Innovate UK

Results of competition: **Supply Chain Integration in Construction** – Feasibility Study

Competition code: 1503_FS_BUIL_ECCSC

Total available funding for this competition was £2m from Innovate UK.

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title & NR	Proposed project costs	Proposed project grant
Wates Construction Ltd Accord Housing Association Limited Orbit Group Limited Affinity Sutton Group Limited National Energy Foundation The Manufacturing Technology Centre	Refurbishment as a Manufacturing Industry (REMI) 132100	£150,000	£97,000
Project description – provided by applicants			
This feasibility study project aims to establish the basis for a new construction industry sector in mass-customised, off-site manufactured domestic refurbishment. This will require innovation in business models; supply chain relationships and interoperability; the treatment of risk, performance assurance and warranties in contractual relationships; financing and investment; post refurbishment maintenance arrangements and in the technical approaches adopted from capturing the pre-refurbishment property data to physical upgrade, testing and verification and building operation. The project will thus set out a coherent set of industry and market interventions to deliver physical, organisational, contractual, performance guaranteed and warranted framework that will drive the development and mass uptake of affordable deep refurbishment packages for the existing housing stock. If successful the partners will exploit the findings through progressing to physical piloting of the approach in social housing stock and through dissemination across a wide customer and supplier base.			

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Concentra Consulting UK University of Warwick Costain Group Plc	Platform for an Integrated Supply Chain in Construction 132101	£149,540	£104,222
Project description – provided by applicants			
This study will investigate the feasibility of using an innovative supply chain analytics capability to analyse a selected portion of a construction supply chain to identify levels and causes of unnecessary costs and delays. The solution will be applied to construction material, equipment and labour supply chains to provide visibility of material flows, demand and supply of resources and utilisations over time. The analysis will drill down to find root cause of inefficiencies and waste and identify opportunities for better integration and process improvement. The team will then assess the feasibility and benefits of applying supply chain best practice techniques that have been developed and proven in other industries. Building scenario models to investigate and demonstrate the impact of integrated supply chain practices built on principles of material flow and the levelling of demand on supplying resources. The findings from the project will be published and disseminated through supply chain and construction industry forums and a 'Discovery day' hosted by the University of Warwick.			

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Skanska Building Research Establishment Rollalong Panel2Panel	CAVE (Construction Accredited Volumetric Exchange) 132102	£146,566	£77,343
Project description – provided by applicants			
CAVE (Construction Accredited Volumetric Exchange) is a framework for bringing together all the required parties to deliver accredited volumetric construction: the clients, the designers, the certifiers, the materials suppliers, the assemblers and logistics. CAVE will reduce risk throughout the supply chain, encouraging suppliers to invest in the manufacturing capabilities needed to enable the delivery of quality volumetric solutions to meet contractors, and end user's needs. The whole system will be accredited and enable efficient exchange (selection) of the suitable organisations for a given project. The feasibility study will review, develop and assess the CAVE framework concept in the context of other supply chain focussed initiatives such as the drive towards industrialised construction and automation. It will use the information collected to assess its suitability for mainstream use in Skanska (and wider) supply chains. It will establish the next steps towards implementation (including investment, R&D, cultural change and skills needs).			

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Costain Ltd University of Edinburgh Cenex Ltd	Reducing Construction Carbon Emissions in Logistics (ReCCEL) 132103	£141,119	£98,941
Project description – provided by applicants			
This project will analyse the feasibility of low-carbon delivery of major infrastructure projects whilst ensuring compliance to schedule/budget and resilience to operational disruptions. To achieve this, we aim to introduce 'Intelligent Construction Transportation Assets' (ICTAs) to enable better informed, and more integrated, collaborative management decisions. ICTAs will integrate state-of-the-art technologies from a number of disciplinary areas: procurement, maintenance, routing and refuelling, operations research, and information and communication technologies. Our consortium brings together Costain, one of the UK's leading construction engineering solutions providers; Cenex, the UK's first Centre of Excellence for Low Carbon and Fuel Cell Technologies; and the University of Edinburgh, a global leader in big data science. By focusing on a portfolio of Costain's major infrastructure projects we aim to map current construction processes and elicit the current barriers to the fully integrated, low-carbon construction supply chain; roadmap scenarios based on our blend of solutions; and provide and disseminate return on investment recommendations.			

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Costain Limited Cambridge University Pinsent Masons LLP	Maximising Innovation Beyond Procurement and Contract Execution 132104	£ 149,970	£96,953
Project description – provided by applicants			
The project will bring together expertise from Costain Ltd, Pinsent Masons LLP and researchers at Cambridge University to advance understanding of innovation in the supply chain for large scale construction and infrastructure projects. The project will assist in removing barriers to innovation within the contractual and commercial process and maximise the ability to innovate. The project will develop a conceptual model around how to rectify supply chain problems surrounding contractual and commercial processes. This will link the customer to the supply chain, assess what can be done to facilitate change and encourage innovation. This will involve a number of considered industry case studies. Behaviours and the strength of relationships within the supply chain will be measured, specifically looking at communication and trust. Commercial and legal guidelines will be produced. A white paper will also be produced to use the learning and discussion points from the organisations involved to stimulate debate within the industry.			

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National Energy Foundation Joseph Rowntree Housing Trust Elmhurst Salford University	Integrated Asset Information Management (iAIM) 132105	£148,000	£115,099
Project description – provided by applicants			
Social housing providers' asset strategies are becoming more sophisticated, requiring multiple outcomes from stock upgrades reflecting a broad range of economic, social, and environmental requirements. To fulfill these requires supply chains which are integrated, and which learn from experience. Independent monitoring has identified very substantial performance gaps (e.g. in energy, comfort, air quality, maintenance, defects) between low carbon housing refurbishment specifications and in-use. This project will test the feasibility of combining two elements which are critical in ensuring effective integrated supply chains which can bridge these gaps: Use of PAS 1192-3 (asset information management) to drive better information integration; combined with the development of a complimentary whole life cost benefit and risk appraisal tool to ensure the robustness of the selected refurbishment approach.			

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Steel Construction Institute (SCI) The University of Cambridge (UoC) Alliance for Sustainable Building Products (ASBP) National Federation of Demolition Contractors	Supply chain integration for structural steel reuse 132106	£130,834	£100,824
Project description – provided by applicants			
The objective of this project is to encourage widespread reuse of structural steel in the UK through improved coordination and information exchange along the construction supply chain. Currently only 5% of structural steel is reused, but reusing steel leads to significant energy and emissions savings compared to the common practice of recycling steel. By coordinating information from designers and demolition contractors, the supply and demand of reused steel can be matched, leading to the deconstruction and reuse of buildings compared to traditional destructive demolition. This in turn, will lead to reduced embodied emissions impacts, cost savings and the development of a new UK market supporting steel reuse. This project will examine the practical and economic feasibility of establishing an on-line information portal through which the supply and demand of reused steel are mapped to stimulate a reused structural steel market.			

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Belgrave Homes Ltd Fforest Timber Engineering Ltd University of Reading	Supply chain integration to deliver off-site solutions for new housing 132115	£149,040	£114,199
Project description – provided by applicants			
There is an urgent need to develop integrated off-site integrated supply chains to deliver the required sustained increase in the supply of new, energy-efficient homes. This Innovate UK project, led by Belgrave Homes in collaboration with Fforest Timber Engineering and the University of Reading, we deliver the following benefits: (a) the promotion of the build quality and energy efficiency benefits of innovative time-frame construction to home buyers; (b) the development of new integrated supply chain processes and practices to accelerate the introduction of expertise from the manufacturing sector to Belgrave Homes to aid efficient delivery and operation of new homes, and, (c) the development of an innovation five-year roadmap for Belgrave Homes and Fforest Timber Engineering to move towards the required integrated supply chains to deliver modular and volumetric off-site solutions.			

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Stickyworld Ltd BSRIA Costain Ltd Studio Klaschka CSJ(Management) Ltd NCTech Ltd	Online Soft Landings (OnSoLa) 132107	£146,275	£101,957
Project description – provided by applicants			
The OnSoLa project looks to innovate in how Soft Landings and Government Soft Landings can be delivered effectively and efficiently using digital communications. Stickyworld, BSRIA, COSTAIN, Studio Klaschka, CJS (UK Management) Ltd, and NCTech will collaborate across 9 months to explore the commercial and technical feasibility for a fully digitally enabled and supported Soft Landings process. Combining BIM, digital media, online expertise via an integrated stakeholder engagement platform, the aim is to develop a digital platform and supporting service that aligns perfectly with Soft Landings and Government Soft Landings process in order to reduce risk of poor briefing, handover or operations which often occurs when end users, facilities and suppliers are excluded from the design and handover processes. The OnSoLa project team will map, measure and test the technical and commercial viability of packaging their solution for Contractors, their clients and Soft Landing champions, combining technology subscriptions, content creation services and supporting advice.			

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Stewart Milne Group Barratt Developments PLC Crest Nicholson Homes Building Research Establishment	Advanced Industrialised Methods of Construction for Homes (AIMCh) 132108	£120,658	£66,329
Project description – provided by applicants			
AIMCh (Advanced Industrialised Methods of Construction for Homes) is a collaboration between Barratt Developments, Crest Nicholson, Stewart Milne and BRE. In this project we will challenge our current approach to speculative house building by applying lessons from overseas business models, especially where they use advanced offsite construction. We will map out the UK business process from land purchase through design, the supply chain, construction & sales with a view to understanding added value, waste, cash inflows & outflows, as well as risks. From this we will create a "SimCity" type business model that will enable us to visualise the business transformations needed to increase volume, control or reduce cost, whilst meeting new customer & future legislative requirements.			

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Citu Developments LLP Leeds Beckett University	Vertical supply chain integration to deliver high volume ultra-low energy offsite construction	£ 144,578	£ 114,067
Project description – provided by applicants			
To meet the target of decreasing CO2 emissions by 80% by 2050, new house builds must improve energy performance by up to 80%, whilst the rate of construction must also double. The traditional supply chain structure between end user and product suppliers means that the potential to capture innovation from product suppliers and exploit this in a cohesive ultra-low energy (ULE, e.g. Passivhaus) end product is often lost due to the inherent segregation of client, contractor and product suppliers. Citu developments LLP will collaborate with Leeds Beckett University to develop the first industrial scale ULE offsite construction system, based on Passivhaus type concepts, but designed for UK brownfield applications where build form and orientation cannot always be optimised for energy efficiency. This project will investigate the feasibility of vertically integrating suppliers and an industrial manufacturing process with unprecedented quality/control into a viable business model for commercial exploitation, to optimise the energy efficiency of a particular site at a fraction of the cost of existing energy-efficient technologies.			

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Bauman Lyons Architects Citu Developments LLP	Integrating a dynamic supply chain into MassBespoke - a parametric digitally fabricated construction system 132110	£ 70,257	£ 49,180
Project description – provided by applicants			
Home building in the UK is unable to achieve the 250,000+/ year required and BLA target the requirement for a fast, high-performance and commercially competitive build process with MassBespoke (MB), a novel construction system based on a composite panelised superstructure (CPS), driven by Parametric Digital Framework Modelling (PDFM). However, there is no existing framework supporting the proposed model of construction delivery and scope exists for the PDFM to become an integrated open digital platform (ODP). This collaborative project between Bauman Lyons Architects and Citu Developments LLP therefore aims to establish the feasibility of integrating further user requirements and suppliers into the PDFMs to realise a fully integrated construction system, as well as investigating the feasibility and technical/commercial requirements of developing MB into a digital platform.		

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BSRIA Ltd Willmott Dixon Energy Services Ltd. Good Homes Alliance Passivhaus Trust	Study to inform a 'framework' to integrate supply chain for delivering energy efficient homes 132116	£ 63,841	£ 49,131
Project description – provided by applicants			
The housing industry suffers from a fragmented approach to project conception, execution and delivery, the result of which often is a product that is not consistent with design intent and a 'performance gap'. Limited engagement of occupants with the project team post-occupancy means that any 'settling in' issues are not addressed. There are also no industry-wide mechanisms for feedback to be used to inform future work. The housing industry faces the dual challenge of delivering the 'zero carbon homes' standards from 2016 and meeting the large volumes of new homes to address the housing demand in the country, government figures for which are as high as 240,000 a year. Recent research has indicated that as-built and in-use performance of homes can be significantly worse than the design targets. This study will look into the requirements from a 'framework' based on BSRIA's Soft Landings, that will guide the roles and responsibilities within project teams to ensure there is a higher degree of confidence in the performance of new homes, both in terms of their energy use and satisfaction amongst the occupants.			

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Skanska UK Action Sustainability (Trading) Ltd	Offsite Innovators Network 132111	£ 148,931	£ 96,489
Project description – provided by applicants			
Led by Skanska UK and supported by leading construction contractors and major UK-based companies, this feasibility study will focus on testing the efficacy and impact of an inter and cross sector 'Offsite Innovators Network'' model to understand its ability to improve the flow of information, innovation, integration and collaboration in the offsite construction sector supply chain. The offsite construction supply chain is fragmented with design, manufacturing, logistics and onsite construction all vital to the process. The lack of collaboration between these sectors hampers both the sector's growth and its ability to innovate. This study will test the feasibility and impact (economic, social and environmental) of identifying and developing an 'Offsite Innovators Network' drawn from the offsite sector to deliver, free of charge, supply chain knowledge transfer to companies both within their own sector and across the sectors that make up the offsite construction supply chain.			

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Zero Carbon Hub Oxford Brookes University Joseph Rowntree Housing Trust	Management of housing performance information (HAPI) through hindsight, insight and foresight 132112	£ 149,653	£ 124,221
Project description – provided by applicants			
HAPI is an innovative online housing performance feedback management system, which seeks to provide a step-change in improving the flow of information throughout the construction supply chain of new social housing projects, by better use of housing performance feedback through hindsight from past projects, insight from ongoing projects and foresight to influence future projects. HAPI will have the capability to capture, collate, curate and link feedback on housing performance right from briefing stage through to design, construction, commissioning, handover and occupation, and provide best (and common) practice and bespoke advice in one place, in an easy-to-understand and accessible manner. Currently there is no such information/knowledge management system which makes actual performance data available, accessible and searchable at any time for use by housing providers, designers, constructors and suppliers. HAPI will enable integration across the housing construction supply chain to deliver better performing homes. This will in turn streamline the supply chain processes and reduce performance gap.			

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English Woodlands Timber Limited Grown in Britain Ltd Sylva Foundation Building Research Establishment Ltd T Brewer & Co Ltd Willmott Dixon Rethinking Limited Forestry Commission England	Grown in Britain WoodStock 132113	£ 149,829	£ 101,838
Project description – provided by applicants			
This project will transform the supply of British hardwoods, and new wood products to the construction industry. In doing so it will create huge benefits in employment and value through investment in new processing and innovation and will spark a renewal of British Woodland with improvements in productivity, biodiversity and climate change mitigation.			

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Whole Life Consultants Limited University of the West of Scotland	Built Asset Life-cycle Intelligence (BALI) 132114	£ 108,826	£ 85,769
Project description – provided by applicants			
[*Taken from summary in absence of public description being submitted*] The main business opportunity is to offer integrated life-cycle supply chain intelligence for key performance measures of a built asset. The main aim is to assess feasibility for a novel web-based whole-life intelligence tool that will provide an integrated digital environment for life-cycle monitoring of user-defined performance. If feasible, it will be used by construction supply chain stakeholders, clients and their facilities managers to dynamically capture, integrate and interrogate performance information throughout the life-cycle of a project. To achieve the aim, the project team will identify key life-cycle performance indicators to be used in feasibility and later in the fully developed version of the tool and user software issues and needs in the targeted construction subsectors; analyse requirements and functions for web-based tool deployment and design & develop pre-alpha release of the tool; and develop and test alpha release of the web-based tool for the identified key life-cycle performance indicators.			

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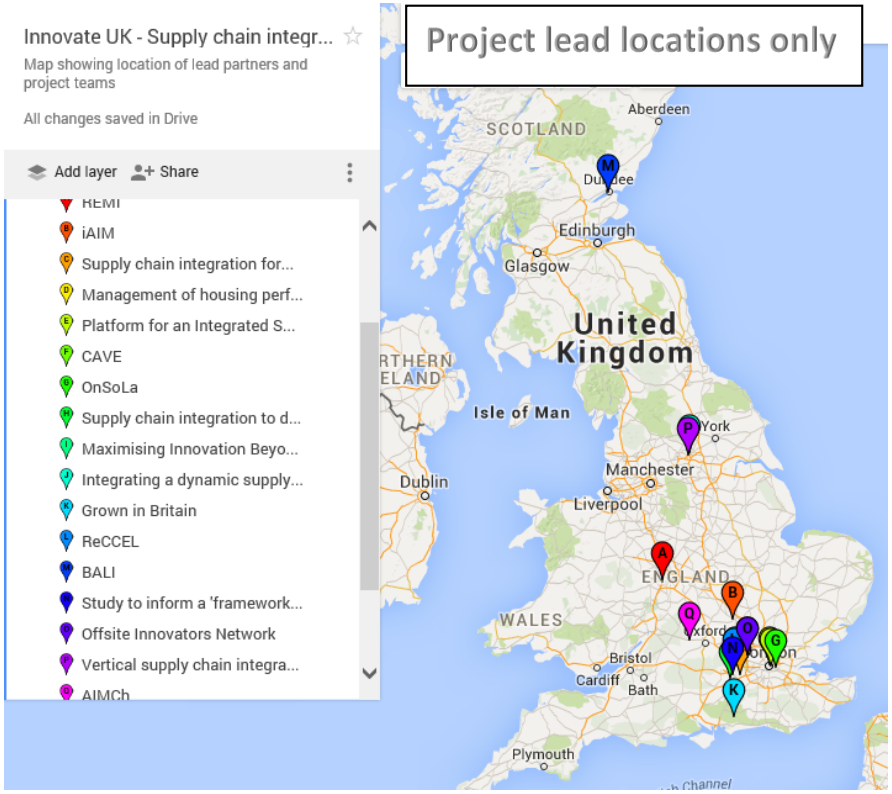
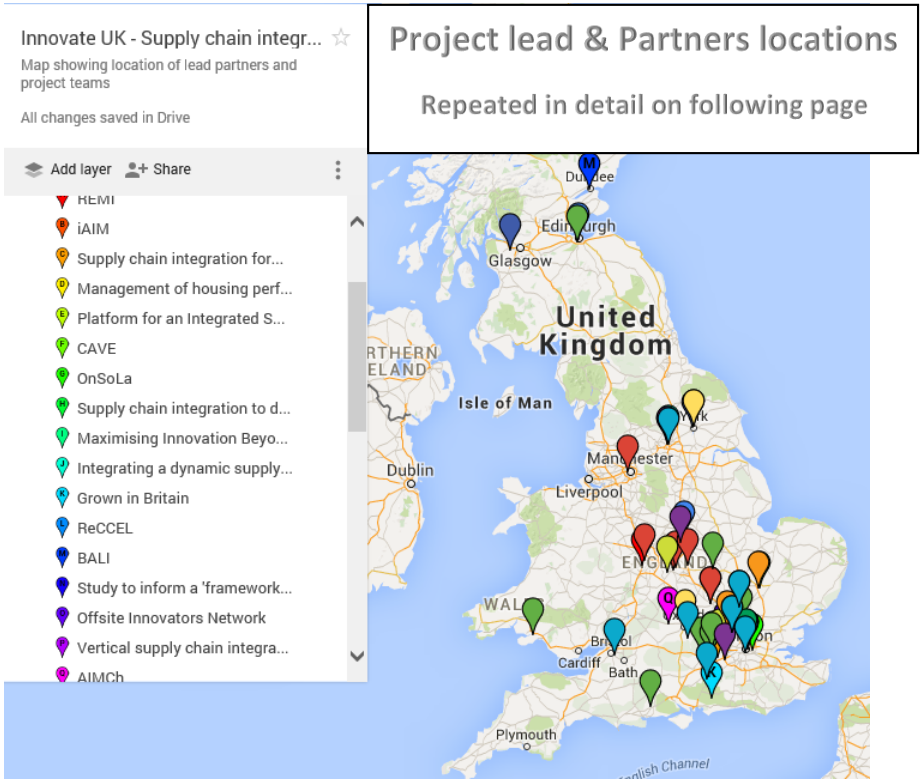
17 projects have been awarded funding with 63 organisations contributing to the projects and drawing a grant.

Total grants offered was £1,593,562 against project investment of £2,267,917.





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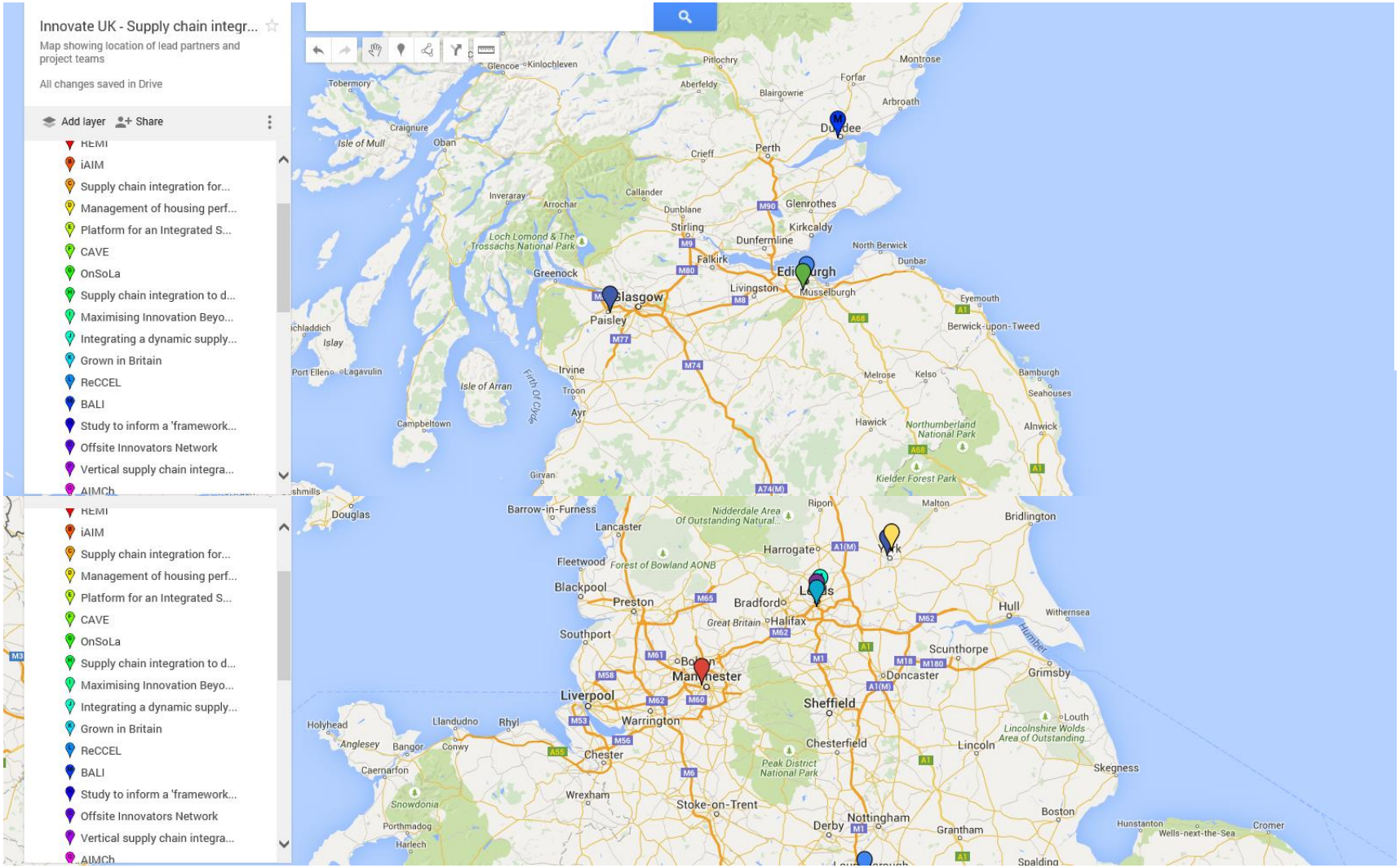

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