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The Circular Buildings Coalition (CBC) is a collaboration that convenes industry leaders who aim to accelerate the deployment of circular solutions as a way of securing a global built environment operating within planetary boundaries while ensuring a just transition. The CBC is an initiative of Metabolic, WorldGBC, WBCSD, EMF, Circle Economy and Arup. The CBC is funded by Laudes Foundation.

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1. Executive summary

We cannot tackle climate change without tackling embodied carbon in buildings. This is because 11% of global energy-related carbon emissions come from building materials and construction.¹

We can limit the extraction and production of virgin building material by mining existing materials from the available built stock ('reuse'). The problem is that the reuse of construction materials needs greater coordination and systematisation to operate viably at scale. City administrations have a central role in enabling this by helping to unlock consistent demand for material reuse through their planning policies and procurement and by standardising the reuse market's foundational physical and digital infrastructure.

ReLondon has assessed the feasibility of a public-private collaboration network that could leverage city administrations' influence, entitled the *London Circular Construction Coalition* ('the Coalition') – offering a replicable model for other cities. We have engaged in structured conversations with 12 London local authorities, 12 businesses (including developers, architects, engineers, contractors and demolition contractors) and five material reuse platforms to assess the desirability, practicality and funding model of our proposed solution.

Our assessment reveals significant political will for supporting a local circular economy and strong support from London local authorities for a harmonised approach that can be unlocked by the Coalition. Letters of support have been secured from eight local authorities; several of them have already expressed interest in contributing funds in a blended-finance model. Local authorities were specifically interested in using the Coalition to develop the practical day-to-day assets, tools, processes and policies that city administrations should adopt. In consultation with the private sector, we also validated the proposition that city-led planning data could create an important foundational infrastructure to support viable business models around reuse – as long as the data can be improved for consistency, completeness and accessibility. Letters of support have been secured from four private sector reuse platform providers.

Therefore, if awarded, we propose to use the next round of funding to activate the collaboration network, focusing first on the aspects that particularly interested our key stakeholders. The governance model will be structured around 'action groups' that will develop the practical assets local authorities can apply to their policies and procurement. In parallel, the Coalition will define the city-led data standards/templates that will be applied by city administrations; these in turn can be leveraged by the private sector to grow a viable reuse marketplace.

As a result of the Coalition, we expect to achieve a 20% reuse rate by 2030 and thus tackle 1.5% of the construction carbon footprint in London, with potential to scale impact by expanding the network's scope of focus in London (e.g. by supporting the uptake of building transformation instead of demolition or by supporting the use of other low-carbon building materials), and replicating the public-private collaboration network in other European cities.

¹ [Bringing Embodied Carbon Upfront](#), World Green Building Council (2019)

2. Introduction

The construction industry has a large ecological and carbon footprint (representing 11% of energy-related greenhouse gas emissions globally¹). Its negative impact is expected to grow if nothing is done to mitigate it, especially in cities, where an additional 2.5 billion people are projected to live by 2050.²

Materials used in the construction of buildings (i.e. concrete, steel, aluminium, glass and bricks) are estimated to represent around 9% of overall energy-related CO₂ emissions. Raw material use is predicted to double by 2060 – with steel, concrete and cement already major contributors to greenhouse gas emissions.³

One key solution to tackle this environmental footprint is to limit the extraction and production of virgin building material by mining materials from the available built stock in cities.

Whilst several businesses are starting to develop methods to mine materials from existing buildings and supply them to secondary materials markets, such solutions have so far failed to reach the economies of scale needed to compete against traditional supply chains of virgin materials. This is because of the lack of demand for secondary materials from new developments and the lack of visibility of what the demand will or could be. This prevents investment in better deconstruction practices and in new reuse infrastructure and business models.

City administrations have a crucial and unique role to play in driving, at scale, the demand for secondary materials and in making demand data visible through three key levers:

- **Planning policies** that can require large new developments to use secondary materials to receive planning permission.⁴
- **Public procurement practices** that can evolve for city administrations to use more secondary materials in their own public buildings.
- **Digital and physical infrastructure** for reuse, the development of which can be supported by city administrations. In particular, for digital infrastructure, city administrations can make the demand for secondary materials visible at an early stage through the establishment of data standards and the use of planning application data to facilitate matchmaking between the demand for and supply of secondary materials.

In London, there is a unique opportunity for local city administrations to activate these three complementary levers.

- The Greater London Authority (GLA) has already started activating the planning lever in 2021 by adopting a policy requiring Circular Economy Statements (CE Statements) for the approximately 100 annual largest developments in London (referable projects⁵). This is a great foundation to collect demand data to support the development of a digital reuse infrastructure.

² [United Nations](#) (2018)

³ [Global Status Report for Buildings and Construction](#), UNEP (2022)

⁴ In the UK, 'planning' refers to the stage in building design when the applicant team applies for permission to build, by submitting information into the public domain to demonstrate how the development will comply with local, metropolitan and national planning policies.

⁵ Referable projects are those on which the Mayor of London is consulted due to their strategic importance. They include developments of more than 150 residential units, for example, or buildings over 30 metres in height (outside the City of London).

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- London's 33 local authorities (boroughs), which hold planning powers for most developments, have set up ambitious climate and circular economy plans, and are looking to activate their planning and procurement levers to drive building material reuse. In particular, some are considering extending the requirement for CE Statements to small to medium-sized projects as part of their local planning policies.
 - The EU-funded [CIRCuiT](#) project has developed resources that are already supporting London's local authorities to activate the three key levers, for example via [planning and procurement guidance](#), and the [material reuse portal](#), an online aggregator of existing reuse marketplaces that can be used as the foundation for a harmonised and more efficient digital infrastructure.

However, a more structured collaboration is needed to drive the practical implementation of ambitious planning and procurement policies.

- London's local authorities currently lack key practical resources and expertise needed to proceed effectively on planning and procurement policy (see more details in the feasibility study). They have called for coordinated, collective action to avoid duplication of effort and achieve more robust outputs.
- Ad-hoc collaboration groups have emerged, driven by individual boroughs, to answer these needs. However, boroughs only have resources to lead such groups for short periods, and this support is not consistent or centralised enough for the complexity and scale of the transition to a circular economy.

Moreover, for secondary materials, digital reuse infrastructure needs to be improved to enable earlier matchmaking between demand and supply.

- Architects need to know early in the design stages what secondary materials will be available for the construction of new buildings to influence their decisions on materials.
- Demolition businesses must be aware of the upcoming demand for secondary materials when deciding to invest in a more expensive deconstruction practice that will enable materials to be reused and sold.
- Current online marketplaces only show secondary materials that are available at time of publication; they do not collect data on short- to mid-term upcoming supply of or demand for secondary materials that would enable the necessary matchmaking.

3. Solution overview

a. What is the proposed solution?

The London Circular Construction Coalition ('the Coalition') is a public-private partnership using London as a testbed to support the development and test the implementation of three key levers identified for city administrations (planning, procurement and digital infrastructure).

To achieve this, the Coalition will develop two key solutions:

- Relevant tools, common ambition and monitoring framework (common scorecard for measuring progress is yet to be defined) to support London's local authorities in implementing:
 - planning policies fostering demand for secondary materials
 - procurement practices stimulating demand for secondary materials in local-authority-led projects
- Data infrastructure, leveraging data coming from London's planning applications and from pre-demolition audits (PDAs) to enable existing digital reuse solution providers to match demand to supply of secondary materials at early RIBA stages.⁶

These solutions will be co-developed in collaboration with London's 33 local authorities (the boroughs), the GLA and the construction industry.

Ongoing collaboration with the whole construction supply chain (developers, architects, engineering consultancies, contractors, reuse solution providers etc.) is a key success factor for the Coalition. It will be essential to ensuring the policies developed are achievable and the data infrastructure developed fits the industry's needs.

This will create a blueprint for regional collaboration and action by local authorities that other local or national authorities globally can replicate and deploy (see more details in the diffusion plan).

London's Coalition will build upon existing initiatives in Europe and beyond:

- Collaboration networks
 - As a collaboration network, the Coalition develops the methods used by international city networks (e.g. C40 Cities, Circular Cities and Region Initiative) at city scale. London's 33 boroughs have populations of around 300,000, so the analogy is apt – they are like small cities. However, unlike global cities networks, the London Coalition, by working in a coherent regional regulatory, cultural and infrastructure context, will be able to provide tailored support and foster more ambitious political commitments.
 - The scope of the Coalition has been developed through engagement with other existing London construction networks (London Councils' Low Carbon Development programme, UK Green Building Council's Circular Economy Forum, Future of London, New London

⁶ This solution will mainly support the development of the digital reuse infrastructure. We also recognise the need and the opportunity for cities' administrations to invest in and develop physical reuse infrastructure, but this is outside of the scope of the pilot phase for the Coalition. Some London authorities are currently looking to develop and invest in physical reuse infrastructure, but these projects do not require as much London-wide coordination and support as changes in planning and procurement policies or digital infrastructure development do, which are the chosen key areas of focus for the Coalition in its pilot phase.

Architecture) to ensure it addresses gaps and avoids duplication of effort with existing initiatives.

- Planning policy and data infrastructure lever
 - Many cities have now developed planning policies to divert construction waste from landfill and increase recycling rate, but very few have policies that promote reuse over recycling, and those that do mainly focus on requiring demolished buildings to be deconstructed to maximise the availability of secondary materials on reuse markets (e.g. the deconstruction ordinances of Portland or San Antonio in the USA).⁷ To our knowledge, there are no examples of policy that require stringent enough targets to drive demand for secondary materials for new buildings and make good use of planning applications data.
- Procurement lever
 - Some other cities have developed procurement policies and committed to a certain amount of secondary materials in their own development (e.g. Seattle). The Coalition will learn as much as possible from these examples when developing policies for London.

b. Impact objectives

Type of expected outcomes:

Within London, following the successful implementation of the actions of the Coalition, we expect to see the following responses from the construction industry at large:

- Demolition projects implementing less damaging deconstruction practices to salvage and sell more secondary materials to new projects.
- Design practice shifting from typical ‘goal-oriented design’ to ‘means-oriented design’, which begins from the local availability of secondary materials.⁸
- New developments being designed and built with more secondary materials.

Breadth of outcomes (the extent to which construction projects will be impacted by the Coalition):

Within London:

- The planning lever will mostly impact major development projects: those developing more than 10 homes or more than 1,000 m², and representing around 1,000 planning applications per year in London. We estimate this will influence the work of between 10,000 and 20,000 construction businesses every year (developers, architects, engineering businesses, contractors) involved in these 1,000 largest development projects.⁹ This represents between 17% and 33% of the total number of construction businesses in London.¹⁰
- The project’s procurement lever will impact projects by local authorities, which represent 14% of the total construction market by spend. We aim to engage all 33 boroughs and the GLA by 2027.

⁷ [Clean construction policy explorer](#), C40 (2020)

⁸ <https://www.icevirtuallibrary.com/doi/full/10.1680/jensu.17.00074>

⁹ Assuming 20 to 40 businesses are involved in each project, and each business is involved in two major projects per year on average.

¹⁰ Around 60,000 construction businesses are operating in London ([Office for National Statistics](#), 2021).

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- The project's infrastructure lever will have a knock-on effect on other projects: as the infrastructure will be in place, and supply will be scaled up, it will be easier for other projects both to provide materials for reuse and to access secondary materials.

In other cities the effect will be indirect, but the level of impact could be the same, as the governance and economic framework of the Coalition can be replicated.

Depth of outcomes (how long the change will last):

- Planning policies and procurement commitments from local authorities are usually quite long-lasting regulations. Local political terms last five years in the UK, meaning that the policies will at least stay live for five years, and will continue to operate for longer unless there is a political shift. The objective during the period these policies will operate is to level the playing field between use of primary and secondary materials, which will drive the industry to invest in long-lasting capabilities and infrastructure. Therefore, after the policies have been in place for five years (or more), the industry should be in favour of maintaining the operations they have established, as costs for reuse should have fallen, and businesses will seek to recover their investment in reuse infrastructure. There will thus be little incentive for politicians to change the policy framework.
- Digital infrastructure enabling earlier connections will be relevant and necessary for the foreseeable future as the reuse of materials is one of the most proven ways to reduce the carbon impact of schemes. Individual construction companies have made commitments to tackle the climate crisis and environmental responsibility will be of growing concern amongst clients.¹¹ In addition, an effective local reuse market would likely be seized upon as a welcome alternative to international supply chains, which have proven unreliable and price-volatile in the UK over recent years.

The action on the three proposed levers should lead to the following impacts by 2030:

- **Implementation of percentage material reuse targets:** we should be able set a target of at least 20% reuse (in both new developments and demolition projects), as delivered in other cities/countries (Seattle; the Netherlands) for the projects mentioned above. This can be the starting point, with the Coalition governance ensuring that targets are always driving the industry towards state-of-the-art capabilities.
- **Waste reduction:** This will reduce waste by an estimated 297,000 tonnes per year, representing around 4% of waste arising from the construction and demolition sector.
- **Carbon reduction:** This will reduce carbon emissions associated with the construction sector by an estimated 112,000 tonnes of CO₂ per year, representing around 1.5% of the construction carbon footprint in London.

The above impact estimation on waste and carbon are conservative numbers based on a 20% reuse rate for timber, bricks and steel only.¹²

¹¹ <https://www.constructionnews.co.uk/sustainability/global-warming-what-are-the-top-20-contractors-promising-to-do-01-02-2021>. Also see <https://builtenvironmentdeclares.com>

¹² Estimation based on WRAP's report, [UK's policy pathway for increasing resource productivity by 2050](#) (2021), whose impact estimations for reuse policies have been downscaled to estimate their potential impact in London.

c. Status of the solution

Tools, common ambition and monitoring framework to support London's local authorities implementing planning policies and procurement practices

There is political will from several London local authorities (and other cities) to progress on planning and procurement policies. Some tools already exist (existing policies from other cities, guidance documents) but are not sufficient to drive practical implementation in London. A common scorecard for measuring progress is to be defined.

The feasibility study below identifies the current barriers preventing progress. Specific actions to overcome those barriers are proposed in the mitigation plan.

Data infrastructure enabling earlier connections between supply and demand for secondary materials

Some private stakeholders currently enable connections between the supply and demand of secondary materials (marketplaces, material banks) for materials that are already available or will soon be available, but fail to enable the early connections that are needed to influence the design of new buildings and enable the growth of the reuse market at scale.

The feasibility study below identifies opportunities and challenges to use data collected through planning applications to enable these early connections. It identifies the need for the public sector to develop the right standards and a data/API infrastructure that will enable marketplaces and material banks to enhance their solutions to enable earlier connections.

4. Feasibility analyses

Methodology

This white paper addresses the feasibility of:

1. The part of the programme developing the tools, common ambition and monitoring framework to support London's local authorities in implementing planning policies and procurement practices.
2. The part of the programme developing the data infrastructure to enable the growth of secondary material markets.

In both cases, the focus has been on wide engagement with stakeholders.

For the first part, we have engaged with:

- Twelve London local authorities, to explore their specific needs in relation to circular construction, to discuss the Coalition governance and funding model and to seek commitment to fund and participate in the programme;
- Twelve businesses, including developers, architects, engineers, contractors and demolition contractors, to gain insight, understand and prioritise needs, gauge support and potential for funding, and build the networks that the Coalition will develop through action groups.

For the second part, we have engaged with:

- Four London local authorities to assess availability and suitability of current forms of supply info (e.g. PDAs) and demand info (e.g. CE Statement's bill of materials, specifications, schedules, bill of quantities, BIM), to understand current procurement practices and to understand barriers faced in implementing supportive planning and procurement policies;
- Five reuse platform providers (marketplaces, material banks, material passport providers) to understand their position in the reuse ecosystem, test our proposed approach, test our ideas on the role of the public sector, assess willingness and ability to share data, and seek commitment to be involved in Phase 2 of the CBC project.

For the second part, we have also reviewed the data currently submitted as part of planning applications and assessed their usability for enabling connections between the supply and demand of secondary materials.

A numbering system is used across the feasibility study report to identify barriers to success in the 'Findings' sections. These numbers will be used across the mitigation plans to link mitigation measures with identified barriers. A letter represents the 'Findings' section subheading, e.g. 'E' stands for 'Economic'; 'S' for Social.

4.1. Feasibility of empowering boroughs to implement ambitious planning and procurement policies fostering material reuse, through the development of tools, common ambitions and monitoring frameworks

a. Findings

Economic feasibility

With the CBC Phase 2 funding, and in addition to funds already secured from national research funding and from some local authorities, enough funding will be secured to launch the Coalition in the UK financial year 2024-25 (see Tables 1 and 2 below). During the first 2-3 years, the Coalition will rely mainly on philanthropic and research funding and will gradually evolve to rely mainly on sponsorship funding from construction businesses and membership fees from London's local authorities (see Graph 1 below).

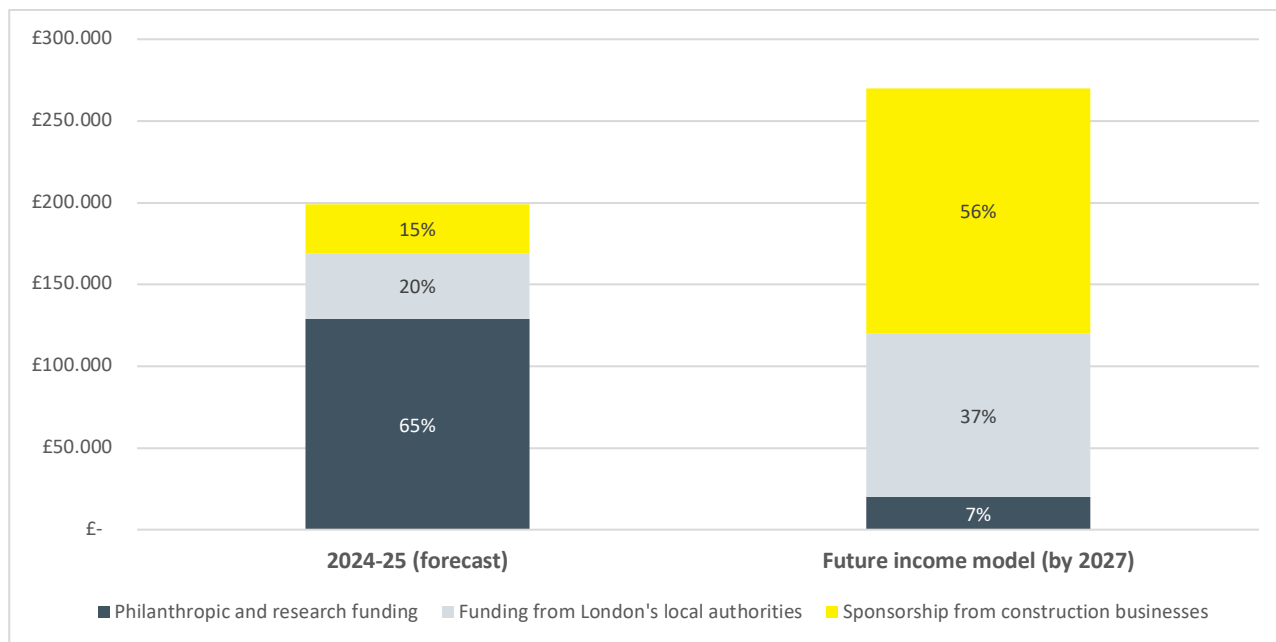
Table 1 – Minimum viable and maximum annual cost models for the Coalition

	Minimum viable form of the Coalition	Maximum form of the Coalition to achieve maximum impact
Annual staff costs (incl. overheads)	£110,000	£220,000
Annual direct costs	£5,000	£45,000
Total	£115,000	£265,000

Table 2 – Estimated income model for 2024-25 financial year

	Forecast	Secured
Philanthropic and research funding (including CBC Phase 2 funding and already secured research funding)	£149,000	£84,000
Funding from London's local authorities	£40,000	£10,000
Sponsorships from construction businesses	£30,000	n/a
Total	£219,000	£94,000

Graph 1: Vision for the evolution of the income model for the Coalition in the coming 2-3 years



The feasibility of achieving these levels of income has been tested by engaging with a diverse range of potential funders as part of this feasibility study.

Although some of the potential funders are currently struggling with the UK inflation level – especially local authorities (E1¹³) – and the Coalition will need to demonstrate its ability to deliver change to unlock trust from private sponsors and public funders, this market testing revealed that there is a strong interest in the initiative from a wide range of potential funders. They highlighted many potential benefits that the Coalition could bring:

- For local authorities:
 - Circular construction is seen as a means to achieve high-level goals, particularly net zero.
 - The Coalition is seen as a way to deliver work that many local authorities require to be done and which would otherwise be undertaken independently, at greater expense, and potentially less effectively due to lack of expertise.
- For private sponsors, the benefits vary depending on the type of company:
 - Demolition contractors benefit from greater reuse of materials and less need to pay disposal gate fees.
 - Developers and contractors benefit from the reputation of being associated with the Coalition. In due course, all could benefit from cost and carbon savings.
 - Market leaders in this area benefit from policy requirements obliging the rest of the market to match what they are already doing.

¹³ A numbering system is used across the feasibility study report to identify barriers to success in the 'Findings' sections. These numbers will be used across the mitigation plans to link mitigation measures with identified barriers. The letter represents the 'Findings' section subheading, e.g. 'E' stands for 'Economic'.

Over and above the economic viability of the Coalition, the study also highlighted other economic factors that could make the uptake of the solution difficult for stakeholders:

- Local authorities have internal resource constraints in developing new planning and procurement policies, in particular to develop the necessary evidence base, to collaborate with industry to ensure the applicability of policies (E3), and to review more complex planning applications when new requirements are in place (E4).
- Local authorities can also be reluctant to adopt more stringent reuse targets within their procurement, because of cost uncertainty and the risk of higher costs it could generate (E5).
- Construction businesses may experience higher costs to deliver higher reuse targets against planning policies and in public procurement requirements (E6).

Social feasibility

The study has revealed quite a strong overall political buy-in from leading boroughs:

- Most boroughs have declared a climate emergency.
- Most boroughs have some form of circular economy strategies or targets, or are about to publish a CE strategy (70% of boroughs interviewed); most clearly identify construction as a key area in which the borough needs to influence its circular transition, but lack robust and detailed steps to achieve strategic goals.
- Few boroughs at present are actively looking to incorporate reuse targets within their upcoming local plans (three of the boroughs interviewed), but most are open to exploring this strategy if the evidence base exists to back it up.
- Several boroughs are already implementing reuse requirements within their own development projects (five out of ten of boroughs interviewed) but most of them do so inconsistently (no borough-wide longer-term commitment). Most of the other boroughs are currently exploring how they can implement similar requirements within some of their projects (four out of ten).

However, some social barriers that could prevent boroughs adopting more ambitious planning and procurement policies have been identified:

- Only a limited sample of boroughs at the forefront of circular economy leadership were interviewed. It may therefore be harder to make the case for all boroughs to implement changes in planning and procurement policies (S1).
- Some boroughs highlighted a lack of data to assess the impact of the existing CE Statement policy, which makes the case harder for boroughs to replicate it (S2).
- Several internal departments need to be engaged within boroughs (teams for planning, procurement, climate, waste, regeneration, housing etc). This is an issue because they may have:
 - competing priorities and limited resources to engage (S3). For example, most housing teams in boroughs have a large programme of work to build a large quantity of new social housing as part of the mayor's affordable homes programme, which they could deliver more quickly if they were not to spend time on changing their usual procurement process to maximise the use of secondary materials.

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- a varied level of available skills and knowledge to develop and implement new planning policies or new procurement practices (S4), for example to review planning applications with strengthened CE requirements.
 - Some officers interviewed mentioned their fear to engage in knowledge sharing groups if they feel they are behind other boroughs and do not have much to offer (S5).
 - Industry stakeholders are likely to push back on harder reuse requirements (S6).

Several social barriers have also been identified that could prevent construction businesses from complying with higher reuse requirements:

- In most cases, developers do not currently appear to be engaged in submitting high-quality CE Statements that push the dial on material reuse. They mainly see this as a formal exercise (S7).
- There is also a lack of skills and experience within a large part of the industry, because this is not yet the norm (S8).
- There is little capacity for change in small-scale residential projects and refurbishments. Changing the way such small projects operate is also complex because they are so numerous (S9).

Policy and legal feasibility

The study has identified several policy and legal barriers:

- Having different types of funders with competing drivers and needs may complicate the governance of the programme (PL1).
- Several boroughs reported that planning processes are sometimes too rigid. They do not always take place at the time needed to influence practice (PL2). For example, there is currently little that can be done to influence design after a CE Statement review (most design decisions have already been made), or to influence post-planning waste management (post-completion CE Statement submission is too late).
- The current planning requirements to improve circularity (including submitting a CE Statement for new development projects and submitting PDAs for demolition projects) are only required for the approximately 100 largest projects in London, referable to the GLA, but not for smaller projects (PL3).
- The current long-term contracts that some local authorities have with their contractors to manage their built assets can make it hard to introduce new requirements regarding material reuse for refurbishment and maintenance (PL4).

Technical feasibility

There is no technical barrier for this part of the project, as this does not relate to developing technologies. The technical barriers are addressed in the feasibility analysis of developing data infrastructure (section 4.2).

Practical feasibility

Several practical barriers have been identified by the study:

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- There is a lack of agreed metrics and a lack of agreement on ambitious but achievable targets due to a lack of data on what is feasible (P1).
 - There is a lack of case studies that can be used as benchmarks to demonstrate feasibility to developers (P2).
 - There is a lack of data and tools to monitor progress regarding CE for local authorities to assess the impact of their policies. This also makes it harder to make the case for policy changes (P3).
 - If local authorities are not well coordinated, there is a risk of developing different policies that will make adaptation more complicated for the industry (P4).
 - Local authorities have slightly different local contexts, which can make it hard to establish harmonised targets and policies (P5). For example, some own a lot of housing stock and have large regeneration projects, while others have limited built assets and few new development projects.
 - The timing of local plan renewals, which take place every four to six years, can prevent a rapid change in planning policies within some boroughs (P6).
 - There are several other initiatives that use the time, resources and expertise of the same stakeholders, and which may produce slightly different recommendations for action (P7).
 - The construction industry may not be ready to deliver on high material reuse targets because of a lack of storage infrastructure (P8) and a lack of knowledge and adequate skillset on the part of some of the boroughs' usual contractors (P9). The study revealed that some businesses do have the right skillsets and resources, but boroughs lack knowledge and do not have contact with relevant reuse service providers.

b. Mitigation plan

Governance structure

To coordinate the potentially competing drivers of funders (PL1), due diligence will be carried out to check the intention of private funders and limit conflicts of interests. This will also be managed by establishing a governance structure that will help align funders and local authorities, and overcome the slight variations in local contexts (PL1, P4, P5).

We will establish a robust governance structure consisting of the following:

- **Coalition programme board**
 - Function: deciding on the programme's activities and budget spend year on year
 - Members: funding boroughs, large philanthropic funders, large private sponsors, ensuring most votes are attributed to boroughs
- **Industry steering group**
 - Function: makes recommendations to board on the programme's activities and outputs based on industry needs, but without final decision power
 - Members: smaller private sponsors
- **Action groups**
 - Function: develop, [test and adopt](#) specific outputs (e.g. circularity metrics)
 - Members: interested boroughs and industry players
- **Boroughs discussion group**
 - Function: foster knowledge sharing between boroughs' officers
 - Members: interested boroughs

The above governance structure guarantees that:

- Needs of key funding boroughs are prioritised, thus ensuring the tools developed by the Coalition are fit for purpose for them to take action on planning and procurement policies.
- Industry stakeholders are involved in practical action groups developing policy recommendations and tools, thus ensuring they are applicable to the industry.
- All interested boroughs (even non-funders) are involved in action groups, thus ensuring outputs are fit for purpose for their individual needs and context and widely adopted.

Action groups

Action groups will form the core of the programme's activities.

To combat any pushback from industry stakeholders on ambitious requirements (S6), we will aim to prioritise the involvement in the action groups of those stakeholders that are leading the uptake of circular construction, to ensure recommendations and tools drive the entire industry towards delivering on circular requirements. We will also leverage the action groups to engage borough officers from a wide range of teams within boroughs (S4) and thus increase capacity across teams. We will direct stakeholders towards available training resources, for example those developed by the UK Green Building Council (UKGBC).

Expanding circular planning policies at borough level is hampered by the long and disjointed policy development timelines, internal resource constraints for both development and review of eventual applications, and lack of open discussion with industry leading to uncertainty around potential policy impacts (PL2, PL3, P5, P6, E4, E6, S9).

To combat this, we will launch an action group tasked with developing recommendations including material reuse requirements within boroughs' local plans, ensuring:

- They build on the existing planning requirements for the approximately 100 largest projects in London to extend it to major projects (approximately 1000 larger projects in London).
- They consider how best to use the different planning stages to influence projects at key points, considering what data is available and how much of the design can still be changed at each stage.
- The best possible consistencies across all boroughs' local plans, to facilitate adoption from businesses operating across London.
- The boroughs that have the earliest renewal of their local plan are involved, to ensure rapid impact and timely testing of recommendations.
- The boroughs' resources needed to evaluate new planning applications will be kept to a minimum, for example by setting up simple metrics to assess against a target.
- It is primarily major projects that are targeted at first, given the challenge of engaging with smaller residential projects, and the disproportionate cost implication changes in policy may have on smaller projects. Such projects may be targeted at a later stage when industry capabilities and infrastructure have evolved.
- Reuse targets enforced within local plans will be established at a low level at first to ensure affordability for private and public developers, and will be set up to evolve with time to align with the development of reuse infrastructure, and the expected decrease in reuse costs that will be progressively enabled by rising economies of scale.

Updating borough procurement policies requires a detailed understanding of potential cost implications, confidence that contractors have the right skill sets to deliver, and flexibility to ask for ambitious targets within long-term contracts (E5, P9, PL4). High quality and the consistent industry engagement that is necessary to develop achievable but ambitious policies can be difficult for an individual borough to maintain due to lack of internal capacity.

For this reason, we will launch an action group tasked with developing recommendations including material reuse requirements within boroughs' public procurement, ensuring:

- Additional costs (if any) of delivering on the new requirements are minimal and accepted by the boroughs.
- Existing construction businesses are able to meet the requirements (if necessary with the support of material reuse service providers/specialists). This could be achieved, for example, by incorporating a dialogue phase during the tendering process to understand the state of the industry capabilities to achieve higher reuse rates.
- The challenges posed by some existing long-term contracts are considered.

There is a lack of agreed metrics and a lack of agreement on ambitious but achievable targets against those metrics due to a lack of data on what is feasible (P1).

For this reason, we will launch an action group tasked with defining one or more circularity metrics and associated targets that boroughs can use as a planning requirement and as a requirement in their procurement brief, ensuring:

- Additional costs (if any) of delivering on these targets are minimal and accepted by the boroughs (for their own procurement) and by several developers that are leading in this area.

Action groups are the core drivers of the Coalition's work. To ensure the groups remains welcoming, accessible and relevant to less developed boroughs (S1, S5), we will continue to engage with all London boroughs to encourage them to take action and adapt their planning policies to foster reuse. Seeing the progress and impact that the leading boroughs achieve by implementing changes should incentivise others to do the same. In particular, all boroughs (including non-funding ones), will be encouraged to join the boroughs discussion group, even if they are only starting to explore this area.

As we recognise that most boroughs face resource constraints regarding the attendance of programmes and external meetings (E3), we will ensure that borough officers are required to attend a minimal number of meetings, and that most of the legwork is done by Coalition staff and experts. We will also define a plan to liaise regularly with other programmes and industry groups developing solutions within a similar area (P7), to ensure that initiatives are mutually reinforcing and to leverage their networks to disseminate the Coalition's outputs.

Matchmaker, case studies, material stocks and flow analysis

Action groups will be supplemented with the development of tools and research projects that build the necessary evidence base and support changing practices.

We will seek to address the skills gap and lack of experience of internal borough teams and industry players, including some of the boroughs' usual contractors (P9, S4, S8), by building on the existing [Circular Economy Matchmaker](#) to incorporate more material reuse service providers in the directory. This will ensure:

- Traditional construction businesses are able to find partners that can enable them to reuse more materials within their projects and that can be drawn on to upskill their teams.
- Boroughs are able to connect with new service providers to procure more secondary materials, or to connect their existing contractors with those service providers.

We will also collaborate with universities/members associations (e.g. UKGBC) to encourage the development of training and promote existing training offers to industry stakeholders and boroughs' officers. This will help to bridge the identified knowledge gaps in industry and local authorities.

The lack of case studies was also noted as a major hindrance to illustrating feasibility to developers (P2). We will develop a library of case studies, with economic data to demonstrate return on investment, which can act as a benchmark to help the industry achieve required planning and public procurement targets, and to build the financial case that will support further private investment in material reuse.

Boroughs also noted the lack of data helping to understand the impact of current policy and monitor the progress of future policy (S2, P3). The development of a material stocks and flow analysis of London's buildings will support boroughs in developing policies that target hotspots where material reuse has the most potential for impact.

Most industry stakeholders do not yet see the value in submitting high-quality CE Statements or embracing ambitious reuse requirements (S6, S7). Developing digital infrastructure leveraging planning data in parallel to the development of planning and public procurement requirements will be key to:

- Further developing industry capabilities to achieve higher reuse rates, thus enabling boroughs to set higher reuse targets.
- Providing economic value to developers in submitting good quality data through their planning application (as data will be used to support them to procure secondary materials or find buyers for secondary materials in the case of a demolition project).

When developing tools and recommendations, we will ensure they are accessible to non-expert boroughs officers and can be used to upskill them (S3).

Building a sustainable financial model

Market testing revealed that while there is significant need for such a programme, some potential funders are currently struggling with the UK inflation level – especially local authorities (E1, E2, E3).

When trying to secure funding from boroughs, we will emphasise:

- The direct and practical benefits of the Coalition to boroughs (providing practical tools and support to enable them to achieve their climate and CE targets).
- The cost efficiency of this type of centralised approach compared to a situation in which all boroughs develop separate tools and policies with duplication of effort.

We will focus on securing philanthropic funding for the first one or two years of the Coalition to showcase the benefit of the programme to boroughs and to private sponsors.

c. Remaining challenges

As mentioned in the mitigation plan, several barriers have been identified that need to be tackled within individual action groups when developing policy recommendations and tools, so there is still uncertainty as to the extent to which they can effectively be addressed consistently for all boroughs.

In addition, whilst there are encouraging factors showing the high potential for securing the required income to develop and operate the Coalition (high level of political will, securing of some funding) there is still some uncertainty as to our ability to secure funding in the medium to long term. Funding for the next UK financial year (starting April 2024) is not yet fully secured. Phase 2 funding from the CBC will be crucial to develop a pilot of the Coalition during this period and secure longer-term funding for the wider programme.

4.2. Feasibility of matchmaking data infrastructure

a. Findings

Economic feasibility

The development of the core of the data infrastructure can be covered fully by the funding of the CBC Phase 2, if secured. The maintenance and continued evolution of this core infrastructure (see Table 3) will be funded, in the first two to three years, with a similar income model as the one for the wider Coalition solution, based on philanthropic, public and private sponsorship funding (see Graph 1).

Table 3 – Estimated costs to maintain and further develop the data infrastructure based on users’ needs subsequent to the development during Phase 2. The maximum budget assumes a larger budget for developing new features that will be appealing to users.

	Minimum viable form of the digital infrastructure	Maximum form of the digital infrastructure to achieve maximum impact
Annual staff costs (incl. overheads)	£20,000	£65,000
Annual direct costs	£13,600	£35,000
Total	£33,600	£100,000

In due course, the data infrastructure is expected to cover its costs by its primary users (digital reuse platforms) that will be able to use improved planning application data to offer enhanced services to their customers.

Another solution that will be explored to strengthen the financial viability as well as maximising the impact of the platform is to scale the platform to other geographies (beginning in the UK or in other European countries).

Over and above the economic viability of the data infrastructure, the study also highlighted other economic factors that could make the uptake of the solution difficult for stakeholders:

- Buying secondary materials can sometimes be more expensive for construction businesses than buying new materials, because of the following costs:
 - Higher costs because of lack of economies of scale versus traditional supply chain due to insufficient user numbers (E1).
 - Additional costs for secondary materials because of storage space needed when timelines do not fully align between donor and recipient projects (E2) – especially costly in cities; because of recertification costs when there is no material passport (E3); and because of transportation costs when donor and recipient projects are in different places (E4).
- Deconstructing and selling secondary materials instead of demolishing and disposing of waste can be more expensive, because deconstruction increases costs compared to business-as-usual demolition (E5), and although resale may mitigate the deconstruction cost premium, it is often uncertain (E6).

Social feasibility

Local authorities presented several social barriers that could prevent the development of the data infrastructure:

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- All four borough interviewees showed a clear willingness to change planning data requirements and improve digitalised planning processes in order to enhance data flows. However, it is likely that this would not be the case in less engaged boroughs (S1).
 - There is a risk that a platform devised by the public sector will fail to respond to the dynamic needs of users over time (S2).

Digital reuse platforms (marketplaces, material banks, material passport solution providers) presented several social barriers that could prevent the development and use of the data infrastructure:

- Whilst all interviewees were open to exploring opportunities to use planning data and improve collaboration between platforms, there were concerns that a centralised data repository may be a competitor to some of their services (S3).
- If the private sector were running the underlying infrastructure, there would be a risk of business failure and loss of infrastructure capacity, and a risk of shareholders' interests competing with the public good (S4).

Developers, architects and contractors (end users of the digital reuse platforms) also presented several social barriers that could prevent the use of the data infrastructure:

- Using the digital infrastructure would force them to change their procedures, work with unfamiliar partners and, in some cases, adopt an unfamiliar role (e.g. as material supplier), which all add up to high perceived risk (S5).
- If they design a project to use a specific material found through the digital infrastructure, there will be a risk of relying on a unique source of material (S6).
- Developers and architects may be reluctant to share detailed data regarding their building designs because of the risk of sharing too much of their IP and losing their competitive advantages (S7).

Policy and legal feasibility

The study has identified several policy and legal barriers:

- There is a lack of existing data standards linked to material specifications, which are needed to match supply to demand for secondary materials, although several initiatives are underway to create them (e.g. European Digital Product Passport initiative) (PL1).
- Some PDAs associate waste codes to materials, jeopardising the ability to reuse them because of 'end of waste' regulations (PL2).
- The lack of insurance or warranty for secondary material has also been identified as a key barrier to their use (PL3).

Technical feasibility

The study assessed the availability and suitability of demand and supply data from planning applications to efficiently enable the matchmaking between recipients and donor projects.

The demand data, coming in the form of bills of materials within CE Statements, presented several challenges:

- It is currently used only for planning purposes and is published in a way that makes it harder to be used for other purposes: on individual boroughs' websites, in Excel spreadsheets that need to be downloaded (T1).
- The data provided varied levels of detail (no clear standards or requirements). In many cases, the detail is not sufficient to determine the specific product needed, which could be matched with available secondary materials (T2).
- The data presented some quality issues (e.g. copy/paste errors) (T3).

The supply data coming from PDAs were sometimes of good enough quality (when consultants are brought in specifically with a view to maximise reuse, PDA data are of better quality) but most of the assessed supply data presented the following challenges:

- It varies significantly in terms of structure, content, quality and time of drafting (T4).
- In most cases, it is focused on health and safety, so does not provide the right data at the right time to allow for reuse (T5).
- There is a lack of stringent PDA standards (T6), although some good PDA templates exist that would allow the data to be used for reuse matchmaking (e.g. the one created in CIRCUIT).
- Details on materials are sometimes hard to find because of the building's age and the lack of material passport or BIM for old buildings (T7).
- PDA data is published too late to allow architects and engineers to adapt their design to upcoming available materials (T8).

If the above challenges are solved, the overall levels of detail requested for CE Statements and PDAs are comparable and should be enough to initiate more detailed matchmaking conversations.

Practical feasibility

Several practical barriers to the development and use of data infrastructure have been identified:

- Whilst many digital platforms are emerging, addressing various parts of the challenge of enabling reuse (marketplaces, material banks, material platforms), none has the scale and coverage of clients/building projects to maximise city-wide reuse opportunities (P1).
- There are practical and logistical issues to enable material reuse after a successful matchmaking process: storage, transport, certification. Whilst several players are starting to develop services to tackle these issues, the market is still immature (P2).
- If data standards for planning applications become more complex, there is a risk that this will make planning submissions more costly and time consuming for developers (P3).
- There is sometimes a lack of data from new developments at early design stages (P4).
- There are practical challenges to dismantling some parts of buildings without damaging them (e.g. concrete frames present less opportunity to dismantle than steel frames). But with the right (sometimes costly) dismantling technique, almost all materials could, in theory, be reusable. The issue is therefore to make the economics work for components that are hard to dismantle (P5).

b. Mitigation plan

Adapting and digitising planning processes to foster material reuse

CE Statements have the potential to provide highly relevant data for city-wide material matchmaking, but the inputs currently are not detailed and robust enough for successful matchmaking and the data is not easily accessible or shareable (T1, T2, T3, T4, T5, T8).

We will launch an action group tasked with supporting London boroughs to adapt and digitise planning processes, to make supply and demand data usable:

- **Using standards defined in a Single Source of Truth architecture** (for both new projects and demolition projects).
- **Requiring information at early stages in the design process** (for new developments) and in the demolition planning process (requiring PDAs earlier on).
- **Working with BIM and material passport providers to feed automatically into planning applications**, avoiding typographical errors and benefitting from full details available through these existing platforms, and making it easier for developers to submit planning applications.

This robust approach will help support a change in processes and ways of working for developers, designers and contractors (S5, S6).

‘Single Source of Truth’ architecture and data standards

Many digital platforms have emerged, all addressing various parts of the reuse challenge, but none have the scale and coverage needed to maximise reuse opportunities (P1). Establishing consistency in inputs, which is currently lacking in PDA standards (PL2, P6), can support connections between platforms.

To drive necessary scale and consistency, we will develop a ‘Single Source of Truth’ architecture.

This involves:

- **Setting standards for data submissions**, with a data format that allows interoperability across platforms and workflow:
 - For new developments: standard to be defined for bill of materials.
 - For demolition projects: using the CIRCuiT PDA template as a starter (omitting waste code, to avoid the challenges caused by the end-of-waste regulation)
- **Establishing a suite of APIs to allow digital reuse platforms to access and use the planning application data** to allow matchmaking between donors and recipient projects. In a second phase, those APIs could evolve to allow interoperability between platforms so that donor and recipient teams can communicate and progress without being signed up to the same platform.

Data standards will be developed in collaboration with industry stakeholders (including developers and architects) to limit the risk of their having to share sensitive IP (S7). A regular review of existing international effort to develop data standards and alignment on published standards will ensure an easier usage of the standard by businesses operating internationally (PL1, P3).

It is of critical importance that the APIs allow for matchmaking projects based on predicted timelines, to reduce the burden of logistical costs such as storage (E2).

Data standards and new planning requirements will be discussed with industry stakeholders to ensure they will be available at the required stage and avoid unnecessary additional planning application costs and complexity (P4, P3).

Platform interoperability

All interviewees recognised the opportunity presented by connecting planning data to robust data infrastructure; however, there were concerns about the ability of a public platform to respond to user needs, and the potential for the infrastructure to emerge as a competitor to existing services (S2, S3, S4). To negate these concerns, we will define clear roles between public and private stakeholders to develop and operate the digital infrastructure:

- The role of private digital platforms will be to develop online marketplaces and matchmaking services, with businesses competing on the strength of their platform functionality. Businesses are best placed to adequately service multiple and varied needs of end users.
- The role of the public sector will be kept to a minimal level in the development of the necessary shared data infrastructure (focused on sharing planning application data) that can underpin the private sector's matchmaking services. The clients of this shared infrastructure are expected to be digital marketplaces and reuse services, not the end users (construction businesses).
- Reducing the number of clients for the public platform will make it easier to adapt to their evolving needs. This will be tackled by a shared governance, with a dedicated board that will be established for the development of the data infrastructure, whose members will be a mix of local authorities and private digital platforms.

Engaging the wider market

To limit inconsistencies in planning approaches with less engaged boroughs (S1), we will continue to engage with all London boroughs through the Coalition to support them in taking action and adapting their planning policies to foster reuse. Seeing the progress and impact that the leading boroughs achieve when implementing changes should incentivise other to do the same.

Buying secondary materials can still be more expensive for construction businesses than buying new (E1, E2, E3, E5, E6, P5). To help support the viability of reuse, we will develop more stringent planning requirements and public procurement requirements and incentives, in parallel with developing the data infrastructure, to drive both supply of and demand for secondary materials. This will help with:

- Making economies of scale;
- Fostering trust and minimising risk from developers, demolition and reuse businesses;
- Supporting the development of cost-effective services needed in the reuse process (storage, logistics, recertification).

Beyond matchmaking, logistical solutions for storage, transport and certification must be in place to allow for successful reuse (T7, P2). The programme will continue promoting the support of reuse services (storage, logistics, recertification) by regularly updating the directory of businesses providing these services on the CIRCUIT Material Reuse Portal and on the Circular Economy Matchmaker.

c. Remaining challenges

Several barriers have been identified that need to be tackled when defining the data standards for the planning application submissions, so there is still uncertainty as to the extent to which they can effectively be addressed consistently for all boroughs. This is particularly true for the challenge caused by a fixed planning application timeline, which may hinder the possibility to access required information from recipient projects at the best time in their design process.

5. Diffusion

Below is a summary of the diffusion plan, delivered primarily through ReLondon's internal team.

We have carefully selected and prioritised the stakeholders that we will engage, starting with the remainder of London's local authorities to encourage them to join the action groups and adopt the templates and tools produced by the Coalition. In parallel we will involve the industry within the Coalition, including existing digital reuse providers, to establish the necessary data standards and infrastructure to support the reuse marketplace.

Our engagement strategy and delivery approach is designed to be targeted, mindful of the limited time and capacity available among our key stakeholders. Simultaneously, we are also deliberately engaging with diverse stakeholders to ensure a coordinated and harmonised development of the planning policies, tools and data infrastructure. Finally, we are taking a stage-gated approach to our delivery, with clear outputs identified at the end of each work package, to ensure that progress occurs at pace, is demonstrable to all stakeholders involved, and always remains synchronised.

Our key works packages for the period February 2024 to March 2025 are:

- Phase 2: London Pilot (February – July 2024)
 - WP1: Support local authorities in developing supportive planning policies and procurement practices
 - WP2: Develop data infrastructure
 - WP3: Develop a financially viable income model for the Coalition
 - WP4: Prepare for wider diffusion to other cities and regions
- Phase 3: London scaling phase and diffusion to other cities and regions (Aug 2024 – Mar 2025). Work packages to be defined during Phase 2.

The main risks we identified for the first three work packages are:

- **WP1.** Election cycle and/or other political distractions further limit capacity within local authorities, which can result in tools/assets produced being less relevant or adopted inconsistently. This will be mitigated by diversifying our contact points at local authorities, and thus diversifying the local authorities' interests in engaging with the Coalition. This should help secure more consistent engagement from local authorities.
- **WP2.** Local authorities and the private sector progress at different pace, resulting in lack of harmonisation between data standards, digital infrastructure and policies. This will be mitigated by a close involvement of key industry stakeholders (businesses and industry groups), and a stage-gated/outputs approach.
- **WP3.** Lack of funding availability in the long term impedes the ReLondon team's ability to deliver, resulting in lower impact profile achieved. This will be mitigated by a continuous and reinforced engagement with potential long-term funding partners (public and private).

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ReLondon is the operating name of the London Waste and Recycling Board.