



Compacting the city centre: densification in two Newcastles

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**SPECIAL COLLECTION:
URBAN DENSIFICATION**

RESEARCH

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ABSTRACT

The compact city and the associated process of densification have attained almost hegemonic status as a sustainable urban form. Seeking to counteract the negative impacts of sprawl, urban densification has usually focused on areas beyond the city centre. However, a renewed attraction of the urban core is altering patterns at a time when other trends, including the decline of retailing and commercial activity, are also changing demands for space in the city centre. This paper investigates different approaches to the use of urban densification as part of strategies for the regeneration of the city centre. Drawing on two case studies—Newcastle upon Tyne in the UK and Newcastle in New South Wales, Australia—it considers the different mechanisms by which city authorities and their development partners are seeking to densify the city centre, and examines the tensions created by the process in these two contexts. In addition to document analysis, data are derived from symposia based in both cities as part of the future of the city centre project led by the authors. Contributors included representatives from local government, non-government organisations, business and community groups. The outcome is an appraisal of contrasting approaches to the densification of city centres.

POLICY RELEVANCE

Coherence of city form and consistency throughout the city centre are important objectives, and great differences in density disturb this unity. The city centre is not a project, but a continuous process. Thus, it benefits from fine grain developments on the principle of a rich built environment being generated through small contributions by numbers of people over time. A concept is proposed that densification has positive outcomes up to a point at which negative effects begin to occur. Density is readily measured, but the question remains where the balance point is for each city. There is also a notion that negative impacts may occur before a stipulated density is realised. Support is needed to develop a virtual city model for all cities, and funding to advance city information modelling for all aspects of sustainability, to encourage optimum levels of densification to be achieved.

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1. INTRODUCTION

While the drive towards more compact cities and urban densification as an alternative to continuing urban sprawl may have achieved almost hegemonic status amongst planners and policy-makers, the process is not without its downsides. McFarlane (2016) notes that density has often been cast as a solution not just to urban issues but also for global concerns about climate change and sustainability, and has been viewed as central to fostering economic growth. Density has taken on the mantle of being a desirable and positive alternative to the allegedly less environmentally sustainable and economically productive sprawl against which it is compared. Strong arguments are made that densification also provides social benefits, encouraging social connections, networks and fostering social capital; and providing a means to help address social inequalities.

Set against these positives, dense patterns of living and working have their own negative effects, creating what de Roo (2000) terms the dilemma of the compact city. Densification of the city centre can come at a cost, such as the reduction of green spaces and increased infrastructure (Naess *et al.* 2020). Where compact living and working become overcrowded and congested, there can be negatives of ill-health, pollution and poverty. Neuman (2005) argues that high density is neither necessary nor sufficient to develop a sustainable city. He terms it the compact city fallacy, underscoring that the goal of sustainability may not be achieved solely by city form. Rather he suggests that co-evolutionary processes could take place between the city centre, its inhabitants and users, and the wider socioeconomic environs. Moreover, the future of a sustainable city centre may be as much about culture, governance and digital technology as it is about the established pillars of environment, economy and society. Nevertheless, for most city shapers around the world, addressing compact urban form is central to their attempts to accommodate increasing numbers of people whilst contributing to climatic and sustainability goals. In the debate over sprawl versus densification, the processes operating in the city centre are often overlooked as the gaze focuses on changes in suburban areas (Harrison *et al.* 2020).

This paper enters the debate by considering the structure of compact city centres and processes of densification, identifying that although the urban core has often been viewed as already dense, in comparison with other urban areas, there can be considerable variation between and within city centres. The empirical lens is two specific case studies: the city of Newcastle upon Tyne in the UK and Newcastle in New South Wales, Australia. Similarities between these two cities run much deeper than just the headline. The UK Newcastle is a regional capital, and the latter is the second largest city in New South Wales. They are similar sizes with city populations of over 300,000, and approximately 800,000 in the metropolitan areas. They both have maritime histories, and economies that were based on heavy industry, especially coal. There has been no coal production in Newcastle upon Tyne for several years, but it is still a major contributor to the economy in Newcastle NSW. However, concerns about global climate change may see an end to it, earlier than assumed. Names are also culturally significant with the same suburbs being found in both cities. This paper will explore the different mechanisms by which these city authorities, their regeneration partners and developers are seeking to densify the city centres, and it examines tensions created by the processes in these two contexts. Density of building is measurable in terms of the floor area-to-plot site ratio and dwellings per hectare or acre. The number of people implies the density of activities, but it does not actually measure it. Although there may be a need to increase built space for an increasing population, the real objective is a sustainable city. Therefore, more nuanced measures of sustainability are required. If there is a situation where each city reaches its own optimum density for sustainability, then there needs to be a means of assessing where this optimum lies.

2. CONCEPTUAL FRAMEWORKS

2.1 COMPACT CITIES

Compact cities have become a mantra to achieve sustainable cities because it is argued that they can substantially improve cities' environmental, social and economic performance. The key characteristics are:

- dense and adjacent developments and activities
- public spaces, including squares, parks and streets
- effective public transport systems
- walking distances within the city centre
- accessibility to work, services and provisions.

Therefore, a compact city is identified by high-density, mixed-use, efficient transport, and socially and economically diverse activities. It is notoriously difficult to assess the impact that multiple features of the compact city have on a range of economic, social and environmental aspects of sustainability; but a well-designed compact city should be able to achieve all these sustainability benefits and more (Dempsey & Jenks 2010). Nevertheless, policy-makers can be selective in those aspects of the compact city that suit their sustainable urban model, often concentrating on increasing densities to contain urban sprawl (Jones *et al.* 2010) and largely reflecting their economic or environmental interests (Giddings *et al.* 2002). Yet, other aspects may become neglected. For instance, citizens with less access to the public realm and green space are more likely to suffer with their physical and mental health (Mitchell & Popham 2008). The term 'compact city' tends to be associated with a monocentric urban structure, to counteract urban sprawl and decentralisation, but some city centres are developing as clusters. New growth hubs appear as a variety of spatial forms to create new centralities. This emerging pattern may have negative effects on traditional centres within the cluster, as resources are focused on new areas of development, and there is a notion that the existing may be left behind. Therefore, it needs to be examined whether the monocentric urban structure is the only configuration that can deliver the compact city centre. Alternatively, the new polycentric compact city model can combine density in terms of housing, jobs and urban amenities, as well as proximity, accessibility to public transit and diversity of land uses in order to establish an urban hierarchy that includes the city centre (City of Johannesburg 2016).

Compact city centres are often associated with high-rise buildings as a means of achieving high density. City cores are being systematically reconfigured through speculative building as accommodation for neoliberal elites. The widespread construction of vertical, gated towers now rivals the more familiar gated suburban estates. High-rise densification is presented as smart growth in which it is claimed that environmental sustainability is increased. Regulation is perceived as a barrier by developers and relaxed by authorities, but densification through verticalisation forms a simple economic imperative that neglects social engagement and inclusive governance (Graham 2015). Comparisons between building developments of different heights demonstrate that high-rise developments are not necessarily more dense. It has been shown that districts of six to seven stories high in Paris are in fact denser than 20-storey areas of Hong Kong, with floor area-to-site ratios being 5.75 and 4.32, respectively (OECD 2012). According to Graham (2015), criticism of the assertion that high-rise delivers high densities, green spaces and cost-effective buildings is gaining traction. This concentration on density is justified by a list of positive benefits. They include: an enhanced public realm; reduced energy consumption; less pollution; a greater diversity and choice of workplaces; increased social communication; and reduced travel, decreased car dependency and less commute time. The underlying premise is that density in the compact city has multidimensional positive effects on life in the city centre (*Figure 1*).

Accessibility and ease of movement are major tenets of the compact city centre, and several studies have associated sustainability with public transport (*e.g.* Naess & Sandberg 1996). A case has also been constructed that in denser places there is less need for car transport and more opportunities for walking. However, these benefits of high-density compact cities are contested. There is a concern that as density increases, so may the negative effects. Compact city centres can produce high levels of noise pollution due to the close proximity of dwellings, transport lines, business activities, service facilities and leisure activities. A key concern is the potential loss of green spaces in urban areas and the prospect of developing green fields beyond, due to congestion associated with high density. Development inevitably generates pressure from the private sector. The public realm might be perceived as a cost that could be turned into profit, if it were built upon. There

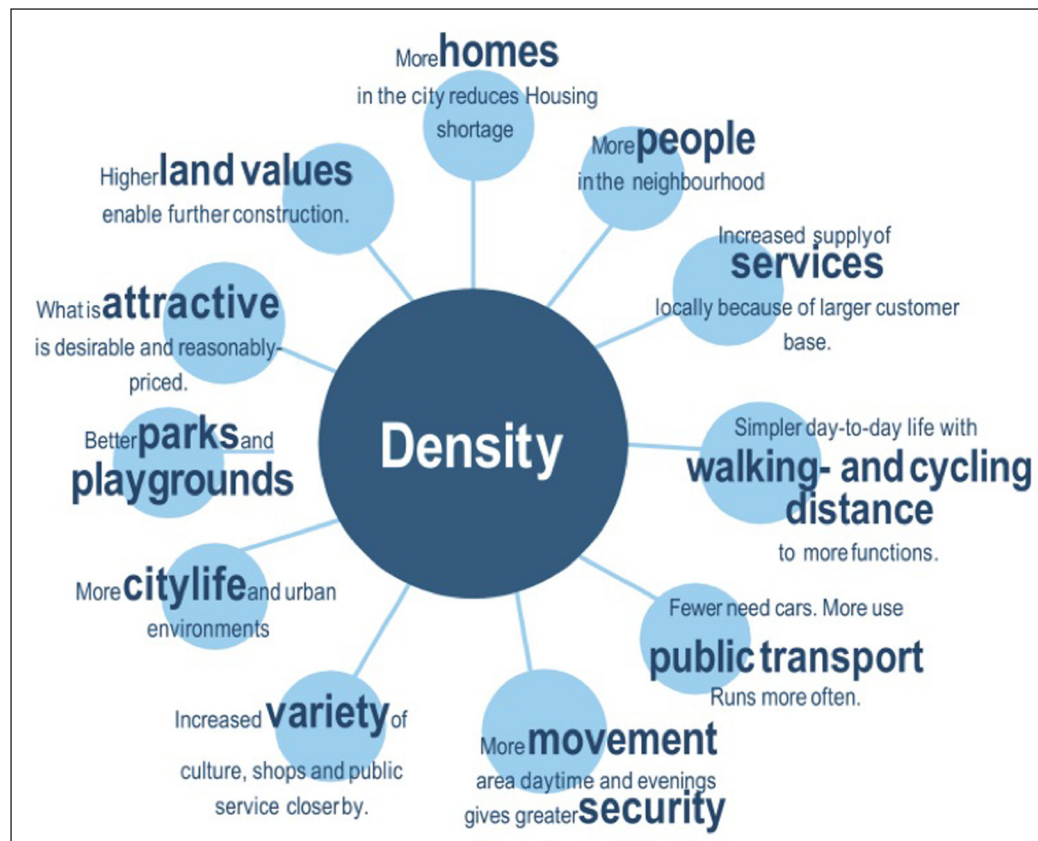


Figure 1: Positive effects of density.

Source: Bibri *et al.* (2020).

might also be a negative impact on social sustainability, including loss of sense of attachment and dissatisfaction with the development of dwellings. Increasing residential density is an important principle of compact urban development in theory and policy, but it can be a contentious issue in practice (Jenks & Jones 2010). Living in the city centre may be inexorably a more intense experience than the suburbs. Indeed, it is one of the main reasons why the suburbs were created in the first instance. In the city centre, there can be stress created by reduced living space and a concern over lack of privacy. Moreover, it is suggested that compactness could be partly responsible for increased levels of crime. Additional people and movement by day and evenings could offer greater security through defensible space, but there reaches a situation in which people become an anonymous mass rather than the eyes on the street (Jacobs 1961). Critics of the compact city also highlight a large ecological footprint that extends beyond the city boundary. However, one advantage of the compact city is that the boundaries are clearly defined, allowing for productive agricultural land outside the city (Bibri *et al.* 2020). So, perhaps generic problems of urbanisation should not be associated with the compact city form in particular (Lim & Kain 2016).

2.2 CITY CENTRE DENSIFICATION

Also known as urban consolidation and urban intensification, densification is commonly understood as a process whereby new buildings are (re-)constructed at higher densities. It is also associated with an increase in population density, economic and social activity. Williams *et al.* (1996) set out the main features, differentiating between characteristics of built form and those associated with urban activities (*Table 1*).

A significant issue is that there is no established definition of high density, and interpretations vary in cities around the world (Dempsey 2010). Comparative urbanism may provide a means of framing the data. This would involve a systematic study of the similarities and differences between cities. Although density has no pre-given geography (McFarlane 2016), most studies explore densification within neighbourhoods dominated by residential development: either suburbs or the inner-city areas that surround the city centre. In this paper, the focus is on the city centre and the processes and nature of densification taking place. Encouraging high urban density associated with compact

BUILT-FORM INTENSIFICATION COMPRISES:

- The redevelopment of existing buildings or previously developed sites at higher densities
- A subdivision or conversion of buildings
- Building additions and extensions to existing structures
- The development of previously undeveloped land

ACTIVITY INTENSIFICATION INCLUDES:

- The increased use of existing buildings or sites
 - Changes of use, leading to an increase in activity
 - An increase in the number of people living in, working in, or travelling through an area
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Table 1: Types of intensification.

cities has become international urban planning orthodoxy (Crommelin *et al.* 2017) and has been largely immune to critical study (Perez 2020). Infill buildings can contribute to the coherence of the urban fabric, and the reuse and upgrading of existing buildings can have a positive effect on the image of the city bringing more people into the centre to increase its vibrancy, and encouraging the development of cultural activities and facilities. City centres are changing from industrial, office and retail to cultural, healthy and for life. Culture and cultural activity lie at the heart of urban renewal, and could be instrumental to what makes the future city centre attractive, creative and sustainable (Egoreichenko 2018). People are at the core of intensification. As well as bringing people into the city centre, there is a recognition that an increased residential population is essential for sustainability. Yet, there is apprehension that intensification may lead to loss of amenity, especially private and public green space that contributes so much to the environment, and air quality in particular. Concerns also come from long-term associations of density with specific socio-spatial and political difficulties. New types of residents may not create communities or merge with existing ones. There can be mutual accusations of bad-neighbour effects, particularly in mixed-use areas, as the urban environment becomes progressively more noisy. Intensification has all the advantages associated with greater activity in the city centre until it reaches the tipping point, after which infrastructure overload, overcrowding, congestion, air pollution, health hazards and environmental degradation can all become evident (Tonkiss 2013). One consequence of this perspective is that consolidation of the city centre will have to overcome such negative connotations to make development appealing. According to Williams *et al.* (1996), there is limited empirical evidence of definite benefits arising from consolidation. In joining the debate over urban densification, the convention is to consider the volumetric dimensions of density (Elden 2013), but there are also temporal aspects of urban densities that exist beyond the visible, and the ability to calculate such densities. The rhythms of density in the centre fluctuate, reflecting residents' activities and commuting movements into and out of the city (Tonkiss 2013).

2.3 DENSIFICATION IN THE UK AND AUSTRALIA

The practice of densification in the city centre is not neutral. It can be the outcome of processes of direct and indirect displacement, with their own political layering. The valorisation of some spaces in the city centre over others, alongside the prioritisation of some of these spaces, enable different forms of urban densification and occupation to occur. Whilst both countries have adopted neoliberal practices and governmentalities, McGuirk (2005) asserts that it does not mean state intervention has ended or that in adopting similar political agendas, the outcomes are reproduced in every city. In both the UK and Australia, whilst there has been a shift from social-democratic to neoliberal government, it has been accompanied by state mechanisms through which it can influence spatial outcomes. Along with the different histories, geographies and path dependencies of cities, neoliberal forms of urban planning and development differ, charting their own ways through the neoliberal maze. A shared approach to implementing greater urban densification has been the assembly of regeneration partners, able to circumvent established practices of urban change and designed to generate new, smoother partnerships and collaborations between public and private sector. Based on a limited agenda, such organisations act as growth coalitions, not only to harness available resources

to address urban change, but also to foster ways of delivering transformation. An appraisal of this transformation could be a comparative analysis of the ways that the characteristics are applied in city centres and the extent of convergence and divergence between them.

In the UK context, families with children constitute just one household in five. Conversely, there is a rapid growth in the number of households. Thus, central and local government will need to reconsider patterns of urban intensification. Single-person households account for two-thirds of projected growth in households to 2031. As household sizes are falling, the average density of dwellings would need to increase by 7% over this period just to maintain existing population densities. Therefore, abandoning intensification over the next few decades is not a realistic option in the UK, and especially in England. According to Melia (2010), if central and local government wish to minimise the loss of greenfield land and prevent a housing crisis without worsening the quality of life, intensification and more city centre housing are indispensable elements of a workable solution. There has been a marked concentration on development within existing urban areas, and brownfield land redevelopment rates are running at relatively high levels (ODPM 2003).

Urban consolidation to increase city populations has been the major planning policy in Australia's larger cities. Central city areas are now growing high-rise blocks (Searle 2004). Reviews of compact city urban policy in Australia have highlighted how policy initiatives to increase centralisation have led to key employment sectors and residents locating in the city centre. Low-density urban expansion had been the standard solution to accommodating population growth in Australian cities. The capital cost may be lower, but the long-term costs for households, that is, travel, time and social, the impacts on the natural environment, and the costs of infrastructure and maintenance for governments are considerable. Polycentric development, which aims to create additional centres, is one solution. Creating more specific compact development around a public transport interchange is another. As the majority of employees travel into the city, improving accessibility by co-locating jobs, people and facilities could be significant to city centre regeneration (Commonwealth of Australia 2011). This is known as transit-oriented development, with the objective of creating mixed-use high-density nodes, incorporating residential, offices and retail, as well as opportunities for education, leisure and recreation, adjacent to the interchange. A short walking distance to these facilities avoids complex journeys brought about by changing to another form of transport, and enables location-efficient development (Croese 2016). Australia has a tradition of private vehicles, but more passengers of all income levels may be encouraged to use public transport if an interchange can provide a link to city centre activities.

In exploring the character and nature of densification in the city centre, there are similarities to the urban agglomeration as a whole with its drive towards greater compactness and sustainability, but also differences reflecting the dynamic and particular character of the city centre (Rogerson & Giddings 2020). By considering the contexts of urban planning and policy in the UK and Australia, city centre densification can be encapsulated through both the changing nature of the built form of the city centre and the activities encouraged to exist in this space (*Table 2*). In the remainder of this paper, the processes and nature of densification in the two specific city centre case studies will be examined, drawing out the ways in which there is both convergence and divergence between the two Newcastles.

BUILT-FORM DENSIFICATION	ACTIVITY DENSIFICATION
Compact city structure	New purpose-built buildings
Redevelopment of buildings or developed sites at higher densities	Reuse of existing buildings for new activities
Subdivision or conversion of buildings	Increased number of people living in the centre
Extensions to existing structures	Growth in the number of people working in the centre
Development of previously undeveloped land	Attraction of temporary residents
Verticalisation of building form	Improved transport infrastructure for mobility
Pressure on green space provision	Enhanced movement and flows

Table 2: Densification in the city centre.

3. METHODS

The centrepiece of the analysis of densification in the two cities of Newcastle involves key planning documents produced by the municipal authorities, articulating their vision for the future of their respective city centres. These form the upper level, tier 1, of the approach to the data collection (see [Appendix A](#)). In giving these plans such centrality, it is recognised that city plans are situated. Their generation is more in response to statutory and regulatory obligations placed on both municipal authorities by their respective national governments than as a response to a groundswell need to build a local consensus on the city's future. They also represent the outcome of a process of neoliberal governments designed to mobilise particular forms of urban growth coalitions, especially around economic growth and residential development, and increasingly attempt to address limited issues of urban sustainability.

First, the key plans for each city (Newcastle City Council & Gateshead Council 2015; NSW Government 2018) position the centre within the larger hinterland of the local authority areas, viewing the urban core as nested within the wider urban region. The vision for the city centre is thus viewed as contingent, although in both case studies the urban core is viewed as central to the future of the urban agglomeration as a whole. Second, the documents privilege a focus on economic prosperity and urban growth alongside aspects of sustainability. The underlying assumptions are about population expansion and additional services, housing, employment and other facilities that enact densification. The possibility of decline is viewed throughout as market failure and the need for further intervention rather than considering that it may be a rejection of intense urban living.

Given such a situated nature, the two documents arguably represent a partial and partisan view of the city authored by one actor—the local authority—in each case. However, in achieving its ambitions, local government is only one partner, able to propose a vision that requires the active engagement of multiple other partners for realisation. Fundamentally, these planning documents act as discursive papers, designed to mobilise and align selected actors to join an urban growth coalition. The methods thus sought to verify the significance of these plans as guiding visions and to establish how other stakeholders are engaging with the discourses and proposals contained in the documents. Two-day symposia were held in both cities as part of an Arts and Humanities Research Council (AHRC) international research network grant with the objective of bringing together stakeholder presenters involved in the delivery and appraisal of city centre plans, with a wider group of participants to engage in the debates. For details of the presenters and participants, see [Appendix A](#).

The second level of analysis, tier 2, uses the contributions of the invited speakers from authorities, non-government organisations, business and community groups who outlined their interpretation of the plans and experiences of implementation. This provides opportunities for deeper and more critical interrogation of the proposals for the city centre.

A further level of analysis, tier 3, follows the debates of the symposia participants, representing significant civic, community, academic and professional organisations. This process enables triangulation of the key details of the proposals, and their resonance and dissonance with local groups. The presentations and the subsequent question sessions were video-recorded and the round table discussions were audio-recorded, with oral summaries being presented to plenary sessions.

4. FINDINGS

4.1 NEWCASTLE UPON TYNE

The city is the regional capital of the North East of England, approximately 60 miles south of the Scottish border and 10 miles west of the North Sea. It is a monocentric compact city centre, confined by protected green spaces to west, north and east, and by the River Tyne to the south. The river sits in a ravine creating a slope from north to south. The core strategy and urban core plan present a major growth strategy based on office, retail, housing, leisure, culture and tourism development, including 380,000 m² of new office space, and as a location for major retail growth (Newcastle City Council & Gateshead Council 2015). An additional retail study identifies capacity for at least 50,000 m² of additional gross floorspace (DTZ 2012). The urban core is already home to 23,000 people, and

the strategy asserts that there is potential to significantly increase the resident population through consolidation of the city centre, providing a broader range of housing with new build, conversions and bringing empty upper floorspace back into use. There have been considerable traffic restrictions to discourage cars in the city centre. It is generally walkable and the strategy proposes careful and targeted efforts to enhance pedestrian and cycle routes and to establish new links to houses, shops, entertainment and commercial premises. There is only a small amount of green space, adjacent to the Civic Centre. However, Exhibition Park to the north-west and Jesmond Dene to the north-east are only about 15 minutes' walk, and Leazes Park to the west is no more than 10 minutes' walk from the city centre (*Figure 2*).



Figure 2: Newcastle upon Tyne, city centre.

Source: Newcastle City Council & Gateshead Council (2015).

The urban core is not particularly blessed with an integrated public realm. Nevertheless, there is a commitment to improving existing public spaces and creating new spaces, although there are no indications as to how this will be achieved. Consolidation in the 20th and early 21st centuries was mainly achieved by fine-grain, small-site redevelopment on the principle of a rich built environment being generated by small contributions by numbers of people over time. The main exception was the Eldon Square Shopping Centre, which occupies a large area of land to the west of Northumberland Street. As the 21st century unfolds, intensification is focused on larger parcels of land, tending towards (re-)development of entire districts of the urban core. The principal locations are outlined in *Table 3*.

While the city council has prepared development plans for these areas, it can only respond to developers' proposals. While the system does not entertain spontaneity, it can be expressed as unintended outcomes. It raises the question about whether the planning department can afford to refuse proposals because they do not conform to its vision. Moreover, if there is flexibility in the planners' views, it then becomes a matter of judgement as to how far the parameters can be stretched. Together with Eldon Square Shopping Centre, these four densification districts occupy a significant proportion of the city centre. They all promise hundreds of jobs, which is a huge positive to the way they are perceived. The proposed uses seem to be set in late 20th-century models, that is, retail, offices, leisure and residential. The advent of the Fourth Industrial Revolution

Stephenson Quarter	Predominantly a brownfield district, but includes significant cultural heritage. After decades of neglect, a private developer was appointed to manage the consolidation of the whole area, but financial difficulties led the city council to terminate the contract. In July 2020, the council entered into an agreement with another developer to complete the second and final phase (Whitfield 2020)
East Pilgrim Street	A total of 27 ha representing one of the most strategically important city centre opportunities (Lawless 2016). The area was sold to an international real estate investment and development company in 2016. Since then, most of the buildings have been emptied and some demolished. There have been reports of proposals for £200–£300 million of luxury leisure, shopping and living, but there does not seem to be definite agreement (Ford 2019)
Newcastle Helix: Science Central	A total of a 10 ha site of the former Newcastle Brewery. The £350 million regeneration scheme has received investment from the European Regional Development Fund and UK government. It is claimed that it will become one of the most important innovation hubs in Europe and the UK's biggest urban development outside London (Newcastle City Council & Gateshead Metropolitan Borough Council: Newcastle Helix 2020). It has been partly constructed, but in 2018 it was rebranded to bid for more investment from around the world (Property Funds World 2018)
Forth Goods Yard	A brownfield area presented by the city council as an opportunity for developers to deliver a new gateway entrance into the south-west of the city centre. The framework document sets out an ambition to deliver a vibrant mixture of uses with a linked green infrastructure. Movement emphasises enhanced provision for cyclists and pedestrians (Lawless 2019). The location is not part of the metro network and there is a concern that it will increase traffic

Table 3: Key densification areas in Newcastle upon Tyne's city centre.

was already starting to reduce demand for offices and retail, and this trend seems to have been accelerating recently. There is optimism in the council's statement that, in partnership with the business improvement district NE1, it has set out ambitious plans to transform the city centre's retail core into the North of England's leading retail district and a significant European destination (Newcastle City Council 2020a). The capacity for residential growth is not clear, especially across the demographics. When introduced, permitted development rights were applied to small changes such as house extensions. Yet, since 2013, they have included converting whole offices into housing. The government is now making it easier for shops to be converted as well. Office-to-residential conversions in other cities have already exhibited poor quality. According to Bibby (2020), the main beneficiaries of these inadequate standards due to intensification will be commercial landlords who add value to their property portfolios. Recent city centre residential development has been in the form of student housing, with at least 2000 units expected in the short term. Students are reported as being an important part of the local economy, but they do not pay council tax, and therefore could be perceived as a cost to, rather than an income for, the city centre. In addition, their expenditure patterns are skewed because they do not purchase high-value domestic goods, which are provided by their landlords. The scale of these districts means that it will take several years for them to be completed, and there is no guarantee that it will happen for any of them. Large sums of money are being sought from national and international sources, which adds to the feeling among citizens that they are being excluded from the decision-making process. Finally, as these intensification proposals are happening at the same time, the community is confronted with an image of empty buildings and sites for years, possibly unfavourably affecting their engagement with the city centre.

4.2 NEWCASTLE, NEW SOUTH WALES

The city is the second largest in New South Wales, 100 miles north-north-east of Sydney. It is a polycentric linear city centre running east-west along the harbour to the north. The ocean contains development to the east, but there are no such constraints to the west. Cities such as Sydney and Melbourne have adopted dramatic intensification with numerous high-rise buildings. However, studies demonstrate that policies used to regulate decision-making for high-rise developments in central Melbourne are weak, ineffective or non-existent. In addition, these studies show that there is no valid argument that high-density, high-rise puts places on the map as global cities (Hodyl 2015).

As a regional capital, Newcastle is aiming to be a globally competitive and sustainable city (City of Newcastle 2008) in the context of the high-density compact city becoming the Australian urban norm (Randolph 2006). The Newcastle City Vision states that the most significant future growth will

occur in the West End of the city (HDC 2009). The catalyst was the long-held desire to remove the railway line that ran along the peninsula and replace it with a street-based light-rail system, and the construction of a transport interchange (Ruming *et al.* 2016) (*Figure 3*). The council could be bullish about this densification as the development corporation is funding the infrastructure in the West End to enable growth. Newcastle City Council readily aligned local plans to increase commercial and residential floorspace adjacent to the new interchange (NSW Government 2018). Civic and the East End are low rise and relatively low density, but the elected mayor announced that a:

new height limit of 90m has been introduced to incentivise development in the West End as the new CBD [central business district] district.

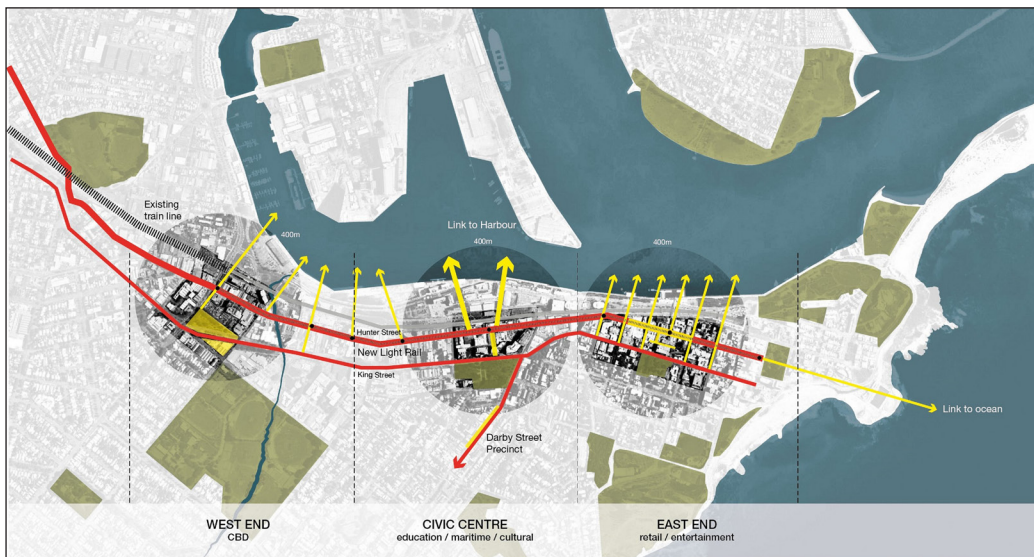


Figure 3: Newcastle, NSW, city centre.

Source: EJE Architecture.

The change to this criterion resulted from developer pressure, and is already an unintended consequence of the decision to intensify the city by developing the West End.

Some of the intent for the West End needs to be viewed in the context of previous plans and their failure to halt the outward migration of retail facilities and the negative impact on existing centres (Lehmann 2010). The strategy includes an invitation for large retailers and big box retailing to become established in the new CBD (City of Newcastle 2010) in little more than a hope that the agglomeration of buildings will create sufficient critical mass to allow them to thrive. The council itself had been operating from purpose-built offices at Civic for many years, but in 2019 it moved headquarters to a new rented building on a 15-year lease, located opposite the Newcastle Interchange in the new CBD. The mayor confirmed that the move was in accordance with the strategic relocation of Newcastle’s city centre to the West End under its urban renewal strategy, and reflects the continuing evolution of the city (City of Newcastle 2017). This would appear to show that the West End is now endorsed as the new city centre, and may lead to a concern about Civic and the East End being left behind. The character of Civic seems to be changing, and as seen in Newcastle upon Tyne, university developments are being encouraged with the notion of students rescuing the local economy. Statements related to the future of the East End are about protecting heritage values (HDC 2009), which seems to be maintaining the status quo. The concentration on development in the West End, its density and form appear to be in stark contrast to the other parts of the polycentric structure. Critics of urban consolidation have long warned of possible tensions in high-density areas if effective noise mitigation, management of communal areas and protection of privacy are not factored into the design of new developments. These kinds of centres inevitably increase the demand for open space (Randolph 2006). This is made up of spaces between the buildings that are accessible to the public. The design of buildings within private land has a direct impact on the quality of this public realm (Hodyl 2015) and over-development has a noticeable adverse effect on it. The higher the quality of the public realm, the more likely that people will choose to stay and enjoy these spaces, creating lively, interesting and safer urban environments

(Gehl 2010). Although much is made of Birdwood Park (Urbis 2017) and a new green gateway at Cottage Creek (Moir Landscape Architecture 2019), they are actually small spaces.

Success in the process of densification is contingent on the extent to which developments coincide with the desires and interests of citizens. A combination of the layers of government—the New South Wales Government, Hunter Development Corporation (HDC), and Newcastle City Council—as well as large-scale private developers and businesses, tend to dominate the process. The symposia workshops underscored the limited consultation that had preceded the publication of the future plans for the city centres. In particular, they highlighted the absence of community engagement in the decision to densify the city centre by creating a new CBD, the scale of the development, and the change in heights of buildings and uses.

5. DISCUSSION

It has already been established that most academic research on densification has focused on the urban agglomeration scale, examining the nature and form of intensification across the city as a whole. The translation of the associated principles and characteristics to the city centre remains at an early stage, and the above analysis offers an attempt to explore their use within the planning for future city centres of the two Newcastles. It is noteworthy that although there is clear evidence of planned densification, neither of the two case studies explicitly mentions densification, or indeed intensification, in the key documents, and many of the insights on this topic emerged through the discussions with those implementing them or stakeholders in the process. Instead, the plans focus on specific areas and particular sites. The emerging characteristics represent densification within the context of a compact city centre (Newcastle upon Tyne) or a polycentric city centre (Newcastle, NSW). Together they deepen insights to densification within urban cores, offering a sense of how such forms and activities are being played out in similar and divergent ways (*Table 4*).

Plans for Newcastle upon Tyne have clear aspirations for growth through further densification in a monocentric compact city centre. Many of the rationales for urban consolidation identified for the city as a whole, including a decreased dependence on cars, increased social cohesion and greater walkability, are present in the city centre. Notable traffic restrictions have already been introduced to reduce congestion, and these are to be expanded, with extensions of pedestrian routes and cycle paths. There is little scope for green spaces in the centre, but there is already good access to protected green spaces within walking distance. Nevertheless, the city centre will need to become more attractive for residents and visitors to maintain economic viability through usage. High-quality design and maintenance of the public realm represent a cost, which the local authority is struggling to meet. The business improvement district NE1 is taking more of a role in public spaces, and innovative partnerships may be derived from it. The main attention is on a small number of large-scale redevelopment areas, in keeping with the UK urban policy focus on providing a high quality of life for city centres by developing infill sites (Williams 2004). While compact city centres are often associated with high-rise building, Newcastle exemplifies that this does not need to be the case. Rather, densification of the city centre is being expressed as a combination of built form and activity (*Table 4*). Although it could be argued that the former should be a result of the latter, this relationship can be adversely affected by speculative building and other more sporadic developments. While expunging redundant districts and brownfield sites adds value to the attractiveness of the city and lie at the heart of Newcastle's plan, there are difficulties with this strategy. Built-environment-led regeneration and densification are a risk, as activities may not be available to occupy the buildings. It would arguably be preferable to expand existing activities rather than trying to replace them, which implies incremental growth patterns. Large-scale development requires high levels of finance. The sources may be fragile and the solvency of the developers precarious.

Newcastle NSW provides a contrasting approach to city centre densification. The linear, polycentric design linked with enhanced connectivity by a light-rail system is a good structure for encouraging living, working, recreation and culture in the city centre. It introduces the possibility

CHARACTERISTICS	NEWCASTLE UPON TYNE	NEWCASTLE, NSW
Built-Form Densification		
Compact city structure	Monocentric Infill	Polycentric Strategic relocation of the city centre to the west end
Redevelopment of buildings or developed sites at higher densities	Brownfield development in four large densification sites	–
Subdivision or conversion of buildings	Integral part of plans	–
Extensions to existing structures	As part of infill development	–
Development of previously undeveloped land	–	Major growth
Verticalisation of building form	Mainly low- to medium-rise	High-rise: increased height limits to incentivise development
Provision of green spaces	Small amount, but 15 a minutes' walk to large green areas	Few and small green spaces
Activity densification		
New buildings	Plan for retail development, but mainly Student accommodation	Commercial, large-scale retailing, residential and new council office
Reuse of existing buildings	Conversion of retail and commercial into residential	–
Number of people living in the centre	Conversion of buildings into residential; significant increase of students	New residential buildings
Number of people working in the centre	Potential in four large densification sites	New commercial buildings
Temporary residents	Students, visitors and tourists all encouraged	
Transport infrastructure	Railway station in the centre and a metro light rail network	New transport interchange in the west end and new street-based light rail
Movement	Increasing traffic restrictions, enhancing pedestrian and cycle routes	No restrictions to traffic
Process		
Community engagement	Pro-growth, neoliberal, market-led ethos dominates citizen and cultural agendas	

Table 4: Convergence and divergence of densification in the two centres.

of green spaces between the hubs, which will also assist their visual identity and enhance the environmental sustainability of the city centre. The aim of the city authorities and agencies is to produce a globally competitive and sustainable city by following the methods of higher rise densification in Sydney and Melbourne. The city's 2036 vision follows this form of densification, encouraging more verticalisation on large sites. The quantity of such land means that in contrast to the traditional forms of infilling and subdivision, a new denser landscape is being constructed in the city. This approach to densification has been questioned in the big cities of Australia (Hodyl 2015) and its transferability to second-tier cities on the scale envisaged in Newcastle is especially contested. As participants in the symposium workshops noted, there are concerns about how the resulting changes will redefine or even threaten the identity of the city centre. The polycentric model defined by form and density is important to the plan, but the coherence between the elements is less evident. The process of transformation and densification is challenging key

dimensions of the city centre. The relocation of the civic offices and functions is designed to enable new opportunities to densify the city centre through new occupiers, but this repositioning away from Civic symbolises a loss of identity to residents. Similarly, the desire to attract temporary residents—students, visitors, tourists—has comparable negative connotation, mirroring the concerns raised in Newcastle upon Tyne. While making valuable contributions to the vibrancy of city centres, there is a risk that they become so numerous that they engender a perception among permanent residents that they feel like strangers in their own city. Together, the two case studies highlight how perceptions of density are different between cities and there is no clear idea as to what the optimum is for any particular city. The absence of explicit statements by both sets of stakeholders further obscures the concept and definition of densification in the context of the city centre.

In these cities the principal aim of densification of the city centres is to enhance long-term urban sustainability and growth. The established interpretation is environmental, social and economic perspectives (Giddings *et al.* 2002). Yet, for the future of the city centre, these objectives are often presented in terms of an emphasis on health and wellbeing, governance with inclusive city level democracy, digital capacity, culture and heritage. These aspects, and conceivably others in future, are influenced by density; and there needs to be an assessment as to what level of density produces positive or negative effects on them. In addition, by the time an assessment is made, density may have already moved into a diseconomy of scale, and therefore predictive techniques would be advantageous. Many cities, including Newcastle upon Tyne, have generated virtual city models. The next stage is to add layers to create city information modelling, similar to building information modelling. This has already been achieved for some aspects including microclimate, vehicle and pedestrian movement (Charlton *et al.* 2015), but further applied research is needed to incorporate other layers and combine data from the existing, with predictive software. Digital presentation online will assist the democratisation process by enabling citizens to engage with data and outcomes.

6. CONCLUSIONS

In considering densification of the city centre, there is a need to move away from notions of dichotomies associated with urban sprawl and intensification to more nuanced assessments of the benefits and drawbacks of denser urban activities. Most previous studies about urban consolidation relate to wider urban areas, beyond the city centre. Arguments over the negative effects of peripheral living provide powerful rationales for more compact cities and, in turn, for densification of the city centre. The visions for the two Newcastle cities set out a direction of travel towards greater densification in their city centres. Such aspirations still have to be turned into actuality. Although the two city plans offer a vision for a city centre where densification and intensification contribute to their realisation, for that to happen, the city councils know they have to rely on several other partners. Not least are those providing the finance, constructing buildings and formulating market demand amongst future citizens who it is hoped will live, work and find recreation there. There remains a concern, espoused both by citizens and professionals, that unintended and sporadic developments have the potential to derail the neat objectives set out. Density is malleable and plastic, acting as a political tool and a type of geographical form, which can be influenced by market forces, and shaping these aspects lies beyond the bailiwick of those initiating the plans.

Importantly, in considering the defining characteristics of a denser city centre, this paper reflects on how variegated it can be. It extends beyond the forms of densification associated with disparities between the single compact city centre and the polycentric variety. There are clear differences in the way urban density is imagined in the visions of the two city centres, but there are also implicit similarities about the value of densification in revitalising the city centre. In these contexts, pro-growth, neoliberal and market-led perspectives dominate over the citizen and cultural agendas. High density has become a powerful and persuasive mantra of urban design. Perhaps surprisingly in Australia, this is interpreted as high-rise development. Offering the promise of lower carbon

footprints, proximity to facilities and services, and contribution to economic creativity, this form has become the beacon for densification. Nevertheless, evidence is accumulating that high-rise does not in itself represent densification any more than other forms. Neither does it guarantee environmental benefits as carbon footprints often reflect socio-economic profiles. Moreover, there is no clear definition of high density and it appears to vary between cities.

Much of the success of densification lies in how density is produced, experienced, perceived, negotiated and contested, as people move in and out of the city centre. As the plans are realised, research exploring the experiences and impacts of those who choose to occupy the city centre will add insights to the process. However, by that time over-densification may have already occurred. It is therefore important to develop predictive techniques about the impact of increasing density in each city through the emerging city information modelling, which will include democratisation of the process through connected digital technology.

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The authors have no competing interests to declare.

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	NEWCASTLE UPON TYNE	NEWCASTLE, NEW SOUTH WALES
Symposium dates	10–11 September 2018	5–6 March 2019
Tier 1: Documentary sources		
Primary source	Core Strategy and Urban Core Plan for Gateshead and Newcastle upon Tyne 2010–30	Greater Newcastle Metropolitan Plan 2036
Supplementary sources	Lawless (2016, 2019), Newcastle City Council (2020a, 2020b)	Commonwealth of Australia (2011), HDC (2009), City of Newcastle (2008), Urbis (2017)
Tier 2: Key delivery stakeholder presenters		
	Place Directorate, Newcastle City Council Council Housing, Design and Technical Services, Gateshead Council Newcastle NE1 Ltd Newcastle Gateshead Initiative Shelter	Hunter and Central Coast Development Corporation Smart Cities, Newcastle City Council EJE Architecture Renew Newcastle Cycle Space
Tier 3: Discussion participants		
Civic	BALTIC Centre for Contemporary Art North East England Chamber of Commerce North Tyneside Council Stadt Neuburg, Germany Sunderland Business Improvement District	Newcastle City Council Lake Macquarie City Council New South Wales, Department of Education New South Wales, Department of Health
Community	Changing Newcastle and Newcastle Liberal Democrats Green Party Merseyside Civic Society Newcastles of the World North East Times Place Changers Shelter	Hunter Research Foundation Newcastle Museum Newcastle NOW
Academic	Durham University Northumbria University University of Newcastle	Newcastle High School University of Newcastle
Professional	Access and Inclusion Consultant AECOM BeemCar Ltd Civic Engineers FaulknerBrowns Architects groundSTUDIOS Architecture GT3 Architects GVA Nicholson Nairn Architects Ryder Architecture Stanton Walker Vital Energy	APP Property and Infrastructure consultants Core Project Group De Witt consulting Planners GHD Engineers Hansen Yuncken Contractors Morrissey Law Muller Partnership Surveyors and Property Managers O'Brien Winter Partners Rider-Levit Bucknall Quantity Surveyors Suters Architects

Table A1: Symposia data sources.

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