SUSTAINABLE URBAN DEVELOPMENT

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ABSTRACT

This submission for PhD by publication aims to capture, reflect upon, analyse and offer critical insights into how the use of land and exchange of property can help serve the search for sustainable urban development (SUD).

This aim is subsequently met by:

- hypothesising how the applicant's publications provide a representation of SUD able to get beyond the state-of-the-art and offer a conceptual framework capable of uncovering the positive role land and property can play in sustaining urban development;
- reviewing the research undertaken by the applicant to define SUD and develop a framework for analysis, set of protocols and directory of assessment methods to evaluate the sustainability of urban development;
- highlighting the possibility there is for the valuation methodologies and investment appraisal techniques underlying the use of land and exchange of property, to be constructive in terms of the relationship their corporate strategies and financial instruments have to the environment;
- illustrating how it is possible to compute the informational basis of property management and draw upon the intelligence this offers cities to develop electronically-enhanced services underpinned by e-learning platforms, knowledge management systems and digital libraries, capable of supporting environmental improvements;
- showing how the environmental improvements that surface from such developments in turn support the community-based approach to urban regeneration which underlies the UK government's socially-inclusive and participatory venture into ecological modernisation and democratic renewal;

- providing examples of where the management of property by cities is intelligent, not only because the environmental improvement supporting their community-based approach to urban regeneration are socially-inclusive and participatory, but for the reason the ecological modernisation and process of democratic renewal underlying these developments meet the sustainability requirement;
- reflecting on the contribution this representation of SUD as informational, intelligent, socially-inclusive, participatory, community-based, regenerative, ecological and democratic, makes to what is known and understood about the subject.

Together these positive, analytical and constructive examinations of SUD augment into the informational basis of property management and surface as the corporate strategies and financial instruments of the electronically-enhanced service models needed for cities to be intelligent. In particular, the strategies, instruments and eGov(ernment) service models, cities need to be intelligent in valuing the environment and accounting for the socially-inclusive, participatory, community-based, regenerative, ecological and democratic qualities underlying their improvement programmes.

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Introduction

This document sets out the applicant's submission for PhD by publication and draws upon a series of papers disseminated over the past ten years under the heading of Sustainable Urban Development (SUD).

The submission aims to review, reflect upon, analyse and offer critical insights into how the use of land and exchange of property can help serve the search for SUD. It also serves to capture the main findings of research projects funded by the European Commission (EC), the UK's Economic and Social Research Council (ESRC) and Engineering and Physical Science Research Council (EPSRC). Findings disseminated by the applicant as high-quality research papers, either in fully-refereed journals, or text books from leading publishing houses.

Aims

In bringing the applicant's publications together under the title of SUD, the submission aims to:

- outline the state-of-the-art on SUD; the hypothesis, conceptual framework, method and institutional means which the submission advances to uncover the positive role that land and property can play in sustaining urban development;
- review the research undertaken by the applicant to define SUD, develop a framework for analysis, set of protocols and assessment methods, to evaluate the sustainability of urban development;
- draw upon the critical insights which this knowledge of SUD offers to get beyond state-of-the-art understandings of land and property and make the valuation methodologies and investment appraisal techniques that underlie the discounting mechanism meaningful in terms of representing the relationship growth, obsolescence and depreciation have to the environment;

- show how these critical insights into the relationship are meaningful in terms of the corporate strategies and financial instruments they provide to not only compute the informational basis of property management, but draw upon the intelligence this in turn offers as a means to balance the technical needs of the market against their respective environmental requirements;
- reveal how the management of this intelligence by cities is underpinned by the e-learning platforms, knowledge management systems (KMS) and digital libraries of an electronically-enhanced services model capable of bringing these needs and requirements into balance;
- clarify how the environmental improvements that surface from such developments in turn support the community-based approach to urban regeneration which underlies the UK government's socially-inclusive and participatory venture into ecological modernisation and democratic renewal;
- give examples of how the interdisciplinary research outlined in this submission, links the use of land and exchange of property to SUD and connects them in ways that:
    - allow the valuation methodologies and investment appraisal techniques underlying the discounting mechanism to meet the need for improved measures of environmental performance;
    - makes such improvements a standard requirement of the e-learning platforms, KMS and digital libraries upon which the electronically-enhanced services of intelligent cities are based;
- reflect on the contribution this representation of SUD as informational, intelligent, socially-inclusive, participatory, community-based, regenerative, ecological and democratic, makes to what is known and understood about the subject.

What these critical insights reveal shall be presented under the sub-headings of SUD, property management, intelligent cities and urban regeneration. Together and with the examples of the interdisciplinary research underlying them, they surface as the means to shift our knowledge and understanding beyond the state-of-the-art.

The submission is also supported by a set of appendices. The first provides a list of all the papers published as either, refereed journal papers, or chapter contributions in books. The second lists all of the funded research projects the publications are drawn from. The third offers copies of the publications in question. The fourth serves to document the academic contribution the applicant has made to the co-authored papers drawn upon to support this submission. The fifth lists the citations attributed to the applicant's publications.

State-of-the-art

The state-of-the-art which the applicant's publications have sought to develop an understanding of and subject to critique, are set out below. They include:

- Nijkamp's (1991) text on SUD and the follow up publications by Nijkamp and Perrels (1994) and Nijkamp and Pepping (1998). Those publications also reported on by Mitchell et.al (1995), Mitchell (1996, 1999), Brandon et.al (1997) and Hatfield-Dodds (2000).
- Harvey's (1989, 1996) accounts of property valuation and investment appraisal in the 'net annual return' model of the urban (re)development process, Baum's (1991) attempt to qualify this in terms of a risk, growth, obsolescence and depreciation explicit analysis of returns and Rydin's (1992) call for the discounting principle upon which all of this is based to extend beyond the market. That is extend beyond an analysis of market transactions

and into a valuation and appraisal of the environmental costs which are associated with the call from O'Brian et.al (1996) for any such assessment of land and buildings to meet the 'sustainability requirement';

- the calls from the likes of Mitchell (1995, 1999, 2001, 2003), Guy and Marvin (1996, 2001) and Komninos (2002, 2008) for managers to begin:
    - computing the intelligence needed for the built environment to meet the sustainability requirement;
    - assembling the information and communication technologies (ICTs) needed for cities to account for environmental risk when assessing the sustainability of development proposals;
    - building the eGov(ernment) services required for them to meet the sustainability requirement as a standard measure of their environmental performance.
- Kearns and Turok's (2004) suggestion the benefits of such measures should not be seen as an end in themselves, but balanced against the social exclusion, poverty and deprivation of communities. The social exclusion, poverty and deprivation of communities whose built environments are not only in decline, obsolete, or depreciated, but so degraded any improvement in their quality of life means subjecting them to a process of urban regeneration.

Hypothesis

Together the publications brought together under the title of SUD, offer the critical insights needed to reveal how it is possible to:

- get beyond state-of-the-art understandings of the valuation methodologies and investment appraisal techniques that underlie the discounting principle and which surface in their representation

of the relationship growth, obsolescence and depreciation have to the environment;

- compute the informational basis of property management and draw upon the intelligence this offers cities to develop electronically-enhanced services underpinned by e-learning platforms, KM systems and digital libraries, capable of supporting environmental improvements;
- meet this call for improved standards of environmental performance by setting the stage for socially-inclusive, participatory and community-based urban regeneration programmes, whose ecological modernisation and process of democratic renewal is capable of meeting the sustainability requirement.

Conceptual framework supporting the hypothesis

Figure 1 captures the conceptual framework supporting the hypothesis and draws particular attention to the theoretical, analytical and synthetic components of the research. Under the title of SUD, it highlights the areas of research that have been subject to investigation and which the applicant's publications report on. The second column draws attention to the analytical content of the research and then goes on to outline the critical insights this offers as a substantive synthesis of the investigation's findings.

Represented horizontally the research can be read at a very high level of abstraction. In that sense it can be read as a progression from the theory of networked communities, collaborative platforms and consensus-building which underlie the visions, frameworks and protocols of SUD and that support the methodology of environmental assessment. The progressive nature of the relationship between the areas of research highlighted may also be read vertically. That is as an integrated approach to property management, which is not only a key component of an intelligent city, but pivotal to the process of urban regeneration they are subject to.

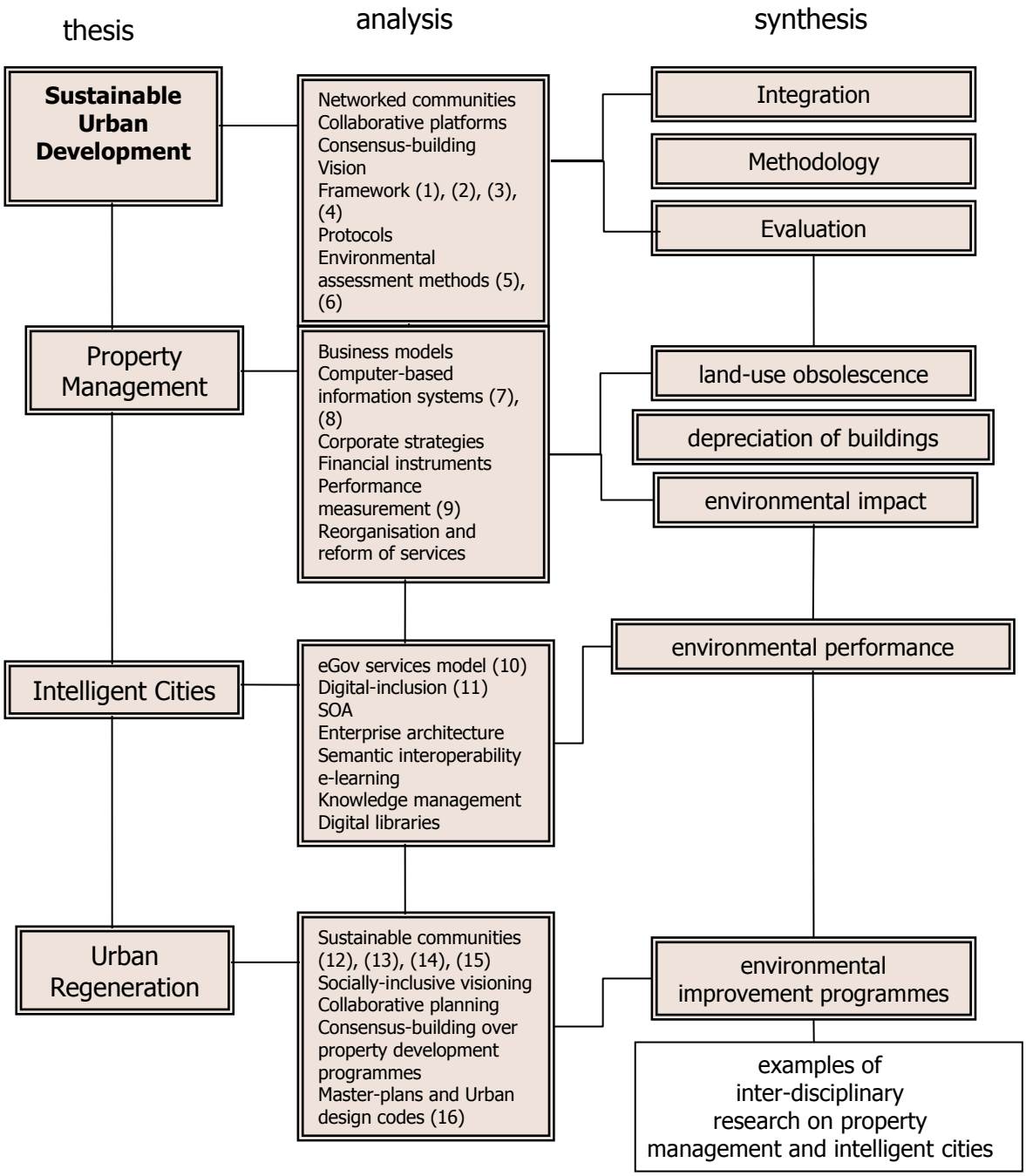

Figure 1: Conceptual framework

NB the numbers shown in parenthesis relate to those specific publications the applicant shall draw from and use as the basis for the following examinations of SUD, property management, intelligent cities and urban regeneration. They are also listed chronologically in Appendix 1.

Irrespective of whether the research is read horizontally, or vertically, Figure 1 goes some way to illustrate the cumulative nature of the investigations undertaken by the applicant and highly iterative process of development the research has been subject to.

In strict chronological terms, this has meant developing the research vertically from top-to-bottom i.e. from SUD to property management, intelligent cities and so forth. While beginning with such a 'top-to-bottom' line of reasoning, the research has also tended to invert this logic as the investigations have progressed from the generic (i.e. SUD) to the particular (i.e. investigations into property management, intelligent cities and urban regeneration).

This has been achieved by taking the deliberate methodological decision to make the higher level research the bottom-line for each subsequent investigation. This is particularly well illustrated in the material brought together under the sub-title of urban regeneration. For here the top-level issues become the bottom-line for urban regeneration and the axis around which everything that is understood about intelligent cities, property management and SUD turns back on itself.

The interdisciplinary nature of the research emerging from this 'progressively integrative' line of reasoning is something the submission shall also go some way to demonstrate the methodological significance of. This shall be demonstrated by offering two such examples of interdisciplinary research. Both of them are drawn from the interdisciplinary research carried out by the applicant. Together they serve to underline the environmental challenges that property management poses and which cities are now developing the intelligence to meet.

Method

In moving what is currently known about SUD beyond the state-of-the-art, the research has switched attention from a critical analysis of the subject and towards an examination of those concepts better able to bridge the gaps between what is known and understood about the management of property, the intelligence of cities and process of urban regeneration. This has been achieved by drawing upon Gibbon's et.al (1994) influential work on knowledge production. In particular, the role of multidisciplinary

teams working together as a networked community, collaborating with one another and building consensus over their critical insights.

Taking property management as an example, the critical insights this investigation into valuation and investment appraisal reveals about land use, property exchange, growth, obsolescence and depreciation, is first captured and then deployed as objects of knowledge. In particular, as objects of knowledge that not only reveal the adverse impact obsolescence and depreciation have on the environment, but which also uncover the affect this in turn has on the sustainability of urban development. The critical insights this knowledge of SUD offers is then used to further what is understood about the relationship obsolescence and depreciation have to the environment.

While much about this knowledge is conventional and grounded in a critical analysis of the subject under investigation, the deployment of these insights as a platform capable of not only building on such understandings, but constructing the means to transform what is currently understood about them, is anything but. For it is the knowledge these critical insights in turn produce that offers the material by which to transcend what they currently mean. Transcend what they have traditionally been understood to mean i.e. issues about the transaction of land and property and do this by revealing what it is about the use of land, valuation of property, appraisal of investments and discounting mechanism, that make obsolescence and depreciation a matter which is of such concern.

This ‘changing of minds’ as to what all of this means, is something equally important. For it is not just the outcome of a theoretical argumentation, but an ongoing institutionalisation of the changing relationship the use of land, and exchange of property have to the environment. An ongoing institutionalisation which in turn surfaces as a set of practices offering the type of subject-based reasoning that is needed to not only support the

theoretical aspects of any such assertions, but underpin them with the technical and semantic means required to demonstrate their significance.[1] This is what each of the examinations of SUD, property management, intelligent cities and urban regeneration does. Each of them offer the type of subjective reasoning needed to support the theoretical aspects of the assertions made about the changing nature of the relationship in question and underpins them with the technical and semantic means required to demonstrate their significance as object of knowledge.

The examples of interdisciplinary research following on from these examinations, also serve to reinforce the significance of this 'changing of minds and 'turning around' of what is known and understood about the nature of the relationship land and property have to the environment. This is done by providing two worked examples of the positive relationship which the use of land and exchange of property can have to the environment. That is positive in the sense which they reveal how:

- the valuation methodology and investment appraisal techniques underlying the discounting mechanism, can be made to meet the call for improved standards of environmental performance;
- such performances can in turn become standard measures of the e-learning platforms, KMS and digital libraries that intelligent cities are based on and the semantically-interoperable eGov services which their socially-inclusive and participatory urban regeneration programmes in turn rest.

Both examples serve to capture the changing institutional relationship between the use of land and exchange of property. Together they reveal how in practical terms the adverse effect of obsolescence and depreciation can be 'turned around' so cities can obtain the intelligence they need to ensure the use of land and exchange of property no longer degrades the environment. That is no longer degrades the environment up

[1] The term subject is used here to denote: SUD, property management, intelligent cities and process of urban regeneration.

to the point whereby the relationship which exists between them breaks down. Breaks down and becomes socially-exclusive, leaving communities divided, either wealthy enough to fend for themselves, or poor, impoverished and so deprived any attempts to ‘turn their fortunes around’, calls for a thorough, deep and wide ranging process of urban regeneration.

That is to say, calls for a thorough, deep and wide ranging process of urban regeneration, which is capable of not only turning things around, but taking matters ‘full circle’. What-is-more, taking them full circle by providing the means to ensure the built environment is no longer obsolete, depreciated, or degraded, but instead valuable and worth investing in. Valuable and worth investing in because under this process of urban regeneration, the use of land and exchange of property is no longer ruled by the market, but is instead governed by socially-inclusive and participatory programmes whose environmental improvements offer the means to not only ‘turns things around’, but take matters ‘full circle’.

How this submission’s particular institutionalisation of SUD meets the said requirement is a matter which can perhaps best be represented as a set of practices drawing upon:

- the integrating methodology of the BEQUEST framework, protocols and assessment methods as a means to evaluate the sustainability of urban development;
- the corporate strategies, financial instruments (valuation methodologies, investment appraisal techniques) and standards of performance measurement (land-use, building obsolescence and depreciation) used to compute the informational basis of property management;
- the intelligence this information system develops as a means to assemble the e-learning platforms, KMS and digital libraries, cities

need for their semantically-rich and interoperable eGov(ernment) services to ‘turn things around’;

- a simulation of the socially-inclusive and participatory urban regeneration programmes required for these eGov services to not just ‘turn things around’, but take matters ‘full circle’. Not just ‘turn things around’, but take matters ‘full circle’ by bringing about a range of environmental improvements that are no longer governed by either the technical needs of the market, or semantically-rich interoperability requirements of the information systems underpinning such electronically-enhanced service developments, but the bio-physical standards which support the ecological modernisation this lays down;
- revealing the significance of these improvements by way of and through worked examples demonstrating how such a modernisation is not:
    - based on a representation of the environment that is divisive in the sense which the use of land, exchange of property, obsolescence and depreciation of buildings degrade the environment up to the point whereby the relationship that exists between them breaks down and becomes socially-exclusive, leaving communities divided. That is, either wealthy enough to fend for themselves, or poor, impoverished and so deprived any attempts which are made to ‘turn their fortunes around’, calls for a thorough, deep and wide ranging process of urban regeneration;
    - divisive, but reconciliatory in ensuring the built environment is no longer obsolete, depreciated, or degraded, but instead valuable and worth investing in. Valuable and worth investing in because under this process of urban regeneration, the use of land and exchange of property is no longer ruled by the market, or the semantically-rich interoperable requirements of information systems, but the bio-physical standards of socially-inclusive and participatory programmes, whose

> environmental improvements offer the means to not only 'turns things around', but take matters 'full circle'. Take matters 'full circle' by meeting the need for the standards of this ecological modernisation to be upheld as a process of democratic renewal which is 'restorative' in the sense it provides civil society with the means to meet the sustainability requirement.

A detailed discussion of this institutionalisation can be found in Deakin (2003a, 2003b, 2009a and 2009b). While these articles cover the methodological issues relating to the institutionalisation of SUD, the examinations that follow shall draw upon a larger set of papers which have been published by the applicant, either as 'single' or 'co-authored' papers over the past ten years.

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Sustainable urban development

The research undertaken by the applicant to address this particular question was carried out as a member of the BEQUEST network. Referring to Brandon, et.al (1997), it is possible to see what this network's research has added to the knowledge and understanding of SUD[2].

As Brandon, et.al. (1997: xiv-xv) states:

> *"This volume includes several studies on the evaluation of the built environment for sustainability, considering the built environment as a dynamic scenario that changes over time. …. it represents sustainability as, the 'product' of urban planning, [property development] and architectural design processes and of various construction activities that take place in a defined spatial organisation. …. Unfortunately, at present there does not exist a trans-disciplinary language across the built environment that can bring together the diversity of interests necessary to assess the built and natural environmental impacts. In evaluating the built environment for sustainability, the disciplines involved bring their own classification system and techniques to the problem and they are unwilling (or unable) to consider the views represented by others, because there is not a common vocabulary or a systematic methodology which will allow a fruitful dialogue to take place. Therefore, the task is to find an integrating mechanism, or tool for helping decision making processes in planning [property development] design and construction."*

[2] Brandon, P., Lombardi, P. and Bentivegna, V. (eds.) (1997) *Evaluating the Sustainability of the Built Environment,* E&FN Spon, London.

The integrating mechanism, or, tool in question, is the BEQUEST framework, vision and methodology of an integrated SUD. This framework and vision provides the 'trans-disciplinary language' of the consensus building methodology adopted by BEQUEST to 'bring together and represent the diversity of interests' - planners, property developers, designers, contractors, users and operators - in the urban development process. It also provides the common vocabulary of the vision and 'systematic methodology' called for by Brandon (1997) and has proven equally successful in generating a fruitful dialogue between the stakeholders in question.

The applicant's publications on the BEQUEST framework have also sought to identify the common issues underlying the growing interest in SUD and to structure them in such a way as to provide a framework for analysis. This has been done by first adopting the PICABUE definition of sustainable development, 'mapping out' the 'fuzzy buzzwords' associated with the concept and modifying what it means so as to include the sustainability issues underlying the urban development process.[3] This has meant:

- foregrounding the question of urban sustainability;
- agreeing the sustainability issues underlying the urban development process;
- identifying the environmental, social and economic relations of SUD.

Visioning urban sustainability in this manner has allowed a wide range of sustainability issues to surface concerning the environmental, social and economic structure, spatial level and time scales of urban development. The methodology developed to support this representation of SUD is that of an integrated, iterative process of collaboration and consensus building.

[3] The definition in question is four-sided and relates to the ecological-integrity, equity, participation and futurity of SUD.

As the ‘BEQUEST framework’ of activities, issues, levels and scales of analysis, this vision and methodology is based on a 4-sided ‘model’ of SUD. That model of SUD which:

- adequately represents, but simplifies, the breadth and complexities of the issues which are faced in consensus building exercises of this type;
- forms the basis for a common understanding of the subject and knowledge-base capable of being shared across a wide range of stakeholders;
- provides a framework for integrating the analysis of SUD across the respective activity, issue, level and scale;
- calls for a set of protocols that allow the planning, property development, design, construction and operational components of SUD, to be integrated with one another and each of their respective environmental, social and economic relations;
- allows decision makers to select the assessments capable of evaluating the sustainability of urban development on such terms.

The framework’s vision and methodology is primarily that of a collaborative platform for building consensus, supported by a set of protocols and assessments methods which come together to form a decision support tool-kit for evaluating the sustainability of urban development.

While the framework itself represents a significant step forward in what is understood about SUD, the contribution which the protocols make is something that should not go unrecognized. This is because they provide a formal link that casts back to the issues, spatial levels and time scales of the framework and connection which throws them forward to the assessment methods.

As such they provide a set of ‘coordinates’ that not only links the ‘top-level’ issues, spatial levels and time frames to the middle-ground of ‘first and

second level' protocol(s), vis-à-vis procedures, but also connects them together as a route to follow in 'getting to the bottom of the matter', by way of and through a set of environmental assessment methods which are capable of evaluating the sustainability of urban development.

In this way, the BEQUEST framework, protocols and assessment methods, set out the grid references that allow the network and community of stakeholders which they represent, to take the matter of evaluation full circle. That is to say, take it from a framework for analysis, to a protocol to follow and procedure to adopt in selecting the environmental assessment methods which are best able to evaluate the sustainability of urban development.

The first set of papers published on the BEQUEST network outlined the principles, underlying concepts, models, vision and methodology of an integrated SUD (Deakin, et.al 2001, 2002a). This drew attention to the framework BEQUEST has developed for such an understanding of SUD and went on to set out the protocol(s) the network argues should be followed in carrying out an environmental assessment. These papers argued:

- SUD's goal is to improve the quality of life for an increasingly urban population;
- actions aiming to improve the quality of life need a simple, clear framework for analysing the sustainability of urban development;
- this framework for analysis requires a vision and methodology that brings such concerns into the scope of actions which can be taken to bring about environmental improvements;
- within this vision and methodology, protocol(s) provide a middle ground between the environmental assessment methods available to evaluate SUD and bring about improvements in the quality of life;

- such evaluations of SUD must transcend purely environmental factors and embed themselves securely in environmental, social and economic assessments;
- a community of academic and professional advisers is emerging, willing and able to use new information technology as a means of supporting such assessments and make the evaluations they produce available to local, regional, national and international agencies.

This protocol was then presented as set of guidelines to follow in assessing the environmental impact of urban development. In this respect, it was presented as a set of procedures for:

- 'screening' urban development activities;
- 'scoping' key sustainable development issues;
- 'clarifying' what activities, environmental, social and economic issues need to be addressed;
- carrying out the required 'consultations' with affected parties;
- 'deliberating' over the environmental assessments of urban development plans, programmes and projects;
- 'assessing' whether the said urban development plans, programmes and projects, build the capacity which cities need to carry their cultural heritage and produce forms of human settlement that are sustainable;
- 'reporting' on the ecological integrity and equity of the resulting resource distribution and ability of the public to participate in decisions taken about the future of the city, its cultural heritage and forms of human settlement;
- 'monitoring' the sustainability of urban development.

The said protocol has its origins in the European Commission's (1997 and 2001) Directives on Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) and focuses attention on the

procedures to follow in assessing whether-or-not urban development plans, programmes and projects provide the capacity that cities need to carry their cultural heritage and produce forms of human settlement which are sustainable.[4] [5] However, while such a representation of the protocol is valuable for the generic description of the environmental assessment process it advances, the procedures set out to do this are currently not detailed enough to overcome the risk and uncertainty stakeholders face in trying to use them as methods for evaluating the sustainability of urban development. This is because the legal instruments surrounding environmental assessment are themselves insufficiently developed, too generic and not specific enough for stakeholders as diverse as planners, property developers, designers and contractors to follow when evaluating the sustainability of urban development (Deakin, et.al. 2002a; Curwell and Deakin, 2002; Bentivegna, et.al. 2002).

In response to this, the publications went on to examine the 'soft' and 'hard' gates of environmental assessment and develop the five (planning, property development, design, construction, operation and use) protocols for evaluating the sustainability of urban development. From here attention turned to the directory of environmental assessment methods available for such evaluations and reported on how they are currently being used to evaluate the sustainability of urban development.

What this did not do, however, is provide a detailed examination of the environmental assessment methods themselves, or how they are being used by the diverse range of stakeholders drawn attention to. For while it drew attention to the legal instruments of environmental assessment and tense relationship emerging between the 'hard' certainties of the bio-physical sciences and the more uncertain, risky sphere of socio-economic relations, it did not provide a detailed account of the environmental assessment methods, or a statement on how those listed in the directory

[4] Directive 97/11/EC: *Environmental Impact Assessment.*
[5] Directive 01/06/EC: Assessing the *Effects of Certain Plans and Programmes on the Environment*.

are currently being used to evaluate the sustainability of urban development. This particular challenge has now been met through a series of publications that provide a unique insight into environmental assessment and methodological questions which are of critical importance to SUD.

The assessment methodology developed for such purposes is based upon an understanding that the growing international and increasingly global nature of the relationship between the environment and economy of civil society is uncertain, resulting in as yet incalculable degrees of risk. As yet incalculable degrees of risk which in turn means that standard 'tried and tested' methods of assessment are of limited help in evaluating SUD.

This research found the limitations of such standard measures can only be overcome by adopting a 'co-evolutionary approach' to environmental assessment and turning attention towards methods able to evaluate the ecology of resource consumption.[6] This has meant developing a detailed account of the environmental assessment methods that are key to this transformation and studying the way in which they are currently being used to evaluate the sustainability of urban development.

These examinations are seen as being of particular value because they highlight the significance of the BEQUEST framework in capturing the sustainability issues surrounding the 'ecology of resource consumption' and representing them as matters of particular concern to the quality of life. They also go some way to highlight the value of the protocols in dealing with the hard and soft issues of SUD. For while the hard gates of the protocols can be represented in statutory terms and therefore as rules of law: for example as a legal requirement for either an SEA, or EIA, this

[6] This captures how two or more interdependent entities adapt to changes in the other and proceed to jointly evolve as part of an eco-system. Co-evolution assumes such developments progress by way of a step-wise logic, whose symbiotic incorporation of one another's needs is systematic in the way it meets these requirements.

research has provided the opportunity to develop a harder-edge to the bio-physical, social and economic science underlying the use of land in the planning, property development, design and construction of buildings (Deakin, et.al. 2002c).

All the publications on this subject go a long way to develop such a 'co-evolutionary approach' to environmental assessment and manage to overcome the limitations of existing methodologies by focussing attention on the so-called 'hard' certainties of the bio-physical science underlying the more uncertain, risky and 'softer' social relations of SUD. This has been done by offering an account of the environmental assessment methods that are key in building the capacity which is needed to qualify the ecological integrity of urban development and by providing the techniques of analysis required to evaluate whether this distribution of resources is equitable. Whether, that is, the distribution of resources which emerges is equitable, not only in the sense it is socially-inclusive, but the outcome of the public's participation in decisions taken about the future of cities.

The significance of the aforesaid also becomes apparent when considering the science and technology developed to support this extensification of the evaluations. For it is evident that each stage of the development needs progressively more science and technology to be 'factored into the equation' and for the simple reason the ecology of bio-physical sciences is something which can no longer be relied upon. This is because the ecology of bio-physical sciences can no longer shield us from the social and economic logic of SUD.

This is what the BEQUEST toolkit does: it casts the networked vision, methodology, framework and protocols of environmental assessment in such a way that when 'strung together' they provide the know-how which is needed to evaluate the environmental, social and economic sustainability of urban development. In particular the know-how that is not only environmental, but equally social and economic and for this reason,

offers the basis to support decisions taken about how to assess the sustainability of urban development.

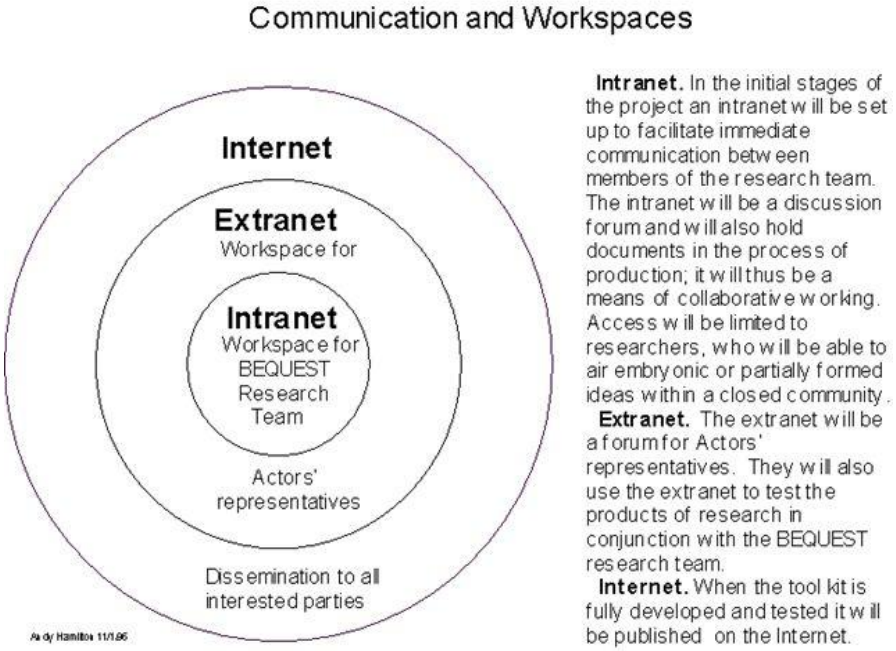

Figure 2: Communication and Workspaces of the BEQUEST Toolkit
Source: Deakin et.al. (2008)[7]

Figure 2 shows the relationships and workspaces BEQUEST has developed as a set of online services freely available to support the assessment of SUD. This virtual representation of SUD provides another cut into the underlying issues, linking the environmental, social and economic together as a set of inter-connected relations. As such, it consolidates the work done to understand the assessment of SUD and serves to intensify the efforts made to uncover the highly integrative and multi-scalar logic of the complex, advanced and very advanced evaluations emerging from this knowledge-base.

For this indicates that it is not just the knowledge base which is changing, but the very institutionalisation of SUD itself. This is because the on-line

[7] Deakin, M., Vrekeer, R. and Curwell, S. (eds.) (2008) Conclusions, in Vrekeer, R., Deakin, M. and Curwell. S. (ed.) *Sustainable Urban Development Volume 3: the Toolkit*, Routledge, Oxon.

services in question don't just augment the networked community into a virtual organisation, but set the stage for a whole new polity. This taking SUD into hitherto uncharted territory that not only needs engagement with citizens, businesses and non-governmental organisations (NGOs), but which also requires partnerships capable of empowering such communities and sustaining their development.

While this extensification of SUD into the civic domain can in many ways be seen to consolidate the research already undertaken by BEQUEST, it also calls for a redoubling of efforts and intensification of the work, so as to allow the vision and methodology of an integrated SUD already developed to capture these issues. This in turn means reworking not only the framework and protocols for environmental assessment, but the highly-integrated and multi-scalar directory of assessment methods developed for such purposes. In short it means intensifying the work already undertaken so as to recast it in line with the needs of citizenship and the corporate social responsibility requirements of both the business sector and NGOs. Those needs and requirements each of them is crying out to be met for the reason they are seen as key in working out exactly what this community of stakeholders can contribute to SUD.

It is perhaps these qualities which have lead Kohler (2002: 130), who wrote a full review of work published by the BEQUEST network, to propose:

> *"BEQUEST is without doubt one of the really interesting network research programmes with an excellent input/output relation and a high multiplication effect. ….[It] provides an excellent state of the art report and a point of departure for projects on 'the City of Tomorrow', helping them to define their own approach and focus".*[8]

[8] Kohler, N. (2002) The relevance of BEQUEST: an observer's perspective, *Building Research and Information,* 30 (2): 130-138.

Under the heading of ‘principle achievements’ and referring to the four-sided definition of SUD - ecological integrity, equality, participation and futurity - Kohler’s (2002) review goes on to say the principle achievements of the BEQUEST network relate to the following:

The definition of SUD

Here Kohler (2002:131) draws attention to the achievement of the vision and methodology of an integrated SUD. In particular the manner in which the ‘BEQUEST vision’ manages to ‘scope’ SUD and ‘enlarge’ what is normally considered to represent the environment. In including environmental, social and economic relations, he suggests one of the principle achievements is that such a representation allows SUD to:

> *“…increasingly become a complete alternative to the actual development model of late modernisation (globalisation and its widening of social inequalities etc.).”*

Clearly, Kohler (2002) is in favour of this approach and draws attention to the manner in which this has developed into the BEQUEST framework**.**

The BEQUEST framework

On this matter, Kohler (2002:132) says:

> *“The principle advantage of the framework is its simplicity which makes it [SUD] understandable to lay people and therefore usable in the public sphere”.*

The protocol

Kohler (2002) sees this instrument as a guideline helping key stakeholders (planners, property developers, designers, contractors and operators) procure the assessment methods needed to evaluate the sustainability of urban development.

The directory of assessment methods

It is noticeable here that Kohler (2002) is more guarded in his comments. He sees the linking of the framework and protocols to assessment methods as a challenging exercise because many of them have not been originally developed with such connections in mind. However, he is complimentary about the standard reporting system devised for this purpose and the classification of assessment methods drawn from the analysis of case study applications. This he suggests shows great promise and provides an ideal opportunity to spread best practice across stakeholders, at various spatial levels and over a number of time scales.

Summing up these principle achievements, Kohler (2002: 137) writes:

> *"The BEQUEST project is exemplary in several ways: 1. By advancing the basic definitions of SUD and establishing common agreements. 2. By producing material which has been brought to a wide audience in a short time. 3. By the very dynamic information exchanges and international discussions made possible through the workshops and above all, the extranet".*

Stanghellini (2002) also provides a positive review of the BEQUEST network's concerted action on SUD and echoes the sentiments of Kohler (2002) in his reference to the exemplary nature of the project. These reviews by Kohler (2002) and Stanghellini (2002) are taken from 'Special Issues' of *Building Research and Information* (Curwell and Deakin, 2002) and *Urbanistica* (Lombardi, 2002) on BEQUEST and SUD respectively.[9] [10]

[9] Stanghellini, S. (2002) Evaluation in planning: the BEQUEST Toolkit contribution, *Urbanistica*, 118: 62-62.
[10] Lombardi, P. (2002). The BEQUEST project for sustainable urban development, *Urbanistica*, 118: 20-93.

Publications

1. Deakin, M., Curwell, S. and Lombardi, P. (2001) BEQUEST: the framework and directory of assessment methods', *International Journal of Life Cycle Assessment*, vol. 6 (6): 376-383.
2. Deakin, M., Curwell, S. and Lombardi, P. (2002a) Sustainable urban development: the framework and directory of assessment methods, *Journal of Environmental Assessment, Management and Policy*, vol. 4 (2): 171-197.
3. Curwell, S. and Deakin, M. (2002) Sustainable urban development and BEQUEST, *Building Information and Research*, vol. 30 (2): 79-82.
4. Bentivegna, V., Curwell, S., Deakin, M., Lombardi, P., Mitchell, G., Nijkamp, P. (2002) A vision and methodology for integrated sustainable urban development: BEQUEST, *Building Research and Information*, vol. 30 (2): 83-94.
5. Deakin, M., Huovila, P., Rao, S., Sunikka, M. and Vrekeer, R. (2002b) The assessment of sustainable urban development*, Building Research and Information*, vol. 30 (2): pp. 95-108.
6. Deakin, M., Mitchell, G. and Lombardi, P. (2002c) Assessing sustainable urban development, *Urbanistica*, vol. 112: 50-54.

Property management

The publications surfacing from this research examine the computer-based development of property management in terms of the corporate strategies and financial instruments made use of to appraise the land and buildings of the urban environment. These papers outline the key issues underlying the development of property management and draw attention to the corporate strategies and financial instruments supporting the informational basis of this computation (Deakin, 2000a).

The research has gone on to examine the corporate strategies and financial instruments surfacing to improve the standards of property management. These examine how the corporate strategies and financial instruments in question develop the capital accounting systems, asset

registers, valuation methodologies and investment appraisal techniques needed to undertake a comprehensive appraisal of land and buildings.

These examinations show that while a great deal of information is currently available on the various initiatives underlying the development of property management, there is still a noticeable absence of any data surfacing on either the corporate strategies, or financial instruments, which form the mainstay of the capital accounting systems, asset registers, valuation methodologies and investment appraisal techniques under consideration.

Developing this theme, the research investigates the contribution valuation methodologies and investment appraisal techniques can make to SUD. This developed a framework for analysing property management's contribution to SUD and a protocol to follow when selecting environmental assessment methods suitable for appraising land and buildings. The benefits of taking such a interdisciplinary approach to the developments and bringing together disciplines which have previously remained separate fields of study, were found to be manifold. They may be summarised as follows:

- such an approach allows for an examination of the core values lying at the centre of property management. This in turn allows attention to focus on the corporatisation of property management and the authority this gives central units to develop the financial instruments of capital accounting;
- the subsequent examination of the asset registers, valuation methodologies and investment appraisal techniques making up these corporate strategies and financial instruments, draws attention to the computer-based information systems developed to appraise the land and buildings making up the urban environment;
- this examination of the information systems demonstrates the link between property management and environmental science as it

surfaces in the connection both have to the appraisal of land and buildings;

- this in turn shows that in order to be meaningful, the connection which exists between the two disciplines needs to be developed through a common language, set of vocabularies and shared terms of reference;
- under such a shared terms of reference, SUD provides the said language, vocabularies and terms of reference and advances a framework, vision and methodology, with a set of protocols and directory of environmental assessment methods, capable of such evaluations;
- classified in terms of their environmental sustainability, this directory of environmental assessment methods illustrates the significance of the valuation methodologies and investment appraisal techniques underlying the discounting mechanism adopted for such evaluations. This in turn illustrates the significance of the valuation methodologies and investment appraisal techniques as financial instruments of the discounting mechanism and its appraisal of the land and buildings making up the urban environment. Such a classification also makes it possible to highlight the significant role the said mechanism plays in assessing not only the environmental, but social and economic sustainability of urban development. This in turn draws attention to the environmental, social and economic relations of such assessments and the challenges this poses for the development of sustainable communities.

The aforementioned allows property management to be seen as progressive and committed to developing links with other connected fields of study (Deakin, 2002a). Likewise, in forging these links and strengthening the connection between property management and environmental science, the subject is seen to develop an inter-disciplinary nature. There can be little doubt the progressive, inter-disciplinary nature of the relationship between the two disciplines, ensures that property

management does not develop in isolation from one of the few sciences it is linked to and shares a connection with.

In linking property management with environmental science and forging a connection between the two disciplines, it is obvious that a wide-ranging set of opportunities open up for the academics, middle managers, directors and chief executives, who have committed themselves to developing such an inter-disciplinary knowledge of the subject (Deakin, 2004).

These investigations have also provided the basis to examine the 'ontology of real estate transactions'. This research adopted unique modelling language (UML) to automate the transfer of land and property across European boundaries and for programming the registration of entitlements in accordance with the particular legislation of each member state. Here valuation algorithms and investment rule sets have been devised to 'streamline' the process and gain efficiencies from the computer-based automation of such transfers in terms of cost, processing and securitisation.[11] The findings of this investigation have been 'fed forward' into research undertaken to support the development of intelligent cities.

Publications

7. Deakin, M. (2000a) The development of property asset management: towards a pro-investment form, *Journal of Financial Management of Property and Construction*, vol. 5 (1): 15-33.
8. Deakin, M. (2002a) Computer-based information systems, property management and the appraisal of land and buildings in the urban environment, *Journal of Property Management*, vol. 6 (1): 72-89.
9. Deakin, M. (2004) Valuation, investment appraisal, discounting, obsolescence and depreciation: their impact on the urban environment, in Deakin, M.,

[11] http://costg9.plan.aau.dk/

Property Management: Corporate Strategies, Financial Instruments and the Urban Environment, Ashgate Press, Aldershot.

Intelligent cities

Developing property management along the lines of corporate strategies and financial instruments, has meant the benefits are not just technical, but organisational. This research found such benefits rest in the direct link the corporate strategies and financial instruments are able to make - by way of and through the organisation of their computer-based information systems - to a range of environmental and social issues surrounding the sustainability of urban development.

While providing the opportunity for property management to become concerned not only with either, technical or organisational matters, but underlying environmental and social issues, the research recognises this raises the following challenge: the need for property management to develop a working knowledge of the languages, vocabularies and terms of reference surrounding SUD and its framework for analysis. This requires that the technical and organisational matters underlying the corporate strategies and financial instruments of property management, need their computer-based information systems to be supported with equivalent environmental and social data.

Given such developments need to be technical, organisational, environmental and social, it is evident such additional data requirements will also change the informational basis of property management. How the informational basis of property management can be computed in such a way as to be in balance with the environmental issues that society is keen to gain knowledge of is something which is not clearly understood. The search for answers to these questions led towards the development of the IntelCities ‘community of practice’ (CoP) as a virtual organisation supporting the assembly of an e-learning platform and KMS as the

information and communication technologies (ICTs) of intelligent cities. Having computed the informational basis, technical needs, organisational, environmental and social requirements of intelligent cities and found an e-learning platform required to carry them, the research turned to the augmentation of their KMS into a digital library (Curwell, et.al 2005).

Developed as back-office functions, attention subsequently turned to the challenge of integrating the KM system and digital library into the IntelCities middleware and delivering the resulting pool of electronically-enhanced (eGov) services to citizens wanting to learn about the environmental improvements they can access as front-end users. This in turn opened up the opportunity for the research to get beyond the tendency for city learning portals to merely provide links to resources held elsewhere and provided the means to customise an e-learning platform capable of meeting the public's call for environmental improvements.[12] The KMS developed for such purposes is organised and grouped according to the requirements of pre-specified, but evolving, eGov services ontology (Deakin, 2009a).

The overriding objective of the IntelCities CoP has been to provide an e-learning platform that allows access to a KMS which is both accessible and usable. This objective has been met by developing the KM system's document manager (DM). This has built the capacity to perform ontology-

[12] Unlike with the previous examination of property management, here the object is not to develop back-office expertise in the use of land and exchange of property, but work out how the informational, technical and organisational relations of intelligent cities can be pooled together as set of electronically-enhanced services capable of environmental improvements. Environmental improvements that provide civil society with the means by which the use of land and exchange of property relating to growth, obsolescence and depreciation, can be aligned to meet the sustainability requirement The services in question relate to the use, exchange and employment of resources (land, labour and capital) that is ecologically-integral and equitable because the environments they construct meet the socially-inclusive and participatory standards of the community-based approach to urban regeneration which is discussed in the next section. Those which in turn develop as the so-called eGov services citizens situated at the front-end want to learn about and gain knowledge of, for the reason they are both ecologically-integral, equitable and participative and because of this, environmental improvements with the means to meet the sustainability requirement. Those services the e-learning platform, KMS and digital library in turn offers access to.

based annotation in semantic web for the easy creation, application and use of semantic data. This is particularly important where learners require the KMS to perform a deep and semantically-rich annotation of materials.

The digital library is the electronic repository storing the information available for extraction by the KMS. The rationale for developing the digital library as part of the KMS lies with the potential the DM has to function as a service capable of:

- capturing, storing, indexing and (re)distributing learning materials, skill packages and training manuals on environmental improvement programmes;
- extending this to include the formal semantics (metadata, knowledge) for the retrieval and extraction of the said materials, packages and manuals available to support an integrated model of eGov services;
- offering access to the extensive range of environmental improvements stored as knowledge objects in the digital library and available for extraction by those responsible for pooling them together as eGov service developments. In particular, as eGov service developments available for citizens to access the benefits of as front-end users.

Utilising the semantic web paradigm, the e-learning platform is capable of delivering data to its users in a way that enables a more effective 'query-minded' discovery, integration and reuse of the knowledge which can be accessed from the digital library. Through the platform's utilisation of semantic web technologies, data uploaded by the KMS is presented as knowledge products (a set of environmental improvements) corresponding not only to documents (web pages, images, audio clips, etc. as the internet currently does), but more pre-defined objects, such as people, places, organisations and events, deposited in the digital library. Using a pre-defined ontology of this type, the DM allows multiple relations between

objects to not only be created, but standardised as measures of performance.

Currently none of the e-learning platforms forming the basis of the CoP's S.W.O.T. analysis offer such services. Until now it has only been common to see references to the possible convergence of e-learning platforms, KMS and digital libraries. This platform and system gets beyond the call for the convergence of such technologies and begins to integrate eGov services with the ICTs available to achieve this.

Perhaps most importantly of all, the outcome of these developments is an e-learning platform, KMS and digital library with the embedded intelligence cities need to deliver semantically interoperable eGov services as programmes of environmental improvements. Environmental improvements whose standards of performance meet the sustainability requirement the IntelCities CoP has a particular interest in.

Publications

10. Curwell, S., Deakin, M., Cooper, I., Paskaleva-Shapira, K., Ravetz, J. and Babicki. D. (2005) Citizens expectations of information cities: implications for urban planning and design', *Building Research and Information*, vol. 22 (1): 55-66.
11. Deakin, M. (2009a) The IntelCities Community of Practice, in Reddick, C. ed. *Research on Strategies for Local E-Government Adoption and Implementation: Comparative Studies*, IGA Global Press, Hershey.

Urban regeneration

The KM system and digital library developed under the Large Urban Distressed Areas (LUDA) project, sought to investigate the community-based approach to urban regeneration. It reviewed how cities have responded to the challenge LUDAs pose and serves to highlight the key role that social-inclusion and participation can play in unlocking the

potential which exists to combat area-based deprivation and tackle the poverty and exclusion large-scale urban distress gives rise to.[13]

This research argues the solution to the deprivation, poverty and social exclusion experienced rests with the actions cities can take to help communities assess the sustainability of their urban regeneration programmes and use the step-wise logic developed by the LUDA project to evaluate their improvements in the quality of life.[14] This research has been progressed under the ESRC Learning from What Works (LfWWs) in Sustainable Community Development and EPSRC Sustainable Urban Regeneration (SURegen) projects.[15] [16]

The UK government proposes that communities should embody the principles of sustainable development in the sense which sustainable communities integrate their social, environmental and economic development as places with diverse cultures. Under such terms of reference, sustainable communities are said to be places where people want to live now and in the future.

The government also suggests sustainable communities possess these qualities because they are inclusive and participatory. Inclusive and participatory in the sense which they represent a broad cross-section of stakeholder interests, engage citizens, involve the public and because of this are well governed, connected and serviced. Well governed, connected and serviced in the sense which they in turn represent themselves as places that are well designed and built. Well designed, built and fair for everyone (Deakin, 2000b; 2002a; 2003a, 2003b).

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[13] Improving the quality of life in Large Urban Distressed Areas (LUDA) is a research project of Key Action 4 “City of Tomorrow & Cultural Heritage“ of the Programme: Energy, Environment and Sustainable Development“ within the Fifth Framework Programme of the European Union. Further information about the project is available from: www.luda-project.net

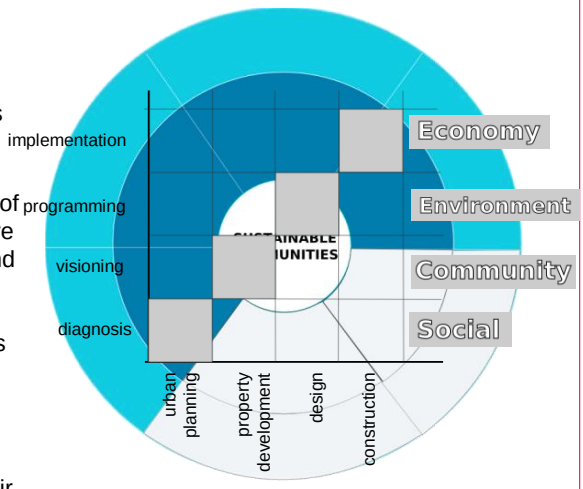
[14] Urban_Regeneration through e-Business' (URBan) is an EQUAL Theme F: 'Worklife Adaptability project‘. Further information about the project is available from**:** http://www.equalscotland.co.uk/napier.php

[15] http://www2.napier.ac.uk/clc/projects_details_11.shtml

[16] http://www.suregen.co.uk/

So what circle is being squared by the simulation?

- The circle is the so-called ' Wheel of Fortune' for Sustainable Community Development (SCD) and the square is the '4-by-4 Matrix' of Urban Regeneration (UR).
- While the performance measurement of the Wheel refers to an 'active, inclusive and safe', fair, well 'designed, built' and 'thriving' components of SCDs, the Matrix provides a 'cross-sectional' representation of the steps and stages of the UR process.
- The far right column provides a 'less segmented', non circular, but linear measure of Sustainable Development (SD), cross-referenced in terms of their integration into the UR process.



actor-network theory

Figure 3: Squaring the circle

Source: Deakin (2009b)[17]

Notes:

1. The segments behind the 4 x 4 matrix are those taken from the Bristol Accord statement and reconfigured into a cross-sectional, real-time representation of the 'Wheel'.
2. The segments are those of the social, equity, environmental and economy, represented here as the 'active, inclusive and safe', 'fair', 'well designed, built' and 'thriving' components of the representation.
3. The circle is squared by the step-wise logic of the urban regeneration process and representation of the social, community, environmental and economic measures this community-based approach offers.
4. To be clear about what is being squared; all the rings in the circle are being squared. That is to say the outer, inner and core. Under Egan, the CRE and the Bristol Accord, the core ring is presented as the point where the values of all these components converge and provide the means to sustain community development. The 'squaring of the circle' taking place under LfWWs does not continue this line of reasoning and deploys the term: 'a community-based approach to urban regeneration' as the means to replace the core and inner circles with a

[17] Deakin, M. (2009b) Definitional components of sustainable communities: the net effect of a realignment and cross-sectional representation, *International Journal of Design Principles and Practices*, vol. 3 (1): 183-196.

series of cells. The cells in question are those - reading them diagonally from bottom left, to top right - components defined in this representation as the social, community, environmental and economic qualities of sustainable communities and what the steps and stages of this regeneration process contributes to the sustainable development of villages, neighbourhoods and cities.

5. In that sense the step-wise and stage-managed logic of LfWWs can be said to be founded on a socially-inclusive vision of a community-based and not centred approach. In particular, on a socially-inclusive visioning of the community-based approach that is inclusive because it offers equal access to life chances and for the reason only such a community-based representation of urban regeneration provides the means by which it becomes possible to be integrative, as opposed to and distinct from, segmented.

Figure 3 indicates how LfWWs proposes to achieve this[18]. As can be seen, it is achieved by offering a cross-sectional representation of sustainable community development, their definitional content, formal components and means which this in turn provides to target ends that are agreed by professional bodies and the government alike. It does this by cutting across the social basis of sustainable communities and through to the environmental improvement programmes supporting their development.

While this is the direction LfWWs also takes the analysis, this is done by using what it should like to refer to as the 'pulleys and levers' of sustainable community development. For it proposes to make the social component of sustainable communities the 'bottom-line' and do this by strategically repositioning the other components (environmental and economic) of the definition to suit. That is by repositioning the social alongside the environmental and economic and leveraging them in such a way as it becomes possible for the community to be geared in line with the sustainable development of the step-wise logic which underlies this particular configuration.

The net effect of this is as follows: firstly the substitution of equity relative to governance raises the social significance of sustainable community development and adds weight to the need for a means capable of meeting this end. Secondly; this adds further weight to what is understood about

[18] http://www2.napier.ac.uk/clc/projects_details_11.shtml

sustainable community development. In particular, that it poses a strategic challenge relating to the social (in)equities of the relationship which communities have not only to the environment, but economy and mutually reinforcing effect such development has on their sustainability. Thirdly, it also serves to highlight the skills agenda underlying this realignment needs to be strategic, capable of capturing the social nature of the relationship communities have to the environment. That relationship which those responsible for sustaining community development, not only need to know about, but also require to understand the significance of.

While this is sufficient to deal with ends, what means are to be deployed for such ends is very much the matter in hand and something which itself means the pulleys and levers used to 'bottom-out' any such repositioning of the definitional components, lever and gear them appropriately, demands we not only see the wheel as a circle, but a circle to be 'squared' before it can be properly understood and offer a knowledge of sustainable community development.

Before setting out the reasoning behind this 'squaring of the circle', it is perhaps best to begin by clarifying why it is felt necessary to base this particular repositioning of what is meant by sustainable community development on a bottom-up reading of the subject. This method of argumentation is chosen because if we are to match means and ends, only a bottom-up reading of the subject offers the opportunity to do this. The reason for this being that only such a approach offers the type of collaborative framework which is needed to build consensus over the substantive content of the as yet somewhat formal definitional components which are currently available for such purposes.

For as the examination of the Egan, CRE and Bristol Accord's representation of sustainable community development goes some way to reveal, up till now the tendency has been to move in a direction that empties out the means in the interests of clarifying ends, so any attempt which is made to reverse this trend and match means to ends, itself

means a greater amount of substantive content needs to be generated as a requirement of any effective realignment of the definitional components.[19] [20] [21]

This is the task in hand and quite literally means there has to be one more twist in the configuration of sustainable communities. The twist 'this time around' being not about the repositioning of equity - as it has been in the previously representations - but on what this means in terms of the substantive content it generates. To be exact: what it means in terms of a distinctively community-based approach to urban regeneration.

This most recent twist is very much about finding a means of 'adding back' much of the substantive content about the socially-inclusive visioning of a community-based approach to urban regeneration absent from practically all the other representations of sustainable community development offered so far. The cross-sectional representation of sustainable community development outlined in Figure 4 provides the basis for this substantive reworking of the previous representations and those drawn attention to here as the means to integrate all of them back into the socially-inclusive visioning of a community-based approach to urban regeneration.

The publications emanating from this research set out the framework for analysis LfWWs has pieced together to form the community-based approach and content of the urban regeneration process represented here as a simulation of sustainable community development. What this establishes is that the first round of community-based approaches are flawed by virtue of the environmental determinism which the design codes work to and recourse to the economic, cultural and media-based representations of urban regeneration, they in turn advance as part of their

[19] http://www.communities.gov.uk/publications/communities/eganreview
[20] http://www.ascskills.org.uk/pages/regional-centres-of-excellence
[21] http://www.eukn.org/E_library/Urban_Policy/Bristol_Accord_UK_Presidency_EU_Ministerial_Informal_on_Sustainable_Communities

search for sustainable development. This shows such community-based approaches represent false starts, because their eagerness to speculate over the possible value of such designs is ecologically damaging and for the reason this produces a type of environmental determinism in which the social need and material realities that surround the exclusion and poverty of multiple-deprivation remain hidden.

Rather than trying to disguise such needs and realities, a less speculative approach, asks the community to diagnose the social need of the excluded, poor and deprived and collaborate with other stakeholders as part of an attempt to use urban planning as a platform to consult about the complex and advanced assessment methods available to evaluate the capacity which the property development sector has to build consensus and deliberate over the probabilities of programming a design that is part of a legitimate equity-sharing partnership, as much environmental as economic.

In this scenario, the diagnosis step underlying the collaborative planning and supporting the visioning of the property development stage, do not leave consensus building to operate on a shoestring, or the signature designs of the ‘avant-garde’, too strung out to legitimate the code they take their meaning from, but instead offers the opportunity for urban planners and property developers to use such collaboration and consensus building as a platform for securing a ‘rear guard’ action and whose collective exercise in back-filling supports the participation of the public in something more akin to a shared enterprise.

That is to say, secure a rear-guard action something more akin to a shared enterprise which allows urban planners and property developers to represent themselves as the community’s urban regeneration agents and enter into joint ventures with cities designed to ‘reboot’ the built environment and use the intelligence this uploads as the means to consult and deliberate over how to design a programme of civic renewal.

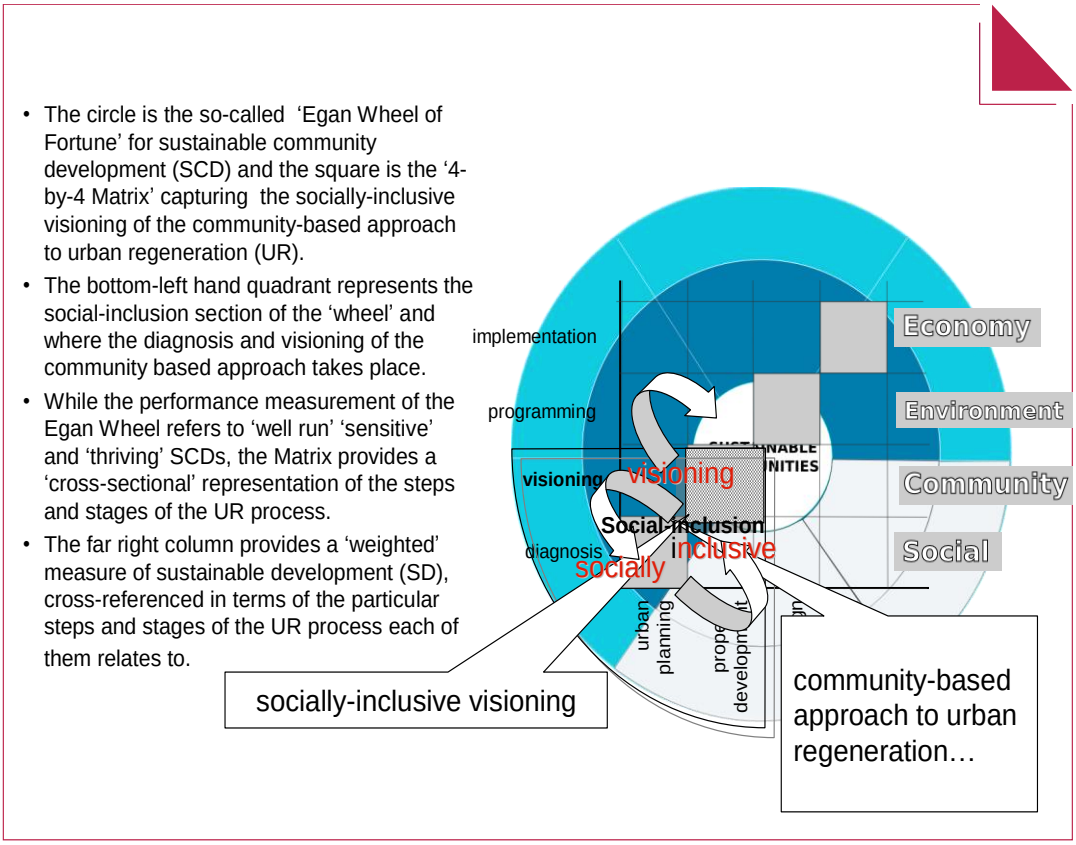


Figure 4: The step-wise logic of socially-inclusive visioning

Notes:

1. Sustainable community is the common denominator in both the Egan Wheel of Fortune and 4-by-4 Matrix. What both the wheel and matrix share in common is a bottom-line commitment to socially-inclusive visioning as a step in the community-based approach and stage of the urban regeneration process underpinning the development of sustainable communities.
2. Socially-inclusive visioning is radically different to standard visioning exercises, either policy, or sector-orientated, this is because it starts by communities taking the conscious decision to step back from the immediate situation they experience, look at them in relation to others in society and material realities they encounter. Then use the critical insight such a reflection produces as a basis to imagine development scenarios that offer an alternative future to the excluded, poverty stricken and deprived landscapes i.e. nightmare scenarios, which they currently inhabit. This is a radically different approach to the exclusively forward-looking, 'best dream', desired future states of idealised landscapes, typical of visioning exercises carried out using futures analysis techniques. This is because it is not just socially-inclusive, but is equally inclusive in the visioning of the community-based approach it advances to underpin both the environmental and economic representations of the urban regeneration process.
3. It asks the community to step down from where they currently stand on the assumption this will provide them with a platform to take three steps forward and upwards in the

process. That is to say, forwards and upwards in the process of urban regeneration and sustainable community development which this is part of.

4. While it is not uncommon to see the diagnosis step of socially-inclusive visioning referred to as either a "preliminary", pre-visioning, or even pre-planning "activity", this merely separates out this step and in effect the planning stage from the exercise (for example: see Ohm (1999)).[22] This representation of socially-inclusive visioning is wrong for the following reasons: first it separates this stage of the process from the others when it is integral to them. Secondly, it also unsound for the reason such a separation is anti-social and runs the risk of promoting community as something that is exclusive, restricted and bounded to a re-territorialisation of space which is segregated. This in turn promoting the development of places that reflect this division and which internalise the poverty of area-based deprivation as part of their design code. That code which is flawed for this reason. Flawed for the reason that while deployed as a means to conserve the community's environment, economy and cultural heritage, such codes do the opposite and work as a means by which to undermine them. This in turn (re)producing, if not intensifying the social division within the community it is supposed to resolve and whose conservation of cultural heritage is often used as the basis to legitimate the visioning process undertaken in their name.

That programme of civic renewal whose revitalisation is something which is also capable of a 'triple bottom-line' (re)integration of neighbourhoods back into the mainstream. That mainstream which not only underlies the triple bottom-line, but that also offers the prospect of moving above such a threshold by including the cultural and media-based developments which also contribute towards the development of sustainable communities.

All of the sustainable community case-studies developed under this project offer evidence of this 'rebooting' and argue the bootstrap theory surfacing out of this also offers signs of how these critical insights are being used to begin 'kick starting' new urbanism's 'turning away' from the environmental determinism of signature design codes.[23] Signature design

[22] Ohm, B.(1999) A Guide to Community Planning, University of Wisconsin.

[23] New Urbanism is a design movement that promotes 'walk-able' neighborhoods and which develops a range of housing and job types. It arose as a design-led movement in the early 1980s and continues to reform many aspects of property development and urban planning in the US and throughout the UK. Now the dominant school of thought, the movement supports collaborative urban planning, balanced property development and traditional neighborhood design (TND). New urbanists believe their urban regeneration strategies, as exemplified in the TND of the HOPE VI and Millennium Villages programmes, are sustainable in the way their built environments increase the supply of affordable housing for communities, reduce traffic congestion within cities and rein in urban sprawl.

codes whose speculative qualities seem incapable of including either, the diagnostic, or visioning steps of the urban planning and property development stages as platforms for building consensus over the very material upon which their designs stand. That is to say, stand and perhaps even more importantly, either serve to underpin, or undermine, uphold, or undercut the design code upon which the urban planning and property development stages of the regeneration process also either stands, or falls. Either stands, or falls and likewise, those claims made about the potential new urbanism has to integrate neighbourhoods as part of a district-wide renewal capable of meeting the civic ambitions of sustainable community development, are also either successfully reloaded, or so over-loaded everything is brought to a ‘crashing’ halt (Deakin, 2009b).

Figure 5 illustrates the step-wise logic of the socially-inclusive visioning underlying the community-based approach. This sets out the steps and stages of the said visioning and approach to urban regeneration. It also suggests that seeing urban regeneration as a shared enterprise is critical to overcoming all of this undue speculation. For it is the collaboration and consensus building of such a joint venture between urban planning and property development that has the capacity to kick-start any possible reloading of the built environment, not only in terms of socially-inclusive visioning, but as part of the diagnostic step which provides the material basis for the collaboration and consensus building. That collaboration and consensus building which in turn provides the foundation for the types of equity sharing partnerships capable of uploading environmental improvement programmes and for the reason those consultations and deliberations that occur over their designs, offer the democratic means by which to overcome revanchist-based gentrifications.

Doing this has meant unravelling the current communicative twist by sticking with the collaborative and consensual, extracting the step-wise and stage managed logic of the community-based approach to urban regeneration and capturing both the urban planning and property development stages of what shall be referred to as the rebooting of the

built environment. That rebooting which meets social need by stepping back from the land and property market and diagnosing the material realities of the situation which communities confront as part of the planning stage and by using the vision this develops as a platform for the urban regeneration process to kick-start the uploading of environmental improvement programmes designed as the stage for a triple-bottom line development of sustainable communities.

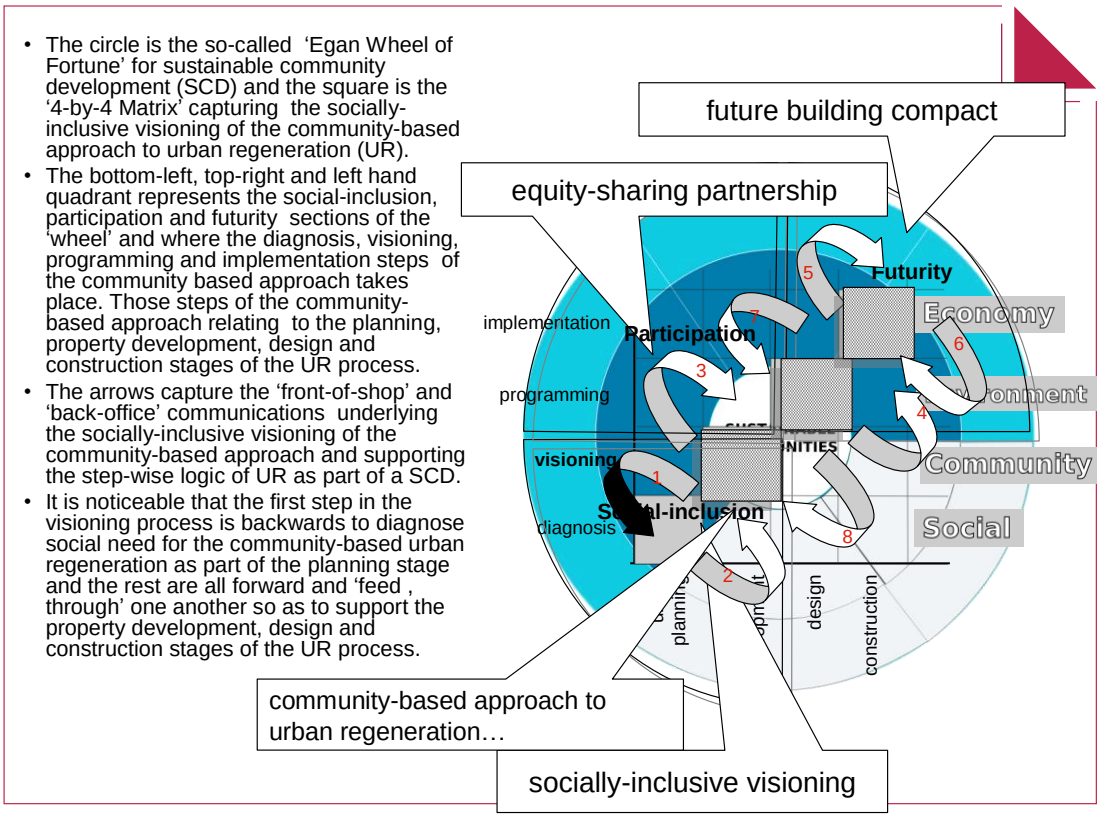


Figure 5: The steps and stages of the community-based approach

Notes:

1. Steps 1 and 2 define the social-inclusiveness of the visioning in terms of the diagnosis of need undertaken as part of the planning stage and analysis of the material realities the community encounters as part of the visioning supporting the property development stage of the urban regeneration process. Step 3 shows how this vision of the property development stage then becomes part of the programming step and in turn develops to underpin the design of the environmental improvements. This in turn developing as step 5 and as the design vision which underlies the implementation of the programme and economics of the construction stage.

2. The vision twists its way back to where it began under steps 6, 7 and 8, as part of the return journey back to socially-inclusive visioning as the 'triple bottom line' of the community-based approach to urban regeneration and development of sustainable communities.
3. This way the visioning can be seen to be socially-inclusive because it includes the diagnosis of social need and material realities the community encounter as a platform for the urban regeneration process and development of sustainable communities everything else is linked to, connected with and therefore part of.

This logic has subsequently been drawn upon to begin codifying the urban regeneration process as part of sustainable community development. This is set out in Figure 6.

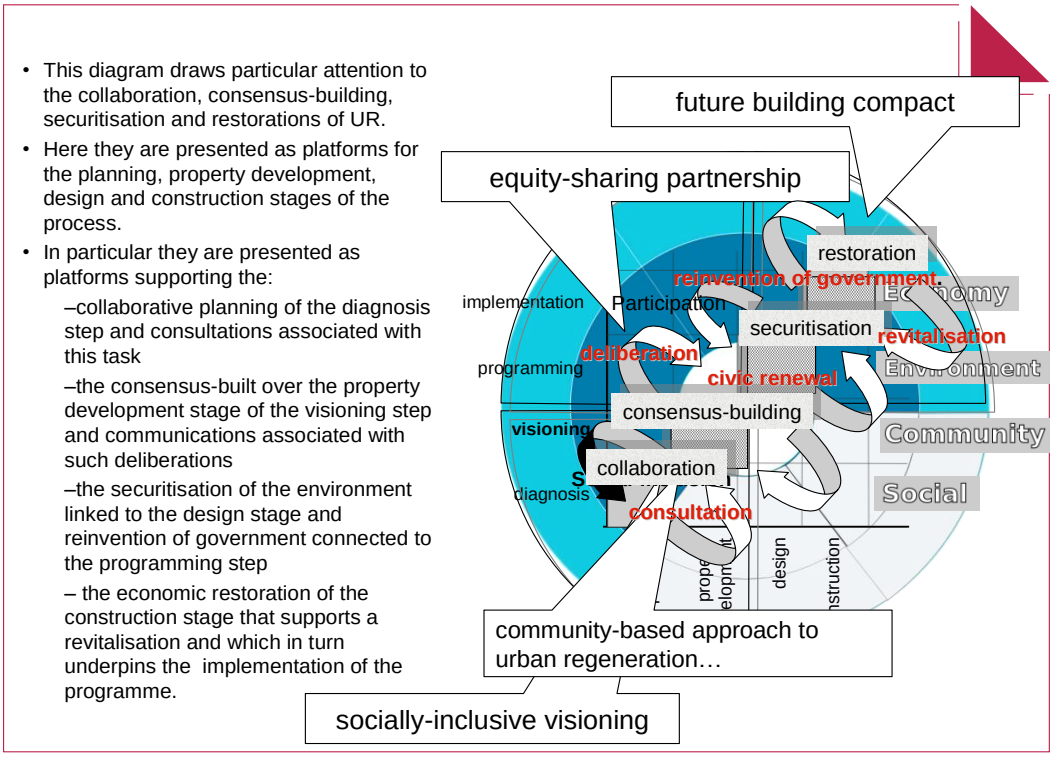


Figure 6: The urban regeneration process

Unlike the previous attempts made by new urbanism to do the same, this simulation does not start from the end and try to work its way back by forcing everything else to 'fall into line'. In contrast to what new urbanism propose, this codification starts from the 'bottom up', not with an analysis of land and property markets, but with the diagnosis of social need and achieves this by substituting the collaborative planning and socially-

inclusive visioning that surfaces from the consensus-built over the material realities of property development, for the rivalry and competition which exists between them.

For rather than forcing the design to fall into line with the environmental determinism of market economics, the simulation turns things around by stepping back from this particular aesthetic on cultural heritage and down from property development as the economic and environmental means for planning to ‘bottom-out’ the social needs and material realities of the community-based approach to urban regeneration. That bottom-line which in turn offers up a raft of collaborative and consensus building measures for the urban planning and property development sectors to deploy as that process of socially-inclusive vision(ing) which communities can use as the means to liberate themselves from the poverty of area-based deprivation and do so by taking the opportunity this offers to ‘rise to the occasion’ and use the ecology this bio-physical system provides to kick-start any such reloading of the built environment. That uploading which in turn allows the urban regeneration process to break-free from the confines of the ‘traditional neighbourhood design’ (TND) strait-jacket which everything has become tangled up in and do this by designing a programme of environmental improvements capable of sustaining communities.

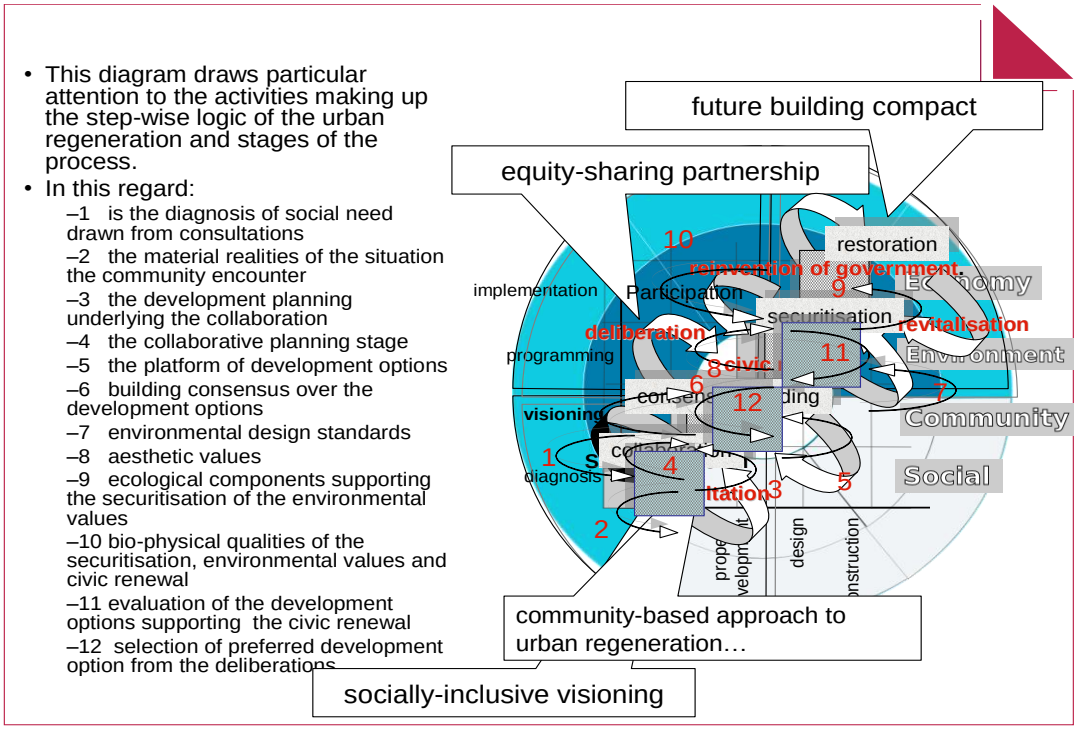


Figure 7: Codification of the step-wise logic

Notes:

1. This figure focuses attention on the first three steps and stages of the urban regeneration process and highlights each of the four sides to the diagnosis, visioning and programming steps of the planning, property development and design stages.
2. Again the codification starts with the visioning step of the property development stage aligned to the community-based approach. It proceeds to the diagnosis step (the social need for and material circumstances of the community). It then turns back towards the community through the development planning and collaboration required from this stage of the urban regeneration. From here the collaborative planning provides a platform for the development options available to build consensus over the environmental standards their designs rest on, the aesthetic values of the same, ecological components and bio-physical qualities of the securitisation, environmental values and civic renewal. From here the visioning embarks on an evaluation of the development options supporting this civic renewal and selection of the preferred development option from the deliberations. Here the visioning twists back to the community as the basis for the urban regeneration and sustainable community development.
3. The codification is limited to these 3 steps and stages because these provide the community with the basis to kick-start any such rebooting of the urban regeneration process, not only in terms of socially-inclusive visioning, but the diagnostic step that provides the material basis for the collaboration and consensus-building which takes place between the urban planning and property development sectors. That collaboration and consensus-building which in turn provide the basis for the equity sharing partnerships in turn capable of kick-starting the

programming of those designs whose consultations and deliberations offer the democratic means to overcome revanchist-based gentrification and in doing so, legitimate not only the environmental, but economic, cultural and media-related actions, whose overall process of civic renewal and revitalisation, puts sustainable community development very much in the balance.

Publications

12. Deakin, M. (2000b) Modelling sustainable community development in Edinburgh's South East Wedge*, Journal of Property Management*, vol.4 (2): 72-89.
13. Deakin, M. (2002a) Modelling the development of sustainable communities in Edinburgh's South East Wedge, Planning *Practice and Research*, vol. 17 (3): 331-336.
14. Deakin, M. (2003a) Developing sustainable communities in Edinburgh's South East Wedge: the settlement model and design solution, *Journal of Urban Design*, vol. 9 (2):137-148.
15. Deakin, M. (2003b) Developing sustainable communities: the settlement model, design solution and matter of environmental assessment, *Journal of Environmental Assessment, Management and Policy*, vol. 5 (4):551-573.
16. Deakin, M. (2009b) Definitional components of sustainable communities: the net effect of a realignment and cross-sectional representation, *International Journal of Design Principles and Practices*, vol. 3 (1):183-196.

Examples of interdisciplinary research

The following provides two examples of the interdisciplinary research underlying the publications drawn upon as the basis for this submission, their link to the use of land and exchange of property and connection this in turn has to SUD. The first extends the previous examinations of the valuation methodology and investment appraisal techniques set out under the sub-heading of property management. This is presented as: the NAR model of discounting under the property valuation and investment appraisal techniques of LCA and EIA. The second example examines the: integrated model of eGov services for improving environmental

performance and is drawn from the previous examination of intelligent cities.

In the interest of highlighting the integrative nature of these examples, the following shall differ from the method previously adopted to provide an account of the applicant's publications on SUD. Here the focus of attention will be on how the applicant's work relates to other academic research on the subject and shall therefore reference not just his own publications, but those of his peer group.

Example 1: The NAR model of discounting under the property valuation methodology and investment appraisal techniques of LCA and EIA

It is been suggested (Harvey, 1887. 1996, 2004; Pearce and Turner, 1900; Rydin, 2002), the debate over the application of the discounting principle in property valuation and investment appraisal has tended to become separated from issues concerning the use of land, exchange of property, obsolescence of buildings and effects their depreciation has on the urban (re)development process. It has also been argued that any attempts to progress the matter should be grounded in the environmental economics of the discounting principle and draw upon what is understood about valuation methodology and investment appraisal techniques as a means to advance our knowledge of obsolescence and depreciation via life cycle analysis and environmental impact assessment.

It is for this reason the following proposes a framework for analysis grounded in a form of environmental economics that provides the opportunity for a detailed examination of the relationship which the time-horizons and spatial configurations underlying the use of land and exchange of property and surfacing here in terms of obsolescence and depreciation, have on experimental designs aimed at the introduction of energy-saving, clean air technologies. That is, by undertaking an analysis of how obsolescence and depreciation reacts back on operating costs, repairs, maintenance, improvements, etc. Or, from the NAR model's point

of view, how they react back on the relationships between *(I + r)* and O_i as set out in equation (1) and (2) shown below:

Equations:

$$P = \sum_{t=i}^{n} \frac{R_i - O_i}{(1+r)^i} \quad \text{.....} \quad (1)$$

Where:

P = value of property in its current land use
n = period when GARs can be earned in its current use
R_i = *gross annual returns (GARs) from i to year n*
O_i = *operating costs, excluding obsolescence and depreciation, from i to year n*
r = rate of discount, or, initial yield, K and represented as RFR + r - g + d*

Harvey's (1987, 1996, 2004) approach represents the valuation of property as a set of investment appraisal techniques to apply in the discounting of returns and calculation of present value. In terms of cleared site value, it is proposed that the value of the cleared site is equal to the present value of the most profitable alternative use, less the cost of clearing the site and rebuilding for the new use. The residual method of property valuation and procedure to be followed in the appraisal of investments required for this calculation is represented in the formula: -

$$C = \sum_{t=i}^{n} \frac{R_i' - O_i'}{(1+r)^i} - D - B \quad \text{.....(2)}$$

Where:

C = the value of the cleared site
n = period when GARs can be earned until alternative use
R_i = *GARs from i to year n*
O_i = *operating costs, excluding obsolescence and depreciation, from i to year n*
r = rate of discount, or, initial yield, K and represented as RFR + r - g + d*
D = the cost of demolition and clearing the site
B = the cost of rebuilding to the new, alternative land use

These are the relationships Rydin (1992) is particularly critical of due to their apparent inability to produce land uses and building programmes with operating costs, repair schedules, maintenance schedules and refurbishments, aimed at low carbon, fossil fuel consumption - the relationship that also appears to be of particular interest to Vale (1993).

Accepting that Rydin's (1992) criticisms and call for downward adjustments to r are not supported by Pearce and Turner (1990) and this leaves the whole question of the relationship between valuation, investment appraisal and the environment wide open, it is possible to argue the best way to further any common interest in the debate over the market basis, bio-physics and ecology of both life cycle analysis and environmental impact assessment (and in that sense the sustainability requirement), is through a closer examination of the relationship between O_i and r, the discount rate.

In terms of the NAR notion of net income, it is only possible at this stage to qualify the equation so that r represents K, *which* = $RFR + r^* - g + d$.

Where:

K	=	*the initial yield on capital investment*
RFR	=	*the risk free, inflation prone opportunity cost rate of return*
r^*	=	*risk premium*
g	=	*expected annual rate of rental growth in new land uses and building programmes*
d	=	*depreciation in the capital component of land use i.e. the building and not the land. This is because land is seen to represent the non-reproducible resource that commands a scarcity value and transfer earnings payment from (re)development potential. This can, of course, be severely restricted if the land in question is subject to contamination and becomes obsolete in the sense it represents an environmental hazard.*

While this shall be common for both equations (1) and (2), it will also affect R_i and O_i due to the fact r will be net of obsolescence and depreciation.

While these modifications appear minor and perhaps insignificant, it is proposed that their true value lies in the fact the adjusted NAR model addresses many of the criticisms made about the tyranny of the discounting principle and selection of an appropriate rate, draws particular attention to both risk and growth in setting the return on capital *and makes it possible for the rate of interest to evolve from the life cycle analysis and environmental impact assessments undertaken rather than the other way around*.

This is an important point, because tackled in this way it is not the market that sets its standards upon the environment, but the life cycle analysis and environmental impact assessment (i.e. environmental economics of the green contingent in the design, engineering and construction sector), whose valuation and appraisal produces the rate of interest acting as a return on capital. The following lists the potential benefits of any such examination:

(a) it should focus attention on the nature of the relationships between O_i and r in the NAR model;
(b) it would build upon recent advances in contemporary property valuation and investment appraisals, not only in terms of the income approach to risk and growth, but the cost based thesis (Deakin, 1997a, b) on outgoings associated with operating costs and capital expenditure on repairs, maintenance, improvements and refurbishments;
(c) the collection of information on such expenditure would augment our understanding of land-use, building obsolescence and depreciation, by using the criteria set out by Baum (1991, 1994) and Rydin, (1992), to establish whether experimental designs of the type in question have notable benefits;
(d) it would also make it possible for the benefits of contemporary valuation and investment appraisal to be formally integrated into the field of development analysis - something it may be difficult to believe has not yet been delivered (Department of the Environment, 1991;

Harou, Daly, Goodland, 1994; Antwi and Deakin, 1996, Deakin 1997; Brooks, Cheshire, Evans and Stabler,1997);

(e) such data would also allow life cycle exercises to be undertaken in the valuation and appraisal of investments, obsolescence and depreciation and should also be capable of incorporating an environmental impact assessment into the (re)development of land-uses and building programmes (Deakin, 1999a,b). This would also allow the market-based criteria of the adjusted NAR-type model to be integrated with the life cycle analysis and environmental impact assessments of BREEAM (see Cole, 1997; Cooper, 1997, 1999; Cooper and Curwell, 1998). Here adjusted NAR-type models would then provide the market criteria, whereas life cycle analysis and impact assessments, like BREEAM, could provide the bio-physics and ecology of energy conservation. Nesting within each other, the adjusted NAR-type model would be able to value land and buildings in line with the market, while the standard for the conservation of energy could be represented in a universal form. The integration of the adjusted NAR-type model with that of life cycle analysis and environmental impact assessment would also add the valuation and investment currently absent from such an analysis or impact assessment (Birtles, 1997; Department of Environment, Transport and the Regions, 1999).

(f) this life cycle analysis and environmental impact assessment would provide the information to establish whether the (re)development proposal meets the sustainability requirement. This would be done by benchmarking the impact against a number of indicators to establish what effect the (re)development has on the downloading of costs and index of sustainability associated with such measurements (Mitchell, May and McDonald, 1995; May, Mitchell and Kupiszewska, 1997; Curwell, et.al, 1999; Ding, 2005; Danman and Elle, 2006).

(g) such a schedule of costing would provide information for the valuation and appraisal of the initial capital and subsequent revenue expenditures in terms of outgoings associated with the energy-saving technologies of clean air. The effect of this on occupational demand for

land uses and building programmes and the value of property as an investment opportunity could then also be analysed;

(h) the with/without logic of comparative analysis could also be drawn upon to establish not so much the potential, but real effects of introducing such technologies. This would identify what value the market puts on such technologies. That is, what price, both users and investors are willing to pay for the benefits of an income stream which does not download costs into the future. It would also demonstrate the cost of not taking such a course of action. Something which could be measured in terms of the different present values of those properties with and without the technologies in question. While, this does not account for the spill-over, or external costs/benefits associated with such a course of action, it ought to be possible to satisfy this by some non-standard form of, hedonic, or contingency exercise (in this instance forming the basis of a life cycle analysis and environmental impact assessment) geared towards a willingness to accept the inter-generational loading in question. The effect this form of valuation, combining, as it does, both market and environmental criteria, has on the appraisal of investments, would also need to be placed under examination (Deakin, et.al, 2002);

(i) *RFR + r** gives an indication of the parameters i.e. upper and lower levels of the discount rate, *r*, or initial yield *K*, whereas *g* provides an indication of anticipated growth. The significance of this being that both variables are linked into the capital markets of the economy and provide the opportunity to estimate the effect any change in the relationship between O_i and *r* will have, not just upon the time-horizons and spatial configuration of land use and building programmes (for example; the income benefits of longer time-horizons, more compact spatial configurations, lower risk, greater growth and cost-savings) but in terms of the reduced rates of obsolescence and depreciation brought about by the introduction of experimental designs aimed at energy-saving, clean air technologies. In short a reduction in the costs of intergenerational downloading, not only from a given land use or

building programme, but city as a whole. The same is true for equation (2), but here the effect also extends into *D* and *B*;

(j) here again the effect which the cost of introducing such new technologies into the (re)development of land uses and building programmes have, could be analysed so as to establish at what point the income benefits that surface become efficient in economic terms and socially equitable from the environmental point of view. Such an analysis would be in accordance with the vision of longer term time-horizons and more compact spatial configurations as scenarios for the consumption of energy by the occupiers of land and buildings (Breheny, 1992; Symes, 1997; Ding, 2005).

This list of considerations does not of course exhaust all the issues in question; it merely sets out a framework for analysis that makes it possible to circumvent many of the criticisms which are made about the discounting principle. That principle which underlies the NAR model of valuation and investment appraisal, its' visioning of the time-horizons and scenarios underlying the spatial configuration of land use, building obsolescence and depreciation.

What this adjusted NAR-type model does is turn the principle of 'the polluter pays' around by introducing the means by which those agents of change in the market (i.e. designers, engineers, contractors, planners etc) can undertake the life cycle analysis and environmental impact assessments that *not only value, in market, bio-physical and ecological terms, the economic efficiency and social equity of such contributions to the marginal productivity of capital, but compensate them with a rate of return which is seen as fair and just from the environmental point of view.*

Without this and what is in effect an environmentally-friendly, green pricing mechanism, it would not be possible to overcome the legacy of market failure in dealing with the environment and link the means with the ends i.e. the market basis of the valuation and investment appraisal techniques

underlying the adjusted NAR model, with the time-horizons and spatial configurations (visioning and scenario-building exercises) of environmentally-friendly green technologies for land use and building programmes. That is, ***show 'how it pays'*****,** in terms of the market and environment, to introduce energy-saving technologies with lower carbon-based emissions. Without this link it would not be possible to demonstrate the range of opportunities open for the state to finance experiments of this kind and show *the real value* such land uses and building programmes offer the public, not only as a form of environmental conservation (be it in terms of energy, or natural capital consumption) capable of sustaining economic growth, but an enhanced quality of life.

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Example 2: The integrated model of eGov services for improving environmental performance

The notion of the intelligent city has become popular over the past decade and the subject of attention from Mitchell (1995), Graham and Marvin (1996) and Mitchell (1999). This attention has in turn spawned a host of intelligent city applications. In response to these developments, research-based CoPs, like BEQUEST and INTELCITY, led by Curwell and Deakin (2002) and Lombardi and Curwell (2005), have emerged to model the integration of such electronically-enhanced services and supply back-office functions with the middleware to meet their e-learning needs, knowledge transfer requirements and capacity building commitments.

What follows outlines the integrated eGov services model developed to meet the emergent e-learning needs, knowledge transfer requirements and capacity building commitments of this organisation's particular interest in demonstrating how the use of land and exchange of property can underpin the environmental improvements of socially-inclusive and participatory urban regeneration programmes. It also serves to outline how the IntelCities model of land use and property exchange underpins the environmental improvements of eGov service developments and builds the socially-inclusive and participatory capacities supporting the community-based approach to urban regeneration advanced for such purposes.

Figure 8 illustrates the integrated eGov services model developed by the IntelCities Integrating project (IP). At the front-end there are a range of electronically-enhanced services highlighted as social inclusion, participation and regeneration and shown in terms of the middleware integrating their environmental im.provements into a city's e-learning platform. This integration of the e-learning platform into the middleware of the eCity platform (eCP) is the challenge the IntelCities CoP has set itself. This has been met by sourcing the IT needed for the e-learning platform to

be augmented into a KMS and digital library supporting the environmental improvements of eGov service developments in question.

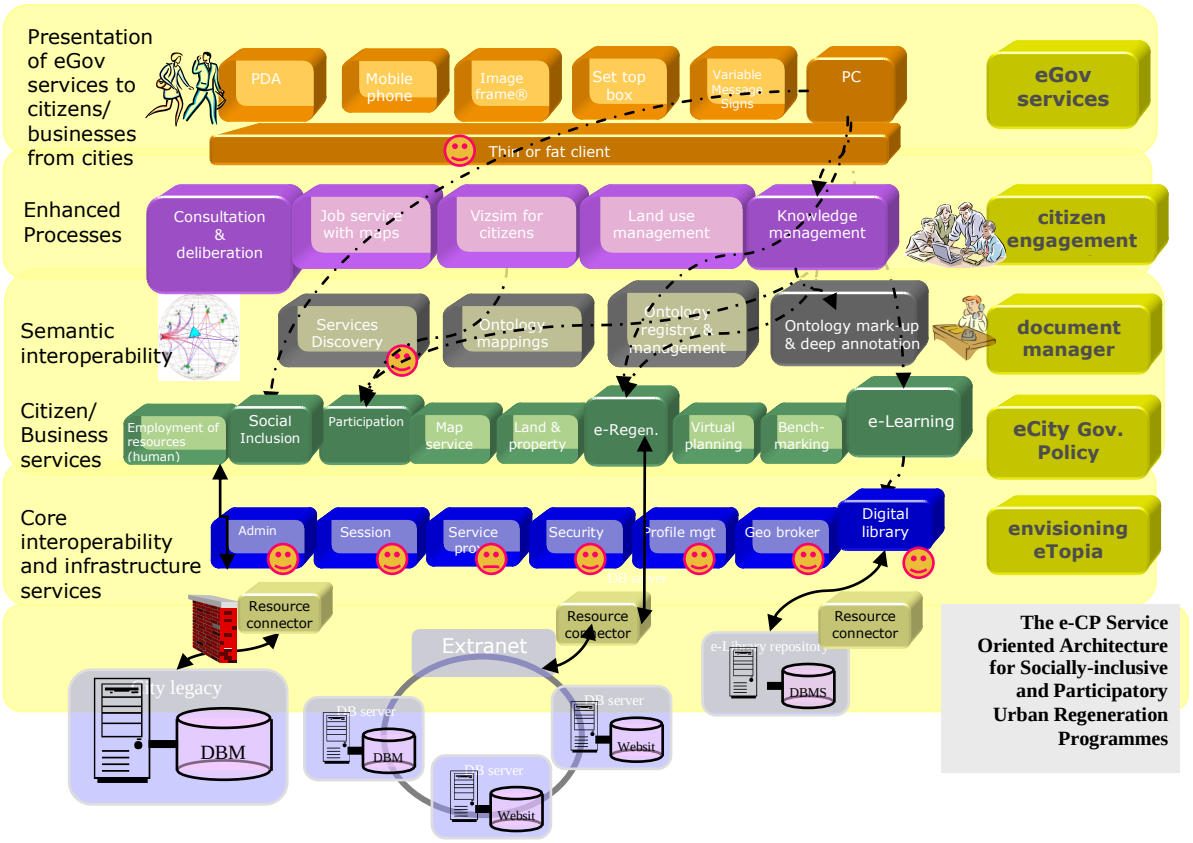

Figure 8: Integrated eGov services model

Source: Deakin (2009a)[24]

The services oriented architecture (SOA) and enterprise-wide business model adopted by the CoP for the development of the IntelCities e-learning platform, meets this challenge by offering a distributed, web based and extendable access system. This develops the enterprise architecture as a distributed system, offering a web services enabled platform, with XML IT utilisation and SOAP communication.

[24] Deakin, M. (2009a) The IntelCities community of practice: the eGov services model for socially-inclusive and participatory urban regeneration programmes, in Reddick, C. (ed.) *Research on Strategies for Local E-Government Adoption and Implementation: Comparative Studies*, IGA Global Press, Hershey. All the other figures appearing in this section are also drawn from this publication.

An important element in the initial system design, relates to the use of the unique modelling language (UML) and rational unified process (RUP) methodology. This allows for the development of complex 'N-tiered' systems and offers a homogenous platform solution supporting the development of specific service applications. It also manages to do this while leaving open the possibility of sharing services developed by other organisations not yet integrated into the platform supporting this model of eGov services.

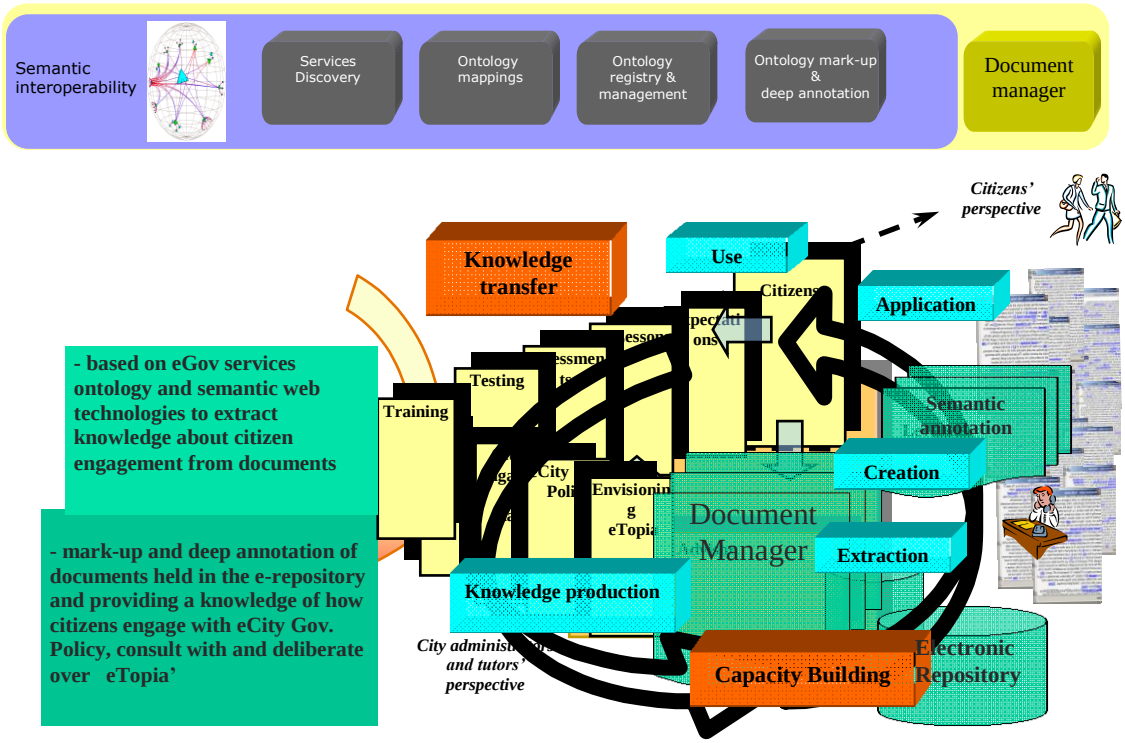

Figure 9: Integration into the eCity platform

The networked community underlying the e-learning platform has been developed as a virtual organisation providing the common ground between tutors, trainers and learners, as spaces where all concerned can co-operate as a CoP: sharing experiences and offering personal and confidential advice about the courses and communication tools. This e-learning platform is supported by core services that provide the learning content, communication, collaboration, assessment and administration of the IntelCities courses i.e. the learning materials, skill packages and

training exercises which are used to underpin the socially-inclusive and participatory components of the community-based approach and support their urban regeneration programmes.

Figure 9 illustrates the integration of the e-learning platform, KMS and digital library and shows the workflow supporting this. This shows the workflow as having its basis in the digital library and KMS of the e-learning platform. Here the system's document manager (DM) is shown to semantically annotate the learning materials, skill packages and training manuals supporting the courses held on the platform and mark them up as environmental improvements, classified in accordance with the eGov services ontology evolving to manage knowledge drawn from the digital library.

Utilising the semantic web paradigm, the e-learning platform and KMS is capable of delivering data that enables a more effective discovery, creation, application and use of knowledge and which the DM can extract from the digital library. Through the platform's utilisation of semantic web technologies, data uploaded by the KMS (as information available from the system's DM) discovers knowledge products corresponding not only to documents (web pages, images, audio clips, etc. as the internet currently does) but more pre-defined objects, such as people, places, organisations and events deposited in the digital library.

Using a pre-defined ontology of this type, the DM allows multiple relations between objects to be created. Currently none of the e-learning platforms forming the basis of the S.W.O.T. analysis offer such services. Until now it has only been common to see references to the possible convergence of e-learning platforms, KMS and digital libraries. This platform and system gets beyond the call for the convergence of such technologies and begins to integrate the environmental improvements of eGov services with the ICTs available to learn about and gain knowledge of both their application and use.

These back-office functions in turn lead to the creation of the citizen engagement matrix designed as a semantically-rich grid, allowing communities to actively participate in the development of the middleware as a platform of knowledge intensive eGov services delivered to the front-end as environmental improvements.

While it is recognised this journey from the front-end to the middleware and back-office functions of the e-learning platform, KMS and digital library, represents a significant detour, it is set out because the route taken does mark a significant step forward. Not only in terms of the additional learning services that existing city portals are now able to offer, but in 'squaring of the circle' and providing a platform with the intelligence which is needed for the semantically-rich and knowledge intensive attributes of such digital repositories to meet their front, middle and back-office requirements.

The 'real time', 'session-managed' demonstration of the platform's capacity to develop eGov services as environmental improvements, turns around the development of three 'eTopia demonstrator' storylines. These three storylines develop scenarios about the environmental improvements of electronically-enhanced services for:

- accessing local services in neighbourhoods subject to urban regeneration;
- carrying out online transactions related to the use of land and exchange of property;
- consultations and deliberations about the safety and security issues surrounding the planning and development of urban regeneration programmes.[25]

[25] It is important to recognise these are front-end services evoked by citizens and are drawn from a deeper pool of environmental improvements held in the back-office. They are not therefore meant to offer an exhaustive list of the electronically-enhanced services available only examples of how the library of knowledge-based applications can be drawn upon to learn about such matters. The deeper and more systematic environmental issues surrounding the ecology and bio-physics of resource consumptions and the distribution of life chances related to this are not dealt with in this scenario.

These storylines fulfil three requirements: firstly, they continue with the environmental improvement theme that underlies the development of eGov services and which surfaces as a means to demonstrate the significance of the socially-inclusive and participatory capacities of a community-based approach. Secondly, they also integrate this line of reasoning into the back-office business logic of the electronically-enhanced services developed to support such community-based urban regeneration programmes. Thirdly, they establish whether-or-not the semantically-rich interoperability of these e-service developments have the socially-inclusive and participatory capacities needed for the knowledge-transfer commitments of their community-based urban regeneration programmes to meet the sustainability requirement.

The testing of the third and advanced level of electronically-enhanced service development, involves environmental improvements surrounding the safety and security issues that underlie the community-based approach and which surface as the planning and development stages of the urban regeneration programme. The scenario tested is of two people, who are keen to learn about what their local governments are doing to tackle environmental problems in their neighbourhood. [26]

Both Mark and Sarah feel their family and work commitments have prevented them from becoming more involved with local groups in the past. However, both are keen on home computing and have broadband connections to the internet.

It should however, be stressed the e-learning platform, KMS and digital library of this integrated eGov services model does have the infrastructure to deliver data, information and knowledge objects relating to the ecological footprint, environmental loading, bio-mass, energy consumption, waste and emissions of land use and property exchange. Indeed the social-inclusion, participation, land use, property exchange and regeneration modules of the IntelCities IP have been designed to offer an understanding of these very issues.

[26] The scenario can be seen as offering an insight into the process of environmental degradation referred to in the previous example of interdisciplinary research. For here the 'back story' suggests the use of land and exchange of property has produced a process of obsolescence and depreciation that is destabilising the neighbourhood, undermining the rule of law which protects it and compromises the safety and security of the area. This in turn surfaces as concerns about the level of crime associated with the poverty and deprivation of such developments.

Mark feels this could solve their problems and proposes that he and Sarah see how much they can achieve online. They both want to know what their local government is currently doing to address security and safety issues across the city and to submit their comments on past and present initiatives. It would also be valuable to see what groups exist in their city, and whether any operate in their neighbourhood. They are also keen to discover how they, as individuals, can use online services to engage with any such environmental improvement programmes. As Mark's work frequently takes him to one of the country's larger cities and he has been impressed by the community-based approach to urban regeneration adopted. He's also keen in comparing the safety and security measures adopted by them and comparing the crime rates in his neighbourhood with those in other cities.

The steps they can take to use the platform in beginning to tackle these challenges are set out in Figure 10.

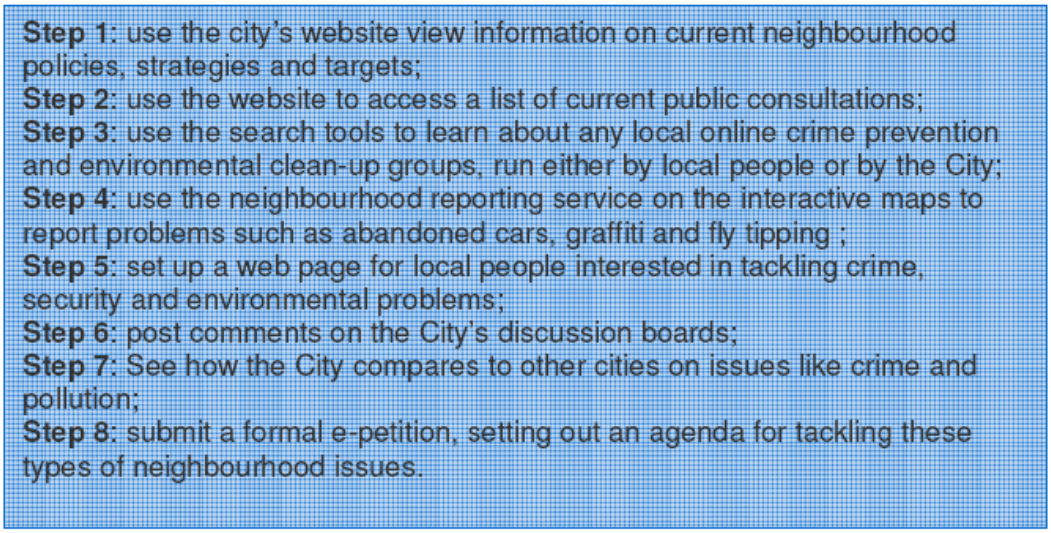

Figure 10: Step-wise logic of the electronically-enhanced service developments

Using this eCity platform, both of them are able to access a mass of data from their local government, such as policy documents and strategies but, more importantly, as citizens they are able to interact with this information as individuals and as part of an online community. They can organise a web page, which is hosted on their City's site, to express their concerns

and encourage other local people to join them in discussing how best the City can tackle neighbourhood issues such as crime and the adverse effect this has on the environment.

They are also able to compare their City's agenda for tackling these issues against those of other cities and learn from the case-study material available. These materials can in turn inform and help shape their online discussions and enable them to submit a formal e-petition, as agreed by the online community.

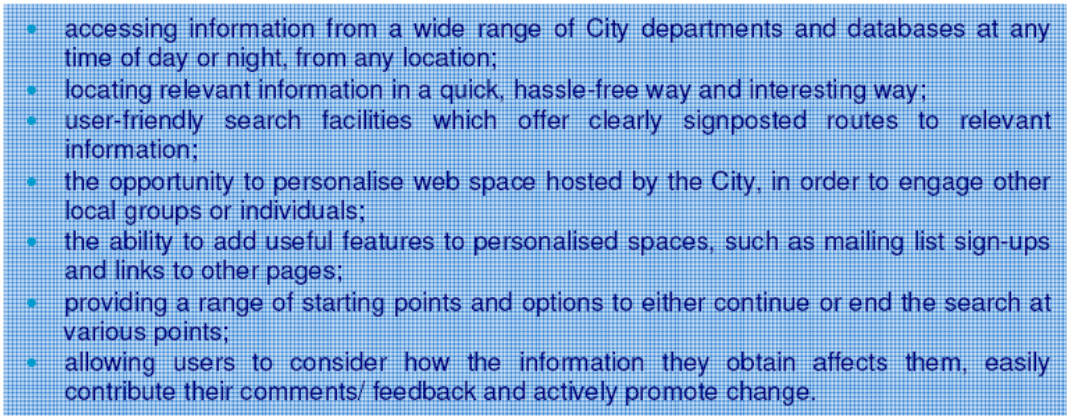

Figure 11: Benefits of the eGov service developments

These enhanced processes of consultation and deliberation in turn offer citizens' multi-channel access to front-end eGov services presented as the socially-inclusive and participatory capacities of community-based urban regeneration programmes designed to bring about improvements in environmental performance.

As such these developments also go a long way to:

- uncover the business logic that is needed to base the intelligence-driven (re)organisation of cities on and standards which are required to benchmark their environmental performance against;

- provide the performance-based measures needed to assess whether the plans cities posses to develop eGov services (over the platform) have the embedded intelligence (the learning, knowledge-based competencies and skills) required to support such actions;
- provide the means to evaluate whether such planned developments meet these needs and requirements by building the capacity the embedded intelligence has to support such programmes of environmental improvements and if this is done by enhancing their consultative and deliberative capacities.

Unlike the previous example of inter-disciplinary research, where all the decision-making is by technical experts, here the ecological integrity, equity, social-inclusion and participation of the public in this ecological modernisation takes on the form of a democratic renewal. *This emerges from the consultations and deliberations urban planners authorise to regulate property development via government and citizen-led decision making.*

The resulting e-learning platform support: the distribution, storage and retrieval of learning material, skill packages and training materials, needed to bridge the digital divide that currently exists within society, build the capacity for inclusive decision making and opportunity this in turn offers members of the public to participate in the consultations and deliberations which are required for the process of knowledge-transfer underpinning this ecological modernisation to work.[27] *Here the ecological integrity and equity*

[27] Here the term is used to capture the idea of a step change in how the urban regeneration process develops in response to the in-situ challenges it faces. In this particular instance the step change is seen to be root and branch reform and systematic transformation. That is as an institutional shift from considerations about the economics of the land and property market and towards those concerning environmental quality, degradation and destruction. This manages to avoid the tendency for all matters surrounding the urban regeneration process to be reduced to economic considerations and also safeguard against the environmental determinism of design-led solutions, by switching attention to the role of civic society in the planning and development of such design-led solutions.

takes the form of decisions made by the community about the urban regeneration's footprint, bio-diversity and environmental loading. The democratic renewal is content to promote the shift from government to citizen-led decision making.[28] *This involves the use of advisory panels, discussion boards, opinion polls, focus groups, petitions, citizens' juries, ballots and online voting as part of the visioning and scenario building exercises gaining consensus on the norms of the democratic renewal governing this ecological modernisation. Under this process the transfer of knowledge is from front-to-back and along channels of communication allowing discussions, messages, documents and other such objects, to be 'backed-up' with material currently stored elsewhere.*

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Curwell, S. and Deakin, M. (2002) Sustainable urban development and BEQUEST, *Building Research and Information*, vol. 30 (2): 4 -8.

Curwell, S. Deakin, M. Cooper, I., Paskaleva-Shapira, K., Ravetz, J. and Babicki, D. (2005) Citizens expectations of information cities: implications for urban planning and design', *Building Research and Information*, vol. 22 (1): 55-66.

Deakin, M.,Van Isacker, K. and Wong. C.(2004) *Review of the IntelCities Knowledge Capture Requirements Using a S.W.O.T. Analysis*, Napier University, Edinburgh.

Graham, S. and Marvin, S. (1996) *Telecommunications and the City*, Routledge, London.

Lombardi, P. and Curwell, S. (2005) INTELCITY Scenarios for the city of the future, in Miller, D and Patassini, D. (eds.) *Beyond Benefit Cost Analysis*, Aldershot, Ashgate.

Mitchell, W. (1995) *City of Bits: Space, Place, and the Infobahn*, MIT, Cambridge Massachusetts.

[28] This environmental modernisation is assumed to be democratic in nature. That is to emerge from the direct, consultative, deliberative and representative democracy of civil society. It is the successful combination of these practices by organisations within civil society; for example by citizens and businesses, rather than government organisations, that is seen as key to the democratic renewal which emerges.

Mitchell, W. (1999) *e-Topia: Urban Life, Jim But Not as You Know It*, MIT, Cambridge Massachusetts.

Contribution to knowledge and understanding

This section reports on how the applicant's publications have been cited by other members of the academic community[29]. It clusters the respective citations into the same four knowledge sets previously reported on. In clustering the citations together in such a manner, it becomes possible for this section of the applicant's submission to do three things:

- build upon the positive reviews of SUD already set out;
- account for what other members of the academic community consider the applicant's publications on property management, intelligent cities and urban regeneration, also contribute to this growing body of knowledge;
- report on how Research Council's in Europe and across the UK also draw upon this knowledge-base as a means to further what is understood about SUD[30]

Figure 12 illustrates the four knowledge sets in question and how the citations cluster around each of these domains.

SUD: cluster 1- 4

As Teller (2001), Kohler (2003) and Walton et.al (2005) all note, the applicant's representation of SUD allows a wide range of sustainability issues to surface around the environmental, social and economic structure, spatial level and time scales of urban development. As these

[29] The 'other' members of the academic community referred to are those outside the Bequest network and researchers drawing upon the applicant's publications in SUD, property management, intelligent cities and urban regeneration.

[30] According to Google Scholar, there are in excess of 100 citations of the applicant's publications. However, those brought together for the purpose of this examination of how they have been made use of and applied, is restricted to those citied in peer-reviewed academic journals.

citations also note, the methodology developed to support this representation of SUD is that of an integrated, iterative process of collaboration and consensus building.

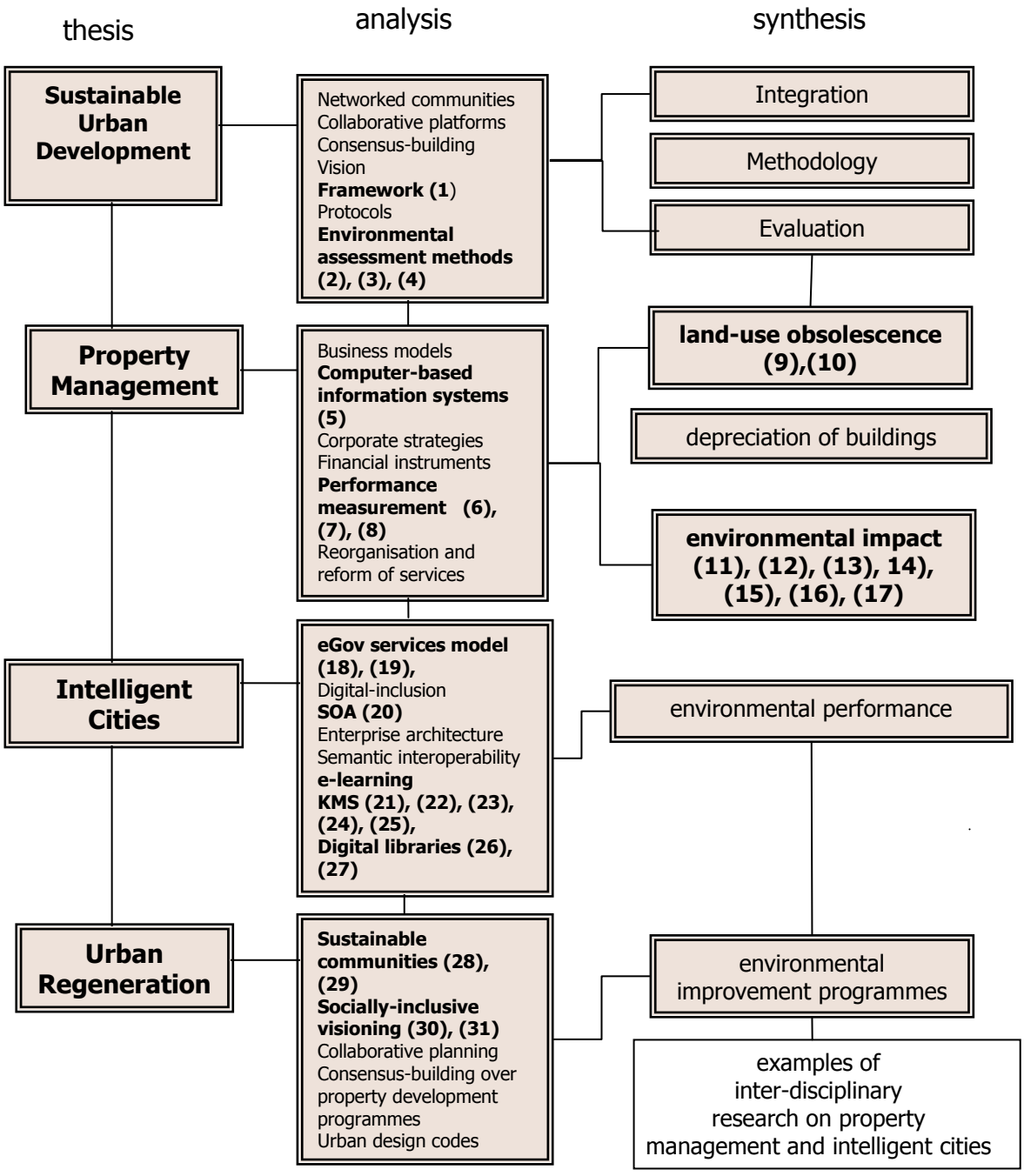

Figure 12: Knowledge and understanding clusters

Notes:

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1. The citations indicate the use of the applicant's publications is both analytical and synthetic in nature, with all four of the clusters illustrating use and application of the papers for analytical reasons.
2. Only with the property management cluster do we witness the use and application of the research for analytical and synthetic purposes. This cluster shadows the applicant's research not only in terms of the analysis and synthesis, but in relation to *Example 1* of the inter-disciplinary research outlined in the previous section under the sub-heading of: *The NAR model of discounting under the property valuation methodology and investment appraisal techniques of LCA and EIA.*
3. The knowledge sets, objects of analysis and synthesis forming the subject of attention are highlighted in bold text. As can be seen, many of these map closely onto those categories developed in the conceptual framework, analysis and synthesis outlined earlier (see Figure 1).
4. Most of those citations either using, or applying the research are shown to fall within the property management cluster and matters relating to the use of land and exchange of property. The second most cited sub-heading is that of intelligent cities, but here the citations are only using the applicant's papers to further their analysis of the infrastructures supporting the platform of services being developed, rather than provide a synthesis of them in terms of what they in turn contribute to the standards of environmental performance.
5. The clusters also indicate more than 80% of all the citations fall into the property management and intelligent cities domains. The analytical and synthetic nature of the property management domain tends to suggest this cluster offers the strongest measure of the contribution the applicant's research makes to knowledge and understanding.
6. It is also noticeable these two domains are those the funding institutions across the Europe and the UK have also done much to support.

As Walton et.al (2005) also stresses, set within this terms of reference, it becomes possible to examine the five (planning, property development, construction, operation and use) protocols of SUD and relate them to the 'soft' and 'hard' gates of environmental assessment.

As Matthias and Coelho's (2007) citation also indicates, the underlying significance of this assessment methodology surfaces when considering

the science and technology supporting the extensification of these evaluations. For as they note, together they reveal such assessments need progressively more science and technology and this means SUD can no longer rely on the ecology of bio-physical sciences to meet this requirement.

Together these citations suggest the ecology of bio-physical sciences can no longer shelter the environment from the socio-economic content of such evaluations and requirement for assessments of SUD to give equal weighting to each of them.

1. Teller, J. (2001) An on-line glossary as a way to foster the construction of a common culture among urban experts, stakeholders and decision-makers, *Construction Innovation: Information, Process, Managemen*t, vol. 1 (4): 259 – 271.
2. Kohler, N. (2003) Cultural issues for a sustainable built environment, in Cole, R and Lorch, R. (eds.) *Buildings, Culture and Environment*, Wiley Press, London.
3. Walton, J., El-Haram, M., Castillo, N., Horner, M., Price, A. and Hardcastle, C. (2005) Integrated assessment of urban sustainability, *Proceedings of the ICE - Engineering Sustainability*, vol.158 (2): 57-65.
4. Matthias, R. and Coelho, D. (2007) Understanding and managing the complexity of urban systems under climate change, *Climate Policy*, vol.7 (4): 317-336.

Property management: cluster 5-17

As Antucheviciene and Zavadskas (2004, 2006) indicate, in adopting this assessment methodology, the use of land and exchange of property becomes the base standard for evaluating SUD. In particular, the standard for the valuation and appraisal of land and buildings and how their representation of growth, obsolescence and depreciation can be drawn upon as a means by which to compute the informational basis of property management (see, also Ugwu et.al 2006; Ugwu and Haupt 2007). That is ‘compute’ the informational basis of property management and systematically draw upon this as a means by which to support the valuation and appraisal of land and buildings making up the urban environment (Lee and Chan, 2008, 2009; Bryson and Lombardi, 2009).

As Duran-Encalada, and Paucar-Caceres (2007, 2009) emphasise, the significance of such computer-based information systems lies in the opportunity they offer the corporate strategies and financial instruments of property management to not only rework the framework and protocols of environmental assessment, but the highly-integrated and multi-scalar form and content of their valuation methodologies and investment appraisal techniques (also see, Cole, 2009). By this they mean, intensify the work already undertaken on SUD, so the corporate strategies and financial instruments of these information systems can be used to recast the valuation and appraisal of land and buildings. That is recast the valuation and appraisal of land and buildings in such a way growth, obsolescence and depreciation can 'fall-into- line' with the environment by meeting the needs of citizenship and the corporate social responsibility requirements which sustainable development places on both the business sector and NGOs (Pediaditi, et.al. 2010).[31]

5. Ugwu, O., Kumaraswamy, M., Wong, A. and Ng., S. (2006) Sustainability appraisal in infrastructure projects (SUSAIP): Part 1. Development of indicators and computational methods, *Automation in Construction*, vol.15, (2): 239-251.
6. Ugwu, O. and Haupt, T. (2007) Key performance indicators and assessment methods for infrastructure sustainability - a South African construction industry perspective, *Building and Environment*, vol.42 (2): 665-680.
7. Lee, G. and Chan, E.(2009) Indicators for evaluating environmental performance of the Hong Kong urban renewal projects, *Facilities*, 27 (13-14): 515-530.
8. Antucheviciene, J. and Zavadskas, E. (2004) Rational use of derelict buildings from the viewpoint of sustainable development, *International Journal of Environment and Sustainable Development*, vol.3, (2): 96-110.
9. Lee, G. and Chan, E. (2008) A sustainability evaluation of government-led urban renewal projects, *Facilities*, 26 (13-14): 526-541.
10. Duran-Encalada, J. and Paucar-Caceres, A. (2007) Sustainability model for the Valsequillo Lake in Puebla, Mexico: Combining system dynamics and sustainable urban development, in: The 2007 international conference of the System Dynamics Society. Systems Dynamics Society
11. Duran-Encalada, J. and Paucar-Caceres, A. (2009) System dynamics urban sustainability model for Puerto Aura in Puebla, Mexico, *Systemic Practice and Action Research*, vol. 22 (2): 77-99.

[31] While the previous citations relate to the use and application of the applicant's publications for analytical purposes, this section on the "reworking of the framework, protocol and assessment methods" represent the synthetic elements of their contribution.

12. Ding, G. (2008) Sustainable construction - the role of environmental assessment tools, *Journal of Environmental Management*, vol. 86 (3):451-464.
13. Cole, R. (2010) Environmental assessment: shifting scales, in Ng, S. (ed) *Designing high-density cities for social and environmental sustainability,* London: Earthscan.
14. Antucheviciene, J. and Zavadskas, E. (2004) Rational use of derelict buildings from the viewpoint of sustainable development, *International Journal of Environment and Sustainable Development,* 3 vol. (2): 96-110.
15. Antucheviciene, J. and Zavadskas, E. (2006), Development of an indicator model and ranking of sustainable revitalization alternatives of derelict property: a Lithuanian case study, *Sustainable Development,* vol.14 (5): 287-299.
16. Bryson, J. and Lombardi, R. (2009), Balancing product and process sustainability against business profitability: sustainability as a competitive strategy in the property development process, *Business Strategy and the Environment,* vol. 18 (2):97-107.
17. Pediaditi, K., Doick, K. and Moffat, A. (2010) Monitoring and evaluation practice for brownfield, regeneration to greenspace initiatives: a meta-evaluation of assessment and monitoring tools, *Landscape and Urban Planning*, vol. 97 (1): 22-36.

The intelligent cities cluster: 18--27

As Marceau (2006) and Ugwu's (2006) citations indicate, the informational basis of property management provides the means for their corporate strategies and financial instruments to act as a platform of knowledge intensive services for 'governing' environmental improvements (Rose and Sanford, 2007, 2008). Knowledge-based services that Zavadskas et.al (2010a, 2011b) also draw attention to and highlight the value which their e-learning platforms add to the KMS and digital library making up the infrastructure of environmental improvements.

As Saebo and Rose (2008), González, et.al (2008), Zissis et.al (2009) and Kamal's, (2009) citations all highlight, while these emerging infrastructures are all seen to be 'full of prospect' by cities keen to draw upon such intelligence, at present the value of integrating them into the information systems underlying such knowledge-intensive eGov services is mainly technical. Mainly technical in the sense they relate to the value of the software surfacing as environmental improvement programmes. As environmental improvement programmes that are hosted as eGov service developments and presented as the electronically-enhanced means by

which to build the socially-inclusive and participatory capacities of the community-based approach to urban regeneration.

18. Marceau, J. (2008) Innovation in the city and innovative cities, *Innovation: Management, Policy & Practice*, vol. 10 (2-3):136-145.
19. Zavadskas, E. and Kaklauskas, A. (2010) Applications of e-technologies for regional development: the case of Vilnius City, *Journal of Business Economics and Management*, vol. 11 (3): 415-427.
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22. Saebo, O. and Rose, J. (2008) The shape of eParticipation: characterizing an emerging research area, *Government Information Quarterly*, vol. 25: 400-428.
23. Rose, J. and Sanford, C. (2007) Mapping eParticipation research: four central challenges, *Communications of the Association for Information Systems*, vol. 20, Article 55.
24. Rose, J. and Sanford, C. (2008) Characterizing eParticipation, *International Journal of Information Management*, vol. 28 (1): 406-421.
25. González. A., Gilmer. A., Foley. R., Sweeney,J and Fry J. (2008)Technology-aided participative methods in environmental assessment: an international perspective *Computers, Environment and Urban Systems*, vol. 32 (4): 303-316.
26. Zissis, D., Lekkas, D. and Papadopoulou, A. (2008) Competent electronic participation channels in electronic democracy, *Electronic Journal of e-Government* vol. 7 (2):195-208.
27. Kamal, M. (2009) An analysis of e-participation research: moving from theoretical to pragmatic viewpoint, *Transforming Government: People, Process and Policy*, vol. 3 (4):340-354.

Urban regeneration cluster: 28-31

These citations also offer a critique of the market-led urban regeneration initiatives and the measures taken by the UK government to replace them with a plan-led alternative, where strategic actions require to be based on a sufficiently ‘place-based’ knowledge of what communities need to be sustainable (Franz et.al. 2008; Hebbert, 2009).

While aiming to be socially inclusive, it is pointed out the urban planning, property development and design stages of their regeneration programmes tend to be market-led, ‘economistic’ and overly aesthetic, representing stakeholder interests, instead of the collaborative platforms

that are needed to build the consensus which communities require to participate in the decision making processes underpinning the sustainability of such developments.

In turning attention towards the social capital of such collaborative platforms and consensus building surrounding them, the citations suggest it becomes possible for intelligent cities to recognise the critical role networks, innovation and creative partnerships each play in representing places. Not only as sites of ecological integrity, equity and democratic renewal, but locations where the knowledge-intensive services underlying the environmental improvements of socially-inclusive decision making, allows participation to institutionalise the civic values of their community-based urban regeneration programmes (Lee and Chan, 2010).

As Greig et.al (2010) note, this points towards new priorities for the environment and focuses attention on the critical role social inclusion and participation take in successfully bringing the public sector's position on the sustainability of community-based urban regeneration programmes into sharper focus.

28. Franz, M., Guiles, O. and Prey, G. (2008) Place-making and green reuses of brown field in the Rhur, *Tijschrift Voor Economische en Social Geografie* vol. 99, (3): 316-328.
29. Hebbert, M. (2009) The 3 Ps of place-making for climate change, *Town Planning Review*, vol. 80 (4-5): 359-370.
30. Grieg, A., El-Haram, M. and Horner, M. (2010) Using deprivation indices in regeneration: does the response match the diagnosis? *Cities*, 27: 476-482.
31. Lee, G. and Chan, E. (2010) Evaluation of the urban renewal projects in social dimensions, *Property Management*, vol. 28 (4): 257 - 269**.**

The institutional cluster:

This cluster serves to cite the underlying significance of the applicant's publications in terms of what this body of knowledge contributes to SUD. They draw attention to how major funding institutions in Europe and the UK have responded to the applicant's publications. In particular, how the EC's Environment and Climate Programme and both the UK's EPSRC and

ESRC Sustainable Urban Environment and Sustainable Communities Programmes, have each drawn upon this emerging body of knowledge.

Here it is noted the EC draws upon the findings of the applicant's publications to inform the Urban Environment Expert Working Group on SUD and set the funding priorities for Framework 6 of the Environment and Climate Programme.[32] The equivalent response from the UK has been for the EPSRC to draw upon the applicant's publications as a basis for the Sustainable Urban Environment Programme (SUE1&2).[33] [34] The response from the ESRC has taken the form of the Sustainable Communities joint funding initiative with the Housing and Communities Agency of the Department for Communities and Local Government (CLG). This initiative has produced a number of policy briefings and best practice case studies.[35] [36]

Conclusions

The aforesaid has set out the applicant's submission for PhD by publication under the sub-headings of SUD, property management, intelligent cities and urban regeneration. Each sub-heading has summarised the main questions the research addresses and critical insights the findings offer. The submission has also sought to capture, reflect upon, analyse and offer critical insights into how the use of land and exchange of property can help serve the search for SUD.

As such the applicant would like to suggest the publications go some considerable way to meet the challenge interdisciplinary research poses

[32] http://ec.europa.eu/environment/urban/pdf/interim_report_august2004.pdf
[33] http://www.epsrc.ac.uk/about/progs/pes/sue/Pages/default.aspx
[34] http://www.epsrc.ac.uk/about/progs/pes/sue/Pages/Sue2consortia.aspx
[35] http://www.strath.ac.uk/media/departments/geographysociology/suscoms/pdfs/policybriefings/SusComs_Policy_Brief_5_SusComms.pdf
[36] http://skills.homesandcommunities.co.uk/whatwedo/esrc-research/raising-competencies

and Brandon et.al (1997: xv) first drew attention to. For together they go some way to represent SUD as:

"the 'product' of urban planning, [property development] and architectural design processes and of various construction activities that take place in a defined spatial organisation. ….and a systematic methodology which will allow for a fruitful dialogue..."

As a result, the applicant should also like to suggest, the publications referred to offer sufficient critical insight to change our understanding of land and property and gain knowledge of the relationship their use and exchange has to SUD.

Meeting the aims

The aims of the submission, do, however, also, extend well beyond the search for a "systematic methodology" and "fruitful dialogue". For this merely refers to a systematic and methodical exchange of views and opinions on SUD. What such 'exchanges' don't do, however, is perhaps even more important. For what such an exchange of views and opinions do not do is assemble the means for the stakeholders in question to collaborate with one another and build consensus over how to break with state-of-the art explanations for environmental degradation.

This necessitates much more than a dialogue and demands a CoP dedicated to the development of a discourse comparing the shortcomings of the existing knowledge-base against what is currently understood about and expected of SUD. The considerable distance between them (i.e. what is known, understood and expected) is the gap which the publications outlined in this submission have sought to bridge. This has been done by:

- outlining the state-of-the-art on SUD; the hypothesis, conceptual framework, method and institutional means to uncover the positive role land and property can play in sustaining urban development;

- reviewing the research undertaken to define SUD, develop a framework for analysis, set of protocols and assessment methods, to evaluate the sustainability of urban development;
- drawing upon the critical insights which this offers to get beyond state-of-the-art understandings of land and property and make the valuation methodologies and investment appraisal techniques underlying the discounting mechanism meaningful in terms of representing the relationship growth, obsolescence and depreciation have to the environment;
- showing how these critical insights are meaningful in terms of the corporate strategies and financial instruments they in turn offer to compute the informational basis of property management and draw upon the intelligence this brings forward to balance the technical needs of the market against their respective environmental requirements;
- revealing how the management of this intelligence by cities is underpinned by the e-learning platforms, KMS and digital libraries of an electronically-enhanced services model capable of bringing about improvements in the standards of environmental performance;
- clarifying how the environmental improvements that surface from such developments in turn support the community-based approach to urban regeneration which underlies the UK government's socially-inclusive and participatory venture into ecological modernisation and democratic renewal;
- giving examples of how the interdisciplinary research reported on in this submission, links the use of land and exchange of property to SUD and connects them in ways that:
    - allow the valuation methodologies and investment appraisal techniques underlying the discounting mechanism to meet the need for improved measures of environmental performance;

    - makes such improvements a standard requirement of the e-learning platforms, KMS and digital libraries upon which the electronically-enhanced services of intelligent cities are based;
- reflecting on the contribution this representation of SUD makes to what is known and understood about the subject.

These aims are far more extensive and need the “fruitful dialogue” referred to by Brandon (1997), to *not only be translated into a discourse, but converted* into the informational basis of the corporate strategies and financial instruments that underlie the management of property and which surface as the models of eGov services cities draw upon to be intelligent in meeting the need for environmental improvements to be socially-inclusive and participatory. To be socially-inclusive and participatory in terms of the community-based approach to urban regeneration they adopt as the means to meet the sustainability requirement.

Getting beyond the state-of-the-art

This is how the applicant’s research findings get beyond state-of-the-art representations of the subject advanced by the likes of:

- Nijkamp’s (1991) text on SUD and the follow up publications from Nijkamp and Perrels (1994), Nijkamp and Pepping (1998), Mitchell et.al (1995), Mitchell (1996, 1999), Brandon et.al (1997) and Hatfield-Dodds (2000) on the subject;
- Harvey’s (1989, 1996) accounts of property valuation and investment appraisal, Baum’s (1991) attempt to qualify this in terms of a risk, growth, obsolescence and depreciation explicit analysis of returns and Rydin’s (1992) call for the discounting principle upon which all of this is based to extend beyond the market;

- Mitchell (1995, 1999, 2001 and 2003), Guy and Marvin (1996, 2001) and Komninos' (2002, 2008) calls for managers to take note of the challenges this poses by:
    - computing the intelligence needed for the built environment to meet the sustainability requirement;
    - assembling the ICTs needed for them to account for environmental risk when assessing the sustainability of development proposals;
    - building the eGov services required for cities to undertake such assessments.

Those representations of the electronically-enhanced service developments and related infrastructures, Kearns and Turok's (2004) also draw attention to and suggest should not be seen as an end in themselves. Not an end in themselves, but as eGov service developments able to tackle social exclusion, combat poverty and the deprivation of those communities whose built environment is not just, either obsolete, or depreciated, but so degraded any improvement in their quality of life rests on a thorough and wider-ranging process of urban regeneration.

Verifying the hypothesis

As has been shown, the way such state-of-the-art representations of land use and property exchange tend to use the discounting principle is contradictory because their valuation methodologies and investment appraisal techniques fail to manage the relationship between growth, obsolescence and depreciation in a manner which is not environmentally destructive. Not environmentally destructive in the sense which the relationship doesn't end up running the considerable risk of turning the valuation and appraisal of the land and buildings making up the urban environment, into the antithesis of everything that is known about the subject.

The publications drawn together for the purposes of this submission are different in this regard and in the sense they offer the opportunity for the use of land and exchange of property to militate against any such risk. For rather than seeing valuation methodology and investment appraisal techniques as the product of free choice and to be left to the ‘privatism’ of property market transactions, their appraisals of land and buildings are revealed to represent the informational, corporate and financial needs of cities. In particular, the informational basis, corporate strategies and financial instruments needed for the environmental improvements of their electronically-enhanced services to be hosted on e-learning platforms, KM systems and digital libraries. That is on platforms, systems and libraries which offer cities the intelligence needed for eGov services to regulate such developments in line with the consultation and deliberations of their socially-inclusive and participatory approach to community-based urban regeneration.

That socially-inclusive and participatory approach to community-based urban regeneration, which is equally important for the reason their infrastructures offer the intelligence cities need to be constructive. In particular, the intelligence cities need to be constructive in ensuring the environmental improvements of their eGov services developments underpin the community-based approach to urban regeneration and surface in such a way as to meet the sustainability requirement. That is meet the requirement this lays down for such developments to sustain the communities which they serve and do this by way of and through:

- the socially-inclusive visions which underlie the consultations and deliberations of such a community-based approach and that are participatory in the way they surface as the means for urban regeneration programmes to stage any such ecological modernisation as a process of democratic renewal;
- an ecological modernisation and process of democratic renewal whose consultations and deliberations are not regulated by the

market, but via government and citizen-led decision making. Government and citizen-led decision-making underpinned by e-learning platforms, KM systems and digital libraries with the embedded intelligence cities need for such infrastructures to support the development of electronically-enhanced services as environmental improvements capable of meeting the sustainability requirement;

- improvements whose corporate strategies and financial instruments provide the basis to compute the informational basis of property management and draw upon this as a means to balance the technical needs of the market against the environment;
- means that in turn provide the opportunity to get beyond state-of-the-art understandings of the valuation methodologies and investment appraisal techniques underlying the discounting principle and surfacing in their representation of the relationship which they in turn have to growth, obsolescence and depreciation.

The papers reported on here offer just such a knowledge-base and go a considerable way to demonstrate how these challenges are beginning to be met through the publication of the applicant's findings. For they go a long way to demonstrate how the management of property by cities can be intelligent, not as any 'exception to the rule', but as a standard measure of the environmental improvements underlying the electronically-enhanced services of the community-based approach and supporting the infrastructures of their socially-inclusive and participatory urban regeneration programmes.

The evidence

As has already been mentioned, it is all too easy to call for a fruitful dialogue between those members of the academic community with an interest in SUD and the relationship this has to the use of land and exchange of property. The problem with this is that any such dialogue

does not automatically generate the means by which to break with the state-of-the art explanations for environmental degradation. That is to say, be constructive in assembling the frameworks for analysis, protocols and assessment methods, which are needed to formulate, codify and programme the knowledge required to understand the critical role valuation methodologies and investment appraisal techniques play in sustaining urban development.

While the knowledge and understanding the applicant has gained over the past decade is grounded in such a dialogue, it cannot be said to rest upon it. For the mutual exchange it has developed relates to knowledge of the frameworks, protocols and assessments methods supporting SUD and an understanding of what the vision and methodology advanced by the BEQUEST network means for the use of land and exchange of property. In particular what this understanding means for the valuation methodologies and investment appraisal techniques it represents as knowledge of how to manage the relationship growth, obsolescence and depreciation in turn have to environmental degradation.

This is what the applicant's publications offer evidence of: the application of SUD to the property market, the underlying valuation methodologies and investment techniques, whose discounting principle and calculation of growth surface as being jointly responsible for the obsolescence, depreciation and degradation drawn attention to.

The nature of this has been explored through an examination of property management, intelligent cities and urban regeneration. That is in terms of where the use of land and exchange of property has an adverse impact on the environment and their contamination, air and water pollution surface as general concerns about levels of carbon emissions. Levels of carbon emission critical for the reason the rates of growth and natural resource depletion associated with this obsolescence and process of depreciation are seen to be well beyond those the environment has the capacity to carry.

Given transactions relating to the use of land and exchange of property are estimated to account for up to 70% of resource consumption, property management is clearly a good place to start searching for the valuation methodologies and investment appraisal techniques that not only explain this process of degradation, but can also account for the corporate strategies and financial instruments which are capable of realigning growth, obsolescence and depreciation into a much more constructive relationship.

The means the applicant has developed to demonstrate this possibility involves:

- a critique of what is known about the valuation methodologies and investment appraisal techniques, corporate strategies and financial instruments underlying the discounting principle;
- the use of this realignment of growth, obsolescence and depreciation, as a basis to compute the informational basis of property management;
- the deployment of this information system as the intelligence of the e-learning platform, KMS and digital libraries, cities are now building as semantically-rich interoperable eGov services capable of supporting environmental improvements;
- an examination of the consultations and deliberations that underpin the socially-inclusive and participatory capacities of the community-based approach to urban regeneration and which support the ecological modernisation and democratic renewal called for. That modernisation and process of renewal which is called for because it is seen by civil society as offering the means to meet the sustainability requirement.

Evidence of how the challenges surfacing in the first two of these bullet points are met by the applicant’s publications, can be found in the first

example of interdisciplinary research set out earlier. For drawing directly from this example, it confirms the adjusted NAR model:

not only value[s], in market, bio-physical and ecological terms, the economic efficiency and social equity of such contributions to the marginal productivity of capital, but compensate them with a rate of return which is seen as fair and just from the environmental point of view.

Without this and what is in effect an environmentally-friendly, green pricing mechanism, it would not be possible to overcome the legacy of market failure in dealing with the environment and link the means with the ends i.e. the market basis of the valuation and investment appraisal underlying the adjusted NAR model, with the time-horizons and spatial configurations (visioning and scenario-building exercises) of environmentally-friendly green technologies for land use and building programmes. That is, show 'how it pays', in terms of the market and environment, to introduce energy-saving technologies with lower carbon-based emissions. Without this link it would not be possible to demonstrate the range of opportunities open for the state to finance experiments of this kind and show the real value such land uses and building programmes offer the public, not only as a form of environmental conservation (be it in terms of energy, or natural capital consumption) capable of sustaining economic growth, but an enhanced quality of life.[37]

The challenge the third and fourth bullet point sets is answered by the second example of interdisciplinary research. For here it is stated:

The resulting e-learning platform support: the distribution, storage and retrieval of learning material, skill packages and training materials, needed

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[37] This extract is taken from, *Example 1: The NAR model of discounting under the property valuation methodology and investment appraisal techniques of LCA and EIA* (see page 59-60 of this document). It is taken from Deakin (2004) and the BEQUEST research project listed in Appendix 2. The model was applied to examine the urban (re)development of Craigmillar, Edinburgh as part of the LUDA research project (also listed in Appendix 2).

to bridge the digital divide that currently exists within society, build the capacity for inclusive decision making and opportunity this in turn offers members of the public to participate in the consultations and deliberations which are required for the process of knowledge-transfer underpinning this ecological modernisation to work.[38] *Here the ecological integrity and equity takes the form of decisions made by the community about the urban regeneration's footprint, bio-diversity and environmental loading. The democratic renewal is content to promote the shift from government to citizen-led decision making.*[39] *This involves the use of advisory panels, discussion boards, opinion polls, focus groups, petitions, citizens' juries, ballots and online voting as part of the visioning and scenario building exercises gaining consensus on the norms of the democratic renewal governing this ecological modernisation. Under this process the transfer of knowledge is from front-to-back and along channels of communication allowing discussions, messages, documents and other such objects, to be 'backed-up' with material currently stored elsewhere.* [40]

Reflecting on what others also consider the applicant's publications have contributed to such knowledge and understanding, the evidence available tends to suggest fellow members of the academic community not only

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[38] Here the term is used to capture the idea of a step change in how the urban regeneration process develops in response to the in-situ challenges it faces. In this particular instance the step change is seen to be root and branch reform and systematic transformation. That is as an institutional shift from considerations about the economics of the land and property market and towards those concerning environmental quality, degradation and destruction. This manages to avoid the tendency for all matters surrounding the urban regeneration process to be reduced to economic considerations and also safeguard against the environmental determinism of design-led solutions, by switching attention to the role of civic society in the planning and development of such design-led solutions.

[39] This environmental modernisation is assumed to be democratic in nature. That is to emerge from the direct, consultative, deliberative and representative democracy of civil society. It is the successful combination of these practices by organisations within civil society; for example by citizens, businesses and NGOs, rather than government organisations, that is seen as key to the democratic renewal which emerges.

[40] This extract is drawn from *Example 2: The Integrated Model of eGov Services for measuring environmental performance* and appears on page 71-72 of this document. The statement is drawn from Deakin (2009a) and the IntelCities research project (see Appendix 2) The IntelCities model of eGov services has been adopted by Marseille, Siena and Manchester. These applications are also reported on by Curwell et.al (2005) and Carter (2009).

appreciate the merit of the frameworks, protocols and assessment methods assembled to explore the possibility of such a constructive realignment, but recognise their worth as a set of applications capable of realising this. For as the analysis of the way in which the applicant's publications have been cited by other members of the academic community goes some way to indicate, the research has been used as a means to, not only analyse the relationship that land and property have to the environment, but an authority by which to synthesise the results of their own investigations into such matters.

Noticeable too is the tendency displayed for the majority of their investigations to also be on this very subject. That is on the way in which the adverse environmental impact of land use and property exchange can be ameliorated, rather than on an examination of either the corporate strategies or financial instruments available to compute their informational basis. This tends to suggest the informational basis of intelligent cities and the relationship environmental improvements have to eGov services development whose infrastructures are socially-inclusive, participatory and community-based still remains a challenge.

This also suggests that if the academic community is going to meet the environmental agenda which is set for SUD, it can no longer hide behind the 'ecology of the bio-physical sciences' and must come forward, extend its reach and include the softer and more risky social and economic issues they also relate to. For while such a triple-bottom line representation of SUD is what the author's publications on intelligent cities and the environmental improvements of those electronically-enhanced services underlying the community-based approach to urban regeneration have 'set the stage for' and sought to 'tread-out' the 'step-wise logic' of, the evidence currently available tends to suggest the challenge of making such programmes not only socially-inclusive, but participatory and therefore, sustainable on such terms, still remains.

Viewed in this way and in light of the support the applicant's research into intelligent cities and urban regeneration has received from funding institutions also keen for their own programmes of environmental improvement to be socially-inclusive and participatory, the progressive nature of the publications submitted by the applicant as a potential means to overcome such obstacles, also becomes evident.

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APPENDIX 1: Publications: listed chronologically

Deakin, M. (2000a) The development of property asset management: towards a pro-investment form, *Journal of Financial Management of Property and Construction*, vol. 5 (1):15-33.

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APPENDIX 2: List of research projects the publications have been drawn from

There are eight projects in total: Bequest, IntelCity, myEdinburgh, IntelCities, Worklife adaptability, LUDA, Learning from What Works and SURegen. They are summarised as follows:

Title of project:	**BEQUEST:**– Building Environmental Quality Evaluation for Sustainability through Time Network
Website:	www.research.scpm.salford.ac.uk/ bqextra
Dates:	March 1998 – May 2001
Funding:	EU 4th Framework Programme
Project Contract Number:	ENV4970607

Objectives:
To establish a common EU understanding of sustainable urban development, from a multi-disciplinary network of researchers and professionals drawn from 14 partner organisations. The project also aimed to develop an understanding between those working at the scale of a city or urban district and those working on the scale of individual buildings.

Partners:
9 partners and 4 associate partners from 6 countries: Austria, Finland, Italy, Holland, Portugal, UK.
Austria: Vienna University of Technology
Finland: VTT (Valtion Teknillinen Tutkimuskeskus), LT Consultants
Italy: University of Florence, Polytechnic of Turin, Venice University Institute of Architecture
Holland: Delft University of Technology, Free University of Amsterdam
Portugal: CEQA (Centro Europeu de Qualidade do Ambiente)

UK: University of Leeds, Leeds Metropolitan University, University of the West of England, University of Salford, Building Research Establishment (BRE)

Title of project:	**IntelCity:** Towards Intelligent Sustainable Cities
Website:	http://ndmodelling.scpm.salford.ac.uk/ intelcity
Dates:	2002 – 2003
Funding:	EU 5 th Framework IST
Project Contract Number:	IST-2001-37373

Objectives:
IntelCity was a one year project to explore the opportunities for the sustainable development of cities through the intelligent application of information and communication technologies.

Partners:
UK: University of Salford, University of the West of England
Finland: VTT (Valtion Teknillinen Tutkimuskeskus)
France: CSTB (Centre Scientifique et Technique du Bâtiment)
Germany: ITAS (Institut für Technikfolgenabschätzung und Systemanalyse), IOER (Leibniz Institute of Ecological and Regional Development)
Italy: University of Florence, Polytechnic of Turin

Title of project:	**myEdinburgh**
Website:	www.myedinburgh.org
Dates:	2003 – 2004
Funding:	New Opportunities Fund and Scottish Enterprise

Objectives:
MyEdinburgh was developed by the city-wide Edinburgh Learning Partnership, a collaborative venture with partners from public, private and voluntary sectors. The project aim was to create an online portal to act as both a resource for local community education and as a community grid. The resulting web portal provides users with relevant, up-to-date community information: personalising this information for registered users. The portal also offers interactive local maps, seamless transition to-and-from Council websites, opinion polls, discussion areas and secures webspace for online collaboration. The portal was awarded a "special mention" by Telecities in 2004, in the "eCitizenship for All" benchmarking and awards initiative.

Together, the research team designed, authored, publicised and launched the SW Edinburgh Local Community Grid (www.swelearning.org.uk); the only local grid developed in the pilot phase of the larger myEdinburgh city-wide development. In addition, the web group ran tailored training sessions for local voluntary/ community-based organisations and for local people.

Title of project:	**Worklife Adaptability Project**
Website:	www.equalscotland.co.uk/napier.php
Dates:	October 2004 – December 2007
Funding:	EQUAL Theme F: 'Worklife Adaptability project' 'Urban Regeneration through e-Business' (URBan)

Objectives:
The project aims to address rural and urban regeneration by creating Smart Communities, increasing the drivers for economic growth, work life balance and skill levels in ICT. It will provide an advanced communication and information infrastructure that enables SMEs and their communities to create a synergy that

changes the dynamics of a community, making it an attractive and competitive place to live, work and accelerate business. The CLC aims to develop 4 projects to support and develop enterprising individuals, businesses and communities in Craigmillar, Edinburgh.

Partners:
UK: Craigmillar European Partnership
UK: Adam Smith College, Fife
Czech Republic: LANGMaster Group s.r.o.
Ireland: Southside Partnership
Poland: IDEA Management Consulting Sp. z.o.o.; Zachodniopomorska Szkola Biznesu
Spain: Gobierno Del Pais Vasco

Title of project:	**LUDA** – Large Urban Distressed Areas
Website:	www.luda-project.net
Dates:	February 2003 – January 2006
Funding:	EU 5th Framework Programme
Project contract number:	EVK4-CT-2002-00081

Objectives:
Large urban distressed areas (LUDAs) are common to most European cities and feature environmental, economical and social distress. Politicians and city administrators are continually under pressure to make rapid improvements to the quality of life in these areas. The LUDA project addresses major strategic planning and development issues, with particular focus on the take-off phase as the most difficult, and crucial, phase in the rehabilitation process. It aims to help decision-makers by facilitating the exchange of experiences between cities across Europe. Project developments include the production of a compendium, systematically describing the major issues in rehabilitating LUDAs and documenting approaches from across Europe.

Partners:
6 cities taking part in the project's research group – Bratislava, Dresden, Edinburgh, Florence, Lisbon and Valenciennes.
12 Reference Cities with experience in dealing with LUDAs

Title of project:	**IntelCities**
Website:	www.intelcitiesproject.com
Dates:	January 2004 – October 2005
Funding:	EU 6 th Framework Programme €6.8m of the €11.4m budget from EU's Information Society Technologies programme
Project contract number:	IST-2002-507860

Objectives:
IntelCities aims to support achievement of the EU policy goal of the Knowledge Society by 2010 through advancement of e-Governance at the city scale, focusing on a range of citizens' and business concerns about decision-making in relation to regeneration and management of their local built environment. A key outcome of the project has been the development of a demonstrator eCity portal: an integrated citywide information system continuously accessible to all (planners, developers, politicians, designers, engineers, transport and utility service providers and individual citizens), enabling more inclusive planning and decision-making.

Partners:
The IntelCities project brings together 18 cities, 20 ICT companies and 36 research groups from 20 countries.

Role in project:
Staff from Edinburgh Napier were responsible for leading the knowledge management and capacity-building components of the project.

Title of project:	**Learning from What Works,** - The challenge of learning from what works in the development of sustainable communities: closing the skills gap by raising competencies
Dates:	2007 – 2008
Funding:	ESRC/ASC Skills and Knowledge for Sustainable Communities Initiative

Objectives:
To demonstrate how a shifting knowledge base (from subject-specific to generic) can be used by core occupations (architecture, planning, engineering and surveying) to raise social competencies

Co-investigators:
Eclipse Research Consultants
School of the Built Environment, University of Salford

Title of project:	**SURegen** - Integrated Decision Support System for Sustainable Urban Regeneration
Dates:	Oct 2007 – Sept 2011
Funding:	EPSRC
EPSRC Ref:	EP/F007213/1

Objectives:
To undertake research in order to develop a prototype Regeneration Simulator Workbench (RSW) that meets the decision-making challenges of Sustainable Urban Regeneration. The RSW will provide a major new training vehicle for regeneration professionals, aimed at addressing the knowledge and skills gaps identified in the Egan Review (2004). The RSW will form a multi-perspective, collaborative digital workspace: a learning lab and library of good practice for regeneration actors.

Partners:
The Research Institute for the Built and Human Environment, University of Salford (Lead Partner)
Dept of Civil Engineering, University of Dundee
School of Architecture, University of Liverpool
School of Environment and Development, University of Manchester
School of the Built Environment, Oxford Brookes University
Built and Natural Environment, University of the West of England
ABRA, Arup, Cities of Manchester and Salford, FusionGFX, Manchester Digital Development Agency, MaST LIFT, RENEW Northwest, Sheppard Robson, Sustainability North West

APPENDIX 3: Copies of publications

APPENDIX 5: Citations for Mark Deakin (as listed in Google Scholar)

Modelling sustainable community development in Edinburgh's South East Wedge, **M Deakin** - Journal of Property Management, 2000 Cited by 15 - Related articles

BEQUEST: The framework and directory of **assessment** methods, **M Deakin**, S Curwell Journal of Life Cycle **Assessment**, 2001, School of the Built Environment, **Napier University**, Scotland 2 School of Construction and Property Management, **University** of Salford, England 3 Casa-Citt~ Department, Polytechnic of Turin, Italy Corresponding author: Mark **Deakin**; e-maih **M**.**Deakin**@napier.ac.uk **...** Cited by 11 - Related articles - BL Direct - All 3 versions

Sustainable urban development and BEQUEST SR **Curwell**, M **Deakin** – Building, 2002 - Routledge, part of the Taylor & Cited by 14 - Related articles - BL Direct

V Bentivegna, S **Curwell**, M Deakin, Building Research and Information,2002 - ingentaconnect.com The concepts and visions of **sustainable development** that have emerged in the post-Brundtland era are explored in terms laying the foundations for a common vision of **sustainable urban development** (SUD). The described vision and methodology for SUD resulted from the activities of an Cited by 41 - Related articles - BL Direct - All 11 versions

M **Deakin**, P Huovila, S Rao, Building research and Information, 2002 - ingentaconnect.com This paper describes the outcomes of a survey of **assessment** methods for **sustainable urban development** (SUD) undertaken by an international network called BEQUEST. It addresses aspects of good practice in terms of SUD, explores the range of methods available and explains Cited by 30 - Related articles - BL Direct - All 8 versions

Sustainable urban development: The framework and directory of assessment methods - all 3 versions » M Deakin, S Curwell, P Lombardi - Journal of Environmental Assessment Policy and Management, 2002 - worldscinet.com ASSESSMENT METHODS **MARK DEAKIN** School of the Built Environment **Napier University**, Scotland, UK m.**deakin**@**napier**.ac.uk STEVE CURWELL Cited by 30 - Related Articles - Web Search - BL Direct

Urban sustainability assessment: a preliminary appraisal of current techniques, **M Deakin**, G Mitchell… - **Urbanistica**, 2002 Cited by 8 - Related articles

Property Management: Corporate Strategies, Financial Instruments and the Urban Environment M Deakin - 2004 - books.google.com**...** Corporate Strategies, Financial Instruments and the Urban Environment **MARK DEAKIN**, School of the Built Environment, **Napier University** AS H GATE Cited by 3 - Related Articles

Citizens expectations of information cities: implications for urban planning and design - S Curwell, M Deakin, I Cooper, K Paskaleva-Shapira … - Building Research & Information, 2005 - informaworld.com, Steve Curwell 1 ,**Mark Deakin** 2 ,Ian Cooper 3 ,Krassimira Paskaleva-Shapira 4 **...** 2 School of the Built Environment, **Napier University**, Edinburgh EH10 5DT,UK **...** Cited by 17 - Related Articles - Web Search

The IntelCities Community of Practice: The eGov Services Model for Socially Inclusive and Participatory Urban Regeneration Programs **M Deakin**, Handbook of Research on Strategies for Local E- …, 2009 - igi-global.com Back to Source Title. DOI: 10.4018/978-1-60566-282-4.ch005 ISBN13:9781605662824 ISBN10:1605662828 EISBN13: 9781605662831. Author(s): Mark **Deakin** (**Napier University** - Scotland, UK) . Cited by 3 - Related articles - All 6 versions

Developing sustainable communities in Edinburgh's South East Wedge: The settlement model and design solution **M Deakin** - Journal of Urban Design, 2003 Mark **Deakin**, School of the Built Environment, **Napier University**, UK. Email: **m**.**deakin**□**napier**.ac.uk 1357–4809 Print/1469–9664 Online/03/020000-00 □ 2003 Taylor & Francis Ltd DOI:10.1080/1357480032000108134 **...** Cited by 15 - Related articles - View as HTML - Further Options - BL Direct - All 10 versions

Developing sustainable communities: the settlement model, design solution and matter of environmental **assessment**, **M Deakin** - Journal of Environmental **Assessment** Policy and …, 2003 - worldscinet.com MARK **DEAKIN**, School of the Built Environment, **Napier University**, 10 Colinton Road, Edinburgh, UK. **...** Cited by 3 - Related articles - BL Direct - All 4 versions

Definitional Components of the UK **Sustainable Communities** Plan: The **Net Effect** of a **Realignment** and **Cross**-**Sectional Representation** of the Development and …M Deakin, **Principles** & **Practices**: An **International** …, 2009 - ijg.cgpublisher.com **...** made to match means to ends, the paper shall go on to suggest the wheels, pulleys and levers which are needed to 'bottom-out' the **definitional components** of the UK's **...** Keywords: **Sustainable Communities**, Socially-Inclusive Visioning, **Community**-Based Approaches **...** Cited by 1 - Related articles - Cached - All 2 versions