

Compacting the city centre – densification in two Newcastles

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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 New South Wales in Australia - it considers the different mechanisms by which city authorities and their development partners are seeking to densify the city centre, and examines tensions created by the process in these two contexts. In addition to document analysis, data is 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 as to where the balance point is for each city. There is also a notion that negative density may have been reached before it 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.

Key Words

compact cities, city centres, density, UK, Australia, sustainability

1. Introduction

The unusual lived experience shared by many people across the world due to Covid-19, acts as a timely reminder that whilst 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 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 socio-economic 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 to 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 New South Wales in 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 a number of 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 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 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 means of assessing where this optimum lies.

2. Conceptual Frameworks

2.1 Compact Cities

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

1. dense and adjacent developments and activities
1. public spaces including squares, parks and streets
2. effective public transport systems
3. walking distances within the city centre
4. 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 measure 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 of these sustainability benefits and more (Dempsey & Jenks 2020). 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) largely reflecting their economic or environmental interests (Giddings et al. 2002). Yet, there are other aspects that may become neglected. For instance, it has been shown that citizens with less access to the public realm and green space, are more likely to suffer with 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 focussed on new areas of development, and there is a notion that the existing may be left behind. It therefore needs to be examined whether the monocentric urban structure is the only configuration that can deliver the compact city centre or if there is also a role for a polycentric structure. There is an argument that provided a city centre can demonstrate the above characteristics, whether it is monocentric or polycentric might just be determined by local circumstances.

Compact city centres are often associated with high rise buildings as a means of achieving high density. A significant issue is that there is no established definition of high density, and perceptions vary in cities around the world. Regardless, comparisons can be made between building developments of different heights, and studies demonstrate that high rise developments are not necessarily more dense. Comparisons have shown that districts of 6-7 stories high in Paris are in fact denser than 20 storey areas of Hong Kong, with floor area to site ratios being 5.75 to 4.32 (OECD 2012). This concentration on density is justified by a list of positive benefits. They include: enhanced public realm; reduced energy consumption; less pollution; greater diversity and choice of workplaces; increased social communication; reduced travel, decreased car dependency and less commute time. The underlying premise is

that density in the compact city has multi-dimensional positive effects on life in the city centre, as represented in Figure 1.

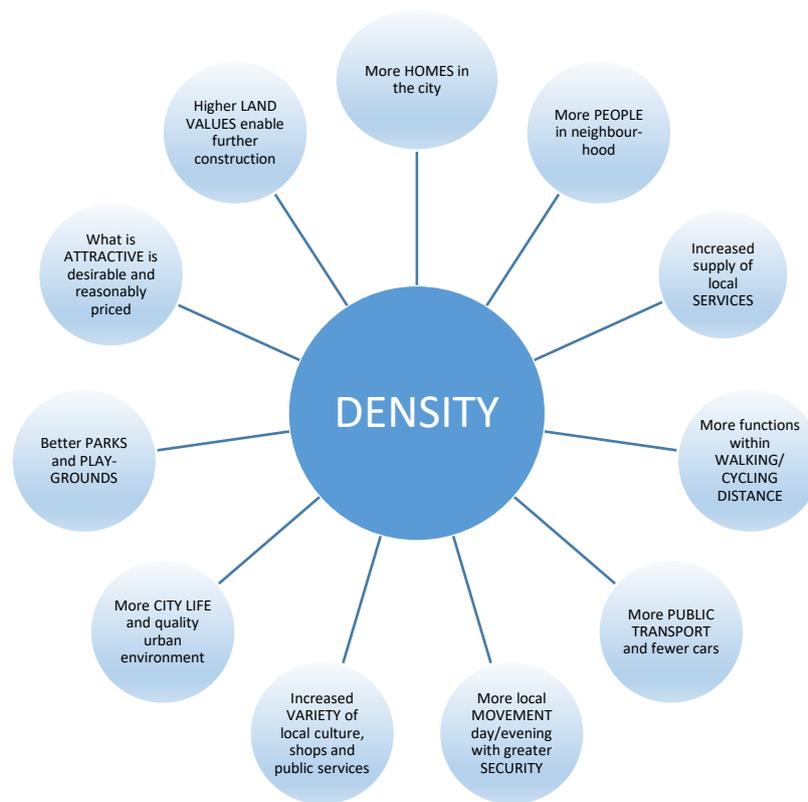


Figure 1: Positive Effects of Density
Source: after Bibri et al. 2020

Accessibility and ease of movement are major tenets of the compact city centre, and a number of studies have associated sustainability with public transport (eg 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 concern that as density increases, so may the negative effects. Compact city centres can produce high levels of noise pollution due to 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 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 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 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 of the advantages 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, it 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.

Built form intensification comprises:

- redevelopment of existing buildings or previously developed sites at higher densities
- sub-division or conversion of buildings
- building additions and extensions to existing structures
- development of previously undeveloped land

Activity intensification includes:

- increased use of existing buildings or sites
- changes of use – leading to an increase in activity
- increase in the number of people living in, working in, or travelling through an area (Williams et al. 1996)

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. Encouraging high urban density associated with compact 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 lies 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, especially air quality; and concerns also come from long-term associations of density with particular 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 which exists 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 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.

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 re-consider patterns of urban intensification. Single person households account for two-thirds of projected growth in households up 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. Within the UK context, 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 and old industrial areas are now growing high rise apartment 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 ie 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 public transport interchange and activity centres is another. Improving accessibility by co-locating jobs, people and facilities could be significant to city centre regeneration (Commonwealth of Australia 2011).

3. Methods

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. The significance of the documents in shaping discourse around the city centres' future was reinforced in debates at research symposia held in both cities as part of an Arts and Humanities Research Council (AHRC) international research network grant, led by the authors. In these sessions, attended by significant private, public and civic stakeholders including academics, representatives of the local councils and the business community, non-governmental organisations, and community groups - dialogue about the city centre's future was framed by the municipal authority's plans, stimulating both support for and opposition to various elements of the proposals.

In adopting plans as a centrepiece of the analysis, it is important to recognise that these city plans are situated. Their generation is more in response to statutory and regulatory obligations placed on the municipal authorities by national governments than by 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. As such, these city centre plans represent a partial, partisan view of the city authored by one actor in each case, the local authority. In realising its ambitions, local government has become a minority partner only able to propose a vision that requires the active engagement of multiple other partners. Fundamentally, as was evident from critical engagement in the symposia and the subsequent dialogue with other community groups and local stakeholders, these planning documents act as discursive papers, designed to mobilise and align selected actors to join an urban growth coalition.

While some plans are exclusively about the city centre, the geographical scope of others extend across the whole urban area including the larger hinterland of the cities, where the city centre or urban core is viewed 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. Secondly, 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 facilities to 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.

As noted above, the intentions for the two city centres are initially derived from plans reflecting the relational power of these sources to shape debates. The symposia analysed their role as guiding visions and critically investigated some of the key research issues that need to be explored about the city centre and its future. Cross-scalar investigation came to the fore as interest at city centre, district and site levels attracted attention. Response to proposals at different scales is also found in professional journal, conference, blog, newspaper, interview with city leader, and official website sources.

4. Findings

4.1 Newcastle upon Tyne

The city is the regional capital of the North East of England, approximately 60 miles from the Scottish border and 10 miles to 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 square metres of new office space, and as a location for major retail growth (Newcastle City Council and Gateshead Council 2015). An additional retail study identifies capacity for at least 50,000 square metres 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, as Figure 2 shows - 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, no more than 10 minutes walk from the middle of the city centre (see Figure 3).



Figure 2: Newcastle upon Tyne City Centre
Source: Newcastle City Council & Gateshead Council 2015

Figure 3: Middle of the City Centre
Source: Newcastle City Council

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. 20th century and early 21st century consolidation 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 focussed on larger parcels of land, tending towards (re-) development of entire districts of the urban core. The principal locations are shown on Table 1:

Table 1: Key Densification Areas in Newcastle upon Tyne City Centre

Stephenson Quarter	predominantly a brownfield district but includes significant cultural heritage. After decades of neglect, a private developer was appointed 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	27Ha 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 £200m-£300m of luxury leisure, shopping and living but there does not seem to be definite agreement (Ford 2019).
Newcastle Helix: Science Central	10Ha site of the former Newcastle Brewery. The £350m regeneration scheme has received investment from 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 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	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 concern that it will increase traffic.

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 ie retail, offices, leisure and residential. The advent of the fourth industrial revolution was already starting to reduce demand for offices and retail, and this trend seems to be accelerating under Covid-19. 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 2020). 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 rather than income to the city centre. In addition, their expenditure patterns are skewed, as 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. 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 (Hunter Development Corporation 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) (see Figure 4). 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 accommodation

floorspace adjacent to the new interchange (New South Wales Government 2018). Civic and the East End are low rise and relatively low density (see Figure 5) but the elected mayor announced that 'new height limits of 90m have been introduced to incentivise development in the West End as the new CBD district'. The term central business district (CBD) originates from EW Burgess' Chicago School city model of concentric circles, from 1923 and in itself seems to be an outmoded concept from the 20th century (Yaguang 2011). The mayor added that the proposed '99m towers would be huge for Newcastle', and that 'the proposal is only 10% over the height limit and most of the 10% is for air-conditioning ducts and the like. This 200 million dollar investment in Newcastle's West End is huge for this city' (Nelmes 2019). Seemingly the Council has become mesmerised by large private sector inward investments, and others are on the way (Property Development 2018). Michell & Wadley (2004) note that the Australian development industry has created organisations that are capable of generating very large projects. They have the capacity to shape the clustering implied by consolidation, and therefore economic influence and spatial outcome become conjoined. One of the developers, Core Project Group said 'The Council are keen to see increased density to the CBD area of Newcastle. There has been a lot of applications relating to residential, so I think Council are quite happy to see more commercial development applications coming through' (Property Development 2018).



Figure 4: Newcastle NSW City Centre
Source: EJE Architecture



Figure 5: Newcastle NSW East End
Source: EJE Architecture

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 is to invite large retailers and big box retailing into the new CBD (Hunter Street Strategic Framework 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, and next to the CarLovers carwash. 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 illustrate that the West End is now confirmed as the new city centre, and may lead to 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. Yet, there are similar concerns about this strategy. Statements related to the future of the East End are about protecting heritage values (Hunter Development Corporation 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. An investor driven market responds to different stimuli than the owner-occupier market, and may deliver outcomes in a very different way. The Council should be aware of the role this driving force is playing in the delivery of its plan. These kinds of centres inevitably increase the demand for open space (Randolph 2006). The public realm 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 public 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 – New South Wales Government, Hunter Development Corporation, and Newcastle City Council; as well as large scale private developers and businesses, tend to dominate the process. The community was largely excluded from the decision to densify the city centre by creating a new CBD, the scale of the development, heights of buildings, and uses.

5. Discussion

Rationales for urban consolidation focus on its perceived ability to achieve sustainability goals, including decreased dependence on cars, increased social cohesion, and greater walkability. In the UK, urban policy was focused on providing high quality of life for city centres by developing infill sites (Williams, 2004) in monocentric city centres, but the scale of densification has increased, leading to concern about quality and sustainability. Urban consolidation has become contentious and often inspires almost systemic community opposition (Raynor et al. 2017). The characteristics of the compact city are still valid and there is lack of evidence that any other form would be preferable, especially in counteracting urban sprawl. Research for this paper also investigated compact polycentric structures. New centralities are valid provided they are a response to increasing demand and not just extending the centre through displacement. The polycentric structure can also offer accessibility through public transport, cycling and walking, to the public realm and green spaces. Compact city centres are often associated with high rise building but this study has shown that it does not need to be the case. Densification is expressed as built form and activity. It could be argued that the former should be a result of the latter, although this relationship can be adversely affected by speculative building. The concept of density has been a major issue but there is no consensus on definitions. It is readily measured but the figures are not particularly useful. This is because perceptions of density are different between cities and there is no clear idea as to what the optimum is for any particular city. There is certainly a notion that densification has positive outcomes up to a point at which negative effects begin to occur. The question remains as to where this point could be set for each city. The influence of local authorities in both UK and Australia is diminishing under neo-liberal governments, and the resulting

regeneration partnerships are increasingly growth coalitions, raising issues about governance and the role of the community in these transformations.

Plans for Newcastle upon Tyne have clear aspirations for major growth in the monocentric compact city centre. Notable traffic restrictions have already been introduced to reduce congestion. 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. While expunging redundant districts and brownfield sites adds value to the attractiveness of the city, 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. Permitted development carries the danger of inadequate quality standards. It is not necessarily about planning control, especially as Carmona & Giordano (2017) point out that nearly half of local planning authorities in England now have no dedicated urban design staff, despite the profound and proven benefits of investment in a high quality built environment (Carmona 2019). The UK benefitted from the Commission for Architecture and the Built Environment (CABE) until it was wound up in 2011. As well producing publications such as *Grey to Green: How We Shift Funding and Skills to Green Our Cities* (CABE 2009), it organised design reviews of building proposals. The re-introduction of a similar organisation would be greatly beneficial (Carmona et al. 2018). In Newcastle NSW, the linear polycentric city linked with light rail system is a good structure for encouraging living, working, recreation and culture in the city centre. It introduces the possibility of green spaces between the hubs, which would also assist their visual identity. The aim of the authorities and agencies is to produce a globally competitive and sustainable city by following the methods of high rise densification in Sydney and Melbourne. This approach is debatable in the big cities but its transferability to second tier cities really needs to be questioned. It would seem that coherence of the hubs in terms of their form and density is important, otherwise citizens may find it difficult to appreciate the identity of the city. Local governance is in flux but its civic image appears to matter to residents and city centre users. The location of local governance should therefore be visible and symbolic. Temporary residents – students, visitors, tourists may become almost as much of a notable issue in Newcastle NSW as it is in Newcastle upon Tyne. While making valuable contributions to the vibrancy of city centres, they should not be so numerous that they engender a perception among permanent residents that they feel like strangers in their own city.

The principal aim of densification of city centres is to enhance sustainability. The established interpretation is environmental, social, economic perspectives (Giddings et al. 2002). Yet, for the future of the city centre, there is a growing emphasis on health and well-being, 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 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 eg 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. Conclusion

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 for densification of the city centre. The visions for the two Newcastle cities set out a direction of travel towards greater densification in the city centre. Such aspirations still have to be realised, and for that to happen, the city councils know they have to rely on a number of other partners; not least in providing the finance, constructing buildings, and formulating market demand amongst future citizens who it is hoped will live, work and find recreation there. Density is malleable and plastic, acting as a political tool and a type of geographic form, which can be influenced by market forces. There are clear differences in the way urban density and the compact city are imagined in the visions of the two city centres in this paper, 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 agenda. 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 of densification. However, by that time over-densification may have already occurred. It is therefore important to develop predictive techniques regarding 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.

Funding

The work reported in this paper is part of the outcomes from: Future of the City Centre, an Arts and Humanities Research Council Research Grant: Research Networking AH/R006881/1.

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