Two fifths of Scotland's infrastructure network of roads and railway lines are located close to our coastline. Dynamic Coast has shown the combined threats of coastal flooding and erosion to have increased over recent decades and are expected to worsen with climate change. Planning and action is needed now to reduce the impact on Scotland's infrastructure. Dynamic Coast provides the evidence base and advice to inform the Scottish Government and local authorities on the pace of coastal change and allow adaptation and increased resilience.

Who will this impact?

- Of the **1,440km** length of road and rail links within 50m of the current Mean High Water Spring, **40% lies behind soft coast with a risk of erosion**[1], and **10% behind defended artificial coast**.
- The Scottish Government and Transport Scotland spend **£160M a year** maintaining Scotland's roads[2], yet sea level rise and more severe storms in the future will lead to more extensive repairs.
- An estimated **£3.2B** of **roads** and **£8.7B** of **rail lines** lie behind unprotected soft coast[2]. Of this, approximately **£361M** of **road** and **£743M** of **rail** are **at risk of erosion by 2050**.
- **Climate change is increasing the risks and impacts to Scotland's vital transport infrastructure**.

How can Dynamic Coast help you?

- Dynamic Coast provides detailed interactive maps of coastal change over the last 100 years and informs how this may affect transport infrastructure as erosion increases toward 2050.
- Nationally, 5 km of rail line is expected to be affected by erosion by 2050 at 63 locations, and 55 km of roads at 727 locations, including 4.9 km within the Trunk Road network.
- **Highland** is the Local Authority with the **greatest length of infrastructure** that could **erode by 2050**, including **4 km of rail in 27 locations** across **all three Highland rail routes**, with significant impact (Inverness–Kyle of Lochalsh line: ~70k passengers/yr).
- Dynamic Coast webmaps and data identify the sites and pace of coastal erosion impact on transport, allowing local and regional action to address erosion risk, adapting and enhancing resilience while there is time.

What can you do to improve future resilience?

- ✓ To understand how your coast has changed and may change in the future – view the erosion maps here and SEPA's flood maps here.
- ✓ Plan ahead for adaptation of at risk infrastructure (including re-routing), before end of design life and post-storm
- ✓ Early adaptation has the potential to greatly reduce future costs.
- ✓ Communicate to the public the increased risk of road, rail and ferry disruption in a changing climate with more severe weather events.

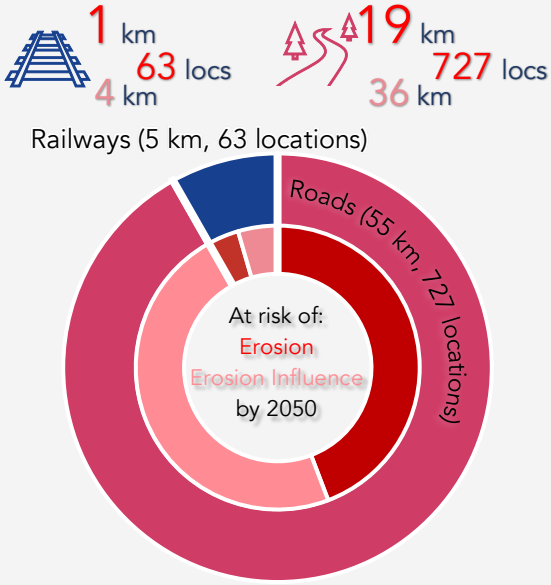
A window of opportunity

- The science is clear, we have a window of opportunity to put in place plans to adapt and improve the protection and resilience of our transport network before erosion and flooding worsens.
- Leading local authorities use DynamicCoast.com to plan ahead and Build with Nature to increase their resilience.

Find out more at:

DynamicCoast.com, transport.gov.scot, nature.scot, SEPA.org.uk

At risk of erosion by 2050:



What does this show?

'Erosion' figures (red) reflect assets that lie seaward of anticipated 2050 high water mark. 'Erosion Influence' figures (pink) reflect assets within the next 10m inland which may also be affected by erosion, storm damage and disruption.

What impact on assets?

*Direct risks include temporary flooding and/or permanent erosion. Erosion and flooding can reduce ground stability, block roads and railways with water and debris, remove important base stonework and damage electrical signalling equipment, causing delay, reducing safety and isolating people and property on lifeline routes. **Existing artificial defences** are increasingly threatened by rising sea level, increased storm and flood frequency and wave reflection. Existing **natural defences** (beaches, dunes and saltmarsh) are likely to narrow and retreat.*

Good practice

*Transport Scotland are following their **Climate Change Plan** to minimise carbon emissions and protect our coastal biodiversity under increased climate change risks.[3] Network Rail's **Weather Resilience and Climate Change Adaptation** (WRCCA) Strategy aims to ensure "a railway that is safe and more resilient to the effects of weather, now and in the future".[4]*

1 Dynamic Coast (2021) National Risk Assessment & Fitton, James Michael (2015) A national coastal erosion risk assessment for Scotland. PhD thesis, University of Glasgow
2 Transport Scotland (2016) Scottish Transport Statistics No 35. https://www.transport.gov.scot/publication/scottish-transport-statistics-no-35-2016-edition/
3 Transport Scotland (2017) The Climate Change Plan. https://www.transport.gov.scot/our-approach/environment/climate-change/#48812
4 Network Rail (2017) WRCCA Strategy. https://safety.networkrail.co.uk/home-2/environment-and-sustainable-development/wrcca/wrcca-strategy-2/