

Extreme weather resilience report: Devon



May 2014

Devon County Council
County Hall
Topsham Road
Exeter
Devon
EX2 4QD

1. Introduction

The succession of storm events across the three months from December 2013 through to February 2014, including the effect on the strategic rail network with the collapse of the sea wall at Dawlish on the South Devon coast, has yet again underlined the severe impact that extreme weather has on community resilience, transport, local government and the economy of the South West Peninsula. The Peninsula is southern Britain's front-line for intense storms tracking across the Atlantic under the influence of the jet stream. Climate change projections warn that such events are likely to occur more frequently. This report focuses specifically on the impacts the weather has had on Devon.

2. Background and context

There are approximately 13,000 kilometres of road in Devon, more than any other Local Authority area in the Country. This network is a vital part of the transport infrastructure of the County, enabling people, services and goods to move efficiently. The combined network of Trunk Roads, rail lines and County highways provides the strategic links both within Devon and between Devon and the rest of the country. The network is also vital in terms of the connectivity of Plymouth, Torbay and Cornwall. The local road network supports all of Devon's rural communities providing their vital link to jobs, services and support to Devon's rural economic activity.

Severe flooding events, storm surges, coastal tidal issues and high winds were experienced in Devon and the wider South West peninsula during December, January and February of 2013-14. These events have had a significant impact on individual people, communities, infrastructure and the economic performance of Devon.

Rainfall totals for these months in the South West have been well above average and have consequently had a significant impact on the condition of the strategic and local transport infrastructure in Devon and the far South West.

	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	Average
Oct	155	117	98	114	154	212	142
Nov	107	260	131	87	184	107	146
Dec	86	137	46	171	247	203	148
Jan	154	98	134	104	145	248	147
Feb	61	78	98	46	61	219	94
Total	563	690	507	522	791	989	677

Table 1: Rainfall totals (mm) in South West from 2008/09-2013/14

The financial implications have been felt in terms of a significantly increased maintenance burden which is placed on upper tier Authority revenue and capital budgets in the short term, but also longer term when the legacy of the repairs

becomes clearer. This has occurred on top of an existing maintenance backlog from previous winters. Furthermore there is a more wide-spread impact on the local economy both in the short term through operational issues, but perhaps more damagingly, in the longer term through a lack of strategic and local transport infrastructure resilience and connectivity which will affect economic output and investment confidence. There are some roads which are being closed, including those leading to business units.

Individuals have also felt the impact as a deterioration of road surface conditions causes vehicle damage and, potentially risks personal injury.

3. Direct impact of the weather events

3.1 Highway maintenance impacts

There has been significant damage to the conditions of the road, which has resulted in large financial implications for the Local Authority:

- In 2013/14 the highway maintenance backlog for carriageways alone escalated to an estimated £767 million.
- Devon County Council is still left with the legacy of the remaining repairs from the £18 million of damage caused by the storms of 2012/13, which will have to be funded from future capital allocations. This was forecast to continue until 2017.
- Devon's 13,000 kilometres of highway network, the biggest of any authority in the country, needs to spend around £62 million per annum over the next ten years to maintain the current condition of the highway at pre-2012 standards.
- The initial clear-up of the storm damage in 2013/14 is estimated to have cost around £3 million to the end of the financial year, but the County Council is yet to finalise a figure for the short and longer term damage caused by the storms as the road network and structures are still being assessed.
- The County Council will receive £35 million for its capital highways budget from Government for the next financial year. This is £4m less than 2013/14 and together with reduction in revenue funding will reduce the amount of maintenance funding available to the network. Recent grant applications have resulted in a £7m allocation from the DfT which is very welcome but only partially closes the gap between network needs and the funding available to address those needs. The emphasis of the grant is also towards "potholes" and therefore leads to the use of this money in tackling "worst-first" roads and not to the better value for money of preventative maintenance.
- The strength and frequency of the storms across Devon has made the clear-up much more difficult than during the storms in 2012/13. The Government has said that it will foot the bill for the storm damage, but despite putting extra resource into repairs there has been a massive increase in pothole numbers.

The condition of the road surfaces in Devon has been steadily deteriorating and the recent storms and intense rainfall have exacerbated the issue. One of the major

issues on the Devon County Council road network has therefore been the increasing number of potholes reported since the start of the storm period. A pothole is defined by a fault in the road which measures at least 300mm in any one dimension and 40mm in depth. The number of potholes in an average month is about 2000. This has escalated to a peak of over 10,000 in March 2014. Devon Highways has responded by increasing the number of pothole repair teams across the county from 13 to over 40 with an extra 64 staff tackling the problem at an approximate additional cost of around £93,000 a week.

The table and graph below shows the rainfall totals for the South West England and South Wales region against the number of potholes reported in Devon.

2013/14	Rainfall (mm)	Number of Potholes
Oct	212	2299
Nov	107	2044
Dec	203	2025
Jan	248	7564
Feb	219	7900
Mar	72	10551
April (up until 22 nd)	51	5369

Table 2: Rainfall and number of potholes recorded by Devon County Council

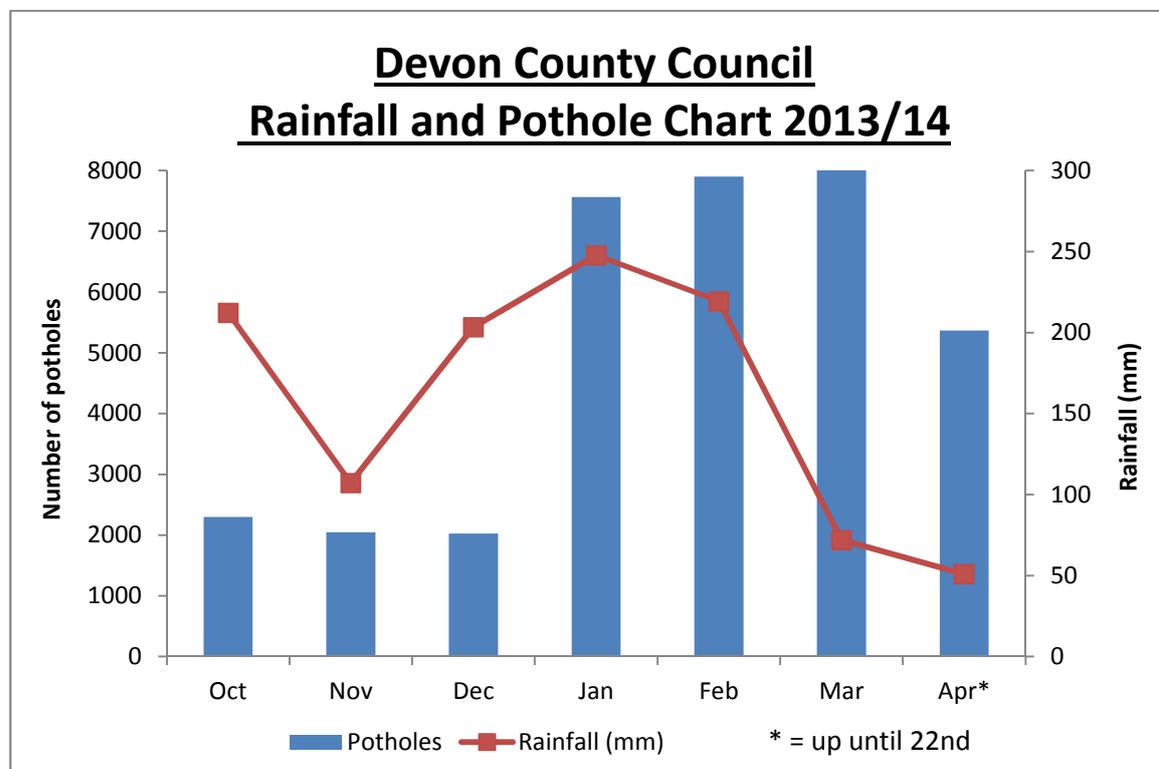


Figure 1: Rainfall and pothole chart for Devon in 2013/14

The table and graph above show that the increased rainfall has resulted in a greater number of potholes being reported which suggests the conditions of the roads deteriorated more as a result of the increased precipitation.

Across the whole storm period, starting on Monday 23rd December, more than 1,340 reports of fallen trees and branches on Devon's roads, about 180 embankment slips, and about 4,600 flooding incidents were recorded across the county. The majority of the flooding affected coastal areas whilst river flooding was not a particular issue this year so there were no reports of any bridges being washed away in the same way as last year.

There were many incidents where roads were closed due to these fallen trees, brief periods of highway flooding or small landslips. The dates of the significant road closures on the highways authority network are listed below:

23rd-24th December 2013

- A377. Significant problems between Crediton to Barnstaple due to a combination of fallen trees, flooding and landslips.
- A358 Weycroft Bridge. Similar problems to the ones experienced on the A377.

5th February 2014

- A379. Closed at Blackpool Sands in South Hams due to large collapsed tree.
- A375. Closed at Sidbury due to a fallen tree.
- A382. Closed between Lustleigh and Moretonhampstead due to collapsed barn.
- A396. Closed at Stoke Canon due to flooding, with alternative routes in Killerton also affected.
- B3174 (old A30). Closed at Rockbeare due to a fallen tree.

12th February 2014

- A375 Putts Corner. Closed in both directions towards Ottery St Mary and Honiton due to fallen tree.
- A361 North Devon Link Road near to South Molton flooding numerous calls regarding blocked gullies.
- A385 Dartington to Totnes. Closed after a tree brought down power cables.
- Taw Bridge in Barnstaple. Closed due to wind speeds exceeding 70mph.

14th-15th February 2014

- A380. One lane blocked on A380 Telegraph Hill southbound because of a fallen tree.
- A3052. Closed for a while due to river Coly bursting its banks and numerous trees along the route.
- A377. Various closures due to flooding and fallen trees.
- A382. Closed between Lustleigh and Moretonhampstead due to flooding.

Prior to the severe weather the main A and B (13% of the network) road network was in fairly good condition. This has been achieved by focused maintenance interventions based on sound asset management principles over a number of years. Parts of this network have suffered with potholes over the prolonged wet winter period. Only 50% of the C road network (35% of the network) is considered to be in good condition prior to the storms. This network will have suffered considerably due to the severe weather and is in need of considerable investment to repair the damage and make it more resilient.

The remaining 52% of the network is unclassified roads connecting villages, hamlets and individual properties to the main network. Some parts of this network, particularly in coastal areas, have been washed away. Other sections of the network are severely damaged. Where these roads remain saturated or are very expensive to repair, road closures have been introduced to preserve public safety. Surveys of this network will be carried out over the coming year but it is clear there is a need for a series of interventions including the decommissioning of some parts of the network and bringing other parts up to a safe standard.

As previously mentioned, some roads in the most extreme cases have suffered landslips or been washed away during the winter storms including the C253 Blackpool Valley Road at Stoke Fleming, a minor road at Hallsands and the road and public right of way near the Golf course at Thurlestone. Old Beer Road in Seaton, which originally suffered a cliff collapse during storms in July 2012, sustained further damage on 6 February and then again on Thursday 20 February where it lost more of the road and footway.

In summary there is a need for approximately £15m of investment during 2014/15 to address the legacy of damage of the last 2 years. It is recognised that £7m has recently been received from the DfT but this is split between capital and revenue expenditure and is not enough to repair all of the winter damage. Devon has submitted a Bellwin claim to cover the winter period, but it has recently been announced to Devon that this will not cover pothole repairs. This is despite the fact that this was not made clear when the severe weather recovery bid was being prepared and the fact that this was included and paid in previous Bellwin claims. The impact of this decision is that the effectiveness of the Severe Weather Recovery Grant will be diminished in carrying out lasting repairs as some of the money will be needed to cover Devon's increased pothole repair costs.

The Highway service is under severe financial pressure given the reductions it has to make in revenue funding of the service and the shortfall in capital funding to address the needs of the network. The planned cyclic, routine and capital maintenance programmes of the Service have been disrupted by the severe winter weather and the needs to include winter damage into an already underfunded programme.

The strategy of the Service is to:

- Improve the efficiency of service delivery so that the available funding can go as far as possible,
- Invite community self-help to maintain and repair the highway asset,
- Managing demand for the service by downgrading or stopping up parts of the network and by managing expectations and levels of service.

Despite all of the above, a significant funding gap remains which leaves parts of the network vulnerable to damage and disruption in the event of future severe weather events.

3.2 Highway connectivity impacts - Trunk Road Network

The Highways Agency escalated their activities to regional crisis during the period which meant they increased their resources and response to issues arising on the network. Given the major issues on the rail network, the Highways Agency were very aware of the need to maintain their network to support the South West and keep it open for business. The following roads on the Highways Agency network suffered from closures:

County	Location	Date	Length of closure (hours)	Reason for closure
Cornwall	A30 Bolventor (both carriageways)	22/12/13	9	Collision due to a hail storm
Devon (Torbay and Cornwall)	A38 Tamar Bridge	14/02/14	6	High winds caused restrictions to high sided vehicles on the bridge
	A30 Fenny Bridges (westbound exit slip road)	01/01/14	21	Issues on Local Authority network
	A38 Lee Mill	09/02/14	3	Collision due to a hail storm
Somerset	A303 Ilchester Meads (both carriageways)	24/12/13	24	Flooding

Table 3: List of trunk road closures due to weather

The A303 was closed between Southfields Roundabout (junction with A358) and Devonshire House (junction with A30) from midnight on Friday 28 February until 4pm on Sunday 2 March for essential drainage work to be carried out safely. The A303 along this length is single carriageway and the diversion route was a similar standard. The work was designed to address repeated incidents of flooding and run off from adjacent fields and included replacing a pipe beneath the road. Hence a

total road closure was required. The works had already been postponed once due to bad weather and were re programmed at the end of February to avoid the summer rush period. The scheme is to actually prevent flooding at this location so is more relevant now than ever.

The motorway network has generally performed well during the severe weather due to its relatively recent construction generally outside flood areas. However, the A303 is a fragile link due to a combination of single carriageway sections, vulnerability to flooding and proximity of trees which can be prone to falling. This demonstrates the need for a comprehensive improvement plan. The legacy of the storms is also very apparent on the M5 where large areas of carriageway have suffered from high levels of surface deterioration.

3.3 Railway impacts

Damage to the rail network, with associated delays and service cancellations, was significant in the South West from December 2013 to February 2014. Sections of the Great Western Mainline, West of England Mainline, the Exeter to Barnstaple branch line, Torbay branch line and the Exmouth branch line have all been closed at some point during the period which has impacted significantly on rail connectivity – at times cutting off the whole South West Peninsula.

This occurred alongside planned disruption to rail services due to a three week blockade of Whiteball Tunnel, located on the stretch of line between Taunton and Tiverton Parkway, from Saturday 18th January to Sunday 9th February so that essential engineering works could be carried out. In the final week of this period the railway infrastructure across the South West Peninsula experienced its most severe weather in generations, creating extreme disruption with the complete severance of the line at Dawlish in Devon and the large scale flooding, again, of the Somerset Levels. The impact on the railway in this period has arguably been the most severe of any on the transport network.

Most notably the sea wall at Dawlish, closed due to damage on 3rd February, sustained its worst damage since Victorian times with the complete collapse of an 80 metre section of wall on 4th February. This breach suffered further significant damage on 14th February, extending it to over 100 metres. A landslide behind the railway at Teignmouth further delayed repair work with no trains due to run until 4th April. Overall the collapse of the sea wall at Dawlish resulted in 7500 full or part service cancellations to and from west of Exeter St David's and created severe disruption for rail travellers throughout the South West Peninsula due to the organisation challenges encountered by rail operators.

East of Exeter, flooding on the Somerset Levels caused further disruption to the principle connections between Devon and the rest of the country. The lines were blocked at Athelney, closing the Exeter to Paddington line from 3rd to 10th February, and Bridgewater, closing the Exeter to Bristol line from 7th February to 10th March.

With both lines north of Taunton blocked in early February the sole route out of the West Country was via the Waterloo line from Exeter. This is a single-track line with limited capacity and it too was also blocked for a short period following a landslip at Crewkerne on Saturday 8th February.

Location	Cause	Length of closure
Dawlish seawall	Sea wall collapse	60 days (03/02-03/04)
Exeter-Waterloo Line	Crewkerne landslip	1 day (08/02)
Exeter to Exmouth	Exe estuary wall damage (Lypstone)	1 day (14/02)
Newton Abbot to Paignton	Sea wall collapse	2 days (04/02-06/02)
Newton Abbot to Plymouth	Sea wall collapse	3 days (04/02-07/02)
Exeter to London Paddington	Somerset Levels flooding (Athelney)	7 days (03/02-10/02)
Exeter to Bristol	Somerset Levels flooding (Bridgewater)	31 days (07/02-10/03)

Table 4: Lines closures in Devon between December 2013 and February 2014

The extremely high and sustained passenger growth on all our Peninsula lines displayed on figure 2 shows the vital role of the network to the economy, which is being compromised still further by a lack of capacity and resilience. In addition displacement of traffic from the railways onto other transport modes causes further delays for travellers using these modes.

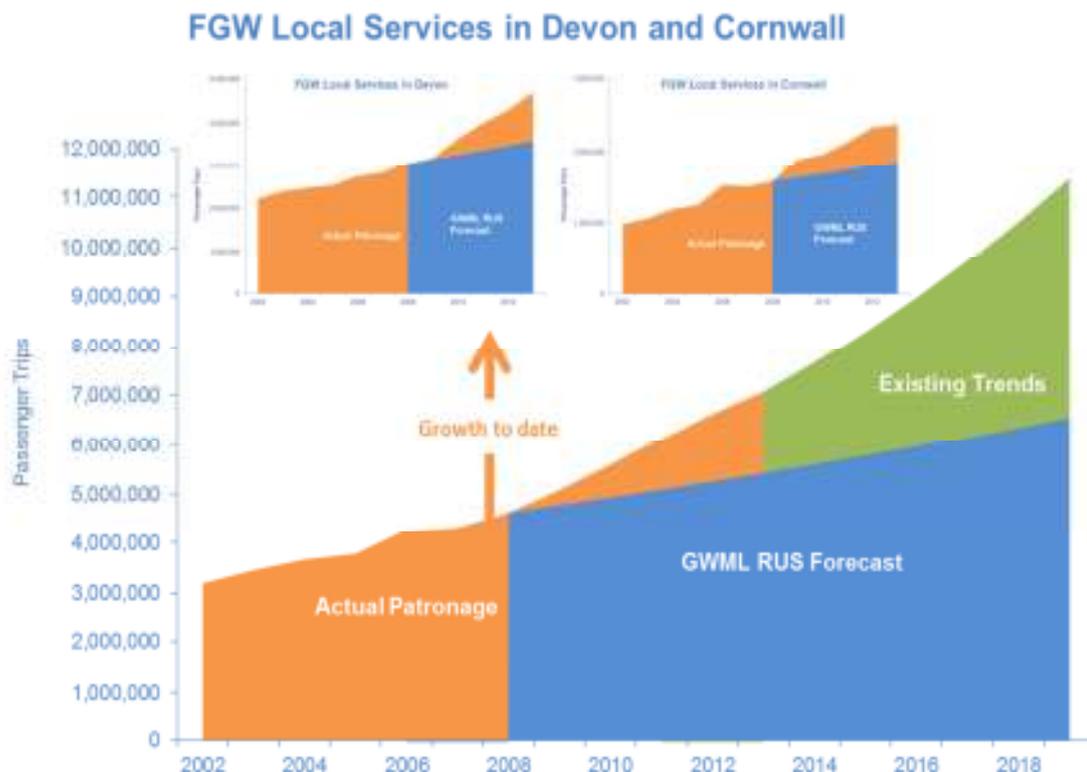


Figure 2: Growth on branch lines in Devon and Cornwall

At a time when our economy is only slowly recovering from the recession, these events have dealt a severe blow to businesses across the South West and our economy. There is an immediate requirement to secure funds to address the immediate priorities of repair including Dawlish and Bridgwater, as well as a package of additional vital flood relief measures, but also to look to the longer term and ensure the route becomes more resilient. To do this, and so achieve a greater return on investment, the route needs of higher quality, with greater capacity and more reliable.

Following the reinstatement of the line at Dawlish there is a need to immediately carry out the flood resilience measures previously identified at Cowley Bridge which was root of the problem in the previous year. It is understood money has been made available for this. Concurrently with these improvements the whole route into the south west needs a flood resilience review. It is clear the network follows the contours of a low lying area and can be impacted by a range of measures including land slips, flooding and sea water. All these are likely to occur more frequently due to the effects of climate change and there is a need for a comprehensive improvement plan. This must consider resilience to the East of Exeter as well as the issues West of Exeter, which are currently the subject of several studies by Network Rail.

3.4 Flooding impact on properties

In addition to the impacts on the strategic transport network, many properties across the whole South West Peninsula have been affected by the extreme and repetitive weather. Some areas have been hit harder in comparison to other areas; the Somerset Levels experienced severe and prolonged period of flooding. Coastal areas, particularly in Cornwall, repeatedly experienced a combination of storm surges and gale force winds. Similarly to past flooding incidents, it should be acknowledged that the number of properties reported to have internally flooded is highly likely to be an underestimate due to the negative impact on property insurance.

Across Devon, 196 properties (118 residential and 78 commercial) are reported to have experienced internal flooding between 23rd December 2013 to 14th February 2014; a significant reduction in comparison to the approximately 2000 properties in 2012 and early 2013. The two month period of extreme weather led to every possible type of flooding including Main River, ordinary watercourses, surface water, groundwater and tidal. Widespread impacts were felt across all parts of the County affecting 58 communities, although coastal areas were particularly affected as a result of the repetitive nature of the storms.

The starting point of the severe weather conditions was from 23rd December 2013 to 1st January 2014, consisting of prolonged periods of rainfall. A number of isolated incidents of properties internally flooding across Devon were reported, mainly as a result of the overwhelming of ordinary watercourses and drainage systems. In total 63 properties experienced internal flooding across seven of the districts, the majority of the areas affected were inland.

A combination of high tides, strong winds and large waves caused a succession of 5 major and 5 minor storms to hit coastal regions in Devon throughout January to mid-February. Tidal communities repeatedly experienced the impacts of the severe storms, including 59 households being evacuated in Dawlish and a number of residents self-evacuated in Torcross. Due to the number of warnings provided before each storm event a large number of properties were effectively protected, for example in Topsham approximately 40 to 60 properties were protected using sandbags. In addition to the severe weather conditions a number of properties suffered from internal flooding as a result of overwhelmed sewage systems in South Hams and Teignbridge districts during February.

During the preceding events of 2012, a sequence of prolonged and intense rainfall events resulted in flooding linked to the overtopping of watercourses, surface water issues in areas which experienced intense rainfall and problems with sewage systems. The impacts affected 200 communities across Devon and resulted in an extensive series of investigations and studies and a major programme of works to be addressed through national, regional and local funding streams. In contrast to the 2012 floods, the severe weather during the 2013/2014 winter primarily affected coastal regions. The impacts can't be seen in isolation but in addition to the overall programme of investigations and works.

The flood events of 2012/13 and 2013/14 have massively increased the need for the implementation of works to better protect these affected areas from future flooding. However, this reactive requirement is above and beyond the pre-existing and planned programme of investment which is intended to offer increased protection and resilience to areas previously identified as being at significant flood risk, including locations identified through commissioned studies such as Surface Water Management Plans.

The Government has recognised this to some degree through the short-term allocation of increased national funding for the immediate repair of existing flood and coastal protection assets affected by the events of 2013/14. However, what is urgently required is a more sustained programme of investment through regional programmes (i.e. those supported through the Local Levy) and local intervention, especially that arranged by Lead Local Flood Authorities (LLFA) and District Councils. By way of example, the specific funding allocated to Devon County Council in its LLFA role is currently £0.55m per annum; however, over the last 12 months, the Authority has invested approximately £0.9m through its LLFA flood functions, including direct support for scheme delivery. With the further recovery requirements identified through 2014/15 events, there is a pressing and ongoing demand for similar levels of investment for several years to come.

3.5 Green Infrastructure

Devon County Council manages 5,000 kilometres of Public Rights of Way in the County. The South West Coast Path National Trail and Regional Routes (such as the Tarka Trail and Devon's Coast to Coast Walk) are key tourism assets for the County as well as important routes for the health and wellbeing of local communities. Coast Path users spend £157 million annually, which supports over 3500 full-time equivalent (FTE) jobs mostly in SMEs. The record breaking rainfall in 2012, followed by the storms of 2012-13 and early 2014, have caused an unprecedented amount of damage to the network, including the Coast Path and river and estuarine routes, with numerous sections needing to be temporarily closed or diverted due to cliff falls and flood damage. This deters users and so has a significant impact on local users and also businesses such as pubs, cafes and accommodation providers.

The main locations where storm damage has impacted on the network of paths are:

- Topsham : Goat walk – iconic path important for locals and visitors alike – works underway
- Appledore: damage to sea wall, resulting in path being diverted onto nearby road (partially without a footway).
- Coast Path closed at Morteheo because of sink-hole. Alternative route available.
- Wembury: Receding cliffs. Fencing adjacent to the path needs moving inland.
- Westcombe Beach: Bridge requires replacement. New bridge to be installed with addition of rock armour.
- Ayrmer Cove: Footbridge washed away. New bridge installed.
- Thurlestone (golf course): Path realigned slightly inland.
- South Milton Ley: bridge damaged and needs redecking and other structural work. Longest footbridge on SWCP.
- Thurlestone (Beacon Point Cottages): Short section of path damaged by adjacent cliff fall. Now unsafe. Temporary diversion is along narrow road and a significant detour. Permissive off-road diversion to be created by end of May 2014 with negotiations continuing for a permanent solution.
- Hope Cove (Mouthwell Beach): cliff fall has closed short section of Coast Path with temporary diversion inland. DCC seeking to discuss options with neighbouring landowner.
- Chivelstone, Ivy Cove Cottages. Path lost to cliff fall. New permanent diversion negotiated with adjacent landowners.
- Dartmouth: Footbridge washed away. National Trust has provided temporary route immediately inland but steps to Compass Cove also destroyed and land still on the move so no immediate repair is viable. Bridge will not be replaced as in susceptible location and original structure had to be helicoptered in to place.
- Old Beer Road diversion in place ('The Clinton Way') following collapse of Old Beer Road.
- Axmouth to Lyme Regis. A section of the Coast Path closed at Culverhole. DCC exploring options with Natural England to re-open path. Can do 'out and return'

walk from each end. Alternative route in place but inland and on road in places or public can catch X53 bus.

There are also a number of other locations that suffered damage and closures where paths run along a road or other structure - these include the sea walls alongside the railway at Teignmouth and Dawlish, car parks and tracks at Hallsands and South Milton and Marine Parade at Shaldon.

Accesses to beaches damaged:

- Rockham Steps, Mortehoe.
- Combesgate Beach steps, Mortehoe.
- Buck's Mills slipway, Bideford.
- Ivy Cove access footpath, Chivelstone.

Other significant SWCP damage:

- Beacon Road, Kingswear
- Beesands
- Torcross
- West Down Farm, Exmouth
- Otterton to Ladram Bay
- Alma Bridge footpath, EDDC land at Sidmouth

Other significant inland damage generally relates to fallen trees, culvert damage, bridge displacement by flood debris, gullying and land slips.

In total, the outstanding work to repair or relocate the key public rights of way including the Coast Path (£130,000) following the storms is estimated to be around £400-500k. With a declining PROW budget (10% this year) and contributions from Natural England for Coast Path maintenance having reduced by 30% since 2010 there is currently insufficient budget to deal with the backlog of damage (despite DCC allocating £50,000 from the Local Transport Plan). As a result additional funds are being sought from a variety of sources including local communities through their parish precepts and a public appeal and an application to the Coastal Communities Fund for improvements to the south west coast path but this is still unlikely to enable us to return the network to its pre-2010 condition.

3.6 Wider Economic Impact

A report studying the economic impact of the extreme weather on Devon and Cornwall is currently being commissioned, focussing particularly on the impact of the sea wall collapse at Dawlish.

4. The future

Climate change projections can be used to understand how our climate is likely to change over the 21st century. UK Climate Projections 2009 (UKCP09) were funded by Defra and are the most recent and comprehensive projections produced to date for the UK. The projections underline that the annual mean temperature in Devon is very likely to continue throughout the 21st century beyond the 1 degree Celsius rise already experienced since 1900. This increase in temperatures is very likely to increase the frequency and intensity of rainfall events, particularly in the winter months, and further increase sea levels by between 20cm and 68cm by the 2080s.

But the UK has seasonal weather that also varies hugely from year to year due to natural processes. New analysis by the Met Office suggests that we should also plan to be resilient to wet summers and to cold winters through this century. The projections identify that the severe weather experienced in Devon in both the 2012/13 and 2013/14 winters is likely to be experienced more regularly in the future. This has led to an analysis undertaken by the Met Office for Ofwat which states that for the Exeter area the current 1:100 year winter (December, January, February) rainfall event will become a 1:35 year event by 2040.

As yet, there is no definitive answer on the possible contribution of climate change to the recent storminess, rainfall amounts and the consequent flooding¹.

5. Summary and actions

Devon and the South West Peninsula are vulnerable to a range of weather conditions. The last two winters, for example, have suffered from different issues. In 2012/13, the problems were generally associated with river flooding and the subsequent impact upon properties and the rail line at Cowley Bridge just north of Exeter. However, the greatest impact this year has been on coastal communities with a greater number of storms and tidal surges. These events are very hard to predict which increases the Peninsula's level of vulnerability to extreme weather and add further strength to the need for greater investment towards providing a more resilient network.

The recent flood events of 2013-14 have had a significant impact on Local Authority budgets and the economic performance of Devon and the Far South West. It follows the severe disruption to the transport network by extreme weather in 2012/13. The Met Office and Environment Agency agree that these events reflect an increasing likelihood of more frequent and intense storms.

¹ Met Office (2014) *Too hot, too cold, too wet, too dry: Drivers and impacts of seasonal weather in the UK*. Met Office. URL: http://www.metoffice.gov.uk/media/pdf/4/8/Drivers_and_impacts_of_seasonal_weather_in_the_UK.pdf

Climate change projections underline that such events are likely to occur more frequently in the future. As such, strategic infrastructure interventions are required to adapt to climate change and mitigate the associated transportation and economic risks. The strategic rail and highway interventions are vital to maintain connectivity for Devon, Somerset, Plymouth, Torbay and Cornwall. Potential interventions include:

5.1 Local and strategic highway interventions

There is a need for funding to permit the highway maintenance strategy to evolve. The current emphasis on A and B roads is proving effective and needs to be maintained. Additional funding is required for the C road network to make it safe and more resilient. The unclassified road network needs to be reduced in size and the remaining network made safe with additional funding. This will involve a combination of new maintenance methods and greater community involvement.

Devon has lobbied Government for extra funding and we are also working with Devon's MPs to explain the impacts of insufficient funding on our roads. The County Council has put a case to the Department for Transport for £15 million of extra capital funding in 2014/15. The current situation is that following bids being submitted for additional funds as part of a recent Government initiative aimed at addressing the highway maintenance problems caused by the recent severe weather Devon has received £7m. The government has also announced a £200 million fund for potholes as part of the budget and Devon will be bidding for its share of this extra money once the rules are announced.

An assessment of the risks posed by climate change to Devon County Council's Highways Management Service is underway and is due to be completed in April 2014. This has been informed by the Highways Agency's contribution to the UK Climate Change Risk Assessment, coordinated by Defra.

Devon County Council is part of a South West partnership, including Somerset County Council and Wiltshire Council, campaigning for Government investment to improve the strategic resilience of the A303/A30/A358 corridor. The partnership is working closely with the Highways Agency to support its feasibility study of the route. The results of the study are due to be reported to Government in time for the Autumn Statement. Improving the corridor is supported by a cross-party group of MPs, all five South West LEAs and a wide range of businesses, emergency services and local authorities including Cornwall Council, Dorset County Council, Plymouth City Council and Torbay Council.

5.2 Strategic rail interventions

The railway is arguably the most vulnerable of all the strategic routes in the county given its low lying route through Devon and Somerset and route along the coast at Dawlish. Due to the collapse of the sea wall and the subsequent large-scale damage to the railway at Dawlish, there was an immediate need to provide the best repairs to

the coastal line at Dawlish in order to get the line back up and running again as soon as possible. However the severity of the damage meant that this wasn't achievable within Network Rail's original estimate of six weeks. The £31.3m resilience improvement programme by Network Rail needs immediate implementation whilst it is important to identify long term resilience solutions on the Somerset Levels. It will also be beneficial to fast track the government into studying to provide the best resilience against future weather disruption across the Peninsula.

Devon County Council is part of a Peninsula Rail Task Force, comprising Cornwall, Plymouth, Torbay, Somerset and the two LEPs, actively campaigning to secure investment to improve the resilience, speed and quality of services on the network.

5.3 Property flood risk intervention

A sustained programme of increased funding and support for Lead Local Flood Authority flood risk management measures to approximately £1m per annum to facilitate new studies, prepare schemes and undertake small scale improvements. This increased funding is required to tackle new recovery and resilience requirements, on top of the backlog of existing and planned programmes of work

5.4 Green Infrastructure

To reduce the frequency, time and cost of dealing with storm damage on the South West Coast Path in future, there are a number of measures that the SWCP Team are seeking funding to deliver. These are:

- Where the Coast Path is fenced on the inland side, and is considered vulnerable to coastal erosion working with the National Trust and other landowners, to provide a wider strip (which also has wildlife and amenity benefits) and so provide scope to quickly move the path in response to small-scale erosion
- Encourage the implementation of Coastal Access legislation throughout the length of the SWCP (currently the programme only covers the Dorset section of the path), as this provides provision to quickly and inexpensively roll-back the Coast Path on most land types in response to coastal erosion. It is expected to also improve the line of the path in some locations
- Improve path drainage structures so they shed water before the volume reaches damaging levels.