

**Landvaluescape and U.K. Tax Reform:  
A Report on Aspects of the Study of  
Land Value Taxation carried out in Oxfordshire, 2003-2005**

Anthony Vickers  
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## **Abstract**

The author obtained a grant from Lincoln Institute to enable site values to be assessed for a study of land value taxation (LVT) in Oxfordshire, England.

This paper describes the political background and course of the study and technical aspects of valuations and their uses by the local authorities in preparing models of the impact of various possible tax reforms. It also describes the author's uses of the 'landvaluescape' model for his academic work and the extent and nature of interest generated by the study outside Oxfordshire.

Conclusions are drawn concerning the problems faced by local government, the property and related professions and the land policy research community in England and the paper makes recommendations for further work. The main conclusion is that lack of political will and IT awareness among key decision-makers in government throughout the UK is the major barrier to property tax reform.

## About the Author

Tony Vickers is a chartered geomaticist who has worked on geo-spatial data policy issues for most of the past 30 years. During 14 years in British Military Survey, he became a founder member of the Association for Geographic Information (AGI) and was elected a Council member (Director) of AGI for 2005-7.

Between 1998 and 2002 he was Chief Executive of the Henry George Foundation of Great Britain (HGF) and in 1999 he became a David C. Lincoln Fellow in Land Value Taxation. He has published several Lincoln Working Papers linking tax and geo-data policy and contributed to the 2004 book *Land Value Taxation in Britain: Experience and Opportunities* by Owen Connellan for Lincoln Institute.

He is currently a researcher and occasional lecturer at Kingston University, and writes for various journals about his work studying aspects of 'landvaluescape' mapping with special relevance to the U.K. He is also a local councillor in West Berkshire (neighboring Oxfordshire) but served the study Working Group purely as its Researcher.

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## Acknowledgements

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## **Landvaluescape and U.K. Tax Reform: a Report on Aspects of the Study of Land Value Taxation carried out in Oxfordshire, 2003-2005**

### **Introduction and Political Background**

In 1999 the author was awarded a David C. Lincoln Fellowship in LVT to conduct a study of property tax reform in Britain (Vickers 2000). His conclusion was that pilots of LVT would need to be carried out before any decision by the U.K. Government to implement the tax nation-wide. Meanwhile Liverpool City Council had resolved to ask Government to be allowed to conduct such a pilot<sup>1</sup>, so for his second and third years' Fellowship studies the author focused on that city (Vickers 2002 and 2004).

Local politicians in Oxfordshire learned about the Liverpool study and visited their counterparts in February 2002. Oxfordshire County Council (OCC) has had three main parties – Conservative (Con), Labour and Liberal Democrat (Lib Dem) - with similar numbers of councillors for nearly twenty years, which has meant that no one party has been able to form an administration without an agreement with at least one other to support its programme<sup>2</sup>. A tripartite administration of OCC had recently given way to a Conservative and Lib Dem coalition – with Labour the Opposition - but the then leaders of the Labour and Lib Dem groups, Cllrs Brian Hodgson and Margaret Godden, both strong supporters of LVT, persuaded colleagues to support a trial.

The following resolution was passed at a meeting of OCC on 18<sup>th</sup> June 2002:-

*“This Council invites the Executive to set up a Working Party to investigate the possibility of following Liverpool City Council’s example, by lobbying the government to allow it to raise a Land Tax.”<sup>3</sup>*

Cons abstained on the grounds that many of them were major land owners and had conflicts of interest. Again at the next Con / Lib Dem Executive meeting, Cons abstained but nevertheless it was agreed...

*“to set up a Land Tax Working Group, comprising the Leader of the Council, the Deputy Leader of the Council and the Leader of the Opposition (ex officio), plus one nominee from each of the political groups, a staff member appointed by the Director of Business Services / County Treasurer and not more than 3 co-opted members.”*

The main task of the Working Group was *“to advise the Executive on the feasibility and advisability of following Liverpool City Council’s example”* in the matter of LVT. It was given a budget of only £500 (\$840) and permission to invite expert witnesses and commission studies.

Council Leader Keith Mitchell (Con) chose not to take his seat on the Working Group, which therefore was chaired by the then Deputy Leader of Council and Lib Dem Group Leader, Cllr Godden. Cllr Hodgson, Opposition Group Leader until April 2004, took the main political initiatives on Council motions and meetings with ministers and government officials. In addition to them, the membership of the Working Group comprised Cllrs Terry Joslin (Labour), Dermot Roaf<sup>4</sup> (Lib Dem), Craig Simmons (Green Party) and David Illingworth<sup>5</sup> as staff nominee. Lib

Dem Group Support Officer Stephanie Ouzman acted as secretary. Con members did no more than attend one or two presentations on the subject.

At the outset it was realised that only a sample area of Oxfordshire could be used in the study. Since the Liverpool study was of an inner city area in need of major redevelopment, to complement this it was decided to choose an area that was typical of prosperous suburban southern England but with as full a range of land use types as possible. Responsibility for most spatial planning and tax functions in British local government lies with the 'lower' tier<sup>6</sup> of principle authorities, usually known as District Councils (DCs), so it was necessary to fully involve one of the five Oxfordshire DCs. Vale of White Horse (VoWH) DC had a Lib Dem administration whose then Leader, Cllr Paul Bizzell was a supporter of LVT and in his professional life was familiar with many relevant IT issues. He persuaded his VoWH colleagues to "...support the work of the County Council in investigating the implications of the introduction of Site Value Rating<sup>7</sup> by undertaking an analysis of a representative area of the Vale".

Cllr Bizzell was also co-opted onto the Working Group. His Deputy Director of Finance, Steve Bishop – a qualified accountant – was made manager of the project.

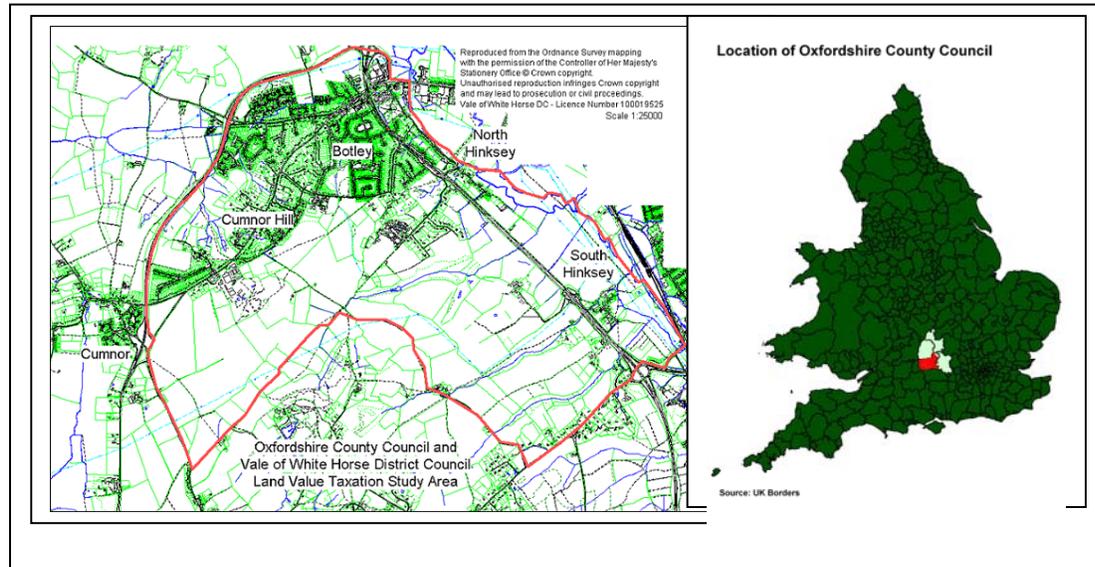
A seminar was organised at Oxford County Hall in June 2003, at which the author was invited to present his David C. Lincoln Fellowship findings and his ongoing research at Kingston University. Delegates discussed how Oxfordshire should proceed with its trial. It became clear that without significant additional funds a professional valuation could not be undertaken and any study would fail to receive the necessary attention from government or academia. The author agreed to use his contacts to seek professional and financial support, which led to the award of a grant of \$15,000 from Lincoln Institute to obtain the services of Robert Ashton-Kane FRICS IRRV, who had been the Valuer for the Liverpool study and had visited the United States to gain familiarity with assessment practice there. From the time of the award being announced in October 2003, Kane and the author were co-opted onto the Working Group. Although the author was himself elected to local political office in May 2003, he has served the Working Group purely in his capacity as Research Adviser.

The trial area chosen was at the north east corner of VoWH, just outside the city of Oxford, straddling a major euro-route linking the south coast and the English Midlands (see Figure 1). About half the area is housing: the villages of Botley, Cumnor Hill and North & South Hinksey. The rest is mainly agricultural with samples of most types of land use (see Appendix 1). Interest in LVT in Liverpool has waned since it was announced in mid-2003 that the city was to be European City of Culture for 2008 and a World Heritage Site. This was followed immediately by a sudden rise in city centre property values and relaxation of civic concerns about funding urban renewal. However nationally LVT has continued to grow as a subject of interest to politicians and property professionals.

The funding levels and reputational risk were significant enough to warrant contractual safeguards. In late 2003 therefore three contracts were drawn up:

- \* VoWH – Researcher (Kingston University): Access to study data and results in return for research funding;

- \* VoWH - Lincoln: Production of a landvaluescape demonstration map in return for funding;
  - \* VoWH - Valuer: Provision of valuation services by fee agreement.
- These were fairly easy to agree and were signed in January 2004. The intention was to complete the site valuations by the end of July and the whole project shortly after.



**Figure 1 – Location of Trial Area**

## **Conduct of Study**

### **Preparatory Work within the Local Authorities**

Prior to the author joining the Working Group, the County and District Councils had been working on compiling a database of land and property information for the trial area. Their own joint report describes this work for a British readership (OCC 2005). Here it is put into context for those less familiar with British geo-data policy.

The United Kingdom (U.K.) is almost unique in the developed world in not having a comprehensive cadastre of land information. There are still no firm plans within Government to complete the registers of land ownership in England and Wales, although the Chief Land Registrar is working on the assumption that he will be required and able to do so by about 2014 (Hollis 2004). Apart from his organisation Her Majesty's Land Registry (HMLR) and its counterparts in Scotland and Northern Ireland, nobody holds a set of definitive land ownership parcel data and the set being compiled nationally by HMLR is not in a format that allows it to readily be used by others.

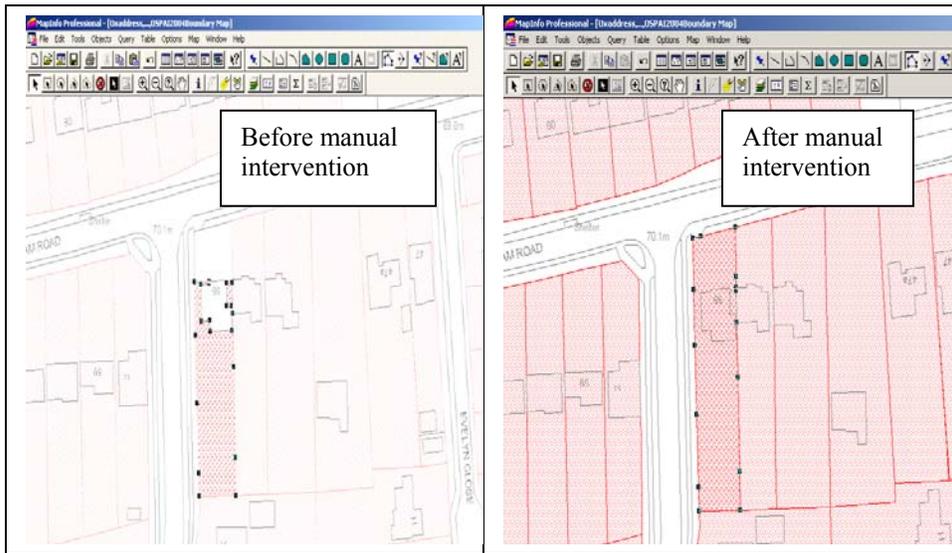
All DCs in Britain have a Local Land and Property Gazetteer (LLPG), which is merely a list of addresses and locations each with a unique reference number and a U.K. map grid reference to enable it to be linked to computerised maps and other spatially referenced records held by local

authorities and others. The LLPGs are being combined to make up a National Land and Property Gazetteer (NLPG) to support various national *e-government* projects and potentially the wider community including private business and citizens.

County councils have responsibility for street gazetteers which need to be related to LLPGs. Counties also have certain functions that use LLPGs, so that a group of officers from the six local authorities in Oxfordshire had for some time been working together informally on matters relating to land and property records. There was and remains a considerable interest in evaluating methods of matching different sets of records within the authorities, including the use of point-in-polygon techniques<sup>8</sup>. This required someone to lead on preparation of a trial dataset in which a complete set of land parcels existed, quite apart from what the LVT study needed.

The LVT study gave the geographic information systems (GIS) officer at VoWH DC, Jonathan Black, an added incentive to proceed with a trial process of land parcel formation and then to demonstrate the usefulness of this dataset to colleagues in Oxfordshire and beyond. A consultant working for the County Highways Department had already done some work linking the County Street Gazetteer to the latest Ordnance Survey (OS) topographic map data product MasterMap, which is structured in such a way that various data ‘themes’ can be extracted. David Simmons had devised a means of generating indicative land parcel boundaries from MasterMap data, which was about 60% successful. The County Council supplied VoWH with this dataset and by late 2003 Black had proceeded to manually complete the remaining parcels for the trial area using temporary IT staff and some on-site checks. An illustration of a typical situation where manual intervention was required is shown in Figure 2: because OS maps only record physical features, the site boundaries on open-plan housing estates without fences or hedges have to be deduced.

The next step in the process of preparing a land parcel dataset was to link a property address to each polygon. The only address dataset available nation-wide is that maintained by the Royal Mail for postal services, the Postal Address File (PAF). OS incorporates PAF in its AddressPoint product by simply geo-coding the position of each mail-box. Since many properties do not require mail to be delivered to them (for example an educational establishment may have many buildings but only one mail-box), AddressPoint is inadequate as the basis for a comprehensive database of physical properties or land parcels. Also many mail-boxes are on the periphery of the land parcel to which they relate, so that a slight error in geo-coding can lead to failure of any automated point-in-polygon process to associate the two datasets. These problems had been faced by the author in the Liverpool study, on a smaller scale.

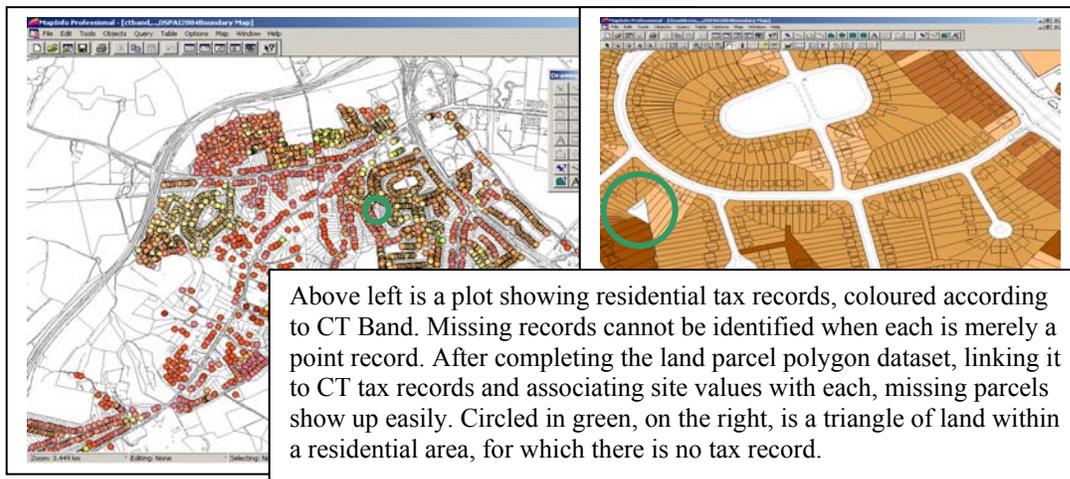


**Figure 2 – Illustration of problem forming land parcel**  
(Front garden and building excluded from automated land parcel formation.)

Having linked AddressPoint to the polygon dataset in the trial area and created additional property records for any properties missing from PAF, Black next obtained from his VoWH Revenues Section colleagues a dataset comprising all taxable properties. There were very many mismatches<sup>9</sup> between the records in AddressPoint and those in the local taxation records, for example where properties (business or residential) had multiple occupants (hereditaments) unknown to the LLPG officer or where a new housing estate, although mapped, had not yet been added to the tax files. Administrative procedures are supposed to ensure that these mismatches do not occur but human error means that they do with no visual method to help those responsible in the relevant departments. It was seen from the outset by Black that the LVT study potentially provided his Council with the means to help eliminate mismatches by using land and property polygons to spot errors of many kinds. Figure 3 shows how a map of tax records only as point features cannot show mistakes, whereas one showing them related to land polygons can.

The British local property taxes for which DCs have to maintain records are twofold. There is a residential property tax, the council tax (CT) that is levied on every habitable domestic property, with the exception of certain institutional residences such as prisons and student halls of residence. Non-domestic properties generally are liable for what is known as business rates or non-domestic rates (NDR). However CT and NDR do not between them cover all land that would be liable for LVT. For example, vacant sites within urban areas and all agricultural and forest land is tax exempt, as is all public open space. The Working Group wished to compile a land parcel dataset that was complete for the entire area, with only highway land presumed to be fully tax exempt. They also wished to differentiate between the ‘net’ tax liability of current property occupiers and the ‘gross’ potential liability of each taxable hereditament irrespective of actual occupancy. The Revenues Section was able to produce spreadsheets<sup>10</sup> for this in respect of

both CT and NDR, which Black related to the GIS through a combination of address-matching and visual checks on screen.



**Figure 3 – Mismatched tax and property records**

At the time that the Valuer joined the study team, decisions on categorisation of land uses and definition of boundaries of non-addressable properties had not been made. The Working Group as a whole never found a satisfactory remote way (i.e. from imagery and/or paper/digital records, not on-the-ground) to define rural and open-space legal boundaries without access to HMLR's records, which are particularly poor where land has not recently changed hands. Air photos were of assistance in allocating a land use and OS map data show most physical boundaries but neither can be regarded as definitive sources. They were good enough for this desk study but only an official cadastre could be used for a tax-raising trial of LVT.

Once the polygons had been created, the GIS<sup>11</sup> was used to calculate site areas. The supposedly complete and accurate dataset of parcels was ready to supply to the Valuer. Only he would visit most sites, so that some modifications to site boundaries were inevitable during the valuation stage. His judgment on the ground was accepted in almost all cases, which was good enough for the purpose of this study but again does not represent a sound methodology for LVT. In particular the several 'composite' sites, where a number of retail units make up a single land parcel, may actually consist of a more complex set of property rights each requiring a separate site valuation or apportionment of the one assessed site value. Neither physical maps nor inspection on site always reveal the boundaries of these internal divisions.

### **Site Valuations**

A summary by Kane of the valuation process which focuses on the issues and problems is contained in the Councils' report (OCC 2005). The complete Valuers' Report is available separately as Appendix 2 to this report, also a copy is retained by VoWH DC. In this section a concise discussion of the methodology, which was debated throughout the course of the study, is included which is covered in an annex to the Councils' report but not in the Valuer's. The views expressed in this section are those of the author, who is an expert neither in valuation nor in land

economics. The focus here is on the feasibility of handling valuation data under current conditions of policy and practice.

Kane was obliged to conduct the requisite valuations in the absence of any approved methodology specifically designed for U.K. conditions, in what he calls in his report a “*physically and legally hypothetical exercise*”. The legal Agreement between Kane<sup>12</sup> as Consultant, the author as Researcher, VoWH DC as “The Authority” and Lincoln Institute, which funded his part of the study, required him to produce

*“new valuations of the private and commercial properties ...in accordance with recognised standards of professional property and land valuation in the industry...in order to extrapolate the effects of various LVT scenarios. ...The basis of value shall be Site Market Value of the highest and best assumed use.”* (VoWH 2003)

There are few circumstances in which valuers practicing in the U.K. are required to do such work at the present time, although work in connection with statutory Compulsory Purchase Orders (CPOs) is very similar and much of the work done for developers of previously developed urban land has certain similarities, requiring the separation of site values from gross market valuations. To become more familiar with the way in which assessors in North America routinely conduct their ‘split valuations’, Kane visited Bridgport CT in 2001, before producing site valuations for the Liverpool LVT trial.<sup>13</sup> He later attended a workshop on the subject in Cambridge MA organised by Lincoln Institute. Apart from this, he had no previous experience of this type of work but was nevertheless probably the practising British valuer best qualified to undertake it. The methodology used is, in theory, quite simple and is known as the Residual Method. The market value of the whole property – land and buildings together – is first assessed, then the depreciated replacement cost of the buildings is deducted, which produces a capital figure equal to the value of the land alone: Site Market Value. The difficulties in the U.K. are in getting at the market evidence from which to make consistent assessments for each site, in the absence of a publicly accessible register of property transactions, including all information affecting the degree to which those transactions are made equitably as between parties. A major sub-set of these difficulties is, for many sites, the lack of evidence as to what ‘highest and best use’ (HABU) would be allowed. His contract recognised that Kane would need to make assumptions about HABU, which might prove inadequate if they were actually to form the basis of taxation.

For the lay reader of the Councils’ report, Kane summarises some of the specific issues in Britain:-

*“Without a definitive statement from the planning authority in respect of each and every parcel of land, there is an element of conjecture as to exactly what is the site’s HABU.”*<sup>14</sup>

*“It is assumed that the unencumbered freehold interest is to be valued and that, unless it is apparent from an inspection of the site, there are no third party interests, easements or rights of way affecting the site.”*

*“[This exercise] would require the assistance of the District Valuer in ensuring that as much transactional evidence as possible was made available.”*

On this last point, it must be emphasised that in the U.K. there is no requirement for vendors or buyers or their agents to supply details of property transactions to any authority other than the District Valuer (DV), whose job it is to compile evidence used only in preparing property tax assessments<sup>15</sup>. The DV is prevented by law from divulging any information that he receives to anyone not authorised by Parliament or for any purpose not connected with that for which it was supplied to him. In the absence of Government support for this study, the Authority's Consultant, Kane, was not able to obtain from the DV any of the information which would otherwise have formed the main source for preparing site valuations. As he puts it in OCC (2005, 8): "*The converse of the freedom of information enjoyed in Bridgport exists in Britain.*" Absence of any official source of market evidence helps to maintain a general lack of transparency in the property market, since it allows property agents to hide behind confidentiality clauses in their codes of ethics and contracts with clients and treat their personal knowledge of the local market as a selling point for their services. It effectively prevents buyers and sellers from dispensing with the services of professional intermediaries.

For this reason, Kane relied very largely on his skill in persuading local property agents that he was no rival to them and that the subject of the study was of broad public and professional interest and importance, so as to gain their confidence and share their knowledge with him. He undertook not to divulge his sources and reported to his client VoWH: "a number of private landowners and developers were prepared to informally assist in my ongoing exercise".

Nevertheless, given the time and resource constraints of his contract, he was able to persuade the Working Group that a limited number of "Beacon" residential sites would suffice: sites which were representative of others in the various localities within the trial area. Most of these sites had recently been the subject of sales or developments and one or more parties to those transactions were prepared to divulge details that enabled him to produce a robust site valuation. These Beacon sites are shown in Figure 4.

For residential sites, Kane arrived at an indicative value per square metre which was then applied, subject to adjustments for physical attributes of particular sites (such as shape, slope or soil conditions), to neighbouring sites according to their area or potential for redevelopment. This is similar to the process used by VOA when preparing the CT Register and, according to Kane "is the basis for the computer aided mass appraisal (CAMA) techniques used by many American States and elsewhere around the world" (OCC 2005, 9). VOA procured a CAMA system in 2005 (Hansard 2005).

For commercial properties, Kane applied an individual residual valuation exercise to each. This involved direct inspection of all such sites and many meetings with occupiers, owners and agents, as well as with VoWH planning officers who, he says, were all extremely helpful to him. The planning authority were also able to share with him all official spatial planning policy documents and other emerging policy evidence that might relate to site valuations of all kinds of land use found in the area. Appendix 2 gives examples of Kane's detailed valuations.

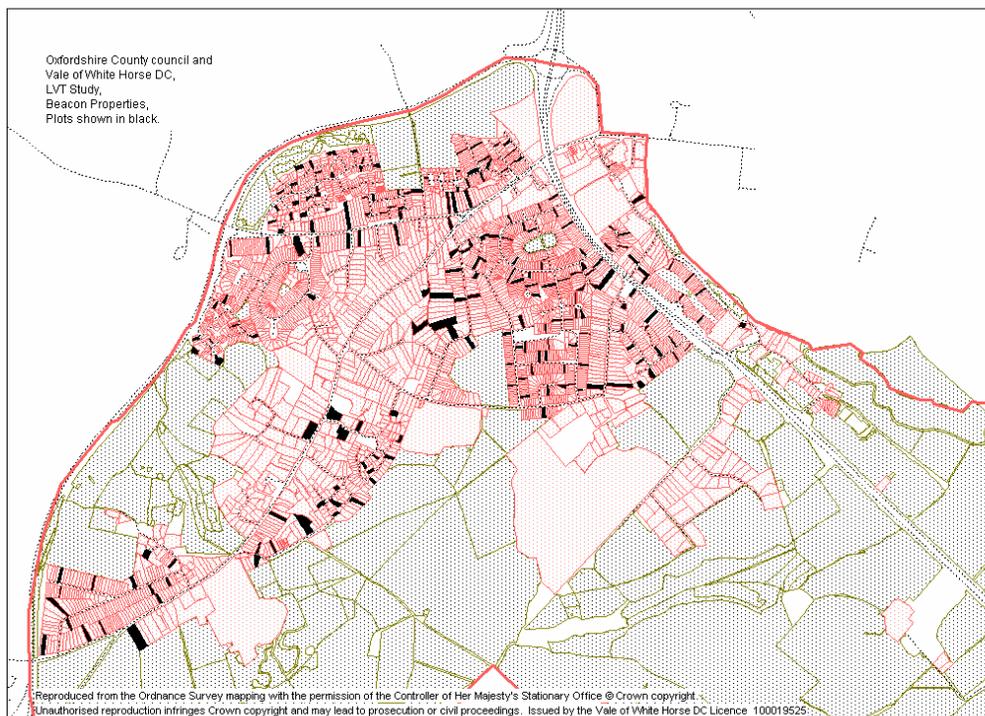


Figure 4 – Beacon residential sites

Agricultural and other open land presented more a problem, since it rarely comes on the market without a massive element of speculative or ‘hope’ value that may be unrelated to either its current use or its official planned use<sup>16</sup>. The uplift in value when farmland does obtain planning permission for housing is around £1 million per hectare, so that despite comprising about half the trial area open land represents a trivial proportion of its total value under current use assumptions. Any hope value has to be discounted for the purpose of tax assessment. Nevertheless Kane was able to make a sufficiently accurate assessment, as he states in the Oxfordshire report:

*“With regard to the large number of ‘open spaces’, the majority of these were agricultural land uses ranging from grazing land to commercially operated woodland. In these instances, the hierarchy of land quality was considered<sup>17</sup>, along with any specific geotechnical features such as severity of slope, presence of water courses, evidence of inherent waterlogging etc together with other features such as whether the parcel of land was crossed by power lines or other easements including public footpaths/bridleways etc. With open market evidence of arm’s length sales being available in the region, it was possible to analyse and interpolate such information to allow valuations of the subject land by direct comparison. Similarly the several leisure land uses including the golf course, tennis clubs and rugby ground were considered by reference to (limited) transactional evidence of similar properties, albeit drawn from a wider geographical area.” (OCC 2005, 9)*

In Appendix 2 Kane lists the many factors that he took into account in arriving at his assumptions of HABU. These include market factors, such as the long period of historically low

interest rates that has underpinned property prices, lack of confidence in the office market, extreme shortage of residential land in the Oxford area and lack of demand for low quality farmland. He also examined the local spatial planning policy framework, which included a recent Urban Capacity Study<sup>18</sup>, the VoWH housing density guidelines, likely requirements for new local roads within future developments and provisional land use allocations within the draft Local Development Plan. He discounted potential financial burdens on developers through so-called planning gain, but also took no account of the likely uplift effect on adjacent land parcels of higher value uses to which certain sites might be put. He was given access to the VoWH register of recent planning permissions and obtained many valuations from parties to recent or impending transactions arising from them. Many of these sites became Beacons within his valuation model.

The completion of the valuation model was delayed by a breakdown in communication between VoWH and Kane in late summer 2004. Having thought he had completed all Beacon valuations and extrapolated from them to produce site values for all associated domestic parcels, his data when plotted on the GIS showed one large and several small gaps. Somehow there had been a failure by VoWH to identify all the parcels and it took several weeks to prepare data for the missing ones, pass it to Kane and then for him to visit the area and complete his work. Neither Black nor Kane had made provision for this extra work in their schedules and it proved difficult to make time for it.

Kane's key conclusion arising from his experience with VoWH in this trial was that

*“the principle of conducting a revaluation of all properties in anticipation of adopting a Land Value Tax system need not be as laborious or resource-consuming as feared by many. Indeed, with the advances in information technology, including GIS, there is an argument that, given there are, by definition, substantially fewer plots of land than hereditaments, this tax base would be a more efficient use of current resources in the event of a national revaluation.”* (OCC 2005, 10)

The biggest problem for Kane was his lack of the “*statutory inquisitorial powers*” (Appendix 2, 9.2) possessed by the DV and the VOA or of access to data to which they are privy. Had the trial been blessed with official government backing, even for valuations alone and not in respect of tax raising powers, the cost in terms of time and money for the Working Group would have been substantially less.

### **Data Modeling<sup>19</sup>**

The purpose of the Oxfordshire LVT study was to model the effects of different options for property tax reform, not to model land values *per se*. Therefore having completed the database of site values, the next task for the Working Group was to devise ways of calculating the revenue yielded from each site under different possible versions of LVT. Maps were used to illustrate the effect of these versions rather than to envision the underlying landvaluescape. In this sense, uses for the database other than in support of property tax reform campaigning and tax administration were outside the scope of the Working Group. The author played a small part, alongside Black, in devising ‘tax effect maps’ but this work was not part of the research contracts described

above, except inasmuch as their usefulness would be an indicator of the prospects for value maps generally.

### Depersonalising the tax data

It was assumed by the Working Group that for LVT no account would be taken of the circumstances – financial or otherwise – of the taxpayer. With CT and NDR, the tax bill is generally paid by occupiers unless the property is vacant in which case any tax due is paid by the owner. Principle residences occupied by a single person are subject to fifty percent discount and additional discounts are available to other categories of occupier (e.g. registered disabled persons). Similarly business premises that remain unoccupied for three months or more are subject to a lower tax rate – or exempted altogether. Therefore the notional gross yield of local property taxes is significantly greater than the actual net revenue. To put it another way, the revenue requirements of a local authority are not divided simply according to relative taxable values of properties. Therefore any comparison between the tax effect of LVT and that of current local taxes would be distorted by exemptions that are totally unrelated to property value but related instead to some notion of ‘ability to pay’ of occupiers or owners set down in statute law. The first stage of data modelling was therefore to remove the personal factors from the net tax liability of hereditaments in the trial area. The total actual yield of property taxes in the year 2002-03 (£6.619m) was redistributed between all hereditaments without reference to discounts and exemptions that applied to particular taxpayers or properties that year. This produced a smaller tax liability for all hereditaments that had actually been liable for full CT/NDR but a much larger liability for the much smaller number that had benefited from exemptions. The result was a baseline tax burden against which each version of LVT could be compared for each land parcel. Some parcels were comprised of several hereditaments and some hereditaments were comprised of more than one land polygon which could be treated as one or more records for the purpose of the analysis. In the former class of instances it was not possible to say what the effect on the tax bills of individual taxpayers would be, because apportionment of the LVT burden within a land ownership parcel record could be complicated by the different use classes within it and hence disproportionate tax bills payable under the NDR/CT system. A few parcels consisted of a mixture of residential and business hereditaments, which further complicated comparisons. All subsequent analysis was at the land parcel level, comparing gross liability for CT/NDR with the liability calculated under the respective notional LVT systems.

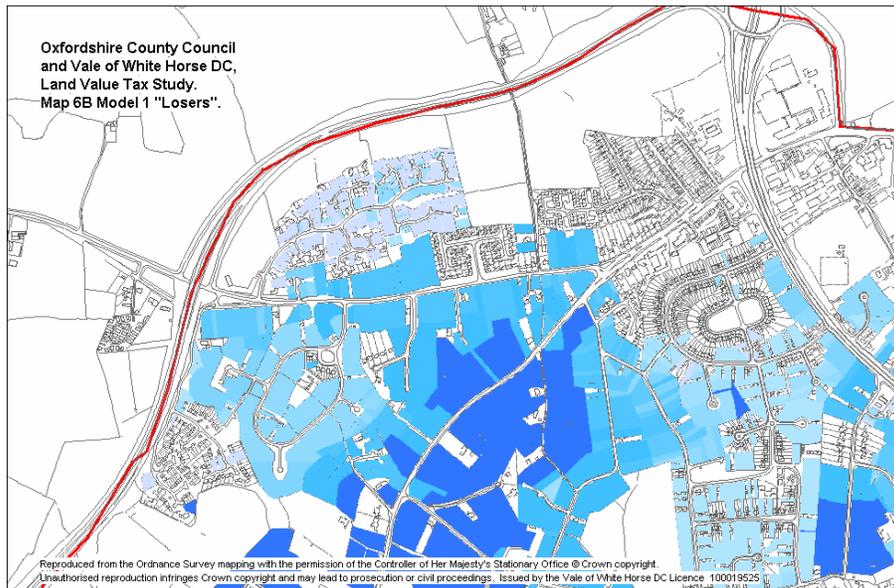
### Model 1

A further assumption was made for the first and simplest of LVT models (Model 1): that all types of land use would be subject to the same tax rate. In some LVT jurisdictions, for example most of Australia, there are many different rates of tax applied to the basic site values, according to both nature of land use and – in some cases – circumstances of land owner. All such differential rates and exemptions are aberrations from the principle of LVT, which assumes that site valuation takes account of the ability of the land, its owners and occupiers to pay rent and taxes according to value alone. The economic effect of LVT is supposed to encourage optimum use, even if that causes short-term hardship to current owners and occupiers: transfer of ownership and/or use to an economically efficient purpose is to be encouraged for the greater

good. Planning restrictions are supposed to express the collective wish on the part of the community to regulate land use and they will be reflected in valuations. For example, allowing public access to private open space by deed of covenant clearly reduces the value of such land considerably, thus reducing its tax assessment. It should not in addition be necessary to have a lower tax rate. Every reduction in tax rate for one category of land results in a higher tax rate for other types of land. A higher tax rate is reflected in a lower value and vice versa, so that distortions in value inevitably follow the creation of differential tax rates.

This is exemplified in the current U.K. property tax system and became evident when the computation of Model 1 was complete in this study. The severity of the NDR, as compared to CT, meant that the share of total revenue raised from commercial properties within the trial area fell under this simple LVT model from 40.9% to 4.5%, based on the fact that 94.4% of the total assessed land value was on residential land, yet CT (gross, not net) is only yielding 59.1% of revenue. The author believes that the main reason for this is that, in the fifteen years since the old rating system was abolished, the shortage of housing land - caused mainly by planning restrictions and demographic changes - has worsened substantially so that it has increased in value far more than has land designated for commercial uses<sup>20</sup>. This has happened without any cross referencing between the totally separate property tax systems for domestic and commercial properties. In effect, NDR and CT have diverged in their relative tax rates (pound per unit of value) ever since they were created: Bizzell calculates their rates at about 10% and 0.5% of land value respectively (OCC 2005, 13), based on this study. Despite NDR revenue being pegged by statute to yield no more than a specified proportion of CT – and despite the rises in CT rates in most local authorities – the effective tax rate of CT has not risen as fast as that of NDR. It is no wonder that the impending revaluation of domestic properties for CT – the first since its introduction in 1992 – is expected to reveal massive increases in taxable value. CT has since 2000 been based on values that are seven years more out-of-date than NDR (1991 as opposed to 1998). In those seven years, house prices in Oxfordshire roughly doubled.

The political impact of introducing LVT at a uniform rate for all types of land use would therefore be unacceptable. More than five out of six households and voters would pay more tax, even the poorest (or lowest band) occupiers would be worse off under this form of LVT. The tax effect map at Figure 5 shows how this affects an area that includes both low and high value residential estates.



**Figure 5 – Model 1 tax effect map**

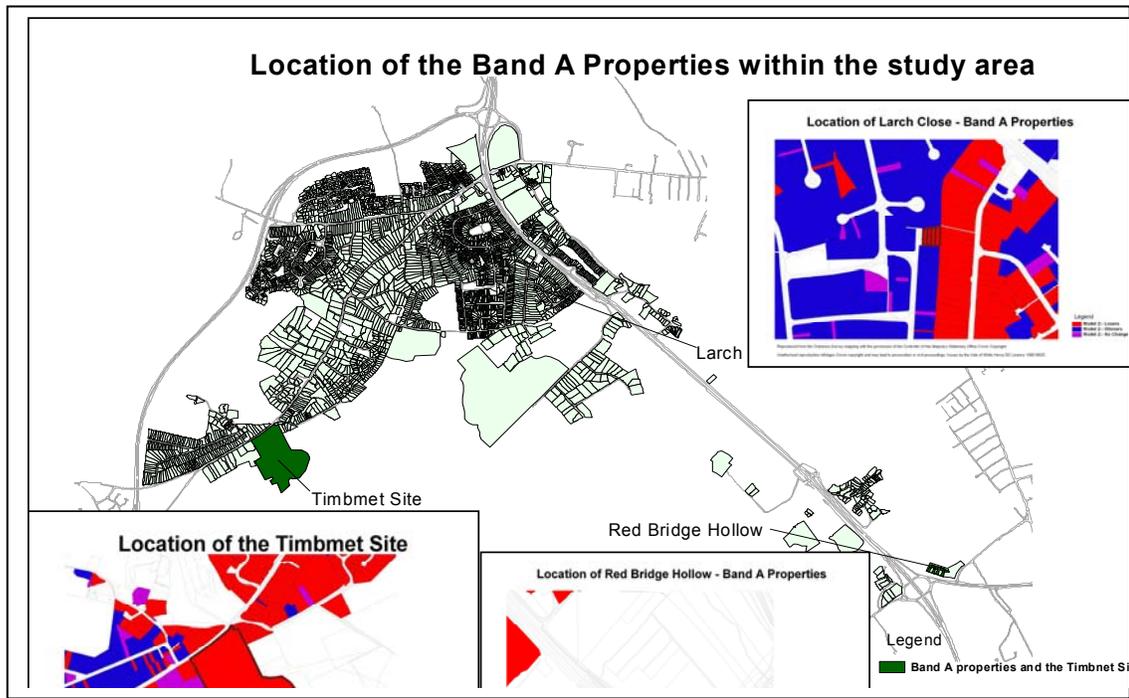
## Model 2

Before Kane had even finished his site valuations and based on an incomplete data set that was ready by June 2004, the Working Group therefore decided to expand the number of land use categories it would seek to define, to allow for possible differential LVT tax rates and partial exemptions. The first refinement to tax effect modeling was simply to keep separate the revenues yielded by CT and NDR and seek to raise the same total revenue from residential land under LVT as was raised in 2002/3 by CT: £3.91m (59.1% of total revenue from property taxes combined). Commercial land alone, not agricultural or public use land, would carry the LVT burden of the remaining £2.71m.

For the purpose of analysis, the commercial and ‘public use’ categories were sub-divided into eight and seven sub-categories respectively. As it happens, these sub-categories were not used to create further differential tax rates in any models that the Working Group considered, however they are there for others to use. Bizzell, who led the task of defining which (sub-)category each land parcel would be assigned to, acknowledges that it introduces an element of arbitrariness and complexity to the administration of the tax, however he believes that such problems are not insurmountable and solutions would evolve given the political will to take necessary decisions (OCC 2005, 12).

Model 2 was known also as the Zero Net Sum Model. This achieves a much more acceptable result politically, with more than two thirds of residential sites ‘winning’, as well as four fifths of commercials. The fairly small number of losers tend to lose by much more than most winners gain, which is to be expected: it highlights properties that are under-utilised, such as the group of

low-grade Band A homes in the middle of a high value suburb (Larch Close - see Figure 6) and the Timbmet industrial site where outline planning permission for housing has recently been given<sup>21</sup>.

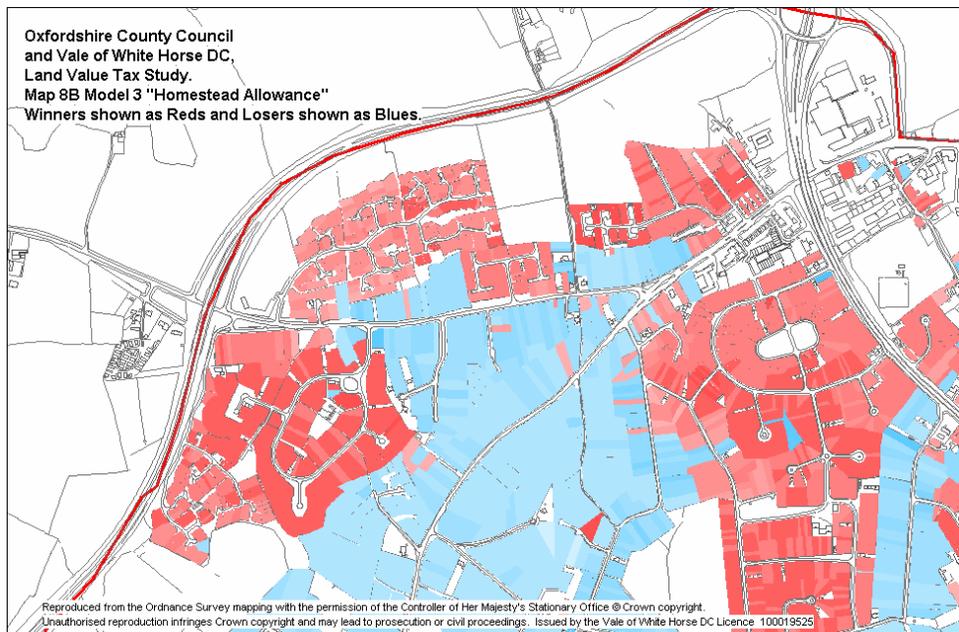


**Figure 6 – Model 2 tax effect on underused sites (losers: red; winners: blue)**

### Model 3

An attempt was made in the next model to revert to a single LVT tax rate but retain the high proportion of residential ‘winners’ by introducing a domestic or Homestead Allowance (HA) on all homes. This would in effect be a cross-subsidy from non-residential land to residential land, with the ethical basis that everyone has a right to live somewhere. Such a principle is applied to actual property tax systems in many countries, not just those where LVT is used. The HA can be based on a tax-free area per household or person (with reduced space per person for each additional member of a family), or on a tax-free element of assessed value. The latter model would not perhaps suit cities like London where land values are exceedingly high. However for this study the HA was kept as simple as possible, partly because there was no link to any database of occupancy or electoral register. Similarly it was not possible to identify those residences that are owner-occupied, where the occupier (i.e. the voter) would benefit. Since LVT is a tax paid directly only by owners and HA might only be applied to one residence per tax-paying owner (perhaps administered through the income tax system, as in Sweden<sup>22</sup>), one beneficial effect of HA would be to give an incentive for owners to share equity in all their residential properties with their tenants. This would add to the redistributive effect of this version of LVT, directly spreading the subsidy from commercial land (in the study area £773,750

produces £250 per domestic property) among more residents. Figure 7 illustrates the tax shift effect on a part of the trial area.



**Figure 7 – Model 3 tax effect**

Other models were looked at but discarded. An infinite number of other LVT models could be analysed using spreadsheets and tax effect maps. What this study showed is that having done the site valuations the task of devising, comparing and selling various options for LVT can be made quite easy using modern computer technology – the same technology that is making valuation easier too. The LVT approach is versatile and transparent largely because it makes full use of such technology.

### **Landvaluescape Modeling**

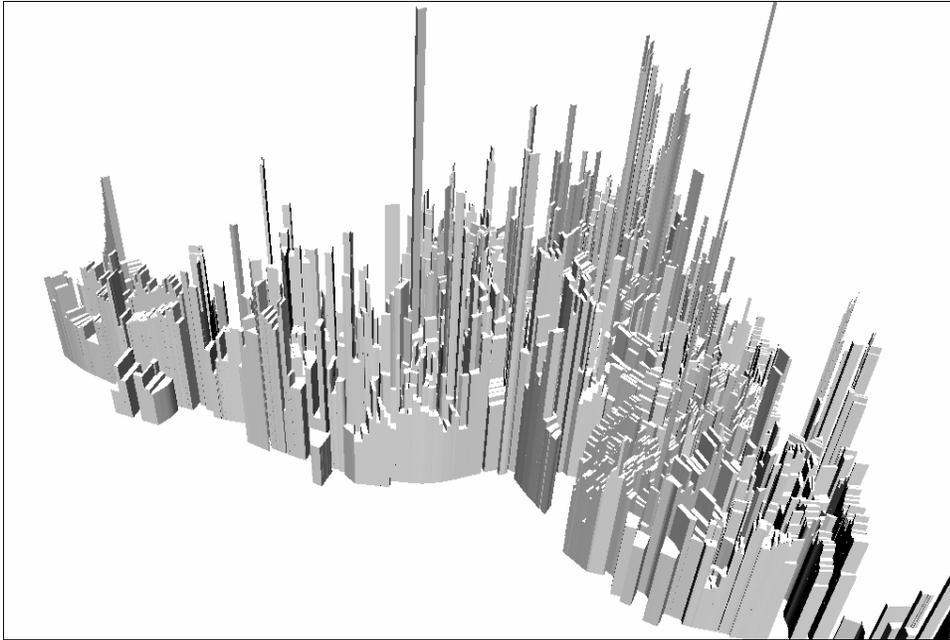
The justification for involving the author in this study and for Lincoln Institute financing the site valuation was not to directly assist the political campaign for LVT but to enable the creation of a demonstrator dataset for modeling ‘landvaluescape’. This was a key part of his doctoral research into the potential uses - and barriers to creation – of land value maps as a spatial planning and economic policy tool. The assumption made in the author’s hypothesis is that property tax reform is a means to a greater end, that of better land policy formulation and monitoring. The Oxfordshire LVT study was a convenient source of data that would, he hoped, help prove his hypothesis rather than justify LVT (Vickers *et al* 2005).

Although British local authorities have important spatial planning and economic policy functions, they operate very much within a framework of policies and policy tools that is defined by central Government. In England, central government works largely through nine regional

offices. Oxfordshire falls within the Thames Valley sub-region of the south east region, which is the largest English region and which enfolds London – a separate region administratively but economically interdependent. Officials at the Government Office for the South East (GOSE) and ODPM who declined the author's invitation to directly participate in his research have however attended events held in conjunction with the Oxfordshire LVT study.

Prior to the creation of this trial land value dataset, the only recent attempts to produce comparable datasets in Britain were by the author in Liverpool (Vickers 2003) and London (Mitchell and Vickers 2004) and a study of the methodology for separating property value influence factors for RICS, ODPM and TfL in London (ARW *et al* 2003). TfL continues to sponsor research by property consultants AtisReal<sup>23</sup> in London and McGill and Plimmer are also developing a land values dataset as part of their continuing David C. Lincoln Fellowship study centred on Whitstable, Kent (McGill and Plimmer 2004). The Liverpool LVT trial area was too small to allow creation of a usable landvaluescape model, although it allowed some work on a Tax Effect Demonstrator (TED). The London studies did not directly model land values but used changes in assessed commercial property values for NDR (Geofutures 2002) and HMLR house prices at postcode sector level of aggregation as a surrogate. The Oxfordshire study has used similar spatial analysis and visualisation techniques to those which had been used in Liverpool and London. However the latter were not directly mapping land values, in the way that Thurstain-Goodwin did with Lucas County Ohio AREIS data (Vickers & Thurstain-Goodwin 2002, see also Ward *et al* 2002).

In this study, the author used a fellow student at Kingston University, GIS graduate David Holloway, to assist with creation of a range of map graphics and 3D visualisations made from the data compiled by Black at VoWH. By incorporating this work within his PhD studies, it was possible to avoid copyright charges for use of OS map data and ArcView extension software which VoWH does not possess: both are licensed to Kingston University for use by students and researchers. VoWH had no need to employ 3D visualisation techniques, although officers there could see potential benefits for them and their local government colleagues in being able to do so. The nearest Black could come to producing a 3D image of land values in the trial area was an extruded block diagram (Figure 8).



**Figure 8 Trial area site values as vertical extended blocks**

Appendix 3 shows some of the graphics that Holloway has so far been able to generate at the author's instigation. The results have been somewhat disappointing but largely this is because of a lack of resources to fix the underlying data problems which have been described.

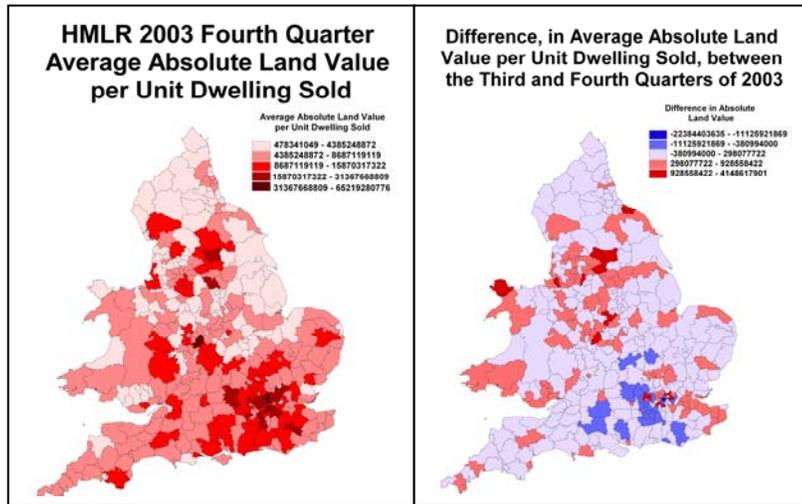
On the basis that 'a picture speaks a thousand words', landvaluescape visualisation is seen not so much as a means of producing tax assessments or supporting tax reform policy development but more as a means of communicating between tax and policy specialists and the wider public, which includes the property industry and elected representatives. The next section describes how value maps using this data have been presented and received in recent months, even before the site valuations were complete. This section concludes with some remarks about the modelling techniques used: their validity rather than their effectiveness.

Before there was any site value data in the Oxfordshire GIS, Vickers asked Holloway to experiment with value mapping and 3D visualisation techniques using a freely available surrogate dataset at a much smaller scale: the Land Value Monitor of indicative land values in England and Wales produced for the Henry George Foundation (HGF) by Duncan Elliott, a researcher for the Foundation<sup>24</sup>. This dataset is based on HMLR's quarterly house price data and has two advantages (apart from being free of charge and official):-

- (a) it can be associated with 'land' polygon data in a GIS and ...
- (b) it is available as a time series.

In this last respect it has advantages over the dataset from Oxfordshire, which is for a single era only. One of the applications envisaged for value maps is the ability to monitor relative rates of change in land values, to identify where policy action may be most needed in 'property hot spots' where there are higher than average rates of change (in absolute or percentage terms). Although the 'land parcels' in this case are very large – whole local authority areas are the unit at which HMLR reports house prices for free – the principles are the same as for individual land

sites. The values can be mapped in several different ways. In Figure 9, England’s DCs are first shown in automatically generated bands shaded according to the average absolute ‘land value’ per dwelling unit sold in each authority in the previous quarter.



**Figure 9—England ‘value mapped’**

HMLR reports separate average house prices for each of four categories of dwelling: detached, semi-detached (duplex), terraced and ‘flats/maisonettes’ (apartments). For HGF’s Land Values Monitor, Elliott takes an average equivalent land area for each type of dwelling and its construction cost to produce an adjusted figure that he asserts approximates to land value per dwelling sold<sup>25</sup>. The second map in Figure 9 shows the local authorities where the rate of change in absolute terms (not percentage, which is what the newspaper headlines usually report) has been greatest in the darkest shade of red, those where it has fallen in blue. This highlights ‘hot spots’ in the current property market.

Similar maps could be produced at land parcel level or at intermediate geographies for a local land value monitor, if the data was available at low enough cost. The ODPM House Price Index, which is based on data supplied free by mortgage lenders on a monthly basis since 2003 only<sup>26</sup>, includes full post-code and could be aggregated by either local authority or postcode sector level without any breach of confidentiality (ODPM 2004). Its use is currently being investigated by the author, with the Society of Mortgage Lenders (SML) and ODPM. SML own the data.

Besides these choropleth maps, Holloway produced contour plots and surface models using various algorithms available in ArcView 3DAnalyst software, such as Inverse Distance Weighting (IDW) and kriging. Initially these took the HMLR data of England, then when the Oxfordshire LVT data was available this was used. The ‘z’ axis in the surface models is value per site (or per dwelling for HMLR) not value per unit area, i.e. in the LVT trial area it is not strictly a landvaluescape (which would represent value per unit area changing over the surface) but a representation of spatial changes in the local value of land sites.

At the edges of the model, a ‘cliff’ is assumed, i.e. the model is clipped at the value of the edge polygon and not taken to zero. Appendix 3 gives a more technical description. These products

are merely indicative of the kinds of graphics that can be derived from land values datasets which as yet, in the U.K. are not available in the public domain on an extensive basis. If they were, then the issue of edge treatment would not arise: the actual coast<sup>27</sup> would be the limit of the model, not the artificial trial boundary.

## **Presentations and Feedback**

The results of the trial were presented to external audiences at four different events between September 2004 and January 2005. The author was either instrumental in or closely involved with the organisation of these events. At all four some versions of the value maps and other landvaluescape graphics in this report were included in Powerpoint presentations and a questionnaire form was offered to members of the audience to complete and return, as part of the PhD project at Kingston University. The aim of the questionnaire was to discover what people thought about value maps, not about LVT.

The four events are described briefly below, together with the general reaction of that audience at the time and as discerned from analysis of completed questionnaires. The overall approach and reaction to the events as a whole is then discussed.

One of the four versions of the questionnaire form is at Appendix 4, with a note about the other three variations. The questions in the form were derived from ideas emerging at the time out of other strands of the author's PhD studies: there are a range of potential uses of value maps and of stakeholder groups that can either enable or benefit from their development – or both. Using a Policy Delphi approach (Turoff 1970) a policy plan is being worked out and costed that might be followed by a U.K. government inclined to either improve land policy in general or property taxes in particular through LVT. The dynamics between stakeholder groups interested in value maps, listed in the forms at Appendix 4, is seen as crucial for the advancement of that policy plan. The questions on which this report focuses are those dealing with the perceived usefulness of value maps, not the possible policy options that might assist in their introduction to the U.K.

The events were:-

- 16 September 2004 Waterfront Conference “Towards Land Value Taxation for Local Government”
- 23 November 2004 West Berkshire Housing Action Group meeting (morning)
- 23 November 2004 RICS “3CPD” seminar on Databases for Property Professionals (evening)
- 25 January 2005 Oxfordshire County Council seminar on the LVT Study

### Waterfront Conference

This was a major one-day commercial conference in an Oxford city centre hotel, organised by one the U.K.'s leading conference companies specialising in public policy subjects relating to the built environment. Waterfront had previously run conferences that touched upon LVT but had not run one that was entirely on the subject. The author approached them in April with a view to using an event in the autumn to reveal both the results of the LVT study in Oxfordshire and the uses of value maps, the latter to feed directly into his PhD. The idea was to devolve to

Waterfront the organisation, costs and risks of an event that he needed to have some influence over for research purposes. After promises of sponsorship from Lincoln Institute and the Joseph Rowntree Foundation (JRF)<sup>28</sup>, Waterfront agreed in June to take the event on, in the expectation that Government was likely to announce in July that it would investigate LVT as an option for local government finance. As it happened, Government did not do so, merely mentioning LVT as a possible minor source of funding but giving no indication of pursuing it (Raynsford 2004). About 90 people including conference presenters and organisers attended the event. All had a questionnaire form in their delegates' packs. During the author's presentation and again at the end of the conference delegates were asked to complete the form before leaving. Only 15 did so and they were not a representative sample of the delegates as a whole. Most were LVT supporters. The conference failed to attract any members of the property professions currently working for private sector property companies, who had been the target audience for the author's research. Most delegates were from central or local government or the non-profit sector (Waterfront 2004).

As one would expect, the audience appeared to be very interested in the subject of LVT. They also seemed to be interested in the particular uses of value maps that relate to it. A workshop in the afternoon that focused on value maps was attended by about twenty of the delegates. Waterfront Conference Company were particularly pleased with the event from the results of their own feedback form, although it was not a commercial success because the policy environment had failed to meet expectations.

None of those who completed this version of the feedback form were property tax experts. There was a mixed reaction to value maps. They were seen as being of considerable use to tax administrators and urban planners, as well as the property market in general. Specifically as regards tax, it was thought the benefits of value maps would lie in enabling better quality assessments and taxpayer understanding of the basis of assessments but not necessarily a reduction in appeals or of the cost of administration. From a group consisting mainly of self-confessed political types came the view that planning, property and tax professionals would benefit more than business in general or politicians, should value maps be developed in the U.K. Software suppliers were seen as the stakeholder group least benefiting from their development.

### Housing Action Group

The West Berkshire Housing Action Group (HAG) is part of the Local Strategic Partnership (LSP). Government requires all local authorities to establish an LSP in their area, so as to engage the wider community in work for public benefit. West Berkshire HAG is chaired by the Chief Executive of the largest non-profit social housing provider in the area, who agreed to the author using its meeting as an opportunity to inform HAG members about policies that aid land value capture and thus help enable affordable housing. Value maps were used to illustrate aspects of LVT as one such policy.

Attendees of HAG meetings are mainly senior managers or policy specialists of organisations working in the local housing development industry. Only eight members of the HAG attended this meeting, out a possible membership of over twenty. Of these only five completed the form and owing to an error in photo-copying by the host organisation the form received by HAG

members at the meeting was missing all the key questions. A follow-up email with the missing page was immediately sent which elicited only two fully completed forms, however both were from highly influential and well-informed members of the local property industry: the chair of HAG herself and a partner in one of the main local property agents (realtors).

Neither respondent was very confident in their scores but they appeared to think value maps would be of some use across all areas. The property agent was sceptical as to the basis of HABU valuations underlying the maps. In contrast to the Waterfront conference delegates, both HAG respondents thought value maps were mainly for the benefit of the organisations supplying the data and software that enable them to be produced, rather than the property industry which they are supposed to serve.

### RICS Property Professionals

'3CPD<sup>29</sup>' is a non-profit company created by the Thames Valley region of the Royal Institution of Chartered Surveyors (RICS), the largest international U.K.-based body for property professionals. It exists to organise and market events aimed at its local members, for their continuing professional development (CPD). RICS requires all chartered surveyors to take part in CPD and to maintain a log of their activities if they wish to retain chartered status. 3CPD event attendees are mainly junior or mid career general practice surveyors, recently qualified and/or working in organisations that offer few in-house opportunities for CPD.

The particular event that the author presented at was advertised as being about databases for smaller professional practices. The main feature of the event was an illustrated talk about the use of spreadsheets for general property business management, which was seen by 3CPD's event organiser as the most suitable of the 2004/5 programme of evening events to be associated with. Advance publicity did not feature the added bonus of the author's slide show about GIS and value maps, entitled "Content and Uses for Professionals' Databases".

Nearly fifty people attended. Unfortunately the preceding speaker had difficulties with his slide projector, which resulted in some people leaving early and not seeing all the presentation on value maps.

Only six forms were fully completed, all but one by people regarding themselves as at least 'good' at valuation. Two of these scored the uses of value maps across the board at a maximum of '5' ('extremely useful') and thought they would 'greatly benefit' all stakeholders for which they felt qualified to score. The other three valuation professionals were more selective in their scores but all gave a 'very useful' score for value maps against 'could help reduce the number of appeals against assessments'. One of the three worked for the local VOA office, so his view should matter. There was least agreement over whether value maps 'are necessary for good land management', with one of the three giving this a score of '5' (the only top score given) and the other two not seeing much if any use for value maps in this area.

Of the stakeholder groups presented to the 3CPD attendees as potential beneficiaries of value mapping, only three were scored (once each only) at a maximum '5': Risk Insurers, Estate Agents, and Data Providers. Politicians were again seen as the least likely to benefit.

## County Council Seminar

This half-day event was at County Hall in the centre of Oxford. It offered probably the most useful audience to the author, because it was well publicised among a more focused group of people who attended free of charge. They were all either from the area local to the LVT study or had a clear professional reason to attend and learn about practical aspects of such a study. It was also late enough in the study to benefit from maps derived from the fully completed data model, not a provisional version.

Fifty-two people attended, including valuers, academics, officials from HM Treasury and the Local Government Association (LGA), as well as councilors and officers of the Oxfordshire local authorities behind the study. The author's questionnaire form was in delegates' packs and during his joint presentation on the results of the study he asked for it to be completed before departure. However only six forms were left with him, only one of which was from someone with expertise in land policy or valuation and only four were fully completed. Three of these were from county councilors.

The one expert's view was that value maps are universally useful and extremely beneficial to almost all stakeholder groups. Other views were very mixed. One person, an Oxfordshire county councilor, felt that value maps were 'no use at all' except to politicians and citizens, also possibly to help inform the property market. Yet the same person also scored under beneficiary stakeholder groups in such a way as to indicate that he felt politicians would receive no benefit from them, while other categories would receive considerable benefit. The other two councilors were more clearly of the view that most stakeholders would benefit considerably and that value maps had some – or even very great – usefulness.

## General Comments on Feedback to Value Maps

None of the above events benefited from all the final versions of value maps contained in this report. Also the extent of development of value mapping enabled through this study fell well short of what had been hoped for, owing to the late and poor completion of the data model of the area and the lack of resources to work on that model when it was completed.

Nevertheless there is enough encouragement from some of the responses from a range of relevant experts for a conclusion to be reached that value maps deserve to be developed further and exposed to a wider audience. Of those who completed the questionnaire forms, the vast majority expressed interest in learning about further development in value mapping. A meeting has since been held, arising out of the OxonLVT seminar, between the author and his university colleagues and Government officials specifically on the uses of value maps in property tax reform. HM Treasury has asked for a copy of the data model.

As expected, there is a very low level of awareness of the potential of GIS generally and value maps specifically, even among groups that would be expected to have an interest. This study did not set out to provide data for value maps and the author's interest in developing them for a wider set of uses is a by-product of LVT campaigning, which may cloud the views of people who see the results - in either direction.

Much more exposure and analysis of feedback from landvaluescape graphic presentations is needed before it can be categorically stated that value maps are worth developing in a very detailed geographic granularity. The whole idea of landvaluescape is a novel concept to the vast majority of people and not readily accepted by even some senior land and property professionals in the U.K.

## **Conclusions**

### **Success of the Study**

Judged against the objectives set by those who instigated it, the study was a success. It proved that LVT ought not to be difficult to introduce if there is the political will to do so: it is definitely feasible. It provided sufficient evidence to the Executive of OCC for that Authority to be able to confidently recommend to the U.K. Government that the time is ripe for further studies drawing on official sources of land and property information which the councils themselves could not use. Among the Working Party's own conclusions in their report to the Executive, these are relevant:-

*“(a) Valuations based on the undeveloped value of the land present no special problems to a professional valuer...*

*(c) The increasing availability of well-developed GIS systems and other IT developments have the potential to make all property tax administration and land use planning easier and cheaper.”*

This was the first study of LVT in Britain to involve the local authorities in active participation. It was inevitable that problems would arise. There was no support from central government, as would be provided if this had been an official initiative such as is required for LVT to be implemented. Moreover although VoWH managed to complete the study without significantly supplementing its resources (other than for site valuations), small authorities such as theirs are not endowed with spare capacity to undertake work of this nature. The study had to take a low priority and delays were inevitable. If this had been part of a central government initiative, VoWH would have had access to funds, staff and data that should have ensured a more timely completion.

### **Value of Lincoln Institute Contribution**

Given that Lincoln Institute's contribution was to finance the essential work of indicative professional site valuations, which proved possible broadly within the budget allowed by the Valuer, then the contracts to which Lincoln and the author were parties also succeeded. Apart from the considerable delays caused by problems alluded to above, which amounted to more than a doubling of the project duration from time of contract signing, nothing occurred to throw doubts on the prospects for eventual satisfactory completion. However key people at VoWH had to put it in a quite exceptional effort, which is not reflected in the cost summary, in order to ensure completion. This would not have happened without political backing.

Because of the artificial nature of a study of tax reform without support from the statutory central tax and other authorities, costs actually incurred (see Appendix 5) are likely to have been significantly greater within the local authorities and by the Valuer than would have been the case with a centrally sponsored government study. Data acquisition costs in particular cannot be extrapolated in any sense to give an indication of what it would cost to develop and implement LVT nation-wide or even authority-wide for an official LVT pilot.

All that can be said is that there is no reason from this study to suppose that LVT would be any more difficult or expensive to administer than current local tax systems, once initial teething problems are overcome. Indeed there is a good chance that net tax administration costs could be reduced, especially if the likely spin-off benefits from having to maintain a proper land cadastre to support LVT are factored in. Most of the problems that arose can be put down to lack of such a cadastre. Many of the benefits of LVT will appear through wider use of value maps that the tax system will require and enable.

### **Prospects for Further Studies**

Following change of control of OCC in May 2005, it is highly unlikely that the County Council will participate voluntarily in any follow-up studies. However VoWH is still run by a party that favours LVT and several other local authorities in Britain remain interested in it as an alternative source of local revenues.

It is likely that the Labour Government will, early in its third term, decide whether to pursue LVT as a potential source of public revenues, either at local government level or more generally. Officials and policy advisers are thought to be broadly favourable in principle but concerned about detailed practicalities and the political implications. The best that can be expected is for a decision in favour of official support to studies by the end of 2005, with actual trials of some reformed property tax similar to LVT possible about two years later.

### **Condition of Key National Datasets**

The main technical obstacle to LVT is the inadequacy of existing land and property datasets, specifically addresses and land parcels. This study confirmed that there are many potential uses for such datasets besides property taxes but that in the absence of a coherent U.K. strategy for GI there is not the confidence among key stakeholder groups necessary for the policy actions that would resolve these data inadequacies to be pursued. Such a strategy needs to conform to the spirit as well as the letter of the draft INSPIRE Directive of the EU, which includes land values among key datasets to be developed. It is not envisaged that these issues will be resolved for some ten years (i.e. before 2015) unless there is a change of Government priorities and policy on GI.

### **Recommendations for Further Work**

The most urgent action is for Government to acknowledge that U.K. land information is inadequate and that this impacts upon a number of important policy areas, including property taxes (local and national), spatial and transport infrastructure planning and housing. Merely

acknowledging this and agreeing to release publicly owned geodata for research purposes would stimulate interest in LVT and value maps by others. Barker (2004) alluded to this in a recent report on housing land supply and her recommendations are likely to be taken up in some measure later in 2005.

Further more extensive studies of LVT are predicated upon a more supportive attitude by national agencies such as VOA towards release of data. To some extent the development of value mapping can proceed at relatively small scales and limited levels of detail using publicly available sources but this will not directly assist research into LVT. For example the use of spatially attributed aggregated house price and mortgage or insurance valuation data from lenders, HMLR or insurers could be pursued with the aim of developing generic value maps 3D graphics at intermediate scales as public policy tools or to improve the working of the housing market. These tools could later be adapted at the level of land parcels to support LVT administration.

A study of the market potential of value maps themselves should be instigated by stakeholders in their use. These include VOA, HMLR, OS, local government as both data suppliers and users. This could be independent of moves towards property tax reform. The Oxfordshire LVT study and its by-products could be used in this market study. The author intends to conclude his PhD studies with a 'road-show' for property professionals, as a first stage.

If Government does decide to support studies of LVT, one of its first actions might be to take up the offer of VoWH to extend the land values dataset across the whole district. At the same time, the trial area used in this study should be revalued, so as to give a 'mini time series' at land parcel level and enable the wider implications of 'rolling revaluation' for property taxes to start to be assessed<sup>30</sup>.

Other areas that require further study as soon as possible and before LVT is used even for pilots include:

- \* ways of defining parcels of agricultural land at sub-farm-unit level, if farmland is to be included in LVT;
- \* whether capital or rental values should be used as the basis;
- \* how to acceptably define HABU for all types of land;
- \* the transition between existing property taxes and a future LVT, especially whether interim methods of assessment would be acceptable while the old taxes are being phased out.

There is a need for different kinds of area to be subjected to LVT studies. In particular areas of high-value retail and commercial land need to be looked at. Ideally a number of studies should be carried out simultaneously in a variety of areas under overall central control that would enable a more robust extrapolation of the effects of tax reform to be made.

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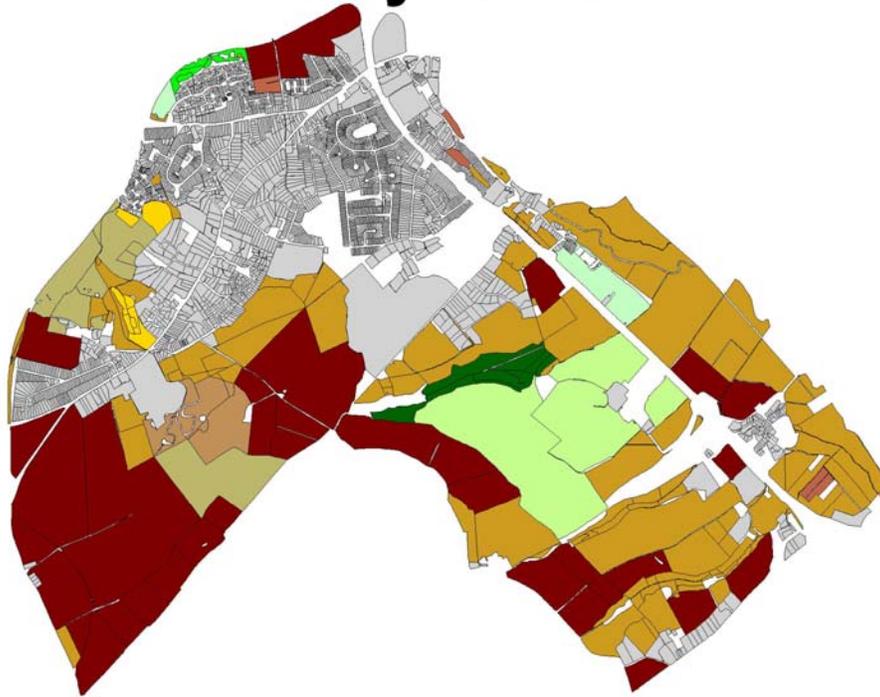
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## **Appendix 1 – Breakdown Of Land Uses In Trial Area**

**General note.** There is no statutory requirement to define land use categories in the U.K. nor is there a generally accepted categorisation system. For the purposes of the LVT study, land use was defined by the VoWH GIS team from a range of sources, some of which are more authoritative than others. For example, sites of special scientific interest (SSSIs) are officially designated with defined areas, whereas the distinction between ‘ploughed land’ and ‘cropped land’ changes seasonally according to the whim of the farmer.

# Landuse types in the LVT Study area



Land use in the LVT study area

	Residential, Industrial and Commercial Land
	Allotments
	Ancient Woodland
	Cropped Land
	Cropped land
	Golf Course
	Land
	Park
	Ploughed Land
	SSSI
	Sports Ground
	Woodland

Source: Ordnance Survey

The map above includes 'white' highway and undefined public use land, for which no parcel area figures are available. It was considered that no LVT would be levied on these areas under any scenario. The numbers of parcels and their total area in hectares, used in the study, are given in the table below.

Land Use Category		Nos. of parcels	Area (hectares)
Main	Secondary		
Agricultural	Farming	167	56429
	Woodland	8	643
	Allotments	5	448
	SSSIs	7	1848
<b>Total Agricultural</b>		<b>187</b>	<b>59368</b>
Commercial	Catering	5	87
	Communications	3	<1
	Leisure	5	71
	Manufacturing	7	1002
	Office	13	730
	Retail	13	215
	Short stay parking	2	32
<b>Total commercial</b>		<b>48</b>	<b>2136</b>
<b>Domestic (total)</b>	<b>Residential</b>	<b>3095</b>	<b>20435</b>
Public Use	Community	20	354
	Educational	5	3268
	Health	3	47
<b>Total Public Use</b>		<b>28</b>	<b>3669</b>
<b>Grand Total</b>		<b>3358</b>	<b>85608</b>

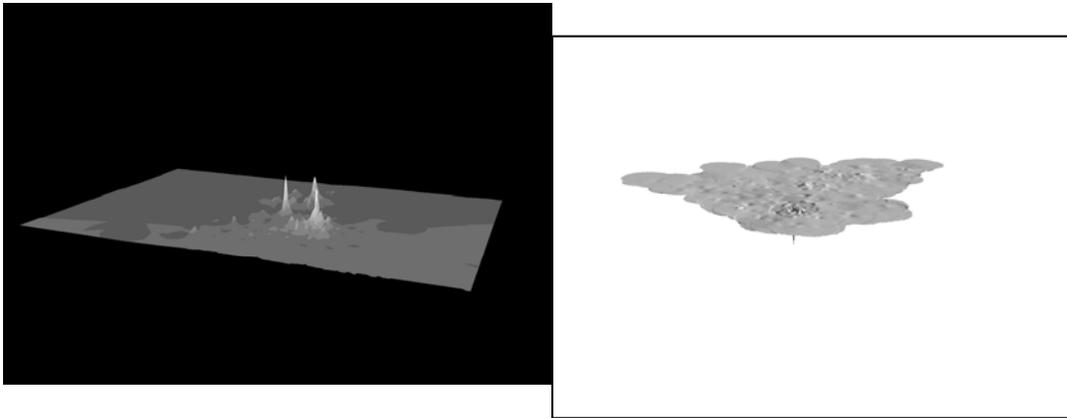
## Appendix 2 –Valuers Report

This document is held by the author

## Appendix 3 – Landvaluescape Graphics

The study showed that it is possible to generate 3D visualisation graphics and ‘value contour’ plots of a large-scale parcel level ‘landvaluescape’ using tax assessment data. However there was insufficient resource available to work on the data before the main phase of the study was complete and none at all from within the local authorities sponsoring the study. There were also problems caused by gaps within the trial area model, where no land value had been assessed and this made it difficult to automatically interpolate and smooth sensibly. Much more work is needed when a suitably skilled person can be identified to work for longer to develop the techniques in a UK context which are fairly common in some other countries.

This appendix merely describes what graphics were produced and the problems encountered. Because the HMLR house price index dataset was used first, while completion of the OxonLVT trial dataset was awaited, the ‘England & Wales Landvaluescape’ products are described first.



The left-hand picture above is a view of the model from a point south-south-east of England. Unlike the picture to the right, the model has not been clipped at the coastline, so it exhibits edge defects. It shows the very high concentration in land/house values in parts of the south east but also two anomalous peaks further north. These can also be seen in the left-hand map of Figure 9 in the main paper. The model uses the inverse distance weighting (IDW) algorithm<sup>1</sup> to smooth

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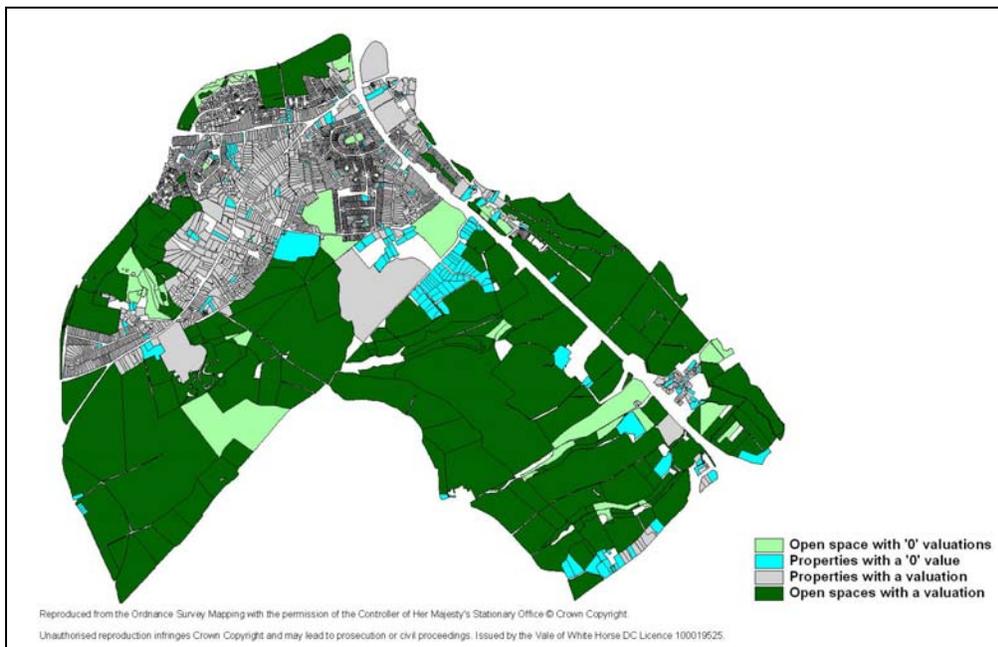
<sup>1</sup> The IDW algorithm estimates the value of unknown points as a weighted average of nearby points with a known value, with the greatest weight being given to the nearest points. (Longley *et al.*, 2001) The two maps above were created using the IDW algorithm but vary in the way they select the points with a known value to use as the input for interpolation. The left-hand map is created by searching a fixed number of points regardless of the distance they are from the unknown point, the map on the right-hand side searches a fixed radius for the points it will use to determine the value of the unknown point.

the values for nearby ‘parcels’ (in this case local authorities) but fails to allow the viewer to relate the peaks to specific areas or to show more than broad generalities.

The right-hand picture, viewed from south-east of England, shows the difference in values between third and fourth quarter datasets for 2003, using a modified IDW algorithm (see Figure 9).

Average values for each local authority (LA) are assumed to apply at the centroid of each. The boundaries of each LA are not shown here. IDW smooths the values to form a surface for the whole country: the coastline is ‘blotted’ by the overlapping circles that the spatial algorithm follows. More work needs to be done to enable such graphics to be useful.

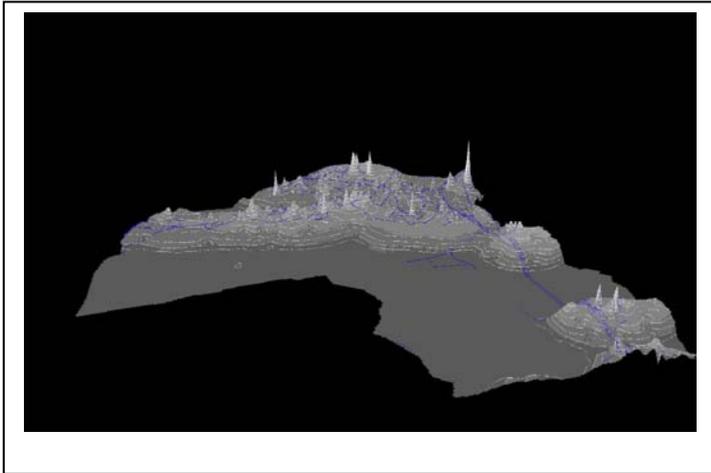
As has been said, the main problem with the OxonLVT trial area is the large number of land parcels without a site value (see next figure). It can be seen that a residential estate towards the east of the area is missing, also several individual plots elsewhere. This highlights the problems that follow from lack of a U.K. cadastral database and land and property gazetteer: problems which affect all land management applications by governments at all levels.



In order to create the Landvaluescape surface in the trial area the IDW algorithm uses points with a known site value to estimate the unknown site value of other points within the study area. Therefore any point without a value will be assigned a value based upon the nearest points with a known value. Therefore where the values are restricted to just the residential sites the algorithm will estimate all other points to a distance thus creating the shadowy effect around the surface.

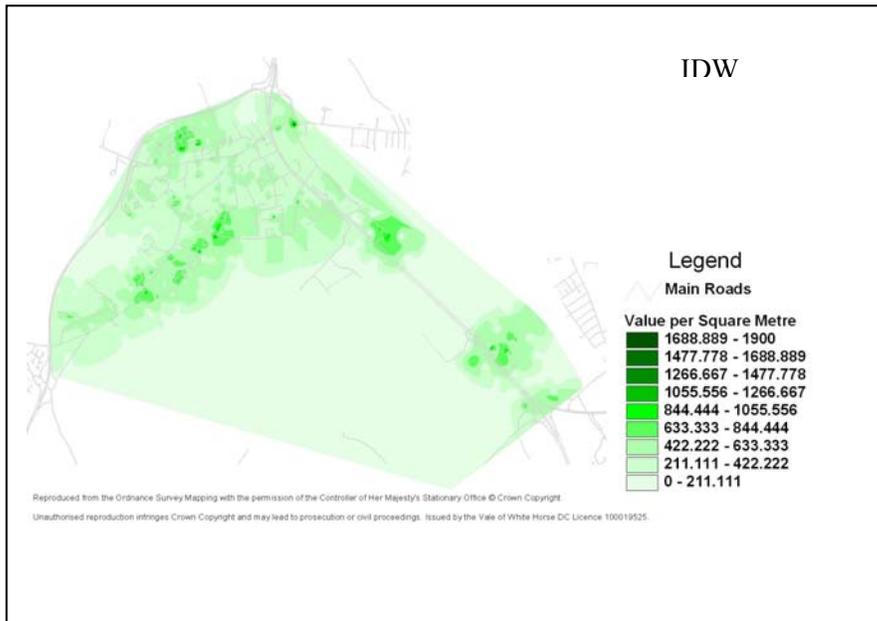
Attempts were made to create 3D images from the model. It was not possible to create a useful graphic with all the land parcels shown as well as landvaluescape. The next graphic is a ‘cookie-cut’ image (i.e. trimmed at the edge of the area) with roads (blue lines) and value contours (pecked white lines) draped over it. The view is taken from above and slightly west of due south and clearly shows the edge of the built-up area as the edge of a ‘low value plain’. Peaks of high value commercial land are also evident, with a relatively tight circle of influence distance reducing the smoothing effect. This allows anomalous values to be investigated if required.

However this graphic doesn't allow the northern edge of the trial area to be seen, as it 'slopes' away from the viewer.

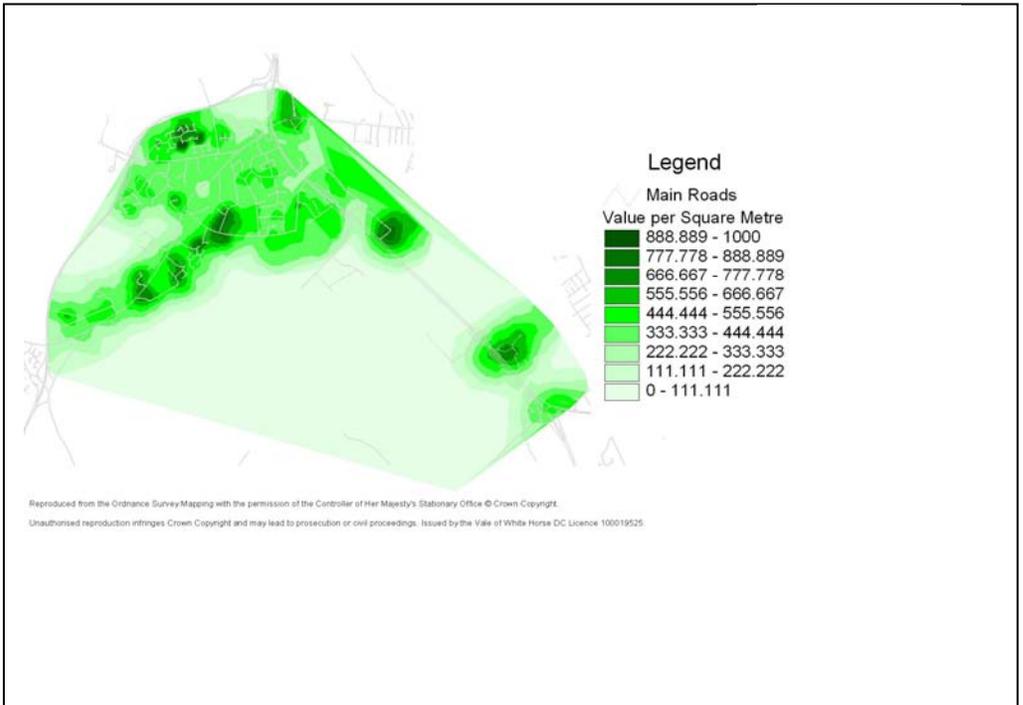


The same version of the 3D model is then presented as a layer-tinted value contour plot. Again the roads are shown, this time as white-filled blue lines over the value-tinted layer. It begins to be possible to identify high-value residential areas. Note that what is plotted is site value per square metre, in pounds.

Finally, the model is recalculated using a different spatial algorithm for smoothing, which is also available through an extension for ESRI ArcView software: kriging.<sup>2</sup> As well as showing how the use of different maths can affect the resulting landvaluescape view, it shows how different graphics can be more or less effective.



<sup>2</sup> Kriging is another spatial interpolation method; it determines the properties of known values and then applies those properties to the points with unknown values. There are a number of methods of kriging that can be used to determine the unknown value, and the user will select these depending on the method that is most suitable for the data. In the image below, Ordinary kriging was used to estimate the properties of the known points and apply them to make the surface.



Reference: Longley P, Goodchild M, Maguire D, and Rhind D, 2001, Geographic Information Systems and Science, Wiley, Chichester, New York, Weinham, Brisbane, Singapore, Toronto.

## Appendix 4 – Value Mapping Event Feedback Forms<sup>3</sup>

### Waterfront Conference 16 September 2004: Value Maps Feedback Form

(forms completed on the day will be entered in a prize draw for a free copy of the book “Land Value Taxation in Britain: Experience and Opportunities” by Owen Connellan, normal price \$20 + \$6 p&p.)

Tick this box if you do **not** want to be entered in the draw  Complete all shaded parts.

**Forms completed after the conference should not be sent to the conference organisers but to: Tony Vickers, Modern Maps, 62 Craven Road, Newbury, Berks RG14 5NJ (fax 01635 230046)**

During the conference you will have seen many examples of Value Maps<sup>4</sup>. A research project at Kingston University School of Survey is looking at the case for ‘UK plc’ to implement a national value mapping programme, which would be greatly assisted by (and would itself assist) Land Value Taxation. After hearing the case for LVT and seeing examples of Value Maps, your views are sought as part of this research<sup>5</sup>.

**A. About You.** (All information supplied will be used in strict confidence for this research only.)

1. Name: \_\_\_\_\_
2. Organisation: \_\_\_\_\_
3. Contact details (attach business card or insert:) email: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_
4. Ten ‘Value Maps Stakeholder Groups’ are defined for the purpose of this research, in the table below. Please tick one Group that you most closely belong to.

Stakeholder Group	Code	Tick one
Property & geographic data providers	D	<input type="checkbox"/>
Software suppliers and IT consultants	S	<input type="checkbox"/>
Property tax administrators	T	<input type="checkbox"/>
Urban planners	U	<input type="checkbox"/>
Sponsors of national <i>e-government</i> projects	N	<input type="checkbox"/>
Politicians and campaign groups	P	<input type="checkbox"/>
Property investors	I	<input type="checkbox"/>
Insurers and underwriters	R	<input type="checkbox"/>
Entrepreneurs and business managers	B	<input type="checkbox"/>
Real estate agents and their customers	E	<input type="checkbox"/>

5. Four areas of expertise are relevant to this research. Indicate your level of expertise in each (4=expert; thro’ to 0=nil) below:-

Field of expertise	Level
Spatial analysis techniques	<input type="checkbox"/>
Valuation	<input type="checkbox"/>
Land and tax policy	<input type="checkbox"/>
Geo-data policy	<input type="checkbox"/>

Your current job description:-  
\_\_\_\_\_

Note: \* delete as appropriate

6. Had you been exposed to or used Value Maps before this conference? Yes / No\*
7. Would you be interested in receiving details of the progress of this research? Yes / No\*
8. Have you any objection to being contacted for further views at a later stage in this research? Yes / No\*

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

<sup>1</sup> For the events on 23 Nov 2004 and 25 Jan 2005, Questions 10 and 11 were not asked.

<sup>2</sup> Definition of Value Map used for this research: “Any map that shows the variations in land or property values, where data are derived from market transactions and/or professional assessments made for taxation purposes in accordance with local statute.”

<sup>3</sup>For details of the project “Visualising Landvaluescape”, see [www.landvaluescape.org](http://www.landvaluescape.org) or contact the researcher [tonyvickers@phonecoop.coop](mailto:tonyvickers@phonecoop.coop)

**B. Your Views**

**9. Uses of Value Maps.** Indicate the extent to which you agree with the following statements, using a ‘score’ from ‘5’ (= ‘extremely useful’) to ‘1’ (= ‘no use at all’)

No.	Statement	Score
1	Value maps could help achieve better property tax assessments.	
2	Value maps could help taxpayers better understand the basis of assessments.	
3	Value maps could help reduce the cost of tax administration.	
4	Value maps could help reduce the number of appeals against assessments.	
5	Maps could be used by development and environmental planners.	
6	Maps could help inform the property market.	
7	Maps could help elected politicians, their advisers and citizens understand their local economies and so enable better government decisions.	
8	Value maps are necessary for good land management.	

**10. Policy Options.** A number of policy proposals have emerged from this research so far. Indicate which (if any) you would support, with a ‘desirability score’ against each (5 = ‘extremely desirable’; to ‘1’ = ‘extremely undesirable’)

No	Description	Score
1	Government to support existing LVT ‘desk studies’ by others, specifically by allowing access to confidential publicly held property value data in trial areas.	
2	Enabling legislation to allow trials of LVT in a range of areas.	
3	Commission a UK Value Maps Market Analysis.	
4	Government to appoint a single UK politician as Champion to oversee all national geo-data initiatives, including valuation within land management.	
5	Re-engineer VOA’s IT systems to ensure advances in CAMA <sup>6</sup> and GIS techniques are exploited, both for internal efficiencies and wider public benefits.	
6	Compare first- and second-order costs of continuing with periodic revaluations for the present local property taxes (UBR/CT - albeit modernised and using GIS), and replacing both with LVT and annual or ‘rolling’ revaluation.	
7	Extend UBR to cover all non-domestic, non-agricultural land, including vacant sites and derelict buildings at HABU <sup>7</sup> valuation, to give nation-wide coverage of property values.	

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<sup>4</sup> Computer Aided Mass Assessment.

<sup>5</sup> Highest and best use.

## Appendix 5 – Trial Cost Estimates

**General.** The study had several different drivers and no overall purpose, hence no basis from the start upon which to assess costs and benefits in total. The purpose of this appendix is to assist the planning and budgeting of any future task of a similar nature which might be proposed.

There were several sources of funding for the study, obtained at different stages as various participants found it necessary. The County Council obtained authority to spend £500 to establish and support a Study Team, which then had to appeal for funds to carry out site valuations and for District Council resources to be allocated for those parts of the work that it was equipped to carry out. External funding was essential for anything specifically related to LVT, because local authorities have no independent remit to undertake research on tax reform. The cost of producing site valuations was artificially constrained by the size of the Lincoln Institute grant for that purpose, the separate Lincoln grant towards the Waterfront conference costs is acknowledged as having promulgated the work of the Study Team – and helped to market the recently published book by Connellan - but did not contribute to carrying out the study itself. Various small donations helped the Study Team conclude its report and a personal grant from the Director of JRF to the author of this working paper enabling him to produce it.

Much of the database creation work (data matching and appraisal in particular) needed to be done anyway, irrespective of the LVT study. Similarly there was considerable spin-off value in the mapping: polygon creation and land use categorisation. Very little work by council officers was related to site valuations or LVT: the largest part of the work done within VoWH which could be said to exclusively relate to LVT was by the politician Cllr Bizzell on an unpaid, non-chargeable basis: the Tax Scenario modelling. Most local authorities would not have someone with the expertise and motivation to do this work unpaid, so that his time (five days is a rough estimate, as he did not keep a record) ought to be added to the total.

With the above *caveats*, the schedule of costs below is given as a rough estimate only. If, as is hoped, any future study of LVT is carried out with the blessing of U.K. Government, a very different basis of costs and a significantly smaller total would be derived by comparison.

The costs tabulated below were obtained from the Project Manager in December 2004 and use FY 2004/5 rates. They are probably lower than what was actually spent but more than would have been spent if the work had been supported by central government. It must be remembered that this was the first project of its kind in the country and the officers involved were doing the work on top of their normal duties. However about half the cost could reasonably be considered of general benefit to the their normal work and to the Council as a whole: the LVT study was merely a key driver.

Officer time – daily rates of local authority staff

SB	-	Project Manager @ £257
HB	-	Revenues practitioner@ £209
JB	-	GIS officer @ £174

Project Activity	Days			
	SB	HB	JB	Total
Database Creation				
Data Extraction (Council Tax & Business Rates)		1	2	3
Data cleansing (preparing for matching)			1	1
Data matching (with corporate property database)			6	6
Data appraisal (other potentially useful databases)			4	4
Data import (site values & additional records)			2	2
Mapping				
Linking data records with digital maps			14	14
Polygon completion			5	5
Site area calculations			2	2
Tax Modelling				
Model building (Excel based)	3			3
Display & linkage with GIS			1	1
Project Management				
Co-ordination, monitoring & corrective actioning	11	2		13
Report writing	1			1
<b>Total days</b>	<b>15</b>	<b>3</b>	<b>37</b>	<b>55</b>
<b>X Daily rates (£)</b>	<b>257</b>	<b>209</b>	<b>174</b>	
<b>= Cost (£)</b>	<b>3855</b>	<b>+ 627</b>	<b>+ 6438</b>	<b>= 10920</b>

### County Council Activities

The Liberal Democrat Group Support Officer acted as Secretary to the Study Team and probably spent in excess of 20 days of her time on the study over two years. This included servicing meetings, filing correspondence and organising the seminar in January 2005. One other officer attended most meetings but was not required to do much else. The four councillors' time is not counted in the total, although considerable time was spent writing and commenting on the Councils' joint report.

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## Endnotes

- <sup>1</sup> Local councils in the U.K., unlike much of North America, have no discretion over the types of local taxes they can levy. Primary legislation at national level has to precede even tax-raising trials.
- <sup>2</sup> On May 5<sup>th</sup> 2005, Cons won outright control of OCC in county-wide elections.
- <sup>3</sup> This section draws heavily on OCC (2005), the report of the Working Party.
- <sup>4</sup> Cllr Roaf replaced Cllr Godden as Leader of the Lib Dem Group and Deputy Leader of Council in April 2004.
- <sup>5</sup> David Illingworth was a senior official in the Financial Services department of OCC.
- <sup>6</sup> Some parts of England and all of Scotland and Wales have a single-tier local government structure but most of the less urbanised areas are two-tier. Counties run education, highways, social services and strategic planning; DCs run housing, development control, leisure, municipal waste collection, environmental health, democratic services (elections) - and local taxation.
- <sup>7</sup> Site Value Rating (SVR) is the local form of LVT. It is currently the policy of the Lib Dems in England to replace the non-domestic rates levied on occupiers of most business premises with SVR levied on all land not used for agriculture or principle residences.
- <sup>8</sup> Local authorities can each hold dozens of separate address datasets. LLPG compilation typically produces a 70% rate for matching records of individual properties and a significant proportion of properties are unrecorded in crucial datasets such as those used for electoral registration and property taxes.
- <sup>9</sup> Around 40% of records had to be matched manually, according to Black in OCC (2005).
- <sup>10</sup> Extracted from the Revenue Section's Civica (previously Sandersons) system, using the parish identifier in the records and imported to MS Excel.
- <sup>11</sup> VoWH use MapInfo GIS software, which does not have 3D analysis capability. ArcView was used by Holloway for this paper.
- <sup>12</sup> Strictly between Kane's firm, at that time Clark Scott-Harden Ltd. Shortly after commencing the work, Kane moved to Rapleys LLP, another firm of chartered surveyors.
- <sup>13</sup> Kane's experiences in Liverpool are set out in Vickers (2002) and were largely repeated in Oxfordshire.
- <sup>14</sup> Hudson (1975) deals with this problem and suggests a Certificate of Development Potential (CDP) be produced on request by the planning authority, purely for the purpose of valuation for taxation.
- <sup>15</sup> The Land Registration Act 2002 now requires buyers to supply price paid information and details of mortgages and other interests to HMLR but not other information which would allow a valuer to reliably assess whether the price represents a fair market value.
- <sup>16</sup> In a 'Property Brief' on the front page of its August 13<sup>th</sup> 2004 issue, the *Oxford Times* says: "...in the south east, which includes Oxfordshire, traditional individual farmers represent the lowest proportion of purchasers of agricultural land and lifestyle purchasers the largest." It cited a RICS report that between June 2003 and June 2004 agricultural land in the region increased in price by 16 percent.
- <sup>17</sup> Previously referred to as the 'MAFF category' (Ministry of Agriculture Food and Fisheries no longer exists), this is an official index of value for agricultural purposes, based on soil, drainage, etc.
- <sup>18</sup> Urban Capacity Studies are being done for the whole of England by local planning authorities. They will be an important source of evidence for valuers, especially in residential areas, if LVT were to be adopted.
- <sup>19</sup> The Agreements between Lincoln, VoWH, CSH and the author allow the datasets produced for the trial to be made available, upon request to any of them, for the purpose of research. Requests should be submitted to the Chief Executive of VoWH in the first instance.
- <sup>20</sup> Other reasons have been advanced to explain this unexpected shift from commercial to residential tax burden. These include the absence of any significant amounts of unused, derelict developable land and property in the

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- trial area and the low proportion of higher value commercial uses such as are found in Oxford city centre. It is not the purpose of this report to explain such things, only to describe how well (or otherwise) the use of GIS can illustrate them.
- <sup>21</sup> Property ID 001100 Timbmet Ltd, Cumnor Road (see Appendix 2)
- <sup>22</sup> The Swedish wealth tax includes an assessment of property assets and is administered within the income tax system (Swedish Tax Board 2001)
- <sup>23</sup> AtisReal is the new trading name of Atis Real Weatheralls (ARW).
- <sup>24</sup> Elliott was working one day a week for HGF, and four days a week as a methodologist for the Office of National Statistics (ONS).
- <sup>25</sup> Although construction costs are available regionally, dwelling densities are not. Elliott assumes that the land occupied by an average new dwelling is the same throughout England, which is not the case.
- <sup>26</sup> Although only 5% of mortgage offers was requested by ODPM for the national House Price Index, it has proved easier for most lenders to supply their entire dataset than to supply a sample. Consequently ODPM estimates that the Index is based on about 70% of purchases by first-time home-owners. It excludes lending for buy-to-let. (ODPM 2004)
- <sup>27</sup> Coasts are in fact the first parts of Europe where the word ‘landvaluescape’ has featured in public policy literature. The impact of climate change on sea levels and hence on land values in coastal areas was studied by Eurosion (2004) in a report where landvaluescape was described as *“a key input for a number of analyses, namely assessment of economic capital at risk, and cost-benefits analysis”*.
- <sup>28</sup> JRF’s founder was a follower of Henry George. 2004 was JRF’s centenary year. Its Director Lord Richard Best attended the Waterfront conference and in addition to a specific grant for the event has secured over £500 towards the study by OCC and £5000 to the author in 2005 for his wider LVT research, part of which has been used to produce this report.
- <sup>29</sup> the ‘3’ in 3CPD stands for the three counties in the Thames Valley sub-region: Oxfordshire, Berkshire and Buckinghamshire.
- <sup>30</sup> Annual revaluations have recently been suggested by Heard (2005). OCC (2005) concluded that, after initial valuations for LVT, *“the system would be simpler and cheaper to maintain than those based on developed values”*.