7 – Conclusions and recommendations

This final chapter revisits the original hypothesis, the objectives of this research and the conceptual model for 'Landvaluescape', critically analysing findings from the literature review, Delphi and other strands of the work, to reach conclusions and suggest lines for further research.

The policy environment in which the subject matter and stakeholder groups exist is fluid and sensitive to change. However by undertaking four independent and parallel methods of research, it has been possible to draw a robust set of conclusions:

- The literature review (chapter two) increased in significance, relative to the Delphi, as the study proceeded. It was initially scoped to inform the researcher as to the baseline level of knowledge in a range of subjects related to Value Mapping. It became apparent towards the end of the Delphi Process that the policy environment was changing rapidly in key respects (GI and climate change) and that the Group composition was deficient in two key areas: insurance and strategic spatial planning. Therefore the literature was revisited after completion of the Delphi.
- A detailed critique of the Policy Delphi (chapters three and four) as used for this research is in Appendix J. This includes an analysis of the possible impact on the study of how the integration of the Delphi Process with the other two strands of empirical research (overseas surveys and use of a demonstrator) was managed. In summary, for various reasons little integration of the three strands took place, although the Process was internally robust and well received by participants. The absence of links with other strands had one beneficial unintended outcome: all three strands arrived at results almost completely independently, yet reinforced each other's findings in most respects.
- The overseas surveys before and during the Delphi (chapter six) were less comprehensive than had been hoped for but were followed up by in-depth studies of five comparator countries, which produced a number of insightful

and relevant conclusions. However this delayed completion of the overall study.

- The Value Maps Demonstrator (chapter five) was also not as successful as had been hoped and could not be used to inform the Delphi Process. However this outcome itself is significant, proving the existence of the major obstacles highlighted both in the literature and by the Delphi participants.

Therefore the overall methodology is regarded as fit for the purpose. It has enabled a robust set of answers to be given to the research questions (restated in the next section).

Nevertheless the policy environment remains fluid and the range of possible instances (applications) of future British Value Mapping varied, in scale and purpose. This makes predicting the outcome and defining the meaning of "implementing" hard. Figure 7/1 below is a simplified version of Figure 4/3 (based on the Delphi Process outcome) and shows one possible Action Plan, with indicative timescale, illustrating three possible scales (small/national; medium/regional; large/local), using a colour code. Red indicates small-scale; green is medium-scale; yellow is large-scale. Illustrative maps are boxed in these colours at appropriate points in the timeline.

Figure 7/2 describes various aspects of the conceptual information domain and stakeholder typologies occupied by the range of possible Value Mapping applications at each of these scales, drawing on Manning (2009) and Schlossberg and Shuford (2003) respectively. These graphically summarise the conclusions from analysis of all strands of the research. The following sections refer to these.

The idea of Visualising Landvaluescape remains largely invisible to the wider GI and land polity and therefore subject to external influences such as those described below, despite being regarded by the Delphi Group as capable of being fully implemented within some five years.

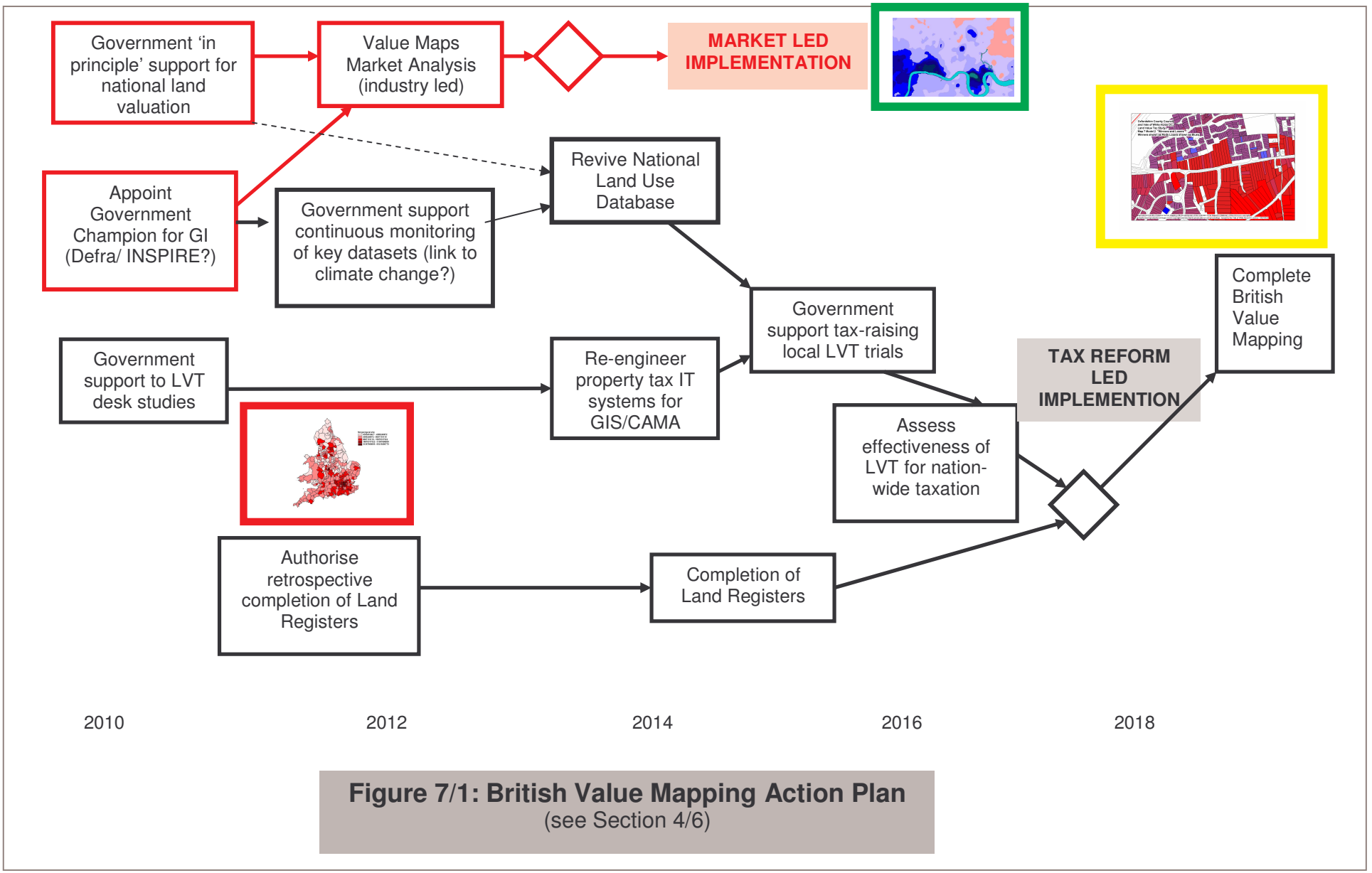

Figure 7/1: British Value Mapping Action Plan
(see Section 4/6)

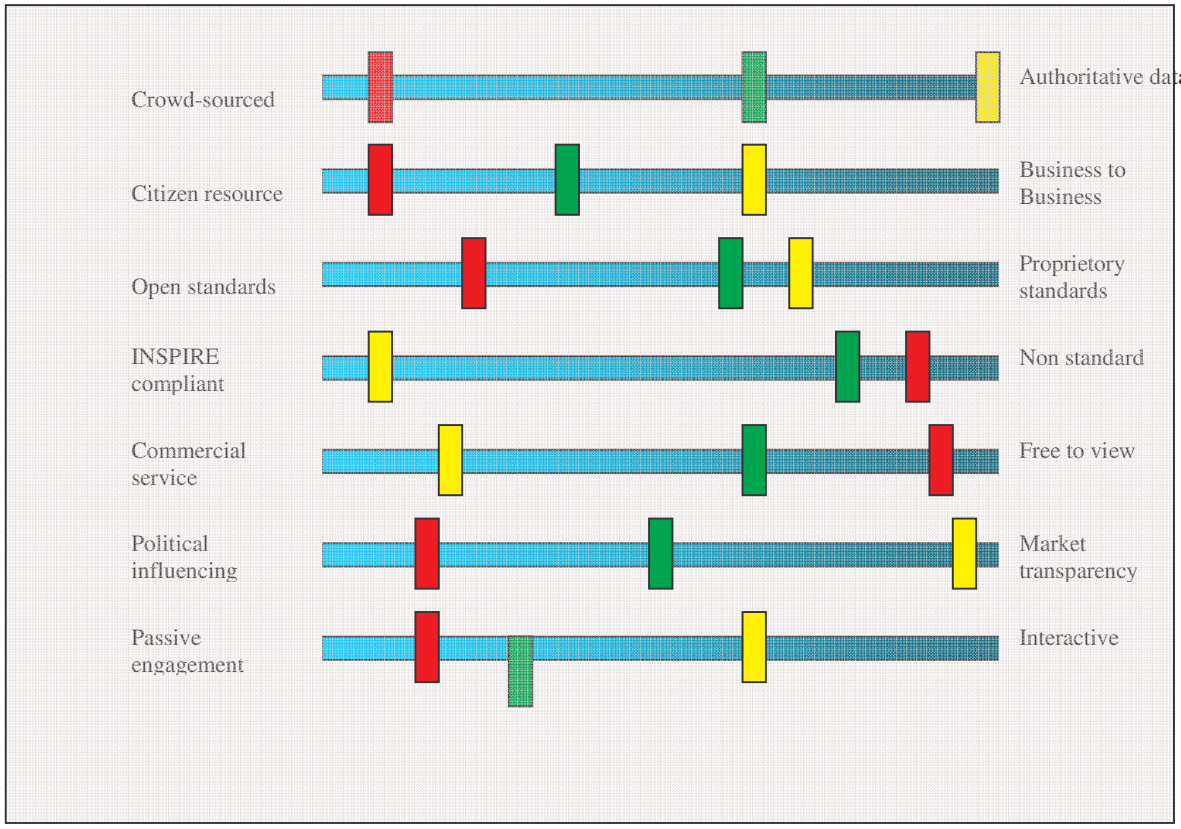

Figure 7/2: British Value Mapping information domain and stakeholder typologies

After Manning (2009:16) (design and first three indicators)
and Schlossberg and Shuford (2003:22) (last two indicators)

Notes to Figure 7/2:
"Crowd-sourced" data is supplied free and unchecked by the public, as opposed to "authoritative" data which is validated and supplied by or on behalf of Government.
A "citizen resource" is a service designed to be used by ordinary citizens, not by businesses.
"Political influencing" through to "interactive" are selected purposes of Public Participation GIS, according to Schlossberg and Shuford (2003). The four purposes chosen for this diagram are represented diagrammatically in a different way to that used by those authors.

7.1 Revisiting the hypothesis & objectives

The hypothesis to be tested was that the concept of Visualising Landvaluescape now offers discernable public and commercial benefits for Britain, sufficient to justify immediate and coherent steps to be taken to overcome any institutional, technical and policy (including tax policy) barriers that might be exposed. It compared the situation during the period of this research and into the foreseeable future with that revealed by Howes (1980) some thirty years earlier, when Value Mapping was last known to be of interest to academic researchers in this country.

There are three implicit research questions to be answered in testing the hypothesis:-

- Was it established that the Landvaluescape concept is understood and regarded as worthy of investigation in Britain, such that visualising this 'economic reality' by means of Value Maps and other graphics merits action?
- Have the benefits to various stakeholders and costs to both private and public sectors through implementing the British Value Mapping programme been established?
- Have the barriers to implementing a Value Mapping programme in Britain and the potential steps (including further research) to overcoming those barriers - an Action Plan – been identified?

Each question is analysed, discussed and answered in the following three sections, synthesising what was learned from each strand of the research. The final two sections summarise the overall conclusions drawn from this research and a number of 'next steps' recommended for further work in this area.

7.2 Perceptions of Economic Reality: Britain and Overseas

Landvaluescape is not an immediate concern to any significant element of polity anywhere in the world. Examples of Value Mapping are still, as in Howes' time, invariably found only where an *ad valorem* property tax is established and modernised to reflect property market conditions (see section 6/8). Those who initiate the design of these tax systems and who use them are, mainly if not exclusively, concerned with achieving fair, efficient and transparent assessments of taxable value and not with assisting spatial planning decision making. They focus on defining neighbourhoods or zones possessing broadly similar value characteristics, each typically of a few hundred properties, to refine the AVM (generally CAMA using applied GIS) processes which produce the overwhelming proportion of those tax values. Any use of maps is often only as an input to the process, not an output.

Despite the maturity of spatial analysis technology in other fields, there are few examples of property tax authorities worldwide that have adopted a holistic approach to the design of their systems, such that other applications for the fiscal cadastre are made possible. Examples studied in Lucas County Ohio (USA) (Section 6/4), Victoria (Australia) (6/7), Denmark (6/3), Lithuania (6/5) and Sweden (6/6) illustrate that a very small number of practitioners and even fewer academics associated with them are aware of the wider potential uses of Value Maps and the underlying datasets which they have developed for tax use; none appears to have developed a holistic concept of Landvaluescape. Other applications for fiscal cadastres are however beginning to be developed, especially for online use by property market players such as property investors, commercial property agents and insurance underwriters. Yet the recent academic literature is almost devoid of any discussion of these wider uses.

The Delphi Process and the FIG surveys in this research showed that property professionals in many disciplines and many countries are receptive to the Landvaluescape concept, independent of tax uses of value maps. They recognise that technology and increasing availability of geodata from their

property markets are making Value Maps economically viable. British stakeholders in the Delphi clearly recognised the strong link with taxation, although some questioned the inevitability of a tax-inspired implementation of British Value Mapping. However there is a general lack of coherent holistic thinking on the subject at the higher levels of polity, in governments and professions worldwide, symptomatic of a lag in applying geospatial technologies to land management generally (Williamson *et al*, 2006; Jackson *et al*, 2009). Even in America, where CAMA and GIS are most advanced, the literature on value maps is almost exclusively related to tax and that on PPGIS, such as Schlossberg and Shuford (2003), barely touches on property value mapping.

This lack of interest and coherent thinking is especially evident in Britain, from the academic and official literature over many years. Our unusual mixture of property taxes, with the banded and somewhat contentious nature of the Council Tax in particular, means that there is no body of practitioners in property taxation from which is likely to emerge (as in the examples above) innovative modern Value Mapping systems that might have wider applications, unless tax modernisation and reform are imposed from outside the practitioner communities. The Delphi Group, including its representatives of those communities, found it hard to separate the non-contentious issues around implementation of Value Mapping from the contentious ones relating to a major property tax reform (see sections 4/2 to 4/5): an equivalent group from most other countries would probably not have needed to.

Largely because of the lack of a comprehensive property tax and deficiencies in the fiscal cadastre needed to support it, Britain is relatively deficient in valuation professionals familiar with AVMs. The literature (section 2/4) and (to a lesser extent) the Delphi (4/7) showed that this is likely to change rapidly, as changes to International Valuation Standards and pressures on financial institutions that invest in property take effect. Meanwhile there is perhaps a poorer basic understanding of Landvaluescape among property professionals in Britain than in most developed countries, owing to the different ‘non-cadastral’ environment in which they work. Also there is little indication that non-tax applications for AVMs,

such as those used by lenders, have a GIS component or use Value Maps. Even in CAMA/GIS, the recent NI DR project showed that despite all the relevant datasets having been brought under the same Government department during this modernisation of property tax, it has not led to a multi-purpose approach or any use of Value Maps.

The more recent literature relating to climate change and strategic spatial planning (see section 2/6) indicates that the non-tax reasons to visualise Landvaluescape at intermediate scales are becoming stronger. This aspect was not stressed to the Delphi Group, nor was it dealt with in the other strands of empirical work.

There remains an absence of the “demonstrable demand” for Value Maps in Britain that Howes noted, despite positive developments in the potential for their use and the ease with which the Delphi Group and others encountered in this research understood the Landvaluescape concept and its potential usefulness. This is largely because of the “bounded rationality” within which the whole information polity operates, which makes it hard for any individuals possessing part of the necessary knowledge and awareness to take effective action in an area where Government has control over the fundamental reference datasets.

Nevertheless the Delphi Group remained of the view with which they began the Process eighteen months earlier, after learning about the various issues confronting any British Value Mapping initiative, that it could – even would – be implemented within some five years. Subsequent developments, especially in the understanding of climate change impacts, would reinforce this view. What this means and the barriers to overcome on the way, also the costs, benefits and actions involved are now summarised in the next two sections.

7.3 The Case for a British Value Mapping Programme

Despite the absence of 'demonstrable demand' for Value Mapping, this research has revealed 'discernable benefits' from at least one category of non-tax stakeholder. In the absence of any 'tax led' motivation to develop the concept, a combination of public and commercial arguments have been discovered. Uniquely to Britain, a holistic, multi-disciplinary and multi-sector approach to Value Mapping appears more likely to trigger its development as a suite of multi-scale graphic tools for land and property decision makers. From the Delphi Group's perspective, this was set out under categories of stakeholder in section 4/7. This section draws that together with findings from other strands, especially the overseas case studies (chapter 6) and the literature (chapter 2).

Private sector case

What the Delphi Process uncovered is that there is a case to be made for a more strategic small- or medium-scale dataset and product range to support non-tax Landvaluescape visualisation. This was illustrated in the top part of Figure 4/3 and called the Market Led Action Plan, simplified as Figure 7/1. Subsequent reading of recent literature relating to impending global crises in climate change and asset-backed lending strengthens that case.

The one Delphi participant from the insurance industry was able to give a well informed estimate of annual benefits to that industry and its clients of 30 to 100 million pounds per year, from just one value-related mapping application: fluvial and coastal flood risk. This represents a return on investment in a single year of at least 7:1. Subsequent developments in the modelling of ground-water and surface flooding, and work in hand to improve coastal flood mapping in the context of predicted sea-level rises (Nicholls *et al*, 2007) and more frequent extreme weather events due to global warming, will result in that figure rising and becoming more robust. Not surprisingly, flood risk mapping is the subject of considerable European research (Spachinger *et al*, 2008). However the ability to produce more targeted insurance risk premiums could have the effect of making many properties uninsurable, transferring the risk and associated potential

interest in value mapping to the state, as insurer of last resort (Kenney *et al*, 2006). This is already the situation with flood risk management in most other developed countries.

The insurers' business case is not for value mapping *per se* but for flood mapping: for which height and address datasets are inputs but which is itself an important determinant of land use and value. This illustrates the complex nature of the interactions between data suppliers and users and the resulting value chains in the UK SDI, which Manning (2009:15) says needs to be designed as a "federated, collaborative 'joint venture' involving public, third and private sectors", to "evolve as the [polity] environment evolves".

Although insurers are, like property tax administrators, interested in discrete property valuations and hence parcel-based, large scale datasets, that does not mean they are uninterested in more generalised smaller-scale Value Maps. Many of the Delphi participants believed that such products had a market, also that the private sector could take the lead in a Project to produce them. Despite the apparent absence of such a programme anywhere else in the world, the fact that private insurers carry a larger share of the overall British flood risk burden than they do in other countries, combined with the relatively high value of land in Britain compared to many parts of the developed world, would suggest that this country is more likely than any other to see the private sector lead in Value Mapping.

Although most definitive national property datasets in Britain, as elsewhere, are held and owned by public agencies, transaction price information – and hence value data – originates in the private sector. Private lending institutions (through CML), private and institutional investors, insurers, and commercial property intermediaries such as IPD, already collaborate in certain data sharing projects, with or without Government partnerships. IVS, Basle-2 and CAD all point to increased volume, frequency and consistency of what might be called 'balance sheet' or 'collateral' property valuations being demanded by and for these private sector bodies, using AVMs. Furthermore, the considerable costs of obtaining and

using publicly owned large-scale geospatial reference datasets (MasterMap, NLPG, etc) are falling over time, while land values and financial risks faced by the property industry are on a long-term rising trend – not just in insurance.

An initiative by one or more private industry bodies named above to develop intermediate scale Value Mapping and simultaneously work together on a detailed Market Analysis for all scales and applications of Value Mapping, with or without Government participation, was seen as feasible (if unlikely) by the Delphi Group in 2004. It becomes more feasible over time and might be concluded within five years from inception. Figure 7/1 illustrates this in simplified form.

As a demonstration project, it is possible that products similar to those in Figure 5/7 at a very small scale (section 5/2) would be sponsored by one or more of the potential collaborators in larger scale Value Mapping. Some of the characteristics of this kind of product are indicated in Figure 7/2, with the red markers on the 'sliding scales'. The datasets could be 'crowd sourced', although definitive free-to-view or public domain datasets (e.g. quarterly house prices by local authority from Land Registry) could also be contributed. The business model would need to be simple and costs to both producer and user extremely low (probably free to the latter). Perhaps the main aim of this would be to raise public awareness of the Landvaluescape concept, thereby stimulating a broad political groundswell of support for developing for practically useful and larger scale products: what Schlossberg and Shuford (2003:19) refers to as "circles of public involvement activity". Tomorrow's decision makers can be today's observers, then reviewers, advisers and even creators of geoinformation or graphic products relevant to Landvaluescape modelling.

The scope of a market led implementation, in terms of scale and authoritativeness, is limited by the fact that definitive datasets at the largest scale are held by public bodies and governed by statutes that restrict their use. The green markers in Figure 7/2 illustrate some characteristics of the resulting data products and services related to Value Mapping. There are likely to be limits on access, reuse, derived applications and currency of content, as well as scale and

accuracy. MAUP will be a limiting factor but there should be considerable commercial and/or practical value for certain users across the property industry, in all sectors. However a detailed Market Study will need to confirm this (see Figure 7/1).

Public sector case

The launch of a UK Location Strategy and Panel improves the prospects for coherent Government thinking in GI policy, including plans for a National Property Databank (see sections 2/4 and 2/7). INSPIRE and PSI Directives lend weight to the case for data sharing among public bodies as well as with the private sector (Manning, 2009). The pervasiveness of the internet and initiatives such as NLIS, HIPs and the PlanningPortal, as expounded in the Power of Information report (see section 2/6), should give cause for the Location Panel to address a range of potential citizen-facing and commercial applications, which might have significant revenue earning potential for Government itself. Government claims to want a better informed public: 'better' should mean citizens and commerce being able to visualise the potential impact of climate change on property values. This might form part of the case for Value Mapping, as suggested by Schlossberg and Shuter (2003:16).

The fact that the wholly public sector Location Panel is sponsored by Defra and not CLG may make the case for Value Maps easier to link to other INSPIRE work. Defra is more distanced from the 'political' issue of local property taxation – and arguably closer to that of climate change. However significant barriers remain in the way of a wholly public sector British Value Mapping initiative, which are discussed in the next section. At this stage, until the Location Programme is persuaded and resourced to go further than INSPIRE demands (which does not include a 'value' theme), Government is more likely to follow than to lead.

If a private sector funded and led intermediate scale Value Mapping project, perhaps with strong input from academia (see section 7/6 below), could achieve an effective national demonstrator of Landvaluescape Visualisation in the short term, public sector bodies might be persuaded to join the project later. There is

already evidence that some local and regional public bodies (e.g. TfL) are interested in such tools for decision making and infrastructure funding but as recently as 2002 they found datasets to be inadequate (see section 2/2).

Most of the short-term costs of any Value Mapping Project are more political than financial, because of the link that is bound to be made by commentators to property taxation. Initial costs also fall very largely in the public sector and are spread among several agencies, which is likely to cause inter-agency friction (see Appx.N). On the other hand, the long-term financial benefits appear to be mainly in the private sector, especially if there is no prospect of radical property tax reform: a Green Tax Switch (Liberal Democrats, 2008) but involving LVT as a significant new source of general taxation.

Such a prospect, of a tax-reform led British Value Mapping implementation, cannot be discounted but was regarded by the Delphi as difficult to envisage (see section 4/3). Indeed the understandable perception that any Value Mapping initiative involving Government would have tax reform as its underlying motive could destroy public support for such an initiative. It is the reason why the Liberal Democrats avoid mentioning any element of property tax in their Green Tax Switch proposals, even though they recently formally reaffirmed the Party's commitment to LVT (Liberal Democrats, 2007:13).

As property market and geospatial data almost inevitably improve in quality, currency and affordability over time, the economic case for modernising existing property taxes to fully exploit these improvements will grow stronger, regardless of other economic and political arguments for using property tax more effectively (Barker, 2004). Meanwhile the absence of a comprehensive modern *ad valorem* property tax in Britain acts as a brake on those improvements, since the main reason for Government to maintain accurate fiscal cadastres is not applicable. All the evidence from overseas would suggest that only a tax-led implementation will produce the large-scale Value Mapping that is seen in Denmark, parts of USA and Australia. Transparency of tax assessments was scored highest of all by the

Delphi Group, so that LVT (or any enhanced property tax) would almost certainly secure the prospects for Value Mapping.

7.4 Towards a British Value Mapping Project

A third and final objective of this research was to establish what barriers stand in the way of implementing Landvaluescape Visualisation of Britain and the policy actions – or 'coherent steps' – that would need to be taken in order to achieve it.

The Delphi Process very clearly exposed a number of significant barriers, all of a policy rather than technical nature (sections 4/3 and 4/4). The literature review (section 2/6) revealed significant insights into the causes of these barriers and the attempt to create a British Value Mapping demonstration dataset confirmed them (chapter 5). This section summarises those barriers and discusses ways of navigating a way through the current polity to produce a viable Action Plan resulting in large-scale Value Mapping within five to ten years. However the purpose of this research was not to produce an Action Plan – that was a tool with which to engage the Delphi Group – but to map the polity: the factors influencing any Plan that others might devise.

Figures 4/1 and 4/3 respectively summarise the barriers (Issues) and the actions which the Delphi Group believed to be relevant. The main ones are discussed here in the light of what other strands of this research revealed. A modified and simplified representation of the Action Plan derived from the Delphi Process is at Figure 7/1.

Geodata policy

Four of the five Issues that scored highest on relevance (Figure 4/1) in the Delphi concern geodata policy and performance. Having "better property market information in the public domain" (4/3), "joined-up thinking on datasets" (3/3), "maintaining currency of site values" (2/2) and "completing and maintaining related data sets" (3/2) do not overtly relate to property taxation. The first two were regarded as self-evidently desirable in their own right; the second two were scored very highly desirable by the Group. All except "maintaining currency" were seen as eminently feasible.

Improving property market operations was Lithuania's driver for its property data modernisation and creation of its SECR. Although the Delphi did not support the idea of a British equivalent to SECR and were less than enthusiastic about "a single government champion" (for "the idea" of Value Maps), they agreed with the need for a single policy focus in Government. Lack of such a focus at a sufficiently senior level is a barrier to radical change of policy in any seemingly peripheral and technical area. Unlike Lithuania, Britain has no perceived need to modernise its property market: Value Mapping will never be an election issue or even appear in a political manifesto.

Until now, the lead Agency in Government has been OS, whose history lies with mapping and not cadastral land information. Moreover OS' increasingly commercial attitude towards copyright (Issue 5/5) has placed a financial barrier in the path of other agencies (local government and Land Registry) developing their related "cross-cutting projects" (#24) on address (NLPG) and land title datasets. This is evidenced, during the course of this research, by legal disputes in the case of address data and scaled back ambitions for its data in the case of LR. Failure to 'join up' potential uses for HIPs is also evidence of what happens to good ideas without a GI Champion (see section 2/6).

Hence the lack of coherently designed, complete, consistent, regularly updated and affordable property data has been a significant barrier to developing the concept of British Value Mapping and will remain a barrier until a GI Champion is appointed and addresses these specific Issues. Such an appointment was not felt by the Delphi to be difficult for Government to make and the subsequent creation of a Location Panel reporting to a Defra Minister goes some way towards it.

That Minister would seem the obvious main focus for any private sector led Value Maps Market Analysis (see Figure 4/3). Although it would need Treasury to support the principle of a national land valuation at parcel level (i.e. for tax purposes), climate change (for land management adaptation planning) might be sufficient reason for Defra to lend 'in principle' Government support to a

medium/small-scale land/property valuation exercise. Provided the scope of the Market Analysis included large scale applications as well, this key Action might proceed quickly and inform all stakeholders in Value Mapping as to the remaining actions needed.

There is some evidence that combining within a single agency the responsibility for more of the key elements of a fiscal cadastre makes property tax administration more efficient and reform easier. Northern Ireland's recent DR project (see page 253 above) is most relevant here. Jamaica (McCluskey, 2005) is also felt to have benefited from such a merger between agencies. "Fragmented institutional arrangements" (Nicholls *et al*, 2007:351) are likely to be unhelpful to any aspect of national land management. However what is important is that the public interest takes priority over the interests of any one agency in the management of PSI more generally. The benefits of merger may be largely offset by the problems of greater organisation size. Strong, holistic central direction of the national GI Strategy is more important that organisational change.

As the Oxfordshire LVT Trial (see section 5/2) showed, 'support' from Government would need to include a more open-minded attitude towards the release and pricing of PSI, specifically VOA data and background OS map data. The current closed attitude, which is contrary to the spirit of recent EU Directives and the Chorley Report twenty years ago, is much less of a barrier to small/medium-scale Value Mapping but is a "huge barrier" (#24) to any large-scale application linked to tax reform. Before any sensible Market Analysis is carried out involving large-scale mapping, there needs to be a resolution to the issue of PSI Trading Funds' business model. Pollard (2006) has traced the link between the use of this model and an apparent decline in the necessary "federated, collaborative" (Manning, 2009) attitude among key suppliers, which may now change following the adoption of a Location Strategy.

To some extent the process of converting Government from a 'follower' to a 'leader' role is iterative: if Government realised what the potential benefits from Value Mapping (or other novel, public benefit spatial data applications) were, they

could better judge the respective merits of different business models for the GI industry which its agencies serve. Defra is better placed than some other Departments to champion a change of Government policy in this area, since it is not responsible for any major PSI holder that currently depends on geospatial data revenue.

Property tax policy

Based on the views of the Delphi Group, the best prospect for a British Value Mapping implementation is through a commitment to LVT. However this was also shown to be highly controversial, both within the Group and in the wider public debate on local government and infrastructure funding. That debate ran in parallel to this research and involved the Oxfordshire Study intended to generate the demonstration dataset to inform both the wider debate and this research, which fell victim to the politics surrounding LVT (section 5/2).

The polity climate for such a debate might change in favour of LVT, if Climate Change itself and infrastructure funding become higher political priorities. These two issues are linked, for example very expensive flood defences will be required if the sea level rises, as Eurosion (2004) recognised when using the term Landvaluescape (section 2/6). If the extremely high costs of the infrastructure investment needed for Britain to adapt to climate change are balanced against the far higher cost in terms of property value write-offs due to flooding alone, should adaptation not be achieved (Stern, 2006), then the political risks of tax reform reduce significantly. The Issue of Climate Change was not presented to the Delphi Group, because it had not in 2003 assumed such importance as it has since 2006. Recent academic literature, drawn together by the IPCC, lends strong support to this argument (IPCC, 2007).

LVT would require completion of land registers, a parcel-based property gazetteer, and reform of the planning system so that HABU was known for every land site and hence each site could be assessed fairly for LVT. The public store of up-to-date land information would be enormously enriched through LVT and, given sufficient political commitment to it, no formal business case for Value

Mapping would be needed. Value Maps would be used by the tax authorities themselves, as they are elsewhere in the world, internally to maintain tax assessments and externally to inform taxpayers in a transparent manner as to their liabilities, which was seen as highly relevant and desirable by the Delphi Group. Other non-tax uses could be considered as a spin-off.

A Government commitment to any radical property tax reform is however extremely unlikely in the near future, even with the added dimension of climate change and paying for the infrastructure needed to mitigate – and adapt the British economy and society to - its effects. Although the Delphi Group agreed strongly that "re-engineer property tax systems to fully exploit GIS/CAMA" (Action 11) was the most desirable of all Actions proposed to them, linking it to LVT proved highly contentious. Even a Government that was privately convinced of the need for LVT would most likely wish to dress up support for Value Mapping initially as being linked to other policy priorities, or at least a less radical kind of tax reform than LVT (see section 4/5). The work of Bell and Morse at Bayswater Institute indicates that PPGIS can raise levels of sustainability and environmental awareness in the face of climate change (e.g. Bell *et al*, 2007).

What the literature review showed is that GIS/CAMA (although not necessarily Value Maps) can be and have been (e.g. NI DR) justified for tax modernisation without any reference to LVT, also that land value can readily be derived from AVMs. Experience in Sweden and USA (Lucas County) prove this (sections 6/4 & 6/8). The literature also showed that the component datasets of a fiscal cadastre are largely in place to enable such a GIS/CAMA tax modernisation (section 2/6). However the datasets would all need some restructuring, which involves a cost. Costs and benefits of a tax-led Value Mapping implementation would emerge more clearly from a Market Analysis.

Tax reform could perhaps be made more likely by a medium/small-scale Value Mapping implementation. Landvaluescape Visualisation, albeit at a fairly crude level, would enable the link between property values and infrastructure spending to become more transparent. Other property market players (investors, lenders,

owners and occupiers) would also become better informed and likely to demand more up-to-date statutory valuations to enable more consistent, robust and transparent decisions of their own. For both political and budgetary reasons, Government might wish to implement Value Mapping at parcel level (suitable for tax) ostensibly through a PPP which presented the project as serving mainly non-tax applications. Such a project would also be more likely to result in datasets that served those applications better than an implementation that was designed (as are most elsewhere) almost entirely to support the property tax system.

Therefore a market-led non-tax-related medium/small-scale British Value Mapping programme, actively supported by Government, could help overcome the greatest single barrier to large-scale Value Mapping: the political opposition to property tax reform. As Figure 7/2 shows, this could be done without using such maps overtly for political persuasion, that task having been done more subtly using smaller scale maps. This accords with the Schlossberg and Shuford (2003) theory of using PPGIS to help empower citizens.

Technology: barrier or enabler?

Technology is no barrier to British Value Mapping. The few technology-related Issues presented to the Delphi Group were either dismissed by participants in Round One (section 4/2) or scored highly not because they are inherently incapable of being made to work in this country but because of difficulties they present to British policy-makers and institutions. Technology is in several ways a strong enabling factor but the barriers presented by associated policy and institutional difficulties (summarised above) are somewhat stronger.

The same globalisation of technological innovation that presents, in theory, an opportunity for Britain to adopt Value Mapping, is also affecting property markets. However the Delphi Group did not see globalising property markets as very significant at this stage, compared to domestic policy and institutional factors. British attitudes to property rights and taxes, evident in some Delphi participants, remain unusual and resilient, despite the increase in numbers of British people now exposed to different attitudes to these things elsewhere. These include a

“non-disclosure culture” (on transaction information) which #27 said “is changing”, also taxation of property occupiers rather than owners. For the significance of technology to be seen clearly, there first needs to be a change in culture among key enabling stakeholder groups to make them take interest in what technology can offer.

In one particular and important respect, recent research and literature has shown that technology is an enabler. That is the ability to transfer spatial data between organisations in a standard software-independent format: XML (Sayce *et al*, 2008:13). The implications for being able to monitor changes in land use and other related attributes affecting land value are profound (*op cit*, pp.24-6). Because Britain is a largely urban (hence high value), centralised and advanced nation, it could potentially adapt and develop existing datasets that support the spatial planning system in a way that results in the most extensive, up-to-date, detailed and accessible Value Mapping system in the world. The cost of this has not been investigated through this study but it is likely to be very much less than the benefits that would accrue to the commercial property market.

As Jackson *et al* (2009) conclude: “The question is, can we find the institutional will - in academia and government - to make changes that enable societies around the world to make the most of these new tools?”. Geospatial technology is not alone in experiencing polity acting as brake to technological progress. British Value Mapping is not held back by gaps in available technology but by political and institutional inertia: it is hard for society to keep up with what technology offers, especially perhaps when an over-centralised but “hollowed out” (Pollard, 2006:36) Government controls the levers.

7.5 Overall conclusions

This research has revealed the considerable complexity of the institutional environment in which a full implementation of detailed Value Mapping has to be planned in Britain. This was not anticipated at the outset, although it was envisaged that the technical Issues would be less significant than the non-technical ones. However the compartmentalised state of public policy and the innate conservatism of many of the institutions that would be affected by Value Mapping were only barely understood at the outset of this research. Pollard (2006) was revealing in her insights (see pp.84-6).

The concept of Landvaluescape is especially poorly understood in Britain because the imperative to introduce it – modernisation of property tax – is not accepted. Although the components of a British fiscal cadastre are largely in place and are also key components of a UK SDI, the lack of a coordinating 'GI champion' or a Location Strategy has until now kept them in their "silo world" (Manning, 2009:8). Yet where tax modernisation is undertaken elsewhere using GIS, that same 'silo' tendency militates against a holistic approach to Value Mapping. It can therefore be said that this research has uncovered a novel concept and that if the Location Programme is managed well and takes account of the concept (among the many concepts that Manning and his colleagues presented throughout the UK as this thesis was being finalised), Britain could become the first state-wide jurisdiction to apply the Landvaluescape concept holistically.

The role of Champion – earlier in this Chapter bracketed with 'joined up thinking' on relevant policy, which was another high-scoring Issue with the Delphi – should be more to influence than to direct any Value Mapping Action Plan that may be devised under the Location Programme. Information policy is a subject that does not fall clearly within the remit of any one Government Department. Nor is it seen as sufficiently important, either politically or to the national economy, as other subjects (health, education, housing etc) for a GI Champion to be given status to direct: Manning's "federated, collaborative" approach, with Pollard's emphasis on

"social informatics" and Stern's "satisficing" are likely to achieve more effective results than "new right" NPM methods of civil service decision making.

The more that property market players can be entrained with the SDI 'federation', the greater the chance that Value Mapping products and services will evolve in sustainable ways (as regards their own durability and utility) and in support of sustainable development and climate change mitigation objectives (Stern, 2006, Nicholls *et al*, 2008). Apart from information that relates to property tax, there would appear to be no great political sensitivity around the way geospatial data in general is treated as a commodity. However to a number of public sector bodies and to those parts of industry that need to use PSI in their business, Ministerial decisions on the future business model for PSI can be of crucial importance. For example, #11 cited a "major financial institution retreat[ing] from implementing GIS because of data pricing". At the recent UK Location Programme workshops, this was cited by participants – as it was by Delphi Group participants in this research – as a major barrier to market growth in GI.

The Delphi Process Action Plan (Figure 4/3) is just one collective, moderated, informed expert view (as of 2005) of the likelihood and sequence of events leading towards a British Value Mapping implementation: either based on tax reform; or on the operation of the land and property information market; or a combination of both. In particular, it illustrates the logical relationships between the activities that comprise each of the two routes and their relative importance in the overall scheme: some Actions are non-essential; others are pre-conditions of any progress. Figure 7/1 strips out the non-essentials, adds a timescale and is associated with a diagrammatic representation of some likely attributes of three possible products along the range of scales. The main Delphi Process finding – that British Value Mapping is desirable and feasible within the same timeframe as INSPIRE full implementation – is supported by the literature review. That the main barriers appear to be technical but are in fact caused by a lack of coherent public policies on GI was proved by the Oxfordshire LVT Study (chapter 5). The fact that other countries, in a variety of circumstances, exhibit Value Mapping proves that it is technically achievable (chapter 6).

Among the more confident assertions that can be made about the prospects for a British Value Mapping implementation, using the Action Plan framework of Figure 7/1 are the following:-

- In the absence of clear Government support for LVT, only by first progressing to a Market Analysis could a decision to implement Value Mapping be reached;
- Even to progress to a Value Mapping Market Analysis, Government would first need to formally express support for the idea of a national land valuation, with a possibility of associated property tax reform;
- Clarity as to the overall direction of UK GI policy, plus the appointment of a Government Champion for GI, are pre-conditions for being able to comprehensively assess the market for Value Mapping;
- Without completion of Land Registers and a commitment to carry out trials of LVT, the chances of even commencing a detailed parcel level Value Mapping exercise are extremely remote;
- Although there is no precedent elsewhere in the world for Value Mapping being instigated in isolation from property tax administration, it is possible that non-tax factors (e.g. climate change and strategic spatial planning) could be the catalyst of an intermediate scale, private sector led, British implementation;
- Involvement of private sector stakeholders early in a Value Mapping Project might result in its evolution into a world-leading multi-application full (large-scale) implementation, eminently suitable for tax purposes and at the heart of the UK SDI.

Before any Government or industry grouping took up the Plan (summarised as ‘influence factors’ in Figure 7/1 at the start of this chapter) as a basis for policy action in the real world, it would need to re-visit most of the Issues presented to the Delphi Group to assess whether the above conclusions remained valid, in a fast moving polity.

Drawing on the insights of Pollard (2006) it would seem that, were it not for the "bounded rationality" within which components of British geoinformation polity have been operating, a strong case would be more widely evident for undertaking a comprehensive Value Mapping programme. As it is, the case exists but remains hard to portray to all stakeholders that need to be involved in its realisation. The formation of the Location Programme Team within Defra portends a shifting paradigm in geoinformation polity: a move away from output and performance control of non-integrated – even competing - PSIHs, towards collaborative, adequately resourced and neutral management of the necessary activities to support the needs of spatial decision makers.

7.6 Recommendations

The final section of this thesis considers what further academic research steps could be conducted, in the light of this successful testing of the hypothesis that "Visualising Landvaluescape now offers discernable public and commercial benefits for Britain, sufficient to justify immediate and coherent steps to be taken to overcome any institutional, technical and policy (including tax policy) barriers that might be exposed".

In other countries where Value Mapping is done purely as an adjunct to property taxes, the concept of Visualising Landvaluescape is not explicitly recognised, let alone discussed. This research found no examples of significant investment by non-tax departments of any foreign government or by private industry into research or implementation of nation-wide value mapping, although the potential value of GIS applied to tax valuations for other purposes was acknowledged when suggested to FIG members.

Therefore the research proposals outlined briefly below focus on non-tax applications for Value Mapping, where the gap in knowledge and academic literature is greatest.

1) Seek funding from the private sector (property investment and insurance industries) for further research into non-tax uses in other countries of tax-derived property/land value data.
2) Engage with the Foresight Land Use Futures Study, to make the academic case for the Landvaluescape concept to be adopted within their programme of long-range research.
3) Re-engage with FIG to update and detail the global picture regarding non-tax uses of Value Maps.
4) After '1' and '4', investigate in-depth country case studies to explore the typology of polity for land and geospatial information management.
5) Develop a case for alternative 'upstream' funding of geospatial reference PSI datasets, to enable Trading Funds to operate sustainably (i.e. without

recourse to general ‘vote’ funding) while focusing on genuinely ‘public task’ activities – especially in relation to the putative National Property Database.

6) Form a network of academics interested in developing the Landvaluescape concept, perhaps in collaboration with property tax reformers.

7) Investigate, with insurance industry and Government support, the ethics / economics of alternative ways of managing the asset valuation risks associated with climate change impacts, using Landvaluescape modelling.