CAT Machynlleth

*Building Performance Assessment and Evaluation 12 May 2015*

**PART 2.2**

# COMING TO TERMS WITH BUILDING PERFORMANCE IN USE

## *Changing the way we do things: A cultural problem*

Bill Bordass and Adrian Leaman

*the Usable Buildings Trust*

www.usablebuildings.co.uk

# Part 2.2
# Changing the way we do things

1. **A new professionalism?**

2. **A focus on outcomes, with Soft Landings**

3. **An Institute of Building Performance?**

# 1

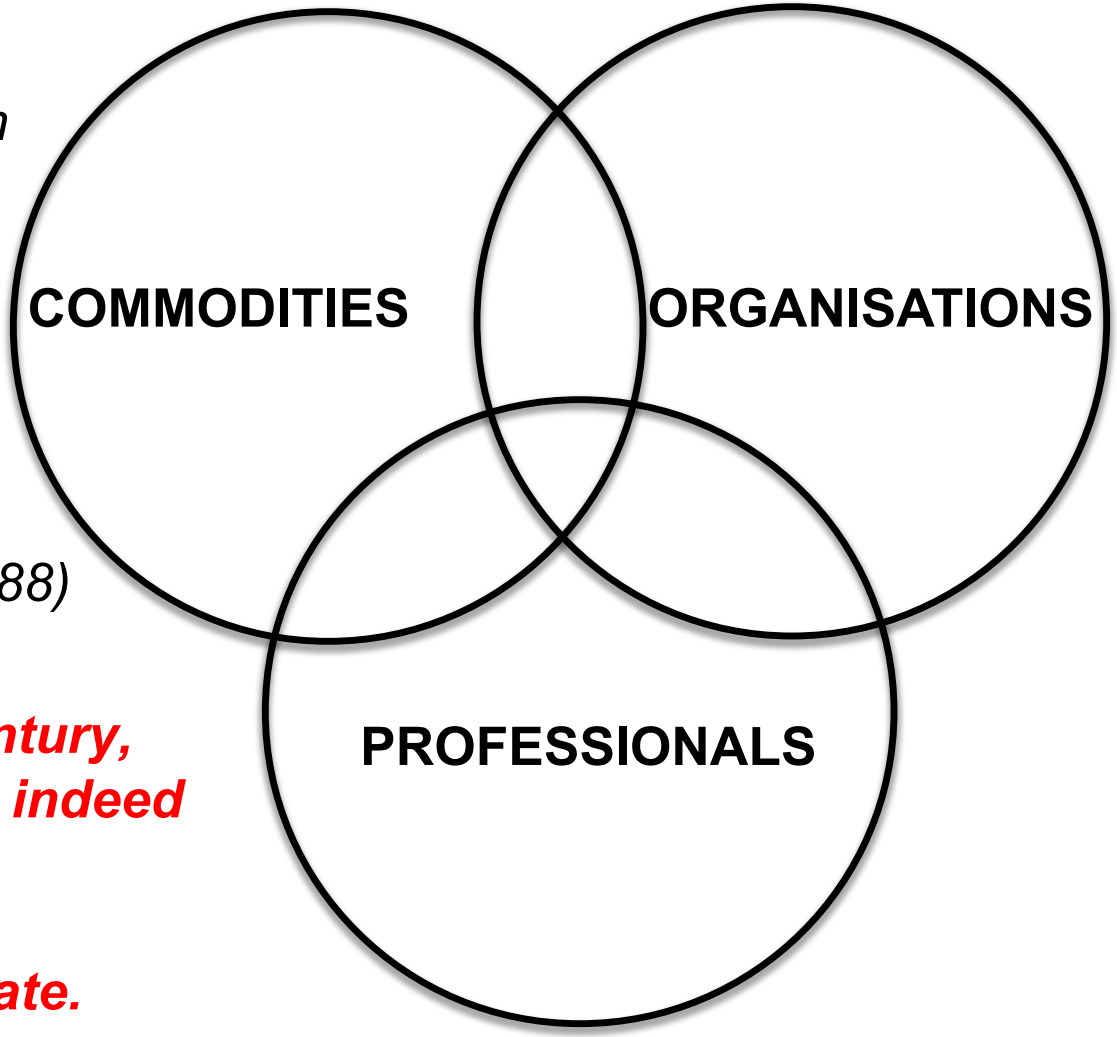
# A NEW PROFESSIONALISM?

# Recap: *How societies structure expertise*

*"At present, professionalism seems to hold its own.*

*"It has stayed ahead of commodification … but may ultimately lose out to organisations …"*

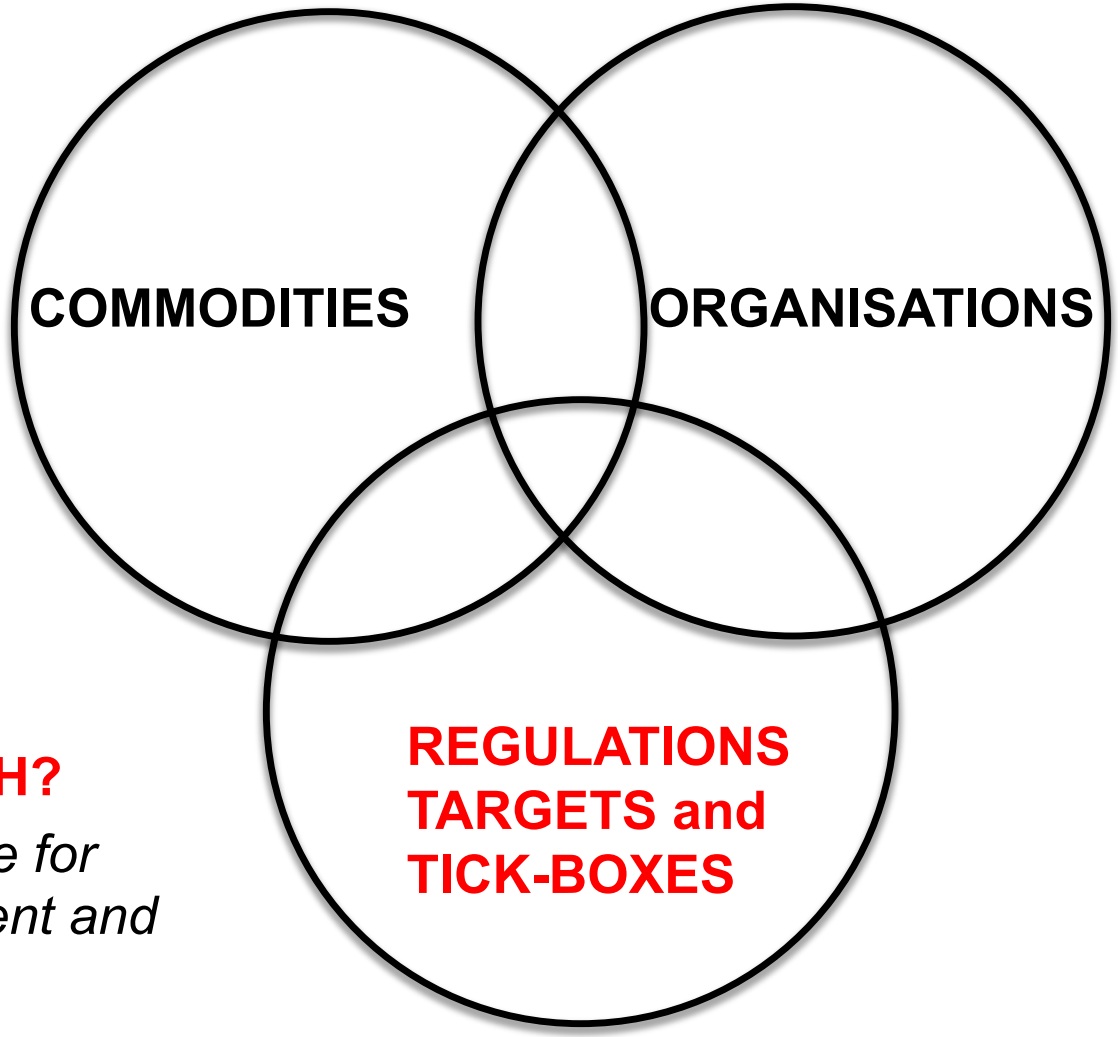
*ABBOTT (1988)*




***In the ensuing quarter-century, building professionals do indeed seem to have lost out to organisations – both governmental and corporate.***

SOURCE: A Abbott, *The system of professions,* University of Chicago Press, 1988, page 325.

# Recap: *Where the UK now seems to be*


**BUT ARE RULES ENOUGH?**

*Should there be more scope for vision, commitment, judgment and the public interest:*

***A New Professionalism?***

# What are professionals and their institutions for?

*The word derives from the notion of an occupation that the practitioner "professes" to be skilled in.*

## **Essential attributes** *(after Davies & Knell, 2003)*

- **A body of knowledge**, *not just codified knowledge: a professional's tacit knowledge is unique, the know-how (and who) as well as know-what.*
- **Trustworthiness**, integrity and independence as intermediaries*, establishing levels of behaviour in markets where there are extreme information asymmetries.*
- **Formal association**, to help wield power and influence. *To earn the role above the market, the association needs to maintain a sound body of knowledge and a secure reputation for itself and members.*
- **Protection of public interest.** *There is a tension between the ethos and the market mechanisms within which members work. Hence the need for codes of conduct and regulatory frameworks.*

SOURCE: W Davies & J Knell, in *The professionals' choice,* Building Futures, ed S Foxell, RIBA & CABE,18-34 (2003).

# The role of the building professional needs reinforcing

- There's a big job to do, *in making new and existing buildings more sustainable.*
- We're short of money:
  *we can't afford to spend it on the wrong things.*
- Current procurement systems are not fit for purpose:
  *we need to do things very differently.*
- We can't change everything tomorrow …
  *but we can change our attitudes to what we do.*
- It's not a question of whether we can afford to do it:
  *We can't afford not to !*
- WHEN DO WE START?
  TODAY. *We can't wait until 2050!*

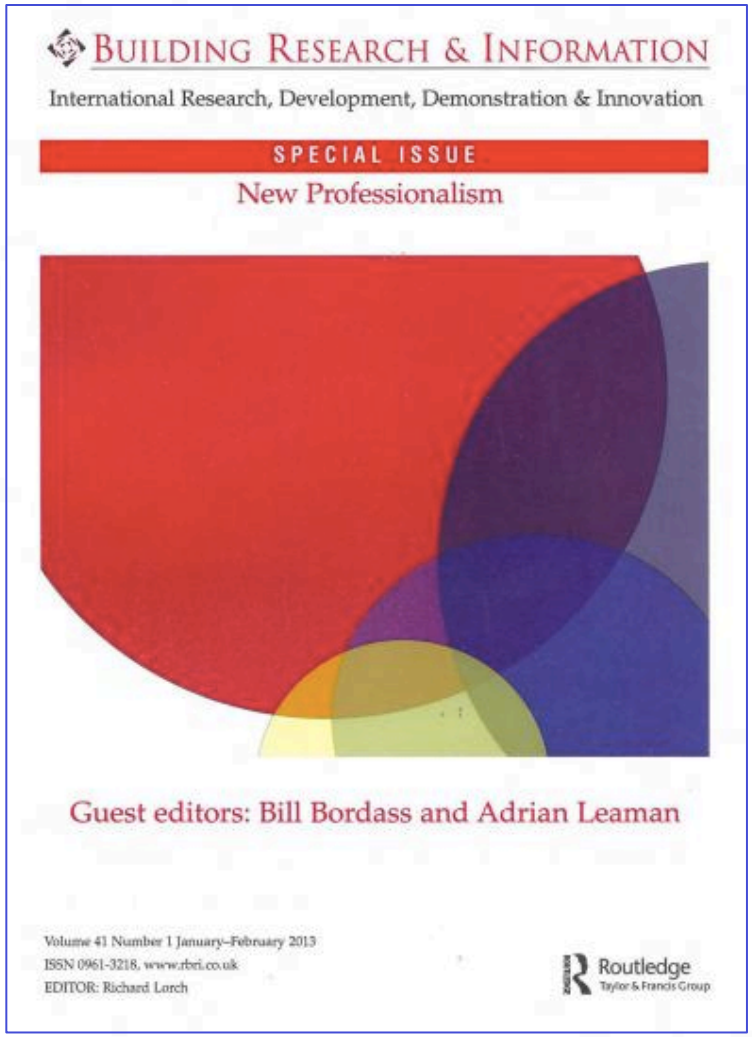
# Changing the way we do things

- Many construction-related institutions require their members to understand and practice sustainable development.
- How can members do this unless they understand the consequences of their actions? *The real outcomes.*
- If they don't, they are working outside their region of competence …
- **or in other words, not acting in a fit manner for a professional !**

**SO HOW ABOUT?**

- Changing attitudes to the nature of the job.
- Re-defining perceptions of the professional's role, to follow-through properly and to engage with outcomes.
- Closing the feedback loop – rapidly and efficiently, with routine BPE.
- Making much more immediate, direct and effective links between research, practice and policymaking.

# New Professionalism: getting started
## *Principles anyone can adopt tomorrow*




**PROVISIONAL LIST DEVELOPED WITH THE EDGE**

***ETHICS AND PRACTICE:***

1. Be a steward of the community, its resources, and the planet. Take a broad view.
2. Do the right thing, beyond your obligation to whoever pays your fee.
3. Develop trusting relationships, with open and honest collaboration.

***ENGAGEMENT WITH OUTCOMES:***

4. Bridge between design, project implementation, and use. Concentrate on the outcomes.
5. Don't walk away.
   Provide follow-through and aftercare.
6. Evaluate and reflect upon the performance in use of your work. Feed back the findings.
7. Learn from your actions and admit your mistakes. Share your understanding openly.

***THE WIDER CONTEXT:***

8. Seek to bring together practice, industry, education, research and policymaking.
9. Challenge assumptions and standards. Be honest about what you don't know.
10. Understand contexts and constraints. Create lasting value. Keep options open for the future.

SOURCE: The Editorial of BR&I **41**(1), Jan-Feb 2013 can be downloaded at www.tandfonline.com/toc/rbri20/41/1

# Why do we need a new professionalism?
## *What has changed over the decades?*

- The urgent need to reduce the environmental impact of existing and new buildings: *we must now find ways to do this quickly and reliably.*
- Shortages of financial and material resources: *we can no longer afford to "invest" in the wrong things, but we can do things more carefully.*
- Rapid technological, social and economic change: *we need to keep ahead of the game.*
- Increasing *(often unnecessary)* complication of requirements, process and product: *we need to find what works well and do it better.*
- Outsourcing of technical and operational skills, research and feedback by government: *we need to replace this lost practical expertise.*
- Excessive reliance on economics, contracts and markets: *we need to go beyond the specification and the profit motive.*
- Virtualisation of education and practice: *professionals need to confront the consequences of their actions, learn from them and share results.*
- 30 years of professionalism being regarded as anti-competitive or elitist: *but how else can those we trust also have the wider interests at heart?*
- Destruction of professional judgment by PR, *reinforcing received wisdom.*

# And what is this the antidote to?
## *The new (or old?) big corporatism*

1. Pretend to be a steward of the community and the planet,
   *but always put your own and your organisation's interests first.*
2. Trumpet your ethics, *but always work strictly within the terms of your appointment and never question its appropriateness.*

3. Base relationships on roles and contracts, never on trust.
4. Focus strictly on your own areas of activity.
   *Transfer responsibilities onto others where possible.*
5. Terminate your involvement as soon as the work ceases to be profitable.

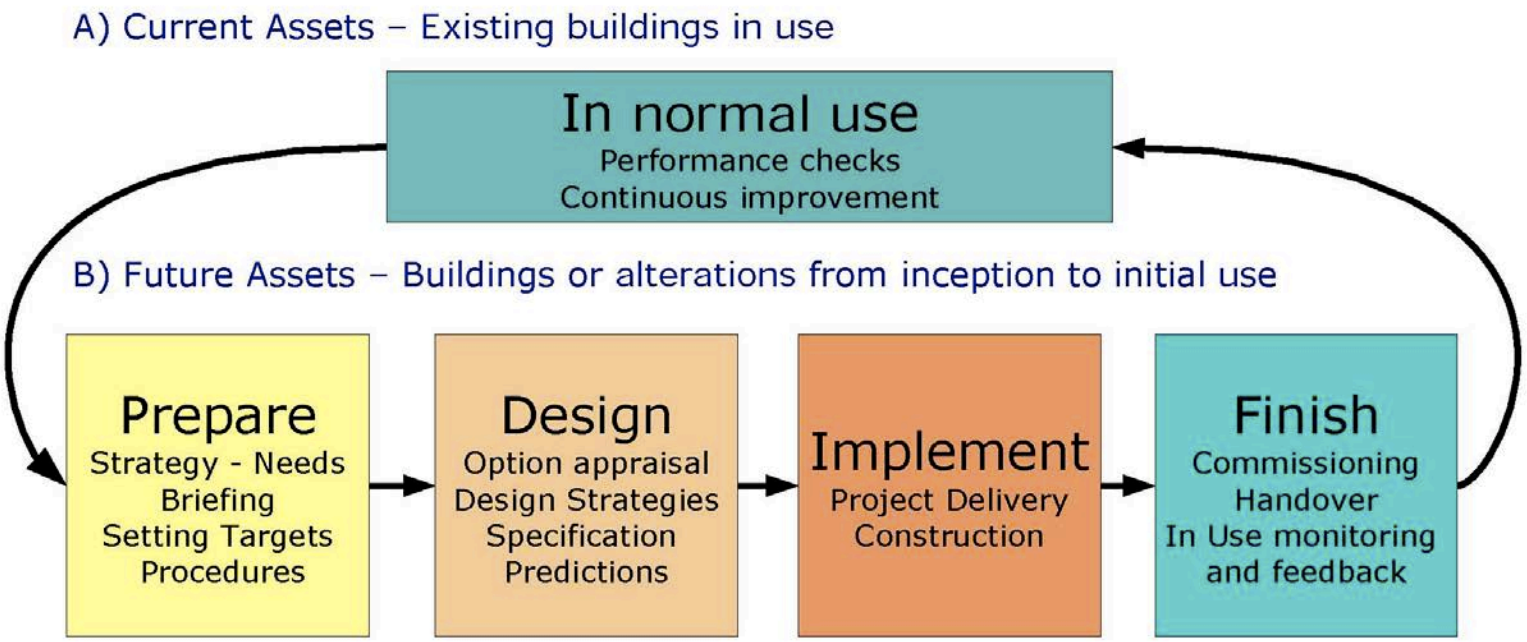
6. Do not share knowledge with others.
7. Never admit mistakes.
8. Resist collaboration.

9. Always work to existing norms and standards.
   *Never reveal what you don't know.*
10. Extend your control as widely as possible.
    *Dependencies create future income streams.*

# 2

# A FOCUS ON OUTCOMES, WITH *SOFT LANDINGS*

# THE FUTURE: *Closing the loop, making follow-through and feedback routine*




**Using BPE feedback at any stage in the life cycle of a building or project**
HINDSIGHT: After you've completed a project *(learning and fine tuning)*
FORESIGHT: Before you do something new *(existing situation + analogues)*
INSIGHT: At any time *(reality checking, managing expectations).*

*Good processes need to bring it all together, and reinforce the **Finish** stage*

SOURCE of hindsight-foresight-insight classification: D Bartholomew, *Building on Knowledge,* Wiley-Blackwell (2008).

# How can we get this to happen?
## ***Soft Landings*** *may be able to help*

**It augments the duties** of the design and building team, *(and of client representatives),* especially:

- During the critical briefing stage.
- With closer forecasting of building performance.
- With greater involvement with users before and after handover, and on-site presence during settling-in; and
- including monitoring and review for the first three years of use.

***It can:***

- *Be used on any project, in any country, with any procurement route.*
- *Provide a fast track to improving building performance in use.*
- *Help to provide more customer focus for the industry.*
- *Improve client relationships and user satisfaction.*
- *Build recognition that some debugging is to be expected.*

***It is primarily about a change in attitude.***
***It needs champions to take it forward - The new professionals.***

# Building performance evaluation: *From post-mortem to life support*

- Assists **new professionalism** that engages directly with outcomes.
- "Hand over and walk away" procedures do not suit complex modern buildings, which also need tuning up.
- Building performance evaluation must become a routine part of project delivery. *However, evaluation also needs to be undertaken with some independence.*
- Feedback experience also needs to be incorporated within the briefing, design and construction process. *It could potentially become a project management activity.*
- The whole process of creating buildings needs to change if we are to make the built environment genuinely more sustainable.


SOURCE: The *Framework* can be downloaded free from www.usablebuildings.co.uk and www.softlandings.org

# Soft Landings: the Five main stages
## *from the Framework (July 2009, revised 2014)*

1. Inception and Briefing
   *Appropriate processes.*
   *Assigned responsibilities.*
   *Well-informed targets.*
2. Design development
   *and expectations management.*
3. Preparation for handover
   *better operational readiness.*
4. Initial aftercare
   *Information, troubleshooting,*
   *fine tuning, training.*
5. Longer-term aftercare
   *monitoring, review, independent*
   *POE, feedback and feedforward.*


the SOFT LANDINGS FRAMEWORK
for better briefing, design, handover and building performance in-use

# Soft Landings **Stage 1**:
## *Inception and briefing*

**The most important stage,** because it binds the team and sets the whole style of engagement with outcomes.

- However, clients have been reluctant to pay, thinking that the industry ought to be doing it anyway.
- Modern procurement methods have often salami-sliced things, making it difficult to maintain *the golden thread* of maintaining and refining design intent throughout a project and on into use.
- *Some clients are writing it into their briefs.*
- *Some PFI teams are starting to put it into their bids.*
- *Some designers want it to be in their standard service.*
- *May become mandatory for government projects from 2016 …*
  *but not quite in the way we hoped for – more targets than culture.*

**FEEDBACK**:
The project team should select a **Soft Landings Champion** or Champions, who can provide the leadership to help things along …
**these are in effect the new professionals.**

# Four aspects of briefing: *if poorly managed, don't be surprised if there are large performance gaps*

**THEORY**

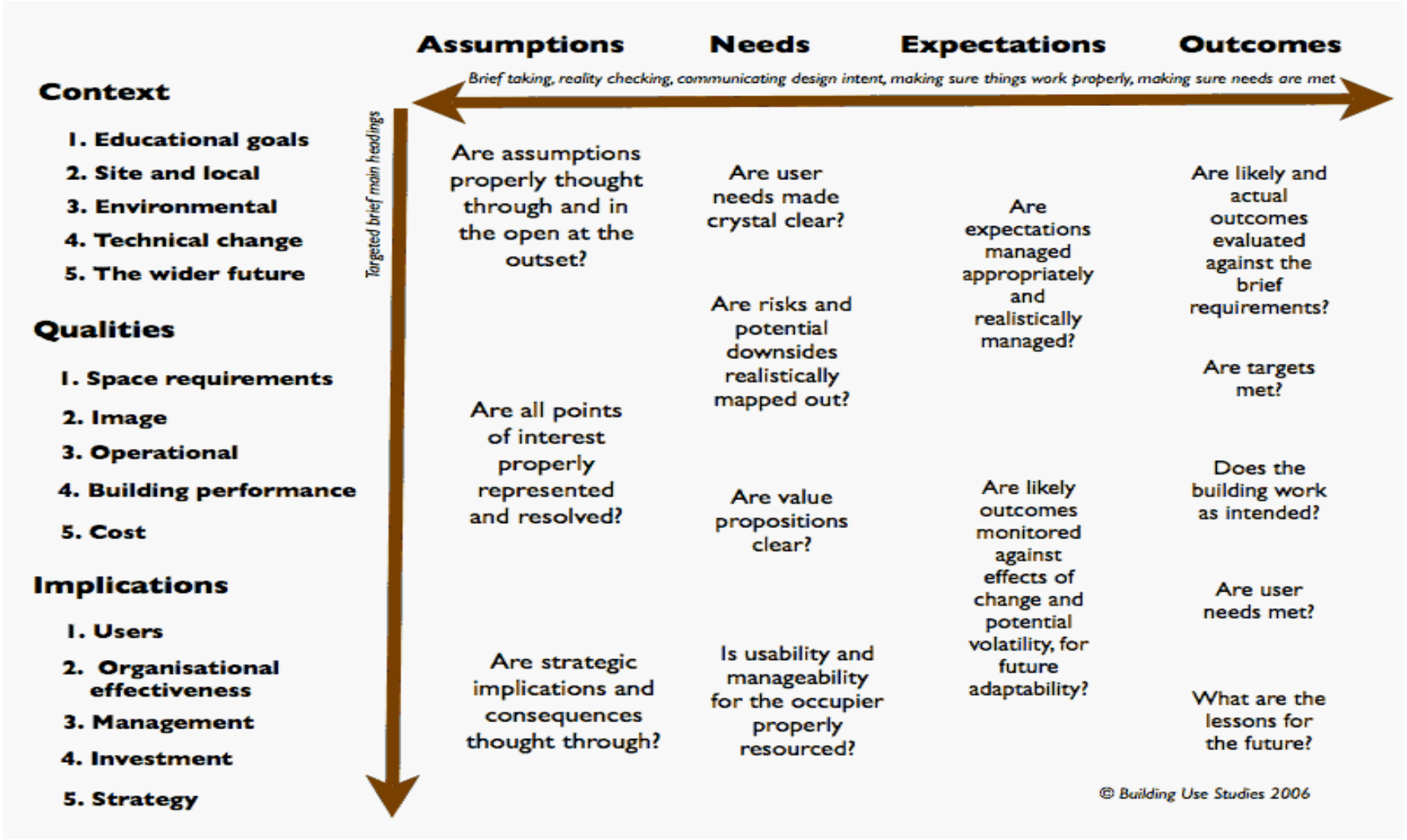
**BEFORE**

| | |
|---|---|
| **ASSUMPTIONS**<br>*What is being taken for granted?* | **EXPECTATIONS**<br>*Will predictions prove robust?* |
| *Will what is proposed meet them properly?*<br>**NEEDS** | *How will these be evaluated?*<br>**OUTCOMES** |

**AFTER**

**PRACTICE**

# Soft Landings **Stage 1**:
## *The briefing process can often be inadequate*




SOURCE: A Leaman, *Strategic Briefing Framework,* Building Use Studies Ltd, developed for the Norwegian Building Institute (1997).

# Soft Landings **Stage 2:**
## *Reviews during design and construction*

- Set stretching but realistic expectations, *not pie-in-the-sky.*
- Manage them through the process.
- Undertake regular reviews and reality checks.
- Leave elbow room: *this is systemic improvement, not exact science.*

**FEEDBACK:**

- Any costs up to handover can usually be met by efficiency gains, *though there may be a learning curve to pay for.*
- Soft Landings Champion(s) can provide leadership, maintain the emphasis on outcomes, and remind project managers that it is not enough just to keep to time and budget.
- This must all be done in the sprit of learning, not blaming.

*Soft Landings research team members Feilden Clegg Bradley and Max Fordham use an expectations management process in their projects.*

# Managing expectations:
## *Sustainability matrix approach*

**Sustainability Matrix: Offices** **Feilden Clegg Bradley** Architects LLP ©

**Operational Energy Consumption and $CO^2$ Emissions**

| | 1. GOOD PRACTICE | 2. BEST PRACTICE | 3. INNOVATIVE | 4. PIONEERING | NOTES |
|---|---|---|---|---|---|
| **1. $CO^2$ Emission Target** | 40kg$CO^2$/m²/yr | 30kg$CO^2$/m²/yr | 15kg$CO^2$/m³/yr | "Carbon neutral" 0kg$CO^2$/m | Industry standard EEO targets |
| **2. Heating Load Target** | 79kWhr/m²/yr | 47kWhr/m²/yr | 30kWhr/m²/yr | 20kWhr/m²/yr | Industry standard EEO targets |
| **3. Electrical Load Target** | 54kWhr/m²/yr | 43kWhr/m²/yr | 35kWhr/m²/yr | 25kWhr/m²/yr | Industry standard EEO targets |
| **4. U Values: Wall**<br>**Average Window**<br>**Roof**<br>**Ground Floor** | 0.35<br>2.2<br>0.2<br>0.25 | 0.25<br>1.8<br>0.18<br>0.22 | 0.2<br>1.4<br>0.15<br>0.2 | 0.1<br>0.9<br>0.1<br>0.1 | good practice=current building regulations pioneering=Bedzed values |
| **5. Airtightness** | <10m³/hr/m² | <8m³/hr/m² | <5m³/hr/m² | <3m³/hr/m² | All measures require careful attention to details and monitoring construction. |
| **6. Ventilation** | Natural ventilation where possible. Mechanical ventilation where not. | Designed natural ventilation with automatic openers, mechanical ventilation to WCs etc. | Mechanical ventilation with heat reclaim in winter and BMS controlled natural ventilation in summer. | | BMS with manual overrides preferable on all windows. |
| **7. On Site Energy Generation** | | Solar domestic water heating to WCs. | Solar domestic water heating to WC cores. Cost effective PV installation using PVs to shade rooflights. Gas fired CHP installation. | Solar water heating to kitchens. Maximum PV installation using most efficient PVs. Wood/waste fired CHP. | Potential 50% grant available from DTI for wolar water heating, up to 65% for PV installation. |
| **8. Daylighting** | "Reasonable" to BS8206 part 2. A 2% daylight factor. | 80% office space daylit to meet criteria of BS8206: part 2. | 100% of office space daylit to BS8206 part 2 | | Ensure prevention of solar heat gain/glare by building form/shading systems |
| **9. Artificial Lighting Controls** | PIR detectors in WCs etc. Low energy fittings throughout. | Luminance and presence detectors throughout building. No dimming. | Luminance and presence detection at all fittings with dimming to zero and BMS override. | | Personalised controls strongly recommended by Rob Jarman |
| **10. Cooling Systems/Sources** | Zero ozone depletion refrigerants in high efficiency comfort cooling/air conditioning systems. | Night time structural cooling with automatic window vents. | Evaporative cooling to rooms with high internal heat gains. | Borehole/ground water cooling to rooms with high internal heat gains. | Need to provide for areas where cooling is required and provide upgrade path for entire building. |
| **11. Embodied Energy in Structural Materials** | Steel and concrete frame engineered to minimise mass of materials. | Use of cement replacements eg GGBFS in concrete. Use recycled steel. | Timber structure in lieu of steel or concrete but retaining concrete floors.<br>Use of recycled aggregates in structural concrete. | All timber structure with thermal mass provided using minimum amount of concrete. | NB. Rob Jarman particularly keen on use of timber for low embodied energy |

REF: W Gething & W Bordass, *A rapid assessment checklist for sustainable buildings,* BR&I **34**(4), 416-426 (2006).

# Soft Landings **Stage 3:** *Preparation for handover*

- **A change in concept:** Handover becomes an event in an extended *Finish* stage, not the point where the design+building team walk away.
- **Preparation for operational readiness** includes not just static and dynamic commissioning of the fabric and building services, but much closer engagement with the occupier's move-in and their management and maintenance team, *if of course they have one.*
- **Preparation for aftercare,** with representatives of the design and building team on site after handover. *The time allocation depends on the size and complexity of the project - it might be one person for half a day a week or less, or much more for a large and difficult project.*
- **If there is unfinished business,** e.g. owing to a forced early handover, then the *golden thread from design intent to reality* is easily carried through into STAGE 4: initial aftercare and fine tuning.

**FEEDBACK:** Early appointment of a facilities management team is not enough, they also need to be brought into the process deliberately.

Material such as building log books should be prepared at an early stage and provide an ongoing narrative on how the building is intended to work.

# Soft Landings **Stage 3:**
## *Preparation for handover*

## Section 3: Operating and Maintenance Instructions

### CRITERION 5 – PROVIDING INFORMATION

82 In accordance with Requirement L1(c), the owner of the building should be provided with sufficient information about the building, the ***fixed building services*** and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.

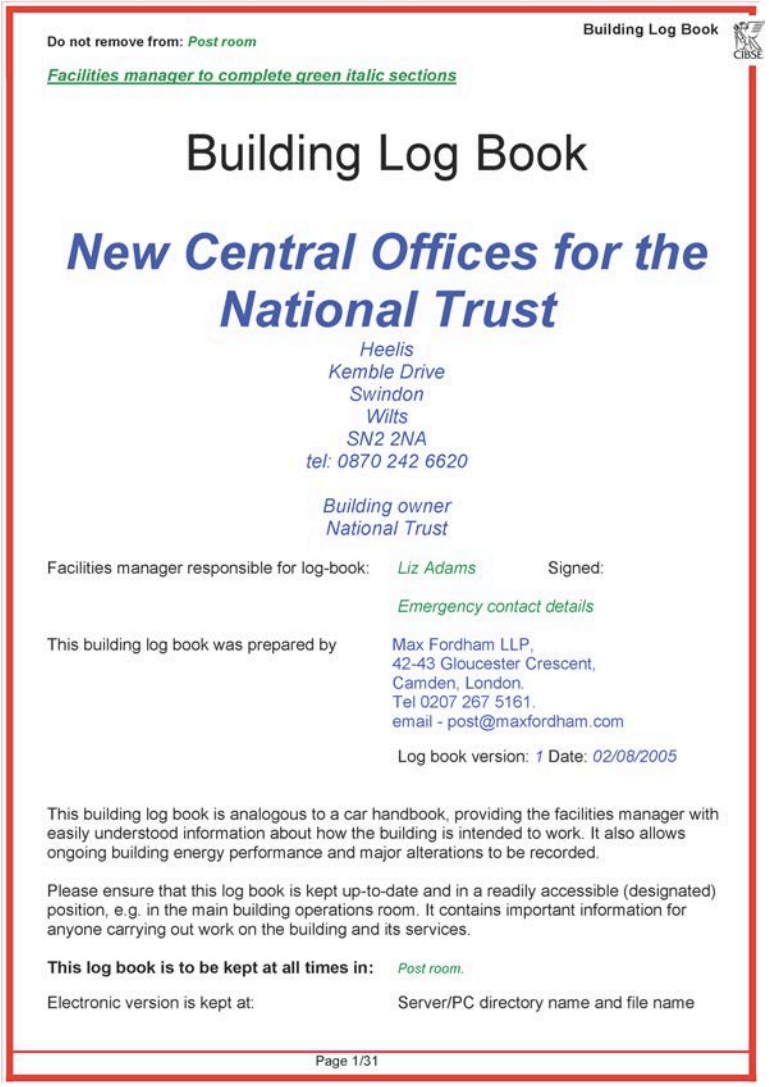
### Building log-book

83 A way of showing compliance would be to produce information following the guidance in CIBSE TM31 Building Logbook Toolkit[32]. The information should be presented in templates as or similar to those in the TM. The information could draw on or refer to information available as part of other documentation, such as the Operation and Maintenance Manuals and the Health and Safety file required by the CDM Regulations.

84 The data used to calculate the ***TER*** and the ***BER*** should be included in the log-book.

*It would also be sensible to retain an electronic copy of the input file for the energy calculation to facilitate any future analysis that may be required by the owner when altering or improving the building.*





Do not remove from: *Post room*

Building Log Book

*Facilities manager to complete green italic sections*

Building Log Book

**New Central Offices for the National Trust**

*Heelis*
*Kemble Drive*
*Swindon*
*Wilts*
*SN2 2NA*
*tel: 0870 242 6620*

*Building owner*
*National Trust*

Facilities manager responsible for log-book: *Liz Adams* Signed:

*Emergency contact details*

This building log book was prepared by
Max Fordham LLP,
42-43 Gloucester Crescent,
Camden, London.
Tel 0207 267 5161.
email - post@maxfordham.com

Log book version: *1* Date: *02/08/2005*

This building log book is analogous to a car handbook, providing the facilities manager with easily understood information about how the building is intended to work. It also allows ongoing building energy performance and major alterations to be recorded.

Please ensure that this log book is kept up-to-date and in a readily accessible (designated) position, e.g. in the main building operations room. It contains important information for anyone carrying out work on the building and its services.

**This log book is to be kept at all times in:** *Post room.*

Electronic version is kept at: Server/PC directory name and file name

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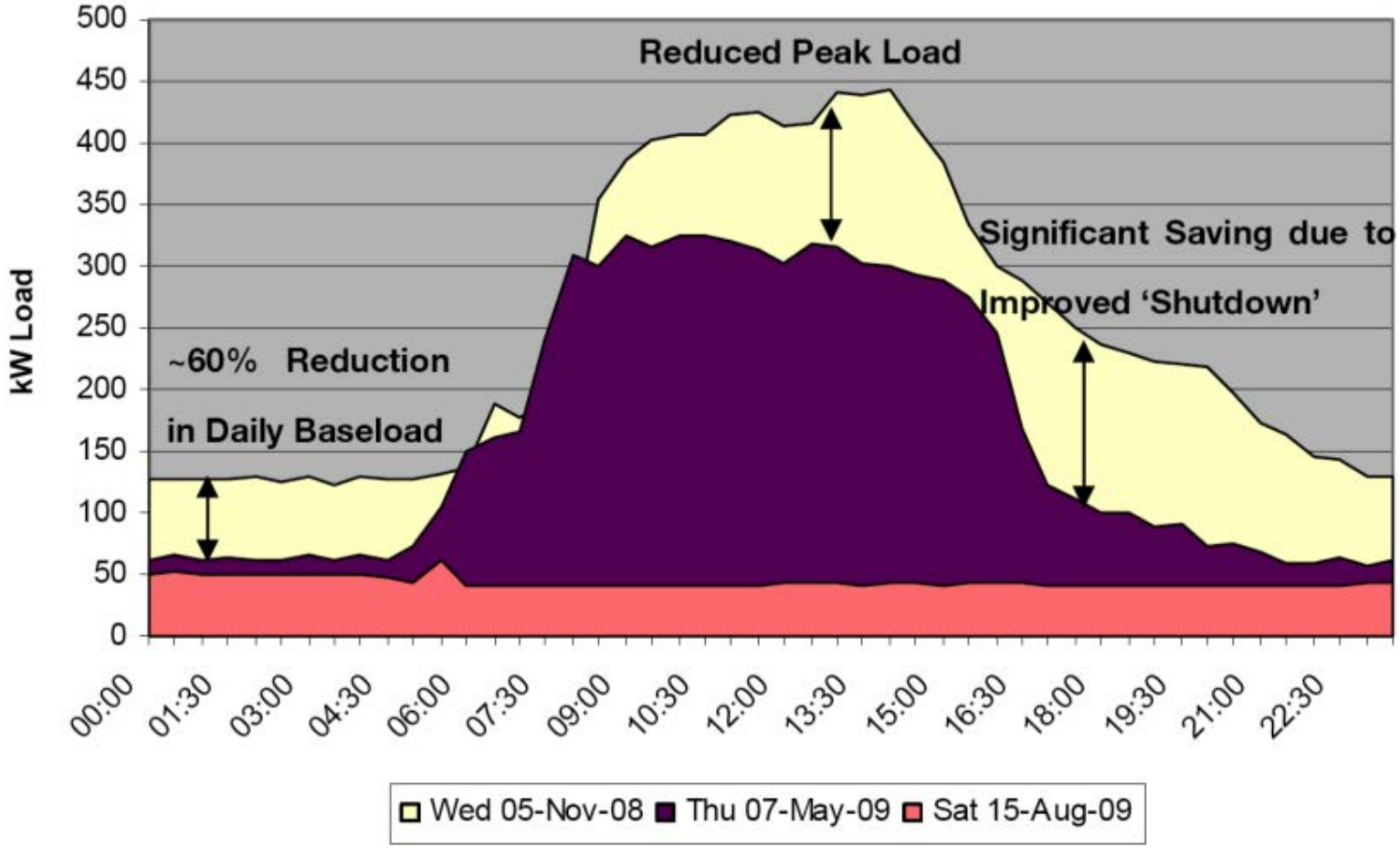
**Log books are a legal requirement, but are seldom produced. Where they are, it is often by third parties, not as a design narrative.**

# Soft Landings **Stage 4:**
## *Initial aftercare*

- **Design and building team members visit regularly:** *who and how many visits will depend on project.*
- **They need a home in the building where they are visible to occupants,** *not be hiding in the site hut.*
- **They explain the building to the users,** *in simple guides and in one or two introductory events.*
- **They help the management to take ownership,**
  *the occupier must take the initiative, not stand back.*
- **They keep people informed,** *e.g. via a newsletter on the organisation's website, e.g. alerting to any problems.*
- **Troubleshooting and fine tuning can be undertaken,**
  *the best insights have arisen where the soft landings team does some of its own work in the building and experiences its facilities.*

**FEEDBACK: Will contractors engage properly?** *Soft Landings priorities are very different from dealing with snags and defects.*

# **Stage 4** aftercare may pay for itself:
## *Intervention in a new secondary school*




*Saving over £ 50,000 p.a. in electricity bills: avoiding default to ON … and occupant satisfaction will often improve too!*

SOURCE: Buro Happold Engineers, Soft Landings Trials (2009).

# Soft Landings **Stage 5:**
## *Monitoring, evaluation and feedback*

- **Extended aftercare period,** typically two or three years.
- **Occupiers must take ownership,** running the building and doing routine monitoring themselves. *They may need motivating.*
- **Independent post-occupancy evaluation can be included,** e.g. for occupant surveys, energy analysis, and structured discussions. *Independent review and benchmarking can be helpful and reassuring.*
- **The findings can be fed through rapidly,** *e.g. to fine tune the systems, refine use and operation of the building and plan upgrades.*
- **The learning can also be spread much more widely,** via the people and organisations involved, and beyond.

**FEEDBACK:** Often this has needed external funding.
How can we make it routine? The value that can be added is enormous.
We can't afford not to do it; and it can be done with a light touch.

# **Feeding forward** in phased projects: *Window control improvements at Cambridge Maths building*

**PHASE 1** **>>>**

- Difficult to understand
- Some poorly located
- Remote control problems


**PHASE 2**

- Improved, custom design
- Better located
- Not yet perfect

# Soft Landings:
## *Everybody can win*

- Better communication, proper expectations management, *fewer nasty surprises.*
- More effective building readiness. *Less rework.*
- Natural route for feedback and Post-occupancy evaluation, *to improve the product and its performance in use.*
- Teams can develop reputations for customer service and performance delivery, *building relationships, retaining customers, commercial advantage.*
- Vital if we are to progress towards more sustainable, low-energy, low-carbon, well-liked buildings and refurbishments, *closing the credibility gaps.*

***SO WHAT IS STOPPING US?***

- *ATTITUDES: Everybody needs to be committed, starting with the client - perhaps the biggest obstacle. The "golden thread" needs to be put in place.*
- *PROCESSES: There is a learning curve to pay for (probably best from marketing budgets), and the feedback has to be managed.*
- *TECHNIQUES: Independent POE surveys cost money (but not much).*
- *CAPACITY: We need facilitators, investigators, troubleshooters and fixers.*
- *MONEY: Particularly allocation for tune-up etc. after practical completion.*
- ***IMAGINATION: Often constrained by burgeoning bureaucracy!***

# SOFT LANDINGS FOR SCHOOLS

## Case Studies

### Feedback from use of the Soft Landings Framework in new schools

Edited by Mike Buckley, Bill Bordass and Roderic Bunn

BSRIA BG 9/2010

SOFT LANDINGS

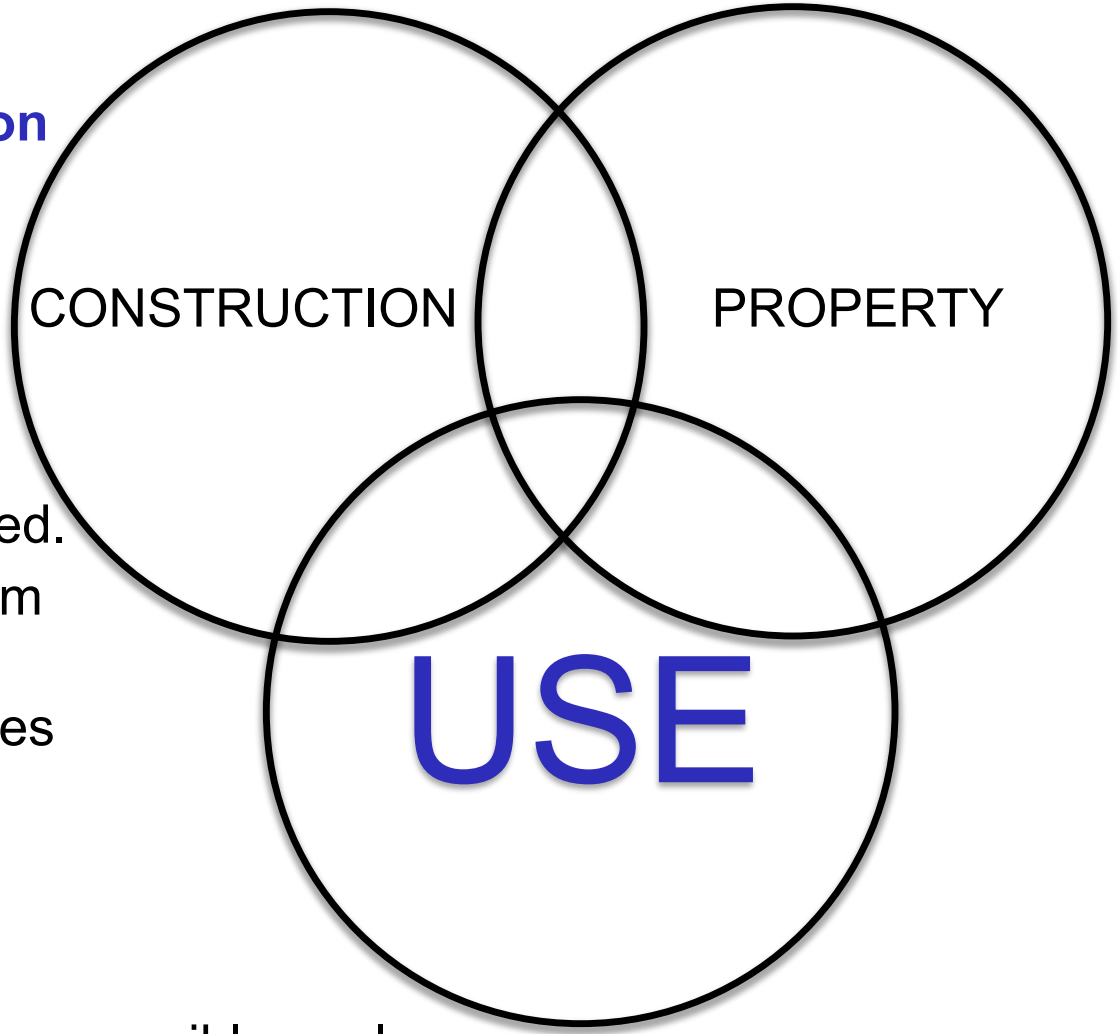
Research funded by
**Technology Strategy Board**

# 3

# AN INSTITUTE of BUILDING PERFORMANCE?

# How about an independent Institute?

- **Strengthens representation of BUILDING USE**
- Public interest.
- Independent.
- Interdisciplinary from the start. No historic silos.
- Authoritative, evidence based.
- Can bring together work from many different sources.
- Both supports and challenges the construction and property industries.
- Connects research, practice and policymaking.
- Institute for Fiscal Studies is a possible analogue.



# Good and Bad attributes of major players *that must be involved but not dominate*

Leadership, standards

Government

Bureaucracy

Delivery, innovation

Industry

Market capture

Vision, connection, integration(?)

Professions

Priesthood

Imagination, grounding

Academe

Isolation, obscurity

*It must aim to bring out the good aspects*

# Next steps, Next week …

the EDGE

## Collaboration for Change:

### The Edge Commission Report on the Future of Professionalism

6.00 - 8.00pm
**Monday 18th May 2015**
Arup, 8 Fitzroy Street, London W1T 4BJ

**In 2014 the Edge invited Paul Morrell to chair a Commission of Inquiry into the future of professionalism in the built environment/construction industry.**

The Edge is very proud to launch the resulting report, which explores a number of key issues facing professionals and their institutions at this 'moment for change' and hopes you will join us to discuss this critical issue for the industry and its professional institutions.

Paul Morrell will outline the findings of the report and the recommendations for action by the professional institutions and their members. These include a series of key recommendations and a number of projects for the institutions to develop collaboratively in the public interest.

www.usablebuildings.co.uk