



Infrastructure in Wales 2026-2031

Prosperity, growth and jobs



Conwy Castle is a place where modern rail runs through history

About the ICE

The Institution of Civil Engineers (ICE) is the home of infrastructure.

It is a professional institution with 95,000 members and over 200 years of history.

It qualifies civil and infrastructure engineers, promotes lifelong learning, and provides trusted, impartial, expert advice to decision makers.

Its vision is a world where infrastructure enables people and planet to thrive.

Its global membership designs, builds, and maintains trustworthy and sustainable infrastructure.

ICE Wales Cymru represents over 3,500 members across Wales.

About this report

This report provides infrastructure recommendations for the Welsh government, following the Senedd election in May 2026. Infrastructure delivery will be at the forefront of our economy's growth and decarbonisation in the following decades. ICE Wales Cymru stands ready to support and provide impartial expertise.

For many years, ICE Wales Cymru has provided Welsh parliamentarians with briefings and information on a range of infrastructure topics, including how Wales funds major infrastructure projects, transport connectivity and the role of the national transport strategy, how to incentivise investment in resilience and adaptation, and structural and operational barriers in infrastructure delivery.

ICE Wales Cymru remains ready and willing to continue to work with the Welsh government on infrastructure matters and would be pleased to provide necessary information, briefings, and answer any questions.



Resilience

Wales must continue to invest in new and existing infrastructure assets and speed up the transition to a zero-carbon economy.



Executive summary

Skills

Wales must continue to invest to grow the next generation of civil and infrastructure engineers and upskill our current workforce so that we can deliver the infrastructure that drives our economy and society.



Infrastructure pipeline

Wales must improve, maintain and fund our pipeline of short, medium and long-term infrastructure projects.

Image above: ICE Wales Cymru supports and promotes continued investment in the skills needed to deliver current and future infrastructure

ICE recommendations:

Infrastructure for prosperity, growth and jobs



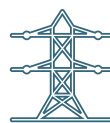
- improve the infrastructure pipeline set out in Wales infrastructure investment strategy 'Project Pipeline' by gathering data from a wider set of stakeholders, identifying overlap in project planning, and supporting coordination of regional skills and construction material planning.
- supported by the National Infrastructure Commission for Wales, plan an infrastructure pipeline for the next 25 years to address ageing public infrastructure and climate change.

Transport



- undertake asset mapping to ascertain vulnerabilities and implement a fully funded asset management system across Wales.
- resolve the transport challenges around Newport and on route A55 as a priority.
- improve road links across the country.
- deliver an efficient and resilient road and freight network.
- work with the UK government to deliver the electrification of all railway lines in Wales.
- implement a modal shift to active travel.

Energy



- promote the PAS 2080 standard in carbon management.
- work with the UK government to ensure the consistent supply of electricity to avoid interruptions.
- reduce the production of harmful emissions.
- promote energy efficiency measures, particularly through public engagement and behavioural change strategies.

Flood risk management



- develop a long-term capital and maintenance investment programme to prioritise nature-based solutions.

Enable and require lead local flood authorities to:

- develop strategies to improve property level resilience in flood risk areas and identify and protect exceedance flood pathways to operate in extreme events. This will build on the good progress made in Wales on the implementation of sustainable drainage systems (SuDs).

Support and require industry to:

- work with the research community to innovate in the use of flood resilience technology. Research and innovation should result in the development of resilient buildings that meet high sustainability standards in other aspects.
- work with planners to proactively create flood resilient community systems. Education, training and Continuing Professional Development (CPD) for designers, builders, product manufacturers and property managers is necessary.

Water and wastewater



- progress innovative low carbon ways to transfer water across river catchments, prioritising nature-based solutions.
- invest in and improve the existing water network, improving efficiency and security of service. Reservoir stock must be upgraded to meet future water demand with a long-term strategic plan for water resources in Wales.
- promote the benefits of Wales' water resources, linked to inward development – domestic and commercial opportunities. Availability of water can be a business differentiator in some sectors.
- help the public to view water as a valuable resource to improve water efficiency and reduce demand.
- work with the UK government to implement the water reform programme to address pollution and environmental harms caused by sewage discharge.

Skills



- develop a long-term skills plan to meet the government's infrastructure and net zero objectives and further develop accredited engineering courses in North Wales.
- continue to invest in apprenticeship initiatives. As experience shows, apprenticeships are effective in retaining talent.

Infrastructure for prosperity, growth and jobs

Joined up infrastructure across land, sea and air remains urgent as we face the compounding effects of climate change and underinvestment in public services. ICE Wales Cymru lays out a set of policy priorities that would put infrastructure considerations at the heart of Welsh government policy.

We urge the Welsh government to address the opportunities and gaps in our public infrastructure to unlock economic growth, overcome the challenges posed by climate change, adapt in response to demographic change and improve the lives of the public. Civil and infrastructure engineers and technicians are well-placed to tackle the increasing challenges of the changing climate for the safety and wellbeing of the Welsh population. Our esteemed profession is equipped to lead, scrutinise and advise on matters related to design and infrastructure.

Our quality of life depends on infrastructure. There would be little economic activity without energy generation and distribution, water supply and disposal, transportation by rail, road, sea and air, and waste management. As the 'home of infrastructure', ICE Wales Cymru urges continued investment in Wales' infrastructure. Ongoing investment will protect the current service levels of infrastructure, ensure that Wales is well-placed to take advantage of greater economic prosperity, and help us meet our climate change obligations.

Wales needs a vision for infrastructure. ICE Wales Cymru's vision is a world which maximises the use of infrastructure systems to support sustainable outcomes towards net zero and green infrastructure.

Infrastructure investment provides value as it multiplies in economic returns. But delivering that value depends on our ability to accurately identify community need and build assets cost and carbon efficiently. We advocate for the right frameworks to identify, prioritise and plan infrastructure that long-term supports economic growth and sustainability. We advise joined-up strategies that are based on well-evidenced need, reinforced by relevant data and valuable policy insights.

The lack of understanding about the vulnerabilities of Wales' infrastructure networks has created gaps in our approach to protecting critical infrastructure. The interdependence of our infrastructure assets must be recognised with increased levels of information sharing and joint forward planning.

ICE Wales Cymru recognises the need for strict energy efficiency standards for buildings, as a key contributor towards progress on net zero. There are differing views on the devolution of energy powers to Wales; ICE Wales Cymru calls on all parties to resolve these issues so that Wales can realise its energy potential.

Since the last census in 2021, the population of Wales has increased by 1.4% (1). Between mid-2022 and mid-2032 the highest projected growth is in urban areas, notably in Cardiff, Newport, and the Vale of Glamorgan (2). This will drive infrastructure requirements around current and future urban areas to ensure that they are smart and liveable for people who work in, live in, and visit them. Population growth will have challenges for transportation, energy, water, communications and waste management provision.

With its use of ecological footprinting, Wales is leading the way in targeting reductions to the UK's carbon emissions. We promote and support the innovative development of renewable energy technologies, particularly wind and marine power. We advise working with the UK government in this area.

We support the United Nations Sustainable Development Goals as a valuable shared framework for the alignment of choices, investment and long-term strategies with global sustainability targets. Providing a safe, affordable, and reliable system is a key focus for ICE Wales Cymru, tied to its purpose to improve lives by ensuring people and planet have the infrastructure needed to thrive.

¹ Office for National Statistics (2022) Population and household estimates, Wales

² Welsh government website (2025) Local authority population projections: 2022-based



Technicolour transit

ICE Wales Cymru supports and is a cosignatory of the Placemaking Charter, supporting the principles of the National Development Framework (NDF). This is in the context of achieving the 2050 Net Zero target which will require unprecedented transformation of Wales' infrastructure.

Infrastructure pipeline

We welcome the Wales infrastructure investment strategy 'Project Pipeline' that lays out outcomes enabled by infrastructure between 2021-2031. The pipeline sets planned infrastructure investments by both the Welsh government and its delivery partners over rolling three-year periods. We recommend extending the three-year period to five years to match the Senedd term. This provides synergy between work streams, projects and programmes.

Long-term planning is also essential to address ageing public infrastructure and climate change in Wales. The infrastructure pipeline needs a joined-up infrastructure vision that looks forward 25 years. A long-term needs assessment must be developed with the support of the National Infrastructure Commission for Wales (NICfW) and through engagement with governments, clients, investors, operators and delivery teams.

We advise a digital and interactive map-based format to increase the visibility of the programme of projects. This must be developed with clear timelines, be regularly reviewed and updated, and be supported by NICfW. The infrastructure pipeline should be updated when a financial commitment is agreed upon.

The Welsh government should engage with communities as a range of stakeholders and the public can better understand the options for future infrastructure needs in Wales. This collaborative effort will lead to a built environment sector that encourages confidence, capability, creativity and ambition, as well as identify the infrastructure options available to the Welsh government to meet its ambitions.



Transport

ICE Wales Cymru recommends that the Welsh government:

- *undertake asset mapping to ascertain asset vulnerabilities and implement a fully funded asset management system across Wales.*
- *resolve the transport challenges around Newport and on route A55 as a priority.*
- *improve road links across the country.*
- *deliver an efficient and resilient road and freight network.*
- *work with the UK government to deliver the electrification of all railway lines in Wales.*
- *implement a modal shift to active travel.*

Asset mapping must be undertaken to give an overview of the vulnerabilities of infrastructure in Wales. We recommend that the Welsh government invests in specific understanding regarding the state of infrastructure in Wales so it can better invest in maintenance and renewals, as well as implement fully funded asset management.

The interdependence of our infrastructure assets must be recognised with increased levels of information sharing and joint forward planning. Wales must have a safe, affordable, integrated and accessible transport network that supports local and regional economic growth, productivity, and a vibrant society.

Wales needs a robust and resilient transport network and electrification of railway lines across Wales with genuine choices for the travelling public and freight carriers alike. Improved connectivity and capacity of road and rail links with London, southwest England, the Midlands and northwest England would drive economic growth within Wales, provide access to jobs, and ensure that Wales can compete for investment with other parts of the UK. The resolution of transport challenges around Newport and on route A55 should be progressed as a priority.

Transport requirements across the porous border are particularly important and collaboration between Welsh and English border areas deserve particular attention in terms of capacity and resilience. ICE Wales Cymru supports further development of Transport for Wales with an integrated transport network across all parts of Wales. Integrated systems of heavy rail, light rail, metro and bus are needed. ICE Wales Cymru supports Transport for Wales in the development of a multi-modal approach to transport in Wales.

ICE Wales Cymru supports the continued development of active travel routes and policy across all Wales, recognising the clear challenges across rural areas. Wales needs to build public support for walking, cycling and wheeling routes. Given the clear health benefits of walking and cycling, these forms of transport should be supported and promoted. The Active Travel (Wales) Act 2013 leads the way in this regard. There is a need for continued collaboration between the Welsh and UK governments to expedite infrastructure delivery, particularly where innovative solutions or funding requirements may be needed. A move to a greener network is required.

A modal shift to active travel will play a critical role in meeting several Welsh government priorities, notably decarbonisation, reducing road congestion and improving health and air quality. In a cost-of-living crisis with rising fuel prices, active travel is an affordable and sustainable solution to expensive and carbon intensive transport modes.

Image left page: A465 Heads of the Valleys trunk road completed in 2025 provides safer and more reliable journeys

Energy

ICE Wales Cymru recommends that the Welsh government:

- *promote the PAS 2080 standard in carbon management.*
- *ensure the sufficient supply of electricity to avoid interruptions.*
- *reduce the production of harmful emissions.*
- *promote energy efficiency measures, particularly through public engagement and behavioural change strategies.*

Regulation of carbon emissions in construction must be prioritised. Developed with support from the ICE, PAS 2080 is a globally applicable standard for managing carbon in buildings and infrastructure which should be adopted across Wales. The whole value chain should be considered to reduce carbon and cost through intelligent design, construction and use. We advise adoption of this standard by the Welsh government and private sector.

Alongside reductions to carbon emissions released during construction, and enabled by infrastructure assets, investment in renewable and clean energy solutions is required to support the transition to net zero. ICE Wales Cymru also recognises the importance of energy security as an issue facing Wales and the UK.

Reducing carbon emissions whilst meeting security of supply needs should be at the top of the agenda. This means a mixed approach to our energy generation, including nuclear and renewables. Full use should be made wherever possible of the heat produced by electricity generation plants, through combined heat and power schemes.

Wales should take full advantage of its natural resources and its ability to deliver innovative and sustainable energy from a wide variety of sources. ICE Wales Cymru envisages Wales becoming an energy hub for the UK. Wales is ideally placed to play a very significant role in clean energy generation due to its many advantages including topography, tidal range, higher-than-average wind speeds and areas of low population density. Nuclear power has a key part to play in the transition to net zero. ICE Wales Cymru supports the Welsh and UK governments in the development of small modular reactors.

Delivering this change will require significant engagement with the public. We have already seen the fracturing of the consensus on carbon emissions reduction in the UK, and behaviour change will require the government to rebuild the case for the green transition. In particular, the Welsh government should encourage and incentivise demand management approaches to stem emissions and reduce Wales' reliance on fossil fuels.



Image above: Wales is ideally placed to play a very significant role in clean energy generation

Image right: A wind turbine rises above the Rhondda Valley, symbolising the ambition for a sustainable future



Flood risk management

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- *develop a long-term capital and maintenance investment programme to prioritise nature-based solutions.*

Lead Local Flood Authorities must:

- *develop strategies to improve property level resilience in flood risk areas and identify and protect exceedance flood pathways to operate in extreme events. This will build on the good progress made in Wales on the implementation of SuDS.*

Industry must:

- *work with the research community to innovate in the use of flood resilience technology. Research and innovation should result in the development of resilient buildings that meet high sustainability standards in other aspects.*
- *work with planners to proactively create flood resilient community systems. Education, training and continuing professional development (CPD) for designers, builders, product manufacturers and property managers is necessary.*

Current estimates show that over 275,000 properties in Wales are at risk of flooding from rivers, sea and surface water ⁽⁴⁾.

ICE Wales Cymru recognises the important role of SuDS and supports nature-based solutions. These systems, along with a full range of other measures are key to effective flood risk management.

Wales' infrastructure is not ready to tackle the effects of climate change. The increasing prevalence of floods in Wales points to the urgent need to manage risk, develop infrastructure and develop emergency preparedness. Implementing nature-based solutions will require collaboration across a range of stakeholders.

Whilst the number of properties at risk from coastal erosion is less well defined, the number is believed to be significantly smaller. The majority of these will be affected within the next 100 years ⁽⁵⁾. It is essential that Wales begins to plan now.

Climate change poses major challenges across the sector and full consultation with at risk communities across Wales should be undertaken.



Above: Glynneath Flood Alleviation Scheme

^{4 & 5} National Resources Wales (2025) Flood risk management annual report 2024 to 2025

Image right: Hirael Bangor Flood Prevention Scheme





Water and wastewater

ICE Wales Cymru recommends that the Welsh government:

- *progress innovative low carbon ways to transfer water across river catchments, prioritising nature-based solutions.*
- *invest in and improve the existing water network – improving efficiency and security of service. Reservoir stock must be upgraded to meet future water demand with a long-term strategic plan for water resources in Wales.*
- *promote the benefits of Wales' water resources, linked to inward development – domestic and commercial opportunities. Availability of water can be a business differentiator in some sectors.*
- *help the public to view water as a valuable resource to improve water efficiency and reduce demand.*
- *work together with the UK government to implement the water reform programme to address pollution and environmental harms caused by sewage discharge.*

Wales has great potential to harness and benefit from its invaluable supply of water. Water is not only essential for households, but for business and industry alike. However, Wales has ageing reservoir stock, and this must be addressed to ensure security of supply in future.

ICE Wales Cymru recognises the specific situation in Wales where the majority of the country's services are provided by a water company owned by a not-for-profit organisation (Glas Cymru), which is able to reinvest financial surpluses into both clean water supplies and the treatment of wastewater. Capital investment in these ageing systems needs to continue.

While parts of Wales have abundant water resources, some parts of the country suffer from limits on water supplies. A greater focus on demand management is essential, and the ICE Wales Cymru supports public education on the value of water and how it can be used more efficiently.

The UK government's water reform programme represents a once in a generation opportunity to reset water governance, regulation and technical expertise in England and Wales. The Welsh government must work collaboratively to ensure that the changes proposed by Westminster are effectively implemented in Wales.

The sector needs extensive investment in the sewer network to reduce overflows. Alongside grey infrastructure investment in bigger tanks and better pipes, a greener approach should also be taken. Sustainable drainage systems (SuDs), green roofs, and properly treated highway runoff should all be part of the progress on reducing water pollution and wastage.



Image left page: Wentwood Reservoir

Image left: Craig Goch Dam

Skills

ICE Wales Cymru recommends the Welsh government:

- *develop a long-term skills plan to meet the government's long-term infrastructure and net zero skills objective, to grow and maintain a workforce aligned with the government's long-term infrastructure objectives.*
- *further develop accredited engineering courses in North Wales.*
- *continue to invest in apprenticeship initiatives. As experience shows, apprenticeships are effective in retaining talent.*

ICE Wales Cymru supports and promotes continued investment in the skills needed to deliver current and future infrastructure. Long-term investment programmes are required to provide a sustainable approach to boost skills growth in the industry.

A stable pipeline should enable the development of a comprehensive and long-term skills plan. This needs to grow and maintain a workforce aligned with the Welsh government's long-term infrastructure objectives. Shortages of civil engineers, technicians and other technical experts could prove to be one of the greatest pinch points to delivering the country's infrastructure ambitions affordably and on time in the short, medium and long term. This is a challenge that needs to be addressed by the public and private sectors.

ICE Wales Cymru is proud of its strong links with colleges and universities, with its accredited courses for progression to professional civil engineering qualifications. There are civil engineering degree courses available at Cardiff University, Swansea University, University of South Wales and Wrexham University.

The majority of graduates are from these south Wales universities at over 300 per year. North Wales also needs to be positioned to drive academic excellence, to reinforce existing provisions. Bachelor's degrees and apprenticeships in civil engineering are available at Wrexham University, while master's degrees and master's apprenticeship degrees should also be available to better enable future chartered registration.

Civil engineering apprenticeships offer excellent opportunities for civil engineers with clear benefits for both apprentices and employers. Apprenticeships offer a valuable route into the industry, tap into otherwise lost talent, and reduce the financial burden of university education.

The continued investment in apprenticeships and support for Welsh apprentices is required together with investing in technicians and graduates. ICE Wales Cymru supports and is a member of the Welsh Apprenticeship Alliance.

There are learning and virtual learning awards opportunities across all of Wales at all levels. ICE Wales Cymru supports and fosters these initiatives and encourages cooperation and collaboration to maximise the opportunities for all.

Image right: As a membership organisation and an employer, ICE Wales Cymru values equity, diversity and inclusion. We work to create a fair environment in which everyone's skills and expertise are valued





*Front cover image: Welsh Senedd & Cardiff Bay
Image above: The iconic Menai bridge was designed and built by
Thomas Telford, the first President of the Institution of Civil Engineers*

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