

Defining & focusing international investor relations activity in Greater Cambridge

A report for the Greater Cambridge Partnership (GCP) completed by St John's Innovation Centre Ltd in collaboration with the Cambridge Network Ltd.

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Any views expressed are not necessarily those of the EEDA or GCP.

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Executive summary and main recommendations

The aim of this project was to (i) identify the sectors that could help focus inward investment related activity and engender the development of international business relationships to support the high-tech cluster; (ii) identify specific organisations that could comprise a list of top organisations to do business with; (iii) based on outcome of (i) and (ii) seek to identify international city sub-regions which the GCP partners could agree to focus upon for building long term mutual relationships; and (iv) propose ideas relating to how GCP partners could focus their resources on priority business visitors.

The project was carried out in three phases: Phase 1 - Desk based research to review data from published sources; Phase 2 - Interviews with a selection of stakeholders from the private and public sectors, followed by an on-line survey to gather the views of a wide range of organisations operating with the sub-region; and Phase 3 - Analysis, collation and reporting of key findings.

The conclusions for each of the four objectives and detailed recommendations from the research are summarised below:

1. Key sectors for Greater Cambridge: At the top level, the broad sectors of ITC, life sciences are clear, but at the sub-sector level it is very dynamic. The research reflects the richness, diversity and speed of change of the sub-sectors. Consequently, whereas this report has been able to provide a 'rough cut' view of what companies perceive as the main emerging sectors, a review should be carried out on a regular basis. This would help to ensure that sub-regional policy actions keep pace with the changing landscape of the technology, market and business process sectors within the sub-region.

Recommendation 1: *The GCP, with its partners, should coordinate an annual review of key sectors and sub-sectors by bringing together a small group of key players (i.e., University of Cambridge, ERBI, et al.) and commissioning them to produce a brief update on latest trends. The management of this review would be one of the tasks of a new International Relations Officer (IRO). This information should be shared with EEI to ensure that their international investment focus is in tune with the latest economic development trends within Greater Cambridge.*

2. Organisations with which Greater Cambridge should work: There are many organisations working on linking companies in the sub-region with overseas organisations, and each may have a different approach (in terms of incentives, objectives, performance measures, etc.). There is a perceived need from the business community to have more multinationals and large local firms, various professional service / business support firms, investors (in particular those from the US), R&D and specialised manufacturing firms in the sub-region. The survey results indicate the types of companies that are thought to be needed in Cambridge, but the survey alone does not indicate an obvious consensus on what specific

companies should be attracted. Specific companies that were mentioned more than once by those responding to the survey were: Nokia, Vodaphone, Huawei, Siemens and IBM.

Recommendation 2: *The GCP with its partners should draw upon the results of this survey and discuss with key stakeholders (such as the University of Cambridge, ERBI, Cambridge Network, et al.) to agree a list of companies to attract to the sub-region. An action plan for attracting these companies should be developed in partnership with EEI, with progress reviewed on an annual basis. The summary of the type of companies most needed in the Greater Cambridge area should also be shared with EEI. This summary should also inform the decision making process for the list of companies to attract to the region. The management of this process would be one of the tasks of the IRO.*

3. What sub-regions should we partner with?: There is some scepticism about the role of partnering with other sub-regions driven by lack of clarity on (a) what we are trying to achieve by having a particular partnership; (b) why have we chosen these regions; and (c) who is involved in a particular partnership. However, there is also recognition that partnerships with other sub-regions can be useful to (a) help ensure that the Greater Cambridge brand is built and maintained on the international stage; and (b) act as a conduit for business-level leads and contacts. There are a diverse range of partnerships that have already been formed by organisations within the sub-region, but these may not necessarily be being used to best effect. The results of the survey show that China and the U.S. are by far the preferred countries with which the sub-region should have strong links. Within these two countries, the regions surrounding or including Shanghai, Beijing, Boston and Silicon Valley are the regarded as the most useful. The process for forming partnerships with these regions could be either targeted bilaterally, or by joining existing networks that include the target region. Each option has strengths and weaknesses.

Recommendation 3: *GCP and its partners should draw upon the results of the survey reported in this document and in consultation with key stakeholders such as EEDA, EEI, ERBI, Cambridge Network, agree a list of regions with which to build strong bilateral relationships. The top six from the results of the on-line survey are: Silicon Valley (and neighbouring regions) Boston, Shanghai, Beijing, Munich and Bangalore. The various options for partnering with each should be considered, and the relative costs and benefits of each assessed. Once priority locations are agreed the actual costs associated with visits should be determined and these costs spread across GCP partners. Value may be gained from joining multilateral networks such as the Innovations Champions Network. There should be an annual review of both bilateral and multilateral activities to ensure that we have the most useful types of partnership with the most appropriate regions. The management of this process should be one of the responsibilities of the IRO.*

4. Improving visitor management: Hosting visits to Cambridge is perceived in many cases to be a waste of time and effort. This is due to a combination of lack of coordination; visitor management being largely reactive rather than proactive; the relative strategic importance of each visit to the sub-region being unclear; lack of clarity on what value many of these visits

deliver to the business community; absence of tracking and follow-up; and planning and managing visits being time consuming and therefore costly.

Recommendation 4: *There are three parts to this recommendation: (a) Strategy; (b) International Relations Officer; and (c) Resources and infrastructure.*

(a) Strategy: *The International Relations Officer (IRO) working through the GCP needs to develop and communicate a clear international strategy to focus international activities. This strategy must be regularly updated by monitoring the latest trends within the sub-region, drawing on the evidence of this report and the group identified in Recommendation 1. The results of the survey reported in this document, and the deliberations of the group described above, would inform the development of a categorisation of potential visitors. This categorisation could draw upon the examples of the approach used by Bidwells for channelling visitors to the Cambridge Science Park, or a simplified version of the ‘valuecard’ approach used by East of England International to assess potential visitors. The strategy would also help define the ‘proactive’ agenda and should involve working closely with East of England International to target Science and Technology Counsellors at key locations to organise to bring over the delegations able to offer best potential value to businesses in the sub-region.*

(b) International Relations Officer (IRO): *An IRO should be appointed whose role will be to act as a first point of contact for potential visitors and to support the categorisation of potential visitors described above. Once categorised, the IRO would carry out a needs analysis for potential visitors, help them plan their visit but not necessarily organise it for them (as companies such as Cambridge Visits already provide this service). The IRO would need to be sufficiently well informed that potential visitors can be signposted to the most appropriate organisation or individual within the sub-region who may be able to provide what they need. The IRO would also have access to four key sources of information: (i) Which organisation does what in Greater Cambridge; (ii) What events are being held in the sub-region; (iii) What data / resources are available for visitors; and (iv) Who has previously visited Greater Cambridge, and who did they see?*

The categorisation of visitors as described in Recommendation 4(a) would allow the IRO to ensure that potential visitors are then put in touch with the most appropriate individuals and organisations within the sub-region, and are given access to the most relevant resources drawn from a portfolio of offerings. This portfolio could include: regular, open events (e.g., Cambridge Network Open Meetings, Cambridge Enterprise Conference, ERBI BioPartnering event); customisable events (e.g., Corporate Gateway); accommodation (e.g., short term accommodation at Science Park or at SJIC); video resources; web resources; publications and presentations, etc.

The IRO would not be part of any new organisation but could either be a secondment from, for example, East of England International (building on the successful precedent set by the secondment of Jeanette Walker to ERBI), or a new recruit. The organisation responsible for

managing the IRO could be one of the members of the Cambridge Technopole Group¹. One suggested organisation that would be well placed to carry out this role is St John's Innovation Centre (SJIC). Basing the IRO at SJIC has a number of advantages including:

- SJIC could, at least for the first 12 months, provide free space and cover associated overhead costs such as phones lighting, etc;*
- There would be close proximity to both the Cambridge Network and ERBI which should assist in the efficient management of the visitor programmes and discussions about targets;*
- SJIC also houses the Regional Innovation Relay Centre (IRC), Elizabeth McDonald (i10) and Louise Rushworth (Business Link) which again would help with networking and a 'joined up approach';*
- Walter Herriot (CEO of SJIC) would be prepared to act as line manager on a day-to-day basis as he does for Louise Rushworth and Elizabeth McDonald. Overall responsibility however would remain with GCP.*

The activities of the IRO could also be assisted by a subset of members from the Technopole Group who could be called upon via email to deal with queries relating to visitors who do not fit precisely within the categorisation provided.

***(c) Resources and infrastructure:** Data to support the work of the IRO would need to be gathered, structured and maintained. Whereas it would be comparatively straightforward to get at least the basic information on the first items listed earlier (Who does what? What events? What resources?), the tracking of visitors would remain a big challenge. To help overcome this, and to ensure that at least outline data on visitor is captured, it is proposed that all the members of the Technopole Group contribute a simple list at each of their quarterly meetings of what visitors each member has hosted in the previous 3 months. This basic data could be gathered and collated by the IRO. This would then develop into a key resource for businesses and organisations to build on positive leads.*

It is also proposed that a promotional video be produced on the 'Cambridge Phenomenon' and that a website be constructed to provide would-be visitors with (a) basic information on the sub-region (including an on-line version of the Technopole Report² and clips from the promotional video) and (b) information on how visits can be arranged and how to contact the IRO. This website would be linked to by a simple button from the front page of the websites of those organisations that wish to benefit from this enhanced visitor management approach.

¹ Technopole Group members include: Cambridgeshire Business Group, Cambridge Network, Cambridge Science Park, Eastern Region Biotechnology Initiative (ERBI), East of England Development Agency, Great Eastern Investment Forum, Greater Cambridge Partnership (GCP), i10, St. John's Innovation Centre, and various University of Cambridge departments and offices including the Institute for Manufacturing and the Judge Institute of Management.

² www.stjohns.co.uk/documents/cambridgetechnopolereport.pdf

The aim would be to channel all initial enquires to this site unless the organisation wishes to manage the visit independently.

The overall aim is to develop a relatively 'light touch' approach to these activities that will be guided by the international strategy set by GCP, and which will integrate closely with the operations of East of England International.

The overall budget for Year 1 for implementing these recommendations would be £60k, going down to £50k (plus inflation) in subsequent years. If the production of a video on the Cambridge Phenomenon is to be included in the budget, this would add around £30-35k to the Year 1 budget. The costs for the IRO should be share across the GCP partners and other organisations with an interest in developing International Relations in the Greater Cambridge Economy.

Introduction

Project aims and context

This report presents the findings of a short research project to investigate strategic and tactical issues relating to international investor relations in Greater Cambridge. This research was commissioned by the Greater Cambridge Partnership (GCP) and was driven by their perceptions that with the strong international nature of much of the business conducted by companies in the sub-region there is a need to:

- Ensure that the Greater Cambridge perspective was symbiotic with the international investor relations strategy being developed at the regional level;
- Provide a greater degree of clarity on the priority target organisations for East of England International to utilise in their work;
- Focus international investor relations activities to avoid spreading resources too thinly;
- Support businesses in the sub-region in deriving value from Greater Cambridge being recognised as one of the world’s leading high technology business clusters;
- Ensure that Greater Cambridge continues to be promoted effectively on the international stage.

In detail, the aims of the project as defined by the GCP were as follows:

- Identify a range of complimentary sectors/technologies/business processes that could help focus inward investment related activity and engender the development of international business relationships to support the high-tech cluster.
- Identify specific organisations (companies, universities, public bodies etc) that could comprise a list of top organisations to do business with.
- Based on outcome of (i) and (ii) seek to identify approximately 6 international city sub-regions which the GCP partners could agree to focus upon for building long term mutual relationships (these may or may not be locations with existing links).
- Propose ideas relating to how GCP partners could focus their resources on priority business visitors over other “interested” groups.

Before describing the ways in which this research project was implemented, a number of issues need to be highlighted to place this work in context. Firstly, it is important to stress at this stage that the aim of this project was not to provide any definitive list of key sectors for Greater Cambridge, nor to propose a strategy for international activities to support the growth of such sectors. Within the short time frame and limited resources allocated to this project, our aim has been to make an initial attempt at structuring the main issues of how international

investor relations activities could be defined and focused, and to make recommendations for how such activities could be enhanced.

Secondly, the timing of the research is also important. The starting point for the research was triggered by the completion in December 2004 of the report by Martin Oldham of the Government Office for the East of England (GO-East) entitled “International Business Services Review”³, and the end point coincided with the formation at the start of April 2005 of East of England International (EEI; the organisation formed by the merger of Invest East of England and the East of England arm of UK Trade and Investment). The business plan for this new organisation describes in some detail the ways in which EEI will be working to support a range of international investor relations activities at a regional level, and also describes the ways in which these will be supported at the sub-regional level. This research was therefore aimed at examining issues of specific concern to the Greater Cambridge sub-region within the context of the broader regional issues identified by the EEI business plan.

Thirdly, the focus of this report is the high technology cluster at the heart of the Greater Cambridge sub-region. Though reference is made to certain issues that relate to the wider sub-region, these issues do not form a substantial part of this research and hence are not described in this report. However an improved focus and greater emphasis on international relations across the GCP partners is likely, over time, to benefit the whole of the Greater Cambridge area from the City of Cambridge at the centre to the ring of market towns around the City.

Research approach

Following a clarification of the aims of the project through discussion with the Director of the GCP, the main part of the research was divided into three overlapping phases.

- **Phase 1:** Desk based research to review data from published sources, and existing and new initiatives linked to the themes of this research.
- **Phase 2:** Interviews with a selection of stakeholders from the private and public sectors⁴ to gather views on the themes of this research. This was followed by a survey to gather the views of a wide range of organisations operating with the sub-region⁵.
- **Phase 3:** Analysis, collation, refinement and reporting of key findings. This to include the publication of this report and the preparation of a presentation to be made at the GCP Conference in June 2005.

³ Summary given in Appendix 6.

⁴ See Appendix 1 for list of interviewees.

⁵ See Appendix 3 for the survey questions used.

The remainder of this report describes the key findings in relation to the four aims of the project, and then concludes with a set of recommendations. Additional supporting evidence is given in the appendices.

Part I: Identify key sectors to focus inward investor relations

Numerous reports have been written that describe the key sectors in Greater Cambridge. For example, in 2002, the GCP commissioned the economic development consultancy PACEC to produce a substantial report on the ways in which Cambridge could fulfil its potential, and this included quite detailed research on the current and emerging sectors for Cambridge. The aim of this section is not to duplicate the PACEC work (a summary of which is given in Appendix 5) but to:

- Highlight examples of the range of reports that have already been produced that seek to identify key clusters and sectors in the sub-region;
- Compare this with the views of those running high-tech businesses in Greater Cambridge gathered through an on-line survey;
- Suggest ways in which emerging sectors could be monitored to provide a useful input to the other aims of this project.

Existing research on sectors strengths in Greater Cambridge

Sectors can be defined in terms of (a) technologies, or (b) markets served, or (c) business processes⁶. For a sub-region such as Greater Cambridge which has gone through a series of stages of growth, sectors can also be classified in terms of historical, established or emerging. For example, Figure 1 shows the evolution of sectors in the sub-region since the 1970s. The key sectors that have provided core strengths of Cambridge include scientific instruments, IT, telecommunications, biosciences and inkjet printing⁷.

The issue of intended versus emergent is also interesting to consider in relation to Greater Cambridge. Policymakers at the regional and sub-regional level have not, to any great extent, identified specific sectors in order to target resources; the sector strengths have largely emerged from the bottom-up and have subsequently attracted external investment. This is in

⁶ There is also much discussion about the definition of clusters (in all their forms) and how they differ from sectors. It was not felt helpful to spend time discussing the differences between these terms for this project.

⁷ For an overview of the evolution of the high tech cluster see SQW (2000). "The Cambridge Phenomenon Revisited", Segal Quince Wicksteed, Cambridge, UK., or Koepp (2002), "Clusters of Creativity: Enduring Lessons in Innovation and Entrepreneurship from Silicon Valley and Europe's Silicon Fen."

contrast to, for example, regions and sub-regions elsewhere in Europe where there has been explicit targeting of sectors and focusing of resources from the public sector⁸.

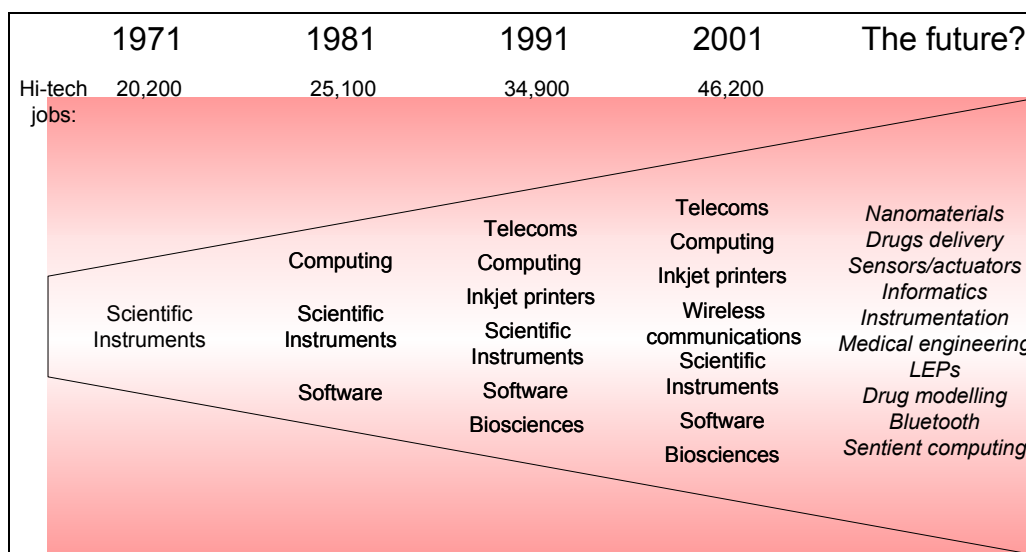


Figure 1: Changing sector strengths in Greater Cambridge (PACEC, 2003)

Numerous reports have been written that describe the key sectors (historical, current and emerging) in Greater Cambridge⁹. Among the most comprehensive of these have been “*The Cambridge Phenomenon: Fulfilling the Potential*” by PACEC, and “*The Cambridge Phenomenon Revisited*” by SQW. In terms main sectors identified through patterns of investor behaviour, the “*Cambridge Cluster Report*” published by Library House gives a very thorough coverage. Examination of the breakdown of research spending at the University of Cambridge provides another means to monitor sector strengths.

There are then also a number of external studies that have examined sectors and clusters at a regional, national and international level that also provide a comparative view on sector strengths in Greater Cambridge. Examples of international comparisons include “*Clusters of Creativity*” by Rob Koepp (comparing Cambridge and Silicon Valley); national comparisons can be found through the DTI’s various cluster reports (such as “*Business Clusters in the UK: A First Assessment*”); and at the regional level, there are reports such as the “*Innovation and Technology Audit for the East of England*” produced by ADL. All of these sources, to varying degrees of comprehensiveness, described the directly or indirectly perceived sector strengths of Greater Cambridge.

At the top level, these sector strengths are typically grouped around the headings of:

⁸ For example, the growth of the biotechnology clusters in Munich and Berlin. See Gill, D., T. H. W. Minshall and M. Rigby (2003). “Funding Technology: Germany - Better by design?” London, Wardour Communications.

⁹ Details of reports used are listed in Appendix 1.

- Information and Communication Technologies (though IT and telecommunications are often considered separately);
- Life sciences (with particular reference to biotechnology, pharmaceuticals and medical devices);
- ‘Other science-based’ (which typically includes strong reference to the various fields that are grouped under the heading of nanotechnology, or perhaps to material science derived technologies more broadly).

If we look at research spend at the University of Cambridge, the breakdown of its annual spend of over £250 million is approximately half devoted to clinical medicine and biosciences. Other major proportions of funding go to areas such as chemistry, physics, engineering and maths¹⁰.

The Library House data¹¹ show that the top level sectors with the biggest proportion of companies (80% of the total of innovation-based businesses as they defined by Library House) are IT and life sciences. Taking it down to the sub-sector level, companies involved in application software, biotechnology, electronic equipment and instruments, and life science devices, instruments and supplies are the most numerous.

Reference is often made to the new sectors that are developing at the overlap of two or all of these top level technologies. This theme was explored in the PACEC report which mapped emerging sectors (shown in Figure 2).

The reports then typically identify further technology-related strengths of the sub-region which do not comfortably sit under these top level technology headings. The most often cited example of this is the significant industrial inkjet printing cluster¹².

There are then those business process sectors in which the sub-region has developed strengths, key amongst these being the technology consultancies (TTP, PA Technology, Generics Group, PA and Cambridge Consultants Limited). These companies have played a significant role in the realisation of solutions for industry drawn from leading-edge research.

There are then the sectors that are still present in the sub-region but which were much stronger in the past, e.g., agrochemicals and veterinary science-related activities.

¹⁰ Data from www.hesa.ac.uk.

¹¹ LibraryHouse (2004). "Flight to quality: The Cambridge cluster report 2004", LibraryHouse, Cambridge, UK.

¹² This on-going strength is reflected in the recent formation of Industrial Inkjet Consortium coordinated by the University of Cambridge Institute for Manufacturing. See <http://www.ifm.eng.cam.ac.uk/service/news/2004.html> for more information.

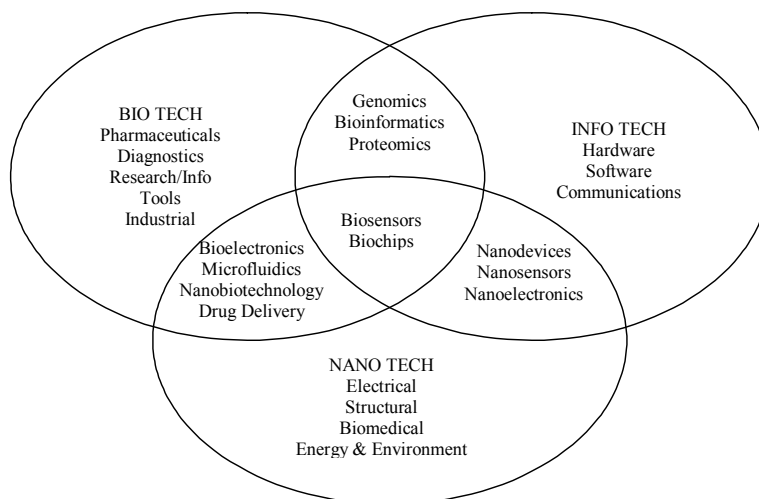


Figure 2: Emerging sectors at overlap of top level technologies (PACEC 2003)

In terms of product or market based opportunities, the PACEC report also presented a number of emerging themes based on their research (see Table 2).

Table 2: Emerging technology product / market areas (PACEC 2003)

<ul style="list-style-type: none"> - New materials developed at a nano level including stronger and lighter plastics for staple products (countertops, autoparts, toys). - Drug and gene delivery systems which enable drugs and genes to be targeted at specific sites within the body to counter for example tumours and incorrect proteins. - Sensors and actuators for use in a variety of consumer electronic devices, cars, medical devices, pollution monitoring. - Electronic communications and informatics for data transmission. - Instrumentation, tooling and metrology for manipulation and assembly at the nanoscale - Tissue engineered medical products and artificial organs, medical implants and devices, new materials to replace bones and teeth. 	<ul style="list-style-type: none"> - Light emitting polymers with applications in inkjet printing thin-film polymer transistors and circuits onto plastic and other substrata for use in flat screen TVs, packaging and smart cards. - Computer-based methods for the identification of drug candidates - ‘Bluetooth’ short range wireless providing device-to-device (entertainment systems, security systems and control systems) communications in the home and in the office - Sentient computing using components (mainly sensors) that can respond and interface with the external environment. For example, computing systems distributed throughout a building detecting, responding and interpreting the environment.
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Key sectors identified through interviews and on-line survey

The survey asked respondents to give their view on the following question: “What do you think are the three most important sectors that will underpin the growth of Greater Cambridge in the coming 10 years?” Responses were invited in terms of technologies and/or markets and/or business processes. The question was left deliberately as open as possible to ensure that a range of views could be captured. The results are summarised below to give a flavour of the diversity of responses.

Technologies

If responses grouped under top level headings of ‘ICT’ (including electronics), ‘life sciences’, ‘materials / nanotechnology’, and ‘other’, then just under 50% of respondents felt that ICT-related technologies were most important, just under 30% felt it would be life science related, and the remainder split between nanotechnology / materials and other. Of greater interest perhaps was the richness of responses at a more specific level as to what was most important for Cambridge excluding those that just stated a top level heading such as ‘IT’ or ‘biotech’ or ‘nanotechnology’. These responses are summarised in Table 3 with the aim of not reflecting the particular significance of any particular technology, or groups of technology, but rather to illustrate the diversity of responses.

Table 3: Examples of responses to key technological sectors

3G & beyond	Machine Learning
Artificial intelligence	Mathematical Modeling
Bioinformatics	Medical devices
Broadband	MEMS
Chip design	Neural interface
Comms integration (RFID, mobile and logistics infrastructure)	New computing platforms
Contract development & investment	New energy technologies
Convergence of IT, materials, engineering and bio	Online User Profiling
Digital printing	Organic devices
Education, including online education	Pervasive/ubiquitous computing
Electronic devices	Polymer electronics
Energy	Printing' of new materials using ink-jet etc
Environmentally responsive polymers	Satellite technologies
Functional materials (catalysts, thermoelectrics, terahertz materials, semiconductors etc.)	Semiconductor developments
Human-computer interfaces (HCI)	Sensors
Hydrogen fuel cell	Software (high tech applications)
Imaging	Software (inc IT Services)
Information and Communications Technologies - Sentient Computing and Software	Software for non-PC platforms
Innovative IT, e.g. Knowledge management, security	Sustainable energy
Internet enabling technologies for small businesses	Systems biology
Lab on chip	Traceability technologies
	Wireless

Markets

The most common responses by far were grouped around ‘mobile communications’, ‘communications’, ‘pharmaceuticals’ or ‘healthcare’. Table 4 summarises the responses of those that gave detail below these top level headings, or who identified different key markets.

Table 4: Examples of responses to key markets

Aerospace	Low power devices
Age related diseases	Medical self diagnostics
Bio security and defense	Medical solutions
Bioprocessing	Medical treatment
Biotech	Medical/pharmaceutical
Broadband internet	Mobile phones
Comms (mobile, fixed, intelligent, ad-hoc, secure)	Mobile services
Communications and 'systems' integration	Mobile systems and interoperability
Consumer electronics	Networking products - consumer electronics
Consumer entertainment	New features, applications and services for mobile phones
Custom semiconductors	Non-invasive imaging
Data transfer and security	Non-medical biotech
Diagnostics and informatics	Personal care
Drug delivery devices	Personal communication
Drug development	Personalized healthcare
Drug discovery	Portals
Drug release	Precision/advanced engineering
Drug targets	Remote sensing
E-commerce	Renewable energy
Energy market non-CO2 sources	Retail (theft prevention), high-speed mobile connectivity
Engineering	Search
Entertainment	Security - identity
Environment and sustainable development	Security devices
Functional foods	Sensors
GIS	Services
Hand-held medical devices for consumer use	Silicon chips - design
High performance engineering	Smart materials
Home appliances	Teaching and learning
Imaging systems	Tissue regeneration
Inkjet printing technologies	Tourism
Internet software	Transportation
Internet tools for non-technical people	Ubiquitous information access
Internet-delivered applications	User interface for mobiles and PCs
IP for semiconductor industry	Vaccine and disease eradication
Knowledge management for everyone (business & private)	Wireless and communications evolution - towards e-education, e-health, etc.

Business processes

This question elicited responses grouped around a relatively small number of processes. The most commonly given were ‘Contract R&D / product development consultancy’, ‘Pilot production’ and ‘Finance for innovation’. A selection of the range of processes identified are summarised (with duplications removed) in Table 5 to illustrate the diversity of responses.

Table 5: Examples of responses to key business processes

Ability to attract strong teams to Cambridge	Design	Management development for SMEs
Access to an equipment pool	Developing global-scale businesses by acquisition and retention of businesses and people	Management of international R&D companies
Accessible financial and professional skills for start-ups.	Developmental manufacturing	Manufacturing
Angel investment	Early Stage 'idea funding'; prototyping at low cost and plenty of it	Market research at international scale
Biotechnology studies	Emphasis on global markets	Marketing services
Broad based commercial networking	Expanding University Summer student work placements	Marketing Strategy
Broad Spectrum of Professional Services	Export markets - awareness raising	More focus on applications
Business development and support for startups	Fundamental research	Networking groups (e.g. CHASE)
Capital providers with long term vision	Funding (second stage)	New business models for drug discovery
Chip design	High tech/biotech licensing	New high growth start-ups
Clinical management/research	Highest quality design and development of technology based products and systems.	Partnerships with Chinese businesses
Collaboration with Funding	Improved infrastructure, in particular improved travel links to the rest of the world	Product development and management
Collaborative R&D	Increased international trade/sales/marketing/partnerships	Productisation skills
Commercialising IP	Incubation Facilities	Prototype/pilot line capability (cf CDT at Godmanchester)
Consulting	Innovation	Sale of Designs or Processes
Consumer facing technology businesses	International acquisition and post-merger management	Sales/marketing
Continued excellence in manufacturing complex and large products / systems - e.g., Industrial Ink Jet printers	International networking rather than local networking	Services including health
Continued excellence in Software development and Software product supply	International sourcing of supplies	Software development
Contract biological services	IP-based product development	Sophisticated quick response concept prototyping
Contract R &D	Knowledge based enterprises; design, publishing, consultancy	Sponsored partnerships between 'made it' and 'yet to make it' companies; in situ mentoring
Contracting with and managing third party manufacturers etc	Large/medium service company operation	Support for designers/inventors (as publishers support authors)
Coordination for distributed innovation	Lean R&D	Technology consultancy - and ability to spin-outs companies on back of this
Coupling of Low volume high value here and outsourcing the developed high value	Licensing IP	Technology transfer and licensing
Customer relation technology	Low volume high value manufacturing	Training in Entrepreneurial Management

Conclusions on sector strengths

The key issues from this section are:

- Background research, interviews and survey reveal that, at the broadest level, there is reasonable agreement as to what the key technology and market sectors are for the sub-region at present. When these broad categories are looked at with any detail it is clear that there are numerous sub-sectors being developed and served.
- It is also clear that sub-sectors change rapidly. For example, the PACEC report in 2003 highlighted Bluetooth as an emerging area for the sub-region. Since then, Cambridge Silicon Radio has become the world's leading Bluetooth IC companies with over 60m chips shipped and over 60% of design wins for this technology. By the activities of this company alone, the sub-region has become a leading centre for Bluetooth technology in 2005. This example illustrates that if we are to ensure that any investor relations activities are effective, there needs to be a regular review of emerging sub-sectors within the sub-region.
- GCP should coordinate an annual review of key sectors and sub-sectors by bringing together a small group of key players (i.e., University of Cambridge, ERBI, et al.) and commissioning them to produce a brief update on latest trends. The management of this review would be one of the tasks of a new International Relations Officer (IRO).
- In terms of business processes, it is interesting to note that there is a clear perceived need to build on the strengths of the R&D base, especially the consultancies, to have the capability to move ideas to production rapidly, and for there to be access to appropriate sources of funding, management expertise, and international connections to make this work.

Part II: Identify specific organisations to work with

How can we identify organisations to work with?

Through the interviews conducted for this research, a number of approaches were suggested for how the sub-region could target specific organisations to work with. Broadly speaking, the approaches could be split into top down versus bottom up, and targeted versus responsive. The issues and approaches for each of these could be summarised as shown in Table 6. Clearly, in practice there are not such clearly defined boundaries between approaches, but structuring the process by which companies are targeted and approached is key to the issue of investor relations management, and this will be discussed in more detail in Part IV of this report.

Table 6: How overseas organisations may be linked to sub-regional partners

	Top down	Bottom up
Targeted	Strategic need defined. Target companies identified. Focused efforts to attract targeted companies.	Businesses identify organisations they would like to make contact with / see in region. Efforts made by various regional organisations to respond to specific needs (providing contacts, etc).
Responsive	Strategic need defined. Target companies identified. Filter applied to those companies showing an interest in sub-region.	Companies within sub-region willing to devote time to networking with visitors / delegations / partnering events.

Which types of organisations are needed in Greater Cambridge?

The clearest messages to be drawn from the responses to this question (summarised in Table 7) were that multinationals and large local firms, various professional service / business support firms (this included IP specialists, technology brokers, head-hunters *et al.*), investors (in particular those from the US), R&D and specialised manufacturing firms were the main types of companies that are needed in the sub-region.

Table 7: Summary of responses to “What type of companies ..?”

Type of company	# responses
Multinational Corporations (MNCs)	38
Business support / professional services	25
Venture capital funds (especially from US)	24
R&D-focused organisations	17
Large, locally grown firms	14
Specialised manufacturer (low volume, prototyping, etc)	12
Specific technologies	10
Unspecified manufacturing	8
Other (includes creative / arts, security, services)	7
Financial services	6
SMEs	5
Chinese companies	5

What specific organisations should Greater Cambridge work with?

This question resulted (unsurprisingly) in a very broad range of responses with little common agreement as to specific companies. Around half of those that responded to the survey did not provide any examples for this specific question.

Examples of the diversity of the responses received are shown in Table 8. Where a company was named more than once, the number of those that responded is shown in brackets.

It was realised from the outset that asking such a question was likely to lead to wide scattering of responses. The previous question relating to the type of companies needed provides perhaps a more useful set of responses to help achieve the aims of this project.

Table 8: Responses to “What specific companies ..?”

3Com	First Investors USA	Nokia (4)
3i Head Office	Fiserv	Novartis
Aerospace Companies	Frost & Sullivan	O2
Alcatel	GE	Oracle
Amazon	Genentech	Orange
AMD	Gillette	Patents Office
Apple Computers	Google	Pfizer
ASML	GSK research activities	Philips
BAe	Harvard Business School	Phone Handset OEMs
BCG	HP (4)	Qualcomm
Benchmark	Huawei (2)	RBoS
BMW or Mercedes or Porsche	IBM (4)	Roche
Boeing	IMechE, IEE	Samsung
BT R&D branch	Index	Samsung
Chinese company	Intel	SAP
representation	Kodak	Siemens (5)
Chiron	Lucent	Sony
Cisco	Motorola	T-mobile
DTI/OST	National Energy Research	TNO
EA Games	Centre	Universal Film Studios
e-Bay		Vodafone (3)

Conclusions on specific organisations with which to work

The broad conclusions from this section are that:

- There are many organisations working on linking companies in the sub-region with overseas organisations, and each may have a different approach (in terms of incentives, objectives, performance measures, etc.);
- There is a perceived need to have more multinationals and large local firms, various professional service / business support firms, investors (in particular those from the US), R&D and specialised manufacturing firms in the sub-region;

- The survey results indicate the types of companies that are thought to be needed in Cambridge, but there is no obvious consensus on what specific companies should be attracted.
- The GCP should draw upon the results of this survey and discuss with key stakeholders (such as the University of Cambridge, ERBI, Cambridge Network, *et al.*) to agree a ‘wish list’ of companies to attract to the sub-region. An action plan for attracting these companies should be developed in partnership with EEI, with progress reviewed on an annual basis. The management of this process would be one of the tasks of the IRO.

Part III: Identify sub-regions with which Greater Cambridge could form strong relationships

Should Greater Cambridge form partnerships with other sub-regions?

The overriding concern raised when gathering views for this section of the report was: Do partnerships between regions actually deliver any real value to the business community in Greater Cambridge? The sub-region is partnered, or works with, a number of regions and sub-regions around the world to varying degrees (see Table 9 examples of such partnerships / linkages, both bilateral and multilateral), but many of those interviewed were very sceptical of the value of such partnerships. This scepticism was driven by factors including:

- **What we are trying to achieve by having a particular partnership?** Is it just profile raising for the sub-region over the medium to long term, or is it trying to deliver tangible benefit to companies in the sub-region in the short term?
- **Why have we chosen these regions?** Some of the regions with which Greater Cambridge already has a relationship seem to have few obvious areas of common interest.
- **Who is involved in this partnership?** Is this something that is largely organised by, and of interest to, a minority of stakeholders within the sub-region?

On the positive side, some interviewees could see that partnerships can deliver value to the business community and their reasons can be summarised as follows:

- **Building and maintaining the Greater Cambridge brand on the international stage.** Greater Cambridge is already recognised as the leading technology business cluster in Europe (e.g., it attracts over 8% of total European venture capital investments, is regularly listed as being the most significant concentration of high growth potential technology-based companies in Europe). To ensure that we maintain and continue to build the brand globally in the face of emerging competition, we need to have a strong presence on the ‘World stage’. An example of a tangible benefit of this can be seen in the increasing interest being shown by large US investment funds in Greater Cambridge-based companies. However, this could be achieved through methods other

than forming partnerships. For example, ensuring that Greater Cambridge appears at all the ‘right’ events may be sufficient¹³.

- **Providing a conduit for business leads.** At a more short term, practical level, having a means to access information and leads on companies within other leading high technology business clusters world-wide could prove very beneficial. While there are many routes to accessing leads in international markets, the existence of strong, useful and up to date links between Greater Cambridge and other leading high tech regions and sub-regions was perceived as being potentially helpful.

Table 9: Examples of the diverse types of partnerships involving Greater Cambridge

Partners:	Background:	More info:
Munich	Initiated by the Munich Network and Cambridge Network. Vision is “to create a shared communications platform for their joint membership of academics, entrepreneurs and investors as well as people from industry and the public sector. This will facilitate exchange of information and experience at a number of levels, with the objective of enabling access to markets and other critical resources”.	www.cambridgenetwork.co.uk and www.munichnetwork.com
Stuttgart, Madrid, Stockholm	Under the EC’s ‘PAXIS’ initiative, Cambridge was awarded a ‘label of excellence for support for innovative enterprises’ and partnered with these three regions. The aims of the network are to “support the evolution of intelligence”, in particular by increasing cross fertilisation between the 4 partnering regions.	www.cordis.lu/paxis
Montreal, Munich, Sophia Antipolis, Tel Aviv (with Boston, Palo Alto and Shanghai to join)	These regions came together to form the Innovation Champions Network (ICN) - “[...] an international association of the world’s leading IT clusters. Its members are making a concerted effort to identify the global requirements of information and communications technology with a view to launching appropriate innovative projects.”	www.innovation-champions-network.org
Silicon Valley (San Jose)	Invest East of England established an office in 2002 with the purpose of assisting American companies looking to expand their businesses in the European market.	www.investeastofengland.com
Boston (MIT)	A £65m partnership between Cambridge University and MIT to “to enhance the competitiveness, productivity and entrepreneurship of the UK economy.”	www.cambridge-mit.org
Beijing (Tsinghua)	A university-university partnership (one of only three active high level partnerships at the University of Cambridge), the main activities of which are the eChina Project	www.cam.ac.uk

¹³ Such events could include: International Venture Capital Summit, www.ivcs.org; EVCA Technology Investment Conference, www.evca.com; UK China High Tech Industry Forum, www.aptn.org/3rd.htm.

What are the obvious partners for Greater Cambridge?

The responses to this question from the survey are summarised in Table 10. The question was left deliberately as open as possible and, as a result, responses were given at the international regional level (i.e., ‘Asia’), national (i.e., ‘China’) and within-country regional level (i.e., ‘Shanghai’). As can be seen in Table 10, at the country level, the two standing clear above the rest are China and the U.S., and the main regions are Silicon Valley, Boston, Shanghai and Beijing.

Table 10: Responses to “Where should we form partnerships?”

International regions	# responses	Countries	# responses	Regions / Sub-regions	# responses
Asia	82	China	48	Silicon Valley (inc. SF, SJ, SD)	13
The Americas	43	US	41	Boston	10
Europe (all)	32	India	15	Shanghai	9
Eastern Europe	9	Germany	8	Beijing	6
Middle East	2	Japan	7	Munich	5
		Korea	4	Bangalore	3
		Singapore	3	Brussels	3
		Taiwan	2	Hong Kong	2
		Russia	2	Paris	1
		France	2	Sophia Antipolis	1
		Sweden	1	Helsinki	1
		Finland	1	Stockholm	1
		Poland	1	NJ	1
		Brazil	1	Hyderabad	1
		Canada	1	Guangdong	1
				Berlin	1

How should we partner?

Assuming that there is a clearly articulated and agreed reason for forming a partnership, there seem to be two general ways this could be implemented:

- **Set up specific bilateral relationship.** This has been the model used by the Cambridge Network for the growing links between Cambridge and Munich, and is the one used by Invest East of England to support links with San Jose.

- **Join network that includes partner region.** This is the approach taken through the growing involvement of Greater Cambridge in the Innovation Champions Network. Assuming the proposed of Silicon Valley, Boston and Shanghai join this network, this would be an alternative way of forming links with these regions.

A concern remains that forming partnerships without clear aims and objectives can result in a great deal of wasted time and effort. Targeting resources on a small number of partnerships that are agreed to be of strategic importance to a range of stakeholder within the sub-region would seem to be the most effective way to address this issue.

Conclusions on regional partnerships

The main conclusions that can be drawn from this section are that:

- There is scepticism about the role of partnerships for Greater Cambridge driven by lack of clarity on (a) what we are trying to achieve by having a particular partnership; (b) why have we chosen these regions; and (c) who is involved in a particular partnership.
- However, there is also recognition that partnerships can be useful to (a) help ensure that the Greater Cambridge brand is built and maintained on the international stage; and (b) act as a conduit for business-level leads and contacts.
- There is a diverse range of partnerships that have already been formed by organisations within the sub-region, but that these may not necessarily be being used to best effect.
- The results of the survey show that China and the U.S. are by far the preferred countries with which the sub-region should have strong links. Within these two countries, the regions surrounding or including Shanghai, Beijing, Boston and Silicon Valley are the regarded as the most useful.
- The process for forming these partnerships could be either targeted bilaterally, or by joining existing networks that include the target region. Each option has strengths and weaknesses.
- GCP should draw upon the results of the survey reported in this document and in consultation with key stakeholders such as EEDA, EEI, ERBI, Cambridge Network, agree a list of regions with which to build strong bilateral relationships. The various options for partnering with each should be considered, and the relative costs and benefits of each assessed. Value may be gained from joining multilateral networks such as the Innovations Champions Network. There should be an annual review of both bilateral and multilateral activities to ensure that we have the most useful types of partnership with the most appropriate regions. The management of this process should be one of the responsibilities of the IRO.

Part IV: Identify ways to focus resources on visitor management

Why should we care about visitors?

At the two extremes, visits to the sub-region can either lead to direct commercial benefit for local companies, or can be a substantial waste of time and effort. The perception of many of the organisations surveyed in the sub-region is that the majority of visits tend to fall into the second category. For those organisations in the sub-region that are popular ‘targets’ for visitors, the actual cost in terms of hours lost quickly becomes quite substantial. If any attempt is made to link this cost to direct benefit to the organisation, it is usually hard to justify spending time on such activities. However, visits may deliver benefits to the sub-region and its individual companies in a number of ways. For example there may be:

- Direct commercial benefit from meeting visitors who may then become customers or resellers, etc;
- Indirect commercial benefit as visitors learn more of the company’s offering and passes this on to others who may then, in turn, become customers, resellers, etc;
- Indirect investment potential as the positive impression that a visitor may have on Cambridge may add to the building of a positive investment climate.

Visits therefore may help individual companies directly, or help the companies indirectly by building awareness of the commercial potential of the sub-region. However, this assumes that there is a ‘right type’ of visitor and, clearly, experience shows that there are many visitors of whom it is harder to see how they deliver benefit to the sub-region.

What are the main visitor types?

The type of visitors coming to Cambridge can be split into two broad categories of:

- Public sector (typically civil servants from trade, industry and treasury functions, academics, diplomats, politicians, etc)
- Private sector (multinational corporations, investors, journalists, analysts, entrepreneurs, networking groups, science parks and incubators, etc.)

It has been noted that visitors tend to come in waves from particular locations. Examination of recent visits show that those coming from China and Korea have been amongst the most numerous in recent months.

Visitors can also be grouped around their motive – which may be very specific or very vague – for coming to the sub-region. For example, they may be:

- Investors seeking new opportunities for investment;

- Companies seeking to setup operations in the sub-region, or local companies with which to collaborate;
- Diplomats (especially commercial, and science and technology, counsellors) seeking to learn more about the sub-region to allow them to be better informed when they return to their embassy / consulate;
- Business support organisations seeking to learn more about how companies are assisted;
- Journalists and academics seeking to learn new angles on how the ‘Cambridge Phenomenon’ works in practice;
- Analysts seeking to learn more about emerging technologies and their commercial potential.
- Entrepreneurs seeking new opportunities¹⁴

For individual organisations within the sub-region, each of the types of visitor listed above will be of differing degrees of interest to them. What is needed is a way of matching these different visitor types with the most ‘useful’ host in the sub-region. This needs to be done with a recognition that not every visit will lead to direct benefit for the host and that a degree of ‘public spiritedness’ is required to justify hosting some visits.

How do we currently deal with visitors?

Many individual organisations within the sub-region have developed quite refined processes for managing visitors to the sub-region. Three examples of these are shown below:

- Bidwells Property Consultants, working on behalf of the Cambridge Science Park, take four fold approach:
 - If the visitors are perceived by Bidwells to be of potential commercial benefit to the Science Park they will be hosted.
 - If the visitors want to learn about the operation of the Science Park they are hosted by Bidwells and charged a fee.
 - If the visitors do not seem to be of obvious commercial benefit to the Science Park, they are passed on the Cambridge Visits who will arrange a tour of the Science Park for a small fee.
 - If the visitors would seem to be of potential commercial interest to one of the Science Park tenants, they are passed on directly to the potential host.

¹⁴ This group was highlighted in a number of the interviews as being one that should be given greater attention, perhaps by building on the activities of the DTI’s ‘Global Entrepreneurs Programme.’

- Invest East of England applies a ‘Valuecard’ approach to filter visitors and ensure that those visitors that could make the greatest potential impact are targeted and supported effectively. The Valuecard approach allows potential visitors to be ranked on a wide range of factors that are linked to various regional strategic goals.
- The University of Cambridge Corporate Liaison has a target list of companies made up of the top R&D spenders. If a company approaches them who is on that list, they will be given every assistance in coming to visit Cambridge. This may well involve encouraging the visitors to attend the Cambridge Network Corporate Gateway.

However, for most organisations in Greater Cambridge, no such systematic approach exists. Without any categorisation process linked to some strategic goal, it becomes hard to justify why a particular visitor, or group of visitors, should or should not be hosted. Visits often end up being hosted purely on an altruistic basis.

What are the gaps in the current approach?

The current approach is a cause for concern for Greater Cambridge for the following reasons:

- **Lack of coordination:** While individual organisations may have developed and refined approaches for dealing with visitors, there is no consistency between the partner organisations.
- **Reactive versus proactive:** Many visits are hosted by organisations in the sub-region on a reactive basis. There is a view that organisations in the sub-region could be more proactive in targeting appropriate, potentially useful visitors.
- **Sub-regional strategic importance:** As each organisation may be planning and managing visits on the basis of their own goals and objectives, there isn’t always a sense of whether a particular visit of strategic importance for the sub-region.
- **Value to business community:** It was noted that with the high volume of visitors coming to Cambridge, there should be some opportunity for capturing and disseminating data on these visitors to business within the sub-region. For example, if a company in the sub-region wishes to make contact with a particular overseas company, it would be useful to know whether that company has visited the sub-region recently.
- **Tracking and follow-up:** As noted earlier, while individual organisations may be very good at tracking and following up on visits, this is not typically done in a coordinated manner.
- **Resources:** Planning and managing visits is time consuming and therefore costly. There is a sense that the lack of coordination of visits is leading to inefficient use of resources.

Recommendations: How could we improve things?

Some of the concerns raised in the sections above on visitor management will be alleviated by the implementation of recommendations made in the Oldham Report through East of England International. For example, the report clearly identifies the need to integrate the management of visits to the East of England. This has been picked up in the Business Plan for East of England International, with the additional focus on ensuring that sub-regional issues are considered within the broader regional recommendations.

In the remainder of this section, we present recommendations for how visitor relations could be more effectively managed at the sub-regional level. At the outset, it is important to reflect the strongly communicated concern of many of those interviewed for this project that whatever is implemented should not add any additional layers of complexity.

The proposal for improving visitor management

There are three elements to the proposal; strategy, people and resources:

(a) Strategy: GCP needs to develop and communicate a clear international strategy in the next three months to focus international activities. This strategy must be regularly updated by monitoring the latest trends within the sub-region, drawing on the evidence of this report and the group identified in Recommendation 1. The results of the survey reported in this document, and the deliberations of the group described above, would inform the development of a categorisation of potential visitors. This categorisation could draw upon the examples of the approach used by Bidwells for channelling visitors to the Cambridge Science Park, or a simplified version of the ‘valuecard’ approach used by East of England International to assess potential visitors. The strategy would also help define the ‘proactive’ agenda and should involve working closely with East of England International to target Science and Technology Counsellors at key location to bring over the visits able to offer best potential value to businesses in the sub-region.

(b) International Relations Officer (IRO): An IRO should be appointed whose role will be to act as a first point of contact for potential visitors and to support the categorisation of potential visitors described above. Once categorised, the IRO would carry out a needs analysis for potential visitors, help them plan their visit but not necessarily organise it for them (as companies such as Cambridge Visits already provide this service). The IRO would need to be sufficiently well informed that potential visitors can be signposted to the most appropriate organisation or individual within the sub-region who may be able to provide what they need. The IRO would also have access to four key sources of information:

- (i) Which organisation does what in Greater Cambridge;
- (ii) What events are being held in the sub-region;
- (iii) What data / resources are available for visitors; and

(iv) Who has previously visited Greater Cambridge, and who did they see?

The categorisation of visitors as described in Recommendation 1 would allow the IRO to ensure that potential visitors are then put in touch with the most appropriate individuals and organisations within the sub-region, and are given access to the most relevant resources drawn from a portfolio of offerings. This portfolio could include: regular, open events (e.g., Cambridge Network Open Meetings, Cambridge Enterprise Conference, ERBI BioPartnering event); customisable events (e.g., Corporate Gateway); accommodation (e.g., short term accommodation at Science Park or at SJIC); video resources; web resources; publications and presentations, etc.

The IRO would not be part of any new organisation but could either be a secondment from, for example, East of England International (building on the successful precedent set by the secondment of Jeanette Walker to ERBI), or a new recruit. The organisation responsible for managing the IRO could be one of the members of the Cambridge Technopole Group . One suggested organisation that would be well placed to carry out this role is St John's Innovation Centre (SJIC). Basing the IRO at SJIC has a number of advantages including:

- SJIC could, at least for the first 12 months, provide free space and cover associated overhead costs such as phones lighting, etc;
- There would be close proximity to both the Cambridge Network and ERBI which should assist in the efficient management of the visitor programmes and discussions about targets;
- SJIC also houses the Regional Innovation Relay Centre (IRC), Elizabeth McDonald (i10) and Louise Rushworth (Business Link) which again would help with networking and a 'joined up approach';
- Walter Herriot (CEO of SJIC) would be prepared to act as line manager on a day-to-day basis as he does for Louise Rushworth and Elizabeth McDonald. Overall responsibility however would with remain with GCP.

The activities of the IRO could also be assisted by a subset of members from the Technopole Group who could be called upon via email to deal with queries relating to visitors who do not fit precisely within the categorisation provided.

(c) Resources and infrastructure: Data to support the work of the IRO would need to be gathered, structured and maintained. Whereas it would be comparatively straightforward to get at least the basic information on the first items listed earlier (Who does what? What events? What resources?), the tracking of visitors would remain a big challenge. To help overcome this, and to ensure that at least outline data on visitor is captured, it is proposed that all the members of the Technopole Group contribute a simple list at each of their quarterly meetings of what visitors each member has hosted in the previous 3 months. This basic data

could be gathered and collated by the IRO. This would then develop into a key resource for businesses and organisations to build on positive leads.

It is also proposed that a promotional video be produced on the ‘Cambridge Phenomenon’ and that a website be constructed to provide would-be visitors with:

- Basic information on the sub-region (including an on-line version of the ‘Technopole Report’¹⁵ and clips from the promotional video);
- Information on how visits can be arranged and how to contact the IRO. This website would be linked to by a simple button from the front page of the websites of those organisations that wish to benefit from this enhanced visitor management approach. The aim would be to channel all initial enquires to this site unless the organisation wishes to manage the visit independently.

Requirements

The overall aim is to develop a relatively ‘light touch’ approach to these activities that will be guided by the international strategy set by GCP, and which will integrate closely with the operations of East of England International. An outline estimate of costs for implanting this visitor management proposal is given in Table 11.

Table 11: Estimate of resources required

Item	Year 1 cost / £k	Subsequent annual cost / £k
Visits manager (assume full time)	40	40
IT infrastructure setup	10	-
IT and data management	3	3
Admin (rent, consumables, etc)	2 (if at SJIC, zero)	2
Reserves (international visits, publications)	5	5
Total	60*	50

*If the development costs of a video on Cambridge Phenomenon are also included here, it would add around £30-35k to the Year 1 budget.

¹⁵ www.stjohns.co.uk/documents/cambridgetechnopolereport.pdf

Conclusions

The aim of this project has been to (i) identify the sectors that could help focus inward investment related activity and engender the development of international business relationships to support the high-tech cluster; (ii) identify specific organisations that could comprise a list of top organisations to do business with; (iii) based on outcome of (i) and (ii) seek to identify international city sub-regions which the GCP partners could agree to focus upon for building long term mutual relationships; and (iv) propose ideas relating to how GCP partners could focus their resources on priority business visitors.

Data has been gathered from a range of primary and secondary sources and presented to address these top level issues. This report provides the GCP with evidence to support the development of a clear international investor strategy for the sub-region. It also provides recommendations for how such a strategy could be implemented to ensure that international investor activities are focused to support the growth of firms within the sub-regional economy.

Appendix 1 – Sources of data for this research project

Individuals: Our thanks to the following individuals who provide input to Phase 2 of this report:

- Martin Oldham (GO-East)
- James Gray (Invest East of England)
- Peter Hewkin (Cambridge Network)
- Jeff Solomon (ERBI)
- Alex Smeets (SJIC)
- John Snyder (EEDA)
- Peter Hiscocks (Cambridge Enterprise)
- Jan Andrews (Invest East of England)
- Gauri Bhalla (University of Cambridge Corporate Liaison Office)
- Terry Hanby (Oxford to Cambridge Arc)
- Walter Herriot (SJIC)
- Patrick Horsley (Cambridge Visits)
- Alan Barrell
- Laurence Garrett (3i)
- Nigel Brown (NW Brown and GCP)
- Gerald Avison (TTP)
- Hermann Hauser (Amadeus)
- Jonathan Burroughs (Bidwells)
- David Cleevely (Communications Innovations Institute)
- Juliette Morgan (Bidwells)

We are also very grateful to all those company directors and other representatives of the high-technology community in the sub-region who provided such detailed responses to the on-line survey (listed in Appendix 4).

Reports: Information for this report was drawn from sources including the following:

ADL (2003). "Innovation and technology audit for the East of England", Report to the East of England Development Agency, November 2003.

EEDA (2005). "East of England Development Agency: Corporate Plan 2005/6 - 2007/8."

Gray, J., (2005), "Business Plan for East of England International"

Library House (2004). "Flight to quality: The Cambridge cluster report 2004", Library House, Greater Cambridge, UK.

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PACEC (2003). "The Greater Cambridge Phenomenon- Fulfilling the Potential", PACEC - Economic Development Consultants report for the Greater Cambridge Partnership.

Herriot, W. J. and T. H. W. Minshall (2003). "Greater Cambridge Technopole Report: An overview of the UK's leading high technology business cluster", St. John's Innovation Centre Ltd.

DTI (2001). "Business clusters in the UK: A first assessment", www.dti.gov.uk/clusters.

SQW (2000). "The Cambridge Phenomenon Revisited", Segal Quince Wicksteed, Greater Cambridge, UK.

DTI (1999). "Biotechnology clusters", www.dti.gov.uk/clusters.

Selected on-line resources: Information from the following websites provided input for this report:

Invest East of England – www.investeastofengland.com (now East of England International – www.eeia.com)

Greater Cambridge Partnership – www.gcp.uk.net

East of England Development Agency – www.eeda.org.uk

DTI Clusters website – www.dti.gov.uk/clusters

University of Cambridge Corporate Liaison Office – www.clo.cam.ac.uk

Higher Education Statistics Agency – www.hesa.ac.uk

Appendix 2 – Example calendar of events

			2005											
Event organiser	Event summary	URL	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ERBI Biopartnering Exchange	Biotech conference and partnering event	www.erbiconference.co.uk												
Cambridge Enterprise Conference	Conference and innovation exchange	www.cambridgeenterprise.co.uk												
Technology World 05	High tech partnering event	www.technologyworld05.com												
Cambridge Network Corporate Gateway	Tailored visits to meet Cambridge innovators	www.cambridgenetwork.co.uk/corporate_gateway												
Cambridge Wireless	Special interest wireless-related events (e.g., games)	www.cambridgewireless.com												
netWorkers Forum	Summer school for people who run business networks	www.cambridgenetwork.co.uk												
Cambridge Technology Management Symposium	International conference practice and research in technology management	www.ifm.eng.cam.ac.uk												
GCP Conference	"A new International Policy for Greater Cambridge Plc"	www.gcp.uk.net												
CLO Horizon Events	First look at new science and technology research at Cambridge	www.clo.cam.ac.uk/horizon												

Appendix 3 – On-line survey structure

In March 2005, an on-line survey website was set up at: <http://www.cmi-enterprisers.org/temp/survey.php> using the questions below as a structure for gathering views from senior representatives of technology-related organisations within the sub-region on the themes of this research. For this survey, responses were sought via targeted emailing (c.100 sent), e-newsletters (to c.300) and news stories placed on the Cambridge Network website. As of the end of March 2005, just under 70 full responses had been received mostly from company directors but also other senior representatives of high-tech related companies and organisations within the sub-region.

Survey questions

The Greater Cambridge Partnership has commissioned St John's Innovation Centre and the Cambridge Network to gather views from local businesses to help define and focus international investment activities in Greater Cambridge.

We would value your views on this topic and so have defined 4 questions that we would like you to answer. Answering these questions should take no more than 10 minutes of your time.

Question 1:

What do you think are the three most important sectors that will underpin the growth of Greater Cambridge in the coming 10 years? ('Sectors' might be technologies and / or market applications.)

Technologies (e.g. nanotechnology)

First:	
Second:	
Third:	

Market applications (e.g. mobile communications)

First:	
Second:	
Third:	

Other comments you would like to make in relation to this question:

--

Question 2:

What do you think are three of the most important types of **business activity** needed locally to underpin the growth of Greater Cambridge in the next 10 years? This could include activities where we have strengths or where you feel we should develop strengths. (Examples could include 'contract R&D' or 'low volume, high value manufacturing'.)

First:	
Second:	
Third:	

Other comments you would like to make in relation to this question:

--

Question 3:

(a) What **types of organisations** do you think there should be more of in Greater Cambridge? Examples might include 'multinationals', 'manufacturing firms', 'US investors', 'financial services', etc.

First:	
Second:	
Third:	

(b) Are there any **specific organisations** that you would like to see move to Greater Cambridge?

First:	
Second:	
Third:	

Other comments you would like to make in relation to this question:

--

Question 4:

What overseas sub-regions (if any) do you think that Greater Cambridge should form strong relationships with to support the growth of the sub-region in the next 10 years?

First:	
Second:	
Third:	

Other comments you would like to make in relation to this question:

--

If there are any other comments you would like us to note in relation to the topic of defining and focusing international investments in Greater Cambridge, please feel free to add them here:

--

Appendix 4 – Organisations who provided response to survey

Senior representatives from the following organisations had provided responses to this survey by the end of March:

3i, Accelerate Consulting Limited, aidworld, Amadeus Capital Partners, Analysys, ARM Holdings plc, Brendan Townsend, CamBP Ltd, Cambridge Accelerator Partners, Cambridge Enterprise, Cambridge Network, Cambridge Technology Transfer, Cambridge Venture Management Limited, Cambridge Visits, China Britain Education Exchange, China Business Solutions Limited, Commerce and Employment, Corporate Liaison Office, Cambridge University, Cambridge Silicon Radio (CSR) plc, Customiser Limited, Diboride Conductors Ltd., EEC EUROPE LTD, ERBI, ET Capital Limited, Health Enterprise East Ltd, Hypertag, Ideas For Limited, Image Semantics Ltd, Institute for Manufacturing, IPPM Ltd. - Interim Process & Programme Management, Jack, Library House Ltd, LTN, Maribrium Associates, Maris Strategies, Ltd., Marks and Clerk, Marshall Aerospace, Media Managers Ltd, MEPC, MSA Interactive Ltd, Nine Tiles Networks Ltd, NovaSecta Ltd, NW Brown, ObjectSecurity Ltd., OxBridge Consulting Limited, oxford2cambridge arc, Pi consulting, Plastic Logic, PolyTechnos Venture-Partners, Pyxidium Ltd, Qi3, SavaJe Technologies, SQW, St John's Innovation Centre Ltd, Team Consulting, the internet marketing company, TTP, TTP Ventures, Unilever, University Challenge Fund, Vecta Consulting Limited, Vivamer ltd, wikiworl.com, Zentian.

Appendix 5 – Executive summary of PACEC report 2003

**Greater Cambridge
Partnership**

**Executive Summary
Second Draft**

An Executive Summary prepared by

PACEC

on behalf of

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Ref: H:\208\08GCP\REP\Exec summary.doc

X1 Introduction

X1.1 The last thirty years has been a period of dramatic economic change and upheaval in the Greater Cambridge economy. 1971 about 200,000 people worked in the area; three decades later this had increased to nearly 360,000. Population over this period has expanded from about 420,000 to 635,000. This performance identifies Greater Cambridge as one of the most dynamic parts of the UK economy generating nearly £12billion GDP in 2001. Moreover, in the period 1993 to 1998, data from ONS shows that the growth of real GDP in Cambridgeshire of 6.5%p.a. was significantly higher than that of the US at 3.8%p.a. Important structural changes have also taken place as Greater Cambridge has transformed itself into a key growth node for high-technology industry in the UK economy. By 2001 over 50,000 jobs were provided by this sector (including some 5,000 R&D jobs in the University of Cambridge) and the wider 'knowledge-based sector' accounted for close to one third of the area's total employment. The purpose of this report is to further develop our understanding of the Greater Cambridge economy, its past performance, the dynamics of its operation and the role of the high-technology and knowledge-based sector. Most importantly, the report aims to provide an informed basis for assessing the critical requirements necessary for the economy to fulfil its potential and meet future challenges and opportunities. In this respect the report builds on a number of recent reports which either directly or indirectly have implications for Greater Cambridge and its future development. What is clear from these past reports and this report, is that the Greater Cambridge economy is poised for further expansion but important choices have to be made if it is to sustain its past dynamism and continue to deliver economic prosperity and an enhanced quality of life for those who will live and work in the area in the future. In particular, long term growth and changes in the structure and composition of Greater Cambridge's economy have produced a situation where infrastructure is now severely stretched and capacity constraints facing a number of sectors put the continued future success of the economy at risk.

Panel X1	Greater Cambridge economy at a glance in 2001
£12billion GDP	
Total employment, 360,000	
50,000 high-technology jobs	
Population 635,000	
Unemployed 9,700 equal to 3% of economically active	

X2 Laying the foundations: evolution of the Greater Cambridge economy in the past three decades

Past performance

X2.1 Chapter 2 of the report demonstrates that the Greater Cambridge economy has turned in an impressive performance in the past three decades. It has delivered rapid economic

growth, near full employment and a relatively high level of wellbeing. On average the economy has generated some 5000 additional jobs each year in over the period 1971 to 2001 and the stock of jobs has risen from about 200,000 to some 360, 000. The relative performance has also been very solid with 80% job growth in Greater Cambridge compared with 16% in the UK over the three decades.

X2.2 An encouraging feature of Greater Cambridge’s past economic performance is that it has been relatively broadly based, embracing a wide range of sectors with growth by no means limited to the heavily publicised high-technology and knowledge-based part of the economy. On a twenty two sector breakdown of the economy only in Agriculture and extractive industries did job growth under-perform that of the UK economy. Knowledge-based industries, including the high-technology, sector experienced relatively fast growth with the number of jobs more than doubling since 1971 compared with a much more modest 16% increase nationally. Within the Knowledge-based sector the number of jobs in high-technology industries also more than doubled from about 20,000 to 50,000 whereas in the UK employment in this declined.

Panel X2	Greater Cambridge economic performance
	GDP growth (1993 to 1998) 6.5% p.a. (US 3.8%)
	Employment growth 160,000, 1971 to 2001,(5,000 p.a.)
	Population growth 215,000, 1971 to 2001, (7,000 p.a.)

X2.3 Driven in part by technological advances but also by other factors such globalisation and internationalisation, the high-technology sector in Greater Cambridge has undergone a continuous process of change and adaptation. Instrument engineering and electronics have a long history in the area and arguably were the important and dynamic high-technology sectors through to the 1970s. In the 1980s contract design and computing services emerged as the key growth sectors. Advances in computing technologies and increasing convergence of different technologies (computer technologies, communication technologies and biotechnology) in the late 1980s and 1990s provoked a redefining (and blurring) of industry boundaries which not only gave a new impetus to computing services but also supported the emergence of biotechnology as a major sources of job growth in the area.

Wider benefits to the UK economy

X2.4 Significant spill-over benefits to other parts of the UK have also resulted from economic activity in Greater Cambridge. These wider benefits arise in a number of ways. These include:

Panel X3	Wider benefits to the UK economy
	The attraction of inward investment to the UK that might otherwise have located in other countries, particularly investment tied to R&D activity, e.g. Microsoft.
	The transfer and diffusion of technology from the University of Cambridge and numerous other research institutes located in the area to companies operating in other parts of

the UK. Collaborative partnerships are often critical in raising the innovative capacity and competitiveness of such companies, e.g. TWI.

The Greater Cambridge economy is an important supplier of a wide range of innovative intermediate goods and services which are inputs into many products and services provided by firms located in other parts of the UK, e.g. ARM.

The development of high-technology industry and the wide variety of initiatives supporting the commercialisation of the science/technology base, have established Greater Cambridge as a 'role model' for economic development organisations with high-technology ambitions.

Industrial structure

- X2.5 The most distinctive feature of the structure of the Greater Cambridge economy is its specialisation in knowledge-based industries. These industries account for just under one third of economic activity (measured by employment), some 30% above the share of this sector nationally. R&D shows the greatest relative concentration, with six times the UK's share of jobs in this sector. A number of other high-technology sectors such as sound and vision, pharmaceuticals, scientific instruments, computing services, office machinery and aerospace are also relatively concentrated in Greater Cambridge by comparison with the UK.

Panel X4 Greater Cambridge- a small firm economy

The report confirms often made observation of the predominantly small firm structure of the high-technology sector in Greater Cambridge. Some 78% of the businesses provide fewer than 5 jobs and 87% less than 11 jobs. For the UK the comparable figures are 83% and 90% respectively.

Drivers of change

- X2.6 Understanding more about the forces propelling the Greater Cambridge economy and the more enduring factors underpinning the competitiveness and vitality of the sub-region is critical in providing a basis for charting future possible economic trajectories. The report identifies six key drivers:

Panel X5 Key drivers of the growth of the Greater Cambridge economy

Population growth linked to net inward migration from London and other parts of the South East and UK has been important, not only in raising the demand for 'non-tradable' or locally provided goods and services, but also in facilitating economic growth more generally. Up to 50 thousand jobs may be linked to the population increase of 215 thousand.

Globalisation and European integration have raised cross border investment flows and the presence of a number of MNCs such as Schlumberger, Microsoft, Hitachi, Toshiba and Monsanto testifies to the competitiveness of Greater Cambridge as a location for certain corporate functions notably R&D.

A business environment conducive to innovation and high-technology entrepreneurship underpinned by a diverse science and technology base, international inter-connectedness, a high quality technical and scientific labour force, availability of specialist financial/legal services.

The presence of a large number of small and medium sized enterprises, now widely recognised as an important source of employment growth, technological change and innovation.

Competitive advantages secured by companies from operating in a cluster affording close proximity to research establishments, specialist business services support for R&D and innovation, supported by well established processes and networks for knowledge diffusion and collective learning.

The international orientation of many local companies, particularly high-technology companies, which although embedded in the local and national innovation system are also engaged in the internationalisation of their markets, research, labour recruitment and product innovation.

X2.7 In summary the major sources of competitive advantage of the Greater Cambridge economy supporting its relatively rapid economic growth are its innovative capacity located in diverse knowledge/science base and research infrastructure located in a variety of research establishments, companies and collaborative relationships; the capacity to diffuse this knowledge across the local economy through effective collective learning mechanisms to create a functioning knowledge-based cluster of; an entrepreneurial business community participating in local, national and international innovation systems and with access to high quality advanced business services.

Greater Cambridge; a sustainable economy

X2.8 The evidence marshalled in this report demonstrates that Greater Cambridge has achieved a remarkable degree of economic success, both absolutely and relative to other parts of the UK. An important question remains however as to whether this economic success has been paralleled by comparable improvements in social wellbeing. Our findings here are quite positive and demonstrate that the strong economic performance has also delivered enhanced social wellbeing to those that live and work in Greater Cambridge relative to those in many other areas of the UK.

Panel X6 Indicators of Social and environmental conditions in Greater Cambridge relative to UK

High quality of human capital reflected in number of graduates and NVQ4 in labour force
Low unemployment and long term sick
Good health
Low crime rates
Relatively low area of derelict land
Good quality housing, limited overcrowding but affordability declining

X2.9 However, disturbing facets of social wellbeing concern deprivation arising from poor accessibility (for example, to shops and other amenities), growing congestion and increasingly unaffordable housing for first time buyers and inward movers where Greater Cambridge compares relatively unfavourably with some other areas of the UK. In addition the benefits are only slowly seeping out to the some of the more remote and disadvantaged parts of the sub-region.

X3 Emerging technologies and their exploitation

- X3.1 The role of the University and the various research institutes located in Greater Cambridge in helping shape the local economy and contributing to its past success is well known. However, this dimension has assumed much greater importance in recent years for several reasons. Firstly, a rash of recent reports and statements by the UK government and the European Commission have emphasised the importance of the science and technology base for business innovation and competitiveness. Secondly there is increasing pressure to capture more value from the commercial exploitation of the science base. Thirdly, there is a revolution underway in which three basic technologies (information technology, biotechnology and nanotechnology) are converging to usher in a new wave of innovation in the coming decades. Convergence of information and biotechnology is already creating new opportunities in genomics and proteomics and biomaterials. Nanotechnology and biotechnology are combining to produce new drug delivery systems and biosensors and all three technologies are intersecting to produce biosensors and biochips. The market potential for these new products is huge. If successfully exploited these emerging technologies would strengthen the competitiveness of the sub-regional economy and provide the basis for consolidation of growth in the future.
- X3.2 In researching those emerging technologies in which Greater Cambridge has a real strength, the aim has been to identify not only areas in which Greater Cambridge has technical and scientific strengths but also the Report deliberately aimed to shift the discussion away from technical merits and to view emerging technologies through lenses focusing on market potential and business value.
- X3.3 Greater Cambridge has a wide range of research institutes, a diverse science base and a portfolio of high-technology companies and specialist business functions to facilitate the exploitation of these emerging technologies. In ICT Greater Cambridge has strengths in photonics, opto-electronics, switching systems, operating systems development, pervasive computing, artificial intelligence, network security and voice recognition. Life sciences are a major strength in Greater Cambridge with the Genomics Campus at Hinxton (Sanger Centre, Human Genome mapping Project Resource Centre, European Bioinformatics Institute), world class research at the University of Cambridge (Depts. of Biochemistry, Pharmacology, Immunology and Parasitology and the Institute of Biotechnology). In nanotechnology Greater Cambridge hosts one of three main national centres of nanotechnology research and is strong in areas such as nano-photonics and molecular nanotechnology.
- X3.4 The diversity of the science base in Greater Cambridge is seen to provide a relatively balanced portfolio of research of obvious importance in the context of increasing convergence of technologies. However a lack of critical mass, limited interdisciplinary activity and potential flight of key staff threatens to limit both local and national economic benefits from emerging technologies such as nanotechnology.

Market opportunities

X3.5 Inevitably we have had to be selective in our choice of emerging product areas and linked to the evolving science and technology base. It should also be recognised that to a significant extent the focus is on nascent markets where clear product areas have often yet to be defined. Ten product areas are identified to illustrate the changing market opportunities :

Panel X7	Emerging technology product areas
	New materials developed at a nano level including stronger and lighter plastics for staple products (countertops, autoparts, toys).
	Drug and gene delivery systems which enable drugs and genes to be targeted at specific sites within the body to counter for example tumours and incorrect proteins.
	Sensors and actuators for use in a variety of consumer electronic devices, cars, medical devices, pollution monitoring.
	Electronic communications and informatics for data transmission.
	Instrumentation, tooling and metrology for manipulation and assembly at the nanoscale
	Tissue engineered medical products and artificial organs, medical implants and devices, new materials to replace bones and teeth.
	Light emitting polymers with applications in inkjet printing thin-film polymer transistors and circuits onto plastic and other substrata for use in flat screen TVs, packaging and smart cards.
	Computer-based methods for the identification of drug candidates
	'Bluetooth' short range wireless providing device-to-device (entertainment systems, security systems and control systems) communications in the home and in the office
	Sentient computing using components (mainly sensors) that can respond and interface with the external environment. For example, computing systems distributed throughout a building detecting, responding and interpreting the environment.

Panel X8	Recommendation
	It is recommended that one of the ten sectors should be taken forward as a pilot to see how through partnership the sector can be developed to exploit the science and technology base.

Commercialisation of the science and technology base

X3.6 Retention of more of the value added from the commercialisation of the science base is of obvious importance for both the Greater Cambridge economy and the wider UK economy. The Report identified both positive and negative features of the commercialisation and technology transfer process. The capacity of the University to engage with industry has been significantly upgraded in recent years and much greater efforts are now being made for example to encourage major multinationals to collaborate with university engineering and science departments and to support academic spin-offs. In addition, more formal links with overseas research establishments, such as the link provided by Cambridge-MIT Institute have been forged with central government support and other initiatives (e.g. The Cambridge Entrepreneurship Centre) have been set up to encourage entrepreneurship

and exploitation of the science base. The report also identifies Greater Cambridge is somewhat unusual in hosting a number of technology consultancies acting as 'technology transfer agents' and intermediaries between industry and the research establishments.

X3.7 Notwithstanding the progress made in developing more effective conduits and processes of technology transfer, constraints to commercialisation persist. Conflict between requirements for academic advancement and those for commercialisation clearly remain an obstacle to effective and efficient commercialisation and within departments, there is insufficient recognition and kudos from 'going commercial'. Moreover a continuing lack of alignment of organisational cultures at the academic-industry interface does not help the commercialisation process. One important constraint for example is the lack of a structured approach to risk management of commercialisation and generally a lack of experience by research establishments in building 'families' of intellectual property to spread product risk for the private sector. Babraham Bioscience technologies is a notable exception here. Finally, despite the presence in the sub-region of venture capital and angel-funders, there is often a funding gap in the early stages of the commercialisation process.

Panel X9	Constraints to Commercialisation
	Too few qualified people to start new companies and need for clearer guidelines in research establishments on the commercialisation process
	Lack of alignment of organisational cultures at the academic-industry interface constrains effective and efficient commercialisation
	Lack of structured approach to risk management of commercialisation
	Limited experience by research establishment in building 'families' of intellectual property to spread product risk for the private sector
	Inadequate finance to cover funding gaps early in commercialisation.

X4 Constraints on business development and economic growth

X4.1 A high quality physical and information infrastructure is a prerequisite for establishing a competitive and prosperous economy. Growing congestion of roads, soaring house prices and persistent unsatisfied demand for specialist business premises, are some of the familiar and clear manifestations of an emerging infrastructure deficit in Greater Cambridge. This problem is not unique to Greater Cambridge and Silicon Valley strategists are facing similar challenges. In addition these problems have been exacerbated by the lack of a coherent planning framework and a consensus on how planning policies should be used to accommodate development pressures arising from economic growth.

Panel X10	Infrastructure constraints
	Rising traffic congestion within the sub-region with inadequate East-West transportation links to other regions and limited air transport connections to international destinations.
	Need for improved access within the core Cambridge urban area particularly between research institutes, University and various science parks and innovation centres
	Limited local public transport particularly outside Cambridge
	Insufficient housing of an appropriate quality and relatively high housing costs constrain recruitment (particularly of technical staff and lower paid public sector staff) and results in increased commuting and traffic congestion
	Inadequate stock of specialist business premises including incubator space for start-ups

X4.2 Business development constraints impact on a company's productivity and competitiveness in a variety of ways, for example through reduced commitments to R&D, lower rates of innovation and more difficulty in addressing key market opportunities. Surveys of high-technology companies in Greater Cambridge and of the organisations which support them (finance, professional services, general business support and networking organisations) show that the main business development constraints are connected with finance and funding gaps and with shortages of skilled and experienced labour, particularly labour with management, marketing/sales and engineering/technical skills. While such surveys are informative, it should be recognised that the severity of

these constraints and their impact must be judged by comparison with competing technology-based regions in other parts of the world, particularly the US. Our conclusions here are that while many competing overseas high-technology regions face similar constraints, in the US in particular, such constraints are often operating within markets (capital/finance/labour) which are more developed and flexible and where company adaptation to constraints is arguably easier. The underlying *supply-side* constraints are as follows:

Panel X11	Business Development Constraints
Supply side	
Investment and finance lacks the scope, depth and complementary services (e.g. venture capitalists with technology specialisms) to facilitate the growth of large, new, high-tech companies or blockbuster products.	
Labour market inflexibility which for example, limits mobility between University/research institutes and the business community or the scope to hire and fire more quickly as a company develops.	
Difficulty in recruiting managers with the necessary skills, experience and understanding of a technology based company which is business oriented and adequately funded.	
Shortages of skilled technical staff and people with degrees and lab. experience	
More positive attitudes by academics should be encouraged towards commercialisation, without detracting from the value of fundamental science research.	
Demand side	
Overall growth of demand and too few large customers demanding high levels of innovation and which would provide routes into global markets particularly the US.	
Too little Government procurement of R&D, compared, for example, with the US defence research agency DARPA, which provides support continually from research to commercialisation.	

X5 What can we learn from the competition?

X5.1 This part of the Report aims to identify what lessons might be learned from successful high tech clusters around the world which might benefit the Greater Cambridge high-technology cluster. The Report identified a number of interesting initiatives and practices undertaken in each these areas of potential relevance to some of the perceived needs and constraints apparent in Greater Cambridge. Examples include the integrated infrastructure approach of Singapore developed around entrepreneurial activity (Technopreneurship 21); Swedish and German experiences in developing satellite sites linked to a 'branded core'; the negative experience in Germany for funding new ventures; focused networks that support a specific cluster such as the Silicon Manufacturing Group in Silicon Valley; and the linking of cluster specialisms in different regions such as the Kompetenznetze in Germany

Panel X12 Examples of interesting initiatives in competing high-technology centre overseas

Leadership and governance: The role played by San Jose City Manager, Anthony Hamann whose relationship with the City electorate was designed to reflect that between a CEO and the company's shareholders.

Balanced enterprise population: By using the reputation of advanced and robust nature of Israeli high technology (particularly in IT and telecommunications) Israel was able to attract numerous multinational players to its shores for R&D purposes, but also in some cases to act as a hub for the Middle East markets.

Infrastructure: The way in which the cluster around Stockholm has been able to grow through the strong links with the nearby city of Uppsala, and expansion of the Kista science park illustrate some ways in which it is possible to combine development in inner 'hot spot' with expansion into more remote areas.

Service providers: One specific example is that of Silicon Valley Bank¹⁶ – a bank that has found a way to provide a balance of investment and business services that provide the bank with an appropriate risk profile yet does more than regular commercial bank.

Funding: the 'Startup Enterprise Development Scheme' (SEEDS) for matched equity investments at the start-up phase, and the related 'Technopreneur Investment Incentive Scheme'. These programmes form an integral component of the 'Technopreneurship 21' programme for the development of technology entrepreneurship in Singapore.

Networks: Singapore is forming an external network of other clusters and related organisations to allow it to become "the nerve centre for an Asian Silicon Valley"

Technology transfer: In Germany, the Max-Planck Institutes and universities largely focus on pure research, the Fraunhofer Gesellschaft on applied research, and organisations such as the Steinbeis Foundation support technology transfer. This allowed for the differing organisations to focus on their particular area of comparative advantage.

X5.2 The regions examined were:

¹⁶ www.svb.com; See also Gill et al. (2000: p13)

Table X1 The competition from selected high tech clusters

Region	High tech companies	High-tech employment	Main industry sectors
Cambridge	3,500	50,000	ITC, Biotech, Instrumentation
Kista (Stockholm)	700	29,000	IT, telcoms
Singapore	6,000	93,000	IT, telecoms, electronics
Taiwan (Hsinchu)	287	102,000	IT, electronics
Israel	4,000	100,000	IT, telecoms
Sophia Antipolis	1,200	22,000	IT
Silicon Valley	7,000	780,000	IT, electronics defence/aerospace

Panel X13 Further research for GCP strategy development process
Investigation of the differing 'business models' that have been applied on other clusters to derive value from balancing of different upstream / downstream activities.

X6 Conclusion and future scenarios

- X6.1 The final chapter of the Report develops three alternative linked scenarios of the future evolution of the Greater Cambridge economy focusing on alternative futures for the 'knowledge-based' sector of the economy. These scenarios are predicated on an interpretation of the past evolution and success of the Greater Cambridge economy that identifies its distinctive capacity to support innovation as its major source of competitive advantage with the 'knowledge-based sector' as the key engine of growth of the economy. The capacity for supporting innovation is located in a wide variety of organisational mechanisms and capabilities, including *inter alia* the maintenance of a strong research and technology base in selected areas such as biosciences, information and communication technologies and in the emerging nanotechnology; more effective commercialisation of the research and technology base; the international interconnectedness of many firms and institutions in the economy; increasingly mature and effective processes of collective learning and a large number of innovative technology-intensive SMEs engaged in collaborative ventures and networks of cooperation. These features of the Greater Cambridge economy are assumed to remain centre stage in each of the three scenarios developed. In addition a continued growth of the high-technology sector and population in Greater Cambridge is common to each of the scenarios.
- X6.2 The economic, social and environmental consequences for each scenario will differ, but each scenario is based on a potentially plausible and realistic future. Each scenario will raise particular policy issues at different tiers of policy making-central, regional and local. The three scenarios are also designed to encourage debate and the development of an agreed scenario setting out what a successful Greater Cambridge economy of the future might look like, the appropriate policy framework for achieving it and the strategic adjustments necessary on the part of the public policy makers at all levels, the business community and other 'stakeholders'.

X6.3 The first scenario '**Creative Catalyst**' assumes an enhanced importance of Greater Cambridge's research capacity and capability and an increased specialisation of economic activity at the 'cerebral' end of the value added spectrum. The expanding science base and research infrastructure, increasing pressures to commercialise research findings combined with potential opportunities (and visions of significant profits) from the development of new products and services, raises the output of new inventions and gives rise to a proliferation of research and corporate spin-offs. These spin-offs are heavily research and technology driven and typically remain very small with relatively few emerging as successful and viable medium sized companies. Ultimately, their primary function is to act as knowledge channels or distribution nodes for potential commercial applications and innovations emerging from the science and research base. Some will collaborate with larger companies elsewhere in the UK, others will find their technologies being harnessed by companies operating overseas to some degree, through licensing and other arrangements. Very few will move to production activities further downstream. Overall the high birth rate of new technology start-ups and the expansion of the research base will sustain relatively rapid growth of the Greater Cambridge economy but arguably at a slower rate than in the past three decades. For historical rates of growth to be achieved the other drivers of growth (namely population growth, increase inward investment and more rapid expansion of the conventional sector) will have to play a greater role than in the past.

X6.4 The second scenario '**Maturing Sub-region**' adopts a number of the assumptions of the first scenario including the expansion of the science base and continuing pressures for its effective commercialisation. However, there are several important distinguishing features of this scenario. The first, is the enhanced capacity of the Greater Cambridge high-technology sector to capture more of the downstream value added (beyond the R&D and early prototyping stages) hitherto appropriated disproportionately by companies operating in other parts of the UK and overseas. The emergence of new business models (such as those of Cambridge Silicon Radio and ARM) which have made the transition from essentially R&D locally based companies to become niche (small) global players are perhaps indicative of developments in this element of the scenario. The second is the ability of Greater Cambridge to compete successfully for large multinationals that move to key locations within the sub-region but with access to the Cambridge core and the University/research institutes and small technology-based SMEs. These MNCs engage in research and the development of new products/services but also early stage prototyping and manufacturing. A third feature is the maturing of the high-technology cluster as the agglomeration benefits from being in the cluster increase with the scale of the cluster and the presence of more specialist players/participants and increasingly selected company functions rather than whole companies and industries. A fourth feature is the 'thickening' of the skilled labour force and the emergence of many more entrepreneurs with both scientific knowledge and business development skills increasing local capacity to drive the innovation process. Fifthly, the research institutes and the University become much more pro-active and effective in commercialising their science, and the interface between industry and academia more easily facilitates speedier decision making. Finally the maturing of the high-technology cluster results in a strengthening and increased stability of local and regional innovation networks.

X6.5 The third scenario '**Global Player**', emphasises the following features. Firstly the much greater integration of the Greater Cambridge economy into the global economy and in particular, more active participation by the technology-based firms in cross-border innovation systems. Creative use of IT will enable companies to more effectively penetrate overseas markets, reconfigure their supply networks and facilitate greater collaboration with strategic partners overseas. A second feature of this scenario is a heightened role for technology-based SMEs as niche players providing inputs and design and development tools to be used in the creation of innovative products and services for overseas multi-national system integrators, producing for mass markets such as telecommunications or aerospace. The third element of this scenario is the emergence of Greater Cambridge as a key global location for R&D functions in a world of intensifying territorial competition between regions in different countries. Enhanced IT capacity will permit companies much greater locational flexibility for different business functions (HQ, R&D, production, marketing , sales and distribution). The growing presence of overseas multi-nationals engaged in R&D in Greater Cambridge indicates that such trends are already underway and for this aspect of corporate activity, Greater Cambridge already has a recognised competitive advantage in the global economy. The final element in this scenario is the much greater scale and diversity of the high-technology cluster compared with either of the first two scenarios. Thus the cluster not only includes more downstream activity including manufacturing but also a much greater presence of overseas MNCs engaged in R&D and early stage manufacturing. In addition the geographic reach of the cluster extends beyond the current Greater Cambridge boundaries along the M11 corridor towards Stansted, along the A14 and into Hertfordshire retaining the 'Cambridge' brand.

X6.6 The three scenarios raise important policy issues and questions, some are common to all three scenarios and others are more specific to an individual scenario. To what extent should:

- Central government be encouraged to concentrate research funding in the centres of excellence in the University as part of other research institutes in the sub-region
- Research funding focus on inter-disciplinary research and link fundamental science to technology and applications
- Incentives be developed to retain and attract world class scientists and entrepreneurial staff
- Technology clusters be further developed to exploit commercialisation, the flow of people and knowledge in the sub-region
- Priority be given to key technology clusters and networks linked to emerging technologies
- Entrepreneurship be fostered and incentivised around the emerging technologies
- The relationship between the science base and specialist downstream prototyping and downstream action be exploited in the sub-regions and where
- Inward investment of technology based firms be positively encouraged to the sub-region and where
- Where should the physical infrastructure in terms of roads and sites/premises be strengthened
- Where should the development of the housing stock, affordable housing, and supporting facilities be positively accommodated and promoted

- Specialist training and development policies be developed to support the needs of high tech firms
- Steps be taken to integrate the high tech sectors and build strong local and international networks
- The Greater Cambridge sub-region integrate itself more with global high tech clusters and networks

Appendix 6 – Summary of the Oldham Report “International business services review”

INTERNATIONAL BUSINESS SERVICES REVIEW – REPORT SUMMARY

1 The Review, which has included extensive consultation with a range of stakeholders and practitioners, has been commissioned by EEDA to make proposals about:-

- ♦ the international services and activities needed to implement the new Regional Economic Strategy
- ♦ the organisational structure best fitted to carry out the strategy development, delivery management and delivery functions related to the international agenda.

2 The world economy is undergoing fundamental change with countries such as China, India and East and Central Europe emerging as huge new markets and fierce competitors and with the increasing importance of Knowledge Based Enterprises. The scenario planning for the RES showed wide recognition that these changes and how we respond to them will be crucial to shaping the future of East of England. Consequently the first four RES goals all have an important overseas dimension.

3 The new economic agenda is wider than the traditional staples of export and inward investment. It is about two-way international business covering.

- Inward and outbound investment
- Trade, joint venture and technology transfer
- Key account targeting
- University to business collaboration
- Aftercare support for priority inward investors
- Strategic international alliances.

4 At present the international business services provided by the public sector, especially Invest East of England and the East of England arm of United Kingdom Trade & Investment, are being delivered professionally and effectively. So we are building on success. However, the services are missing some important targets and we are not covering the whole agenda.

5 There should be a greater focus on helping Knowledge Based Enterprises and medium-sized companies with overseas trade as these segments can have the biggest impact on the East of England economy. In particular there is a need for:-

- ♦ a new “fast track” trade development programme to increase the number of global leader companies in the East of England
- ♦ re-engineering of the channels to existing and prospective business partners overseas including more intensive use of the UKTI overseas network.
- ♦ a more integrated and coherent approach to overseas exhibitions and visits to the region.
- ♦ a new programme of region-to-region alliances
- ♦ more support for non-export activities (eg out-sourcing)

- ♦ Special Interest Groups so that business people with shared interests can learn from each other

6 Inward investment activities should be refocused to bring inward investment to a wider range of locations in the region and there should be a key account strategy to target leading overseas companies with capabilities complementary to our KBEs and Medium-sized Companies.

7 We will have succeeded if in 5 years time we have achieved a critical mass of global leader companies in key locations around the East of England.

8 These and other proposals add up to a radical change in the international agenda for the East of England. Changes in the organisational structure would help to deliver this agenda. The changes should be based on the vision of EEDA leading the regional partnership in collaborative action to deliver a strategy developed by a wide range of stakeholders.

- ♦ EEDA, jointly with UKTI, and consulting with IEE, Sub-Regional Economic Partnerships and other partners should lead in developing a new International Business Strategy for the East of England based on the new agenda and a Delivery Plan.
- ♦ EEDA, jointly with UKTI and consulting with IEE, SREPs and other partners should appoint a new high-level stakeholder forum for international business to advise on the Strategy and Delivery Plan. This should be chaired by an EEDA Board member and should consist of people with an overview of the regional economic agenda and business scene. The aim would be to draw on a wide range of knowledge and experience and to build ownership for the Strategy and Plan.
- ♦ EEDA, jointly with UKTI, should carry out the role of contracting for the delivery of the new International Business Strategy and Business Plan and of carrying out the performance management of the delivery.
- ♦ EEDA, with UKTI, IEE, the SREPs and other partners should create a joint venture company to deliver both the trade and investment aspects of the new international agenda. The company would be created by modifying the constitution of IEE.

9 These proposals are fully compatible with emerging thinking on the wider RSCP project.

10 Partners will be consulted in November and December regarding the practical aspects of implementation. The new organisation will commence operations on 1 April 2005.