



Uxcester

g a r d e n c i t y

Submission to the for the
2014 Wolfson Economics Prize



Summary

We describe in this essay a plan to create a garden city of almost 400,000 people by doubling the size of an existing city. This is based on a real city, if not one that we identify. We have called it Uxcester and created it from an amalgam of at least six other cities, all places with populations nearing 200,000, with long histories, established institutions and settled communities.

This proposal is a result of a debate over the competition period between a number of people (who will remain nameless) who have spent careers designing neighbourhoods and working to improve the quality of development in the UK. Through this debate we have come to the fundamental conclusion that it is probably impossible to create a *Garden City* of any scale from scratch in the current economic climate. The first part of the essay describes why this is and why we have concluded that it is better to graft a *Garden City* onto the strong root-stock of an existing city. This is the basis for our answers to the competition questions:

Vision: We illustrate how the city of Uxcester could double its size by adding three substantial urban extensions each housing around 50,000 people. These lie within a zone 10km from the city centre and are configured as triangles with only the point touching the edge of the settlement. The farmland around the city is currently not accessible to the public and of little ecological value. The concept is that for every hectare of development another will be given back to the city as accessible public space, forests, lakes country parks etc... Each of these satellite extensions would be served by a tram or Bus Rapid Transit (BRT) running from the existing mainline station on disused lines and then switching to on-street running to loop through the new neighbourhoods. The housing would be developed incrementally to create space for small developers and self-builders alongside the

Our model addresses the weaknesses in our system that have made it so difficult to match the quality of the schemes we admire on the continent

volume housebuilders in a process that recreates the way that the great estates were built in London.

Popularity: Extending an existing city solves some problems but creates others. The greatest of these will be the task of winning over the existing community which is likely to be articulate and honed by years of experience resisting development. We suggest a 'Social Contract' that would address the concerns of this community. Rather than a future spent fighting years of ill-planned development, the *Garden City* would offer the prospect of a clear 40 year vision that accommodates development while minimising its impact. The satellite extensions are planned to minimise their visual impact, to create a green grid of accessible open space and to generate investment in new transport infrastructure and city centre facilities to ben-





efit the whole of the community. The aim is to reframe the argument by getting cities to bid to be designated as a *Garden City* as they currently bid for City of Culture.

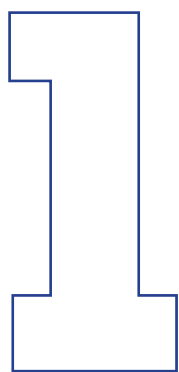
Economic Viability and Governance: In the absence of large scale subsidy the only solution to the economics of the *Garden City* is what Ebenezer Howard called the ‘unearned increment’. We are proposing a deal for landowners in which they trade a small chance of securing a housing consent on their land, for a guarantee of receiving existing use value plus substantial compensation and a financial stake in the *Garden City Trust*. We have assumed that the land will be brought at an average cost of £350,000 per hectare, 20 times its current agricultural value but only 15% of its value as housing land. The economics of the scheme are based on these differentials. We have assumed that, by extending an existing town rather than building from scratch we can reduce the infrastructure bill from £80,000 to £60,000 per unit. Even assuming that half of the land acquired is used as open space, this still generates sufficient value to fund this level of infrastructure spending. By selling the sites to developers at a fixed price and providing the infrastructure collectively, a market incentive will be created to invest in the quality of the housing.

The process would be managed by the *Garden City Trust* that would be owned jointly by the local councils, central government, the local community and land owners – and their stakes would have a tradable capital value. The *Garden*

City Trust would be vested with the land, would commission masterplanning work and then use the equity of the land to raise a Bond to fund the initial investment in infrastructure. Development would take place on a rolling programme with the early land receipts being reinvested. The experience in Holland suggests that such a rolling programme can procure infrastructure investment three times greater than the value of the initial bond.

We describe the seven ages of the *Garden City Trust* from its conception and birth through its infancy and adolescence to maturity, middle age and eventually retirement. Over time the role of the trust will evolve as it moves from the development stage to the management phase where it will be structured to enable the local community to take on the stewardship of their neighbourhoods. Rising values over the life of the project will allow initial investments to be repaid. This is not a new model, it is the modern day equivalent of the great estates like Grosvenor or The Bournville Village Trust.

Our model addresses the weaknesses in the system that have made it so difficult to match the quality of the schemes we admire on the continent. We have debated as a team whether we are being too ambitious with the size of the settlement we are proposing. However nationally we need to increase housing production by the equivalent of one Milton Keynes every year. We therefore need bold strokes to radically increase the rate at which we are building and Uxcelster provides a model to do just this.



Introduction

As human beings we are both brilliant and inept when it comes to building cities. When we are not really trying, when we are just providing somewhere to live, to trade and feel relatively safe we have built some of the most sublimely beautiful towns and cities in the world. Yet in the era of the modern town planning system, when we have focused the best minds of the age on the problem, the results have been at best mediocre and at worst a complete disaster.

There are many reasons for this. Some are to do with the arrogance of the planning and architecture professions, some relate to the workings of the housebuilding industry, the problems of the land market or the functioning of the planning system. Whatever the reason, something that we once found relatively easy when building Bath or Edinburgh New Town, and that they are

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able to achieve with reasonable success elsewhere in Europe - seems to elude us completely. We seem entirely unable to build a new settlement that comes even close to the richness, diversity and character of an ordinary English market town. In the face of this failure our response has tended to be that it is probably better not to build than to build badly. Local people – branded as NIMBYs – have come to see new housing as a threat and the planning system has become fraught with conflict. The result is that we are building half the homes that we need.

In this essay we explore the problems that have led to this situation. In early sections we explore three of the fundamental problems that need to be addressed when building a new *Garden City*.

- The workings of the UK economy as it relates to the production of housing.

- The organisational problems of building a new town.
- The planning and design issues of making a new town a good place.

The main conclusion that we draw from these three sections is that you cannot build a *Garden City* from scratch. The problems are insuperable. Rather than a new town that will spend decades as a vulnerable sapling, you need good root stock to grow your city, a mature town that can be expanded into a 21st century *Garden City*. An existing place with good rail connections, schools, colleges a university, hospitals, art galleries, theatres and a thriving town centre - all things that a new town could never hope to achieve in the lifetime of its first residents. You need an existing city like Uxcester.

To explore the viability of our vision we have created the fictional city of Uxcester (pronounced *us-ter*). This is a historic city with a population of just under 200,000 living in around 85,000 homes. It is currently growing at around 1% a year meaning that, within 30 years it will have a population of just over a quarter of a million. To achieve this it needs to build just under 30,000 new homes at an average rate of 1,000 a year – a process that will cause much conflict and soul-searching amongst its relatively affluent population.

Our proposition is that Uxcester could double its population over the same period. This would mean building 85,000 new homes at a build rate of just over 2,800 homes a year. This is just a little less than the 3,000 homes a year that Milton Keynes built during the life of its development corporation (it has continued to build 2,000 homes a year since the corporation was wound up). The build rate is therefore challenging but not unprecedented.

However unlike Milton Keynes, Uxcester has a substantial existing population which will need to be convinced. Central to our proposition is therefore a ‘Social Contract’ with

the good people of Uxcester with the following clauses:

- ☐ That for every acre of land developed, another will become public open space.
- ☐ That it will be designed to the highest standards and will have minimal impact on the setting of the city.
- ☐ That it will provide transport and sustainability infrastructure to benefit the whole city.
- ☐ That the new housing will broaden housing choice and affordability for everyone.
- ☐ That it will enhance the city centre allowing investment in new facilities.
- ☐ That it will provide generous financial compensation for those directly affected.

This social contract together with the financial model that we outline in this submission has the

potential to create a replicable model for building *Garden Cities* in the UK, not as something imposed from above, but as a prize that cities will compete for. There are scores of towns like Uxcester and the process could make a significant contribution to the UK's housing needs. As good urbanists we also would argue that this should sit alongside policies for urban infill and consolidation along with the growth of the great regional cities. The type of Garden City that we suggest does not stand in opposition to urban infill. By growing Uxcester along transport links from the heart of the town, it synthesises the urban and the suburban in a way that overcomes the decades old stand-off between the two opposing camps.

The remainder of this essay is written in two strands. The even pages set out our case for building a 21st century *Garden City* and how it would be planned, managed, and financed. In parallel the odd pages show the development of Uxcester, from its Roman origins to its inauguration of the UK's first garden city for 100 years.

Growing existing places:

Most of the places that we turn to for inspiration in Europe be it Rieselfeld in Freiburg or Vathorst in Amersfoort (pictured) are extensions of existing places.



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The Bigger Picture

National housing projections suggest a need for more than four million homes in the next 20 years - 200,000 homes a year (plus another 50,000 to make up for the historic deficit). We are currently building around 100,000 homes a year, having reached a peak of just over 200,000 homes a year just before the recession. The recession of course has not helped but the problem runs much deeper since we were failing to build sufficient homes even when the economy was strong.

The Major Government in the early 1990s introduced a target to build 60% of new homes within urban areas. After a slight hesitation this target was adopted by the Labour Government in 1998 and was largely achieved in the next ten years peaking at 75% in 2007. However this success masked a problem since the emphasis on urban development had largely choked-off the supply of greenfield sites. In the years when we did manage to build 200,000 homes half of them were apartments. In many respects this was a great success. It heralded the renaissance

of many northern cities and changed forever the assumption that the only choice for young housebuyers was a suburban starter home. However many of the apartments were bought by investors and some were not even occupied. The bubble in city centre apartments contributed to the crash and since then virtually no new flats have been built outside London. It is therefore not surprising that housing output has halved.

The Coalition Government has removed the 60% target for housing in urban areas in the NPPF and there are many on the Right who would argue that we should be further

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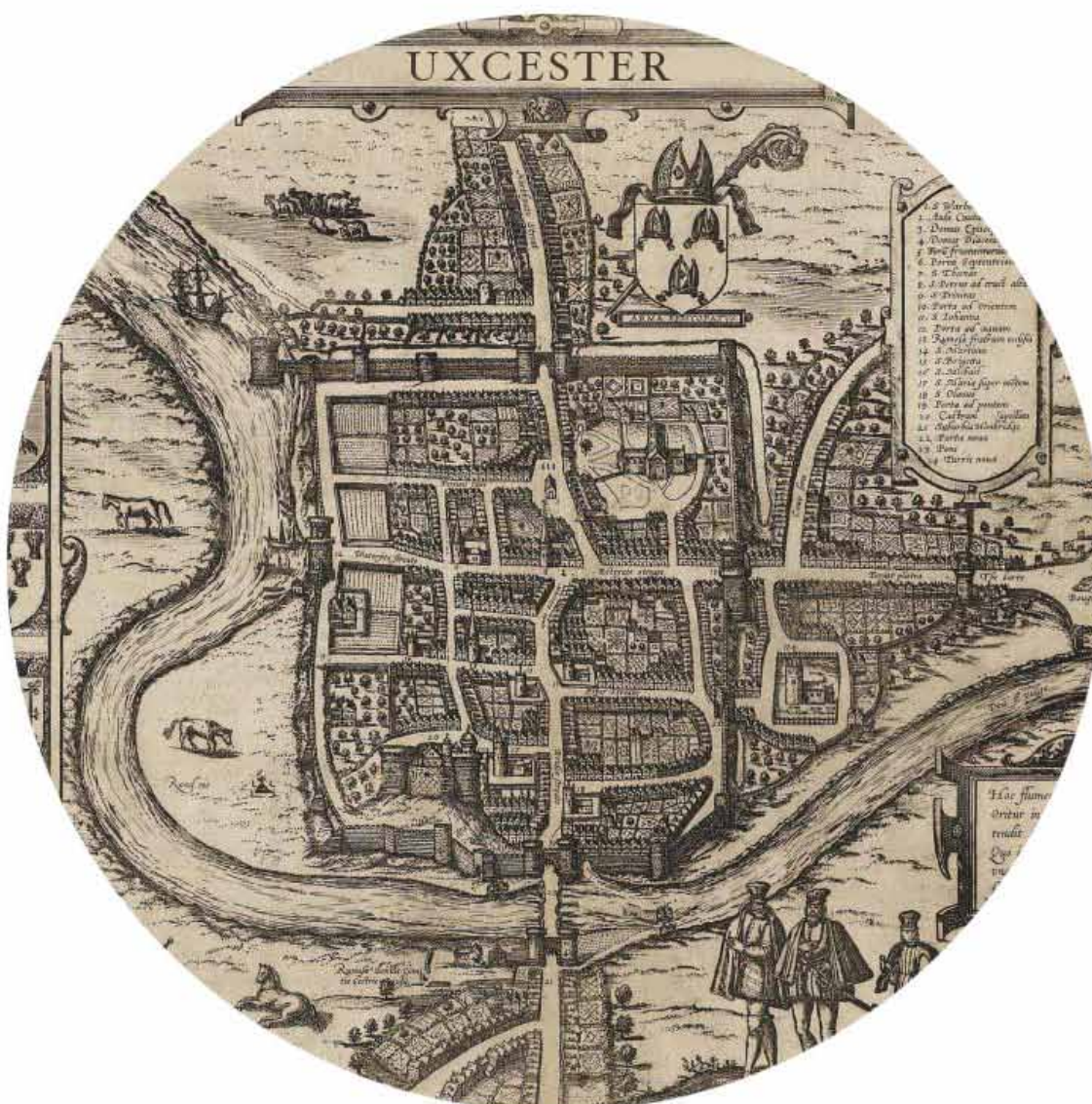
The Urban Renaissance

In the last 20 years we have made huge strides in the quality of urban housing in areas like Hulme in Manchester. This has however been largely at the expense of greenfield housing.

relaxing planning controls to unleash development. However we should not forget that it was the concerns of those living in the Shire Counties that caused a Conservative government to introduce the 60% target and the Countryside March that persuaded New Labour that they should do the same. The further relaxation of planning will only lead to speculation and the inflation of land values, uncoordinated development without the necessary infrastructure and further conflict with local people. What we need is a more proactive and flexible planning system that gives clear guidance about where and how to build but does not try to micro manage the process.

So let us for a moment assume that the 60% target is still in place and run the clock forward for the next 30 years. During this period we will need as many as six million homes based on current trends, of which 3-3.6 million will (or should) go into existing urban areas, something which the larger cities are gearing up for. The balance of 80,000-100,000 homes a year will need to go onto greenfields - the equivalent of building a Milton Keynes every 15 months. This is why the Garden City concept is so important to avoid ruining our 'green and pleasant land.'





Uxcester's History



Uxcester is a small city with ancient roots. It was founded by the Romans and as a fortified river crossing. It later became a Saxon Burth when its walls were rebuilt and its Cathedral consecrated. Its monastery operated a busy inland port trading in the local produce of the surrounding church lands. The Normans built a castle on what was then the edge of the town to ensure the loyalty of its inhabitants.

The Monastery was dissolved by Henry VIII but the ecclesiastical college developed as a university making it one of the oldest learning institutions in the country. In the 1960s the university relocated to a peripheral site creating a landscaped campus specialising in science and technology.

In the 19th century the town was bypassed by the worst excesses of the industrial revolution. However its historical importance meant that it has a fine Victorian mainline station. The town did develop specialities in leather-making and shoe manufacture as well as food processing and milling. The 19th century industrialists left a legacy of fine factory buildings and mills which are now obsolete.

3 A Flawed System

Over the last few years various reports have outlined the dysfunctional nature of the UK housing market. The broadly-accepted conclusions are that we have some of the most expensive housing in Europe but spend the least on construction (measured per square metre).

We have some of the least affordable housing, with large parts of the South of England having average house prices that are ten times average incomes. Yet much of the housing that we build is not very good. It is better than it was in terms of energy efficiency and design but it is still too small. New estates tend to be soul-

The Dutch system allows the value generated by development to be invested in infrastructure rather than to residualise in the land

less places dominated by cars and lacking in basic facilities. This is not unconnected to the fact that many communities view the prospect of a new housing estate on their doorstep as a threat to be opposed with all means at their disposal.

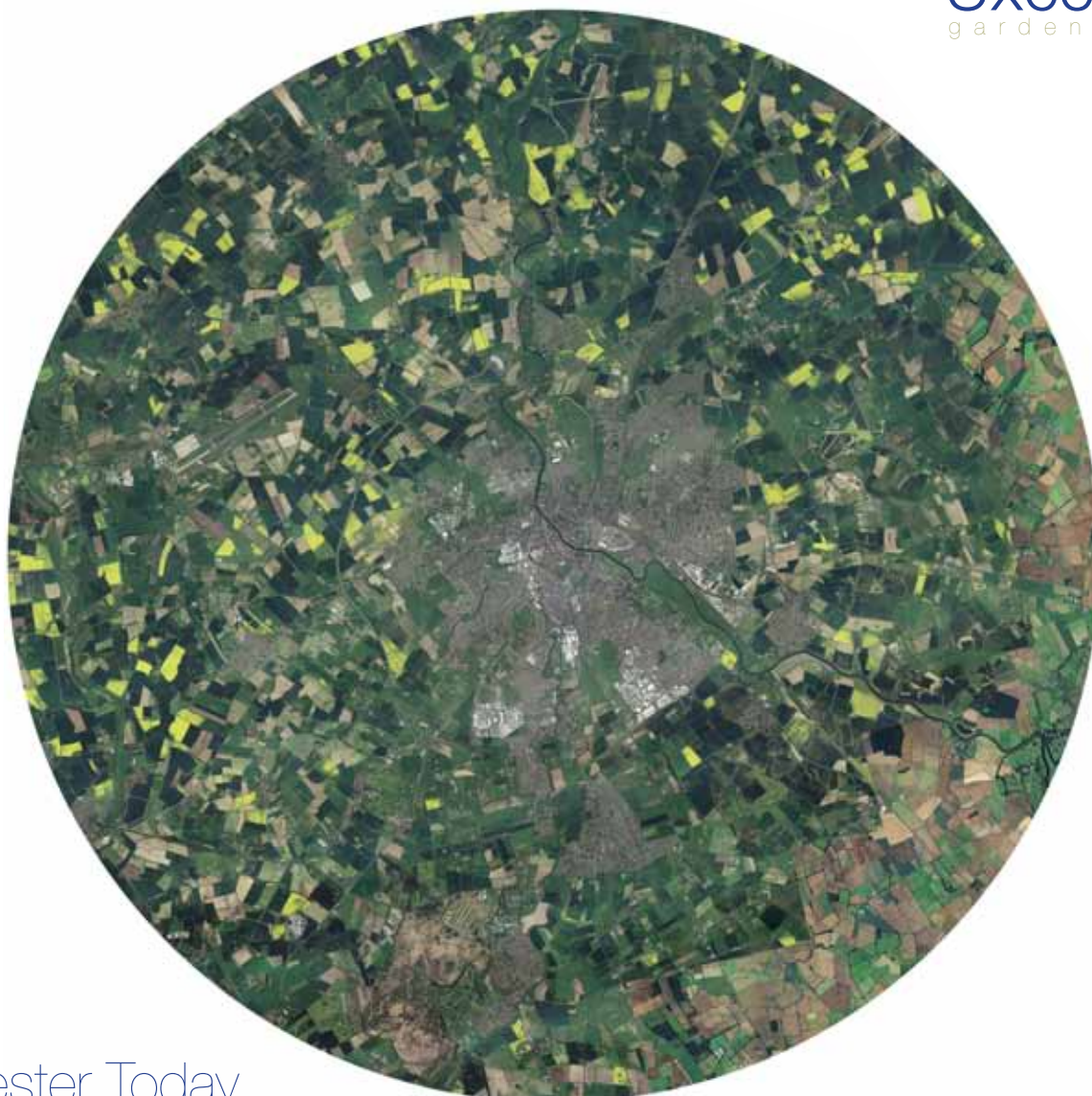
The problem is an inflated land market based on an adversarial planning system. This creates scarcity, making millionaires of a few lucky farmers and generating an industry of land agents, planning consultants and lawyers who play the system to unlock this value (or what Ebenezer Howard called the 'unearned increment'). It also makes it almost impossible to plan for housing growth since so much of the planning system is geared to resisting development.

Derwenthorpe in York by the **Joseph Rowntree Housing Trust**, one of the few exemplar housing schemes built recently in the UK was still subject to a ten year battle through the planning system.



Land value is based on a residual valuation system – what remains after all other costs have been covered. The problem is that these costs do not cover the full costs of building new housing. The developer is responsible for on-site costs but wider infrastructural costs; schools, facilities, transport etc. are captured very inefficiently. Public sector investment in this infrastructure therefore inflates land values to the benefit of landowners who have made little or no contribution to the costs. The Community Infrastructure Levy (CIL) attempts to address this but it is estimated that it captures less than a third of future infrastructure costs. The rest is left to an acrimonious negotiation of Section 106 contributions. Developers wanting to submit competitive bids for land make assumptions that they will be able to negotiate down their S106 contributions. Once the inflated land value has been crystallised the pressure through the rest of the system is therefore to cut costs.

Housing is the only product where price inflation is seen as a positive. The success of initiatives to stimulate the housing market are measured by the rise in house prices, much of which passes straight through into the land value. This creates a market where investing in the quality of the product makes little economic sense. The Netherlands by contrast has been building housing at a far greater rate than the UK – increased its housing stock by 7.6% in ten years. Housing land in the Netherlands is substantially cheaper than the UK despite it being no less scarce and some of it being reclaimed from the sea! The difference is that the Dutch system allows the value generated by development to be invested in infrastructure rather than to residualise in the land. It also means that developers make their money by creating better products. The same is true in Germany and Scandinavia - all the places that we look to for inspiration when considering good practice in housing design. Our aim is to use our knowledge gained studying these places to create a market system within the UK context where similar incentives can apply.



Uxcester Today

Uxcester's population is currently 190,000 although the catchment population of its city centre is twice that. It is experiencing pressures for growth with house prices around ten times average household incomes. This has caused the population to become skewed towards older people and students, while families have been squeezed out to surrounding towns and villages. The most affluent areas are to the West while students live in sub-divided housing to the east and there are a series of social housing estates around the edge of the city.

The city is growing at around 1% a year which represents around 1,000 new homes. A number of housebuilders are pursuing sites around the edge of the town or in surrounding villages and there is an acrimonious argument going on through the local plan process. The city has a vocal and active community with a range of voluntary groups who have traditionally opposed development. There are a number of groups seeking to reduce carbon emissions and promote environmentally conscious lifestyles.

The city centre remains relatively strong with a full range of national retailers. There is however a worry about the increase in shops catering to tourists while the local population drifts away to out-of-town retailing and other towns that have improved their offer. Meanwhile plans for a new retail development are stalled.

The growth of the surrounding villages has caused problems with congestion which in turn has affected air quality. There is an established public transport system but the fleet of buses is intrusive in the tight historic centre. There is a well-connected mainline railway station and a network of park-and-ride facilities, however most people travel to work by car and the ring road that encircles the town is nearing capacity.

The town's manufacturing base was established in the 19th century and has largely disappeared. The University is however a major employer with science-based specialisms that have spun off a number of successful tech companies in its science park. This however is reaching capacity and a number of companies are considering relocating.

Uxcester's valley location makes it vulnerable to flooding and its climate is wet with a limited wind resource. Most of the surrounding land is designated as green belt but generally it is of poor agricultural quality. The local water company has indicated that there will be a need for a new sewage works if the town is to continue to grow at its current rate. The city is governed by a city council and surrounded by rural district councils of a different political persuasion. One thing however they can all agree on is their mistrust of the County Council also based in the town who retain responsibility for transport and education.

4

New Town Blues

Building a new town exacerbates the dysfunctionality of this system. If housebuilding already fails to cover the costs of the infrastructure of a suburban housing estate how will it cover the costs of an entire new town? The infrastructural kit of parts required to service even a modest city of a quarter of a million people, cannot be funded from the construction of the 100,000 homes needed to house a population of this size. In the Cambridge Growth Charter, that included plans for 73,000 new homes in 20 years, the cost of infrastructure was estimated at £6

**When do we create the infrastructure...
Before it is needed or
once it is too late?**



The Millennium Community in Telford, developed by Taylor Wimpey to a masterplan by URBED and Jon Rowland benefitted from huge up-front infrastructure investment

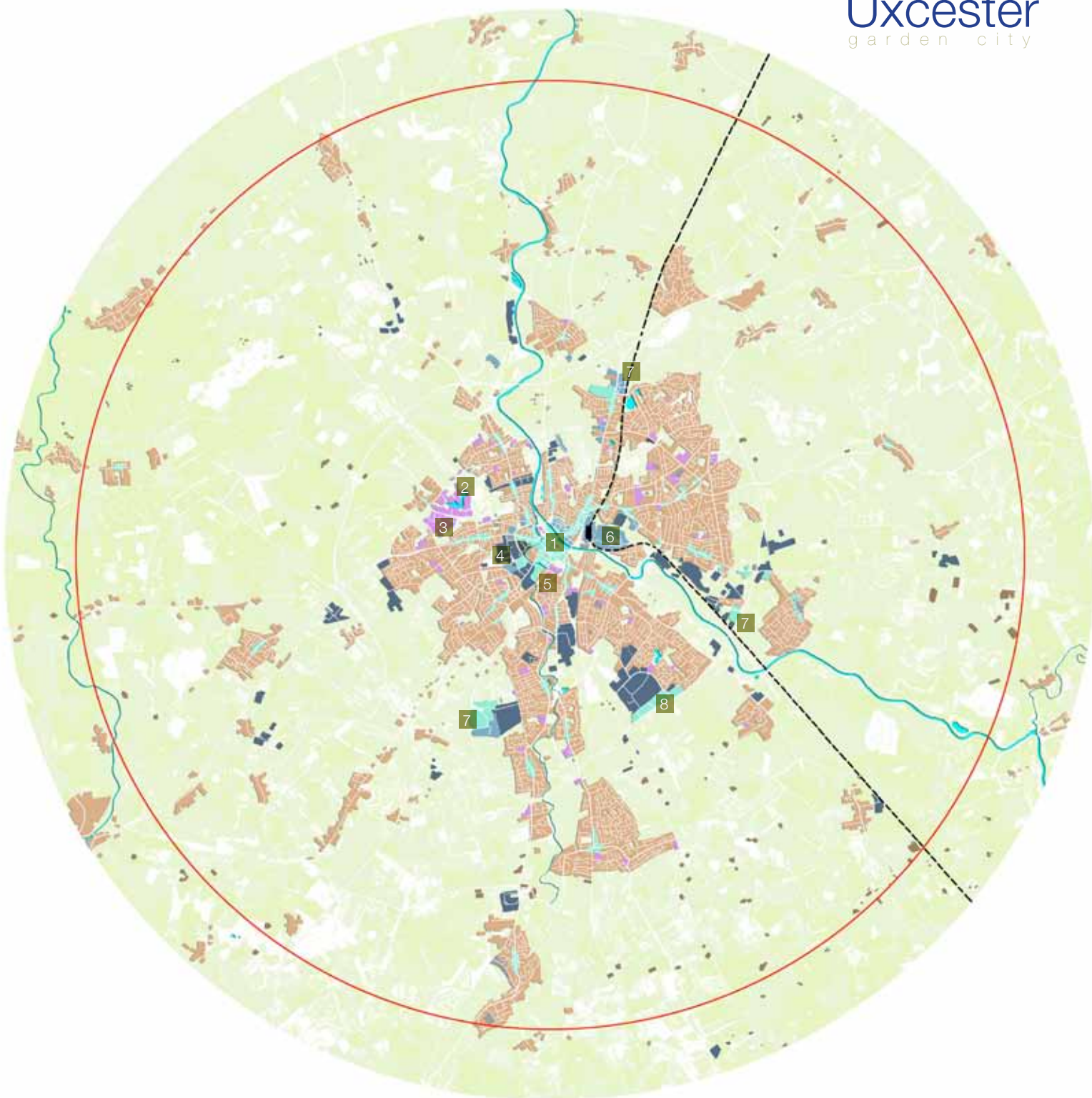
Billion (£80,000 for every home) less than half of which was being collected through developer contributions. Unlike an existing town where the cost of this infrastructure is spread over generations, in a new town it must be funded in a single generation through a planning system that is already not working.

There is a further problem in that even at a very ambitious rate of building, a *Garden City* will take 30-40 years to build, which raises the question of when you build the infrastructure? When do you lay the tram tracks – before the housing is built when they will be underused or after when alternative travel patterns will have been established? How do you build a town centre before it has a catchment a population? How do you encourage pubs and churches, scout troops and allotments? Whether it be large-scale physical investments or fine-grained social capital the problem is the same do you create the infrastructure before it is needed, or once it is too late?

In developing an economic model for a new *Garden City* we therefore have two fundamental problems. The first is a deficit between the costs of the infrastructure and the money available from the sale of the homes. The second is that the infrastructure is needed early on in the process whereas much of the value will be only be available at the end. In the past this has been solved in two ways – a) by investing large amounts of public money and b) by nationalising the land. Neither of these are likely to be acceptable in the current political climate. This leads us to three conclusions:

- We can only build a *Garden City* by extending an existing city where much of the high-end infrastructure already exists and can be expanded. The new housing therefore only needs to fund this expansion.
- We need a mechanism to allow access to the uplift in land values as a source of investment. We should allow land owners to retain a stake in the development and to benefit from rising values over time rather than receiving an up-front windfall.
- We need a mechanism for cashflowing this investment over 40 years at interest rates that do not cripple the development.

If we could do this we would create the conditions conducive to quality development that we regard with such envy in the Netherlands. Yet we would do so in a way based on private finance and pooled land ownership rather than state control. This we believe is the modern version of Ebenezer Howard's model.



Uxcester today

Key	Use	Area (ha)	Yield	Density	People
	Housing	3,500	86,000 homes	25 d/ha	190,000 population
	Industry	400	1.3M sqm	1:0.4 plot ratio	30,000 jobs
	Office	100	750,000 sqm	1:0.8 plot ratio	30,000 jobs
	Retail/leisure	270	120,000 sqm		4,800 jobs
	Community	132	300,000 sqm		32,000 jobs

1. City Centre
2. University
3. Hospital
4. Former factory complex
5. Cathedral
6. Modern office park next to station
7. Supermarkets
8. Retail Park

NB: The plan of Uxcester above is based on a real town, twisted and reversed to make it difficult to recognise. The areas in the table are measured from the plan and the yields, population and job figures are cross referenced with the town in question.



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The Artificial Dune

Custombuild housing pioneered in Almere in Holland is being imported to the UK. The above illustration has been developed as part of a custombuild system being developed by Carillion/igloo.

We started by asking why the process of town building, which the British once found so easy now escapes us? Britain has

some of the most beautiful historic towns and cities in the world but there are few places built since the birth of the modern town planning system that will be cherished in the future. Nowhere is this more true than New Towns which were the focus of so much effort and ingenuity by the country's best architects and planners.

This is not a problem that can be solved by doing the same things we have done in the past but better. Planning a new town is like designing a sand dune, no matter how skilled we are it somehow feels wrong. This is a process issue - the difference between an artificial sand dune and the real thing is not the quality of the design but the process by which it is created. New Towns are conceived on paper in their entirety as fully functioning efficient places with a balance of uses and housing and the requisite number of schools and shops etc... Most are never completed as they were planned and even those that are find that the world has changed while they were being built.

By contrast older towns evolved over centuries. Each generation added to them, adapting to economic conditions and changing technologies. This makes them more robust but it also changes the way they look. They have idiosyncrasies that do not always make sense but which contribute to their character. We cannot compress centuries of growth into a few decades, but we can rethink the way places are built to plan for incremental growth in three ways:

1. Expand an existing place: You need time to grow a real city just as you do to grow an oak from an acorn. You need a place that already has a history; doubling the size of a city of 100,000 is much easier than creating a city of 100,000 in a

field. In this way new development will add to the diversity of a place with a patina of history that cannot be faked or created from thin air.

2. A self-supporting structure: You need to phase development in such a way that it can expand gradually over time and yet be robust at each stage. When an engineer designs a bridge it is must be strong not only when it is complete but also when it is at its most vulnerable during construction. This is even more the case for a town that is never really finished and will have to survive for years in its partially complete state.

We must rethink the way places are built to plan for incremental growth.

3. Balanced incremental development

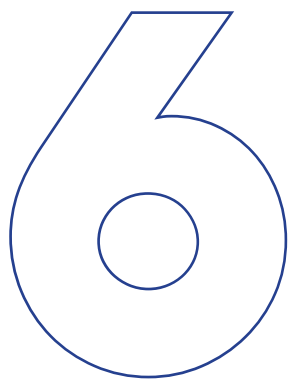
Typically with housing development entire neighbourhoods are developed by a single developer, using one architect or set of house types. In contrast Balanced Incremental Development implies a large number of smaller developers building within a framework set for the neighbourhood. The great estates of London were created by small-scale builders, taking on a handful of properties within a strong masterplan and design parameters enforced through the ground lease. A modern version of this system can be seen in the custom-build sections of the Dutch new town of Almere.

The process of development therefore needs to allow for the balanced development of the town in stages that are self-supporting while providing opportunities for a large number of small developers, custom-builders and self-builders. This may sound inefficient but 60% of homes in France and Italy are built in this way.



Uxcester Constraints

Key	Use	Area (ha)
	Area liable to flooding	1,500
	Protected green space	4,000
	Other unavailable sites	900
	Built up area (darker areas show local centres)	4,500
	TOTAL area within 10km circle	31,000
	Potentially available land	20,000



Growing a city

Our proposal is to grow the historic city of Uxcester into a *Garden City*. Just as a crystal grows into a snowflake in a way that creates symmetry and beauty at every stage, so our *Garden City* will grow according to the infrastructure that we plan and provide. The relationship between this structure and the developing city will be as a trellis to a vine (to switch metaphors for a moment). The Snowflake diagram overleaf is our trellis, an updated version of the original *Garden City* diagram based on the following principles:

From fractured to organic growth: Most places grow by accretion, one field at a time and each of these fields is developed without any certain knowledge of what will happen to the next field. As a result the urban periphery becomes a fractured mosaic of dendritic estates, poorly connected to the town and to each other and difficult to serve with public transport. Our proposals creates a coherent, connected structure for all future urban growth.

From light green belt to deep green grid: The surroundings of Uxcester are mostly farmland. While it may be Green Belt, in reality it has limited public access and little ecological value. Our proposal would transform this into a publicly accessible swathe of forests and lakes, providing flood attenuation, ecological habitats, public recreation and allotments. The creation of this resource will be a key benefit for the existing community.

From a fat city to a fit city: The Snowflake plan is based on some critical dimensions. The neighbourhoods are designed to be served efficiently by a tram (or Bus Rapid Transport - BRT). The distances mean that the stop at the heart of each sub neighbourhood is never more than 15 minutes from the town centre. The sub neighbourhoods are 800m in diameter (10 minutes walk), with the higher density housing being within 400m (5 minutes walk) of these stops. The aim is to make walking, cycling and public transport the most convenient and economic ways of getting around.

From urban sprawl to Sustainable Urban Neighbourhood: The component neighbourhoods of the model have evolved from the Sustainable Urban Neighbourhood (SUN) model. This is based on a set of simple urban design principles, a mix of uses, housing set within walkable streets and a set of sustainability targets described in Section 8.

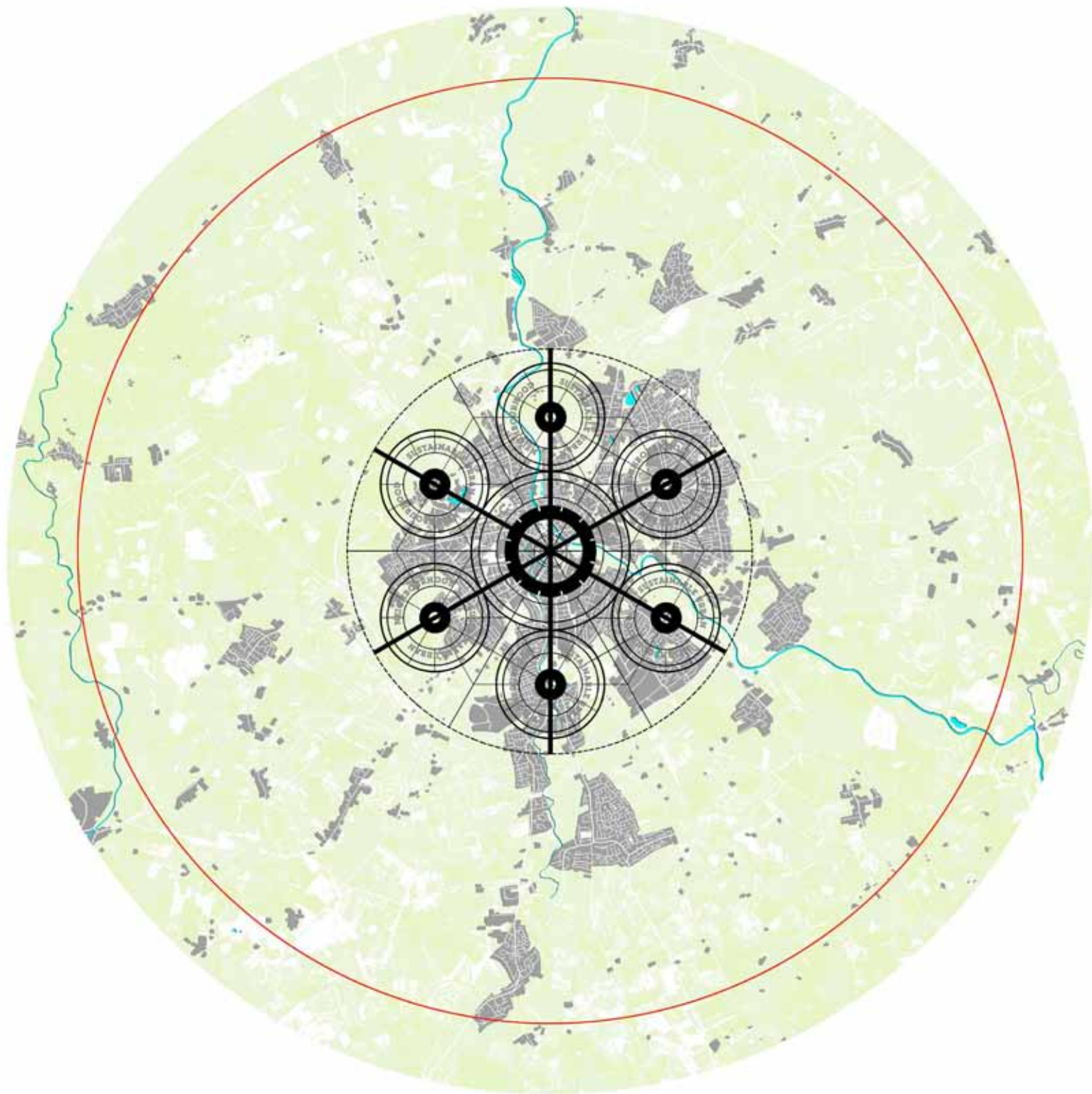
There should be something idealistic about a Garden City, it should attract people looking for an alternative to a faceless housing estate

The Cambridge Growth Charter based on the development of 73,000 new homes over 20 years is one of the few attempts to coordinate the quality and infrastructure provision for new housing on the scale we are proposing



From consumption to co-production: There should be something idealistic about a *Garden City*. It should attract people looking for an alternative to a faceless housing estate. It should therefore be built and managed through a process of local cooperation and collaboration. This could range from custom-build and self-build housing, to community energy schemes, to allotments and sports clubs and community facilities. These are central to the economic model for the city but also designed to fast forward the process of building the social capital, that creates the best places to live (as successful house builders like the Berkeley Group, are starting to learn).

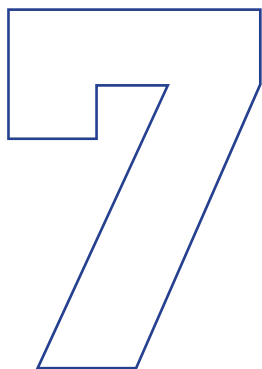
From speculation to long-term stewardship: A new way of building requires a new economic model which we will return to in a moment.



Uxcester's urban structure

Like most towns Uxcester does not really correspond to the neat diagrams of urban theorists. It grew initially within the confines of its walls before developing suburbs to the south and west and over the river to the east. It grew along the main roads leading into the town which developed as strings of local centres. Later the gaps between these were filled with housing estates and some of the surrounding villages were engulfed by the expanding city.

However the idealised diagram overlaid on the plan, inspired by Ebenezer Howard, makes the point that like all towns and cities it consists of an urban centre containing higher order functions and urban housing while being surrounded by neighbourhoods that replicate a similar form on a smaller scale.



The Town Plan

The diagram opposite shows how the population of Uxcester could be doubled in a way that minimises the impact on the city. On the odd pages that follow we show how this diagram could be applied to a real place, making assumptions about avoiding flood plains, ecological features, historic landscapes, existing settlements and where possible taking advantage of opportunity sites such as disused airfields.

The plan shows accommodation for 86,000 new homes to double the size of the city over forty years. We have assumed that 60% of the natural rate of growth of the town would be accommodated through urban infill – 16,500 homes to be achieved through the redevelopment of former industrial premises, infill development and intensification.

The balance of just under 70,000 units will be built in three substantial urban extensions each with a population of around 50,000 people or 23,000 homes. Each extension is made up of a central neighbourhood with 6,000 units and four suburban neighbourhoods with 4,500 homes. Each of these sub-neighbourhood would support a secondary school and 3 feeder primary schools as well as local services, health centres, nurseries

and local shops, while higher order facilities would be located in the central neighbourhoods.

Each neighbourhood is serviced by a tram line (or BRT). This runs from the station, through the city centre and suburbs, where possible on old or under-used railway lines. Then once clear of the built-up area the line runs on-street in a loop through each neighbourhood. There will be a stop in the heart of each neighbourhood meaning that everyone is within 10 minutes walk and most are within 5 minutes walk of a tram stop.

The neighbourhoods are based on the housing densities set out in the table. The major-

Just under 70,000 units will be built in three substantial urban extensions each with a population of around 50,000 people

ity (70%) will be built to suburban densities in the range of 30-45 units/ha. 20% of the homes will be developed at 20 units/ha allowing for detached

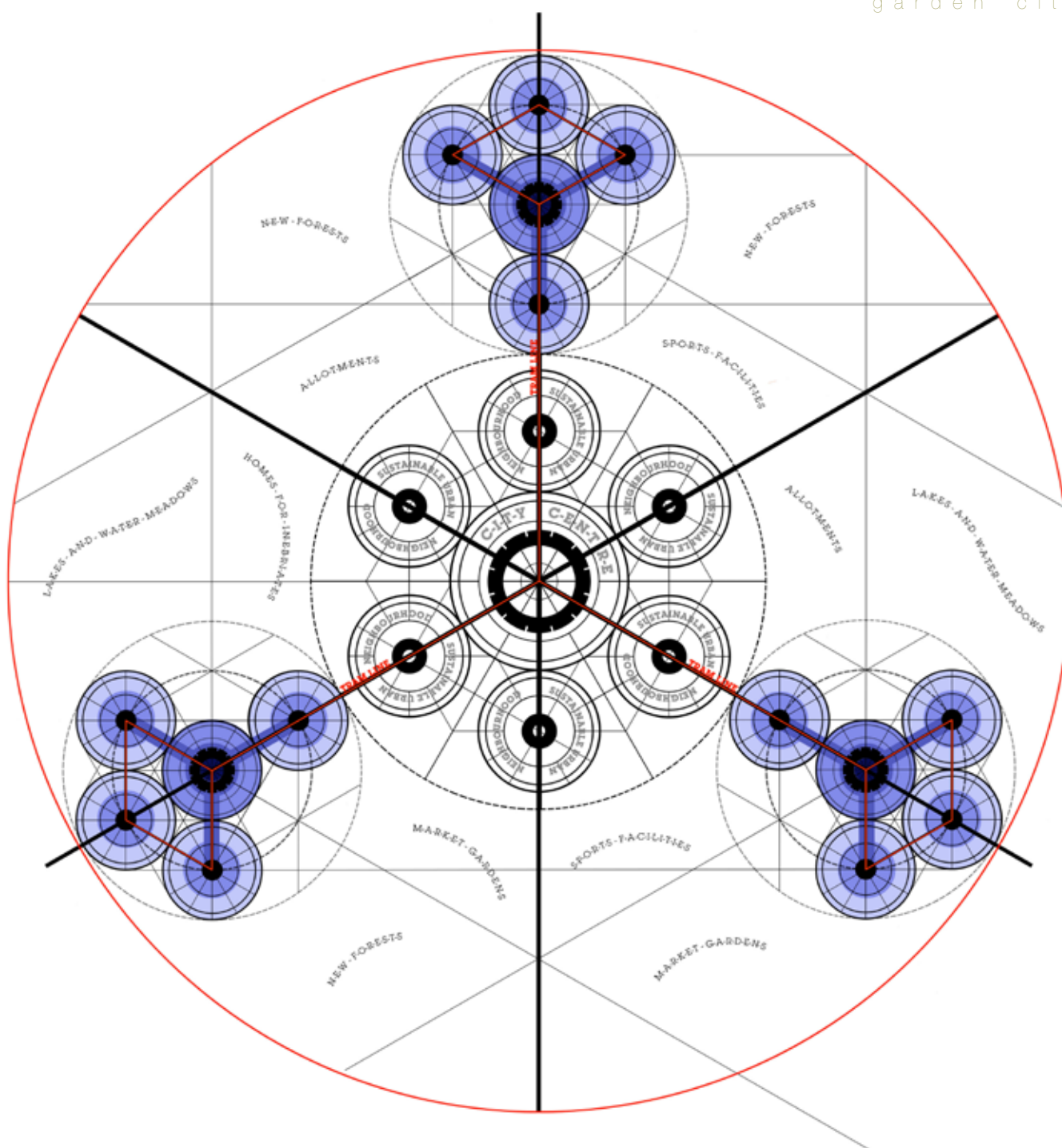
units on the periphery of the settlements while 10% will be built to much higher densities of 65 units/ha in the central neighbourhood consisting of terraces and some apartments. Within this mix there will be a diversity of housetypes, including family accommodation but also older people's accommodation, smaller units, rental property and social housing.

The scheme also includes 1.7 M sqm of employment space, sufficient to house one job per new home built. We have assumed a plot ratio of 3:2 so that this employment space requires 263 ha of land, shown in dark blue on the plan overleaf and located near to major road junctions. The green areas represent publicly accessible open space (at least one hectare for every hectare developed) This is intended to be a rich resource for the whole of the city and will include ecologically rich woodland planting, sports facilities, country parks and market gardens. It could also include lakes for flood attenuation.

This is illustrated overleaf and the act of drawing this plan gives us comfort that development on this scale is possible. Carefully planned development of this type is potentially less intrusive than 40 years of incremental development which is what the city would otherwise face.

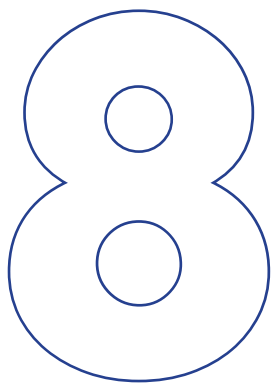
The model for this type of sustainable urban extension is **Freiburg** in Germany that has developed two major urban extensions **Vauban and Rieselfeld**. Here high quality sustainable development has been coordinated with investment in public transport.





The Snowflake plan

Housing	Density (u/ha)	Mix	Numbers	Land take (ha)	Infill	In each N'hood
	20	20%	17,200	860	0	287 ha 5,733 units
	30	40%	34,400	1,147	150 ha, 4,500 units	332 ha 9,967 units
	45	30%	25,800	573	200 ha, 9,000 units	124 ha 5,600 units
	65	10%	8,600	132	46 ha, 3,000 units	29 ha 1,867 units
		100%	86,000	2,412	396 ha, 16,500 units	772 ha 23,167 units



Sustainability

It is incumbent on the developers of a *Garden City* rise to the environmental challenge that we face. This is not as an exemplar, or a demonstration project but just as a sensible response to the standards that all new housing will need to achieve during the lifetime of the scheme. The law of the land (2008 Climate Change Act) specifies that we should be achieving an 80% reduction in Carbon emissions by 2050. This not something that we can put off until future phases it needs to be embedded in the plan from the outset. Work on the Sustainable Urban Neighbourhood (SUN) Initiative has created a framework to achieve this based on two possible approaches:

Neighbourhood-based: This suggests that a range of sustainability systems can most economically be provided at the neighbourhood scale. These include energy and heating systems through Combined Heat and Power (CHP) and renewable energy. They also include water treatment systems through reed beds and 'bioworks', neighbourhood waste collection, food growing and car share schemes. In each case there is an opportunity for community controlled provision generating jobs and savings for local people. It does however mean that the infrastructure budget needs to include the kit to support these systems including; heat pipe networks, waste collection systems, vehicle charging points etc...

House-based: An alternative approach focuses on the design of the home. It includes super insulation and air-tightness together with passive design and roof-mounted photovoltaics to meet the energy needs of the home. Indeed it is possible to create homes that produce more energy than they need, and storage technologies are increasingly making it possible to meet electrical requirements and car charging in this way.

A choice needs to be made between these approaches because the home-based approach reduces the household energy require-

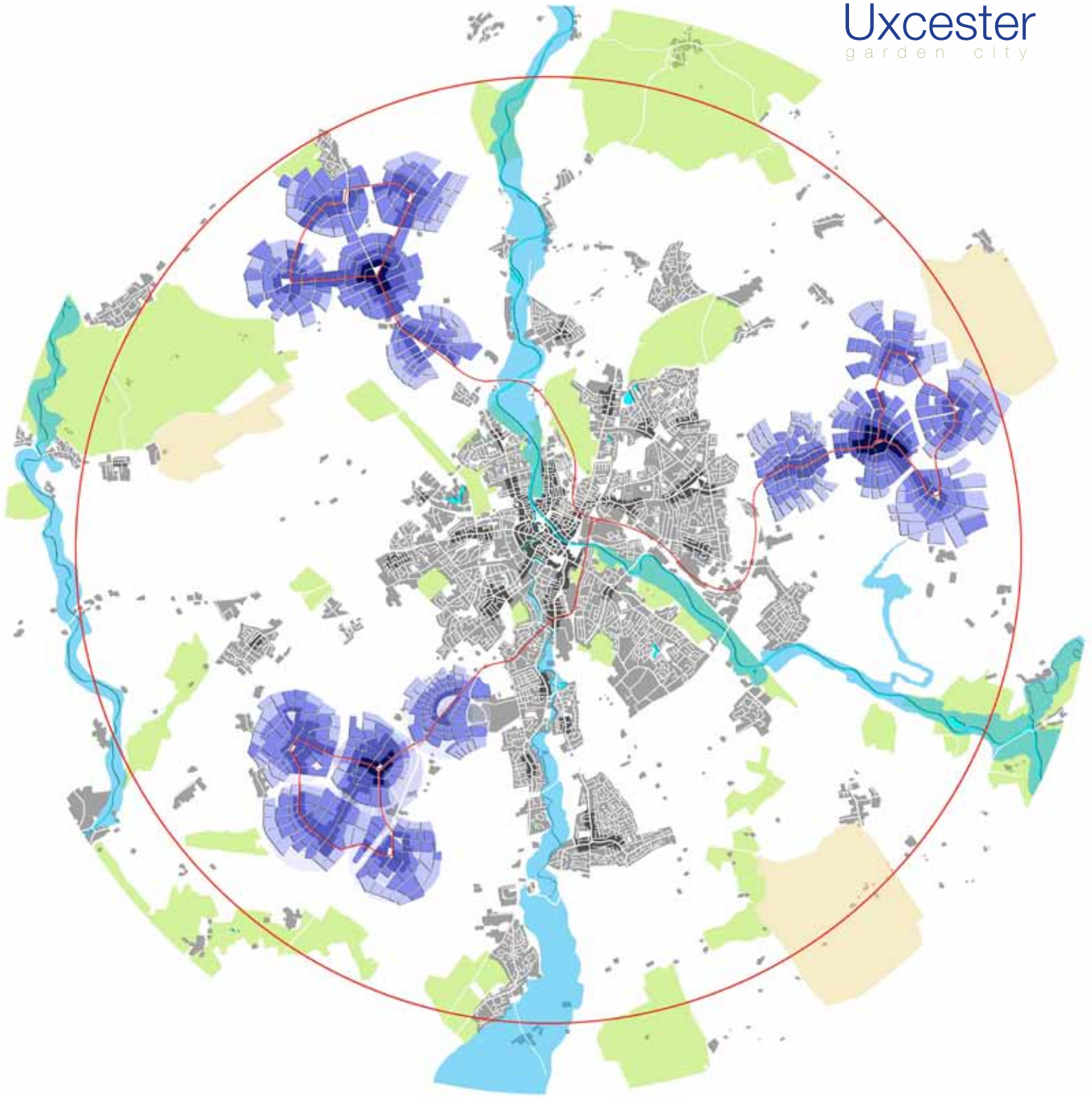
What is needed is a clear set of minimum standards that everyone understands and can factor into their business planning.

ment to the point where neighbourhood systems are not viable. However there is the potential to pursue different solutions in different neighbourhoods, the communal systems in the neighbourhood centres, the home-based systems in the lower density suburbs. On a development over this time period it is not however sensible to be specific about the technologies to be employed. What is needed is a clear set of minimum standards that everyone understands and can factor into their business planning. This would include a minimum 80% reduction in carbon emissions (on a 1996 base) covering all forms of regulated and unregulated energy use plus transport. Similar targets should be set for waste recycling, water use and run-off, local sourcing of materials, transport mode and food production.

The initial work on the *Garden City* should include a Sustainability Charter that is enshrined in the ground leases on the land that sets these targets in perpetuity. This also needs to apply to the existing town which will benefit from public transport improvements and should also benefit from a programme of domestic retrofit for the existing housing stock.

Ecolonia, that started in the early 1990s was one of the first places to pilot ideas of sustainability and planned incremental development that still inspire us today. This included low energy homes, natural drainage systems, and sustainable construction.





The diagram applied

This drawing shows how the Snowflake plan might be applied to a real situation. Using the composite of real places that we have used to construct the fictional Uxcester we have made assumptions about areas of protected landscape, flood plains and other constrained areas. It will never be possible to avoid all potential problems. However the settlements shown above covers 3,000 hectares and what is striking is the way that it does not smother the existing city and retains large areas of green space.



The Social Contract

Winning over the existing community is crucial to the success of the venture. The unfortunate fact is that most new development is opposed by existing residents. New settlements have therefore tended to be sited in places where there are few people to object. Uxcester by contrast is full of articulate people with the time and abilities to mount an effective opposition. We therefore need a Social Contract that makes the proposition palatable to this constituency, and

Rather than being imposed from on high, the designation of Garden City should be a honour that towns and cities compete for

which overcomes objections such as congestion or visual intrusion. The heads-of-terms of this Social Contract are likely to be:

Minimal impact: The plan form that we are suggesting is designed so that the urban extensions hardly touch the existing settlement. This is designed to make them largely invisible to existing residents on the edge of the town who will have their green outlooks saved for posterity. The siting would avoid areas of landscape and ecological value as well as prominent higher ground that affects the setting of the town.

Accessible open space: The countryside around most towns is not particularly attractive, nor is it publicly accessible or rich in ecology. Our

proposal would turn a significant part of this into accessible open space, with forests, lakes and recreational amenities for the whole population. This would be based on a formula specifying that one hectare of public open space be created for every hectare developed.

New infrastructure: The expansion would fund new facilities including schools, health facilities, and sports pitches, available to everyone. It would also include sustainability infrastructure such as renewables, car share schemes, and food growing and, most importantly, a modern town-wide tram/BRT network.

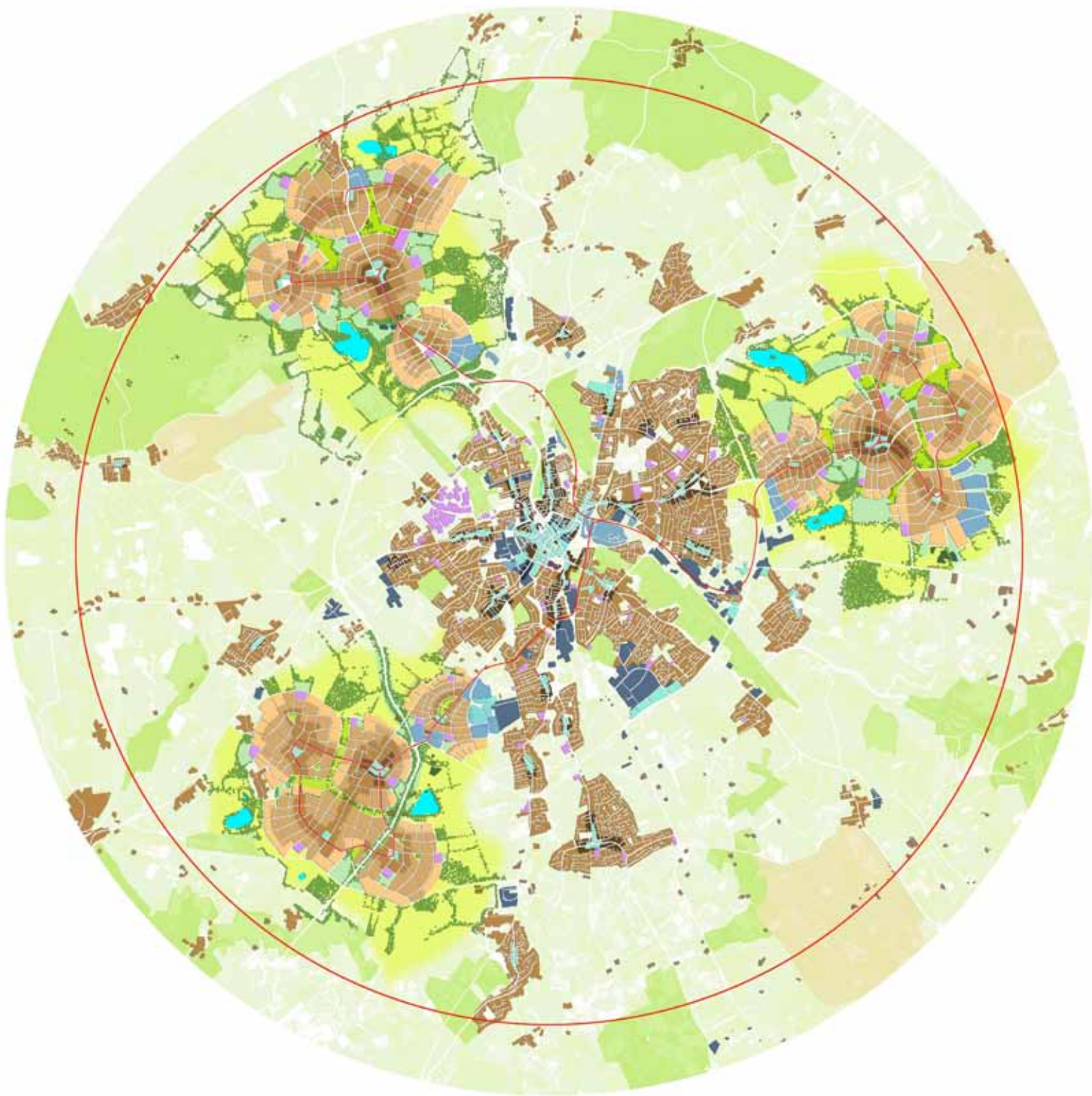
Greater catchment spend: The town centres of many towns like Uxcester have been struggling to maintain their retail offer as people turn to the Internet or shop out-of-town. The expansion of the town will significantly increase the spend profile of the catchment population. The money that would have been spent on creating the town centre of a new town can be spent on upgrading the existing town centre to the benefit of local traders and property owners.

Stakeholder involvement: Finally the community would have a stake in the Trust that develops the town and takes on its long term management. The ownership of the freehold in perpetuity is a guarantee that standards will be maintained and that part of the long-term value of the development will accrue to the local community. This could fund a community chest that can be applied to projects across the city.

In order to turn these benefits into a local consensus to support the proposal it will be necessary to change the way that new towns such as this are designated. Rather than being imposed by government or private developers, the designation of *Garden City* should be a honour that towns and cities compete for, much as they do for the Olympics or the City of Culture. In this way designation would be seen as a huge win for the town, starting things off on the right foot.

No development is without opposition. However the **Bournville Village Trust** in Lighmoor has shown how a socially-responsible developer with a sensitive approach can win over local people.





Land use budget

Key	Use	Area (ha)	Yield
	New Housing	2300	69,500 homes
	Commercial	260	1.7M sqm
	Retail/leisure	40	120,000 sqm
	Community	400	

10 The land question

Before we turn to the process by which the *Garden City* would be built we need to address head-on the fundamental issue of land. For 60 years the planning system has failed to find a mechanism to tap the huge increases in land value created by publicly funded infrastructure and publicly granted planning permission. The New Town Act initially allowed the Government to acquire land at existing use value, and later – following challenges by land owners – at existing use value plus compensation to reflect a degree of hope value. However when this model was suggested to the Coalition Government last year it was not seen as politically acceptable. Our proposal is to go back to an earlier model for inspiration - the great estates that developed large parts of London and other cities in the 18th and 19th century. The key to their success was the retention of the freehold and the incremental development of the estate to benefit from the increase in value over

time rather than taking a capital sum at the outset.

In Uxcester our proposal is that the place of the great estate be taken by the *Garden City Trust*. The stakeholders in this would include the local council(s), central government, community representatives and crucially land owners. The New Town Act is still on the statutes and could be used to acquire the land required around the town to be vested in the Trust. This would be acquired initially at existing land value plus an uplift by way of compensation based on the formula used in the German Entwicklungsmaßnahme law. Most of the land would have an existing value of £15,000/ha, although the area in question would inevitably include other uses with higher values as well as land that already has planning permissions.

We have therefore erred on the side of caution and made provision for land acquisition at an average cost of £350,000/ha.

In addition to this the land owners would be given a stake in the *Garden City Trust* commensurate with their land holding. This stake would have a capital value which initially would be low but which would rise over the life of the *Garden City*. To the landowners the offer is a 100% chance to make a reasonable return on their land set against a very small chance that they might be the lucky owner that hits the jackpot.

The table to the right therefore sketches out the viability of this equation. 6,000ha of land is acquired at an average cost of £350,000/ha costing £2.1 B. Half of this is allocated as open space while the remainder is allocated for housing, commercial uses and social infrastructure.

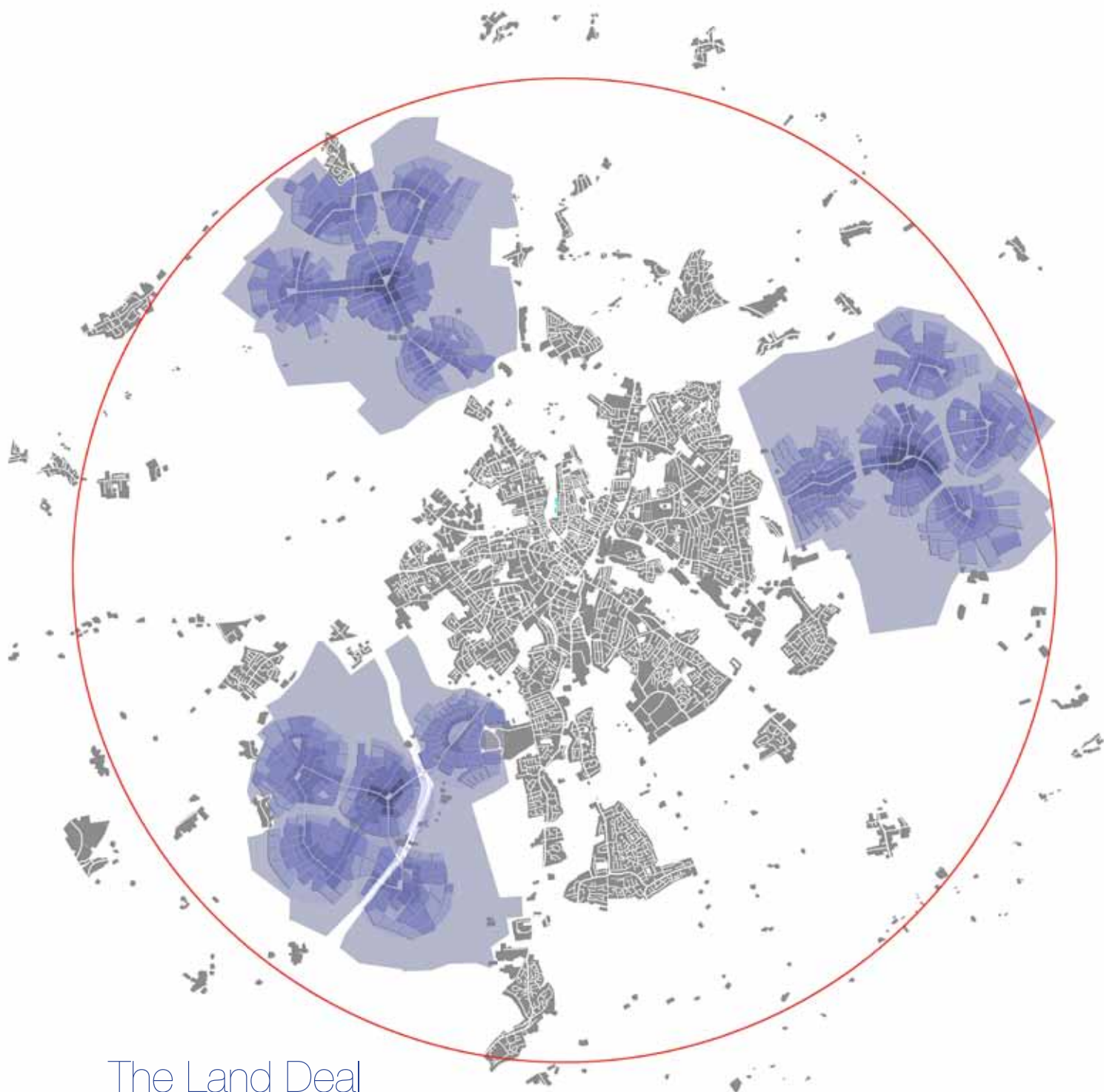
The value of the developed land is just under £6.4 B.

This will allow the development of 69,500 homes (netting off the urban infill). We have assumed that the in-

frastructure budget required for the development will be £60,000/unit. This compares to £40,000 for an urban extension and £80,000 for a virgin new town. The new housing would therefore create an infrastructure budget of £4.17 B leaving a small surplus.

These are rough and ready figures. There is clearly a huge issue with cashflow that we address in the following section and many other sources of income and costs. However this is the position at the outset of the scheme and the development of the *Garden City* and its infrastructure will cause the value of the freehold interest to rise over time creating a return for investors. This we believe suggests that a viable self-funded garden city may be possible.

Our proposal is to go back to an earlier model for inspiration - the great estates that developed large parts of London



The Land Deal

		ha	Cost/ha	Total
	Total land acquired	6,000	£350,000	£2.1B
	...allocated as open space	3,000		
	...allocated as development land	3,000		
	of which...			
	Housing land	2,300	£2.5M	£5.75B
	Commercial development	260	£2.0M	£520M
	Retail development	40	£3.0M	£120M
	Schools and facilities	400	0	0
			TOTAL Value	£6.39B
			Balance	£4.29B
	Infrastructure	Units	Cost per unit	
	New Homes	69,500	£60,000	£4.17B
	Balance			£120M

11 The seven ages... Conception & Birth

Creating a *Garden City* as an expansion of an existing city eases many of problems of growing a town from scratch. Uxcester already has a hospital, a large town centre, a good set of schools with established reputations and the full compliment of doctors, dentists, libraries, theatres, nurseries etc. that you need in a small city. Some of these, like the town centre and the higher order cultural uses will continue to serve the expanded city. Others like the schools will take up the slack before sufficient new housing has been built to allow new facilities to be created. We would therefore envisage the town being developed in the following way:

The way in which the Garden City is designated can do much to influence the way that it is received.

1. Conception:

The way in which the *Garden City* is designated can do much to influence the way that it is received. The designation of City of Culture or the Commonwealth Games creates huge disruption but people still take to the streets to celebrate success. Our view is that *Garden City* designation should run in a similar way with submissions invited from city consortia that have to include the local authority and the community. Success would bring with it the powers to acquire the land, access to low-cost finance and some seed corn financing.

2. Birth:

The successful *Garden Cities* would set up their Land Trust. This would be similar to the New Town Development Corporations in that it would take on ownership of the land and responsibility for promoting the development. The Trust would

be a partnership organisation with representation from Government, local councils, community, businesses and land owners. Each of these would own a tradable stake in the company that would accrue in value over the life of the project.

The first task of the *Garden City Trust* will be to commission masterplanning and technical work for the *Garden City*. This will determine the location of the three extensions and the extent of the land required. It would involve extensive consultation with local people. This however will be done in the context of a decision in principle that has already been made so that the consultation will concentrates on the specifics of siting and design. We anticipate that the masterplan will sit within the statutory plan but will be a much more flexible and practical document. It will be implemented through land ownership rather than just planning powers so include issues such as sustainability specifications, procurement methods and social infrastructure. As happened with the Hulme Redevelopment in Manchester it is anticipated that the council will retain planning powers but will establish a separate committee for *Garden City* applications.

The land identified by the masterplan will be acquired using the New Towns Act, or new legislation as required. Initially it is likely that the *Garden City Trust* would take the equivalent of an option on all of the property paying a level of compensation and offering to purchase at the agreed compensation value if the land owner wishes to sell, but otherwise allowing land to continue to be farmed/occupied in the interim. The cost of this initial land acquisition would need to be covered by Government, either as a low interest loan or in return for an equity stake in the company. The experience with the New Towns was that the government got its money back over the life of the scheme.



The seven ages...

11 Infancy & Adolescence

3. Infancy:

The masterplan will identify the overall shape and land-take of the *Garden City* and will include a phasing plan as well as identifying strategic infrastructure – including the BRT, open space etc. The principle of the development is that initial phases of development be identified that can be serviced from existing infrastructure. As developers are appointed and plots are sold the land value will come back to the Trust to be reinvested in the infrastructure for future phases. This type of rolling programme based on the reinvestment of capital receipts will reduce the need for forward financing of development.

It will not however remove it all together and it is proposed that the *Garden City Trust* would raise a Bond over 20-30 years. This builds on the Dutch model where, for example, the Vathorst Development Company raised a €250M Bond, which it invested in a rolling programme to procure 10,000 housing units plus related business parks and a shopping centre. This resulted in a total investment of €750M in the infrastructure, which equates to roughly the £60,000 per house that we have assumed.

4. Adolescence:

The infancy phase will create the conditions for the *Garden City* to start to grow and develop. At this stage it will be necessary to address the issue of build rate. The volume housebuilders generally assume a build rate of 50-100 units a year from each point of sale. This can be increase by creating multiple, differentiated sales points but nevertheless it is not possible to scale this up to the 2,800 units the *Garden City* would need to produce each year. In Sweden the build rate is five times greater than the UK because they do not rely on a handful of housebuilders to procure the majority of their housing,

By contrast the great estates were built by a huge number of small builders, often modest investors building five or six houses to support them in their retirement. The houses would be built to a pattern book that would be specified by the masterplan for the estate. The masterplan would set clear rules for the ‘class’ of house permissible, its building line, height, access arrangements etc. All of this would be enshrined in the ground lease, which remains in force to this day. The system allowed for a unified masterplan to be created from small increments.

We are proposing something similar for the *Garden City*. Rather than appoint a single developer for an entire estate, a masterplan will be developed that establishes the parameters. Plots will then be sold directly within this framework for a fixed price, as happened in Crown Street in Glasgow. Developers would therefore compete

The process would generate the natural grain and diversity that you get in a real place

on the basis of quality and would not be able to undercut the competition by assuming that they could negotiate down infrastructure costs.

This would provide a framework for a range of developers. There would be space for the volume housebuilders alongside a range of small local and regional developers, specialist providers for the elderly, institutions and housing associations as well as individual self and custom-builders. The process would generate the natural grain and diversity that you get in a real place but crucially would allow development to take place in parallel rather than in series enabling a far greater build-rate to be achieved.

The seven ages...

11 Maturity, Middle age & Retirement

5. Maturity:

We have pondered whether the three suggested urban extensions would be build one at a time or all together. Our conclusion is that, like a snowflake the city should grow symmetrically. The first stage would be the simultaneous development of the three inner neighbourhoods of the extensions each of which includes 4,500 units. The initial phases of each neighbourhood would be served by existing infrastructure. At the same time the tram/BRT line would be constructed through the existing city terminating initially in the centre of the inner neighbourhoods. Once free of the existing built-up area, the tram/BRT would run on street through the extensions being extended outwards as development proceeds.

The next stage of the development would see the three central neighbourhoods developed, each with a further 6,000 units. These central neighbourhoods would include the wider services and facilities for the neighbourhood, which would thus be developed slightly before they are required but with a significant population to support them. It may be that commercial occupiers and community groups, churches etc. need an incentive to build for a population for 50,000 at a point when the population is slightly less than half of this.

This stage would also see the development of the wider 'green grid' with extensive tree planting and landscaping works to open up the landscape to public access. This will create a maturing landscape context of the development so that the three outer neighbourhoods in each extension be developed in a forest setting.

6. Middle Age:

As the development matures management will become the focus for activity. The *Garden City Trust* will retain the freehold under all of the settlement and thus the ability to exert a degree of control over the property. We would not envisaged 'Seaside' levels

of control over the painting of white picket fences, but the experience of the great estates is that a level of control is one of the secrets of their success. The trust will also retain green spaces and common areas and will need to invest in their maintenance. This will, where possible, be delegated to local residents who will be encouraged to establish community forums that can be given devolved management budgets. This is something that has been done on many of the estates cited in this essay, such as the Millennium Village in Telford. The problem on these estates has been gaining agreement on a service charge but in Uxcester the ground rent could be used for this. The community groups thus

As the development matures management will become the focus for activity

established could also take on a role in managing the sustainability infrastructure, allotments and community gardens and well as the community chest funds. The aim is to use the management process to help build community and social infrastructure.

7. Retirement:

There will come a time in thirty or forty years when the *Garden City* is largely complete. This is not to say that it will not continue to grow naturally but the phase of rapid growth will have come to an end and the shape of the city will have been fixed. At this point the *Garden City Trust* will transition into its long-term management mode although there is no reason why it should not develop elsewhere in the way that the Grosvenor Estate or the Bournville Village Trust have done. At the end of the development phase the rising values within the *Garden City* will have allowed the initial investments and bonds to have been repaid and for the initial land owners to have received a further premium.

12

Conclusion

A day in the life...

Rob and Ani moved to Uxchester *Garden City* ten years ago. They bought a 2 bed basic core/shell house through the custom-build scheme, not being able to afford anything fancy at the time. They were however delighted to secure a plot and to be amongst the pioneers in the early days of the *Garden City*. They have a 125 year lease on the plot, and pay a ground rent of a couple of hundred pounds a year. In return they became members of the Neighbourhood Forum which has taken on responsibility for the maintenance and upkeep of the local public realm.

Their membership gave them access to a loan at preferential interest rates from the *Garden City Credit Union*, something that they used to expand their home when the twins arrived.

Their right to expand their home was set out in

Rob and Ani are not radicals or eco-warriors. They don't even read the Guardian.

their 'plot passport' which is enshrined in their lease. This sets out the parameters relating to the height and size of their extension

to ensure that it is compatible with the overall development of the neighbourhood.

They decided to create an office space in the garden for Rob who works as a child psychologist. This freed up the spare room for the children and gave Rob a space where he could be visited by clients in privacy. The plot passport positively encouraged live/work units and many of the neighbours have similar workspaces creating a lively mixed use character. Next door their neighbour's core house has been expanded with the owner using his front room for his hair salon while his partner, an architect who has been working to get the house to passiv haus standards, also has an office at the rear. In the local centre there is a privately run work hub, including meeting space and shared facilities for homeworkers. Rob pays a monthly membership and uses the facilities whenever he needs a larger meeting space.

Ani works for one of the university research facilities on the recently completed Technopole. Built as a partnership between the *Garden City Trust* and the University of Uxchester – which lacked expansion space on its science park – this has led to a huge growth in its commercial operations generating a global research brand for the city. She gets to her lab in the north neighbourhood through a combination of cycling and BRT (they allow bikes on the vehicles). One day a week she teaches at the local college which takes her about 20 minutes on an inter-urban cycle route (It used to take 45 minutes by car).

The twins Sam and Poppy both cycle or walk to school on the safe route for kids - overlooked by lots of houses. At the weekend they go for long walks in the country park that starts five minutes from their home. The trees and lakes are becoming really well-established and every year they are delighted to see the return of wildlife to an area that they remember as just ploughed fields.

Rob and Ani get most of the bulk shopping delivered by Aldirose supermarket. But they often cycle to Delifresh which is close





by and sells organic produce from one of the *Garden City's* three market gardens. Other shops sell locally sourced cheeses and meats and there is a small cafe/bar that does a brisk lunchtime and evening trade. There is also a convivial bar which Ani uses to meet up with friends after work.

At the weekends Rob and Ani get the BRT to the city centre where there is a range of facilities that they would never find in a new town. They enjoy the productions at the Victoria Theatre and at Christmas the carol services in the 12th century Cathedral are magical. Sam has also started to support Uxcester Town and insists that Rob takes him to home games. This year they are challenging for a play off place in Division 2.

Ani's parents moved into one of the nearby older person units, developed by a national housebuilder. They were not sure they would like it at first, having left a large semi in a nearby town. However they find the neighbourhood much easier to get around and there is so much more going on. Her mother has recently been elected to the committee of the neighbourhood forum that meets monthly to oversee the management of the area using the ground rent. Her particular responsibility is handling applications from the community chest which has £5,000 this year to give out in small grants to local organisations.

The family owned a car for the first six years after they moved it. It was easier when the kids were small to get around with buggies. However when it failed its MOT they decided that they could do without it and joined instead the local car club. They have also added photo-

voltic panels to their house, not being in one of the neighbourhoods with a CHP system. The minimum energy performance of their house was in any case specified in their plot passport and their energy bills are only a few hundred pounds a year.

The family are delighted that they decided to move to Uxcester. Rob and Ani are not radicals or eco-warriors. They don't even read the Guardian. At the same time they could never really see themselves living on a new housing estate in a dormitory suburb. Their ideal house would once have been a period property in one of Uxcester's Victorian suburbs, but that was always going to be out of their price range. The *Garden City* has created a neighbourhood which offers many of the same attractions along with a feeling of belonging and control. Indeed they sometimes wonder why not all new housing is built this way?



