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SUSTAINABILITY & CONSENTS

CROSSRAIL SUSTAINABILITY STRATEGY

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1 Introduction

As a public infrastructure scheme Crossrail will make a positive contribution to the UK's sustainability objectives by promoting sustainable transport choices and supporting a sustainable pattern of growth in London and the South East. The details of this formed part of the Crossrail business case and are reported in the Crossrail Environmental Statement. These describe what Crossrail will deliver in terms of sustainability.

The purpose of this strategy document is to clearly articulate for the management of Crossrail and other key stakeholders how Crossrail Ltd (CRL) intends to maximise the sustainable delivery and operation of Crossrail, in line with the Sponsors' requirements. The requirements state that delivery shall be consistent with the Government's overall approach to the provision of major transport infrastructure, the Mayor's plans for the development of the capital's infrastructure, be integrated with the Mayor's transport and sustainability strategies, and provide value for money at every stage of the Project.

As a major investment project in the UK, it is to be expected that the delivery of Crossrail will be at the forefront of sustainability best practice, delivering improvements in the economic, social and environmental sustainability of the UK. This strategy has been prepared by CRL to meet that challenge.

This document is structured to cover the following topics:

- a shared understanding of sustainable development;
- a vision of what CRL is seeking to achieve for Crossrail and the guiding principles to achieve it;
- the sustainable development priority areas; and an overview of the portfolio of activity underway;
- the critical success factors to achieve the sustainability goals; and
- A proposed sustainability management framework that will explicitly establish sustainability as an integral part of the programme management.

To deliver this strategy, CRL will work in partnership with many stakeholders, including Network Rail, London Underground, Transport for London, Department for Transport, Canary Wharf Group, Berkeley Homes, and the main programme and project delivery partners procured to deliver Crossrail.

2 Sustainability

Sustainable development is an important theme in society and politics at all levels, and as noted by the Royal Academy of Engineering, increasingly a central theme for the engineering profession.

'Sustainability' and 'sustainable development' are terms that mean different things to different people, but what is clear is that sustainability is a matter of government policy, professional excellence, and individual responsibility. The original high level definition (and the one still most widely used) is "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The three key components of sustainability are social equity (recognising the needs of everyone), maintenance of stable levels of economic growth and employment, and using natural resources prudently, whilst protecting and if possible enhancing the environment.

The UK Government has responded by establishing a strategy for sustainable development which sets out the following key principles:

- Living within environmental limits;
- Ensuring a strong, healthy and just society;
- Achieving a sustainable economy;
- Promoting good governance; and
- Using sound science responsibly.

In addition, there a number of other government policies and objectives of relevance to Crossrail including:

- DfT, Towards a Sustainable Transport System;
- London Sustainable Development Commission, Sustainable Development Framework;
- GLA Climate Change Action Plan
- OGC, Achieving Excellence in Construction Procurement Guide 11: Sustainability;
- Government mandate to complete BREEAM assessments of all new build projects in government estate, with a target of achieving "excellent";
- Government mandate to use Carbon Trust Carbon Management Programme;
- Energy Performance of Buildings Directive (EPBD); and
- 2008 budget announcement of ambition for new public sector buildings to be zero carbon by 2018.

The diagram below presents an overview of some of the leading sustainability categorisations.

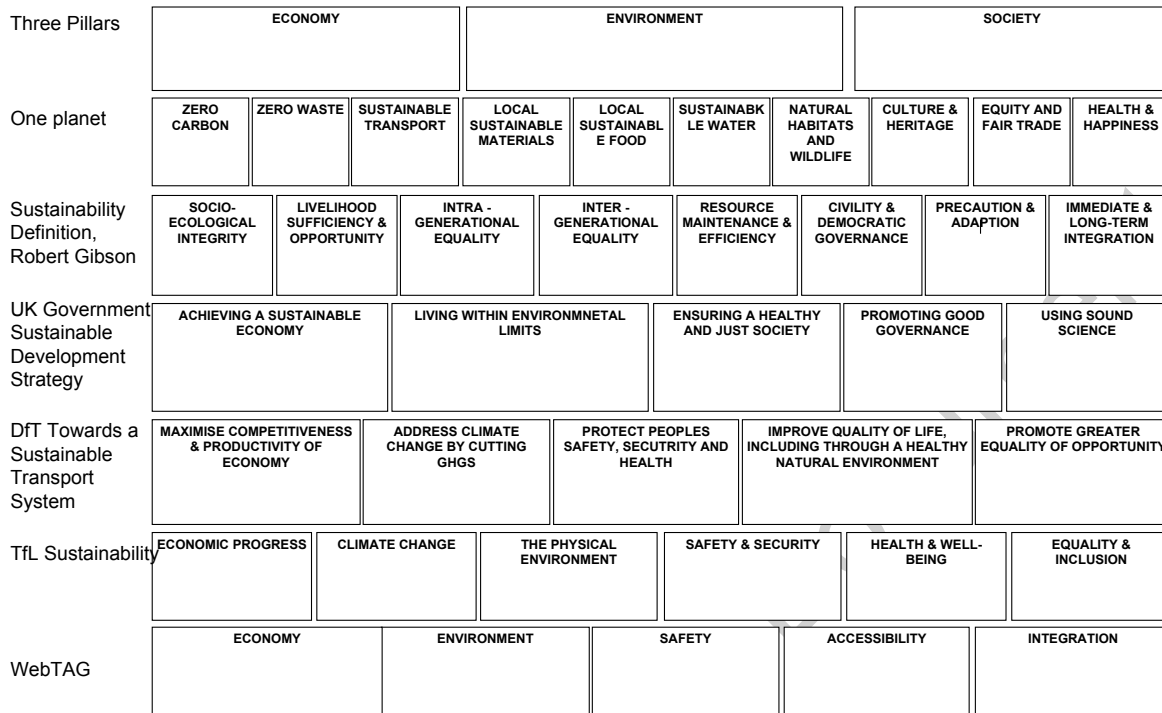


Figure 2: Overview of leading sustainability categorisations

2.1 CRL’s Definition of Sustainability

CRL’s definition of sustainability is inclusive and far-reaching. Seven sustainability themes have been identified based on TfL’s sustainability framework, and worded to also reflect the UK Sustainability Strategy priority areas, and DfT policy. The themes are shown in the diagram below. The principle of “good governance” is to be applied across all seven themes and is developed further in Chapter 4. The principle of “using sound science” is a fundamental foundation of engineering excellence, and hence underpins all aspects of the design and construction.

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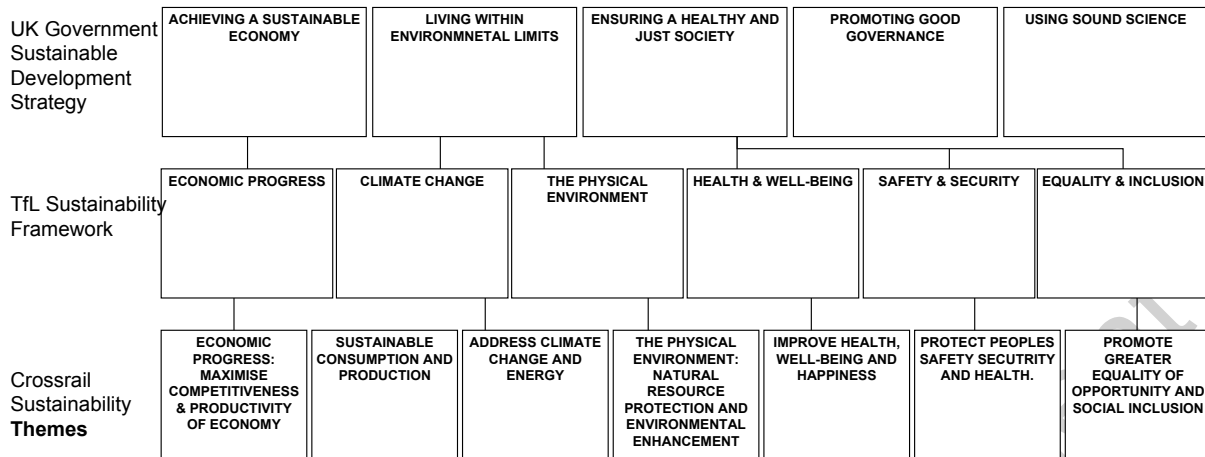


Figure 3: Crossrail sustainability themes and linkage with UK/TfL sustainability development strategy

Six of the Crossrail sustainability themes align closely with those for TfL. The seventh, sustainable consumption and production is also addressed under TfLs themes but has been specifically drawn out for Crossrail to reflect the fact that Crossrail is a massive infrastructure project and the use and final disposal of materials is a particular issue in that context.

There are many elements to each theme and the table below lists these elements and provides further explanation of the theme and the relevance to Crossrail. Several of the elements could be listed under more than one theme however for the sake of simplicity elements have been assigned to the single theme that is considered to best encompass them.

Crossrail Sustainability Themes	Sustainability elements	Description of theme and Crossrail relevance
A. Economic Progress: maximise competitiveness and productivity of economy.	<ul style="list-style-type: none"> • Ensure affordability. • Reduce whole life costs. • Reduced journey time and need to interchange. • More reliable journey. • Improving access. • Reduced crowding and congestion. • Wider economic benefits. • Improve productivity and employment. • Higher earnings. 	<p>Building a strong, stable and sustainable economy which provides prosperity and opportunities for all, and in which environmental and social costs fall on those who incur them (polluter pays), and efficient resource use is incentivised. The objectives are to get good value for money, improve transport economic efficiency for business users, transport providers and consumer users, to improve reliability and to provide wider economic benefits.</p> <p>This theme is core to the creation of Crossrail. Once complete Crossrail will present a more sustainable transport choice and improve the quality of the travelling experience by reducing congestion, shortening journey times and increasing London's accessibility. The new railway will deliver to businesses and individuals significant economic benefit. Economic studies conducted for Crossrail show that when results</p>

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Crossrail Sustainability Themes	Sustainability elements	Description of theme and Crossrail relevance
	<ul style="list-style-type: none"> • Support economic development. • Stable economy. • Delivered within Capital spend funding envelope. • Delivered on schedule. • Realisation of planned Crossrail service. 	<p>are modelled for just one year – 2026 – the annual economic benefit across all of London's boroughs is estimated at £1.24 billion at 2008 prices. Some boroughs in inner London will benefit by more than £60 million a year – including Camden, Greenwich, Lambeth and Newham.</p> <p>During construction, Crossrail will provide significant greater direct and indirect employment with an emphasis on local employment and long term skills enhancement (see Theme G). This is of particular relevance given the current and foreseeable economic climate in the UK.</p> <p>Also during construction, there will inevitably be some disruption and impact on passenger journey time and ambience. A significant mitigation programme will be in place to minimise the net impact.</p>
<p>B. Sustainable consumption and production.</p>	<ul style="list-style-type: none"> • Reduce material requirements. • Reduce waste. • Fate of excavated material. • Reduce usage of non-sustainable products (maximise renewable materials). • Reduce materials movement impacts. 	<p>Sustainable consumption and production is about achieving more with less. This means not only looking at how goods and services are produced, but also the impacts of products and materials across their whole lifecycle and building on people's awareness of social and environmental concerns. Crossrail is a major consumer of resource through its lifetime, most intensively through construction. Also, as a corporate entity, CRL employs hundreds of people, and the programme will at peak provide employment for approximately 14,000, and will therefore be a major consumer of other more typical consumables.</p> <p>Excavated material. One of the key challenges for Crossrail is the amount of excavated material that will be generated by the tunnelling. Crossrail is committed to minimizing the amount generated, reusing it beneficially on the project, and identifying other projects where it can be used e.g. flood protection schemes, land raise projects.</p>
<p>C. Address climate change and energy</p>	<ul style="list-style-type: none"> • Reduce energy consumption. • Greater renewable 	<p>This theme seeks to secure a change in the way we generate and use energy and to significantly reduce the release of greenhouse gases. At the same time we must prepare for the climate</p>

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Crossrail Sustainability Themes	Sustainability elements	Description of theme and Crossrail relevance
	<ul style="list-style-type: none"> energy. • Reduce embodied energy. • Reduce carbon footprint. • Design to accommodate climate change. 	<p>change that cannot now be avoided.</p> <p>Crossrail is a major energy user, through construction (particularly through the operation of tunnel boring machines and associated material transportation) and operation over its lifetime. Also to be considered is the saving of CO₂ per annum through avoided emissions, displaced diesel services and modal shift.</p> <p>As a long term infrastructure asset the design must address the likely impacts of climate change over the likely lifetime of the railway and ensure appropriate adaption or future flexibility is designed in, particularly with regard to water level, flood risk and higher ambient temperature. This will require the application of the outputs of “sound science” where requirements are not already embedded in engineering standards and best practice.</p>
<p>D. The physical environment: natural resource protection and environmental enhancement.</p>	<ul style="list-style-type: none"> • Noise. • Local air quality. • Landscape. • Land use. • Townscape. • Ecology and biodiversity. • Archaeology and cultural heritage (heritage of historic resources). • Water environment. • Nuisance to neighbours. 	<p>Protection of the physical environment forms a central part of the Crossrail sustainability strategy and the design of the underlying engineering solution. Crossrail’s significant environmental impacts occur almost exclusively during construction and consist primarily of increases in noise and vibration and disruption to traffic and transport. The scheme also has the potential to produce significant beneficial impacts on the built environment along the route. The railway design will seek to reduce impacts such as noise and vibration during operation.</p>
<p>E. Improve health, well-being and happiness.</p>	<ul style="list-style-type: none"> • Physical fitness. • Journey ambience. • Residential ambience. • Lack of stress. • Leisure. • Work/life balance. 	<p>There are significant benefits from a healthier and happier population, specific examples include allowing people to get to work in reasonable comfort; minimise noise pollution from transport, promoting health and well-being through transport e.g. cycling and walking.</p> <p>Crossrail will present a sustainable transport choice by providing new cross-London links which avoid or minimise the need for interchanges. The service will improve the quality of the travelling experience to a great extent by reducing congestion, shortening</p>

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Crossrail Sustainability Themes	Sustainability elements	Description of theme and Crossrail relevance
		<p>journey times and increasing London's accessibility through stronger links to international travel.</p>
<p>F. Protect peoples safety, security and health.</p>	<ul style="list-style-type: none"> • Fewer, less severe accidents (Construction and Operation). • Improved Security. • Reduced crime and fear of crime. • Reduce risk of terrorist attack and resilience of system. 	<p>Many tens of thousands of individual workers will be involved in the construction of Crossrail and many millions of passengers will use its services. CRL has the aspiration for Zero Accidents across the project in recognition that their safety, security and health is paramount.</p> <p>The Health & Safety management system containing strategy, policy and procedures will address this requirement, recognising the intrinsically more onerous requirements of sub-surface working. The Tunnelling Y Underground Construction Academy and more general suite of training will play a key role in meeting the goals of this theme.</p> <p>The design will create an environment which maximises safety and security for both passengers and staff, achieved through clear views, clear information, and good lighting, coupled with dependable power, communications, ventilation etc.</p> <p>Public transport users and workers are also concerned about crime and there is at present an enduring terrorist threat to be addressed.</p> <p>The improved transport links and reduced journey times will improve accessibility to hospitals and health related facilities.</p>
<p>G. Promote greater equality of opportunity and social inclusion.</p>	<ul style="list-style-type: none"> • Options value. • Community relations. • Community severance. • Access to transport system. • Fair trade. • Equal opportunities. • Regeneration. • Education and skills. • Local employment. 	<p>The aim is to this theme is to create sustainable communities that embody the principles of sustainable development at the local level and developing opportunities for sustainable employment. This theme covers issues such as enhancing access to key services, goods and employment opportunities for disadvantaged groups, and providing solutions that are suitable for everyone, such that no-one is left out or treated as separate or different.</p> <p>Crossrail will be a major employer and as such offers a significant opportunity to increase employment, the development of sustainable and transferable skills, and the inclusion of local communities and businesses. This is</p>

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Crossrail Sustainability Themes	Sustainability elements	Description of theme and Crossrail relevance
		<p>particularly important given the likely macro-economic climate through the construction phase.</p> <p>The training and education required to meet the significant resource needs of the programme, such as the Tunnelling & Underground Construction Academy will make a major contribution to meeting the goals of this theme.</p>

It is worth noting the relationship between Corporate Social Responsibility (CSR) and sustainability. CSR is a high profile concept, with multiple meanings, often used instead of or as well as sustainability. Its general usage has a focus on corporate self-regulation to adhere to and promote ethical standards and social norms over and above minimum legal requirements in relation to the impact of their activity on communities, consumers, employees and other members of the general public, and integrate such concerns into the general business operations. CRL views CSR as an important subset of the overarching Crossrail sustainability strategy, cutting across many of the themes. CRL has established a dedicated team focused on community relations and communications, working alongside the other CSR activities such as ethical sourcing, local skills and employment, and environmental protection all within the broader sustainability framework.

The following section outlines the approach to delivering against these sustainability themes.

3 Approach

The CRL approach is built around 15 Key Sustainability Initiatives that are designed to deliver the requirements of each sustainability theme and align with the overall vision for CRL sustainability.

3.1 Vision

CRL's vision is that Crossrail will be designed, constructed and operated as far as reasonably practicable, in accordance with the Government's strategy for sustainable development.

CRL seeks a sustainable approach to all aspects of the project lifecycle, optimising opportunities wherever practicable to facilitate economic growth, environmental protection and social progress in the future, recognizing its responsibility to act as a leader and exemplar of sustainable development.

Our approach seeks to meet the expectations of our key stakeholders, demonstrate continuous improvement of the overall sustainability performance of the project, while delivering Crossrail on programme and within the capital spend funding envelope.

3.2 CRL's Sustainable Development Priority Areas

The sustainability elements with highest relevance, impact or difficulty for Crossrail have been individually highlighted and prioritised to form Key Sustainability Initiatives (KSI). These are listed below, categorised by whether they are positives to maximise or negatives to minimise. These represent the minimum set of sustainability objectives.

Key Sustainability Initiative (KSI)	Key Themes	Description
1. Delivery of Crossrail on time/on budget.	Economic progress.	Scheme delivers, on-time and with capital spend within the funding envelope, the planned service frequency / capacity / reliability to enable direct passenger benefits (faster journey time, less congestion) as well as the anticipated wider economic benefits.
2. Minimise whole life cost	Economic Progress.	To minimise whole life costs of the scheme to the Sponsors, including design, procurement, construction, operation, maintenance, renewal, replacement and disposal, and externality costs, within the funding constraints.
3. Minimise resource use.	Sustainable consumption and production &	Sustainable consumption and production is about achieving more with less, and carefully specifying materials to increase

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Key Sustainability Initiative (KSI)	Key Themes	Description
	Address climate change and energy.	recycled and eco-friendly materials, with, for example, reduced embodied energy.
4. Minimise energy use.	Address climate change and energy.	To reduce energy consumption of the working railway, and construction methods. This achieves reduced costs and carbon emissions.
5. Optimise the logistics supply chain.	The physical environment & Address climate change and energy.	To minimise and optimise the movement of materials to and from the construction site, and to maximise the use of rail and water.
6. Minimise environmental impact.	The physical environment.	To ensure the achievement of the Environmental Minimum Requirements and maximise the environmental enhancements where it is practicable to do so. This includes consideration of biodiversity and ecology, water, land, noise, and air. Ensure establishment of a framework to facilitate best practice environmental management of the operational railway.
7. Reuse excavated material.	The physical environment.	To maximise the reuse of excavated material and minimise the impact of the transport to final resting site.
8. Construction health and safety.	Protect people's safety, security and health.	Ensuring that systems are in place to identify hazards and to reduce risk to as low as reasonably practicable for all parties affected during construction. Monitoring consultants and contractors achievement of CRL's requirements for exemplary standards of health and safety performance and management. Reporting to the Crossrail H&S Committee on H&S performance, and reviews of H&S policy and H&S management system.
9. Operational health and safety.	Protect people's safety, security and health.	To minimise the incidence and severity of health and safety incidents during operation of the railway.
10. Local, skilled, employed workforce.	Promote greater equality of opportunity and social inclusion.	To increase the proportion of the workforce that live locally to construction sites and ensure the local businesses

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Key Sustainability Initiative (KSI)	Key Themes	Description
	& Improve health, wellbeing and happiness.	understand the procurement routes and maximise their chances of winning work within the Crossrail supply chain. To ensure the workforce develops new and enhanced skills that are transferable and hence provide opportunities for sustainable employment.
11. Transport integration & access.	Economic Progress & Promote greater equality of opportunity and social inclusion.	To ensure appropriate integration between the Crossrail service and linked modes of transport between the stations and the immediate urban areas, promote green travel, and facilitate regeneration and local economic growth.
12. Art Programme.	Improve health, wellbeing and happiness.	To work with sponsors and artists to deliver an arts programme that is integrated with Crossrail stations.
13. Historic environment.	Improve health, wellbeing and happiness & Physical Environment.	To obtain a better understanding of the prehistory and history of London.
14. Community investment.	Promote greater equality of opportunity and social inclusion. & Improve health, wellbeing and happiness.	To work with and support our communities by contributing to local projects and initiatives to help the disadvantaged and improve wellbeing.
15. Economic opportunities provided by Crossrail.	Economic Progress & Promote greater equality of opportunity and social inclusion.	To ensure that the Crossrail pound is far reaching and is able to promote opportunities for SMEs throughout the UK.

The diagram below completes the picture, with the UK sustainable development goals and the Crossrail sustainability themes realised through the Key Sustainability Initiatives. In addition there are three cross-cutting initiatives the undertaking of which is relevant to the delivery of each of the KSIs.

3.3 Sustainability Governance

To ensure explicit, programme wide direction, oversight, reporting and control of the sustainability related activity so as to deliver the sustainability strategy in as economic, efficient and effective manner as possible.

3.4 Responsible Procurement

To ensure that the procurement process facilitates the realisation of the sustainability themes and KSIs, recognising that ultimately most activity is sub-contracted and in some cases multiple times. Therefore it is essential that procurement is fully aligned and effective throughout the lifecycle of the programme.

3.5 Learning Legacy

To ensure that Crossrail leaves a legacy of a workforce that understands sustainability and is able to take that knowledge onto future projects and endeavours, and to leave a body of knowledge that allows future projects to build on the successes of Crossrail and achieve further levels of sustainable performance.

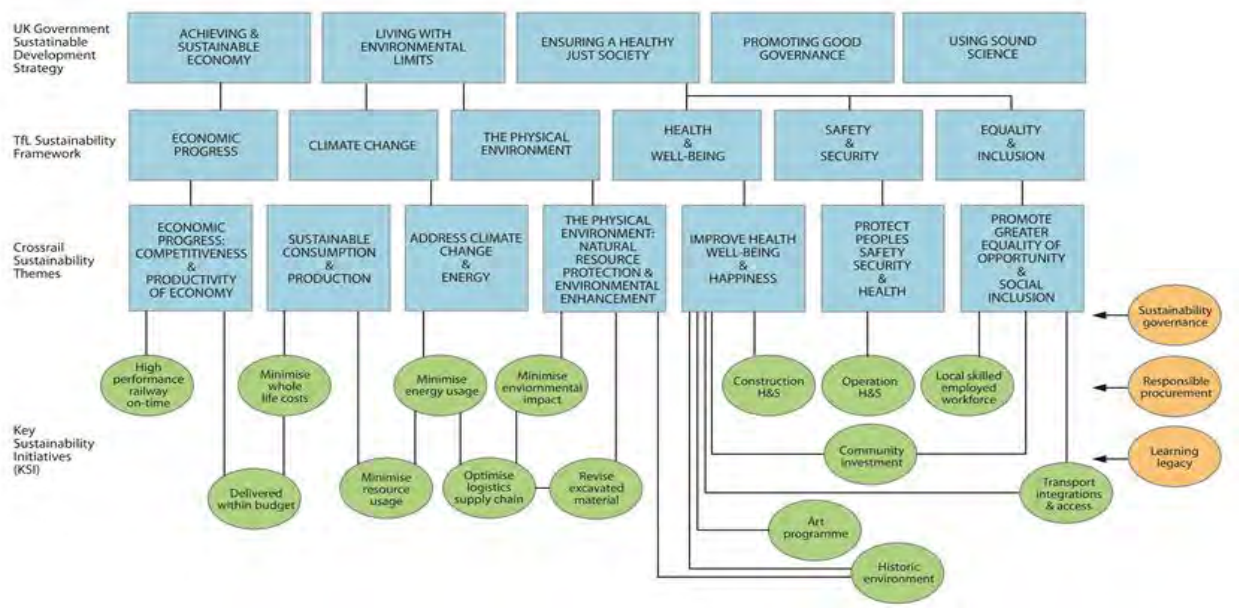


Figure 4: Mapping of Key Sustainability Initiatives with Sustainability Themes

The Key Sustainability Initiatives can also be represented within the “three pillars” model which is widely used to represent the balance between environmental, economic and social aspects of sustainability. This model will be used in Crossrail.

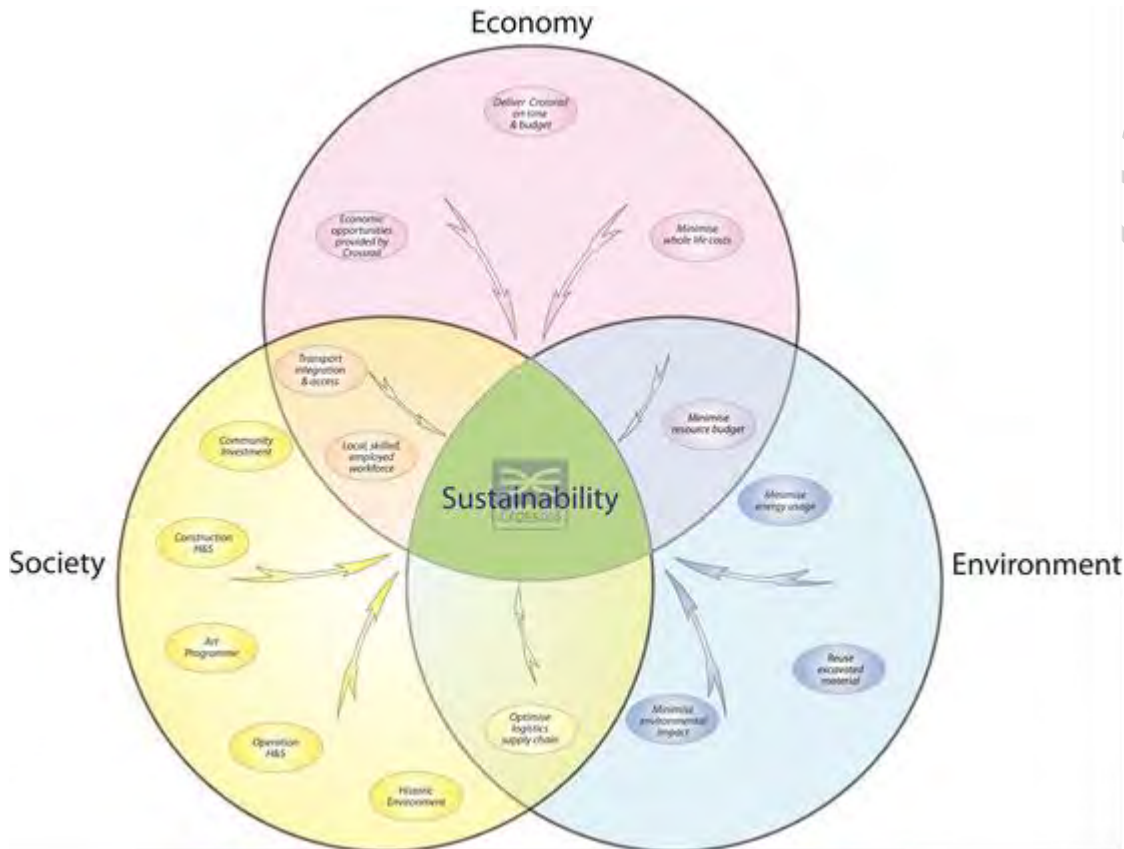


Figure 5. The “three pillars” model depicting the Crossrail Key Sustainability Initiatives

4 Delivery

This section considers the components that must be in place to provide confidence that the Crossrail sustainability strategy is deliverable. They mostly relate to good sustainability governance, and appropriate integration with the overall governance of the Crossrail programme.

4.1 Critical Success Factors

There are several factors that must be in place across all delivery stakeholders to ensure successful realisation of the Key Sustainability Initiatives.

Clarity of Vision	An unequivocal statement, from the Board and ExCom setting out why and how sustainability will be incorporated into the design, construction and operation of Crossrail.
Identification of all activity	<p>Clear line of sight to all on-going and planned activity within the sustainability arena. A clear work breakdown structure. A standardised way to document and report on projects, ensure consistent language across business for describing the portfolio.</p> <p>High quality data on progress, risks, interfaces and interdependencies with the main delivery programme; and clear insightful dashboard reporting of the portfolio status.</p>
Performance Management	To set clear performance indicators and targets within an integrated performance management and reporting system. Ensure accurate, insightful and rapid assessment of performance and progress against plan.
Alignment	Demonstrating a clear consistent alignment of delivery and the Crossrail sustainability strategy. To give insight into completeness, alignment, efficiency and effectiveness of the portfolio of activity. To ensure a benefit focused, not cost focused, portfolio.
Prioritisation of sustainability activity	<p>Sufficient priority to sustainability related activity, particularly if funding and schedule constraints increase. To view sustainability as a core value of the Crossrail programme.</p> <p>Within the portfolio of activity to ensure a clear prioritisation to ensure appropriate resource, and management attention, based on alignment to Programme Objectives, Cost/Benefit, achievability and political and media interest.</p> <p>Also, there needs to be recognition of the diversity of activity, particularly the alignment of the activity to delivery of the project</p>

Awareness & engagement.	performance, safely, on time and to budget, and the extent to which industry best practice and standards have already incorporated sustainability objectives.
Working in effective strategic partnerships	<p>All staff working on the delivery of Crossrail has a role to play in the successful execution of this strategy. Therefore incorporating sustainable development into the ethos and mind-set of all Crossrail staff (including partners) is essential: this to be achieved through a programme of awareness and training.</p> <p>Effective partnering is critical, i.e. a commitment between two or more parties in a collaborative relationship to create value by striving to achieve shared goals and operational benefit through a spirit of mutual trust and openness.</p> <p>This is particularly critical with regard to the Industry and Delivery partners.</p>
Stakeholders	Excellence in stakeholder management – including Sponsors, Industry Partners, Delivery Partners, consultants, contractors, the public, and statutory bodies.
Clarity of organisation	In order to progress the work in the most efficient and effective manner, it is important that roles and responsibilities, priorities and organisational structures are clear and understood.
Budget	To ensure sustainability considerations are integrated into the capital budget, and assessed through whole life costing analysis. To ensure that the staffing required to provide the sustainability oversight and co-ordination is in place.
Integrated portfolio approach	The sustainability activity is spread across all functions, departments, and partners. Whilst fundamentally driven and managed bottom up, there is a necessity to apply a top down approach to ensure visibility, consistency, alignment, appropriate prioritisation and co-ordination of all activity.
Timely Decision Making	It is important that decisions are timely, but considered and integrated.
Integration with programme processes	The sustainability activity, and the related interfaces and interdependencies must be recognised and included in the wider project planning, budgeting, and risk management process, but also managed as an explicit sustainability work stream.
Innovation	The combination of the unique challenges of Crossrail and the increasing expectations of sustainable development, not present to the same degree in historical major infrastructure projects, means that innovation, learning, flexibility and creativity will be key to delivering a strong sustainability performance during design in

particular.

From the above list a number of specific components are addressed in more detail below.

4.2 Integration with existing programme processes and requirements

4.2.1 The Crossrail Environmental Minimum Requirements

Any nominated undertaker for Crossrail must comply with the Crossrail Environmental Minimum Requirements (EMR) which comprise the EMR General Principles; the Crossrail Construction Code (Annex 1 to the EMR); the Crossrail Planning & Heritage Memorandum (Annex 2 to the EMR); the Crossrail Environmental Memorandum (Annex 3 to the EMR); and the Crossrail Register of Undertakings and Assurances. Compliance with the EMR in and of itself ensures that numerous elements within the Crossrail sustainability themes are addressed so as to maximise positives and minimise negatives.

The Environmental Memorandum (EM) requires that the nominated undertaker and any main contractors develop and implement an Environmental Management System (EMS) consistent with the principles of BS EN ISO 14001. In addition, paragraphs 4.4.1 and 4.4.2 of the EM require that the nominated undertaker develop and keep under regular review environmental objectives which address the UK's sustainability agenda (as defined by Appendix 2 to the EM).

As already established earlier in this strategy, there are many themes to sustainability that do not fit under the category of 'Environment' and hence the management of these will lie outside the EMS. However, as also established earlier, CRL's vision recognises that because sustainability is such an all-encompassing concept, every activity within CRL and its partners, from design development, to workforce employment, to procurement, to interaction with local communities, plays a part in the sustainability performance of the delivery of Crossrail. As a consequence, any activities not captured and managed under the EMS will be managed under the overarching Crossrail Management System.

4.3 Crossrail Management System

CRL recognises that to advance Crossrail's sustainability vision requires a robust management approach, ensuring sustainability is core to the decision making processes. This will be achieved through the general Programme management and control processes, underpinned by the Crossrail Management System. This will ensure the sustainability themes, key initiatives and elements are built into the management of the Programme as well as the individual projects. This includes integration into:

- Project appraisal
- Activity planning and scheduling
- Budget management

- Risk management
- Benefits management
- Procurement management
- Commercial management
- Change control

This allows sustainability to be considered as a fundamental starting point rather than as a retrospective bolt-on. The design which underpinned the hybrid Bill deposited in February 2005 was accompanied by a detailed Estimate of Expense. Since that time the design has progressed up to Detailed Design and there have been a number of budget reviews run in tandem that have underpinned the final agreed capital spend funding envelope and profile. To date CRL has been intrinsic to the development of the design and the definition of the spend profile to deliver the Crossrail Programme. CRL monitors changes to the design through the Change Control Procedure to ensure any variances are identified and understood. As the delivery of Crossrail moves into detailed design and construction, in conjunction with procured and industry partners, the role of CRL will shift to one of requirements setting, assurance, quality and compliance checking.

There will be a comprehensive assurance framework in place, built to provide a layered approach to assurance. This will incorporate, as one focus area, assurance of the delivery of sustainability objectives. The fundamental approach is the application of sustainability best practice. The next layer is one of internal assurance, empowered to challenge and support the programme, identify lessons learned, share best practice, and identify shortfalls. The next layer will be Sponsor assurance from the Joint Sponsor Team and the Project Representative. The final layer will be external assurance, performed by the OGC and others.

4.4 Integrated Management Approach

Due to the cross functional nature of sustainability CRL will use a portfolio approach to the management of sustainability, seeking to continually identify, assess and manage the individual sustainability initiatives and projects, with the purpose of aligning activity to the Crossrail sustainability themes. This will require top management commitment, the setting of clear objectives and action plans, and rigorous and transparent monitoring and control.

What this seeks to do is to draw all those diverse activities and plans together so that the results can be monitored as a cohesive whole. This will be achieved by assigning responsibility for the realisation of each of the Crossrail Sustainability Themes to members of the CRL Executive under the overall direction of the CEO. The Executive & Investment Committee will then ensure that each CRL department is either given or required to identify specific sustainability objectives and targets as part of the annual business plan, develop action plans with clear milestone deliverables and assigned responsibilities to achieve them, and report on progress over the year against them.

The Executive & Investment Committee will in turn report on performance to the Crossrail Board. At the individual level, where appropriate, objectives will be established under the Crossrail Performance Review process and reflect departmental objectives.

The proposed organisational structure to achieve this is elaborated further in the following section.

4.5 Organisation

When it transitioned into an integrated delivery organisation CRL strengthened its governance and management organisational arrangements, and established within it a sustainability organisational framework:

1. Sustainability has explicitly been added to the terms of reference of a Board Committee (the Sustainability Committee) which meets every 8 weeks and is chaired by the CEO.
2. A reporting mechanism in the form of sustainability dashboards that report on sustainability performance across the Programme has been established. The dashboards are reviewed at the Sustainability Committee.
3. A Sustainability Co-ordination Group (SCG) performs the function of a forum for the exchange of information on corporate and programme sustainability activity.
4. Sustainability assurance has been incorporated into the overall programme assurance framework.
5. A specific role, the Sustainability Manager, oversees and co-ordinates the thread of sustainability activity across the programme, supporting the operation of the Sustainability Committee and SCG, and provides a single point of contact.
6. The facility for independent verification of design sustainability has been established through the appointment of Crossrail expert panels, such as the CABE design review panel and the adoption of CEEQUAL and BREEAM certification processes. This will be supplemented by independent peer reviews on particular topics should the need arise.
7. A Responsible Procurement Working Group established and acted as a key enabler of many of the sustainability principles and objectives outlined in this strategy document. The group has since been subsumed within the Sustainability Committee.
8. The overall organisational structure for Crossrail is shown diagrammatically below

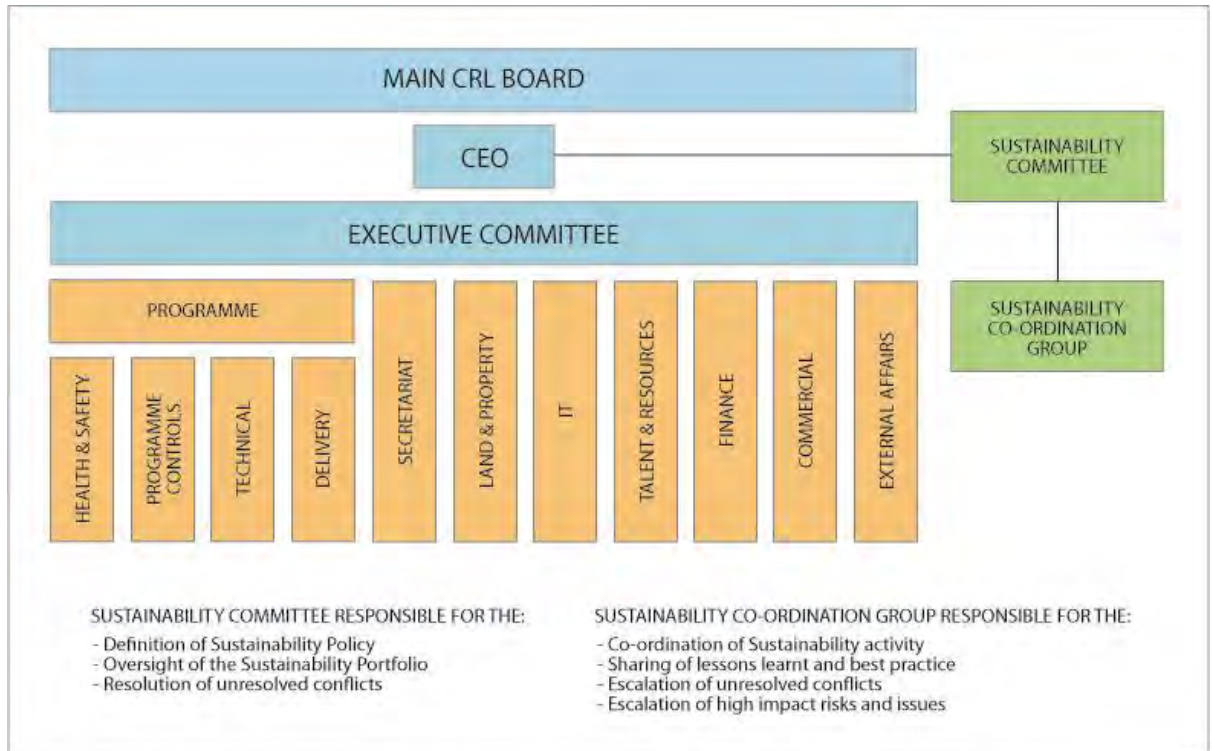


Figure 6: Key sustainability organisational elements

4.6 Sustainability Committee

The Sustainability Committee is a Board Committee that meets to discuss relevant matters and make decisions in accordance with its level of delegated authority. It is chaired by the CEO and membership includes the Finance Director, Programme Director, Procurement Director, 2 Non-Executive Directors, Central Section Delivery Director, Technical Director and Talent & Resources Director. The Chairman also attends by invitation. The Committee provides overall governance of the portfolio, promotes achievement of the sustainability objectives, and supports cross project sustainability initiatives and those responsible for carrying them out (champions), providing oversight, guidance and escalation routes if required. The Committee reports to the Crossrail Board. Membership of the Committee comprises, as a minimum, those members of the Executive Committee responsible for realising the Crossrail Sustainability Themes but also reflects the functions and organisations most involved, and the individuals ultimately responsible for, delivery of the sustainability objectives. The Committee meets every 8 weeks. In addition, every year as a minimum, it reviews the overall sustainability governance and performance to-date, and confirms the establishment of the sustainability critical success factors detailed above. Information is

exchanged with the Crossrail Health & Safety Committee (there being some overlap in membership) and the TfL Corporate sustainability group.

Its role can be summarised as testing the Portfolio of activity to confirm:

- Completeness (Omission). Are we doing the right things, and enough of the right things to achieve realisation of the Crossrail Sustainability Themes?
- Efficiency (Duplication and alignment). Are we doing things the right way?
- Effectiveness (fit-for-purpose). Are we getting the benefits? Are we getting things done well?

External speakers from other organisations are invited to give presentations on sustainable development matters.

4.7 The Health & Safety Committee

The Health & Safety Committee has been established as also a Board Committee meeting to discuss relevant matter and make decisions in accordance with its delegated authority. It is chaired by the CEO and membership consists of the Health and Safety Director, a Non-Executive Director, Central Section Delivery Director, Programme Director and the Talent and Resource Director. This Committee is the relevant forum for providing the direction and overview of the performance of delivery against the theme 'Protect Peoples' Safety, Security & Health'.

4.8 Executive & Investment Committee

The Executive and Investment Committee is a Board Committee and considers matters relating to the day-to-day management of Crossrail, as well as endorsing certain papers to be sent to the Board. It is chaired by the CEO and membership consists of the Finance Director, Commercial Director, Legal Services Director, Health & Safety Director, Programme Director, Technical Director, Talent & Resources Director and Operations Director. Amongst other matters performance against cost and schedule are considered by this Committee.

It is through these three Board Committees, all chaired by the CEO and attended by common membership to greater and lesser amounts, that performance against all the KSIs is monitored.

4.9 Sustainability Coordination Group

The Sustainability Co-ordination Group (SCG) is a forum for the exchange of information within CRL on the sustainability activities currently underway. Membership is cross-departmental and comprises a mix of individuals either carrying out actions to support the achievement of the Crossrail Sustainability Themes (establishing fundamental programmes) and those who will be required to operate under or manage delivery of elements of Crossrail under those programmes. The purpose of this group is

to ensure a broad understanding of the sustainability activities, develop KSI, report and deliver against indicators, authorship of Crossrail's Annual Sustainability Report, ensure the necessary co-ordination is in place, debate issues, risks and decisions made, with the option to escalate to the Sustainability Committee if necessary or appropriate. This group not only promotes the dissemination of information on sustainability at the broadest level, but also encourages the exchange of ideas and facilitates interfaces between departments.

4.10 Decision Making

Given the broad scope of sustainability, many design and delivery decisions will often incorporate a tension between various elements in the sustainability framework. For example, maximising beneficial re-use of excavated material, while resulting in decreased landfill costs and the retention of scarce landfill space, may result in greater carbon dioxide emissions as it is transported further to reuse sites. CRL has already had to make similar such decision in relation to the planning of Crossrail and will continue to employ decision making tools for option selection to ensure a balanced solution that considers all elements in the sustainability framework, and helps ensure that no one element systematically suffers.

Given the changing nature of sustainability expectation and best practice from the public, government, regulators, standards bodies and other public bodies, there will at times be significant uncertainty on the exact requirements. Where possible, subject to the other constraints, the precautionary principle will be applied, i.e. to apply a more sustainable interpretation or expectation to the design process.

A particular focus will be made on the initiatives and work packages outside the scope of the direct delivery organisation, i.e. across Legal, Commercial, Talent & Resources, Information Technology, External Affairs and Land & Property. A core principle of the design process in Crossrail will be to take into account the full lifecycle of the scheme through construction, operation, maintenance and renewal. A key element of this will be the application of life cycle and whole life costing techniques.

5 Appendices

5.1 APPENDIX A: LONDON SUSTAINABLE DEVELOPMENT FRAMEWORK

The Crossrail statement of objectives within the Sponsor Requirements state that Crossrail should support the transport, planning, social and environmental objectives contained within the Mayor's Strategies for London.

The following London Mayor strategies and policies have been identified by the Crossrail commissioned report Sustainability Design Advice as applicable to the Crossrail project:

- London Plan 2004 and Further Alterations to the London Plan 2006
- Air Quality Strategy 2002
- Biodiversity Strategy 2002
- Energy Strategy 2004
- Ambient Noise Strategy 2004
- Municipal Waste Strategy 2003
- Climate Change Action Plan 2007
- Transport Strategy 2001
- TfL Transport 2025
- Older People Strategy 2006
- Children and Young Peoples Strategy 2004
- Sustainable Design & Construction – The London Plan Supplementary Guidance 2006
- Green Procurement Code 2001
- Disability Equality Scheme 2005
- Gender Equality Scheme 2003
- Race Equality Scheme 2005
- Faith Equality Scheme 2005