One Year On Event

18 July 2019
Bartlett School of Construction - University College London
Andy Mitchell
co-chair, Construction Leadership Council
Recap

• Construction Sector Deal published in July 2018

• Product of two year collaboration between industry and government and involves significant commitments by both

• Designed to drive a step change in the productivity improvement of the Construction Sector – and support Government ambitions for infrastructure and housing
Why was it needed?

- Poor productivity performance relative to other sectors
- Skills shortage
- Substantial investment in new homes and infrastructure over the coming decade
What it is our vision?

A sector based on:

✓ **Digital** - deployed at all phases of design will deliver better, more certain results

✓ **Manufacturing** - minimise the wastage, inefficiencies and delays that affect onsite construction

✓ **Whole Life Performance** - shift focus from the costs of construction to the costs of a building across its life cycle

in order to achieve:

✓ **33%** reduction in cost, **50%** reduction in time to build, **50%** reduction in carbon emissions
What are our objectives?

• Effectively implement the Sector Deal and work towards the 2025 targets (you’ll hear more about that shortly...)

• ‘Convene and communicate’ across the construction sector by working with related initiatives

• Build the case and an evidence base for future sector deals / collaboration between industry and Government
How are we structured?

Construction Leadership Council Board

33% Lower Costs
50% Faster Delivery
50% Lower Emissions
50% Improvement in Exports

Industry Innovation

Transforming Construction Programme
Sam Stacey

Transforming Construction Network Plus
Jacqui Glass

Innovation in Buildings
Mike Chaldecott
St Gobain

Skills for the Future
Mark Reynolds
Mace

Procuring for Value
Ann Bentley
Rider Levett Bucknall

Fair Practice
Andy Mitchell
Thames Tideway
Fergus Harradence
BEIS

Green Construction (Sustainability), Building Safety (i.e Hackitt), Exports

33% Lower Costs
50% Faster Delivery
50% Lower Emissions
50% Improvement in Exports

Andy Mitchell
Recap
Building a safer future

- A safety case for HRRB’s
- (Digital) Golden Thread through design, construction, operation
- New duty holder regime and Gateways
- Competence framework
- Materials testing and certification [all overseen by a new Building Safety Regulator]
Fair Practice

CLC workshop in September to consider:

- Adherence to CCS’s PPN March 2015 on prompt payment, and the extent of coverage
- Alternatives to retention mechanism
- Significant improvement on quality and defects
- Proper transparency of actual performance of government, client and supply chain
- Preclusion from future bidding if not complying
- Other unfair/unreasonable T&C’s
So what have we done so far?

- Organised CLC workstreams organised around key sector deal activity
- Broadened our representation
- Creation of an Advisory Group which brings together leaders / influencers from across the sector to act as a “critical friend” to the CLC
So what next?

• Taking a more active stance on payment issues
• Define and refine the role of the CLC Advisory Group
• Consolidate other industry initiatives into the CLC work streams
• Continue to engage with and support the recommendations of the Hackitt review of building regulations & fire safety
Andrew Stephenson MP
Department for Business, Energy and Industrial Strategy
Sam Stacey
UKRI
Transforming Construction Programme
Transforming Construction

Sam Stacey
Challenge Director
UK’s Construction Sector Deal

- £170m Government funding
- £250m Matched industry funding
- 4 years of funding
- Sustainable long-term model

- £59m Construction Innovation Hub
- £72m Active Building Centre
- £36m R&D Projects
Industry integration

Construction transformed

Successes

- Actionable information
- Artificial intelligence
- New skills
- Industry investment
- Robust supply and demand
- Standard products and processes
- Active buildings
- Wide system adoption
- New market entrants
- Long term planning

Challenges
Delivered through three enablers

<table>
<thead>
<tr>
<th>#</th>
<th>Digital</th>
<th>Manufacturing</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Procure for better value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Industry-led innovation</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Skills for the future</td>
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</tbody>
</table>
## Integration models

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Spinoff</strong></td>
<td>• Little change to business</td>
<td>• Slower implementation</td>
</tr>
<tr>
<td></td>
<td>• Structured learning process</td>
<td>• Re-educate supply chain</td>
</tr>
<tr>
<td><strong>Vertical</strong></td>
<td>• Full-stack integration</td>
<td>• Capital-intensive</td>
</tr>
<tr>
<td></td>
<td>• Speed to capture market</td>
<td></td>
</tr>
<tr>
<td><strong>Digital</strong></td>
<td>• Capital-light, industry 4.0</td>
<td>• Less control over product</td>
</tr>
<tr>
<td><strong>Systems</strong></td>
<td>• Agile development</td>
<td>• Longer co-creation process</td>
</tr>
<tr>
<td><strong>p`rojectfrog</strong></td>
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</tbody>
</table>
Policy environment

UK Research and Innovation

Industrial Strategy
Construction Sector Deal

Transforming Infrastructure

Transforming Construction Challenge

Construction Sector Deal
## Funded innovation

### Information
- Data interoperability
- Digital integration platform
- From BIM to machine control
- AR for efficiency
- IoT for site plant
- IoT and concrete curing
- IoT and thermal performance
- LIDAR for cranes

### Machine learning
- AI and logistics
- AI for programme prediction
- AI and BIM
- AI and component tracking
- AI for site safety
- AI and progress monitoring
- AI for quality
- Alexa for sites

### Product and process
- Panelised housing
- DfMA for housing
- Modular Homes
- Industrialised homes
- Energy active prefab
- Smart piles
- Frame optimisation
- Modular steel

- Robot clusters
- 3D concrete printing
- Non-prismatic concrete
➢ UK’s largest house builder and second largest social landlord coming together with their supply chains to industrialise housebuilding

➢ Using challenge approaches to reduce cost, boost productivity (40% target), increase safety onsite, improve quality (75% less rework) and 30% faster

➢ Bringing in wider housebuilding community, and establishing data to prove the business case

**Impacting 35,000 homes a year**

UK Research and Innovation  
https://www.aimch.co.uk/
Schools

➢ Designed using digital tools that use data from existing buildings to optimise performance (potentially including academic achievement)

➢ Assembled from standardised components manufactured in UK supply chains

➢ Generating more power than they use through built in active energy components

➢ Built in weeks at approaching half current costs (9 schools for the cost of 5)
Redesigned steel frame for school buildings, standardised across two major suppliers:

- 40% reduction in cost
- 52% faster assembly
- 57% reduction in weight (40% reduction in emissions)
- Exports - being used overseas

Market uptake:

- Steel frame on Gen. 5 procurement framework for DfE
- Interest for other buildings types
- Digital configurator
- Will extend to other components
The Transforming Construction Network Plus (N+) unites construction’s academic and industrial communities to create a new research and knowledge base, dedicated to addressing the systemic problems holding back the sector.

Provoke, enable and amplify innovation, through four main objectives:

- Knowledge
- Community building
- Business models
- Investment and legacy

1. Interoperability
2. User experience
3. Space tech for hospitals
4. Benchmarking

Next call Sept 2019

@TCN_Plus  #TCNPlus
enquiries.tcnetworkplus@ucl.ac.uk
Future of Consultancy

Consultant services

Expertise sold by the hour

Policy
Strategic Planning and Placemaking

Operation
Data led Asset Performance

Data

Delivery
Delivering Integrated Projects

Expertise

System

Network

Asset

Project
R&D Competition Round 2

£36m total R&D funding available

Two competitions will run in parallel:

- £26m Demonstration fund
- £10m Collaborative R&D fund

Spending Profile:

- £27m in FY20/21
- £8m in FY21/22

£26m Demonstration
- Opens 28th August 2019
- Closes 6th November 2019
- Projects start 1st April 2020

£10m CR&D
- Opens 28 August 2019
- Closes 30th October 2019
- Projects start 1st April 2020
## Draft Benefits Map

<table>
<thead>
<tr>
<th>Benefit Title</th>
<th>Benefit Type</th>
<th>Method of Measure</th>
<th>Target Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in whole life costs</td>
<td>Economic</td>
<td>Contracted projects influenced by TC programme - total value to date, where calculated lifetime cost is reduced (around 33%).</td>
<td>£3bn projects at around 33% reduction</td>
</tr>
<tr>
<td>Reduction in delivery time</td>
<td>Economic</td>
<td>Measured reduction in time versus baseline for project conception to delivery for TC influenced projects - target of £3bn worth</td>
<td>50% reduction for £3bn projects</td>
</tr>
<tr>
<td>Reduction in Trade Gap</td>
<td>Economic</td>
<td>Measured trade gap for construction sector including engineering services.</td>
<td>£200m</td>
</tr>
<tr>
<td>Reduction in greenhouse gas emissions</td>
<td>Economic</td>
<td>Target - £3bn assets with reduction in lifetime emissions.</td>
<td>£3bn projects</td>
</tr>
<tr>
<td>Reduction in productivity gap</td>
<td>Economic</td>
<td>Target £10bn projects contracted with increased productivity.</td>
<td>£10bn projects</td>
</tr>
<tr>
<td>Increased industry investment</td>
<td>Economic</td>
<td>Measured match and aligned funding (influenced R&amp;D and project builds) by the TC programme</td>
<td>£250m</td>
</tr>
<tr>
<td>Critical mass of active energy positive buildings</td>
<td>Economic</td>
<td>Value of buildings contracted or specified using active energy technology, influenced by the TC programme.</td>
<td>£280m</td>
</tr>
<tr>
<td>Demonstration of the business case for active energy buildings</td>
<td>Technology</td>
<td>Measured/calculated from TC influenced projects.</td>
<td>5 - 3 years</td>
</tr>
<tr>
<td>Uptake of concepts at scale</td>
<td>Economic</td>
<td>Measured % of government contracts enabling TC methodologies, e.g. modern methods of construction (offsite or pre-manufactured value).</td>
<td>15% contracts</td>
</tr>
<tr>
<td>Higher levels of lifetime build asset performance</td>
<td>Economic</td>
<td>Measured value of projects influenced by TC programme that demonstrate greater whole-life performance, or include value measures.</td>
<td>£2bn of projects</td>
</tr>
<tr>
<td>Improved assurance of buildings</td>
<td>Legal / Regulation</td>
<td>Measure engagement level of sector/government in new assurance approaches.</td>
<td>No easy metric, will constantly review with gov oversight</td>
</tr>
</tbody>
</table>
Summary - industry and government

**Industry**
- Improved **profitability**
- **Skills Agenda** delivered
- More **sustainable business models**
- Increased **Exports**

**Government**
- Productivity improvement
- Value adding jobs in **regions**
- Impact at **scale**
- **Carbon** reduction

* More houses  * More rail capacity  * Improved car journeys  * Cheaper energy  * Better public services
FOR FURTHER INFORMATION

EMAIL: sam.stacey@innovateuk.ukri.org
TELEPHONE: 0300 321 4357
WEBSITE: https://www.ukri.org/innovation/industrial-strategy-challenge-fund/transforming-construction/

Sam Stacey
Challenge Director – Transforming Construction
UKRI
Jacqui Glass
Transforming Construction
Network Plus
THE TRANSFORMING CONSTRUCTION NETWORK PLUS (N+)

Stimulating participation, facilitating collaboration, and encouraging exploration
The N+ unites construction’s academic and industrial communities to create a new research and knowledge base, dedicated to addressing the systemic problems holding back the sector.

More information about the N+ can be find:
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

- The N+ is funded by UK Research and Innovation through the Industrial Strategy Challenge Fund
- It is supported by UK Research & Innovation (UKRI) funding

The aim of the N+ is to provoke, enable and amplify innovation, through four main objectives:

- Knowledge
- Community building
- Business models
- Investment and legacy
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

- Two year programme 2018-2020
- Engagement events
- Award around £1million to Small Projects, across two calls.
- A central programme of research
- Links to the Transforming Construction Challenge
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

Network Manager
Comms Officer
Project Engineer
Research Fellow
Research Fellow

Jacqui Glass
Transforming Construction Plus Network

#TCNPlus
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

Academic-led and user-inspired projects, with dedicated early and mid career tracks.

Responses to TCC themes:

- Designing and managing buildings
- Constructing quality buildings
- Powering buildings

- Open
- Interdisciplinary
- Ask fundamental questions
- Shift the dial (i.e. don’t do what you always do!)

Jacqui Glass
Transforming Construction Plus Network

#TCNPlus
Round 1: Call for small projects

77 Proposals
- 41 Lead Universities
- 366 Individuals Named
- 85 Industry partners

4 Projects:
- Interoperability
- User experience
- Space tech for hospitals
- Benchmarking

Round 2: Call for small projects

Key dates:
- Release of the call: Thursday 19 September 2019
- Closing time and date for applications: 16:00 - Thursday 14 November 2019
- Projects may start from: Wednesday 1 January 2020

Jacqui Glass
Transforming Construction Plus Network
#TCNPlus
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

International webinar – Wednesday 29 May

How new business models for modern methods of construction are emerging throughout the world and how they are relevant to creating the ‘tipping point’ in the sector, as envisioned in the UK’s Transforming Construction Challenge agenda.

Dr Daniel M. Hall, ETH Zürich
Dr Wei Pan, University of Hong Kong
Prof Jennifer Whyte, Imperial College London
**Engagement**

1510 people directly engaged

- **Events**
  - 534 participants

- **Mailing list**
  - 796 subscribers

- **Website**
  - 7,600 unique pageviews

- **Twitter**
  - 355 followers – 118.9K tweet impressions

**Participation**

- Academic: 60%
- Industry: 30%
- Government: 10%
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

CREATING A MOVEMENT FOR CHANGE

Transforming Construction Network Plus – Conference 2019

By gathering the community around a common goal, we are aiming to create a movement to change the way we build. To do this, we need ideas and we need you!

Our first confirmed speakers are:
- Sam Stacey, Challenge Director, Transforming Construction Challenge
- Prof David Gann CBE, Professor of Innovation, Imperial College London
- Dr Anne Kemp OBE, Chair, UK BIM Alliance, and Director, Atkins
- Dr Daniel M. Hall, Associate Professor, ETH Zurich
- Mike Eggers, VP, Product & Innovation, Project Frog
- David Adams, Technical Director, Melius Homes
- John Pelton MBE, Programme Strategy Director, Palace of Westminster

Register for the N+ Conference now: creating-a-movement-for-change-conference.eventbrite.co.uk
THE TRANSFORMING CONSTRUCTION NETWORK PLUS

For general enquiries about the N+, please contact the network team:
enquiries.tcnetworkplus@ucl.ac.uk

Join our mailing list to hear about the latest N+ news, upcoming events, and funding opportunities:
Mission Statement
Embedding innovative construction techniques to improve productivity and capacity in the construction industry, and the quality and whole-life performance of buildings

Objectives
Scaling up of SMART construction by:
✓ Creating clear pipeline by aggregating demand across housing clients
✓ Establishing centres of excellence and collaboration
✓ Developing SMART Construction metrics dashboard
Who is involved?

and many more...

Working Groups

Centres of Excellence & Collaboration
**Shelagh Grant**
The Housing Forum

Demonstrator Projects, Measures & Business Case
**Simon Cross**
BRE

Demand Creation, Investment & Volume Surety
**Adam Locke**
Laing O’Rourke

Risk-averse Culture, Lending, Valuation & Insurance
**Mark Farmer**
Cast

Schools
**Tim Carey**
Willmott Dixon

Mike Chaldecott
Saint-Gobain
CLC Innovation in Buildings

Part of the Housing Minister’s MMC working group

Mike Chaldecott
Innovation in Buildings Workstream
What has been achieved?

- Suite of case studies and guide setting out the benefits of SMART Construction for housing clients
- Consolidated list of SMART construction centres of excellence to share knowledge, best practice, inspire collaboration and showcase new opportunities
- Dashboard of key metrics to enable the measurement of increased productivity and whole life performance through SMART construction
- Advocating the importance of a clear, aggregated pipeline of demand for SMART construction to create the confidence to invest
What are our priorities going forward?

• Working with the Construction Innovation Hub to apply the lessons learned from housing to social infrastructure – particularly schools
• Developing a “model contract” for SMART Construction
• Building links with the Green Construction Board and the Procuring for Value workstreams
• Working with Homes England to implement the recommendations of the “Demand Creation, Investment and Volume Surety” report
• Creating a “Centre of Excellence Network for SMART Construction in Homes”
Ann Bentley
Procuring for Value Workstream
Mission Statement
Ensure that public and private sector clients are able to effectively and simply procure on the basis of “whole life value” rather than simply “lowest cost”

Objectives
• Develop a standard approach to how value is measured and how built assets are procured with benchmarks that will allow performance to be measured and incentivised
• Increase transparency on the performance of suppliers and assets
• Develop a robust digital platform to capture and compare value and performance data both within projects and between projects.
Objectives

✓ Give policy makers and budget holders a deeper understanding of value
✓ Enable them to make meaningful value choices and trade-offs
Who is involved?

Ann Bentley
RLB
CLC Procuring for Value Lead

The Value Model
Geoff Hunt
Arup / ACE

Procurement Behaviours
John Nolan
CIC

Predictability of Outcomes
Ashley Bateson
Hoare Lea / CIBSE

The Digital Agenda
Simon Rawlinson
Arcadis
What has been achieved?

• Industry-wide engagement
• Following a wide consultation, a draft “Procuring for Value” model has been developed
• Supporting the Infrastructure and Project Authority’s (IPA) work on benchmarking and common reporting in infrastructure projects
• Supporting Build UK and CECA to develop a Common Assessment Standard which will improve efficiency and reduce cost in the construction pre-qualification process.
• Advising potential bidders to Transforming Construction R&D fund on PfV linked research
What are our priorities going forward?

• Work with the Construction Innovation Hub to refine the PfV model into a Minimum Viable Product
• Test this methodology for procurement and promote common and consistent standards across industry
• Work with professional institutions, industry groups and businesses to develop a comprehensive training programme for the PfV Model
• Start to implement PfV on trial projects and use learnings to inform wider implementation
• Work with Government to refine the cost and performance benchmarks for assets and contractors
Minimum viable product

Client’s Value Balance

Whole life outcomes

Design Quality

Programme

Capital cost

Legacy and community benefits

Ann Bentley

Procuring for Value Workstream
Lynne Sullivan

Green Construction Board
GCB provides the Sustainability workstream; it aims:

To advise government and the built environment industry on the regulatory and policy framework and actions required to overcome barriers to the delivery of green buildings and infrastructure as well as to promote the commercial opportunities of sustainable construction

Specific Objectives:

• Buildings Mission 2030 - Improved energy efficiency in new build and retrofit, on journey to zero carbon
• Zero carbon Infrastructure delivery
• Advancing zero avoidable waste in construction and embedding circular economy principles in the industry
• Ensure skills, procurement models and green finance play an increasing role in delivering sustainability goals
• Explore the opportunities for delivering zero carbon and resource efficiency through digitalisation and MMC.

Delivers:

✓ Advice to Government  ✓ Guidance to industry  ✓ Promotes the commercial opportunities of sustainable construction for UK Plc
Who’s involved?

David Pinder  
CEO, Baxi Heating UK  
GCB Chair

Munish Datta  
UKGBC

Richard Bayliss  
CITB

Louise Ellison  
Hammersons

Robert Lambe  
Melius Homes

Lynne Sullivan OBE  
Green Construction Board

Munish Datta  
UKGBC

Richard Bayliss  
CITB

Louise Ellison  
Hammersons

Robert Lambe  
Melius Homes

Heleni Pantelidou  
Arup

3 New GCB members  
July 2019
Achievements: Buildings 2030 Energy Mission

• Evidence base of case studies to show 50% energy reduction is possible now.

  Identified the set of attributes within building typologies that will most likely deliver the multiple objectives of the Buildings Mission

• Recommendations and time line to government on requirements for changes to Building Regulations, necessary research and technology developments and potential policy incentives.
Achievements:

Infrastructure:
• Secured funding for Infrastructure Carbon Review commitment 5 years on event
• Further promotion of PAS 2080 Carbon Management in Infrastructure

Resources & Waste:
• Collaboration with Defra and BEIS on the priorities for construction in the government’s Resources and Waste Strategy
• Defining an interpretation for ‘Zero Avoidable Waste’ in Construction

Innovation, Finance, Skills and Procurement:
• Identifying opportunities for championing sustainability
Priorities going Forward:

**Buildings:**
- Retrofit energy reduction - next steps for policy, innovation and finance / Advise government on the feasibility of halving the cost of retrofitting

**Infrastructure:**
- Reviewing the Infrastructure Carbon Review for 5 years on event, collecting case studies and gaining additional signatories
- Exploring the opportunities for low carbon concrete uptake

**Resources & Waste:**
- Develop a roadmap for achieving zero avoidable waste in construction
- Promoting the opportunities of green finance with the Green Finance Institute
- Championing sustainability goals in CLC procurement, skills and innovation workstreams
- Innovation and Research – input to the Transforming Construction programme.
- Champion the need for better data – regular measurement and monitoring
Mission Statement

• Ensure that the Construction Sector is able to “attract, recruit and retain” the skilled workforce it needs both now and in the future - and thereby deliver the vision of the Sector Deal

Objectives

• Support the growth and development of available apprenticeships, and high quality training
• Promote construction careers to a wider audience and increase the number of routes into the sector
• Understand the skills needs of a sector based around digital, manufacturing and whole life performance
Who is involved

Mark Reynolds
CEO, Mace
CLC Skills Lead

Brian Morrisroe
CEO - AJ Morrisroe (SME)

Steve Fox
Chief Executive
BAM Nuttall

Karl Whiteman
Executive Director
Berkerley Homes
(Attract and Recruit)

Sarah Beale
CEO CITB
(Attract and Recruit)
(Apprenticeships and Training)

Paul Raby
HR Director
Balfour Beatty

John O’Connor
Commercial Director
Laing O’Rourke
(Future Skills)

Ruth Devine, MD
SJD Electrical
(SME)

David Hurcomb
CEO
NG Bailey

Sarah Beale
CEO CITB
(Attract and Recruit)
(Apprenticeships and Training)

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Commercial Director
Laing O’Rourke
(Future Skills)

Ruth Devine, MD
SJD Electrical
(SME)

David Hurcomb
CEO
NG Bailey
What has been achieved

• **78** new Apprenticeship standards in construction related roles were approved for delivery by the Institute for Apprenticeships (IfA) by the end of December 2018 – exceeding the target of **50**. Further 24 to be completed by the end of 2019.

• Through the National Retraining Scheme, we have supported CITB to deliver **20 onsite training hubs** – delivering ‘site ready’ training to over **1200 people**

• Supported CITB’s review of the “Go Construct” recruitment portal to attract a wider pool of talent and create a more diverse workforce

• Published a “Future Skills Strategy” following a wide consultation of industry bodies, client and delivery organisations and Government
  ✓ Increased direct employment
  ✓ Encouraging the adoption of ‘Smart’ Construction
  ✓ Updating Construction training
What our priorities going forward

• Moving focus to ensure adequate provision of new Apprenticeship Standards and increasing Apprenticeship Starts and Completions
• Implement improvements to the “Go Construct” platform
• Establish an Employer Group to work with Government on the development and implementation of the Construction T Level
• Working to implement the recommendations of the “Future Skills Strategy” and promoting wider awareness and engagement in existing funded initiatives
• Better engagement with Education and Training Providers
Skills Alignment Workshop - 12\textsuperscript{th} July

Government

Industry

Education

Brian Morrisroe
Skills for the Future Workstream
Panel Q&A

Sam Stacey  Mike Chaldecott  Andy Mitchell  Ann Bentley  Brian Morrisroe  Lynne Sullivan