
Practitioner's Reflections

Garden cities for the twenty-first century

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Abstract How can cities grow without harming the environment? Nicholas Falk and David Rudlin won the 2014 Wolfson Economic Prize by showing how to build New Garden Cities that are visionary, viable and popular. The principles were tested out first in York and then in Oxford, and are now being applied in a number of other cities. The basic idea is to use the uplift in land values to fund improved local infrastructure. *URBAN DESIGN International* (2017) **22**, 91–110. doi:10.1057/s41289-016-0032-6; published online 20 January 2017

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As cities around the world cope with mushrooming populations and resource shortages, many are looking for better designs than are being offered by developers and architects. Yet there are few proven models for how cities should cope with growth at their edges. Much of the design debate has focussed on the future of so-called World Cities, like New York and London, or the Mega Cities such as Mumbai and Mexico, whose trajectories, like giant oil tankers, are hard to change, and whose urban form is relatively fixed. The prevailing ideology has been to favour the Compact City, and Smart Growth, as promoted by, for example, the Congress for New Urbanism in the United States (www.cnu.org), the Urban Task Force in the United Kingdom (Rogers *et al*, 1999), or the EU (2011). The prevailing idea about future cities seems to be the use of IT in so-called Smart Cities, while in Asia the idea of Ecocities is still current. The suburbs in contrast are often discredited or largely ignored by self-styled urbanists, even though they are where most of the world's urban growth happened (Keil, 2013) and where 80 per cent of the UK's population live.

Economic studies such as *Triumph of the City* are valuable for reminding us what cities contribute to civilised life and innovation, but offer little comfort for the suburbs of medium-sized towns, which are criticised for being unsustainable or plain boring (Glaeser, 2012). There is much excellent research to show the importance

of higher densities to support public transport and sustainable development, but little to show how to design places so people avoid using their cars (Dittmar, 2008). Considerable work has also been done on 'shrinking cities' because of industrial decline, and the importance of public investment to regenerate places such as Detroit and Leipzig that have lost manufacturing employment on a giant scale (Power *et al*, 2010). Useful work has also been done on retrofitting suburbs to reduce their energy impacts, taking account of different types of node, such as railway stations (Talen, 2011).

But models such as these do not offer much in the way of practical guidelines for the growth of the 50 cities with over a million population in India, for example, or the thousands of historic towns and cities in Europe that face escalating property prices and polarising societies, or the outskirts of our large cities that are locked in traffic jams much of the time. Nor do the many superbly illustrated books on masterplans provide practical blueprints, as masterplans soon become obsolete and forgotten without the driving force to implement them (Bullivant, 2012). The real challenge is not analysing what has gone wrong, or even illustrating visions for something better, but rather providing some kind of route map or framework for getting there from here, and one that can be applied through some kind of local manifesto or charter at a local level in places that lack overall control over land use (Rowland and Falk, 2013).

Planning as currently practiced in the United Kingdom can be a barrier to building the kind of places we would prefer to live in, and this requires bringing old ideas up-to-date.

This article sets out to explain first why the old idea of 'garden cities' has suddenly surfaced again as one possible solution to doubling UK housing output before reviewing briefly changing ideas about how cities should grow. It presents the case for a twenty-first century version of the garden city that overcomes the flaws in previous New Towns that have been criticised for not appealing to the wider population, designed around the car, and relied on levels of government funding (such as US £700 million for Milton Keynes) that are no longer available (Alexander, 2009).

The second section summarises URBED's research into what can be learned from innovative housing developments in mainland Europe and the United Kingdom. It suggests new ideas for urban design and development finance at the suburban level that would enable the idea of Sustainable Urban Neighbourhoods to be applied much more widely (Carley and Falk, 2012). Their relevance can be seen not only in the 20 different cities that are profiled in Sir Peter Hall's final book *Good Cities, Better Lives*, especially in the Netherlands, but also in some of the American cities such as Portland Oregon that are applying the principles of Transit-Oriented Development, or Curitiba in Brazil.

The third section sets out seven general principles for smarter growth through designing garden cities to meet the demands of the twenty-first century. In the 2014, Wolfson Economic Essay Competition, David Rudlin and Nicholas Falk of URBED, a UK-based urban design practice, won over 270 other entrants for their proposals for Uxchester Garden City, 'a garden city that was viable, visionary and popular' (Rudlin and Falk, 2014). Having been shortlisted for a scheme for a fictional city, URBED tested the ideas out in the very demanding context of the historic university city of Oxford to show how it could be doubled, drawing on good practice from elsewhere, and the basic principles are illustrated with drawings from the final submission. The final conclusion summarises the lessons for quality urban growth using the framework of the Cambridgeshire Quality Charter for Growth that is already changing the design of what is being built, and creating a better model for what future suburbs could be like (Falk, 2008).

Why Garden Cities Again?

Radical new ideas tend to surface at millennia. At the end of the nineteenth century, when versions of 'art nouveau' swept through Europe and North America, the idea of Garden Cities also took form. But Ebenezer Howard (who apparently took the name from his experience in Chicago), is very misunderstood. His real invention was not leafy avenues and front gardens, but what he called 'The Social City' (Figure 1). Howard, like other Victorian radicals such as William Morris and John Ruskin, wanted to create a better alternative to the city, with its slums and dirty air, but without the drawbacks of the countryside. He went further than philanthropists such as Joseph Rowntree at New Earswick, who built utopian villages for their workers but did not tackle the underlying economic issues (Darley, [1975] 2007). Howard thought the 'unearned increment' from the uplift of land values could fund what Beevers (1988) called 'the whole edifice of the garden city and its associated economic and social reforms'. In his famous Social City plan six different settlements around a 'central city' are linked by an 'intermunicipal railway' or electric tram, as well as by canals – the original 'Polycentric conurbation'.

Parker and Unwin, his architects for Letchworth Garden City, went on to create the sinuous, tree-lined streets most people associate with Garden Cities, along with the 'arts and crafts' houses which were taken up in European versions, such as Hallerau on the edge of Dresden, or around the edge of Paris. The notion that people should live close to green spaces also dominated post-war English New Towns such as Harlow and Milton Keynes with the difference that people were expected to take the bus or cycle or drive to work elsewhere in the same town. The vernacular gabled house that architects such as Webb and Voysey designed for Morris and other influential clients, was copied in the standard British house-builder's estate and in the countless English council estates of semi-detached houses that were built between the wars.

Unfortunately the early English garden cities soon ran out of funds. House builders exploited the new arterial roads with 'ribbon' development, and people with money moved as far away as they could afford into the new suburbs and later into smaller towns. To protect sensitive souls from ugly sprawl on the edges, 14 cities were encircled by Green Belts, like medieval moats, disregarding

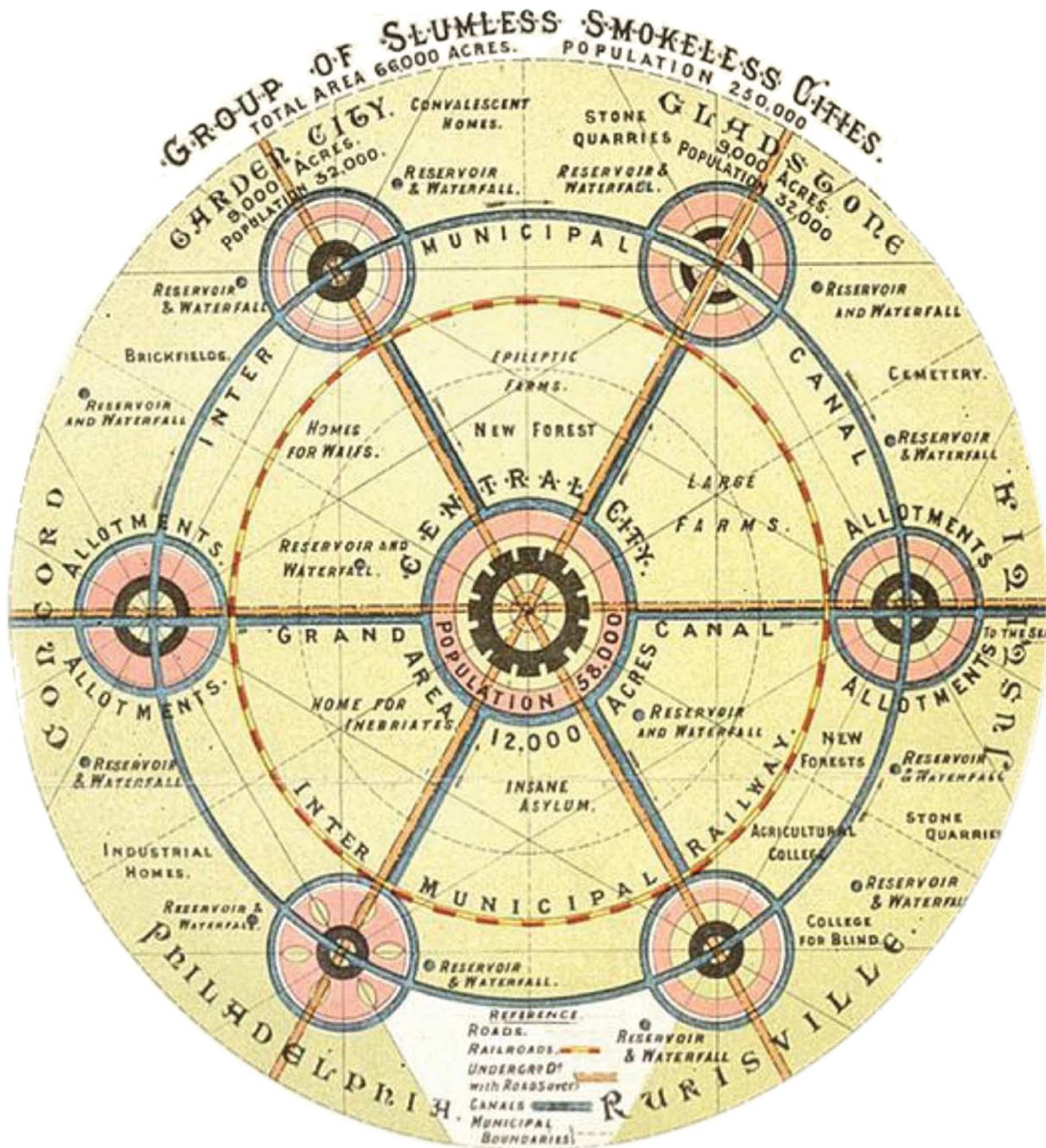


Figure 1: Howard's original plan for The Social City.

areas of often greater ecological value elsewhere and often inaccessible with little biodiversity (Moore, 2014). Similar looking suburban housing estates sprung up beyond them, intensifying the gulf between city and rural dwellers, as the new country dwellers often drove through the inner cities to get to work, creating noise and fumes in their wake.

Development took place in smaller towns and villages, and much of England developed as networks of towns separated by protected countryside with consequently longer journeys to work than in mainland Europe (Hall and Pain, 2006).

In contrast in the rest of Europe, the prevailing idea was the Compact City (Jenks *et al*, 1996). This was taken up by the Urban Task Force



commissioned by an incoming British Labour government (Rogers *et al*, 1999). The inspirational theme of 'toward an urban renaissance' promoted building on brownfield sites abandoned by industry at a minimum density of 30 to the hectare (which was the same as Parker and Unwin had advocated for garden cities), and to much higher design standards. Richard Rogers thought there were no models worth looking at in Britain, and urged people instead to look to Rotterdam or Barcelona. While the Urban Task Force's policies were successful in encouraging apartment building on a grand scale in the centre of big cities such as London and Manchester, they did not produce the family and affordable housing that was desperately needed. Instead 'Buy to let' investors bought many of the new units, often with foreign money, and house prices 'went through the roof'. Many of the schemes were criticised particularly for their poor public realm, often car dominated, and research showed that only 25 per cent of the British population ever considered buying a new home (Future Homes Commission, 2011).

A less grandiose attempt to develop 'urban villages' backed by HRH The Prince of Wales, and interpreted by Leon Krier and others, led to the new satellite settlement of Poundbury outside Dorchester in Dorset, which initially had wider appeal because of its great variety of housing types and homely features. But for all the publicity and expert advice the model was not widely repeated (Aldous, 1992). A series of Millennium Villages promoted by the Labour Government through what became the Homes and Communities Agency were also slow to take off. Developers were then asked to come up with proposals for Ecotowns, which led to a mass of excellent guidance, but very few new homes, as the original eleven dwindled to two or three initiatives (TCPA, 2010). Housing production seemed stuck, however, high prices soared, as the volume house builders who accounted for the bulk of sales produced what was easiest to sell.

In Britain the Urban Task Force had advocated three-dimensional masterplans as a means of redensifying cities and accommodating a growing population. The tool of Design Codes was exported back to the United Kingdom, along with the notion that rules could be set down to produce quality. One result was tower blocks of 'luxury apartments' close to the centres of major cities like London and Leeds where high land values made it hard to replicate traditional streets. The results were limited even in the United States (though

Seaside, Florida, gained notoriety by being used as the set for the film *The Truman Story*). Places that have applied Design Codes do not look fundamentally better so long as cars dominate the open spaces, and people drive to work or shop. It was these problems, as well as the wider issues of how cities were to rebuild their shattered economies that the Urban Task Force failed to address.

In the past the basic problem was that those with most money have moved to spacious suburbs on the outskirts, squeezing poorer households into ever smaller and more expensive rented accommodation. Glaeser (2012) points out that the city offers many more benefits for both rich and poor over living in rural villages. Recently there appears to be a switch among young people in the United States away from car-based lifestyles, and towards a more European shared life of walkable streets and social bars, so it could be that we are on the wave of a new demand for somewhere different (Breen and Rigby, 2004). A new industry is springing up to retrofit failing suburbs in both the United Kingdom and the United States (Dunham-Jones and Williamson, 2009). But the American record on creating planned new communities, for all the rhetoric, remains weak. Reliance on private developers and fragmented patterns of private land ownership limit what can be achieved in practice. A different design and business model is needed to cope with urban growth.

In the United Kingdom, housing came back onto the political agenda as house prices became out of reach of the middle-income first-time buyer, while house production stuck at around 120 000 homes a year, or less than half what is required (Figure 2). Following a series of expert studies, of which the latest is the Lyons Housing Review (2014), a consensus started to emerge that the basic obstacle is the limited supply of land along with declining capacity on the part of house builders. The three main political parties also agree that some major settlements are needed if house building is to double and support the idea of new garden cities (though there are still many, such as the Campaign for the Protection of Rural England, who argue that all that is needed can be provided by using brownfield sites) (Sinnott *et al*, 2014).

There are three unresolved questions. The first is where all the new housing is to go, with strong enough resistance from NIMBIES (Not In My Back Yard) to sway elections, and general scepticism about the quality of new housing. The second is how to fund so much new housing and local

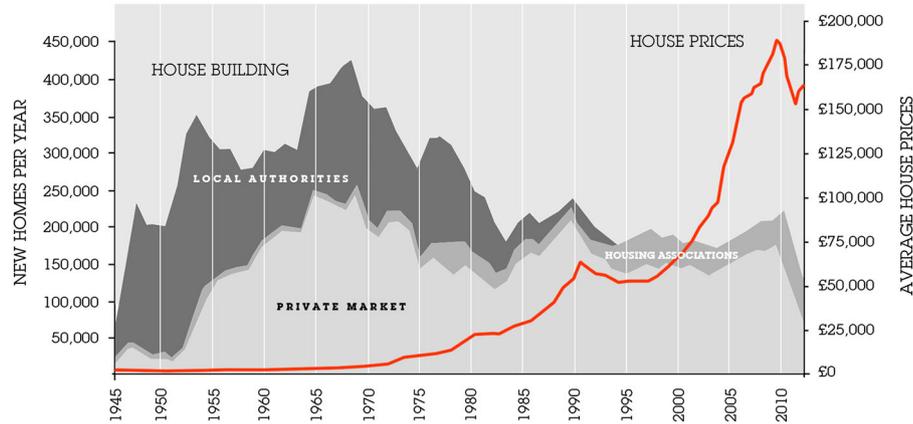


Figure 2: British house prices have escalated, while house building has stagnated (note new artwork supplied).

infrastructure at a time of national austerity with high existing debt levels. Unfortunately the costs of building homes are now higher as a result of meeting higher energy and other standards. But also as much again needs to be spent on the supporting infrastructure of roads, utilities, education and health, as studies in Milton Keynes and Cambridgeshire have shown (Falk, 2014a). The obstacles seemed insoluble. The third issue is the excessively high value put on development land in the United Kingdom, in contrast with most other countries. It is this obstacle which the garden city model uniquely seeks to address by taking over undeveloped land.

The land and property price problem was the source of many of the disappointments of the Urban Task Force agenda. Punter (2010, pp. 343–344) in the most definitive summing up of the first decade of the Task Force's influence, points to a number of key respects in which the mechanisms of the private property markets failed to deliver the aspirations of the programme. It was narrowly market-driven decisions which led to the proliferation of city-core apartment blocks, ill suited to the household composition needs of the local communities and which led to inadequate levels of social housing to enable established communities to sustain themselves in their territories.

Proposals for a new crop of Garden Cities first re-emerged as a result of the prolonged efforts of the Town and Country Planning Association, which is an important part of Howard's legacy. The TCPA believes that high land values, partly the result of a restrictive planning system, should be used to fund the infrastructure through what Howard called 'the unearned increment' – the uplift in land value when farm land is developed

for urban use. The pioneering settlement of Letchworth had not only produced a place where almost anyone (except Jane Jacobs) would be happy to live, but also where the Garden City Trust had held on to enough land to support a good level of extra social services (Ross and Cardannes, 2012). A number of local authorities, including Cherwell in Oxfordshire and South Cambridgeshire, began to think about the idea of building some kind of new town on the edges of existing settlements.

The Coalition government encouraged local authorities to come up with their own proposals for garden cities. But apart from requiring each to have 15,000 homes, they were vague about what this entailed, or how to overcome local opposition. The Liberal Democrats proposed five New Towns along a railway line linking Oxford and Cambridge, the 'brainbelt'. But the concept really took off among design professionals when Lord Wolfson, a successful Tory peer, decided to use his annual Economic Essay Competition to seek fresh ideas for how Garden Cities could be made to work, with a prize of £250 000. Their market research showed the idea was supported by 75 per cent of those questioned. Wolfson asked how they could be visionary, viable and popular without public subsidy in under 25 000 words.

The impact of the Wolfson Essay Competition can be clearly seen in the chapter of the Lyons Review on 'A new generation of Garden Cities and Garden Suburbs', which was published shortly after the results had been announced, and which was intended to form the basis of the Labour Party's housing policy. Significantly the report took up the recommendations of nearly all the five finalists that proposals should be initiated by local authorities, but implemented through



development corporations. Importantly it stated that 'The Garden City vision cannot be realised without access to the right land in the right place at the right price'. The idea of a revolving infrastructure fund was endorsed, along with Treasury guarantees to unlock infrastructure, with reformed Compulsory Purchase Powers, and it is reckoned these recommendations could deliver some 500 000 homes. However, little was said about design, other than adopting a zerocarbon standard, minimum space standards and streamlined regulations. Government was expected to 'set out the criteria that Garden Cities would be expected to meet'. Howard's fundamental insight into the importance of tapping the 'unearned increment' was too radical for either the Lyons Review or the Coalition Government to address.

Designing Sustainable Urban Neighbourhoods

In contrast to the United Kingdom, North America and much of Australia, mainland Europe embraced the Compact City and ensured that most suburbs are well-connected with town and city centres by good public transport (EU, 2011). With much of the new housing being for rent, Northern Europe has largely avoided the problems of house price inflation that have plagued the United Kingdom. The concept of Compact Cities was supported by influential writers such as the American Jane Jacobs, as well a number of academics from all over the world who hated the effects of urban sprawl and country living (Jenks *et al.*, 1996). Designers advocated mixed uses, small walkable blocks, with densities of as much as a hundred dwellings per acre or 250 per hectare. Instead of Green Belts, cities such as Copenhagen grew around a series of 'Green Fingers', with radial transit corridors, the latest development of the new town of Orestad being used to help fund the new Metro line.

In the densely built-up Netherlands, the main cities of the Randstad are located around a Green Heart and connected together by excellent rail links. This enabled the hundred new suburbs built through the VINEX programme to be stitched onto their edges, so that cycling or walking to public transit is both viable and pleasant (Figure 2). Similarly Freiburg in South West Germany calls itself 'The City of Short Distances', and the urban extensions of Reiselveld and Vauban were built around extensions to their tram system. As a

result, car use there has been kept constant over three decades, and more balanced communities have been achieved, with a higher quality of life, especially for children, even if many have to live in apartments or maisonettes. Energy consumption has been cut by investment in schemes such as Combined Heat and Power, most notably in a much praised urban extension of Hammarby Sjostad in Stockholm, but also in the post-industrial Swedish city of Malmö, now linked by a new bridge to Copenhagen (PRP, 2008). By drawing on low-cost long-term loans from state investment banks, local authorities have been able to play a much more proactive role than is possible in the United Kingdom (Falk, 2014a, b).

In France too, eco-town developments are being assisted by the state investment bank Caisse des Dépôts, rather than relying solely on planning policies. An excellent review of the way development is handled in mainland Europe suggests that planning is more like a game of dominoes than a jigsaw (Schuller *et al.*, 2009). In other words, there is no point relying on some ideal end state plan, but rather each step has to respond to what has previously been developed (which is one of the reasons why land ownership is so crucial in areas undergoing a transformation). Comparative data in that book show that good suburban transit systems cut commuting times in cities as different as Amsterdam and Zurich to under an hour a day, hence making it easier to develop peripheral sites. Research reports have also highlighted the effects on poverty of different morphologies. Different patterns of segregation and exclusion in US cities make them more prone to riots and conflict (Kazepov, 2005). The typical Continental city, therefore, is more like a Danish pastry or an Italian pizza than an American doughnut with a hole in the middle! A rich centre connected to nearby suburbs by good public transport along radial routes should be much more sustainable.

The Congress for New Urbanism embraced what was originally a European idea, rather like pizza, and recycled it as Transit-Oriented Development in what became the Charter for New Urbanism (Calthorpe, 1993) (www.cnu.org). But 'recycling suburbs' by increasing densities and building on parking lots, while a great idea, does not cut travel times when trips are dispersed and car usage is dominant (Talen, 2011). Making the most of public transit is difficult because it is hard to change established travel patterns without imposing restrictions on driving, such as taxing parking spaces. In a few progressive cities, such as



Denver, progress is being made, but the idea of 'smart growth', while favoured by most planners, is hard to implement when power lies with suburban property owners.

Furthermore as Ravetz and others have argued, there are also 'sustainability trade-offs' to be made (Ravetz *et al*, 2013). As well as concerns to reduce carbon emissions, it is vital to consider social equity before concentrating poorer people in high density blocks of flats on the remote edges of 'peri-urban' city regions, as happened in Paris or in Indian cities where city slums are being cleared and replaced with luxury apartments (as the film *Slumdog Millionaire* vividly illustrated).

According to Rudlin and Falk, who first coined the term, a Sustainable Urban Neighbourhood can be defined by five features:

- Wide enough choice of housing and facilities to ensure long-term value and create a balanced community over time
- Well-connected to jobs and services by foot, bike and public transport
- Offering places of different character to stand the test of time and appeal to different markets
- Designed to conserve resources
- With hands-on management and long-term stewardship.

With funding from the Joseph Rowntree Foundation, a network was set up in 2009 to help 12 innovative new housing schemes to learn from each other over a 2-year period through study tours and discussions. The research findings fed into the Joseph Rowntree Housing Trust's development of Derwenthorpe on the edge of York, a century or so after the pioneering garden suburb of New Earswick (www.jrht.org.uk/communities/derwenthorpe). The full research report contrasted what we already know from research and with what we found from the case studies. The report concluded that:

Even where design codes had been drawn up, the public realm often lets the development down, partly because highway or utility engineers are not so interested in the way things look, and overrule designers, and partly because of poor urban design. (Falk and Carley, 2012)

Though progress was being made in applying fresh thinking, building rates were still very slow in the United Kingdom. One of many study tours to look at VINEX suburbs in the Netherlands revealed how much better the Dutch were doing,

for example, increasing the housing stock by almost 8 per cent in under 10 years. The visit showed the potential for people commissioning and building their own homes, as in Almere Poort. A previous report had brought out the crucial role that local authorities were playing in leading the development of exemplary new communities (PRP, 2008). What became clear is how the Dutch had taken much of the risk out of building new housing, which helps explain why new homes cost so much less than in the United Kingdom. Thus low-cost long-term loans from the Dutch state bank BNG enabled land to be assembled, master-planned and provided with infrastructure, as a result enabling a multitude of small builders to provide for different market niches.

A further message was the importance of long-term stewardship, as house builders have short time horizons, and higher densities require close management if the public spaces are not to decay. Instead it is better to enable new communities to share in the 'common wealth' by having an interest in the land, for example, through some form of development trust that can manage the common parts, such as playing fields. Significantly, though every scheme studied looked very different, a common issue was in achieving higher levels of cycling and walking and thus reducing the use of the private car.

The report's tests and guidelines for design and management, along with seven main messages provided a good foundation for the prize-winning Wolfson submission. The recommended steps in summary were:

- Agree the spatial framework
- Facilitate public-private partnerships
- Mobilise public undesignated land
- Attract private funding for infrastructure
- Open up housing markets
- Endow community stewardship
- Learn from what works.

URBED's submission to the Wolfson Essay competition took a radically different approach from almost all the others because it was based on European good practice (Figure 3). The submission argued that it was unviable to create communities from scratch, and so a twenty-first century garden city 'should be grafted onto strong rootstock'. Furthermore, the developments would need to be located close to where people currently want to live and work, and so the concept for Uxchester Garden City was born. The basic principles had already

transport both to cut carbon emissions and to overcome local concerns about congestion (Banister *et al*, 1988). Inspection of the map identified some 40 cities in England that might qualify, and many others would benefit from smaller garden suburbs or sustainable urban extensions that applied similar design principles.

Equally important is making it easy and safe to walk and cycle to transport stops and other facilities, which is why new neighbourhoods in Dutch VINEX towns like Houten and Amersfoort are so popular and look so attractive (Figure 4). Planners should aim to create a ‘fit’ or walkable city, not a fat city full of holes. The Uxcester Garden City submission takes the debate about compact cities versus smart growth a few steps forward, and the first of the proposed criteria is illustrated by URBED’s *snowflake plan* (Figure 5). The key design principle is that everyone can live within 20 min of the city centre by rapid transit.

Build at densities that support rapid transit

The second big issue is *density*. By assembling the land, commissioning the masterplan and installing the basic infrastructure, as in the Netherlands or Germany, sites can sold off to a wide range of builders, including housing for private and social rent as well as self-builders and co-housing groups (Dittmar and Ohland, 2004). Variety comes also from a range of densities to avoid everywhere looking the same. Neighbourhoods of around 5 000 homes or 12 000 residents are large enough to support a new secondary school, as well as a number of primary schools, thus putting the heart into new a communities. There is even room for some detached housing on the periphery, which will boost demand and win support from potential opponents. The Trellis Plan shows how the new community can grow up around a clear pattern of streets (Figures 6 and 7).



Figure 4: Vathorst on the edge of Amersfoort.

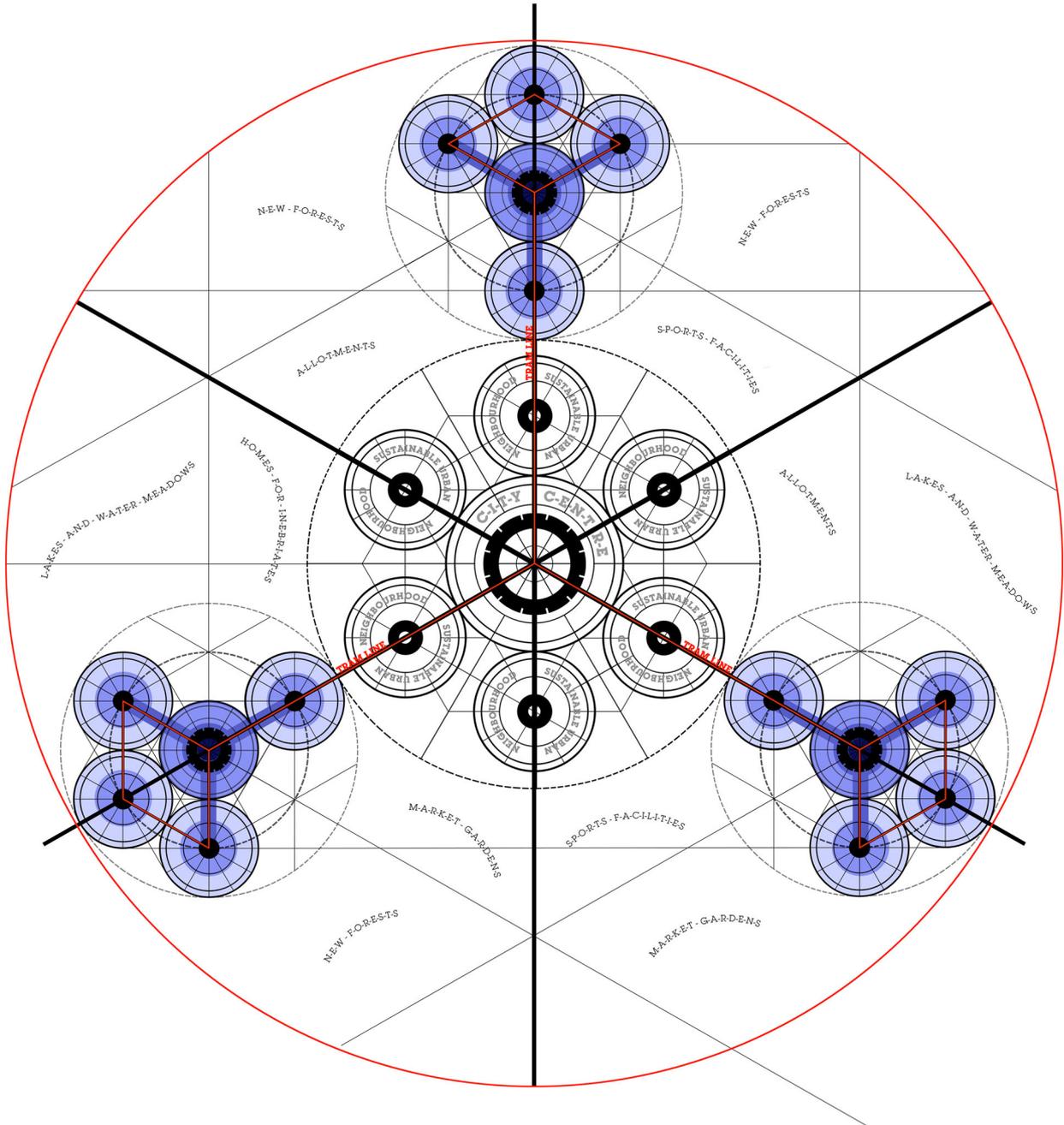


Figure 5: New Garden Cities should grow like snowflakes along transit corridors.

URBED's infrastructure budget showed that by acquiring land at close to agricultural value it is feasible to finance a new tram line, as well as support a good proportion of affordable housing, with the highest densities along the transit corridor. Paying less for the land also allows a much wider range of housing to be built, which will speed up sales, and hence the cash flow that is so critical to quality. The key design principle is planning for a range of densities from 20 to 60 to

the hectare to allow for some generous gardens and public open space.

Provide recreational opportunities to attract brain workers with families

A third issue is that by starting with country parks, designed to reduce the risk of flooding and possibly grow organic food or biomass, a much



Figure 6: A trellis of streets provides the framework for sustainable development.



Figure 7: Housing densities support good public transit and country walks.



better quality of life can be provided than on a brownfield site or conventional housing estate. Instead of inaccessible and arid ploughed land, the countryside effectively comes to town. By involving many of the new residents in commissioning their own homes and recreational facilities, a much stronger community will result. By opening up lakes and waterways, many more people can enjoy a good view. And by catering for a broad mix while rebalancing the tenures in the surrounding area, a much more balanced community will be created than in New Towns such as Harlow, where a relatively narrow range of housing has been provided up till recently (Figure 7).

The values of coproduction will prevail over consumption, as they did in Letchworth, through close contact with other people, but this time facilitated by social media, whether it be choirs, car clubs or cooking classes! Incidentally the Solutions report for JRF found that the main schools and shops need to be on the edge, where they can also be used by existing communities, thus avoiding a division between 'them and us'. For some English cities this means taking a 'confident bite out of the Green Belt, rather than nibbling at the edges' (Rudlin and Falk, 2014). The key design principle is that a Social Contract will be agreed that offers greater protection to the character of landscape around other villages by prohibiting development unless local people in the neighbourhood approve. It is only by offering existing residents some tangible benefits that any progress can be made in opening up land for development on a major scale (Figure 8).

Fund local infrastructure from land value uplift

The most critical issue of all is *finance*, as the strongest argument used to stop development is the over-stretched local capacity of roads, schools, health centres and so on. By acquiring land at close to agricultural value, as Ebenezer Howard did, but linking the new communities with an existing city, it becomes possible to fund much better infrastructure, such as a tram or a Combined Heat and Power system, as in Freiburg or Vathorst in Amersfoort near Utrecht. By raising private finance through bonds underpinned by public sector agreements to provide the necessary infrastructure, the costs of development can be cut along with many of the risks. As serviced sites are rapidly



Figure 8: New housing at Trumpington Meadows.

sold off for development within Codes that shape densities and protect amenity, investors will receive their payback with the added satisfaction of investing in 'green growth' (Girardet and Mendonca, 2009) (Figure 9). There is a wealth of finance looking for inflation-proofed investments, and this includes not just 'patient' or ethical investors, but also the many older people with money to invest, some of whom are looking to downsize if only attractive new homes were available.

The Garden City Foundation provides the security, as the Great Estates that built central London did in the past, by acquiring the freehold of all the land. The exceptional results achieved in the Southern Fringe of Cambridge at Trumpington or that are under development on University of Cambridge land show what is possible, given the necessary ambition. The key design principle is to focus on areas where property values are quite high, and where economic activity is growing.

Oxford as a Test Case

To ensure that the Uxcester proposals were realistic, they were tested out in central Oxfordshire, where house prices are currently 15 times mean income, and where some 28 000 new homes are needed in the City alone, along with a much improved transport infrastructure to tackle congestion on the surrounding roads. The Uxcester Garden City submission examined the most ambitious scenario of doubling the city over a 30-year period. Fortunately extensive discussions had already taken place in the City over the previous year, promoted by the Oxford Civic Society and

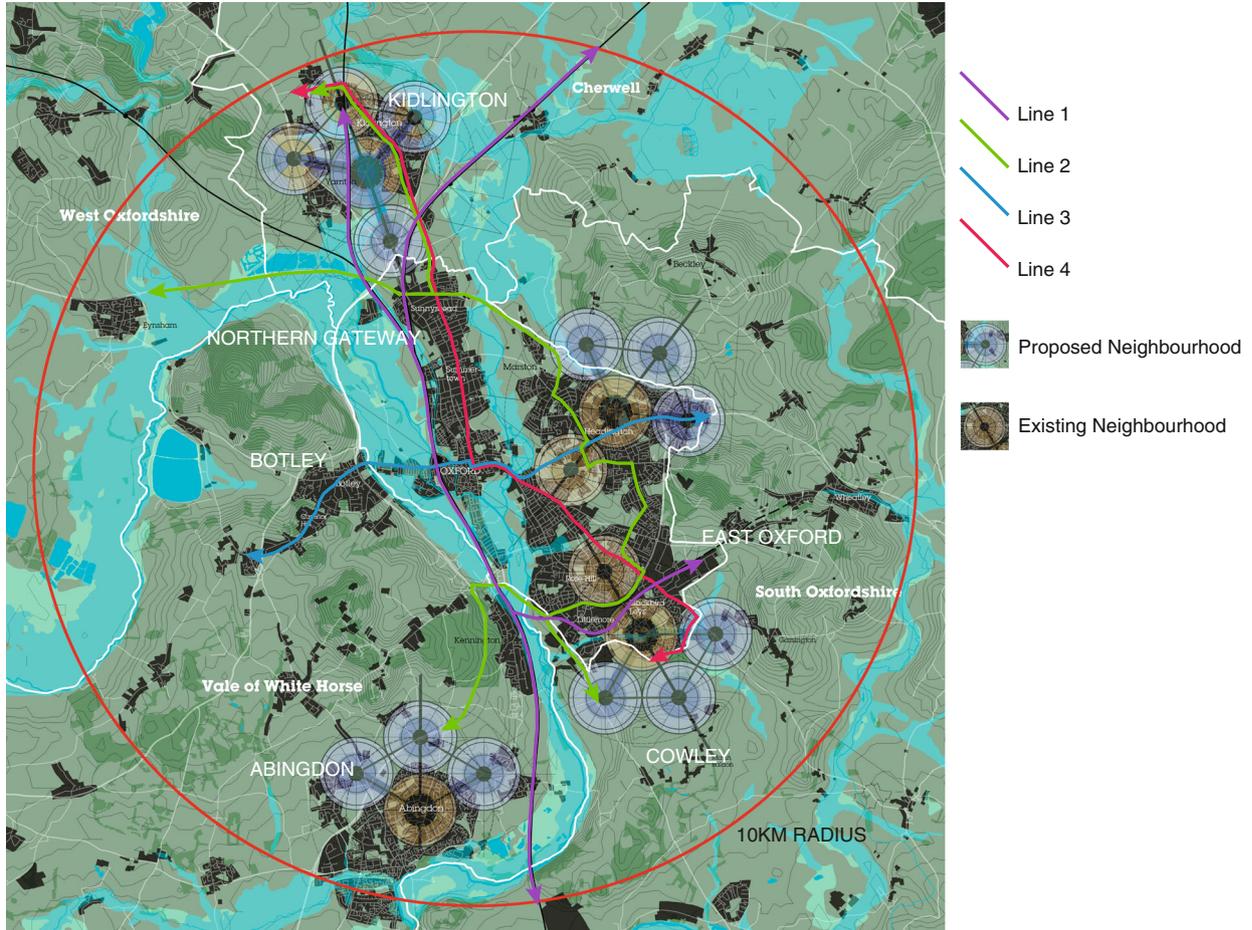


Figure 9: Oxford could double in population through new housing on the edges of the City.

others, which drew on experience in both Cambridge and Freiburg (Falk, 2014a). Four principles for guiding further growth came out of workshops that involved the Academy of Urbanism, as well as members of the local community:

1. Develop in the right place and reduce car use.
2. Minimise environmental impact.
3. Build distinctive places.
4. Create balanced and healthier communities.

These conclusions were supplemented by a series of Oxford focus groups reacting to different aspects of the Uxcester proposals, which were generally encouraging as they showed how local support could be secured.

Build where public transport allows

As a major concern for most people is the level of traffic and congestion, URBED's plan makes the most of the upgraded railway lines and new

stations that are being built, with a new Oxford Parkway station next to a popular Park and Ride site and close to the dual carriageway that connects up Bicester (where an eco-town is being built) and Didcot, which is next to Harwell and a major concentration of science-based organisations.

The infrastructure budget allows for building a new tram line connecting the new railway station with the city centre, and also with a new neighbourhood to the North of Oxford, where house prices are highest. In time, an existing freight line to Cowley could also be brought back into use, funded through new housing to the South. Further work is being done on the transport options and alternative scenarios before an extensive modelling and consultation exercise covering Oxfordshire as a whole (Falk and Harman, 2015). The compelling vision for Uxcester Garden City is changing prevailing views about both the product and the process. The key design principle is to develop both incrementally and organically so that sceptics are won over.



Avoid flood plains and areas of natural beauty

Green issues are raised wherever development is proposed. URBED's initial studies showed that even avoiding all the constraints of flood plains and areas of natural beauty, there is enough land potentially available to allow Oxford to double in size without having to rely on more disconnected car-based developments such as in Bicester or Didcot. In return for taking a 'bite' out of the Green Belt (8 per cent at most and probably only half that would be covered over), the Social Contract will protect the character of all the other villages from unwanted development. There are about 250 fine villages in Oxfordshire, and the new developments will only affect less than a tenth of them, thus potentially winning support from all the others who are saved from development.

Twenty-first century garden cities will also benefit the existing urban residents of Oxford by adding to local facilities and accessible countryside while reducing the risk of flooding. The new trees and waterways will hold on to the water for longer before it enters the City and form part of a Sustainable Urban Drainage System. A Green Grid of pathways will open up the countryside for recreational purposes, and create great views. Hence garden cities should be more popular than the various other alternatives for meeting the major part of the forecast housing demand in historic cities like Oxford. The key design principle is the old one of designing with nature, not against it, as many academics have convincingly argued (Birch and Wachter, 2008).

Create places with a mix of uses that complement what exists

A third design issue is *diversity* or creating character. The general criticism of modern developments is not only that they look sterile and dead most of the time, but also that they offer little to the existing residents to compensate for what they expect to lose. Urban designers invariably extol mixed uses, without understanding the economics of developing them. Old places inherit pubs, churches and shops that have long been paid for, and it takes at least twice the population to support reinstating them in a new development. There is little point in building shops that fail to let.

By integrating the new and the old, a twenty-first century garden city can inject new life into

failing High Streets, and provide the very kinds of housing and workspace that are currently missing, such as modern apartments to attract 'empty nesters' to downsize, thus freeing up family homes for those who really need their own garden. Economies of scale can be tapped in encouraging new start-ups and the growth of existing small businesses (even though it is unrealistic to expect more than half the new residents to work nearby or at home). Once there is agreement on the amount of land to be given over to development, people in the wider area can participate positively in discussion on how specific neighbourhoods should be designed, and what should be conserved or improved. A key design principle is, therefore, to get the spatial form right from the start, but to leave the maximum freedom to builders and occupiers over how they use the new spaces, as in successful and sustainable growth cities like Freiburg, or in the pioneering garden cities such as Letchworth and Hampstead Garden Suburb (Figure 10).

A final issue is one of *balance*. For reasons of social justice or equity, it is essential to create mixed communities, which means catering for a range of ages, as well as income levels. Of course this can create problems, if there is not strong management from the start, for example, to tackle conflicts over where children are to play or cars are to be parked (Falk and Bailey, 2008). Many of the problems arise from building at much higher densities than Howard would have ever contemplated in a world where most people drive to work in other towns. Good urban design can help but needs to be backed up by policies to avoid some areas becoming stigmatised over time. The emerging interest in creating 'healthy New Towns' is already leading to initiatives to try to change behaviour. Thus the 'garden city' at Bicester, which was originally conceived as an Eco-town, is now bringing health professionals and development officers together in a new alliance, while URBED is hoping to include a 'sports village' in one of the extensions proposed around Oxford City itself (Figure 11; Figure 12).

Lessons for Urban Growth

Therefore, in conclusion, if we are to grow our towns and cities so that they are fairer, efficient and resilient, what needs to be done to secure a paradigm shift? An important starting point must



Figure 10: The plan for Uxchester Garden City shows how York could be extended, (with the image reversed).

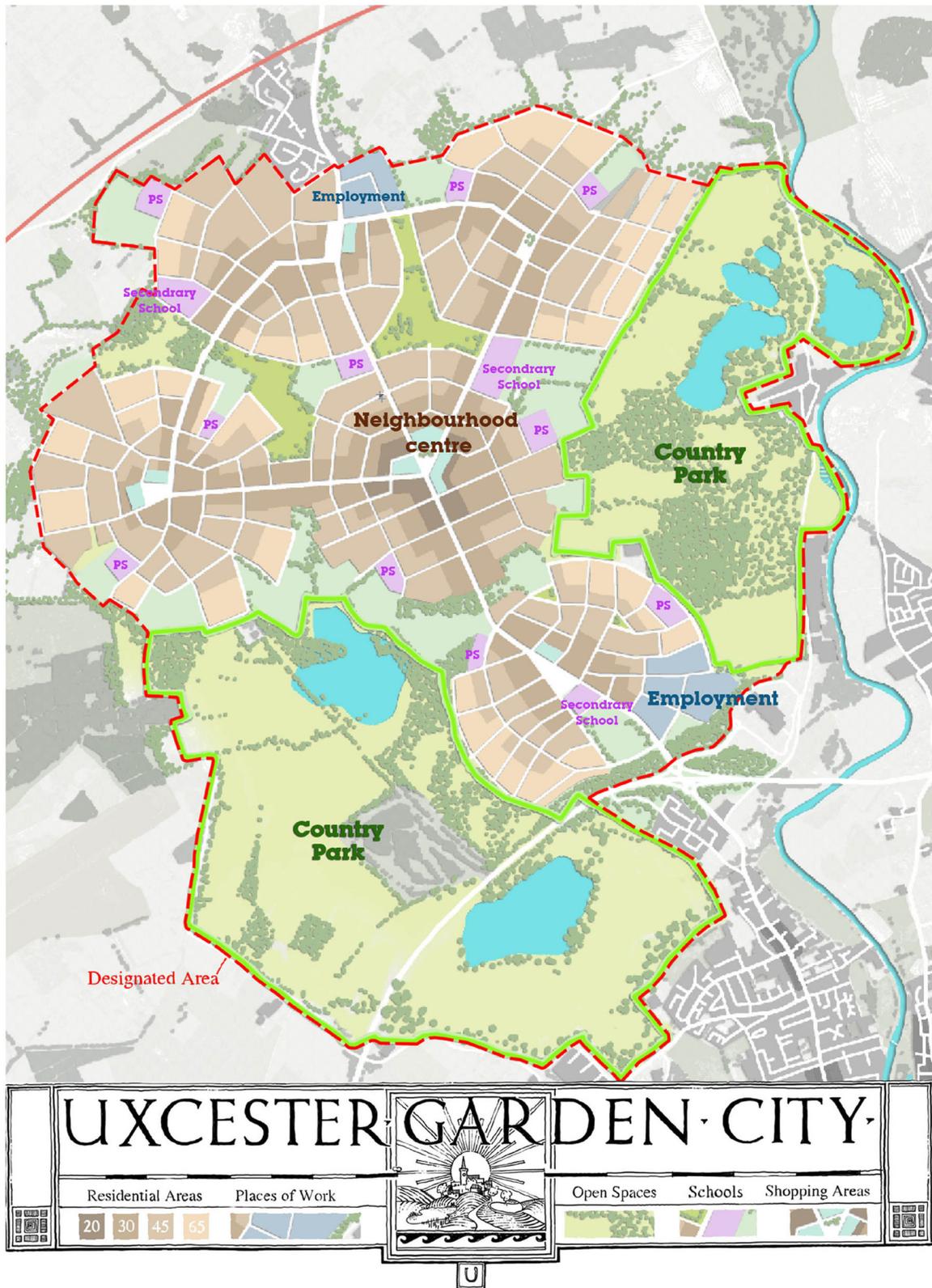


Figure 11: The finished neighbourhood.



Figure 12: This plan shows how Oxford could be extended to the North as a series of neighbourhoods.



be to make the idea of living in a new home much more attractive than the alternatives, which is where developments built to Garden City standards could score. Growing a new community is more like growing a garden than building a train set, and allowance, therefore, has to be made for both time and unpredictable events, such as recessions and changes of government. The five Cs of the Cambridgeshire Quality Charter for Growth provide a useful framework on which to hang a few basic adages for building twenty-first century garden cities (Falk, 2008).

Connectivity

Instead of developing wherever land becomes available, and a landowner or developer is prepared to bear the risks, local authorities have to be more proactive in identifying suitable locations. As far as large or strategic developments are concerned, say over 5 000 homes, the fundamental criterion must be good transit links, preferably close to motorways as well as railway junctions. New infrastructure is extremely expensive. So let's start where there is a railway station, and then make the most of walking and cycling, and all the energy that will save (Dittmar, 2008).

Community

Instead of copying what already exists, we need to use strategic developments to rebalance communities. Garden cities should be providing affordable housing where existing housing is expensive, and blocks for 'empty nesters' to downsize into where there are lots of family houses where the young have moved on. Community spirit or social capital is hard to create and easily lost. Therefore, projects such as co-housing and custom build should enlist the very pioneers needed to get the process going, and overcome isolation. Social media and smart phones can make this happen without relying on building a new institute (Putnam, 2000).

Character

Instead of building replicas of existing housing estates and standard house-builder products, we should be creating distinctive neighbourhoods,

each with their own character. The Dutch have used 'branding' to produce places that are different, and that compete well with established towns and villages. Landscaping costs much less than buildings, and so should be used extensively and early on. In Milton Keynes the adage was 'start with a park', and the principle still applies (CABE, 2005). But this time town and country will be combined not separated.

Climate proofing

Instead of creating low density suburbs with detached houses, or lonely tower blocks, in each case surrounded by wasteful tarmac, we should be building streets, and streets that are connected with each other, not closed-off culs de sacs www.createstreets.com. New homes should consume much less energy by being well insulated, but can also be designed to produce less waste by supporting better lifestyles. Surveys have shown that Dutch children are the happiest in the world whereas those of the United States and the United Kingdom are among the most miserable, according to UNICEF research, and the reasons could well lie in the much greater freedom that children have to cycle once cars have been 'tamed' (UNICEF, 2007). As energy and food costs start to rise faster than inflation, the economic incentives to change behaviour will become stronger, starting with cycling wherever possible and creating allotments.

Collaboration

Instead of an adversarial system that delays decisions, and only adds costs, we should be working across boundaries for a common purpose. This applies not only across sectors and professions, but within organisations. It is often said that there is no shortage of finance, only good projects. Building a garden city for the twenty-first century that responds to all the challenges we face should not only be much less risky, but also more satisfying for all concerned. There is now plenty of experience with development trusts of all kinds, so that the Uxchester principle of Grow Your Own Garden City is no longer utopian (Rudlin and Falk, 2014).

There is plenty of good work for all in building twenty-first century garden cities, from planning

and design to maintenance and community development. There is no shortage of well-researched and illustrated guidance for how we should change the way we deliver new housing and design more sustainable neighbourhoods. Hence the challenge for us all must be how to rebuild our capacity to deliver in terms of scale, quality and social mix. Inspired by Ebenezer Howard, but brought up-to-date, twenty-first century garden cities can show the way. They will not be the whole answer to the nation's housing needs but they could go a long way in that direction. We know how to do it and we should start now.

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