

Introduction



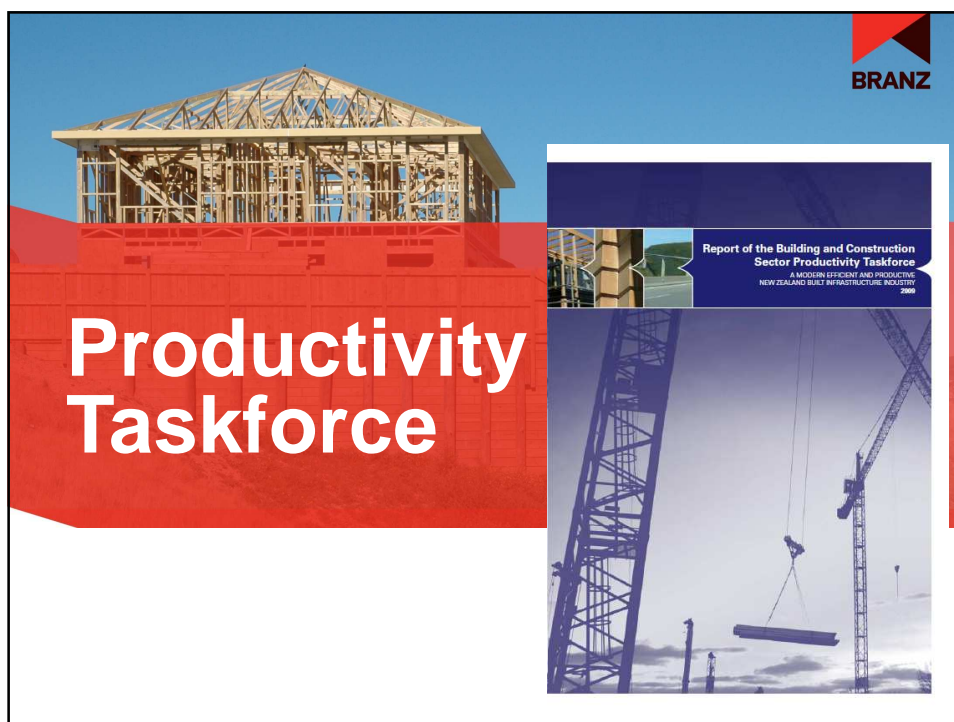
Productivity very similar to Climate Change

- ▶ **Very strong believers there's a problem**
- ▶ **And just as many strong believers that there isn't!**
 - ▶ In my own case, would put NZ trades skills ahead of any other country in the world
- ▶ **Like Climate Change, things that might be done to fix Productivity are worth doing anyway, for their own sake**
- ▶ **Hence value in more work being done**

Agenda



- ▶ **Productivity Task force report**
 - ▶ Productivity measurement
 - ▶ Recommended next steps
- ▶ **Other work done since then**
 - ▶ BRANZ research
 - ▶ Prefab NZ
 - ▶ University consortium
 - ▶ (Failed) FRST funding proposal
- ▶ **Construction Productivity Partnership**
 - ▶ Key work streams and next steps



Background



- ▶ **Construction leaders meet 1 August 2008 at Minister for Building and Construction's instigation**
- ▶ **Concluded:**
 - ▶ Productivity growth low and limiting industry innovation and profitability
 - ▶ Improved skill levels across industry needed to improve sector productivity
- ▶ **Taskforce set up late 2008**

Context



Construction Sector:

- ▶ 24,000 new houses per year average
- ▶ \$4 billion non-residential building/year
- ▶ 178,000 employed (Dec 08)
 - ▶ 8% NZ work force
- ▶ **Contributes 5% to GDP**
- ▶ **BERL study 2003:**
 - ▶ 10% increase in construction sector productivity = 1% increase in GDP

Definition of Productivity



$$\text{Productivity} = \frac{\text{Output}}{\text{Input}}$$



- ▶ Many forms of Output and Input used, NZ and internationally
- ▶ Can take years to get relevant data

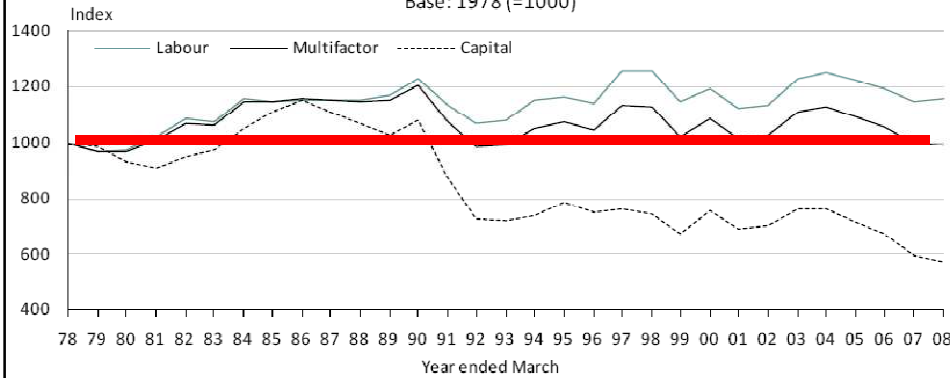
How productive are we?



Construction productivity indexes

Year ended March, 1978–2008

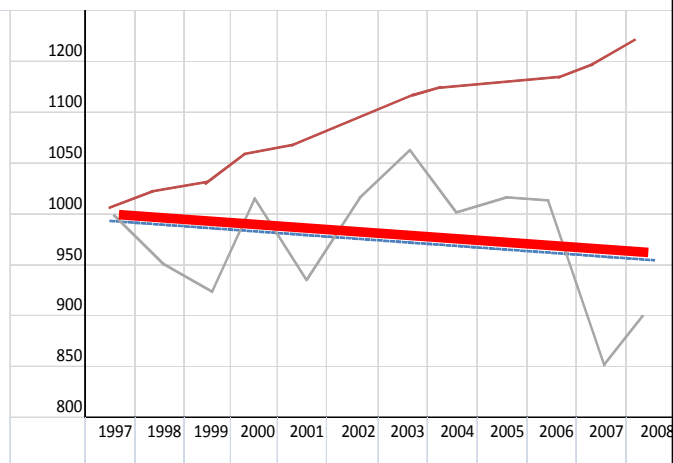
Base: 1978 (=1000)



How productive are we?

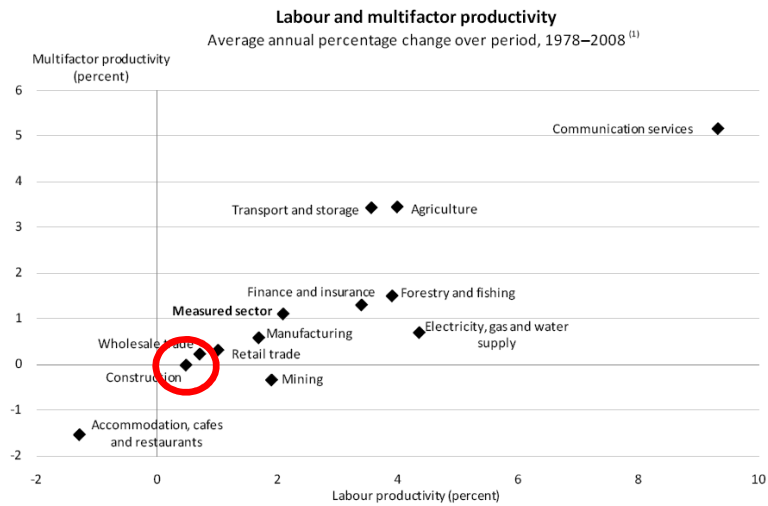


Labour productivity in the aggregate economy and the construction sector compared (1997-2008)

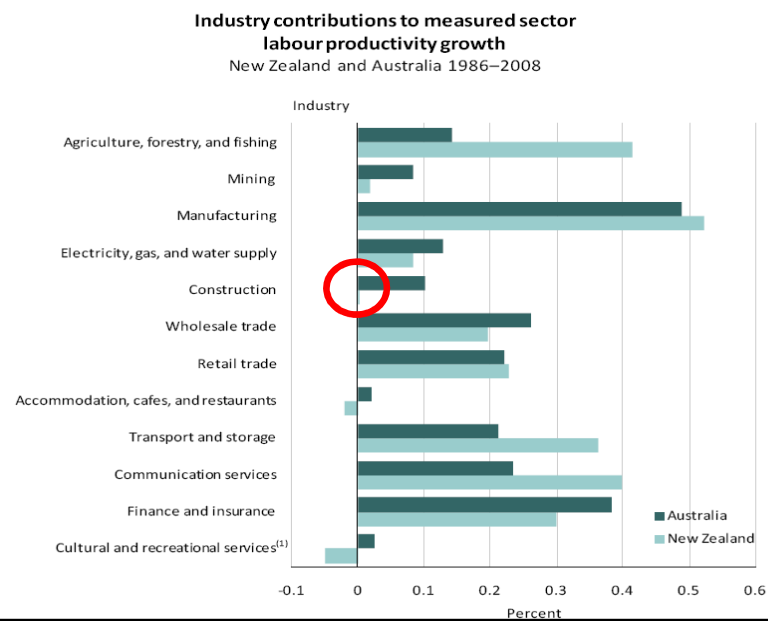


Nick Davis (2007), Construction Sector Productivity Scoping Report, Martin Jenkins, Wellington

How productive are we?



How productive are we?



Taskforce main findings



Poor productivity growth due to:

- ▶ **Lack of innovation**
- ▶ **Impact of regulations**
- ▶ **Poor procurement practices**
- ▶ **Shortage of management skills**
- ▶ **Skills**
 - ▶ Decline in average skills
 - ▶ Legacy skills gap
 - ▶ Insufficient skills upgrading
 - ▶ Lack of ongoing skills development
- ▶ **Job churn/cyclic nature of industry**

Taskforce main findings



Recommendation that industry and DBH work together to:

- ▶ **Develop a better analysis/ understanding of sector performance**
- ▶ **Develop a work programme to address other factors to address factors affecting productivity**

Industry reaction



Ensuing industry debate following report:

- ▶ **Are we really that unproductive?**
- ▶ **Are we measuring the right things?**
- ▶ **If we raise productivity, will quality suffer?**
- ▶ **Impact of 2004 regulatory reforms?**
- ▶ **Impact of leaky building crisis?**
- ▶ **Impact of boom/bust cycles?**



Research Consortium proposal



Concept of research consortium developed

▶ Modeled on Beacon Pathway Ltd

- ▶ Public/private research consortium established 2004
- ▶ Intent to markedly increase environmental sustainability of NZ houses
- ▶ FRST report on Beacon 2010 very complimentary on successes

Research Consortium proposal



Initial work on CPP late 2009, intent was to:

- ▶ Follow Beacon model
- ▶ Find industry partners/shareholders
- ▶ Establish research programme
- ▶ Bid to FRST for consortium funding
 - ▶ 1:1 industry : Government \$

Led by BRANZ and SCION

Research Consortium proposal



Initial work planned by CPP late 2010

► Intent was to:

1. Measure productivity – how, with what, benchmark current performance
2. 'Map' how industry works/interacts – to identify best ways to increase productivity
3. Find the best ways to embed innovation in the sector
4. Improve industry resource efficiency

Key starting point



In measuring productivity, need to measure at three levels (NIST):

National	total portfolio of projects for sector
Project	collection of tasks/ processes necessary to construct a building
Task/ Process	specific activity e.g. concrete placement

Funding declined by FRST



- ▶ Unfortunately funding bid declined by FRST
 - ▶ Research capacity not strong enough
 - ▶ Benefits to NZ Inc insufficiently clear
- ▶ CPP partners still progressing elements of base work
 - ▶ In anticipation of research programme to be kicked into gear later

Other Research Reports/ Activities



Measuring Productivity



Ian Page, BRANZ economist

- ▶ **Suggests using a multifactor productivity index in NZ**
 - ▶ subject to data delay and national level only
- ▶ **Suggests also using a labour productivity index**
 - ▶ less data delay, less accurate, national level only
- ▶ **Need to monitor quality as well**

Download from BRANZ website www.branz.co.nz

International initiatives #1



Deane Smart – Report to BRANZ Sept 2009

- ▶ **An initial desk-top study**
- ▶ **General international declines in construction sector productivity**
- ▶ **Noted international initiatives to improve productivity included:**
 - ▶ Phasing of Government building projects
 - ▶ Procurement practice improvement
 - ▶ Upskilling
 - ▶ New technology
 - ▶ Capability enabling

Available from Wayne Sharman at BRANZ

International initiatives #2

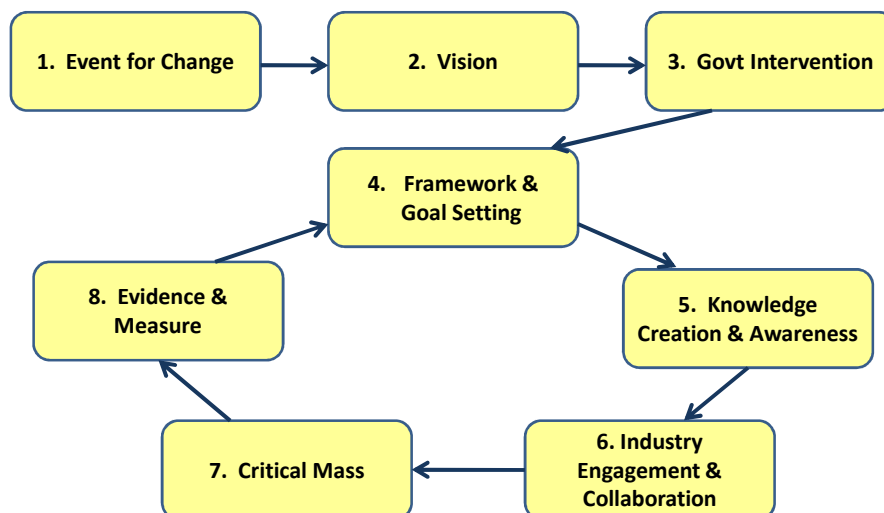


Constructing Excellence – August 2010

- ▶ **Explores construction sector productivity initiatives in:**
 - ▶ Australia, Denmark, Japan, Singapore, Sweden, UK, USA
- ▶ **With the exception of the USA, all other productivity interventions were initiated and funded by Government**
- ▶ **Suggested 12 themes for productivity improvement**

Download from www.constructing.co.nz

Continuous improvement cycle



www.constructing.co.nz

Benchmarking Project



Constructing Excellence KPI proposal

- ▶ Proposes extending the collection of a national key performance indicator benchmarking dataset
- ▶ Data collected on an individual project basis, combined, anonymised and available for companies to benchmark their performance against
- ▶ Already being done with selected input group

Proposed KPIs (based on UK)



- ▶ Client satisfaction - product
 - service
- ▶ Defects
- ▶ Predictability cost - design
 - construction
 - project
- ▶ Predictability time - design
 - construction
 - project
- ▶ Safety
- ▶ Profitability

Why Do Builders Innovate?



A Review of the International Literature on Home Builder Innovation

Lincoln University

- ▶ **Building sector not particularly innovative**
 - ▶ Innovation does occur on site
 - ▶ But no formal channels to explore innovation opportunities
- ▶ **Recommends 'virtual innovation' centre, linking inventors with researchers and Government funding**

Download from BRANZ website www.branz.co.nz

Auckland University/Massey/AUT



**BRANZ-funded research cooperative producing 6 ME theses and 3 PhDs to 2014
So far started are:**

- ▶ **Off-site manufacture of components**
Shahzad, Massey. ME
- ▶ **On-site constraints and improvements**
Durdyev, Massey. ME
- ▶ **Incidence of Snags in Residential Housing**
Rotimi, AUT. PhD
- ▶ **Labour Productivity Representation in NZ**
Tran, AUT. ME
- ▶ **Information Flow and Innovation**
Miller, Auckland. PhD (Dec 2010)

PrefabNZ



**Prefabricated buildings
industry association
established February 2010**



► **Objectives are for PrefabNZ to be:**

- A catalyst for prefab collaboration
- A portal for prefab information
- An incubator for prefab innovation

See www.prefab.com



**Construction
Productivity
Partnership**

Productivity JV



- ▶ Arises specifically out of Productivity Task Force recommendations
- ▶ JV partners
 - BCITO
 - BRANZ
 - DBH
- ▶ Many stakeholders
 - ▶ construction sector and Government
- ▶ Admin funding
 - ▶ BCITO/BRANZ/DBH

\$150k / year each

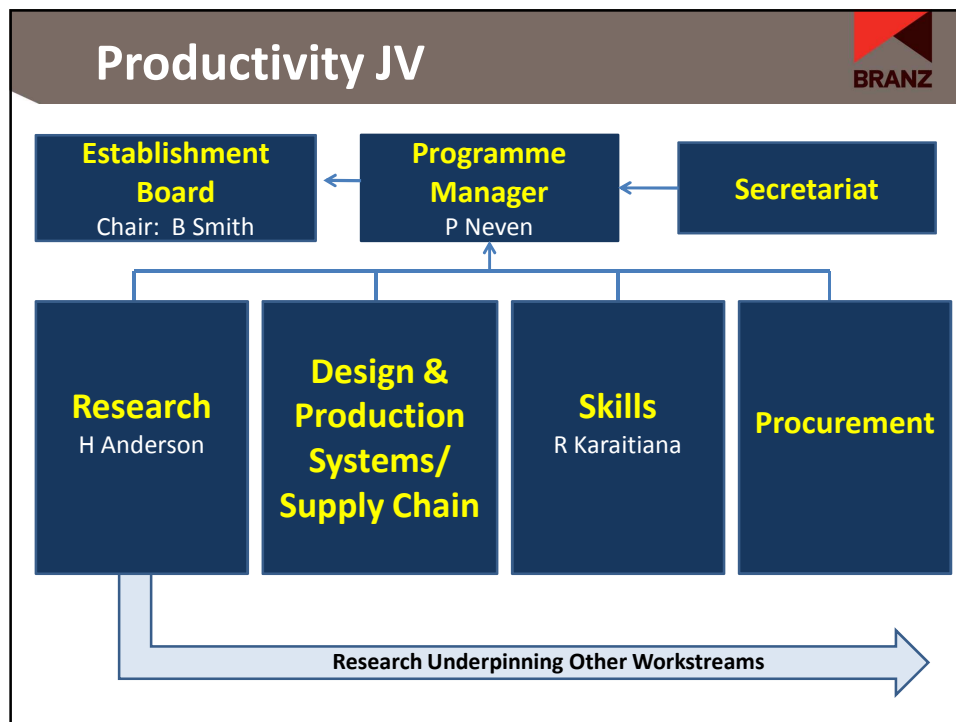



Productivity JV



Purpose: to foster cooperation to enhance productivity in the building and construction services for the long term benefit of consumers and the sector

Goal: to facilitate a 20% increase in construction sector productivity by 2020 (20 by 2020)

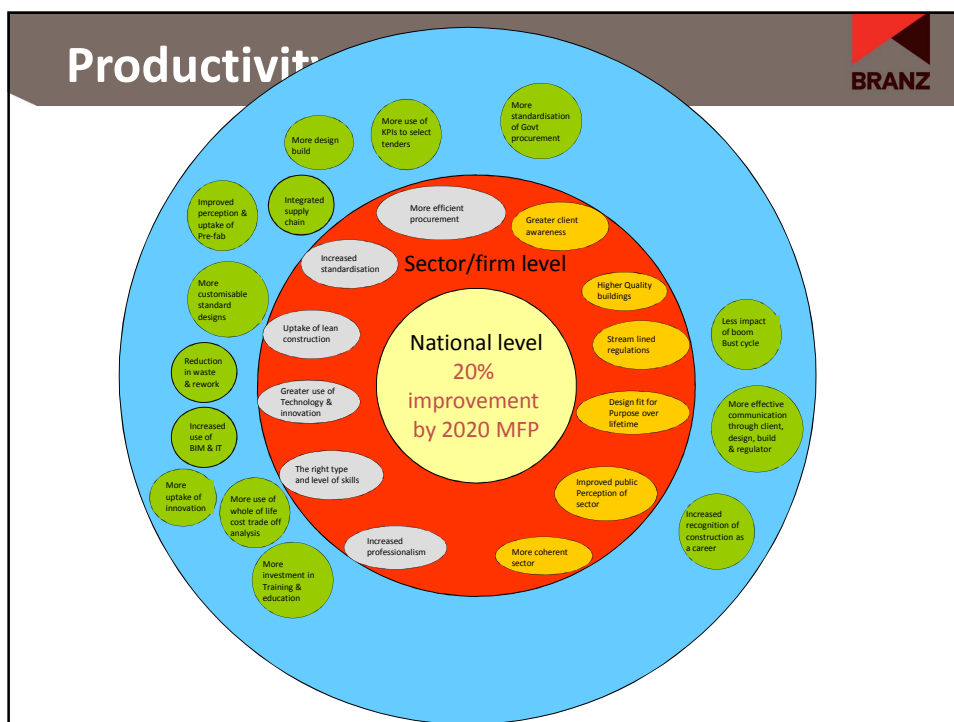
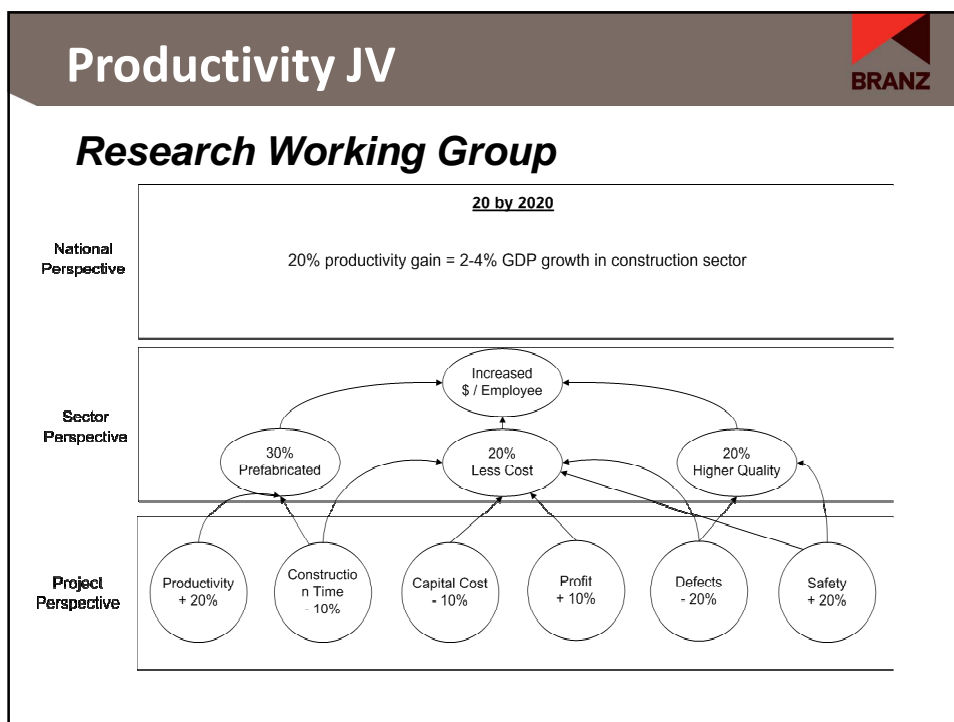


Productivity JV 

Research Working Group

Productivity Indicators
What to measure which can be done quickly and meaningfully

Research Action Plan
Identify what NZ productivity research is already done, what's needed/missing, how to plug gaps



Productivity JV



Design & Production Systems/Supply Chain Working Group

Being scoped March 2011

Potential starting focus on

- ▶ **rework**
- ▶ **waste**
- ▶ **innovation**
- ▶ **technology**

Productivity JV



Skills Working Group

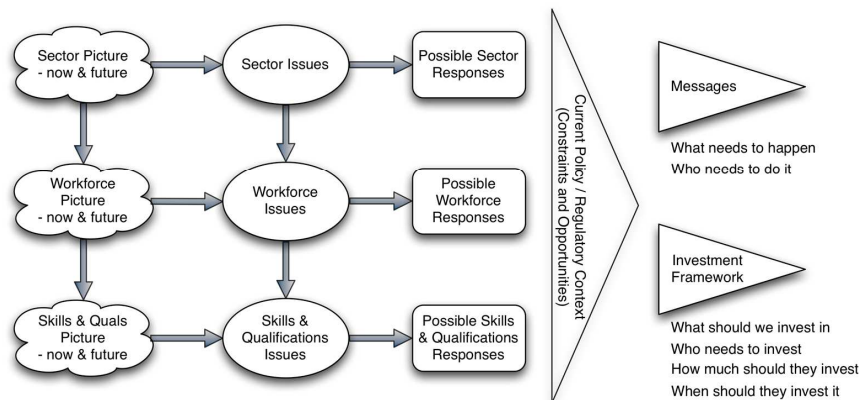
- ▶ **Development of skills strategy to get better return on current investments**
- ▶ **Consolidate and analyse existing skills research, identify gaps**
- ▶ **Identify entry issues/barriers**
- ▶ **Utilisation and retention issues/barriers**
- ▶ **Wider issues – SMEs, boom/bust cycles**

Productivity JV



Skills Working Group

Sector Skills Strategy Development Framework



Productivity JV



Procurement Working Group

- ▶ Focus on non-residential sector
- ▶ Investigate how Government procurement can be used to create value for both customers and providers
- ▶ Get Government agreement for Government procurement processes to be used this way
- ▶ Design procurement criteria

Productivity JV



Next Steps

- ▶ Consolidate work streams, develop work programmes, get industry / stakeholder / Government buy-in
- ▶ Work with industry / stakeholders / Government to implement work programmes
- ▶ Communicate
- ▶ Act as exemplar



Conclusions & opportunities

Conclusions/ Opportunities



- ▶ **Much international literature on attempts to improve construction sector productivity**
 - ▶ But little on how successful attempts were
- ▶ **There are a number of measures of productivity available at a national level**
 - ▶ But little at company or project level
- ▶ **Productivity must be measured at a national, project, product/process and skills level**

Conclusions/ Opportunities

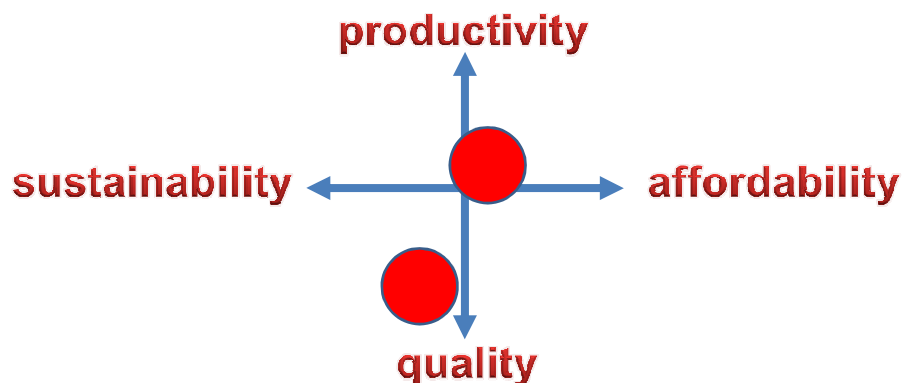


- ▶ **Successful productivity increase interventions will require embedding at a company/project level**
- ▶ **Ongoing successful national productivity increases require ongoing industry + Government cooperation**
- ▶ **Concentration on improving productivity should not be at expense of other key construction sector/company/project performance factors – such as quality**

Keeping a Balanced View



In endeavouring to increase productivity, must bear in mind the tensions between productivity and other factors



Conclusions/ Opportunities



- ▶ Canterbury earthquake has changed industry paradigm
- ▶ Creates both risks and opportunities for industry
- ▶ Particularly an opportunity to rest run different ways of working

Conclusions/ Opportunities



THANK YOU!