

# **Transforming Regions by Building Successful Science Cities**

**Submission as a Discussion Paper to the  
Comprehensive Spending Review**

**By the**

**Science Cities Consortium**

**March 2007**

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# Transforming Regions by Building Successful Science Cities

## Executive Summary

### **Science Cities – a partnership ready for dialogue**

1. Since their designation by the Chancellor, the six Science Cities (Birmingham, Bristol, Manchester, Newcastle, Nottingham and York) have been engaged in activity on two levels. Inevitably, the main focus of each has been to define its mission; to explore the scope and opportunities within its locality to maximise its potential as a Science City; and to form and extend partnerships and undertake projects that develop that Science City. However they have also increasingly identified a set of opportunities and challenges that they have in common that can be explored and tackled to best advantage if this is done jointly (without compromising their individual opportunities). They have therefore formed a Science Cities Consortium that via its Development Group has held three successful Summit events and has commissioned a programme of research work by the Centre for Sustainable and Regional Futures (SURF) of Salford University.

2. This submission to the CSR, in the form of a Discussion Paper and Annex, draws upon the individual and collective experience of the Science Cities to date and the outcomes of the SURF research. It is an important milestone in the development of the Science Cities as a cohesive and coherent partnership, seeking to engage in dialogue in depth with Government with the aim of ensuring that the designation of ‘Science City’ results in the maximum contribution to Government objectives and policies.

### **The structure of the Submission**

3. This submission is in three parts. First, the Discussion Paper proposes a ‘Transformational Alliance’ between Government and the Science Cities, and suggests areas in which joint actions by Government Departments and the Science Cities would be effective in removing barriers and achieving outcomes.

4. These proposals are then supported by an Annex summarising the findings of the SURF work and comprises two Parts. The first focuses on a content analysis of policy across Government Departments and demonstrates that within current Government frameworks there is a strong rationale for the concept of Science Cities and justification for their existence, e.g. by reference to their partnerships of public/private/academia creating practical benefit to many different Government departments (illustrated by the Table attached to this Executive Summary, extracted from the Annex). It also analyses the concept of Science Cities in the international context. The second briefly charts the significant progress achieved by each Science City, before moving on to scope current and potential contributions and added value.

## Key Features of the Discussion Paper

5. The paper proposes (**section 1.1 – 1.3**) that the context and timing suggest that it would be appropriate to move the initiative of Science Cities onto a basis that recognises that:

- Science Cities are justified by Government policy and that their rationale in policy terms is clear;
- They have made significant progress in joining up policy areas, partners and funding and are uniquely placed to work with government to develop joined-up approaches at a national level.
- The establishment of a Transformational Alliance between Government and the Science Cities would confer national recognition and endorsement of the Science Cities in terms of their capabilities to deliver against Government objectives and to act as test beds for new policies and programmes.

6. The paper continues by proposing that the Transformational Alliance should be the means of establishing a national level of funding targeted on Science Cities' activities, **but crucially without this necessarily constituting a demand for 'new' money (section 1.4)**. The proposal is that the funding would come from the ring-fencing of part of Departments' agreed budgets, and that these ring-fenced funds (in effect a Science Cities block grant) would match the funding secured by the Science Cities at their local and regional levels, and would be deployed for the achievement of agreed Departmental outcomes by the Science Cities.

7. **Section 1.5** of the paper then considers a framework for using such ring-fenced funding within a Transformational Alliance – i.e. Science Cities as Innovation Hubs, both within their city boundaries and wider catchment areas. Some specific areas are proposed where the Science Cities and Government could jointly achieve progress and outcomes. These areas are grouped under the components of the 'Triple Helix' of business, universities and local/regional government, an approach that has informed much of the Science Cities thinking about their roles and opportunities.

8. The Science Cities fully accept that the use of public funds requires monitoring to ensure that it results in efficient and effective outcomes. **Section 1.6** of the paper addresses this point, suggesting that work is needed to identify the appropriate data and how it should be gathered; and that the main focus needs to be on outcomes rather than targets.

9. **Section 1.7** concludes the Discussion Paper by noting the innovative nature of the submission in terms of the progress it shows the Science Cities have made in just over two years, as well as the proposals it contains.

**The Science Cities strongly believe that this submission forms a basis for focused dialogue and stand ready to play their part in this.**

## Science Cities Consortium

March 2007

## Addendum to the Executive Summary

<b>Public Sector Agreement Targets To Which Science Cities Can Contribute</b>	<b>Departments</b>
Demonstrate further progress by 2008 on the Government's long-term objective of raising the rate of UK productivity growth over the economic cycle, improving competitiveness and narrowing the gap with our major industrial competitors.	DTI/HMT
Improve the relative international performance of the UK research base and increase the overall innovation performance of the UK economy, making continued progress to 2008, including through effective knowledge transfer amongst universities, research institutions and business.	DTI
By 2010, increase participation in higher education towards 50% of those aged 18 to 30 and also make significant progress year on year towards fair access, and bear down on rates of non-completion.	DfES
Make sustainable improvements in the economic performance of all English regions by 2008, and over the long term reduce the persistent gap in growth rates between the regions, demonstrating progress by 2006.	DTI/HMT/ DCLG
Build an enterprise society in which small firms of all kinds thrive and achieve their potential, with an increase in the number of people considering going into business; an improvement in the overall productivity of small firms; and more enterprise in disadvantaged communities.	DTI
Demonstrate progress on increasing the employment rate as part of the wider objective of full employment in every region, over the three years to Spring 2008, and taking account of the economic cycle.	HMT, DWP
By 2008, improve the productivity of the tourism, creative and leisure industries.	DCMS
Raise standards in English, maths, ICT and science in secondary education so that: by 2007, 85% of 14 year olds achieve level 5 or above in English, maths and ICT (80% in science) nationally, with this level of performance sustained to 2008; and by 2008, in all schools at least 50% of pupils achieve level 5 or above in each of English, maths and science.	DfES
By 2008, deliver a measurable improvement in the business performance of UK Trade & Investment's international trade customers, with an emphasis on new to export firms; and maintain the UK as the prime location in the EU for foreign direct investment.	DTI/FCO
Tackle social exclusion and deliver neighbourhood renewal, working with departments to help them meet their PSA floor targets, in particular narrowing the gap in health, education, crime, worklessness, housing and liveability outcomes between the most deprived areas and the rest of England, with measurable improvement by 2010.	DCLG
By 2008, improve the effectiveness and efficiency of local government in leading and delivering services to all communities.	DCLG
The planning system to deliver sustainable development outcomes at national, regional and local levels through efficient and high quality planning and development management processes, including through achievement of best value standards for planning by 2008.	DCLG
Lead the delivery of cleaner, safer and greener public spaces and improvement of the quality of the built environment in deprived areas and across the country, with measurable improvement by 2008.	DCLG

# **A new “Transformational Alliance” between Government and Science Cities**

## ***1.1 Introduction: A new Transformational Alliance***

**This submission proposes the development of a new form of “Transformational Alliance” between Government and the Science Cities. This would unite Government and Science Cities in a joint effort to accelerate the UK’s global competitiveness in innovation, science and technology; and to create a deepened and extended popular science culture to raise the skills and education base in key regions.**

The analysis that the Science Cities believe justifies this proposition results from the programme of work that they commissioned from the Centre for Sustainable Urban and Regional Futures (SURF) at Salford University as the basis for a continuing productive dialogue between the Science Cities and Government departments; and to inform more effective national, regional and city-regional policies. This analysis is annexed to this submission and consists of an examination of the rationale across Government Departments; and the contribution that Science Cities already make to Government policies, strategies and targets.

This submission considers the implications of the SURF analysis for future policy and practice that should inform the ongoing development of Science Cities. We are proposing that this take the form of the “Transformational Alliance” between the Science Cities and Government, recognising the overlapping interests of each.

The suggestion for the Alliance is based on three key arguments:

- 1. There is an undeniable logic to Science Cities and justification for their existence, within current Government policy and programme frameworks - particularly in terms of the potential benefits for Government arising out of their unique public/private/academia partnerships (Annex, Part 1);**
- 2. Science Cities are developing from the bottom-up in imaginative and novel ways and are already making considerable contributions to the realisation of Government policy across a range of areas (Annex, Part 2);**
- 3. There are several key areas where Science Cities’ activities can be rendered far more effective by (i) developing changes to national frameworks that encourage and enable action on the ground. This would result in major contributions to Government’s strategic objectives and targets; (ii) providing ideal test beds for new policies or changes to existing policies; (iii) providing national and international exemplars of**

**good practice; and (iv) providing a creative nexus to attract inward investment for the benefit of cities, regions and the national economy.**

The underlying ethos of this submission is that there must be commitment to the formulation of policy in partnership between national and sub-national levels, recognising the need for sensitivity to different contexts of implementation as well as efficient co-ordination and accountability in the use of public resources.

**The Science Cities believe that this is an agenda of critical national importance. As a first step, we would welcome the establishment of an inter-departmental working group, with specific sub-groups, to work through these proposals in more detail.** The Science Cities have considerable expertise that could inform such groups and develop particular proposals in greater depth, e.g. via position papers to outline shared objectives and how they might be jointly achieved. Increasing the economic benefits of public investment in research, regional development, health, education and the sustainability agenda are key areas in which Science Cities can contribute through their focus on exploiting the research base for economic, social and civic benefit.

Science Cities are already contributing to new developments and making a difference through helping key organisations and agencies work together for socio-economic benefit. However, a major part of their potential is that they provide clear opportunities to explore new approaches and pilot new policies. Through increased recognition nationally and internationally as the key drivers of innovation-based economic growth, the Science Cities have a great deal to offer. The Government has the opportunity to utilise them in the development and piloting of innovative policies to promote knowledge-based economic growth through improved effectiveness in S&T funding, learning and skills, business support, inward investment and physical planning.

**Through the proposals submitted in this document and in joint working between sub-national and national partners, the potential of Science Cities for national, regional and city growth, competitiveness and development, can be realised**

The following policy proposals have been developed for this Discussion Paper by the six Science Cities on the basis of their extensive experiences over the past 2/3 years and building on the SURF research. The proposals move from the general level to looking at specific implications through the perspectives of the different Science City partners - business, universities and sub-national agencies - through the concept of 'Innovation Hubs'.

## ***1.2 The Importance of National Recognition and Endorsement of Science Cities***

Part 1 the Annex highlights the logic of the Science City initiative according to the Government's own objectives. Science Cities are already making a range of contributions to the realization of Government policies and strategic objectives. Science Cities are not only relevant to the DTI, but also DfES, DCLG, DH, DWP and DCMS and other Government departments, funding agencies and strategic bodies.

Greater national recognition of this role and explicit endorsement of the Science Cities as a key element of international and national - not only regional - policy would be of significant benefit to Government departments, not just to the Science Cities. It would provide a clear focus for policy-making in the area of innovation broadly defined, and it would enable consistent and coherent messages to be conveyed (for instance to the RDAs), enabling greater effectiveness at the local, city-regional and regional levels. A strategic national decision is needed about the importance of innovation in cities, as the recent NESTA report highlights.<sup>1</sup> Innovation is not a linear but an iterative process, directly informed by a particular urban ecology. The existing and potential contribution of Science Cities in this process should be recognised and promoted.

### ***1.3 Joined-up Thinking, Policy Processes and Co-ordination***

There is a need to commit to a partnership process between the Science Cities and relevant Government departments to identify policy changes that can create a fertile environment for Government to realise their objectives by enabling Science Cities to realise their full potential. Forums need to be established in which strategic understandings from different partners and sectors can contribute to the formulation of policies tailored to maximise the contribution of Science Cities. Science Cities need to be animated through all relevant departments with the formal establishment of an inter-departmental working group with the appropriate authority to take initiatives forward into action.

The aim of such a group would be to seek strategic fit through linking the ‘what’ of policy with the ‘how’ of its realisation. The SURF research (Part 1 of the Annex) has highlighted a number of areas where Science Cities could contribute to the further development of joined-up national policy. This requires a number of steps.

- First, it involves a serious examination of city-regional needs and potential and how they can inform emerging policy and the improvement of existing policy.
- Second, good strategic fit means having a foresight element to policy that seeks to identify the difficulties that will be faced in the process of design and implementation, and how to overcome them. Greater emphasis is needed on how specific initiatives work in particular places so there is mutual learning.
- Third, any evaluation should ask how it will be known that a policy is working, but also the appropriate methodology for communicating that to different audiences. Understanding the capacity of different institutions to deliver outcomes is key throughout this process.

This needs to be complemented by improved modes of communication within and between Government departments concerning Science City development and the identification of particular officials to have responsibility for substantive areas of developmental activity within and between departments.

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<sup>1</sup> NESTA (2006) *Innovation in UK cities*. NESTA.

## ***1.4 Creating Flexibilities in Spending and Resource***

Science Cities need to be part of a coherent national and regional policy framework, with some specific funding to help catalyse new activity. Science Cities have already demonstrated how they can act as partnership vehicles to align various local and regional funding streams to provide focus, enable strategic investments and improve delivery. Greater flexibility in spend would enable different places to apply resources in appropriate ways to meet high level outcomes. There are two specific suggestions to take forward in discussion with Government.

### ***1.4.1 A Science Cities ‘block grant’***

The Science Cities have achieved a joined up approach to funding in their localities across traditional boundaries by forging new partnerships between RDAs, local governments, universities and industry. The same ‘joining up’ of funding streams needs to occur at national level. This involves an approach to securing a block fund for Science Cities that is not dependent on ‘new’ money and offers a match of aggregated funds secured by Science Cities at the local and regional levels.

The proposal is that HMT secures a position whereby each Government Department, with policy objectives to which Science Cities can contribute, would ring fence a proportion of its budget resulting from its CSR settlement and as agreed by HMT for the next 3-5 years for expenditure on Science City projects (this could include funding for the suggestions elsewhere in this submission). The DTI and DfES are obvious candidates for this approach; there are also strong connections with the DCLG interest in the growth of the urban knowledge economy, the translational research agenda of the DoH and the DCMS focus on the creative economy.

A ring-fenced budget of this type would be complemented by the Science Cities in negotiated proportions with the aggregate of what they secure from local and regional sources.<sup>2</sup> Each Science City would also need to demonstrate the extent to which it has been able to engage the private sector at a local/regional level, has secured funding from it and the realistic prospects for doing so in the short and medium term (with due recognition of the different level of opportunity within each region). With the active commitment of the Science City partnerships and central Government on a very significant scale, there will be a convincing case to present to the private sector investment community.

A systematic approach for ensuring that Government will obtain value for money in terms of outcomes that contribute to the achievement of Government Departments’ objectives will be required. This could be achieved by each participating Government Department declaring clear outcomes and targets against its ring fenced funding. Opportunities for these to reflect cross-departmental approaches would add to the power of this approach. The funding would then be disbursed on the basis of each Science City developing a clear outcome-based framework, which will allow flexibility in the subsequent package of projects and activities that would contribute to the declared outcomes. This would allow each Science City to design a package

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<sup>2</sup> This proposal is similar to contract planning in France – the negotiation of shared visions and the joint contribution of national and sub-national partners to their funding and delivery. There is scope for greater learning of how national and sub-national relationships are constituted internationally and the lessons for the relationship between Science Cities and Government.

aligned with its strengths and strategic priorities. Each Science City would accept that it would be monitored against its proposed contribution to targets (recognising the importance of outcomes as opposed to outputs). In order to ensure adequate buy-in and sign up from participating Government departments, an inter-departmental group, led by HMT, should carry out approval of allocation of funding against packages. This would need careful design to ensure that rapid progress and actions could be undertaken to deliver benefits within appropriate time frames.

### ***1.4.2 Special Purpose Vehicles***

Each of the Science Cities has major investment requirements. Attracting private

sector commercial property investment is likely to be essential for financially viable site development. In order to attract the levels of combined public/private investment required to deliver major economic impact in their regions, access will be needed to public sector rates of borrowing similar to those available to local authorities over similar time periods, without prejudicing any local authority's borrowings for other purposes. The creation of special purpose vehicles for Science Cities could be explored to enable borrowing through public sector sources at preferential rates. The Science Cities would wish to explore further the opportunities that the current proposals for "City Development Companies" by DCLG might enable. Equally, such special purpose vehicles will need to be configured to attract the appropriate kinds of private sector investment to match the public sector input; there could be significant help in that regard that HM Treasury and Partnerships UK could provide.

## ***1.5 Supporting Science Cities as Innovation Hubs***

The Science Cities offer the greatest opportunity for realising their potential to maximum effect if they are supported explicitly as Innovation Hubs. They each feature a distinctive partnership of a research-intensive university (or universities), a progressive city council and the RDA for their region. This offers the unique chance to formulate approaches and programmes that can for the first time pursue in a spatial context solutions to issues such as how to achieve greater economic impact from public investment in research and how to reverse the trend away from science in schools and career choices, and to align these with investment in infrastructure leading to urban regeneration. The Science Cities are already acting as Innovation Hubs to varying and limited degrees within their city boundaries but each has the ambition to do so more vigorously and consistently and to extend this effect beyond the city and into the city-region and the region as a whole, on a 'hub and spokes' model. This could facilitate investment in projects or infrastructure outside the city boundary, taking advantage of more appropriate local circumstances, and thus constituting the 'spokes'. A valuable outcome of this approach is that it will enlist the support of a wider set of partners.

The Innovation Hub approach has three inter-related propositions relating to: business and private sector R&D; the public sector research base; local authorities and RDAs.

### ***1.5.1 The Business Proposition***

Government's role would be to examine and test fiscal and legal incentives that could accelerate innovation within the Science Cities to the benefit of their impact as Innovation Hubs on wider areas. The focus would be not only local or regional but also national and international, with the overall aims of attracting and retaining existing knowledge-based businesses and of transforming and growing new knowledge-based businesses. Whilst the attraction of major R&D active corporates to the UK is important, the strength of the national economy in the future will also be critically dependent on developing and growing our own knowledge-based businesses and creating platforms for new international businesses to develop. These aims could be met by a number of measures, suggestions for which include:

#### **1. International branding and attractiveness**

The six Science Cities represent a considerable array of the UK's knowledge and innovation assets beyond the 'Golden Triangle'. We would seek to work jointly with UKTI and have already had initial discussions on promoting these attributes, providing a critical mass to encourage inward investment. Government needs to support the development of a clear national brand for the Science Cities to maximise inward investment opportunities for UK plc.

#### **2. Improving the tax and regulatory environment**

The Science Cities believe there is a strong case for further extending successful tax incentives to encourage private sector R&D activities within geographic specific zones. There is a need to improve the tax and regulatory environment for knowledge-based businesses to grow, as well as reviewing the regulation for micro-businesses to thrive and expand. A number of incentives could include initiatives like corporate tax holidays, extension of VAT exemption regulations, national insurance holidays and subsidised rent in incubators/science parks

#### **3. Early stage finance to inject commercial investment capital**

Each Science City has slightly different needs in terms of early stage finance, given factors such as its particular financial infrastructure and the regional economy within which it sits.

The Science Cities in particular highlight the need for:

- **Proof of Concept funds** outside the university sector (see also 1.5.2 1) to give entrepreneurs with innovations (products or processes) access to early stage funding to develop new ideas to the stage where conventional forms of finance will be available to enable further growth. Currently available funds tend to be small and limit the potential support offered to new innovative businesses.
- **Accelerator funds** to facilitate companies judged as having the capability to grow to move to larger facilities. This will enable the company and the economy to realise this latent growth much earlier in the organizational development cycle

We propose that these needs are brought together as a single request for early stage finance to be managed on a local basis in line with particular needs. This could take

the form of a ‘Science City Fund,’ managed under a single contract to invest in appropriate initiatives across all Science Cities. Seed funds, follow-on and Proof of Concept Funds could then be created which could help to meet increased commercial activity around the Science Cities and complement, but not replace, the Enterprise Capital Funds currently being created on a national scale. The attraction of this would be to offer the opportunity for potential private sector investors to participate and also spread the risk across a range of funds while keeping a strong commercial focus.

#### **4. Business Support for Science-based Business**

The provision of a general business support service as a mechanism for stimulating and supporting growth does not readily fit with the needs of businesses derived from the knowledge-based economy.. There is a wealth of evidence, much of it within Science Cities, that coordinating and providing for the needs of innovation-driven businesses requires sector specific specialist business support. A national business support review of general and business support services needs to produce not only more effective incentives, but also to recognise the need to tailor support mechanisms for innovation-driven businesses. Science Cities could be the vehicles for testing and delivering such support as part of their role as innovation hubs..

Knowledge-based start-ups can find it difficult to source appropriate business mentoring and interim management support: that is, business people with the right level of experience who can act as facilitators or non-executive directors. For early-stage companies such guidance and help is crucial to underpin their viability and growth. A ‘specialist mentor and interim managers’ database that is consistent with the needs of a city/region’s cluster businesses is needed. Mechanisms to reward and retain long term partnerships between these individuals and the business community need to be an integral part of the initiative. Resources to establish a bank of suitable advisors and the necessary brokerage are a prerequisite of any city or region trying to develop its knowledge economy. This bank could cover all six Science Cities and would include those with expertise across sectors, particularly relating to the creative industries, digital industries, health sector, and financial and professional services.

#### ***1.5.2 The Universities and Public Research Base Proposition***

Universities are critical to the realisation of national and regional aspirations to be at the heart of the global knowledge economy. There is a need to encourage the cultural change and institutional incentives necessary to better exploit the potential for universities (alongside partnerships with, for example, FE colleges) to maximise their role within Innovation Hubs and become the drivers of economic and social change in national and sub-national economies. The technology/knowledge transfer model in the UK, with HEIF at its centre, is developing and its establishment as a permanent and enlarged third stream of funding is to be encouraged as a platform to improve the knowledge transfer of a university’s activities.

The need for greater collaboration between HE and FE colleges in building a high skills knowledge economy that meets the needs of businesses has been noted in numerous Government documents. The key issue here is the connection between leading edge science skills and the supporting technical skills to run and maintain specialist equipment and procedures. Greater incentives and pilot projects to encourage this collaboration between higher and further education sectors in meeting

relevant Government objectives are needed, as well as the opportunity to learn from best practice. The Science Cities as Innovation Hubs are extremely well-placed to act as vehicles for such pilots, not least because their partnerships can integrate the role and contribution of key players other than HE and FE.

The RAE as a measure of performance of traditional academic excellence is clear. However, success in the RAE will not automatically lead to economic competitiveness. Whilst the Research Councils are increasingly embracing the knowledge transfer agenda, there is still more that can be done to capitalise upon the excellent strengths within the public research base. Science Cities would welcome a systematic review of funding streams and incentives for engagement, to better identify how universities can simultaneously meet the expectation (and their own aspirations) that they will achieve and maintain world-class excellence in research and achieve a step-change in their rate of innovation and knowledge transfer.

More generally, different universities can make different ‘offers’ to their localities: it is not simply the case that research-intensive universities are global, while teaching institutions are ‘local’ or ‘regional’. The former often have strong connections with local and regional SMEs; the latter may have pockets of research excellence that are international as well as relevant to particular sub-national needs. The landscape of universities’ multi-scalar roles is far more complicated than simple dichotomies imply. A greater recognition of the diversity and complexity of universities’ relationships and contributions at international, national and regional levels is key to harnessing the breadth and depth of expertise in the public sector research base.

The following propositions are examples of specific actions that would be instrumental in facilitating the translation of research expertise and outcomes into economic impact.

## **1. Pre-commercial funding**

The development of University Challenge funds and regional Proof of Concept funds have had a significant impact in changing the nature of the investment environment for university-based research in the UK and such initiatives have been successful in stimulating private sector investment. However these are often relatively small-scale and time-limited. Measures to improve support for pre-commercial ideas or translational research are needed which would create a large scale, easy-access programme of grants or soft loans to university-based innovators to increase the pace and the success rate of moving good ideas through the early, pre-commercial stage. This would fill the gap that exists between research grant funding and commercial concept evaluation and investment funds.

More importantly, it should incorporate funding to assist academics and researchers to pursue a “pre-commercial” idea arising from their research work on a basis that would “invest” in the person not the idea, giving researchers the time to concentrate for a concerted period on a commercial product/service. The emphasis is therefore on capacity building by supporting individuals and teams of researchers, whereas other funds are directed towards the support of potential businesses within particular time frames. This would need to be accompanied by a mentoring process linked to the “investment readiness” platform (see below). The creation of a Science City fund would provide an ideal platform for universities in Science Cities to tackle the gaps

that exist between basic research in the UK and business utilization in order to develop excellence platforms for translational research and knowledge transfer.

## **2. Mentoring and investor readiness**

Science Cities need to increase the opportunities for the commercialisation of science. To attract private sector support, investment propositions need to be well thought through and planned. Most university-based entrepreneurs lack the experience needed to present their business ideas to investors, manage the process of investment and commercialisation or develop a new business. We propose a Science City fund to provide investment readiness and mentor facilities to address these needs. As with early stage finance this should be tailored to local delivery with a mix of commercial/financial awareness training, investment readiness and mentor schemes.

## **3. Graduate schemes and undergraduate entrepreneurship**

Graduate employment by established medium and large companies is the norm, but in small companies it remains a challenge. Many of these organisations have the potential to grow through technology acquisition. Graduate placement schemes in small companies with no history of employing graduates would demonstrate the value of a more highly skilled workforce. A Science City incentive scheme to help finance graduate employment, linked to technology adoption, would encourage growth within this segment of the community and raise the level of graduate employment. The potential value of undergraduate entrepreneurship should also be explored through the greater use of industrial placements to provide effective learning with real business experience. Specific mechanisms for young entrepreneurs emerging from the university also need to be enhanced, including doctoral and post-doctoral business training programmes.

## **4. Knowledge transfer activities**

As noted, innovation is not linear but a complex and iterative process. Furthermore, innovation fundamental to the economy, with relevance for different industries, can emerge from a number of disciplines and is not merely measurable through spin-outs or spin-ins. Universities and FE colleges have vital contributions to make in terms of providing strategic intelligence and advice to inform policy, consultancy, evaluation, citizen engagement etc. Within an outcome-based approach, greater emphasis on the more strategic and intangible elements of Science City impact needs to be given.

One proposal, that illustrates what this would mean in practice, would be an extended approach to Knowledge Transfer Partnerships in Science Cities to cover the NHS and Financial and Professional Services. More broadly, we would like to see a general increased funding for KTPs and a willingness to adapt what is a very successful model to make it more sustainable and more accessible to SMEs. Science Cities therefore provide an ideal laboratory for assessing how far measures supported by universities (e.g. technology transfer offices), HEFCE (e.g. HEIF), RDAs and Research Councils (e.g. KTPs) - each designed to enhance the economic impact of research - can be co-ordinated at the sub-national level, and deliver outputs and outcomes relevant to DTI and DfES..

## **5. Extending the Small Business Research Initiative (SBRI)**

Research Councils as well as Government departments must achieve meaningful SBRI targets. This may require policy review and significant culture change within some Research Councils. Strategic links could be established between SBRI incentives and the aspiration to facilitate local or SME benefit from public sector procurement. The US equivalent of SBRI has enjoyed great success in increasing the engagement of small companies in innovative product development. The universities within the Science City innovation hubs would be well placed to act as SBRI multipliers.

## **6. Increasing the economic impact of Research Council funding**

The Science Cities are well placed to fast track some of the key recommendations of the Warry Report (2006) on Increasing the Economic Impact of Research Councils. Working in partnerships with their RDAs and business, universities in the Science Cities have highlighted areas where they have research excellence with scope for yielding significant economic development impacts.

We therefore recommend that RCUK invites Science Cities and their RDAs to bid together for earmarked funds to enhance their capacity to:

- Maximise the economic development impact across the current research council projects and programmes;
- Develop a franchise for fast tracking research grant applications that are accredited via this local infrastructure and which are then only subject to academic peer review;
- Support research to measure the economic impact of sponsored research undertaken in Science Cities and the value-added of this designation and the ensuing partnership working. As part of this, we recommend that HEFCE use its Strategic Development Fund in Science Cities to underpin research excellence identified by RCUK peer review, but where robust economic impact maximisation measures are in place.

The ultimate aim would be to ensure that such a scheme would be open to all universities. However, in the medium term, ideas and impacts should be tested within the Science Cities so that the potential learning lessons that could inform a possible later national programme are not diluted.

### ***1.5.3 The Role of Local and Regional Government and ‘Place-making’***

In the context of Science Cities, the role of public agencies is to create the conditions in which innovation can flourish and develop. However, international experience demonstrates that this is an active not passive role and requires appropriate resources and support. In addition to the measures noted above, here we focus on the planning system, accountability and co-ordination and the civic offer.

#### **1. A responsive planning system**

Firstly, in support of the Innovation Hub concept, the planning system needs to be made more responsive to developments to support knowledge-based business creation

and growth, with time scales and levels of risk that allow private finance to be levered in. A key requirement in enabling Science Cities to fulfil their potential is ensuring that the city-based economic agenda is brought together with physical and spatial planning processes.

The framework for this is already being set – at the national level through the Barker Review of the planning system and also through such changes as the introduction of Local Development Frameworks in April 2006. National planning guidance should reflect the needs and requirements of the Science Cities, offering appropriate, but not constraining, topic-specific advice.

These needs include the following:

- Ready availability of premises, sites and facilities for knowledge-based companies is essential both to increase their birth-rate and to facilitate their growth. Commercial pressure, understandably aimed at maximising developers' returns, can make it difficult to maintain land allocated for science-related uses. Safeguarding land for incubator space, science parks and technology parks can be facilitated by a strong strategic plan for localities that is consistently applied by all partners and understood by all partners. Incentives need to be offered to developers to advance build 'state of the art' facilities that meet the needs of the cities' economic plan and cluster communities. A fast-track should enable the development of 'brown-field' sites to be brought forward and in so doing guarantee their special designation [Science City Innovation Hubs etc.] status and hence protect them from being appropriated for other use.
- It is also important accurately to assess and respond to the levels of demand for new science-based developments (incubators, science parks and technology parks). Gauging the level of risk and providing confidence to partners are often major challenges. A more consistent demand assessment process would increase planner's confidence in safeguarding sites and of development partners in progressing and delivering science-related property schemes.
- Creating 'a property ladder' to accommodate the needs of expanding technology-based businesses is regarded as fundamental to stimulating the development of 'early-stage' businesses and provision of 'grow-on' space for successful businesses.
- Understanding and accepting the key role which high quality transport infrastructure must play in securing the international competitiveness, reputation and profile of the six Science Cities. This needs to be reflected in the transport priorities in two respects:
  - (i) The external connectedness of Science Cities to the wider global community, which is absolutely vital to extend the reach of the UK's research base; and
  - (ii) To have high quality internal transport system within each of the Science Cities which fosters and encourages interaction and connectedness appropriate to connect people, business and life within 21<sup>st</sup> century knowledge based economies.

## **2. Clarifying lines of accountability**

Each Science City has a different view on the relative importance and leadership of RDA/local government partners in its locality. Government needs to acknowledge that different arrangements work in different places and to create flexibility to exploit existing, rather than impose new governance structures. Coherent frameworks for action are needed for Science Cities that enable the joined-up thinking achieved locally to be replicated nationally; yet such frameworks need to be based on an intelligent recognition of difference as the basis for effective and efficient policy implementation.

The Science Cities acknowledge that many of the measures proposed here, including the block grant or innovation zones, require clear lines of scrutiny and accountability. Science Cities is currently constituted as an RDA-led policy.<sup>3</sup> However, the Local Government White Paper also introduces a strengthened role for local authorities in economic development, particularly in relation to the knowledge economy. Government departments see regional and local scales of action in different ways. This implies that clarity of vision needs to be provided through the support of RDAs and Government Offices for a greater sub-regional focus in the development and delivery of Science Cities. Science Cities offers Government a test of how the new economic development functions of the local authorities (through DCLG) and the RDAs (through DTI) might work in practice. Greater clarity would be welcomed in terms of Government expectations of different organisations to ensure that appropriate and clear lines of accountability accompany the freedoms and flexibilities requested by the Science Cities.

## **3. Public and civic engagement**

Local authorities, with RDAs, are key partners in delivering on the employment and skills agenda as noted above. There is great opportunity for Science Cities to play a significant role in addressing the needs of the knowledge economy, through measures to improve the recruitment and retention of expertise; to improve STEM skills and deliver activity in the context of the new 14-19 partnerships, as well as raise the attractiveness of STI careers. There is considerable enthusiasm in all of the Science Cities to extend their existing work and pilot new initiatives in this area.

This also extends to providing some flexibility within existing national educational and skills support frameworks. The Science Cities provide a unique translational capability to develop, innovate and apply new methods of innovative culture across whole communities. However flexibilities in arrangements with LSC and DfES educational programmes and provision will be essential to fully deliver on this component of the Science Cities ambitions.

Increasing the public understanding of science, especially with young people, is not only beneficial in terms of improving the attractiveness of STI careers, but has a wider civic impact related to policies aimed at climate change, nuclear energy or stem cell research. Effective initiatives are often small-scale and grounded within local contexts in order to highlight the relevance of the debate to particular populations or places. Whilst acknowledged as important, public engagement (as opposed to policy or

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<sup>3</sup> HMT, DTI, ODPM (2006) *Devolving decision-making: 3- Meeting the regional economic challenge: the importance of cities to regional growth*. HMSO: London.

industrial relevance) is not strongly reflected in incentives for research. What this means is that finance for this valuable activity is difficult to source. Incentives are needed to encourage and monitor the public consciousness and understanding of science in Science Cities as a testing ground for meeting a number of policy objectives on a wider basis.

## ***1.6 Metrics and Measurement***

The Science Cities fully accept that part of the quid pro quo of public funding is the need for assurance that it is used efficiently and effectively, and that this must require an appropriate degree of target setting and monitoring. However, it should also be recognised that “fleet of foot” innovative organisations steer their course against high level strategic outcomes. Effective management information in achieving these outcomes is essential. But this should not be an excuse to impose management information targets from outside the Science City itself. Science cities should be held accountable for their strategic outcomes being met, not for just tabulating targets.

More sophisticated measures are needed to understand innovation and socio-economic improvements that are shared across Government departments. Metrics and measurement need to relate to the complexity of innovation across a range of disciplinary areas; relevant units of analysis and spatial scales; different time-scales of activities; intangible activities as much as tangible deliverables; and outcomes more than outputs. In other words, they need to reflect the strategic added value of Science Cities in a range of areas. Development of economic, social and civic impact models to guide long term programme decisions is required. The “horizontal” strategic added value of Science Cities should be acknowledged by allowing first, a focus on outcomes rather than outputs and second, a flexible approach to the delivery of those outcomes that reflects the different stages and places characterised by the six cities.

A great deal of work has already been done in this field. However, as has already been argued, incentives, performance and evaluation criteria influence institutional behaviours. It is important that the work done locally and regionally is reflected in nationally set incentives in partnership with Science Cities. It would be possible to produce some more sensitive data sets from currently available indicators but this would require detailed and sustained work, including discussion with key agencies responsible for existing data collection. HESA/NOMIS/ONS/HEFCE could readily produce the kinds of categories that would be useful, given that much sampling already relates to the HEI or travel-to-work-area (TTWA) level. The Science Cities wish to engage with national Government on how to improve metrics and measurement as a prerequisite for accurate evaluation of Science Cities as well as to inform the more sensitive development of policy frameworks.

## ***1.7 Conclusion***

**This submission is a major demonstration by the Science Cities that individually and collectively they have recognised and accepted the challenge, inherent in their designation by the Chancellor, to define their distinctiveness in terms of their present positions and the greater contributions that they can make if they realise their potential.**

**The Summit event in February of this year showcased the evidence of their progress individually so far. It was also the focus of a resolve to work together to highlight the basis of partnership with Government that is a prerequisite to the step change that is needed if the Science Cities are to fulfil their ambitions. This submission is their collective statement of how they see the next steps.**

**This submission contains a set of proposals that are wide-ranging and imaginative. They might not all find immediate favour with current thinking, but the Science Cities strongly believe that they form a substantial basis for a creative dialogue with Government Departments; that none of the proposals should be discarded until it has been the subject of such dialogue; and that the next step should be to initiate that dialogue.**

**Science Cities Consortium**

**March 2007**