



City of London Corporation

# Climate Action Strategy

## **RS3 Resilient Buildings**

Project Plan

Version 1.1

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## Project Introduction

### Project Aims

In support of the Climate Action Strategy (CAS), commencing implementation from April 2021, this Project Plan details how action will be accelerated to deliver the roll out of retrofit measures for residential and non-residential properties throughout the Square Mile and for those assets that The Corporation are responsible, ensuring they are resilient to changing weather conditions and environmental patterns.

This will support achievement of the following net zero vision and goals:

**NET ZERO VISION:** A future where the Square Mile's built environment and infrastructure is adapted to meet the challenges of hotter, drier summers; warmer, wetter winters; stronger winds; more frequent weather extremes and sea level rise.

**NET ZERO GOALS:** Climate resilience in our buildings, public spaces and infrastructure.

### Introduction

A climate risk assessment has been carried out by Buro Happold for the Square Mile. As part of this, analysis of the Met Office Climate Projections (2018) was undertaken which identified climatic trends for the area. A risk assessment was then completed based on these which focused on the 'top six areas of inter-related climate change risks for the UK' as identified by the UK Climate Risk Assessment 2017, namely:

- Flooding and coastal change risks to communities, businesses and infrastructure;
- Risks to health, well-being and productivity from high temperatures;
- Risk of shortages in the public water supply, and for agriculture, energy generation and industry;
- Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity;
- Risks to domestic and international food production and trade; and
- New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals.

In all cases the risks were found to be pressing. This is largely due to the diversity of the occupants and users of these spaces, the scale and importance of the green spaces run by The Corporation and its dependence on international trade and its role as a centre for the insurance sector.

The report identified that one of the resilience measures to mitigate these risks was the recommendation for a programme of resilience-enhancing retrofits for residential and non-residential properties throughout the Square Mile and assets under the responsibility of The Corporation. This would focus on ensuring assets are resilient to changing weather conditions and environmental patterns and that their influence on, and risk from, climatic changes is reduced.

Against this background, this Project Plan identifies Tasks that have been developed to address the following three aims:

- **Deliverable** – tasks can be completed within the identified timescales;
- **Affordable** – projects can be accommodated within The Corporation's current and future budget constraints; and
- **Impactful** – actions improve building resilience and mitigate climate change risk.

To achieve these aims the following high-level actions will be implemented, these are split it into individual Tasks in Table 1.

**Year 1-2**

- Identification of resilience risks and constraints to implementation for The Corporation's physical assets;
- Development of Buildings Resilience Action Plan;
- Dovetailing of identified interventions into existing estates/asset strategy;
- Coordinate with Design Standards Action Area.

**Year 2+**

- Delivery of pilot project, gathering lessons learnt and quantification of benefits;
- Full roll out of Buildings Resilience Action Plan;
- Reporting and monitoring of risk mitigation.

**How to use this document**

This document outlines the costs, benefits and overall approach to implementing resilience measures across The Corporation's building assets to support delivery of the Climate Action Strategy. It is to be used as a baseline against which to monitor progress. It will be kept as a live document and will be updated periodically subject to the Change Control Procedure.

## Project Objectives

The Project Objectives for this Project Plan are:

- Identify resilience risks to The Corporation’s buildings;
- Assign resilience measures to planned works where possible;
- Implement and monitor resultant risk mitigation; and
- Inform Design Standards workstream.

The table below details key Tasks that will be completed to achieve the Project Objectives. Further detail on each project can be found in Appendix 1. The focus of the 2021/22 plan will be to mobilise resource to complete impact modelling for CPG and IPG assets, identify resilience risks and develop a Resilience Action Plan. This includes co-ordinating with the other resilience workstreams to provide a unified approach across action areas.

Table 1 – Tasks and project objectives

Theme	Ref	Task	Rationale	Outcome	Key Actions in 21/22	Team Lead	Lead Support
<b>Climate change impact modelling</b>	1	Delivery of climate impact modelling for CPG and IPG assets.	Identification of resilience risks and constraints to implementation for The Corporation’s physical assets.	<ul style="list-style-type: none"> <li>• Phase 1 – Modelling to identify assets with heightened risk and the need for enhanced resilience measures to be implemented.</li> <li>• Phase 2 – Model the impact of specific resilience measures on key assets, providing insight into the scope and specification of interventions to be adopted and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>• Procurement of consultancy support.</li> <li>• Collation of data to feed into modelling exercise (Phase 1).</li> <li>• Phase 1 modelling.</li> <li>• Phase 2 intervention identification and modelling.</li> </ul>	Property Project Director	Buildings Resilience Specialist
<b>Development of Resilience Action Plan</b>	2	Development of detailed action plan covering resilience project roll out that meets the needs of the Climate Action Strategy.	<p>Resilience measures need to be assigned to planned works including being embedded into 5-year plan upgrade plans for IPG and CPG properties.</p> <p>Key assets, critical building infrastructure and sensitive equipment in flood zones need to be protected.</p>	<ul style="list-style-type: none"> <li>• Identification and quantification of specific resilience projects.</li> <li>• Prioritised action to mitigate resilience risks.</li> <li>• Integration of actions into existing planned works and 5-year plans.</li> <li>• Engagement plan for tenants and occupiers.</li> </ul>	<ul style="list-style-type: none"> <li>• Procurement of consultancy support.</li> <li>• Development of Resilience Action Plan (continues into 2022/23).</li> <li>• Input from Design Standards workstream.</li> </ul>	Property Project Director	Buildings Resilience Specialist

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Theme	Ref	Task	Rationale	Outcome	Key Actions in 21/22	Team Lead	Lead Support
			Pilot projects on Corporate and Investment Property Group assets need to be identified.				
<b>Resilience Action Plan – Pilot Project Delivery</b>	3	Based on previous Tasks, this will identify, specify, procure and deliver pilot projects to improve the resilience of CPG and IPG assets.	Ensure that knowledge and information is obtained from pilot projects to understand any issues and impacts and gather lessons learned.	<ul style="list-style-type: none"> <li>• Delivery of resilience pilot projects.</li> <li>• Gathering of lessons learned.</li> <li>• Identification of procurement routes.</li> <li>• Quantification of potential benefits.</li> <li>• Implementation and monitoring of risk mitigation.</li> </ul>	<i>Planned for 22/23 as dependent on other workstreams – see Project Schedule</i>	Property Project Director	Buildings Resilience Specialist
<b>Resilience Action Plan – Full roll out</b>	4	Roll out of phased Resilience Action Plan.	Using knowledge and learning from previous Tasks to roll out the Resilience Action Plan. Embed resilience measures into 5-year plan upgrade plans for IPG and CPG properties.	<ul style="list-style-type: none"> <li>• Mitigation of climate change related risk and resilience of built assets.</li> <li>• Implementation and monitoring of risk mitigation.</li> <li>• Engagement with stakeholders including tenants and occupiers on resilience.</li> </ul>	<i>Planned for 22/23 as dependent on other workstreams – see Project Schedule</i>	Property Project Director	Buildings Resilience Specialist
<b>Staff resource</b>	5	Appoint specialist resource	Activities identified above will need to be managed. Development of Resilience Action Plan. Management of pilot project. Link with other resilience Action Areas e.g. RS2 and RS4. Link with Design Standards work.	<ul style="list-style-type: none"> <li>• Resourcing of Buildings Resilience Specialist.</li> </ul>	Resourcing of Sustainable Design Specialist.	Property Project Director	Senior Accountable Climate Lead: Resilience

## Team structure

The Teams involved in the delivery of this Project Plan are shown in Figure 1. How this integrates within the wider delivery approach and Buildings Centre of Excellence is explained in more detail in the Delivery Approach Section.

How additional resources are managed within the City Surveyors Department is shown in **Error! Reference source not found.**

The colour coding is as follows:

- Yellow boxes indicate areas of current activity that support the CAS;
- Green boxes show those additional activities required by this Plan that will be unlocked through additional resources;
- The grey boxes indicate additional staff resources either through outsourced team members (e.g. secondments) or third party flexible resource to be employed according to delivery need. As indicated by the legend this is not necessarily permanent employees.

This structure identifies the role of a Buildings Resilience Specialist. Working across departments, this role will initially be to lead and manage climate change impact modelling and development of the Resilience Action Plan. This will then switch to focus on delivery of resilience projects and reporting and monitoring of subsequent risk mitigation. To successfully achieve these outcomes, it is important that there is organisational reach back to a wider pool of specialisms e.g. architecture, MEP, structural, sustainable materials, etc. to encompass the breadth of expertise required for this action area. Therefore, the procurement approach for this role should reflect that this role may not be a specific individual but could be an organisation (or combination of the two).

The Team Structure has been developed to focus on the Year 1 priorities of completing climate change impact modelling and development of the Resilience Action Plan. This will likely change as the programme progresses depending on service outcomes. For example, the role of the Buildings Resilience Specialist will change towards the delivery of resilience projects over time. To make sure that the Team Structure remains fit for purpose, the Senior Responsible Officers and Buildings Chief Officer Group will review and manage resource requirements instilling a flexible approach that allows the market to innovate and deliver The Corporation's requirements efficiently.

Figure 1 – Delivery Teams - RS3 Resilient Buildings

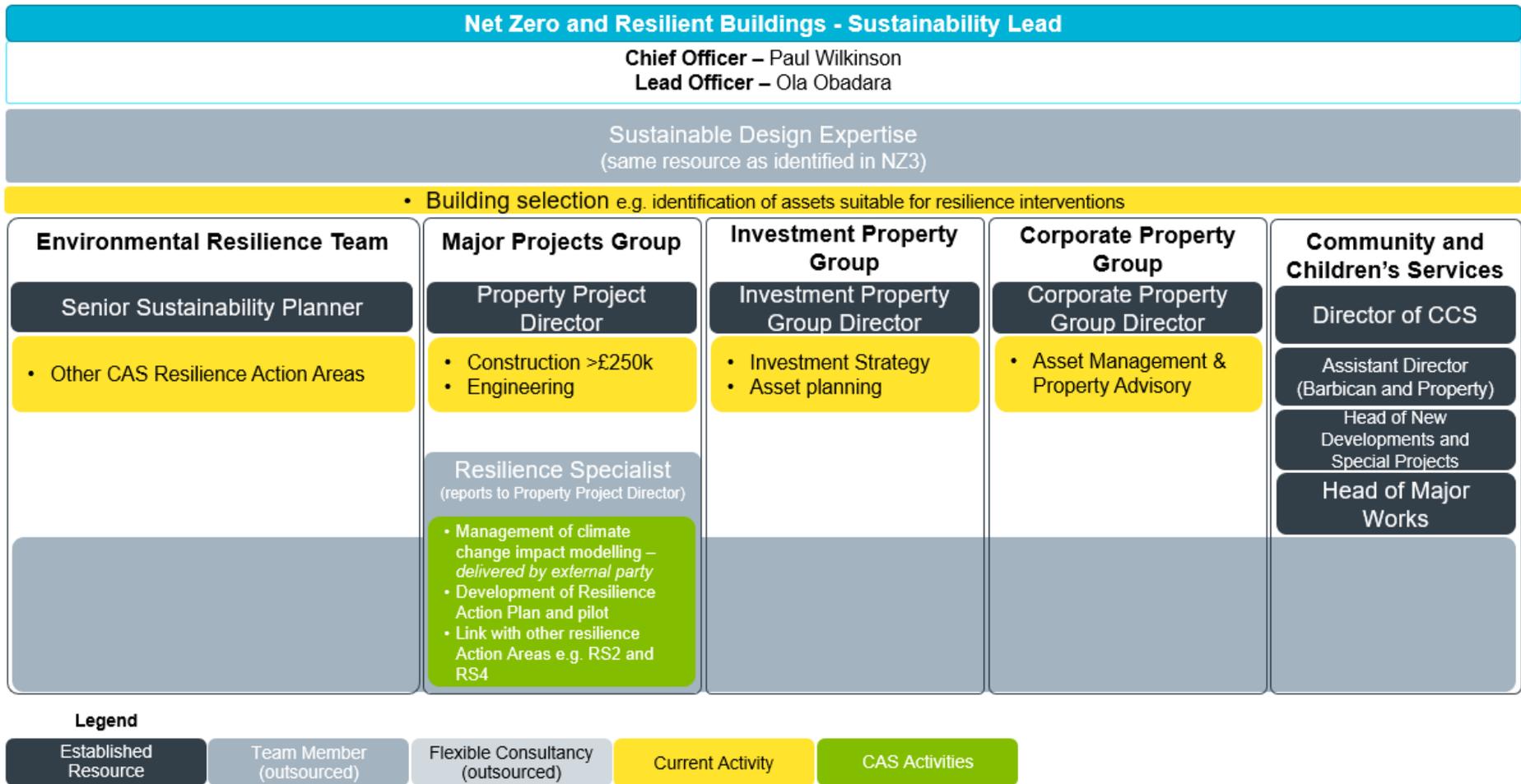
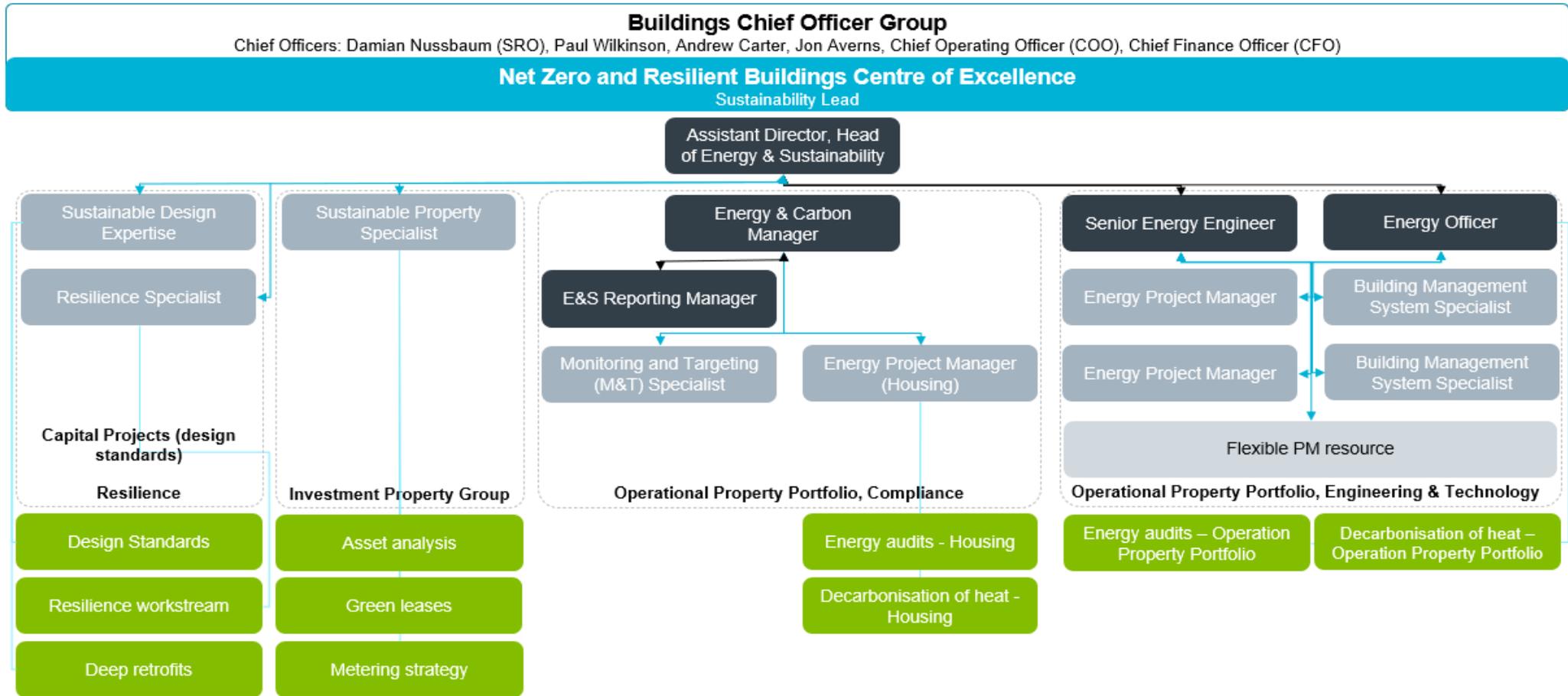


Figure 2 – Team Structure - RS3 Resilient Buildings



# Project Schedule & Gantt Chart

## Delivery Plan (Gantt chart)

Task Number	Task Detail	Responsible	Completion (%)	FY 21/22				FY 22/23				FY 23/24				FY 24/25				FY 25/26				FY 26/27				
				Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	
<b>Net Zero and Resilient Buildings Centre of Excellence</b>																												
CoE-1	Establishment of Net Zero and Resilient Buildings Centre of Excellence	Director of Innovation & Growth, City Surveyor	0%																									
CoE-2	Establish energy targets and intensity metrics where data gaps	Director of Innovation & Growth, City Surveyor	0%																									
<b>RS3 Resilient Buildings</b>																												
R-1	Delivery of climate impact modelling for CPG and IPG assets	Property Project Director	0%																									
R-2	Development of Resilience Action Plan	Property Project Director	0%																									
R-3	Resilience Action Plan - Pilot Project Delivery	Property Project Director	0%																									
R-4	Resilience Action Plan - Full roll out	Property Project Director	0%																									
R-5	Appoint specialist resource	Property Project Director	0%																									

## Project Business Case

### Project Costs

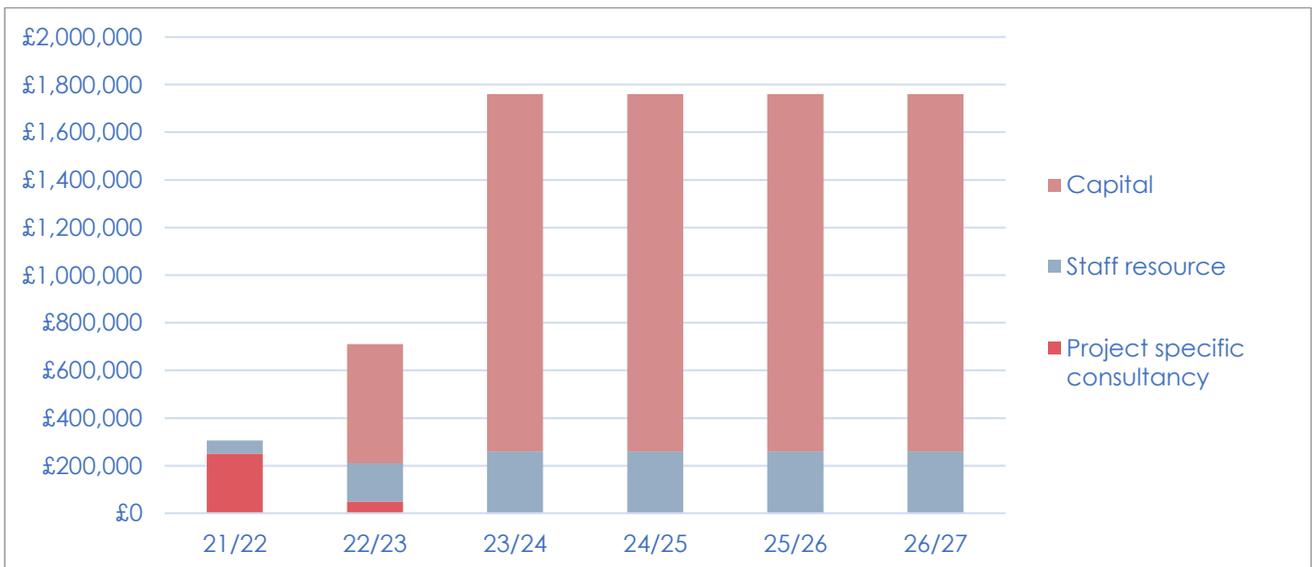
Total project costs of £8 million have been identified in the Project Initiation Document by the Climate Action Strategy Team. At present this budget is not index linked to allow for inflation and it is unclear if this includes VAT. These costs include resource time which is to be capitalised and therefore come out of this budget. In addition, inflation has not been applied. It is assumed that funding will be available to support workstreams to be mobilised in line with the Project Schedule.

As Table 2 demonstrates, this has been broken down into an initial focused period of project consultancy in Years 1 and 2 to complete modelling and develop the Resilience Action Plan. This will identify pilot projects that will be implemented from Year 2 and following this the full roll out of actions in the Resilience Action Plan.

Table 2 – Costs by Task

Tasks	Category	Costs per year (£k/annum)					
		21/22	22/23	23/24	24/25	25/26	26/27
1 - Climate change impact modelling	Project specific consultancy	£200	-	-	-	-	-
2 - Development of Resilience Action Plan	Project specific consultancy	£50	£50	-	-	-	-
3 - Resilience Action Plan – Pilot Project Delivery	Staff resource (outsourced)	-	£50	-	-	-	-
	Capital	-	£500	-	-	-	-
4 - Resilience Action Plan – Full roll out	Staff resource (outsourced)	-	-	£150	£150	£150	£150
	Capital	-	-	£1,500	£1,500	£1,500	£1,500
5 – Buildings Resilience Specialist	Staff resource (outsourced)	£55	£110	£110	£110	£110	£110
<b>Total</b>	<b>Project specific consultancy</b>	<b>£250</b>	<b>£50</b>	<b>£0</b>	<b>£0</b>	<b>£0</b>	<b>£0</b>
	<b>Staff resource (outsourced)</b>	<b>£55</b>	<b>£160</b>	<b>£260</b>	<b>£260</b>	<b>£260</b>	<b>£260</b>
	<b>Capital</b>	<b>£0</b>	<b>£500</b>	<b>£1,500</b>	<b>£1,500</b>	<b>£1,500</b>	<b>£1,500</b>
<b>Total</b>		<b>£305</b>	<b>£710</b>	<b>£1,760</b>	<b>£1,760</b>	<b>£1,760</b>	<b>£1,760</b>

Figure 3 - Costs breakdown by Category (£/annum)



## Project Benefits

There are a number of quantitative benefits that will be achieved from this Project Plan. These will be measured and reported as per the KPIs in Table 6.

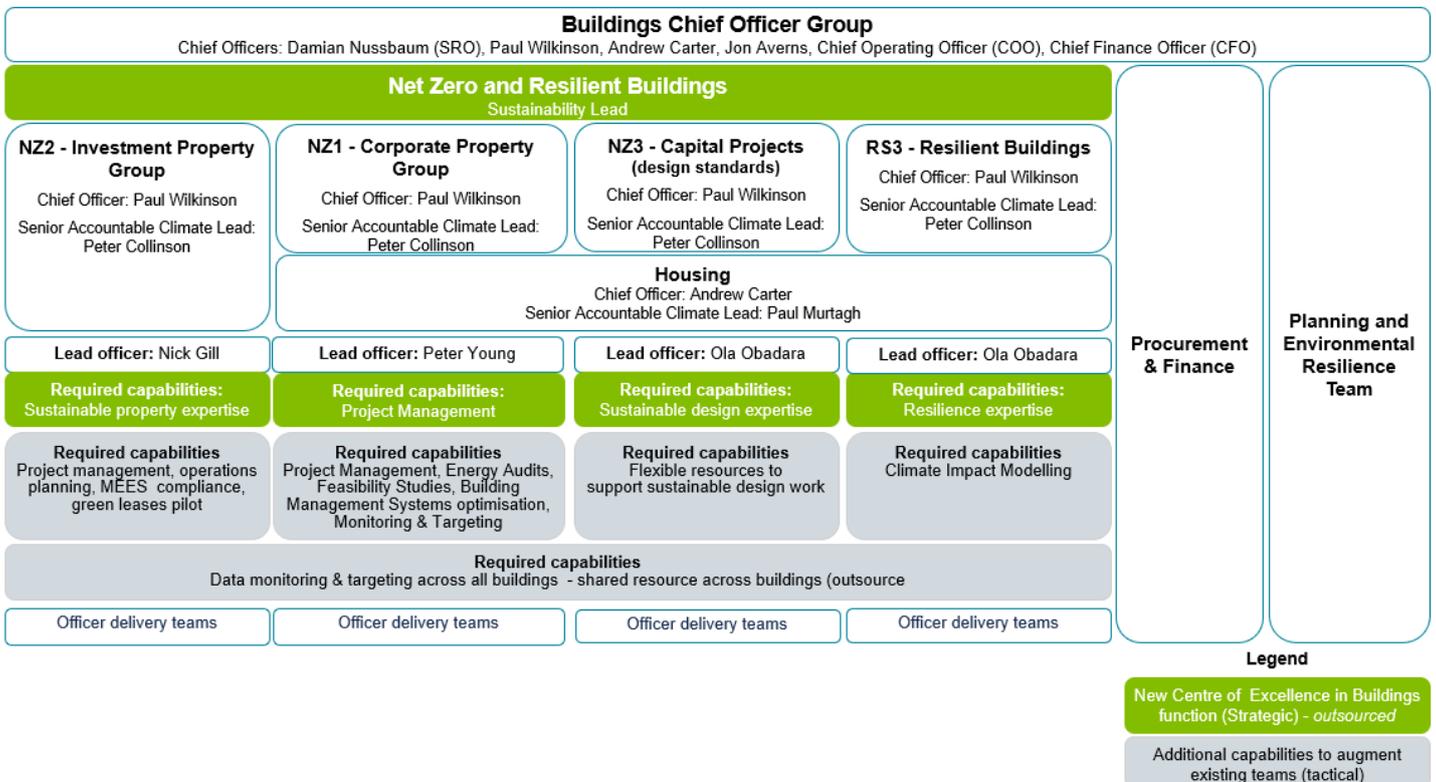
The main benefit of this Project Plan is that it will achieve a climate ready City Corporation avoiding disruption to services from climate risks and preparing the Square Mile to adapt to future climate projections.

In addition, the following benefits are expected to be achieved:

- A Resilience Action Plan for CPG and IPG assets;
- Delivery of tangible actions to address risks as identified in the Buro Happold, Adaptive Pathways Study;
- Identification and delivery of pilot studies to test solutions and gather lessons learnt;
- Active engagement with tenant and occupiers on resilience issues;
- Mitigation of health impacts where overheating may be an issue;
- Improved occupant comfort and internal environment;
- A climate aware workforce with the knowledge and skills to adapt operations and services to the changing climate;
- A reputation as a forward thinking organisation leading other authorities and public bodies in climate resilience.

## Delivery Approach

Figure 4 - Net Zero and Resilient Buildings Centre of Excellence, Delivery Model



To drive and direct leadership, best practice, research, support and training to all areas of building decarbonisation and resilience work to deliver the CAS, a Net Zero and Resilient Buildings Centre of Excellence will be established. This will sit outside of the regular reporting structure to drive strategic level targets into mobilisation and delivery across departments. Through this approach it

will provide a view across all Tasks and Project Plans to control and package up service requirements based on the outputs of feasibility studies, climate impact modelling etc. maximising value from the market based on clear desired outcomes and programme level view.

Its role will include concentrating knowledge from across all activity areas to attain and sustain high performance and value, capture lessons learnt and provide a feedback loop for continuous improvement.

The benefits of this approach will be:

- Member-buy in and confidence;
- Limiting “single points of failure”;
- Development of a cross-discipline team;
- Share resources and learning across workstreams;
- Ability to flex staff resource to meet need;
- Ability to draw in a wide range of expertise and experience from the private sector.

### Net Zero and Resilient Buildings Sustainability Lead

To manage and lead the Net Zero and Resilient Buildings Centre of Excellence, a Sustainability Lead will be resourced. This will allow The Corporation to utilise the third party expertise of someone with extensive experience of delivering large, complex programmes across net zero, resilience and energy in buildings to drive delivery across the four buildings workstreams.

Their role will comprise:

- Managing and leading the Net Zero and Resilient Buildings Centre of Excellence;
- Reporting progress to CAS Senior Responsible Officers;
- Coordinating and identifying synergies between workstreams;
- Aligning strategy and policy with delivery;
- Managing the transition from project definition to mobilisation and implementation;
- Facilitating reach back to private sector expertise and best practice.

### Delivery model

The delivery model for the Net Zero and Resilient Buildings Centre of Excellence is illustrated in **Error! Reference source not found.** This shows how all four workstreams across the buildings Action Areas will come together, identifies the key officers and illustrates the role of additional resource capabilities to support existing teams.

For this Project Plan the key resources are:

- Net Zero and Resilient Buildings Centre of Excellence Sustainability Lead
- Chief Officer – Paul Wilkinson
- Senior Accountable Climate Lead – Peter Collison
- Lead Officer - Ola Obadara

The team structure for the Resilient Buildings Action Area is detailed above.

### Approach to staff resourcing

The diagram above shows how the proposed Net Zero and Resilient Buildings Centre of Excellence Sustainability Lead would relate to the four workstreams, including this one.

Whilst this plan identifies staff resource requirements, it is not expected that this will be delivered through new internal hires. This will be delivered through project specific consultancy, outsourced

staff and/or flexible project management resources allowing The Corporation to drive value from the supply chain through competitiveness, contractual measures to secure outcomes, flexibility, reach back support and market innovation. This will also inform plans under the current Target Operating Model update. This is particularly relevant to the resourcing of a Buildings Resilience Specialist where this may not be a specific individual but could be an organisation (or combination of the two).

At present, staff resourcing has been developed to address the initial need to complete climate impact modelling and develop a buildings Resilience Action Plan. As the CAS progresses (informed by Year 1) a key review point will be to evaluate resourcing requirements as this may change depending on service outcomes. This review will be managed and guided by the Senior Responsible Officers and the Buildings Chief Officer Group.

### Linking with complementary CAS workstreams

There are a number of CAS workstreams underway that link to the work to be completed under this Action Area, notably Mainstreaming Resilience (RS4) and Cool Streets and Greening (RS1). Resilient actions taken here, such as greening (for example), could increase solar shading, reducing the need for air conditioning and thus reducing carbon emissions and ultimately adding value to the overall CAS.

It is also important that outputs from the Design Standards Action Area relate and feed-into the Resilience Action Area and vice versa. For example, the review and development of design standards will support and recognise future resilience requirements, while the Resilience Action Plan will give direction to the focus of design standards.

There is also the opportunity to incorporate resilience thinking into proposed Corporate and Investment Property Group work. For example, energy audits could also encompass water efficiency, review of cooling provision and/or additional BMS upgrades to track internal temperature levels.

By establishing the Buildings Centre of Excellence, working across all these areas, it will facilitate and manage workstreams to make sure action is not duplicated, activity is streamlined and that lessons learnt are shared.

In addition, the Project Schedule for all Action Areas has been developed to account for dependencies from each. This will allow sufficient time for feedback to be shared and incorporated into outputs.

## Risk Management

Table 3 illustrates the key risks identified for this Project Plan. It is recognised that some of these will be universal across the four building Action Areas. Therefore, it is important that mitigations and solutions are matched up to ensure they are addressed at the programme level.

It is expected that the role of the Sustainability Lead will be to manage these risks across the four Action Areas so that comparative risk analysis can be completed, risks can be stress tested to quantify their impact on meeting carbon targets and mitigations aligned to ensure a holistic approach.

Table 3 – Risk Management, RAID analysis

Ref:	Description	Type (RAID)	Criticality	Proposed mitigation
<b>R-1</b>	Delays in Governance and sign off result in carbon savings being realised later than planned.	Risk	Critical	<ul style="list-style-type: none"> <li>• Programme Management Approach to be considered.</li> <li>• Stakeholder Engagement approach detailed below.</li> <li>• Internal Governance requirements to be mapped for Tasks at mobilisation.</li> <li>• Reporting cycles to be mapped for each Task on mobilisation.</li> </ul>
<b>R-2</b>	Capital for implementing the Resilience Action Plan from Year 3 onwards has yet to be identified.	Risk	High	<ul style="list-style-type: none"> <li>• Resilience Action Plan to identify likely capital requirements.</li> <li>• Pilot projects will provide an indication of capital requirements to inform future years.</li> <li>• Mainstreaming resilience workstream seeks to embed resilience work as not additional but BAU costs. The Resilience Action Plan will align with the outputs from this work.</li> <li>• External funding to be sought where possible.</li> <li>• Role of private sector funding to be considered and incorporated.</li> </ul>
<b>R-3</b>	Current procurement routes are too slow causing project delay.	Risk	Medium	<ul style="list-style-type: none"> <li>• Delivery approach to consider delegated authority allowing rapid release of budget where needed to support rapid procurement.</li> <li>• Officer Steering Group (like Flood Risk) could be used to oversee duties.</li> <li>• Pilot projects to identify and test potential procurement routes.</li> <li>• Gain feedback from current Cool Streets and Greening Project</li> </ul>
<b>R-4</b>	Innovation may pose a risk in terms of untested technologies, unintended consequences and knowledge/awareness gaps.	Risk	Medium	<ul style="list-style-type: none"> <li>• Pilot projects to test innovative technologies and approaches.</li> <li>• Use of project specific consultancy to leverage market expertise.</li> </ul>
<b>I-1</b>	Benefits aren't quantified at present.	Issue	Medium	<ul style="list-style-type: none"> <li>• Pilot projects to support identification of likely benefits including establishing a process for benefits quantification.</li> <li>• Benefits realisation and feedback loop to be included in all projects.</li> </ul>
<b>D-1</b>	Resilience measures are embedded into 5-year plan upgrade plans for IPG and CPG properties.	Dependency	Medium	<ul style="list-style-type: none"> <li>• Mitigated through actions in Design Standards</li> <li>• Mainstreaming Resilience Project Plan.</li> <li>• Resilience Action Plan to include actions to embed behaviours</li> </ul>

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<b>D-2</b>	Tenants and occupiers are willing to engage with the programme.	Dependency	High	<ul style="list-style-type: none"> <li>Dedicated tenant engagement workstream to be developed (see Stakeholder Engagement). This should link with the IPG tenant engagement for a co-ordinated approach.</li> </ul>
<b>D-3</b>	Dependant tasks must be completed on time. Year 1 tasks must be complete on time to action tasks from year 2 onwards etc.	Dependency	Medium	<ul style="list-style-type: none"> <li>Robust Project Schedule developed.</li> <li>Project Controls in place (see below).</li> </ul>
<b>D-4</b>	Needs to link to other Resilience workstreams	Dependency	Medium	<ul style="list-style-type: none"> <li>Team members to sit on other relevant project plan/steering group meetings for continuity.</li> <li>Stakeholder engagement approach (see below).</li> </ul>

## Stakeholder Engagement

The following table outlines the key stakeholders, how and when we intend to interact with them and what channels will be used.

Table 4 – Stakeholder engagement

Category:	Department / Who	Message	Channels	When
<b>Internal Stakeholders - Department</b>	Chamberlains (Financial) Chamberlains (Procurement) PPG City Surveyors (Chief Officer, CPG, PPG, Energy, Climate Team) Comp Controller Possibly DBE Business Continuity Environmental Resilience Team, Open Spaces	Engage, Inform, Consult, Validate	Tried and tested Climate Chats Interviews Team meetings 1:1 meetings	Needs minimum 6 week lead in time before referring to Committee.  Internal liaison through programme and project lifecycles
<b>Internal Stakeholders - Committees</b>	Corporate Project Board Project Sub Committee PIB CASC RASC Court (where complex) Buildings Chief Officer Group	Seek Approval	Tried and tested Committees Meetings	Gateways 1, 2, combined 3 & 4 (4b where relevant), 5 and 6
<b>External</b>	Funders	Seek Offers, Inform	Regular partnership meetings Funding opportunities	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6
<b>External</b>	Environment Agency	Engage, Inform, collaborate	Consultation Regular partnership meetings Funding opportunities	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 1-6
<b>External</b>	Wider businesses within the Square Mile Residents Building Users Tenants	Engage, Inform, collaborate	Consultation surveys Interviews Meetings Website Social media	(At required times in RIBA stage 3 and 4 and 5) At required times gateways 3-5
<b>External</b>	Building Managers Facilities Managers	Engage, Seek information, validate, Inform	Interviews 1:1 meetings	(At required times in RIBA stage 2, 3 and 4) At required times gateways 3-6
<b>External</b>	Supply Chains	Engage, seek information, Inform	Consultation 1:1 meetings	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 2-6
<b>External</b>	External Consultants (design) and Contractors (surveys, design and works)	Engage, Seek Information, collaborate, commission	Consultation Partnership meetings	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 1-6

## Reporting cycle

It is assumed that projects will evolve from the master programme of works. It is envisaged that projects will, in the majority, follow the 'regular' route but some may fall under the 'complex' route. The table below identifies reporting envisaged along with stakeholder category.

Table 5 – Reporting cycle

Category:	When	Benefit Realised
<b>Internal Stakeholders (Internal Departments)</b>	Throughout project lifecycle, Gateways	Obtaining advice and feedback. Output monitoring Governance Checks
<b>Internal Stakeholders (Buildings Chief Officer Group (BCOG))</b>	Throughout project lifecycle, Gateways via the Programme Function and progress to KPIs via the CAS Dashboard	Commitment 2: To support the creation of a consistent format and content for effective progress reporting at monthly Chief Officer Group and quarterly Committee meetings from 1 April 2021.
<b>Internal Stakeholders (Committees)</b>	Gateways 1, 2, combined 3 & 4 (4b where relevant), 5 and 6	Tracking and monitoring of project outputs and objectives. Escalation of issue management. Seeking project direction required. Governance Checks
<b>External (Funding)</b>	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6	Known funding outcomes. Progress reporting against funding elements incl. tracking of progress Lessons learned from other projects or best practice
<b>External (Environment Agency)</b>	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 1-6	Obtaining advice and feedback. Complying with Statutory consents. Specific technological information and expertise. Opportunities to link with planned EA works.
<b>External (Residents, Users and Tenants)</b>	(At required times in RIBA stage 3 and 4 and 5) At required times gateways 3-5	Keeping all informed and engaged Informing of methodologies and outputs intended – Involving residents and user's ideas Informing of methodologies and outputs intended – Involving residents and users by allowing people to voice their views Informing of methodologies and outputs intended – how people can play their part. Positive reputational image
<b>External (Building Managers and FM)</b>	(At required times in RIBA stage 2, 3 and 4) At required times gateways 3-6	In-depth knowledge sharing Lessons learning – what works and what works less than envisaged Watch Points sharing - Specific building usage / information that could help or hinder projects.
<b>External (Supply chains)</b>	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 2-6	Gathering market intelligence and information Complying with Statutory consents
<b>External (Consultants &amp; Contractors)</b>	RIBA Stage 1, 2, 3, 4, 5 and 6 At required times gateways 1-6	Obtaining advice. Receiving specialist design knowledge and sharing. Specific technological information and expertise. Additional resource to assist existing teams.
<b>External (Distribution Network Operator)</b>	Concurrent with gateway 4 (RIBA Stage 2, 3, 4, 5 & 6) At required times gateway 2-6	Identify the viability of proposed interventions and any required enabling works. Understanding of impact on project timescales and costs. Specific technological information and expertise.

## Project Controls

The following Key Performance Indicators (KPIs) will be defined and tracked by this Project in order to judge its overall delivery success. Each will be tracked on a quarterly basis for qualitative (initially) and move toward quantitative progress reporting and will be reported formally in the Annual Report each year starting FY22/23.

### Project-level Key Performance Indicators (KPIs)

The below table sets out the principal KPIs that will track the delivery of the four CAS headline targets listed below. A trajectory and set of milestone target dates are to be developed for each.

1. Net zero by 2027 in the City Corporation’s operations
2. Net zero by 2040 across the City Corporation’s full value chain
3. Net zero by 2040 in the Square Mile
4. Climate resilience in our buildings, public spaces and infrastructure

Reporting KPIs are intended to be refreshed as part of the annual cycle of baseline re-assessment work beginning in FY22/23. The Management KPIs will be refreshed more regularly and will be reported via the Climate Performance Dashboard to committees from FY21/22.

Table 6 - Key performance indicators (KPI)

KPI name		Definition	Relevant CAS target	Regularity of reporting
<b>Resilience actions taken by department</b>		Number of resilience actions taken by service departments.	<ul style="list-style-type: none"> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Rolling total on a real time dashboard
<b>Resilience actions influence on carbon reduction</b>		Tonnes of CO <sub>2</sub> e reduced by implementation of resilience actions	<ul style="list-style-type: none"> <li>Net Zero by 2027 in the City Corporation’s operations</li> <li>Net zero by 2040 across the City Corporation’s full value chain</li> <li>Net zero by 2040 in the Square Mile</li> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Annually
<b>Resilience risk</b>	Total % of resilience risks addressed	Percentage of identified resilience risks addressed	<ul style="list-style-type: none"> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Annually
	% of critical resilience projects delivered	Percentage of identified critical resilience projects delivered	<ul style="list-style-type: none"> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Annually
	% of sub-critical resilience projects delivered	Percentage of identified sub-critical resilience projects delivered	<ul style="list-style-type: none"> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Annually
	% of non-critical resilience projects delivered	Percentage of identified non-critical resilience projects delivered	<ul style="list-style-type: none"> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Annually
	Residual risk	Number of identified business critical, sub-critical and non-critical risk outstanding	<ul style="list-style-type: none"> <li>Climate resilience in our buildings, public spaces and infrastructure</li> </ul>	Annually

### Key Data and Information

Documentation and process controls will be improved to allow for future audit and quality assurance measures such as alignment to best practice international standards on climate reporting.

Where data governance gaps exist, the Sustainability Lead will develop a data maturity strategy to increase data accuracy and completeness, ensure integration of key data across key workstreams and provide clear governance and performance management going forward. This will also include data and information requirements that will extend to any outsourced work to provide assurance on quality.

As this project progresses data will be generated as to the effectiveness of resilience interventions. Further KPIs and targets may be periodically linked to the efficacy of measures and their overall contribution to the CAS. This will be subject to the Change Control Procedure.

The data generated by this project will be collated and displayed through Power BI dashboards to improve accessibility and understanding for a range of audiences.

### Internal Governance

- Net Zero and Resilient Buildings Centre of Excellence to report to Buildings Chief Officer Group;
- Action Area Chief Officers and Senior Accountable Climate Leads to report to Buildings Centre of Excellence;
- Lead officers to report to Action Area Chief Officer and Senior Accountable Climate Lead;
- Proposed Project Board (Extraordinary Board) where required for cost and progress updates under the holistic Capex cost allowance;
- Internal Stakeholders (all gateway reports) - informal project updates and formal gateways reports ahead of submission to Committees.

## APPENDIX 1

### Task breakdowns

<b>Task</b>	<b>1 - Climate change impact modelling and risk assessment</b>						
<b>Outcome</b>	Delivery of climate impact modelling for CPG and IPG assets.						
<b>Responsible officer</b>	Property Project Director						
<b>Description</b>	Modelling and risk assessment exercise to identify resilience risks and constraints to implementation for The Corporation's physical assets.						
	It will identify key risks both natural and man-made and specify the likely interventions necessary to provide protection to the users of the buildings. By identifying the climate resilience assets already in place (e.g. green roofs and flood resilience), this modelling will also allow for greater efforts and impact towards strengthened buildings' resilience.						
	The output will provide a strong, data-led approach allowing for a deeper understanding of climate related risks and will support the CAS goal of mitigating these risks within the first six years of CAS implementation.						
<b>Timescales</b>	This is expected to be split across two phases:						
	Phase 1 - Identification of areas with heightened risk (e.g. flooding, temperature increases) and the need for enhanced resilience measures to be implemented.						
	Phase 2 – Model the impact of specific adaptation and resilience measures on key assets, providing insight into the scope and specification of interventions to be adopted and implemented.						
<b>Costs</b>	<b>Year 1</b> – Commissioning and delivery of climate change impact modelling and risk assessment						
	For further breakdown see Gantt Chart (Project Schedule).						
	<u>Key dependencies</u> None.						
<b>Costs</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	£200	-	-	-	-	-
	<i>Staff resource (outsourced)</i>	-	-	-	-	-	-
	<b>Resource</b>	<b>£200</b>	-	-	-	-	-
	<b>Capital</b>	-	-	-	-	-	-
	<b>TOTAL</b>	<b>£200</b>	-	-	-	-	-
<b>Benefits</b>	Identify resilience risks, and constraints to implementation.						
<b>Assumptions</b>	Data-led approach allowing for a deeper understanding of climate related risks.						
	Identification of pilot projects in the Corporate and Investment Property Estates.						

<b>Task</b>	<b>2 - Development of Resilience Action Plan</b>						
<b>Outcome</b>	Development of detailed action plan covering resilience project roll out.						
<b>Responsible officer</b>	Property Project Director						

<b>Description</b>	<p>Following the completion of Task 1, and co-ordinating with outcomes from the Design Standards Project Plan, a Resilience Action Plan will be developed to provide a roadmap for delivery across the CPG and IPG estates to mitigate risks such as flooding, temperature increases and energy security.</p> <p>This will reference and build upon the Resilience Pathways work completed by Buro Happold, identifying how key assets, critical infrastructure and sensitive equipment will be protected.</p> <p>This Action Plan will identify the timescales for action, key risks and specific interventions. Importantly this will also identify how specific interventions can be aligned with planned works (including 5-year plans) and establish a framework for measuring and monitoring resultant risk mitigation.</p> <p>It is expected that interventions will be divided into three broad categories:</p> <ul style="list-style-type: none"> <li>• <b>Critical resilience projects</b></li> <li>• <b>Sub-critical resilience projects</b> - measures that are important to business continuity, but less critical in nature.</li> <li>• <b>Non-Critical resilience projects</b></li> </ul> <p>For each intervention, detail in relation to the scope, specification, engagement process, governance and timescales will be provided. It will also identify a reporting process and metrics designed to manage progress to ensure identified outcomes are deliverable.</p> <p>An overview of measures that may be adopted as part of a building retrofit programme to manage the impacts of a changing climate were shared by Buro Happold. This is provided in Appendix 2 for reference.</p>						
	<p><b>Year 1</b> – Commissioning and development of Resilience Action Plan.</p> <p><b>Year 2</b> – Finalise Resilience Action Plan</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>Task 1 and Design Standards Action Area.</p>						
<b>Timescales</b>							
<b>Costs</b>	<b>Year</b>						
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	£50	£50	-	-	-	-
	<i>Staff resource (outsourced)</i>	<i>As identified in Task 5</i>					
	<b>Resource</b>	<b>£50</b>	<b>£50</b>	-	-	-	-
	<b>Capital</b>	-	-	-	-	-	-
	<b>TOTAL</b>	<b>£50</b>	<b>£50</b>	-	-	-	-
<b>Benefits</b>	<p>Prioritised action plan to mitigate resilience risks.</p> <p>Integration of actions into existing planned works and 5-year plans.</p> <p>Protection of key assets, critical buildings and sensitive equipment.</p> <p>Identification of pilot projects on the Corporate and Investment Property estates.</p> <p>Identification and quantification of specific resilience projects.</p>						
<b>Assumptions</b>							

<b>Task</b>	<b>3 - Resilience Action Plan – Pilot Project Delivery</b>
<b>Outcome</b>	Identify, specify, procure and deliver at least one pilot project to improve the resilience of CPG and IPG assets.
<b>Responsible officer</b>	Property Project Director

<b>Description</b>	<p>Based on previous Tasks, this will identify, specify, procure and deliver pilot projects to improve the resilience of CPG and IPG assets on a small scale before full roll out. This could include Sustainable Urban Drainage Systems, grey water recycling measures, thermal mass inclusion within buildings and/or green roof retrofit.</p> <p>The pilot phase is expected to incorporate a higher level of data gathering and measurement and verification to ensure interventions can be assessed in terms of their effectiveness and appropriateness before being taken forward at a greater scale. This will capture lessons learnt and provide feedback to inform future phases.</p> <p>It is expected this task could be delivered in collaboration with other resilience actions e.g. Cool Streets and Greening to allow a coordinated approach.</p> <p>An overview of measures that may be adopted as part of a building retrofit programme to manage the impacts of a changing climate were shared by Buro Happold. This is provided in Appendix 2 for reference.</p>						
	<p><b>Year 2</b> – Delivery of pilot project(s) informed by the Resilience Action Plan.</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>Task 1 and 2.</p>						
<b>Timescales</b>							
	<b>Year</b>						
<b>Costs</b>	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	-	-	-	-	-
	<i>Staff resource (outsourced)</i>	-	£50	-	-	-	-
	<b>Resource</b>	-	£50	-	-	-	-
	<b>Capital</b>	-	£500	-	-	-	-
	<b>TOTAL</b>	-	£550	-	-	-	-
<b>Benefits</b>	<p>Delivery of resilience pilot projects.</p> <p>Gathering of feedback and lessons learned.</p> <p>Identification of potential procurement routes.</p> <p>Quantification of potential benefits and process for measuring these going forward.</p> <p>Implementation and monitoring of risk mitigation.</p>						
	<ul style="list-style-type: none"> <li>Flexible PM resource at 10% of total capital cost.</li> </ul>						
<b>Assumptions</b>							

<b>Task</b>	<b>4 - Resilience Action Plan – Full roll out</b>
<b>Outcome</b>	Roll out of Resilience Action Plan.
<b>Responsible officer</b>	Property Project Director
<b>Description</b>	<p>Using knowledge and learning from the previous Tasks this will include the implementation of capital projects to roll out the Resilience Action Plan. This will likely be broken down into the following phases (subject to finalised Resilience Action Plan).</p> <p><b>Phase 1: Critical resilience projects</b></p> <p>Focuses on the implementation and delivery of critical resilience measures across the estate.</p> <p><b>Phase 2: Sub-critical resilience projects</b></p> <p>Focuses on the implementation and delivery of measures that are important to business continuity, but less critical in nature.</p> <p><b>Phase 3: Non-Critical resilience projects</b></p>

<b>Timescales</b>	<p>Focuses on the implementation of measures that are not critical to business continuity, but merit investment to safeguard future opportunity or need. It is envisaged these projects will be delivered towards the end of the Project Plan term.</p> <p>An overview of measures that may be adopted as part of a building retrofit programme to manage the impacts of a changing climate were shared by Buro Happold. This is provided in Appendix 2 for reference.</p>						
	<p><b>Year 2</b> – Roll out of projects identified in the Resilience Action Plan</p> <p>For further breakdown see Gantt Chart (Project Schedule).</p> <p><u>Key dependencies</u></p> <p>Task 1, 2 and 3.</p>						
<b>Costs</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	-	-	-	-	-
	<i>Staff resource (outsourced)</i>	-	-	£150	£150	£150	£150
	<b>Resource</b>	-	-	<b>£150</b>	<b>£150</b>	<b>£150</b>	<b>£150</b>
	<b>Capital</b>	-	-	<b>£1,500</b>	<b>£1,500</b>	<b>£1,500</b>	<b>£1,500</b>
	<b>TOTAL</b>	-	-	<b>£1,650</b>	<b>£1,650</b>	<b>£1,650</b>	<b>£1,650</b>
<b>Benefits</b>	<p>Protection of Built Environment against adverse climatic events.</p> <p>Asset value maintained and enhanced.</p> <p>Business continuity secured.</p> <p>Growth and development protected.</p> <p>Comfort &amp; Wellness for building users.</p>						
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Costs run up to Year 6 (2026/27) only.</li> <li>Flexible PM resource at 10% of total capital cost.</li> <li>Capital funding identified as the remaining budget from the £8 million envelope secured for this Action Area.</li> </ul>						

<b>Task</b>	<b>5 – Appoint specialist resource</b>						
<b>Outcome</b>	Resourcing of Buildings Resilience Specialist						
<b>Responsible officer</b>	Property Project Director						
<b>Description</b>	Recruitment of resilience expertise to form the core of the extended team to lead Tasks identified above, co-ordinate consultancy activity and support departments in the delivery of carbon reduction interventions.						
	To successfully achieve the Task outcomes, it is important that there is organisational reach back to a wider pool of specialisms e.g. architecture, MEP, structural, sustainable materials, etc. to encompass the breadth of expertise required for this action area. Therefore, the procurement approach for this role should reflect that this may not be a specific individual but could be an organisation (or combination of the two).						
<b>Timescales</b>	<b>Year 1</b> – Resourcing of Buildings Resilience Specialist						
	<p><u>Key dependencies</u></p> <p>None.</p>						
<b>Costs</b>		<b>Year</b>					
	<b>Cost - £k</b>	<b>21/22</b>	<b>22/23</b>	<b>23/24</b>	<b>24/25</b>	<b>25/26</b>	<b>26/27</b>
	<i>Project specific consultancy</i>	-	-	-	-	-	-

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	<i>Staff resource (outsourced)</i>	£55	£110	£110	£110	£110	£110
	<b>Resource</b>	<b>£55</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>
	<b>Capital</b>	-	-	-	-	-	-
	<b>TOTAL</b>	<b>£55</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>	<b>£110</b>
<b>Benefits</b>	Enabling action for identifying and managing Tasks above.						
	Coordination and linking of Resilience with Design Standards workstreams. Link and coordinate with other resilience Action Areas e.g. RS2 and RS4.						
<b>Assumptions</b>	<ul style="list-style-type: none"> <li>Assumed average cost of £110k/annum/FTE for this resource level.</li> <li>Resources to start six months into Year 1, hence costs of £55k.</li> </ul>						

## APPENDIX 2 - Typical building resilience measures



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