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# TfW Climate Adaptation and Resilience Plan

Annual Progress Update for 2023/24



TRAFNIDIAETH CYMRU  
TRANSPORT FOR WALES



Llywodraeth Cymru  
Welsh Government

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# 1 Introduction

The Term of Government remit letter for Transport for Wales requires us to "ensure all TfW operations delivered on behalf of the Welsh Ministers are designed and delivered based upon the latest data on climate change risk and impacts and robust climate change adaptation plans are in place". Our Climate Adaptation and Resilience Plan (CARP), published in March 2023, gives us the strategic framework for delivering on this remit. The CARP was based on the latest data on climate change risk for the Core Valley Lines (CVL) and aims to strengthen the resilience of our transport networks and operations.

Our CARP and Climate Change Risk Assessments (CCRAs) have been designed to align with Taskforce on Climate-related Financial Disclosures (TCFD) recommendations. The TCFD guidelines provide a structured framework for reporting on climate risk and adaptation in line with core corporate operational functions: Governance, Strategy, Risk Management, and Metrics and Targets. This annual update supports TCFD recommendations by reporting progress against our strategic objectives since the CARP's publication in May 2023.

The remainder of this report details our progress against the strategic objectives set out in our Climate Adaptation and Resilience Plan

# 2 Objective 1: Ensure climate change resilience is embedded in everything we do

## 2.1 Governance Framework

During 2023/24, we developed our governance framework for climate change to provide a robust approach for the oversight of our climate-related risks and opportunities in line with our strategic objectives. The governance structure demonstrates the reporting functions of core internal stakeholders and working groups.

It is intended that the TfW Board will oversee our resilience activities to ensure they align with TfW's corporate vision. By creating a formal monitoring and reporting process for climate change we can ensure our Board has full accountability of our activities to increase climate resilience across the organisation.

## 2.2 Climate Change Steering Group

In 2023, we established a Climate Change Steering Group (CCSG) to oversee and provide an accountability framework for the work undertaken by the Climate Adaptation and Energy and Carbon Working Groups. The CCSG convenes monthly and provides oversight and guidance on investment decisions related to decarbonisation, energy management, and climate adaptation. In addition to providing an effective assurance function, the CCSG maintains consistency in the working methods across the two reporting working groups.

## 2.3 Climate Adaptation Working Group

The CVL Climate Adaptation Working Group (CVL CCAWG) is jointly chaired by the Climate Adaptation and Resilience Lead and Senior Asset Engineer. The working group's purpose is to engage with key stakeholders to secure support and ensure a coordinated and collaborative approach to climate adaptation throughout TfW's operations.

## 2.4 Governance Framework

In March 2024 we worked with external consultants to conduct a 'Climate Decision System Mapping' workshop covering the CVL network. Thus, decision system mapping Workshop was held at Llys Cadwyn on Wednesday 6 March 2024.

# 3 Objective 2: Assess climate change risks across all TfW networks and operations

## 3.1 Climate Change Risk Assessment Framework

### 3.1.1 Publication and Guidance

In November 2023, we published our CCRA Framework that provides a standardised approach for assessing climate-related risks and opportunities across TfW's assets and business functions. The Framework includes a comprehensive guidance document and intuitive assessment tool to support users with the completion of CCRAAs across the organisation.

We worked with our internal data team to create a Power BI Dashboard (see below). All CCRAAs will be added to the dashboard, managed and monitored by the Climate Change and Energy Team, allowing for transparency across the organisation.

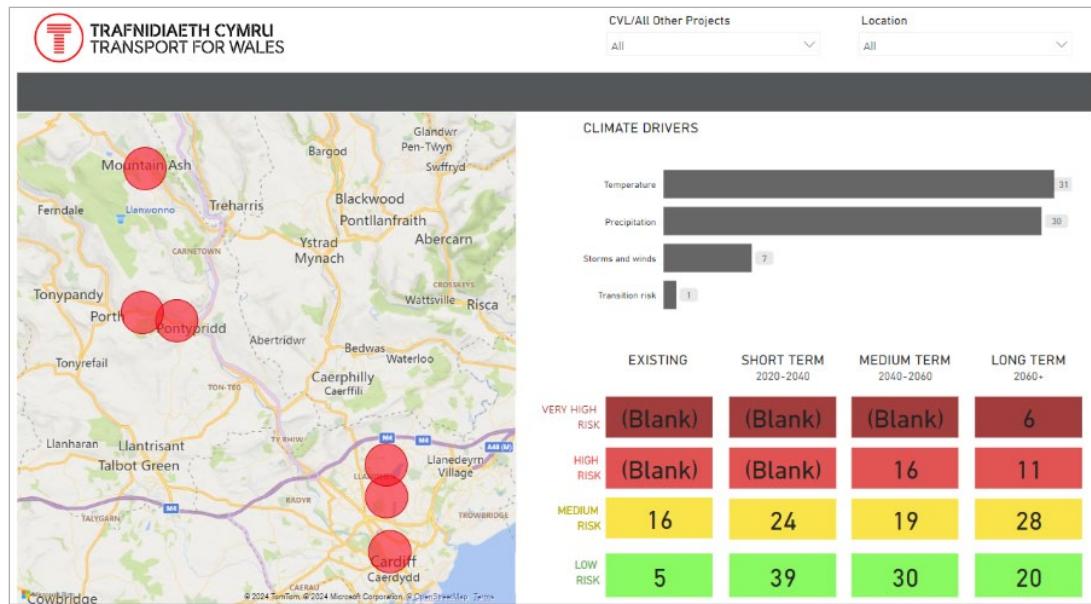


Figure 1: TfW's CCRA Dashboard

### 3.1.2 Climate Change Risks on the Core Valley Lines

Since we have launched TfW's CCRA Framework, priority has been focused on CVL as our owned assets, in accordance with the Welsh Government remit directive. Locations for CCRAs have been prioritised according to a risk level approach based on the areas we know are already vulnerable to weather events.

We use both localised asset knowledge and information for train delays (see graph 1) to identify vulnerabilities. CCRAs have been carried out on two geographical locations and one project specific; identifying 51 climate risks for the CVL, mostly attributed to rainfall. We are currently managing and monitoring these climate change risks in line with our climate change governance process.

### 3.1.3 Mountain Ash - Climate Change Risk Assessment Workshop

We conducted CCRAs for Mountain Ash and Trehafod stations. These CCRAs found a range of risks for service disruption, transport operations, reputational damages, safety of customers and staff, financial impacts and potential environmental incidents.

In 2023, we completed the first CCRA at Mountain Ash, having previously been identified as a high-risk site. The assessment served as a pilot to refine the process for future CCRAs across the organisation. This process called on input from TfW's Climate Change Energy Team, Infrastructure Owner Team and Asset Engineers from Amey Infrastructure Wales.

The assessment outcome exceeded TfW's risk appetite and was escalated to the CCSG for decision. Given Mountain Ash's role in the adaptation pathways planning, the group deemed the risk acceptable, with ongoing monitoring and re-evaluation planned post completion.

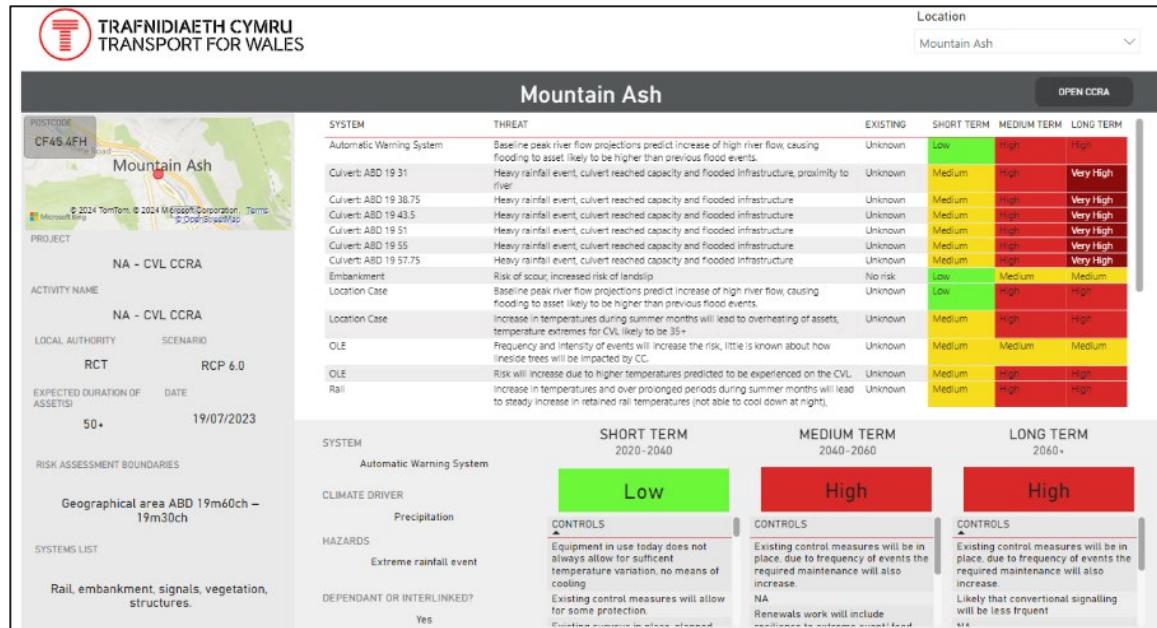


Figure 2: Completed CCRA for Mountain Ash

## 4 **Objective 3: Design and implement solutions that reduce the impacts from future climate change**

### 4.1 Early Adoption of CCRAAs in Projects

In 2023/24, we formalised the process so that CCRAAs are completed pre-design stage so that climate change adaptation is a consideration from project inception. To ensure that adaptation requirements specified by projects to reduce climate change risks are captured, we have also formulated TfW's template Climate Adaptation Plan (CAP). All CAPs will require approval from the CCSG, this is in line with our governance process stated above.

### 4.2 Rapid Adaptation Pathways

We are committed to future proofing our infrastructure assets against the impacts of climate change. To support this, we commissioned external consultants to develop Climate Adaptation Pathways, in addition to the Decision Systems Mapping piece.

The development of Adaptation Pathways provides TfW with an analytical approach for exploring and sequencing a set of possible actions based on external developments over time. It allows decision makers to plan for, prioritise and stagger investment in adaptation options with trigger points and thresholds helping to identify when to revisit decisions or actions.

The Rapid Adaptation Pathway Assessments (RAPAs) were developed during four workshops scheduled between February and April 2024. The final RAPA report on these climate adaptation pathways was issued in August 2024. It is intended that this process will support learning and provide a framework for TfW to follow, with the methodology being used to develop adaptation pathways for other assets across Wales.

## 4.3 Green Wall and Roof at Llys Cadwyn

In 2023, we invested in our first prototype green wall and roof at our Llys Cadwyn office. Green walls and roofs can play a vital role in flood reduction, help keep buildings cool during the summer and provide shading.

Both prototypes have provided key learning for us as an organisation and improved our understanding of nature-based solutions as an option for climate change adaptation.



Figure 4 : Green wall at TfW's Llys Cadwyn office

Climate change adaptation is vital to reducing the risks of climate change impacts on our business, the well-being of our staff and transport in Wales. As work progresses with our CCRAs, we will continue to prioritise nature-based solutions as adaptation measures.

## 5 **Objective 4: Enable timely recovery from the impacts of adverse weather**

### 5.1 **Monitoring the Impacts**

Adverse weather affects TfW as an organisation, as well as the people and communities that we serve. Our CARP included an analysis of weather-related incidents which have adversely impacted performance, we have continued to build on this data and have created a Power BI dashboard to help us understand vulnerable areas across the CVL network.

### 5.2 **Planning for Adverse Weather Conditions**

During 2023/24, we worked closely with external consultants and Amey Infrastructure Wales to develop Adverse Weather Management Plans across the CVL network. These documents have been produced to support rail operation during periods of adverse weather. Our asset management teams are currently reviewing the suitability of the existing weather forecasting system and are in liaison with the weather team in Network Rail to explore new options for forecasting. This includes a review of the thresholds in relation to each discipline to determine what is deemed an adverse and extreme weather event.

### 5.3 **Route Condition Monitoring**

We have an ongoing workstream looking at Route Condition Monitoring (RCM) across the CVL network. Several monitoring devices have already been installed by Amey Infrastructure Wales providing real time information of asset condition. A range of RCMs have been deployed at sites that are high risk, such as drainage assets prone to flooding due to flow restrictions. In 2023/24 we have developed our long-term RCM Strategy, which will improve our understanding of the effects of Climate Change on CVL Rail Infrastructure.

### 5.4 **Cardiff University – Fluvial Flooding Mapping**

TfW's Infrastructure Owner team worked with Cardiff University to develop a case study hydraulic model, constructed of a sub-area within the region (the River Cynon) during a significant event (Storm Dennis – February 2020). The aim of this work was to provide the footprint for the development of an operational flood warning system for the CVL area. The case study provided insights into the benefits of developing effective flood warning systems across the CVL network, by assessing flood risk and vulnerability due to climate change.

## 6 **Objective 5 - Collaborate with external partners to reduce TfW's vulnerability to cascading failures**

### 6.1 **Our Work with Network Rail**

In 2023/24, we worked closely with Network Rail through the 'Cyfuno Model'; a 'Memorandum of Understanding' between TfW and Network Rail to find ways that we can work together more seamlessly to deliver shared objectives. The ambition is to create a joint plan including a mission statement focussing on climate change resilience and adaptation. The intention of the joint plan is to work closely with Network Rail on those sites which cross network borders; as well as looking at catchment areas for flood attenuation, working with larger landowners and focussing on 'Nature Based Solutions'.

### 6.2 **The Well-being of Future Generations Act 2015**

In preparation for becoming a named body under the Well-being of Future Generations (Wales) Act 2015, we have been working closely with Public Service Boards (PSBs) across Wales. This includes involvement in PSBs Climate Change Risk Assessment Task Group to support with their CCRAs. By providing data, we will be able to support our stakeholders and engage with them to explore different risk combinations associated with climate change.

### 6.3 **Working Groups and External Forums**

Throughout 2023/24, we contributed to several working groups and forums, including the National Infrastructure Commission Wales Flooding Actions Group, the Infrastructure Owner Adaptation Forum (IOAF) and the RSSB Climate Adaptation Working Group. We worked collaboratively with core members of the RSSB group to collate group consultations and to develop a climate adaptation maturity matrix for the rail industry.

## 7 Summary of key action updates

Within our CARP, we have outlined our Action Plan for climate resilience, it exists as the first step in our journey of increasing resilience across TfW. The purpose of this section is to provide key updates on the actions set out within the plan that have been completed throughout 2023/24. Our understanding of the resources required to complete these actions has improved as this work has progressed, therefore, the target completion dates have been revised accordingly.

Table 1: Summary of Key Actions and Updates

Action	Target Completion	Actual Completion	Updates
Set up an overarching TfW Climate Change Steering Group (CCSG) and a CVL-focussed Climate Change Adaptation Working Group (CCAWG)	2022	2022	<p>TfW's CVL-focussed CCAWG has been running periodically since November 2022 and is the focal point for all climate-related issues affecting the CVL infrastructure.</p> <p>TfW's CCSG (formally Climate Change Adaptation and Resilience Steering Group) has been running periodically since March 2023 and is responsible for providing an effective assurance function for the management of our climate change risks. The group's remit is currently being revised to incorporate transitioning risks.</p>
Embed the climate change adaptation standard ISO 14090:2019	2025	On-going	Work is progressing to align TfW's adaptation processes with ISO 14090:2019 principles. Initial integration steps have begun, focusing on embedding the standard into governance and project frameworks, with further refinement planned for 2024/25.
Develop management and response plans for extreme weather events and outbreaks of invasive species/emerging pests and diseases	2024	On-going	Adverse Weather Management Plans are currently in development and will be prioritised for 2024/25 (see <b>Objective 4</b> for further details).

Action	Target Completion	Actual Completion	Updates
Facilitate the coordination of a cross-discipline Climate Change Adaptation Working Group for Welsh Infrastructure Owners to support the development of management for cascading failures	2024	On-hold	We have carried out the initial stakeholder mapping.
Develop a framework and climate projections guidance document to support the assessment of climate risk	2023	2023	We published our CCRA Framework in October 2023. The document provides a standardised approach for the assessment of climate change risk across the organisation.
Produce weather-related impact assessments for the CVL, focusing on: Flooding, landslips, heat, lightning, sea-level rise, wind, extreme cold, heat and fog	2024	On-going	We are working to understand system-wide risks identified through CCRAFs.  Gap analysis to be carried out in 2024/25 to understand overlap with existing actions.
Embed the requirement climate change risk assessments into all TfW major projects (such as North Wales Metro) and existing policies	2024	2024	We have designed and delivered CCRA training across TfW to enable this action. We are working closely with internal teams to embed the requirement into TfW's Plan of Work Lifecycle.
Conduct a comprehensive assessment of climate risk across the CVL network, including stations and depots	2024	On-going	We are in the process of completing CCRAFs across the CVL network. These are prioritised based on risk scoring for areas prone to the impacts of adverse weather events (see <b>Objective 2</b> for further details).
Develop a Climate Adaptation and Resilience Delivery Plan for the CVL network, including drainage and earthworks	2024	On-going	Action to be prioritised for 2024/25 (see <b>Priorities for Year Ahead</b> for further details)

Action	Target Completion	Actual Completion	Updates
Develop a Vegetation Management Plan	2024	On-going	We have worked with stakeholders to produce a biodiversity strategy for the CVL, aiming to maintain, restore and improve ecological resilience within the CVL railway corridor.
Develop climate change adaptation pathways (supported by BS 8631: Adaptation to climate change - Using adaptation pathways for decision making) for the CVL	2024	On-going	We are working with external consultants to develop adaptation pathways for 8 locations across the CVL (see <b>Objective 3</b> for further details).
Conduct research into Nature-based Solution schemes and develop implementation guidance	2024	On-going	Action to be prioritised for 2024/25 (see <b>Priorities for Year Ahead</b> for further details).

# 8 Priorities for 2024/25

Table 2: Priorities for 2024/25

The below table lists activities we've prioritised to support the objectives within our CARP and to increase our understanding of how climate change will affect us.

Priority	Supporting action	Business Benefit
1. Develop the Climate Adaptation and Resilience Delivery Plan for the CVL Network	<p>This will be informed by the CCRAs and will provide details of how we are managing these risks across the network.</p> <p>Set up Extreme Weather Working Group to support with management of the plan.</p>	We will be able to determine the actions we will take over the long term to increase the resilience of the network. Inform the Welsh Government about investment and funding opportunities.
2. Research Into Nature-Based Solution Schemes and Develop Implementation Guidance	Activities in upcoming financial years will include a selection of trial sites to demonstrate the benefits of nature-based solutions. This may be for biodiversity mitigation, flood risk reduction, local amenity and other non-economic benefits. We will monitor and evaluate the performance of these schemes with a view to develop implementation guidance for our stakeholders.	Demonstrating the effectiveness of nature-based solutions; including economic, social and environmental benefits for TfW and our key stakeholders. Any such proposals will be co-ordinated between various teams, to ensure alignment with multiple strategic outlooks; including but not limited to our <a href="#">Biodiversity Action Plan</a> , CARP, and Transport Development Schemes.
3. Embed the Assessment of Climate Risk Across TfW	CCRA training across the organisation, TfW's Climate Change and Energy Team will work closely with the Strategic Development team who are leading on early scheme development, including for the TfW bus network and bus depots.	Embed climate resilience measures at the project feasibility stages. Support TfW's Annual Business Plan 2024/25 whereby climate resilience has been stated as a priority.