

UNDER-INVESTMENT  
IN UNIVERSITY  
RESEARCH INFRASTRUCTURE  
CONSULTATION PAPER

J M Consulting Ltd

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## 1. Introduction

- 1.1. In this paper, we are consulting HE institutions in the UK and other relevant organisations on issues related to the investment in, and management of, the higher education infrastructure for research. The Office of Science and Technology (together with the DfES, HE Funding councils and UK devolved administrations) have commissioned us to review the “under-investment in UK science research infrastructure” and the impact of JIF and SRIF. In parallel with this, HEFCE with Universities UK (UUK) and the Scottish HE Funding Council have commissioned us to review infrastructure for research in the arts and humanities.
- 1.2. The two studies of the research infrastructure are being done together and to a common methodology. The principal outcomes required are: to provide data and evidence on past under-investment and current investment needs; to understand how any investment gaps have arisen; and to review how far public funding schemes, and in particular JIF and SRIF, will have contributed to alleviating gaps. The report will also address what the sector can do to manage its infrastructure on a more sustainable basis in future. There is an advisory or steering group for each of the studies and further details are available on the HEFCE and OST websites, or from ourselves.
- 1.3. We have also been commissioned by HEFCE/UUK to carry out a review of teaching infrastructure, and will be consulting separately on this at a later date (probably in November/December).
- 1.4. It is clear that many institutions have problems in funding their research infrastructure at the level that is necessary to maintain their research capability. These studies therefore offer an important opportunity for the sector to establish the extent and impact of past under-investment, and to contribute to consideration of possible remedial action and longer-term solutions, including how HEIs can manage their infrastructure in a sustainable way.
- 1.5. We are now part-way through the study, and through a programme of institutional case studies (listed in the appendix). The purpose of this paper is to inform all institutions about the study and the preliminary findings which are emerging, and to provide an opportunity for those who wish to do so to contribute evidence or views to our work.

## 2. How to respond to this consultation

- 2.1. We are happy to be contacted by institutions or individuals by letter, fax, telephone or EMail at the addresses below. We can accept any material which is relevant, but we would appreciate it if all responses could include your perspective on the points made in this consultation paper based on the attached short questionnaire, plus an overview or summary of any additional material you wish to send. Please make it clear on what group or

institution's behalf you are responding.

- 2.2. To influence our final report to the OST we have to ask for all comments please to reach us no later than Thursday 25 October. We could, by agreement, accept some responses in November, subject to receiving an initial communication from institutions by 25 October, with an indication of the nature of any further material you wish to provide.
- 2.3. We look forward to hearing from you.

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### 3. Scope of the consultation

- 3.1. We are basically interested in:
  - buildings and equipment which are specifically provided to support research;
  - generic institutional research support resources including libraries and IT networks;
  - any non-academic staff or other non-capital costs associated with the effective use of this infrastructure (e.g. IT support staff, technicians etc).
- 3.2. We are looking at unmet investment needs in three broad categories:
  - a. **Baseline:** capital investment required now (i.e. within the next four years) to permit continuation of existing research activity at broadly the current level of quality and volume (this addresses backlogs);
  - b. **Development:** capital investment which institutions need to make over the next four years to meet other academic objectives (e.g. to improve RAE scores, to extend research capacity etc);
  - c. **Maintenance:** the recurrent annual investment which you need to be making in order to avoid future back-logs or problems with your research infrastructure.

- 3.3. We are only concerned with unmet need. Institutions should already have some plans for investment in their research infrastructure, and there are publicly-funded schemes to support this (such as those run by the funding councils, research councils, and of course JIF and SRIF for the sciences). We need to identify the investment requirements of types (a), (b), (c) above which institutions cannot fund from such public schemes, or from their own resources (surpluses, borrowing etc).
- 3.4. In particular, our report will need to consider:
- i. what is the total level of remaining “under-investment” post JIF and SRIF?
  - ii. why has the sector got into this position, and what would prevent institutions doing the same again?
  - iii. what benefits would the country obtain from any further public investment – as compared for example with investment in health, education or other public services?
  - iv. what are the alternatives to additional public investment, and why should they not be seen as solutions?
- 3.5. We therefore need information and evidence from institutions on what has driven their past investment decisions; on the need for further investment and the justification for it; as well as data on the actual infrastructure requirements.

## 4. Issues to be considered

- 4.1. In the remainder of this paper we share our current understanding based on limited research part-way through the review. It would strengthen the evidence base for our report if institutions could comment on the following propositions and where possible, add evidence, examples, or data of their own. Equally, if some institutions disagree with the propositions (or have managed things differently) it is valuable and important for us to be aware of this too. In your response, please note whether your comments are broadly applicable to all the main fields of research, or are there disciplines or institutions where things look very different. Finally, we are particularly keen to find examples of good practice, or new ways of managing research infrastructure which can help the nation to achieve more valuable research output at a reduced demand on public funding.
- 4.2. Please feel free to enter a dialogue with us on these issues if you wish, but we also need the written responses.

### **Issue 1. Is there a research infrastructure investment gap?**

- 4.3. The evidence from our case studies covers a range of types of institution, a range of disciplines, and research which is at all levels of assessed outputs

from that which is being developed to internationally-competitive.

- 4.4. The needs at these levels are different. For example at the 5\* level in science, a prime requirement for a relatively few institutions may be to invest in outstanding facilities (research institutes, possibly not tied to a single academic department) which create a sufficiently attractive research environment to be able to attract world-class academics who are then capable of generating their own grant funding for equipment and research staff.
- 4.5. More broadly, a larger number of institutions need to improve space, equipment, and technical support to permit leading edge research in a number of disciplines, and to keep departments up to the pace where they can attract external funding.
- 4.6. All institutions seriously engaged in research in the sciences or the arts and humanities need a basic generic infrastructure of adequate space for post-graduates and staff; IT networks and equipment; libraries; uncommitted academic staff time; research training and career management; and the minimum of equipment and technical support to enable them to engage in research to a level where this can gain peer recognition and the prospect of some external funding. This “base level” might be equated to the concept of the “well-found laboratory” which is still commonly understood in the sciences.
- 4.7. Investment gaps are apparent in departments where staff productivity and research outputs are affected by lack of space, inadequate research equipment, low technician levels, or poor state of buildings (e.g. inadequate temperature control). Not all of these are apparent in all departments, and many 5 and 5\* research groups are well resourced. However, this is unlikely to be the case for all 5 and 5\* specialities in a department or institution, and all research groups have an on-going need to support their equipment, and to upgrade/replace them at the end of a short life span. There are investment gaps (with few overt sources of external funding) in the generic or permissive infrastructure in many institutions – e.g. campus networks, offices, clerical staffing levels, lifts, infection control, fume cupboards, etc.
- 4.8. Many institutions have backlogs of maintenance, evidenced by poor buildings condition, and gaps in legislative compliance. Once institutions have met the matching funds on JIF/SRIF projects there appears little scope from forecast surpluses or new/additional borrowings to undertake a systematic replacement/refurbishment programme of existing, and the new, buildings. There appears to be little capacity for significant structural change or even to allow flexibility in existing infrastructure to develop science research rapidly.
- 4.9. In the arts and humanities, there have been many fewer opportunities for external research funding, and because of this, and other factors noted below, the need in these disciplines may be less well articulated than in the sciences.
- 4.10. The above is, of course, a simplified picture, and we welcome comments.

Our work so far suggests that there are investment needs at all these levels, which institutions are currently unable to resource through the existing external funding schemes including JIF and SRIF.

- 4.11. We will need to quantify and illustrate these needs.

## **Issue 2. How has this investment gap arisen?**

- 4.12. There are two possible simplistic explanations of this. In our view, each contains an element of truth, but neither is by itself a satisfactory explanation. They would be that:
- a. institutions have not been adequately funded for research; and/or
  - b. they have chosen to allocate their resources in a way which expands activity and consumes their assets rather than investing for the future.
- 4.13. The situation is more complex, and we believe that the principal factors at work here have included:
- i. **unfunded growth:** whether or not the public funding for research was adequate in the 1980s, institutions have responded to national and institutional incentives to grow their research activity rather rapidly in recent years. At the same time, their funding for teaching has reduced in unit terms; the funding councils' funding for research infrastructure (QR) has not grown nearly so fast as research volumes; and almost all externally-funded research grants and contracts have been priced at a level below the actual cost of the work;
  - ii. **cultural factors:** institutions have a propensity to spend available resources on staff and research activity, rather than on physical infrastructure. Excellent staff are a pre-requisite to achieving the research quality and volumes that need the infrastructure. Department-led research proposals (with short planning cycles) do not support strategic infrastructure planning well. It is also partly a cultural phenomenon whereby academics (like some other public service professionals) do not see themselves as interested in, or responsible for, bricks and mortar, and many have accorded relatively low priority and status to concepts like investment strategy and whole-life asset management. It is also very difficult to move resources from staffing to infrastructure without additional funding, as the costs of this move are very high;
  - iii. **perverse incentives:** these operate at a number of levels to re-inforce the cultural factors. The short-term nature of government finance does not encourage anyone involved to take a long term view of managing assets. Academics and institutions are rewarded in funding as well as reputation by research outputs measured in the short term. There has been a multiplicity of Government schemes to fund research infrastructure – most involve bidding and reward institutions with the best-presented case, or the most pressing problems. There is

no apparent penalty for neglect of infrastructure, indeed often the reverse. There has never been a clear statement that institutions are responsible for investing in their own infrastructure, and it is far from clear that the funding bodies or their research customers could accept the financial implications of this.

- 4.14. How significant are these factors? Are there other significant influences that have driven institutions' investment policy? Have any institutions managed to overcome the cultural issues?

### **Issue 3. Does the same apply to arts and humanities?**

- 4.15. Many of the issues above apply equally to research in the arts and humanities. Research in the arts and humanities is evolving from a model where much of it used to be seen as an extension of scholarship (essentially using resources provided for teaching) to one where much of it has similar features and requirements as the sciences, notably: work in teams; often heavy use of IT; and, in some disciplines, need for some specialist facilities and equipment. There is scope better to build on the research capability in many of these disciplines with closer collaboration between them, and with science research. It remains true however, that in many arts and humanities disciplines it is more difficult to distinguish between infrastructure for teaching and research, than in the sciences.
- 4.16. Arts and humanities infrastructure is not generally as high-cost as science (except in some disciplines), but there have been fewer sources of external funding available for any specific research infrastructure in the arts and humanities. Investment levels have suffered as institutional funding has been diverted towards supporting the new JIF projects. Some institutions have specifically addressed this, but there remain gaps in many institutions, particularly in annual library spend, and space (volume, configuration and condition). Arts and humanities face similar issues to science about the long-term replacement and refurbishment of buildings and specialist equipment and facilities.

### **Issue 4. What has the impact of JIF and SRIF been?**

- 4.17. There have been many publicly-funded schemes to support institutions' investment in infrastructure for research. We have identified well over 20 in recent years. However, JIF and SRIF have been the largest, and we have a remit specifically to review their effectiveness.
- 4.18. JIF and SRIF have been largely used to support to the physical and biological sciences.
- 4.19. There is no doubt that JIF already has, and SRIF will, make a major contribution to improvement of certain specific parts of the science research

infrastructure. In the best cases, successful JIF bids have had a multiplier effect of bringing together scattered research groups, re-energising whole areas of science, and releasing other space and facilities for groups not directly involved in the bid.

- 4.20. However, we would also note a number of reservations:
- many of the JIF awards went to extend research activity and into new infrastructure rather than for existing infrastructure (and in this sense may have actually made the problem of over-stretched infrastructure worse);
  - the whole bidding process under JIF was expensive and inefficient (and was of course a net cost to unsuccessful institutions);
  - successful bids increased pressure on institutions' own resources (to find the necessary institutional contribution) and often this had to be made at the expense of projects that would have brought benefits to other areas of work, such as the arts and humanities, or teaching;
  - planning JIF bids, often department-led, and with short-time cycles before spend, did not support strategic planning at an institutional level;
  - the whole JIF initiative does little to encourage institutions to take responsibility for the management of their own infrastructure needs – on the contrary it reinforces a dependency culture;
  - some institutions felt that the process of bidding was itself unfair and favoured those “already in the charmed circle”.
- 4.21. We should stress that none of the above should detract from the real achievements made by many institutions under JIF. However, these points show the limitations of a one-off bidding scheme as a means to address continuing investment in infrastructure.
- 4.22. It is clear that most institutions' experience with SRIF has been much better, in the sense that they have had the opportunity (and been required) to take a more strategic approach to prioritising needs, and to consider each initiative in the broader context of the institution's overall finances. Perceptions of this inevitably differ, and are coloured by the fact that some academic departments were successful in JIF when their institution might not have regarded their bid as the highest institutional priority. However, many we have met would probably agree that “JIF was a lottery” and that SRIF is a more strategic institutional response. It allowed both unfunded JIF projects to be taken forward as well as sorting some institutional priorities (generic infrastructure etc).

### **Issue 5. How serious is the remaining investment gap?**

- 4.23. The scale of any remaining investment gap will be a core finding from our study, as discussed under Issue 1. We are seeking here any evidence, examples, or views from institutions which identify unmet requirements to address the potential criticism that this is just a “wish-list” of academic aspirations. Do these requirements represent a real cost or loss to the nation, to the discipline, or to the institution and its staff?

- 4.24. We would especially invite institutions to provide any examples or quantification they can on:
- the impact of under-investment on the UK economy; business opportunities; new technologies; employment etc;
  - impact on the international competitive position of UK research and higher education;
  - impact on developments in national policy; health; welfare; society etc
  - impact on regional or local business and communities;
  - impact on the institution
  - impact on staff.
- 4.25. To the extent that we can provide robust evidence of real costs or disbenefits, this will help to strengthen any case for further remedial public investment in competition with other Government priorities.

### **Issue 6. What should institutions be doing?**

- 4.26. An important part of the outputs which the OST are seeking from this study is a better understanding of the pressures or other factors that have led to institutions acting in a way which, at face level, is inimical to the long-term sustainability of their research enterprise. We discussed some of these factors under Issue 2.
- 4.27. It seems clear that few institutions have had a whole-life strategic asset management approach to their infrastructure, still less one which is fully integrated with their academic strategies. Some privately admit to over-trading in the sense that their activity and liabilities have grown faster than their investment in assets and their reserves.
- 4.28. In the absence of additional funding, to bring these factors better into balance could imply a reduction in the volume of research, and/or adoption of very different policies in terms of financial risk (e.g. borrowing) and of cost management (e.g. ruthless pruning of less-viable activity). Some of these changes could represent good practice in the professionalisation of research management, but some might be seen as threatening the very nature of a university.
- 4.29. What we are seeking here is firstly any examples or ideas of good practice which institutions have already adopted or would wish to adopt to provide a better balance between consumption and investment, at any given level of public funding. Secondly, what are the institutional or national barriers which make it more difficult to adopt such good practice?

## 5. Conclusion

- 5.1. We hope that many institutions will feel able to respond to this invitation. If you are able to do so, please as a minimum complete and return the attached pro-forma. As already noted, we would welcome any additional material or communications that you feel may help with this important study.
- 5.2. Thank-you very much for your assistance.

## **Appendix**

### **List of institutions participating as full case studies**

Cardiff University of Wales  
Leeds Metropolitan University  
Nottingham Trent University  
Harper Adams University College  
University of Birmingham  
University of Bristol  
University of Oxford  
University of Glasgow  
University of Hertfordshire  
University of Newcastle  
University of York  
Queens University, Belfast  
Worcester University College

#### **plus visits to:**

Imperial College London  
Kings College London  
Royal College of Music  
Sheffield Hallam University  
Surrey College of Art and Design  
University College London  
University of East Anglia  
University of Glamorgan  
University of Westminster  
Wimbledon School of Art

**We have also visited other organisations and individuals in the course of these studies.**

# Questionnaire: investment in research infrastructure

Please refer to the attached consultation paper and return your response to these questions to:

J M Consulting Ltd, Glenthorne House, 20 Henbury Rd, Westbury-on-Trym,  
Bristol BS9 3HJ phone 0117 959 3687 fax 0117 959 3686  
[JMConsulting@dial.pipex.com](mailto:JMConsulting@dial.pipex.com) no later than Thursday 25 October 2001

## **Issue 1. Do you have an unfunded research infrastructure investment gap?**

Do you have research infrastructure requirements identified now which you are unable to fund through your own resources, through borrowings or through schemes such as SRIF and those run by the funding councils (Poor Estates etc)?

Could you illustrate these in the three categories of paragraph 3.2 and relate them to particular disciplines and levels of research effort as discussed under Issue 1?

## **Issue 2. How has this investment gap arisen?**

Could you comment on this for your institution?

## **Issue 3. If the answers above relate primarily to science, could you please also comment on the arts and humanities?**

## **Issue 4. What will be the impact of JIF and SRIF?**

Please summarise briefly (a high level overview with illustrations is all we need) with particular reference to:

- (a) any new extensions of research capability;
- (b) any benefits in redressing of investment backlogs;
- (c) how this funding will affect your research output;
- (d) any other impact that they have had on your infrastructure (positive or negative).

## **Issue 5. How serious is the remaining investment gap?**

Please comment as indicated under this proposition, giving specific examples where you can on the impact that the gap is having on the areas in paragraph 4.24

## **Issue 6. What should institutions be doing?**

Please comment on (a) steps institutions might take as part of good practice in management of their infrastructure; and (b) on any barriers or impediments that make adopting such good practice more difficult. What could be done to alleviate these?

Name:.....

Position:.....

Institution:.....

Contact details:.....

(if you do not mind a call or Email to discuss this reply)