AtkinsRéalis

CLIMATE RESILIENT TRANSPORT

Engineering Net Zero™

AtkinsRéalis

We're AtkinsRéalis, a world-leading design, engineering and project management organisation. We connect people, data and technology to transform the world's infrastructure and energy systems.

Together, with our industry partners and clients, and our global team of consultants, designers, engineers and project managers, we can reduce our impact on the planet and prepare for the future.

Our corporate purpose and values drive how we deliver value to customers, how we manage resources, and how we innovate.

We are proud of our inclusive, diverse and energised work environment and share an open culture founded on our values: **safety**, **integrity**, **innovation**, **collaboration** and **excellence**.

Engineering a better future for our planet and its people

WHERE WE WORK

From designing entire cities to delivering nuclear power stations and transforming manufacturing systems, we focus our business in the areas that have the most impact on the way we all live and the resources we demand from the planet.

Engineering Net Zero

BUILDINGS AND PLACES

- Cities and Communities
- Social
- Commercial
- Residential Property

DEFENSE

- Aerospace
- Defense
- Security

INDUSTRIAL

- Life Sciences / Pharma
- Advanced / Hi-Tech Manufacturing
- General Manufacturing

MINERALS AND METALS

- Minerals
- Metals

NUCLEAR

- New Build
- Reactor Support and Life Extension
- Environmental Remediation

POWER AND RENEWABLES

- Power Grids
- Hydropower and Dams
- Alternative Energies and Technologies

TRANSPORTATION

- Rail and Transit
- Roads
- Aviation
- Ports
- Hydrogen, Electric and Autonomous Vehicles

WATER

- Water and Wastewater Utilities – Treatment and Resources
- Environment Protection, Regulation and Resilience

WHAT WE DO

Our commitment to a whole-life view of major development programmes enables us to lead projects at every stage and ensure that, wherever we are involved, our people have a wider view of the challenge to better guide our clients and partners.

Consulting, Strategy and Advisory — Engineering and Design — Project and Programme Management — Project Delivery — Operations and Maintenance (O&M) — Capital — Decommissioning

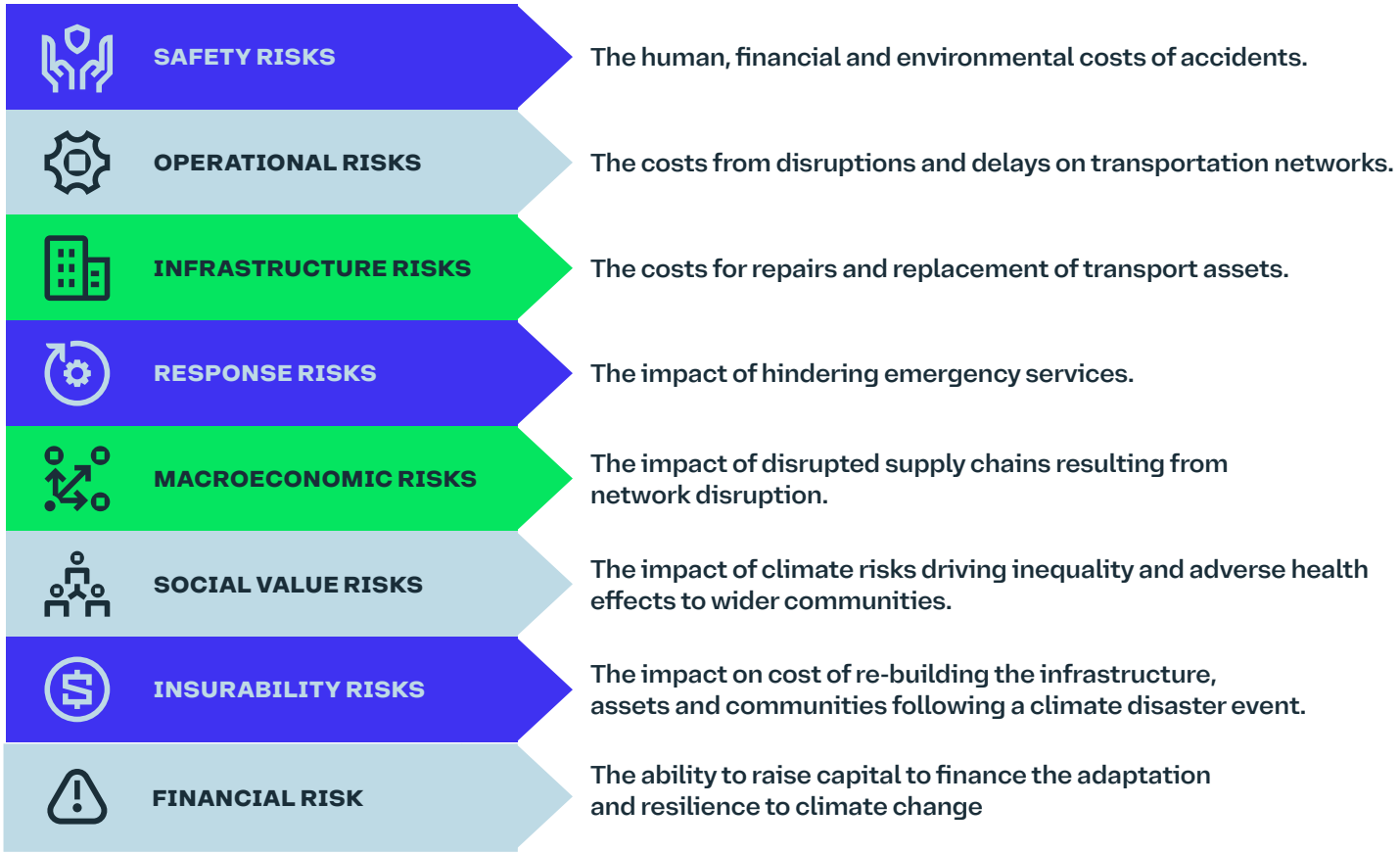
THE CLIMATE IS CHANGING

Climate change is having a significant impact on transportation: endangering life, disrupting services, reducing revenue and increasing costs through damage to infrastructure.

What were considered extreme weather events are now becoming the norm. This trend is set to continue, with the UK expected to see even hotter and drier summers, warmer and wetter winters, and more frequent and intense weather extremes, including storms which bring heavy rainfall and high winds.

This increasing frequency and intensity of weather events poses a direct threat to the functionality and safety of our transportation networks. As a result, climate change is reducing the availability of key assets and eroding their value.

The economic costs associated with climate change are significant, and while it is possible to calculate the impacts via revenue loss to some forms of transport and damage to infrastructure, the broader socio-economic costs are likely far higher.



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MEETING THE CHALLENGE HEAD ON

Transport is fundamental to our society and economy. It needs to adapt to the changing climate both now and into the future.

AtkinsRéalis can help you respond to the climate challenge, manage the risks and realise opportunities to maintain services for all.

Our team of climate adaptation experts work closely with engineers, economists, planners and other specialists across key disciplines to manage risks and realise opportunities presented by climate change.

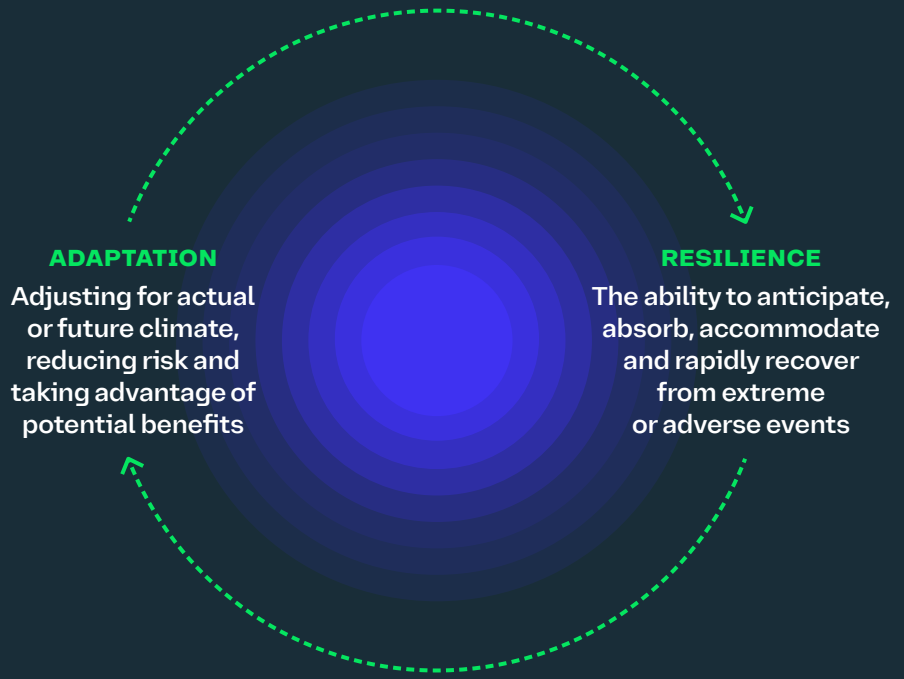
We have well-grounded expertise in the development of unique climate tools, methodologies and techniques, including the application of these across all transport modes and other sectors to promote climate resilient and low carbon development.

Every £1 spent on adaptation measures returns £2 to £10 in the future.[1]

Strategic investments in adaptive resilience, guided by data insights are key to cost-effective adaptation.

To meet the scale and pace of the challenge ahead, we must approach resilience intelligently.

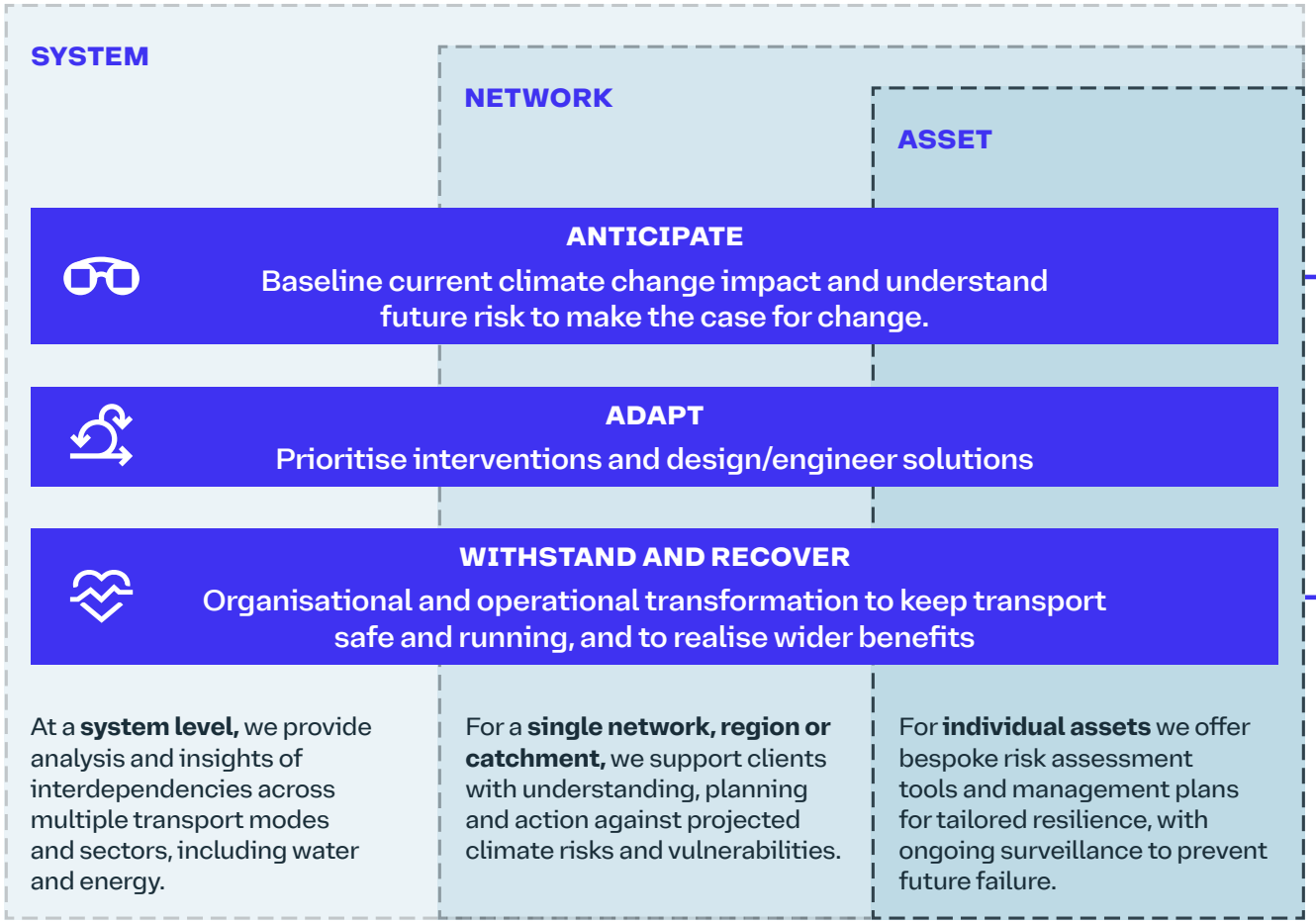
An adaptive approach, where sustainable investment is strengthened gradually over time, reinforced by continual monitoring will lead to low-regret decisions.



1. https://www.ukclimaterisk.org/wp-content/uploads/2021/06/Monetary-Valuation-of-Risks-and-Opportunities-in-CCRA3.pdf

OUR APPROACH: EMBEDDING RESILIENCE

AtkinsRéalis offers an end-to-end resilience framework that addresses clients' challenges and embeds resilience to deliver future-proof transport infrastructure and operations.



ANTICIPATE

Understanding your system, network or asset exposure to climate change risks provides the evidence to advocate for a change in approach.

BASELINE

ORGANISATIONAL PREPAREDNESS

We assess your organisation's preparedness for climate change. We review strategies, decision making processes, maintenance regimes and responses to extreme events, including management of supply chains.

CLIMATE SCREENING

We analyse historical weather and climate data, exposure and asset vulnerability factors to understand present-day climate risks.

CLIMATE CHANGE IMPACTS

We evaluate the current impact of climate change, including on safety, disruption, costs (maintenance, revenue, insurance), and socio-economic impacts.

UNDERSTAND FUTURE RISK

CLIMATE PROJECTION RISK ANALYSIS

We apply the latest climate projections to understand the potential future risk under multiple climate change scenarios to your system, network and assets, including short range to seasonal forecasting of impacts. Incorporating asset vulnerability factors such as age, condition, and route importance, we can project the likelihood of occurrence against potential impact. This enables us to:

- Identify key risks, their thresholds and asset exposure.
- Examine cascading risks, to and from transport, to other infrastructure and sectors.
- Estimate infrastructure damage and operational disruption costs.

MAKE THE CASE FOR CHANGE

ADAPTATION GAP ANALYSIS

We compare the projected climate change risk with the current organisational preparedness.

- Set out a projected 'do nothing' scenario based on the organisation's current approach to the prioritisation of maintenance, renewal and response.
- Provide an alternative proactive scenario and how interventions could be prioritised differently, including how climate risk can be built into operational monitoring and planning.
- Set out the costs and benefits associated with each approach.
- Recommend next steps to embed changes.

ADAPT

Understanding climate change risk enables a data-driven approach to the prioritisation of maintenance and renewal, and determines the thresholds for the design and engineering of infrastructure that can withstand a changing climate and extreme conditions.

PRIORITISE AND PLAN INVESTMENTS

DYNAMIC MAINTENANCE - ADAPTATION PATHWAYS

Climate change is not a static state - maintenance, renewal and build plans need to be dynamic. Adaptation pathways map multiple action pathways with thresholds for infrastructure which, when reached, direct interventions. This approach manages cost and uncertainty over time by avoiding unnecessary extensive work, focusing effort where and when it's needed.

ADAPTATION SOLUTIONS

We identify design and engineering solutions to key risks, building in an assessment of the co-benefits brought by those options including climate change mitigation, biodiversity net gain and social value.

ECONOMIC ANALYSIS

We assess the cost-benefit and value for money of adaptation options against transport needs and desired level of risk thresholds for assets, networks and systems. We maintain a focus on balancing acceptable levels of service while maintaining safety.

BUILD RESILIENCE INTO ASSETS, NETWORKS AND SYSTEMS

DESIGN AND ENGINEER SOLUTIONS

We implement targeted maintenance, renewal and build, designed and engineered to withstand climate change and meet the specifications set by adaptation pathways and economic analysis.

INNOVATIVE MATERIALS AND CONSTRUCTION

We use innovative materials and construction techniques to deliver the desired level of resilience, while minimising embedded carbon. This includes specialised testing and analysis of new, living, recycled and reused materials which will determine whether a material will last within the required thresholds.

ASSURANCE AND DUE DILIGENCE

We ensure that the solutions meet the latest requirements, standards and specifications of resilient design and engineering. This includes climate risk disclosure, which is an increasingly important reporting requirement for companies. We work with clients to help them understand and report on both their physical and transition climate risks, including Task Force of Climate-Related Disclosures (TFCD), Adaptation Reporting Power and Paris Alignment of portfolios. We also work with clients to ensure that they have the plans and policies in place to meet requirements to access Green and Sustainable Finance.

WITHSTAND AND RECOVER: OPERATIONS

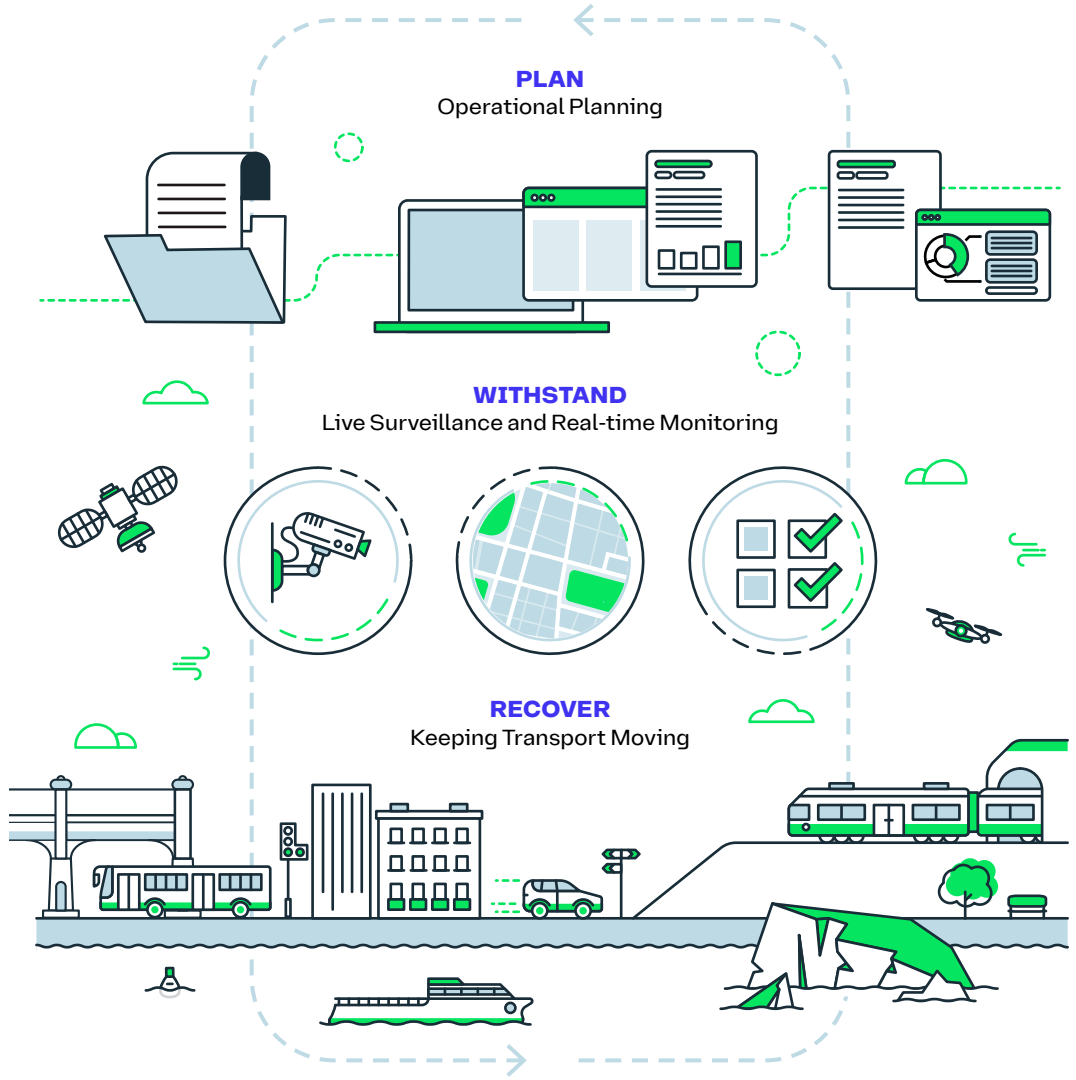
To keep transport safe and running, infrastructure operators must manage and minimise climate change impacts and quickly recover from extreme weather damage and disruptions. AtkinsRéalis takes a data approach to plan for, react, and recover from extreme weather.

OPERATIONAL PLANNING

Having identified assets at risk of climate change, and developed adaptation pathways to prioritise maintenance, renewal and build, we can combine these data to generate scenarios that inform operational planning in the event of extreme weather. This includes, but is not limited to, route planning to manage the strain on parallel transport infrastructure and ensuring there are viable routes for emergency services.

LIVE SURVEILLANCE AND REAL TIME MONITORING

Extreme events that surpass thresholds are inevitable, especially as climate change evolves. By identifying at-risk assets, we can deploy various sensors and capabilities to monitor their status and combine these data with weather forecasts. This approach allows us to assess weather impacts, inform operational decisions, and provide timely information to the travelling public, ensuring safety and network continuity.



WITHSTAND & RECOVER

WITHSTAND AND RECOVER: ORGANISATION

Undertaking adaptation, building resilience in transport operations and achieving long-term benefits requires strong decision-making, governance, skills, and leadership. AtkinsRéalis can support you in delivering this change and translate policy and strategy into action.

ORGANISATIONAL CHANGE

LEADERSHIP: STRATEGIES, STRUCTURES AND PROCESSES

Leadership is key. AtkinsRéalis can help you evolve your governance and decision-making structures to incorporate climate change risk into business as usual and reap the benefits of adaptation and resilience. This includes weaving the new approach into strategies and policies and embedding process improvements.

COLLABORATION: RESILIENCE AS A PARTNERSHIP

Your ability to withstand and recover from events is reliant on a broad set of services and wide supply chain. Everyone needs to be on board, understand their roles, and be empowered to deliver - both in planning and in response. AtkinsRéalis can bring your stakeholders together, align them around a common purpose, and help you embed the necessary working practices and coordination.

PEOPLE: DEVELOPING CAPABILITY

Ultimately, people will deliver adaptation and resilience. AtkinsRéalis develop and deliver training plans to ensure all levels across an organisation, and its partners, have the skills to achieve ongoing adaptation and resilience.

FINANCIAL PLANNING AND STRATEGY

Ultimately, embedding resilience into transport infrastructure and operations is climate change risk management. As such, successful implementation will create opportunities to make funding go further by transforming long term financial planning. Particularly pertinent for those with budget constraints and competing priorities.

AtkinsRéalis can provide expert financial planning advisory services including but not limited to, re-evaluating insurance premiums, restructuring infrastructure loan portfolios, and working with the wider supply chain to drive down costs.

AtkinsRéalis has acted as Investors and Lenders' Traffic and Revenue Advisor for many transport assets. We have successfully carried out well over 100 Technical Advisory commissions for transport projects. We are well known to the major investors, banks and financial institutions and we have an established reputation internationally for undertaking due diligence and Technical Advisory services.

OUR SERVICES

We are a leading provider of consultancy services in the field of climate adaptation and resilience, offering related professional advice, engineering and design solutions. Our services are backed by a comprehensive understanding of the transportation sector and our multidisciplinary approach.

OUR BESPOKE ADAPTATION AND RESILIENCE SERVICES:

- Strategic Advisory
- Engineering and Design
- Project Management
- Asset Management
- Climate Risk Assessment
- Flood Risk Management
- Transportation Planning
- Urban Planning and Development
- Digital and Technology Services
- Energy Solutions
- Business Transformation
- Reporting and Disclosure
- Funding, Finance and Transaction Advisory
- Technical and Commercial Due Diligence

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OUR EXPERIENCE

How our climate adaptation and resilience services have been applied to future-proof transportation infrastructure.

Click on each of the projects below to read more

Transport Scotland, UK: Trunk Road Adaptation Plan →

Network Rail, UK: Washout Vulnerability Assessment Tool →

High Speed Two (HS2) Ltd, UK: Climate Resilient Infrastructure →

National Highways, UK: Natural Flood Management →

Oxfordshire County Council, UK: Capturing Climate Risk →

Cambridge County Council: Network Criticality & Resilient Network →

Government of Kenya: Climate Resilient Railway Station →

EBRD: Green City Action Plans →

South Wales Trunk Road Agent: Protecting Critical Infrastructure Through Georesilient Design →

Asian Development Bank: Urban Transport Adaptation Support →

Government of Malawi: Mainstreaming of Climate Risk & Vulnerability →

City of Edinburgh Council, UK: Climate Risk & Adaptation Assessment →

International Investment Bank (Confidential Client): Sustainable Finance →

EBRD: Due Diligence for Fleet of EV Vehicles →

Thames Water, UK: Sustainable Drainage System Retrofit Pilot Study →

Southeastern Trains, UK: Advisory & Assurance for Climate Governance & Financial Disclosures →

Network Rail, UK: East Coast Digital Programme (ECDP) →

Team Scotland, UK: Creating An Enterprise Culture →

TRANSPORT SCOTLAND, UK: TRUNK ROAD ADAPTATION PLAN

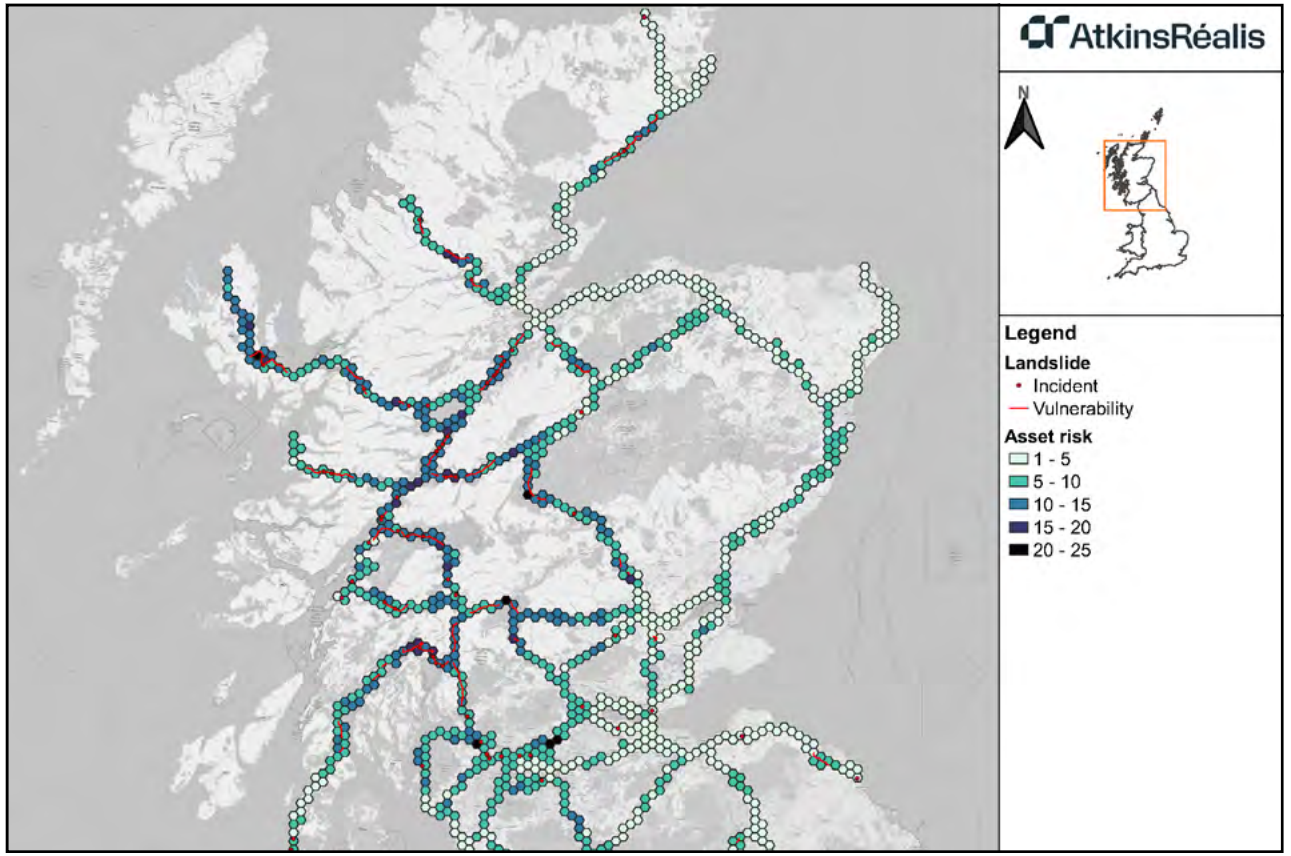
AtkinsRéalis is supporting Transport Scotland to deliver their vision of a transport system which is well-adapted and prepared for current and future impacts of climate change, safe for all users, reliable for everyday journeys, and resilient to weather related disruption.

SERVICES PROVIDED:

- Phase 1 involved an assessment of baseline of future climate, with relevant thresholds applied to generate climate risks.
- Risk scoring based on likelihood of occurrence together with impact, considering asset damage, disruption to users, public safety and wider economic consequences.
- Delivery of adaptive pathways and adaptation options to inform integrated risk and adaptation plan.
- Phase 2 delivered spatial analysis of areas of highest risk, including asset data to understand vulnerability.
- Assessment of impact on physical assets, social and economic impacts, including estimated annual damages for major risks.
- Development of over forty actions within an adaptation framework to build climate resilience.

BENEFITS AND SUCCESS FACTORS:

- Future climate risk assessment used UKCP18 climate models and threshold analysis informed by real-life events.
- Framework promotes integration of climate resilience across the organisation, including a consideration of governance and collaboration with other parties for greater outcomes.



NETWORK RAIL, UK: WASHOUT VULNERABILITY ASSESSMENT TOOL

The derailment of a passenger train at Stonehaven in August 2020, increased awareness of the management of Earthworks and Drainage assets during extreme weather events and the need for a more resilient railway to resist the effects of future climate change.

The AtkinsRéalis Washout Vulnerability Assessment (WVA) tool enables a rapid, cost-effective method to assess the risk of washout failures, using readily available LiDAR data.

The WVA tool identifies:

- Sections of track prone to flooding.
- Rainfall trigger values which may cause slope failure.
- Specific locations where drainage, or asset renewal could lead to improvements in slope resilience.

Results can be fed into asset management decision support tools, and in turn support intelligent asset management.

BENEFITS AND SUCCESS FACTORS

The application of the WVA tool for the North, West & Central (NW&C) region supports the development of Network Rail's regional climate change adaptation pathways, as detailed in regional Weather Resilience and Climate Change Adaptation Plans. By successfully identifying sections of the rail network at highest risk from extreme weather and climate change, asset owners and decision makers can plan for, target, prioritise and stagger investment decisions in adaptation solutions to deliver greater resilience to future climate change.

HIGH SPEED TWO (HS2) LTD, UK: CLIMATE RESILIENT INFRASTRUCTURE

HS2 is a planned, transformational high-speed railway in the UK with the vision to be a catalyst for growth across Britain, connecting the country's major cities and economic hubs through a low carbon climate resilient network.

HS2 commissioned AtkinsRéalis to integrate the consideration of climate change and resilience across the HS2 Programme.

SERVICES PROVIDED:

- Climate Change assessment of Environmental Statement to gain Parliamentary approval for the development of the scheme.
- Technical assurance for climate resilient design.
- Managing climate resilience related to interdependencies with third parties (including power, water and communications).
- Building latest UK Climate projections (UKCP18) into HS2 technical standards and guidelines.
- Developed HS2's Adaptation Report submitted to the UK government, to feed into the UK's National Adaptation Programme.
- Review of high-level climate-related risks and opportunities and financial impacts, and assessed readiness for HS2 to publish TCFD disclosures alongside their financial reports.

BENEFITS AND SUCCESS FACTORS:

- Systematic screening of climate risks for all main civils and rail systems contracts.
- Mainstreaming of climate change into HS2 technical standards and guidelines.
- Innovative risk assessment methods using UKCP18 climate models and streamlining for more efficient project delivery.

NATIONAL HIGHWAYS, UK: NATURAL FLOOD MANAGEMENT

National Highways worked with AtkinsRéalis and partners at the Mersey and Don Catchment Rivers Trusts and NatureBid to develop a smart catchment-based approach to target, fund and implement natural flood management measures that reduce flood risk to the road network.

SERVICES PROVIDED

- Increasing catchment water storage to reduce flooding on a major road.
- Payment to land managers to reduce flood risk as well as funding to highways operator.
- Making the links between road improvements, land management and flood risk management.

BENEFITS AND SUCCESS FACTORS

- Our collaborative approach created a new way for National Highways to manage flood risk to its road network. Collaborating with local partners allows infrastructure providers to target measures sustainably at strategic locations close to source on land outside their own estate, as opposed to being restricted to land owned adjacent to roads. In return, landowners received additional income, whilst having the opportunity to actively implement environmental improvements. This highly effective, mutually beneficial model is applicable to many other linear networks or distributed national estates.
- Whilst the focus of the Pilot was flood risk, measures also delivered co-benefits - for instance, improved air and water quality, reduced soil loss and biodiversity improvements.

OXFORDSHIRE COUNTY COUNCIL, UK: CAPTURING CLIMATE RISK

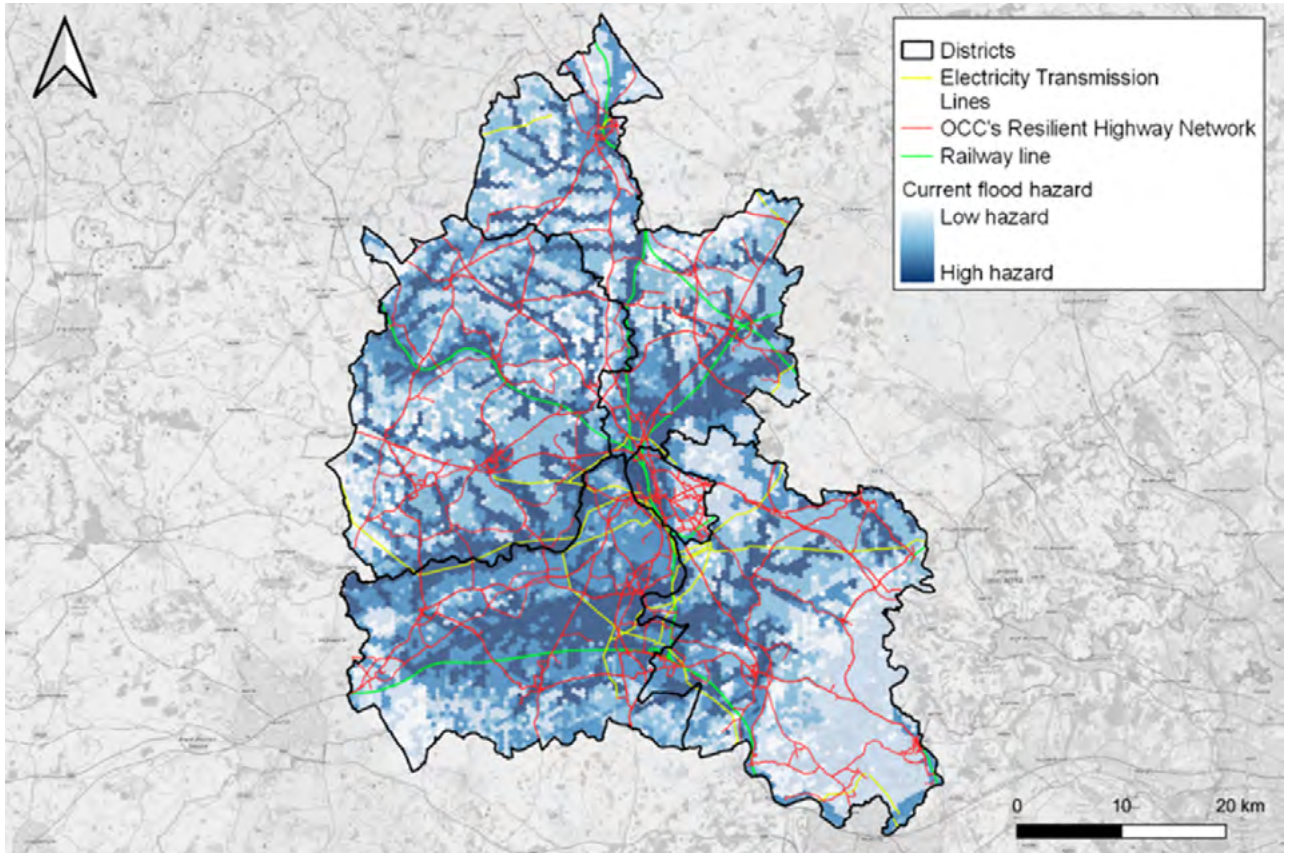
Oxfordshire County Council commissioned AtkinsRéalis to support them with identifying risks to infrastructure due to the changing climate, and to minimise financial cost to the council and other stakeholders from future adverse and extreme weather events – improving the resilience of council services.

SERVICES PROVIDED:

- AtkinsRéalis led the development of Oxfordshire's climate risk and opportunity assessment, adaptation strategy, and action plan.
- We produced the evidence base of current and future vulnerability to climate change, including an assessment of expected climate-related health impacts, using a range of local climate and socio-economic data.
- Conducting an assessment of the current and future vulnerability of various sectors including physical infrastructure, natural environment, health, communities and built environment and business/industry.
- The project used GIS analysis to provide a spatial assessment of the climate vulnerability of assets and communities and AtkinsRéalis developed climate risk visualisations and risk maps using this data.
- We led extensive stakeholder engagement activities, including workshops with decision makers across the county e.g. NHS, Environment Agency, water companies, agricultural groups, universities. Workshops enabled us to gather inputs and feedback, ensuring local voices and concerns were a key driving force for the project.

ADDED VALUE

- AtkinsRéalis contributed to Oxfordshire County Council's Annual Report on climate change and health on projected heat and flooding risks to care homes, GP and healthcare facilities, and hospitals.
- We identified that a large proportion of the Oxfordshire highway network (e.g. M40, A34), rail network and national cycle network is within areas of high current flood hazard. Our analysis also identified a higher heatwave hazard in urban areas, thus affecting railway lines and the highway network in these areas.



CAMBRIDGE COUNTY COUNCIL: NETWORK CRITICALITY & RESILIENT NETWORK

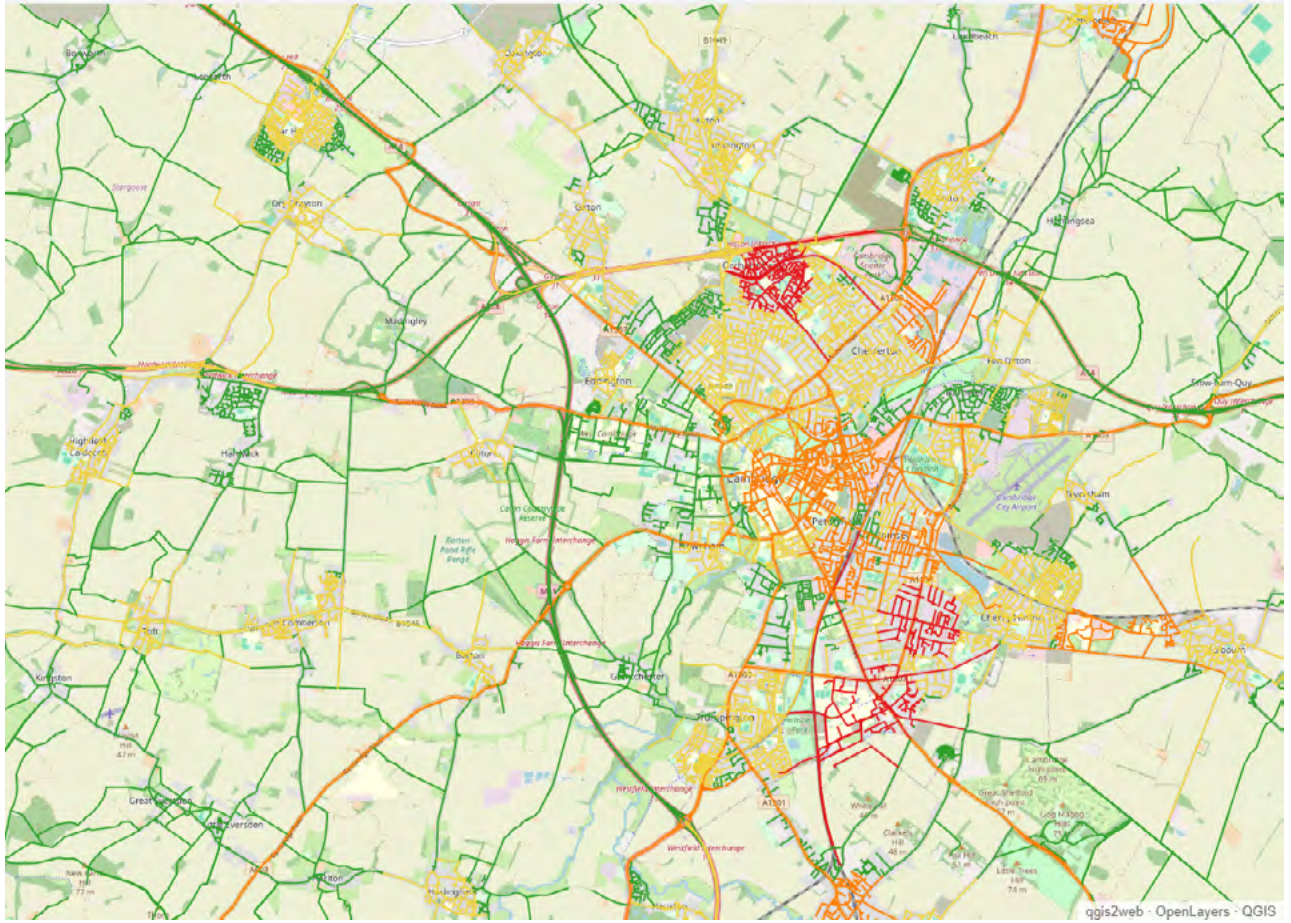
AtkinsRéalis is supporting Cambridgeshire County Council to review and assess their existing understanding of their road network. The review will inform the development of a more resilient network and enhance their existing winter service provision.

SERVICES INCLUDED:

- Baseline review and gap analysis of existing services, utilising CIHT Code of Practice.
- Definition of new or revised severe weather requirements, depot, vehicles, plant and resourcing.
- Development of a transparent assessment process and GIS tool to visualise network criticality.

BENEFITS AND SUCCESS FACTORS

- Improved understanding and precision of the criticality of key routes.
- More nuanced network hierarchy for wider asset management activity.
- Assessment of where winter service provision is meeting or exceeding standards and national best practice, to aid future service reviews.
- Additional input to the assessment of high risk assets.
- Identification of areas of best practice to be shared with other authorities.
- Cost saving opportunities through adjustment of winter service provision.
- Carbon reduction opportunities to help meet Council-wide targets.
- Improvements to climate resilience via greater understanding of potential impacts.



GOVERNMENT OF KENYA: CLIMATE RESILIENT RAILWAY STATION

The Government of Kenya commissioned AtkinsRéalis to design a climate resilient and sustainable railway station in central Nairobi. The government's ambition is that Nairobi Central Station is conceived as a climate and site responsive project that will meet some of the highest sustainability and resilience goals.

SERVICES PROVIDED:

AtkinsRéalis led the consortium between several partners, including the following services:

- Conducted a high level legal, transaction and technical review of the Nairobi Railway City Masterplan to define next steps for the Government of Kenya (Phase 1).
- Developed the design and costing of the Central Station and Public Realm to achieve commercial close and guide subsequentEngineering Procurement Construction (Phase 3).
- Currently developing the detailed design for the Central Station and Public Realm (Phase 4).
- Building Climate Resilience of Urban Communities in Coastal Zones:
  - Mapping current and projected populations in coastal and shoreline urban settlements at-risk of sea level rise.
  - Providing Urban Climate Risk and Vulnerability Analysis.
  - Integration of Common Alerting Protocol (CAP).
- Reducing the Impacts of Extreme Heat in Cities:
  - Developing city heat action plans informed by risk analysis.
  - Adapting the built environment through engagement with urban planning tools and professionals.
  - Supporting locally applicable actions to reduce future impacts of extreme heat on people and the built environment.

BENEFITS AND SUCCESS FACTORS

The integrated development of the station and its associated public realm enables the creation of circular and Nature Based Solutions which reduce the impact of the station on the environment while bolstering the resilience of the city's fragile infrastructure, e.g:

- The station provides a new covered public space for the city which is naturally ventilated and cooled.
- The public realm includes large floodable areas which moderate and absorb the intense rainfall experienced in Nairobi and reduce the need for grey infrastructure storm water management.
- Local planting and biodiversity have been incorporated to provide shelter, shade, cool the surrounding area and mediate humidity to provide respite from the heat.

EBRD: GREEN CITY ACTION PLANS

Green City Action Plans (GCAPs) are strategic planning documents that help cities to identify, prioritise and address their environmental challenges within natural assets such as air quality, water resources, biodiversity and ecosystems and soils as well as pressures from urban sectors such as transport, energy, industry, solid waste, water management or land use.

SERVICES PROVIDED:

Fundamental to each GCAP is the consideration of city resilience based on a risk and vulnerability assessment (RVA). The AtkinsRéalis team works with GCAP cities through all stages of the RVA to list hazards relevant to the City.

- Identify impacts on critical urban systems and services.
- Assess vulnerabilities.
- Analyse and prioritise risks and vulnerabilities.

Outputs from the RVA then inform the development of Green City challenges, the initial formation of Green City actions, and mapping Green City actions against identified challenges, risks and vulnerabilities.

BENEFITS AND SUCCESS FACTORS

AtkinsRéalis successfully manage multi-disciplinary teams made up of international and locally based specialists to deliver targeted policy actions and interventions.

Green City development has shown cities how they can promote green and resilient infrastructure, low carbon transport, water cycle management, green building development and the use of Nature-based Solutions, to improve the quality-of-life outcomes for residents and support the natural environment.

SOUTH WALES TRUNK ROAD AGENT, UK: PROTECTING CRITICAL INFRASTRUCTURE THROUGH GORESILIENT DESIGN

The River Towy is a highly active river system, with the river planform in a constant state of flux as it migrates across its floodplain. The river flows past the A40, which is at risk of undercutting near the village of Llanegwad, where the river was measured at approximately 24m from the road in June 2020. The banks of the river here are protected as a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC).

AtkinsRéalis were commissioned by the South Wales Trunk Road Agent (SWTRA) to assess flood risks, and design and construct a single solution to install flood defences to the river to protect the A40 and surrounding area.

SERVICES PROVIDED:

- Strategic and whole catchment assessment of flood and erosion risks using an iterative approach.
- Understanding historical river movement and anticipating future changes in climate.
- Intensive geomorphological assessment.
- Undertook optioneering assessment to result in singular design, which included installation of sheet piles, management of an active floodplain, and anchor installation.
- Full embedment post-construction, with no visible signs of hard engineering.

BENEFITS AND SUCCESS FACTORS

- Multi-disciplinary approach to inform risk-based decision-making.
- Singular design enabled efficient installation.
- Limited impact to the landscape and on the SSSI and SAC.
- Sustainable material re-use.
- Understanding historical river movement and anticipating future changes in climate allowed determination of an appropriate solution to build resilience into the asset.

CITY OF EDINBURGH COUNCIL, UK: CLIMATE RISK & ADAPTATION ASSESSMENT

The City of Edinburgh Council commissioned AtkinsRéalis to guide the City through the development of a climate risk and adaptation assessment to feed into the City's 2030 Climate Strategy.

SERVICES INCLUDED:

- Analysis of Edinburgh's climate risk profile based on UK climate projections (UKCP18), the UK Climate Change Risk Assessment (CCRA), and case studies of the impacts and costs of climate hazards across the city.
- Climate risk mapping (heat and flood mapping), making use of public data and GIS to identify risk hotspot locations and infrastructure vulnerabilities, including a focus on vulnerable groups (e.g. care homes).
- Facilitation of interactive workshops with key stakeholders from across the public sector, infrastructure operators, health and environmental agencies from Edinburgh and Scotland to agree priority risks and adaptation actions.
- Development of an adaptation assessment using guidance from ISO14092, considering progress made through Edinburgh's previous adaptation programme, and opportunities to enhance alignment with Scotland's Adaptation Programme.
- Identification of key barriers to achieving climate adaptation (e.g. resources, policies, finance, data).
- Development of case studies of best practice for adaptation solutions and lessons from adaptation programmes from other cities/regions.
- Development of an illustrative economic assessment of the costs and benefits of nature-based solutions to prevent increased surface-water flooding.

BENEFITS & ADDED VALUE

AtkinsRéalis developed the work in collaboration with the Council, and through regular progress meetings, the team rapidly gained insights and reached consensus across stakeholders of the key priorities, including adding another stakeholder engagement workshop on risks to the natural environment.

The project was successful at bringing together stakeholders from across different departments in the Council and different sectors across the City to collectively develop findings and agree next steps. AtkinsRéalis is now supporting the Council to take forward elements of the work:

- Application for funding to implement nature-based solutions.
- Advisory services to develop Edinburgh's next adaptation programme and provide an economic analysis to determine the costs of inaction, and the costs and benefits of enhancing climate resilience.

THAMES WATER: UK. SUSTAINABLE DRAINAGE SYSTEM RETROFIT PILOT STUDY

In recent years, over 2,000 properties across the Counters Creek catchment area, in West London have reported basement sewer flooding, with widespread flooding occurring in 2005 and 2007, following severe heavy rainfall. AtkinsRéalis was the technical reviewer to Thames Water for the retrofit of SuDS in the Counters Creek catchment area, we reviewed/enhanced designs and oversaw the project through to construction and monitoring.

SERVICES INCLUDED:

The scheme involved introducing a number of elements into the local area to reduce surface water-run off entering the sewers by introducing sustainable drainage systems such as rain gardens, permeable block pavement / porous asphalt and attenuation basins (geocellular boxes).

AtkinsRéalis supported Thames Water in achieving attenuation in all three streets by lining the drainage system with an impermeable membrane that will prevent runoff infiltrating the ground.

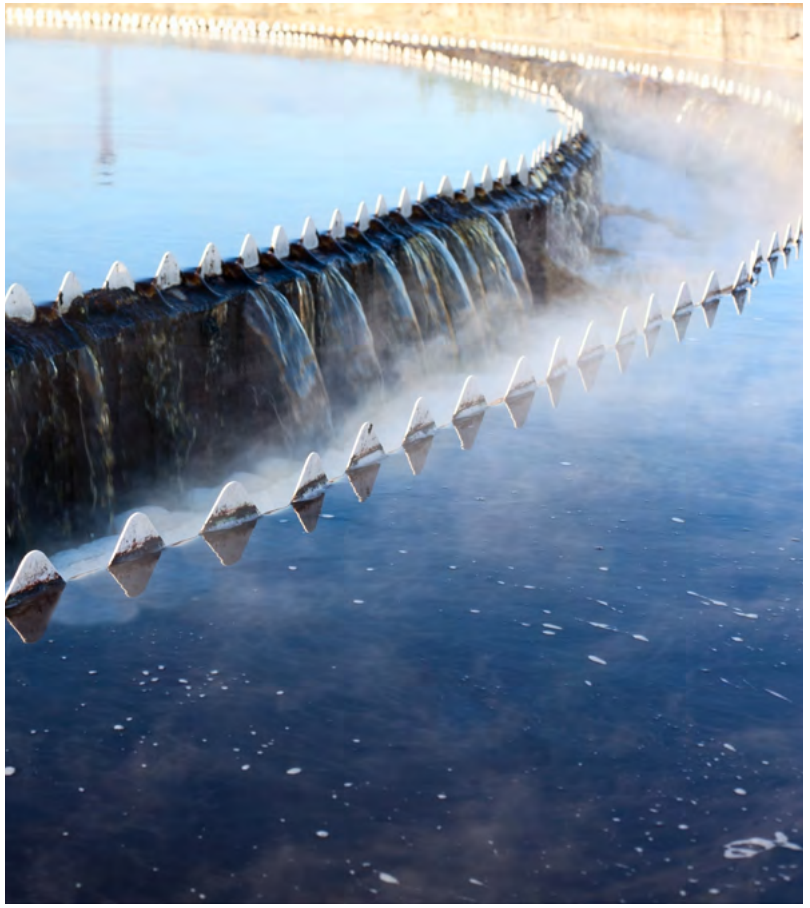
SuDS elements in all three streets have been designed by AtkinsRéalis to hold a one-hundred-year storm event, with allowance for climate change within the underground system.

The team worked flexibly throughout as revisions were necessary to the project design on multiple occasions to adapt to unexpected requirements such as a high voltage cable under a pavement, excessive concrete surrounding a water main that required a design change for the SuDS and rain garden designs needing to be adapted to allow high pedestrian footfall.

AtkinsRéalis were also heavily involved in undertaking monitoring of the three sites and ensuring that the pilot projects remain robust in terms of measurable outcomes so to influence the nature of future schemes.

BENEFITS & ADDED VALUE

- The methodology developed by AtkinsRéalis is now implemented across Thames Water catchments.
- Achieved project aims to deliver a long-term solution to basement sewer flooding specifically across west London.
- Reduces runoff peaks.
- Community involvement and endorsement.
- Increased the level of green space and biodiversity.
- Improved amenity value of the area.
- Cost effective compared to traditional solutions.
- Water quality improvements.



ASIAN DEVELOPMENT BANK: URBAN TRANSPORT ADAPTATION SUPPORT

Since 2022, AtkinsRéalis' experts have provided expertise to the Asian Development Bank's E-mobility Programme development. The Programme promotes an integrated transformational shift to climate resilient, zero-emission mobility systems. This is achieved through investments in climate resilient urban transport infrastructure and large-scale deployment of electric bus systems, combined with mode-shift measures to increase the performance and convenience of urban public and Non-Motorised Transport in Programme countries.

SERVICES PROVIDED

AtkinsRéalis provided dedicated climate vulnerability assessment and adaptation recommendations to support EV bus investment programmes in three capital cities, namely Tbilisi, Kathmandu, Bishkek.

BENEFITS AND SUCCESS FACTORS

The incorporation of climate adaptation in the design of the EV projects will provide a multitude of benefits including:

- Increased comfort for passengers and public transport users, thus improving attractiveness of public transport to users.
- Enhanced safety and improved working conditions for employees across the public transport service.
- Improved resilience of the wider transport network to maintain operations and levels of service for all modes.
- Enhancements to natural urban habitats and biodiversity benefits.

These solutions are being designed and implemented in three cities initially, to serve as lighthouse cases for replication in other cities and countries in the future.

GOVERNMENT OF MALAWI: MAINSTREAMING OF CLIMATE RISK AND VULNERABILITY

Funded by the World Bank, the Roads Authority of Malawi commissioned AtkinsRéalis to undertake a National Transport Master Plan (NTMP). The primary objective of the NTMP is to guide the sustainable development of an integrated multi-modal transport sector over the period 2017 - 2037.

The NTMP recognises that Malawi is experiencing the adverse effects of climate change as seen in more frequent and severe flooding and drought, and as a result, transport infrastructure is deteriorating more rapidly. Therefore, the NTMP is proposing measures in relation to design standards, materials and maintenance regimes to improve the resilience of Malawi's transport infrastructure to climate change.

To ensure the long-term viability of the transport network it was essential to embed comprehensive climate change considerations through each stage of project design and delivery.

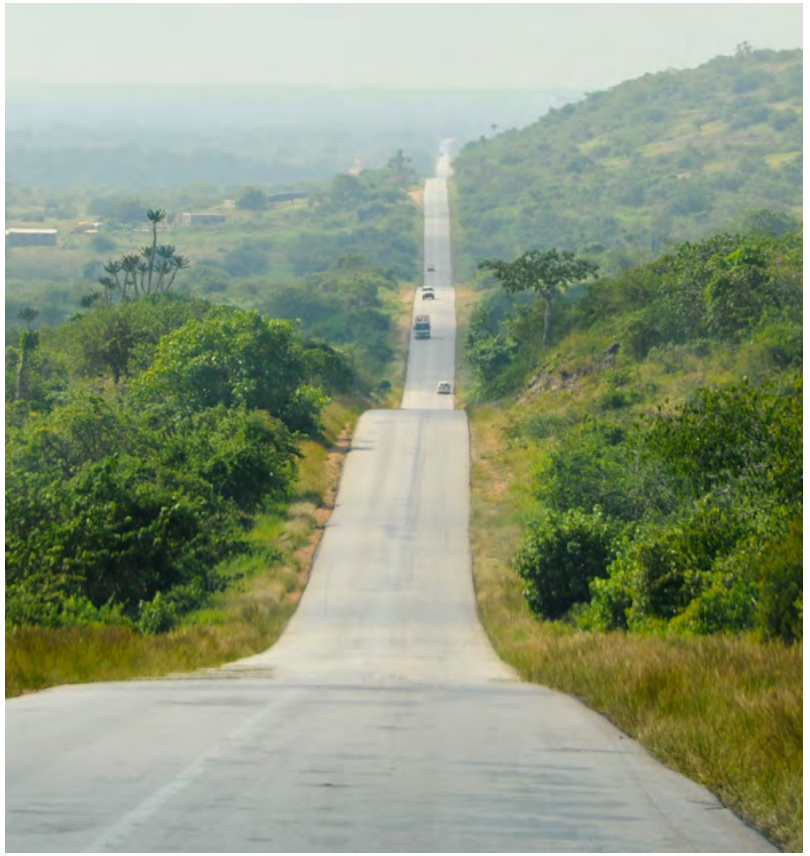
SERVICES PROVIDED:

The adaptation aspect of the study assessed the resilience of Malawi's transport assets and services by conducting a Climate Vulnerability Assessment (CVA) of the transport sector in Malawi, working in close collaboration with the wider NTMP project team, the client and key stakeholders. It ensured that climate resilience is mainstreamed within the development of the National Transport Master Plan. Our methodology for doing so consisted of three stages:

1. **Baseline climate vulnerability assessment** — examining resilience to a range of climate risks and assessing future vulnerability in light of projected climate change.
2. **Climate risk screening and identification of adaptation measures** — identification of potential impacts due to extreme weather events and the formulation of potential actions which will enhance resilience and build adaptive capacity.
3. **Development of a prioritised Strategic Action Plan** — appraisal and refinement of prioritised measures which enhance resilience and build adaptative capacity, including information on benefits, barriers to implementation, risks and responsibility for implementation.

BENEFITS AND SUCCESS FACTORS

- Identified adaptation potential in Malawi's transport sector, including the economic costs and benefits associated with these policies and measures;
- Developed an adaptation action plan for the agreed policies and measures – including recommendations for their integration into the National Transport Masterplan and for potential funding streams; and
- Development of related capacity in the Ministry of Transport and Public Works.



INTERNATIONAL INVESTMENT BANK (CONFIDENTIAL CLIENT): SUSTAINABLE FINANCE

Investment in roads can be challenging because of the potential perceived adverse environmental, safety and social impacts. AtkinsRéalis worked with the client to provide a simplified method of assessing the economic impacts of sustainable road improvement investment programmes.

SERVICES INCLUDED:

AtkinsRéalis worked with an International Investment Bank in the development of a Cost Benefit Analysis (CBA) tool. The tool helps ensure that investments in roads are sustainable, that proposed plans consider climate change and that adverse effects are not only mitigated but also reversed wherever possible to generate significant economic, social and environmental benefits. The model is based on the EU Sustainable Finance Taxonomy.

BENEFITS & ADDED VALUE

The CBA model AtkinsRéalis developed provided a simplified method of assessing the economic impacts of road improvement investment programmes with the aim to generate a high-level view of the intrinsic quality of an investment, illustrating the areas in which it would be expected to perform strongly or unfavourably. This will go on to inform investment decisions, as to whether a proposed road improvement package is not deemed environmentally sustainable or whether it represents a quality investment that could be improved by excluding specific components which represent poor value for money or are not deemed sustainable.

EBRD: DUE DILIGENCE FOR FLEET OF EV VEHICLES

AtkinsRéalis were engaged by the European Bank for Reconstruction and Development (EBRD) to provide Due Diligence services in the acquisition of a fleet of 250 electric vehicles (EVs) for Abou Ghaly Motors (AGM) in Cairo Egypt.

SERVICES INCLUDED:

- Reviewed the Company's procurement process and the technical specifications for EVs.
- Assessment of ride-hailing services, demand forecast and taxi fleet requirements, EV operational plan and project scope and project cost and investment plan.
- Provided technical and economic inputs for the financial model.
- Conducted assessments of GHG and air emissions.
- Prepared a Social and Environmental Assessment report in addition to the Red Flag and Final Reports.
- Carried out a Supply Chain Assessment.

BENEFITS & ADDED VALUE

The AtkinsRéalis team developed the due diligence in collaboration with the beneficiary and the EBRD to ensure that the transaction concluded ahead of the COP 27. The team also supported the client on the development of an EV operational plan and the assessment of the Supply Chain from an ESG perspective.

SOUTHEASTERN TRAINS, UK: ADVISORY AND ASSURANCE FOR CLIMATE GOVERNANCE AND FINANCIAL DISCLOSURES

Southeastern Trains is a train operating company responsible for rail operations across south-east London, Kent and East Sussex in the United Kingdom. Southeastern operates one of the busiest networks in the UK with over 1,700 trains a day, including the UK's first domestic high speed service, across 165 stations.

Southeastern commissioned AtkinsRéalis in 2023 and again in 2024 to enhance their climate governance, strategy, risk management, metrics & targets, supporting them to meet UK climate disclosure requirements and align with international frameworks for sustainable financing (e.g. alignment to the recommendations of the Task Force on Climate-related Financial Disclosures - TCFD).

SERVICES INCLUDED:

- Enhancing Southeastern's climate risk assessment (spanning physical and transition risks) and climate scenario analysis by providing 1:1 support, and advice and building capacity within the Southeastern Environment team; by defining relevant metrics to quantify risks and financial impacts, and monitoring progress in meeting targets.
- Advised Southeastern to increase alignment with best practice for net zero transition planning (e.g. recommendations from the Transition Plan Taskforce), building on the work undertaken by AtkinsRéalis to develop Southeastern's decarbonisation pathways and Net Zero routemap in 2022.
- Provided training to raise employee awareness across different departments in the company including finance, operations, environment and procurement on transitioning to a climate resilient low carbon economy.
- Presented climate disclosure recommendations and facilitated collaborative workshops with Southeastern's Managing Director and Climate Change and Carbon Board.

BENEFITS & ADDED VALUE

- AtkinsRéalis supported Southeastern to enhance key company practices to align with UK climate disclosure regulations, positioning Southeastern to better manage climate risks and realise opportunities related to the transition to a climate resilient low carbon economy.
- Following AtkinsRéalis' advisory support, Southeastern published its first climate financial disclosure.
- AtkinsRéalis supported organisational capacity building in climate adaptation and net zero transitioning at Southeastern by providing training and awareness raising, highlighting the roles that each department has to play to enable climate resilience.

NETWORK RAIL, UK: EAST COAST DIGITAL PROGRAMMEME (ECDP)

The ECDP aims to transform the performance of the East Coast Mainline South, one of the UK's busiest and most important economic rail routes, by implementing the European Train Control System (ETCS) digital train control technology and deploying Traffic Management. Upgrades to the East Coast Main Line will deliver a further 55,000-tonne reduction in carbon emissions over 60 years.

SERVICES PROVIDED:

As the Rail Systems Integration Partner, AtkinsRéalis have a pivotal role in bringing together over 30 partner organisations and bring established and proven expertise to:

- Integrate industry 'Like Never Before', overcoming decades of legacy behaviours across the railway and endorsing the Programme's values of Caring, Pioneering, Inclusive and Tenacious.
- Provide experienced senior leadership to deliver a transformational change programme.
- Lead operational excellence to ensure we are a 'little better every day'.
- Provide integrated expertise in transformational change, rail operations, business readiness, programme management, engineering, benefits and assurance.

BENEFITS AND SUCCESS FACTORS

- Established a leading Industry Change community and defined the Industry Change Strategy.
- Developed robust communications, branding and PR for the Programme including newsletters and related events.
- Contributed to and supported the successful Full Business Case submission and development of our Learning Legacy.
- Re-developed the operating model to enable the Programme's vision to be realised as it transitioned from design to delivery.
- Provided leadership to 'user-led design' and 'business readiness' by bringing rail operations, business change and engineering expertise / experience together.

"The future of the railway industry has a pioneering collaboration at the heart of it. This is the only way for the industry to solve complex system-wide challenges together. The experience of creating ECDP with its mission and partnership model has shown what this will look like, and our partner AtkinsRéalis has helped us pioneer this approach for success."

Toufic Machnouk,
Director of Industry Partnership for Digital Railway at Network Rail

TEAM SCOTLAND, UK: CREATING AN ENTERPRISE CULTURE

Set up in 2018, Team Scotland is a multi-organisational enterprise between Transport Scotland, Network Rail and ScotRail. Its purpose is to create a more dynamic, outcome focused way of working across the Scottish Rail Industry.

Team Scotland were struggling to achieve their ambitions of becoming a high performing enterprise and commissioned AtkinsRéalis to develop new, collaborative ways of working and effectively embed these within Team Scotland.

SERVICES PROVIDED

We undertook an extensive stakeholder engagement exercise to get to the root of the problems. Including online workshops, individual meetings, and a project case study to assess the impact on delivery and to shape future thinking, culminating in a tripartite face-to-face workshop focused on shared objectives:

1. **Enterprise Culture** — Developed and embedded a set of unique Working Principles, designed around specific challenges, aligned to their Values. Providing Team Scotland with the rules and tools to develop new habits of thinking and behaving in an enterprise setting.
2. **Valuing Each Other** — Created a bespoke Project Scenario Model to showcase the unique skills, expertise and experience each partner brings to the Enterprise.
3. **Strong Foundations** — Developed a practical and realistic Improvement Roadmap, based on shared objectives, designed to create a strong foundation for the Enterprise to move forward.

VALUE ADDED

"AtkinsRéalis gained respect and co-operation from all members which had hitherto been a challenge. They gained buy-in to the need to focus on the stated core values of Trust, Transparency and Collaboration by developing a range of Team Scotland Behaviours and Working Principles which has undoubtedly enabled the Team to be better placed to deliver the key objective of project delivery."

Alan Marshall,
Continuous Improvement Group Chair,
Team Scotland Enterprise

Engineering Net Zero

DELIVERING RESILIENT, NET ZERO TRANSPORTATION

Net Zero Masterplanning: simon.shapcott@atkinsrealis.com
Whole Life Carbon Management: mathew.metcalf@atkinsrealis.com
Adaptation and Resilience: jodie.mitchell@atkinsrealis.com
Energy Transition: alex.sinclair@atkinsrealis.com

Masterplan Sustainable Transport:

Deliver sustainable transportation systems that meet the needs of the users and places they serve, encourage modal shift and behavioural change.

Design-in Resilience:

Safe and reliable transport infrastructure for communities and the economy, while reducing whole life costs.

Design-out Carbon:

Transport infrastructure that has the lowest possible embedded and operational carbon.

Enable Energy Transition:

Renewable energy, where and when its needed, and encouraging low carbon journeys.

Engineering Net Zero

WORKING TOGETHER TO PROTECT TOMORROW

DIFFERENTIATORS BRINGING VALUE TO OUR CLIENTS

FULLY INTEGRATED SERVICE OFFERING

As a global business, we leverage our capabilities and expertise across regions to deliver the best value for our clients. Our teams of experts collaborate and share international best practice to apply our global service offering to local projects – seamlessly.

LOCAL COMMUNITIES AND SUSTAINABLE DEVELOPMENT

We are committed to leaving behind a positive and sustainable legacy for the communities in which we work. We have a demonstrable track record of our commitment to community engagement, particularly in industrial work locations, delivering:

- Skills training and mentoring programmes
- Involvement in our local community's organisations
- Traditional knowledge and community studies
- Assistance in education and health services
- Permitting and approvals

NET ZERO CARBON. NET ZERO EXCUSES.

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