By design
from design guidance to built form

David Chapman
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David Chapman 2016-02-13

Abstract
This paper explores the planning policy era of *By Design: Urban design in the planning system: towards better practice* through the lens of *Planning Policy Guidance 1 (PPG1): General Policy and Principles and Planning Policy Guidance 3: Housing*. The paper explores the objectives of urban design, as set out in *By Design* against PPG1’s objective to promote higher standards of urban design and PPG3’s objective to revise housing densities. Research takes a systematic approach to reviewing the evidence base available for the production of *By Design* and analyses density targets and urban design objectives against generic housing types of the day and four housing led development schemes delivered during the policy period. The paper argues that on density grounds, only two of the researched generic housing types delivered the density targets prescribed by PPG3, requiring the development industry to bring forward new models of development. The case study analysis establishes that the industry was able to adapt to the objectives of *By Design* with selected developments delivering the urban design objectives set out in *By Design* and density standards of PPG3. The paper concludes by arguing that whilst ‘By Design’ was extinguished as policy in 2012, its design objectives are still valid and may be relevant to new emerging dimensions related well-being as part of; Ease of movement and seasonal climate change as part of; Quality of the public realm.

Introduction
*By Design* was English planning policy guidance between 2000 and 2012. It was jointly published by the Department of Environment, Transport and the Regions (DETR) and the Commission for Architecture and the Built Environment (CABE), the Government’s advisor on architecture, urban design and public space. It was produced to promote higher standards of urban design and help deliver Government’s commitment to good design as set out in PPG 1, within the framework of density standards set out in PPG3. It responded to outcomes of *Towards an Urban Renaissance* (1999), commissioned by Deputy Prime Minister John Prescott (1998) to examine how housing demand in the UK could be accommodated and the later *Urban White Paper -Our Towns and Cities: The Future* (2000), which acted as a government policy initiative and proposal for legislation. *By Design* focused on the creation of a good urban product and established seven objectives of urban design; *Character, Continuity and enclosure, Quality of the public realm, Ease of movement, Legibility, Adaptability and Diversity.*

This paper reflects a systematic literature review of the evidence base for compact city policy up to the year two-thousand, the publication date of *By Design*, coupled with Dutch compact city design patterns that emerged between the 1970’s and 2000, to establish common principles and objectives. The paper compares generic UK housing types available before PPG1 and *By Design*, to
establish planning policy relevance. Four housing led schemes delivered during the period (that were been classified as good practice by CABE) are then assessed against PPG1 density targets and By Design’s objectives of urban design.

**Literature Background to By Design**

The conceptual model of ‘compact city’ as sustainable city was not new in 2000, it was acknowledged throughout Europe that “nowhere is the implementation of sustainable products and processes more important than within cities” (Urban Task Force, 1999, P.28), since they are the largest consumer of products and polluter. It was further established that the major problem facing sustainability was the private car with proposed planning policy progression bearing heavily on the issue of sustainable transport and its relationship with urban patterns and the debate around development density.

Towards an Urban Renaissance and the Urban White Paper -Our Towns and Cities: The Future focused on social, economic and physical conditions and a sustainable urban renaissance for Britain. The main focus of Towards an Urban Renaissance was the built environment, where “some 90% of us (in England) live” (Urban Task Force, 1999, p.8) and which creates “75% of all pollution……, roughly 45% from buildings and 30% from transport” (Urban Task Force, 1999, p.28). In response to such statistics the Urban Task Force scheduled a series of proposals at the time to create a sustainable urban renaissance for Britain, which included establishing "the importance of developing a higher quality urban product by creating compact urban developments, based upon a commitment to excellence in urban design and the creation of integrated urban transport systems that prioritise the needs of pedestrians, cyclists and public transport passengers" (Urban Task Force, 1999, p.11). Whilst broad in content this statement emphasised the concept of the compact city and its relationship with connectivity, movement and mobility. A relationship reinforced in the Urban White Paper that proposed: “we need an approach to the design and development of urban areas which: makes efficient use of the available land and buildings and reduces the demand for greenfield development...... and makes good public transport viable and makes walking and cycling attractive options” (DETR, 2000, p.43). Whilst emerging planning thought leading to the year 2000 in the UK saw resource efficiency and pollution reduction as directly linked to individual mobility, research available was less conclusive.

Frey (1999) defined three future urban models: The Compact City: Centralisation, The Multi – Nucleated City: Decentralisation and The Mixed Compact and Multi – Nucleated Environment: Centralisation and Decentralisation working together, the compromise position. Towards an Urban Renaissance, the Urban White Paper, PPG1 & 3, and By Design, all focused on the compact city as preferred model with theoretical arguments for and against the compact city covering environmental, economic and land-use debates. The overarching theme being the proposition that compact settlements “can achieve substantial reductions in energy consumption and emissions, principally through more limited use of private motor transport” (Gordon, 1997, p.239). The rational being reduced private transport use will reduce vehicle emissions, especially carbon dioxide, and help curb global warming. Sub arguments for the compact
city included; “Improved quality of urban life that would result from higher densities in cities” (Breheny in Jenks, Burton & Williams, 1996, p.21), “Intensified urban areas are claimed to lead to more social cohesion and community spirit” (Jenks, Burton & Williams, 1996, p.90), Bringing more people into the city can make it more vibrant, and encourage the development of cultural activities and facilities” (Jenks, Burton & Williams, 1996, p.88), “A better environment – due to overall reduced emissions and greenhouse gases and lower consumption of fossil fuel – and consequently better health” (Frey, 1999, p.25), “Developing in existing urban areas reduces pressure for development in the countryside and makes the most effective use of urban land, especially if it is derelict, contaminated or vacant” (Jenks, Burton & Williams, 1996, p.86), “Compact cities reduce the length of journeys; promote energy efficient modes of travel such as walking and cycling; offer opportunities to reduce private car use; and support public transport” (Jenks, Burton & Williams, 1996, p.91), and “A city with a spectacular group of tall buildings at its centre is likely to make a far more interesting townscape than one in which building heights have been standardised” (Sherlock, 1990, p.52).

Counter arguments at the time however focused directly on this is not what people want. “The compact city solution is naively based on the idea that urban decentralisation, which has been the dominant urban trend in all Western countries since 1945, can suddenly be stopped and then reversed” (Breheny & Rookwood in Blowers, 1994, p.155), “The exodus from the city – the process of ‘extensification’ rather than of ‘intensification’ – has been in evidence for 50 years, and the basic reason for this is that it met people’s personal aspirations” (Welbank in Jenks, Burton & Williams, 1996, p.78), and “In practice, given the general dominance of decentralisation trends, it is centrist policies that are most likely to be against the grain of the market” (Breheny in Jenks, Burton & Williams, 1996, p.27).

Whilst the arguments for the compact city leading up to the year 2000 were diverse they can be summarised as: first, the relationship between urban densities and energy consumption suggests that the more compact a settlement the less energy per person will be consumed; second, compaction of urban settlements will prevent the need to develop rural land; third, by increasing population numbers in the city, quality of urban life will be improved and greater social cohesion will be created (Chapman, 2001). A counter summary is provided by Breheny who suggests “the case against the centrists rests on four main points: first, the likelihood that it will not deliver the environmental benefits claimed; second, the probable impossibility of halting decentralisation, whether it is regarded as desirable or not; third, that some greenfield development is inevitable even with compaction policies; and fourth, that higher densities are unlikely to bring about the high quality of life that the centrists promise” (Breheny in Jenks, Burton & Williams, 1996, p.30).

Whilst theory behind the compact city was disputed, other lines of enquiry at the time sought statistical evidence to back up compact city proposals (Chapman, 2002). Newman & Kenworthy’s early (1989) research suggested densities of below 30 people per hectare (PPH) appear to generate greater automobile
dependence due to the combination of little public transport and greater travel
distances, whilst densities of 30 to 40 PPH appear to generate less automobile
dependent societies. Research by the Urban Task Force, UK (1999) suggested
that public transport and communal facilities required 40-60 DPH (160-240
PPH), the Local Government Management Board, Sustainable Settlements Guide
(1995), proposed a minimum of 25 DPH (100 PPH) for bus services and 60 DPH
(240 PPH) for tram services. Friends of the Earth (1994) suggested that 23-30
DPH (90-120 PPH) is required for public transport, sustainable urban residential
areas required 56-75 DPH (225-300 PPH), whilst a central/ accessible urban
area can be up to 93 DPH (370 PPH). URBED (2000) suggested increased
maximum urban densities for a sustainable urban neighbourhood at 124 DPH
(494 PPH).

![Figure 1: Zones of sustainability against land take. Source: Based on research by the DETR, 1998. Friends of
and the Urban Task Force, 1999.]

**Lessons from Europe: The Dutch Experience**

Introduced to Amsterdam in 1978 the concept of the ‘compact city’ gained
national adoption in 1985 as part of the Structural Sketch for the Urban Areas
[Stuctuurscets voor de stedelijke gebieden (Faludi, 1991), which led to over a
decade of city revitalisation based on urban intensification. The policy of the
‘compact city’ was originally proposed in Amsterdam as a “radical reaction to the
previous policy of building satellite towns, or ‘growth centres’ as they were
known, and was designed to reverse the negative effects of this overspill policy”
(Pistor, 1994, p.78). A policy which saw a marked decline in the population of
Amsterdam and other Dutch cities; “Amsterdam had in 1965 866,000 inhabitants, but in 1987 683,000 inhabitants” (Bom et al, 1987, p.8). The period 1978-82 also saw the worst economic stagnation of major Dutch cities as a result of ‘growth poles’ and the ‘compact city’ was intended to strengthen the economic vitality of cities as well as repopulate urban centres. The period further acknowledged that travel distances created by overspill policy increased commuting to the point that it was negatively effecting the Dutch environment. The new policy led to new city plans which were “based on the compact city concept, that is to say: To fully utilize the spatial possibilities within the urban area; support existing services; maintenance of the existing structure; with emphasis on accessibility by public transport” (Bom et al, 1987, summary).

By 2000, Bontje & Jolles had established a form of checklist of features/patterns for compact city developments which included; Flexible Construction, Less fuss; less is more was the motto, More Public Space, Re-profiling of roads for cyclists and pedestrians before motorists, Reduced Car Use, Reduced Road Noise, Autodate (carpooling), Public Transport, and Woonatlas, housing that “includes single-person homes for young people, studio apartments, flexible family homes and group homes for young peoples, adults and seniors” (Bontje & Jolles, 2000, p.70). Amsterdam’s compact city policies reflected the need to address the balance of space and usage. It intended to prioritise people over cars and specifically it intends to reduce ease of private vehicle use, increase available space for people, re-profile it for people and create adaptable housing, as part of a city strategy to increase occupant diversity. On comparison, Dutch objectives and By Design can be seen to address some similar areas of concern in regard to the quality of the public realm integrated with ease of movement and adaptability.

<table>
<thead>
<tr>
<th>‘By Design’ objective</th>
<th>Related Dutch pattern</th>
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<tbody>
<tr>
<td><strong>Character</strong></td>
<td></td>
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<tr>
<td>A place with its own identity</td>
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<tr>
<td><strong>Continuity and enclosure</strong></td>
<td></td>
</tr>
<tr>
<td>A place where public and private spaces are clearly distinguished</td>
<td></td>
</tr>
<tr>
<td><strong>Quality of the public realm</strong></td>
<td></td>
</tr>
</tbody>
</table>
| A place with attractive and successful outdoor areas | • Less fuss  
  • More Public Space  
  • Reduced Car Use  
  • Reduced Road Noise |
| **Ease of movement** |                       |
| A place that is easy to get to and move through | • Re-profiling  
  • Autodate  
  • Public Transport |
| **Legibility** |                       |
| A place that has a clear image and is easy to understand |                       |
| **Adaptability** |                       |
| A place that can change easily | • Flexible Construction  
  • Woonatlas |
| **Diversity** |                       |
| A place with variety and choice |                       |
Methodology
The aim of this paper is to test UK planning policy guidance, By Design against physical developments delivered during the guidance’s policy era. In order to do so we have deployed a number of methods. *By Design: Urban design in the planning system: towards better practice*, was planning policy guidance between 2000 and 2012, and focused on the planning process behind creating a good urban product and established seven objectives of urban design; *Character, Continuity and enclosure, Quality of the public realm, Ease of movement, Legibility, Adaptability and Diversity*. For the purpose of this paper, this document is taken as the planning policy translation and working tool that resulted from; *Towards an Urban Renaissance*, the *Urban White Paper -Our Towns and Cities: The Future*. The methodology consisted of four steps. The first, the proceeding literature review and overview of the Dutch experience, was undertaken to establish the research and evidence base available up to the point By Design was enshrined in planning policy. The second step was to compare and contrast generic UK housing types established at the time against density targets set out by PPG 3 and density thresholds highlighted in the literature background, to establish density relevance of each type. The final step was a comparative analysis of four UK housing led development schemes delivered between 2000 and 2012 against the density standards of PPG3 and the urban design objectives of By Design.

Literature Review
The paper is grounded in a literature review of the compact city development model and research available on the model in the year two-thousand, the publication date of By Design. The review aimed to establish a global view of the model and establish key arguments, discussions, and opposing & complementary views. The literature review also sought to collect data on development densities available in the year 2000 for later statistical testing against generic UK housing types and housing case studies.

Interviews
Primary and secondary research was undertaken in the Netherlands during 2000 and 2001. Interviews were held with key actors and stakeholders from the public and private sector and academic institutions. Interviews were semi-structured and discussion focused on: the procurement methods used to assemble land for redevelopment; Development density; the underlying urban design principles necessary to make high density living acceptable to residents; and the master plan constraints imposed to ensure design diversity. A semi-structured approach was taken due to the variety of sites visited and stakeholders interviewed. Secondary research information was also collected in Amsterdam, Rotterdam, Utrecht and Nijmegen. Respective interviewees and their professional backgrounds:

<table>
<thead>
<tr>
<th>interviewee</th>
<th>Organisation</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joep Boute</td>
<td>Physical Planning Department, Rotterdam.</td>
<td>Physical Planner</td>
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</tbody>
</table>
Analysis of generic housing types
Established generic housing type research focused on outcomes from Llewelyn-Davies’s; ‘Sustainable Residential Quality, Exploring the Housing Potential of Large Sites’ (2000). Types illustrated were chosen for analysis as they; Are "well proven and relevant in both historic and contemporary development practice"; Are "successful and familiar in terms of the creation of enduring places of quality; and "Relate closely to present and future housing typologies from a market standpoint" (Llewelyn - Davies, 2000, p.18). Generic housing types were analysed by comparing the development density of each type against development densities highlighted in the literature review and standards set by PPG3. This analysis was undertaken to establish which types delivered the density standards required by PPG3.

Case studies analysis
Primary research into four built and occupied housing led developments in the United Kingdom was undertaken in 2009 with elements of research, not related to this study, published in This way to better residential streets, CABE, 2009. Criteria for case study selection was based at the level of the public realm and street and focused on; accessibility, flexibility, high quality aesthetics, services and parking, legibility, distinct character and identity, liveliness, connectivity, and environmental sustainability. An extended list of potential case studies was drawn-up in collaboration with CABE. Project designers, developers and related local planning authorities were contacted for each scheme, with Design and Access Statements and other related design information requested. On review, four projects were selected for further investigation; Accordia, (Cambridge), Crown Street, (Glasgow), Gun Wharf, (Plymouth) and Upton, (Northampton). Selected projects were subject to site visits, visual appraisals and structured interviews with the developer/ local authority. An inclusivity expert and photographer were in attendance at each project visit. Delivered schemes were first quantitatively tested against density set out by PPG3 and then, qualitatively tested against the urban design objectives as set out in By Design.
Results

Analysis of generic housing types

Llewelyn-Davies’s “Sustainable Residential Quality, Exploring the Housing Potential of Large Sites” (2000), analysed a range of generic housing models that were established in 2000, prior to compact city proposals or adoption of By Design. For the purpose of this paper, information draws on Llewelyn-Davies’s generic housing types in terms of the density and block layout. Densities are then compared against density targets proposed by the DETR, 1998; Friends of the Earth, 1994; Jenks, Burton, and Williams, 1996; Newman & Kenworthy, 1989; Rudlin, and Falk, 2000; and the Urban Task Force, 1999. Analysis then highlights which generic types achieve targets set out by PPG3 (which stated that Local Authorities should avoid developments of less than 30 DPH and promote more efficient land-use at between 30 and 50DPH). Here density is "expressed in terms... of number of units or habitable rooms per hectare for residential development" (DETR, 2000, p.89).

<table>
<thead>
<tr>
<th>Model Type</th>
<th>Layout</th>
<th>Density targets</th>
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<tr>
<td></td>
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<td>Friends of the Earth (1994)</td>
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<tr>
<td></td>
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<td>URBED (2000)</td>
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<tr>
<td>(A2) Semi-detached houses, street-based layout</td>
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<tr>
<td>(A3) Semi-detached houses, Cul-de-sac layout</td>
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Viable local bus service
Viable public transport
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<tr>
<td>139.7</td>
<td>423</td>
<td>66.7</td>
<td>155</td>
<td>43.6</td>
<td>52.8</td>
</tr>
<tr>
<td>Public transport and communal facilities</td>
<td>Public transport and communal facilities (including central areas)</td>
<td>Public transport and communal facilities</td>
<td>Public transport and communal facilities</td>
<td>Public transport and communal facilities</td>
<td>Public transport and communal facilities</td>
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<tr>
<td>Viable local bus and tram services</td>
<td>Viable local bus and tram services</td>
<td>Viable local bus and tram services</td>
<td>Viable local bus and tram services</td>
<td>Viable local bus service</td>
<td>Viable local bus service</td>
</tr>
<tr>
<td>Viable public transport but exceeds maximum residential densities.</td>
<td>Viable public transport but exceeds maximum residential densities.</td>
<td>Viable public transport and in sustainable urban design range.</td>
<td>Viable public transport but exceeds maximum residential densities.</td>
<td>Viable public transport</td>
<td>Viable public transport</td>
</tr>
<tr>
<td>Exceeds maximum urban densities proposed</td>
<td>Exceeds maximum urban densities proposed</td>
<td>Exceeds maximum urban densities proposed</td>
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</table>

Low density detached houses 'enclave', layout (A1) and semi-detached houses, street based layout (A2) fail to achieve the lower threshold established by PPG 3 and would fail year 2000 planning tests. Semi-detached houses, cul-de-sac layout (A3) marginally achieves PPG 3 and potentially viable bus services, whilst terraced houses (B1), street based layout, medium frontage and free standing flats, low-rise clustered blocks (C2) would exceed PPG 3 standards with the potential delivery of viable public transport and communal facilities. In contrast,
grouped flats, perimeter block layout, low-rise, walk-up (C1), grouped flats, perimeter block layout mansion flats, mid rise (C3), and super block, mixed houses and flats (D1) all significantly exceed recommendations by PPG 3 and upper thresholds proposed by Friends of the Earth and URBED. Terraced houses, integral parking, wide frontage (B2) is the single model that fits neatly within PPG 3.

Generic models illustrated by Llewelyn – Davies in 2000 can be argued in the main to be ‘non-fit for planning purpose’; two fail the basic test of PPG 3, two broadly achieve standards, whilst four exceed standards, with three exceeding proposed upper research limits.

**Case studies**

The following section reviews four case studies that were planned and delivered during the 2002-2012 era of By Design. Each has been highlighted as an example of good practice in; *This way to better residential streets*, CABE, 2009 and all highlight the determination of their creators to make something much better than the suburban norm and none of them copies an existing template that has been tried and tested. Case studies:
Accordia, Cambridge is an attempt to create relatively high-density, high-quality housing on a large urban infill site, creating a strong street hierarchy, without private gardens in the conventional sense. Two miles from Cambridge city centre, almost surrounded by a conservation area of Victorian housing, the Accordia development is designed in a modernist style. The Setting is urban/suburban and the development comprises of 378 flats and 212 houses; 30 per cent affordable mixed tenure (76 per cent for rent and 24 per cent shared ownership). The site area is 9.5 hectares, density 40 units per hectare overall, 67 units per hectare in the built area and the parking ratio is 1.26:1 overall (affordable, 1:1; for sale, 1.16:1, and 54 visitor parking spaces). The project timescale was Council’s design brief 1997, Planning consent 2003, and Construction 2003–10.
Crown Street area, part of Glasgow's Gorbals district, is about a mile from the city centre, immediately south of the River Clyde. What stands out is the scale; the ambition of its attempt to create a new urban form (inspired by an old one); and the determination – sustained through almost two decades – that has been necessary to make the project a reality. The Setting is just beyond the city centre and comprises of 1,270 private sector homes, 600 socially rented homes, 80 student flats, 12 local shops, a supermarket, a hotel, a library, a local park and 5,000m² of office space. The site area is 18 hectares, density 100 units per hectare overall, Parking ratio 1.2:1 overall. The project timescale was master planners appointed 1990, Crown Street development completed 2000, and Adjacent sites to be completed by 2015.
Gun Wharf, Plymouth replaces a 1950s council estate in a severely deprived neighbourhood which became one of the first projects under the New Deal for Communities programme. Overlooking the River Tamar, the site slopes steeply down to a rather scruffy beach on the River Tamar. It is sandwiched between high dockyard walls on two of its sides. A historic tunnel (that cannot be built over) runs beneath it. The setting is urban; redevelopment of post-war housing estate and comprises of 87 houses, 10 flats, 2 maisonettes. Of these 99 units, 35 are for private sale, 46 rented affordable housing and 18 shared ownership affordable housing. The site area is 2.3 hectares, density 43 units per hectare overall, parking ratio 93 spaces total, not assigned to houses. Two disabled and 10 grouped in a gated courtyard. The project timescale was post-war council estate 1950s, consultants appointed 1999, outline planning consent 2000, demolition 2000, detailed planning consent 2003, start on site 2004, first houses occupied 2005, and completion 2006.
Upton, Northampton on the edge of Northampton, is a striking sight. In a location where you would expect to see yet another suburban housing estate, Upton’s planners and designers, however, have been determined to create an urban place. The setting is urban extension and comprises of Phase 1: 214 units, of which (46) 22 per cent are affordable (14 shared ownership, 32 rented). The site area is 3.7 hectares, density 58 units per hectare overall with a parking ratio of 1.5:1 overall. The project timescale was phase 1 outline planning permission 1997, Enquiry by Design 1999 and 2001, variation to original outline planning approval 2003, Upton Design Code published 2003, start on site 2004 and Phase 1 completed 2007.

Each of the developments reviewed achieved or exceeded density thresholds established by PPG 3. Accordia and Gun Wharf achieve 40DPH and 43DPH respectively, whilst Upton marginally exceeds targets at 58DPH. In contrast, Crown Street was developed at double PPG 3 standards at 100DPH. Whilst, This way to better residential streets did not raise the discussion around density and raised a number of objectives related to By Design, visual surveys of each scheme for this research highlights the following characteristics:

<table>
<thead>
<tr>
<th>'By Design' objective</th>
<th>Accordia</th>
<th>Crown Street</th>
<th>Gun Wharf</th>
<th>Upton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character A place with its own identity</td>
<td>Development builds on the sites historic character,</td>
<td>Development marks the rediscovery of the urban</td>
<td>Development builds upon the sites steep slopes down</td>
<td>Development builds upon sustainable objectives</td>
</tr>
<tr>
<td>Continuity and enclosure</td>
<td>A clear hierarchy of streets based on adaptations of traditional forms, including mews streets, shared spaces and a grid patterns. The use of non-private, green and landscaped places is an integral part of the development concept.</td>
<td>A clear hierarchy of streets with buildings located at or near the edge of the pavement creating a sense of enclosure. Building/block layouts provide clarity about what is private and what is public space.</td>
<td>Development makes the most of its sloping site. Where possible houses are given views of the estuary, often with bay windows. The streets and circus with the two halves of the street provide a strong sense of enclosure.</td>
<td>The scale of the buildings that line streets, their continuous building line, and the attention to detail in the streets gives a strong sense of enclosure and distinguishes public and private space. Placing parking within the block frees streets from being dominated by cars.</td>
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</tr>
<tr>
<td>Quality of the public realm</td>
<td>Use of a limited high-quality pallet of materials. The appearance of</td>
<td>Whilst high-quality materials have been used, the quality of the public realm is</td>
<td>As a home zone, its high-quality surface materials and the twisting</td>
<td>The hierarchy of streets has been well conceived, and implemented</td>
</tr>
<tr>
<td>Successful outdoor areas</td>
<td>The scheme is enhanced by the lack of carriageway markings, subtle signage, and the fixing of lighting to the buildings rather than poles.</td>
<td>Compromised by a lack of coordination and consistency of detailing, and by failures in maintenance.</td>
<td>Course of the roadway calm the traffic without excluding it.</td>
<td>With good attention to detail. Pedestrians and vehicles share space in mews and courtyards, while the streets have conventional kerbed footways.</td>
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<tr>
<td><strong>Ease of movement</strong></td>
<td>The grid layout makes it easy for residents and visitors to find their way around. The development has only one vehicular entrance, so there are no through routes for vehicles. This means that none of the street contributes to the vehicular movement of the wider area.</td>
<td>A layout of connected streets over a wide area with routes to local shops and, further afield, to the city centre. The development has limited vehicular entrances, so there are limited through routes for vehicles. This means that none of the streets contribute to the vehicular movements of the wider area.</td>
<td>Development forms a network of other streets, fronted by houses along their length that leads into and out of a communal open space. Whilst limited the street network plugs into the surrounding street pattern and could contribute to vehicular movements of the wider area.</td>
<td>The development is based on a clear hierarchy of connected streets. These are designated as the main street; streets with exposed sustainable drainage systems; ordinary streets; lanes (home zones); and mews and provide connectivity within the development area. However, development has limited connections to the wider vehicular network.</td>
</tr>
<tr>
<td><strong>Legibility</strong></td>
<td>The development’s strongest feature is a central avenue,</td>
<td>The development’s strongest feature is the high-street and its mix of</td>
<td>The development’s strongest feature is the east to west, down the hill,</td>
<td>The development’s strongest feature is the main streets with</td>
</tr>
</tbody>
</table>
following a line of ancient trees.

uses.

the street opens out first to a circular open space (the circus), then to the river estuary.

integrated sustainable drainage systems.

<table>
<thead>
<tr>
<th>Adaptability</th>
<th>Diversity</th>
<th>Reflections</th>
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<tbody>
<tr>
<td>A place that can change easily</td>
<td>Around a third of the units are classified as affordable. These benefit from the overall quality of the development, though their inferior detailing is recognisable. The apartment building (Aberdeen Avenue) may include a shop. Otherwise no other uses other than housing are likely at Accordia.</td>
<td>By Design delivered a step change in UK planning policy. Its framing as guidance under PPG1 and PPG3, which promoted good design and increased density levels for housing developments, meant planning policy guidance provided Local Authorities with standards for density and objectives for design. By Design’s approach and recommended reading reflected classic urban design texts, including Lynch, Jacobs, Alexander, etc and contemporary best practice of the period including; Towards an Urban Renaissance and the Urban Design Compendium which, grounded By Design in traditional urban design methods and contemporary best practice from the UK and abroad; and in particular, the</td>
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<td>Just under half of the homes are socially rented and the development includes 80 student flats. The design and construction of the private and social housing is tenure blind. Errol Street provides a mix of uses, a small supermarket, a library and several smaller shops, including cafes, butchers, newsagents and chemists.</td>
<td>Thirty-five of the units are private sale, 46 rented affordable housing and 18 shared ownership affordable housing. No new facilities are included in the development.</td>
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<td>In Phase one, 22% of the housing is affordable and no new facilities are provided. Later phases are expected to deliver a primary school, shops and live-work units.</td>
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Netherlands. The objectives of urban design, as set out by, By Design, can be seen in part, to address similar features/patterns as set-out by Bontje et al. Both placed emphasis on the importance of public realm, movement and connectivity, and sought to put the needs of people before traffic. Similarly, both emphasised the importance of the built environment, landscaping, and the need for adaptability.

Whilst By Design refers to density throughout the document, no guidance on density thresholds is needed, as guidance is tiered under PPG3, which seeks to avoid developments below 30 DPH and encourage development between 30 and 50 DPH. Whilst PPG3 density targets do not correlate directly to research recommendations by the Urban Task Force et al, the 30-50 DPH target highlights PPG3 and by default By Design sort to enable less car dependent settlements. On comparison with Llewelyn-Davies’s generic housing types of the time, only two of the models fall within the 30-50 DPH target (and of these, one exhibits a ‘cul-de-sac’ form of development that would fail to achieve the movement and connectivity objectives set out in By Design). Four exceed targets, suggesting that whilst the UK housing industry was experienced in developing high-density housing, types were not aligned to the planning policy. Similarly, two models failed to achieve 30DPH, and as such were not fit for planning purpose.

Housing led schemes designed and delivered during the PPG3 and By Design are, however, more broadly aligned to PPG3. Accordia and Gun Wharf fit neatly into the density range with Upton exceeding it slightly at 58DPH. Crown Street, however, which was not subject to PPG3, being under Scottish planning policy, breaks the mould at 100DPH. In regards to By Design objectives the four schemes exhibit a commitment to design quality in building design and public realm and, critically, all create a connected network of streets and spaces within development, a core objective for ‘ease of movement’. However, all fail to create a connected network of streets to surrounding areas and neighbourhoods, limiting public transport accessibility. Crown Street, however, whilst not under the policy direction of By Design, can be seen singularly as the only development in this group that delivered the types of mix of use promoted in By Design, with the associated connected network of streets, high-quality public realm and building design. For these developments, PPG3 and By Design appear to have had a positive influence on the ground and created the ‘high-quality’ of urban product originally sought.

**Conclusions**

PPG3 and By Design created a step change in planning policy by setting design as a material consideration, establishing density targets and describing urban design objectives. However, whilst By Design can be viewed as a landmark publication, this paper has highlighted that the evidence base available on the benefits of compact city policy at the time was sketchy. Urban design theories behind By Design can be seen as established and endorsed (through practice and education) but unscientifically tested and without a clear evidence base. Data surrounding density was also unclear, with alternate densities being promoted by different lobby groups. A sketchy research base and opposing views led to uncertainty around the debate and created inconclusive arguments; for and against the compact city. It can however be seen from the paper that PPG3 and By Design attempted to use settlement form to address resource efficiency and
pollution by promoting reduced car dependency, enhanced public transport and walking and cycling. Whilst these objectives can be seen to reflect similar objectives to Dutch principles, the rationale behind each is somewhat different. UK promotion was based on resource efficiency and pollution, whilst the Dutch intention was to help repopulate shrinking cities and improve economic development. Suggesting, policy evolution of these design objectives may not necessarily be single-outcome and may be multi-dimensional.

Generic housing types analyzed in this paper cannot be fairly judged against objectives set out in 2000, as they reflected housing typologies that were developed prior to the promotion of compact cities. However, they do provide a benchmark of densities being delivered prior to policy progression. Review of generic housing types illustrated that only two of the typologies would deliver housing densities within PPG3 thresholds, suggesting that on density alone, new housing types were needed. Their ability to deliver the design objectives set out in By Design is less clear, as generic housing types were researched by Llewelyn-Davies at the scale of block with no relationship to context, public space, etc. Review of design objectives and densities against the four delivered schemes highlights that the UK development industry evolved their design approach in the early years of the 21st Century to develop medium density schemes (around thresholds) with urban layouts that facilitate less car dependency, increased accessibility and walking and cycling. At this level alone, By Design and embodied objectives can be seen as a positive planning tool for the period that may continue to have relevance to today.

Strengths/Limitations
The methodology allowed a reflective review of compact city theory and density thresholds discussed before the year 2000. This time limited period for literature research provides a state of the art for information available during the policy development period. Review of the Dutch experience allowed By Design’s urban design objectives to be compared and contrasted against Dutch principles - who at the time were considered market leaders in the European approach to compact cities. Analysing contemporary generic housing types of the time against densities thresholds set-out in PPG3, allowed housing types suitable for planning policy to be identified and appraising delivered housing schemes against the targets of PPG3 and objectives of By Design, allowed policy success or failure to be reviewed.

A limitation to this research was the fact that the review of generic types was restricted to types proposed by Llewelyn-Davies, which doesn’t cover all UK housing types available and therefore can again be seen as a limitation. This limitation was compounded by the review of a limited sample of delivered schemes which were selected on a quality and place-making basis.

Future Research
Whilst this paper set-out to look at the policy period of By Design, its development and impacts, research has highlighted the period’s commitment to connectivity and movement as a key objective to urban design. The paper has highlighted that whilst delivered schemes provide connectivity and a networks of streets within development, connections to surrounding areas were often
limited. This suggests that whilst planning policy such as By Design, has been successful at creating ‘ease of movement’ at the micro-scale, this has not been achieved at the macro-scale; across communities. As such, it can be suggested that the area of ease of movement, is still unresolved and requires further research. Such research may relate to ease of movement within and across neighbourhoods and may focus on issues as diverse as human well-being and seasonal climate variation. At present, well-being within urban design is developing momentum, as physical inactivity is now the fourth leading cause of death worldwide contributing to a mortality burden as large as tobacco smoking (Kohl, 2012). Whilst this agenda is currently championed by the World Health Organization, it is beginning to trickle down into early forms of guidance; NHS England (2013) proposes four health planning themes where one is active travel, while the American Planning Association establishes six health topics, which are headlined by active living. Whilst such a development should be seen as positive, the field of well-being under the umbrella of urbanism, and specifically connectivity and movement, is only emerging and should be subject to research and debate.

Equally the dimension of connectivity and movement may benefit from research into the impact of seasonal climate variation. Urban Design guidance excepting wind and solar analysis often omits to reflect the inhibitors and enablers of seasonal climate variation. Impacts of climate on levels of outdoor activity may play an important role in understanding the well-being potential of settlement form and is worthy of research as part of the connectivity and movement agenda.

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