Infill Development
Planning for a sustainable suburbia

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Low density suburban development characterises many New Zealand towns and cities. Often described as ‘sprawl’, suburban development is decried as being unsustainable on several grounds. In response to this, many district plans promote a more compact urban form. For decades many local authorities have been actively encouraging infill development as a means of achieving this. Drawing on international literature, this paper explores the complexity of suburbs, with a particular focus on the environmental benefits that they offer, to show that in some respects suburbs have been miscast as unsustainable. Suburban infill development in a provincial New Zealand city is then used to quantify the changes in a suburban environment as a result of infill development.

A spatial analysis comparing the layout of a suburban area between 1956 and 2010 shows how urban morphology in this location has changed over time. The potential effects of these changes are identified, particularly as they relate to the literature describing the benefits of suburban development. The planning policy affecting this suburb, as contained in the present and previous district plans, shows how policy has contributed to the current suburban form. The paper concludes by suggesting the challenge for planning is considering how to configure future suburban spaces to achieve the benefits of infill development, while at the same time avoiding any unintended or possibly overlooked adverse environmental effects that are occurring through the loss of private open space.

Keywords: infill, backyards, planning, private open space, suburbs, urban morphology

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Introduction

Considering the future spatial arrangements of an urban area is part of the purpose of planning, and is required in order to ensure that the benefits of a particular land use can be realised whilst any adverse effects thereof are avoided (March, 2012). This paper explores how infill development has changed the morphology of a suburban environment over the past 60 years. It highlights a challenge for planning, being how to configure future suburban spaces to achieve the benefits of infill development, while at the same time avoiding any unintended, or possibly overlooked, adverse environmental effects that are occurring through the loss of private open space (backyards).

This paper begins by defining infill development and highlighting the societal preference for suburban living. The notion of a compact city as an ‘antidote’ to suburban sprawl is then discussed, in which the relevance of the use of the term ‘sprawl’ in the New Zealand context is questioned. Drawing on international literature the effects of infill development, as a response to the compact city agenda, are then identified.

A spatial analysis of a typical suburban area, in a provincial New Zealand city between the late 1950s and 2010, explores the degree of change over this time. An analysis of the planning policy over time examines how the provisions for urban consolidation and more particularly, infill development, contributed to this change.

This paper explores the growing acceptance of the need for residential intensification within planning policy, and considers whether this has effectively closed down the discussion on what might constitute a sustainable suburban environment.

The paper concludes by suggesting there is a gap in urban consolidation and infill policy that, as this longitudinal study demonstrates, reflects a lack of value being placed on the intrinsic benefits of suburban private open space. When considering future suburban spatial arrangements an opportunity exists to build on the benefits of infill development through more critical consideration of the planning controls in order that the potential of the suburbs can be realised.

Infill development

Infill development is defined as the creation of new lots within established residential areas on vacant or underused sites (PNCC, 2000; Steiner & Butler, 2007). Commonly infill development occurs in the form of ‘battle-axe block’ development, where a new house is built at the rear of an existing house (Brunner & Cozens, 2012). More intensive infill development can involve the construction of two or more medium density dwellings on sites that were previously occupied by detached housing (Phan, Peterson, & Chandra, 2008). This more intensive form of infill development has also been described as ‘6-pack’ development, where a single house is replaced ‘by the maximum number of units possible without the expense of going above two or three storeys’ (Hall, 2010, p. 77). Hall (2010) comments that such developments are the product of ‘a low level, if not non-existent, level of planning control’ (p. 77).

Internationally suburban environments, and the form thereof, continue to be important given that the vast majority of people want to live there (Carmona, Carmona, & Gallent, 2003; MJP Architects,
2005), as it the case in New Zealand. NZ has a long history of low-density residential development and it has been long known as the ‘quarter acre pavlova paradise’, where ‘owning a home in the suburbs with a garden was a common aspiration’ (Howden-Chapman, et al., 2010, p. 34). This aspiration is not unique to NZ, and owes its origin to the upper and middle classes in Britain in the late 18th Century, who escaped to residential havens on the outskirts of a city from the ill effects of urbanization and capitalism including noise, crime, immorality, pollution, factories, poverty, and a mass working class (Nicolaides & Wiese, 2006).

The notion of pavlova paradise continued to grow after the second world war when, internationally, suburbia was seen ‘as a welcome reward’ after years of hardship – depression and war (Nicolaides & Wiese, 2006, p. 4). In America suburbia was defined as being ‘the site of promises, dreams, and fantasies’, ‘a landscape of the imagination where Americans situate ambitions for upward mobility and economic security, ideals about freedom and private property, and longings for social harmony and spiritual uplift’ (Hayden, 2003, p. 3), and arguably it could defined as such within a New Zealand context.

Infill development can contribute to this societal desire. A significant benefit of infill development includes that higher densities can be accommodated within an environment that has an existing and established level of residential amenity and the capacity to absorb additional dwellings (Newton, Pears, Whiteman, & Astle, 2012). It is an environment with access to public transport and it can also have access to employment destinations (Newton, et al., 2012). However, higher densities cannot be achieved simply by raising the ratio of dwellings per hectare or by packing and stacking volumes in ever-tighter configurations (Chow, 2002). This would result in backyards like fishbowls, and an overall finer, denser grain of wasted outdoor space (Chow, 2002). These are the very effects that the history of the district plan has been seeking to avoid.

Residential intensification (including infill development), although often unpopular with the existing resident population (Vallance, Perkins, & Moore, 2005), if introduced sensitively and respecting the local resident’s views, need not be seen to be a bad scenario for the residents (Schmidt-Thomé, Haybatollahi, Kyttä, & Korpi, 2013, p. 9). However infill development, particularly of the battle-axe or six-pack variety, may not constitute ‘a sensitive manner’ of development, and may potentially pose a threat to the sustainability of suburban environments.

**Low-density suburban ‘sprawl’ versus a compact city**

Infill development is often promoted within district plan policy as a means of repairing ‘sprawl’. The term sprawl is often associated with low densities, ribbon developments, or unplanned, single use, automobile-dependent developments (Bruegmann, 2005; Hiller, Melotte, & Hiller, 2013; Rogers, 2010). It is a term fraught with negative implications and is the subject of much debate (Hiller, et al., 2013; Tachieva, 2010). ‘Sprawl’ typically occurs at the periphery of urban areas and is described as ugly, awkward, inefficient, inequitable, environmentally damaging, and unsustainable’ (Bruegmann, 2006; Hayden, 2006). Rogers (2010) suggests the word 'sprawl' denotes decline, in comparison with 'compact' which implies control, and found the use of words such as 'sprawl' closed down policy discussions because of these preconceived interpretations of 'sprawl'.
Troy (1996) raises his concern in relation to the use of the term ‘sprawl’ in the Australian context, noting that the term sprawl and comparisons with American studies are inappropriate given the role of development control and infrastructure development that has been in place since the early post-war period. This is also true for New Zealand and in this context as we talk about suburbs, policy discussions should not be closed down through references to ‘sprawl’ per se as the release of land for suburban development in New Zealand has been planned, and is largely in response to societal preferences. The lesson for planning policy should be to use the term ‘sprawl’ with caution.

In contrast to the reality of low density suburban developments compact cities are seen as being ‘ideal’ (Gordon & Richardson, 1997). With their higher population densities and mixed uses, compact cities have become synonymous with ‘sustainable’ urban form (Williams, 1999). Proponents of compact cities see them as an antidote to unsustainable traditional low-density suburban developments which erode the countryside, isolate residents causing car dependence which then contributes to higher levels of air pollution and traffic congestion (Frey, Ferguson, Bagaeen, & Woods, 2006).

The concept of the compact city is also a contested view, with some researchers questioning their sustainability given the lack of, or contradicting, empirical evidence to support the claim (Echenique, Hargreaves, Mitchell, & Namdeo, 2012; B Gleeson, 2012; Neuman, 2005; Vale & Vale, 2010; Williams, 1999). However, as Ghosh and Head (2009) suggest, it is difficult to ignore the wide acceptance of urban intensification as a means of improving sustainability. That a compact city can improve sustainability is a shared understanding but there is a lack of agreement about how best this can be done (Rice, 2010; Rogers, 2010).

**Sustainable suburbs**

At the same time as this growing acceptance of urban intensification and policy directing land use towards compact cities, there is a growing amount of research highlighting the positives of more traditional suburban layouts, and in particular the contribution of private open space (backyards) in achieving a sustainable urban form. Gleeson (2010) suggests that suburbs have been miscast as anti-environmental. In particular, suburban backyards contribute to a landscape-dominated environment with associated ecological, climatic and aesthetic benefits (Hall, 2010). These benefits include increased biodiversity; increased aesthetic values; the potential for microclimates; storm drainage, carbon sequestration, and other benefits including those related to rainwater collection, composting, laundry drying (Hall, 2010). Low density cities (suburban areas) also have the potential advantage of being able to collect energy for home use, and to grow food (Vale & Vale, 2010). As Gleeson (2010) comments, 'suburbia is a low-density landscape with a lot of disorganised but potentially productive land' (p. 2).

The social benefits of private open space also cannot be overlooked. Hall (2010) describes the role of the backyard in providing an area for supervised, active, children’s play as being one of its most important. The immense social benefits of private open space are encapsulated by Stretton (1996) who writes,

> if you are poor and car-less in an upstairs flat in a neighbourhood without much open space – especially if you are a child, or bringing up children – you can do a
good deal less for yourself than you can do with a house and garden and shed in a
suburb, with the parks and playgrounds and school grounds that Australian
densities allow’ (p. 49).

So suburban environments, those complete with back yards, tick a number of the sustainability
boxes – environmental, social, and cultural. They do not necessarily merit negative perception
(Hiller, et al., 2013), particularly if growth and/or infill development is planned appropriately.

Planning policy that promotes infill development for the sake of a more compact city, is changing the
morphology of suburban environments, and what becomes important to ascertain is ‘at what cost’
do these policies come. While intensification of suburbs is an ongoing process there is the potential
that this may worsen already unsustainable conditions, and these, together with issues of potential
inequality for poorer households, as highlighted by Stretton (1996), require consideration.

A particular unintended outcome of infill development is the loss of urban vegetation and trees, and
the subsequent implications for biodiversity, ecology, and climate change (Brunner & Cozens, 2012;
B Gleeson, 2012; Hall, 2010). Brunner & Cozens (2012) suggest that the loss of this resource will
have significant consequences if it is not protected. In the New Zealand context, where the
sustainable management of natural and physical resources should be the basis of all planning
provisions (at least since 1991), the uncritical acceptance of the compact city, with what Gleeson
(2012) refers to as widening cracks in its empirical base, should not continue. Instead, critical
consideration should equally be given to the changing morphology of a suburb, with a focus on what
is being lost, and how this could be more sustainably managed.

Spatial Analysis

Using spatial analysis on a ‘typical’ suburban area the changes in suburban morphology over the last
60 years is explored, focussing particularly on changes to private open space. The study site is a
residentially zoned block in Hokowhitu, Palmerston North; a provincial New Zealand city. It was first
purchased from Maori ownership in 1893, and then subdivided into blocks of varying sizes ranging
from less than 1 acre to 75 acres (Mather cited in O'Neill, 2012). By 1920 O'Neill (2012) describes
Hokowhitu as having been ‘more closely settled’, and notes that large plant nurseries, orchards and
market gardens had been established on the rich soils of the area, which remained until after World
War Two. It was after this time that more subdivision occurred, particularly following flood
protection works (O'Neill, 2012). This paper explores the degree of change in a portion of this suburb
between the late 1950’s when suburban development was well underway, through to 2010. The
subject area could now be described as being a middle ring suburb, given its relatively close
proximity to the city centre. The study area is surrounded on each side by a collector or arterial
road, and has a high degree of permeability within.

In order to understand how the suburban morphology has changed, historic aerial photographs were
uploaded as a layer into ArcGIS 10 and aligned with the 2010 digital aerial imagery. Dwelling
footprints were manually digitised for 1956 and 2010. Property boundaries on an historic cadastral
map were also manually digitised, and then aligned with a GIS layer containing the digital property
boundaries in 2010. It is noted that the 1956 aerial photographs for this area, having been scanned
and uploaded were slightly distorted after rectification. This potential limitation of the dataset was
overcome primarily through comparing the data with the 2010 dwelling footprints, many of which remained to this day (although often extended). Additionally, historic maps can be inaccurate in terms of scale (Laycock, Brown, Laycock, & Day, 2011), and this was overcome through matching features on the original cadastral map to modern vector data. Other limitations exist in this process with regard to resolution of the scanned 1956 aerial photographs. The original black and white photographs had a ground resolution of 0.1m once rectified. This means that fine detail of building roof features could be missed, or ground features could be interpreted as building footprint, due to similarity of apparent colour with the surrounding roofline or interaction with shadow. The 2010 building footprint layer was much easier to digitise as we were supplied orthorectifed, high resolution, and colour imagery.

Figure 1: Degree of change to suburban morphology through infill development between 1956 and 2010.

Figure 1 compares the number of infill sections in 2010, with the 1956 sections. In 1956 there were approximately 639 parcels within the study area. By 2010 this had increased by 63%. Not surprisingly, given the presence of plant nurseries, orchards and market gardens in the late 1950s, some of the older lots have been subdivided into 10 or more additional lots by way of infill development. The study area also exhibits both battle-axe and ‘six-pack’ infill development (refer figures 2 and 3), which accounts for 25% and 10% of infill development respectively. 62% of the sections which existed in the late 1950s have remained unchanged.
The median and average lot size in 1956 was 1,276 m$^2$ and 920 m$^2$ respectively. By 2010 this had changed to 757 m$^2$ and 567 m$^2$. The average dwelling footprint size in this location has also changed over time, going from approximately 163 m$^2$ in 1956 to approximately 210 m$^2$ in 2010, consistent with the phenomenon elsewhere of larger dwellings on smaller lots. This smaller lot phenomenon is also reflected in Figure 4 which shows a significant increase in the number of lots that are 700 m$^2$ or smaller. Together with the larger footprint statistics, this suggests reduced private open space.

In light of the literature which suggests that loss of private open space is a significant effect of infill development, and in order to avoid the data being skewed by those areas previously used for horticultural purposes, a smaller portion of the study area (sub-area A as shown in Figure 1) was examined to determine the degree of change to the curtilage per dwelling. This curtilage space (which excludes outbuildings) has halved in this sub-area going from 871 m$^2$ in 1956 to 429 m$^2$ in 2010.

This spatial analysis of a fairly typical suburban area in a provincial city has shown significant changes to its form between the late 1950s and 2010 (refer Figure 5). Many of the sections (62%) remain
unchanged over the last sixty years – although the dwelling footprints have often been extended. Where infill has occurred there has been a significant change in the morphology of suburban space – particularly as it relates to private open space. On this basis the planning policy over the same time frame is explored to find out why.

![Figure 3: A comparison of section sizes](image)

![Figure 4: Degree of change in building density between 1956 and 2010](image)
A brief history of planning policy in Palmerston North

A document analysis looking at the District Plans (formerly Schemes) was undertaken to look at how the city of Palmerston North has managed urban form. As infill development is often a response to sprawl, or an attempt to create a more compact city, references to these terms were specifically sought. In addition to these references, the document analysis looked for indicators of the level of protection put on private open space, to determine whether the policy acknowledges its value, or whether the loss thereof could be deemed an unintended effect.

In 1959, the operative District Scheme, prepared under the Town and Country Planning Act, 1953, was adopted. Under this Scheme, containing the footprint of the city and limiting residential zoning was primarily for the purpose of avoiding uneconomic extensions to the city’s services (Scheme Statement, Section (2), Clause (1)(c)). At this time there were two residential zones; Residential A, which envisaged low density and included the study area, and Residential B, which envisaged higher densities. The code of ordinances included bulk and location standards which required yard space, and which also required that this space should be left ‘unoccupied and unobstructed from the ground level up’, although in particular circumstances, council could make exceptions if the written consent of owners of adjoining land was obtained, and this provision essentially still exists.

An additional residential zone was included in 1968, after the first review of this Scheme. Although not referring specifically to ‘sprawl’ the Council’s policy at this time reflected a need to direct development so as to avoid the indiscriminate mixture of incompatible uses, to economise the servicing of the District, to maintain the stability of individual property prices, to maintain and provide amenities appropriate to every locality and, so far as practicable, to avoid the encroachment of urban uses upon land of high actual or potential value for the production of food (Clause(3), sub-clause(1)). It was at this time that the compact city ‘driver’ started to emerge in council policy. This Scheme made specific mention of urban consolidation in its zoning policy, requiring that urban development be consolidated and confined, so far as practicable to areas that are already urban in character in preference to permitting expansion beyond present urban limits (Clause(3), sub-clause(2)).

Private open space and yard space was required under the Code of Ordinances for reasons associated with visual amenity, protection of privacy and the penetration of daylight and sunlight.

By 1973, a number of changes to the Scheme had been approved by Council, resulting in five Residential Zones. These changes allowed residential development of all kinds ‘so that new concepts in housing can take place to meet the changing needs of the City’ (Clause 5(1)(a)(3)). Those residential areas considered ‘stable’ were to be maintained at their present density ‘to prevent premature change and detraction from existing amenities’ (Clause 5(1)(a)(4)). The renewal of older residential areas was to be encouraged through either active participation ‘or by encouragement through the studying of permitted densities and permitting a range of densities’ (Clause 5(1)(a)(5)).

At this time the study area was predominantly zoned R1, which catered specifically for low density development, and allowed a maximum density of two household units on any site less than 50 perches (approximately 1265 m²). A portion in the north-west corner was zoned R2, which allowed medium density housing as a predominant (permitted) use. The other three zones provided for...
higher densities, and even restricted the development of standalone dwellings. The next review of the Scheme saw a major u-turn in relation to this policy.

The enactment of the 1977 TCPA saw a major review of the District Scheme. The overriding goal of the 1981 District Scheme was the efficient management of the City’s future growth in order to provide the best possible environment for the people of Palmerston North. Specific planning aims echoed previous aims, including the need to maintain and enhance existing residential environments by allowing new residential development that was compatible with existing.

In relation to infill development the 1981 Scheme stated that ‘one of the main reasons for encouraging urban renewal has been a continuing concern to at least maintain, and, if possible, increase residential densities in existing built-up areas’ (PNCC District Scheme, 1981, p. 49). This scheme notes that land suitable for urban development is in relatively short supply on the perimeter of the city, and that it is highly desirable for land in the existing build-up area to be used as efficiently as possible.

A significant change in the 1981 Scheme was the provision of a single residential zone, as a means to increase residential opportunities (PNCC District Scheme, 1981, p. 45), the aim of which was to encourage infill development. Council’s objective was to encourage subdivision of existing large sites and undeveloped back land by introducing a system of subdivision control based on a relationship between site boundaries, buildings and degree of amenities rather than area and dimension (Objective 18.5). To achieve this objective, it was Council’s policy to approve any subdivision which creates a site on which it is possible to erect a dwelling that complies with the bulk and location requirements of that zone in which it is situated, and it was expected that 25% of residential development would be infill (PNCC District Scheme, 1981).

To provide for additional dwelling units this Scheme had, what it described as, flexible subdivision standards and reduced yard requirements. Allowing more than one resident on a site was seen as a feature of this Scheme.

This Scheme, and its focus on infill development arguably of the battle-axe variety, reflects a deliberate move away from higher density forms of housing. Council ‘recognised’ the need to provide for better land utilisation, but sought to achieve this with a ‘minimum of disruption’ to existing residents. In particular they were concerned about the long rows of flats, commonly known as ‘sausage flats’, as they detracted from amenity, and ‘failed to provide satisfactory living conditions’ (PNCC District Scheme, 1981, p. 83).

In light of this, there can be no doubt that a stand-alone dwelling was highly valued, but the reduced yard requirements and flexible subdivision standards would indicate that private open space (i.e. the suburban backyard, with all its positive attributes), was less valued.

Of most significance to this paper, was the change to the Rear Yard standard (which is essentially the requirement for the largest area of private open space). This was reduced from 25 ft (7.6m) under both the 1959 Scheme and the 1968 Scheme (in all their Residential Zones) to 3 metres in the 1981 District Plan. Despite this permitted reduction in backyard space by over 50% of what was formerly
required, the Scheme still included reference to the importance of private open space, not only for
use by its residents, but also to provide visual amenity for the site.

In 1991, with the enactment of the Resource Management Act, the Scheme was again reviewed.
Transitional provisions remained in place until December 2000 when the first PNCC District Plan was
made operative.

Under this Plan the Council notes,

If development of the “City is to be managed in a sustainable manner it is important that this
compactness is maintained and that excessive sprawl on the fringe of urban areas is avoided.
For this reason, well managed infill development is important as it makes good use of existing
infrastructure such as roads, water pipes etc, and avoids excessive development on the fringe
of the City (PNCC District Plan, 2010; p. 10-3).

Under this District Plan ‘infill’ is identified as a specific resource management issue, and is justified
on the grounds that it makes ‘very good use’ of existing urban services and infrastructure and is an
important element in slowing the peripheral growth of the City. However the Plan also recognises
that infill sites do not always ‘blend harmoniously’ with the existing character of residential areas,
and can give rise to adverse effects such as overshadowing, or loss of privacy.

This District Plan, through its objectives, policies and methods for the Residential Zone, strongly
advocates for a compact city through the continuation of managed infill development. The
encouragement of infill development, where it can make use of existing services, is a specific policy.
In seeking to secure and maintain a high standard of amenity within the Residential Zone, Council
continues to have bulk and location requirements to ensure on-site amenity, access to sunlight and
daylight, open space, to protect privacy, and to require residential developments through design
standards to avoid, remedy or mitigate any adverse environmental effects. This Plan refers to ‘well-
managed infill development, as being important as it makes good use of existing infrastructure, and
as a means of slowing peripheral growth of the city, but it does not specifically recognise the actual
intrinsic values and environmental benefits of private open space.

Discussion

Incremental changes to individual houses and lots begins when a residential area is created and can
be expected to continue (Whitehand, Morton, & Carr, 1999). In light of this it is important to
consider the cumulative effect of infill development. In the New Zealand context the incremental
potential effects of infill are exacerbated by the resource consent process, which, since the late
1950s has provided for district plan infringements subject to obtaining the written consent of
adjoining land owners. Yet, arguably there is a mandate for the consideration of the contribution of
private open space to environmental and social sustainability under the Resource Management Act
1991, where planners are tasked with sustainably managing natural and physical resources.
Although not touched upon within this paper, others suggest that there is also an economic value of
open space (Brunner & Cozens, 2012) which, as planning moves towards a system that is basing
planning decisions on cost-benefit analysis, needs to be a critical consideration in urban
development decisions. Infill development should be looked at more holistically, looking both at the
cumulative effects particularly as a result of the incremental loss of private open space. The building density resulting from infill development should not be able to be described as being ‘a low level, if not non-existent, level of planning control’ (Hall, 2010, p. 77), the unplanned outcome of a series of bulk and location development controls, but rather as an element of planning that ‘must be considered in terms of the configuration of urban form – that is, a product rather than a determinant of design’ (Carmona, Heath, Oc, & Tiesdell, 2003, p. 185).

This brief history of the PNCC District Scheme/Plan provisions shows that avoiding ‘sprawl’ and accepting urban consolidation has a long history within the city. In striving for a compact city the messages in the various District Schemes/Plan have echoed the rhetoric suggested by Rogers (2010), where ‘sprawl’ is portrayed as negative and ‘compact’ as good and sustainable. This is most notable in the operative District Plan which refers to maintaining the City's 'compactness' and avoiding 'excessive' sprawl on the fringe urban areas.

In the same way that sprawl erodes the countryside, it can be argued that infill development, particularly the battle axe and six-pack variety, is incrementally eroding the suburban environment, potentially robbing it of all its intangible benefits. In particular, reduced rear yard setbacks have the potential for adverse environmental effects. Gleeson (2010) refers to the potential advantages associated with lower density development in the age of climate adaption and social resilience, and in particular the benefits of suburban space, with its soils, climate, solar access, and the water (via tanks) to be used for food production. In the case of this research, although there is a substantial number of sections that have not been affected by infill development, if the trend of development continues as seen in the smaller portion of Hokowhitu examined, this advantage will be lost.

Gleeson (2010) also suggests that leadership is lacking and that 'inflexible visions of the compact city, freighted with much impotent anxiety about the 'sprawling' suburbs' overwhelms the food bowls of old' (p.4). This could be extended to include the loss of other benefits of private open space. Rather than being wedded to the notion of a detached dwelling on a site, with its ever decreasing backyard space, planners need to critically rethink the role and benefits of suburbs, before those very characteristics that contribute to a sustainable environment are lost.

How to do this is not the subject of this paper, however many of the authors debating the benefits of a suburban environment consider suggest a variety of options. These include reconsideration of the traditional bulk and location requirements for new dwellings to include more specific requirements such as regulating for the protection of urban tree canopy (Mincey, Schmitt-Harsha, & Thurauc, 2013), or the inclusion of a minimum back-to-back distance between dwellings (Hall, 2010). Others refer to the need for bigger picture objectives for residential zones, suggesting a more reflexive role is required (Cook, Taylor, & Hurley, 2013).

This paper does not intend to suggest that suburbs remain unchanged, or that infill development as a means of efficiently using a city’s infrastructure or making a city more compact should be avoided. Rather, it suggests that how sustainable suburban environments are depends, in part, on how they are designed, and in particular how the backyard is protected.
Conclusions

The compact city is not necessarily the panacea to urban sustainability that has been claimed. Understandably though, given its potential benefits, there has been a long acceptance of urban consolidation and, as has been shown in the case study, the use of infill development is seen as a means of achieving this. The policy documents reviewed showed urban consolidation was included as a policy goal in the late 1950s and that this has continued through to today. Although at first its primary focus was on the efficient use of services, by 2010 this had changed to include reference to the need to avoid excessive sprawl.

Sprawl is a similarly contested term, which some would argue is not applicable in the New Zealand context (given that urban form has long been planned), and which has been described as a negatively loaded term. Legitimising infill development on the grounds that it will avoid ‘sprawl’, and therefore create a more sustainable form, is therefore ambiguous. Indeed, a growing number of researchers are suggesting there are numerous benefits of low density development that are yet to be realised.

Considering how to configure future suburban spaces so as to avoid the creation of a finer, denser grain of wasted outdoor space as a result of insensitive infill development, whilst at the same time achieving the benefits of infill development, is therefore the challenge for planning. There is an apparent gap in existing and historical planning policy that reflects a lack of value being placed on the benefits of suburban private open space. In order to ensure that the potential of suburbia is not eroded this gap needs to be filled, which will require that discussions about the future suburban form are not closed down by the uncritical acceptance of urban consolidation or by references to verbs with negative connotations such as sprawl.

References


