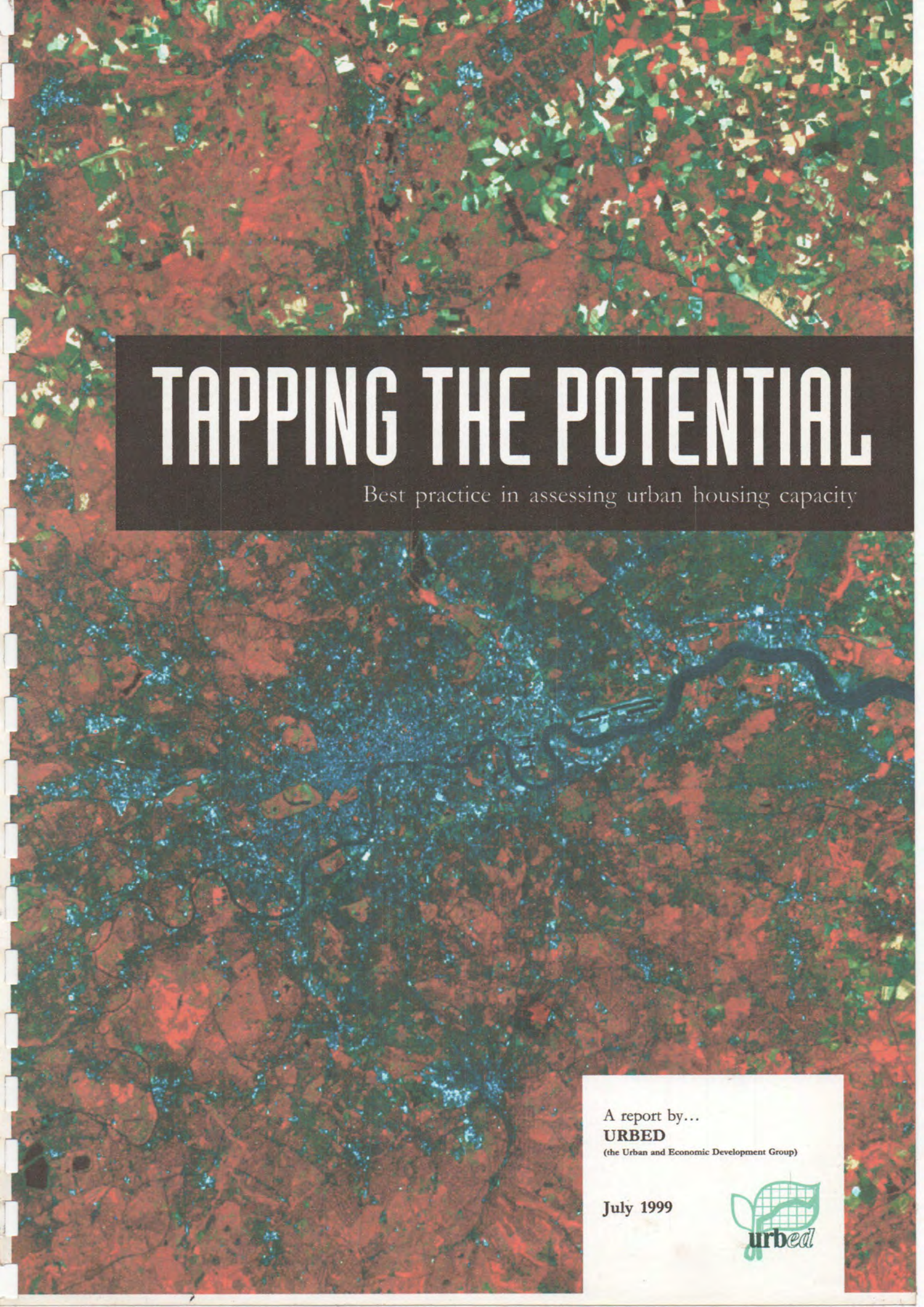

TAPPING THE POTENTIAL

Best practice in assessing urban housing capacity

A report by...
URBED
(the Urban and Economic Development Group)

July 1999

urbed

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A report of background research ondertaken for the DETR as part of the preparation of the Tapping the Potential Good practice guide published to accompany PPG3

July 1999

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1. Introduction

The last ten years has seen some fundamental changes in our attitudes to planning in the UK. With the recent delivery of the Urban Task Force Report[1] and a promised Urban White Paper to follow these changes are likely to continue and even accelerate in the future. At the heart of these changes is a new understanding that the planning system should do more than just 'predict and provide' for future market trends. In many areas these trends have led to the loss of the countryside, the decline of urban areas and to a range of environmental problems such as increasing car-use. Planning policy at all levels is therefore being reframed to check the unnecessary outward expansion of urban areas and to encourage more development to take place within those areas - what has been called by the Urban Task Force an Urban Renaissance.

Planning policy for housing development is central to this debate. Housing is the most important land-use within urban areas and has been the greatest contributor to their outward expansion. Due to changes in household size, housing will also generate some of the greatest pressures for development in the future. The way in which the planning system works to find the land for, and to shape the form of, new housing will therefore be an important part the urban renaissance.

Measures to direct housing development into existing urban areas have been part of government policy for a number of years[2], most notably through the setting of targets for the proportion of housing to be developed on recycled land. As early as 1992 PPG3 on Housing included an aim to 'increase the emphasis on reusing urban land… as a means of reducing pressure on the countryside'[3]. This has been strengthened in the new draft of PPG3 published for consultation in March 1999. This states the government's aim that 'new housing should be well-designed and accommodated *principally* in existing towns and cities'[4] (author's emphasis).

The new PPG 3 requires planning authorities to consider a housing supply. This however now focuses on housing rather than just housing land and is intended to be integrated with the authority's housing strategy. The new draft also suggests some important changes to the way in which land for this housing is allocated. The main change is the introduction of a sequential and phased approach by which urban and previously developed land is allocated before greenfield land can be released. Because of this, the requirement formerly on planning authorities to undertake Housing Land Availability Studies is to be replaced with a requirement to carry out 'Urban Capacity Studies'.

This begs the question, what is an urban capacity study and how should it be undertaken? There has, in the last few years, been a great deal of interest in urban housing capacity and a number of high profile studies have been undertaken in different parts of the country. All have sought to measure the ability of urban areas to accommodate housing development. With a couple of exceptions the objective has been to increase the proportion of housing built in urban areas and therefore to relieve pressure on greenfield sites.

The science (perhaps art is a better word) of urban capacity assessment is however in its infancy. Many of the studies that have been undertaken have used different methodologies and have looked at different aspects of the issue. Given that the new draft of PPG3 includes a requirement for local authorities to undertake urban capacity assessments, the DETR is therefore concerned to identify good practice and to ensure a degree of consistency of approach across the country.

This research has therefore been undertaken to examine the urban housing capacity assessments that have taken place over the last few years and to draw from them recommendations on best practice. The project has involved a review of previous research on the subject as well as a survey of all planning authorities in England to identify the extent of urban capacity work that has been undertaken. This as been followed up with 15 case studies of the most significant capacity studies from which conclusions have been drawn. From this we have identified the key elements of urban capacity methodologies and explored the issues that these raise in order to make a series of policy and methodological recommendations on good practice.

2. Policy context

In which we outline the policy context behind the need to undertake urban housing capacity assessments. We look first at the nature of the household projections and the opportunities and problems that they represent before looking at the policy targets for urban housing and considering the role of urban capacity studies.

The need to undertake urban housing capacity assessments is a relatively small but important part of a wider policy context. In order to understand why capacity assessments are being undertaken and what they need to achieve it is important sketch in briefly this context.

The household projections

The starting point for much of this policy debate is the government's projections of future household growth which are published and rolled forward roughly every four years. The projections published in 1991[5] were the first to stimulate concern about the scale of house-building required to meet these projections. With a 1989 base, they predicted an increase of 2.8 million households between 1991 and 2011. These projections were the basis for Regional Planing Guidance issued by government and were seen by many local authorities as the maximum that they could accommodate.

The debate therefore intensified with the publication of revised projections in 1995[6]. With a 1992 base, these increased the predicted number of new households between 1991 and 2011 to 3.4 million and rolled forward the projections to 2016 to create a headline figure of 4.4 million which has since become such a central part of the planning debate. The 1995 household projections were not incorporated into Regional Planning Guidance. However they created a great deal of concern that regional housing allocations would be increased to a point which could no longer be accommodated in some parts of the country. This is one of the reasons for the growing interest in housing capacity studies - in some cases as part of a genuine attempt to accommodate more households, in others to make the case that household allocations should not be increased.

A new round of Regional Planning Guidance is currently in progress. To assist in this process the Government released on 29th March 1999 the advanced results of the new household projections between 1996 and 2021[7]. These show an increase of 3.8 million households and therefore represent a slowing of household growth from the 4.4 million in the previous 25 year projections. The main reason for slowing this is that cohabitation is increasing more quickly than

expected so that the projected number of couples has increased. Table 1 sets out the regional allocation of these projections. We will refer back to these figures later in this report when assessing the proportion of household growth that can be accommodated on the capacity identified by different studies.

TABLE 1
Household projections for Government Office Regions: 1996 - 2021

	Households (millions)			Percentage
	1996	2021	Increase	Increase
North East	1.1	1.2	0.1	8
Yorkshire and the Humber	2.1	2.4	0.3	14
East Midlands	1.7	2.0	0.3	20
East of England	2.2	2.7	0.5	25
Greater London	3.0	3.6	0.6	21
South East	3.2	4.1	0.9	26
South West	2.0	2.5	0.5	25
West Midlands	2.1	2.4	0.3	13
North West and Merseyside	2.8	3.1	0.3	11
ENGLAND	**20.2**	**24.2**	**3.8**	**19**

Source DETR March 1999

Household growth – problem and opportunity

The increase in household numbers is the result of the declining size of households. It is part of a trend which has seen a steady increase in household numbers for much of this century and is therefore nothing new. However the absolute number of households which need to be accommodated in the next twenty years is very large. An increase of 3.8 million, for example, is equivalent to the total number of households currently living in the East and West Midlands.

The first concern prompted by these projections is the loss of greenfield land which they could imply. Bibby and Shepherd[8] have shown that, in the past, for every 1,000 homes built in England, 40 hectares of land changed from rural to urban uses. If applied to the 1995 household projections this could have meant the loss of an area of countryside the size of Hertfordshire. It is true that we are currently achieving significantly higher levels of land recycling that we did in the period covered by the Bibby and Shepherd research. However it remains the case that household growth could put significant pressures on greenfield land. These concerns are exacerbated by the regional distribution of household growth. The percentage increases on Table 1 illustrate that household growth ranges from just 8% in the North East to 25% in the East, South East and South West. It is therefore in the South of England where the greatest pressures are being felt.

While these pressures are, of course, due to the level of household growth, the form and location of development are also a significant influence. If the majority of housing is built at low

densities on greenfield sites it will clearly have a far greater impact on the countryside and on local communities than it would if it were accommodated within urban areas and at medium densities. Such urban development has other potential environmental benefits such as the reduction in car use and CO_2 emissions. These issues have been well covered elsewhere[9] and will not be rehearsed again here. It is however clear that the accommodation of more housing within urban areas addresses concerns about household growth as well as current thinking on sustainable development, creating a potential win/win situation.

There is also the possibility of a third 'win' since the urban areas with the greatest potential to accommodate household growth are those which have suffered the greatest decline over recent years. This is where significant problems exist for policy makers since declining urban areas are the very districts that are loosing population and therefore adding to the pressures for household growth elsewhere. It is for this reason that the government established the Urban Task Force with a threefold remit; to promote the regeneration of urban areas; to accommodate household growth and to create more sustainable settlement patterns. This is also why the Regional Development Agencies have been given a remit to address out-migration as part of their economic development strategies. This urban regeneration agenda means that household growth can no longer be treated solely as a planning issue. Co-ordination is required between the regional planning conferences and regional planning guidance on the one hand and the RDAs and their strategies on the other.

Policy targets for urban housing

The convergence of housing policy with sustainability and urban regeneration has become an important part of government policy. Central to this has been a desire to accommodate a greater proportion of new housing within urban areas. This was first articulated in the 1995 Housing White Paper[10] that set a national target that half of all new homes should be built on previously developed land by 2005. However, land-use change statistics published in 1996[11] suggested that this target was virtually being achieved emboldening the government to suggest that the target could be increased to 60%. This higher target was accepted in February 1998 by the current government in the policy document *Planning for the communities of the future*[12] which included a key target to 'raise the national proportion of new homes to be built on previously developed land to 60% over the next ten years'. One of the roles of urban capacity assessments is to assess whether and how this target is to be met. It is therefore important to understand some of the issues raised by this target.

Regional variations: A national target is of only limited value when considering the situation at the regional and local level. As Table 2 illustrates, only in London and Merseyside does the proportion of housing land, which is recycled from urban uses, exceed the 60% target. It drops to just 31% and 34% respectively in the South West and the East Midlands. Indeed the county figures show that the percentage drops to just 25% in Avon, Northumberland, Cornwall, Gloucestershire and Lincolnshire. For this reason the Government has asked regional planning conferences to draw up regional targets for inclusion in Regional Planning Guidance. This has led to a debate on

whether the national 60% target should be a minimum for each region or an average across the country. As Bibby and Shepherd have recently suggested [x] a 60% national target is a 20% improvement on current performance. It could therefore be achieved by improving the performance of each region by this amount (i.e. an increase from 31% to 37% in the South West).

TABLE 2

Percentage of change to residential uses that is on land previously developed for urban uses: 1998 England.

Per cent

Government Office Region	Average 1990-1994	Annual Minimum	Annual Maximum
North East	42	30	46
North West and Merseyside	52	43	58
▪ North West	50	38	54
▪ Merseyside	63	48	76
Yorkshire and Humberside	41	34	48
East Midlands	34	26	36
West Midlands	43	32	48
Eastern	45	37	47
London	80	72	85
South East	49	38	50
South West	31	23	35
England	**45**[1]	**36**	**47**

Source Land use change in England No. 13 DETR 1998

1. These figures exclude conversions which accounts for the difference between these percentages and the current headline figure of 56% of housing on recycled land.

Housing or land: A further issue is that the target refers to the proportion of new housing built on recycled land whereas the land-use change statistics have previously only referred to the proportion of land developed for housing from different sources. This has been rectified in the most recent land-use change statistics[13] that include an analysis of the proportion of housing built on recycled land. As Table 3 illustrates, while 48% of land developed for housing in 1995 was previously in urban uses, 53% of all housing was built on this land. The reason for this is that housing is generally built to higher densities on urban sites. Given that the government target refers to housing rather than land it would seem that we are actually quite close to meeting the 60% target, especially when conversions are included in the returns.

Urban areas or urban land: The definition of urban land used in the statistics relates to the previous use of the land rather than its location. This is also analysed on Table 3 which shows that 17% of recycled urban land is outside urban areas – including Ministry of Defence establishments, mine workings etc... Table 3 therefore shows that the proportion of land and housing built on

recycled land within urban areas is 31% and 41% respectively. It is therefore important that urban housing capacity assessments consider both the previous use and the location of housing land.

TABLE 3

Previous use of land changing to residential use: 1995 England

Per cent of all previous uses in all areas

Previous use	Area			Dwellings		
	Outside urban areas	Within urban areas	All areas	Outside urban areas	Within urban areas	All areas
Rural uses	34	7	41	26	7	33
Urban uses						
▪ Residential	7	9	16	3	8	11
▪ Transport and utilities	0	1	1	0	1	1
▪ Industry and commerce	1	4	5	1	6	7
▪ Community services	1	3	4	1	4	4
▪ Vacant previously developed	8	15	23	8	22	30
All land previously developed for urban uses	**17**	**31**	**48**	**13**	**41**	**53**
▪ Vacant: Not previously developed	5	7	12	5	8	13
All urban uses	22	37	59	18	49	67
All uses	56	44	100	44	56	100

Source Land use change in England No. 13 DETR 1998

The targets for urban housing are part of a wider and still developing policy context that will crystallise in an Urban White Paper in the next 12 months. The elements of this policy context include:

- The Urban Task Force report published on 29th June which recommended ways of promoting urban areas.
- The creation of the National Land Use Database (NLUD) to collect information in a consistent manner on the availability of previously developed land (see Chapter 4).
- A move away from 'predict and provide' to 'plan, monitor and manage'. The implication of this is that the allocation of new housing need not be entirely determined by the projections of historic household growth provided that the consequences of this are monitored and carefully managed.

- A requirement that regions set their own targets for the proportion of housing built on urban recycled land.
- The suggested introduction of a phased sequential approach requiring local authorities to consider the reuse of existing property and the use of previously development land before greenfield sites can be released.

As John Prescott said earlier in 1999: 'together these represent the Government's new policy direction to planning for housing and mark a clear departure from what has become known as the "predict and provide" approach'.

The importance of urban housing capacity

This policy agenda has given new significance to the question of urban housing capacity for three reasons:

An input to the debate: The accommodation of more housing within urban areas has prompted a vigorous debate. Organisations such as the Town and Country Planning Association have cautioned against increasing the proportion of new housing on recycled urban land[14]. Their arguments are based partly on the social acceptability of building within urban areas, either because of the unpopularity of those areas or because of the danger of what they call 'town cramming'. They also doubt the practicality of building more homes on urban recycled land, suggesting that the supply of this land is drying up and that abnormal development costs make housing unviable. This has lead Breheny and Hall[15] to suggest that far from a 60% target, the future proportion of housing on urban recycled land is unlikely to be sustained at more than 30-40%. Many of these concerns relate to the issue of urban capacity. Indeed Breheny has argued[16] that we should use capacity in its broadest sense to include 'physical capacity' – whether there is space for development, 'social capacity' – the level of growth possible without harming the quality of life in urban areas and 'environmental capacity' – limits on growth implied by the natural environment. This debate continues both nationally and locally and capacity assessments can play a role in assuaging the fears of local members and officers about the implications of accommodating more household growth in their areas.

A central part of the planning system: Urban capacity assessments may therefore be useful to inform the debate about the benefits of building more housing in urban areas. This however is not the main issue that concerns us here. Far more important is the role of urban capacity assessments in the planning system. The consultation draft of PPG3 suggests that capacity assessments should replace the housing land availability studies that local authorities are currently required to undertake. These urban capacity studies will thus inform the operation of the sequential approach to the allocation of land for housing development. It will not be possible to determine the amount of greenfield land which should be allocated for housing, or to phase the release of this land, until the potential for housing development within urban areas has been fully explored. Urban housing

capacity assessments will therefore become a central part of the development plan system at the regional, county and district level. As such they are likely to be thoroughly tested through the appeals process as developers seek to challenge restrictions on greenfield development. This has important implications for the methodology, rigour and consistency of assessments undertaken by different authorities.

A tool for regeneration: The third reason for the importance of urban housing capacity work, is perhaps the most important of all – its value as a tool to promote urban housing development. It is a common mistake for planners to assume that identifying and allocating land for housing will automatically lead to its development. This may be the case with attractive greenfield sites but recycled land in urban areas can be very different due to problems such as contamination, access, fragmented ownership etc. An increase in the amount of housing accommodated in urban areas therefore implies a far greater role for local authorities and urban capacity studies are potentially an invaluable tool to identify priorities and to highlight necessary action.

This report has been commissioned in response to the changing policy context described in this chapter and increased importance of urban housing capacity work. It is clear from this that the urban capacity studies likely to be required by PPG3 will need to fulfil a number of roles:

- To provide useful and accurate information about the level of housing which can be accommodated within urban areas.
- To recognise the social, economic and environmental consequences of developing housing in urban areas and the limits that these factors might impose of the amount of the capacity that can be released.
- To be sufficiently robust in methodology to be used in the development plan system and withstand challenge at appeal.
- To inform local authority policy by exploring the consequences of different options, suggesting priorities and highlighting necessary action.

In developing a methodology for urban capacity assessments we do not however start with a clean sheet. A great deal of urban capacity work has been undertaken in the last few years. In the next two chapters we therefore assess the nature and extent of this work before exploring the methodologies in greater depth in Chapters 5, 6 and 7.

3. Past attempts to find housing land

In which we assess the strengths and weaknesses of land availability studies and windfall assumptions before looking at the attempts that some authorities have made to improve these studies through the assessment of environmental capacity.

The need to identify land for housing development has been a concern of the planning system for many years. As part of the study we have therefore reviewed past attempts to identify land for housing and to apply concepts of capacity as a planning tool. The results of this work are set out in this chapter.

Land availability studies

As part of their responsibility to maintain a five-year supply of housing land, local authorities outside London have been required to undertake land availability studies. These are generally updated every two years and are based on a methodology set out in the 1992 edition of PPG3[17]. Their aim is to identify land that is 'genuinely available' for housing. 'Genuinely available' is defined as free, or readily freed, from planning, physical and ownership constraints, capable of being developed economically in areas where housebuyers want to live and suitable for a range of different housetypes. Research by Halcrow Fox[18] in 1996 found that the system was generally working well. Most local authorities were maintaining a five-year housing land supply and housebuilders were generally happy that land was being made available in the right locations.

The Halcrow report does however question the accuracy of land availability studies in identifying housing land. It points out, for example, that land identified for housing in statutory plans accounts for just 39% of land actually developed for housing. Similar results have been found by other studies. Back in 1978 the Economist Intelligence Unit found that more than half of all sites with planning permission for housing had not been identified in statutory plans[19]. More recently Roger Tym and Partners in a 1987 study of the South East and East Anglia[20] found that 65% of housing sites had not been identified in development plans. This picture is even true of one of the first housing capacity studies undertaken by LPAC for the period 1992 to 2006[21]. By 1996 39% of the sites identified in the study had been developed, pretty much as would be expected. However 53% of residential permissions had taken place on unidentified sites.

So while housing land availability studies may have been successful in identifying sufficient housing land to maintain a five year supply this has not generally been the land on which housing

has been developed. The studies that have sought to explain this discrepancy have generally focused on the reasons for the land identified in plans not being developed. In a study for the West Midlands Regional Planning Forum[22] Halcrow Fox found that in the majority of cases (73%) identified land had not been developed because of market/viability reasons. As they suggest, this an important component of the judgement that planners must make about land being 'genuinely available' and one which they appear to be badly misjudging. This is despite the fact that Housing land availability assessments are supposed to be jointly produced with the Housebuilders Federation and local developers who presumably comment on the viability of sites. Halcrow Fox conclude that there is a need to replace the concept of 'genuinely available' with a tighter concept of 'viable for development'. This however leaves a number of questions about the sites that were developed. These sites were presumably not counted in land availability studies because they were not considered available for development. It might therefore be expected that a tighter definition of genuine availability would exclude even more of these sites exacerbating, rather than correcting the error.

Windfall assumptions

Planning authorities have attempted to deal with this uncertainty by using windfall assumptions. Guidance is given in PPG 3 about the dual role of windfall assumptions. The first is to make allowances for small sites (less that 0.4ha or 1ac) which would be too difficult to identify individually. The second is to make an allowance for larger sites that unexpectedly become available, for example due to a factory closure. PPG3 however states that assumptions should not be made about sites over 1 hectare because it would add too great an element of uncertainty into land availability studies and 'defeat their main purpose which is to *identify* available sites'. Windfall assumptions are based upon historic trends, generally a 5 year moving average. This allows assumptions to me made about the future level of housing from this source which is then used to determine the amount of housing land required to meet a five year supply.

It is however clear that windfall assumptions do not bridge the gap between the land allocated and that developed for housing. While more than half of new homes are built on unallocated land, the ARUP study for the North of England Assembly[23], found that annually windfalls accounted for just 15% of new homes. What is more, the Halcrow Fox study on the capacity of larger sites in London[24] found that many of the unidentified housing sites in London were larger than one hectare (and therefore outside the PPG 3 definition of a windfall). Their findings show that between 1992 and 1996 windfall permissions in London were granted at four times the rate assumed in previous studies, and that 46% of these were for 10-49 dwellings.

Weaknesses with the current system

The current system of land availability studies would therefore appear to be flawed for a number of reasons:

Accuracy: The role of the system is to identify housing land and yet it consistently has a success rate of less than 50% in this respect. This must call into question the value of the procedure and its efficacy as a planning tool. The fact that up to 50% of housing sites are not identified in statutory plans and yet those plans still provide a five-year supply, also suggests that there is a huge over allocation of housing land. This undermines the role of the planning system in determining the most appropriate location for development.

Genuine availability: Central to this problem is the concept of genuine availability. Availability, particularly over a five-year period is difficult to predict especially as market conditions can change over time. Planners are not well qualified to assess market issues and the housebuilders that have participated in land availability studies (as PPG3 requires) have naturally favoured unconstrained sites. The 'genuinely available' test therefore tends to rule out many brownfield and urban sites. This becomes self-fulfilling because if such sites are not identified for housing while more 'available' sites are they will not be developed.

Windfall assumptions: There appears to be a lack of consistency in the application of windfall assumptions. It seems likely that the windfall potential of smaller sites is being underestimated. In smaller settlements, the majority of urban housing sites are likely to be below the windfall threshold. This may mean that more large greenfield sites are allocated removing the incentive for developers to seek out windfall sites. This in turn will mean that there are few windfall completions so that future windfall assumptions remain low.

Larger sites: Sites over one hectare are supposed to be excluded from windfall assumptions and yet cannot be counted in land availability studies unless they are genuinely available for development. Many utility and transport sites are likely to fall into this category. This land may be constrained due to existing use, planning allocation or contamination and therefore not considered to be genuinely available. As the Halcrow Fox, LPAC study suggests, this represents a significant source of housing capacity that is being missed.

Capacity estimates: There is no clear guidance on how to identify the capacity of sites identified in land availability studies. The tendency will therefore be to assume that past average housing densities will continue in the future so that the potential for increasing densities will be ignored. It is also generally true that capacity estimates will not question planning standards such as parking provision or overlooking distances.

Planning policy: As part of the statutory planning system land availability studies are not designed to question existing allocations in statutory plans such as employment land allocations even where there is little apparent commercial demand. In the North East, for example ARUPs found that some authorities have a hundred year supply of allocated employment land at current take-up rates[25] yet many authorities continue to defend the loss of any of these sites.

The success of housing land availability studies in maintaining a supply of housing land for development has been achieved despite these weaknesses. Yet inherent to the system is an acceptance that past trends will continue into the future and that current market conditions and planning policies will prevail. As Halcrow Fox conclude[26] the system is an inappropriate tool to increase the proportion of housing on recycled land or in urban areas. It is therefore clear that an alternative approach is required for urban housing capacity assessments.

Environmental capacity studies

Considerable efforts have been made by some authorities to overcome these problems. An important area of work has been the development of the concept of environmental capacity[27]. While this is a different concept to urban housing capacity it has similarities in that it implies the measurement of a finite resource and its ability to accommodate housing development. It is therefore relevant that the two most high profile applications of environmental capacity in the Hampshire and Berkshire structure plans in the early 1990s were rejected at public enquiry. This has resulted in a vigorous attack on the concept of environmental capacity by the Housebuilders Federation[28] and a spirited defence by the CPRE[29]. The conclusion of this debate has been that the real value of environmental capacity is as a metaphor. As the CPRE report suggests, it is a good way of explaining that limits must be set on growth but not for deciding what those limits should be.

There have however been three recent studies in Suffolk[30], Cambridgeshire[31] and West Sussex[32] that have applied elements of the environmental capacity approach to an assessment of housing capacity. The Suffolk and Cambridgeshire studies are largely concerned with identifying the least harmful form of greenfield development. As such they establish a series of criteria against which different options for growth can be assessed. The Cambridge Capacity Study evaluates six development scenarios against a set of environmental, social and economic criteria. The Suffolk Study takes this a step further by identifying environmental capital that should be protected. The *capacity* for the expansion of the 20 main settlements in Suffolk without impinging on this environmental capital could then be assessed.

Neither of these studies included an assessment of urban housing capacity. The Suffolk Study drew upon work by the districts in 1997 to estimate that just 29% of dwellings between 1995 and 2016 could be developed on brownfield sites. However the study suggested that the balance of housing requirements could not be accommodated outside urban areas without eroding critical environmental capital and so recommended that the brownfield contributions should be reconsidered. The Cambridgeshire study also drew on survey work by districts to estimate that 46% of housing could be accommodated on brownfield land. The Standing Conference of East Anglian Local Authorities (SCEALA) has recently published a fuller assessment of the potential of brownfield land. This produces quite different figures suggesting that Suffolk can realistically accommodate 50% and Cambridgeshire 39% of household growth on recycled land between 1998 and 2016[33].

The West Sussex Study takes this further by assessing both environmental and urban capacity. This was however undertaken as part of an argument that the county was unable to accommodate an increase in household growth as described in Case study 1. Indeed the suspicion is that the study was undertaken to prove this point.

CASE STUDY 1
Environmental Capacity in West Sussex - West Sussex County Council June 1996

The aim of this study was to prove that West Sussex could not accommodate additional housing growth. It focused, not on total housing capacity, but on capacity over and above sites identified in land availability studies. The study also excluded sites over one hectare.

The first part of the study looked at the potential for peripheral expansion of settlements in the county concluding: 'the massive growth of the towns and villages this century has used up most of the open land within the main settlements and virtually all of the options on their peripheries where development could take place without serious loss of environmental resources'. It then explored the housing potential from urban intensification, smaller brownfield sites, conversions and living over the shop. This was to assess whether the windfall assumptions were right in the Consultation Draft of the Structure Plan.

Methodology: The study split the urban areas of the county into 22 different typologies - what other studies call Typical Urban Areas (TUAs). Case studies were undertaken to assess the average additional housing capacity of each TUA which could be grossed up to give an estimate for the county. The study did not question existing local plan allocations and included only sites which could be developed at 'reasonable costs' and without 'insurmountable problems'. It therefore represented only a marginal relaxation of the criteria for land availability studies. In determining the capacity of sites no explicit density guidance was used and it was assumed that development should create no additional parking burdens – so that parking existing standards were applied and surface car parks not considered.

Findings: The study found a theoretical capacity figure of 28,822 dwellings. This was discounted by a range of issues resulting in a reduction in the capacity figure of 63%. This produced an 'available capacity' of 10,000 units compared to the windfall allowance of 17,000 based upon past trends. The study concluded that past trends would not continue, that the windfall allowance was therefore an overestimate and that, as a result, there was no capacity in the county for any additional household growth.

Conclusions: While this study is similar to the urban capacity assessments examined in the other case studies, it has many of the methodological weaknesses of land availability studies. It does not question current planning policy and as Llewelyn-Davies suggest[34] the study is 'more a prediction of the constraining effect of district policies... than a true reflection of capacity'. The theoretical capacity is therefore not the maximum that might be available if policies were changed. This is compounded by the way that capacity estimates, take-up rates and market demand are rolled up into a very arbitrary discounting procedure which reduces the 'theoretical capacity' by almost two thirds. It is hard to see how such an arbitrary figure can be used to suggest that historic windfall assumptions are an overestimate.

The main weakness of environmental capacity as a concept is that it implies a degree of objectivity but that this is little more than a cover for a range of subjective judgements. In the natural world environmental carrying capacity refers to the point beyond which a particular eco-system is unable to support a species and is relatively easy to measure. This is not the case with human settlements where environmental capacity is not an objective, measurable given but a value judgement about acceptable change. As Michael Jacobs argues[35] this need not undermine the value of environmental capacity as a concept so long as its limitations are recognised. For this reason the Chester Study[36] is interesting (Case Study 2). This does not actually measure the physical capacity for additional development. Instead it established a series of capacity thresholds which can be assessed against the current situation, a current trend scenario and different policy scenarios. The

value of this study is that it recognised that these thresholds are subjective decisions and should be reviewed and changed over time. However once they are accepted by politicians and the public the Chester methodology provides a way to show whether these thresholds are breached by different policy options.

CASE STUDY 2

Environmental capacity in Chester: A methodology for historic cities – ARUP and BDP – February 1995

Most applications of environmental capacity have been to rural areas. This study is unique in that it develops a methodology for an urban areas as a means of reconciling the complex issues facing a historic city in dealing with pressures for growth.

Methodology: The method is based upon the identification of ten sets of indicators covering the following issues: pressure on the edge, pressure on green areas, townscape, skyline, historic buildings, uses, pedestrian/vehicle conflict, pedestrian congestion, parking and commuting. For each issue, one or more indicator is selected giving a total of16. For each of these indicators, thresholds are set where possible based upon measurable data – for example the number of vehicles per hour beyond which it becomes difficult to cross a road. This framework is then used as part of a 12 stage process which maps the urban areas and identifies critical environmental capital and explores areas of conflict and perceptual limits in order to determine the appropriate indicators and threshold levels. These threshold are then used to explore different capacity scenarios as outlined below:

- Actual state: The situation as it is now
- Trend state: What will happen if current trends continue
- Scenario states: This allows projections to be made for different policy options. In Chester's case these were a) meeting only local needs b) becoming a regional capital and C) focusing on tourism.
- Capacity state: The point 'beyond which the system should not be'.
- Desirable state: This framework can be used to set policy targets such as the maximum amount of new shopping allowed in the city centre.

This allows matrices to be developed to illustrate the extent to which thresholds are breached for each scenario. An analysis of issues in this way will identify areas where the capacity state is already exceeded by the actual state. These represent existing environmental problems that should, where possible, be addressed and certainly should not be exacerbated. With other indicators the capacity state may exceed the trend state pointing to headroom for expansion in these areas. This methodology thus provides a useful tool for determining priorities.

Findings: The Chester study has generated a great deal of information that we have not reviewed in detail. However the results were generally to find more capacity than officers had been expecting. This makes the study almost unique in that it illustrated the scope for additional urban housing whereas in most other cases the opposite has been true.

Conclusions: The logic and comprehensiveness of the Chester methodology has many attractions as a positive planning tool. There are however doubts about whether it can really accurately mirror the complexity of urban areas. The study accepts for example that measures to prevent certain thresholds being breached may have unforeseen side effects (such as increased land values) which create problems elsewhere. The use of the term environmental capacity also implies a level of objectivity and statistical rigour which is not justified as the study itself recognises. It would probably be more accurate to call it a threshold study and to recognise that the setting of thresholds is a subjective, indeed a political process. If this is recognised it does not however undermine the value of the findings.

The study is however significant in that it considers a far wider range of issues than purely physical capacity and a wider range of land uses than purely housing. Other studies may measure the scope to accommodate more housing but are not able to assess the impact of this on quality of life or the effect of other uses. In fact the one issue that the Chester study does not consider is physical capacity. The value of the technique may therefore be to be used alongside physical capacity studies in sensitive locations such as historic towns.

Environmental capacity studies, like housing land availability studies therefore pose some useful questions for urban capacity studies if not many solutions. They show how seemingly objective techniques can be used to mask subjective judgements. This need not be a problem where those judgements are exposed and subjected to public or political scrutiny. They are more problematic when they are based upon the views of the individuals undertaking the work and can undermine both the value of the work and its chances of withstanding challenge. The studies reviewed in this chapter also show the difficulty of assessing complex systems with over-simplistic methodologies. They suggest that the margin for error may be so great as to question the value of the effort and resources which has gone into the studies.

4.
Urban housing capacity: The national picture

In which we review the urban capacity work undertaken in the last few years. We start by looking at the methodology and the initial results from the National Land Use Database (NLUD). We then describe the results of the local authority survey that we have undertaken and draw conclusions about the scale and nature of urban capacity work in the England.

In the last chapter we looked at the methods used in the past to identify housing land. In this chapter we look at the national picture of work on urban housing capacity, describing first the National Land Use Database (NLUD) before setting out the results of the local authority survey undertaken as part of this research.

National Land Use Database

One of the most important initiatives relating to urban housing capacity is the creation of a National Land Use Database (NLUD). This was announced in February 1998 in the *Planning for the communities of the future*[37]. While it is not intended as an alternative to urban capacity studies the NLUD does attempt to overcome some of the weaknesses of land availability studies. The NLUD is therefore important as both a methodology and as a source of data for local urban capacity assessments. The NLUD was launched in November 1998 when a data specification[38] was sent out to all local authorities in England. The intention is to provide a national picture of the amount and distribution of previously developed land and to provide a future tool for intervention. The NLUD therefore adopts a very broad definition of previously developed land including all land and buildings that have been developed in the past or are likely to become available for development in the future. Urban and rural sites are included as are sites used for mineral extraction and waste disposal. Only agricultural sites are excluded and land in urban areas which has not previously been developed. The data specification includes five categories of sites which are described in more detail on Table 4:

- Previously developed land which is now vacant
- Vacant buildings, including 'vacant dwelling zones'
- Derelict land and buildings

- Previously developed land in use, allocated for redevelopment or with planning permission for housing
- Previously developed land where there is known potential for redevelopment but no planning allocation or permission

TABLE 4
Definition of NLUD categories – An overview

	Category	Definition	Includes	Excludes
a.	Previously developed land which is now vacant	Land that was previously developed and is now vacant which could be developed without treatment.		Land previously used for mineral extraction or waste disposal which has been or is being restored for agricultural use, other open countryside
b.	Vacant buildings	Unoccupied buildings that are structurally sound and in a reasonable state of repair (ie. capable of being occupied in their present state)	Buildings that have been declared redundant or where re-letting for their former use is not expected. (ie. Where long term vacancy is an issue)	Vacant buildings that will be subject to re-letting for their former use in the short to medium term. Single residential dwellings except where they could reasonably be converted to 10 or more dwellings
bz.	Vacant dwelling zones	Concentrations of unoccupied dwellings. The minimum vacancy rate to use when delineating these zones is 25%		
c.	Derelict land and buildings	Land so damaged by previous industrial or other development that it is incapable of beneficial use without treatment (includes demolition and levelling)	Abandoned and unoccupied buildings (including former single residential dwellings) in an advanced state of disrepair.	Land damaged by development which has been or is being restored for agricultural use, forestry or other open countryside previously developed land that has blended into the landscape.
d.	Allocated for any use or planning permission for housing	Other previously developed land or buildings, currently in use, allocated for development in the adopted plan or having planning permission for housing;	Sites allocated for development in the adopted local plan that have not yet been developed. Sites which have planning permission for housing.	Single residential dwellings where conversion to less that 10 dwellings is planned
e.	Known redevelopment potential but no allocation or permission	Other previously developed land or buildings where it is known there is potential for redevelopment (but without allocation or planning permission)	Sites likely to be disposed of by their owners for redevelopment or conversion in the next five years	

Local authorities are required to identify sites within their area falling into each of these categories. Each site is entered onto a schedule under the above headings with details of location, area, previous or current land use, ownership, planning status and local plan allocation. Without prejudice to this planning status, local authorities are also asked to assess the suitability of each site for housing and to estimate its capacity (giving details of the density assumptions used). In addition the data specification lists a range of desirable data items which local authorities are asked to submit only if the information is readily available. The intention is that English Partnerships will select larger sites in high demand areas to prioritise the collection of this additional information. With their return local authorities are also asked to provide aggregated data on conversions to residential uses (in schemes below the cut-off size of 10 units) and annual windfall figures.

The NLUD is an important attempt to overcome many of the problems associated with the identification of sites for housing. Most importantly, all potential sites are included, even those which local authorities believe not to be suitable or available for housing development. For this reason the specification makes clear that the information collected will be without prejudice to the planning process and that individual site details will not be published without prior agreement. This will lay bare the assumptions that are made when considering the suitability of site housing, something which is impossible when sites are excluded at an early stage of the process so that details are not collected.

TABLE 5: NLUD - Previously developed land that is unused or may be available for redevelopment by land type and Government Office Region – England 1998

Hectares

	Vacant and derelict land			Currently in use		
Government Office Region	Previously developed vacant land	Derelict land and buildings	Vacant buildings	Allocated for any use or planning permission for housing	Known redevelopment potential but no allocation or permission	TOTAL
North East	1,300	1,640	150	610	350	4,050
North West	3,290	2,990	660	800	690	8,430
Yorkshire and the Humber	2,970	3,510	620	570	730	8,400
East Midlands	1,380	2,740	440	970	890	6,420
West Midlands	1,690	1,550	330	390	960	4,920
East of England	1,460	840	570	1,260	1,030	5,160
London	520	710	380	1,090	420	3,120
South East	1,790	1,350	900	3,910	2,210	10,160
South West	1,180	1,950	430	1,290	810	5,660
ENGLAND	**15,590**	**17,260**	**4,480**	**10,900**	**8,090**	**56,320**

Source: DETR 1999

The provisional results of the NLUD have recently been published[39] and are set out in Table 5. These shows that there were some 33,000 ha of previously developed vacant and derelict land in England in 1998 a further 4,480ha of vacant buildings and 19 000ha of land currently in use but likely to be redeveloped. This gives a national total of 56 320 ha which is quite close to the 60 000ha estimate of current and future recycled land made by URBED[40]. This also broadly accords with the 1990 vacant land survey[41] but not with the derelict land surveys[42]. This discrepancy is discussed in the Urban Task Force Report[43] as well as in URBED's previous research[44]. Part of the reason appears to be the exclusion from the NLUD and the previous vacant land figures of large mineral, railway and military sites which are outside urban areas and regarded by local authorities as having limited development potential.

Even with a very precise data specification there is scope for interpretation and judgement by local authorities so that a degree of inconsistency is inevitable. This is particularly true of the capacity estimates for the NLUD sites. The local authorities replying to the survey estimated that just under half was suitable for housing and that it would yield around 710 000 units. There is undoubtedly considerable variation in the assumptions used to judge availability and capacity but at least the NLUD will allow these inconsistencies to be uncovered. It is inevitable that many of the sites identified will never be developed for housing. It is also true that a great deal of future housing will be built on urban sites not recorded in the NLUD. However the data collected does enable a much more comprehensive assessment of capacity on a national level and as such will provide a valuable source of data for local urban capacity assessments. This is particularly true as the NLUD is updated over time and extended to cover all land uses.

Local Urban Housing Capacity Assessments

The data collection for the NLUD has taken place in the context of a great deal of urban capacity work being undertaken by local authorities across the country. As part of this research we have undertaken a survey of English local authorities to gain an insight into the scale and nature of this work.

TABLE 6
Survey results

	Counties		Districts		Total	
	Number	%	Number	%	Number	%
Undertaken studies	14	48%	69	35%	83	36%
Contributed to studies	4	14%	65	33%	69	30%
Not done a study	11[1]	38%	66	33%	77[1]	34%
Total respondents	**29**[1]		**200**		**229**[1]	
Sample size	34		353		387	
Reply Rate	71%		57%		58%	

1. This figure includes 5 National Parks that responded but which have not been included in the response rates

In total 229 local authorities responded to the survey including 24 counties, 5 National Parks and 200 districts. This represents a response rate of 71% for counties and 58% for districts. The survey shows the extent of urban capacity work with two thirds of all authorities having undertaken or contributed to what they would classify as an urban capacity assessment. These capacity studies have been undertaken at three different scales; the region, the county and the district. We explore each in turn along with the particular situation of London.

Regional studies: The regional studies were not recorded directly by our survey since they have not been undertaken by local authorities. However from the replies and our literature review it is clear that a great deal of work has been undertaken at the regional level because of the role of the regional planning conferences in housing allocations. Indeed every region of England has undertaken work of some kind as detailed below:

CASE STUDY 3

Study of settlement capacity and regional development options in Yorkshire and Humberside – Baker Associates – January 1998

This is one of two regional capacity studies undertaken by Baker Associates and is one of the best examples of the Typical Urban Area technique.

Methodology: The study involved the following stages:

1. The identification of 32 typical urban area types (TU As) including 9 residential types, 7 mixed-use, 5 employment, 7 other uses, 3 community and 3 vacant.
2. The allocation of all urban areas in the region by local authorities into one of these TUAs. In some cases these were adjusted, for example when it was considered that some authorities had allocated too much employment land.
3. An assessment of the average capacity of each TUA. Ten TUAs were assessed through sample areas, sixteen through assumptions and four through a combination of the two.
4. 53 sample areas were studied to ensure a regional coverage and a good sample of the TUAs covering the greatest area. 1:1250 base plans were used to identify potential capacity including undeveloped land (including large gardens), vacant land, car parks, non-conforming uses and underused land.
5. These sites were sieved for 1) availability and 2) suitability. The latter included an assessment of neighbouring uses, site conditions and constraints such as access. On this basis the sites were graded into A: Easy, B: Medium and C: Difficult.
6. Density assumptions were made based on past performance, good examples and the Llewelyn-Davies examples in the North West Study (Case Study 12). Two scenarios were selected; a small increase in densities and a radical increase.
7. Data was so patchy and inconsistent on conversions that they were omitted from the study.
8. Market demand was assessed by ranking sites into a hierarchy of three developer preferences.
9. The regional capacity was assessed by translating the sample areas into an average number of extra housing units per hectare for each TUA. These were then converted into factors to reflect market conditions and applied to the total land area for each TUA. These were combined with yardsticks for other types of TUA to estimate a total regional housing capacity.

Findings: Despite the fact that the study assessed 32 types of TUA almost half of the land was in just one category; estate housing. The second most important use was open spaces with just 9% of the urban area. The study identified capacity for 179,800 houses at the lower density scenario and 227,400 at higher densities.

The three difficulty levels determined in stage 5 of the methodology were to develop three policy scenarios:

	Lower density	high density
Current trends with minor improvements	84,800	110,900
A policy to increase urban infill	142,200	182,100
The development of all realistic opportunities	179,800	227.400

These figures compare to suggested household growth in the region between 1991-2016 of 387,000 households. The study therefore concluded that there was capacity to meet 21-58% of household needs within urban areas.

We have identified five regional studies which have sought to measure housing capacity:

- North of England Assembly[45] – Urban Capacity Study - Undertaken by ARUPS and published in January 1998 (case study 8)
- South East Regional Planning Conference (SERPLAN) – Various capacity assessments
- Yorkshire and Humberside Regional Planning Conference[46] – Settlement potential and development options study – Undertaken by Baker Associates and published in July 1998 (case study 3)
- South West Regional Planning Conference[47] – Strategic study of urban housing potential – Undertaken by Baker Associates and published in November 1998 (case study 11)
- Standing conference of East Anglia Local Authorities (SCEALA)[48] – Housing development potential of previously developed land in East Anglia – undertaken by officers – January 1999

In addition to this three further studies have been undertaken which have not measured capacity but have developed a methodology to be undertaken by individual local authorities:

- East Midlands Regional Local Government Association[49] – Housing capacity in urban areas of the East Midlands – Undertaken by ENTEC and published in November 1998 (case study 15)
- North West Regional Association[50] – Exploring Urban Potential for Housing – Llewelyn-Davies – 1997 (case study 12)
- West Midlands Forum of Local Authorities – Monitoring regional land supply – This study undertaken by Halcrow Fox and published in March 1997 focuses on land availability assessments but is very relevant to urban housing capacity.

County Studies: From our survey it would appear that urban capacity work at county level is closely linked to the cycle of structure plan review. Of the 29 counties which responded to our survey just under half had undertaken capacity work. In addition to this the survey identified a number of county-wide studies being undertaken by consortia of unitary authorities. This gives a total of 16 county studies of which 7 were commissioned from consultants.

- **Completed studies:** West Sussex (case study 1), Hertfordshire (case study 10), Suffolk (see chapter 3) Northamptonshire and Hampshire have completed studies. Additionally Dorset and Staffordshire have undertaken studies for parts of their area.

- **Studies underway:** Worcestershire, Nottinghamshire, Kent (case study 4) Surrey (case study 13), and Shropshire are all undertaking urban capacity assessments at present. Of these only Kent is using consultants. The others have produced methodology for use by their district councils.

- **Consortium studies:** In parts areas where unitary district authorities have replaced counties a consortium approach is being used. In Leicestershire the county has jointly commissioned ARUPs with the two unitary authorities within its area - Leicester and Rutland. The four former Avon authorities have commissioned Roger Tym and Partners while in Berkshire six districts have prepared a brief for a study to be commissioned later this year. While Scotland was not covered by our study we are also aware that a capacity study has been undertaken by eight authorities for the Glasgow and the Clyde Valley structure plan area[51].

The counties that have not undertaken recent capacity work included Norfolk, East Sussex and Essex. These counties have undertaken land availability work in the past but are not at the current stage of structure plan review to require further work.

CASE STUDY 4
Kent Urban Capacity Assessment: Kent County Council - 1998

A major urban capacity exercise is currently underway in Kent. This will not be complete until late 1999 but is an interesting attempt to reconcile existing land availability data with NLUD returns and an urban capacity study.

Methodology: The study involves four main elements:

- Site identification: The identification of land and buildings with potential for reuse in Kent's urban areas. This is to be combined with the NLUD survey work, however there is concern that the NLUD identifies sites that may not be available for development, has no lower threshold, and includes land outside urban areas. For this reason the methodology suggests that the urban capacity and NLUD data is kept in separate but complimentary databases.

- Character assessment: A character assessment of the main settlements to assess their ability to accommodate extra growth. This is being undertaken by the Districts on the basis of a methodology produced by Land Use Consultants. This uses a combination of age, development, density and site visits to define Typical Urban Character Areas (TUCAs). These are to be analysed and positive and negative attributes identified. This allows each character area to be categorised into one of five categories from 'high conservation' to 'in need of signifi cant enhancement'. This will be used to judge the scope for change and to accommodate growth.

- Sustainability framework: A framework to assess the social, environmental and economic sustainability of larger settlements has been commissioned from Entec to d etermine priorities for growth. This will define environmental, physical and community infrastructure thresholds for urban areas and to assess the effect on these of different levels of growth.

- Design and Planning: The production of design guidelines and planning policies relating to the accommodation of more housing at higher densities in urban areas. This is to be commissioned at a later stage.

Conclusion: This methodology is quite different to some of the others in that it seeks to assess not the phy sical capacity for growth but its consequences. Indeed the first stage which does look at physical capacity appears to be the weakest since it appears to prejudge the suitability of sites and infers that many of the NLUD sites should not be considered.

The use of Typical Urban Character Areas is an interesting twist on the TUA technique although it is unclear whether this will work in practice as a tool for directing capacity to areas where it can be feasibly developed. The sustainability framework then a ppears to be an application of Environmental Capacity with all of the attendant difficulties.

London studies: Some of the most detailed work on urban capacity has been undertaken by LPAC for Greater London. This included some of the first housing capacity studies in 1988 and 1994[52]. The 1994 study identified capacity for just over a third of London's projected increase in

households between 1991 and 2016. Yet since 1991, 82% of housing in London has been built on brownfield sites and 88% within the urban area. Dissatisfaction with this earlier study therefore prompted LPAC to revise the methodology for the 1998/99 capacity study (case study 5). Instead of asking the London Boroughs to estimate their own capacity the current approach is to supply them with a portfolio of capacity benchmarks or targets. These include historic rates of building on recycled land (already far higher in London than elsewhere), and benchmarks for each source of capacity. Boroughs were asked to respond to these capacity portfolios and to discuss with LPAC and in certain cases the Housebuilders Federation any problems that they might have.

CASE STUDY 5
London 1998/99 Study – LPAC – July 1998

LPAC undertook capacity estimates in 1988 and 1994. They are currently undertaking a third study which covers 25 years (1991-2016) looking both back and for ward. It is intended to repeat this on a rolling five yearly basis. The current study has been informed by the other major LPAC studies described in this report (Case Studies 7, 9 and 14). These have been used along with past trends to set out a portfolio of capacity benchmarks for each borough. The boroughs are able to accept or challenge these and to work with LPAC to refine the figures. The study is thus a 'bottom up testing of LPAC's previous top down work'[53].

Methodology: The portfolio of capacity es timates sent to each London Borough included:

- Capacity benchmarks: Benchmarks based on historic trends. This is sensible because London already achieves 85% of housing on brownfield land so LPAC would be happy enough to maintain this figure.
- Large sites: Capacity benchmarks for large sites based upon the Halcrow Fox report (although further work is being commissioned using SRQ techniques to measure this capacity.
- Windfalls: In previous studies windfall assumptions for large sites have underestimated capa city by a factor of four. The portfolio therefore includes a windfall assumptions based upon past trends. Boroughs can challenge this only if they can demonstrate a robust methodology for identifying large sites.
- Small sites: Benchmarks are set for small sites around local centres based on the SRQ work.
- Sites of constrained frontages: Formerly called backlands development, this is considered separately. While it is recognised that this is potentially a very significant source of capacity which boroughs ar e urged to consider, no benchmarks are set.
- Conversions: A range of benchmarks are proposed based upon historic data and research. These cover both the subdivision of residential property a nd conversions from other uses.
- Retail conversions and space over shops: Benchmarks are set based upon the Civic Trust work.
- Empty properties: Doubt is expressed about this since it is beyond the control of planners. However it is suggested that the difference between the vacancy rate and the government's target of 3% is a good benchmark.
- Redevelopment: Boroughs are asked to consider the effect of redevelopment schemes although this could include density reductions as well as increases.

In identifying capacity the study uses four time zones between now and 2016 so th at more difficult sites can be included in a later phase. It also incorporates the concept of core and non-core capacity.

Boroughs were asked to respond to this portfolio by the end of 1998. They could challenge it but only if they were able produce argum ents and evidence that would withstand scrutiny at UPD enquiry. The benchmarks and any challenges to them are being scrutinised by LPAC with each borough and the Housebuilders Federation in selected areas. This stage will also involve an exercise to apply capacity scenarios to the sites identified based upon the parking levels in the SRQ research.

Findings: This study brings together many of the techniques and issues that we discuss in this report. Indeed the process of establishing capacity benchmarks at a strategic level and allowing them to be tested at the local level has many attractions. The situation is easier in London because the historic proportion of housing built on brownfield sites means that LPAC are justified in basing future targets on pa st trends. Because the targets have been achieved in the past they are easier for boroughs and housebuilders to accept. Elsewhere in the country, the proportion of housing on brownfield land is so far below the government target that they cannot form the basis for targets.

In order to assemble the capacity portfolios LPAC have been very active in commissioning urban capacity studies. These have included:

- Offices to other uses – London Research Centre[54]
- Sustainable residential quality: New approaches to urban living – Llewelyn-Davies[55] (case study 14)
- Possible future sources of large housing sites in London - Halcrow Fox Planning[56] (case study 7)
- Dwellings in and over shops – The Civic Trust[57] (case study 9)

CASE STUDY 6
Stroud: Environmental capacity study – Alison Brown – November 1998

Most urban capacity work has been initiated at the regional and county. This study commissioned by Stroud Town Council is therefore an interesting example of the application of capacity methodologies at a local level.

The study was initiated because of concern in Stroud at the allocation of greenfield land around the town for Development. Gloucestershire County Council had initially planned to accommodate household growth through new settlements but because of opposition opted instead to accommodate household growth in existing settlements. In response to this Stroud District Council identified land for 480 new homes 82% of which were on greenfield land and 42% within the Area of Outstanding Natural Beauty. The Town Council objected to this and commissioned the study to challenge the view that this housing could not be accommodated in the urban area.

Methodology: The methodology is similar to the Chester Study (case study 2) in that it seeks to apply the concept of environmental capacity to an urban area. Combined with this is a physical assessment of sites and their capacity to accommodate housing in the town. The methodology involved five stages:

- A socio-economic profile of the town based upon census data and a housing needs survey
- A survey of local people to determine environmental issues and indicators of change. These indicators were incorporated into a matrix to assess sites and their potential for development.
- The identification of potential development sites based upon existing allocations and survey work.
- The analysis of these sites against the aims of sustainability, conservation of natural resources and environmental quality. This included the matrix of locally determined environmental issues.
- The capacity of each site and its likelihood of being brought forward for development was assessed with reference to three development scenarios.

Findings: The study concluded that 190 units could be accommodated on committed housing sites and a further 420 on other urban sites. In principle this meant that there was no need for the District Council to allocate greenfield land around the town.

Conclusions: While an attempt was made to apply the concept of environmental capacity the study concluded that this 'will not give a fixed ceiling to development as there are too many subjective judgements involved'. The environmental issues were however used to assess the impact of developing each site and the study concluded that this is a potentially useful tool.

The study does illustrate that one problem with capacity studies covering small areas is that they become site specific. A significant part of the capacity identified, for example, was on a former industrial site allocated for employment uses. This raises confidentiality problems as well as making it difficult to deal with uncertainty. So, for example, whereas a larger study might estimate potential for x units per year from in vacant buildings – in Stroud the question would immediately arise of which buildings these were. It might then be possible to show that development in this or that building is impossible and therefore to undermine the basis of the capacity assessment. With larger studies it is easier to argue that even if the identified sites are not developed it is likely that others will come forward.

The consultants also recognised that much of the capacity that they identified would not easily be brought forward. They therefore make a number of recommendations to unlock capacity. They conclude that the present system of counting urban sites as part of windfall assumptions and making new allocations on greenfield sites is prejudicing urban development, argue for a sequential test and for the finance and powers to be made available to smaller authorities to bring difficult sites forward.

Of those respondents that had undertaken studies, 24 were North-West authorities which had undertaken work using the Llewelyn-Davies methodology. In addition to this 15 were London boroughs responding to the LPAC 1998/99 study although two of these, Westminster and Brent, had also undertaken independent studies. A further authority was undertaking work as part of the Nottinghamshire study. On the whole these authorities undertaking work as part of wider initiatives were satisfied with the methodology. Only one authority was unhappy with the North West methodology stating that the 'guidelines were totally unrelated to reality' and that they 'set no store by the results which (they) have produced'. In London there were three dissenters from the LPAC methodology, the City which saw it as inappropriate and Bromley and Havering who were unable to devote staff time to the exercise and were therefore happy to accept LPAC's figures.

Thirty-one district respondents had initiated urban capacity assessments, independently of county or regional studies. Unlike the regional and county studies, the majority of these (23) had been done in-house. Of the eight that involved consultants four related to issues likely to be important at appeal or were done in conjunction with other authorities. However four districts had engaged consultants purely to undertake capacity studies for their area. Six of the studies are yet to be completed. However, of the 25 that had been completed, 13 remain unpublished in a form available to the public. In a significant number of cases this is due to issues of confidentiality because of information on individual sites.

Of the 65 district respondents that had contributed to studies undertaken elsewhere, 6 had assisted with the ARUPs Northern Study, 9 with the Baker South-west study and 10 with the Baker Yorkshire and Humberside study. Thirteen authorities also indicated that they were currently working on the Kent or Surrey studies. Virtually all of the districts co-operating with studies referred to studies that we have already mentioned, the only exception being a study in Buckinghamshire.

Of the 66 districts that responded saying that they had not undertaken capacity assessments, 28 gave no reason. Of those that did, 14 indicated that they intended to undertake or commission urban capacity work in the future (often as part of their local plan review). Many of these authorities indicated that they would welcome government guidance on these issues. One authority had tried and given up because they had found measuring capacity to be very difficult. Ten councils had not done studies because they were relying on the work of other authorities while 8 indicated that the issue was not relevant to them. The latter was generally because they were too rural, although in one case it was because they 'knew' that there was no capacity worth looking for. One of the rural authorities expressed the hope that all councils would not be required to devote resources to capacity work that was of no relevance to them.

It is clear from the requirements of the NLUD and from our survey of planning authorities that a huge amount of urban capacity work has taken place across the country. Indeed there is probably very little of England which has not been covered by a study at one of the levels described above. However it is also clear that, despite the volume of work being undertaken, there is little consistency of approach and widely varying quality standards in different parts of the country. It also seems that as much, if not slightly more, effort has been made in northern areas where the

pressure for housing development is less intense. In the following chapters we explore the methodologies used in these urban capacity studies based upon 15 detailed case studies. These studies are listed on Table 7 and are written up as case studies throughout the report. In Chapter 5 we look at the sources of capacity covered by the studies, in Chapter 6 at how data on these sources is collected, in Chapter 7 at the way in which the number of dwellings is estimated and in Chapter 8 at the discounting procedures used to adjust these totals.

TABLE 7
Capacity Studies reviewed as part of the study

Case Study	Page	Study	Date	Area covered	Undertaken by	Client
1	14	Environmental Capacity in West Sussex	1996	West Sussex	West Sussex County Council	In-house
2	15	Environmental capacity: A methodology for Historic Cities	Feb. 1995	Chester	ARUP Economic and Planning and BDP	Chester City Council, English Heritage, EP.
3	20	Study of settlement capacity and regional development options in Yorkshire and Humberside	Jan. 1998	Yorkshire and Humberside Region	Baker Associates	Yorkshire and Humberside Regional Planning Conference
4	22	Kent Urban Capacity Assessment	1998-99	Kent	Land Use Consultants / Entec / District authorities	Kent County Council
5	23	London: 1998/1999 Capacity Study	1999	Greater London	London Boroughs	LPAC
6	24	Stroud: Environmental Capacity Study	Nov. 1998	Stroud Town Council Area	Alison Brown	Stroud Town Council
7	30	Possible future sources of large housing sites in London	July 1998	Greater London	Halcrow Fox	LPAC
8	32	North East Urban Capacity Study	1998	Urban areas of the North East	ARUP Economic and Planning	North of England Assembly
9	35	Dwellings over and in shops in London	July 1998	Greater London	The Civic Trust	LPAC
10	36	Hertfordshire: Dwelling provision through Planned regeneration	Oct. 1995	Hertfordshire	Urban Initiatives and Chestertons	Hertfordshire County Council
11	40	Strategic study of housing potential in the South West	Nov. 1998	South West Region	Baker Associates with UWE	SW Regional Planning Conference
12	42	Exploring urban potential for housing in the North West	1997	North West Government Office Region	Llewelyn-Davies / District planning authorities	North West Regional Association
13	47	Surrey urban capacity study	Feb. 1999	Surrey	District planning authorities	Surrey County Council
14	49	Sustainable residential quality: New approaches to urban living	1998	Greater London	Llewelyn-Davies	LPAC
15	61	Housing capacity in urban areas of the East Midlands	Nov. 1998	East Midlands Region	ENTEC	Regional Planning Forum

5.
Sources of housing capacity

In which we review different sources of housing capacity and the extent to which they are covered in each of our case studies. We look in particular at different forms of previously developed land before exploring other capacity sources such as redevelopment, the development of car parks, the conversion of commercial buildings, space over shops, the subdivision of existing housing, intensification and bringing empty homes back into use.

The first task facing any capacity study is to identify potential sources of additional housing. As we described in Chapter 3, the approach in the past has been to identify larger sites and to make windfall assumptions about the capacity from less easily measurable sources such as small sites and conversions. However windfall trends are a measure of the rate at which the market is taking up potential capacity rather than a measure of capacity itself. Many of the capacity assessments that we have reviewed have therefore sought to measure a wider range of capacity sources in order to improve upon or replace windfall assumptions.

Sources of capacity

The first step in doing this is to know where to look. We have therefore reviewed each of our capacity studies against the different sources of capacity that we have identified in previous research[58]. Table 8 (next page) shows the relative importance of each of these sources of capacity. While these remain very rough figures they are one of the very few attempts that have been made to arrive at capacity estimates at a national level. More recent work has been done by Llewelyn-Davies and the University of Westminster to estimate the capacity from conversions, demolitions and redevelopment[59]. If their annual estimates are converted to the 25 year figures in Table 8 they suggest that our estimate for the conversion of residential property is too high but that we may have underestimated capacity from the conversion of non-residential buildings and intensification. The important aspect to Table 8 is not in any case the total numbers but the proportion under each heading. This suggests that capacity from previously developed land makes up only a third of total capacity. Another third comes from living over the shop and the subdivision of existing housing and 13% from empty properties.

TABLE 8

Relative importance of different sources of housing capacity

	Unconstrained Capacity (000)[1]	Policy target (%)[3]	Constrained Capacity (000)	Percentage contribution (constrained)
Previously developed land	1,344[2]	63%	845	33%
Vacant not previously developed	293	70%	205	8%
Redevelopment	22	100%	22	1%
Car Parks	100	80%	80	3%
Non-residential conversions	100	80%	80	3%
Living over the shop	1,000	40%	400	16%
Subdivision of existing housing	1,900	20%	380	15%
Intensification	280	80%	224	9%
Empty homes	767[4]	42%	325	13%
TOTAL	**5,806**	**44%**	**2,561**	**100%**

Source:
Rudlin, David - Tomorrow a peaceful path to urban reform- URBED and Friends of theEarth - 1998 - (Exhibit 39 Page 43)

1) Capacity estimates are based on a net density assumption of 30 units/ha and take account of gross to net ratios on larger sites. In our original work we also explored the effect of increasing these density assumptions to produce a higher total capacity figure.
2) The brownfield figure is derived by combining the current and projected derelict and vacant land figures from the original work
3) The policy target is a measure of the likely ease with which the unconstrained capacity can be released.
4) The unconstrained empty homes figure includes all of the empty homes as recorded by the Empty Homes agency in 1998 unlike the previous work.

* Figures are rounded so may not add up to the totals.

We have assessed the extent to which each of these categories is covered by our case studies. The results of this analysis are set out on Table 9 which records the capacity sources specifically mentioned by each study. It shows that the most comprehensive exercise is the current LPAC capacity estimate (case study 5) which covers 10 sources of capacity. Next is the North West methodology with 8 sources and the South West and North East studies with 7 sources apiece. Some of the studies do not claim to be comprehensive, however of those that do, six cover less than half of the capacity sources that we have identified. The picture is even starker if we use the percentage contributions to total capacity adjusted from Table 8. As the right hand column shows, the Yorkshire and Humberside, Kent and Stroud studies potentially measure less than 40% of total potential capacity. We should add as a word of caution, that this refers to capacity sources specifically mentioned in each study. It is possible that categories such as car parks are measured under other headings. However it is clear that a number of studies are omitting to even consider a significant part of potential capacity.

The most popular categories are small sites and industrial land both of which are covered by 11 of the 15 studies. Following this the most commonly measured categories are intensification and the subdivision of existing property. The least popular issue is the use of car parks (although it is possible that some of the studies pick up car parks as part of TUA studies. There are also very few studies which look at redevelopment. However the two most significant omissions are living over

the shop and empty homes which are covered by just 4 and 3 studies respectively despite making up almost 30% of potential capacity.

TABLE 9

Sources of capacity considered by the case studies

Case study	Vacant sites					Other sources of capacity							Total issues covered	Estimated % capacity
	Large sites	Small sites	Housing allocations	Industrial allocations	Not previously developed	Redevelopment	Car parks	Non-residential conversions	Living over the shop	Residential subdivisions	Intensification	Empty properties		
1 West Sussex		■							■	■	■		4	47%
2 Chester	Not applicable													
3 Yorkshire and Humberside		■		■	■	■	■				■		6	37%
4 Kent	■	■	■	■				■					5	36%
5 London: 1998/1999 study	■	■	■	■		■		■	■	■	■	■	10	89%
6 Stroud	■	■	■	■				■					5	36%
7 London – Large sites	■			■									2	16%
8 North East Region	■		■	■	■			■		■		■	7	63%
9 London – LOTS									■				1	16%
10 Hertfordshire		■		■				■	■		■		5	42%
11 South West Region		■		■	■	■	■			■	■		7	52%
12 North West Region	■	■		■	■			■		■	■	■	8	72%
13 Surrey	■	■		■						■	■		5	48%
14 London - SRQ		■	■							■	■		4	40%
15 East Midlands		■		■				■		■	■	■	5	43%
Coverage of each issue	7	11	5	11	4	3	2	7	4	8	9	3		

Previously developed land

The largest source of housing capacity and the one that has received most attention due to the government targets is previously developed land. URBED's previous work used derelict and vacant land data to suggest that the national total of previously developed land currently available or likely to become available by 2016 is around 60,000 hectares. There is however a good deal of confusion in the way that previously developed land sites are treated in capacity studies. This is because previously developed land is rarely just that. Some sites will have been identified in land availability studies and allocated for housing, some will be designated as industrial land, some will include buildings and residual uses while other will have been landscaped or will have regenerated naturally and so be considered as natural open space. Some studies such as the North East study assess each

CASE STUDY 7
Possible future sources of large housing sites in London - Halcrow Fox –July 1998

This is one of the suite of LPAC capacity assessments referred to in case study 5. It was prompted by the fact that 52% of permissions in London since 1992 have been on large windfall site sand confined itself to sites larger than 1 hectare (0.5 ha in central London).

Methodology: The study was undertaken in 5 stages:

1. Analysis of housing and industrial land supply and take-up
2. Identification of potential sites using maps, aerial photographs, site visits, a survey of owners and interviews with local authorities, owners and developers.
3. Case studies of 100 sites to explore: suitability for housing and competing uses, physical and policy constraints, owner aspirations, viability and potential capacity.
4. The application of three policy scenarios: maximum employment growth (existing policy), minimal employment growth (job decentralisation) and a balanced approach.
5. The grossing-up of figures to produce capacity estimates for each scenario.

The case studies in stage 3 assessed six issues: residential value, alternative use, physical constraints, contamination, policy constraints and ownership. Each issue was scored from 1 to 5 allowing an analysis of which sites would come forward for development. For example, it was assumed that contaminated sites would be developed only if they had a residential value of more than £1 million/hectare.

Central to the study was a market assessment comparing housing values to the best available use that would get planning permission. Housing values were based upon three models: market-based (the highest value), policy-based (using higher densities) and policy-based but without a 25% social housing requirement.

Findings: The higher value of lower density housing was found to outweigh the extra yield of higher densities. On the market-based model only 6 of the 100 case study sites were ruled out because site values were insufficient to overcome problems. Housing development was assumed on the 51% of viable sites where it produced the highest value yielding 7,380 units at 25 units/ha.

With the policy-based model 60% of sites had insufficient value to overcome physical problems and housing was the most valuable use on only 28% of the sites. This produced 9,700 houses at 55 dwellings/hectare. If however the requirement for 25% social housing was removed this figure rose to 16,500 units at 59 dwellings/hectare.

The amount of land available on large sites was estimated from the Stage 2 survey work. The industrial and commercial sites were subject to the three scenarios in stage 4. In each case it was assumed that 75% of surplus industrial and commercial land would be developed for housing. The market and employment scenarios were then combined into three overall policy scenarios:

A. A market based scenario with densities gradually increasing over time. This was estimated to produce 63,144 dwellings
B. A market based scenario with policies to increase density around public transport nodes - estimated yield 116,266 dwellings.
C. A sustainable development scenario with a balance of employment and high-density housing. This would produce 96,218 dwellings.

Conclusions: There are two particularly significant elements to this scheme; the way in which it identified sites and the way in which capacity and likelihood of development was estimated. The former appears to be the weakest area of the study. Windfall sites, by their very nature, are sites that have not been identified yet the study relies upon surveys to identify sites. The study will have identified more future housing sites than previous studies but almost certainly not all of them. This could make it more difficult to know what windfalls assumptions to use in the future.

The model for assessing capacity and viability is however one of the few techniques to fully consider market issues and the value of competing uses. The most significant finding is that the increased yield from higher densities is cancelled out by the fact that it makes many sites unviable. In very rough terms doubling densities appeared to reduce the number of viable sites by 40% and therefore only increased housing yield by a third.

of these categories separately. This study assumes that all previously developed land will fall into one of these categories and therefore make no direct allowance for previously developed land capacity. In contrast to this the NLUD ignores all of these distinctions and seeks to collect

information on all previously developed land regardless of location, planning allocation, size, or previous use. The methodologies that we have studied take a variety of approaches to this issue as described below.

Large sites: Large sites are something of a blind spot on several of the studies that we have considered. This is because the studies are founded on an assumption that existing land availability studies are essentially sound and that existing allocations for industry and other uses should not be questioned. Several methodologies such as the Hertfordshire and West Sussex specifically exclude large sites. Others such as the Yorkshire and Humberside and South West studies appear to exclude them by default due to the use of Typical Urban Area techniques. The North West and Surrey methodologies identify large sites at an early stage and consider them separately, but again the main thrust is to look at other sources of capacity.

The threshold used to define large sites also varies. The Halcrow Fox study for LPAC used a 1 hectare threshold (0.5ha in Central London) although the LPAC 1998/99 study uses a different definition of sites with a capacity of more than 10 units. Other studies, such as Surrey, use 0.4 hectares (1 acre) which is also the windfall threshold in PPG3.

There are two main ways in which the number of large sites considered for housing can be increased. The first is to improve survey techniques as was done by Halcrow Fox in London in the belief that we will find more large sites if only we look harder. The second is the application of the 'genuinely available' test. The problem with land availability studies is that many sites are ruled out at the outset on the grounds of availability and are therefore not even considered. Some studies, such as Surrey, do little more than apply the genuine availability test a little more loosely. A better approach is that required by the NLUD which considers all sites so that the effect of different policies and market scenarios can be fully tested.

Small sites: The identification of small sites was something that 11 of the 15 case studies sought to do. However, while the NLUD imposes no lower limit on site size, most studies recognise the difficulty of identifying all sites of less that 0.4ha. The identification of small sites also runs risks of double counting since many smaller sites fall into other categories such as intensification. Small sites therefore tend to be identified through sample areas that are examined in detail for a range of opportunities such as gap sites, underused open space, backland development and intensification which can then be grossed up to give estimates for a wider area. These methodologies are described in the following chapter.

Housing allocations: Some studies such as West Sussex concentrate solely on sites over and above existing housing allocations on the basis that they are exploring only the potential to increase existing allocations. There is however the potential to develop existing allocations more intensively as explored by the SRQ report for LPAC and the North East study. It is therefore important to consider existing housing sites in capacity studies.

CASE STUDY 8
North of England Assembly: Urban capacity study - ARUP Economics and Planning –1998

The North East currently has the lowest proportion of housing on previously developed land of any metropolitan area despite low levels of household growth and industrial decline. This study aimed to respond to the challenge of household growth while protecting the countryside, the amenity of existing housing and the supply of land for other uses.

Methodology: This is the only study to be based not on fieldwork but on existing data sources. Eight mutually exclusive sources of capacity were identified. Trends for each resource were analysed and capacity measured based on existing data, local authority knowledge and yardsticks. This capaci ty was also adjusted to take account of policy and market considerations.

Findings: The study found urban capacity of 35,735 units or 55% of projected household growth. This varied from less than 50% in the rural counties to 70% in the metropolitan area s. This was made up of the following results from each of the capacity sources:

Increasing the density of existing housing allocations: A range of net densities were used from 10 d/ha (executive housing) to 25-35 d/ha and 50-80 d/ha in central areas. The se were converted to gross densities and applied to existing housing allocations. This trebled the yield of central sites to 75,400 units and increased yields elsewhere from 20,600 to 27,700. Just 10% of these figures was assumed to be viable – 5,020 dwellings.

Windfalls: Information from local authorities suggested a contribution of 930 units per year from sites less than 1 hectare or 25 dwellings in urban areas (around 15% of new homes). It was assumed that this rate would continue with no increase in densities producing 9,300 dwellings.

Conversions: It was estimated that 8% of the housing stock (70,000 units) had potential for conversion due to its size and age. 45% of this was under-occupied and it was decided that half of this should be retained as sing le dwellings. It assumed that just 10% of the remainder would get planning permission yielding on average three flats per house. This produced 3,200 units.

Vacant office space was used as a proxy for the conversion of commercial and industrial buildings y ielding another 1,750 units. These two figures produced a capacity of just under 5,000 units. This represented an 80% increase on historic rates whereas it was felt that a 40% increase was more reasonable so that the estimate was reduced to 3,850 units.

Vacancies: A reduction of 0.5% in vacancy rates in areas where the rate was more than 2.5% was assumed plus a third of all vacancies on difficult-to-let estates producing 3,850 units.

Urban greenspace: This included landscaping, recreational space and brownfield land. It was suggested that urban areas had too little greenspace so that the capacity from this area was negligible.

Town centres: This included redevelopment but excluded office conversions (counted elsewhere) and dismissed potential from surface car parks. It assumed that 8 ha of land would become available in the two larger cities and 2 to 4 ha in smaller towns. Half of this would be developed producing just 1,885 dwellings.

Future allocations: An estimate was made for sites over 1 ha which would become available and are not currently allocated for housing, industry or greenspace. Assumptions were made from 23ha in the large cities to 6 ha in the minor centres. A third of this was to be developed as housing and a third as mixed-use, half at high densities and half at medium densities producing 5,745 units.

Employment land: The region has 4,740 ha of land allocated for employment and a take-up rate of just 100 ha/year. The study assumes that 2.5% of this land will become available for housing –6,080 units.

Conclusions: While this study is very wide in its in its coverage some of the assumptions made seem very arbitrary. It almost seems that the capacity figures have been discounted until they seem about right. The study is more a prediction o f urban housing development than an assessment of capacity. It may be an accurate prediction (and would fall just short of the 60% target). It does not however show total housing capacity or the potential for improvement. For example experience from other cities suggests that the estimate of just 780 units from commercial conversions in major city centres is a gross underestimate. This may reflect current market conditions but is no reflection of potential capacity.

These concerns do not necessarily unde rmine the approach of categorising capacity sources to avoid double counting and make best use of existing data sources without resorting to expensive survey work.

Industrial Land: The new draft of PPG 3[60] asks that local authorities consider the reallocation of employment land for housing or mixed-use development. Most of the studies consider this issue although a variety of assumptions are used to determine how much land should be reallocated. The Hertfordshire study assumes that half of all vacant industrial sites could be developed for housing,

although this is heavily reduced by discounting later in the methodology. The North East Study looks at industrial land supply and take-up and concludes that just 2.5% of industrial land in the region can be developed for housing. The most sophisticated methodology was used in the LPAC Large Sites study which incorporates three scenarios: maximum, minimum and balanced employment growth. For each scenario the industrial land take-up was estimated and 75% of the surplus land was assumed to be available for housing.

Vacant land not previously developed: The land use change and vacant land data include a category for vacant land which has not previously been developed. This is a significant category accounting for 57% of all the vacant land identified in the 1990 vacant land survey[61] and for 13% of all housing development[62]. It is however difficult to get a clear picture of what this land is. The Ordnance Survey, who are responsible for the land use classification, confirm that it is not land in use for parks, playing-fields and allotments, all of which would not be considered vacant. It is also not rural land within urban areas since this is covered under a separate category. The only study to recognise this land was the North East study that has a category for 'urban greenspace'. This however included landscaping and recreational land and was, in any case, written off as a source of capacity. It is also likely that the studies based upon detailed local areas studies would pick up this category although this is not explicitly stated. It may be that this land is a valued asset but, given its scale and importance as a source of housing land, we would suggest that it requires further investigation.

Other sources of capacity

The development of recycled land is only part of the urban capacity picture as most studies recognise. In Tables 8 and 9 above we identify a range of other sources of capacity which are discussed below:

Redevelopment of existing uses: One source of capacity is the redevelopment of council estates at higher densities. The Hertfordshire study refers to intensification through 'redevelopment' or 'replanning' but this was rejected for residential areas. The only study to make specific reference to residential redevelopment is the LPAC 1998/99 study. This suggests that the impact of redevelopment should be considered and that this could lead to either an increase or a decrease in housing densities. In our previous work[63] we compared the redevelopment of Holly Street in Hackney with that of Hulme in Manchester. The former, like many London housing estates, was built at very high densities and has been redeveloped at slightly lower densities with a slight loss of capacity. In Hulme, by contrast, redevelopment is doubling the housing densities, creating a significant source of capacity. LPAC is therefore right to be cautious in London, but elsewhere redevelopment is generally an opportunity to increase densities.

The NLUD also recognises the potential for redevelopment. As well as including land which is currently in use, it asks authorities to identify 'vacant dwelling zones' where 'possible future consolidation could make a significant contribution to urban capacity'. Vacant dwelling zones are

defined as areas with vacancy rates over 25%. Given the findings of the recent study by Anne Power and Katharine Mumford[64] on the extent of urban abandonment such areas could be quite extensive in certain inner city districts. The data from the NLUD may allow these areas to be included in future capacity assessments although there are clearly issues that need to addressed about housing demand.

The development of car parks: Many vacant sites around town and city centres are used for surface car parking. This often starts as a temporary use but can be so lucrative (especially for cash hungry local authorities) that other uses become commercially unattractive. These car parks are often of a poor quality and blight surrounding areas. Work by Llewelyn-Davies and JMP consultants in the South East[65] has shown that 'there is considerable over provision of parking for all land use types, except B1, and in all areas, even in town centres'. This was rarely covered as a source of capacity in the case studies. Indeed the West Sussex and North East studies dismiss surface parking as a source of capacity. The only study to specifically consider reallocating underused parking areas is the Yorkshire and Humberside study. However other methodologies based upon detailed area surveys are likely to include potential from car parks even where this is not specifically mentioned.

The conversion of commercial buildings: Non-residential conversions are a good example of the unpredictability of capacity assessments. As LPAC points out, vacant offices were not considered in their 1994 study but have since proven a very significant source of capacity. The potential for the conversion of commercial and industrial buildings to housing is covered in just under half of our case studies although it is an area that has proved difficult to estimate. One of the problems is that individual opportunities can be quite large and unusual so that they are difficult to estimate through sampling or the extrapolation of past trends. The East Midlands study, for example, debated how to treat a large vacant office block in one of its Typical Urban Areas. Quite extensive research has been done on commercial to residential conversions in London[66] which has allowed LPAC to make quite sensitive assumptions about capacity. Much less work has been done in the provincial cities[67] and nothing elsewhere. Several studies such as the North West study identify individual buildings and use gross to net ratios and floor area assumptions to estimate their capacity. Others such as the North East and Hertfordshire studies use vacant office data as a proxy to estimate the total potential from non-residential conversions. This however excludes vacant industrial buildings which, in parts of the country where mills are common, have been a significant source of capacity.

Living over the shop: The same is true of the potential capacity above retail premises. The Living Over the Shop (LOTS) Project has estimated in the past that the national potential is around 500,000[68]. In Hertfordshire a yardstick was used which assumed that the potentially available space was equivalent to a third of the retail floor area and that a third of this could be converted or brought back into use. Detailed work by the LOTs project in Stockton on Tees[69] is broadly in line with this yardstick. However as previous work by URBED[70] has shown, if this yardstick is applied

nationally, it produces capacity for 1-1.5 million dwellings. The LPAC study of dwellings over shops illustrates a methodology to provide a better estimate of the potential. Unfortunately it does not include floor areas and so it is not possible to check the Hertfordshire yardstick. However it does identify around 100,000 shops in London with a constrained capacity of 30-40,000 additional dwellings. It also estimates that 60% of the space over shops in London is already in residential use, something which is probably unique to the London property market. This means that there is the potential for approximately 100,000 dwellings over London's 100,000 shops – a yardstick which is very easy to apply elsewhere.

CASE STUDY 9

Dwellings over and in shops in London - Civic Trust - July 1998

Another part of the jigsaw making up London's potential capacity was provided by this Civic Trust study of living over the shop.

Methodology: The initial part of the study was based upon an analysis of existing data. This include the English House Condition Survey, the LOTS database, the Valuation Office Support Application Database (which records the number and area of shops and restaurants along with any residential accommodation), the Traffic Director for London's research on Red Routes and LPAC's own town centre health checks. Some of the local authorities surveyed also used the Council Tax Register to identify accommodation and the study also drew upon the Yellow Pages which includes half of all shops in London.

The LPAC health checks of 202 town centres and the Traffic Director for London's research on Red Routes was used to create a sampling framework to select 10 main centres and 25 neighbourhood centres for detailed work. Each of these of these was followed up with retailer and agent questionnaires and a survey of 2,400 premises to create a typology in terms of physical suitability, ownership and historic/previous use. This was used to classify property into high/medium and low potential to which a series of policy scenarios could be applied.

Findings: The Valuation Office estimates that there are just under 100,000 shops in London while LPAC have identified just over 36,000 in its 202 town centres leaving just under 64,000 in smaller centres and parades. The study estimated that 60% of the space above shops was already in residential use and that 75% of premises have independent access to the upper floors. It was estimated that there is theoretical capacity for 73,000 additional dwellings just over half of them within the town centres. The application of different policy scenarios produces an appoximate constrained capacity of between 30 and 40,000 units.

Conclusions: Living over the shop is a source of urban housing capacity often overlooked or underestimated in other studies. Some such as the Hertfordshire study use rough yardsticks but this study along with the LOTS study of Stockton on Tees helps to substantiate these yardsticks. Having said that London may be atypical, particularly in the 60% of space over shops which is already in residential use.

The subdivision of existing housing: The subdivision of existing housing is something that 8 of the 15 case studies tried to estimate, although most found it difficult. Indeed sensitivity testing undertaken as part of the South West study found that assumptions made by different local authorities could alter estimates by up to 300%. This explained why Dorset was estimating that it had four times more capacity from conversions than the urban areas of Avon. Baker Associates concluded in both the South West and Yorkshire and Humberside studies that a more accurate estimate would be too labour-intensive. Other studies have however attempted to quantify a figure. Llewelyn Davies in research for the Joseph Rowntree Foundation[71] and subsequently in the SRQ

CASE STUDY 10

Hertfordshire: Dwelling provision through planned rege neration – Urban Initiatives, Chestertons – October 1995

This has been a very influential study. It's aim was to assess the potential in Hertfordshire for the intensification of existing housing areas. This was seen as important because declining household size meant that the housing density of many residential areas could be increased without raising the population density.

Methodology: Like other studies the Hertfordshire approach was based upon Typical Urban Areas (TUAs) or what the study called 'Character types'. These included ten residential types, two town centre types and three commercial types. Case study areas were selected for each type and analysed in terms of density, plot size, built form and parking.

Each areas was then studied in detail to identify opportunities for subdivision, infill, redevelopment and replanning. 32 Design exercises were used to estimate the amount of new housing that could be accommodated in each area. The cost of creating this housing was compared to its value leading to conclusion that 17 of the 32 case studies were not viable. Public meetings in the case study areas were used to gauge public reaction.

Each of the TUAs was given an index to represent its potential for viable intensification. Town centre and commer cial areas were assessed using the following assumptions:

- Flats over shops: That a third of space over shops was vacant and that a third of this was suitable for housing.
- Town Centres: That town centres could generate 1.1 additional units per acre (exclud ing the redevelopment of car parks)
- Industrial sites: That 50% of vacant sites were suitable for housing.
- Vacant offices: That 25% of older accommodation and 10% of modern space was suitable for residential conversion.

These figures were grossed up for the whole county by assigning all urban areas to one of the 15 TUAs and applying the indices and yardsticks. This 'unconstrained figure' was then discounted to reflect the likelihood on this capacity being realised:

- Local circumstances: Capacity was reduced by 60% in conservation areas and by similar proportions in areas where there had been a lot of intensification in the past.
- Structure plan period: An estimate was made of the capacity likely to be brought forward in the structure plan period.
- Scenarios: Two scenarios were applied which wrapped up assumptions about site assembly, market conditions and policy delays. A pessimistic scenario saw the capacity further reduced by a third while an optimistic scenario increased it by a third.

Findings: The regional planning guidance requires Hertfordshire to accommodate 60,000 additional households by 2016. The 'unconstrained' capacity uncovered by this study was over half of this figure at 34,693. This was discounted to 11,079 (a reduction of over two thirds) to take account of local circumstances and structure plan period. It was further reduced to 7,522 by the pessimistic scenario and increased to 16,500 by the optimistic scenario. This represents 12-28% of the County's housing requirement.

Conclusio ns: The capacity uncovered by this study is significant – the equivalent, for example to the number of units in the planned extension of Stevenage. However this compares to more than 50% of housing that is already built within urban areas in Hertfordshire. What this study does not tell us is how much of the capacity for intensification is part of this existing 50% and how much is additional to it.

The study does not claim to uncover the total capacity of the county. It excludes previously developed sites a nd, while it is not tied by current local plan allocations, it does not question planning policies such as parking standards.

The discounting procedures also a huge effect on the result. There seems to be a mismatch between the effort that went into measuring unconstrained capacity and the fairly blunt assumptions used to reduce it by two thirds. This means that, while the study no doubt helped to inform the debate in Hertfordshire, it did not really provide clear answers about the total level of capacity and therefore the amount of greenfield land that would have to be released.

and North West studies have suggested measures based upon under-occupied houses with more than seven habitable rooms. The North East study puts figures to these yardsticks suggesting that 8% of the housing has more than 7 habitable rooms and that 45% of this is under-occupied. In

URBED's previous work we suggested that the Office for National Statistics occupation density data could also provide a proxy for under-occupation.

These methods produce enormous unconstrained capacity figures – in the case of the Llewelyn-Davies work these were four times the capacity from previously developed land – much of which can never be realised. It is therefore clear that subdivisions cannot be ignored but the key issue is not the unconstrained capacity but how this is discounted to produce a realistic estimate of potential.

Intensification: Nine of our case studies considered intensification despite this making up a relatively small part of the total capacity picture. There are a number of reasons for this. One is that in areas of high demand such as West Sussex and Hertfordshire the capacity from previously developed land is very limited so that intensification is relatively more important. It may also be the case that certain authorities have found it useful to demonstrate how difficulty and controversial intensification can be as part of a wider argument about housing allocations. Studies like Hertfordshire have focussed on intensification while others, like the London SRQ study, specifically considered backlands development. In addition to this, all of the studies that use Typical Urban Areas to assess capacity are, by default, concentrating on intensification because they are confined to homogeneous built-up areas. A number, like Surrey and Yorkshire and Humberside make specific reference to identifying large gardens and 'land left over after planning'.

The results of this work vary greatly. The East Midlands study concluded that the capacity to intensify existing urban areas was so limited that it was not worth pursuing. In Yorkshire and Humberside and the South West, by contrast, 'estate housing' made up the majority of capacity. The Hertfordshire study gives the most detailed picture of the potential capacity from intensification by combining design exercises to measure physical capacity with a viability assessment. This suggests that there is little or no capacity to intensify private sector estate housing be it 'garden city', inter-war or more recent. Nor is there capacity to intensify older terraced housing areas. The main areas of potential are low density private housing as well as council and new town estates. In the latter an index of 1.12 to 1.3 was suggested in Hertfordshire – that is an increase in the dwelling stock of 12-30%.

Empty homes: The final area of capacity is the number of empty homes that can be brought back into use. Nationally the stock of empty homes is around 750 000 which is 3.7% of the housing stock, the majority of which are in the private sector. The last government set a target that this should be reduced to 3% and the LPAC 1998/99 study suggests that the capacity from empty homes should be based on the extent to which local vacancy rates exceed this target. A similar approach is taken in the North West however here the capacity from empty homes is estimated as the extent, if any, to which local vacancy rates exceed the regional average of 4.4%. As we have mentioned the NLUD also records areas with vacancy rates of over 25% as candidates for redevelopment. There is some concern about the inclusion of empty homes in capacity estimates because they are entirely outside the control of the planning system. However by our estimates they make up around 13% of total capacity and therefore cannot be ignored.

In this chapter we have reviewed the different sources of housing capacity and the extent to which they are covered by different studies. It is clear that an effective capacity study needs to ensure that it covers all of these headings or to ensure that they are covered by other work. It may well be that the capacity from some of these sources is limited in parts of the country or is considered unacceptable. This however is no reason for not looking at all sources of capacity because unless information is collected it is impossible to make these judgements.

6.

Urban housing capacity methodologies

In which we assess the main methodologies employed by urban capacity assessments. We look first at the use of Typical Urban Areas (TUAs) before describing studies that target efforts at certain priority areas and describing other methods such as surveys and the use of existing data.

In the last chapter we described the different sources of housing capacity. The next task facing any capacity study is to quantify each of these sources. This is no easy task since urban areas are large, complex and constantly changing. It is therefore rare for studies to try to measure directly all of the capacity within their area, the exceptions being small studies such as Stroud and Chester. It also appears that the Kent study is aiming for total coverage by linking data collection to the NLUD although it is not clear how detailed this will be. Most studies have tried to reduce the amount of work involved by using Typical Urban Areas, Priority areas or using sampling and existing data. In this chapter we describe each of these methodologies.

TABLE 10

Techniques used to measure capacity

Case study		Typical Urban Areas	Priority Areas	Total coverage	Surveys	Existing data
1	West Sussex	■				
2	Chester			■		
3	Yorkshire and Humberside	■				
4	Kent			■		
5	London: 1998/1999 study					■
6	Stroud			■		
7	London – Large sites				■	
8	North East Region					■
9	London – LOTS				■	
10	Hertfordshire	■				
11	South West Region	■				
12	North West Region		■			
13	Surrey		■			
14	London – SRQ		■			
15	East Midlands	■	■			
	Total	5	4	3	2	2

Typical Urban Areas

The most popular technique is the use of Typical Urban Areas or TUAs as used by 5 of our 15 case studies. The principle of the TUA technique is that the urban area in question can be categorised into a range of different types. Case study areas are selected to represent each type that are examined in detail to measure different sources of capacity. This information informs assumptions about the average capacity across all urban areas of that type. These assumptions can be expressed as an additional number of units per hectare or alternatively as a dwelling index – the extent to which the number of dwellings can be increased. It is then relatively simple to divide the whole urban area into TUAs and to use the yields or indexes to gross up the capacity estimates.

While this technique is common to 5 of our case studies the details vary greatly. TUA types are generally based on a combination of the age of the area, dwelling type, and density. Separate TUAs are identified for commercial areas, town centres etc… West Sussex, for example, classified all urban areas by age using old maps, separated out town centres and then divided each age band into different densities and forms to create 23 types of TUA. As Table 11 illustrates the parameters for selecting and sampling TUAs vary greatly from area to area ranging from just 10 TUAs in the East Midlands to 35 in the South West. A larger number of TUAs allows greater sensitivity and means that one-off opportunities such as large sites can be treated as separate TUAs. Against this must be set the additional work involved and the fact that in both the South West and Yorkshire and Humberside studies more than half of the urban area was in just one TUA – Estate Housing.

TABLE 11
TUA sampling parameters

Case study		TUAs							
		Residential	Industrial/commercial	Town Centre	Mixed use	Vacant	Other uses	**Total**	Number of case studies
1	West Sussex	19	-	[*1]-	4	-	-	**23**	70
3	Yorkshire and Humberside	9	5	-	7	3	13	**32**	[*2]53
10	Hertfordshire	10	3	2	-	-	-	**15**	32
11	South West Region	9	5	-	5	3	13	**35**	[*2]47
15	East Midlands	4	2	3	1	-	-	**10**	[*3]13

1 Included in the mixed-use categories
2 In both of these cases the studies related just to the residential and mixed-use areas
3 These were sample case studies as a model for others undertaken by local authorities

Typical Urban Area methodologies have a number of drawbacks. They firstly rest upon an over-simplistic view that urban areas have similar characteristics and that data derived from one area is applicable to another. They generally deal with complexity by increasing the number of

TUAs and case studies although this can generate a huge amount of work which may not be reflected in the increased accuracy of the results. Linked to this is the problem that TUAs are not very good at dealing with the unusual. How does one deal with a source of capacity which is not found in every TUA but which is not big enough to be a TUA in it own right? It is also possible that TUA techniques are looking in the wrong place. As the London SRQ report (case study 14) suggests the majority of capacity is found not in homogeneous urban areas but in the transitional or shatter zones between TUAs. Looking for urban capacity through TUAs is therefore a bit like looking for weeds on a path by searching only the flagstones. They may cover the majority of the surface area but it is the cracks in-between the TUAs where the capacity is to be found.

CASE STUDY 11

South West Regional Planning Conference: Strategic study of urban housing potential – Baker Associates with UWE – November 1998

This is the second of two major studies by Baker Associates and uses a similar methodology to the Yorkshire and Humberside study. The study was commissioned by the regional planning conference because of dissatisfaction with a previous study undertaken in 1994. This had asked districts to estimate the capacity of settlements over 10 000 and had been so riddled with inconsistencies that the information was regarded as untrustworthy.

An example of this is the treatment of conversions where Dorset estimated potential almost four times greater than the urban areas of Avon. Some authorities assumed that the numbers of conversions were falling while others that it was rising and some based estimates on planning approvals while others used completions. Sensitivity testing showed that these different assumptions made a difference of up to 300% in estimates. Despite all of this the Baker Study concluded that a better estimate of conversions was too difficult and labour intensive so that they ended up relying upon the previous study.

Methodology: The methodology was similar to that used in Yorkshire and involved the following stages:

10. The identification of 35 typical urban area types (TUAs) including 9 residential types, 5 mixed-use, 5 employment, 7 other uses, 3 community and 3 vacant and 3 others.
11. The allocation of the urban areas of the region into one of these TUAs.
12. 47 case studies to assess capacity and to categorise sites into a) easy, b) medium and c) difficult.
13. The application of two density scenarios: a) 35 houses/ha (low), b) 50 house/ha (high). The implications of increasing this to 60h/ha was explored and found to add 10% to capacity.
14. A market analysis based upon a categorisation of the region into three levels of demand A, B and C and two take-up scenarios - High and Low. These were combined in a matrix to adjust capacity so that in A/High areas 100% of capacity was used whereas in C/Low areas only 10% was used.

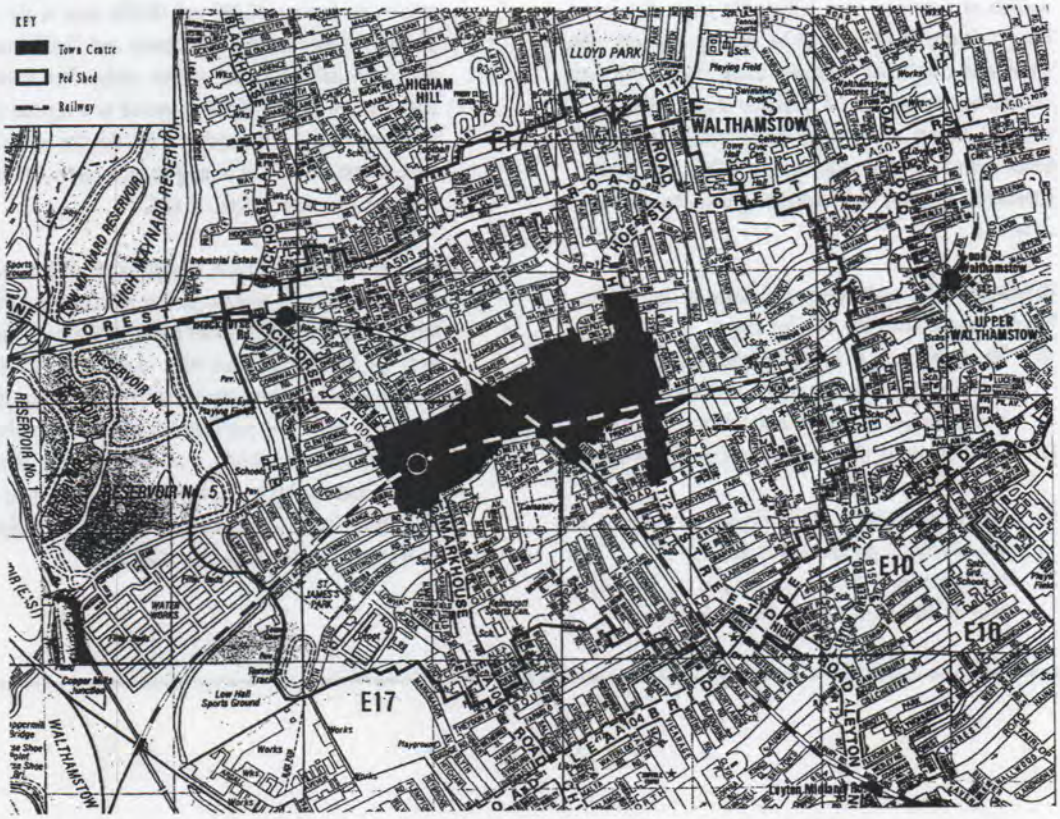
Findings: Like the Yorkshire study the majority of land 51% fell into just one TUA – Estate housing. The study found capacity for between 70,000 and 103,800 units in the region plus 82,000 from existing commitments and 12,420 from conversions (taken from the previous study). This produced a total capacity of 165-199,000 compared to a regional allocation of around 450,000. The conclusion was that the region could accommodate 45-50% of housing in urban areas but would not reach the government target of 60%.

Conclusion: This is a typical example of the TUA methodology and has many of its weaknesses. This is illustrated by the fact that 53% of the capacity found comes from existing housing areas and yet we know from other studies (e.g. East Midlands) that this is not the most significant source of supply. Most notably the study does not even consider former industrial land. The use of density yardsticks is an interesting part of the study – firstly because they are somewhat higher than those used in other studies and also because they avoid questions about local planning policies such as parking standards.

Priority areas

The second methodology for identifying capacity is similar in many ways to the TUA technique but addresses some of its weaknesses. Rather than covering the whole urban area this technique concentrates the search on the areas of greatest potential. Four of our case studies incorporate elements of a priority area approach. We have included the East Midlands study here because while it uses TUAs these are used to prioritise efforts on areas of greatest potential. The best examples of the priority area technique are the two Llewelyn-Davies studies Sustainable Residential Quality (SRQ) in London and the North West and the Surrey study which appears to be modelled on them. The SRQ technique has also been tested in the South East on case study areas in Reading, Southampton and Maidstone[72] with the conclusion that it is applicable outside London.

Two types of area are targeted by priority area studies: places where capacity is likely to be found and places where it is desirable to develop housing. The Surrey study, for example, excludes all large housing developments built since 1971 along with conservation areas on the basis that they are unlikely to yield capacity worth looking for. The North West study similarly excludes all homogeneous housing and employment areas from consideration except for the identification of one-off opportunities. The North West study then identifies what it calls Interface zones (the cracks between the homogeneous urban areas). These include transitional areas between different uses, mixed-use districts and areas of decline. A similar exercise was done as part of the SRQ study that found that 60% of all capacity was in these interface zones despite the fact that they covered only 15% of the land area.



Source: Llewelyn-Davies – An example of a Ped-shed from the SRQ study

Areas can also be prioritised due to accessibility on the basis that it is sensible to concentrate the search for capacity in locations within easy walking distance of local centres and public transport. Housing in these areas will reinforce the local centres, create less additional traffic and can also be built at higher densities by reducing car parking. Each of these studies therefore prioritises catchment areas around local centres – what the SRQ study calls 'Ped-sheds'. This

CASE STUDY 12

Exploring Urban potential for housing: North West - Llewelyn-Davies – North West Regional Association 1997

This has become one of the most influential capacity methodologies and has been widely used by local authorities elsewhere. It was developed for as a manual planning authorities in the North West to assess the capacity of their urban areas on a consistent basis.

Methodology: The manual takes authorities through a series of stages:

1. Identification of the boundary of each urban area and the subtraction and sites (like parks) not suitable for housing.
2. The division of the urban area into 4 types: town or city centre, housing area, employment area and interface zone. The latter are the most important and include transitional zones between different uses, mixed-use districts and declining areas.
3. The identification of one-off development opportunities in the residential and employment areas.
4. The definition of 'Focus locations' - places which are well served by public transport such as town and city centres.
5. The use of three scenarios to guide the selection of sites and the way in which they are assessed:
   Scenario 1: Including only sites currently acceptable for housing and mixed-use development assuming current land allocation and policy standards.
   Scenario 2: The same as Scenario 1 except that planning standards are relaxed and densities increased in focus locations.
   Scenario 3: Including all sites in the focus locations whether or not they are allocated for housing, assumes a proactive approach to issues like site assembly along with relaxed planning standards and higher densities.
6. A survey of the interface zones and town centres to identify housing sites for classification according to the three scenarios.
7. Estimates of the capacity of each site using a series of design exercises covering different site configurations and scenarios.
8. Rules of thumb for the conversion of commercial buildings.
9. The assessment of intensification using six TUAs and a series of design exercises to generate a yardstick for the housing capacity per hectare. This yardstick is adjusted depending on the policy scenario and local circumstances.
10. An assessment of conversions based on the number of properties with more than seven habitable rooms and two or less occupants. The capacity estimate is based on design exercises or previous planning applications.
11. An assessment of empty properties based on districts with vacancy rates higher than the regional average of 4.4%.

The stages up until this point produce an unconstrained housing capacity. The next stage is to qualify this capacity depending upon the policy context and market conditions. The policy context is assessed using the policy scenarios. However rather than being used to discount capacity, these are used to illustrate to policy-makers the implications of different decisions. The difference between Scenarios 1 and 2 illustrates the impact of policies, for example, on parking standards, while Scenario 3 shows what might be possible, for example, through compulsory purchase powers.

Sites are graded according to market conditions into; those attractive to the market; those likely to come forward with a little help and those unlikely ever to be developed. This allows an assessment of market conditions and the impact of different interventions.

Conclusions: The results of our survey suggest that most local authorities in the North West have worked their way through this methodology and are starting to produce results. There is an attractive logic to the methodology which local authorities understand and which appeals to the way that local planning officers work. However it is complex and involves a great deal of work. It might be questioned whether this is proportionate to the accuracy of the results particularly in parts of the North West where there is a surfeit rather than a scarcity of vacant land.

prioritisation of areas allows the search for capacity to be focused. So, for example, the Surrey methodology allows districts to ignore recent large housing developments and conservation areas but requires them to survey all 'ped-sheds'. Similarly the North West methodology requires only a survey of interface zones and town or city centres.

These priority area techniques are an important improvement on TUA methodologies. However total coverage of target areas at the regional level is a time-consuming and expensive business. The SRQ methodology therefore extrapolates from a series of case study 'ped-sheds' an estimate for all local centres in London. While the extrapolation technique is quite sophisticated, like the TUA methodology, it relies on the assumptions that local centres share similar characteristics. The alternative used in the North West and Surrey is to get local authorities to do the work. This assumes that local authorities support the idea of the study and want to find additional capacity. Yet it is often the authorities with the greatest pressures for development who are least enthusiastic about finding urban capacity. Clearly there will be very little consistency between the findings of a study which has been done enthusiastically and one done grudgingly.

Other techniques

Other techniques used to assess capacity include sampling and the use of existing data. The former tend to be used by studies which have explored specific sources of capacity, such as the LPAC studies on large sites and living-over-the-shop. Both of these studies involve detailed surveys of a representative sample of sites and properties. The problem in both cases was to establish a comprehensive data set from which the sample could be made. As the case studies show, this made up a significant part of each study. Other than this they used well established research techniques.

The alternative is to use existing data without original survey work. This is dismissed by many of the studies as likely to miss the much of the capacity. It is however clear from URBED's previous work[73] and from the North East and LPAC 1999 studies that significant and reliable data sources do exist on most forms of capacity. It is true that there can be dangers in using data on past trends, for example on conversions or windfalls, because they measure the current performance of the market rather than the scope to improve this performance. In London however where the aim is to maintain current performance past trends can be a useful tool. There can also be dangers in using data collected by local authorities because of inconsistencies and the potential influence of unstated value judgements. However other techniques are not immune from these problems. The main study to rely on existing data was the North East study where the problem lie not with the data used but with the discounting procedures.

It is therefore possible that the use of existing data could be a cost-effective alternative to original survey work in capacity studies. Regional data exists on land allocations for different uses and, with the completion of the NLUD, on vacant land. In addition to this there is reliable data from the Office for National Statistics, the English House Condition Survey, the Valuation Office, and various national and regional research projects which can provide an insight into many capacity sources. It is therefore sensible for authorities at look at the data already available before

committing themselves to expensive additional survey work which may do little to further clarify the situation.

In this chapter we have reviewed the main methodologies used to quantify urban housing capacity. All have strengths and weaknesses that make them appropriate for the measurement of some forms of capacity but not for others. There are particular problems, we believe, with Typical Urban Area techniques when they are used to measure general urban capacity. TUAs focus attention on the wrong areas, oversimplify the complexity of towns and cities and are only really suited to the measurement of the intensification potential as in Hertfordshire. Priority area techniques are more effective at measuring capacity sources such as vacant land and buildings, car parks and redevelopment because they concentrate the search on the atypical urban areas where capacity is most likely to be found. However the detailed survey work involved in TUA or Priority Areas techniques may not be the most cost effective approach in cases where good information exists. This is true of under-occupied housing (from which estimates of conversions can be made), living over the shop and empty homes. With these sources of capacity it is likely that the quality of existing data will be comparable to or better than that which can be collected through survey work. The starting point for capacity assessments should be to use existing data where possible and to commission appropriate survey work only where there are gaps in the data or a need to focus on certain areas.

7.
Assessing housing yields

In which we look at the main methods for assessing how much housing can be accommodated in each of the identified sources of capacity. We look first at the use of density guidelines and design studies to assess the capacity of vacant land before outlining yardsticks used in the assessment of other forms of capacity.

Having surveyed the area and measured the opportunities for new housing the next stage is to assess the number of units which can be accommodated on each of the sites and in each of the buildings identified. Several of our case studies are quite vague about how this is done. West Sussex, Surrey, Kent, and the East Midlands do not make specific mention of density guidelines but suggest that the capacity of each site be judged individually. In some cases, such as Surrey, it is suggested that local planners look at recent planning applications to assess site capacity. This is a concern because urban capacity studies should be about more than just identifying more housing land. They must also explore the potential to develop these sites more efficiently. Basing capacity estimates on current development standards is unlikely to do this and it is important to at least explore the implications of increasing densities. Those studies which have explored the potential to increase densities have used one of two methods; density guidelines and a design based approach. We deal with each in turn below.

Density guidelines

Density guidelines were used by four studies – The London large sites study, the South West, Yorkshire and Humberside and the North East. The London study used two density scenarios; a market based scenario of 25 dwellings/hectare and a policy-based scenario of 55 d/ha. These were part of a wider viability assessment since market testing was done on the two density options as described in the next chapter. In the South West the two density levels used were 35 and 50 d/ha. This study also found that increasing densities to 60 d/ha increased the number of houses by 10%. The Yorkshire and Humberside study used more flexible guidelines. These were not expressed as figures but as a marginal and a radical increase in current densities, which presumably varied across the region. The only other study to use densities was the North East study which explored the potential to increase the density of existing housing allocations. It used densities of 10 d/ha for 'executive housing', 50-80d/ha for town centres and 25-35 d/ha for the rest of the district. These studies generally agree on a lower density limit of 25-35 d/ha and a higher limit of 50-60d/ha. The

lower density equates to the classic garden city density of 12 units to the acre. The higher density is also well accepted as a typical urban density that would include a mixture of terraced homes and flats. As Table 13 illustrates even the urban density is easily achievable with development forms acceptable to the market. Indeed when assessing central housing sites it may be possible to substantially increase these densities to as much as 100-120 d/ha. These higher densities are equivalent to highly desirable areas like Islington or alternatively could be achieved with well designed apartments as in Manchester city centre.

TABLE 12
The Density Gradient

Area	Units /hectare	Persons /hectare	Source
Low density detached – Hertfordshire	5	20	Urban Initiatives
Average net density Los Angeles	15	60	Newman and Kenworthy
Milton Keynes average 1990	17	68	Sherlock
Average density of new development in UK 1981-91	22	88	Bibby and Shepherd
Minimum density for a bus service	25	100	Local Government Management Board Sustainable Settlements Guide
Private sector 1960s/70s – Hertfordshire	25	100	Urban Initiatives
Inter-war estate – Hertfordshire	30	120	Urban Initiatives
Raymond Unwin 1912	30	120	Nothing gained by overcrowding
Tudor Walters 1919	30	120	Local Government Board's Manual on the preparation of state-aided housing schemes
Private sector 1980s/90s – Hertfordshire	30	120	Urban Initiatives
Hulme - Manchester 1970s	37	148	Hulme guide to development
Average net density London	42	168	Newman and Kenworthy
Ebenezer Howard - Garden city 1898	45	180	Tomorrow: A peaceful path to real reform
Minimum density for a tram service	60	240	Local Government Management Board Sustainable Settlements Guide
Abercrombie – Low	62	247	Greater London Plan 1944
RIBA	62	247	Homes for the future group
New town high density low rise – Hertfordshire	64	256	Urban Initiatives
Sustainable Urban	69	275	Friends of the Earth
Hulme - Manchester Planned	80	320	Hulme guide to development
Victorian/Edwardian Terraces – Hertfordshire	80	320	Urban Initiatives
Abercrombie – Medium	84	336	Greater London Plan 1944
Central accessible urban	93	370	Friends of the Earth
Holly Street - London 1990s	94	376	Levitt Bernstien Architects
Holly Street - London 1970s	104	416	Levitt Bernstien Architects
Abercrombie – High	124	494	Greater London Plan 1944
Sustainable urban neighbourhood (max)	124	494	URBED
Hulme - Manchester 1930s	150	600	Hulme guide to development
Average net density Islington – 1965	185	740	Milner-Holland
Singapore planned densities 1970s	250	1,000	Scoffham and Vale
Kowloon actual	1,250	5,000	Scoffham and Vale

Source URBED

1. The grey boxes show the source figure from which the other has been calculated
2. An average dwelling size of 4 bed spaces bs been assumed throughout this table to calculate persons per hectare. This is likely to be considerably higher than occupancy but is how persons/hectare is generally measured
3. As far as possible these figures refer to gross neighbourhood densities.

Gross and net densities: As the recent report *The use of density in Urban Planning*[74] illustrates care must be taken in the application of density yardsticks. It is not just a case of adding up the total amount of vacant land and multiplying it by the density yardstick. The density that a site can be developed at will vary depending on its size, configuration and the surrounding area. So, for example, a small site with a street frontage can be developed entirely for housing whereas on a larger site provision needs to be made for roads, open space and possibly facilities such as schools. The report on density in the planning system identifies five levels of density from 'town or district density' through 'neighbourhood' and 'gross density' to 'net developable site densities'. None of our case studies specify which density they are using although it seems reasonable to assume that they are net densities. Net densities relate only to the site on which the housing is being built and

CASE STUDY 13
Surrey: Urban Capacity study – Surrey County Council – February 1999

Surrey County Council have been working for 12 months with the districts to undertake an urban capacity study of the county. The results are not yet available but the methodology seeks to address some of the weaknesses of other studi es. The aim of the study is 'to provide a comprehensive, honest and unconstrained assessment of the capacity of Surrey's urban areas'.

Methodology:
Defining the urban area: The urban area is defined on maps excluding areas like nature reserves.
Classif ying the urban area: The urban area is classified into five types by dwelling density. Conservation areas, other policy areas and large housing developments built 1971 -1991 are also identified. 800m catchments are plotted around town centres and sites over 0.4ha are identified from aerial photographs and categorised by the NLUD procedure.
Calculating the 1998 dwelling stock: Existing housing, recent completions and current commitments are used to create a 1998 baseline data set.
Assessing capacity: Capacity is based on two scenarios; 1) assumes that current policies are maintained and 2) tests the consequences of selective relaxation of policies. Capacity is identified using large scale plans onto which all of this information is plotted. Sites less than 0. 4ha are identified based upon guidelines which include looking for sites similar to those which have recently been developed, have had planning applications made or refused, are in less than four ownerships, have a street frontage, or have potential for re development.

All town centre catchments and policy areas are surveyed in this way. Districts were however able do a 50% sample of the remaining residential areas (excluding large housing developments since 1971). Districts were also asked to provide an estimate of how much capacity could be increased with Scenario 2 along with a commentary on the policy implications and 'institutional and marketing constraints'. The capacity of large sites was also identified by categorising them by their prospects for de velopment (high, low and no chance). For Scenario 1 only the 'high' chance sites were considered while Scenario 2 includes the 'low' chance sites. Capacity estimates were based on densities achieved in similar schemes elsewhere which were increased for the large Scenario 2 sites to 35dw/ha on rural sites and 50dw/ha on urban sites.

Conclusions: While the methodology appears onerous the districts appear to have had few problems using it and three have actually surveyed the whole of their urban area. The st udy set itself a number of objectives: To be consistent and county - wide, to be based upon original site survey work and not to be constrained by policy. While these objectives are achieved in the identification of sites it is less clear how site capacity i s estimated. If as the methodology suggests, capacity is based upon similar recently developed sites, the views of planners, and recent planning consents, it is difficult to see how they can test current policies. This is left to a written commentary by individual officers which will be impossible to quantify and may undermine the aim of a dopting a consistent approach.

are measured up to either the site boundary or the center line of the street if there is a road frontage. Gross densities, by contrast, relate to the whole site including open space and other uses. URBED has explored the difference between net densities and gross neighbourhood densities

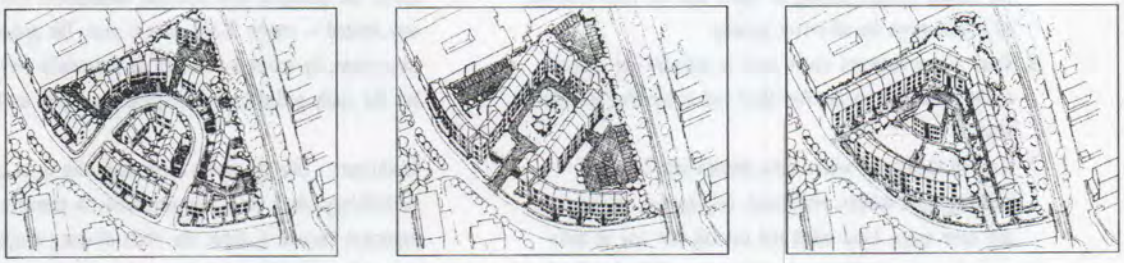
through the Sustainable Urban Neighbourhood Initiative[75]. This has shown that gross densities can be as little as 45% of net densities across a mixed-use area including neighbourhood facilities.

In URBED's work for Friends of the Earth a rough yardstick was used which assumed that half of the identified vacant land would be in small sites and could be developed at net densities. The remainder, it was assumed, would be larger sites where gross densities would apply. We assumed gross densities to be half of net densities. However where possible it is preferable to apply density yardsticks on a site by site basis. One approach would be to simply vary the density depending on the size of the site. However a better approach is to use a gross to net ratio as in the North East study. So for example, a small site (up to 0.4ha) would have a 100% ratio, a medium site (up to 2 ha) where roads and local services would be needed would have a 75% ratio while a large site where other facilities such as a school or park were needed would have a 50% ratio. Density guidelines would thus be applied by multiplying the site area by the gross to net ratio before applying net densities.

Design led approaches

The alternative to the intricacies of density guidelines is the adoption of a design led approach as used in three of our case studies - the Hertfordshire study and the two Llewelyn-Davies studies in London (SRQ) and the North West. In these studies design work is undertaken for potential housing sites to assess the amount of housing that can be accommodated.

In the Llewelyn-Davies studies typical sites were selected and subjected to design exercises. In both cases the design exercise were based upon three scenarios although these were slightly different in the two studies. The first scenario assumed current policies, the second assumed a relaxation in these policies and the third a proactive approach to developing the site. These scenarios were used for site selection but also guided the design exercises. The critical issue in the London study was parking, so that Scenario 1 assumed current parking standards, Scenario 2 reduced this to 100% and Scenario 3 in highly accessible locations removed parking altogether (see illustration). The study found that parking had a profound influence on potential densities to the extent that Scenario 2 increased densities by 50% and Scenario 3 doubled them.



Source Llewelyn-Davies - Design scenarios from the London SRQ study

It is clearly not possible to undertake designs such as this to assess the capacity of every site. Instead the Llewelyn-Davies studies developed a tool-kit of designs for typical site configurations. The appropriate design could then be selected to estimate and illustrate the potential of any

particular site. In the North West this was developed in the form of a manual for use by local authorities. The SRQ study also used these design exercises to generate a very rough yardstick to assess existing housing sites. This assumed that their capacity could be increased by 50% by reducing the parking requirements to one space per unit.

CASE STUDY 14
Sustainable Residential Quality: New approaches to urban living - Llewelyn-Davies –1998

One of the LPAC capacity studies which sought to identify capacity within easy walking distance of local centres in London. In addition to this the study looked at: existing allocations, backland development and the subdivision of existing housing.

Methodology: The study used a similar methodology to the North West Study (case study 12). However while the NW Study developed a methodology for use by local authorit ies, this study sought to produce an estimate for London and was therefore based upon case studies. The methodology for the study involved the following stages:

1. Four case study areas were selected: Two metropolitan centres - Bromley and Hounslow, one majo r centre - Walthamstow and one district centre Mare Street in Hackney.
2. The definition of a 'Ped Shed', an 800m catchment area measured from the edge of each centre.
3. A detailed study of each Ped Shed using 1:2500 maps to identify development opportunities (excluding large sites, living over the shop and office conversions since they were covered in other studies. The sites were identified without reference to planning allocations, development proposals or constraints.
4. 27 of the sites identified were selecte d for design exercises. These were intended to cover a range of circumstances and to provide examples of how problems could be solved.
5. For each site three design exercises were undertaken. The first applied existing planning policies and parking standard s. The second reduced parking to 100% and the third removed all requirements for off-street parking.
6. These design exercises where used to estimate the capacity of the other sites in the Ped Shed and of the Ped Shed as a whole.
7. The Ped Shed areas where the n divided into land uses including town centres, residential, employment, institutional, and open space. Land which did not fall into any of these categories was classified as interface zones. This classification was done to enable the findings to be appli ed to other town centres.
8. These land use areas were the used to analyse and produce capacity estimates for six further case study centres.
9. These together with the original four case study areas were then used to provide an estimate for all centres in Lon don based upon their size and pattern of land use.

Capacity was also estimated for small sites outside the Ped Sheds based upon the London Development Monitoring System. The numbers of houses on each site was factored up by 50% to represent the difference between options 1 and 2. Design studies were used to assess the potential for backland development and yardsticks to estimate potential from conversions.

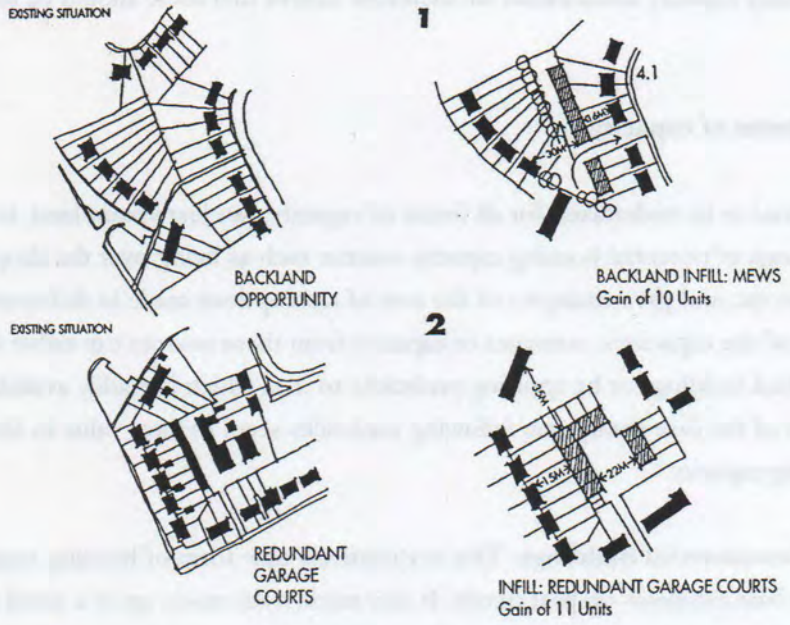
Findings: The study found that 60% of the sites identified were in the interface zones. This was therefore a more significant predictor of capacity than the size of the centre. The design exercise also showed that the capacity increased by 50% with option 2 and doubled with option 3. What is more it was suggested that the design solutions and scale of options 2 and 3 were more appropriate to the character of the surrounding areas. More significantly and in direct contradiction to the Halcrow Fox study (case study 7) Llewelyn-Davies found that Option two increased site values by 91%, and Option 3 by 164%.

The tudy found capacity in London for 52,000 homes under Option 1, 77,000 under Option 2, and 106,000 under Option 3. In addition to this it was estimated that there was potential to increase the yield of small sites outside the Ped sheds by 2,300. The potential from backland development was felt to be very limited – maybe 2-300 units a year. The potential from conversions, by contrast was seen as potentially very significant but the study pulled back from putting a figure on this.

Conclusions: Like the North West study this is an appealing methodology which has many attractions to planners. It is important because it shows the effect of using design studies rather than yardsticks to estimate the capacity of sites and the enormous impact of plann ing and parking policies.

It is significant that the higher densities in this study were judged to produce more site value whereas the opposite was true of the Halcrow Fox study of larger sites in London. This illustrates the subjective nature of many suc h assumptions and the danger of using them as a central part of the methodology.

The design-led approach was also used by Urban Initiatives in Hertfordshire to explore the potential for intensification. For each of the Typical Urban Areas case study sites were selected and subjected to design exercises as illustrated below. These allowed an assessment of the potential for accommodating additional housing. However rather than being used as a tool kit, the intensification designs were used to assess an average number of additional units which could then be applied to similar areas.



Source Urban Initiatives- Design scenarios for intensification from the Hertfordshire study

The design-led approach has a number of advantages. First it allows a much more realistic assessment to be made of a site's development potential. In particular it allows densities to be increased by showing how these can be accommodated while producing attractive housing in keeping with the character of the surrounding area (which the studies illustrated with axonometric sketches). Without these designs there is a danger that talk of higher densities conjures up images of town cramming and overcrowding particularly amongst local politicians. Indeed the SRQ study concluded that the higher density solutions were both a more appropriate response to site conditions and local character as well as being more attractive to the market. It is, in our view, significant that the opposite conclusions were drawn by the studies that used density guidelines.

The design-led approach also has the advantage of allowing the implications of different policies such as parking standards to be explored. It is often hard, even for professionals, to visualise the effect of changes such as an increase in densities or a reduction in parking. This can make it difficult to weigh up different options. A design led approach lays bare these implications and allows more informed decisions to be made. Set against this is the time and effort that can be involved in undertaking a design-led study. However once the toolkit has been created it can be used time and time again. Indeed a number of authorities from across the country who responded to our survey admitted to using the North West toolkit in their own capacity studies.

It is clearly not possible to undertake design exercises on all potential housing sites. However we do believe that a design-led approach has a valuable role to play in informing judgements about the housing capacity of sites. This is particularly true of small sites near to local centres where density yardsticks would produce a very small number of units. A design- led approach also allows an informed discussion to take place about the potential to increase densities and about the policy implications of doing this. While it is inevitable that density yardsticks will need to be used in many capacity assessments we therefore believe that these should be informed by design exercises.

Estimating other forms of capacity

Capacity estimates need to be undertaken for all forms of capacity, not just vacant land. In Chapter 5 we reviewed the range of potential housing capacity sources such as living over the shop, the subdivision of houses etc. and gave examples of the sort of assumptions made in different studies. Like the assessment of site capacities, estimates of capacity from these sources can either be based on a study of individual buildings or by applying yardsticks to data which is readily available. Based upon our assessment of the case studies the following yardsticks seem to have value in allowing an assessment of housing capacity.

The conversion of commercial buildings: This is a relatively new form of housing supply so it is not appropriate to base estimates on past trends. It also tends to be made up of a small number of relatively large developments so that it is not well suited to TUA methodologies. It is possible to base estimates on vacant office data provided that recent completions and Grade A office space is not counted. In industrial cities it is also important to also consider industrial buildings such as mills. In all but the largest cities it is probably most effective for local authorities to judge capacity by assessing buildings individually. The housing yield of commercial buildings is assessed by assuming an 80% gross to net ratio (60% in difficult or deep plan buildings). The remaining floor area should then be divided by 50-60m^2 for one-bed flats or 65-75m^2 for two-bed flats.

Living over the shop: Unlike commercial conversions, living over the shop schemes are small and the potential capacity is much more difficult to measure on a site by site basis. It is therefore sensible to use yardsticks of which there are two which seem to have value. The Hertfordshire yardstick assumes that a third of the retail floor area is suitable for housing and that a third of this will be developed. The same yardsticks as suggested above for commercial conversions can then be used to convert this floor area into a number of flats. This has the advantage that local authorities have retail floor area data and so can do the calculation very quickly. It is however important to exclude retail parks and modern shopping centres from these calculations but to ensure that local shopping parades outside town centres are included.

An alternative approach would be a yardstick based on the Civic Trust London study. This would assume a potential capacity of roughly one residential unit for every shop less the number of existing units over shops (from the English House Condition Survey). These yardsticks produce

figures which are considerably higher than past estimates of potential from living over the shop however they appear to be backed up by studies such as that undertaken in Stockton on Tees[76]. It is not clear how the Hertfordshire yardstick takes account of the amount of housing already over shops, which can be quite significant especially in London. We would therefore tend to favour the yardstick based on the LPAC research.

Both of these yardsticks produce large unconstrained capacities which are significantly reduced by the discounting that we discuss in the next chapter. Provided that the estimate is in the right ballpark it is therefore not sensible to put a huge amount of effort into detailed survey work since it is the measures to release capacity rather than the capacity itself which is the main issue.

Subdivision: This is similar to living over the shop in that huge unconstrained capacity is reduced drastically by discounting. It is therefore only sensible to estimate the approximate scale of unconstrained capacity rather than doing detailed surveys. A reasonable yardstick is to count all homes with more than seven habitable rooms and an occupancy of 2 or less people. On average each of these homes could yield a net gain of one unit.

Intensification: In some parts of the south intensification is likely to make up a significant proportion of housing capacity. This may be because there is more capacity, for example from large gardens. However it is more likely that the scarcity of other capacity sources makes intensification relatively more important. In areas where intensification is regarded as important design-led, TUA methodologies of the type used in Hertfordshire are a useful tool. However elsewhere the importance of capacity from intensification is unlikely to justify detailed work. In these cases yardsticks would be useful. The Hertfordshire work suggests that private suburban housing and older terraced housing can be discounted as a source of capacity. While it is an imperfect measure, we would therefore suggest that the total capacity from residential intensification is roughly equivalent to a 5-10% increase in the stock of post-war council and new-town property.

Empty properties: Various yardsticks have been used for empty properties, most based upon the difference between the local vacancy rate and the national or regional average. It is reasonable to assume that the difference between the local rate and the regional average is a good staring point. If the strategy is successful this will of course mean that the average falls overtime.

The density measures, design led approaches and yardsticks described in this chapter provide an estimate of unconstrained housing capacity which will be considerably higher than the levels of capacity which are likely to be released. In the next chapter we therefore look at the methods that have been used to discount this unconstrained capacity to produce realistic estimates of the capacity that can be developed.

8. Discounting procedures

In which we assess the approaches used to reduce total or 'unconstrained' capacity to give an estimate of the amount of capacity which can realistically be tapped. We look first at the approaches that have been taken to discounting before listing the different factors which are used to justify these reductions. We conclude that this is the most problematic aspect of many studies and suggest an alternative approach based on capacity targets.

In the last three chapters we have discussed different sources of capacity, how they are measured and how their potential housing yield is assessed. This will produce, what is generally called, an 'unconstrained' capacity figure. The unconstrained capacity of an area is the theoretical total number of dwellings that it could accommodate if all of the potential capacity was developed. This, of course is unlikely ever to happen so that the unconstrained capacity alone is not a particularly useful figure. We therefore need to predict how much of this unconstrained capacity can be brought forward during the plan period. This is done through discounting procedures and is, without doubt, the most problematic aspect of most urban capacity assessments.

The West Sussex study is a good example of the problem. This study was designed to test whether a windfall allowance of 19,000 homes was reasonable. An extensive study produced an unconstrained capacity figure of 28,822 homes. A range of discounting measures were however used to reduce this figure by 65% to produce an estimate of just 10,000 dwellings likely to come forward in the plan period. While the discounting measures were set out in detail, the report admitted that they were arbitrary and that no sensitivity testing was done to explore the implications of using different assumptions. Yet the report still argues that it provides 'proof' that the 19,000 windfall figure is an overestimate. Similar examples of this can be seen throughout the North East study where, for example, the assumptions for the conversion of commercial buildings produced an estimate which represented an 80% increase on historic rates. This was felt to be too high so that the increase was reduced to 40%.

These examples illustrate two fundamental problems with discounting procedures. The first is that they appear to be starting with an answer in mind and constructing a set of assumptions to produce that answer. The second is that they are not estimating the capacity of an area to accommodate additional housing but the willingness of the market to develop it. If an estimate of market take-up is the net result of all this effort then one might question why we do not simply rely on projections of past performance. What we need is a mechanism that tells us what proportion of

the unconstrained capacity can realistically be targeted for development. This should not be a prediction of what the market is likely to do and should explore rather than be bound by different policy options. It should be founded on the assumption that we want to maximise the amount of capacity taken up so that the aim should be to identify the point (or thresholds) beyond which the consequences of developing urban capacity become unacceptable.

Approaches to discounting

We have structured this report on the basis that studies should assess the unconstrained capacity of an area before applying discounting assumptions. This accords with the language used in many of our case studies but not always with the way in which they have actually assessed capacity. Seven of the methodologies were based, to an extent, on a unconstrained/constrained approach. Of these only three produced constrained and unconstrained figures that can easily be compared – West Sussex as described above, Hertfordshire and the London LOTS study. In each case the unconstrained capacity is more than halved by discounting assumptions.

However even these studies do not maintain an absolute separation between constrained and unconstrained capacity, something which is even more the case with other studies. The reason for this is that discounting assumptions are applied not just to an unconstrained figure at the end of the study but throughout the methodology. The main points at which this generally happens are:

- In the selection of sites
- In the assessment of site capacity
- In the adjustment of unconstrained capacity

To an extent this is understandable. A large part of a capacity assessment is about identifying sites and deciding which can be developed for housing. The distinction between the site identification stage and the discounting stage can therefore become blurred. Why, after all, go to the trouble of recording a site and measuring its capacity if you 'know' that it will only be deleted later as part of the discounting procedure? The answer, of course, is that you do not know for sure that a site will be discounted and unless it is recorded in the first place this judgement can never be made.

There is also a problem that discounting assumptions are often unstated. The Kent methodology, for example, bases site selection on the NLUD returns but warns authorities not to include NLUD sites in their capacity assessments if they are 'unsuitable for housing'. The Surrey methodology similarly leaves judgements about the capacity of sites and the impact of different policy to the discretion of the local authority. In such cases assumptions will be made about capacity that will be inconsistent and difficult to analyse.

Even when explicit assumptions are made an analysis of the case studies is difficult because each methodology tends to consider different issues in different combinations at different stages of the process. The London Large Sites study, for example, based two *density* yardsticks on *policy* scenarios to assess the *viability* of residential development in order to determine which sites would

be brought forward. This is a perfectly logical process but no other study deals with density, policy and viability in this way.

This proliferation of assumptions makes it very difficult to compare different methodologies or to draw firm conclusions about good practice. Take for example the issue of industrial land. The Hertfordshire study includes half of all vacant industrial land in its assessment whereas the North East Study includes just 2.5%. The reason is that the North East Study has incorporated discounting assumptions into the site identification stage whereas the Hertfordshire study considers a less constrained initial figure which is heavily discounted at a later stage of the methodology. The results may be very similar – it is impossible to tell, just as it is impossible to assess whether these assumptions bear any relationship to reality.

This has been addressed by a number of methodologies by using scenarios to give a range of capacity figures. In Yorkshire and Humberside, for example, sites were assessed for their availability and suitability and graded as easy, medium or hard to develop. These three difficulty levels were used later in the methodology to explore three policy scenarios. This was based on the assumption that current policies would only bring forward the easy sites whereas a more proactive policy stance would bring forward the medium and a proportion of the hard sites. These policy scenarios were therefore combined with two density assumptions to give a range of six capacity figures, the lowest of which was 63% less than the highest figures (a similar figure to the difference between most unconstrained and constrained capacity figures).

Discounting factors

While it is difficult to draw conclusions about discounting techniques it is possible to summarise the factors which various studies use to discount capacity. These are dealt with in turn below:

Site availability: As we have said, the first discounting assumption to be made is often a judgement about site availability. This generally takes account of ownership, access arrangements, condition and contamination. The West Sussex study only included sites that could be developed at 'reasonable cost' and without 'insurmountable problems'. Clearly the application of this test by local planning officers is likely to involve a range of assumptions. It is, in any case, only a marginal relaxation of the 'genuinely available' test. A more sophisticated technique is the grading of sites by difficulty as described in Yorkshire and Humberside above. This is a technique also used by in the South West, London LOTS and Surrey studies. A further refinement is incorporated into the London Large Sites study which links site availability to viability by assuming that access and contamination problems can be overcome if the site value exceeds £1 million per hectare.

Suitability for development: A number of studies make reference to the suitability of sites for housing based upon issues such as surrounding uses, proximity to public transport etc. These however tend to be criteria for selecting sites and are not stated specifically. An exception to this is the Stroud study which developed a matrix to assess sustainability, natural resources, and environmental quality in the selection of sites. The suitability of sites for development is also an

implicit part of the Priority Area technique. This prioritises certain areas in the search for capacity partly because they are considered to have more capacity and partly because of their suitability for development.

Local character: A number of studies discount to take account of local character. The Surrey methodology identifies conservation areas and excludes them from consideration while in Hertfordshire the capacity of conservation areas is discounted by 60%. However the most advanced technique is the Typical Urban Character Areas (TUCA) methodology in Kent. This requires local authorities to divide their urban areas into continuous areas of similar character. These are classified into five categories from 'high conservation' to 'in need of significant enhancement'. These can then be used to assess the capacity of each area to accommodate additional development.

Public attitudes: Only three studies take account of public attitudes. In Stroud a survey was undertaken at the start of the study to determine the aspects of local character that people most valued. These were then used in the matrices to assess the suitability of each site for housing. In Hertfordshire workshops were held in the case study areas and the East Midlands methodology also includes public consultation. While the Hertfordshire workshops highlighted the potential public opposition to intensification this does not appear to have been used to discount capacity.

Planning Policy: Planning policy effects capacity in two ways; the local plan allocation of each site, and local policies such as parking standards, overlooking distances etc. Clearly because planning policy is under the control of the local authority it cannot be discounted in quite the same way. Rather than discounting capacity to take account of policy, several studies develop different policy scenarios. The North West methodology uses three policy scenarios, the first based on existing policies, the second on a relaxation of these policies and the third based on a proactive approach to site development. A similar approach is used in the Surrey study and the SRQ methodology, the latter based on car parking. In addition to this the London Large Sites, the Yorkshire and Humberside and the South West studies use policy-based scenarios to increase densities.

Market viability: Most studies discount to take account of market conditions. The only study not to do this is the London SRQ study because the market analysis undertaken on the case study sites shows all of them to be viable. By contrast the North West methodology grades sites into three levels of demand – sites attractive to the market, those likely to come forward with a little help and those unlikely ever to be developed. The South East and Yorkshire and Humberside studies also use three levels of developer preference. An alternative approach was taken in Hertfordshire where a market analysis of case study areas was undertaken comparing the cost of development with the values of the completed units. Only those case study areas which were viable were then used in the capacity estimates. The most sophisticated methodology was the London Large Sites study which linked viability to density, used values to assess whether problems such as contamination could be

overcome and compared the viability of housing to other uses. So, for example, if housing was viable, but another use produced a higher value it was assumed that the site would not come forward for housing. However the London Large Sites study concluded that high density sites would have a lower value than low density sites (even taking into account the higher yield), the opposite of the conclusion drawn by the London SRQ study. This illustrates the degree of subjectivity and judgement that can creep into these assumptions.

Plan period: Finally a number of studies discount to take account of the amount of capacity likely to come forward in the plan period. This is done in Hertfordshire and is part of the justification for discounting in West Sussex. The Hertfordshire study applies an optimistic and a pessimistic scenario to vary the constrained estimate by plus or minus a third. Plan period assumptions are really just another way estimating market take-up rates and are therefore similar to viability issues.

Capacity targets

Discounting assumptions are used to a greater or lesser extent in all of our case studies. It is clear that all of the above factors will affect housing capacity take-up and are legitimate issues to consider in capacity studies. However while the discounting factors may be legitimate, we have come across no study where the discounting rates are adequately justified. How do we determine whether the unconstrained capacity should be discounted by 40%, 60% or 80%? The answer in many methodologies appears to be that a figure is chosen that seems 'about right'. It is hard to see how this does not entirely undermine the effort and resources that go into capacity studies. There would appear to be three possible solutions to this fundamental problem:

Targets: The problem is overcome if we recognise that the percentage of unconstrained capacity to be developed is a target rather than a prediction. The above factors represent too many variables to make any sort of watertight prediction possible. The aim of capacity studies should therefore be to set targets for the amount of housing built on urban recycled land. These capacity targets are a subjective, political decision rather than something that can be objectively measured. The capacity study thus becomes an exercise to inform this political decision by confirming whether the target is achievable and highlighting the policy implications of achieving it.

Threshold analysis: In doing this the threshold approach used in the Chester study may prove a useful tool. Rather than measuring the capacity of the town to accommodate growth this highlights the implications of different growth scenarios. By setting thresholds these scenarios can be tested and used to inform the political process. So a policy of maximum growth may result in the loss of *X* hectares of open space and an increase of traffic on key roads to *X* vehicles per hour. If thresholds have been set of *Y* hectares of open space and *Y* vehicles per hour on the roads the acceptability or not of the scenario can be easily judged.

Policy scenarios: This process can also be aided by policy scenarios as used in the SRQ and North West studies. These are used to explore the impact on capacity take-up of changes to planning policies such as the release of employment land or parking standards. This again is useful in informing the political process by exposing the policy options and need for action to achieve different capacity targets.

In this chapter we have shown how the use of discounting procedures is a serious flaw in many capacity studies. It is extraordinary that so much effort can be put into the collection of information on urban capacity only to be swept away in a series of blunt and poorly-justified discounting procedures. None of the studies that we have assessed adequately addresses this issue. Indeed, we believe that it cannot be addressed while we maintain the pretence that urban capacity assessments are an objective process to measure a finite resource. The only solution to this is to recognise that urban capacity, as with so much else in the planning system, is a political issue that needs to be resolved through the political process.

9. Conclusions and recommendations

In which we set out ten conclusions from this research and map out a framework for the incorporation of urban capacity assessments in the wider planning process.

In the last four chapters we have explored the methodologies used to assess urban housing capacity based upon 15 case studies which illustrate the range of approaches that have been taken to the subject. In this chapter we highlight some of the issues raised by our research and make recommendations for good practice.

Conclusions

1. Most studies fail to consider all forms of capacity: As described in Chapter 5 many methodologies do not even consider some sources of capacity. For methodologies intended to throw light on a specific issue such as the three LPAC commissioned studies, this is not a problem. However many of the studies claim to give a picture of total housing capacity. This will clearly be misleading if certain key sources of capacity are ignored. There are particular problems with space over shops and the better use of empty homes. Both of these represent significant components of capacity and yet are ignored by many studies.

2. Most studies are seriously underestimating capacity: Most of the studies that we have assessed appear to be seriously underestimating capacity. Table 14 attempts, in a very rough way (and only to illustrate the point), to compare the results of those case studies that have produced results with regional household projections. For the sake of consistency we have used the most recent household projections up until 2021. These are slightly lower than the previous projections but cover a longer period than assumed by a number of the studies. It is also true that some studies omit certain sources of capacity - West Sussex and Hertfordshire, for example, do not include existing allocations. The fact remains however that the scale of the capacity uncovered, by even the most successful studies, accounts for only around half of projected household growth. This is hardly a great improvement on current land recycling performance. If the aim of urban capacity assessments is to identify the scope to increase the proportion of urban housing on recycled land then many recent studies would appear to be failing. The only way in which these studies could be seen to be contributing to this aim is if the capacity uncovered is additional to the current rate of development on previously developed land. Most of the studies admit that this is not the case. Even in London the three LPAC studies identify capacity for less than half of the 80% or more of

housing already built within London on previously developed land. It is for this reason that the capacity portfolio in the LPAC 1998/99 study starts by setting out the current trend. The starting point for any capacity study must therefore be that the proportion of housing on previously developed urban land be increased.

TABLE 13
Comparison of capacities measured by the case studies with household projections

Case study		Capacity estimate from the study[1]	Projected household increase 1996-2021	Percentage of increase identified as capacity
1	West Sussex	10,000[2]	73,325	14%
3	Yorkshire and Humberside	156,100	300,000	52%
8	North East Region	35,735	100,000[3]	36%
10	Hertfordshire	12,011[2]	60,000	20%
11	South West Region	181,320	500,000	36%
	London			
7	London – Large sites	89,705		
9	London – LOTS	91,500		
14	London – SRQ	35,000		
	London total	216,205	600,000	36%

1. Where studies produced a range ofcapacity figures an average has been used
2. The West Sussex and Hertfordshire figures do not include existing allocations
3. The North East study concluded that it uncovered capacity for 55% of household growth. This however was based upon a housing requirement of 65,000 homes between 2006 and 2016.

3. The term capacity is not particularly useful: A number of studies dismiss the idea that any such thing as urban housing capacity exists[77]. Capacity, they suggest, implies a finite limit beyond which urban areas will be full and unable to accommodate any further housing. They are right as illustrated by the density gradient (Table 2). If we were willing to live at the densities of Kowloon, the capacity of UK urban areas would be virtually infinite. The fact that we are unwilling to do this is not because British cities have less urban capacity than Hong Kong. It is because of the limits that we rightly choose to put on development through the planning process, the housing market and the residential aspirations of British people. These are subjective limits determined through the political process rather than objective limits that can be measured. The role of a capacity study should therefore be to look at the ability of an urban area to accommodate development in relation to these political limits. A number studies suggest that 'urban housing potential' or even 'urban capacity' is a better term to describe this concept.

4. Most studies concentrate on supply but not demand: Many of the studies treat market demand as an independent external influence that is separate from capacity. This is not the case. In areas of high demand like London the development industry consistently seeks out more capacity than capacity studies could ever identify, because there is a demand for the housing. In contrast there are many northern cities where the question is not about the capacity of urban areas to

accommodate housing, but how people can be persuaded to live there and developers to build there. In both of these cases the value of urban capacity studies is open to question.

While some studies take account of house prices and their effect on viability, none recognise that the planning system can influence this viability. If urban sites are assumed to be unviable so that a larger number of greenfield sites are identified, it is likely the urban sites will remain unattractive to the development industry as the costs and complexities are generally much greater. If, on the other hand, the supply of greenfield sites is constrained, scarcity should make urban sites and urban housing more valuable and therefore more viable.

CASE STUDY 15
Housing capacity in urban areas of the East Midlands - ENTEC – November 1998

At just 32%, the proportion of housing built on previously developed land in the East Midlands is the lowest of any region in the country. This study concerned itself with not so much with measuring the capacity of urban areas as with establishing a mechanism by which this capacity could be tapped.

Methodology: The study was based upon the development of a 'Common Framework' for identifying opportunities for urban housing. This framework was used during the study to assess a series of case study areas and was recommended for use by local authorities to assess the capacity of their areas.

The study identified 10 types of urban areas (what other studies call Typical Urban Areas or TUAs). These included 4 residential types based upon the age of the property (pre 1918, Inter war, 50s-60s and 70s onwards), 2 industrial areas (pre and post war), 3 commercial areas (city, town and district) and one mixed-use area. The urban area of the region was classified into these categories and 13 case study areas were selected to be studied using the Common Framework that assessed:

- The historic and future role of the area
- Current initiatives operating in the area
- Key census information on population and housing
- The character of the area
- Historic housing development and planning permissions
- The likely impact of future development on residents
- Sources of housing supply in the area
- Barriers to development

Findings: The study concluded from the case study areas that housing capacity of existing residential areas was minimal and did not justify special intervention. However industrial, commercial and mixed-use areas did have the potential to accommodate additional housing development and justified intervention by local authorities.

The study went on to assess the form of this intervention. It recommended that an area-based approach should be used in commercial, industrial and mixed-use areas while a portfolio approach (concentration on specific issues such as empty property) was appropriate for housing areas. The area-based approach included the following elements:

- The Common Framework as described above to identify opportunities
- A programme of action, timetable and key players
- A vision for the area
- A masterplan identifying development opportunities and how they might be developed
- Public consultation
- The investigation of potential development sites
- Details of requirements relating to sustainable development
- A timetable for delivery
- An implementation partnership

Conclusions: This study is useful in that it concentrates on unlocking rather than just measuring urban housing capacity. It does however have a number of weaknesses. The first is that the sample size of 13 case studies used in the study seems to have been too small to generate conclusions that could be applied more generally. The one mixed-use case study, for example, included a 17,000m^2 vacant office block. By looking at typical urban areas the study also tended to overlook one-off opportunities for development as well as the housing capacity of transitional areas (the cracks between the TUAs).

It is also not clear how the area-based approach would work in practice. The study implied that the areas considered should be relatively small but it is not clear how these areas are identified as those with the greatest potential. The intensity of effort implied for each area would also suggest that they are used sparingly and only in areas of significant capacity. Inevitably most urban capacity will be outside such areas.

5. Most studies measure capacity but few promote its development: Market demand for housing is a prerequisite of exploiting urban housing capacity. This is a major problem in declining urban areas but can also be the case in quite prosperous areas. Most developers specialise in building a certain type of product. They know how much it costs and how much it can be sold for and are therefore disinclined to develop other housing types in different locations if they can help it. Housebuyers, for want of an alternative, opt for the developer's standard product, making it appear that this is the only type of design that buyers want. Planning authorities can then reinforce this standardisation through their policies and local plan allocations. It can therefore become difficult to imagine how more urban housing capacity could be unlocked, and it is often this lack of imagination that permeates capacity studies. This is one strength of the design-led approaches that we described in Chapter 7 in that they illustrate how sites can be developed.

It is therefore important that capacity studies do more than just measure capacity, they must highlight how this capacity can be unlocked. In this respect the East Midlands methodology is a good model. It only measures capacity in as far as is needed to prioritise efforts. Most of the methodology is then focused on the sort of policies needed to unlock this capacity. Such strategies could include relaxation of planning policies or proactive measures to assemble sites or to provide subsidy.

6. Many studies treat capacity as a static issue: The urban capacity picture changes over time. While the NLUD and the LPAC approach incorporate the intention that they will be updated on a regular basis, most of the studies read like one-offs. Yet capacity is ever changing. At the local level sites and buildings will become available that no one ever expected. Over time land uses change as well as the housing market so that whole categories of capacity, such as the conversion of offices in London, will appear or indeed disappear. It is therefore vital that urban capacity assessments are repeated, or at least updated, over time. It is clear from the complexity and cost of some of the methodologies that this has not been built into the process.

7. There is confusion about windfall assumptions: The way in which the planning system has dealt with this fluidity in the past has been through windfall assumptions. These are a well-accepted and understood part of the planning system. However, the situation has become confused because of urban capacity assessments. In theory, because we are now seeking out more capacity, windfall assumptions should become less important. A good urban capacity assessment will identify sites that would otherwise have come forward as windfalls and should therefore reduce the overall number of windfalls. It is however difficult to know by how much windfalls will be reduced and therefore what allowance should be made for windfalls in the future. The LPAC approach has been not to alter windfall assumptions unless a local authority makes a particular efforts to identify small sites. However as we argue below, it may be more sensible to roll up windfalls into a more general unidentified urban housing allowance to deal with this issue.

8. There can be problems with the identification of individual sites: There is an important issue about whether individual sites and buildings are identified in capacity assessments. If they are

it can create confidentiality issues that have led many authorities to decide that they cannot make public their capacity studies. This has also been a problem with the NLUD. This confidentiality does not aid the transparency of the process nor the ability to defend or challenge capacity studies at appeal.

Identifying sites can also raise questions about the accuracy of a study, particularly at a local level. Take for example a study which bases a capacity estimate in a series of identified sites. What happens if one of those sites is developed for another use while another is proven not to be 'genuinely available'. Does this mean that the study is out of date and should be updated? Should the capacity total be adjusted with the implication that an equivalent area of greenfield land should be released in line with the sequential approach? Such issues will inevitably be raised through the appeals process as the sequential approach is fully tested and will very quickly undermine the role of urban capacity assessments.

This is an important difference between a land availability study and an urban capacity assessment. The former is concerned with identifying housing development land which is 'genuinely available' whereas the latter takes a snapshot of housing capacity in order to make a judgement about the amount of housing that an urban area can accommodate. This housing capacity will be incorporated into the local plan and, in line with the sequential approach, will determine the amount of greenfield land that should be allocated. The role of the capacity study is to inform this judgement rather than to identify individual development sites. As with land availability studies, some of the sites considered in capacity assessments will not be developed while other sites that were not measured will be. This should not undermine the value of the study.

9. There is a need for an unidentified urban housing allowance: We have concluded that urban capacity assessments should inform judgements about the scale of urban housing that can be accommodated but should not identify individual sites. This will not remove the requirement for local plans to allocate housing sites or for these sites to be 'genuinely available' for development. This means that there will be a gap between the local plan allocation of urban housing land and the target for the proportion of housing built in urban areas. At present this gap would be covered by windfall assumptions. However, windfall assumptions are based upon past trends whereas our aim should be to improve on these trends. We are therefore suggesting that local plans should incorporate an 'unidentified urban housing allowance'. The role of urban capacity assessments would be to assess whether this allowance is practical. The allowance would be monitored in line with the 'Plan, Monitor and Manage' approach. If the level of housing on unidentified sites fell below this target, the first response would be to explore policy changes to increase the proportion of urban housing. Only if this did not work would consideration be given to lowering the allowance.

10. Capacity assessments need to balance complexity and accuracy: We have suggested in this report that the accuracy of many studies bears little relation to the effort and resources that go into them. In blunt terms, an informed guess would probably have been as accurate. The problem is that the complexity of urban areas defeats even the most rigorous of methodologies. We

therefore believe that most non-site-specific capacity can best be measured without recourse to original survey work. Data on retail premises, large homes, empty properties etc. can be used to produce estimates of capacity which are not greatly improved by detailed survey work.

However we believe that there is value in combining these general estimates with detailed, design-led work in priority areas. These priority areas are likely to be around local centres and in transitional zones. The value of detailed work in these locations is that it will help tap a significant amount of capacity, will illustrate the results of this to local residents and politicians and will explore the policy implications of unlocking this capacity.

Recommendations

We have set out above ten conclusions that we have drawn from our review of capacity assessments and in doing so have started to suggest elements of best practice. It is clear that there is no one methodology that holds all of the answers and also that capacity assessments cannot be considered in isolation. We therefore set out below a suggested process for the incorporation of urban capacity into the planning process.

The focus for work on urban capacity should be at the strategic level

It is clear that work on urban capacity needs to take place at a strategic regional level. It is at this level that decisions are required about the accommodation of household growth and where judgements must be made about the balance between urban and rural areas. We therefore believe that the starting point for capacity assessments should be the Regional Planning Forums. This indeed ties in well with much of the activity on urban housing capacity that has taken place to date and the suggestion in *Planning for the Communities of the Future*[78] that Regional Planning Forums should set regional targets for the amount of housing on previously developed land.

There should be a hierarchy of capacity targets from the national to the district level

Regional Planning Forums have a vital role to play in reconciling the national targets set by government with the local circumstances of their region. Through this process the Regional Planning Forums guided by the Regional Assemblies and in partnership with the Regional Development Agencies will need to provide each local authority with both household growth figures and targets for the proportion of this growth to be accommodated within their urban areas.

This needs to take place in the context of the wider operation of the 'Plan, Monitor and Manage' approach. Some local authorities have great pressures for household growth and very small urban areas in which to accommodate this growth while the opposite is the case in many of the older industrial cities. The Regional Planning Forums will need to make judgements about the extent to which housing pressures can be shifted from the former to the latter. Targets for the proportion of household growth to be accommodated on previously developed land will form part of these judgements with much higher targets being appropriate in local authority with large urban areas. The targets for each local authority will then combine to inform the regional target.

The role of urban capacity assessments is to inform these targets

The targets set regionally and for each local authority need to be realistic but at the same time driven by a policy imperative to increase the proportion of housing on recycled urban land. The targets therefore need to be set at a level that is at the upper end of what is possible (and certainly above the current trend) and yet not so high as to cause unacceptable conditions in urban areas. As we have argued, the acceptability or not of the conditions created by household growth in urban areas is a political decision like any other major planning decision. The role of urban capacity assessment is to inform this political decision.

A range of targets should be set for different sources of capacity

We believe that the system being used by LPAC in its 1999 study has much to commend it. This suggests that local authorities should not be given a blunt capacity target but rather a portfolio listing targets for each of the capacity sources that we described in Chapter 5. For each capacity sources (such as living over the shop, intensification etc.) the portfolio should set a target for the number of units to be created during the plan period. It would set out the basis on which this target has been set and the assumptions that have been made. The targets for each source of capacity should be based upon capacity studies undertaken at the regional level.

These capacity targets should be incorporated into the statutory planning process

The sum of the targets for each source of capacity will provide an overall target for the number of units to be accommodated within the urban areas of each district. By subtracting this figure from the total housing requirement for the district it will be possible to determine the number of homes to be accommodated outside the urban areas. These figures will feed into the local plan. The target for the number of homes to be developed in urban areas will be greater than the capacity of the land allocated for housing in the local plan. This is because many opportunities will either be too small or will not currently meet the 'genuine availability' test. However, we know from experience that as much as 60% of all housing development takes place on sites that were not allocated in the local plan and that windfall allowances are generally not sufficient to accommodate this. We are therefore recommending that windfall allowances be wraped up in a general *Unidentified Urban Housing Allowance* which will make up the difference between the urban housing land allocation in the local plan and the urban housing target for the authority.

A Regional Partnership

The key decisions about urban capacity should be taken at the regional level. Only at this level can strategic decisions be made about the balance of development between say Newcastle and Northumberland or Manchester and Cheshire. However the regions can only do this in partnership with individual planning authorities. The Regional Planning Forums, after all, have very limited resources and will only be able to make assessments of capacity with the co-operation and practical

assistance of local authorities. While the key decisions are taken regionally they should be taken in partnership with local planning authorities.

Best practice in undertaking capacity studies

We anticipate most urban capacity work will be co-ordinated at the regional level as part of the process of establishing targets and for each local authority. While we have suggested that none of the existing capacity studies are perfect, they do represent an enormous amount of work and the commitment of considerable resources. It would therefore be unreasonable to suggest that this work should be ignored and that new studies should be commissioned by an approved methodology. We therefore believe that Regional Planning Forums should be guided in the setting of capacity targets by the best available information available to them, which will include existing capacity studies. It is however inevitable that many regions will need to undertake new work or to update existing studies. It is important that this work is undertaken in partnership with local authorities who are likely to do much of the work. It is inevitable that different authorities will approach this task with varying levels of enthusiasm. The methodology for capacity assessments should be robust enough to embrace this while maintaining a degree of consistency. In commissioning studies the following guidelines should be followed:

- Full use should be made of existing information sources before original survey work is commissioned. These information sources include previous studies, the National Land Use Database, the English House Conditions Survey, Valuation office data and information collected by local authorities. As this information is progressively integrated into GIS systems it should be possible to use it much more effectively.

- Capacity estimates for space over shops, the subdivision of residential property and empty homes should be made by applying yardsticks to this data as suggested in Chapter 7. Consistent yardsticks should be used throughout the region.

- TUA methodologies are only appropriate to assess capacity for the intensification of existing areas and only then when this is considered to form a significant element of potential capacity. Elsewhere intensification should be measured with the yardstick suggested in Chapter 7.

- Broad estimates of the potential for the development of derelict and vacant land, redevelopment and the conversion of commercial buildings can be based on the NLUD returns. If, as seems likely, this falls short of the policy target, efforts should be made to identify more capacity from this source.

- These efforts should be based on Priority Area techniques as described in Chapter 6. Areas thought to have significant capacity or which are within walking distance of local centres, should be studied in detail to identify potential capacity. The SRQ work done for the

Government Office for the South East[79] shows that such techniques uncover significant amounts of capacity even in prosperous urban areas.

- The capacity of sites and buildings should be assessed using density guidelines and yardsticks as described in Chapter 7 which:
  - Are based, initially at lease initially on design exercises which explore different policy scenarios
  - Represent an increase on current average development densities
  - Take account of gross to net ratios on sites of different sizes
  - Take account of the location of development and the potential to increase densities around local centres.

8. Urban capacity studies must be linked to strategies to unlock this capacity

All capacity assessments should focus as much on the measures required to unlock capacity as they do on its measurement. This should be integrated into wider urban regeneration strategies prepared by local authorities and RDAs. As the Urban Task Force recommended Urban Priority Areas should be identified covering areas where there is plenty of urban capacity in locations close to local centres or well served by public transport. Alongside this idea, should it be taken forward, it is important that capacity studies consider issues already detailed in PPG3 such as:

- The implications for planning policies and standards.
- The need to review planning land allocations.
- The requirement for public sector intervention such as land assembly, decontamination, improvements to access and the possible use of Compulsory Purchase Orders.
- The need for public subsidy either in the preparation of the site or in subsidising the housing and where this might come from.
- The need for wider regeneration initiatives to address urban decline, low levels of demand and employment.
- The way in which strategies to tap urban capacity reinforce the strategy of the RDA, local councils, and public bodies such as the Housing Corporation.

In this final chapter we have outlined ten conclusions and eight recommendations which map out a way forward for urban capacity assessments as envisaged by PPG3. It is clear to us that the answer lies not in one methodology or another but in the way that urban capacity is considered as part of a wider policy context. While a great deal of urban capacity work has taken place in the past it seems to have been disconnected from this wider context. Indeed it is difficult to see what practical use has been made of many of the studies that we have reviewed as part of this research. It is our hope that this framework will ensure that urban capacity studies have a direct impact on the policy process and become a valuable tool in the protection of our countryside and the regeneration of our urban areas.

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