Appendix C Adaptive Pathways







2020 2030 2040

2020-2080



Mainstream climate resilience into City Corporation **IIII** governance and decision-making

2020-2080

虛 Review and expand data collection and monitoring across all properties to support decision-making

2020-2080



2020-2080

Public communications and ΙΠΙ awareness raising campaigns

2020-2080



2020-2080



Embed principles of inclusion and equity throughout all climate action strategies

2020-2080

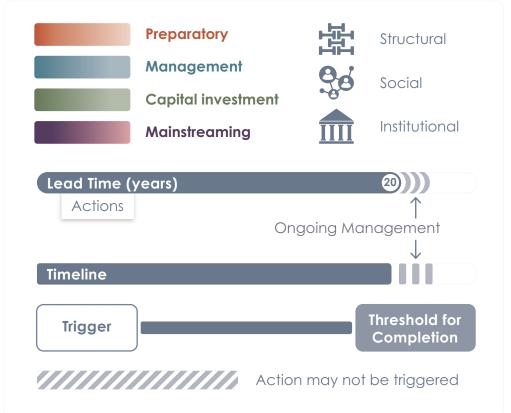


Develop financial package and programme to manage resilience actions

ADAPTIVE PATHWAYS

Cross cutting





Ongoing Measures

2050	2060	2070	2080

Period of Implementation/Update

Integrate throughout planning, regulation, decision-making and governance, updating with UK Committee on Climate Change Risk Assessment cycles

Period of Implementation/Update

Integrate with asset management regimes for City Corporation owned property, and engage business and resident forums for other properties

Period of Implementation/Update

Support community initiatives, small business and resident networks. Utilise and build upon existing networks and partnerships. Rolling five year programme and annual delivery plan.

Period of Implementation/Update

Integrate with existing communication platforms and networks. Develop new platforms as necessary. Support and coordinate with others.

Period of Implementation/Update

Review, refine and develop existing plans. Strengthen position and relationships with key partners.

Period of Implementation/Update

Mainstream under internal protocol

Period of Implementation/Update

Develop a robust and diverse financing portfolio. Continuous management, impact assessment and refinement.



2020 2030 2040

2020-2023



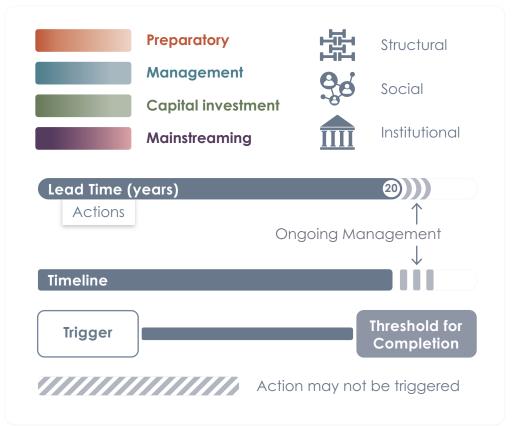
Review of above and below ground **IIII** space utilisation in the Square Mile

ADAPTIVE PATHWAYS

Cross cutting

BURO HAPPOLD







2020-2024 B

Expand use and availability of Expand use and availability of non-sensitive data for decision support/plan implementation.





Strengthen City Corporation skills and capabilities

Preparatory Measures

Lead Time

Years 0-1.5

Analysis of current space utilisation and feasibility: stakeholder engagement.

3 Year 1.5-3 Possible adaptive re-use planning of opportunity areas

Years 0-1

Review current public/private data: identify stakeholder needs.

Year 1-3

identified.

Collaborate with partners and data holders (internal and external) to establish new dataset strategy.

Year 3-4

(4)

Build, test and refine platforms.

Years 0-1

Critically review capacity and existing skill base in relation to the strategy.

Year 1-2.5



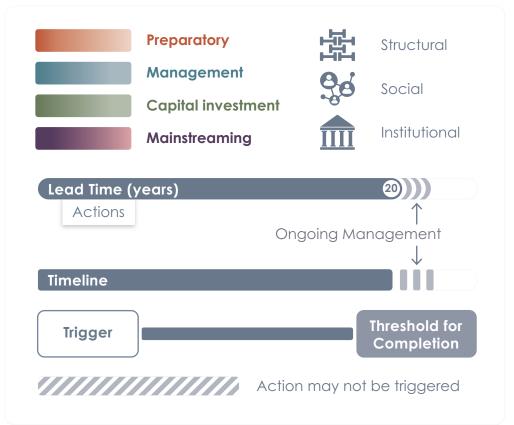
Define a programme of skills sharing, learning and development, and where necessary hiring.



ADAPTIVE PATHWAYS

Flooding





0			
2020	2030	2040	
2020-2080			

Flood defence assets maintenance and management regimes

2020-2080

Continue to fund flood modelling, which include SUDs and other mitigation strategies, to complement EA flood models

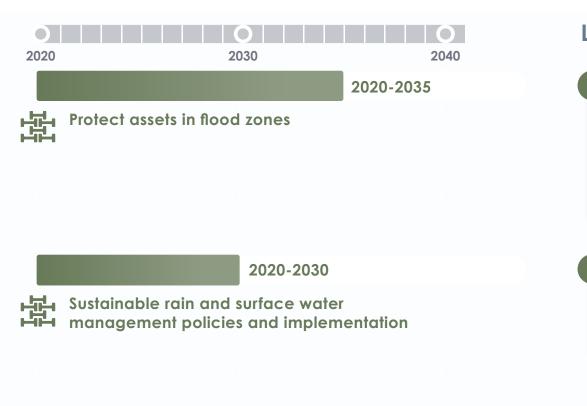
2020-2080



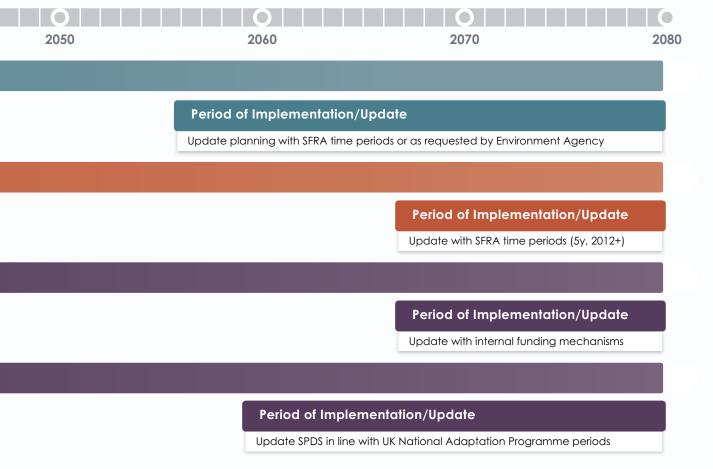
Introduce retrofit support, funds and prioritisation for vulnerable residents and those in affordable housing

2020-2080

Strengthen resilience requirements for planning



Ongoing Measures



Preparatory Measures

Lead Time

Year 0 - 1	Year 1 - 3	Year 2 - 15	
Review floodplain areas. Identify key assets and owners and associated flood risk. Engage	Develop implementation strategy with stakeholders, production of	Early implementation focused on City Corporation owned, critical and sensitive infrastructure	Work with asset owners and business forums to embed guidance in refurbishment cycles and planning Year 3-6
Environment Agency and key stakeholders	guidance	Year 2-15	Implementation programme beginning with critical infrastructure Year 3-15

Year 0 - 1

Review progress of SUDs work. Review opportunities and barriers. Revise guidance and approaches.

Year 1 - 3

Design period for corporation-run SUDs expansion

Asset owner and developer engagement

Evidence base development: policy amendments

Year 3 - 10

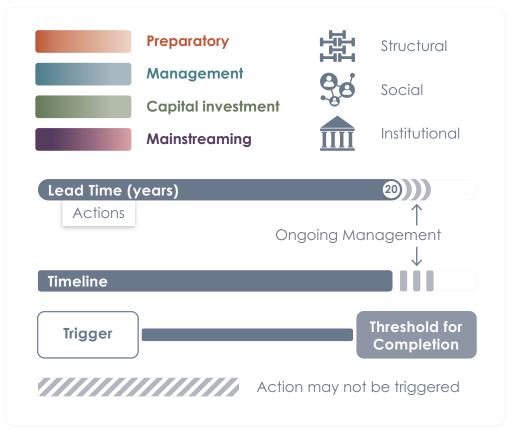
Construction and implementation: ongoing monitoring of effectiveness: ongoing support to private SUDs scheme operators 10



ADAPTIVE PATHWAYS

Flooding





2020		2030	2040	
	ood risk dy in place	Building retrofit programme		
\bigcirc	2020-2040			
	Year 0 - 1.5	Years 1.5-3	Years 3 - 20 20	
	Launch retrofit declaration with asset owners	Utilise business network to disseminate guidance, embed in maintenance programmes and identify	Owners roll out retro-fits, with City Corporation implementing early action on owned assets	Thc fror Floo
	Production of retrofit guidance (technical and financial)	early opportunities		_
flood-r energy alread	N indicates elated risks to y supplies are dy significant d probable	regional organisa	ources and partner with tions and utility providers power for critical servic	

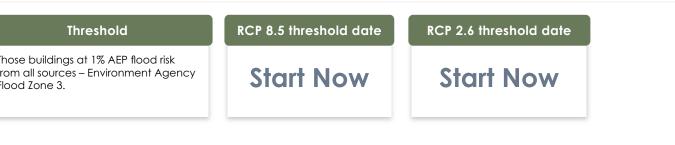
2020-2040

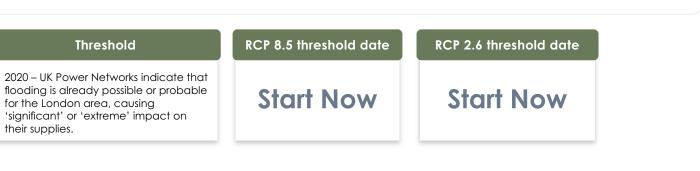
Year 0 - 1.5	Years 1.5-3	Years 3 - 20 20
Engage relevant nfrastructure providers: critical assessment of energy network vulnerabilities	Plan replacement and upgrade regime or engage with utilities to develop programme	Support installation of back-up and short term changes e.g. renewables and generators Year 3-8 Begin implementation period: support 3rd party and utility
		upgrades with resident and property liaison and communication etc



Adaptive Measures









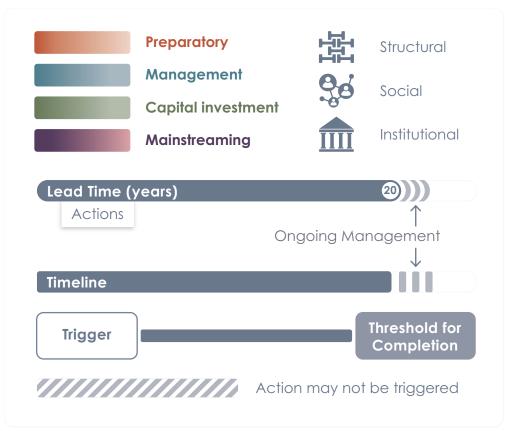
CP 2.6 threshold date	Year 1-2	Years 2-4	Years 4 - 15
	Review floodplain areas and highlight potential sacrificial	Establish evidence base and revise planning	Implementation period for insurance
2070	070 potential sacrificial areas and zoning, in collaboration with key stakeholders.	requirements. Develop implementation programme. Create and disseminate.	Implementation period for sacrificial areas and physical redevelopments
			Development of contingency plans.



ADAPTIVE PATHWAYS

Overheating





2020	2030	2040	
2020-2080			
Climate-ro programn	eady, fortified public he nes	alth	

2020-2080

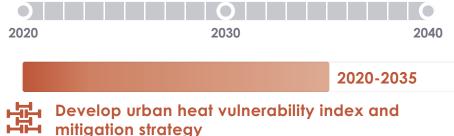


Introduce retrofit support, funds and prioritisation for vulnerable residents and those in affordable housing

2020-2080

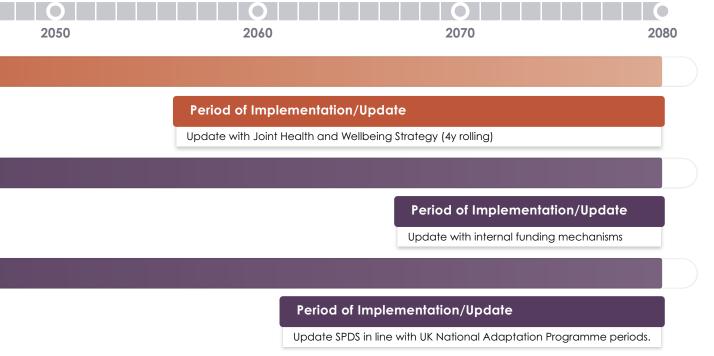


Strengthen resilience requirements for planning



mitigation strategy





Preparatory Measures

Lead Time

Year 0 - 1	Year 1 - 3	Year 2 - 15	3
Project set-up: identify partners and objectives	Develop vulnerability index	Embed vulnerability index in all decision making	



—

26°C Tmax weekly overheating criteria surpassed 2020-2040 WAYS Year 0 - 1.5 Years 1.5-3

2020

Launch retrofit declaration with asset owners Production of retrofit guidance (technical and financial)

Years 1.5-3 Utilise business network to disseminate guidance, embed in maintenance programmes and identify early opportunities

Building retrofit

2030

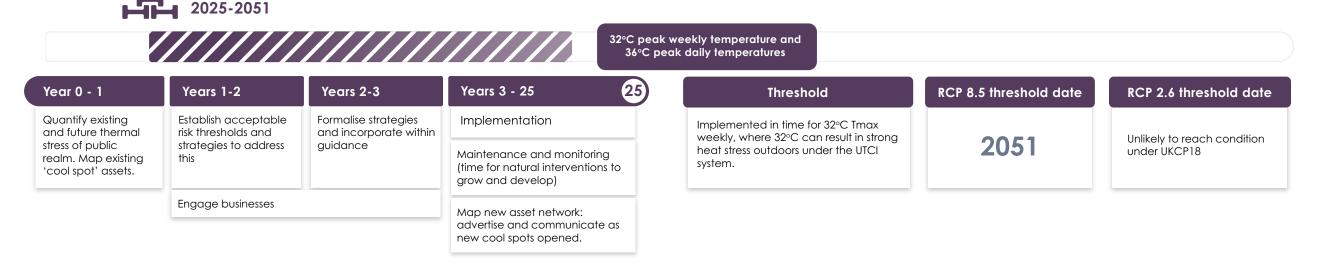
Years 3 - 20 Owners roll out retro-fits, with City Corporation implementing early action on owned assets

2040





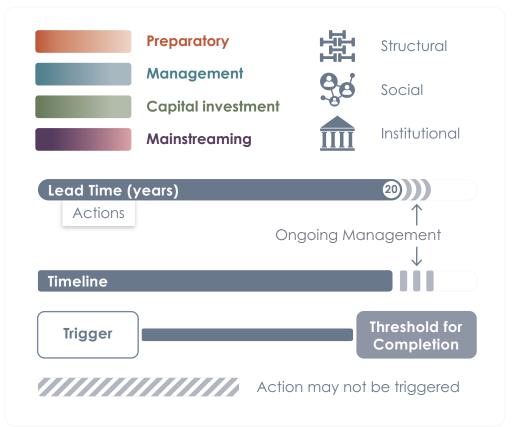
Support installation of
back-up and short term changes e.g. renewables and generators Year 3-8
Begin implementation period: support 3rd party and utility upgrades with resident and property liaison and communication etc Year 3-20



ADAPTIVE PATHWAYS







Adaptive Measures







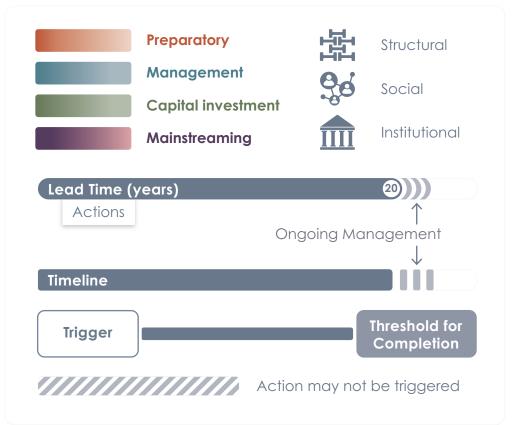




ADAPTIVE PATHWAYS

Overheating







虛 Heat resilient public realm and highway surfaces

2020-2040

Year 0 - 1.5	Years 1.5-3	Years 3 - 20 20
Engage Highways England or relevant partners. Assess age and typologies of	Plan replacement and upgrade regime.	Begin implementation period (likely following accelerated replacement schedule to minimise embodied energy of scheme (as
roads and associated vulnerability.	Review of best available technologies.	opposed to replacing structurally sound roads)): continuous review of technological and material opportunities.



Increase the quality and provision of green space and coverage in the Square Mile and wider City Corporation spaces 2030-2051

Year 0 - 2	Years 2-4	Years 4 + 25
Stakeholder engagement. Biodiversity pledges.	Pilot studies. Review and refine zoning and planning requirements. Updates	Implementation: continuous monitoring and management.
Design and study period: establish level of greening required, identify opportunity areas, define pathways.	to relevant SPDs.	

Adaptive Measures



Threshold	RCP 8.5 threshold date	RCP 2.6 threshold date
Implemented in time for 33°C Tmax daily, at which point the London Climate Change Partnership notes that tarmac roads begin to melt.	Start Now	Start Now





2020

2030

2020-2080



Introduce retrofit support, funds and prioritisation for vulnerable residents and those in affordable housing

2040

2020-2080



Strengthen resilience requirements for planning



2020-2030

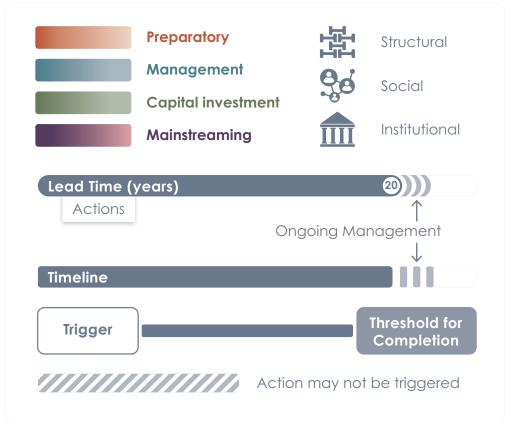
Sustainable rain and surface water management policies and implementation Sustainable rain and surface water



ADAPTIVE PATHWAYS

Water stress





Ongoing Measures



Period of Implementation/Update

Update with internal funding mechanisms

Period of Implementation/Update

Update SPDs in line with UK National Adaptation Programme periods

Preparatory Measures

Lead Time

Year 0 - 1	Year 1 - 3	Year 3 - 10	10
Review progress of SUDs work. Review opportunities and barriers. Revise guidance and	Design period for corporation-run SUDs expansion	Construction and implementation: ongoing monitoring of effectiveness:	
approaches.	Asset owner and developer engagement	ongoing support to private SUDs scheme operators	
	Evidence base development: policy amendments		
Year 0-1	Year 1-2	Year 2-3	3
Review systems and best practice, refine approach.	Training and pilot studies	Full roll-out	

Year 0-2	Year 2 - 3	Year 3 - 5	5
Develop footprint and prepare management strategy with Thames Water and other stakeholders.	Stakeholder engagement and strategy test	Develop final strategy and prepare relevant guidance, programming and communications for implementation	+ potential for 10 year Infrastructure interventions as a result



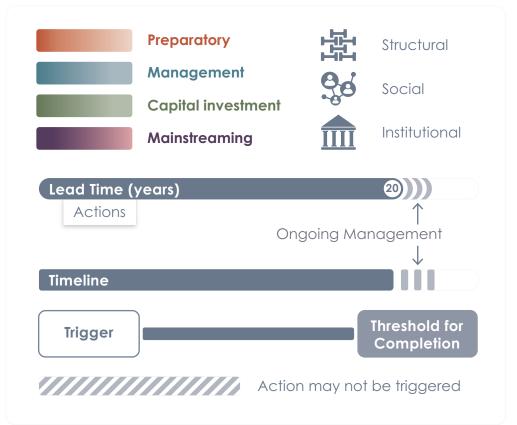


ADAPTIVE PATHWAYS

Water stress

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	Building retrofit programme -2040	
Year 0 - 1.5	Years 1.5-3	Years 3 - 20
Launch retrofit declaration with asset owners	Utilise business network to disseminate guidance, embed in maintenance programmes and identify	Owners roll out retro with City Corporatio implementing early on owned assets
Production of retrofit guidance (technical and financial)	early opportunities	

Threshold	RCP 8.5 threshold date	RCP 2.6 threshold
As an indicative scenario, the CCC reports that the UK would be in Mediterranean conditions where: Jan Tmean > 7°C; July Tmean >22°C Source: CCC, 2017. Climate Change Risk Assessment Evidence Report, Chapter 3	2071	Unlikely to reach condi under UKCP18

Adaptive Measures





ro-fits, tion / action

Threshold

Use water footprint management strategy results to align with Thames Water per capita preferred targets (Source: Thames Water, 2018. WRMP, table 11-6).

RCP 8.5 threshold date

Threshold not dependant on emissions scenarios

RCP 2.6 threshold date

Threshold not dependant on emissions scenarios

Introduce climate-resistant and adaptive landscaping Π 2051-2071 2071 conditions for Mediterranean planting

date

dition

Design and study period to inform future species selection and strategies.

Year 0-1

Years 1-3

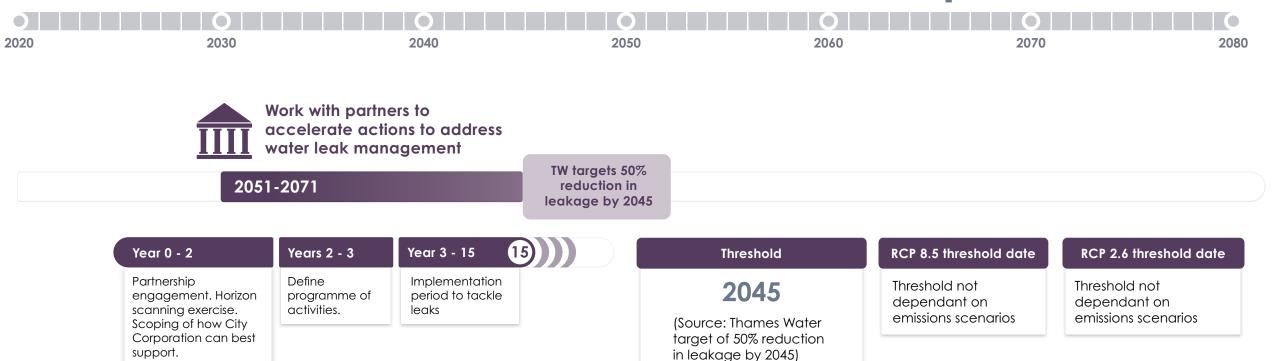
Planning implementation programme. Pilot studies. Stakeholder engagement. Produce landscaping design guidelines and revise relevant SPDs.

Implementation: communication:

Year 3 (onwards) 20

monitoring





ADAPTIVE PATHWAYS

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	Preparatory Management Capital investment Mainstreaming	述 Solo	Structural Social Institutional
Lead Time (Actions Timeline		Ongoing Mc	20))) ↑ Inagement
Trigger	Ac	tion may no	Threshold for Completion

Year 0 - 2	Years 2 - 3	Year 3 - 15 15
Partnership engagement. Horizon scanning exercise. Scoping of how City Corporation can best	Define programme of activities.	Implementation period to tackle leaks
support.		

Π

Diversify energy sources and partner with regional organisations and utility providers to increase back-up power for critical services. 2051-2071

Design based on results of water footprint

Year 0 - 1.5	Years 1.5-3	Years 3 - 20 20
Engage relevant infrastructure providers: critical assessment of energy network vulnerabilities	Plan replacement and upgrade regime or engage with utilities to develop programme	Support installation of back-up and short term changes e.g. renewables and generators Year 3-8
		Begin implementation period: support 3rd party and utility upgrades with resident and property liaison and communication etc

Adaptive Measures



Threshold

Review future risk assessment guidance – this will depend on the future energy mix, with some scenarios resulting in severe water stress as early as 2030 according to Byers et al. (2016).

RCP 8.5 threshold date

RCP 2.6 threshold date

The energy mix pursued in the UK after the 2030s will determine abstraction limitations, rather than the emissions scenario itself e.g. the UK could decarbonise without decrease in global emissions. As such this measure is adaptive to UK energy policy, not emissions. See Byers et al.2016.

Byers, E. Hall, J. Amezaga, J. (2014). Electricity generation and cooling water use: UK pathways to 2050. Global Environmental Change. Volume 25. Pages 16-30. Available online



2020 2030 2040 2020-2080

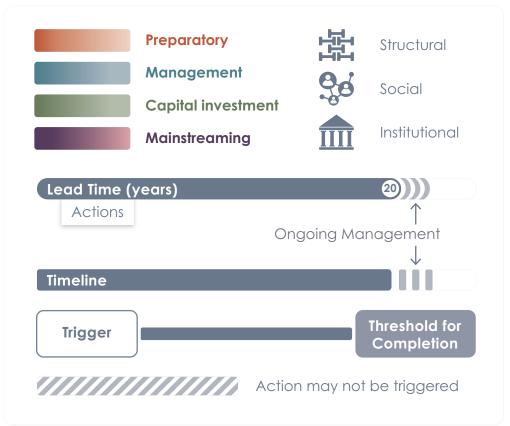


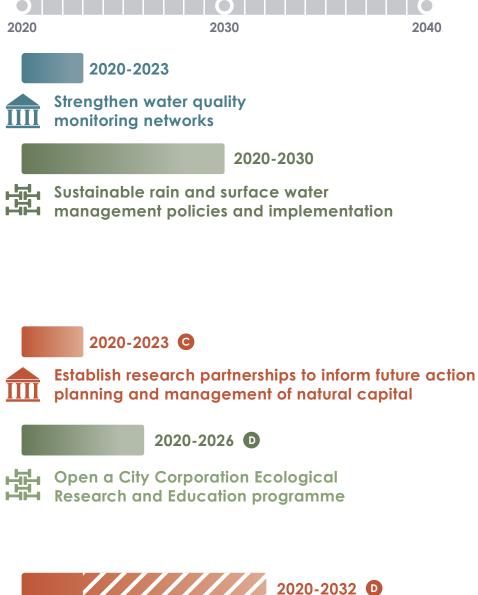
Enhanced monitoring, surveying **IIII** and tracking of ecosystem health

ADAPTIVE PATHWAYS

Natural Capital









to promote regional food production

Ongoing Measures



Period of Implementation/Update

As per Biodiversity Action Plan periods

Preparatory Measures

Lead Time

Year 0-1	Year 1-2	Year 2	2-3
Review systems and best practice, refine approach.	Training and pilot s		
Year 0-1	Years 1-3	Year	s 3-10
Review progress of SUDs work. Review opportunities and parriers. Revise guidance and	Design period for corporation-run SU	Ds expansion imple	truction and mentation: ongoing toring of effectiveness:
pproaches.	Asset owner and c engagement		ing support to private scheme operators
	Evidence base de policy amendmen		
Year 0-1	Years 1-3		
ngage partners. Scope articular areas of study.	Establish research partnerships. Undertake research / develop evidence base/. Disseminate and embed findings throughout City Corporation.		
'ears 0-2	Years 2-6		
entify partners and establish v evelop pilot projects. Embed t			opportunities and barrier
entify possible research entre partners. Establish and st business case.	Construction. Desigence of the second structure of the second structure of the structure of the second	gn of content and progrc egy.	immes. Public
Years 0-2	Year 2-3	Year 3-4	Year 4-5
istablish project scope and objectives. Engage key takeholders and partners. ecure funding. Undertake preliminary research and	Synthesise results of studies + carry out research into local growing options	Consider feasibility and suitability, develop potential programmes and partners	Final decision on pursuit of growing strategy and programme



2020	2030	2040
	Increase the quality and	provision of green

....

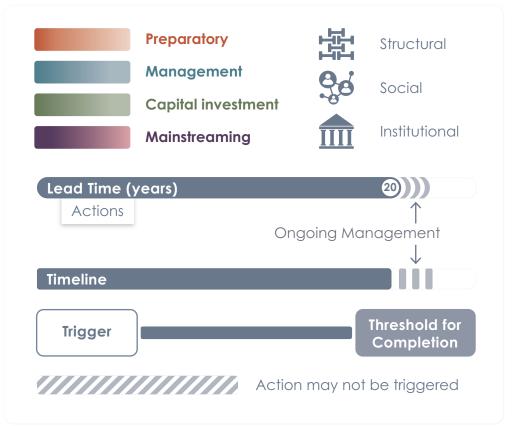
2023-2053

space and coverage in the Square Mile and wider City Corporation spaces

ADAPTIVE PATHWAYS

Natural Capital





Years 0-2	Years 2-4	Years 4 (onwards) 20
Stakeholder engagement. Biodiversity pledges.	Pilot studies. Review and refine zoning and planning	Implementation: continuous monitoring and management.
Design and study period: establish level of greening required, identify opportunity areas, define pathways.	requirements. Updates to relevant SPDs.	

Threshold	RCP 8.5 threshold date	RCP 2.6 threshold date	Year 0-1	Years 1-3	Year 3 (onwards) 20
an indicative scenario, the CCC ports that the UK would be in editerranean conditions where: In Tmean > 7°C; Imean >22°C Urce: CCC, 2017. Climate ange Risk Assessment Evidence port, Chapter 3	2071	N/A Condition not reached within C2100 on 50 th percentile projection	Design and study period to inform future species selection and strategies.	Planning implementation programme. Pilot studies. Stakeholder engagement. Produce landscaping design guidelines and revise relevant SPDs.	Implementation: communication: monitoring
literranean conditions where: Tmean > 7°C; Tmean >22°C ce: CCC, 2017. Climate nge Risk Assessment Evidence	2071	within C2100 on 50 th		engagement. Produce landscaping o guidelines and	lesign

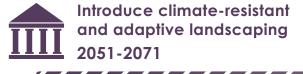






2043 Defra 25y plan target deadline

Threshold	RCP 8.5 threshold date	RCP 2.6 threshold date
2043		
Update as per targets: currently 10% tree canopy increase by 2050 [GLA], and Defra 25y Environment Plan targets by 2043 (e.g. restore 75% of protected sites to favourable condition and improve overall status of declining species group)	Biodiversity targets remain regardless of emissions scenario	Biodiversity targets remain regardless of emissions scenario





2071 conditions for Mediterranean planting

32°C peak weekly temperature and 36°C peak daily temperatures

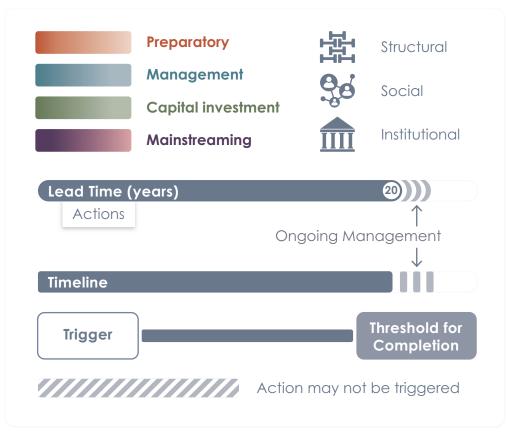


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ADAPTIVE PATHWAYS

Food





2020	2030	2040	2050		2060		2070	
2020-2	2080							
	tion to tackle food poverty			Peri	od of Implementatic	on/Update		
				As pe	er Corporation funding cy	cles		
2020-2	2080							
Por	ts and markets operational resilience plan	ning			Period c	of Implementat	ion/Update	
Ū.					Update gu	vidance and aims	in line with CCC UK ri	sk assessment advi
2020	O 2030	2040	Lead Time		Prepo	arato	ory M	easu
	2020-2023		Year 0 - 1	Year 1 -	2	Year 2 ·	3 3	
O Model	del food supply networks through the		Set up study goals. Identify collaborators. Stakeholder	Stakehold	er-based research		conclusions ommendations	
م Sdr	uare Mile to inform future planning		engagement strategy.	Desktop c	Inalysis and modelling			
	2020-2024		Year 0 - 1	Year 1 - 3			Year 3 - 4	4
	ergency support and contingency plannin ckage for food networks and businesses	g	Establish project scope and objectives: engage key stakeholders and partners: secure funding	Stakeholder engo	egy development agement: understanding standing needs and chall		Disseminate finding recommend next st for implementation secure funding	eps
	2020-2032	2	Year 0 - 2	Year 2 - 3	Year 3 - 4	Year 4 - 5	Year 5 - 12	4-12
Exp	plore and facilitate opportunities to mote regional food production		Establish project scope and objectives. Engage key	Synthesise results of studies + carry	Consider feasibility and suitability,	Final decision on pursuit of	Implementation appropriate	period if
pro			stakeholders and partners. Secure funding. Undertake preliminary research and produce findings report.	out research into local growing options	develop potential programmes and partners	growing strategy and programme	Public communi campaign and programme and if growing space	support to d participants
	2020-2024		Year 0 - 1	Year 1 - 2	Year 2 - 4		4	
Foc	od 'waste' collection and redistribution sys	em	Engage business network: establish key partnerships					
	2020-2026		Year 0 - 2	Year 2 -	6		6	
	Open a City Corporation Ecological Research and Education programme		Identify partners and establish working groups. Share research findings. Identify opportunities and barriers. Develop pilot projects. Embed findings into ways of working. Identify possible research centre partners. Construction. Design of content and programmes.					
			Establish and test business case. Public engagement strategy.			у.		
	2020-2022		Year 0 - 2		2)			

Ongoing Measures



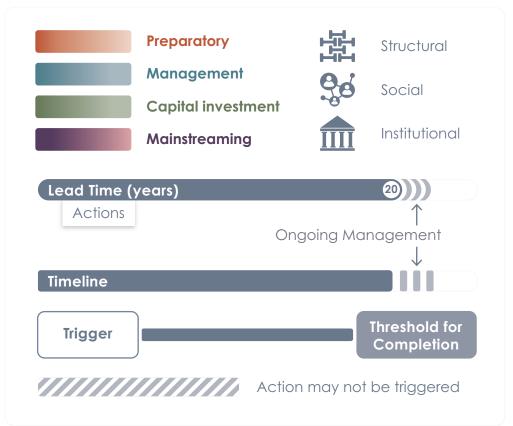
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ADAPTIVE PATHWAYS

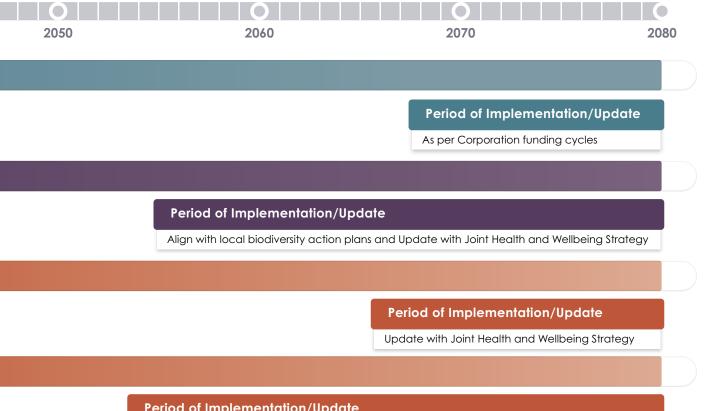
Pests and diseases





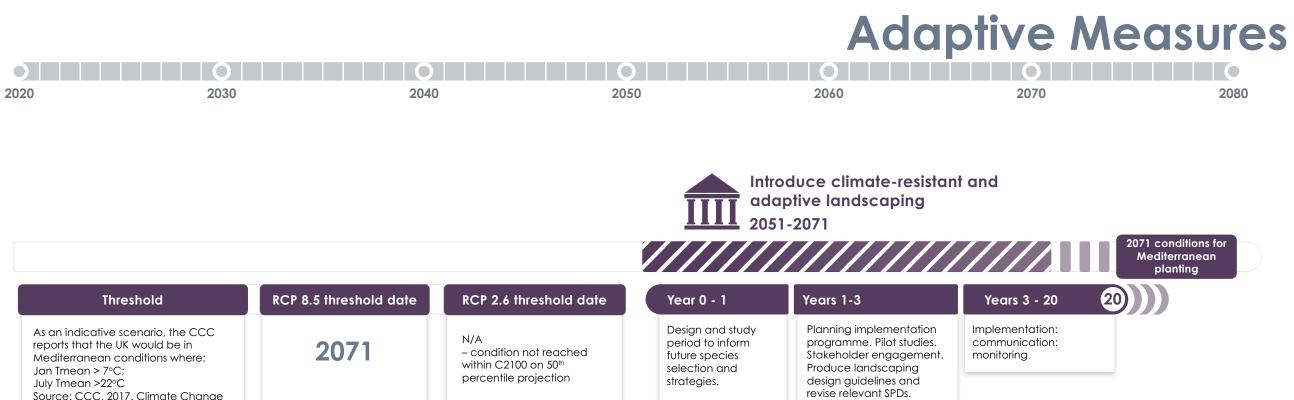
20 2030	:	2040	2050	2	2060	2070	:
2020-2080							
Support mutual aid and	community aid					Period of Imple	ementation/Update
groups						As per Corporation	n funding cycles
2020-2080							
Pest and disease horizor and research programm		ce			plementation/Update	e and Update with Joint Healtl	h and Wallbeing Strategy
2020-2080				Aigh with local	bloarversity action plans c	and opdate with John Healing	n and wellbeing siralegy
Climate-ready, fortified	public health program	nmes			-	Period of Implemente	ation/lindate
Ī						Update with Joint Health a	
2020-2080							
Ports and markets operational resilience planning							
Ports and markets operc I	ational resilience planı	ning		Period of Implen	ientation/Update		
Ports and markets operc	ational resilience planı	ning		Update guidance an	d aims in line with UK Nati	ional Adaptation Programm	
Ports and markets operation		ning 2040	Lead Time	Update guidance an	d aims in line with UK Nati	ional Adaptation Programm	
0		2040	Lead Time Year 0 - 2	Update guidance an	d aims in line with UK Nati		
I 20 20 2030 I J Open a City Corporation) 2020-2026 n Ecological	2040	Year 0 - 2 Identify partners and	Update guidance an	d aims in line with UK Nati		
0 2030) 2020-2026 n Ecological	2040	Year 0 - 2 Identify partners and	Update guidance an P establish working groups of projects. Embed finding arch centre partners.	d aims in line with UK Nati TEPATO Year 2 - 6 . Share research findings. s into ways of working. Construction. Desig	Identify opportunities and	
I 20 20 2030 I J Open a City Corporation) 2020-2026 n Ecological	2040	Year 0 - 2 Identify partners and barriers. Develop pilo Identify possible rese	Update guidance an P establish working groups of projects. Embed finding arch centre partners.	d aims in line with UK Nati TEPATO Year 2 - 6 . Share research findings. s into ways of working. Construction. Desig	Identify opportunities and	
0 2030 • Open a City Corporation • Research and Education) 2020-2026 n Ecological n programme	2040	Year 0 - 2 Identify partners and barriers. Develop pilo Identify possible rese Establish and test bus	Update guidance an P establish working groups of projects. Embed finding arch centre partners. siness case.	d aims in line with UK Nati TEPACO Year 2 - 6 . Share research findings. s into ways of working. Construction. Desig programmes. Public	Identify opportunities and n of content and c engagement strategy.	
 Open a City Corporation Open a City Corporation Research and Education 2020-2023 Strengthen water quality) 2020-2026 n Ecological n programme	2040	Year 0 - 2 Identify partners and barriers. Develop pild Identify possible reser Establish and test bus Year 0 - 1 Review systems and best practice,	Update guidance an P establish working groups of projects. Embed finding arch centre partners. siness case. Year 1 - 2 Training and pilot	d aims in line with UK Nati TEPCIC Year 2 - 6 . Share research findings. s into ways of working. Construction. Desig programmes. Public	Identify opportunities and n of content and c engagement strategy.	

Ongoing Measures



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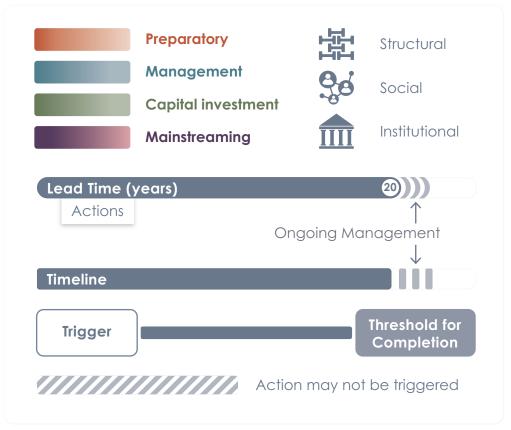


ADAPTIVE PATHWAYS

Pests and diseases

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Threshold	RCP 8.5 threshold date	RCP 2.6 threshold
As an indicative scenario, the CCC reports that the UK would be in Mediterranean conditions where: Jan Tmean > 7°C; July Tmean >22°C Source: CCC, 2017. Climate Change Risk Assessment Evidence Report, Chapter 3.	2071	N/A – condition not reache within C2100 on 50 th percentile projection