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Sustainable urban environments research dialogues

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Sustainable Urban Environments Research Dialogues

One doesn't have to be a City Planner or Professor of Urban Studies to discuss, improve and shape cities.

Jane **Jacobs**, after all, was neither – just a neighborhood activist and writer. Daniel **Burnham** was an architect, **Sir** Patrick **Geddes** was a biologist, **Frederick** Law **Olmstead** a landscape architect and Ebenezer **Howard** was a designer.

All of these people were urbanists in the way they appreciated and contributed to the understanding of the built environment in people's lives.

One question we might ask then is: has the SUE Programme created a new generation of 'urbanists'?

Executive summary

The SUE Research Dialogues Workshop was designed to bring together the academics funded under the Engineering and Physical Sciences Research Council (EPSRC) Sustainable Urban Environment (SUE) Programme. These academics came from a wide range of disciplines that had been brought together by EPSRC to collaborate on research into sustainable urban environments with the overarching purposes of (1) improving the quality of life of UK citizens, (2) supporting the sustainable development of the UK economy and (3) meeting the needs of users of EPSRC funded research in industry, commerce and the service sector (EPSRC 2010e). The Workshop sought to determine what the future of the research capacity developed by the SUE Programme might be.

The study of sustainability and urban environments separately or together is not, in and of itself, a recognised academic (or practitioner) discipline. Instead, such study falls under other disciplinary headings such as engineering, geography, environmental sciences, sociology, history, architecture and design, and many more. On the practitioner side delivering sustainable cities is the joint responsibility of the local council, planners, architects, developers, government agencies responsible for encouraging regional development and others. This is, perhaps, one of the great strengths of such study that it brings disciplines together to tackle the 'wicked' problem of creating and maintaining sustainable cities. As the field matures, however, the question must be asked: at what point could/should sustainable urban environments become an academic (and practitioner) discipline of its own? The Workshop delegates attempted to locate their research in the context of larger sustainability and research landscapes. This was naturally closely tied to the question of where the boundaries of scientific study into sustainable urban environments lie. The Workshop was preceded by desk research to analyse the breadth of the SUE Programme and the topics covered. The following major points emerged from both the desk research and the Workshop:

- There was little shared ground in terms of vocabulary or locus of attention for the research amongst the research consortia funded as part of SUE as they embarked on the EPSRC-funded Programme. In a positive sense this might illustrate that the consortia were covering a full breadth of sustainability issues and there was no duplication of research. However there is a greater degree of convergence in the language of the final report summaries. This convergence of language could indicate that during the intervening period there was more common understanding of the critical issues arising from the research activity, and thus the development of a common vocabulary.
- There appears to be only limited evidence of common approaches to 'scale' used by research teams, the units of analysis for the research ranging from individual property, to development and to city and suburbia.
- The stages of the production and operation of the built environment upon which the consortia concentrated spanned the whole range from initial concept and appraisal through to remediation and re-use. However one stage – design – was embraced by nearly half of the consortia, and 'appraisal and planning' by about a third of them.
- The focus of concern by the consortia was very broad – not to be unexpected over a complex field – although analysis of the data illustrated that transport, land use, and technologies were topics most discussed in award statements, whereas transport, technologies and infrastructure arose in the final report summaries.
- It is around the creation of 'practical' outputs that the most clustering and coherence of the SUE Programme begins to appear, especially as reported on research teams' websites. All of the SUE 1 consortia claim to have produced at least one type of tool. Some consortia have produced multiple types of tools, with WaND,

VivaCity2020 and AUNT-SUE leading here. Nearly half of the research teams have produced an assessment tool, with a third developing models of some sort as well.

■ There are indications that a heavily applied research area such as that embraced by the Sustainable Urban Environment Programme, produces very closely aligned academic and practice-based work.

■ Holistic approaches to reporting research on sustainable urban environments remains a challenge for the academic community, whose members readily fall back into the comfort zones of their traditional disciplines.

■ There is a reasonably well developed 'collective consciousness' amongst those who self-selected to attend the Workshop which could be built upon. However, as further discussion at the Workshop indicated, this collective consciousness lacks stability and is potentially vulnerable.

■ The SUE 1 priorities for research in the field, as set out in 2001, now constitute less than 30% of current priorities in sustainable urban environments identified by the Workshop delegates. This reflects the intervening ten-years of research and the increased exposure of the research teams to the many disciplines involved in research on sustainable urban environments.

It is clear that the SUE Programme has generated a significant body of research. It has started to, and will to a greater extent in the future, deliver considerable impact as the research programmes mature. The potential to maximise this impact is to some degree dependent on the ability of academia and its judges to appreciate the value of cross-disciplinary research. Perhaps more importantly, the SUE Programme has created a large group of researchers (Principal Investigators (PIs), Co-investigators (CoIs) and Research Fellows) who are uniquely able to tackle the grand challenges that are being advocated by the Government and placed in front of us by the planet. The ultimate benefits to society and the economy of getting it right, or perhaps more compellingly not getting it wrong, and doing so quickly enough (commentators are widely suggesting that the next 5-10 years are crucial in shaping our long-term futures), are almost beyond measure. Bringing this argument back to impact, the SUE community is rightly in the vanguard of delivery of real impact because of the nature of the topics that it is researching and because of the holistic views and approaches that it takes. That the SUE community has no shortage of Big Ideas is illustrated on the Big Idea's City Map that was produced at the Workshop. There is evidence that its visions are becoming bigger and its plans more ambitious and allied to the evidence of real passion for the research in this area from senior and junior researchers alike the potential of this community remains very high indeed. The questions of how the SUE community is encouraged and how this potential is realised can only be answered if all parties work together, which of course is what in research terms the SUE Programme has demonstrated beyond doubt to be the most effective methodology.

Urbanisation

Scale (geographical and temporal)

Megacities

Air quality / pollution

Governance

City as lab / creating a sustainable city

International context

Longitudinal studies

Carbon (footprint, low carbon)

Economics (finance, insurance, investors, effects of recession, value for money, business case)

Future proofing

Suburbs (SSUE?)

Climate change

Technology

Quality of the built environment

Healthcare

Behaviours (changing: public, policy, government, drivers of changes in)

Access (to opportunities offered by cities)

Environmental equity

Barriers (limits to growth, social attitudes, inequality, behaviour, financial)

Demographics

Inclusion

Transport

Quality of life / wellbeing / livability

Food (security, urban agriculture)

Green space

Population

Public perceptions

Utilities

Place making/shaping, value creation (social, how created and managed)

Energy

Monitoring

Security of supply (food, energy, etc.)

Resources (conservation of, efficiency)

Waste (management)

Water

Rural areas / urban rural interface

Underground space

Resilience

The Next Big Idea?

Cityscape © A B Wootton 2010

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Introduction

> **A city should be a nice, healthy and affordable place to live, now and in the future (whatever *that* turns out to look like …)**
>
> **Rob Kinnersley, Environment Agency**

In March 2010 approximately 60 researchers and practitioners in the field of sustainable urban environments attended a Workshop whose purpose it was to probe the experiences of those involved in the Engineering and Physical Sciences' (EPSRC's) Sustainable Urban Environment Programme (SUE)[1] and the 'Big Ideas' resulting from it. **This report describes the Workshop, the preliminary research leading up to it and the recommendations resulting from it.**

The Workshop took place over two days (the 29th and 30th of March 2010) and was designed to take the delegates through a carefully organised set of facilitated sessions, the purposes of which were to:

- explore the coherence and resilience of those involved in the Programme,
- scrutinise the impact of the research funded under the Programme,
- explore possible future areas of research and to examine how these might be addressed in future research projects.

Movement towards more sustainable urban environments is all about generating a balanced approach in which all aspects of, and the impacts resulting from, a development (and/or urban initiative) are considered. These aspects necessarily cover a very wide range of academic disciplines and the perceived wisdom is that all disciplines must be engaged in the dialogue that accompanies the development. Recent research has demonstrated two important facets of this dialogue if it is to be effective: the engagement of all parties must take place at the initial conception stage – once a development has been conceived and planning is underway it can already be too late to incorporate efficiently and effectively solutions that might lead to a more sustainable outcome – and simply having all of the relevant disciplines around the table does not mean that a balanced outcome will be achieved. This is for several predictable reasons, such as individual characters, their specific agendas and site-specific constraints, but is also due to the different interpretations that people from different disciplines take away from meetings, not least due to the very different use of language (Lombardi *et al* 2010).

Identifying and bringing together the different disciplines required to study sustainable urban environments within academia is no less challenging than doing so in practice. The Workshop sought to investigate the level of success with which this happened, and continues to happen, as part of EPSRC's SUE Programme and the impact of the research.

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[1] EPSRC SUE – The Sustainable Urban Environment (SUE) programme is a £45M initiative supported by the Engineering and Physical Sciences Research Council (EPSRC) investigating different ways of improving sustainability in the urban environment.

Spanning 30 different UK Universities, the programme has funded 18 consortia in all areas of sustainability including: waste, water management, transport planning and strategy, spatial planning, regeneration and stakeholder engagement.

As well as funding over 400 researchers, SUE's multidisciplinary consortia can boast over 120 project partners including local authorities, large and small companies, town planners and charities.

Background

In 1987 sustainability was placed firmly on the UK political map by the Brundtland Commission, which defined sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). But it was not until 1996 that *urban* sustainability established itself as a high priority for all levels of UK Government, the private and academic sectors when the requirement for Local Agenda 21 documents was made compulsory. A flurry of commissioned reports were published around this time that described what urban sustainability is, what it means to various groups and how it can be achieved. The *'Towards an Urban Renaissance'* report (Urban Task Force, 1999) led the way focussing upon sustainable urban regeneration through design excellence, environmental and social responsibility, economic investment and legislative change, and presents a vision of city centres that are compact, high-density, well connected and vibrant 24 hours a day. Given the UK's limited rate of urban new build, urban *re*development must satisfy much of the country's sustainability targets and its proper execution is thus crucial for sustainable urban living in the UK. Sustainable urban *re*generation introduces particularly complex challenges beyond those of new builds.

Creating and maintaining a truly sustainable urban environment has proved extraordinarily difficult. This is largely due to the breadth of different perspectives that need to come together and the complicated trade-offs that have to be made. For those that might have thought "if I build it they will come", the reality turned out to be far from the truth.

Numerous resources to assist urban designers in achieving the goal of designing and building sustainable urban environments have been, and continue to be, produced. These include guidelines, checklists, best practice guides, ICT tools and so on. Indeed, it would be fair to say that hundreds of such tools exist. The uptake, influence, quality and usability of the tools varies greatly with some embedded into policy and becoming industry standards (for example BREEAM) and other disappearing into obscurity.

It was into this ocean that the researchers in EPSRC's-funded SUE Programme dived in 2001, many contributing tools themselves, and they weren't alone. The European Commission (the largest funder of research in Europe) launched the URBAN programme in 1994 with the focus on troubled urban districts in the European Union. The total investment comes to a staggering €1.8B. In the UK the Natural Environment Research Council (NERC) launched the URGENT Programme (Urban Regeneration and the Environment) in 1997, a £9.7M initiative. In 2002 the Economic and Social Research Council (ESRC) funded 18 projects as part of its Sustainable Technologies Programme for a combined investment of £1.4M. By way of comparison, EPSRC is the UK's largest funder of research and its SUE Programme is a £45M initiative.

The projects within these programmes shared one common characteristic: cross-disciplinarity. Tackling a complex problem such as urban sustainability requires multiple perspectives to be brought together both in practice and in research. Funding mechanisms for research were, at that time, largely mono-disciplinary and so funding councils began to move from funding within disciplines to funding across disciplines via managed programmes. Furthermore, backed by Government, research councils were able to ringfence significant investment into urban sustainability over a number of years. The combination of these two elements meant the door for research into urban sustainability was well and truly opened.

The Workshop

The SUE Dialogues Workshop provided an opportunity for the academics involved in the SUE Programme to discuss jointly *for the first time* the nature of the research capability developed by the SUE Programme as well as identifying priorities for future research in sustainable urban environments.

rationale

The SUE Programme had previously focused upon the individual research consortia/projects, concentrating upon providing a strong empirical research base for achieving sustainable urban environments. At the time of the Workshop there existed a sufficient body of work across an extensive range of sustainability issues for it to be imperative that the researchers exchange knowledge between each other. Indeed, as the SUE Programme develops into its third and final stage of funding it becomes increasingly important to build the research community, i.e., to broaden and improve the research experience through improved academic collaboration and knowledge exchange[2].

Standard dissemination strategies, partly driven by the Research Assessment Exercise (RAE)[3], were leading to widespread dispersal of the results of the SUE Programme. While this dissemination was necessary, a major opportunity was being lost by the lack of a single forum for SUE researchers. Therefore, the Workshop was designed to develop the necessary forum for improved communication and collaboration, bringing together investigators and researchers from SUE as well as complementary research and a few nominated industry representatives and in so doing sought to improve the research experience.

preparation

In order to ensure that the Workshop could achieve its objectives, the SUE Dialogues team's pre-Workshop preparation involved a three-pronged investigation into the SUE Programme.

First, the team engaged with each SUE consortium/project to determine (1) what literature exists that accurately and holistically represents the consortium/project and (2) the consortium's/project's priorities for the Workshop. This was limited in its success as not all consortia responded and, of those that did, not all addressed both queries. With regard to project literature, the SUE Dialogues team took the decision to limit its review of the SUE Programme to publically available and consistently reported sources, i.e. the project award statements and final report summaries. Both are freely available on EPSRC's website. The award statements are taken from the project proposal submitted to EPSRC and include a summary of the research to be undertaken. The final report summaries are taken from the project's final report (where a project has ended) and include a summary of the research actually undertaken (as distinct from what was *intended* to be undertaken).

Second, a review of the SUE Programme was undertaken. This included analysing the 'vital statistics' of the SUE Programme (such as number of projects funded and associated budgets and foci), the award statements and final report summaries deriving from each of the consortia, each SUE researcher's self-expressed research interests as available on their biography pages, and the tools and techniques produced by the SUE Programme as made available on each SUE project's/consortium's website. The purpose of the review was to ensure that all the delegates had

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[2] This need is distinct from the knowledge transfer activities that aim to *implement* the research from the SUE Programme, which is facilitated by the ISSUES project (Implementation Strategies for Sustainable Urban Environment Systems). See http://www.urbansustainabilityexchange.org.uk

[3] The Research Assessment Exercise is the UK government review of all UK university research.

enough information about the SUE Programme and its projects to engage meaningfully in the discussions. The SUE Programme is extremely complex and the SUE Dialogues team was aware before the Workshop that many of the delegates were only familiar with a part of the Programme. In order for the Workshop to be successful the team had to ensure that all delegates had information that was accurate, holistic, useful for the ensuing debates and thought provoking. Inevitably the picture presented of the SUE Programme was limited by the methodologies chosen to investigate it. Perhaps most significant is the limitation of only using the award statements and final report summaries as representative of the consortia/projects. These statements and summaries are limited in length. Furthermore, all award statements are supported by a six plus page narrative case for support (although this is not publically available) and in some cases (but not all) the final report summaries are supported by an additional eight pages of narrative.

Finally, the SUE Dialogues team capitalised upon its already strong working relationship with the ISSUES team, which had established links with the SUE consortia and had been undertaking research into the SUE Programme's knowledge transfer activities for almost two years.

structure of the Workshop

The intensive, two-day Workshop opened with presentations from four speakers from outside the academic community intended to prime the subsequent debate, each being asked to give short (10 minute) presentations on how the economic, social, environmental and governance pillars of sustainability had been impacted by the SUE Programme. The brief for each speaker was: "if I were the economy / society / the environment / the government, what would I think to SUE so far? – pluses, and minuses." Each of the four speakers – Peter Braithwaite of CH2M Hill, Rob Kinnersley of the Environment Agency, Elanor Warwick of CABE and Tim Allen of the Local Government Association – were practitioners familiar with the SUE Programme.

The first day of the Workshop focused upon the SUE Programme, what is was and what it had (and had not) done to date. It raised for discussion whether the SUE Programme had simply pulled together a cohort of researchers or built a community of practice. It asked whether the answer to this question was important and, if so, what it might mean for sustainability research going forward. The second day of the Workshop concentrated upon the future of the SUE Programme, its impact and big ideas and where research into sustainable urban environments could go in the future. The second day included presentations from Rachel Lomabrdi (researcher), Paul Jowitt (impact) and Caroline Batchelor (EPSRC, the funder).

The Workshop had support from an external facilitator (Ian Cooper) and a conceptual designer (Andrew Wootton), who were involved to help the exchange of knowledge, i.e. to understand, document and map the knowledge within the SUE Programme and to identify the relationships between the academic areas funded.

attendees

The Workshop involved researchers funded under the SUE Programme plus other complementary research groups and a small number of nominated industry representatives. Three fully-funded places (i.e. covering travel and subsistence) were allocated to each SUE consortium. The Dialogues team approached the Principal Investigator of each consortium, asking him/her to nominate three attendees with the brief that they be chosen to represent the economic, social and environmental pillars on behalf of their consortium. It transpired that these selected representatives were primarily project investigators supplemented by a few members only of their research teams. Only one SUE project (one of the Plus Projects) was not represented at the Workshop. Additional invitations were

issued to a small number of specific academics and other researchers outside the SUE Programme, as well as to selected industry stakeholders invited to drive forward the debates.

dissemination

A website that includes a blog and is linked to a Twitter feed has been developed for the entire SUE network to share knowledge and views, based around the documents emanating from the Workshop (which are available to download). This can be accessed at http://suedialogues.wordpress.com

The Workshop was audio recorded, part video recorded and Twittered live, and these are available for subsequent viewing via the Dialogues website along with copies of all the Workshop's presentations and preparatory materials. The site also includes links to all SUE consortium/project websites and is thus a valuable archive of the SUE Programme. SUE researchers will be able to use the site to disseminate information directly to their own consortia partners.

The Sustainable Urban Environment Programme (SUE)

Good design and sustainable design are indivisible

Elanor Warwick, CABE

background[4]

In 2001 EPSRC released its first call for funding under the newly established SUE Programme (SUE 1). It would be the first of three funding rounds that would span over 10 years. The second call (SUE 2) came in 2006 and the third (SUE 3) followed in late 2009. In early 2010 EPSRC announced that the third round of funding would be the last.

The aim of the SUE 1 call was to *support* research. This broadened for SUE 2 to *deliver* research and *knowledge transfer*, which broadened again for SUE 3, which aimed to seed and support significant new research directions. In other words, SUE 1 sought necessarily to jump-start a research community by addressing specific sustainability issues. SUE 2 built on but did not replicate SUE 1, requiring a more holistic and integrated approach, possibly in order to match the growing expertise and experience of the researchers and the increasing profile of sustainability research within the UK and globally. SUE 3 was holistic, integrative and *forward looking*, pointing to the need for the research community to look beyond SUE to the grand challenges facing society*.*

aims and objectives of the SUE Programme

The Sustainable Urban Environment Programme is an EPSRC-funded portfolio of research looking at ways of improving sustainability in the urban environment (ISSUES 2010a).

The Sustainable Urban Environment (SUE) programme is a £45M initiative supported by the Engineering and Physical Sciences Research Council (EPSRC). Several ambitious multidisciplinary consortia have been funded, altogether involving more than 30 UK universities and over 120 project partners including local authorities, large and small companies, town planners and charities.

SUE aims to:

- ■ Develop and promote a strategic research agenda to address sustainability in the urban environment for the 21st century and beyond.

- ■ Strengthen the capability of the UK research base in sustainability issues within the urban environment.

- ■ Engage with end users of research in industry, commerce, and the public and service sectors (ISSUES 2010b).

The two descriptions above capture, in different ways, the aims of EPSRC's SUE Programme. Both are publically available on the SUE Exchange website – created by a project entitled ISSUES (Implementation Strategies for

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[4] This section, and the accompanying information found in *Further Information and Primary Data*, was circulated to the delegates before the Workshop.

Sustainable Urban Environment Systems) that has the purpose of ensuring that the findings from the SUE projects are understood and used by policy makers, practitioners and other end-users (ISSUES 2010a). What is apparent even from these brief statements is that through its SUE Programme EPSRC has aimed to build a critical mass of researchers with experience and expertise in sustainable urban environments. What will become apparent is that this was achieved in a remarkably short space of time.

More information about the SUE Programme including details on the funded projects can be found in the section *Further Information and Primary Data*.

Part 1 Preparatory research

The landscape of the SUE Programme

Solve rather than displace problems

Rob Kinnersley, Environment Agency

This section presents the results of the preparatory research undertaken by the Dialogues team prior to the Workshop, and subsequently used with the participants in the Workshop.

The Dialogues team conducted content analyses of public domain information offered by SUE consortia about themselves and what they had done (SUE 1) or what they were still doing (SUE 2). These content analyses were focused on a) the components of sustainability that consortia (and plus projects) have highlighted in their own public-facing information about themselves, b) what they have defined as the problems they sought or are seeking to address, and c) what they have listed as their proposed and achieved outputs. These analyses are limited to front-end (as opposed to less accessible, but more detailed) information that the consortia and projects have put in the public domain through:

- their own statements about the awards made under SUE 1 and SUE 2 placed on EPSRC's website
- where available (SUE 1 only) their final report summaries placed on EPSRC's web site
- their consortia and project websites as extant in June 2006 (SUE 1 only), and
- their consortia and project websites as extant in February 2010 (SUE 1 and SUE 2).

Accordingly, the analyses were restricted to how the consortia and projects have chosen to present themselves to the outside world through their front-end, summary public-facing statements about themselves and what they are doing.

disciplinary focus of the SUE consortia

More Joseph Chamberlain than
Albert Einstein

Tim Allen, LGA

All three of EPSRC's SUE calls for proposals refer to the research challenge as highly multidisciplinary. The disciplinary focus was broader between SUE 1 and SUE 2, but then narrowed to prioritise engineering and physical sciences research in SUE 3. Furthermore, the SUE 1 call stipulated that projects *must* engage the expertise of engineers, physical scientists, environmental scientists, economists and social scientists, and related subjects such as physical geography and town planning. The language in the SUE 2 call is, however, softer, stating only that projects are *likely to require* the involvement of engineers, physical scientists, environmental scientists, economists, social scientists and a range of related disciplines. There was no change in this language in the SUE 3 call, but there was an important addition: proposals must "fall sufficiently within EPSRC's remit."[5]

It is clear from our analysis that whether due to the changing language in the calls for proposals, the increased SUE experience and expertise within the research groups or the changing priorities of sustainability issues between 2001

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[5] The SUE calls can be found in the section *Further Information and Primary Data.*

and 2009 (or a combination of all three and probably other factors as well), the disciplinary focus of the projects funded under the SUE Programme varied significantly from call to call.
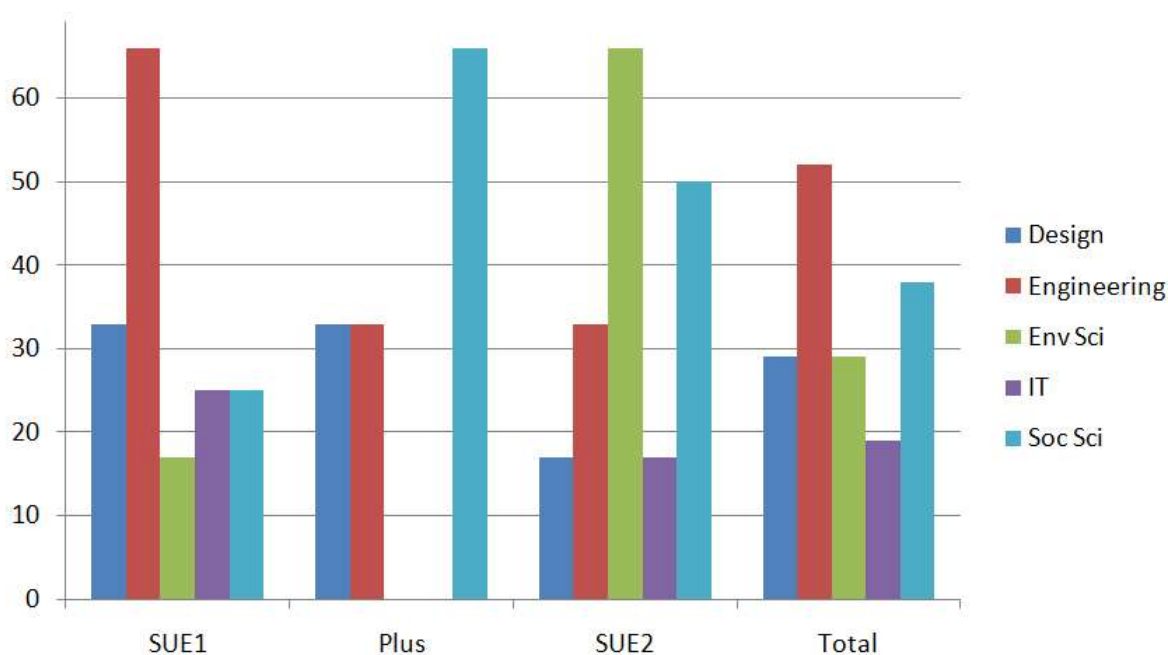
Figure 1 – Disciplines represented in EPSRC's SUE Programme, shown as a percentage of each funding round

Figure 1 shows the balance of disciplines within each call.[6] So, for example, 66% of SUE 1 projects said they incorporated an engineering discipline whilst only 17% said they incorporated an environmental science discipline and there was hardly any contribution from the physical sciences.

This figure clearly shows that overall the SUE Programme described itself as engineering biased, as would be expected with it being an EPSRC-funded programme. SUE 1 exhibited an engineering bias, whereas the Plus Projects showed a heavy social science bias and SUE 2 a strong environmental science focus. SUE 3 could be expected to return to an engineering bias with its explicit focus upon the engineering and physical sciences, but no complete information on the projects funded under SUE 3 is yet available.

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[6] The sources of the information are the project final report summaries if available or their award statements if not, both are available on EPSRC's website.

components of sustainability mentioned

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Methodology

Each award statement and final report summary was read and words and phrases relating to sustainability were marked up. These were categorized according to whether they referred to economic, environmental, social or institutional sustainability. Then each award statement and final report summary was re-read and each mention of these words and phrases (or similarly expressed ideas) was catalogued.

In the columns at the top of each table below are listed all of the SUE consortia/projects funded to date, 21 in all. In the rows on the left are listed all the words and phrases they used to describe the aspects of sustainability they claimed to address.

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Tables 1a, b, and c illustrate the components of sustainability mentioned by consortia and projects in their award statements and final report summaries. These are reported against four category headings: economic, environmental, social and institutional sustainability. Table 1a illustrates the incidence of words and phrases relating to economic sustainability.

Table 1a – Aspects of economic sustainability mentioned by SUE consortia/projects in their award statements and final report summaries

Economic	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScit	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	PUrE Intrawise	ReVISIONS	4M	TOTALS
Economic disadvantage										•				••								1 2
Economic efficiency				••																		1 1
Economic impacts/issues/benefits			•	••				•			•	•		••			•	•	•	•		7 5
Economic vitality/viability/well-being/competitiveness	••		••						•	•		•	•							•	•	6 4
Value of time											•											1 0
Whole life costing		•																				1 0
TOTALS	11	10	12	11	11	0	1	1	01	01	11	11	01	11	11	0	1	1	1	2	1	17 12

● aspects of economic sustainability mentioned in award statements

● aspects of economic sustainability mentioned in final report summaries

Attention here is drawn to just three issues in this table. First, as can be seen from the bottom row of totals, not all of the consortia or projects signalled at the start of their work that they would address any aspect of economic sustainability. Second, even where they did, SUE 1 grant holders did not necessarily report on that same aspect (using the same vocabulary) in their final reports. And third, as the column totals on the right indicate, the two most frequently mentioned aspects – economic impacts and economic viability – were addressed only by about a third of the grant holders. So, at least as far as economic sustainability is concerned, from the front-end, public-facing information examined, there appears to be a relatively small area of shared ground occupied by the research teams funded under SUE 1 and SUE 2 across the SUE Programme.

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Table 1b – Aspects of environmental sustainability mentioned by SUE consortia/projects in their award statements and final report summaries

Environmental	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScit	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	PUrE Intrawise	ReVISIONS	4M	TOTALS
Brownfield (development)									●🔴													1 1
Carbon footprinting/trading/budgeting																					●	1 0
CO2 emissions / climate control	●																	●			●	3 0
Ecological health				●🔴										🔴	🔴			●				2 3
Energy	●	●						●						●🔴	🔴				●	●🔴	●	6 3
Environmental efficiency					●🔴			●						●					🔴			3 2
Environmental impacts/issues				●🔴		●			🔴	●🔴				●🔴		●	●	●🔴		●	●	9 5
Global warming																			●			1 0
Pollution	●			●🔴					🔴					●		●		🔴			●	5 3
Land remediation									●🔴													1 1
Material (flows)														●🔴								1 2
Resource (flows)														●🔴	🔴							1 2
Waste	●								●	●				●🔴						●		5 1
Water (surface)		●🔴							●					●						🔴		3 2
Environmental viability	🔴													🔴								0 2
Environmental management			🔴																		●	1 1
Environmental quality			🔴																			0 1
Natural environment / biodiversity														🔴								0 1
TOTALS	4 1	1 2	0 2	3 4	1 1	0	1	1	4 3	2 1	0 0	0 1	5 9	1 6	0 0	0 0	2	3	4	5	6	**43 30**

● aspects of environmental sustainability mentioned in award statements

🔴 aspects of environmental sustainability mentioned in final report summaries

Table 1b records which grant holders mentioned environmental sustainability in the information examined and indicates that almost all them did so. Those who did employed a wide range of different words and phrases to do so. However only one set of words, "environmental impacts" / "environmental issues" (or close synonyms thereof), was mentioned by more than a third of grant holders and these words constitute notably generic and non-specific phrases. Even energy, pollution and waste – key terms in discourse about environmental sustainability – were mentioned by less than a third of grant holders. So as far as environmental sustainability is concerned, at least in terms of the front-end, public facing information examined, there appears to be only a small area of shared ground occupied by the research teams funded across the SUE Programme.

Table 1c – Aspects of social or institutional sustainability mentioned by SUE consortia/projects in their award statements and final report summaries

	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScIt	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	PUrE Intrawise	ReVISIONS	4M	TOTALS
SOCIAL																						
Accessibility			●									🔴			🔴							1 2
Aesthetics							●								🔴							1 1
Crime			●🔴												🔴							1 2
Diversity			●🔴					●														2 1
Disabilities										●												1 0
Equity					●🔴		●															2 1
Ethnic minorities										●🔴												1 1
Health/Well-being	🔴	●🔴		●🔴						🔴									●	●	●	5 4
Quality of life / livability			🔴							🔴	●	🔴										1 3
Social benefit/needs	●🔴						●	●				🔴			●🔴			●			●	6 3
Social capital							●															1 0
Social deprivation/exclusion/ inclusion/marginalisation			●			●				●🔴					●🔴					●		5 2
Social impacts/issues					●🔴		🔴		🔴				●🔴	●	●	●	●	●			●	8 4
Social viability	🔴		🔴																			0 2
TOTALS	1 3	1 1	4 4	1 1	2 2	1	5	2	0 1	3 4	1 0	1 4	0 0	1 1	2 5	0	1	2	2	2	3	**35 24**
INSTITUTIONAL																						
Community engagement/participation/ collaboration			🔴		●					●🔴	●🔴	●	🔴		●🔴	●						6 6
Evidence based decision-making			🔴	🔴				●				●🔴		🔴	🔴		●	●				4 5
Importance of time			🔴											🔴	🔴							0 3
Social acceptability	●🔴	●			●🔴								🔴									3 3
Social responsibility			●🔴																			1 1
Stakeholder engagement/dialogue			🔴				🔴		🔴	●🔴		●🔴		●🔴	●	●	●		●	●		8 7
TOTALS	1 1	1 0	1 5	0 1	2 2	0	1	1	0 2	2 2	1 1	2 3	0 2	1 3	2 3	2	1	1	1	2	0	**22 25**

● aspects of social or institutional sustainability mentioned in award statements

🔴 aspects of social or institutional sustainability mentioned in final report summaries

Table 1c records which grant holders mentioned either social or institutional sustainability. It indicates that almost all of the grant holders signalled that they were addressing social sustainability, and most institutional sustainability as well, in some form or another. The vocabulary they use draws attention to a wide range of issues here. However only two of them – the generic catch all, "social impacts and/or issues", and "stakeholder engagement or dialogue" – were mentioned by more than a third of grant holders. As far as social and institutional sustainability are concerned, from the front-end, public-facing information examined here, there appears to be only a relatively small area of shared ground occupied by the research teams funded across the SUE Programme.

The fact that there was little shared ground in terms of vocabulary or locus of attention can be viewed both positively and negatively. In a positive sense this might illustrate that the consortia were covering a full breadth of sustainability issues and there was no duplication of research, while in a negative sense it might indicate that there is no common vocabulary amongst the consortia.

problem definitions offered

Tables 2a, b and c report on how grant holders framed the nature of the problems that they said they were researching. This content analysis is focused on three issues:

- the spatial scale(s) on which they said they were addressing sustainability issues
- the stages of the production and operation of the built environment on which they said they were concentrating, and
- what is labelled here as the stated 'focus of attention' of their research.

Table 2a – Spatial scale(s) addressed by SUE consortia/projects in their award statements and final report summaries

SCALE addressed	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScit	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	Intrawise	ReVISIONS	4M	TOTALS
Components	●					●							🔴									2 2
Buildings	●🔴	🔴				●							🔴					●	●	●		5 3
Sites		●🔴				●		●🔴					🔴									3 3
Neighbourhoods/communities/suburbs		🔴	🔴		●				●	🔴			●🔴	● ●	●🔴					🔴		7 7
Cities			●🔴		●🔴	●	●	●				●	🔴				●			●	●	9 3
Urban environment	●	●	●🔴	●🔴						🔴		🔴	🔴	●	●			●				7 5
Regional																	●			🔴		2 0
National																	●					1 0
International																	●			🔴		2 0
TOTALS	3 2	1 4	2 3	1 1	2 2	3	3	1	1 1	1 1	0 0	1 2	1 5	2 1	2 1	1	4	1	1	5	2	**38 23**

● spatial scale(s) addressed in award statements

🔴 spatial scale(s) addressed in final report summaries

Table 2a illustrates that across the SUE Programme research has addressed a very wide range of different spatial scales. Surprisingly, given the 'urban' title of the programme, only just under half of grant holders drew attention to

the city scale, while a third point to the neighbourhood scale or used the generic phrase 'urban environment' as a catch-all description. A significant minority pointed to site-scale analysis and, below that, there are also projects that have focused specifically on buildings or their component parts. Some consortia report that they have focused on a wide span of spatial scales, while others are much more narrowly focused. So here, where a degree of unanimity might be expected just from programme title, there still appears to be only limited common approaches to scale used by research teams funded across the SUE Programme.

Table 2b indicates the stages of the production and operation of the built environment on which grant holders signalled they concentrated. Again, the whole span of stages – from initial appraisal through to remediation and re-use – is identified. One stage – design – is mentioned by nearly half of the grant holders and 'appraisal and planning' by about a third of them. So despite the wide range of stages reported, there does appear to be more shared ground occupied by the research teams funded across the SUE Programme and that is a focus on design. Nevertheless there still are not enough common factors to unite more than about third to a half of the research teams funded under the SUE Programme.

Table 2b – Stages of production and operation of the built environment addressed by SUE consortia/projects in their award statements and final report summaries

stages supported	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScit	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	Intrawise	ReVISIONS	4M	TOTALS
Appraisal/assessment/evaluation		◉		●◉		●	●	●	●		●◉			●●						●	●	8 5
Demolition						●																1 0
Design		●◉	●		●◉	●		●			●◉	●◉		●◉	●		●	●				10 7
Development		●◉					●							●								3 1
Implementation		●◉									●◉				●							3 2
Inception						●								●								2 0
Maintenance	●◉	●																			●	3 2
Management	●◉	●	●	●								◉						●			●	5 4
Operation	●◉		●		●	●					●◉	●◉										5 4
Planning		●◉	●◉			●			◉		●			●◉●	●				●			7 6
Redevelopment														●●		●	●	●				4 1
Refurbishment	●◉														●							2 1
Regeneration									◉					●		●◉	●	●				3 3
Remediation									●◉													1 1
Re-use						●			◉													1 1
TOTALS	2 4	6 7	4 2	2 2	2 2	4	5	2	1 5	0 0	4 4	2 3	1 1	5 5	4 3	2	4	2	1	2	3	58 38

● stages of production and operation of the built environment addressed in award statements

◉ stages of production and operation of the built environment addressed in final report summaries

Table 2c records the issues that grant holders mentioned as the particular focus of attention in their research. As the table reveals, there is huge variation in what grant holders report to have been the focus of their attention here. Only three issues represent shared or common ground, being mentioned by six or more of the consortia:

- transport (in some shape or form)
- land use, and
- technologies.

Once again, the wide divergence amongst the consortia could signal the absence of shared or common ground amongst the research teams funded under the SUE Programme or the breadth over which research in a complex field has to cover.

Table 2c – Particular 'focus of attention' addressed by SUE consortia/projects in their award statements and final report summaries

FOCUS OF ATTENTION	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScit	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	Intrawise	ReVISIONS	4M	TOTALS
Barriers		●						●					●	● ●						●		2 4
Compaction							●															1 0
Density			●				●										●					2 1
Disposal/waste systems						●							●									2 1
Existing buildings	●	●												●					●			2 3
Factories						●																1 0
Homes		●	●				●						●								●	2 3
Heritage			●												●							1 2
Infrastructure		●								●		●	●	●	●					●		4 5
Land remediation/brownfield sites									●													1 1
Land use			●					●		●	●							●		●		6 2
Leisure															●							1 1
Mixed use			●					●														1 1
New build/new development		●																				1 1
Offices							●														●	2 0
Open spaces/green spaces								●						●							●	2 1
Outer cities (suburbs)				●																		1 1
Planning processes											●			● ●								2 2
Public realm						●								●								2 1
Policy		●							●					●				●	●			2 3
Pollution				●					●				●						●		●	3 3
River corridors																		●				1 0
Scenarios / forecasting		●		●							●	●					●	●				4 4
Shops							●															1 0
Spatial development/ strategy/ scales		●																	●			1 1
Storm drainage		●																●				2 1
Technologies	●	●		●	●						●	●						●				6 6
Tourism															●							1 1
Transport policies/routes/systems/mobility/walking			●	●	●	●	●		●	●	●	●			●				●	●		10 6
Urban form/typologies/sprawl			●				●										●	●				3 1
Urban design/planning/development		●				●	●		●					●	●		●					5 3
Vehicles/fleets				●								●										2 2
Water supply		●											●									2 2
Water efficiency		●																				0 1
Waste									●	●			●								●	4 1
TOTALS	2 2	6 11	2 8	3 4	4 4	2	7	8	1 4	4 2	4 4	3 4	4 9	2 7	5 6	1	3	5	5	6	6	**83 65**

●   focus of attention addressed in award statements

●   focus of attention addressed in final report summaries

Towards completion – a change in focus

Figure 2 illustrates the results of further analysis of the focus of attention of the research consortia, conducted using the same dataset as in the problem definition focus of attention described above (and summarised in Table 2c), but including only those projects that had returned a final report.
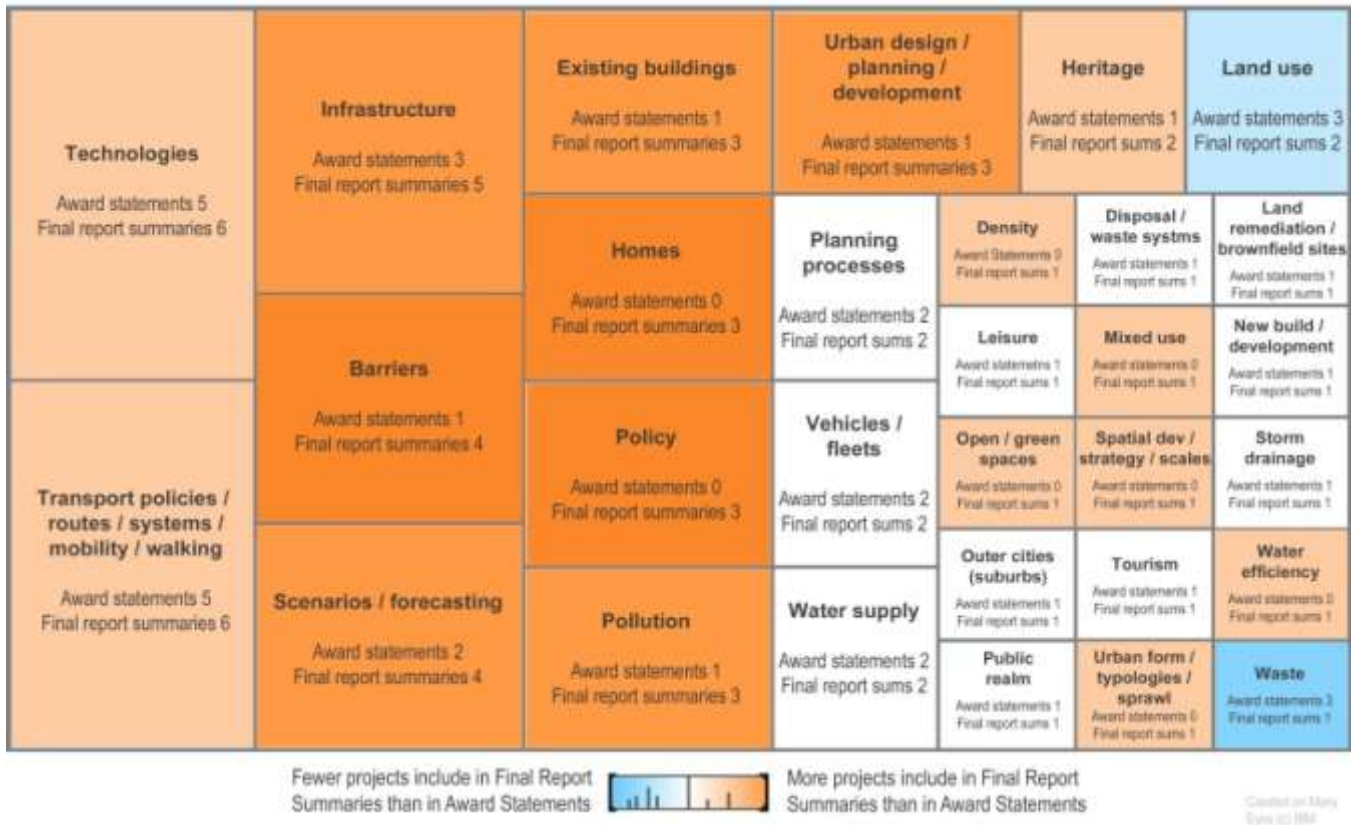
Size of boxes	the number of consortia/projects that include the named focus of attention in their final report summaries
Colour of boxes	the increase (more orange) or decrease (more blue) in the number of consortia/projects that include the named focus in their award statements versus final report summaries

Figure 2 – The emphasis upon and relative increase or decrease in particular 'focus of attention' addressed by SUE consortia/projects in their award statements versus their final report summaries

The tree map shows an increase in reporting across the consortia from award statements (what the projects intended to do) to final report summaries (what they actually did) by 17 foci of attention (indicated by orange boxes, i.e. technologies, transport policies/routes/systems/mobility/walking, infrastructure, barriers and so on). Eleven foci of attention maintain parity of reporting across the consortia (indicated by white boxes, e.g. planning processes, vehicles/fleets, water supply and so on), with only two foci of attention actually decreasing in reporting between award statements and final report summaries (indicated by blue boxes, i.e. land use and waste). Although this could be due to the increase in available (and thus reported level of) detail between the award statements and the final report summaries, the loss of these terms when describing the research done is noteworthy.

Of the foci of attention in the final report summaries that are most mentioned by the consortia (by three or more), and thus those where there is the greatest amount of convergence (reflected in larger boxes), all 10 saw an increase in focus between award statements and final report summaries. It should be noted that it is not necessarily the same consortium reporting back on the same focus of attention in the award statement and final report summary.

Together Table 2c and Figure 2 show there is a greater amount of convergence in the language of the final report summaries than in the language of the award statements. There is overlap in two of the top three of each (transport and technologies), but these are followed closely by infrastructure in the final report summaries whereas they are followed by land use in the award statements. Indeed, in the final report summaries land use is not even amongst the top ten. This convergence of language could indicate that during the intervening period there was more common understanding of the critical issues arising from the research activity, and thus the development of a common vocabulary.

outputs listed

Methodology

Each award statement and final report summary was read and words and phrases relating to outputs were marked up. Then each award statement and final report summary was re-read and each mention of these words and phrases (or similarly expressed ideas) was catalogued. This information was combined with that from a survey of SUE 1 websites undertaken by Eclipse Research Consultants in July 2006.

In the columns at the top of each table are listed all of the SUE consortia/projects funded to date, 21 in all. In the rows on the left are listed all the words and phrases they used to describe their outputs.

The final content analysis deals with the outputs mentioned by grant holders in their Award Statements and Final Reports and as identified in a survey undertaken by Eclipse Research Consultants of SUE 1 websites in July 2006. The outputs mentioned in the top half of Table 3 exhibit a similar pattern of wide distribution as those seen in the previous tables. In the top half, SUE 1 grant holders begin to cohere around advancing scientific understanding or filling gaps in the existing knowledge base, especially when summarising their research in their final reports.

Most SUE 2 grant holders already share this characteristic in their Award Statements. However, the bottom half of Table 4 is quite different. It illustrates that it is around the creation of 'practical' outputs that the most clustering and coherence of the SUE Programme begins to appear, especially as reported on research teams' websites. Here, in 2006, more than half of SUE 1 grant holders reported that they were producing outputs with a practical purpose – with models, tools and techniques, and policies and guidance as front-runners, although few of these were subsequently mentioned in SUE 1 final report summaries.

Table 3 – Outputs listed by SUE consortia/projects in their award statements, final report summaries and SUE 1 websites (the last from a survey undertaken in July 2006)

	IDCOP	WaND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUBR:IM	SuScit	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	SURegen	Urban Futures	URSULA	PUrE Intrawise	ReVISIONS	4M		TOTALS		
OUTPUT Highlighted																									
Advanced theory							●																0	1	0
Scientific understanding/knowledge base																							5	5	9
Stakeholder participation																							4	2	6
Stakeholder benefits																							3	1	3
Synergies and trade offs																							5	1	7
Barriers to delivery																							0	1	6
Technologies, products or processes																							3	11	7
Models, tools or techniques																							6	12	10
Policies or standards																							1	12	3
Guidance																							2	9	8
TOTALS	3 5	3 6	5 8	4 3	3	4	5	4	3 7	6 6	5 6	3 3	3 7	3 6		1 2	6	4	4	5	7	3	29	55	59

● outputs listed in award statements

● outputs listed in final report summaries

● outputs listed on SUE 1 websites from a survey undertaken in July 2006

In February 2010, the tools then listed as available on SUE 1 and SUE 2 websites were re-examined. A full list of the 34 tools identified, with information about where to find them and how they can be used, is provided in the section entitled *Further information and primary data*. Table 4 simply classifies the types of tools on offer from consortia and projects funded under SUE 1. All of the SUE 1 consortia claim to have produced at least one type of tool. Some consortia have produced multiple types of tools, with WaND, VivaCity 2020 and AUNT-SUE leading here. Nearly half of the research teams have produced an assessment tool, with a third developing models of some sort as well. So assessment and evaluation look to be other points of coherence in the SUE Programme. However, the table does not distinguish between research tools and those intended for use by practitioners since this distinction is not made uniformly on the websites in the description of the tools available.

Table 4 – **Outputs** listed as delivered on extant SUE 1 websites in February 2010

TYPES OF TOOLS	SUE CONSORTIA															TOTALS
	IDCOP	WAND	VivaCITY	PuRE	SOLUTIONS	AUNT-SUE	SUE-MOT	SUFC	SUB-RIM	SuSci	DISTILLATE	FUTURES	SUE Waste	Birmingham Eastside	InSITU	
Analytic			●													1
Assessment/evaluation	●	●	●		●	●		●	●		●	●		●		10
Checklist		●														1
Communications			●			●			●	●					●	5
DSS Toolbox/Toolkit	●	●	●	●		●			●		●					7
Forecasting/Prediction		●				●										2
Modelling		●		●	●	●	●				●		●			7
Testing facility	●															1
TOTALS	3	5	4	2	2	5	1	1	3	1	3	1	1	1	1	34

research interests and connections

In addition to the above analyses, the Dialogues team also examined the research interests of the SUE projects' principal investigators (PIs) and co-investigators (CoIs) as indicated on their personal websites. The team defined research interests as the expressed areas of study of *interest* to the individual, which are not necessarily the same as the areas of study *undertaken* by the individual.

The aggregated data are visually captured in Figure 3 in a word cloud. The aim here is simply to visually express the frequency of the topics mentioned.

Figure 3 – Word cloud of self-expressed SUE PI and CoI research interests

It is clear from the word cloud that the dominant elements of the early SUE Programme are well represented in the research interests of its PIs and CoIs (e.g. water, transport, design, development, sustainable, waste, environment, management, modelling and such like). Surprisingly, regeneration, climate, economy and carbon (which are top priorities today) are hardly mentioned and 'green' does not make an appearance at all.

Although it cannot be said for certain, it is highly likely that this word cloud would have looked quite different ten years ago, at the start of the SUE Programme. The PIs' and CoIs' research interests would have reflected much more strongly their disciplines, which complemented the disciplinary emphasis of research funding at that time. What is clear from the word cloud above is the influence the SUE Programme has had upon those involved in it, with more holistic terminology such as urban, sustainable, environment, development and design coming to the fore and more disciplinary-specific terminology falling away (e.g. ecology, construction and infrastructure). We can expect on this

basis to see the emergent areas of regeneration, climate change, resilience, etc. to emerge through these consortia as the political and global focus changes.

Using the same dataset for research interests described above (Table 2c and Figure 3), the team examined how connected the PIs and CoIs are in terms of self-expressed research interests and then compared this to the connectedness of the language used to construct each SUE project's final report summary.

Methodology

The connections are illustrated in Figures 4 and 5 as phrase nets. The dataset of Figure 4 is the research interests of the SUE projects' principal investigators (PIs) and co-investigators (CoIs) as indicated on their personal websites. The dataset for Figure 5 is the contents of the summary of each SUE project's final report, where a consortium or project had finished, using the verbatim text. These summaries are all readily available on EPSRC's web site.

The phrase nets were created using the Many Eyes website © IBM. A Phrase net is an experimental technique that analyses text by looking for pairs of words that fit particular patterns, in this case using 'and' as a connector. Many Eyes is part of IBM's Collaborative User Experience research group, exploring information visualizations that help people collectively make sense of data. For more information visit the Many Eyes website: http://manyeyes.alphaworks.ibm.com/manyeyes/.
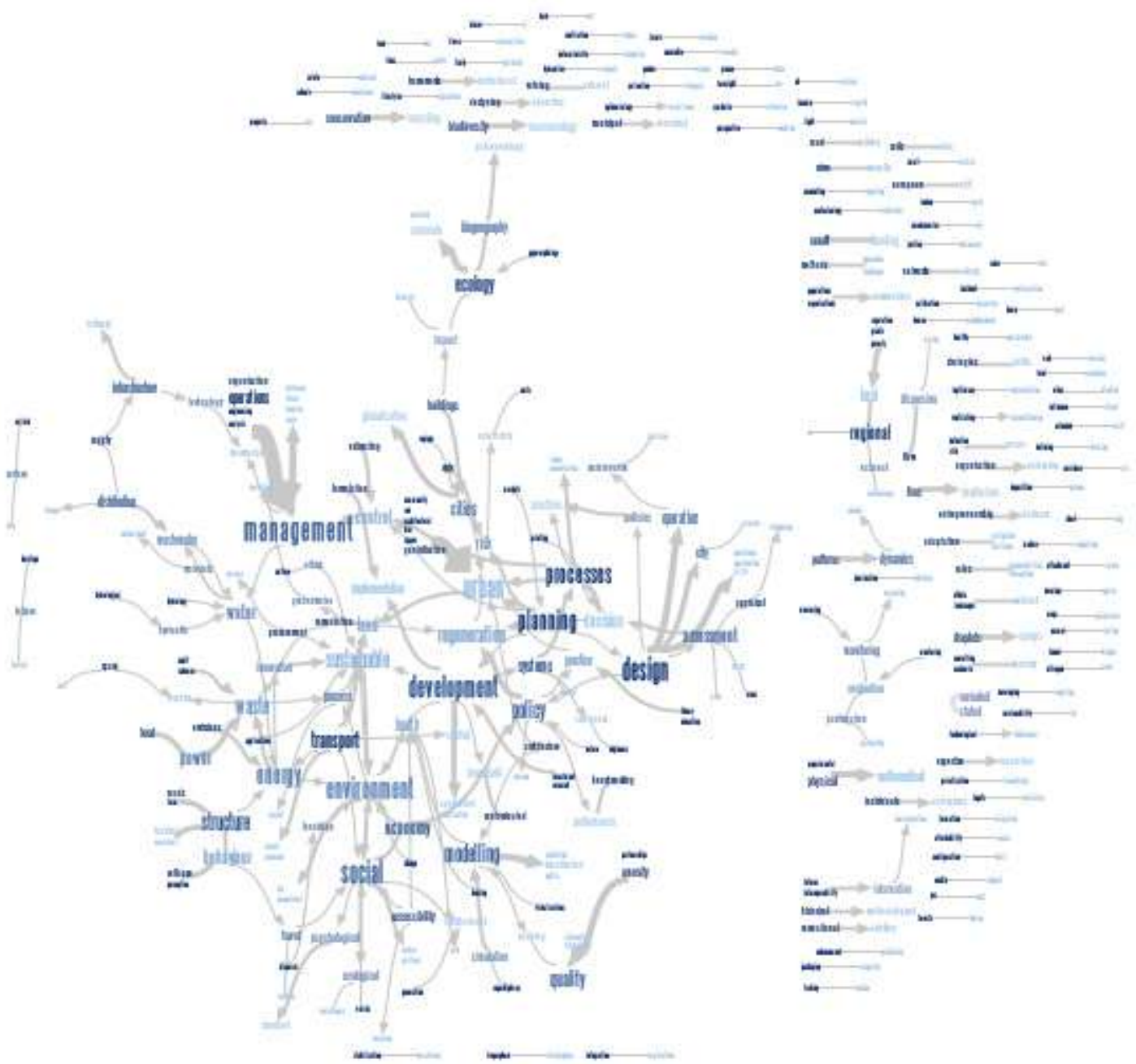
Figure 4: Phrase net of self-expressed SUE PI and CoI research interests (showing 412 of 412 terms)

The figure above illustrates that there is clear coherence around a core of PI and CoI research interests, which includes development, management, environment, planning, sustainable, environment and design. However when this is compared to Figure 5, which illustrates the coherence of the final report summaries of those SUE projects that have ended, it is clear to see that this coherence is lost and there is, in fact, very little overlap in the language used in the final report summaries.
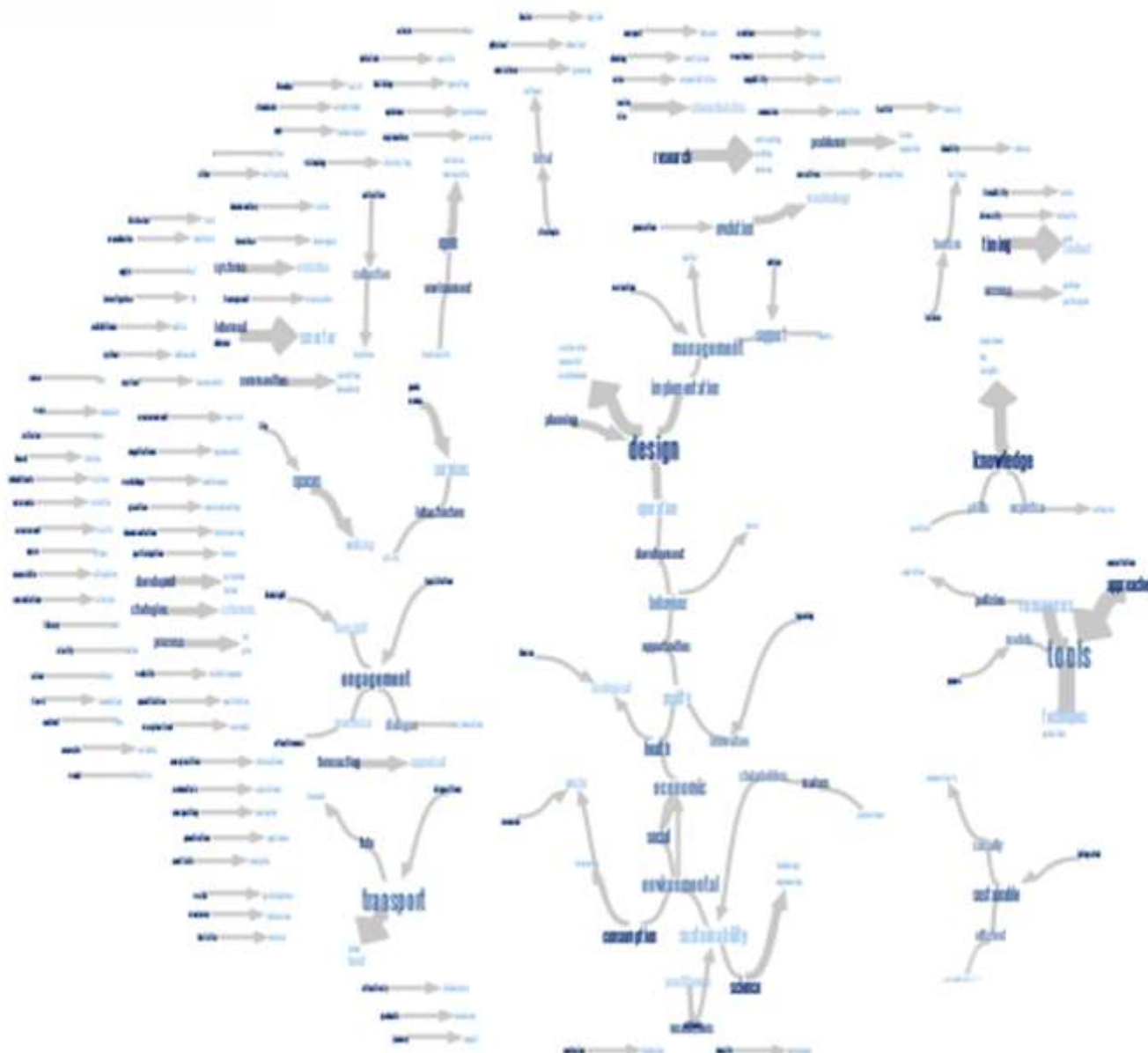
Figure 5: Phrase net of SUE consortia/projects final report summaries (showing 287 of 287 terms)

It is apparent from these phrase nets that there is much more convergence of research interests within the SUE Programme than there is of projects when expressed through their final report summaries. The coherence that clearly exists amongst the PIs and CoIs is lost when the researchers report on what they have done. One likely reason is that the content of the final report summaries is much broader, with most reporting upon specific outputs, tools and techniques, whilst for others (the minority) reporting is on more holistic outcomes and impact. This perhaps demonstrates that holistically addressing and reporting on sustainable urban environments remains a challenge for the academic community, which easily falls back into the comfort zones of its traditional disciplines. A question that might then be considered is: "Does this affect the SUE Programme's ability to create impact?"

cross-consortia working[7]

The highly multidisciplinary nature of the individual projects that is evidenced above and the challenges of working effectively across the disciplines within each project could potentially have been compounded by the challenge of working across projects. However one of the characteristics of the SUE Programme is a limited approach to cross-consortia working. In the SUE 1 call there was no explicit reference to collaborative or cross-consortia working. In fact, it was not expected that the consortia even try to work together as illustrated in the call: "The required combination of research excellence and understanding of the needs of a diverse user base is unlikely to be found within a single academic institution. A secondary challenge will, therefore, be to establish effective Research Consortia … with the appropriate mix of academic and non-academic expertise to address these major challenges" (EPSRC 2001). The SUE 2 call refers to the possibility of cross-consortia working: "Case studies could be sited within a single consortium or could cut across several consortia" (EPSRC 2006a), but there is no evidence that this actually occurred. At the same time as the SUE 2 call was issued, EPSRC also announced a call to fund a knowledge transfer project to support the SUE Programme. "As the SUE Programme has developed, the need has become apparent for dedicated knowledge transfer action to facilitate better sharing of information between the consortia and the dissemination of research outputs to policy makers and users" (EPSRC 2006b). This project became known as KT-SUE, the grant funding being awarded to a consortium project entitled ISSUES (Implementation Strategies for Sustainable Urban Environment Systems). The stated intention of the ISSUES project was to facilitate knowledge exchange, but not working across consortia. The SUE 3 call returned to omitting mention of collaboration or cross-consortia working. This is in spite of its holistic, *integrative* and forward looking approach. Clearly there has been no concerted push from EPSRC for consortia to work together and there is little evidence that the projects have done so other than in a few isolated cases.

The result of this may be the reason that some SUE researchers instinctively see themselves more as a cohort than a community (see section *Reflections on the SUE landscape*). It may also be why the impact of the SUE Programme has, perhaps, fallen short of some people's expectations (again see *Reflections on the SUE landscape*). It cannot be denied that one way the Programme could become more than the sum of its parts is if those parts worked together in pursuit of a common goal. There are other reasons that collaboration across the consortia did not occur, including perceived competition between the projects, a desire to protect intellectual property, not wishing to 'give away' good ideas, and not building the time or resources into the work-plan to engender such working relationships on top of the time-consuming cross-disciplinary working required within each of the projects. The lack of incentive from EPSRC meant each consortium could work in almost complete isolation. However, it is important to note that as the consortia were multidisciplinary and largely addressing interdisciplinary research questions, the challenges each faced in working effectively across disciplines within each consortium were themselves significant and are unlikely to have allowed for the additional challenges that would have been faced working across consortia.

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[7] The three SUE calls can be found in the section *Further Information and Primary Data.*

SUE from a naive perspective

Methodology

A researcher new to SUE was asked to invest one day researching the SUE Programme with the purpose of (1) summarising the lessons learnt from the SUE projects, (2) recording the process he had followed in trying to finding out about SUE, and (3) creating a five-minute story about SUE to sell it to his colleagues. The only guidance he was given was the address of EPSRC's homepage (http://www.epsrc.ac.uk).

In order to test the general accessibility of SUE research and the level of SUE's dissemination, the Dialogues team ran another exercise prior to the Workshop. Using a 'naïve' outsider to the SUE Programme, we asked him to spend a day trying to find out about SUE with just EPSRC's website as a starting point. The researcher recruited was Jason Luger and although he was new to SUE he was not new to research on cities and sustainability. He had recently completed a Masters in Urban Regeneration and Development at the University of Manchester and had previously read for his undergraduate degree in City and Regional Planning in the US. Jason had also been employed in the UK, the US, and Australia on various aspects of Applied Planning. It therefore seemed reasonable to assume that Jason might have encountered either the SUE Programme as a whole, or at least individual SUE consortia, in his studies or work. However, prior to being set the exercise, he hadn't.

By exploring EPSRC's website Jason was able relatively easily to identify the key aims and objectives of the research Programme as a whole. However, gaining insight into the outputs, new knowledge and 'value added' by the Programme or by the individual consortia proved impossible from EPSRC's website alone. Jason therefore 'Googled' Sustainable Urban Environments and subsequently found several project websites as well as the ISSUES-run SUE Exchange website (http://www.urbansustainabilityexchange.org.uk/).

Findings

Inspecting these sites revealed a disparity in content and quality. Some of the consortia's sites were comprehensive and kept relatively up to date, while others were either frozen in time or were no longer active. Jason found visiting individual consortia websites intimidating. His personal preference would have been for one site that summarized the whole of SUE. This site would not necessarily need to include the intimate details of each project, which could be facilitated by a link more detailed information. He therefore found the SUE Exchange website rewarding, once discovered, as he was able to get a quick overview of SUE as well as access to some projects' outputs, outcomes and lessons learnt. However, he observed that the SUE Exchange website itself seemed to be frozen in time around the time SUE 2 began, without further updates on the progress and expected outputs of SUE 2 being provided.

Jason concluded that there seemed to be a disconnect between the SUE consortia information that is available on the web and what had been introduced as the general knowledge / evidence base in the fields of City Planning and Regeneration through his previous studies and work experience. This could be because the SUE outputs are relatively new. Certainly in his Masters coursework Jason noted that the University of Manchester focused primarily upon literature published before SUE. The disconnect may also reflect the inherently fractured nature of the field – research on the sustainability of cities, which is split across different disciplines into: an applied vocation such as Urban Planning, an art (Design), technical skills like engineering and architecture, and broader social sciences, from economics to sociology and cultural studies. The interdisciplinary nature of the SUE Programme might have been expected to act as a bridge between these disciplines, but disappointingly, at least as far as Jason's experience was concerned, this hadn't happened.

Recommendations

Jason concluded that the SUE Programme would benefit from a central information site, with a comprehensive database, that describes how SUE research fits into the broader international urban discourse – particularly in terms of UK, European, and global policy. How, for example, can SUE relate and add value to what is happening in Brussels, Washington, Brasilia and Beijing? Neither the SUE Exchange nor EPSRC's sites properly tackle these wide arenas, although the SUE Exchange site does begin to make some preliminary inroads.

One area in which the SUE Programme has been successful is in bringing together different disciplines around urban research that might not otherwise have come together. As Jason said to the Workshop participants in his presentation, one doesn't have to be a City Planner or Professor of Urban Studies to discuss, improve and shape cities. Jane Jacobs, after all, was neither – just a neighbourhood activist and writer. Daniel Burnham was an architect, Sir Patrick Geddes was a biologist, Frederick Law Olmstead a landscape architect and Ebenezer Howard was a designer. Nevertheless all of these people were urbanists in the way they appreciated and contributed to the understanding of the built environment in people's lives. One question we might ask then is: has the SUE Programme created a new generation of 'urbanists'?

Part 2 The Workshop findings

Reflections on the SUE landscape

Methodology

This exploration was undertaken in two ways. Separate Workshop sessions were organised around specific topic areas. For each session delegates were broken into small groups and asked to do two things: (1) complete individual delegate response sheets that asked specific questions, and (2) discuss the questions and their answers as a small group and report this back to the full group in a plenary session. Then, at the close of the first day of the workshop, the delegates were asked to think of two bits of 'unfinished business', write these down and bring them to dinner that evening and pin them on the wall. These were then reviewed by the Dialogues team and categorised at the start of Day Two.

During the Workshop delegates were asked to consider and discuss a number of themes that arose from the SUE Dialogues team's analyses of the SUE Programme. These included:

- the coherence of the researchers funded under the SUE Programme, and in particular if they constituted a 'cohort' or a 'community', and whether this affected what might be done in the future,
- the impact of the SUE Programme, how this was achieved, how it might have been better and what it might be in the future,
- research questions not tackled by SUE that either should have been or that could be in the future, and
- the big ideas arising from the SUE Programme and sustainable urban environments research in general that should be addressed in the future.

The individual responses of delegates captured during these sessions have been anonymised and are available in the section entitled *Further information and primary data*.

Having mapped the SUE Programme's themes, foci and competencies and considered their emphases in a variety of ways the SUE Dialogues team, along with the Workshop delegates, were then able to directly reflect upon the SUE landscape. This section of the report discusses the process and findings from the Workshop.

SUE, a cohort or a community?

> ### How will this investment in learning endure / how do we continue to mine it?
> Tim Allen, LGA

The content analyses previously reported raise questions about how best to describe the research capacity that has been built by EPSRC through its SUE Programme. Since the research teams funded under the Programme appear (outputs and research interests excluded) to occupy little shared or common ground, do they display the characteristics of a tightly grouped research community or do they more closely resemble a loosely-linked research cohort, and if the latter do they show any desire to move towards the former? Here a cohort is taken to be a group of people who share a common characteristic or experience during a defined period, e.g. funding from the SUE Programme over a set number of years, whereas following a community (of practice) is a group of people who share a common interest in a particular domain or area, often specifically created with the goal of gaining knowledge related to their field, e.g. sustainable urban environments (Lave and Wenger 1991).

If SUE grant holders and their research teams are just a cohort, then perhaps all they share is the common feature that they have received or are receiving funding from EPSRC under the SUE Programme. However, if they are a community of practice, then this raises further queries about the nature of their practice.

- What are their shared common interests and skills?
- What precisely is the nature of the commonality of their shared research domain or area?
- Just what is their shared field of view?
- What is the extent of the shared ground they stand on?

Behind these queries lie other questions.

- Quite what is the nature and value of the research capacity that EPSRC has built through its funding for the SUE Programme?
- How best can this capacity be developed and exploited in future?

These questions were explored further with the participants via the individual delegate response sheets. The detailed answers to all response sheet questions are contained in the individual forms in the section *Further information and primary data. T*he analysis here is restricted to exploring the cohort versus community aspect.

1 Indicate individually whether you see the research capacity built under the SUE Programme as a cohort, a community, or as being somewhere between the two?

Forty of the Workshop participants gave answers to this question. Most (27/40) indicated that they saw it as a cohort while only 12 saw it as a community (and two of these qualified their responses by saying that it was only a low level one). However another 9 suggested that they saw it as moving from a cohort towards being a community. (Some respondents gave more than one answer against this question so there is a degree of double counting here.) Participants were also asked "What should we do in the future?" They were also requested to indicate what they meant by 'we' in their answers. Almost half (19/40) did not do so. Of the 21 that did, 3 answered for themselves alone and another 5 pitched their answer at the level of their own research team or colleagues in their own university or discipline. But another 13 gave more collectivist answers by referring to the whole SUE Programme or extensions to it – SUE cohort/community (8), SUE plus (business or local authority) industry partners (2), SUE plus EPSRC and other research councils (2), or SUE plus knowledge brokers (1).

2 What would you have liked to do (with your SUE funding) that you didn't?

Forty-two of the Workshop participants answered this question. Most of them (28/42) replied at a personal level, stating what they as individuals would like to have done. However, 13 of them gave more collectivist responses, answering at a whole consortium/project level, while six gave both types of response – answering both personally and for their consortium and project as well. Just one participant responded at the whole SUE Programme level. Conversely, when participants were asked what other unfinished business they could see from SUE, most of them gave collectivist answers. Again 42 of them responded to this question. While 20 of them answered personally, at an individual level, 24 responded in terms of the SUE Programme as a whole, 6 for their consortium or project, and 1 at the level of the research councils.

3 What overall impact has SUE had?

Thirty-two delegates responded. Five indicated a personal response, seven responded at the consortium level, six at the SUE Programme level, but 14 responded at two or more of these three levels. When these same respondents were asked what further impact SUE should have, a similar pattern emerges. Five responded personally, seven answered from the consortium level, eight from the SUE Programme level, 11 from multiple levels and one did not indicate a response level.

4 How can SUE achieve further impact?

A slightly different picture emerges. Six responded personally, but only two responded at consortium level, seven at the SUE Programme level, 14 at multiple levels and three did not indicate a response level.

What do these responses signal? There was a significant proportion of participants at the SUE Research Dialogues Workshop for whom engagement in SUE transcends the personal or their specific consortium/project and operates, on some issues at least, at a whole programme level. The size of this 'significant proportion' varied across issues examined, but could reach a half or more of those participating in the Workshop. There is thus a reasonably large 'collective consciousness' amongst those who self-selected to attend the Workshop which could be built upon. However, as further discussion at the Workshop indicated, this collective consciousness is lacks stability and is potentially vulnerable.

5 *What are the Big Ideas arising from the SUE Programme?*

Although the Big Ideas session was billed as being an opportunity to identify Big Ideas, much of the discussion did not focus on this issue. Instead, without finally settling in one direction or another, it revolved around whether the research capacity built by the SUE Programme was:

- ■ a domain or discipline or subject area expertise (labelled as 'sustainability science' or more specifically 'sustainable urban environment science'), or
- ■ a set of transferable skills focused on multi/trans/inter-disciplinary working practices.

So just as there was disagreement amongst participants about whether the research capacity built by SUE is a 'cohort' or a 'community of practice', so too they differed along this 'domain versus transferable skills' dimension. A complex mix of positions co-existed at the Workshop, as expressed through what participants said in the plenary session.

This same divergence (ambivalence) could be seen in the reaction to one of the 'Big Ideas' expressed during the discussion: namely that those funded under the SUE Programme should seek to "be a threat to existing disciplines and professional institutions and turn undergraduate education upside down". Against this, others argued for a Nader-style policy of entryism and infiltration, taking sustainability into the heart of existing courses, disciplines and institutions (see http://en.wikipedia.org/wiki/Entryism). What these multiple divisions suggest is that it would require something more (e.g. a funding incentive)to build and maintain a large, stable shared platform on which many of those funded under the SUE Programme would be prepared to continue to stand together in common cause. Unless united behind an initiative capable of transcending these divisions, the tendency of those funded under the SUE Programme would be to revert to disciplinary bases. Having stated this, the converse argument is that it would probably not take much to cause the group of those now experienced, skilled and uniquely able to remain outside their comfort zones to tackle the really 'big questions', or grand challenges, via multi- and trans-disciplinary research. It was evident from the Workshop that the researchers involved in SUE had worked long and hard to develop their cross-disciplinary expertise and that in general they found the experience highly rewarding. There was a tangible passion for research of this nature, and a degree of despondency that the funding for this activity might cease now that much of the hard work has been done in creating the necessary capability. The feelings might be best summed up as a collective concern that a unique opportunity should not be lost.

the impact of SUE

How do you draw it all together for an industry which has few links with academia and little time to assess research? Academic outputs need a new availability for practitioners.

Peter Braithwaite, CH2M HILL

Trying to determine the impact the SUE Programme is a complicated undertaking. At its simplest, it can broadly be split into two parts: academic impact and practitioner impact.

Academic impact is the impact the research has on the academic community (both within and outside of the project itself, on how research is carried out as well as how the various research agendas have been advanced, and on teaching as well as research). Practitioner impact is the impact the research has on the practitioner community, industry and government. It is frequently measured in uptake of tools and techniques and embedding of knowledge into policy and practice. On Day Two of the Workshop Caroline Batchelor (EPSRC) described how Research Councils UK has recently moved to a more robust assessment of the impact of the research that it funds. It has also broadened its definition of impact. In the past, impact was measured exclusively in academic terms, in accordance with the Research Assessment Exercise (RAE), prioritising peer-reviewed journal papers and conference proceedings. Now UK funding councils are defining impact in academic, economic and societal terms (thus incorporating practitioner impact). Furthermore, researchers can now request resources to deliver impact as part of their project's budget.

There is, however, a tension between creating academic impact and practitioner impact, which was described by both Paul Jowitt and Rachel Lombardi in their presentations to the Workshop delegates. This tension is partly an artefact of the way academic impact is measured. For researchers to progress up the career ladder they need to publish in abundance in peer-reviewed publications, be cited in other peer-reviewed publications and be returned by their institution to the RAE. Publishing in non-peer reviewed publications, trade journals or other press "does not count". Furthermore, influencing practice and policy also does not count. So, with the attendant budgetary and time constraints that come with all research projects, researchers are incentivised to prioritise the creation of academic rather than practitioner impact.

The assessment criteria of the RAE has had another knock-on effect: they value mono-disciplinary work over cross-disciplinary work. Cross-disciplinary work necessarily produces a breadth of knowledge as well as having the potential to produce the depth of knowledge possible via mono-disciplinary investigations. Broad research is much more difficult to get published in peer-reviewed journals, partly because most journals are set-up along strict disciplinary lines, so there are issues of ownership and fit to the journal's mission ("for an engineering journal you should emphasise the engineering aspects and condense the social/environmental science aspects" might be a typical reviewer's comment). A second issue concerns the fact that finding qualified reviewers who have knowledge of the associated cross-disciplinary working can be challenging. A straw poll conducted at the Workshop by Rachel Lombardi revealed that of the nine early-career researchers in the room about half said they thought that were "shooting themselves in the foot" career-wise by participating in cross-disciplinary work. The lack of external publishing incentives for cross-disciplinary working is also likely to have influenced the willingness of the consortia to work together, and therefore it will have negatively affected the overall impact of the SUE Programme and contributed to the perception held by some of the development of a SUE cohort rather than a SUE community.

Changing the RAE assessment criteria to be inclusive of cross-disciplinary research would, of course, have a significant impact upon how research is conducted in the UK. In her presentation Rachel Lombardi suggested just

that, stating that it would be quicker and easier to change the criteria than trying to change the fundamental way research disciplines operate. The current system is indeed being changed, both in name (Research Excellence Framework, REF, see below) and in requirements: it is being refined to go beyond the assessment of research outcomes via the traditional disciplinary criteria of number and type of publications (peer-reviewed journals and conference proceedings) to the assessment of impact.   This effectively allows some degree of assessment by the end users of research: steering committee members, project partners, practitioners and policy makers. To encourage the development of cross-disciplinary communities of research practice, dissemination activities should include professional and trade journals, practitioner workshops and non-academic conferences, and publishing outside one's own discipline should be valued, as should training and attending conferences. This is perhaps best done via recognition by universities when making appointments of making judgements on promotion cases. Such changes would incentivise cross-disciplinary working, would draw practitioners into research and push academics into practice, and would help bridge the knowledge/knowhow gap that currently exists between academia and practice.

Like its predecessor, the REF will provide a framework in which to review research in higher education institutions for the assessment of quality and funding. Unlike the RAE, the system is based upon metrics. Importantly, the REF will assess institutions based upon three criteria:

1. the quality of research outputs (the dominant metric),
2. the wider impact of research, and
3. the vitality of the research environment. (HEFCE 2010b)

HEFCE has been working out the best way of assessing impact, including asking researchers to complete an impact statement and providing case study examples (HEFCE 2010a). What is assured is that by assessing practitioner impact alongside academic impact the REF will incentivise researchers to conduct research that goes beyond the academic community, has real world impact, is cross-disciplinary and closes the knowledge/knowhow gap.

During Day Two of the Workshop delegates were asked to answer individually three questions regarding impact.

1 What overall impact have we (SUE) had?
2 What further impact should we have had?
3 How to achieve the further impact identified in the previous question.

> **Methodology**
>
> Each individual response sheet was read and words and phrases answering each of the three impact questions were marked up. Similarly expressed ideas were grouped together and categorized. Then each category was re-read and those with similar themes were grouped together.

The table below shows the themes that emerged from the individual response sheets. The response sheets themselves are found in the section *Further Information and Primary Data.*

Table 5 Impact of the SUE Programme

What overall impact have we had?	What further impact should we have?	And how do we achieve this?
1. Academic outputs ■ Academic literature ■ Academic conferences ■ Book ■ Hosting conferences ■ New methodology/ framework ■ New models 2. Practitioner outputs ■ Guidance documents ■ Development of software ■ Gallery exhibitions ■ Prototype tools ■ New models 3. Networks/contacts/ engagement ■ Links with stakeholders ■ Engagement with stakeholders ■ Personal contacts and networks 4. Influence/impact ■ Influenced policy ■ Influenced stakeholders ■ Impact in particular industries (e.g. waste, construction) ■ With local communities ■ Directly influencing externally authored guidance documents / plans/strategies 5. Knowledge/understanding/ awareness ■ Background to current work ■ Understanding of common issues ■ Understanding of how to build a community ■ Awareness of project(s)and issues ■ Understanding complex problems ■ Developed a body of knowledge and evidence ■ Original research ■ Put certain issues 'on the agenda' 6. Capacity building (people) ■ Researchers into teaching ■ Researchers into industry ■ Trained researchers in multidisciplinary approaches ■ Raising aspirations of industry 7. Influencing education	1. Method/approach/ways of working ■ Follow outputs to outcomes ■ More engagement in 'real' projects ■ Developed a common approach ■ Identifying and encouraging stakeholders to work with us on their problems ■ Create impact interactively with stakeholders – is it welcome/wanted/useful? ■ Addressed academic/ practitioner issues ■ Integration across research studies ■ Work specifically to demonstrate industry and academic impact. Get evidence of practitioner uptake ■ Larger scale and longer timescale integrated case studies ■ Implement the findings ■ Grow the young researcher community ■ Identify broader sustainability-related issues with which to link ■ Access to knowledge held by developers and communities ■ Understand the gaps (in research and methods to integrate) ■ Make engagement relevant and successful ■ Create traction for work already done – inclusion of outputs in practice ■ Drive the transition to sustainable futures 2. Outputs/outcomes (focus of) ■ Delivering tools that meet user requirements ■ Outputs presented in a usable form ■ If outcomes don't push the boundaries of science (as SUE does not) then must be practical and useful for end users and addressed early on ■ Guidance notes ■ Target non-academic outputs ■ Skills training and Certified Professional Development activities ■ Consultancy services	1. Outputs (practitioner and academic) ■ Database of projects, project outputs and impacts to provide at 2010 baseline ■ Proof of concepts ■ Consultancy ■ Build a common approach and exchange of ideas via annual SUE conferences ■ Consultancy study on impact ■ Business development 2. Dissemination/communication ■ Elevator pitches ■ Literature (e.g. fliers) ■ Use those skilled in translating research for practitioner audiences ■ Attract attention ■ Continue with academic dissemination ■ Coordinate dissemination routes ■ Short summaries for stakeholders ■ Lobby high profile stakeholders ■ Match activities to target audience ■ Mixed and wider dissemination such as web-based learning ■ SUE knowledge transfer exercise or 'roadshow' 3. Networks/contacts/engagement ■ Harness community generated groups ■ Harness businesses ■ Exploit industry partners ■ Remain engaged with stakeholders ■ Collaborations with Local Government Association (LGA), Regional Development Agencies (RDAs) and national government ■ Identify the 'right' people for achieving impact ■ Enlist help of professional institutions such as the Institution of Civil Engineers (ICE)

- MSc courses
- Sustainability research embedded into higher education / post graduate education

8. Ways of working
   - Promoted multidisciplinary working
   - Drawn in a range of disciplines into the sustainability arena
   - Joint working to refine problems from different perspectives

- Support evidence based decision-making
- Background to current work
- Foresighting exercise

3. Dissemination/communication
   - Translation to stakeholders
   - Continued effort to disseminate in conjunction with stakeholders
   - Distillation of ideas, concepts and recommendations
   - Create a SUE brand
   - Understand and map SUE's cumulative output and outcome – coherent message

4. Sphere of influence
   - Influenced planning and environmental policy
   - Working with schools to get SUE into the national curriculum
   - Change RAF/REF and HEFCE's perceptions of academic success
   - Change researcher's perception of the value of their work
   - Impacted post graduate and under graduate education
   - Target policy makers for the greatest impact
   - Transfer knowledge to local authorities
   - International transfer of knowledge
   - Public meetings and feedback to the public
   - Exploitation of models by industry and government
   - Make SUE a central information source for practitioners and policymakers

- Build strong society/science/politics interface

4. Methods/approach/ways of working
   - Continue with ideas learned and used.
   - More networking across SUE
   - Rapid prototyping and testing
   - Make outputs more accessible and usable – package them
   - Identify target users
   - Give stakeholders a greater degree of ownership and control
   - Refine strategy
   - Listen to non-academic partners and modify research accordingly
   - Let non-academic partners set the research agenda
   - Real city experiments
   - Face-to-face Q&A sessions with stakeholders
   - Use SUE in academic paper keywords
   - Empower government to draw upon our research
   - Hard work, teamwork, dedication and enthusiasm
   - Interdisciplinary collaboration
   - Incentivise knowledge transfer
   - Creation of laboratories we can monitor

5. Funding
   - Funding from EPSRC for dissemination and maximising impact for completed projects
   - More funding
   - Fund opposite numbers in industry and policy to engage with research
   - Fund researchers to engage with industry and policy
   - More work from ISSUES team – future role?
   - SUE4 funding
   - Knowledge transfer funding
   - 'Impact evaluation' grants

The first question elicited in the main two types of response: (1) listing of outputs (14/32) and (2) listing of areas impacted by the research (e.g. "impact on waste management strategy at regional level") (22/32). Four responses contained both types of answer and so there is a small degree of double counting here. This demonstrated confusion by about a third of the respondents between the creation and dissemination of outputs and the creation of impact.

Respondents to question two again provided two types of answers: (1) how SUE could increase its impact (17/32) and (2) who SUE should influence *and* how could this be achieved (15/32). In all cases delegates described mechanisms for increasing impact, but in only less than half the responses were the mechanisms linked to a target audience. This perhaps demonstrates that there is still work to be done on best practice for achieving impact with the researchers funded by the SUE Programme (and an opportunity for EPSRC, perhaps via the ISSUES project, to take supportive action).

Differentiating between the responses to the third question was much more difficult, as all respondents described some type of mechanism for achieving impact. Broadly, however, half (16/32) of the respondents gave answers that could be measured (e.g. "... publication in trade and professional journals, consultancy and further research..."). The other half (15/32) described mechanisms that could not be easily measured (e.g. "Finding out more about what our stakeholders want from participation in research."). One respondent did not answer this question. The variety of responses and the near even split in the types of mechanisms described highlights just how multifaceted creating impact is and how difficult it can be.

It is worth mentioning the increase in the number of categories of responses from the impact SUE has had, the impact it should have had and how to achieve this. The delegates offered lots of ideas on how to achieve future impact, and on what future impact should be, but were not able to report as many that came to fruition (the impact SUE had). Conversely, there is a decrease in overarching themes between the impact SUE had and how to achieve the impact SUE should have had, perhaps indicating the ideas are focussed on just a small number of alternatives.

An interesting feature about the responses is that there is considerable overlap between the responses to the impact SUE has had and the impact SUE should have had and how this might be achieved. For example, influencing policy was given by one respondent as evidence of the impact SUE has had but by others it was given as impact SUE should have had. These overlaps support other analyses presented here that demonstrate it has been extremely difficult for those funded under SUE to develop an holistic and coherent understanding of the Programme, its objectives and outputs. Many of the delegates have a good grasp of their consortium's work, outputs, outcomes and impact, but not of the Programmes'. It also speaks to SUE having not effectively drawn together the outcomes and messages from the various consortia into a coherent message for itself or the outside world. Of course, there is some debate as to whether this was ever intended.

unfinished business and big ideas

How to prioritize SUE in a time of increasing demands and decreasing resources?

Elanor Warwick, CABE

Unfinished Business

Part of the Workshop was dedicated to exploring the unfinished business from the SUE Programme. In other words:

1 What the researchers would like to have done, but did not as part of their SUE research (backwards looking).

2 What emerged from the research that they would like to explore further (forwards looking).

The individual response forms were dominated by process issues such as dissemination, cross-disciplinary working and creating practitioner impact. In fact, only a third (16/45) of forms returned were focused on content issues. The answers that dealt with content fell broadly into the following categories:

The evening exercise (narrowing the choice down to only two) worked somewhat better in generating a breadth of answers that included both research content and process, with sixteen areas emerging as described in Table 5. However, as is evidenced in this list, there was still a clear predominance of issues connected with process (in this case dissemination and practitioner impact) with 31 of the 74 responses in this area.

Table 6 Unfinished business from sustainable urban environments research

Individual unfinished business	Evening Group discussion – unfinished business
1. Air quality and air in place	1. Air in place
2. City as lab	2. Behaviours (understanding regarding sustainability)
3. Climate change	3. Benefits and effectiveness of the SUE interventions (including action research)
4. Crime and fear of crime	4. Climate change, low carbon footprint
5. Earth capacity (effects of global trends such as population growth and resource capacity)	5. Complexity and the dynamics of change
6. Economics	6. Dissemination and engagement
7. Energy	a. Work with policymakers and key decision-makers
8. Equity and social capital	b. Establish forum/hub for SUE end users
9. International context	c. Exemplar case studies and standard tools
10. Maintenance and management	d. Conference, book, guidelines
11. Mapping key agendas and decision-making	e. Connect with CABE
12. Systems (including efficiency, resilience and complexity)	f. Teaching resource
13. Underground space	g. International network
14. Waste (reduction, management, new technologies, human behaviour)	h. Novel public engagement activities
	7. Energy
	8. Green technology
	9. Inclusion and its assessment
	10. Low-carbon communities
	11. Sustainable business models and systems (e.g. handling 'less')
	12. Transport
	13. Underground issues (governance and exploitation)
	14. Urban agriculture and the relationship with 'rural' (urban)
	15. Waste
	16. Water

Big Ideas

Methodology

In contrast to previous sessions, for the Big Ideas session delegates were not broken into small breakout groups. Instead, at the start of the session delegates were given five minutes to individually complete an individual delegate response sheet. This was followed by a plenary that included the full group.

The unfinished business session described above was followed immediately by another designed to build upon SUE's unfinished business through exploring where next to take the research capacity developed by the SUE Programme and identifying what big ideas it should be used to tackle. In contrast to the individual responses from the previous session, and possibly as a direct result of the discussion (where although dissemination issues dominated, content had also been generated and discussed), 30 of the 41 total individual response forms for this session included some element of content. These fell into the following categories listed in Table 6.

Clearly, there was no paucity of ideas for future research areas. Indeed, this had been expected and it had been the intention of the Workshop organisers to use the plenary discussion that followed to start to shape future research projects. However, in the discussion that followed the delegates did not manage to move away from process issues. Four concerns dominated the discussion – (1) practitioner and academic impact; (2) routes to effective dissemination, practitioner and public engagement; (3) cross-disciplinary working and (4) the future nature of research into sustainable urban environments (e.g. can/should it be its own discipline/science or should it be a bringing together of existing disciplines or an element considered in all disciplines?). The latter subject captured the imagination of a number of delegates, although no resolution or clear future direction was agreed. Although it is impossible to say for certain why this session did not produce the intended discussions and outcomes, it can be hypothesised that some combination of the following factors contributed to this: (1) delegates may have been unwilling to share their big ideas with the group for fear others might steal them (but they were happy to do so on individual response forms), (2) the mix of delegates (personal and professional) may have stalled the discussion, and (3) the delegates may have been genuinely more interested in discussing process over content. Just one of the individual response forms suggested that the SUE Programme should not be thinking about the next big ideas until it has managed to effectively disseminate its current ones.

Clearly, there is convergence between the list of 'Big Ideas' produced by the delegates on their personal response forms and the current, broader sustainability agenda. This could be expected, especially in the prevailing educational, political and social environment. However, the dissemination of the findings from the SUE Programme, its engagement with practitioners and knowledge transfer into industry must have helped to shape current sustainability priorities (and vice versa, this engagement will have helped shape research questions). Furthermore, this interaction was not solely based upon content, but also upon the methodological challenges faced in tackling such complex issues. This list does seem to provide evidence that in a heavily applied research area such as sustainable urban environments, academia and practice are, out of necessity, very closely aligned.

This does not mean that the content of the list is in any way surprising. However, when compared with the first SUE call for funding (see Table 6) there is some indication that if this exercise had been run ten years ago the list would have been quite different.

The Workshop's 'Big Ideas' that overlap with the SUE 1 call's priority areas are in bold and constitute 11 of the 25 identified areas, so less than half. Looking at it the other way around, the SUE 1 priorities constitute less than 30% of current priorities identified by the Workshop delegates. It might also be argued that the priorities identified at the Workshop are broader than those identified in the SUE 1 call, reflecting the intervening ten-years of research and

the increased exposure of the research teams to the many disciplines involved in researching sustainable urban environments.

Table 7 Big Ideas for research into sustainable urban environments compared to original research call topics

Big Ideas – new areas for research SUE Dialogues Workshop 2010	A list of priority research areas for the SUE 1 call is below (2001).
1. Air quality / pollution 2. Access (to opportunities offered by cities) 3. Barriers (limits to growth, social attitudes, inequality, behaviour, financial) 4. Behaviours (changing, public, policy, government, drivers of changes in) 5. Carbon (footprint, low carbon) 6. City as lab / creating a sustainable city 7. Climate change 8. Demographics 9. Economics (finance, insurance, investors, effects of recession, value for money, business case) 10. Energy 11. Environmental equity 12. Food (security, urban agriculture) 13. Future proofing 14. Green space 15. Governance 16. Healthcare 17. Inclusion 18. International context 19. Longitudinal studies 20. Megacities 21. Monitoring 22. Place making/shaping, value creation (social, how created and managed) 23. Population 24. Public perceptions 25. Quality of life / wellbeing / liveability 26. Quality of the built environment 27. Resilience 28. Resources (conservation of, efficiency) 29. Rural areas / urban rural interface 30. Scale (geographical and temporal) 31. Security of supply (food, energy, etc.) 32. Suburbs (SSUE?) 33. Transport 34. Technology 35. Underground space 36. Urbanisation 37. Utilities 38. Waste (management) 39. Water	1. **air quality / pollution** 2. buildings (design, function, reuse) 3. **climate change** 4. construction 5. contaminated sites 6. **density and pattern of development and use** 7. distribution services 8. **energy services** 9. environmental services 10. **health services** 11. heritage (integration of) 12. housing 13. land use 14. open spaces 15. **quality of life** 16. noise pollution 17. public services 18. spatial relationship of buildings, streetscapes, green spaces and infrastructure 19. sustainable products and services 20. **transport – public and commercial** 21. **transport (integrated for social inclusion)** 22. **utility services** 23. **waste management and resources (avoidance, reuse and recycling)- urban domestic** 24. **water quality / services** 25. whole life costing (of buildings and urban infrastructure)

Going forward

The results of this study and Workshop identified that the boundaries of 'sustainable urban environments' have grown, the topics that described the domain in 2001 have grown significantly in number and maturity, and a common language has developed since the beginning of the programme. This is evident from the distinct changes between project announcements and the final reports. However, researching the topic collectively and holistically still remains a challenge, primarily because of the nature and structure of the scholarly world, where disciplines are still the major focus of reward. This programme has, it appears, created 'urbanists' within disciplines, who recognise the need to take a higher-level view of their disciplines and acknowledge the need to engage extensively and deeply with other disciplines. Some of the more senior researchers (PIs and CoIs) have been able to generate an holistic and overarching view of the research processes and outcomes that have been achieved; however the struggle remains for others, and perhaps junior researchers especially, to take their optimism and enthusiasm forward in their careers and find spaces for them as 'urbanists'. They are the researchers who have found new ways of working across disciplines and should be empowered to continue.

 This programme has illustrated how SUE has moved from a collection of topics (e.g. water, transport, design, waste, management, modelling) to an understanding of current and future priorities (climate change, carbon, security of resources, environmental pollution, wellbeing, healthcare, biodiversity). Many of the Workshop delegates recognised these as areas to which they could address their research. Our industry representatives saw the value and relevance of the work, and are able to use the tools to address the overall challenges that face urban sustainability and development.

The question as to whether this large SUE Programme is a 'community' or a 'cohort' still remains. There will be a significant few that return now to focus on research in their disciplines and it is recognised that this is of value: they will understand far better the context in which they operate and bring a wider perspective to bear on their research programmes, as well as understanding the challenges of bringing together diverse perspectives. There are others who have learnt, developed and honed the skills necessary to take forward research that addresses challenges and problems from multiple disciplinary perspectives coherently and effectively. This in itself is a major outcome of SUE and must not be underestimated; the UK now leads the world in this way of thinking and working. Certainly there is no shortage of topics and this programme has developed groups of experts who are uniquely able to truly deal with 'grand challenges'. The question will be whether there is an appetite for further developing this community and driving it forward via some sort of forum, conferences and journals. Continued access to research funding would be a prerequisite in achieving this, of course.

In terms of impact, the output from this programme has resulted in a plethora of tools, techniques and reports, on a diverse range of topics, although at present the only route to accessing even the tip of the iceberg is through ISSUES or the website created by this project (http://suedialogues.wordpress.com). Therefore, policy and public impact is still emerging. However the stage is now set upon which the story of urban sustainability research and practice over the next five years will be played out. Influencing factors include the new coalition Government and its emphasis on local responsibility, the global recession, peak oil, rising world populations and the continuing trend to urbanisation. This is also the period of time the world has been given in which to avoid catastrophic climate change[8]. How the UK and the world respond to these factors will, it is widely argued, determine how we will live, work and play in the

[8] The Last Parliament: Priorities for Urgent Action on Climate Change. Published by the Green Alliance, March 2010.

future. The challenge for the research community is to build upon past work with a mix of short- and long-term investigations that can have real-world and academic impact now and in the future.   The challenge for the funders of research is to recognise the value of truly cross-disciplinary research in solving the complex grand challenges that we face, making allowance for the costs involved in funding researchers from different disciplines to engage and putting in place processes that do not disadvantage the broad cross-disciplinary approaches when set against the narrow, highly focussed research that many disciplines engage in. Achieving this will be no mean feat.

In amongst all of this debate is the underlying question of whether there is something of very considerable national importance (to the combined good of society, economy and the planet) that must not be allowed to dissipate, or whether a new community of researchers has been given the start it needs and it should now fend for itself. The answer is probably not a clear cut 'either / or', but a joint responsibility: the research community should now come together with big, ambitious proposals to tackle the urgent, paradigm-changing and planet-saving challenges that we all face, and the research councils should establish a means of prioritising such research and facilitating its funding via fair and transparent peer review processes that appreciate the value and complexity of broad as well as deep cross-disciplinary research.

Further information and primary data

The SUE Dialogues research team

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SUE Research Dialogues Workshop Programme

Monday 29 March: *Who is SUE?*

10.45	Registration and refreshments
11.15	Welcome and introduction
	Chris Rogers and Rachel Cooper
11.45	The view from atop the four 'pillars' of sustainability
	Four keynote speakers reflect upon the needs of their constituencies and to what extent these needs have been addressed (or not) and advanced (or not) by SUE.
	» Peter Braithwaite – Economic pillar
	» Rob Kinnersley, Environment Agency – Environmental pillar
	» Elanor Warwick, CABE – Social pillar
	» Tim Allen, Local Government Association – Policy/Governance pillar
12.45	Discussion
1.00	Lunch
	Don't forget to contribute to capturing the issues addressed by SUE by filling-in the poster in the breakout area
2.00	Who is SUE? (and what has SUE done?)
	Describing the expertise and knowledge that exists within SUE
2.45	SUE, a cohort or a community? (Where is the coherence and where is the research capability?)
	How does this influence what we do in the future?
4.00	Break
4.15	What hasn't SUE done? (What is the unfinished business beyond SUE?)
	In hindsight, what would you like to have done or included in SUE that you did not (for whatever reason)? And what unfinished business do you have from SUE?
5.30	Close
7.30	Dinner
	...and an interactive activity

Day 2

Tuesday 30 March: *What is the future?*

9.00	Is there something to build on?
	Review of yesterday
9.15	Beyond the boundaries of SUE, what are our big ideas?
10.45	Break
11.15	Action 1: When the SUE Programme ends, where will we find future funding?
	Including perspectives from the RCUK and the EPSRC, with representatives from the EPSRC available to answer questions and receive comments
12.00	Action 2: How do you want your research to be assessed for impact and how should the success of any future funding be measured?
	What are the expectations of impact and the definitions of success from...

» ... the funder's perspective?

Presentation by EPSRC

» ... the stakeholder's perspective?

Presentation by Paul Jowitt, Heriot-Watt University, and President of the ICE

» ... the researcher's perspective?

Presentation by Rachel Lombardi, University of Birmingham

1.00	Lunch
2.00	Impact!
	What overall impact have we had and could we have?
2.45	Reflection by the keynote speakers
3.05	What else?
	Plenary discussion
3.30	Close

The SUE Programme

There have been three formal funding rounds within the SUE Programme. In addition to this three Plus Projects were funded alongside Round 1 but were not formally part of this or the other two rounds of funding.
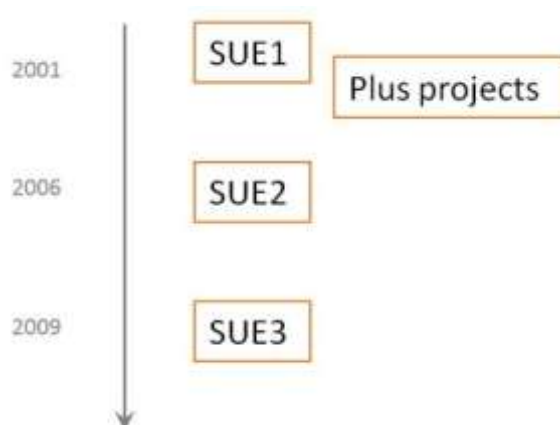
Figure 6 – Timeline of EPSRC's SUE Programme

round 1 (SUE 1)

The first round of SUE funding was announced late in 2001.

Twelve large, consortium-style projects were funded with durations of up to five years. Staggered starting dates meant that almost all of the projects had finished before the Workshop was held and those few that had not were due to finish shortly thereafter. This funding round accounted for a total spend of £21,024,648. No project received less than £1M and two received over £2M. The average spend per project was £1,752,054. The projects were required to be multidisciplinary in nature and include collaborations between two or more universities as well as demonstrating strong industry partner links (EPSRC 2010e).

Through this round of funding EPSRC wished to support research that:

1. targeted key quality of life indicators in water and air quality, waste and resources, transport, climate change, land use, construction and housing;
2. was conducted in the context of the 1987 Brundtland Report definition that sustainable development "...meets the needs of the present without compromising the ability of future generations to meet their own needs.";
3. met the needs of users of the research through supporting developments in sustainable products and services; energy, water and utility services; integrated transport and distribution services; sustainable environmental services and holistic waste management; and efficient and inclusive health and public services.

(Batchelor 2010)

Five themes were devised for the call:

1. Theme one: *Towards a new physical infrastructure*
2. Theme two: *The sustainable built environment*
3. Theme three: *Waste, pollution and urban land use*
4. Theme four: *Urban transport and urban design*
5. Theme five: *Social Inclusion*

(EPSRC 2001)

These themes were then revised after sight of the applications and in the end the 12 funded projects fell into the following four categories (now re-named clusters):

1. Cluster 1: *Urban & Built Environment* (3 projects)
2. Cluster 2: *Waste, Water and Land Management* (3 projects)
3. Cluster 3: *Transport* (4 projects)
4. Cluster 4: *Metrics, Knowledge Management & Decision-making* (2 projects)

 (EPSRC 2010e)

The 12 funded projects along with their foci are listed below. Further details about each can be found later in this section and on the SUE Research Dialogues website (http://suedialogues.wordpress.com) in the section 'blogroll' in the right-hand column.

1. IDCOP (http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=GR/T04878/01). Produce innovative solutions with respect to the maintenance and refurbishment of existing buildings (EPSRC 2010g).
2. VivaCity2020 (http://www.vivacity2020.eu/). Develop decision-making tools and resources to support and enable sustainable and socially responsible urban design in four themed areas: (i) the process for urban design decision-making; (ii) urban policy; (iii) urban form; (iv) urban experience (EPSRC 2010g).
3. SUFC (http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=GR/S20529/01). Advance theory on sustainable urban form through systematic evidence-based research, and to provide practical and useful outcomes from it (EPSRC 2010g).
4. SUE Waste (http://www.suewaste.soton.ac.uk/). Carry out research relevant to the problems of waste resource management in urban environments (EPSRC 2010h).
5. SUBR:IM (http://www.subrim.org.uk/). With regards to brownfield redevelopment to experimentally research one problem contaminant (acid tars), three remediation techniques (S/S, compost and charcoal), and one outcome (greening), as well as researching sustainability assessments of remediation and climate change issues (EPSRC 2010h).
6. WaND (http://www.wand.uk.net/). Support the delivery of integrated, sustainable water management for new developments by provision of tools and guidelines for project design, implementation and management (EPSRC 2010h).
7. SOLUTIONS (http://www.suburbansolutions.ac.uk/). Examine the interaction between strategic (whole city) and local (neighbourhood) levels with close attention to transport and urban design issues (EPSRC 2010f).
8. FUTURES (http://www.sue-futures.org/). Research into the role of new technologies in progressing towards a state of sustainable urban mobility (EPSRC 2010f).
9. DISTILLATE (http://www.distillate.ac.uk/). Develop improved tools and techniques to assist in the planning, design and implementation of sustainable transport and land use strategies and schemes (EPSRC 2010f).
10. AUNT-SUE (http://www.aunt-sue.info/). Produce rigorous methodologies for sustainable policies and practices that will deliver effective socially inclusive design and operation in transport and the public realm from macro down to micro level (EPSRC 2010f).

11. PUrE (http://www.pureframework.org/). Consider the 'urban environment' as an integrated system and address the environmental, economic and health implications of multiple forms of pollution (EPSRC 2010b).
12. SUE-MOT (http://www.sue-mot.org/). Assess simultaneously the economic, environmental and social issues which contribute to the sustainability of urban developments (EPSRC 2010b).

plus projects

Once the Round 1 SUE projects were underway EPSRC decided to fund three smaller, 'plus' projects that had been submitted to the Council in Responsive Mode. "Responsive Mode is for unsolicited research proposals submitted by anyone eligible to apply to EPSRC for funding at any time and in any field of research relevant to EPSRC's remit." (EPSRC 2010a)

Three smaller, consortium-style projects were funded with durations of up to two years each and all had finished before the Workshop was held. This accounted for a total spend of £1,639,199, although there was significant variation in the amount of money received by each project: one received the lion's share at just over £1M, one received less than half this at ~£350,000 and this was more than halved again for the third project, which received ~£150,000. As the projects were funded in Responsive Mode there was no overarching or prescribed research direction from EPSRC.

The three funded projects along with their foci are listed below. Further details about each can be found later in this section and on the SUE Research Dialogues website (http://suedialogues.wordpress.com/) in the section 'blogroll' in the right-hand column.

1. Birmingham Eastside (http://www.esr.bham.ac.uk/). Explore how sustainability is addressed in the regeneration decision-making process, and to assess the sustainability performance of completed development schemes in Birmingham Eastside against stated sustainability credentials and aspirations.
2. SuScit (http://www.suscit.org.uk/). Design a 'bottom-up', public engagement and foresight process which empowers lay citizens in dialogue with scientists, policy makers and professional stakeholders, and which articulates the environmental and sustainability research needs of marginalised and excluded urban communities.
3. InSITU (http://www.insitu.org.uk/). Support those who are working to improve public spaces and walking routes with the active participation of local communities, especially in areas of economic and social deprivation.

(EPSRC 2010d)

round 2 (SUE 2)

The second round of SUE funding was announced in the second half of 2006.

> The first round of SUE consortia understandably focussed on specific sectors of the urban environment within four defined clusters. It is felt that there is a sufficiently research active community within the IEP programme (Infrastructure and Enviroment Programme) and beyond, with appropriate knowledge of the requirements of consortia working, for the new consortia to begin to take a more holistic view of sustainability across these sectors.
> (EPSRC 2006a)

Six large, consortia-style projects were funded with durations of up to four years and all projects were underway at the time of the Workshop. This accounted for a total spend of £16,028,684. No project received less than £2M and two received over £3M. The average spend per project was £2,671,447. As with the SUE 1 round of funding, the projects were required to be multidisciplinary in nature and include collaborations between two or more universities as well as demonstrating strong industry partner links (EPSRC 2006a).

Through this round of funding EPSRC wished to support research that:

1. continued to be conducted in the context of the 1987 Brundtland Report definition that sustainable development, "…. meets the needs of the present without compromising the ability of future generations to meet their own needs";
2. built on initial research within the SUE Programme rather than replicate ongoing work;
3. strengthened the capability of the UK research base in sustainability within the urban environment, building on the current research supported through the SUE Programme;
4. provided an identifiable source of multidisciplinary academic excellence able to respond to the needs of the end users in industry, commerce, the service and public sectors;
5. developed a strategic approach to conducting research so as to address future sustainability challenges in the urban environment;
6. took an holistic and integrated approach in addressing sustainability research issues;
7. worked closely with ISSUES to enable effective transfer of knowledge to policy makers and practitioners.

(EPSRC 2006a)

Projects with foci in the following areas were excluded from the call. This was to prevent overlap with other managed funding programmes.

■ Electricity generation and supply, including sustainable energy generation.
■ Research focused on climate change, including impacts of climate change on the urban environment.
■ River management and river flood prevention unless the emphasis of the research is on interventions within the urban environment.
■ Research focussed specifically on manufacturing unless the emphasis of the research is on sustainability within the urban environment.
■ Research considered to fall within the remit of the Rural Economy and Land Use (RELU) programme, supported by BBSRC, ESRC and NERC.

(EPSRC 2006a)

Four themes were devised for the call and the fit of the funded projects to the themes is as follows:

1. Infrastructure for high quality, high density living and working (3 projects)
2. Health implications (1 project)
3. User centred design and accessibility (0 projects)
4. Decision support (2 projects)

(EPSRC 2006a)

The six funded projects along with their foci are listed below . Further details about each can be found later in this section and on the SUE Research Dialogues website (http://suedialogues.wordpress.com/) in the section 'blogroll' in the right-hand column.

1. 4m (http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=EP/F007604/1). Accurately calculate the carbon footprint of an entire city.

2. PUrE Intrawise (http://www.pureintrawise.org/). Study of the environmental and health effects related to the generation, conservation and use of energy in buildings, with a particular focus on residential buildings.

3. ReVISIONS (http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=EP/F007566/1). Provide the knowledge for public agencies and companies to plan regional infrastructure for transport, water, waste, and energy, (ranging from large capital schemes to small scale decentralised services), in a more coordinated and integrated way so as to maximise economic competitiveness, reduce environmental and resource impacts, and allow households to live more sustainably with an enhanced quality of life.

4. SURegen (http://www.suregen.co.uk/). Develop a prototype Regeneration Simulator Workbench (RSW) that meets the decision-making challenges that sustainable urban regeneration poses, i.e., multiple stakeholder interests, complexity, uncertainty and ambiguity.

5. Urban Futures (http://www.urban-futures.org/). To answer the questions:
   a. How does the ab initio conceptualization of sustainability influence design outcomes (e.g. form, density)?
   b. How would outcomes change if urban renewal were predicated on either environmental or social or economic overriding drivers?
   c. How does development impact on its environs, and vice versa (e.g. is a 'sustainable' site good for the city / region / country and, if so, in what ways?) and is there an optimum development size to yield optimally sustainable outcomes?
   d. Push versus pull to achieve sustainable outcomes. Much of what is done is thought good (for individuals, society, the environment), what might be wanted (push). Thus decisions are made and people must decide whether or not to take ownership. Might more sustainable outcomes follow if those who must take ownership dictate what is created (pull)?

6. URSULA (http://www.ursula.ac.uk/). Investigate the significant social, economic and environmental gains to be made by integrated and innovative interventions in urban river corridors.

(EPSRC 2010c)

round 3 (SUE 3)

The third and final round of SUE funding was announced late in 2009.

> Through the Sustainable Urban Environment (SUE) programme, EPSRC would like to seed and support significant new research directions, by focussing on identifying and addressing the grand challenges associated with integration and connectivity across different spatial and temporal scales within the urban environment to deliver sustainability.
> (EPSRC 2009)

At the time of the Workshop the award announcements had not been made, but what was known was that between £6M and £8M worth of funding was available "to fund a small number of ambitious multidisciplinary research proposals where Engineering and Physical Science research is a major element of the proposed activities involving collaboration between engineering and physical sciences and other disciplines." (EPSRC 2009).

Through this round of funding EPSRC wished to support research that:

■ builds on existing research within the SUE Programme, in order to advance knowledge, build new capacity and explore new directions, rather than replicate ongoing work;

■ proposes truly ambitious and novel, internationally leading research ideas and approaches;

- demonstrates the potential step change in current knowledge and practice;
- demonstrates the long-term and transformative nature of the research;
- supports an appropriate group of researchers of international standing together with suitable academic and non-academic collaborators.

(EPSRC 2009)

Themes were not set for this call, but the following list of grand challenges were put forward with a note that the list was not to be considered complete:

- Managing the transition from current infrastructure to the desired future;
- Creating adaptive cities;
- The seamless integration of utilities and systems;
- Interactions and flows in and between cities;
- Evolutionary decision making processes, enabling future and existing technologies to be embedded;
- Looking beyond current retrofitting ideas and activities, from individual to city scale;
- Studying in situ: city as a lab;
- Ensuring true trans-disciplinarity, for example, bringing together systems engineering and behaviour thinking. (EPSRC 2009)

money matters

Industry measures financial returns over time

ROI typically 2.5- 5.0 years
ROI for £45m SUE programme

What are the metrics?
What does success look like?
Are we there for SUE 1?

Peter Braithwaite, CH2M HILL

The pieces of the SUE funding pie, with a total spend of £45 million, can be graphically represented as follows:
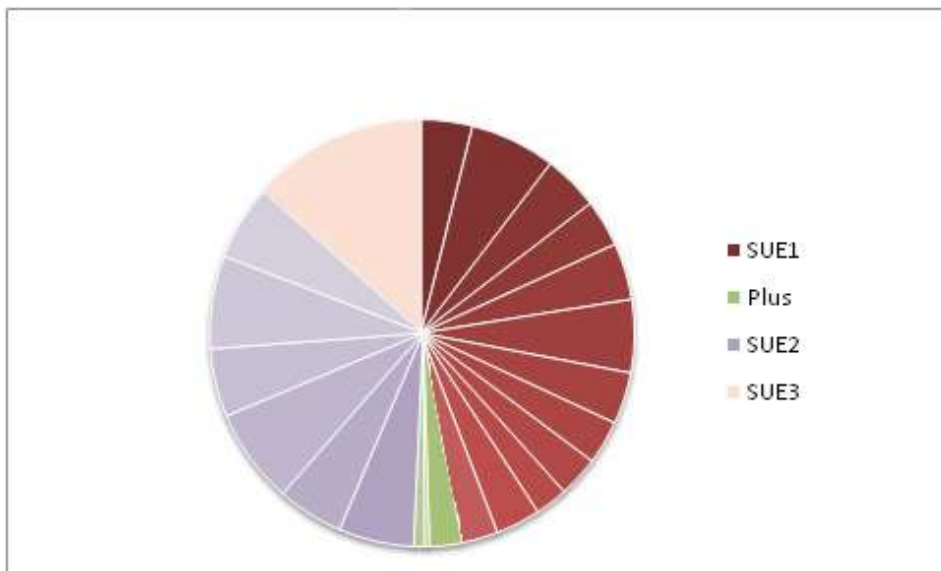
Figure 7 – Funding allocation of EPSRC's SUE Programme, showing both the SUE round of funding and the individual project allocations

SUE 1 tools and techniques by consortia/project

| Tools and techniques developed by SUE 1 Consortia | Information taken from two sources | 1) From SUE 1 Consortia extant websites (except IDCOP and WAND, see below) | 2) From Issues Project publication on Research outputs from EPSRC's Sustainable Urban Environment (SUE) programme, see http://www.urbansustainabilityexchange.org.uk/ISSUESSUEResearchOutputs.htm | NOTE: On occasion, a Consortium's web site signals an intention to deliver a tool or technique but subsequent delivery has not yet itself been signalled. Where this happens, rows are shown in grey, except where the ISSUES 2006 publication records that that the tool or technique is already available. |

SUE 1 Consortium	Tool/ technique	Used for	Further information	Access
Innovation in Design				
	B-Space	Building Specific Pre-refurbishment Assessment of Comfort and Energy is an energy demand assessment tool for multi-storey office buildings that takes into account occupier comfort.	Taken from The Issues Project's (2006) Buildings & Energy research outputs from the SUE Programme.	Web address given for tool, http://www.idcop.soton.ac.uk/index.2.html, no longer accessible. Contact A.S.Bahaj@soton.ac.uk

	IDCOP Toolkit	A suite of building performance rating and decision-making tools aimed at building professionals including: a façade rating system; key performance indicators and a knowledge base for the study of building facades; a decision-making model using an Analytic Hierarchy Process approach; and a Multi-Criteria Decision-making tool for sustainable maintenance in social housing.	As above	As above
	Test Facility for Integrated HOEs	Facility for testing integrated Light Directing Holographic Optical Elements (HOE) at Southampton University. Monitoring of the performance of HOEs is ongoing.	As above	As above
WAND				
	Urban Water Optioneering Tool	Allow the exploration of alternative sustainable technologies' compatibility. Enables sustainability evaluation at a strategic level using specific criteria based on the SWARD framework.	See WAND CD Portal. For SWARD, see http://www.wand.uk.net/index.php?module=articles&func=display&aid=13&ptid=7. See also www.wand.uk.net	Access through WAND CD browser. For further information on the WAND CD, contact D.Butler@exeter.ac.uk. For further details about the exploitation of WAND outputs and results by CIRIA, contact Robin.Farrington@ciria.org
	Hazards Checklist		See WAND CD Portal and www.wand.uk.net	As above.
	SUDS Site Evaluation Tool	Can be used by planners to evaluate SUDS technologies: performance and resource utilisation	See WAND CD Portal and www.wand.uk.net	As above.

	Project Assessment Tool	For use in collaboration with decision-making between stakeholders. Acts as an aid to the decision-making process rather than providing a definitive assessment. Has easily interpretable visual outcomes.	See WAND CD Portal and www.wand.uk.net	As above.
	MicroWater Tool	Forecasts regional water demand at Generic Operator Returns (GOR) level up to 2031. Developed to be interactive. Allows investigation of effects of various scenarios. Intended as a serious tool for use by water sector researchers as well as enabling non-specialists to develop an understanding of the effects of demand factors.	See WAND CD Portal and www.wand.uk.net	As above.
	MacroWater Tool	Calculates the combined impact of house building, water efficiency legislation (and to a lesser extent climate change) on water consumption over the medium term under different scenarios.	See WAND CD Portal and www.wand.uk.net	As above.
	Scoping Tool	For scoping application of water management options. Structured around four types of water management intervention. Provides early stage check on impact of effects of novel interventions, covering SUDS, greywater recycling, water conservation, and rainwater harvesting.	See WAND CD Portal and www.wand.uk.net	As above.
	IPF Tool	A tool for Multi-dimensional Iterative Proportional Fittings. Helps construct arrays of future household structures.	See WAND CD Portal and www.wand.uk.net	As above.

	Flood Modelling	GIS-centred tool for modelling surface flooding for use in planning new developments.	Originally developed by Imperial College, with further development and testing by WAND. See WAND CD Portal and www.wand.uk.net	As above.
	Decision Support Toolbox	A DSS environment for use in developing a set of tools for water cycle management in new developments. Includes a Screening Tool, an Optioneering Tool, and a Suitability Evaluation Tool.	See WAND CD Portal and www.wand.uk.net	As above.
VivaCity2020				
	Space Syntax Analysis	Analysis of street morphology	See Perdikogianni, I. et al, Decoding Urban Diversity in a 'mixed use' neighbourhood	http://www.vivacity2020.eu/Members/VivaCity%20Decoding%20Diversity.pdf
	i-VALUL	Analysis of city centre formation	See Hiller, B. and Wedderburn, M. The value of urban centres,	http://www.vivacity2020.eu/Members/880-MidTerm-02KIT3.pdf#professor-bill-hillier-university
		Analysis of the economic cost of crime	See Chiaradia, A. et al, The economic cost of crime	http://www.vivacity2020.eu/Members/i-VALUL-Workshop02-Presentations.pdf
		Analysis of the relationship between street layout and property value	See Hillier B. and Barnes, Y. Residential Property Value	http://www.vivacity2020.eu/Members/880-MidTerm-03KIT4.pdf
	Household Survey Questionnaire	Quality of Life assessment of living situation in terms of location, building mix, layout and likes and dislikes about neighbourhood		http://www.vivacity2020.eu/vivacity-toolkit/understanding-business-and-resident-values

	Business Survey Questionnaire	Profiling firms in terms of service provided, number of staff, travel mode/distance to work, customer catchment, premises type, tenure, location advantages and disadvantages		http://www.vivacity2020.eu/vivacity-toolkit/understanding-business-and-resident-values
	Liveability Survey	A questionnaire based postal survey based on the Government's 'liveability agenda'	For a description of its use on the project, see http://www.vivacity2020.eu/vivacity-toolkit/liveability-surveys	http://www.vivacity2020.eu/Members/Liveability%20survey.pdf for the survey form
	Toilet Audit Tool	To use the audit tool you will need: ▪ A tape measure ▪ A copy of the audit sheet (Microsoft Word document, 3.5mb) ▪ A pen or pencil ▪ A camera to record the layout of facilities (not essential but may be useful as an aide memoire)	Developed in collaboration with Vin Goodwin a National Registered Access Auditor, to collect data on the accessible provision that was currently available. The tool is based on the design of the unisex corner accessible cubicle described in Approved Document M (ADM) of the Building Regulations 2004.	http://www.vivacity2020.eu/vivacity-toolkit/toilet-audit-tool-1

	Toilet User Personas	Tool that developed to communicate users' needs to the professionals involved in the design and management of away from home toilets.	Each persona is an 'archetypal user' that has been created in collaboration with user groups involved in the research. The personas have been edited from narratives of actual user experiences. Each persona therefore provides a snapshot of their combined experiences, an amalgamation of all those involved in its development. NB: Personas have also been developed for accessibility issues in relation to transport on AUNT-SUE, see HADRIAN, http://www.aunt-sue.info/toolkit/hadrian.html	http://www.vivacity2020.eu/vivacity-toolkit/toilet-user-personas.
	Toilet User Survey	Survey attitudes to toilet provision		http://www.vivacity2020.eu/vivacity-toolkit/toilet-user-surveys-and-personas

	RELATED TOOL:			
	Culture and Sport Planning Toolkit	The toolkit is a practical source of information and advice for all practitioners involved in culture and planning. For the first time, this toolkit brings together a combination of existing and new tools to incorporate planning for culture and sport into new and existing developments.	Produced by Living Spaces (a collaboration between Arts Council England, the Commission for Architecture and the Built Environment (CABE), English Heritage, the Museums, Libraries and Archives Council (MLA) and Sport England; their sponsoring department the Department for Culture, Media and Sport (DCMS) and the Department for Communities and Local Government (DCLG).	http://www.living-places.org.uk/culture-and-sport-planning-toolkit/about-the-toolkit/
PUrE				
	PUrE Software	An integrated decision-support framework to enable more sustainable management of urban pollution. The decision-support framework comprises a suite of appropriate models and tools for conducting either simple screening studies and/or detailed modelling and assessments of urban pollution.	The main outputs from the project are a decision-support framework, the supporting software platform and user-guidance documents.	http://www.pureframework.org/?page=software
	PUrE Software Guide		As above	http://www.pureframework.org/?page=software

	Vegetation Pollutants Capture Model	To predict how vegetation captures pollutants, backed by a dataset of ecotoxological hazards, establishes the benefits of projects for air quality.	Taken from The Issues Project's (2006) Contaminated Land & Pollution research outputs from the SUE Programme.	Web address given for tool, www.ceas.manchester.ac.uk/research/groups/sustainable/projects/pure. Contact carol.pettit@manchester.ac.uk
	Life Cycle Impacts and Flows Model	For analysing and assessing the life cycle impacts and flow chains of pollutants.	Taken from The Issues Project's (2006) Contaminated Land & Pollution research outputs from the SUE Programme.	Web address given for tool, www.ceas.manchester.ac.uk/research/groups/sustainable/projects/pure. Contact Adisa.Azapagic@manchester.ac.uk
SOLUTIONS				
	Computer Models	Sophisticated computer modelling of land use and transport interaction.	Computer models developed to test the sustainability of options by a detailed simulation of where people will live and how they will travel.	http://www.suburbansolutions.ac.uk/DocumentManager/secure0/SOLUTIONS%20Brochure.pdf
	Assessment Framework	Assess the sustainability of these options against environmental, social and economic indicators using inputs from a range of stakeholders.	Criteria list comprehensive enough to cover the main factors that affect the sustainability of the options whilst minimising double-counting of the impacts of the options. These criteria are compared and traded off within an assessment framework using analytical hierarchy method.	http://www.suburbansolutions.ac.uk/method.aspx

Aunt-SUE				
	Benchmarking Module	To determine, for various groups of travellers generally considered socially excluded, what was likely to constitute a "reasonable" level of accessibility, with sufficient accuracy to understand what the accessibility implications would be, for the reduction of social exclusion, of given changes in provision.	See flier for further information, http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-02.pdf. See also Titheridge, H. et al, Assessing the extent of transport social exclusion among the elderly, Journal of Transport and Land Use 2 (2) [Spring 2009] pp. 31–48 Available at http://jtlu.org.	http://www.aunt-sue.info/toolkit/minimumstandards.html
	VISIT	A GIS-based multi-criteria 'whole journey' audit tool to help identify areas with accessibility deficits for particular groups	See flier on Visualising Safe and Inclusive Transport Environments, http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-03.pdf	http://www.aunt-sue.info/toolkit/visit.html
		Adaptation of Geographic Information Systems for Participation (GIS-P), enabling users to express views and preferences in their own terms and on an equal footing with transport professionals, designers and planners		
		2D and 3D visualisation to help practitioners design-in more people, and design out crime/ fear of crime		
	AMELIA	To test in a comprehensive and systematic way the extent to which transport policies can increase social inclusion, taking the needs of those who are socially excluded into account.	Mackett, R. et al, AMELIA: A tool to make transport policies more socially inclusive, Transport PolicyVolume 15, Issue 6, November 2008, Pages 372-378,	http://www.aunt-sue.info/toolkit/amelia.html

		Street Design Indicator	Widens the scope to perceptual factors such as fear of crime, natural surveillance, key amenities such as WCs, furniture, signage and legibility, and uses a more comprehensive mapping of neighbourhoods, communities and routes. This provides a more in depth context for identifying at risk and excluded users, and relates this to the physical and journey environment.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-07.pdf.	http://www.aunt-sue.info/toolkit/sdi.html
		Street Environment Index	To evaluate fear of crime in relation to the likelihood of being observed, using both direct factors, such as surveillance, and indirect factors such as graffiti and fly-tipping.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-08.pdf. User Guide at http://www.aunt-sue.info/assets/files/SEI/SEIUserGuideJune2009Final.pdf.	http://www.aunt-sue.info/toolkit/sei.html
		Prospect/Refuge Mapping	A mechanism to predict the level of fear of crime felt by pedestrians in an area, and to highlight hotspots of fear.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-09.pdf.	http://www.aunt-sue.info/toolkit/prospectrefuge.html
		i-Journey: Inclusive Journey Planner	An innovative web interface that has been designed to demonstrate how these concepts can be realised. The prototype demonstrates how journey planners could be developed to fulfil their potential as tools for inclusion.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-10.pdf. Design guide at http://www.pete-davis.co.uk/aunt-sue/.	http://www.aunt-sue.info/toolkit/i-journey.html

	HADRIAN: Human Anthropometric Data Requirements Investigation and Analysis	Software database of 102 people, including 59 with various disabilities, comprising of a broad range of body size, shape, joint range of motion, and task based capability.	Database includes a wide range of data about behaviour, and lifestyle, both at home and out and about. HADRIAN is also a 3D human modelling and task analysis system to enable modelling of discrete physical interactions that are based on the complex limitations of real people rather than generic population data.	http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-11.pdf
	HADRIAN Journey Stressimator	Makes use of the HADRIAN database of 102 real people, including 59 with various disabilities, to enable modelling of discrete physical interactions that are based on the complex limitations of real people rather than generic population data.	Works by comparing stressors that feature in a particular journey with the known capabilities, behaviours and emotional responses of the 102 individuals within HADRIAN. This simulates the stress levels that these people would experience throughout the journey.	http://www.aunt-sue.info/toolkit/stressimator.html
SUE-MoT				
	Generic, Integrated Assessment Framework	Brings together the current sustainability assessment metrics, models and tools as well as the new tools developed by SUE-MoT, creating a coherent, comprehensive, flexible, transparent and stakeholder-value centred platform to assess the economic, social and environmental dimensions of different contexts of the urban environment.	Signalled at beginning of Consortium as under development, see Work Package description.	http://www.sue-mot.org/research/work-package-1/

	Capture of stakeholder Values	Methods for identifying and capturing urban stakeholders' values in a way that can be integrated into the Integrated Sustainability Assessment Tool (ISAT) processes.	As above	http://www.sue-mot.org/research/work-package-2/
	Costs and Benefits Estimator	To estimate the sustainability costs and benefits of competing alternatives on a similar basis and to select sustainable, cost-effective and context-specific solutions over the whole life cycle of an urban development.	As above	http://www.sue-mot.org/research/work-package-3/
	Environmental Equity Model	A model for the prediction and assessment of environmental equity in urban developments.	Taken from The Issues Project's (2006) Urban Planning and Design research outputs from the SUE Programme.	http://www.sue-mot.org/research/work-package-4/. Contact r.m.w.horner@dundee.ac.uk
	Social Capital Model	A model for the prediction and assessment of social capital in urban developments.	As above	http://www.sue-mot.org/research/work-package-5/. Contact r.m.w.horner@dundee.ac.uk
	Knowledge Portal	To act as a bank of information and knowledge on the outcomes and issues of previous assessments which users of the Integrated Sustainability Assessment Tool (ISAT) can interrogate before and during their own assessments.	Signalled at beginning of Consortium as under development, see Work Package description.	http://www.sue-mot.org/research/work-package-6/
	Common Unit of Measurement	To provide algorithms, mathematical models and rules to convert the various dimensions of sustainability issues into a selected common unit.	As above	http://www.sue-mot.org/research/work-package-8/

The Sustainable Urban Form Consortium (SUFC) aka CityForm				
	Urban Form Typologies		The measurement of urban form includes building typologies, digital map footprints and configurations which are mapped on GIS, and analysed using methods including SPSS, Space Syntax, measures of accessibility and Multiple Centrality Assessment	http://www.city-form.org/uk/research_methodology.html
	Sustainability Performance Benchmarks			http://www.city-form.org/uk/research_core.html
	Urbanising Suburbia	To assess the sustainability of approaches to urbanising suburbia	See http://www.city-form.org/uk/pdfs/urbanising_suburbia.pdf	http://www.city-form.org/uk/research_projects.htm
	Sustainable Lifestyles	To analysis the sustainability of lifestyles	see http://www.city-form.org/uk/pdfs/sustainable_lifestyles.pdf	http://www.city-form.org/uk/research_projects.htm
	Valuing Open Space	Enables detailed examination of the trade-offs between the different values of open space (environmental quality, social benefits, ecological diversity, cost and added value).	See http://www.city-form.org/uk/pdfs/valuing_open_space.pdf	http://www.city-form.org/uk/research_projects.html

	Energy Consumption Methodology	A new methodology for determining indicators of domestic energy consumption using annual energy consumption data obtained for individual households covering, for instance, number of bedrooms, occupants working from home, and ownership of technology.	Taken from The Issues Project's (2006) Buildings & Energy research outputs from the SUE Programme.	Contact keith.baker@sistech.co.uk
SUB:RIM				
	The SUBR:IM Book	Assesses the effectiveness of different types of regeneration policy by identifying best practice.	Published in October 2007, Sustainable Brownfield Regeneration: Liveable Places from Problem Spaces, presents many of SUBR:IM's key findings. See http://www.subrim.org.uk/SUBRIMBookFlyer.pdf	http://www.subrim.org.uk/
	CL:AIRE End User Guides	Nine end user guides centred around SUBR:IM research covering key issues including sustainability measurements, design for deconstruction, communicating risk and community engagement	Produced by CL:AIRE (Contaminated Land: Application in Real Environments - an independent, not for profit organisation), see http://www.claire.co.uk/	http://www.subrim.org.uk/

SuScit				
	A Review of Tools and Techniques for Community Foresight for Sustainability	To identify, test and develop a range of participatory tools for engaging citizens in foresight activities.	This review addresses the methodological and practical challenges of involving lay citizens, particularly those form marginalised and socially excluded groups, in dialogue with scientists, engineers, local professionals and sustainability practitioners. See http://www.suscit.org.uk/resources/documents/ Methodsfinal140706.pdf	http://www.suscit.org.uk/
DISTILLATE				
	KonSULT Tool	A knowledge base which provides assessment of the potential contribution of 40 transport and land use policy instruments. Users identify their objectives and performance indicators (including weightings) and the options generator then uses the assessment scores for each instrument in the knowledge base to identify those which are likely to contribute most.	Taken from The Issues Project's (2006) Transport research outputs from the SUE Programme.	Web address given, www.konsult.leeds.ac.uk. Contact A.D.May@its.leeds.ac.uk.
	Strategic Transport Model	A multimodal transport model used to address a range of public transport related policies under different land use planning scenarios.	As above	Web address given, www.distillate.ac.uk/outputs/pr oducts.php#productsB. Contact A.D.May@its.leeds.ac.uk.

	Funding Toolkit	Provides overview of potentially available funding sources for a variety of schemes and projects, including the potential benefits and disadvantages of using a source.	As above	As above
FUTURES				
	Wayfinding Support	To develop and test one or more wayfinding services in two case study cities (Bristol and Manchester).	The results of the research will be used to advise policymakers and those responsible for transport delivery, enhance the base of research knowledge, contribute to teaching, and inform the population more widely. See http://trg1.civil.soton.ac.uk/futures/pa2a_info_02.pdf	http://www.sue-futures.org/
SUE Waste				
	Local Area Resource Analysis (LARA) Model	To estimate household resource use and waste arisings in small geographical areas.	A top-down model of material and energy flows in households. A highly socio-economically disaggregated model that forms the basis of the AR-Gini, an area-based indicator of resource inequalities.	Originally http://www.suewaste.soton.ac.uk/project1.htm. Model extended with EPSRC SUE 2 funding of RESOLVE consortium, see www.surrey.ac.uk/resolve/LARA.htm. Contact a.druckman@surrey.ac.uk.

	Energy Footprinting Model	To compare different waste recycling and disposal techniques with respect to their energy use. The model is based on the city of Southampton and takes into account both energy and material flows. A mechanistic model in the form of a flowchart-based spreadsheet for calculation of the overall energy and materials balance for different waste management options. A manual describing the basis of the model, to allow modification and customisation by users elsewhere.	Taken from The Issues Project's (2006) Waste and Water research outputs from the SUE Programme.	http://www.suewaste.soton.ac.uk/project8.htm. Contact c.j.banks@soton.ac.uk
	Waste Input-Output Model	To estimate upstream wastes that arise as a result of household expenditure.	The model covers 122 business sectors and differentiates between different types of commercial and industrial wastes.	http://www.suewaste.soton.ac.uk/project1.htm
	LCA (Life cycle analysis)	To investigate the relative sustainability of alternative approaches to thermal processing of urban wastes, with a particular focus on recovery of value in the form of energy products from smaller-scale plant integrated into the urban environment.	Adopts a cradle-to-grave or life cycle approach, with a primary system boundary set at the point at which a material is designated as waste: from that point collection, transportation, processing, thermal treatment, and residue management processes are analysed, together with the production of useful energy and/or material products.	http://www.suewaste.soton.ac.uk/project2.htm

	Bioprocessing of Organic Urban Wastes Assessment Methodology	Data and methodologies for the rational selection of bioprocessing plant and management manual for urban organic wastes.	Designed to supply answers in areas where it is known that data needed for the determination of appropriate scales and/or technologies are currently inadequate.	http://www.suewaste.soton.ac.uk/project3.htm
	Auditing Methodology	For auditing commercial and industrial (C&I) wastes, particularly those arising from small to medium size enterprises (SMEs).	To provide a means for gathering reliable quantitative data at the same time as developing an IT-based interface between waste service providers and companies that provides positive information benefits to both user groups.	http://www.suewaste.soton.ac.uk/project4.htm
	Household Waste Recycling Centres (HWRC) Visitors Surveys	To make proposals for new methods of providing next-generation services in the context of the requirement for fully integrated sustainable urban waste management.		http://www.suewaste.soton.ac.uk/project5.htm
	Cost-benefit Assessment Methods	To investigate urban waste avoidance network schemes in terms of operation, participants and different views (e.g. technical, socio-economic, financial) of success.	Analysis of how technical, economic, environmental and social costs and benefits can augment existing standard CBA methods.	http://www.suewaste.soton.ac.uk/project6.htm

	Social Survey Techniques: Observation, Semi-structured Interviews and Questionnaires	To identify key factors that determine people's behaviour and performance with respect to re-use, recycling and disposal of domestic waste	Analysis of different domestic waste management strategies (in the context of cultural beliefs and physical restrictions). Recommendations to improve/target waste services that rely on householder participation. Design recommendations for i) retro-fitting existing domestic spaces to allow recycling, ii) waste management facilities in new build / conversions.	http://www.suewaste.soton.ac.uk/project7.htm
Birmingham Eastside				
	Comprehensive, Longitudinal and Cross-cutting Dataset	To investigate how and where urban sustainability (environmental, social and economic) is conceived, developed and adopted or not adopted within the urban regeneration decision-making process.		http://www.esr.bham.ac.uk/aims/phase2.shtml

	Development Timeline Framework	A multidisciplinary tool to assess the actual built form through interdisciplinary tools designed to analyse and conceptualise the sustainability impacts of development.	The Development Timeline Framework (DTF) tool was developed to elucidate the points at which a single design decision may 'lock-in' or 'lock-out' various possible outcomes; in essence it is a tool that facilitates an understanding of the linkages and synergistic effects of decisions on sustainability outcomes. Critically, it allows the tensions and trade-offs that may lead to 'lock-out' to be identified, and windows of opportunity to be made apparent. The DTF may be applied to any aspect of redevelopment.	http://www.esr.bham.ac.uk/aims/phase2.shtml http://www.esr.bham.ac.uk/aims/phase3.shtml

InSITU				
	New Approaches and Tools to Widen User Participation and Inform Design	Through innovative application of Geographic Information Systems for Participation (GIS-P), lay participants with in-depth local knowledge contributed to the physical design of schemes on an equal footing, with each other, and with the practitioners who could deliver significant improvements to public realm infrastructure.	The approaches and tools for community engagement were developed and validated in five live-case schemes, two in the City of York, two in Hackney, East London and one in the City of Salford. Particular emphasis was placed on eliciting valuable local knowledge and insights from so-called 'hard-to-reach' groups, and on developing novel ways of encouraging their participation in urban design, especially improvements to pedestrian environments that would be made safer, more accessible and attractive. The InSITU Project featured a number of methodological advances in GIS-P that were developed by the research team in collaboration with the Project Partners. These included experimental 'on-street ' and 'on-site' participation of local people in mapping public spaces and walking routes, as opposed to the more established approach of facilitating focus group panels. It also included the mapping of interior spaces, and participation of young children as well as young adults, see http://www.insitu.org.uk/ProjectReports/FacilitatingInclusiveDesignusingGISP.pdf.	http://www.insitu.org.uk/

Summaries of the consortia/projects funded under the SUE Programme

	Full project title:
4M *Measurement Modelling Mapping & Management*	Measurement, Modelling, Mapping and Management (4M): An Evidence-Based Methodology for Understanding and Shrinking the Urban Carbon Footprint
SUE 2 Cluster	http://mmmm.lboro.ac.uk/background.html
PI: Kevin Lomas, Loughborough University	**CIs:** Margaret Carol Bell, Anil Namdeo, Kevin Gaston, Mark Rylatt, Jonathan Leake

Project Summary (from call announcement available on EPSRC's website):

Global warming is a serious threat to mankind and is exacerbated by the release of greenhouse gases, in particular carbon dioxide. In the UK, as in other developed counties, buildings, and the activities in them, and transport generate significant carbon emissions: in the UK buildings 47% and transport 23%, and rising significantly. The UK has legally binding targets to reduce greenhouse gas emissions and has an intention to cut national CO_2 emissions by 60% by 2050. The sequestration of carbon by living plants can 'lock' carbon in soils and ameliorate carbon dioxide emissions. In the UK about 80% of the population live in cities and other urban areas and these are continually expanding.

One way to represent carbon emissions from different sources and to compare them is to calculate the carbon footprint. This can be done for an individual, a household, a city (or a country). There are however some difficult problems to be overcome in order to do this.

The 4M project will then calculate the carbon footprint of the entire city of Leicester by:

* Measuring the carbon released by traffic, and by the burning of fossil fuels in homes and places of work and the rate at which green plants and trees capture carbon and lock it in the soil;

* Modelling the effects on carbon budget of road layouts, traffic volumes and traffic speeds, the way we use energy in our homes and places of work; and the way we look after green spaces;

* Mapping the sources and sinks of carbon for the whole city and comparing this with the social and economic well-being of its 270,000 inhabitants; and

* Management studies which will investigate how to shrink the city's carbon footprint through: changing the road network and/or the provision of better public transport; alterations to the maintenance of green spaces and the treatment of waste; the use of renewable and low energy systems to provide power and light; and the operation of individual Carbon Trading (ICT) schemes.

ICT schemes give a limited carbon emissions allocation to individuals. People must emit less carbon dioxide than their limit or buy more credits. The tradeoffs that people might make, e.g. travelling less or buying renewable energy, will be studied. This will be one of the first studies to explore the likely impact of such schemes on the life-styles and well-being of city dwellers.

The project consortium consists of the Institute of Energy and Sustainable Development (IESD) at De Montfort University the Institute for Transport Studies (ITS) at the University of Leeds and the Biodiversity and Micro-ecology Group (BIOME) at Sheffield University. It is supported by both central and local government representatives and contributors form various organisations concerned with the future, more sustainable development, of cities in the UK and overseas.

	Full project title:
	Accessibility & User Needs in Transport for Sustainable Urban Environments
SUE 1, Transport Cluster	www.aunt-sue.info/
PI: Graeme Evans, London Metropolitan University	CIs: Steve Shaw

Project Summary (from call announcement available on EPSRC's website):

The proposal integrates the expertise of the research centres and project partners in transport policies and planning, design, operations and evaluation. The UK government, European Commission and other agencies rightly emphasise the importance of socially inclusive and sustainable interventions. As yet, however, there is a dearth of comprehensive 'toolkits' and resources to support those who are working to reduce social exclusion in journey environments. The shared vision is to produce rigorous methodologies for sustainable policies and practices that will deliver effective socially inclusive design and operation in transport and the public realm from macro down to micro level. Three Core Projects will develop decision-support tools that will establish benchmarks and incorporate inclusion into policies, and support the design and operation of journey environments and transport facilities. A real-world but controlled 'Testbed' facility will allow these to be piloted in the context of the policy intentions and constraints that shape implementation. Solutions will then be tested and transferred to other Case Study areas and sites.

Phase 2 of AUNT-SUE will build on the suite of tools developed in Phase I and apply these to intensive case studies of transport interchanges, nodes and development areas. This will both develop and test techniques to design accessible journey environments (routes and facilities) and transport provision and planning, and consult on these with people who have been identified as socially excluded from travel. Three inter-linked research modules will be validated through integrated case studies outlined below, utilising a GIS-based platform supported by CAD, relational databases and both quantitative and qualitative social surveys.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Benchmarking Module	To determine, for various groups of travellers generally considered socially excluded, what was likely to constitute a "reasonable" level of accessibility, with sufficient accuracy to understand what the accessibility implications would be, for the reduction of social exclusion, of given changes in provision.	See flier for further information, http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-02.pdf. See also Titheridge, H. et al, Assessing the extent of transport social exclusion among the elderly, Journal of Transport and Land Use 2 (2) [Spring 2009] pp. 31–48 Available at http://jtlu.org.
VISIT	A GIS-based multi-criteria 'whole journey' audit tool to help identify areas with accessibility deficits for particular groups	See flier on Visualising Safe and Inclusive Transport Environments, http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-03.pdf
	Adaptation of Geographic Information Systems for Participation (GIS-P), enabling users to express views and preferences in their own terms and on an equal footing with transport professionals, designers and planners	
	2D and 3D visualisation to help practitioners design-in more people, and design out crime/ fear of crime	
AMELIA	To test in a comprehensive and systematic way the extent to which transport policies can increase social inclusion, taking the needs of those who are socially excluded into account.	Mackett, R. et al, AMELIA: A tool to make transport policies more socially inclusive, Transport Policy Volume 15, Issue 6, November 2008, Pages 372-378, http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VGG-4VGVTM5-1&_user=983321&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&view=c&_searchStrId=1126028005&_rerunOrigin=google&_acct=C000044920&_version=1&_urlVersion=0&_userid=983321&md5=60692ad2018fafca5fbd0c17eb80d07a
Street Design Indicator	Widens the scope to perceptual factors such as fear of crime, natural surveillance, key amenities such as WCs, furniture, signage and legibility, and uses a more	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-07.pdf.

	comprehensive mapping of neighbourhoods, communities and routes. This provides a more in depth context for identifying at risk and excluded users, and relates this to the physical and journey environment.	
Street Environment Index	To evaluate fear of crime in relation to the likelihood of being observed, using both direct factors, such as surveillance, and indirect factors such as graffiti and fly-tipping.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-08.pdf. User Guide at http://www.aunt-sue.info/assets/files/SEI/SEIUserGuideJune2009Final.pdf.
Prospect/Refuge Mapping	A mechanism to predict the level of fear of crime felt by pedestrians in an area, and to highlight hotspots of fear.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-09.pdf.
i-Journey: Inclusive Journey Planner	An innovative web interface that has been designed to demonstrate how these concepts can be realised. The prototype demonstrates how journey planners could be developed to fulfil their potential as tools for inclusion.	See flier at http://www.aunt-sue.info/assets/files/Publications/08023_flyer_10-10.pdf. Design guide at http://www.pete-davis.co.uk/aunt-sue/.
HADRIAN: Human Anthropometric Data Requirements Investigation and Analysis	Software database of 102 people, including 59 with various disabilities, comprising of a broad range of body size, shape, joint range of motion, and task based capability.	Database includes a wide range of data about behaviour, and lifestyle, both at home and out and about. HADRIAN is also a 3D human modelling and task analysis system to enable modelling of discrete physical interactions that are based on the complex limitations of real people rather than generic population data.
HADRIAN Journey Stressimator	Makes use of the HADRIAN database of 102 real people, including 59 with various disabilities, to enable modelling of discrete physical interactions that are based on the complex limitations of real people rather than generic population data.	Works by comparing stressors that feature in a particular journey with the known capabilities, behaviours and emotional responses of the 102 individuals within HADRIAN. This simulates the stress levels that these people would experience throughout the journey.

Eastside Sustainability Research	**Full project title:** An Integrated Approach to Sustainable Urban Redevelopment: Birmingham Eastside as a National and International Demonstrator
SUE Plus Project	http://www.esr.bham.ac.uk/
PI: Chris Rogers, The University of Birmingham	**CIs:** Austin Barber, Ian Jefferson, John Bryson, Jon Sadler, Mark Gaterell

Project Summary (from call announcement available on EPSRC's website):

The aim of the Sustainable Eastside Project is to explore how sustainability is addressed in the regeneration decision-making process, and to assess the sustainability performance of completed development schemes in Birmingham Eastside against stated sustainability credentials and aspirations. The incorporation of sustainability into an urban regeneration program, such as Birmingham Eastside, appears best conceptualised as a complex decision-making process carried out by stakeholders who are embedded within the development process. The barriers to and enablers of sustainability (as identified in Phase I of this project) appear at various moments or locations within this complex. The timing and context of decisions are critical (examined in Phase II), and can cause path-dependency which then limits how sustainability features in final development plans.

In Phases I & II, the research set in place a framework of cross-disciplinary knowledge and key partnerships; highlighted the importance of coherent integration of the three pillars of sustainability to enable the complexity of achieving urban sustainability to be sufficiently grappled with; gained access to key decision-making forums in Eastside; built strong links with key stakeholders in the area; and firmly integrated into the policy agenda for Eastside. In addition, researchers are working to establish a cross-cutting baseline dataset of developments in Eastside rigorously to measure change over time and the impact of particular decisions on the sustainability of the overall urban regeneration programme. In so doing the foundations for a zonal urban regeneration case study site are being established, augmented by the creation of a study facility, with library and hot desking, now available for researchers from SUE / IEP consortia, to study the application of research to practice.

The emerging findings of Phase II have allowed researchers to develop a series of hypotheses about the timing of decisions for sustainability in a range of decision-making forums, and the extent to which path-dependency becomes problematic. In Phase III, a suite of innovative analytical tools will be employed to elucidate further the complexities and interactions of the key elements of the sustainability vision for Eastside. First, a Development Timeline Framework (DTF), a multidisciplinary tool that makes explicit the path dependency of decisions toward achieving sustainability goals, and the conflicts and synergies between different sustainability objectives, will be used as the basis for further research. Second, a cross-cutting Sustainability Checklist (SC) applied to the DTF will allow each researcher to analyse the impact of timing and context of decisions for each sustainability element (e.g. biodiversity, public participation, space utilisation, local sourcing, and recycling). Third, an Industrial Ecology (IE) analysis will follow particular resources (e.g. water, aggregates) thus highlighting their interdependence, while a Social Impact Assessment (SIA) approach will enable assessment of the socio-cultural aspects of sustainability (not covered by the IE approach). This

suite of tools underpins the delivery of the work package aims. This analysis will be undertaken on a case history site basis, using development sites within Eastside that are all currently 'live,' each site representing a different conceptualisation of sustainability. This provides a unique opportunity to evaluate the specific impact of early thinking about sustainability in the planning and design stages, and the impact of this timing and path-dependency on sustainability performance in the final built form.

Final Report Summary (available on EPSRC's website):

The aim of the Sustainable Eastside Project, which was conducted in three phases, was to explore how sustainability is addressed in the regeneration decision-making process, and to assess the sustainability performance of completed development schemes in Birmingham Eastside against stated sustainability credentials and aspirations. The incorporation of sustainability into an urban regeneration programme, such as Birmingham Eastside, appears best conceptualised as a complex decision-making process carried out by stakeholders who are embedded within the development process. The barriers to and enablers of sustainability (as identified in Phase I of the project) appear at various moments or locations within this complex. The timing and context of decisions are critical (examined in Phase II), and can cause path-dependency which then limits how sustainability features in final development plans. In Phases I & II, the research team:

- set in place a framework of cross-disciplinary knowledge and key partnerships;

- highlighted the importance of coherent integration of the three pillars of sustainability if the complexity of achieving urban sustainability is to be successfully dealt with;

- gained access to key decision-making forums in Eastside;

- built strong links with key stakeholders in the area; and

- firmly integrated its findings into the policy agenda for Eastside.

In addition, the team established a cross-cutting baseline dataset of developments in Eastside rigorously to measure change over time and the impact of particular decisions on the sustainability of the overall urban regeneration programme, and this has been further developed in Phase III. Thus the foundations for a zonal urban regeneration case study site have been established, and augmented by the creation of a study facility at the University of Birmingham, with library and hot desking, which is now available for researchers from SUE consortia to study the application of research to practice.

The findings of Phase II allowed researchers to develop a series of hypotheses about the timing of decisions for sustainability in a range of decision-making forums, and the extent to which path-dependency becomes problematic. In Phase III, a suite of innovative analytical tools has been employed to elucidate further the complexities and interactions of the key elements of the sustainability vision for Eastside. First, a Development Timeline Framework (DTF), a multidisciplinary tool that makes explicit the path dependency of decisions toward achieving sustainability goals, and the conflicts and synergies between different sustainability objectives, has been developed. Second, a cross-cutting Sustainability Checklist (SC) applied to the DTF has allowed each researcher to analyse the impact of timing and context of decisions for each

sustainability element (e.g. biodiversity, use of underground space, etc.). Third, an Industrial Ecology (IE) analysis has followed particular resources (e.g. water, aggregates) thus highlighting their interdependence, while the socio-cultural aspects of sustainability (not covered by the IE approach) have been explored. This suite of tools has underpinned the delivery of the work package aims covering social and economic aspects of urban redevelopment, built environment and open space provision, infrastructure and utility service (water, energy) provision, and the natural environment and biodiversity. The analysis has been undertaken on a case history site basis, using 'live' development sites within Eastside, each site representing a different conceptualisation of sustainability. This provided a unique opportunity to evaluate the specific impact of early thinking about sustainability in the planning and design stages, and the impact of this timing and path-dependency on sustainability performance in the final built form.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Comprehensive, Longitudinal, and Cross-cutting Dataset	To investigate how and where urban sustainability (environmental, social and economic) is conceived, developed and adopted or not adopted within the urban regeneration decision-making process.	
Development Timeline Framework	A multidisciplinary tool to assess the actual built form through interdisciplinary tools designed to analyse and conceptualise the sustainability impacts of development.	The Development Timeline Framework (DTF) tool was developed to elucidate the points at which a single design decision may 'lock-in' or 'lock-out' various possible outcomes; in essence it is a tool that facilitates an understanding of the linkages and synergistic effects of decisions on sustainability outcomes. Critically, it allows the tensions and trade-offs that may lead to 'lock-out' to be identified, and windows of opportunity to be made apparent. The DTF may be applied to any aspect of redevelopment.

	Full project title: Design & Implementation Support Tools for Integrated Local Land Use, Transport & the Environment
SUE 1, Transport Cluster	www.distillate.ac.uk
PI: Anthony May, University Of Leeds	**CIs:** Angela Hull, Neil Paulley, Peter Jones, Johan Kuylenstierna, Steve Cinderby, Matthew Page, John Forrester, A Pedler, J King

Project Summary (from call announcement available on EPSRC's website):

This four-year research programme represents a major collaborative effort between four academic institutions and a research establishment, collectively providing a wide range of disciplinary skills and practical experience, the content of which reflects the priorities of our local authority partners. The research seeks to develop improved tools and techniques to assist in the planning, design and implementation of sustainable transport and land use strategies and schemes, and to test them by working with local authorities in a series of case studies.

The programme is divided into five inter-related Core research tasks (plus a co-ordination and dissemination task) and four Plus Projects, each of which meets one of the sub-objectives listed above. Core Task 1 provides the central integrative feature of the programme; by reviewing documentation and interviewing key staff, it produces a conceptual map of the problems and issues affecting the delivery of integrated and sustainable transport/land use solutions in a range of local authority administrative settings; it will also coordinate the feedback of outputs from the other research tasks, to ensure that they meet local needs. Core Task 2 seeks to improve the quality of transport/land use strategies and schemes by enhancing the range, innovation and quality of the options that are generated to be input to the forecasting and appraisal procedures. Core Task 3 establishes an effective set of core indicators that are able to encapsulate the concerns of various stakeholder groups, to be transparent and measurable, and to take due account of links with forecasting and appraisal. Core Task 4 aims to develop novel solutions to problems where effective outcomes depend on the cooperation of multiple actors. Core Task 5 seeks to develop improved methods for dealing with different funding strategies that could affect scheme design and successful implementation, and to suggest how phasing of implementation should be handled at the planning stage.

Plus Project 1 enhances existing predictive transport and land use models so that they can be used more effectively and intensively by local authorities and other stakeholders, and includes the development of an optimisation technique for strategy generation. Plus Project 2 explores the enhancement of appraisal

techniques concentrating on three areas: (1) the investigation of the role of value of time and incorporation of quality of life indicators; (ii) the development of methodologies for appraising small schemes and 'soft' measures; and (iii) development of methods for the assessment of distributional effects. Plus Project 3 aims to refine and develop tools and techniques for stakeholder and community engagement to assist in the generation, planning, and implementation of sustainable transport policies. Plus Project 4 seeks to improve the effectiveness of post-implementation project operation, to meet the expectations and needs of stakeholders and users, by improving and enhancing the planning processes at an appropriate early stage to take account of operational issues.

Final Report Summary (available on EPSRC's website):

This four-year research programme represents a major collaborative effort between four academic institutions and a research establishment, collectively providing a wide range of disciplinary skills and practical experience, the content of which reflects the priorities of our local authority partners. The research has developed improved tools and techniques to assist in the planning, design and implementation of sustainable transport and land use strategies and schemes, and has tested them by working with local authorities in a series of case studies.

The programme is divided into seven inter-related research projects, each of which meets one of the sub-objectives listed above. Project A provided the central integrative feature of the programme; by reviewing documentation and interviewing key staff, it produced a conceptual map of the problems and issues affecting the delivery of integrated and sustainable transport/land use solutions in a range of local authority administrative settings; it also coordinated the feedback on outputs from the other research projects, to ensure that they meet local needs. Project B sought to improve the quality of transport/land use strategies and schemes by enhancing the range, innovation and quality of the options that are generated to be input to the forecasting and appraisal procedures. Project C provided guidance on the development of an effective set of core indicators that are able to encapsulate the concerns of various stakeholder groups, to be transparent and measurable, and to take due account of links with forecasting and appraisal. Project D developed novel solutions to problems where effective outcomes depend on the cooperation of multiple actors. Project E developed improved methods for dealing with different funding strategies that could affect scheme design and successful implementation. Project F enhanced existing predictive transport and land use models so that they can be used more effectively and intensively by local authorities and other stakeholders, and included the development of an optimisation technique for strategy generation. Project G pursued the enhancement of appraisal techniques concentrating on the development of methodologies for appraising small schemes and 'soft' measures, the development of methods for the assessment of distributional effects, and guidance on good practice in appraisal.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
KonSULT Tool	A knowledge base which provides assessment of the potential contribution of 40 transport and land use policy instruments. Users identify their objectives and performance indicators (including weightings) and the options generator then uses the assessment scores for each instrument in the knowledge base to identify those which are likely to contribute most.	Taken from The Issues Project's (2006) Transport research outputs from the SUE Programme.
Strategic Transport Model	A multimodal transport model used to address a range of public transport related policies under different land use planning scenarios.	As above
Funding Toolkit	Provides overview of potentially available funding sources for a variety of schemes and projects, including the potential benefits and disadvantages of using a source.	As above

FUTURES	**Full project title:** Future Urban Technologies: Undertaking Research to Enhance Sustainability
SUE 1, Transport Cluster	www..sue-futures.org
PI: Michael McDonald, University of Southampton	**CIs:** Gordon Andrews, W Hall, Graham Parkhurst, Margaret Carol Bell, Nick Hounsell, Jackie Rafferty, Kiron Chatterjee, Glenn Lyons

Project Summary (from call announcement available on EPSRC's website):

The information age and technological advances are presenting substantial opportunities (and threats) concerning the sign of our transport services, management of our transport systems, design and operation of vehicle fleets and the way which people gain access and participate in society. FUTURES is a 5-year research programme which is part of EPSRC's Sustainable Urban Environment Programme. It is concerned with research into the role of new technologies in progressing towards a state of sustainable urban mobility. The research programme focuses on people, systems and vehicles - believed to be the key elements which, in combination, result in the levels and patterns of urban mobility and the associated economic, social and environmental impacts. FUTURES involves academic expertise drawn from seven research groupings in three universities and which spans engineering, new technology, environmental science and social science. The consortium benefits also from the substantial involvement of a number of leading stakeholder partners drawn from central and local government, transport operators, service providers and other industry players. Through a coordinated programme of research, the intention is to progress in a number of priority areas (identified by stakeholders) from first developing new fundamental understandings to exploring options and opportunities and in turn to trials and demonstrations.

Final Report Summary (available on EPSRC's website):

The information age and technological advances are presenting substantial opportunities (and threats) concerning the design of our transport services, management of our transport systems, design and operation of vehicle fleets and the way in which people gain access and participate in society. The FUTURES programme has been concerned with research into the role of new technologies in progressing towards more sustainable urban mobility.

As traffic is more aggressively managed in urban areas the travel environment will be more constrained. More sustainable and efficient modes and services will receive an increased level of priority on the transport network to the detriment of other users. Conventional private car use will begin to lose some of the perceived advantages it enjoys over other modes in terms of journey times, access and parking. In this future, people will increasingly seek to mitigate the impact of traffic management upon their travel behaviour. Opportunities for mitigation will need to be generated by enabling better informed travel choices and smarter travel choices. New and emerging transport and transport-related technologies will perform an important supporting role in delivering a sustainable urban travel environment. Both the

operation of travel demand management strategies and the facilitation of better informed and smarter travel choices are underpinned by a reliance upon transport (and transport-related) technologies.

Three sets of 'actors' prevail in most if not all aspects of new technology and its application to transport issues in the urban environment - people, systems and vehicles. People ultimately dictate the effectiveness of many technology-based measures and determine whether or not urban mobility is sustainable. Systems represent the design and operation of infrastructure and services which are intended to connect people to places in ways which are efficient and which minimise adverse economic, social and environmental impacts on the urban environment, its inhabitants and visitors. Vehicles are commonly the means by which people using the transport system travel from A to B. New technology can influence the design, performance and use of vehicles in ways that can support people's mobility and the development and operation of new transport systems.

The FUTURES consortium, by bringing together expertise and extensive experience concerning people, systems and vehicles has enabled new and fundamental understandings to be developed in relation to how these three key actors interact within the urban environment and the implications of that interaction for sustainability. The research programme has sought to address the needs of key urban transport stakeholders and this has been reflected in the active participation of a wide range of industry stakeholders in the design, practice and communication of FUTURES research.

The FUTURES research programme has considered a diverse range of transport-related technologies. It has developed fundamental understandings of how such technologies can contribute to a more sustainable urban environment, particularly through advanced Urban Traffic Management and support for individual travellers. FUTURES research has shown how transport (and transport-related) technologies might be used to enable people to make better informed and smarter travel choices. By supporting people's travel choices FUTURES research also enables people to mitigate the impacts of travel demand management policies necessary for sustainability on their access to opportunities and quality of life.

The results of the research have been used to advise policymakers and those responsible for transport delivery, enhance the base of research knowledge, contribute to teaching, and inform the population more widely.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Wayfinding Support	To develop and test one or more wayfinding services in two case study cities (Bristol and Manchester).	The results of the research will be used to advise policymakers and those responsible for transport delivery, enhance the base of research knowledge, contribute to teaching, and inform the population more widely. See http://trg1.civil.soton.ac.uk/futures/pa2a_info_02.pdf

	Full project title: Innovation in Design, Construction and Operation of Building for People
SUE 1, Urban and Built Environment cluster	http://www.idcop.soton.ac.uk/
PI: 'Bakr Bahaj, University of Southampton	**CIs:** Derek Clements-Croome, David Gann, Keith Jones

Project Summary (from call announcement available on EPSRC's website):

This proposal addresses some of the challenges related to the built environment. Its aims are to develop innovative solutions with respect to the maintenance and refurbishment of existing buildings. The longer term outcome is to achieve an urban environment which addresses the changing needs of society and improves the quality of life for UK citizens. The research themes developed within this programme will deliver processes and technological solutions which can be characterised as: reducing adverse affects of buildings on the environment (waste, C02 emissions, pollution and energy); are socially acceptable to the occupiers; and are economically viable for the owners of the buildings. The outcomes from the associated research programme will provide the fundamental understanding to enable demonstrable improvements to be made to the sustainability of the built environment in the short to medium term.

Final Report Summary (available on EPSRC's website):

To deliver buildings which meet the needs of users, it is crucial to establish a two way connection between the users and the managers of spaces. If people do not understand how buildings are supposed to be used then the performance will always be compromised. At present, buildings are often managed on a day to day basis, considering the performance of individual elements (roof, wall, window etc) rather than looking at a more holistic, whole life performance. People represent the 'best sensors' of a building but are generally the most underused resource. At present, building managers generally only respond (hopefully reacting in a positive manner) to fault complaints, they get a far from complete picture of the wellbeing of users. IDCOP has looked at a variety of approaches to connect building users to the building managers. This has encompassed simple web based feedback forms to personalisation schemes where users have profiles and are able to for example, dynamically vote to change the climate in their space.

IDCOP has developed a greater understanding of the factors that influence the consumption of resources over the building life cycle. It had developed a range of explanatory and predictive models which building owners/managers can use to assess the impact of the building envelope on the whole life performance of building. A range of innovative products and processes were assessed in terms of their impact in reducing

resource consumption and improving occupier wellbeing over the whole life of a building. None of the emerging fade technologies appears near to providing a 'magic bullet' and low-e glazing combined with well designed shading and ventilation schemes remain essential. Implementation strategies which deliver real impact were developed which consider whole life building performance and value not just physical condition of a building but social, environmental and economic factors in balance.

Tools and Techniques Produced:

Tool/technique	Used for	Further information	Access
B-Space	Building Specific Pre-refurbishment Assessment of Comfort and Energy is an energy demand assessment tool for multi-storey office buildings that takes into account occupier comfort.	Taken from The Issues Project's (2006) Buildings & Energy research outputs from the SUE Programme.	Web address given for tool, http://www.idcop.soton.ac.uk/index.2.html, no longer accessible. Contact A.S.Bahaj@soton.ac.uk
IDCOP Toolkit	A suite of building performance rating and decision-making tools aimed at building professionals including: a façade rating system; key performance indicators and a knowledge base for the study of building facades; a decision-making model using an Analytic Hierarchy Process approach; and a Multi-Criteria Decision-making tool for sustainable maintenance in social housing.	As above	
Test Facility for Integrated HOEs	Facility for testing integrated Light Directing Holographic Optical Elements (HOE) at Southampton University. Monitoring of the performance of HOEs is ongoing.	As above	As above

InSITU *Inclusive and Sustainable infrastructure for Tourism and Urban Regeneration*	**Full project title:** Inclusive and Sustainable Infrastructure for Tourism and Urban Regeneration
SUE Plus Project	www.insitu.org.uk
PI: Steve Shaw, London Metropolitan University	**CIs:** Graeme Evans, John Forrester, Peter Schofield

Project Summary (from call announcement available on EPSRC's website):

InSITU will develop and test tools to facilitate more inclusive and sustainable infrastructure for transport and the 'public realm' of streets and other public spaces, where leisure & tourism is being nurtured as a catalyst for regional regeneration. The scoping study will be carried out to support practitioners working to address the problems of urban areas that are economically disadvantaged but rich in built heritage. An innovative technique using Geographic Information Systems for Participation (GIS-P) will be piloted, allowing regional and local stakeholders to visualise options and influence design solutions through to implementation. The tool will inform the planning process, so that benefits to local residents, workers and small businesses can be maximised. Thus, it will enable the technical expertise of infrastructure planners and providers to be combined with the knowledge and perspectives of local users, especially 'hard to reach' groups who are often excluded from 'public' consultation on significant changes to their local environment.

Final Report Summary (available on EPSRC's website):

InSITU was conducted as a scoping study to support those who are working to improve public spaces and walking routes with the active participation of local communities, especially in areas of economic and social deprivation. The cross-disciplinary research team developed and tested new approaches and tools to widen user participation and inform design solutions, in areas where leisure and tourism is being nurtured as a catalyst for regeneration. Through innovative application of Geographic Information Systems for Participation (GIS-P), 'lay' participants with in-depth local knowledge have contributed to the physical design of schemes on an equal footing, with each other, and with the practitioners who can deliver significant improvements to public realm infrastructure.

A key aim of InSITU was to allow all participants - regardless of their expertise - to frame the issues, problems and suggested solutions in their own terms. In particular, it was designed to encourage involvement by disadvantaged social groups: people who tend not to respond to 'traditional' forms of consultation, such as questionnaires, surveys, exhibitions and public meetings. Working closely with the Project Partners, valuable insights, opinions and preferences were articulated through 'local panels', and represented on high quality digitised maps. This adaptation of GIS-P has allowed the annotated maps produced by local users to be interpreted with clarity and acted upon by key specialists, especially urban designers, planners, engineers, leisure/tourism and heritage attraction mangers/conservationists.

The approaches and tools for community engagement were developed and validated in five 'live-case' schemes, two in the City of York, two in Hackney, East London and one in the City of Salford. These were chosen to represent the different stages of the design process from conceptualisation, through detailed planning/negotiation to user satisfaction after completion, and to enable the emerging approaches and tools to be tested out in a variety of ways and contexts. In several of the live-case schemes, it was appropriate to compare different community viewpoints and 'official' data. In others, GIS-P also allowed the mapping of different kinds of time-specific information, including the ways in which spaces are used at different times of day, as well as place-histories and folk-memories of how spaces used to be used.

Particular emphasis was placed on eliciting valuable local knowledge and insights from so-called 'hard-to-reach' groups, and on developing novel ways of encouraging their participation in urban design, especially improvements to pedestrian environments that would be made safer, more accessible and attractive. The InSITU Project featured a number of methodological advances in GIS-P that were developed by the research team in collaboration with the Project Partners. These included experimental 'on-street ' and 'on-site' participation of local people in mapping public spaces and walking routes, as opposed to the more established approach of facilitating focus group panels. It also included the mapping of interior spaces, and participation of young children as well as young adults. Project outcomes may be viewed at:
http://www.insitu.org.uk/

Tools and Techniques Produced:

Tool/technique	Used for	Further information
New Approaches and Tools to Widen User Participation and Inform Design	Through innovative application of Geographic Information Systems for Participation (GIS-P), lay participants with in-depth local knowledge contributed to the physical design of schemes on an equal footing, with each other, and with the practitioners who could deliver significant improvements to public realm infrastructure.	The approaches and tools for community engagement were developed and validated in five live-case schemes, two in the City of York, two in Hackney, East London and one in the City of Salford. Particular emphasis was placed on eliciting valuable local knowledge and insights from so-called 'hard-to-reach' groups, and on developing novel ways of encouraging their participation in urban design, especially improvements to pedestrian environments that would be made safer, more accessible and attractive. The InSITU Project featured a number of methodological advances in GIS-P that were developed by the research team in collaboration with the Project Partners. These included experimental 'on-street ' and 'on-site' participation of local people in mapping public spaces and walking routes, as opposed to the more established approach of facilitating focus group panels. It also included the mapping of interior spaces, and participation of young children as well as young adults, see http://www.insitu.org.uk/ProjectReports/FacilitatingInclusiveDesignusingGISP.pdf.

	Full project title:
	Implementation Strategies for Sustainable Urban Environment Systems
KT –SUE	http://www.urbansustainabilityexchange.org.uk/index.htm
PI: Paul Jowitt, University of Cambridge	**CIs:** Peter Guthrie, Heather Cruickshank

Project Summary (from call announcement available on EPSRC's website):

The ISSUES Project Team believes the KT-SUE project is a major opportunity to make an important bank of knowledge readily accessible and usable to a variety of end-users who are tackling the implementation of sustainable development. Academic research has a major roll to play in facilitating the evidence-base for such sustainable development activity, and this project will enable the SUE research to reach a targeted and influential audience and achieve an appropriate impact in sustainable development policy making and management.

The ISSUES Project Team have structured their proposal to ensure that policy makers, practitioners and other interested parties will be able to access, learn about and make use of the knowledge that emerges from the 'Sustainable Urban Environment' (SUE) research conducted by the EPSRC SUE consortia. When enacted, the proposal will provide channels between researchers and end-users so that knowledge can flow both ways, and so that future SUE research is informed by the everyday reality that sets the context for end-users.

The key features of this proposal are as follows:

1.   An extremely high-calibre, experienced team with staff from both Heriot Watt and Cambridge Universities. The team spans all domain knowledge relevant to the project, and will bring substantial academic and industrial experience to the work. The project team will be led by Professor Paul Jowitt with support from Professor Peter Guthrie, both of whom have international reputations in the field of sustainable development.

2.	A robust, comprehensive coverage of the area, and an approach based on proven Knowledge Management tools used by leading professional institutions such as the Institution of Civil Engineers, and adapted to provide an exact fit for this project and for the KT-SUE consortia.

3.	A four-stranded methodology which includes:

a.	Assessing the current status and transferability of existing research and knowledge, and assessing the current ability of policy makers and other end-users to seek out and make use of such knowledge.

b.	Making links between researchers and practitioners so as to establish communication channels and 'knowledge communities'. Alongside this, a Knowledge Transfer implementation plan will be developed.

c.	Implementation of the programme of Knowledge Transfer activities, with input from industry and from communication experts as required. This will provide two-way communication between researchers and practitioners, to ensure that knowledge is transferred in both directions for the benefit of each group.

d.	Evaluation and assessment of the KT work carried out. In addition, the potential of different KT methods for use in ongoing EPSRC work will also be evaluated.

4.	The method will include a survey and assessment of existing KT methods as well as investigating and evaluating new and novel KT methods

5.	Strategic and effective use of personnel, so as to gain maximum value from each team member.

6.	This proposal has the support of a number of external consultancies and bodies, as well as the approval of our listed referees.

7.	Our approach will ensure that the value of the research work carried out by the KT-SUE consortia is understood, appreciated and used by practitioners and other end-users.

In addition to the above points this proposal will provide lasting value for related future research funded by EPSRC. It will do this through the evaluation of the effectiveness of different KT methods for use with sustainability related research and practitioners. Findings from this project could then be used as a platform for any subsequent research into the most effective methods of knowledge transfer in this type of field.

	Full project title: Pollutants in the Urban Environment
SUE 1, Metrics, Knowledge Management, and Decision Making	http://www.pureframework.org
PI: Adisa Azapagic, University of Manchester	**CIs:** Mark Broadmeadow, H Evans, Tony Hutchings, Zoran Kapelan, Dragan Savic, Jim Swithenbank, Peter Cleall , Anthony (Tony) Fletcher, Tim Jackson, Giovanni Leonardi, Vida Sharifi, Hywel Thomas, Jack Dowie, Stephen Jefferis, Alan Robins, Nigel Straw

Project Summary (from call announcement available on EPSRC's website):

There is a need to assess the sustainability of urban activities, and for a more holistic approach to the evaluation and management of urban pollution. The current practices are seldom well integrated, and are often media-specific. New initiatives are required to address the linkages between different environmental media, and deal more effectively with diffuse pollution arising from a range of urban activities.

The PUrE research project will consider the 'urban environment' as an integrated system, and will address the environmental, economic and health implications of multiple forms of pollution. The aim of the PUrE project is to develop an integrated assessment framework that will fulfil three critical tasks:

1.   Mapping the flow of pollutants associated with human activities;

2.   Modelling the fate and transport of chemicals in the environment; and

3.   Understanding the impacts of urban pollution on human and ecological health.

The PUrE approach can be envisaged as a decision-support framework which provides a useful suite of models and tools, linked to a variety of GIS enabled datasets, to help end-users (regulators, industry, researchers) to conduct assessments, ranging from simple screening studies, to detailed modelling of different urban scenarios and prediction of possible impacts of urban pollution.

This new framework would provide a more effective means to:

- Examine the effects of diffuse pollution;
- Assess the implications of new policy measures;
- Evaluate the sustainability of changes to products or processes; and
- Understand the behaviour of key pollutants in the urban environment.

Final Project Summary (from call announcement available on EPSRC's website):

There is a need to assess the sustainability of urban activities, and for a more holistic approach to the evaluation and management of urban pollution. The current practices are seldom well integrated, and are often media-specific. New initiatives are required to address the linkages between different environmental media, and deal more effectively with diffuse pollution arising from a range of urban activities.

In an attempt to contribute to this, the PUrE project considered the 'urban environment' as an integrated system and addressed the environmental, economic and health implications of multiple forms of pollution. The aim of the PUrE project was to develop an integrated assessment framework that can fulfil three critical tasks:

1. Mapping the flow of pollutants associated with human activities;

2. Modelling the fate and transport of chemicals in the environment; and

3. Understanding the impacts of urban pollution on human and ecological health.

The PUrE approach can be envisaged as a decision-support framework which provides a useful suite of models and tools, linked to a GIS enabled environment, to help end-users (regulators, industry, researchers) to conduct assessments, ranging from simple screening studies, to detailed modelling of different urban scenarios and prediction of possible impacts of urban pollution.

The PUrE decision-support framework developed within the project provides a more effective means to:

- Examine the effects of pollution;
- Assess the implications of policy measures;
- Evaluate the sustainability of changes to products or processes; and
- Understand the behaviour of key pollutants in the urban environment.

The decision-support framework is accompanied by a software platform which includes a range of tools, including geographical information system, life cycle assessment, substance flow analysis, pollutant fate and transport modelling, health and ecological impact assessment and multi-criteria decision analysis. The platform is available at www.pureframework.org.uk

Tools and Techniques Produced:

Tool/technique	Used for	Further information
PUrE Software	An integrated decision-support framework to enable more sustainable management of urban pollution. The decision-support framework comprises a suite of appropriate models and tools for conducting either simple screening studies and/or detailed modelling and assessments of urban pollution.	The main outputs from the project are a decision-support framework, the supporting software platform and user-guidance documents.
PUrE Software Guide		As above
Vegetation Pollutants Capture Model	To predict how vegetation captures pollutants, backed by a dataset of ecotoxological hazards, establishes the benefits of projects for air quality.	Taken from The Issues Project's (2006) Contaminated Land & Pollution research outputs from the SUE Programme.
Life Cycle Impacts and Flows Model	For analysing and assessing the life cycle impacts and flow chains of pollutants.	Taken from The Issues Project's (2006) Contaminated Land & Pollution research outputs from the SUE Programme.

	Full project title:
	Pollutants in the Urban Environment: An Integrated Framework for Improving Sustainability of the Indoor Environment (PURE INTRAWISE)
SUE 2 Cluster	http://www.pureintrawise.org/
PI: Adisa Azapagic, University of Manchester	**CIs:** Mark Barett, Vida Sharifi, Paul Wilkinson, Michael Davies, Jim Swithenbank, Tadj Oreszczyn, Paul Thomas

Project Summary (from call announcement available on EPSRC's website):

We spend some 90% of our time inside buildings where we control the quality of the environment for health, thermal comfort, security and productivity. The quality of the indoor environment is affected by many factors, including design of buildings, ventilation, thermal insulation and energy provision and use. Maintaining the quality of the environment in buildings can have considerable consequences on both local and global environment and on human health.

In recent years, the air-tightness of buildings has become an issue, as part of a drive to provide thermal comfort and reduce energy consumption. However, as dwellings are made more airtight, internal pollution sources can have a greater impact on the indoor air quality and occupants may experience adverse health effects unless ventilation is effective. On the other hand, ventilation can lead to ingress of outdoor air pollution; it also reduces energy efficiency of buildings, accounting for 25-30% of the total building energy use. Conversely, efforts aimed at the improvement of energy efficiency through better thermal insulation may affect adversely indoor air quality, e.g. through reduced ventilation and increased moisture content. The latter is the main cause of mould, the exposure to which is being increasingly linked to respiratory and other health problems. Further, burning fuels in micro-generation domestic appliances such as gas boilers and cookers can potentially be hazardous to the health of those in the dwelling or further afield. However, switching to other sources of energy such as biomass, photovoltaics, fuel cells etc., while reducing the impact on the indoor environment can, on a life cycle basis, cause environmental and health impacts elsewhere. Nevertheless, several Government reports have highlighted the importance of household micro-generation options as well as energy efficiency, given the imperatives for reducing greenhouse gas emissions and widespread fuel poverty. The latter has been linked to Britain's large burden of cold-/winter-related deaths, which often exceed 30,000 per year.

Poor indoor environmental quality in residential buildings, offices and schools has been related to increases in sick building syndrome symptoms, respiratory illnesses, sick leave and losses in productivity. Health effects can be immediate (e.g. irritation of the eyes, nose, and throat, headaches, dizziness and fatigue) or can occur over a longer period of exposure to indoor pollutants (e.g. respiratory diseases, heart disease and cancer). A growing body of scientific evidence indicates that the air within homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialised cities. Given that most people spend approximately 90% of their time indoors, their exposure to air pollutants is determined primarily by exposure indoors, particularly in their home.

In order to contribute towards achieving a better quality of the indoor environment, this project proposes to study the environmental and health effects related to the generation, conservation and use of energy in buildings, with a particular focus on residential buildings. The main outputs from the project will be an integrated decision-support methodology and software tool for more sustainable management of indoor pollution. The framework will be applied to a number of case studies that will compare environmental, health and economic implications of the principal options for future home energy provision as an aid to policy development. Using a life cycle approach, the project will examine a range of sustainability issues, including environmental impacts (e.g. resource depletion, global warming, acidification, eco-toxicity etc.) and social issues (e.g. human health, comfort and well-being). The economic implications of different options will also be examined.

	Full project title:
	Regional Visions of Integrated Sustainable Infrastructure Optimised for Neighbourhoods
SUE 2 Cluster	
	http://www.regionalvisions.ac.uk/ReVISIONS/Home.aspx
PI: Marciel Echenique, University of Cambridge	**CIs:** John Barton, Soon-Thiam Khu, Adrian McDonald, Phillip Rees, David Butler, Michael Kitson, Gordon Mitchell, Koen Steemers, David Kay, Matthew Leach, John Nelson, Neil Thorpe

Project Summary (from call announcement available on EPSRC's website):

This research proposal by the ReVISIONS consortium aims to provide the knowledge for public agencies and companies to plan regional infrastructure for transport, water, waste, and energy, (ranging from large capital schemes to small scale decentralised services), in a more coordinated and integrated way so as to maximise economic competitiveness, reduce environmental and resource impacts, and allow households to live more sustainably with an enhanced quality of life. This research will explore the inter-relationships between infrastructure policies and measures at the regional and local scales and explore the tensions and interactions that exist across these scales, and between sectors.

The research builds on the expertise, data, models, and tools of the EPSRC sustainable urban environments projects of SOLUTIONS, (land use and transport), WaND, (water), and SUE-Waste, with additional expertise on energy generation and supply, and building energy demand. The research will aim to develop a holistic and practical integrated framework for the analysis and assessment of the sustainability of regional spatial development. It will devise and test alternative regional spatial strategies integrated across infrastructure sectors and spatial scales to investigate to what extent infrastructure selection, investment, regulation, and pricing can help to achieve more sustainable ways of living. At the regional scale these options will range from focussing new development on the core city of the region, to allocating most of the new dwellings within planned new developments dispersed throughout the region.

Regional policies affect the location of development and the density of housing and hence the demand for transport, energy, water and waste services, which has major implications for infrastructure provision. Whilst regional policies can enhance the sustainability of the allocation of land and movement of resources at the regional scale, they also risk constraining sustainable development through limiting opportunities for sustainable action at the local scale. Local solutions clearly have implications at the regional level (via aggregate demand for travel and resources, and waste flows), and have an important role in making efficient

use of existing infrastructure capacity and obviating the need for potentially unsustainable capital works. These local sustainability improvements will be re-aggregated to estimate the impacts at the regional level for each of these integrated regional options.

The research will be based on case studies of the Greater South East regions, (London, East and South East of England), and contrasted with a case study of a lower growth more polycentric region, such as the North East of England. The research will be carried out in parallel with similar case studies of city regions in other parts of the world to compare and contrast regions of similar size to the Greater South East but at different stages of development. These cases studies will include Beijing, Sao Paulo, and possibly Los Angeles.

Each option will be assessed across a wide range of criteria encompassing environmental impacts, use of resources, economy, social inclusion, health, and other quality of life factors. The options will be compared within a multi-criteria assessment framework in full consultation with end users and stakeholders. This will identify the most robust options that perform well for different value judgements and different future scenarios.

The research will deliver generic normative guidance and decision support tools for use by central and regional government departments and agencies, regional assemblies, utility companies, developers, planners and designers.

	Full project title: Sustainability of Land Use & Transport in Outer neighbourhoods
SUE 1, Transport Cluster	www.suburbansolutions.ac.uk
PI: Marciel Echenique , University of Cambridge	**CIs:** Hugh Barton, Stephen Marshall, Neil Thorpe, Gordon Mitchell, G Vigor, John Nelson

Project Summary (from call announcement available on EPSRC's website):

The overarching research questions that SOLUTIONS intends to answer are how far, and by what means, can towns and cities be planned so they are socially inclusive, economically efficient and environmentally sustainable. The method for answering these questions consists in a series of in-depth, integrated case studies in cities that represent different urban scales and characteristics, undertaken in partnership with the local planning authorities. The research examines the interaction between strategic (whole city) and local (neighbourhood) levels with close attention to transport and urban design issues. The method will apply and test theoretical options to ascertain if there are findings that are transferable between different localities in each case study and between case studies, and how size and characteristics of the city influence the results.

The alternative designs of land use dispositions and transport configurations will be combined to form distinct archetypes of development at strategic and local scales. Each of the alternatives will be analysed in case studies through a combination of quantitative and qualitative procedures to estimate, through time, the likely outcome in terms of people's opportunities and behaviour. The resulting forecast will be assessed in terms of sustainability criteria that encompass the impacts in the economic efficiency of the area studied, its social equity implications, and environmental sustainability. The outcomes of the assessment would be discussed with local and national stakeholders to ascertain the feasibility of implementation of the alternatives as well as their acceptability.

The final products of the research will be individual case study reports and the production of a generic, innovative, practical guide for the development of outer cities to achieve sustainable urban environments.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Computer Models	Sophisticated computer modelling of land use and transport interaction.	Computer models developed to test the sustainability of options by a detailed simulation of where people will live and how they will travel.
Assessment Framework	Assess the sustainability of these options against environmental, social and economic indicators using inputs from a range of stakeholders.	Criteria list comprehensive enough to cover the main factors that affect the sustainability of the options whilst minimising double-counting of the impacts of the options. These criteria are compared and traded off within an assessment framework using analytical hierarchy method(?).

	Full project title:
SUBR:IM — SUSTAINABLE URBAN BROWNFIELD REGENERATION: INTEGRATED MANAGEMENT	Urban Sustainability for the Twenty-Four Hour City: Development of Design Decision-making Tools & Resources
SUE 1, Waste, Water and Land Management Cluster	www.subrim.org.uk
PI: David Lerner, University of Sheffield	**CIs:** Abir Al-Tabbaa, Joe Doak, John Henneberry, Mike Johns, Mike Raco, Sophie Bowlby, Stephen Garvin, Tony Hutchings, Andy Moffat, C Smith, Tim Dixon, Peter Guthrie, Stephen Jefferis, Sabeha Ouki, Walter Wehrmeyer

Project Summary (from call announcement available on EPSRC's website):

At the heart of the project is a portfolio of brownfield sites in two regions, Manchester and the Thames Gateway. Both regions include some of the most deprived communities in the UK, are important from a national perspective, and have substantial brownfield problems. By focusing the core research around a common portfolio, we will automatically keep the work integrated and interdisciplinary. The portfolio, which contains a range of 'hard' and 'soft' end uses, also encourages us to work on the problems actually facing developers, local authorities and other stakeholders, rather than specialist problems which have engineering excitement, but possibly little interest to end-users. Scientists and social scientists will therefore be working on a common set of case studies at the core. As well as having a portfolio and project management work-package, the core work packages will research a range of aspects of brownfield management, from understanding how to measure sustainability, through analysis of decision-making, to developing robust technical solutions to land remediation. Allied to this core is a range of 'plus' projects which extend the research into waste issues, surface water, and alternative remediation techniques.

Final Report Summary (available on EPSRC's website):

In July 2003, the SUBR:IM consortium began its research into brownfield regeneration in the aftermath of the Government's Sustainable Communities Plan. With SUBR:IM's completion in 2007, brownfield regeneration has even greater national importance. However, we found the re-use of brownfields will fall short of Government's sustainability objectives. For instance, it cannot be sustainable unless it meets the aspirations of communities and is technically sound against trends such as climate change.

Better governance structures, policies and regulation are required to deal with the issues of brownfield regeneration. A plethora of public agencies has evolved, each with its own policies and resources, creating

confusion and hindering development. However, local government often plays an important role in successful schemes by setting out a vision, assembling sites and cultivating developer confidence.

Investors can influence negotiations and agreements through their position as eventual long term owners. A select but growing group of investors and developers is pursuing brownfield projects as the potentially high returns become more evident. Private developers still see contamination as a challenge, but consider infrastructure constraints, density and governance issues to be more important obstacles to development. Often the practical reality does not match the rhetoric of sustainability for this group.

There is little evidence that public participation has any significant impact on the practices of brownfield development. Participation is sometimes invited to provide guidance on modifying rather than fundamentally changing established programmes. While some local authorities operate open and democratic processes, others remain suspicious of incorporating lay communities in what is viewed as mainly a technical exercise. Rather than regeneration acting as a catalyst for participation, participation sometimes led to increasing feelings of alienation in communities living in regeneration areas.

We experimentally researched one problem contaminant (acid tars), three remediation techniques (S/S, compost and charcoal), and one outcome (greening), as well as researching sustainability assessments of remediation and climate change issues. Our work has made a significant contribution in all of these areas, and led to further basic and applied research.

Remediation costs are not usually a critical issue for typical brownfield development, e.g. for housing and other high value land-uses, remediation of contaminated land might only be 5% of the site value. However, particular pollutants such as acid tars have high costs associated, and our work has significantly advanced the understanding of these materials and how to handle them. In cases where widespread low-level contamination is present, or low financial value end-uses are planned, techniques such as compost addition, charcoal admixture and greening have great potential, enhanced by the new knowledge generated in SUBR:IM.

SUBR:IM has made major contributions to the capability and capacity of the UK research base. The team of 25 investigators and 30 researchers have had their knowledge and skills increased through multidisciplinary working on a range of world-class projects. Taking the SUBR:IM messages out to end users was important. As well as our main website and acidtarlagoons.co.uk, 3 public conferences, 3 annual newsletters and a roadshow of 27 presentations, we published a book (Blackwells), 12 bulletins (CL:AIRE), 29 magazine articles and gave 52 conference presentations to complement the 31 journal papers.

Other knowledge transfer activities have included patents, a spin-out company, and closer working relationships with a range of external bodies. These include: local politicians, officers and practitioners related to a contaminated site; new research projects URSULA, BioChar and SMiRT; and creation of the Shanghai-Sheffield Geo-environmental Centre.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
The SUBR:IM Book	Assesses the effectiveness of different types of regeneration policy by identifying best practice.	Published in October 2007, Sustainable Brownfield Regeneration: Liveable Places from Problem Spaces, presents many of SUBR:IM's key findings. See http://www.subrim.org.uk/SUBRIMBookFlyer.pdf
CL:AIRE End User Guides	Nine end user guides centred around SUBR:IM research covering key issues including sustainability measurements, design for deconstruction, communicating risk and community engagement	Produced by CL:AIRE (Contaminated Land: Application in Real Environments - an independent, not for profit organisation), see http://www.claire.co.uk/index.php?option=com_content&task=view&id=51&Itemid=50

	Full project title: Metrics, Models and Toolkits for Whole Life Sustainable Urban Development
SUE 1, Metrics, Knowledge Management, and Decision Making	http://www.sue-mot.org.uk
PI: Malcolm Horner, University of Dundee	**CIs:** Jan Bebbington, Andrew Price, Abigail Bristow, Peter Taylor, Cliff Hardcastle Herb Castillo

Project Summary (from call announcement available on EPSRC's website):

Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Groups of homes, factories shops and offices, and the transport, supply and disposal systems that serve them are major contributors to the lack of sustainability from which today's world suffers. One of the problems is that currently we have no way of measuring sustainability because it's such a complex concept, involving economic, environmental and social issues. But if we can't measure sustainability, how can we tell how sustainable an urban development is, or whether one design is better than another? How do we compare the aesthetic damage caused by poor architecture or insensitive transport routes with the lower costs that are often associated with them? How do we compare the social benefits of a more expensive housing scheme that provides an environment which leads to increased employment opportunities with a cheaper one that does not? A comprehensive literature survey has shown that although there are 700 tools which purport to assess at least one aspect of sustainability, none is capable of assessing all three aspects at the same time.

This research will find a way of assessing simultaneously the economic, environmental and social issues which contribute to the sustainability of urban developments. At its heart lies the development of an Integrated Sustainability Assessment Toolkit (ISAT) which will allow key decision-makers to identify, prioritise and express in a common measure all the relevant issues for all the stakeholders in any given situation. It will identify those tools which are relevant to the decision-maker's needs, and where there are gaps, develop new ones. The outputs from the different tools will pass through a conversion unit which will allow us to combine the outputs into a single, common measure. The ISAT will be capable of working at any level of detail, from components of buildings through to complete urban developments, and throughout the whole life cycle from inception to eventual demolition or re-use.

The project is divided into 13 work packages. The five core packages are:

1. developing the ISAT;

2. capturing and quantifying stakeholder values;

3. urban development sustainability accounting;

4. assessment for environmentally equitable urban developments; and

5. assessing the effect of urban developments on social capital.

The eight "plus" packages are:

1. knowledge in an assessment context;

2. investigation of the barriers and incentives to sustainability assessment;

3. the quest for a common measure;

4. measuring and reporting a project's contribution to an organisation's sustainability performance;

5. developing predictive tools to measure the impact of urban developments on crime and perceptions of security;

6. integration of risk management into the ISAT framework;

7. communication and training; and

8. ISAT demonstration.

It brings together a team of four academic and four industrially-based research organisations providing the necessary broad range of expertise. It is supported by 16 collaborating industrial organisations and will take 36 man years of effort spread over four years.

Final Project Summary (from call announcement available on EPSRC's website):

Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Groups of homes, factories shops and offices, and the transport, supply and disposal systems that serve them are major contributors to the lack of sustainability from which today's world suffers. One of the problems is that currently we have no way of measuring sustainability because it's such a complex concept, involving economic, environmental and social issues. But if we can't measure sustainability, how can we tell how sustainable an urban development is, or whether one design is better than another? How do we compare the aesthetic damage caused by poor architecture or insensitive transport routes with the lower costs that are often associated with them? How do we compare the social benefits of a more expensive housing scheme that provides an environment which

leads to increased employment opportunities with a cheaper one that does not? A comprehensive literature survey has shown that although there are 700 tools which purport to assess at least one aspect of sustainability, none is capable of assessing all three aspects at the same time.

This research developed a way of assessing simultaneously the economic, environmental and social issues which contribute to the sustainability of urban developments. At its heart lies a prototype Integrated Sustainability Assessment Toolkit (ISAT) which allows key decision-makers to identify, prioritise and express all the relevant issues for all the stakeholders in any given situation. It identifies those tools which are relevant to the decision-maker's needs and passes the output from the relevant tools through an aggregation module that presents the sustainability profile of the scheme under consideration. The ISAT is capable of working at any level of detail, from components of buildings through to complete urban developments, and throughout the whole life cycle from inception to eventual demolition or re-use. It incorporates a knowledge management system which allows the lessons learned on one project to be passed to the next.

The collaborating team from Dundee, Glasgow Caledonian, Loughborough and St Andrews Universities also:

- developed a tool for combining the social, economic and environmental impacts of an urban development (Full Cost Accounting);
- critically analysed potential "common currencies", developed extended exergy and energy analyses, but concluded that a reductionist approach was inappropriate;
- developed a framework for assessing environmental equity;
- identified the constructs of social capital;
- explored the barriers and potential incentives for sustainability assessment.
- The team has also designed and delivered two international conferences on sustainability assessment. Initial planning has started for a third conference in Turin.
- The team is still convinced that the following work packages, which were mooted in the original application but which were not funded, remain worthy of financial support.
- Measuring and reporting a project's contribution to an organisation's sustainability performance;
- Developing predictive tools to measure the impact of urban developments on crime and perceptions of security;
- Integration of risk management into the ISAT framework;
- communication and training; and
- ISAT demonstration.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Generic, Integrated Assessment Framework	Brings together the current sustainability assessment metrics, models and tools as well as the new tools developed by SUE-MoT, creating a coherent, comprehensive, flexible, transparent and stakeholder-value centred platform to assess the economic, social and environmental dimensions of different contexts of the urban environment.	Signalled at beginning of Consortium as under development, see Work Package description.
Capture of Stakeholder Values	Methods for identifying and capturing urban stakeholders' values in a way that can be integrated into the Integrated Sustainability Assessment Tool (ISAT) processes.	As above
Costs and benefits estimator	To estimate the sustainability costs and benefits of competing alternatives on a similar basis and to select sustainable, cost-effective and context-specific solutions over the whole life cycle of an urban development.	As above
Environmental equity model	A model for the prediction and assessment of environmental equity in urban developments.	Taken from The Issues Project's (2006) Urban Planning and Design research outputs from the SUE Programme.
Social capital model	A model for the prediction and assessment of social capital in urban developments.	As above
Knowledge portal	To act as a bank of information and knowledge on the outcomes and issues of previous assessments which users of the Integrated Sustainability Assessment Tool (ISAT) can interrogate before and during their own assessments.	Signalled at beginning of Consortium as under development, see Work Package description.
Common unit of measurement	To provide algorithms, mathematical models and rules to convert the various dimensions of sustainability issues into a selected common unit.	As above

	Full project title:
	Integrated Decision Support System for Sustainable Urban Regeneration
SUE 2 Cluster	http://www.suregen.co.uk/
PI: Steve Curwell, University of Salford	**CIs:** Sam Allwinkle, Mark Deaking, Phillip James, Richard Knowles, Simon Marvin, Joe Ravetz, Joseph Handibry, Mbatu Tah, Yusuf Arayici, Andy Hamilton, M Kagioglou, John Littlewood, Marcus Ormerod, Martin Sexton, Chris Collier, Malcolm Horner, Richard Kingston, Amanda, Marshall-Ponting, James Powell, Magda Sibley

Project Summary (from call announcement available on EPSRC's website):

The overall aim of the SURegen consortium is to undertake research to develop a prototype Regeneration Simulator Workbench (RSW) that meets the decision-making challenges that Sustainable Urban Regeneration (SUR) poses, i.e., multiple stakeholder interests, complexity, uncertainty and ambiguity. The RSW will provide a major new training vehicle for regeneration professionals aimed at addressing the knowledge and skills gap identified in the Egan Review: Skills for Sustainable Communities (2004) and will be built around the core set of regeneration skills included in RENEW NW's development of the 8point "Egan Wheel".

The RSW is aimed at regeneration professionals and knowledgeable non-experts and will focus on the neighbourhood scale. It will form a multi-perspective collaborative digital workspace providing a learning laboratory and library of good practice for regeneration actors. Past experience shows that 'simulation' of SUR activity requires an open-ended, process-based, learning and gaming-like experience. A conventional technical model system, no matter how sophisticated, is unlikely to deal with the tacit knowledge, complex actor-network relationships, and strategic behaviour or entrepreneurial opportunities. For instance, an effective housing module needs technical information on density, tenure, condition and so on, but it also needs some way of dealing with the perception of different actors on, for example, the effect of gentrification on crime or property values. To address this, the RSW will enable the simulation of the regeneration programme process and help decision-makers recognise the key decision points and guide them towards appropriate evaluations that will support their decision-making. To do this the workbench will contain a number of simulation and evaluation tools and integrate the complex range of data on the sustainable redevelopment of the regeneration area. Use of these tools will enable regeneration actors to collectively simulate a range of outcomes of the longer-term regeneration programme. From this foresight they will gain insights into the impact of selected options that result from the complex interactions of political, social, economic and physical factors that will enable them to make better trade-offs between

options and move towards more satisfying sustainable solutions. They will also be able retrace their steps and explore other options so that they can learn from potential "mistakes".

The project will be led by the University of Salford in collaboration with the Universities of Manchester, Napier, Liverpool, Dundee and West of England. Using an action research methodology the workbench will incorporate the knowledge of good practice in regeneration from the a range of public sector and industrial partners, representing both demand and supply side interests from NW England; including the regional centre of excellence for regeneration skills, RENEW North West, Sustainability Northwest, the Manchester Digital Development Agency, Cities of Manchester and Salford, Urban Vision, Arup Assoc, Wates Construction, ABRA Assoc, MASTLift, Shepherd Robson and Fusion GFX. The project is planned for four years duration. The first two years will focus on knowledge capture and structuring using action research. This will also focus on case studies in New East Manchester and Salford Liverpool Road. The last two years will address testing and validation of the prototype workbench in these case study areas as well as others, with collaborators from other regions of the UK, to validate and develop the workbench to be more generally applicable to all areas of the country.

The WasteConsortium	**Full project title:** Strategies and Technologies for Sustainable Urban Waste Management
SUE 1, Waste, Water and Land Management Cluster	http://www.suewaste.soton.ac.uk/
PI: William Powrie, University of Southampton	**CIs:** Catherine Alexander, Tom Cherrett, Paula Lettieri, Jim Swithenbank, Adisa Azapagic, Tim Jackson, Vida Sharifi, Charles Banks, Matthew Leach, Stefaan Simons

Project Summary (from call announcement available on EPSRC's website):

This proposal brings together a number of leading UK university groups to create an interdisciplinary consortium that will carry out research relevant to the problems of waste resource management in urban environments. Through a combination of scientific, technological and multidisciplinary projects, the consortium will develop an improved understanding of (a) the scientific basis of certain waste treatment and materials/energy recovery technologies and (b) resource and energy flows through and within urban environments. We will engage strongly with the waste management industry in defining research needs and priorities, carrying out projects, and implementing research results, and aim to develop a reputation for high-quality research that will allow us to challenge current policy and influence future policy in urban waste resource management, both nationally and internationally-

Final Report Summary (available on EPSRC's website):

The proposal brought together a number of leading UK university groups to create an interdisciplinary consortium to carry out research relevant to the problems of waste resource management in urban environments. Through a combination of multidisciplinary projects, we have

- developed a framework of models for understanding the social ecology of resource and waste flows, and mapping them through the urban environment;

- demonstrated the high variability in neighbouring households' consumption and waste generation patterns, which is not reflected in national data sets and which proves the need for flexible waste collection services;

- quantified the transport impacts associated with visitor trips to HWRCs, and the potential benefits of selective local bring-site enhancement in terms of reduced householder transport mileage;

- evaluated bulky waste collection and furniture recovery schemes nationally, and used the findings to improve the operational effectiveness and maximise the recovery opportunities of bulky waste collections;

- investigated barriers to wider engagement in recycling schemes for residents in medium and high density households, and produced recommendations for the design and implementation of recycling activities and collection systems;

- demonstrated that segregated waste materials (cardboard, waste wood and textile residue) give a better quality of fuel for incineration than mixed waste or residues of segregation, and are also better for pyrolysis owing to their low ash content;

- shown that unsorted or mixed waste materials are not suitable for pyrolysis owing to the high ash content and low quality of char products;

- shown that gasification technologies are more suitable for large scale applications, where benefits include (i) the production of tar-free fuel gases by thermal cracking of tar in a high temperature environment, and (ii) prevention of ash slagging as a result of non-oxidative gasification reactions;

- developed a new, molten tin based gas desulphurisation system capable of operating at high temperatures (>400 Centigrade), thereby avoiding the need to cool the product gas from the gasification plant prior to cleaning and hence increasing the energy efficiency of the overall process;

- investigated the problems associated with the use of pyrolysis oil for power generation, and shown that its use as the main fuel in small-scale furnaces is not at present technically feasible;

- devised an accurate and reliable method for measurement and analysis of the emissions from home composting, and assessed the potential for environmentally harmful emissions;

- assessed the physical and chemical properties of compost produced through home composting and compared them to standards applied to commercial compost;

- shown that air diffusion rather than bulk convective flow is the main transport mechanism in home composting;

- shown that the per capita generation of organic wastes at the workplace was small, and that even when estate wastes are included, the cost of building and operating an on-site anaerobic digestion plant is unlikely to be justified;

- shown that source segregated food wastes from catering facilities are difficult to digest as a sole substrate due to unstable interactions between high concentrations of ammonia and volatile fatty acids; and identified operating protocols contributing to digester stability.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Local Area Resource Analysis (LARA) Model	To estimate household resource use and waste arisings in small geographical areas,	A top-down model of material and energy flows in households. A highly socio-economically disaggregated model that forms the basis of the AR-Gini, an area-based indicator of resource inequalities.
Energy Footprinting Model	To compare different waste recycling and disposal techniques with respect to their energy use. The model is based on the city of Southampton and takes into account both energy and material flows. A mechanistic model in the form of a flowchart-based spreadsheet for calculation of the overall energy and materials balance for different waste management options. A manual describing the basis of the model, to allow modification and customisation by users elsewhere.	Taken from The Issues Project's (2006) Waste and Water research outputs from the SUE Programme.
Waste Input-Output Model	To estimate upstream wastes that arise as a result of household expenditure.	The model covers 122 business sectors and differentiates between different types of commercial and industrial wastes.
LCA (Life cycle analysis)	To investigate the relative sustainability of alternative approaches to thermal processing of urban wastes, with a particular focus on recovery of value in the form of energy products from smaller-scale plant integrated into the urban environment.	Adopts a cradle-to-grave or life cycle approach, with a primary system boundary set at the point at which a material is designated as waste: from that point, collection, transportation, processing, thermal treatment, and residue management processes are analysed, together with the production of useful energy and/or material products.
Bioprocessing of Organic Urban Wastes Assessment Methodology	Data and methodologies for the rational selection of bioprocessing plant and management options for urban organic wastes.	Designed to supply answers in areas where it is known that data needed for the determination of appropriate scales and/or technologies are currently inadequate.
Auditing Methodology	For auditing commercial and industrial (C&I) wastes, particularly those arising from	To provide a means for gathering reliable quantitative data at the same time as developing an IT-based

	small to medium size enterprises (SMEs);	interface between waste service providers and companies that provides positive information benefits to both user groups;
Household Waste Recycling Centres (HWRC) Visitors Surveys	To make proposals for new methods of providing next-generation services in the context of the requirement for fully integrated sustainable urban waste management.	
Cost-benefit Assessment Methods	To investigate urban waste avoidance network schemes in terms of operation, participants and different views (e.g.. technical, socio-economic, financial) of success;	Analysis of how technical, economic, environmental and social costs and benefits can augment existing standard CBA methods.
Social Survey Techniques: Observation, Semi-structured Interviews and Questionnaires	To identify key factors that determine people's behaviour and performance with respect to re-use, recycling and disposal of domestic waste	Analysis of different domestic waste management strategies (in the context of cultural beliefs and physical restrictions). Recommendations to improve/target waste services that rely on householder participation. Design recommendations for i) retro-fitting existing domestic spaces to allow recycling, ii) waste management facilities in new build / conversions.

	Full project title: The Sustainable Urban Form Consortium
SUE 1, Urban and Built Environment cluster	www..city-form.org
PI: Mike Jenks, Oxford Brookes University	**CIs:** Glen Bramley, Hildebrand Frey, Kevin Lomas, Patrick Devine-Wright, Kevin Gaston, John Mardaljevic, Neil Ferguson, Colin Jones, Katie Williams

Project Summary (from call announcement available on EPSRC's website):

There has been a considerable amount of research that defines and characterises urban form, and which forms may most affect sustainability. It is a complex issue. The physical dimensions of urban form may include its size, shape, land uses, configuration and distribution of open space - a composite of a multitude of characteristics, including the transportation system and urban design features. However, its sustainability depends on more abstract issues - environmental, social and economic. The most recent research is now suggesting that, not one, but a number of urban forms may be sustainable. Yet, much of the debate about the sustainability of urban forms has focused on increasing the density of development, ensuring a mix of uses, containing urban 'sprawl' and achieving social and economic diversity and vitality - characterised as the concept of a 'compact city'. Thus in the UK, reinforced by the Urban White Paper, a dominant paradigm is being implemented in many towns and cities. It is for more compact, high-density and mixed use urban forms, and the belief is that they will be sustainable. However, many of the claims that have been made for such compact forms in terms of sustainability benefits are contested, and few have been rigorously researched. SUFC aims are to take this type of urban form as its starting point, and to test the claims made for it.

In order to make progress, it is necessary to measure and characterise urban form so it can be related to environmental, social and economic sustainability, and to make comparisons between different urban forms. SUFC will concentrate on the physical design of urban form with respect to: physical configuration and layout, including links to the wider urban system; its land uses and functions; the typology and density of built form and presence of open space. The claims made that more compact, high-density and mixed-use urban forms will be environmentally sound, efficient for transport, socially beneficial and economically viable will then be tested.

The core of the research is an integrated programme of research that will investigate 15 case studies across the UK, and will measure, analyse and classify their urban form, and through systematic analysis, test the relationship of these forms to sustainability. While the concentration of the core programme is on the sustainability impacts of urban forms, the six Plus Projects provide in-depth data to support the core, and are also investigating the changes that are needed to achieve sustainability.

The ultimate goal of this research programme is to advance theory on sustainable urban form through systematic evidence-based research, and to provide practical and useful outcomes from it.

The Consortium is a multi centre proposal, and is organised and funded as follows:
Heriot-Watt University (School of the Built Environment) - 290,000; Institute of Energy and Sustainable Development (De Montfort University) - 375,000; Oxford Centre for Sustainable Development (Oxford Brookes University) - 390,000; Sheffield University (Department of Animal and Plant Sciences) - 320,000; Strathclyde University (Department of Civil Engineering) - 275,000; SUFC Management (Oxford Centre for Sustainable Development, OBU) - 120,000

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Urban Form Typologies	The measurement of urban form includes building typologies, digital map footprints and configurations which are mapped on GIS, and analysed using methods including SPSS, Space Syntax, measures of accessibility and Multiple Centrality Assessment	http://www.city-form.org/uk/research_methodology.html
Sustainability Performance Benchmarks		
Urbanising Suburbia	To assess the sustainability of approaches to urbanising suburbia	See http://www.city-form.org/uk/pdfs/urbanising_suburbia.pdf
Sustainable Lifestyles	To analysis the sustainability of lifestyles	see http://www.city-form.org/uk/pdfs/sustainable_lifestyles.pdf
Valuing Open Space	Enables detailed examination of the trade-offs between the different values of open space (environmental quality, social benefits, ecological diversity, cost and added value).	See http://www.city-form.org/uk/pdfs/valuing_open_space.pdf
Energy Consumption Methodology	A new methodology for determining indicators of domestic energy consumption using annual energy consumption data obtained for individual households covering, for instance, number of bedrooms, occupants working from home, and ownership of technology.	Taken from The Issues Project's (2006) Buildings & Energy research outputs from the SUE Programme.

	Full project title: Citizen Science for Sustainability
SUE Plus Project	www.suscit.org.uk
PI: Malcolm Eames, University of Cardiff	**CIs:** Karen Lucas

Project Summary (from call announcement available on EPSRC's website):

The proposed action research and networking activities are designed to build links - to promote engagement, dialogue and collaboration - between EPSRC scientists and engineers, local professionals (such as Local Authority officials, business people, voluntary sector and community workers, officials from the Environment Agency, etc) and most importantly lay citizens, particularly those from marginalized and excluded groups (old people, young people, people with disabilities and from minority ethnic backgrounds, etc).

The overall aim of the research is to provide local communities with a greater say in helping to define future priorities for environmental and sustainability research (on energy, transport, waste, urban infrastructure, land use, etc) so as to ensure that such research more effectively addresses their needs. Previous experience suggests that promoting participation by excluded groups and meaningful dialogue with professionals and scientists presents considerable challenges. This research will therefore develop and test a range of techniques for facilitating participation through an extensive series of workshops with separate panels of lay citizens and local professionals in three case study communities. The research will provide for structured interaction and dialogue between these panels and a group of approximately 30 EPSRC scientists and engineers recruited for the purpose.

Key outcomes from the research will include:
1) Guidance and training for EPSRC and wider science and engineering communities on engaging with excluded communities;
2) An example of a local community-led research agenda for the environment and sustainability based upon the case study research, and an analysis of how this differs from EPSRC's current priorities in this area;
3) A Citizens Science for Sustainability Network which will foster ongoing dialogue and collaboration between these groups.

Final Report Summary (available on EPSRC's website):

We know that it is often disadvantaged members of our society living in poorer neighbourhoods who are exposed to the greatest environmental risks (such as pollution from traffic and industry, vulnerability to flooding), have the worst access to environmental goods and services and who experience the poorest health and quality of life. These communities are also the least likely to be engaged in dialogues about how science and technology can help to address these problems. Citizens Science for Sustainability (SuScit) was a unique attempt to provide local communities with a voice in the future of urban sustainability research. SuScit comprised an innovative programme of action research and networking activities designed to promote engagement and dialogue between EPSRC's research community, professional stakeholders and

sustainability practitioners, and most importantly local citizens: particularly socially and economically excluded citizens, such as older people, single parents, young people, and those from black, Asian and ethnic minority communities. The challenge for SuScit was to design a 'bottom-up', public engagement and foresight process which empowers lay citizens in dialogue with scientists, policy makers and professional stakeholders, and which articulates the environmental and sustainability research needs of marginalised and excluded urban communities. In addressing this challenge we sought to design a participatory process that: i) Recognised the inherently contested nature of sustainability, through providing an open and reflexive framing of the problem, and valuing local knowledge and expertise; ii) Supported lay participants through the use of appropriate facilitation and engagement tools, and by recognising the differing roles and responsibilities of the various participant groups involved; iii) Worked with and through the local community in order to build trust, promote engagement and maximise the value of the project's outcomes to all those who participated. The action research for SuScit was undertaken in the Mildmay area of Islington, between January and August 2008. The project used a range of participatory of tools and techniques, from community walks and participatory video to visioning and storytelling. The innovative 'Community Foresight' process we developed comprised five key phases: i) Engaging local communities and recruiting participants; ii) Exploring narratives and perceptions of urban sustainability; iii) Sharing local knowledge and experience; iv) Visioning sustainable communities; v) Developing a community led agenda for urban sustainability research. Through this process we sought to explore whether it was possible to identify a distinctive community-led agenda for urban sustainability research, and if so what such an agenda might look like. In addition we provided practical advice and support to help researchers and practitioners better engage with local communities. Key outcomes from the research included: 1) A report entitled 'Towards a Community-led Agenda for Urban Sustainability Research' setting out an interdisciplinary community-led research agenda for urban sustainability research and making recommendations for EPSRC and other research funders; 2) A report on 'Community engagement for science and sustainability' providing guidance for EPSRC and wider science and engineering communities on engaging with excluded communities; 3) A DVD documentary and series of short films from the SuScit project; 4) A high profile dissemination event, involving over 50 leading stakeholders, at the Royal Society in May 2009; 5) A SuScit Network, coordinated by Capacity Global, which has fostered ongoing dialogue and collaboration between local communities, researchers and sustainability practitioners; 6) Presentations at four international workshops and conferences; 7) A least three articles currently in preparation for submission to international peer reviewed journals.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
A Review of Tools and Techniques for Community Foresight for Sustainability	To identify, test and develop a range of participatory tools for engaging citizens in foresight activities.	This review addresses the methodological and practical challenges of involving lay citizens, particularly those form marginalised and socially excluded groups, in dialogue with scientists, engineers, local professionals and sustainability practitioners. See http://www.suscit.org.uk/resources/documents/Methodsfinal140706.pdf

	Full project title:
	Sustainable Regeneration - from evidence-based urban futures to implementation
SUE II Cluster	Website: http://www.urban-futures.org/
PI: Chris Rogers, University of Birmingham	**CIs:** Austin Barber, Richard Coles, Nicholas Hewitt, Rob Mackenzie, Duncan Whyatt, John Bryson, Rachel Cooper, Lubo Jankovic, Fayyaz Memon, David Butler, Mark Gaterell, Ian Jefferson, Jon Sadler

Project Summary (from call announcement available on EPSRC's website):

The first phase of the SUE Programme has focused necessarily on the present, assessing current solutions and their application in the near future, thus providing a strong empirical base on which to build. There now exist both the need and a sufficient body of work to extrapolate the findings to establish and test alternative urban futures: to create a variety of scenarios, building on prior and new work, and predicated on different fundamental assumptions and priorities; to assess those scenarios in terms of design, engineering implementation and measurement of performance; to refine them, in terms of mitigation and adaptation measures, incorporating novel solutions; and ultimately to provide alternative solutions with an associated evidence base and strategies for their implementation.

This bid seeks to integrate the outputs of three current SUE consortia (Birmingham Eastside, VivaCity 2020 and WaND) and complementary research on the use of trees to mitigate the effects of atmospheric pollution. The team will work across disciplines to envision and establish alternative futures (using extensive literature on this subject and prior WaND consortium work) and construct scenarios that might flow from each alternative future. The various work packages will then focus on testing specific dimensions of each alternative future vis a vis their design, implementation and performance in the context of case history sites. Each project will engage an expert panel of influential stakeholders who will meet six-monthly to test and help shape new ideas, the chairs of each of the expert panels forming the higher level project steering committee. Panel consultation will be followed by interviews of stakeholders on motivations and the decision-making process, and specific empirical research and modelling. The following high level questions will be addressed via this process:

- How does the ab initio conceptualization of sustainability influence design outcomes (e.g. form, density)? How would outcomes change if urban renewal were predicated on either environmental or social or economic overriding drivers?

- How does development impact on its environs, and vice versa (e.g. is a 'sustainable' site good for the city / region / country and, if so, in what ways?) and is there an optimum development size to yield optimally

sustainable outcomes?

- Push versus pull to achieve sustainable outcomes. Much of what is done is thought good (for individuals, society, the environment), what might be wanted (push). Thus decisions are made and people must decide whether or not to take ownership. Might more sustainable outcomes follow if those who must take ownership dictate what is created (pull)?

Birmingham Eastside will be used both to develop sustainability ideas and to test them on sites at various stages of planning and development (the research team has unparalleled access via its partnerships with key stakeholders involved in Eastside). Lancaster (with Morecambe, population 96k) and Worcester (94k) will be used to test the outcomes at the scale of smaller urban areas (e.g. market towns) but no attempt will be made to build comprehensive databases as at Eastside. Several other UK and international urban areas (including Sao Paulo, Singapore and an urban area in India) will be used to test a sub-set of the project's findings to assess the transferability of the scenarios to a variety of contexts and thus their general applicability.

URSULA	**Full project title:** Urban River Corridors and Sustainable Living Agendas
SUE 2 Cluster	http://www.ursula.ac.uk
PI: David Lerner, University of Sheffield	**CIs:** Paul Armsworth, Joby Boxall, Kevin Gaston, Eckart Lange, Daniela Romano, Virginia Stovin, Richard Ashley, Steve Connolly, John Henneberry, Lorraine Maltby, Elizabeth (Liz) Sharp, Phillip Warren, Peter Bibby, Buick Davison, Stuart Lane, Susan Molyneux-Hodgson, Steve Sharples

Project Summary (from call announcement available on EPSRC's website):

Urban river corridors are experiencing rapid changes in land use and perceptions and offer opportunities to create sustainable, high quality, communities. The hypothesis of the URSULA project (Urban River Corridors and Sustainable Living Agendas) is that there are significant social, economic and environmental gains to be made by integrated and innovative interventions in urban river corridors.

We will test this by providing a portfolio of new ideas, new tools and new data to support redevelopment of urban river corridors as places where people want to live and work, now and in the future. We will do this in cooperation with national and local stakeholders, including government, commercial, community and 'non-organised' groups of stakeholders. The key themes of our analysis and way of working are 'people' (living, working), 'river' (ecological goods and services), 'design' (possibilities for intervention and innovation) and 'values' (agents of change, measures of success). We will draw on case studies in Sheffield, the UK and beyond, and test our Outcomes with local stakeholders in Sheffield on the corridor of the River Don and its tributaries.

In the design theme we will, with stakeholders, choose a set of new and current ideas which may benefit redevelopment of urban river corridors, for example use of rivers for building climate control, better storm water management, or new urban forms. New field data and design analyses will enable us to understand their potential benefits and impacts. From the field and modelling work in the river theme, a deeper understanding of how urban rivers deliver ecological goods and services to the river corridor will show how the design possibilities can be assessed. The values theme will provide new analyses of the financial and other benefits of urban redevelopment, as well novel tools (e.g. visualisation) to work with stakeholders and understand their preferences. All of these activities will take place within a close cooperation through the people theme with the stakeholder groups, who are central to the project's motivation and measures of success.

	Full project title:
VivaCity2020 — Urban Sustainability for the Twenty-four Hour City — Development of design decision-making tools and resources	Urban Sustainability for the Twenty-Four Hour City: Development of Design Decision-making Tools & Resources
SUE 1, Urban and Built Environment cluster	www.vivacity2020.eu
PI: Rachel Cooper, Lancaster University	**CIs:** Ghassan Aouad, Caroline Davey, Julienne Hanson, Steve Sharples, Trevor Cox, Graeme Evans, Bill Hillier, Ben Croxford, Terrence Fernando, Alan Penn

Project Summary (from call announcement available on EPSRC's website):

This proposal brings together experts from design, engineering, construction, urban planning and IT, all of whom have worked on aspects of sustainability, from crime to accessibility and environmental sciences. The vision for the project is to support and enable sustainable and socially responsible urban design through the development of innovative, inclusive and practical decision-making tools & resources. These will be derived from an in-depth understanding of the patterns of human/environment interaction, and will resolve practical urban design, operation and management problems, particularly in relation to the twenty-four hour city. The project uses the development of a generic process for sustainable design decision making as the spine around which knowledge on the various dimensions of sustainability can be built. This is to enable multi-criteria decision-making and 'what if?' scenarios to be undertaken by key practitioners and stakeholders. The project has at its core three work packages addressing: (i) the process of sustainable design decision-making; (ii) land use in urban environments, and the relationship between diversity and social and economic vitality;(iii) the use of design for the reduction of actual and perceived crime and the creation of a positive experience of urban environments. Each peripheral work-package would develop further knowledge to add to the design decision-making resource, while work-package 10 contributes considerable ICT to support application and dissemination of knowledge.

Final Report Summary (available on EPSRC's website):

VivaCity2020 brought together experts from design, engineering, construction, urban planning and IT to undertake research and develop decision-making tools and resources to support and enable sustainable and socially responsible urban design. During the first three years of the project, six urban sustainability issues were studied using multidisciplinary case study research in London, Manchester and Sheffield: (i) the urban design decision-making process and ICT support solutions; (ii) the generation and evolution of diversity; (iii) crime and fear of crime; (iv) environmental quality; (v) housing provision; (vi) public conveniences. The last two years of the project were dedicated to integrating these six areas into four urban sustainability themes: (i) the process for urban design decision-making; (ii) urban policy; (iii) urban form; (iv) urban experience. This integrated approach provides holistic and diverse understanding of the dimensions of sustainability.

VivaCity2020 has created an urban design-decision making process model and a web-based knowledge platform with a suite of tools and resources aimed at supporting decision-makers in making more

sustainable decisions and 'trade offs' in relation to urban policy, urban form and the urban experience. Whilst there are detailed and specific recommendations from the project with regard to sustainable cities, the VivaCity2020 team identified a number of overarching conclusions:

1 We can create the capacity for sustainable cities

The urban design decision-making process-including recommendations for a Legacy Archive and the creation of a sustainability agenda-supports this, along with the web-based knowledge platform.

2 Hindsight and foresight - use them

The study found that an historic perspective on the evolution and morphology of city life and spaces helps us to understand the present. Concomitantly, through a better understanding of the evolution and morphology of cities, we can begin to make predictions of future trajectories by looking at the cyclical and incremental nature of development and behaviour within the market, communities and households. We illustrate that using different tools and techniques-along with the Legacy Archive-can help us to develop an annotated narrative that will inform the process and give us ideas about what we need to do in the short- and long-term future to sustain our cities.

3 All cities are 24-hour cities - we need to consider density, diversity and intensity

The urban design decision-making process highlights the need for a critical dialogue both early and often when planning with the 24-hour rhythm of cities in mind. We found that many urban residents were most concerned about doorstep issues such as rubbish, graffiti, anti-social behaviour and noise, which are exacerbated in urban environments. For day-to-day existence, people felt that environmental management and spatial 'cohesion' was required to maintain liveability and avoid conflicts of use both within and between groups in dense, diverse, intensified areas. Our recommendations, tools and resources offer approaches to identify and address these issues.

4 Everyone is a decision maker - ensure their voices are heard and their stories are told

VivaCity2020 identified novel ways of facilitating engagement between professionals, scientists and the community. These types of mechanisms are critical in the face of consultation weariness and provide another way for voices to be heard and stories to be told. We offered an approach for categorising urban design decision-makers and stakeholders to ensure that more people's voices are heard throughout the lifetime of urban development projects. The urban design decision-making process provides a platform for consultation and tools and resources to use in consulting stakeholders.

Finally VivaCity2020 provides a platform upon which future knowledge can be contributed and used.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Space Syntax Analysis	Analysis of street morphology	See Perdikogianni, I. et al, Decoding Urban Diversity in a 'mixed use' neighbourhood
i-VALUL	Analysis of city centre formation	See Hiller, B. and Wedderburn, M. The value of urban centres,
	Analysis of the economic cost of crime	See Chiaradia, A. et al, The economic cost of crime
	Analysis of the relationship between street layout and property value	See Hillier B. and Barnes, Y. Residential Property Value
Household Survey Questionnaire	Quality of Life assessment of living situation in terms of location, building mix, layout and likes and dislikes about neighbourhood	
Business Survey Questionnaire	Profiling firms in terms of service provided, number of staff, travel mode/distance to work, customer catchment, premises type, tenure, location advantages and disadvantages	
Liveability Survey	A questionnaire based postal survey based on the Government's liveability agenda'	For a description of its use on the project, see http://www.vivacity2020.eu/vivacity-toolkit/liveability-surveys
Toilet Audit Tool	To use the audit tool you will need: ▪ A tape measure ▪ A copy of the audit sheet (Microsoft Word document, 3.5mb) ▪ A pen or pencil ▪ A camera to record the layout of facilities (not essential but may be useful as an aide memoire),	Developed in collaboration with Vin Goodwin a National Registered Access Auditor, to collect data on the accessible provision that was currently available. The tool is based on the design of the unisex corner accessible cubicle described in Approved Document M (ADM) of the Building Regulations 2004.
Toilet User Personas	Tool that developed to communicate users' needs to the professionals involved in the design and management of away from home toilets.	Each persona is an 'archetypal user' that has been created in collaboration with user groups involved in the research. The personas have been edited from narratives of actual user experiences. Each persona therefore provides a snapshot of their combined experiences, an amalgamation of all those involved in its development. NB: Personas have also been developed for accessibility issues in relation to transport on AUNT-SUE, see HADRIAN,

		http://www.aunt-sue.info/toolkit/hadrian.html
Toilet User Survey	Survey attitudes to toilet provision	
RELATED TOOL:		
Culture and Sport Planning Toolkit	The toolkit is a practical source of information and advice for all practitioners involved in culture and planning. For the first time, this toolkit brings together a combination of existing and new tools to incorporate planning for culture and sport into new and existing developments.	Produced by Living Spaces (a collaboration between Arts Council England, the Commission for Architecture and the Built Environment (CABE), English Heritage, the Museums, Libraries and Archives Council (MLA) and Sport England; their sponsoring department the Department for Culture, Media and Sport (DCMS) and the Department for Communities and Local Government (DCLG).

	Full project title: Water Cycle Management for New Developments
SUE 1, Waste, Water and Land Management Cluster	www.wand.uk.net
PI: David Butler, University of Exeter	**CIs:** Richard Ashley, Adrian McDonald, Elizabeth (Liz) Sharp, Paul Jeffrey, John Packman, David Kay, Dragan Savic

Project Summary (from call announcement available on EPSRC's website):

The project aims to support the delivery of integrated, sustainable water management for new developments by provision of tools and guidelines for project design, implementation and management. It consists of six core work packages designed to cover the most important aspects of water management. Three are technically based concerning water supply, storm drainage and wastewater. The goal is to identify key performance and design issues and t+ quantify the key system, infrastructure and environment interactions. Two other packages deal with aspects concerned with social acceptability of new 'sustainable' technologies, the decision-making process and the place of water management in it, the role of whole-life costing in this context and the potential for increased health risks. The final W P pulls together the strands of the issues and techniques raised in the other five to produce a toolbox for the risk-based, planning and outline design of water systems in new developments to maximise sustainability relative to the constraints on the particular development site. The model will be used to evaluate alternative development and water management scenarios and to propose more sustainable strategies, demonstrated through a number of case studies. Funded 'plus' projects will add value to the 'core' programme above, particularly by drawing in further interdisciplinary and inter- sector issues.

Final Report Summary (available on EPSRC's website):

The WaND project supported the delivery of integrated, sustainable water management for new developments by providing tools and guidelines for project design, implementation and management from a variety of disciplinary perspectives. The main findings are that:

- Installing water efficient devices in new homes only is, by itself, insufficient to achieve target sustainable water use levels. Water efficiency improvements must also be implemented in existing housing stock bearing in mind the difference in profile between new and old homes (e.g. occupancy levels, metering penetration and appliance presence).

- A new ultra-low flush toilet design and wastewater collection system saved 87% of water use with no downstream blockage problems.

- Although sustainable drainage systems (SUDS) produce the best runoff response, the greenfield hydrological/hydraulic response is unlikely to be fully replicated after development.

- More careful attention needs to be given to the siting of SUDS in new developments, especially infiltration systems, due to the adverse effects caused by the interaction between infiltrated flows and foundation of houses and to prevent flooding associated with changes in groundwater levels.

- Rainwater harvesting has the potential to provide an integrated approach to both stormwater control from developed sites as well as water saving.

- The first UK empirical data acquisition in this area suggests that rainwater harvesting, greywater reuse and SUDS have minimal potential health impacts with lower risks to health than a five-year return period drought.

- It is difficult to achieve high water saving efficiencies in greywater recycling systems because large tanks are needed to achieve this, yet small tanks are needed to minimise water quality degeneration.

- Widespread application of greywater recycling systems can have both positive (reduction in flooding frequency) and negative (compromise of self-cleansing sewer flows) impacts depending on the specific catchment configuration.

- Lack of non-potable water quality standards and established design and maintenance guidance and are barriers to improved uptake of greywater recycling systems.

- A significant deterioration of river quality can be triggered if the development is bigger than a critical size linked to the urban wastewater system capacity.

- Membrane bio-reactors are the most robust technology for use in water recycling systems. They perform well and are scalable, making them a promising alternative at development scale. However, they have a relatively high energy consumption and environmental footprint.

- Tradeoffs can be made between water use, energy use and land use, allowing win-win technological solutions to development scale water management.

- Low levels of long-term financial support can boost learning and innovation in relation to sustainable water management (SWM).

- SWM will not be advanced if dependent on "voluntary" alternatives.

- SWM is more effectively promoted where organisations trusted by people are involved.

Outputs from the project have been delivered on an intelligent portal, which contains guidance notes, reports, papers and models. Key outputs include a water systems planning and design toolbox, a water demand forecasting tool, a drainage assessment tool, a set of urban water futures and their water cycle implications, a health impact assessment method applied to water cycle management and a 'flexible framework' for sustainability assessment. The portal is available on CD-ROM from the project team and will be made more widely available via the project website: www.wand.uk.net. A practitioners' guide will be published by CIRIA in 2008

The main policy conclusion of the work was that although there are promising technical solutions, to get the most from them, we need to rethink the way we organise water at institutional particularly by managing the water cycle in a more integrated way.

Tools and Techniques Produced:

Tool/technique	Used for	Further information
Urban Water Optioneering Tool	Allow the exploration of alternative sustainable technologies' compatibility. Enables sustainability evaluation at a strategic level using specific criteria based on the SWARD framework.	See WAND CD Portal. For SWARD, see http://www.wand.uk.net/index.php?module=articles&func=display&aid=13&ptid=7. See also www.wand.uk.net
Harzards Checklist		See WAND CD Portal and www.wand.uk.net
SUDS Site Evaluation Tool	Can be used by planners to evaluate SUDS technologies: performance and resource utilisation	See WAND CD Portal and www.wand.uk.net
Project Assessment Tool	For use in collaboration with decision-making between stakeholders. Acts as an aid to the decision-making process rather than providing a definitive assessment. Has easily interpretable visual outcomes.	See WAND CD Portal and www.wand.uk.net
MicroWater Tool	Forecasts regional water demand at Generic Operator Returns (GOR) level up to 2031. Developed to be interactive. Allows investigation of effects of various scenarios. Intended as a serious tool for use by water sector researchers as well as enabling non-specialists to develop an understanding of the effects of demand factors.	See WAND CD Portal and www.wand.uk.net
MacroWater Tool	Calculates the combined impact of housebuilding, water efficiency legislation (and to a	See WAND CD Portal and www.wand.uk.net

	lesser extent climate change) on water consumption over the medium term under different scenarios.	
Scoping Tool	For scoping application of water management options. Structured around four types of water management intervention. Provides early stage check on impact of effects of novel interventions, covering SUDS, greywater recycling, water conservation, and rainwater harvesting.	See WAND CD Portal and www.wand.uk.net
IPF Tool	A tool for Multi-dimensional Iterative Proportional Fittings. Helps construct arrays of future household structures.	See WAND CD Portal and www.wand.uk.net
Flood Modelling	GIS-centred tool for modelling surface flooding for use in planning new developments.	Originally developed by Imperial College, with further development and testing by WAND. See WAND CD Portal and www.wand.uk.net
Decision Support Toolbox	A DSS environment for use in developing a set of tools for water cycle management in new developments. Includes a Screening Tool, an Optioneering Tool, and a Suitability Evaluation Tool.	See WAND CD Portal and www.wand.uk.net

Individual delegate response sheets

session 1

SUE, a cohort or a community?   (Where is the coherence and where is the research capability?)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community?   **Cohort** ☐   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

<u>Within</u> but not between consortia.

Cities – urban focus, spatial focus, international dimensions should be said inclusion dimension and in common with the 4 "pillars" of sustainability.

Must have multi-scale approach and address direct time-scales.

All develop tools/resources in prototype that offer opportunity for future exploitation.

What is the nature of the research capacity that SUE has built?

Some mutual understanding between light/plant sciences and other disciplines e.g. social science, anthropology. Interaction with and influence of end-users both in sense of decision makers city building preferences and users in which social groups whose quality of life the tools and resources should improve.

Interdisciplinary not just multidisciplinary.

And how, if at all, do the answers to these questions influence what we* do in the future?

Should incorporate in professional study programme of city building professions.

Should help PI's and researchers have greater understanding of synergies between disciplines – help build bridges between them.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community?   **Cohort** /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Agreement on broad set of ambitions.

Agreement, to some extent, on the challenges and problems to be addressed, i.e. achieving sustainable urban development.

What is the nature of the research capacity that SUE has built?

Applied research;

Collaborative research;

Develop better understanding of problems/challenges (possibly not solutions or to a lesser extent).

And how, if at all, do the answers to these questions influence what we* do in the future?

Design more "appropriate" research projects i.e. user driven, integrated and collaborative.

Address the right questions?

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? **Cohort** / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

1) More global than specific in that drawn together according to initial funding requirement, lost as consortium funded have reduced urban environment.

2) Academic drivers – how much "need" driven?

What is the nature of the research capacity that SUE has built?

1) Collection of research driven by common agenda – multidisciplinary.

2) Skills portfolio to tackle issues but tends to be focused in a disjointed nature at times, awarding area that impinge on SUE aspects e.g. climate change.

3) Researcher and project partners with changed attitude and knowledge of multidisciplinary working.

And how, if at all, do the answers to these questions influence what we* do in the future?

We relate to funding and remit that drove generation of teams.

Should be more inclusive beyond project partners – buy in?

Use our knowledge to feed back to our own disciplines.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

1) In studying urban sustainability.

2) In interdisciplinary working.

What is the nature of the research capacity that SUE has built?

1) Cohort of PI/CI's with experience in running multidisciplinary consortia.

2) Cohort of young researchers, some of whom have already fled the country.

And how, if at all, do the answers to these questions influence what we* do in the future?

1) We need to build a community in which researchers can learn from and with each other and which captures "tacit" knowledge and transfers it to the next generation.

2) The same community might develop an integrated mechanism for collating and disseminating the results of its work and influencing practitioners, regulators and the public at large (wasn't that what ISSUES was supposed to do?)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Apart from being funded from the same source, coherence is questionable. Micro level alignment has developed locally, but strategically it is weak. Valuable research has been done, but often in silos.

What is the nature of the research capacity that SUE has built?

Cross-disciplinary communication (if not actual working) has created original research outlooks and perspectives. New researchers have developed/been trained in the context of the sustainability agenda, cognisant of broader issues.

And how, if at all, do the answers to these questions influence what we* do in the future?

Early presentations in the workshop raised questions about clarity of strategic objectives (how projects contribute to wider programme goals). More time/resources required for programme integration.

Sustainable Urban Environments: Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Working to a common brief – with the proviso that the brief has been interpreted and projects have addressed only small sections of the brief.

A paradoxical "coherence" of being multidisciplinary groups.

What is the nature of the research capacity that SUE has built?

Very nebulous – and opportunity has been lost in building this capacity by a lack of events in which key issues could be identified and discussed e.g. annual SUE meetings could have been built into the programme. Also this could have prevented "reinventing the wheel" in different projects.

And how, if at all, do the answers to these questions influence what we* do in the future?

We should have annual meetings and other events e.g. smaller meetings of SUE projects with similar interests and/or geographical location.

Sustainable Urban Environments: Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Rare meetings between groups with common interest but disparate disciplines. Strong focus on tasks. High value added due to previous "experience". Very good industrial links but not as strong in advisory as in exploiting our output.

What is the nature of the research capacity that SUE has built?

Very powerful "team" but limited time available for "networking" through semi-random arrangements. World class research but lack of world cooperation within remit. Links with socio-economic to engineering are good but not yet quite as good as required.

And how, if at all, do the answers to these questions influence what we* do in the future?

Hopefully a properly funded and independently organised Network will manage meetings of academics, with and without industry. EPSRC close collaboration needed to ensure work is with EPSRC's remit. More focus on urban energy, food, waste and water is needed – greater links with government by changes in government (MP) structure.

Sustainable Urban Environments: Research Dialogues Workshop

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Similar/shared understanding of problems ahead; face similar pressures (i.e. RAE); share similar background/social profit.

What is the nature of the research capacity that SUE has built?

Challenged us to look beyond our field of expertise, made us feel comfortable to listen and take on new ideas...break free of silo culture.

And how, if at all, do the answers to these questions influence what we* do in the future?

Establish stronger ties, if we are to move from Cohort to Community.

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SUE: a cohort or a community? Cohort ☐   **Community** **/**   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

A common focus – moving to a more sustainable urban environment. We should share common values (regarding the outcomes of our research, at least).

A uniquely effective ability to work with others.

What is the nature of the research capacity that SUE has built?

An ability to engage (and lead) in multidisciplinary activities, and produce effective outcomes.

An understanding of the language/cultures/methodology/"ultimate goals" barriers of such working.

People capable of trans-disciplinary working.

People who appreciate the need for trade-offs in research (sacrifice depth for breadth) to provide a grounded, balanced view of research value.

And how, if at all, do the answers to these questions influence what we* do in the future?

We should tackle the grand inter-disciplinary challenges (those needing social and environmental elements alongside EPS)

Sustainable Urban Environments:
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SUE: a cohort or a community? Cohort / **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Experiences of consortia and multidisciplinarity.

A series of relationships focused on (forced?) application of research to urban environmental challenges (problem-driven)

What is the nature of the research capacity that SUE has built?

Unclear – perhaps relates to "measuring" and modeling sustainability.

Many temporary researcher posts – but do we feel positively about the results?

Temporary and ethereal – links with end-user "market place".

And how, if at all, do the answers to these questions influence what we* do in the future?

More enduring relationships with collaborators in industry and public sector/NGO's.

How to support <u>innovation</u>?

Sustainable Urban Environments: Research Dialogues Workshop

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SUE: a cohort or a community? Cohort ☑   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Very loose coherence based upon the overall focus on "the urban" as the substantive topic of research.

What is the nature of the research capacity that SUE has built?

Research capacity largely resides (i) mostly in individual researchers/academics who have learned about inter-disciplinary urban research via SUE projects; (ii) less so in the consortia (team for many is too strong a word) undertaking projects who learned about each other's disciplinary and substantive perspectives/areas and linkages between them; (iii) hardly at all in any wider SUE community.

And how, if at all, do the answers to these questions influence what we* do in the future?

It depends on what we want to do and the means of getting there. Research communities do not just appear, there need to be strong reasons (drivers?) and/or resourcing for this to occur. There is a strong argument for SUE to become more like a community but it won't happen by itself.

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SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

SUE 1, the one I had most to do with, had little coherence.

Projects did not have any intellectual coherence outside their own rationale. SUBR:IM was intellectually strong, but had weak ties with work going on elsewhere.

What is the nature of the research capacity that SUE has built?

SUE 1 researchers have gone their separate ways. Some loose contacts but large amount of capacity has gone. However, I am still able to draw upon contacts on an ad hoc basis when I see other opportunities.

And how, if at all, do the answers to these questions influence what we* do in the future?

Some e-mail network to connect former SUE researchers to current activities.

Sustainable Urban Environments: Research Dialogues Workshop

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Is there a coherence?

Desire to produce high quality research that sheds light on improving urban sustainability.

In some cases desire to produce a high quality research that makes a positive difference to urban sustainability.

What is the nature of the research capacity that SUE has built?

(Started to) address working with industrial partners in real settings.

(Started to) enable researchers to work across disciplinary boundaries.

Capacity in running large consortia.

And how, if at all, do the answers to these questions influence what we* do in the future?

Go back to industrial partners and other representatives of end user groups and ask what needs to be done to apply/make use of the research -

What role researchers have in contributing to this.

How can SUE findings be "put into context" - does this need a different sort of research.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** / (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Sustainable urban environment, but otherwise the problems addressed are quite diffuse. In SUE 1 links by subject within clusters.

SUE 2/3 more holistic (e.g. applying across sections in common case studies?). An interest in sustainability and quality of life and a desire to see this implemented?

What is the nature of the research capacity that SUE has built?

Quite disparate and presumably mobile in terms of many of the researchers trained. PI's/CI's : have some moved on?

Multidisciplinary – lots of different skills and sectors.

Commonalities? assessment techniques and tools?

And how, if at all, do the answers to these questions influence what we* do in the future?

We could promote SUE and knowledge/expertise gained as a community – but at present academic funding drivers do not encourage or even recognise this. So it is "pro bono" (in spare time) by individual enthusiastic academics. Can we put in enough time to have an impact?

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SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Not really evident other than some common problems addressed.

The funding stream/mechanism.

What is the nature of the research capacity that SUE has built?

Very much in "ad hoc" groups.

SUE 2 = some joint working with industrial partners.

And how, if at all, do the answers to these questions influence what we* do in the future?

We need to build a research community around the concept of sustainable urbanism.

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SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

All taxed by multidisciplinary working.

What is the nature of the research capacity that SUE has built?

Largely engineers focused on developing engineering tools perhaps first exposure to some level of multidisciplinary working.

And how, if at all, do the answers to these questions influence what we* do in the future?

Good outcome: SUE investigators and researchers new to urban issues continue to explore urban issues (not necessarily together)

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SUE: a cohort or a community? Cohort ☒   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

In their common focus on the city.

In finding niche for their research under the sustainability banner.

In being led by academics.

In being EPSRC funded.

In trying to communicate with a diverse stakeholder group, not a strong single client.

What is the nature of the research capacity that SUE has built?

An affinity within SUE-funded individuals for working with academics from other disciplines.

A greater appreciation, post SUE 2, of the role of GIS as a representational vehicle.

An appreciation of the complexities of cross-disciplinary working – tools, language and techniques.

Individuals with a much stronger notion of urban scale matters than they might hither to have had.

And how, if at all, do the answers to these questions influence what we* do in the future?

Ensure a much clearer focus on key problems and the associated conceived "client".

Focus on multidiscipline.

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SUE: a cohort or a community? Cohort / **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Common grievances.

But also a shared common aspiration for urban environment/cities for the future.

What is the nature of the research capacity that SUE has built?

Delicate – lots of useful similar perspective developed at the level of the individuals but difficult to see how this will live beyond the project funding other than as tacit knowledge.

And how, if at all, do the answers to these questions influence what we* do in the future?

Certainly made me more aware of the issues, both of the complexities of the urban environment but also of the way in which knowledge is developed and carried.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Only in the title and funding source.

Little coherence between the consortia and programmes and sometimes within consortia.

Coherence occurred when common subjects were investigated i.e. mostly by chance.

What is the nature of the research capacity that SUE has built?

It built a research capacity across universities within a consortium, but in the case of SUE 1 this broke up when the programme finished.

Did produce a number of models that could be picked up and developed further, but some of these are not user friendly and need expertise which may or may not be there.

And how, if at all, do the answers to these questions influence what we* do in the future?

The research needs to be applied.

Need a more cohesive approach, providing an overall vision or objective.

Require work to meet a "quality standard" that can be carried on by others when that piece of work is completed. Keep multidisciplinary.

Involve industry/politicians/users more comprehensively.

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Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Assessment processes are useful for integrating together different partners.

What is the nature of the research capacity that SUE has built?

Better understanding of different disciplines involved in the built environment.

And how, if at all, do the answers to these questions influence what we* do in the future?

Much more likely to include other universities and disciplines within a research proposal.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

SUE 1 (and SUE 2) will have the coherence of the call itself (although tackling different elements of it). SUE 2 greater than SUE 1.

All interested in SUE!

What is the nature of the research capacity that SUE has built?

Understanding of "the big issues".

Some understanding of inter-disciplinary research.

Some understanding of industry/governance needs.

And how, if at all, do the answers to these questions influence what we* do in the future?

Put funding bids together to investigate knowledge gaps – large, small? Inter-disciplinary or not?

Lobby for funding for "research translation" projects.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

The funding itself is the driver. My experience of working in a consortium leads me to believe that we came together because of a broad interest in "sustainability" but beyond this I do not see any coherence.

What is the nature of the research capacity that SUE has built?

Answering this question for my team, SUE project has helped to build a strong research group working on all aspects of urban sustainability within our school. I am not sure as to the capacity SUE has built in the country.

And how, if at all, do the answers to these questions influence what we* do in the future?

Lessons learned and ideas generated by our work in the consortium has led to new research bids, research/conference presentations, new course modules and the like.

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Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** / (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

1) Why should there be <u>coherence</u>? Or put another way, what does coherence mean in this context? There is – and should be – coherence of aim, and of language, and of output – but in all other ways – methods, approaches etc. - diversity is probably a better thing.

What is the nature of the research capacity that SUE has built?

The biggest problem really is scoping the problem – I think that (some of) SUE has started to succeed in building capacity to have a more holistic understanding amongst researchers and users. This has helped people out of their disciplinary "silos"......

And how, if at all, do the answers to these questions influence what we* do in the future?

....thus we can reverse disciplinary siloism – the "real world" exists out there without disciplines and it is that which we are trying to make (more) sustainable.....

(AKA "participatory action researcher" when I'm talking to other social scientists)

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SUE: a cohort or a community? Cohort ☐   **Community** **/**   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Overlap in urban environments and sustainability (as research interest and topic).

Overlap in some areas (divided by theme, by discipline, by case study sites/cities).

"Raising"/training/skilling researchers (RA's, RF's, PhD's).

Language – beginning to understand each other from different disciplines and the issues we have/how we look at the world.

What is the nature of the research capacity that SUE has built?

Academic papers?

New ways of thinking about sustainability from a multidisciplinary perspective.

New ways of working, methodologically, on sustainable urban environments.

And how, if at all, do the answers to these questions influence what we* do in the future?

It helps us to consider sustainable urban environments (issues facing cities etc.) in a more holistic manner, giving us an opportunity to see the tensions and trade-offs between issues.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

A shared interest in aspects of the urban development process and sustainable development more generally.

A common interest in working to some extent across disciplinary boundaries.

What is the nature of the research capacity that SUE has built?

Some development of frameworks and methodologies that cut across disciplinary boundaries.

Some forms of dissemination and integration with practitioners.

And how, if at all, do the answers to these questions influence what we* do in the future?

Take forward research interests and relationships with colleagues at other institutions in <u>related</u> disciplines i.e. planning and urban design.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

None apparent!?

On an un-evidenced perspective!

EPSRC Brief should create some coherence?

What is the nature of the research capacity that SUE has built?

Lots of learning but all squirreled away and not obvious.

And how, if at all, do the answers to these questions influence what we* do in the future?

Needs some action to draw to the attention of customer groups or to those who support/serve them.

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SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Funding source.

Experience of multidisciplinary working.

Experience of working with industrial partners.

Very broad understanding of sustainability as applied to urban areas of many types.

Experience of consortium working.

What is the nature of the research capacity that SUE has built?

Multidisciplinarity.

Practice "facing".

Facility to work in complex environment.

Consortium working.

And how, if at all, do the answers to these questions influence what we* do in the future?

Communication.

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SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

In funding, obviously, in objectives, in practical outputs.

Interesting for me, came to it like Joanne Leach. Quite difficult to piece together connections. Disunity was clear to me too. Surprised to hear no remit for cross-consortia relations. But proof is in the pudding. Issues – some initial unity achieved but looks like new CP essential.

What is the nature of the research capacity that SUE has built?

Difficult to define as hasn't been a "joined up" review.

A lot of my job was to rewrite/communicate SUE 1 outputs to policymakers.

Treated individually. By name only?

Multidisciplinary.

And how, if at all, do the answers to these questions influence what we* do in the future?

Need review?

More days like this?

Virtual/real community?

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SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Loose/broad range of topics covering "sustainable" at different scales.

What is the nature of the research capacity that SUE has built?

Ability to work with other disciplines.

Ability of GPS community to connect with social agendas.

Young group of researchers who have a broader perspective beyond their specialism.

And how, if at all, do the answers to these questions influence what we* do in the future?

Continue to do multidisciplinary work.

Conscious about big complex holistic issues.

More from urban to semi urban/global and local – think on a bigger scale.

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SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Within the individual project groups – sometimes just within the individual institutions.

What is the nature of the research capacity that SUE has built?

Varied! Large and potentially useful but well hidden.

And how, if at all, do the answers to these questions influence what we* do in the future?

Obviously a need for a "dialogue"!

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Within individual consortia – little knowledge of other consortia.

Added to a generic sustainable extent to own area of expertise. This generic extent may be coherent.

Funding.

What is the nature of the research capacity that SUE has built?

Limited. Mainly continued to work in own areas, "silos".

Some individuals may have spanned across themes/areas.

People.

And how, if at all, do the answers to these questions influence what we* do in the future?

Try to continue to develop/push the cross-theme expertise derived from SUE/SUE 2 (whilst maintaining core interest which is the same as before).

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SUE: a cohort or a community? Cohort /   **Community** ☐   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Substantial coherence within projects but not across projects because of the substantial additional overhead of time and effort involved already.

What is the nature of the research capacity that SUE has built?

Extended the knowledge and capabilities within some groups and brought (limited) new relationships elsewhere with greater insight into other disciplines.

Cross disciplinary value to research students.

Built personal relationships for new funding opportunities (EPSRC and other).

And how, if at all, do the answers to these questions influence what we* do in the future?

Success requires two elements:

(i) High quality research (partly done)

(ii) Ownership of the outcomes by those who will make decisions (largely not done).

Must be addressed in the future.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

The primary coherence in SUE comes not from discipline sharing/knowledge sharing but from interpersonal relations. Second to that, painstaking work to build common working vocabulary has helped coherence. Only after that is knowledge exchange effective.

What is the nature of the research capacity that SUE has built?

Sue has built research capacity most obviously in its research fellows, but has also built capacity in the PI's/Co I's, who are prepared to take on new projects that they could not have tackled before SUE.

There has been technical capacity building through "tools" (of every hue) and guides to practice.

And how, if at all, do the answers to these questions influence what we* do in the future?

Keep Co-I/PI's talking/planning/creating.

Don't be afraid to move away from themed funding to fighting for more general funding.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Not immediately obvious – some will have seen this as just another project while others will have been enthused. There is a greater awareness of grand challenges – benefits of working together etc.

What is the nature of the research capacity that SUE has built?

Multidisciplinary – does reflect changing EPSRC/RCUK influence – move to bigger fronts, industry collaboration, engagement with end users.

Is it more competitive?

And how, if at all, do the answers to these questions influence what we* do in the future?

Obviously depends who "we" is. This discussion probably needs a greater focus on viewpoint – Academic, Authority.

Are the EPSRC boundaries too narrow for this research area.

A greater international focus would be helpful.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

(But developing into a community)

SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

A key "sticking point" is that the SUE research outputs and ideas appear to have had little impact on policy makers and politicians.

Genuine willingness to work together, to break down disciplinary barriers in order to address long-term, complex social issues.

Shared focus on sustainable urban environments/development.

What is the nature of the research capacity that SUE has built?

Different disciplines have moved out of their "silos" and developed a greater understanding and awareness of each other.

Tremendous depth to many research outputs and better linked than previously to local authorities and industry.

Broad and deep pool of research knowledge/ideas focused on urban areas.

Some development and inspiration of "new blood" researchers.

And how, if at all, do the answers to these questions influence what we* do in the future?

Cohorts should become a community in order.

Ring-fenced funding from "combined research councils" for grand challenges and better integration with other key organisations.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** / (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

For diverse backgrounds and disciplines there emerged a shared interest in urban environment as the result of processes and systems.

Several shared sites/cities investigated – could give a critical mass to influencing particular places.

What is the nature of the research capacity that SUE has built?

Hopefully not transient.

Cluster of individuals who have moved between projects or on to subsequent projects.

Consortia that have formed (or been manmade) in an admirably cross disciplinary way.

And how, if at all, do the answers to these questions influence what we* do in the future?

So many projects.

Natural variability of quality of output and success of projects – is there some sort of "usefulness" or worthwhile threshold that could be applied?

Doesn't matter if only a partial picture goes forward if it is the good bits.

Going beyond a shared e-mail group.

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SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Possibly

Where is the coherence amongst those funded by SUE?

Focus on the urban environment (mainly cities).

Funding from EPSRC.

Links with similar industry contacts.

What is the nature of the research capacity that SUE has built?

Vague. More a development of methodologies that can cross disciplinary boundaries. Experience of seeing problems/issues from other disciplinary points of view.

And how, if at all, do the answers to these questions influence what we* do in the future?

Focus on what is good research rather than on what others who form the "problem" consider to be of value.

Understand (and communicate) that the only "simple solution" is tomorrow's problem. Complex problems have complex answers.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

More than a cohort – some cross fertilisation of SUE 1 to SUE 2 partners; and SUE 1 relationships also continued to SUE 2.

Not a community – not much depth in common ties (e.g. where we publish specific goals, group working etc.)

What is the nature of the research capacity that SUE has built?

Much development of toolkits – but will they get used? However most models/toolkits developed in my experience of SUE are perlogogic - they help us learn about a system or input of intervention on a system. A "tool" is an added value tangible asset over and above knowledge generated.

Many of the DG students are "silo facing" not holistic/system oriented – maps to SUE project tools and PG job opportunities.

Stakeholders want outputs not tools i.e. Sewills not models themselves.

And how, if at all, do the answers to these questions influence what we* do in the future?

What we will do to should do?

Does community = better output? If so research/effort needed to develop communities – difficult if not core scheme/output focused funding.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

They populate the engineering domain.

Large scale research projects requiring strong management to achieve aspired outcomes.

What is the nature of the research capacity that SUE has built?

Engineering disciplines have started to apply their knowledge to the Built Environment.

The disciplines have played a minor role in (re)orienting engineers to issues of social links at force, including (positive) decision making processes; research methodology.

Multidisciplinary research environment for younger researchers.

And how, if at all, do the answers to these questions influence what we* do in the future?

Developing funding – difficult to hold up good quality researchers.

Might be a good idea to work with ESRC, NERC etc. disciplines to draw on a wider range of knowledge/skills/expertise in order to create knowledge that can be used by pivotal decision makers (governments, corporations, households, individuals) to reduce the consumption of finite natural resources.

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Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐   **Community** /   (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Broad intention of sustainability – better quality of life.

Research based – intensive evidence based investigation.

What is the nature of the research capacity that SUE has built?

A community that is able to come together to understand about their own issues in depth but also able to understand interconnections/relationships mirror expertise if necessary. However, sharing knowledge, views, expertise across themes has not yet happened at least it looks like.

And how, if at all, do the answers to these questions influence what we* do in the future?

There is much to do from current state of knowledge. In depth expertise of particular themes to moving onto workable solutions in practice. Once the priorities and pressing needs that have to be approached now to reach workable solutions are set, certain pieces of research may have to be supplemented, others need to move on to practice and solutions.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort / **Community** / (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

There is existing coherence amongst members of particular disciplines and, based on my own consortia, there has been some breaking down of barriers between disciplines but this was not extensive. Therefore a community exists where there was previously a community but new pervasive links are rarer and need more time.

What is the nature of the research capacity that SUE has built?

Potential links between PI's/CI's in different disciplines but the ability of those to work with one another is limited; language and "cultural" barriers still remain between science and social science. Many of the researchers, of which I was one, had limited exposure to the "other" discipline (i.e. science or social science) and I don't think true inter-disciplinary researchers have been produced for the future. These links, however, may cause better cohesion in future but this will take time.

And how, if at all, do the answers to these questions influence what we* do in the future?

It's important that these links are developed further otherwise what has been gained will be lost. I think the idea of further working should be encouraged but how this can be done I've no idea?

Sustainable Urban Environments: Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☐　　　**Community** /　　　(please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Contacts made with colleagues in IDCOP and other SUE projects never worked with before.

Understanding of alternate research methodologies. (Social Science).

Contacts made with stakeholder partners (Social Landlords).

Acceptance (reluctantly) by EPSRC of the time and cost of doing multidisciplinary work.

What is the nature of the research capacity that SUE has built?

Multidisciplinary skill set amongst investigators and researchers that can be applied to different types of project.

Scientists and engineers with the confidence to lead bids to EPSRC.

And how, if at all, do the answers to these questions influence what we* do in the future?

We – me – Apply the broad range of issues examined by the SUE consortia to the problems of sustainability in my discipline area. (Responsive mode).

We – us – Extend the SUE ideas to the wider EU context – review what we think we have learned in the changed economic climate – the world is different! Or is it?

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 1 Individual response sheets

SUE: a cohort or a community? Cohort ☒ **Community** ☐ (please tick as appropriate)

Where is the coherence amongst those funded by SUE?

Coherence is with the privileged who have moved from a "silo" research in 2001 to a situation where a much deeper understanding of the inter-relationships and interactions with other disciplines in 2010. A connectivity with other disciplines to crucially develop true sustainability has only come about by the cross-disciplinary discussion, debate, knowledge transfer.

What is the nature of the research capacity that SUE has built?

The creation of a common language and research skills which are, for the success of researching sustainability, made generic such as modeling, analysis frameworks, gis, database survey designs, methodological approaches.

And how, if at all, do the answers to these questions influence what we* do in the future?

It is only in the recent 2 years I have felt really comfortable in the multidisciplinary research environment as is the case with my colleagues. Future research should capitalise and continue to nurture and develop. To give up funding now will be a lost opportunity.

session 2

What hasn't SUE done? (What is the unfinished business beyond SUE?)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Personally: Engage the international community (SUEI)
              More time to finish work
              Build a convincing business case for sustainability

Consortium: Investigated a wider range of technical/managerial (process) issue – limited by funding
              Got follow up funding to take IDCOP outputs higher
              SUE II to the wider decision making community
              - IDCOP identified the business; SUE2 proposed a range of solutions

Personally ☐   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Personally: I don't need a consortium to do this

              Making a real difference to my stakeholder group (FM's and building managers/users) in terms of
              the business case for sustainability)

              -   efficacy
              -   reliability - measuring/evaluating/managing.
              -   M/C etc

SUE: How does sustainability fit with energy/climate change debate?

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done *(more of)* in SUE that you didn't?

- More outreach work with groups of practitioners (workshop) <u>after</u> the project finished and more dissemination through project and other agencies' website and CABE

- more dissemination through internal conferences (beyond our disciplinary area) after completion of the research programme

- perhaps <u>with</u> members of other consorts + clusters

Personally /   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- incorporation of research outcomes into (shared) programmes e.g. planning, urban design, product design

- international comparisons

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Presentation of findings to public and decision makers as video, posters and questionnaires to help people visualise the future sustainable living gauge public response.

More words on sense of place and lifestyles.

Personally ╱   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

SUE communities with longer term need to interface with both physical scientists, engineers and social scientists e.g. efficient vehicles and or sustainable communities – give directions. SUE is start of a long journey.

Personally ╱   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Defined the brief for the SURegen workbench more tightly.

Worked more with SUE 1 and other SUE2 groups to Scope project.

Produced a clear definition of "Sustainability"

Personally /   On behalf of consortium/project **?**   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

SUE could have lead (or been a significant influence) in the change of mindset needed to achieve carbon targets. This is still possible with sufficient organisation.

The problem is even bigger now than 10 years ago – therefore SUE or Son of SUE still has plenty of unfinished business.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Generally <u>did</u> focus on core interests – system view of city region, from env perspective especially.

- Would like simpler set of tools to address system than we did (v. complex, so not easy to forward for other projects outside SUE – it's input differ in SUE2 project)

- Less time in admin/stats etc (more on <u>planning</u>) and more time on science/analysis.

Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Lots of new research questions –

- efficiency is reliance on urban system

- how much/far can engineering take us to SUD (1=Past suggests this is limited to nil gains in tech(?) answer social impact/conservation)

- need for consultation tools for use at strategic scale (e.g. SEA/SA)

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Made a difference to environmental sustainability (C/P)

Engaged effectively with government (local/central)

Been sustained long enough to make a difference (C/P)

Undertaken the initial research we had/or I thought I would be doing (personal)

Funding of stakeholder engagement (in trial but not further)

Personally ☐   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

1.   Work effectively with business and government – to change agendas of key decision makers. Stakeholders have kept a watching eye over our work – but it has not changed practices or their decision making criterion. (C/P)

2.   Focus on best practice abroad. (C/P)

3.   How does SUE relate to climate change?

SUE as a whole

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Be involved in the project from the very start

- Found a way to scan through one to foresee some of the problems start that one main work package had at the end

- Perhaps define the problem differently - and amend the work package differently

- Be involved in the primary research on physical environment/sound scheming before going on to the task of assessment.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- transforming all research to practical solutions

- more work and research to remove the obstacles of "primary research"? before assessment

- find ways to build up or keep the "community" of SUE

- Finding funding or similar SUE

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

We would have devoted more time and effort to research more metrics and measures for equity and social capital respect of urban sustainability.

Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Although there are many (probably too many) measures to urban sustainability some easy-to-use measures are still needed. A "common currency" of measures (though we in our consortium did look at it) is still needed

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Funding to establish say an annual conference (rather similar to the IEH – Department Health Environment MPC community or UTSG) to share outputs to achieve, at an early stage, networking etc. Funding to pay travel and accommodation expenses to allow local authorities to attend the meetings (advisory group, technical, transfer of knowledge events) Opportunities (funding travel and subsistence) for one months work placements for RA.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

To ensure that the community and its cross disciplinary knowledge survives in the future. I honestly believe we have created a new/novel cross disciplinary researchers/engineers/scientists that are our leaders for the future – It would be very sad if we do not continue to establish their careers to enable them to become leaders.

Say 30 EPSRC Advanced Research Fellowships for SUE

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Better respond to research needs of practitioners

Personally ☐   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Personally ☐   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Review of SUE 1 – did reach goals/obj ?

What are main outputs/tools ?

What is impact ? Is this measureable

SUE Digest ?

SUE Centre ?

Personally ☐   Consortium/project ☐   SUE as whole / (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Established across SUE personnel and common understanding of multi/inter/trans-disciplinary working – its benefits and challenges/drawbacks

Established across SUE personnel a structure for communication/learning about various projects (better learning from each other en route)

Established across SUE personnel an understanding of the real world landscape of policy/practitioners early on such that activities could have been better targeted for impact e.g. not 50 tools but 3.

Personally ☐   On behalf of consortium/project ☐   SUE /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Culture change in academia such that

1.   non-academic output is valued within academia;

2.   short terms results/impact is part of how research should work (short cycles of learning & feedback – practice based, research)

Culture change in the society – changing user behaviour.

Connecting user behaviour w/ technology.

Personally ☐   Consortium/project ☐   SUE as whole /   (Research Councils)   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Develop more user-facing output for air quality/urban design

- Make more significant forward strides in urban air quality modelling (deepening discipline knowledge)

- Personally, I would have liked to have seen the opportunities for trans disciplinary work earlier.

- Also personally, I'd liked to have developed a deeper understanding of multi criteria assessment

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

1. More generalised results on impact of urban design on air quality.

2. Urban change dynamics – 10 – 100 yr timescales.

3. Cities in their wider context.

4. Investigation of air in place.

Personally /   Consortium/project ?   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

SUE waste 2, had it proceeded would have solved many outstanding problems on waste that had changed in the time of the programme e.g. the technology and strategy for handling SRF (Solid Recovered Fuel) derived from waste. This is now becoming available in millions of tonnes but has not been studied properly. On the other hand, our activity on Intrawise (PURE2) is very satisfactory.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

The topics specified by Peter Braithwaite as the key challenges for SUE leave Energy and Waste in an <u>Urban</u> context largely ignored by current EPSRC programmes. These should both be addressed in the new Grand Challenge era. The other neglected topic is how should Urban Society survive within environmental limits due to Earth Capacity to meet needs and Population Growth.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Explore how policy makers across a range of areas relating to sustainability have or have not interpreted sustainability in policies and how these have been connected together.

Examine how different tempo-spatial dynamics affect the implementation of submitted projects.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- Developing a broad conception of sustainability that integrates technical and social scientific aspects.

- Blue-sky's thinking – where are the big ideas to integrate broad aspects of SUE's work?

Personally /   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Be able to employ industrial partners' staff on the project who had knowledge and/or skills to contribute to the project but who were constrained by workload or £s.

Personally / On behalf of consortium/project ☐ (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Subjects – detailed map of the urban redevelopment processes and where sustainable development decisions are most influential for environmental change.

Skill – capturing how to manage multi & trans disciplinary projects.

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Applied the work from two of the research teams to that of one of the others, i.e. feedback & reiterated some of the work.

Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- In waste research, the application of thermal technologies to real urban situations

- Advance the understanding of human attitudes and behaviour towards waste

- Apply research to a "resource management" mindset/paradigm

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Certain "pillars" (i.e. economic) were not addressed as well as they might be, due to the expertise on the team.

Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

A true interdisciplinary community is still to be developed.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Broaden out scope to allow other aspects such as climate change to be considered.

- Interact with disciplines across areas to draw lessons learnt back into areas where I have greatest influence/more effectively influence

- Learn/understand language used and modes of operation (methods) quicker (if possible)

- Draw from international research more.

Personally ☐   On behalf of consortium/project ☐   Both   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

To produce impact of work, taking what is now mature findings and using these to make actual change where it counts.

- funding for SUE type companies

- dissemination at key points to make impact

- effective influence of policy that matters

- other area e.g. climate change.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

> With hindsight, what would you like to have done in SUE that you didn't?
>
> Explored cross-consortium synergies, experiences.
>
> Engaged someone expert in dissemination to all levels of governance earlier on (from the start).
>
> Met as a community and been valued as a resource (e.g. being called upon to input into policy/best practice)… which needs a champion/coordinator.
>
>
> Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

> What other unfinished business do you think there is from SUE?
>
>
> Making the final impact – influencing governance (e.g. of underground space as a whole)
>
> Integrate with climate change, RELU, and other EPSRC agenda.
>
>
> Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

1) As a PI on a Sue III Project – some of the issues (LVP, complexity etc) hopefully will be dealt with in that.

2) Find out what any cohort members were doing.

3) Work more closely with the other "social scientists" involved in other SUE projects.

Personally / 1) 3)   On behalf of consortium/project / 2)   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

The literature from other related fields (e.g. complex adaptive management of Complex System) was not as developed when SUE started…. SUE itself is an evolving organisation but is it complexly related to other evolving entities – further as this is a process rather than a state the business in forever unfinished.

Personally /   Consortium/project /   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Developed a more "hands on" action research type of endeavour that might more practically lock in the cross disciplinary approach.

I.e. in a "live" regeneration project this would feed back into teaching as well.

Opportunity for placements

Personally /   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Develop forms of dissemination or arena-setting around urbanism/urbanist.

Disseminate more fully into PB/UGANDA teaching programmes & CPD

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Linked up and connected the knowledge in our consortium

- Spent more time making sense of the whole

- As a PI more time decision making

- More time internationally

- Had a SUE conference

- Get more press coverage

Personally / On behalf of consortium/project / (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- Form a SUE perspective management and maintenance of urban environments for sustainability

- Conceptual mapping of the key agendas and translate them for access by decision makers

- Reassessment of "sustainability" measures now

- Understanding how this all links back to energy Blue-Sky knowledge in disciplines.

Personally / Consortium/project ☐ SUE as whole / (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

From the point of view of my consortium (SUE Waste) I think we did everything we said we would and more. We addressed some key scientific questions and engaged with policy makers. All in all it was a pretty good outcome.

Personally /   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Test effectiveness of interventions in practice. Take account of eroding science and technology on attitudes to waste reduction/management. Holistic case study.

Personally /   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

1. Combined with the research/developed it further.

2. Linked/communicated better with stakeholders in industry (the 'doers')

Personally **1**   On behalf of consortium/project **2**   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- Sustainability is not finished. It is a "process" not an "end point". Therefore, as the context changes so does the process (3)

- Develop a comprehensive "platform" on sustainability (3)

- Continue research into relationship of urban crime and fear of crime with quality of life in cities and development of systems designed to improve things (1)

Personally **1**   Consortium/project **2**   SUE as whole **/**   **3**   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

> With hindsight, what would you like to have done in SUE that you didn't?
>
> (1)   More research less coordinating
>
> (2)   Been able to show the model before the project is finished – for the duration of the project we were always showing people what we were going to do – the final product (software) was only finished at the end of.
>
>
>
> Personally /   (1) On behalf of consortium/project **/ (2)**   (please tick as appropriate)

> What other unfinished business do you think there is from SUE?
>
> (1)   Some mechanism to "tie" the individual projects together.
>
> (2)   There is always unfinished research! A means to tie up loose ends.
>
>
>
> Personally ☐   Consortium/project (2)   SUE as whole (3)   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Started the research on the fundamental building blocks, which formed the "wall" built by the project, at a much earlier stage. Too much time was spent on general discussions.

- Whilst we had regular stakeholder meetings and workshops, outreach could have been better.

- Better addressed the sometime mismatch between short term requirements of stakeholders to solve today's problems and the research focus on tomorrow's problems.

Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- The engagement of decision making stakeholders to the extent that they have sufficient ownership of the results to act on them

- Direct engagement of the public could encourage politicians to act, but this has risks and requires a degree of professionalism not currently available.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Got planners (town) involved earlier on

- Somehow, got better feedback/interaction on tool development

Personally ☐   On behalf of consortium/project / **(ASP1)**   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- integration/distillation of results

- profile raising of research and researchers

- users forum (use pull rather than research push)

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

> With hindsight, what would you like to have done in SUE that you didn't?
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>
> Personally ☐   On behalf of consortium/project ☐   (please tick as appropriate)

> What other unfinished business do you think there is from SUE?
>
> - effective and more extensive knowledge exchange/marketing of benefits to potential customers
>
> - investigate how results/benefits can be used by intermediaries ref above
>
>
>
>
> Personally ☐   Consortium/project ☐   SUE as whole **/**   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- more industrial drive or from others (i.e. not academia)

- ensure end users

- enhance likelihood of continuation (beyond funding)

- more equal collaboration (end tool is heavy in some area, light in others)

Personally ☐   On behalf of consortium/project /   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- promotion of work

- "fine tuning" of outputs – they really aren't ready for the public

- If you want models/tools as outputs then need to understand the consequences otherwise they'll stop and die.

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Spend more time interacting with colleagues (a) from partner institutions and (b) from the wider SUE network. Would require refocusing of budgets at project inception.

Personally / On behalf of consortium/project ☐ (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Explicitly address communication/dissemination strategy for the SUE programme (and component projects). More attention required on the interface with policy makers and delivery agencies, in addition with project partners.

Integration with European research programmes ??

Personally / Consortium/project / SUE as whole / (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- look at examples of research – user channels that are used in other countries/other settings

- get summary of "energy policy issues" (maybe in just one sector as a test) and for which SUE may be relevant and investigate how to get SUE known to this.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Testing of research ideas/tools/model

Follow real situation

Making better links/synergies with other bodies of relevant research – e.g. that commissioned by DEFRA/CLG/DfT and so on.

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Got to grips with the <u>recursive</u> process of knowledge generation, transfer and use (something of a holy grail) – rather than what, overall, was a one way innovation – application process.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Turning the capacity produced by SUE into a sustainable community of urban sustainability researchers.

Developing further that capacity.

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- More work with other consortia – e.g. exchanges

- Visits to other projects' case study areas

- Riskier work with local communities

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- A good and easy to use book of best/good practice examples of urban regeneration

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

1. Interacted even more with other consortia.

2. Worked with real social scientist who could speak language I could understand.

3. Had the resources to focus on dissemination to practitioners/regulators/the public that which was of interest to them in a language they could understand.

4. Taken the software beyond the pilot stage.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

1. Successful dissemination and engagement with the non-academic community so that we really influenced urban design.

2. Changing people's behaviours, but this is not a sustainability specific issue.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Can't think of anything, but that with more time we would've been able to better assess the actual impact of our work; developed more minimum standards and accessibility etc.

Personally / On behalf of consortium/project ☐ (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Evaluate the impact of SUE on:

- policy

- business

- SUE community

- Urban community

Personally ☐ Consortium/project ☐ SUE as whole / (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- disseminated better information about research via University website – time pressure prevented this

- Published (some) papers faster – again competing time pressures prevented this

- Taken a more European perspective - there are some framework projects that might have "added value" to research

- Worked more closely with "third sector"

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- overview of ideas/outcomes need to be published

- more research papers still to be published even from SUE 1

- time impact of SUE research will not be obvious (or even properly measurable) for another decade

- research ideas/outcomes need to be translated into policy and strategy.

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

More practical projects

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Convergence summary of all projects

What overall advice can now be offered? And to whom?

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Real international comparisons – EPSRC often appears to be (too) unfocused.

More new collaborations – didn't get to meet many non-academic collaborators from other parts of the country.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Probably still a case for more knowledge exchange – have we asked what our local partners thought about the SUE experience?

Needs more on dissemination.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- clumps of outsider industry/practitioners participating/visiting various projects – as guinea pig assessors.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- Call 3!

- Digest the individual research outputs into a format accessible and appropriate to industry and non-academics

- Tracking long term outcomes

- the interpretation task

Personally /   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

- Worked more with other consortia on developing outputs (e.g. collaborations on conference papers, academic articles).

- Knowledge exchange with project partners more effectively (making secondments/placements better for 2-way learning)

- Worked more closely with other disciplines/CIS on my projects

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

- SUE induction days within/between projects (similar to a SUE module for all team members)

- SUE book (edited)

- "SUE The Musical" ☺

- Creating international SUE centre & linking them up.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

> With hindsight, what would you like to have done in SUE that you didn't?
>
> Had information databases available for testing new tools earlier, e.g. SUE framework did not have real data until the end of the project. Develop case studies earlier – may have needed stronger support of industry partners.
>
> Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

> What other unfinished business do you think there is from SUE?
>
> Dissemination to the wider construction industry to make a change.
>
> Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Not had funding (yet!). Already wished that I had longer to nurture stakeholder relationships when putting funding bid together. I expect this will follow if we get funding.

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

"Technology translator" role – funding for taking research finding and producing outputs targeted at particular user communities.

Build in "client" (stakeholder) managers into projects to keep them on board.

Personally /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Finish the job !

Reach out more effectively to end-users.

Brought about lasting change?

Personally /   On behalf of consortium/project ☐   (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Answering the questions that have been raised.

Changing policy and practice on a large scale (does this matter?)

Identifying a way forward – what are the next questions?

Challenging the way research is assessed.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 2 Individual response sheets

What hasn't SUE done?

With hindsight, what would you like to have done in SUE that you didn't?

Attended more presentations by other consortia.

Searched SUE website for partners properly.

Formalised more links with data providers in LA's

- funding their time

- defined project role

Personally / On behalf of consortium/project ☐ (please tick as appropriate)

What other unfinished business do you think there is from SUE?

Dissemination through high profile practitioner publications

Targeted political dissemination at SUE level, not consortia

Greater links with sustainability NGO's...

- Dissemination post project

- Testing long term effectiveness of solutions

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

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session 3

Beyond the boundaries of SUE, what are our big ideas?

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Establish multidisciplinary centres to teach sustainable urban environments as an undergraduate subject and post grads plus being research centres.

The two main resources for further research could be "sustainable technologies and built env" and "behavioural classes" (both are interrelated).

And what big ideas should we use it to tackle next?

- (See above) and real life UK dissemination projects and rolling out research internationally to show it is a leader and to have a bigger global impact on improving sustainability.

- More public interaction and engagement with via demonstration projects and video simulations to find out how to investigate and apply SUE research. If public take up technologies and lifestyles it will tend to lead policy – explore how to facilitate roll out of technologies and infrastructure funding and pricing policies.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- Opportunity to transfer/adapt outcomes of SUE to other contexts, including less developed and newly industrialised countries.

- Embed outcomes and further questions for SUE in learning/teaching, including professional studies

- Action research concerning application of ICE reports down to the very local min level.

And what big ideas should we use it to tackle next?

Whatever urban sustainability problems/issues emerge

- award priorities for urban governance in 2010 and beyond, might include

- age-friendly cities

- addressing context of recession/econ recovery

- widening participants in place-shaping (e.g. having case studies to test and develop SUE outcomes and assess their impact

- what should the criteria be for design, planning and generally?

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- There is a need to have a stronger/more detailed expression of what the key problems are (stakeholders to be highly engaged in this) and the way the capability/tool etc developed to these patterns.

- Then decide what problems can be tackled with available resources/capabilities (prioritise) to where new resources/capabilities are required.

- To what extent is research capacity developer in SUE applicable to developing centres, where sustainable city problems are more acute than UK?

And what big ideas should we use it to tackle next?

- Potential of green technology in delivery – SD

- Resilience and sustainability (not limited to climate CO_2)

- Linking stakeholder accessible system models to integrated appraisal tools for scenario exploration/evaluation

- Orientation of system models developed to more fundamental measures of SD – e.g. ecosystem services, "happiness" (not GDP – gross domestic product)

- Equity by environmental quality, social inclusion, happiness

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Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Test and legitimise

Use the science to interact with society and <u>legitimise</u> our scientific findings. If we stay in our ivory towers we are only producing ideologies.

Design processes of social change.

And what big ideas should we use it to tackle next?

Transitions to resource efficiency and resilience to global environmental hazards.

Develop effective model of interaction between society, science and politics – develop ownership.

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Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

I agree that there is a lot of value for a new "discipline of sustainability" we have this year relaunched Civil Engineering @ Newcastle in the context of sustainability. I believe sustainability is to be embedded as a concept or as a science, but one which essentially feeds on the fundamentals of core disciplines – the healthy situation is for the two to coexist moving to team research which delivers the survivor. Speaking generally early calls of SUE have concentrated on the fundamental understanding of the disciplines and their interrelationship – researching and addressing the limitations of the models, tools, methodological approaches and analysis frameworks to build the capacity to assess the interrelationships (which are complex). The community is now at the point where they "can begin to fly". Using the knowledge skills and common language, tools etc to start to look at supply, demand and began to look at "conservation of resources" (energy, resources etc) to deliver sustainability.

And what big ideas should we use it to tackle next?

SUE so far has been parochial; city level. We need to move to regional and national level to understand which components achieve added value at which spatial scale of the "added value" @ spatial level in fact will be optimal at different timescales – leading to a hugely complex system – however this research needs to result in something that is simplified to be practical and provide necessary high impact.

PS: the discussion is going too well to comment on a relatively small issue – so doing it here.

Outputs from SUE form a spectrum of knowledge and skills. The mechanism for delivering knowledge transfer will be different and the choice of the "media for knowledge transfer" is crucial to the success.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- Form a SUE group to build the cohort/community and strengthen it.

- Find ways to improve challenge between the outcome of the projects

- Find ways to exploit the research done – (other than knowledge transfer) – for example – look at the 51 tools and see what we could do to at least impose one in <u>use</u>

- Find a forum to discuss the "gaps" and what we haven't tackled

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And what big ideas should we use it to tackle next?

- forensic proofing

- What for now? For the current

- Find larger remits perhaps emanating from "policies" to integrate

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

That is assuming that there is a research community built by SUE – I rather thought that SUE was about bringing together diverse and dispersed research communities to bring them to bear on "Grand Issues"… maybe, thus, this bringing together (or trans/interdisciplinary) is a "new" research community.

And what big ideas should we use it to tackle next?

Sustainable urban environments…! This is a rolling, ongoing issue from which we should not be deflected. Further the "bringing together" process, bring in other expert, social psychology, planning, "real" sociologists, futures people, et al. Maybe SUE should become a cross-research council programme?

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Towards large scale, high profile partnership projects with local/national government (or perhaps earlier). Clear remit for delivering impact.

Large risks – need to be managed.

- Defined scope

- Rules of engagement

- Academic outputs – (audited at all levels of assessment RAE etc)

- Bias/credibility and interpretation

And what big ideas should we use it to tackle next?

Asking those @ front line, leading practitioners first

Roadmap to more sustainable cities… for each major UK city

Question -   is broad integration across the SUE disciplines a viable academic career path? Better placed as project management/combination role, just as valid.

Big ideas/next steps

Should we formalise SUE as discipline or in some way increase profile

Impact

Academic research

Need for focus on how we can integrate across – methods for works and facilities.

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

> Where next should we take the research capacity built by the SUE programme?
>
> Take the 5 "big hit" ideas/findings to date and develop them on to the point of application, using the capacity built.
>
> For the next stage, continue with multidisciplinary consortia, but no more than 5 universities in any one consortia.

> And what big ideas should we use it to tackle next?
>
> I do not have sufficient knowledge of the whole programme to specify what the big ideas are, but they should encompass:
>
> -   energy minimalisation – metrics and regens
>
> -   sustainable living – transport, utilities (electricity/heat water waste)
>
> -   social inclusion and political systems
>
> -I agree with the William Pownie proposal for a "sustainable urban science" as a interdisciplinary approach to the subject scope. This will give identity and help present SUE to the outside world. Also agree with:
>
> -   Have not solved the "scale" issues
>
> -   Should express findings in (a) risk reduction and (b) economic terms (value for money, NPV, IRR etc)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

1.   Into practice

And what big ideas should we use it to tackle next?

Designing a city:

    a)   to demonstrate our ignorance and

    b)   to demonstrate the great range of (often conflicting) views that exist.

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

    To someone/body who wants it

-        Address the research supply/demand balance.

    To those who might be persuaded that they really do need it.

And what big ideas should we use it to tackle next?

-        Urban dysfunctionality

-        Global urbanisation

But it is time to think of SUE as a useful elderly aunt and look for some new relationships… at risk of SUE becoming genetically interbred.

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Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Towards a more international context – more sharing of experience would be beneficial.

Look at the relationship between research and teaching – is there scope for an MSc in SUE.

What is the capacity of the non-academic sector for research?

And what big ideas should we use it to tackle next?

Rural/urban interaction seems to be important.

What is the relationship between SUE and RELU?

Sustainable international development is a hot topic – can one bring the SUE experience to this debate?

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Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Simply – roll SUE forward to apply its capacity to the existing/new research problems relating to achieving sustainable urban environments – key is (i) to identify such problems in a way that encourages cutting edge research and (ii) to keep SUE energised and reinfused with a mix of existing and new members.

And what big ideas should we use it to tackle next?

- the recursive relationship between the social and the technical in the urban environment.

- One example (of personal interest but of fundamental importance) is the way that <u>value</u>* is created managed and distributed through the urban environment.

- * <u>not</u> cost minimisation of delivering a given functional performance (so called "value" engineering).

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- Another round of funding!

- Higher number of small consortia

- Force consortia to "mix it a bit" – scope – partners

- More exciting proposals

- Not just the same stuff repackaged

- Don't force consortia into some group scheme – book – group model/tool

- Do provide opportunity/assistance to do above if desired either solely/collectively

And what big ideas should we use it to tackle next?

Have we successfully overcome the small ideas?

Ensuring sustainability in leaner times

By the time it's done will it still be relevant?

Promoting the positives of sustainability today – not just the benefits of tomorrow.

The big idea has to be the big change – mass movement from rural to urban and massive population increase. –

Social issues: overcrowding, water/food not just urban also food production sustainability.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

As well as the research and research capacity built by SUE, we have also developed useful knowledge about process, this must be fed back to EPSRC/RCUK – surely we are a significant body with a reasonably coherent message.

Of course, the research capacity should be taken forward into the next series of research and also out to practitioners but we still need to bring that knowledge from practice back into research.

And what big ideas should we use it to tackle next?

We must still tackle how to actually apply the research to practice.

We could better address the human dimension – how people actually interact with their urban spaces and what they want.

We could focus on equity of opportunity in terms of access to the services offered by urban areas.

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

What about input into "real jobs"?

Find a mechanism to work with (probably) consultants, local authorities

…. A consultancy portal?

(some) practitioners are very interested in our expertise, but find us very inaccessible.

And what big ideas should we use it to tackle next?

How to influence and <u>change</u>:

Planning and policy

Personal and institutional behaviours

…..

Undergrad programmes?

SUE as undergrad programme – civil engineering has different core disciplines

Used in physics, fluid mechanics

Integration in construction management.

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- Consolidate and promote a new research and practice community

- Invent a new scientific discipline (Science of Sustainable Urban Living? SUE science – analogous to web science or complexity science)

- Develop strong and focused international links

- Focus on agreeing what is meant by high quality academic outputs in this field and produce them.

And what big ideas should we use it to tackle next?

- improving the built environment from both sustainability and quality of life

- what do we mean by a high quality of built environment? Are we agreed? If so, whey don't we always achieve it?

- "Barriers to sustainability" (stated at the recent ESRC (EPSRC call) – sound, attitudes, inequality, developer behaviour, financial consideration, etc.

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- Individual ideas and concepts need to be brought together into larger-slave, longitudinal case studies e.g. an entire estate or suburb should be used as a "test site" (integration)

- More researchers should be developed: CO-I's developed into PIs etc (general succession planning)

- Existing SUE ideas and concepts should be brought together

NB regardless of what anyone may say, I do <u>not</u> believe that anyone has designed sustainable city or redesigned a city to be sustainable – the surface has been scratched at best.

And what big ideas should we use it to tackle next?

- The ultimate grand challenges:

- Take a whole city that needs regeneration, apply the "best" of the SUE ideas and redesign and build a sustainable urban environment (not forgetting: quality of life, liveability, green space, leisure, industry, schools etc). This will require genuine collaboration between academics, local authorities etc (redesign a city to be sustainable)

- Then build a new urban area from scratch! (Using SUE concepts)

(* cities are dynamic entities and people modify them constantly)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

The urban/rural interface as a key component of a sustainable future/city.

And what big ideas should we use it to tackle next?

1. That in a future warmer UK where dwellings are more thoroughly insulated the risk of overheating in homes will be greater (threatening the young and old).

2. The extent to which behaviour change * can/will make an <u>enduring</u> contribution to reducing demand

   for energy/for all our needs) and so reducing carbon emissions. (This could examine both direct and

   indirect carbon emissions).

   * Rather than new technology.

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Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Consideration of the SUE research capacity through activation of funding (focused) for young SUE researchers.
Develop research pathways for the next 5 – 10 years to embed the capacity (embryonic) which has been created.

And what big ideas should we use it to tackle next?

Linkage between societal needs and personal motivations. Alignment. The key to behavioural and attitudinal change. Communication (even advocacy) will be part of this. Moving from "what" to "how" (with "why" as a constant foundation, evolving).

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Engagement: -   with decision makers

-    with specific projects

-    implementation of low carbon commitments

-    monitoring of performance, "does the community work?" Is it low carbon?

And what big ideas should we use it to tackle next?

Profile engagement -   Iconic projects

Working with local authorities – eco towns etc

Working with companies – Watel, Arups etc

Working with media top profile exemplar projects

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

> Where next should we take the research capacity built by the SUE programme?
>
> We need to "translate" current findings and tools to "usable" form to make these usable by practitioners.
>
> We also need to link up with international work/networks to validate/contextualise the findings.

> And what big ideas should we use it to tackle next?
>
> Work with local authorities to aid in the creation of low-carbon transition towns.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

To a wider audience.

And what big ideas should we use it to tackle next?

Urbanisation issues (IMO) over Europe (and the world) placing the UK into a context of northern Europe and contrasting with southern Europe would be useful – energy provision (for example) issues.

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Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

I'm not sure we should "take" the research capacity anywhere – I <u>hope</u> that the research capacity (our reshaped vision of our research agenda, our trained researchers our ambitions) will <u>take us</u> on a ten year research path of fun and discovery.

And what big ideas should we use it to tackle next?

Megacities

Decadal-to-centennial change (climate, food, population pressures)

The city and its region(s)

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Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Looking at cross-discipline issues related to major developing cities, to include surface/below ground interactions, and how to develop cities to provide quality of life for all.

And what big ideas should we use it to tackle next?

How to feed large urban communities sustainably and avoid food waste

Investigate urban growths to avoid social conflict.

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Work to disseminate to practitioners – the next stage of impact

Engage internationally across Europe and beyond – draw in research from outside UK more.

Training/education to build up the community – profession/students etc.

      -include professional institutions across all areas etc – more from silos

Emailing to communicate

And what big ideas should we use it to tackle next?

Broaden out to encompass all aspects that interact with urban environments against growth of the city/urban populations – climate, energy, rural settings, security of supply (e.g. food)

Interconnection above ground to below ground to allow substantial use of all domains with urban environments

Increase capacity of urban systems for small investment now.

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

To other issues that could benefit from the multidisciplinary approach – climate change, energy, health etc.

Effective public engagement in the debate to "buy in" from the other user community.

"Stimulate"

TV !!! Senior media fellowship

BBC documentary

And what big ideas should we use it to tackle next?

Climate change, energy, healthcare, governance.

Finance, insurance, investors etc

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Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Totality those who can make use of it – designers/planners/regulators/city engineers/managers. Need for engagement with users seems unpopular, but is essential (especially in the current climate) if the capacity is to be used. Take the mountain to Mohammed.

Integrate the SUE approach into education, so that the "upcoming generation" take it as read that the integrated approach is the norm.

And what big ideas should we use it to tackle next?

Continue to integrate, especially with the use of the social/behavioral science "end" to defend how to achieve the improvements identified as possible/desirable by the environmental scientists /architects/planners.

The Ankh-Morpark effect – extent of city's influence on surroundings, (e.g. food and energy security, exporting waste, pollution).

How do we (should we?) avoid a free market future and achieve the "new sustainability" future?

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- continue collaboration and exploit the "freedom" of designing research without a "strict" programme framework.

- Provide environment for knowledge exchange/communication by building to continue/expound on collaboration.

- "Invest" in-house to improve a continuous influx of new blood/new ideas.

And what big ideas should we use it to tackle next?

Better understand policy – science relationship

Behavioural change – mechanisms of and approaches to policy instruments?

Science and practitioners (not decision makers) – how to train/affect behaviour change among professionals.

Sustainable Urban Environments:
Research Dialogues Workshop

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

To the urban grand challenges

World's grand challenges also

But our capacity is SUE related

We know how to engage, influence across disciplines… and <u>there</u> is unfinished business.

Impact

Potential

Exponential ability to make an impact

Time

And what big ideas should we use it to tackle next?

Solving the tricky (wicked) problems

- changing individual behaviour

- making a difference to thinking

- making a difference to practice

And we list many

Sustainable Urban Environments:
Research Dialogues Workshop

Sustainable Urban Environments:
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Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Disseminate, apply, embed our work and ideas

Particularly the integration dimension

- in practice

- in media

- in teaching

And what big ideas should we use it to tackle next?

Food security urban agriculture – how might we approach this in complex urban environments

Not only because of its importance in relation to peak oil etc, but also for its contribution to social and economic sustainability.

Sustainable Urban Environments: Research Dialogues Workshop

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Further collaboration with Medical Research Ccouncil (well being)

International SUE network

Scholar/researcher exchange between projects

Secondments with industry

SUE teaching module

And what big ideas should we use it to tackle next?

Food & SUE

Climate change

Policy writing with policy makers

Sustainable Urban Environments: Research Dialogues Workshop

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Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Sustainable energy in cities needs to be brought up to date e.g. Denmark, Sweden, Germany etc. have already set up efficient district heating systems. The UK relied on North Sea Gas and oil instead. The scene has now changed and we need a strategy to follow Scandinavian lead with a major thrust on Combined Heat and Power / District Heating. This is a huge task and Grand Challenge for SUE. The work includes technology, waste management, local and national government, public perceptions… in fact virtually all aspects of SUE activities.

And what big ideas should we use it to tackle next?

See above. The UK faces fuel poverty, CO_2 emission problems (i.e. carbon footprint), pollution (especially sub-micron particles), lack of government lead, excessive population…

We need to address "limits to growth"

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Back into education – how can the cross disciplinary making enrich learning in individual professions?

Steve's reminder of Egan's skills for sustainability was timely – but the Academy was a total flop – why?

It's a great idea which floundered through being too generic.

And what big ideas should we use it to tackle next?

To the suburbs SSUE (with a stutter?)

- environmental equity (as the next step on from environmental justice)

- * Talk to Richard Lorch (from Building Research & Information – BRI) about his ideas for a "new scientist" type journal for sustainable built environment

I'll introduce you if you want?

Sustainable Urban Environments: Research Dialogues Workshop

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

Does capacity = capability

(Considerable variation in research quality of outputs)

SUE only involves a small part of the capacity available in the UK. The question should relate only to funding opportunities and should not assume that the SUE community as it presently exists should continue.

And what big ideas should we use it to tackle next?

Integrated projects with multi source funding. (e.g. DfT/EPSRC)

- funding based on an integrated bit led by the cities (i.e. give stakeholder ownership)

- contract ensures basis for data collection/system development/deployment etc

- could be two stage process with some funding for a Pilot/Inception/Detailed Bid stage.

- Long term to ensure completeness of research outputs.

- (EC CIVITAS type approach which has been very successful in stakeholder take up, but research timescale is too short)

Sustainable Urban Environments: Research Dialogues Workshop

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- We clearly do need to support and retain it

- Especially important is the multi-disciple/consortium working/leading capacity (almost as important at the SUE capacity)

- SUE Fellowships   - SUE industrial chairs

- SUE research Chairs   - Sue for studentships

- Advanced fellows

And what big ideas should we use it to tackle next?

- Integration still seems key to me – need work on systematic evaluation of linkages, synergies and antagonisms – wrong word – between subjects/concepts, solutions

- Scale: small is beautiful or big is best?

Sustainable Urban Environments: Research Dialogues Workshop

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

And what big ideas should we use it to tackle next?

Changing end-use/chooser/decision maker behaviour (by design)

No matter how clever the ideas and gizmos developed by SUE, if there is no market to pull there will be no real impact. We need to understand the levels and mechanisms that can be pulled/affected to change behaviour to be more sustainable.

Sustainable Urban Environments: Research Dialogues Workshop

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

- Set-up an institute for urbanism

- Use it to raise funds to support research roadmap projects to develop wider SUE research strategy

And what big ideas should we use it to tackle next?

- Some living laboratory experiments in real communities

- Delivering the research strategy with both private and public funding

Sustainable Urban Environments: Research Dialogues Workshop

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Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

SUE4 and programme MGT (e.g. support network building, agree and realise joint tasks (objects))

And what big ideas should we use it to tackle next?

- Construct narrative from SUE 1-3 findings e.g. agreements, disagreements, how these relate to pilots.

- Relate to non-SUE research locally and abroad

- Agree plan to tackle knowledge gaps or disagreements = Aim to speak with one voice when addressing policy community and our silo-peers.

Sustainable Urban Environments: Research Dialogues Workshop

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Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the research capacity built by the SUE programme?

SUE Centre? Start building international links

First need real in depth analysis, distilling and collation of knowledge.

Create a SUE "body of knowledge"/reference.

Capacity is in the people as well as the tools/outputs.

Ensure they maintain a community – research symposium/conference?

And what big ideas should we use it to tackle next?

International scale/links

Must answer lessons learnt for SUE3 + <u>beyond</u>

Create SUE advocates/champions

Raising profile of SUE

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 3 Individual response sheets

Beyond the boundaries of SUE

Where next should we take the <u>research capacity</u> built by the SUE programme?

The <u>research</u> itself

Out to the audiences and end users that SUE believes this to be useful for – with the researchers to help them interpret them

The research capacity

Into major secondment and exchange programme so that researchers are placed in policy and practitioner settings for 3 – 6 months so they get a flavour of these operating environments.

And what big ideas should we use it to tackle next?

- No new big ideas until we have cracked how to get proper use from the first round of SUE research.

- Only where appropriate to the subject matter: get researchers to work with their own University estates to implement their recommendations

- Ask industry and local authorities what THEY need.

Sustainable Urban Environments: Research Dialogues Workshop

session 4

Impact! What overall impact have we had and could we have?

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Short term there was a lot of disseminating interest, links with stakeholders but this hasn't persisted, to my knowledge, aside possibly through academic literature and the book of the project. Perhaps guidance documents in CL:AIRE were of general impact, but not aware of any evidence.

Personally ☐   Consortium/project **/**   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

The work maybe hasn't been translated to stakeholders as well as it might (presuming it was any use in the first place). If it's not there now then I don't think anything can be done now to push it up stakeholders' agendas. Perhaps aside from some individual impacts the work has acted as background for current work, and it is this latter that should be developed in terms of impact.

Personally ☐   Consortium/project **/**   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

The project has developed a new methodology/framework under which researchers and industry can work to achieve sustainable options and decide upon which options are most sustainable – hopefully these researchers will continue with this approach when they move on.

Personally ☐   Consortium/project **/**   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

Firstly – continued effort to spread the word – the approach. <u>But</u> as mentioned in the morning session – this should be done in conjunction with industry to prevent the wheel being reinvented.

Personally ☐   Consortium/project **/**   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

One way is for the individuals involved in the projects to continue with the ideas they have learned and used.

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had? *

My <u>DISTILLATE Guidance for Partnership Working</u> (see www.distillate.ac.uk) has been cited as reading for local authority practitioners in the LTP3 guidance doc from IDFFT ....for me, this is very good output impact – but it needs to be followed up to outcome. Oh and my RA on "my" Sue 1 is now lecturer on social policy and the environment...that probably is leading to impact

Personally   /   Consortium/project   /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

...Lots! Much much more. An understanding/mapping of cumulative output (and eventually outcome) in specific sectoral areas and geographic regions could be evaluated – maybe as an add-on project.

Personally ☐   Consortium/project ☐   SUE as whole   /   (please tick as appropriate)

And how do we achieve this?

We could do with a data base of projects, project outputs and their impacts. This would give us a 2010 baseline on which to carry out the 10 year evaluation of SUE(I, II and III) in maybe 2020.

Personally   /   Consortium/project   /   SUE as whole   /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

1.Contribution to capability of WLC Ltd (two SUE researchers are directors. 2.Large number of publications.
3.Two international conferences on sustainability assessment and a third being planned.

1.Invitation to become a member of a SUE consortium. 2.Development of pilot commercial software.
2.Contributions to Scottish construction centre's information portal.1.Creation of Scottish sustainable construction network (via SCC and SCF)

Personally **1** Consortium/project **2** SUE as whole **3** (please tick as appropriate)

What further impact should we have??

3.Telling people what we've achieved. 1.Providing consultancy services. 3.Develop and deliver a sustainable urban environments foresighting exercise.

Personally **1** Consortium/project **2** SUE as whole **3** (please tick as appropriate)

And how do we achieve this?

3.Development of elevator pitches and associated fliers. 3.Secondment of researchers into practice (Industrial/research fellowships). 2.Development of a "knowledge pool"/info portal ?Suregen? 3.EPSRC to set aside funding for dissemination of results of projects already completed.

Personally **1** Consortium/project **2** SUE as whole **3** (please tick as appropriate)

Sustainable Urban Environments:
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Extending SUE's impact

What overall impact have we had?

To date SUE has been punching below its weight so far. Impact has been dependent on the activity/enthusiasm of individual researchers/groups. This has been successful in some areas but less so in others.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

What further impact should we have??

SUE will have far more impact if it develops and communicates a coherent message to its audience(s). this perhaps needs a synthesis process/project to interpret the overall message of SUE. This would demonstrate that the whole is greater that the sum of the parts (Synergies).

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Whilst continuing to fund new research, ensure that adequate resources are put in place to maximise the value of the research already carried out. Use "integrators" to identify and distill key messages. Different skill sets.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had?

Understanding common issues for all SUE researchers.

What needs to be done to build a "community".

More networking across SUE network.

Understanding that there is a need for sharing outcomes and gaps

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

What further impact should we have??

Understand the gaps - in research, in methods to integrate.

How to find overreaching issues within the sustainability agenda to integrate ideas and research.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Send pots of funding to sustain the SUE community through networking for future proposals – taking forward research to industry.

To discuss emerging and changing issues of sustainability with social change.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
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Extending SUE's impact

What overall impact have we had?

Academically – developed and published a new model of sustainable housing maintenance.

Stakeholder – model of implementation in social housing. - are implementing the above model with a housing association in SE London.

Student – MSc course for Project Managers/Construction Managers

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

What further impact should we have??

(1) Academically – the learning in IDCOP has informed and been incorporated into new EPSRC/ERSC/TSB Projects – behaviour change tools = CCC.

(2) Stakeholder – exploit the new social housing maintenance model across the whole of the social housing sector.

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

And how do we achieve this?

(1) Already in action
(2) In discussion with venture capital funders to develop proof of concept and beta test software solution. Develop consultancy.

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had?

Raising aspirations of regen professionals in the possibilities of what a decision support tool might be able to do for them.

Personally / Consortium/project / SUE as whole ☐ (please tick as appropriate)

What further impact should we have??

Delivering a decision support tool that meets those raised expectations?

Personally / Consortium/project / SUE as whole ☐ (please tick as appropriate)

And how do we achieve this?

Completing the rapid prototyping and testing in an action research environment.

Personally / Consortium/project / SUE as whole ☐ (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had?

Some awareness of VivaCity our academic awareness and use of vivacity by various project partners, local authorities. Impact on local authorities through personal engagement. 400 researchers trained in valid multi-disciplines.

Personally   **/**   Consortium/project   **/**   SUE as whole   **/**   (please tick as appropriate)

What further impact should we have??

Much more use of research by LGA and central government.
Access/impact on developers and communities in terms of knowledge.

Personally   ☐   Consortium/project   ☐   SUE as whole   **/**   (please tick as appropriate)

And how do we achieve this?

Producing more accessible output.

Doing more with "activators" i.e. community generated groups.

Doing more with business.

Personally   **/**   Consortium/project   **/**   SUE as whole   **/**   (please tick as appropriate)

Sustainable Urban Environments:
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Extending SUE's impact

What overall impact have we had?

On policy and decision making, not much. SUE needs to seek "traction" for the work already done and for that moving forward. "Traction" implies getting outcomes included into decision making and transforming the process and/or outcome.

Personally ☐   Consortium/project /   SUE as whole /   (please tick as appropriate)

What further impact should we have??

Policy setters and decision makers should be making reference back to SUE work. SUE outcomes should be used as one of the main information sources for policy setters and decision makers on urban planning matters. The challenge is to achieve this.

Personally ☐   Consortium/project /   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Work outcomes need to be presented in a way that is packaged and easy to assimilate. As was discussed, the first task is to attract attention – further considerations and evidence can follow. Once "packaged", those involved in decision making at local, regional and central government levels need to be informed and familiarised with the package(s). Be focused on informing people –they will not read or take it up just because it's there. Need to identify targets. Exploit industry partners – but these will not necessarily be the policy formers/decision makers.

Personally /   Consortium/project /   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had?

3 Marginal influence on decision makers for a national level programme.

2 Local value for specific stakeholders (local sections).

Impacts may develop more later.

1 Influenced local transport plan with innovative access control system.

Personally **1**   Consortium/project **2**   SUE as whole **3**   (please tick as appropriate)

What further impact should we have??

Must influence stakeholders with -

Stronger clearer research outputs.

Mechanism to give ownership of outcomes to stakeholders.

Support evidence based decision making.

Personally ☐   Consortium/project **/**   SUE as whole **/**   (please tick as appropriate)

And how do we achieve this?

Give stakeholders/decision makers a greater degree of control. (perhaps/certainly with funding from Government).

This may overcome some of the barriers relating to evidence based decision making.

Personally ☐   Consortium/project **/**   SUE as whole **/**   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had?

Impact on waste management strategy at regional level through project partners and dissemination workshops.
Impact naturally through engagement with Defra's. New technologies programme for biodegradable MSW
Internationally through conferences, workshops and IWWG.

Personally   /   Consortium/project   /   SUE as whole   ☐   (please tick as appropriate)

What further impact should we have??

Technology continues to change. Need to remain engaged with partners and stakeholders to refine strategy and
advice in the light of this. Said for waste, but could apply to other areas.

Personally   /   Consortium/project   /   SUE as whole   /   (please tick as appropriate)

And how do we achieve this?

Continued dialogue, publication in trade and professional journals, consultancy and further research (not
necessarily through SUE)

Personally   /   Consortium/project   /   SUE as whole   /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

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Extending SUE's impact

What overall impact have we had?

3. Raising awareness of the issues.

3. Promoting multi-discipline working.

2 and 3. Engagement with urban stakeholders.

1 and 3. Understanding complex problems.

Personally **1**   Consortium/project **2**   SUE as whole **3**   (please tick as appropriate)

What further impact should we have??

1 and 3. More engagement in "real" projects.

1, 2 and 3. Developing a common approach at the "emergent" level.

1, 2 and 3. Urban stakeholders wanting to work with us on their problems.

Personally **1**   Consortium/project **2**   SUE as whole **3**   (please tick as appropriate)

And how do we achieve this?

3. Get funding for a/some projects requiring implementation.

3. Periodic one or two day conferences with continuity to take forward the development of a common approach.

Personally **1**   Consortium/project **2**   SUE as whole **3**   (please tick as appropriate)

Sustainable Urban Environments:
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Extending SUE's impact

What overall impact have we had?

Surely we represent a significant body of knowledge and experts, even if we are not recognised from outside as an entity we have a useful network of personal contacts and this can be used to impact the partners that we have access to and contact with.

Personally ☐ Consortium/project ☐ SUE as whole / (please tick as appropriate)

What further impact should we have??

We have a wealth of <u>useful</u> knowledge and experience plus evidence based on a vast range of case studies. We need to ensure that this is available and disseminated in a <u>useable</u> form so that our ultimate impact is end users making use of our research findings.

Personally ☐ Consortium/project / SUE as whole / (please tick as appropriate)

And how do we achieve this?

More coordinated/networked routes to dissemination and exchange of experiences, within this group (SUE) and between SUE and end users. Developing and maintaining the personal relationships that have begun to establish through this programme.

Personally / Consortium/project ☐ SUE as whole / (please tick as appropriate)

Sustainable Urban Environments:
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Extending SUE's impact

What overall impact have we had?

Drawn range of disciplines into the sustainability research arena.

Developed body of evidence in different fields about urban sustainability.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

What further impact should we have??

Findings and tools should be taken and shared interactively with practitioners and policy makers by each SUE group. We should send out scouts to find out if our offering on an impact is "welcome or unwelcome", "welcome but impractical" "welcome but only if....." etc.

Personally ☐   Consortium/project /   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Fund opposite numbers in practitioners and policy fields to have the time to look at research outputs and comment on their applicability.

Fund researchers to work in practitioner and policy fields to understand how outputs need to evolve/change to be usable.

Personally /   Consortium/project /   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Created guidelines for practitioners

Academic papers and conference papers

Exhibited at galleries

Through these and other forms of dissemination, we (hopefully) spread the word about SUE to various audiences.

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

Our collective project and even collective SUE work should have a direct influence on planning, environmental etc. policy because we have a rich and varied evidence base.

Working with schools to introduce SUE into a national curriculum. Getting SUE into education at a young age.

Personally ☐   Consortium/project /   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Through better/closer collaborations with LGA, RDAs and national government; by work with the "right" people at the "right" time to ensure policy is written with our SUE evidence base in mind. By employing people to help us effectively communicate our ideas, theories, findings etc. into policy.

Personally ☐   Consortium/project /   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
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Extending SUE's impact

What overall impact have we had?

Created good partnerships/relationships that can be taken forward.

Very few tangible impacts – certainly less than we would hope.

Science isn't particularly high level

Workable outputs for third parties are low, although there is definitely potential.

Need to address more clearly needs of end users.

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

If the outcomes don't push the boundaries of science then they must be practical and useful.

This (useful outcomes for end users) must be addressed and at the forefront.

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

By truly listening to non-academic partners and actually modifying plans accordingly.

Not just keeping partners happy until the letter of support is in your hand and then doing what you want. Think of the end users need.

We are in a privileged position to do what we do best, but despite what some academics think we have a much more short-sighted view of the real problems facing end users than they do. (That's bleeding obvious!)

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

A wide range of up to date research knowledge across environmental, economic and social sectors helping to raise awareness across technical and design issues.

Personally ☐   Consortium/project /   SUE as whole /   (please tick as appropriate)

What further impact should we have??

Address the academic/practitioner issues.

Address the whole engagement process and make it relevant and successful.

Integration of the various research studies.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Further "real city" experiments – designing and delivering a city that is sustainable.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

UaNA report (pub by CIRIA) consortium cited in Envir Agency water cycle study document.

Raised awareness of sustainability as a key urban issue.

Trained many pre- and post docs.

Formed a viable network of "like minded" individuals from a multidisciplinary perspective.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

What further impact should we have??

I would like to see some work to <u>demonstrate</u> impact based on research findings.

I'd also like to see some work on academic impact.

Distillation of ideas/concepts/recommendations.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Commission consultancy study on impact (EPSRC mentioned this).

Maybe further role for ISSUES here.

Personally ☐   Consortium/project ☐   SUE as whole ☐/   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

I have heard from stakeholders at this meeting, of specific examples of take-up (even before our primary outputs are published).

From SUE 2, I'd say our impact is only just beginning to emerge.

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

More of what we are doing. Key point is to get evidence of uptake by practitioners.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Stakeholders very keen on very short summaries and face-to-face Q&A sessions. We should facilitate this as best we can, but take care to follow up to gather evidence that interventions have produced change.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Researcher and approaches used – changed way of thinking in my area – developed a mind-set.

Developed close working relationship with key partners – run workshops to draw a developer and department together and via Eastside sustainability adviser.

Springboard to understand the problem enough to make real differences.

Personally /   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

Continued impact in practice, showing how research can and has provided added value, monitored over time period.

Guidance notes along line of CIRIA series on Cent, and which broke down process into stand alone documents which followed a joined up framework.

Personally /   Consortium/project /   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

Full range of activities, depending on who is the customer:

Fellow academics

Practice/consultant

Policy makers

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

The creation of the basis for a SUE research area in my school.

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

We should now move on to actually implementing the findings.

Personally ☐   Consortium/project ☐   SUE as whole /   (please tick as appropriate)

And how do we achieve this?

More direct links with local actors (Councils, Housing Associations, developers) to contribute to actual live projects.

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Academic – the usual tick-boxes – perhaps influenced some academics' perception of cross-discipline working.
Non academic – influenced policy and policymakers, influenced practitioners in sustainable environment.

Personally   /   Consortium/project   /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

Change the RAF/REF – HEFCE's perception of success?
Change investigators' perception of the value of the work.

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Dunno – through our PI's and their respective province chancellors. Their our RC

Could lobby high profile stakeholders (a la Paul Jowett) to influence HEFCE.

Personally ☐   Consortium/project   /   SUE as whole   /   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Outcomes/ideas fed directly into post-graduate education.

SUE Waste has influenced government policy on waste/referenced in government strategy/policy documents.

SUE Waste has produced original ideas and world class outputs that have impacted on individual organisations as well as LA's, governments and national/international academic community.

Not as much visual impact as we would have liked.

Personally ☐   Consortium/project **/**   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

More impact on U/G and P/G education.

Greater impact on policymakers, strategists and politicians.

Greater integration of ideas and SUE approaches.

Larger scale, longer timescale integrated case studies

Greater visibility and recognition of the SUE brand – perhaps the deliberate and coordinated formation of a "SUE community"?

Personally **/**   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Use SUE in keywords in academic papers.
We have taken personal and collective responsibility for delivering out personal research programmes. We should not be afraid to insist that our elected representatives take personal responsibility for availing themselves of our outcomes/ideas.
We discussed many ways of further disseminating SUE's work more effectively – some of these should be taken forward.
There should be a SUE 4 call – there is much work still to be done.

Personally **/**   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Not really sure! Project outputs have been slow to emerge in some cases. How many colleagues in our own schools/disciplines are aware of SUE?

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

We can target non-academic/ non traditional outputs far more effectively. The REF agenda should help with this! SUE can be promoted more widely to other academic colleagues looking for examples of cross-disciplinary working.

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Finding out more about what our stakeholders want from participation in research.

Wider promotion of SUE (see above).

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Across the construction industry – minimal generally – significant in parts.

Developed tools and frameworks can make a difference. Urban Futures – future scenarios provide significant benefit.

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

What further impact should we have??

Combined effort to "tell the story" to a wider audience. Make tools accessible and market them.

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

And how do we achieve this?

Marketing, business development as well as traditional dissemination routes.

Determine who the end user is and then decide most appropriate route to market.

Personally / Consortium/project ☐ SUE as whole ☐ (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

My guess is that each consortium/project will have impacted upon the individuals and stakeholders particular to them. Personal contact has probably been the most effective means of making an impact.

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

We need somehow to influence policymakers as this will have the greatest influence on the way development happens in the UK.

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Difficult! We probably need our collective professional institutions to take a lead on this (ICE etc.), as they have a voice at this level. Research communities should not feel that they have to do everything with regard to communication. The responsibility should be shared by all parties to the dialogue.

Personally   /   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Involved in (a) SUE Waste, (b) PURE and (c) Intrawise. (d) Huge impact on the waste management industry DEFRA through collection, segregation and thermal disposal, with power production and district heating (in Sheffield), Papers, design of plant and network, consultancies, conferences etc. (b) Data on national pollutants exploited widely, sources of urban particulates identified. (c) Measurement and health effects of nano-particles is now high priority.

Personally ☐   Consortium/project ☐   SUE as whole **/**   (please tick as appropriate)

What further impact should we have??

The reference material will be exploited for the foreseeable future. Regular visitors, e-mails, consultancies are major impact that is not captured at present. We know deaths brought forward by particles is a significant factor in urban buildings. Future work will be directed at reducing this adverse impact.

Personally ☐   Consortium/project **/**   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Hard work, dedication, enthusiasm, teamwork, interdisciplinary collaboration, quality, value added technologies etc. Given the means, we will continue to deliver. See diagram for ticking impact boxes (Caroline).

Personally **/**   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Research impact in RJA's within discipline.

On practice of partner end-users where prototype tools.

On "real" end-users, active research in "local communities".

Personally   /   Consortium/project   /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

Research impact in academic publications beyond researchers' discipline, e.g. through joint publications.

To get SUE approaches embedded in partners and practitioners, at least of industry partners.

On mainstream the teaching/learning project processes influence future practitioners/researchers.

Transfer and adapt to other contacts, especially developing communities.

Personally   /   Consortium/project   /   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Continuing to work with academic partners after research process, ULE have completed partner project.

Continuing to work with partners.

Incorporate our teaching/learning process, develop mixed delivery, more widely disseminated on web-based learning.

Personally   /   Consortium/project   /   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments:
Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

SUE 1 project has at least (a) provided the evidence base to DfT/CLG that current policy on spatial planning (city form) is not sustainable and has given evidence of better alternatives; and possibly (b) has led to change in government thinking on urban form.

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

What further impact should we have??

Tools/methods developed in project (to answer Q we set ourselves) have applicability (potentially) in public arena – LA's etc. (e.g. use in SEA/SA) – should seek to transfer this knowledge.

We should be transferring this knowledge to wider inter-nations/practitioner community, as most pressing urban problems are overseas (where the really fast growing cities are).

Personally ☐   Consortium/project /   SUE as whole ☐   (please tick as appropriate)

And how do we achieve this?

Difficult to do as requires dedicated KT funds and motivation/opportunity to do so at personal level very limited (e.g. no time, journal, papers etc.) Might this be done (started) as part of a wider SUE KT exercise/"roadshow" (but risks diluting/losing each project's key outputs in amongst a programme's outputs?)

Personally ☐   Consortium/project ☐   SUE as whole ☐   (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Personally, new wider contextual knowledge and evidence based actions/plans/scenarios to transfer to the urban traffic control and management and intelligent transport systems community. Dissemination through smart environment interest group has enabled a shift in the perspective of managing and controlling traffic not just for safety but also for environment.

Consortium. Creation of tools, methodologies and techniques that have been used by (Futures + 4M) RA to deliver actual results that have been used by LA. SUE – new breed of engineers.

Personally / Consortium/project / SUE as whole / (please tick as appropriate)

What further impact should we have??

Actual skills training – in depth knowledge across disciplines through CPD at the early stage careers graduates working in LA, consultants industry.

Public meetings, feedback to households, schools, workplaces on the carbon footprint estimation of their own trips and the effects they have on others – give them knowledge on how they can take steps to change – go back in 6 months time, redo the questionnaires and quantify the impact – this activity goes beyond the existing project end.

Personally ☐ Consortium/project / SUE as whole ☐ (please tick as appropriate)

And how do we achieve this?

Follow on "Impact Evaluation" grants. If we can deliver evidence of change if it is positive – success breeds success. If it is negative – what are the barriers, how can we change this, what has gone wrong?

Feedback

Personally ☐ Consortium/project / SUE as whole / (please tick as appropriate)

Sustainable Urban Environments: Research Dialogues Workshop

Breakout Session 4 Individual response sheets

Extending SUE's impact

What overall impact have we had?

Interdisciplinary impact i.e. greater understanding of the epistemology, empirical perspectives and methodologies of other disciplines.

Some joint working to refine social problems from different perspectives i.e. priorities identified by key stakeholders group – greater understanding of these and some attempt to address some of the stakeholder group issues.

Personally   **/**   Consortium/project   **/**   SUE as whole   **/**   (please tick as appropriate)

What further impact should we have??

We should use our science to influence stakeholder group priorities (corporations, households/social groups; governments) regarding building-in resilience to infrastructures and solutions to social problems that require low input of resources (natural and human).

We should drive the transition to sustainable futures.

Need to grow the young researcher community.

Personally   ☐   Consortium/project   ☐   SUE as whole   **/**   (please tick as appropriate)

And how do we achieve this?

We first have to test our "scientific" solutions in real life events and thereby gain legitimacy for our science. This means long term engagement with decision makers to learn from projects/tried solutions and then to revise the approach based on what works.

This requires a strong Society – Science – Politics interface

Create laboratories that we monitor.

Personally   **/**   Consortium/project   **/**   SUE as whole   **/**   (please tick as appropriate)

SUE Programme calls

SUE 1 call:

EPSRC

Engineering and Physical Sciences
Research Council

EPSRC Infrastructure & Environment Programme

"Towards a Sustainable Urban Environment"

A Call for Expressions of Interest to Participate in Research Consortia

Closing Date – Friday 27th July 2001

Introduction

EPSRC intends to sponsor a number of new multidisciplinary Research Consortia to address key research issues in the development of a more sustainable urban environment. Expressions of interest to participate in Research Consortia are invited from individuals or research groups in the urban environment field from UK Higher Educations Institutions, independent Research and Technology Organisations, Government agencies, local authorities, public bodies, charitable trusts, industry, commerce and the service sector.

Context

This call for expressions of interest for research partners is made in the context of three key drivers – improving the quality of life of the UK's citizens; supporting the sustainable development of the UK economy and society; and meeting the needs of the users of EPSRC-funded research in industry, commerce, government and the service sector. EPSRC wishes to support research which:

- targets key quality of life indicators in water and air quality, waste and resources, transport, climate change, land use, construction and housing;

- is conducted in the context of the 1987 Bruntland Report definition that sustainable development "…. meets the needs of the present without compromising the ability of future generations to meet their own needs.";

- meets the needs of users of the research through supporting developments in sustainable products and services; energy, water and utility services; integrated transport and distribution services; sustainable environmental services and holistic waste management; and efficient and inclusive health and public services

EPSRC wishes to fund Research Consortia which can address at least two of these three key drivers and ideally which can address all three. For example, research on improving the inclusivity of public transport could aim to improve the quality of life of the elderly and disabled population, focus on the

needs of the transport sector and local authorities while addressing the broader agenda of a more sustainable society through reductions in car usage.

The Research Challenge

In order to meet the Bruntland Report requirements, future sustainable development of the urban environment must involve radically reduced usage of natural resources and energy compared to that seen today. Radical improvements are also required in recycling and reuse of resources through improvements in the design of products, processes and the urban infrastructure as a whole. The design, construction and operation of the built infrastructure, urban spaces, transport systems and their related infrastructure must also take full account of the whole life cycle of the urban environment as a holistic system.

This is a highly multidisciplinary challenge involving engineers, physical scientists, environmental scientists, economists and social scientists and related subjects such as physical geography and town planning. The required combination of research excellence and understanding of the needs of a diverse user base is unlikely to be found within a single academic institution. A secondary challenge will, therefore, be to establish effective Research Consortia – probably in the form of virtual centres of excellence – with the appropriate mix of academic and non-academic expertise to address these major challenges.

Specific Objectives of Research Consortia will be:

- To strengthen the capability of the UK research base in sustainability issues within the urban environment in both breadth and depth.

- To provide an identifiable source of multi-disciplinary academic excellence able to respond to the needs of the end users of research in industry, commerce, the service and public sectors through a programme of collaborative research and technology transfer.

- To develop and promote a strategic research agenda to address sustainability in the urban environment for the 21st century and beyond.

Research Scope

Within the broad agenda of the sustainable urban environment, five potential research themes have been identified. It is anticipated that Research Consortia will be established to address elements of this agenda – it is thought unlikely that a manageable Consortia group could realistically tackle the subject in its entirety.

*Theme One – **Towards a new physical infrastructure:***

- Design and function of buildings and urban areas, including the re-use of existing buildings and integrating heritage buildings and open spaces into a new urban form;

- Density and pattern of development and use, the balancing of land uses and mix of use within buildings to facilitate efficient functioning of urban areas and optimum quality of life;

- Spatial and dynamic inter-relationship of buildings, streetscapes, green spaces and infrastructure including surface and sub-surface services and utilities to contribute to an efficient and effective physical built form, including is contribution to healthy living and lifestyle.

*Theme Two – **The sustainable built environement:***

- Waste avoidance, minimisation, re-use and recycling including construction waste through radical improvements in the design and construction of the built infrastructure;

- Resource, water and energy efficiency including radical improvements to whole life costing of buildings and the urban infrastructure;

- Reduction, minimisation and avoidance of urban noise and air pollution through improved design and operation of the built infrastructure.

*Theme Three – **Waste, pollution and urban land use:***

- Making optimum use of the land resource including remediation and treatment of damaged, contaminated and unstable land;

- Urban domestic waste management, disposal and landfill strategies including recycling and re-use of waste materials and energy from waste;

- Sustainable provision of services and utilities essential to the quality of life e.g. water (nb: note exclusions below).

- Exploitation of demonstrated contaminated sites, such as those available through the CLAIRE initiative and work on collaboration with Environmental Bodies managing Landfill Tax Credit monies.

*Theme Four – **Urban Transport and urban design:***

- The implementation of integrated public and commercial transport systems, including multi-modal interfaces, related to the optimisation of the urban built form and land use for industrial, retail, domestic and social purposes.

*Theme Five – **Social Inclusion:***

- The implementation of improvements to the design, operation and interaction of urban design, the urban built form and urban transport systems in order to maximise social inclusion – particularly for the older, disabled and disadvantaged population – within the overall constraints of the sustainability agenda.

Excluded Areas:

These areas of research are excluded from this call because they are the subject of current or planned activities in their own right: sustainable electricity generation; the longer-term impacts of climate change on the built environment; and river management and river flood prevention. Research focused specifically on manufacturing is also excluded unless there is a clear link through the broader issues of sustainability in the urban environment.

Research Consortia

Research Consortia will vary in size and scope depending on the subject area, the degree of multidisciplinarity and the extent of the user involvement. A consortium funding package will normally be expected to include EPSRC support alongside funding from research users and in some cases other funding agencies, for example Government Departments and Agencies or regional funding. Funding will normally be for four years, monitored annually and formally reviewed after three years. Consortia may be wholly based at a single university, follow a "hub and spoke" model centred at one institution, or be a virtual centre formed from a number of institutions. The majority of research partners will be Higher Education Institutes although Consortia may involve other research providers such as independent Research and Technology Organisations and potentially Research Council Institutes.

Selection of Consortia will follow a two stage process. This first Expression of Interest stage is to allow potential participants to express and interest in taking part, and as such is open to organisations which are themselves not eligible for EPSRC support. **There is no requirement at this expression of interest stage to draw together Partnerships for full Consortia bids.**

The second stage of the process is focused around the Scoping Workshops that will be held in October and November 2001. Following an initial sift of the Expressions of Interest submitted against this call, potential Consortia members will be invited to attend the workshops which will be organised and facilitated by EPSRC. The objective of the Workshops will be to identify a limited number of Consortia involving perhaps 4-6 major partners which can develop research proposals in the range £1-3 million of EPSRC funding over 4 years. The identified Consortia will then be invited to submit EPSRC grant proposals, which will be subject to a rigorous peer review test, including an international dimension, before funding is awarded.

Key features of successful consortia are likely to include the following:

- Strong, multidisciplinary partnerships of researchers with an international profile in the field;

- Active and effective collaboration with users of the research and defined dissemination mechanisms which will be funded as part of the Consortium grant;

- Defined outputs and deliverables against key quality of life and/or sustainability indicators;

- Outreach activities to relevant research providers and users outside the research consortia through workshops and networking;

- Appropriate collaboration with key international researchers in the field;

- Clear and effective integration of the work of the Consortia with both underpinning basic research (e.g. funded under EPSRC responsive mode) and more applied research (e.g. funded directly by Government agencies or industry).

Who can apply?

This call for expressions of interest is open to *all* potential partners in Research Consortia, irrespective of their existing links to academic research in this field. Thus the call is open to organisations which are themselves ineligible for EPSRC funding – for example industry, Central Government agencies or Local Authorities – but which would wish to take part wither in an advisory role or which wish to take an active role in the research programme using their own funds or funding obtained from other sources.

EPSRC funding can only be awarded to Universities and similar institutions, Research Council institutes, CCLRC, Government Research Establishments and not-for-profit research organisations are defined as:

i.   organisation which are, or which are constituent parts of, a charity registered with the Charities Commission; or

ii.   associations which are eligible for exemption from corporation tax under section 508 of the Income and Corporation Taxes Act 1988; or

iii.   organisations which are wholly owned subsidiaries of an association approved under section 508 of the Income and Corporation Taxes Act whose articles of association require that all profits are returned (gift-aided) to the section 508 association.

Who should apply?

The aim of the Research Consortia will be to adopt a fully multidisciplinary approach to address research challenges identified by the users of the research as key to addressing specific quality of life indicators. It is thought unlikely that all of the required skills and expertise to conduct such research will be available within a single academic institution and that Research Consortia are likely to require the collaboration of a number of leading institutions as well as an appropriate mix of non-academic partners from users of the research in the private, public and charitable sectors. Initial expressions of interest are therefore invited from groups, team or organisations that are interested in participating in a consortium of leading academic institutions from across the UK.

Consortia will be invited to submit applications for EPSRC funding following the second stage of the process when scoping workshops will be held involving participants drawn from those submitting expressions of interest against this call, it is expected that *all* members of Consortia will be able to demonstrate:

- a track record in undertaking a multi-disciplinary approach to address either research challenges or meeting user needs in the sustainable built environment;

- an awareness of the strategic issues concerning the adoption of a sustainable approach to the development of the urban environment.

In addition, it is expected that *the majority* of Consortia partners will be able to demonstrate:

- an international reputation for research in fields relevant to the adoption of a sustainable approach to the development of the built environment; **or**

- a successful track record of implementing a sustainability agenda within the urban environment which can be successfully benchmarked against the state-of-the-art internationally.

The emphasis of the Consortia will be to strengthen both the UK academic capability in the area of the sustainable urban environment and the links between the research base and the users of that research. Successful consortia will be required to demonstrate that they have in place the basis of an active and effective collaboration with end users of the research which can be further strengthened during the lifetime of the Consortium and which will be reflected in heir management arrangements. Final Consortia bids will be expected to include funding for specific arrangements for the wider dissemination of research outputs to the user community. Partnership with third-part organisations with established dissemination networks to users in the private, public or charitable sector will also be strongly encouraged.

Resources

EPSRC support for Research Consortia is expected to be in the region of £350-750k per year for 4 years. Consortia will be reviewed formally after three years, with the possibility of a second tranche of funding on a successful review. EPSRC funding will enable a Consortium to:

- Develop a strategic vision of the research challenges to be addressed within the scope of the Consortium;

- Support a programme of scientifically excellent, multidisciplinary, fundamental and strategic research to address the vision;

- Establish a framework to identify training needs at both doctoral and masters level to address the vision;

- Establish contacts with other researches in the field both within the UK and overseas through workshops and networking activities;

- Strengthen collaborative links with the user community to identify barriers to the implementation of research outputs and facilitate knowledge and technology transfer;

- Attract additional funding from other sources of funding from industry, commerce, Government and the service sector;

- Disseminate activities to users of the research outputs outside the Research Consortium.

In addition to the resources normally provided by EPSRC and opportunity exists for EPSRC to support (in partnership with a host institution) a Research Chair to enable a Consortium to recruit a Research Director of international standing from outside the UK academic community. EPSRC support will be limited to provision of all of a proportion of the salary of the new appointee for the initial four years of the Consortium funding, with the understanding that the post will then be taken on by the host institution.

Requirements for Expressions of Interest

Expressions of Interest may be submitted by individual research groups or by a number of groups either within a single university or across a number of universities. While existing groupings of researchers are able to apply as a team, it must be stressed that while the process of identifying partners for full Consortium bids may involve either building on or expanding existing partnerships it may also involve building new partnerships involving only a minority of members of existing collaborations. Expressions of interest should comprise a copy of the attached proforma by no more than 2 sides of A4 text. There are specific requirements for academic and non academic expressions of interest as follows:

Academic Expressions of Interest must provide information on the following:

- Brief details of the individual, group or team;

- Details of research track record, previous funding for research and the particular skills they could bring the Consortium;

- Proposed research activities linked to the five research themes identified in the call;

- Indications of potential deliverables in terms of addressing quality of life indicators;

- Details of at least one non-academic research partner who will be expected to play a role in the scoping workshop and who has expressed an intention to take a full role in a Consortium.

Indications of cash an in-kind contributions from non-academic partners are not specifically required at this stage. The selection of final Consortium bids will be based in part on evidence that the end users of the research will play a fill and active role in the Consortium research programme. As a result, academic partners are strongly encouraged to advise their potential non-academic partners that a clear indication of the level of cash or in-kind commitment will be required at a later date. This restriction also applies to expressions of interest from university analogues such as Research Councils' institutes, CCLRC, Government Research Establishments and not-for-profit research organisations.

Non-academic expressions of interest should provide information on the following:

- Brief details of the organisation including the nature of its business, its size including number of employees and turnover where appropriate;

- The particular skills and expertise the organisation could bring the a Consortium;

- Key research themes which the proposed participants would wish to address as part of a Consortium;

- Information on the level of commitment the organisation would be willing to make to a Research Consortium, as a minimum in terms of the level of effort in staff days per year that could be made available in an advisory capacity.

Indicative figures for cash or in-kind commitment would be helpful but are not essential at this stage. Non-academic expressions of interests will only be accepted from organisations; expressions of interest from *individuals* outside academia will not be accepted.

The Assessment Process

Expressions of Interest should be submitted to EPSRC at the address below, to be received no later than 5.00 pm on **Friday 27th July 2001**. They will first be grouped into theme areas based on the research scope specified in this call document. Due to the restrictions on the number of people that can be accommodated at the Workshops, an initial short-listing of potential partners will then be undertaken. All applicants will be informed as to the outcome of this initial short-listing by **Friday 31st August 2001** at the latest.

The series of Workshops which will be held to develop potential Research Consortia will take place in **October and November 2001**. The workshops will be central to the process of selecting Consortia and their membership, and as such it is important that potential partners plan to be available to attend the workshops on the dates identified for the theme areas of greatest interest. While it is expected that the four workshops will take place focused on the call Themes as indicated, it is anticipated that the workshops will cross theme boundaries to some extent, and it is possible that individuals or groups may be invited to attend more than one workshop. Expressions of interest in Theme 5 – *Social Inclusion* – will not be dealt with in isolation but will be selected for attendance at the most relevant of the other Theme workshops, most likely Themes 1 and 4 as identified below.

The first full Consortia Bids will be invited for submission by **29th March 2002** and the initial batch of Consortia will be funded during FY 2002 – 2003. Key dates in the review process will be as follows:

27 July 2001	Deadline for submission of Expressions of Interest
31 August 2001	Decisions on initial short-listing
7 September 2001	Invitations to Workshops issued & Invitation lists published
28 September 2001	Publication of Workshop Attendees
17-18 October 2001	Themes 1 & 5 Workshop
31 Oct – 1 Nov 2001	Theme 2 Workshop
14-15 November 2001	Theme 4 Workshop
28-29 November 2001	Themes 4 & 5 Workshop
29 March 2002	Deadline for full Consortia Submissions
June 2002	Funding decisions & planned publication date of Second Call for Expressions of Interest

Contacts for further information

Potential partners with general enquiries concerning the scope of Research Consortia, levels of funding and eligibility for funding are encouraged to refer to the Frequently Asked Questions before approaching the most relevant Associate Programme Manager by subject area for further clarification. Potential applicants requiring specific information on the remit of the call and the extent to which their

research interests fit with the research scope should contact the most relevant of the indentified Associate Programme Managers by subject area. Potential non-academic partners with interests spanning a number of areas of the research scope should contact either Peter Hedges or Emily Horwood. Enquiries from Institutions interested in exploring options for Research Chairs should contact Peter Hedges in the first instance.

Application Procedure

Applications in the form of the original plus three copies of the proforma plus the supporting document must be sent to reach EPSRC by 5.00 pm on Friday 27th July 2001.

The full address for proposals is:

Mrs Liz Strange
EPSRC
Polaris House
North Star Avenue
Swindon SN2 1ET

SUE 2 call (outline):

EPSRC

Engineering and Physical Sciences
Research Council

EPSRC Infrastructure and Environment Programme

Towards a Sustainable Urban Environment

Call for Research Consortia Outline Proposals

Closing date for outlines: 4pm, 5 September 2006

Introduction

EPSRC invites proposals for new multidisciplinary research consortia within the Sustainable Urban Environment (SUE) programme, to deliver research and knowledge transfer leading to a more sustainable urban environment. EPSRC hopes to fund up to five research consortia and has allocated up to £12 million in total for this call.

Background

Research in the SUE Programme will continue to be conducted in the context of the 1987 Brundtland Report definition that sustainable development, ".... meets the needs of the present without compromising the ability of future generations to meet their own needs". The aims of the SUE Programme are to improve the quality of life of UK citizens, to support the sustainable development of the UK economy and to meet the needs of users of EPSRC funded research in industry, commerce and service sector.

In the first round of SUE, EPSRC funded twelve ambitious multidisciplinary consortia in the following four clusters:

(i)   Urban and built environment
(ii)   Waste, water and land management
(iii)   Transport
(iv)   Metrics, knowledge management and decision making

Each consortium involves academic researchers from a range of disciplines working closely with users such as local authorities, large and small companies, town planners and charities. In addition, EPSRC has funded a number of SUE-related projects, including regional case studies and a network examining user participation in sustainability research. **Applicants are strongly advised to review both the EPSRC and existing SUE consortia websites, as EPSRC wishes to build on initial research within the SUE Programme rather than replicate ongoing work.**

As the SUE Programme has developed, the need has become apparent for dedicated knowledge transfer action to facilitate better sharing of information between the consortia and the dissemination of research outputs to policy makers and users. In parallel with this call, the EPSRC is therefore also seeking to support a director to lead a major knowledge transfer activity (KT-SUE). KT-SUE will interface with existing SUE consortia and also any new consortia funded through this call. It is expected that the director for KT-SUE will be appointed by September 2006. For more information, please refer to the separate KT-SUE call.

Objectives of the research consortia

The specific objectives of the new SUE consortia will be to:

- Strengthen the capability of the UK research base in sustainability within the urban environment, building on the current research supported through the SUE Programme
- Provide an identifiable source of multidisciplinary academic excellence able to respond to the needs of the end users in industry, commerce, the service and public sectors
- Develop a strategic approach to conducting research so as to address future sustainability challenges in the urban environment
- Take an holistic and integrated approach in addressing sustainability research issues
- Work closely with KT-SUE to enable effective transfer of knowledge to policy makers and practitioners

Research Scope

What would a sustainable community look like? It is unlikely that this question can be answered by looking in isolation at issues pertaining to the built environment, transport, waste and water management or healthcare provision. The first round of SUE consortia understandably focussed on specific sectors of the urban environment within four defined clusters. It is felt that there is a sufficiently research active community within the IEP programme and beyond, with appropriate knowledge of the requirements of consortia working, for the new consortia to begin to take a more holistic view of sustainability across these sectors.

To promote this holistic approach, EPSRC is particularly keen to support research consortia which will examine a range of urban sustainability issues within specific UK-based case studies. Case studies could be sited within a single consortium or could cut across several consortia. Although the focus is on the urban environment, the urban-rural interface is also of interest. Case studies might include aspects of the built and urban environment, transport, waste and water management and perhaps also an international context. For instance, approaches could include:

- Major sustainable development case studies, which address sustainable development by integrating research outputs across sectors, developing common indicators and demonstrating solutions

- Integrated case studies, which examine urban sustainable development across a matrix of different spatial scales e.g. a building, a segment of a street, a town, a region, with appropriate models or test-beds to include all aspects of the built and urban environment, transport planning and provision, water and waste recycling, waste reduction and service provision.
- Case studies which focus on areas of new development, redevelopment, previously developed land and/or regeneration
- Comparative international case studies, as one element of a consortium proposal e.g. world cities or regions with different solutions compared to the UK, to help put research within the SUE Programme in a global context
- International development research, which applies and extends the outputs from the SUE consortia to meet research challenges in developing countries

It is not mandatory for consortia to be based on the case study approach outlined above. The major research themes of interest to EPSRC include the following:

(i)   Infrastructure for high quality, high density living and working
- What infrastructure is needed for high quality, high density living? There are health, crime, transport, planning/design, quality of life and space-creation challenges.
- Sustainable use of materials; new and better materials (e.g. noise and vibration insulation) used innovatively within buildings and in the spaces between buildings.
- Multiple use of buildings and spaces, including shared living and working areas
- Micro-generation of electricity and integration of small-scale urban renewables
- Aspects of intelligent infrastructure within the context of sustainability e.g. measurement of physical decay in buildings, novel sensing systems for security or fire, intelligent local transport systems for self re-routing of traffic.
- Urban water and waste management, including urban drainage and water infrastructure

(ii)   Health implications
- What are the implications of urban design, redevelopment and regeneration on health. How does the urban environment impact on physical and psychological well being?
- What is the impact of urban physical form on mental health?
- What is the relationship between sustainable transport policy, pollution and health? What are the options for integrated urban pollution control within the context of local health?
- The provision of healthcare within the built environment and also the effect of decisions, policies and practices on health and well being.

(iii)   User centred design and accessibility
- Design for people (e.g. buildings, spaces between buildings).
- Inclusive design in the urban environment, including for people with sensory impairment and older people.
- Design for sustainable behaviour
- Accessibility in the urban environment, including access to nature and green spaces; quality of life and space-creation challenges
- Wider public and stakeholder participation

(iv)   Decision support
- What are the obstacles to implementation of good urban design?
- Intelligent tools for decision making:
    - Sustainability indicators and trade-off management
    - Reliable and effective decision support tools
- Integrated models to aid decision making
- Data quality and information management

The following areas are excluded from this call:

- Electricity generation and supply, including sustainable energy generation. (Please see bullet point (i) above relating to micro-generation and small-scale renewable energy)
- Research focused on climate change, including impacts of climate change on the urban environment
- River management and river flood prevention unless the emphasis of the research is on interventions within the urban environment
- Research focussed specifically on manufacturing unless the emphasis of the research is on sustainability within the urban environment
- Research considered to fall within the remit of the Rural Economy and Land Use (RELU) programme, supported by BBSRC, ESRC and NERC

Interface with the KT-SUE

It is anticipated that up to five new consortia will be funded through this call. These are likely to be launched by the autumn of 2007, subject to satisfactory peer review. EPSRC will require the new SUE consortia to work with KT-SUE from their inception.

The structure of the research consortia

The above research challenges are highly multidisciplinary in nature and are likely to require the involvement of engineers, physical scientists, environmental scientists, economists, social scientists and a range of related disciplines. It is thought unlikely that all of the required skills and expertise to conduct such research will be available within a single academic institution. Research consortia are likely to require the collaboration of a number of leading institutions as well as an appropriate mix of non-academic partners from users of the research in the private, public and charitable sectors.

The majority of research partners will be Higher Education Institutes, although consortia may involve other research providers such as independent Research and Technology Organisations and potentially Research Council Institutes. **The research consortia must contain relevant non-academic expertise through appropriate and meaningful collaboration.**

Size of award and duration

Research Consortia will vary in size and scope depending on the subject area, the degree of multidisciplinarity and the extent of user involvement. Subject to the total funding envelope of the call, there is no upper or lower limit to the size of consortium grant available from the EPSRC. **The overall funding package for each consortium will be expected to include EPSRC support alongside funding secured by the applicants from research users** and in some cases other funding agencies, for example Government Departments and Agencies or regional funding. Funding will normally be for four years for each consortium.

Assessment of the research consortia

Selection of consortia will follow a two stage process: (i) Outline proposal and (ii) Full proposals. Outline proposals should be accompanied by a **case for support (up to four sides of A4)** and will be assessed against the following criteria:

- **Fit of the outline proposal to the research scope** described in this document. Research must be within the remit of the EPSRC and contribute to urban sustainability within the context of the Brundtland definition.
- **Quality of the proposed research** with defined outputs and deliverables against key quality of life and/or sustainability indicators.
- **Strength of the research team** in terms of multidisciplinary partnerships of researchers with an international profile in the field. Collaboration with key international researchers should be included, where appropriate.
- **Active and effective collaboration with users** of the research and defined dissemination mechanisms. Proposals must contain relevant non-academic expertise through appropriate and meaningful collaboration. An indication of the project partners to be engaged and their contribution to the project should be provided. Where possible, details of funding (cash or in-kind) expected to be secured should also be provided. **Letters of support are not required at this stage.**
- **Management structures** – a brief outline of management arrangements is required. **A project plan is not required at this stage.**

Outline proposals will be reviewed by a peer review panel and short listed against the above assessment criteria. **EPSRC reserves the right to reject proposals that are outside the remit of EPSRC without reference to peer review.** Short listed proposals will be invited to submit full EPSRC grant proposals, which will be subject to rigorous postal peer review and panel, including an international dimension, prior to any funding being awarded. In addition to the above assessment criteria, those invited to submit full proposals will be asked to provide evidence of:

- Outreach activities to relevant research providers and users outside their own research consortia through innovative workshops and other networking events
- Detailed arrangements for project management in terms of milestones and deliverables
- Clear and effective integration of the work of the consortium with the other SUE consortia and KT-SUE
- Full details of the involvement of project partners (e.g. industrial collaborators, local authorities, charities and other user groups), including cash or in-kind contributions being provided by these organisations and their role in transfer of research outputs into policy and practice.

Applicants successful at the outline stage will receive further guidance on submission of full proposals.

Who can apply?
EPSRC funding can only be awarded to Universities and similar institutions, Research Council institutes, CCLRC, Government Research Establishments and not-for-profit research organisations. The research consortia outline proposal should be submitted by a researcher (the principal investigator), who should be a permanent employee of a university or similar institution. The principal investigator will be the consortium director and will be responsible to the EPSRC for overall management of the consortium. For more information on eligibility, please refer to the EPSRC funding guide
http://www.epsrc.ac.uk/ResearchFunding/HowToApply/FundingGuide.htm

Application procedure

You should submit your proposal using the Research Councils' Joint electronic Submission (Je-S) System (https://je-s.rcuk.ac.uk/).

Candidates will need a registered Je-S account prior to making an application.

http://www.pparc.ac.uk/jes/jes1/RODetails(Web).pdf shows which research organisations have registered to use Je-S.

For further information on the Je-S system please see:
http://www.pparc.ac.uk/jes/jes1/jes1system.asp.

You should select Council 'EPSRC', document type 'FEC Outline Proposal' and the 'EPSRC Outline' Scheme. On the Project Details page you should select the 'SUE 2' Call. Guidance on the types of support that may be sought and advice on the completion of the research proposal forms are given on the EPSRC website in the EPSRC Funding Guide (available from the EPSRC website www.epsrc.ac.uk), which should be consulted when preparing all proposals.

Guidance for completion of the application is provided through the Je-S help text, available from the Je-S System front page and context sensitive help throughout the system. Funding may be requested from EPSRC for the appropriate resources (staff, consumables etc) necessary to undertake the research.

Where details are available, the Project Partner sections of the Je-S form should be completed with the cash and in-kind contributions from the partner(s) and details of relevant contact(s).

EPSRC must receive your outline application by 4pm on 5 September 2006. Please remember to allow sufficient time for your organisation's submission process between submitting your proposal to them and the call closing date.

Networking

EPSRC anticipate holding an awareness raising and community networking meeting in May 2006. This will not be a consortium building workshop and EPSRC will not actively facilitate the development of teams. It will be an opportunity for potential applicants to learn more about the requirements for the call, discuss their research interests with colleagues and develop ideas for outlines. Any invitation to attend will be issued on the EPSRC website. As places will be limited, research groups should consider who would best represent them at the meeting. Should demand exceed available places, EPSRC will undertake a short-listing exercise prior to confirming the final attendance. Attendance at the networking meeting is not a pre-requisite for applying to the call.

Call schedule

Call launched	March 2006
Possible networking meeting	May 2006
Closing date for outlines	5 September 2006
Short listed full proposals invited	October 2006
Deadline for full proposals	13 February 2007
Successful consortia announced	Summer/autumn 2007

Contact

For further details or to discuss your outline, please contact:

Dr. Kedar Pandya
kedar.pandya@epsrc.ac.uk
01793 444334

SUE 3 call (outline):

EPSRC
Engineering and Physical Sciences
Research Council

Towards a Sustainable Urban Environment: Integration Across Scales

Call for Outline Research Proposals

Closing date for outlines: Tuesday 3 November 2009 at 4.00pm

Summary

Through the Sustainable Urban Environment (SUE) programme, EPSRC would like to seed and support significant new research directions, by focussing on identifying and addressing the grand challenges associated with integration and connectivity across different spatial and temporal scales within the urban environment to deliver sustainability.

Between £6-8M is available to fund a small number of ambitious multidisciplinary research proposals where Engineering and Physical Science research is a major element of the proposed activities involving collaboration between engineering and physical sciences and other disciplines. Through this call EPSRC intends to support research activities that are truly forward looking and focused on the Sustainable Urban Environment of 2050. It is expected that the size and scale of applications will vary depending on the challenges being addressed.

Selection of successful proposals will follow a two stage process: (i) Outline proposal and (ii) Full proposals.

Key dates

Closing date for submission of outline proposals: **Tuesday 3 November 2009**

Outlines sifting panel: Late November 2009

Applicants invited to submit full proposals: Early December 2009

Closing date for full proposals: **Tuesday 26 January 2010**

Decision on successful proposals: Early June 2010

Background

'Towards a Sustainable Urban Environment' (SUE) is a major £38M EPSRC initiative, which has supported over 400 researchers to investigate different aspects of planning and delivery of Sustainable Urban Environments. The programme involves a wide range of disciplines including engineers, social scientists, environmental scientists, planners, architects and urban designers. More information on SUE is available at

http://www.epsrc.ac.uk/ResearchFunding/Programmes/PES/SUE/default.htm and

http://www.urbansustainabilityexchange.org.uk/.

Discussions with stakeholders and EPSRC advisory groups have highlighted the need to stimulate new research directions and challenging, long-term research within the SUE Programme.

The recent SUE *Integration Across Scales* Grand Challenge workshop began exploring the research challenges that need to be addressed in order to enable integration across scales. The workshop highlighted challenges such as:

- Managing the transition from current infrastructure to the desired future;
- Creating adaptive cities;
- The seamless integration of utilities and systems;
- Interactions and flows in and between cities;
- Evolutionary decision making processes, enabling future and existing technologies to be embedded;
- Looking beyond current retrofitting ideas and activities, from individual to city scale;
- Studying in situ: city as a lab;
- Ensuring true trans-disciplinarity, for example, bringing together systems engineering and behaviour thinking.

Please note: These are just examples of some of the wide range of challenges which might be addressed by forward-looking, innovative research into integration across scales. Applicants responding to this call should describe the challenge they are proposing to address and explain its importance in the context of a future sustainable urban environment.

Research Scope

Through this call EPSRC intends to support research activities that are truly forward looking and focused on the Sustainable Urban Environment of 2050.

Cities are complex systems consisting of people, technology, buildings and infrastructure, interacting on different scales and with the surrounding environment. City scales range across personal space, whole buildings, streets, neighbourhoods, city centres, suburbs, conurbations and associated hinterlands. Conurbations interact with each other across regions and with the surrounding natural environment, and regions interact across countries. Timescales of systems and changes range from less than a second for driver and pedestrian behaviour to tens of decades for infrastructure and climate changes. Actions to deliver sustainability have to be appropriate to the scale, whether in time or space.

This raises questions such as:

- What are the right scales on which to integrate systems and services to achieve more sustainable outcomes?
- How can we better scale-up sustainable innovations to achieve whole systems change within an urban context?
- How can we take account of the interdependencies between different aspects of the urban environment in designing more sustainable cites?
- How do we engineer more efficient, integrated and resilient infrastructure (both new and existing) and services that can respond positively to change?

EPSRC wishes to build on existing research within the SUE Programme, in order to advance knowledge, build new capacity and explore new directions, rather than replicate ongoing work. Ideas for feasibility studies through to large scale research activities will be considered.

Assessment process

Outline proposals will be reviewed by a peer review panel and short listed against the assessment criteria below.

Short listed proposals will be invited to submit full EPSRC grant proposals, which will be subject to rigorous postal peer review and panel consideration.

Assessment criteria

Through this call EPSRC intends to support research activities that are truly forward looking and focused on the Sustainable Urban Environment of 2050. Outline applications will be assessed on their potential to deliver this aim.

It is expected that successful **<u>outline applications</u>** will:

- propose truly ambitious and novel, internationally leading research ideas and approaches;
- demonstrate the potential step change in current knowledge and practice;
- demonstrate the long-term and transformative nature of the research;
- support an appropriate group of researchers of international standing together with suitable academic and non-academic collaborators.

In addition to these criteria, **<u>full proposals</u>** will also be required to address:

- detailed arrangements for project management, including milestones and deliverables;
- outreach activities to other relevant research groups and users through innovative workshops, networking and dissemination events;
- full details of the involvement of project partners (such as industrial collaborators, local authorities, charities and other user groups) and their role in transfer of research outputs into policy and practice.

Eligibility

Research challenges in this area will naturally be highly multidisciplinary in nature and are likely to require the involvement of engineers, physical scientists, environmental scientists, economists, social scientists and a range of related disciplines, however proposals must fall sufficiently within EPSRC's remit. If you are unsure please contact the office before submission, preferably by email.

EPSRC reserves the right to reject applications that do not fit within the remit of the call without reference to peer review.

For information on the eligibility of organisations and individuals to receive EPSRC funding, see the EPSRC Funding Guide: http://www.epsrc.ac.uk/ResearchFunding/HowToApply/FundingGuide.htm

As this call is a targeted funding opportunity provided by EPSRC, higher education institutions, and some research council institutes and independent research organisations are eligible to apply. A list of eligible organisations to apply to EPSRC is provided at: http://www.rcuk.ac.uk/research/eligibility.htm

How to apply

Submitting proposals

Applications will follow a two stage process: (i) outline proposal and (ii) full proposals.

Outline Proposals

You should prepare and submit your proposal using the Research Councils' Joint electronic Submission (Je-S) System (https://je-s.rcuk.ac.uk/).

When adding a new proposal, you should select:

- Council 'EPSRC'
- Document type 'Outline Proposal'
- Scheme 'Outline'

On the Project Details page you should select the 'Towards a Sustainable Urban Environment: Integration Across Scales - outlines' call.

A three page case for support should accompany your Je-S form. This should give an overview of the project and the proposed methodology and explain how the research activity will meet the assessment criteria above. Project plans, impact plans and letters of support are not required at this stage but should accompany full proposals.

Full Proposals

Applicants successful at the outline stage will receive further guidance on submission of full proposals. Please note: EPSRC now requires an impact plan to be prepared at full proposal stage for all applications (http://www.epsrc.ac.uk/ResearchFunding/HowToApply/EIGuidance.htm).

Guidance on writing proposals

For advice on writing proposals see:

http://www.epsrc.ac.uk/ResearchFunding/HowToApply/WritingProposals.htm

Details of which research organisations have registered to use Je-S are available from
http://www.so.stfc.ac.uk/jes/jes1/RODetails(Web).pdf

Guidance on the types of support that may be sought and advice on the completion of the research proposal forms are given on the EPSRC website (http://www.epsrc.ac.uk/ResearchFunding/HowToApply/default.htm) which should be consulted when preparing all proposals.

Note that clicking 'submit document' on your proposal form in Je-S initially submits the proposal to your host organisation's administration, not to EPSRC. Please allow sufficient time for your organisation's submission process between submitting your proposal to them and the call closing date. **EPSRC must receive your application by 4 pm on Tuesday 3 November 2009**.

Contacts

If after reading the guidance you require further information or wish to discuss your application, please contact:

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EPSRC
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Acronyms

DSS	Decision Support System
CABE	Comission for Architecture and the Built Environment
CI	Co-inventigator
CLC	Communities and Local Government (Department of)
CoI	Co-investigator
DCLG	Department of Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EPS	Engineering and physical sciences
EPSRC	Engineering and Physical Sciences Research Council
GIS	Geographic Information System
HEFCE	Higher Education Funding Council for England
ICE	Institution of Civil Engineers
IEP	Infrastructure and Environment Programme (now PES)
ISSUES	Implementation Strategies for Sustainable Urban Environment Systems
KT	Knowledge Transfer
LA	Local authority
PES	Process, Environment and Sustainability
PI	Principal investigator
PG	Postgraduate
RA	Researc h assistant
RAE	Research Assessment Exercise
RCUK	Research Councils UK
RDA	Regional Development Agency
REF	Research Excellence Framework
RELU	Rural Economy and Land Use Programme
RICS	Royal Institution of Chartered Surveyors
RIBA	Royal Institute of British Architects
SD	Sustainable development
SPSS	Data mining software from IBM
SUD	Sustainable urban development
SUDS	Sustainable Urban Drainage Systems
SUE	Sustainable urban environments

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