, already outweighs the return on investment in the case study analysed, in the current Blacktown housing market.

While the addition of the planning bonus increases cost to build, it also increases the feasibility. However, it still would not meet the requirements for the return on investment required for the market developer. The financial viability would only be met with substantially more GFA.

Sustainable, affordable and universal housing will not be feasible in many areas in need of new housing without further incentives.

There is a relationship between the economics of building and design and design for resident wellbeing.

Potential for uplift is improved on sites with higher land value.

Best practice policy development includes the nomination and evaluation of multiple options before finalising the design of a scheme. The UNSW Cities Institute have the capacity and expertise to partner with government to do undertake the following to inform future policy review:

Recommendations

Design and economic

Analyse sites to determine if a 30% increase in height will equal a 30% uplift in total floors.

Analyse sites on a site by site basis to ensure that health and amenity impacts are minimised, including, but not limited to: reduced natural light and ventilation, overshadowing, adverse impacts of wind, noise and air pollution and the cumulative impacts of multiple developments on traffic generation or existing social infrastructure including open space, social infrastructure, and transport.

Retain and strengthen the existing SEPP 65 as the most comprehensive and appropriate amenity standards for new apartment buildings.

Develop a comprehensive residential and mixed-use precinct best practice case study template that includes metrics and principles for precinct and block structure, including open and green space. These should highlight the key amenity issues from the ADG included in the report, applied to the precinct and block scale. The best practice template would be practical and provide minimum benchmarks rather than controls. This guide would assist state government, councils, and the private sector in establishing optimum densities and amenity.

Undertake a review of relevant State Environmental Planning Policies (SEPP's) to identify improvements to optimise housing densities integrated with amenity. Focus on non-place based Code SEPP's where there are mismatches between planning objectives and development outcomes.

Provide further incentive or provision to better incentivise developers to build affordable housing.

Analyse the impact of the proposed 15% uplift scheme on delaying replacement and renewal of aging stock outside of Sydney's North and East.

Undertake a sensitivity analysis on whether differential affordable housing rates (across locations) will produce additional affordable housing.

Develop collaborative research to reduce the cost of construction to allow affordable housing mandates to be more feasible in more areas, more often.

Establish mechanisms to enable transferable inclusionary zoning requirements to provide flexibility and improve feasibility.

Investigate the potential impact of pursuing permanent transfer policies (i.e. a requirement for affordable housing in perpetuity) on the overall provision of social and affordable housing and its management and renewal.

Conclusions

Market developers are unlikely to take up the planning bonus as the cost of building the base case, already outweighs the return on investment in the current Blacktown's housing market. While the addition of the planning bonus increases cost to build, it also increases the feasibility. However, it still would not meet the requirements for the return on investment required for the market developer. The financial viability would only be met with substantially more GFA.

A further incentive or provision is required to better incentivise developers to build affordable housing, otherwise sustainable, affordable and universal housing will not be feasible in areas in need of new housing. In addition, further investigation must be considered to understand the impact of the building's design on resident mental health. There must be a balance found between the cost building and design costs that have positive impacts on resident wellbeing.

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About the UNSW Cities Institute

We unite world class research with a real world approach, engaging with academia, industry, government and community groups to shape policy and pioneer meaningful change in our cities. We lead with deep experience in design methods, sustainable architecture and healthy urban and strategic planning.

Academic thinking grounds our practical initiatives in robust research. We connect those with insights with those that shape and deliver city outcomes, ensuring a practical application for policy, change and impact that ultimately benefits the communities around us.

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In the spirit of reconciliation, the UNSW Cities Institute acknowledges the Traditional Custodians of Country throughout Australia and their connections to land, waters and community. This publication was prepared by the UNSW Cities Institute. November 2023.

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