



When the Climate Changes

October 2026



Photo: Tiverton Parkway Station, Devon, 2011
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Introduction

1. This year (2026) is the UK's hottest on record according to the Met Office. Southern England has experienced unprecedented summer drought conditions.
2. Keeping infrastructure intact and safe to use has got more challenging, with infrastructure owners necessarily turning to added resilience measures.
3. Inescapably, these measures add to the costs of keeping rail infrastructure in a state of good repair. Long trusted embankments and cuttings fail through an excess or absence of their normal moisture levels. Higher temperature levels lead to new structural challenges. 'Steady state' has just got more expensive — and difficult choices become necessary: which routes are the most important to keep open?
4. Ahead may lie a period of intense rainfall, or a return to drought conditions: who knows which? Maybe both. Flood waters may breach established containment measures, or super-saturate dried out earthworks.
5. The locations of past damaging weather events are not necessarily a good guide to those that lie ahead. But some vulnerable sections of railway — despite mitigation works — will remain at risk of enforced and unpredictable temporary line closures.

6. With Great British Railways (GBR) due to take over shortly, network costs have grown. And with lots of remedial work needed, along come lots of track possessions. In some cases train services will be cancelled on the day; in other cases, timetables may be thinned out to facilitate remedial work on cuttings and embankments. Costs go up, while services are delayed, or cut, putting fares revenue at risk.

7. For now, rail passenger travel is still growing. But if trust in the connectivity promised by the national rail timetable wavers, passengers will defer journeys or elect to drive instead. Then, HM Treasury eyes will peer over a potentially worsening railway cost revenue ledger, and notch down the contribution the system makes to national economic growth targets.

8. For our national transport infrastructure networks — highways as well as railways — extra resilience costs fall directly to the public account. The spectre is one of climate change-driven engineering challenges, with financial consequences. And wider economic implications too: business and trade depends on sustaining dependable, preferably fast, connections.

9. A new report from the Institution of Civil Engineers calls on government to commission a review into the value of infrastructure adaptation and resilience.¹ It points out that infrastructure operates as a connected

system, but policies and investment decisions are often developed separately. So it asks for the new review to take a whole-system perspective, rather than within organisational or departmental silos.

10. From a Treasury perspective, ideally a way would be found to gain a payback for the extra effort and cost entailed in keeping the nation's transport network intact. Some hope, maybe. True, Network Rail — as we shall see — is well advanced in formulating a coherent response following a policy of climate change adaptation. Here we explore where this may lead, concentrating on a part of the national rail network where climate change impacts are of ongoing significance.

Climate Change Adaptation

11. In 2020, Network Rail set out an Adaptation Roadmap with "defined outcomes to incorporate long term adaptation planning and investment into 'business as usual' operations by 2034".² It is putting into practice a key piece of policy advice from the Climate Change Commission (CCC) which observes that it will no longer prove possible to keep every part of the nation's strategic infrastructure intact, day in,

1. New Civil Engineer, October 2026, p6.

2. Adaptation may be contrasted with resilience as categories of response to adverse climate change impacts.

day out. Instead, the CCC suggests thinking of the wider infrastructure network when setting a resilience management programme, so looking across parallel infrastructures, as it urges in its April 2025 review.³

12. The aim with this approach is to ensure there is a viable travel option left open and usable for travellers, day in day out. Not necessarily by every conceivable line — today's rail network often offers multiple route choices — but at least one possible way. Just as it is for other national infrastructure networks (power supply, water etc), this is the practical essence of climate change adaptation. In effect it is saying this: face facts — it simply won't be possible to keep each and every component of our national infrastructure networks intact at all times, in this case, supporting a train service timetable set annually.⁴

13. The CCC has suggested that a well-adapted UK should aim to deliver a future where....“key infrastructure systems function at least as well as they do today, and in many cases better, in the face of changing weather.”⁵

3. “Adaptation Reporting Power (ARP) returns and the Department for Transport’s (DfT) consultation on adapting the transport system to climate change highlights importance of interdependencies, while making multiple key commitments” see: [Progress in adapting to climate change – 2025 report to Parliament](#)

4. While the CCC is of course a national body, the need for an emphasis on adaptation is widely understood: the European Commission, for example, announced its intention to adopt a strategy on adaptation to climate change, on 29 January 2020.

5. [CCC letter to Emma Hardy MP 13 October 2025](#).

14. Under an adaptation approach, the task is to look for viable alternatives to maintain connectivity, for ways around essential engineering works triggered by climate change, and around weather-damaged sections of route, by using parallel infrastructures. For rail it means being able to publish timetables that set out how, across the year ahead, journeys can still be planned and completed, negotiating around sections of route out of action for essential resilience works if necessary. And all without the need to foist on unsuspecting customers the much disliked solution of ‘rail replacement bus services’.

15. Network Rail has ‘got’ climate change adaptation.⁶ But we need to remind ourselves that the impacts of carbon emission-based change are only going to get more severe as global temperatures rise. The policy question isn’t ‘do we need to take adaptation measures further?’ — clearly we do. The question is how to do so in a period of restricted capital budgets.

South West England

16. We’re taking a specific geography in order to focus on possible new ways forward. First let’s note that longer term forecasts show that climate change induced weather change is expected to impact the country differentially — both in terms of expected changes in winter precipitation levels and in summer temperature levels (see the following charts).

6. See [Climate change adaptation – Network Rail](#).

17. What the charts below indicate is that it is across the South of England where greatest changes in climate can be expected — both in summer temperatures and winter rainfall levels.⁷

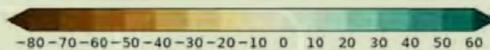
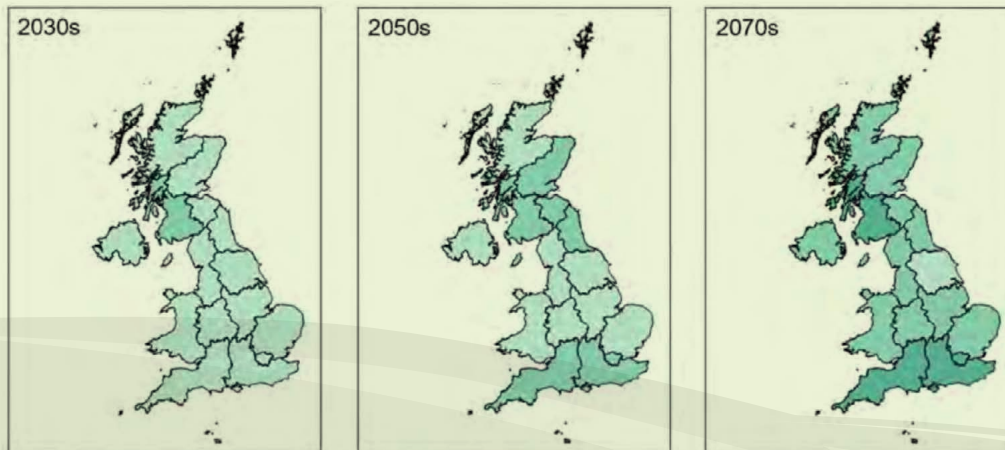
18. But across the south, from east to west, the impact of the remedial works needed to repair climate-based damage to the rail network varies. So, a question: is the problem of climate change-driven weather events particularly severe in South West England? According to Network Rail’s Wales and West Route that covers this geography, the answer is yes:

“..here there are greater than the national risk scores due to the influence of the Atlantic Weather systems and gulf stream arriving at our topography before the rest of the country.”⁸

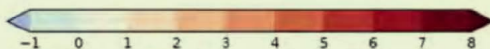
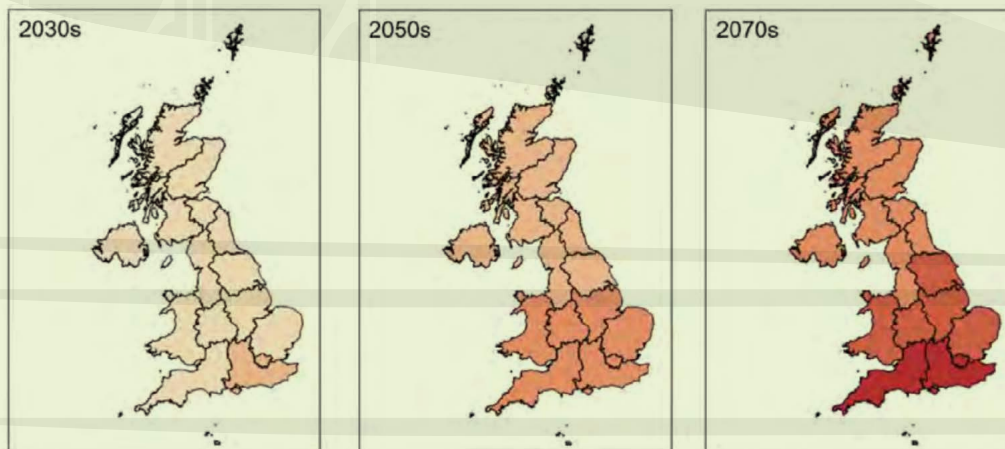
19. This may well be true, but the significantly higher adverse climate change effects we noted earlier across the whole of southern England are presumably related to its proximity to the continental land mass. And the South West already has higher rainfall, of course.

7. Figures 4.2.1 and 4.3.2 taken from the relevant (current) Network Rail Climate Change Adaptation report: [Wales & Western CP7 WRCCA](#).

8. Network Rail’s Wales and West Route’s current “Climate Change Adaptation Plan for ‘Control Period 7’”. – [Wales & Western CP7 WRCCA](#). This is current and covers the period 1 April 2024 to 31 March 2029).



Change in Winter precipitation (%)
RCP 6.0 90th percentile



Change in mean daily maximum Summer temperature (°C)
RCP 6.0 90th percentile

Winter rainfall and summer temperatures

Source: Network Rail

20. And in South East England, there is in effect a joined-up transport network. If one route is unavailable because of essential network repairs, there is often 'another way round', sometimes involving a change of travel mode. The benefits of London's extensive commuter network across 'Network South East' territory, remain significant.

21. In South West England, as we shall see, the rail network is much thinner, with fewer travel route options. In some cases, there is dependency on a single rail line; in others, where an alternative route does exist, it may be under separate management, or jurisdiction, as we shall see. Here then, there is a need for some thinking across travel modes— and this is already better developed here than in other English regions, with established bus services acting as feeders to main line rail.

Route Geography

22. Network Rail's 'Wales and Western Region' (which comprises two Routes: Wales & Borders, and Great Western), feeds the London terminus at Paddington. It comprises a spread of lines that serve South Wales as well as the West Country. Its adaptation strategy is in place, and when planning remedial engineering works it looks to maintain network availability for the most important connections. It is a coherent, financially-driven response, which has to take into account the value of key freight movements to the national economy as well as passenger services. It makes more sense to focus than adopt a scatter gun approach.



Rail network in the West country

Source: Extract from [National Rail Map](#) | [UK Train Map](#) | [Trainline](#)

23. Between Taunton (Somerset) and Reading (Berkshire), the W&WR has a choice of two routes. As might be expected, the route via Swindon which serves Bristol, Cardiff and south Wales as well as the West Country takes priority when planning resilience works. Route availability here is more important than on the parallel route (the 'Berk and Hants') which is a more direct route to the West Country (but doesn't serve Bristol, Cardiff and south Wales as well). This practice is a good example of what the CCC has suggested will become increasingly necessary in future: looking across parallel infrastructure when deciding how to prioritise resilience works. This is Climate Change Adaptation put into practice. But as we will suggest, looking ahead, much more could be done – and will likely become necessary.⁹

9. See Priya Bharadia writing in the *Guardian* of 22 August 2026: "In 2024, Network Rail increased their projected five-year spending on climate, earthworks and drainage by five times the amount allocated from 2019 to 2024."

Devon and Cornwall

24. We focus on part of South West England — specifically, Devon and the Duchy of Cornwall. The Devon & Cornwall geography is of a peninsula stretching to Land's End. Rail journey times to London and other major cities are lengthy. Here, in recent years, air connections have largely been closed down.¹⁰ The motorway network stretches as far west as Exeter, but no further. So, rail connections to and from the rest of the country are lifelines, vital to all aspects of the region's economy. Our aim is to look through the lens of the prospective traveller in thinking through possible adaptation strategies needed to ensure service continuity. At first glance the choices look limited.

25. The question for Network Rail (and ahead, GBR), we pose here is this: “what’s the best way to maintain and provide service continuity at a time when a lot of network resilience work is needed, to keep the rail network safely intact?”

26. Train users from Exeter eastwards have a choice of two lines (see map above), although today, because of extensive resilience works, one of them (the South Western line via Salisbury to London Waterloo) is operating a paper thin service, a problem compounded by the fact that this one-time ‘main line’ was reduced to single track operation following Dr Beeching’s cut-back ideas of 1963 (“we don’t need routes that run in parallel”). The scale of works today on the South Western line from Exeter to Yeovil is such that its timetable has been decimated.¹¹ Earthworks from 150 years ago were built assuming a kinder climate, and when soil mechanics was a less well understood science.

27. The other line (the Great Western) has the advantage of retaining its double track formation. And here, in recent years, major resilience works have been carried out, for instance along the Exe Valley to mitigate flood risk.

28. West of Exeter, it’s a further 3 hours’ train travel time to reach Penzance in Cornwall. And there is only one rail connection, with the South Western line having been chopped into two unconnected branches (ending at Okehampton and Gunnislake on the map above).

29. The surviving main railway line west to Plymouth and Cornwall includes a stretch built along the coast (Dawlish–Teignmouth), a route which is subject to closure when storms and high tides coincide — a problem getting tougher each year as climate change

leads to ever higher sea levels. Resilience measures, much expanded since the line was breached here in a storm 12 years ago, have helped significantly. Then, months of emergency repair work saw the line re-opened, but, over a decade later, a key section of the remedial works remain to be completed, where the railway runs at the base of a section of Devon’s famous red cliffs. The works needed here remain in Network Rail plans ahead, on a date as yet unknown.

30. Network Rail (NR) has demonstrated its ability to recover railway lines from catastrophic storm weather damage. And it has in place a Climate Change Adaptation programme that will be updated as and when needed. As it is absorbed into Great British Railways, we assume that NR’s established best practice will continue.

31. But meanwhile, the railway can still be closed at short notice. This is when confidence in travelling by train is put at risk. How can this be remedied when there is no alternative route available? And is there a way forward that would allow long enough track possessions to get the remedial works done at lower cost, without cutting off the major city of Plymouth¹² and the whole of the Duchy of Cornwall from the rest of the country?

10. Flybe (which used Exeter Airport as a hub) collapsed in 2020/3 and left the West Country with very limited domestic air connectivity. As of September 2026, only Edinburgh has a daily flight connection from Exeter Airport; Newcastle has a service 5 days/week, and Bristol, once weekly. (source: Direct flights from Exeter – 13 destinations – EXT, United Kingdom – Directflights.com). Plymouth City Airport closed in 2011. Newquay Airport offered a single weekly flight to Edinburgh (when checked on Skyscanner, September 2026).

11. [SERUG Newsletter 27 SMD special.pdf](#) – Google Drive.

12. Plymouth is now experiencing a notable economic upturn, as we have outlined earlier: see [Delivering South West England’s New Economy](#) – Greengauge 21.

32. We don't have a measure of how much rail patronage is being lost due to travellers' anxieties about rail service dependability for these lengthy journeys to/from Devon & Cornwall. Or on the damage to the Devon and Cornwall economies. The daily uncertainty about availability of rail connectivity should surely be a matter of concern to HM Government, given its intentions on addressing regional needs, especially at a time when substantial investment in national maritime security is being focused on Devonport. This isn't just a holiday line. It's the lifeline of a significant part of the national economy. And a matter of national security.

33. Assured availability of rail connectivity in the West Country is also of concern in the freight & logistics sector. Current freight usage of rail is limited to Cornish china clay traffic flows, but ahead lie the prospects of daily Lithium ore flows by rail (also from Cornwall, where two mines are under development from what is Europe's largest Lithium reserve), and this could be especially important to UK-based battery plant production (including for EVs). And preliminary arrangements have also been explored to permit the introduction of a regular daily intermodal (container) freight service from logistics hubs in the Midlands to railhead(s) in Devon & Cornwall.

34. Each of these traffics would relieve the national and local highway networks of what would otherwise be a large number of HGV movements on West Country roads. For each of these rail-based freight flows, ideally there would be an alternative rail route available to circumvent sections of railway that remain susceptible to periodic

climate change-related closures. In the longer term, this is just one of the reasons why it remains essential that the second main line Exeter-Plymouth (via Okehampton – a route now partially re-opened) is re-established in full.¹³

35. This points to a medium/longer term strategy that would see the 'South Western' route re-instated to provide the flexibility that is needed to support climate change adaptation strategies. This could and should be built into GBR's future Climate Change Adaptation policy and plans.

36. But here we ask what could be done in the interim, in the next few years, as climate change-induced weather puts continuing, and probably greater, demands on this key component part of our national transport infrastructure.

37. Our assumption is that Climate Change adaptation programmes will need to be expanded. We will suggest that to do so, looking to parallel infrastructures – as the CCC has advised, and as the Institution of Civil Engineers has noted, needs to look beyond institutional boundaries.

38. What this means in practice is, both:

i) looking for solutions that embrace adjacent railway 'Routes'

and:

ii) looking at whether practical adaptation measures exist using parallel national highway infrastructure too.

39. The lens through which such choices should be considered is surely the perspective of rail travellers: what do customers think about travelling with the risk of services disruption a commonplace? What could possibly add to rail use (and so to rail and HM Treasury revenues), and what approach would have the opposite effect? What do we find if we peer through institutional boundaries to see what lies beyond that could possibly help?

40. The travel market, we have in particular focus is for travel from Devon and Cornwall, so for residents in the South West. To grow local economies here, dependable connectivity is vital, so that it becomes possible to live here year-round and realistically and dependably be able to attend business appointments in London and elsewhere from time to time. This will help attract and expand local businesses too, strengthening the regional economy and reducing its reliance on tourism with its inevitable seasonality and other unwanted consequences for the housing sector.

13. See [Rural Reconnections: the social benefits of rail reopening Exeter – Okehampton – Tavistock – Plymouth: a case study](#) – Greengauge 21.

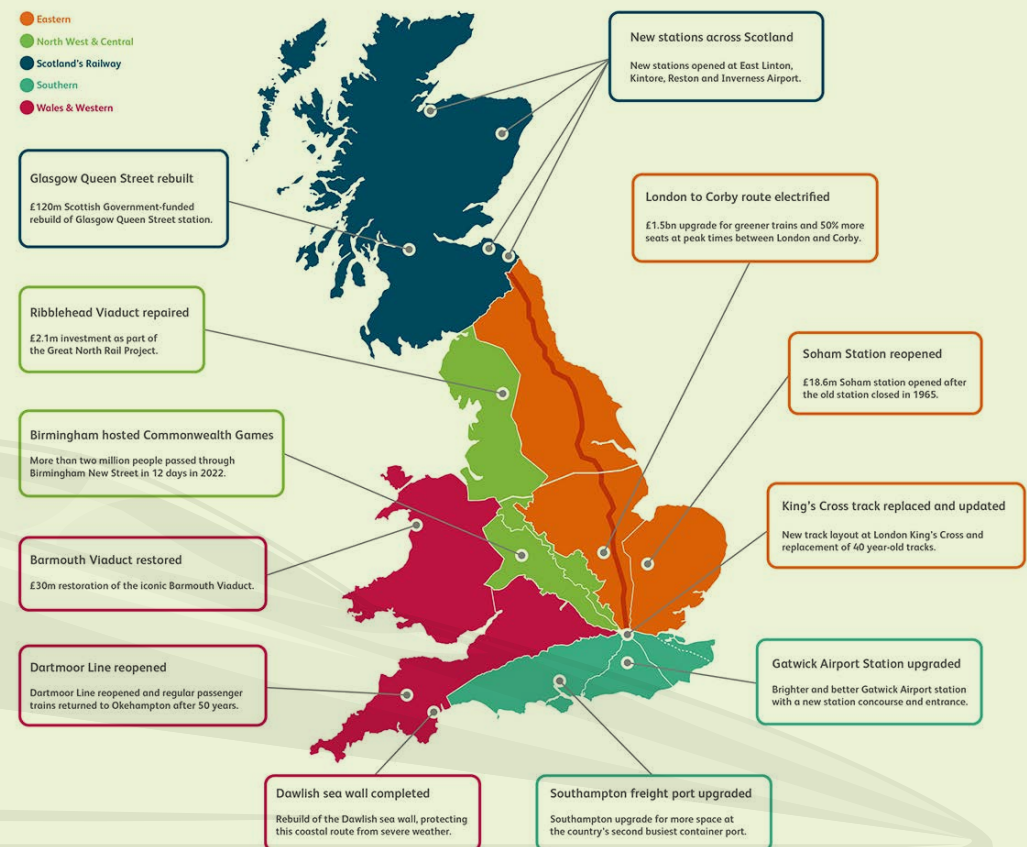
Service delivery strategies to meet customer needs (and strengthen economies)

41. As noted, west of Exeter there is only one railway available (a main line with vulnerabilities to specific adverse weather conditions) together with a set of branches. This is the Great Western Line, and it forms part of Network Rail's Wales and Western Route (the area coverage shown in red in the map opposite; the South Western line is part of the Southern Route, shown in turquoise).¹⁴ The Wales and Western Route has a well-developed adaptation plan which, incidentally, notes that its various feeder branches typically reach the coast where they are susceptible to adverse climate impacts, including from future sea level rises.¹⁵

42. East of Exeter, while there are two lines, one of these, the South Western line, is subject currently to major infrastructure resilience works, and can offer only a limited train service. This line is under separate management within Network Rail and is planned to remain so, assuming the integration of 'track and train' under Great British Railways adopts a management structure based on its existing 'Routes'. Here, at least in theory, there are parallel rail lines that could, if managed together, form a suitable climate change adaptation pathway.

14. It is expected that GBR will be organised around this pre-existing 'Route'-based structure.

15. The branches serve Exmouth, Barnstaple, Torquay/Paignton, Looe, Newquay, Falmouth and St Ives.



Network Rail Route Geography

Source: [Your railway: 2019-2024](#) – Network Rail.

43. But west of Exeter that option doesn't exist. If there is an adverse disruptive weather event here — for instance leading to closure of the main line over its south Devon coastal section (Dawlish–Teignmouth) — a likely management response is to initiate a Rail Replacement Bus Service.

44. These are not popular: research shows that passengers would prefer to stay longer on a train rather than take a replacement bus.¹⁶ Passenger Focus has called for the rail industry to use replacement buses **only as a last resort** when engineering works cause detours or delays. Their research also showed that passengers want information about whether part of their journey will be by bus before buying their tickets, and would appreciate good signposting and staff on hand to help transfers between train and bus.

45. Furthermore, 85% of travellers told Passenger Focus that using buses on a rail journey warranted a discount on the normal fare; 55% said they would not travel by train if part of the journey is to be by bus.

46. Anthony Smith, when chief executive at Passenger Focus, said this:

“It is only natural that passengers stuck on a diverted train, or forced to switch between train and bus with heavy bags, will be frustrated.”¹⁷

47. For travellers with mobility issues, there could even be a case for legal challenge over the accessibility challenges that arise with bus replacement services.

48. In a recent telephone call we had with a Plymouth MP, who had, as it happens, the previous evening made the weekly train journey home to his constituency from Westminster, experiencing an enforced switch to bus (clearly not for the first time) and his reaction was this:

“It’s not a problem: the journey time is the same as if I had been able to continue on the train”.

49. How was this achieved? By a planned transfer to a replacement coach at Tiverton Parkway station. Here, midway between Taunton and Exeter, the main line runs alongside the M5 Motorway to which there is direct access from this Parkway station. Opened in 1986, this station was designed to serve a wide catchment across East and North Devon, and it has more recently served as a coach–rail transfer point

when the Dawlish–Teignmouth line is unavailable. The reality is that the railway route is indirect (as well as vulnerable) between Exeter and Plymouth (journey times of one hour, are readily matched using the M5/A38).

50. Here, then, a frequent, experienced rail user is comfortable with the solution of a hybrid express bus–rail journey. But if this arrangement is to be acceptable across the wider travel customer base, given the views expressed in the Transport Focus research as noted above, it would be necessary to make the interchange and transfer between modes as straightforward as (say) a scheduled transfer between a main line train and connecting branch line train. A Parkway station is a good base at which to create a genuinely multi-modal, integrated, transport hub, with scheduled connecting services, not replacements for when things go awry.

51. This approach also means creating a consistent product offer across the travel modes. We’d need to look at travellers’ expressed needs on longer journeys such as Cornwall/Devon — London. They centre on punctuality, comfort, speed, accessibility and essential amenities. And the ‘amenity gap’ between a modern Express Interurban bus and ‘Intercity’ rail is not as great as might be supposed.

16. www.passengerfocus.org.uk/research/publications/rail-passengers-experiences-and-priorities-during-engineering-works.

17. Train companies could face court over inaccessible rail replacement buses – Disability News Service.

52. Today, for business and leisure travellers, a key requirement is a dependable Wi-Fi signal. West Country travellers told us that Wi-Fi reception is better when using the main road network than on train.¹⁸

53. Standards on contemporary interurban/express bus routes can be high. Reclining seats with seat back tables are standard. On-board toilets are possible. Proper luggage stacking facilities within sight of customers is feasible (avoiding the anxiety and delays associated with old-school below deck stowage). Level access, including for wheelchair users is just as possible with a modern bus as with rail.¹⁹

54. Of course rail retains advantages for longer distance journeys, and offers far higher capacity. But if product continuity is to be provided where there is only a single main railway line available and it's subject to the vagaries of climate disruption, a scheduled, fully integrated, interurban bus-rail network is likely to be the best value option. To repeat the point: by scheduled, we mean incorporated into the national timetable and not scrambled together on an ad hoc, emergency

fallback basis, so that its use can be planned ahead. Of course, such arrangements need to be brought under unified management, with integrated fares, traveller information and timetables. This is a key opportunity to derive value from GBR, currently being created.

55. Four key attributes of such an arrangement would be essential:

- 1) it does not portend any reduction of main line rail services;
- 2) any express interurban bus component of the network of scheduled services needs to avoid routinely congested sections of the highway network — so entry to city centres would only feature if there were continuous, effective, bus lane facilities in place. The intention would be to aim for similar (or better) travel times to those achieved by rail, and a similar level of travel time predictability.
- 3) It is essential, then, that arrangements are made for access modes for the interurban bus component, just as they would be for rail — so park and ride, cycle access and parking, taxis etc, and for similar ease of access for those travelling with mobility issues. This in turn speaks to the need for fully accessible boarding facilities, and station platform-style assistance as needed. Express bus stops in effect need to become stations.

- 4) On board amenities, by express bus and express train — would need as far as possible to reach a common high standard, for: wi-fi, access to a w.c., reclining seats, level boarding — all made part of the service specification.

Maintaining connectivity for Plymouth and Cornwall

56. If the aim is to maximise the value of the South West's transport infrastructure, even as it is subject to climate change-driven disruption, reflecting what is known and understood of traveller behaviour and passenger preferences, it would surely be better to present travellers with scheduled travel route options, not 'emergency arrangements'.

57. This may be a radical policy departure. But how else can connectivity on the day of travel be under-written, with there being only a very slim chance that all of these travel options become unavailable at the same time?

58. This requires a differing service planning mentality; one designed very much with the aim of removing both the stress of en route disruption and the consequent need to make unexpected changes — between trains, or worse, to transfer on to a 'rail replacement bus service'. As we will see, this thinking could and should also open up new rail connections that would grow the revenue base for GBR. Also envisaged is that where there is no other option available, an integrated coach/express bus-rail offer is created.

18. See also It's official: train Wi-Fi doesn't work which concluded that "Wi-Fi on Britain's trains almost never works, official research has found, underscoring the blight of patchy coverage plaguing commuters. A major new survey by Ofcom revealed that onboard Wi-Fi provided by train companies worked properly just 1pc of the time, making it all but impossible for passengers to connect. The regulator blamed the shoddy service on outdated technology and data-speed caps imposed by train operators." But this is an area of current significant investment by the rail sector.

19. [The Interurban Bus network](#) – Greengauge 21.

59. The service proposition is two-fold involving (i) connecting express bus services and (ii) cross-connecting rail services, in each case with services offered as part of the 'national timetable' rather than as a response to disruption on the day, whether foreseeable or not. Which format is adopted depends on the journey time performance capabilities of the rail and parallel highway networks.

60. The scheduled express interurban bus service component would be needed for the west of Exeter geography. Here, two such routes are envisaged where the highway-based option offers matching (Plymouth) or much shorter (Penzance) journey times than rail:

- Plymouth-Tiverton Parkway (no intermediate stops) with a regular, scheduled, hourly service

and

- Penzance-Tiverton Parkway (possibly with intermediate stops at (say) Redruth and /or Bodmin, where in each case multi-modal interchanges on the now extensively upgraded A30 would be needed); this service could be on a limited frequency early morning/midday/late afternoon (3 times/day) basis.

61. Together, these two express interurban bus services could address a significant part of the 'west of Exeter' challenge (until, that is, such time as the northern route between Okehampton and Bere Alston is re-instated).²⁰ The aim is to match (or better) rail journey speeds by using parallel National Highways' infrastructure.²¹ This rules out having express bus routes accessing urban centres which are routinely subject to traffic congestion.

62. The intended style is more point-to-point than would be adopted with conventional bus/coach services, and uses the parallel M5/A30/A38 road network to support journey times that match or better those that the rail network offers.

63. The format is endeavouring to create a rail journey ambience, and attention to customer service and travel amenities intended to engender a sense of 'modal indifference' would be the aim. Facilities at Tiverton Parkway would need to be enhanced to create a model high quality transportation interchange. This needs to be a 'full service' intermodal hub, with its parking facilities duly expanded, catering, toilets, waiting lounges and with scope to expand regular bus services beyond today's local links with Cullompton and Tiverton.

64. There could be capacity issues, because of course, high-quality interurban buses/coaches have modest seating provision compared with trains. Fares would be normalised at rail levels – so not at the much cheaper levels set by today's competing coach services. At times of foreseeable rail service disruption, additional coach/interurban express bus vehicles would likely be needed, and they too would need to meet the same high customer amenity levels.

65. No doubt, express bus provision would need to be on a contracted basis, with costs met and revenues accruing to the GBR account. Truly this is the time and the chance to break down the isolation of the nation's interurban travel modes.

Interface with Plymouth Metro plans

66. TEAM Plymouth is developing plans for a Metro-style train service that will support the high levels of growth that are now taking place in Plymouth city centre and at Devonport (navy yard).²² Thoughts are leaning towards a Liskeard-Plymouth-Ivybridge rail 'metro' service, with the possibilities of a Tavistock connection too.²³

20. [Rural Reconnections: the social benefits of rail reopening Exeter – Okehampton – Tavistock – Plymouth: a case study](#) – Greengauge 21

21. Consistent with Committee for Climate Change guidance on Adaptation strategies.

22. Transport infrastructure across the EU is being seen as more critical given defence & security needs, see: [Military mobility: the EU supports strategic investments on dual-use transport infrastructure with €807 million – European Climate, Infrastructure and Environment Executive Agency](#).

23. This would helpfully reduce the missing gap on the northern rail route to just 10 miles (Tavistock-Meldon).

67. The question of how best to accommodate a regular scheduled express bus link with Tiverton Parkway in Plymouth arises. This is a city, where, like others of a similar scale, there is significant (and growing) highway congestion that bus priority measures can only partially address. Peak period traffic delays would seem inescapable if the boarding point chosen is to be most conveniently located at Plymouth station. Facilities for accommodating waiting coaches would need to be included in the station area development plans (to which a better, direct, connection with the now transformed Armada Way²⁴ remains essential).

68. Another — potentially complementary — approach would be to feed a P+R facility that Plymouth Metro could also service. The obvious location for this would be at Marsh Mills, where access could be made very directly to/from the A38, and spare land in rail ownership could also accommodate a freight terminal as well as a passenger interchange. It would require adding a station for Metro services at this point — and this could serve as city-scale P+R station for other main line rail services too. Starting to think ‘across the modes’ opens up all kinds of opportunities.

24. <https://www.plymouthherald.co.uk/news/plymouth-news/gallery/thousands-flock-opening-armada-way-11045516>.

East of Exeter

69. Here there are two railway lines available, offering some flexibility for travellers, although as noted, the second route, the South Western line, has diminished capabilities while major works are in hand. There is no easy equivalent to the Tiverton Parkway multi-modal hub facility. But it makes sense to look at what might be achievable once the second main line (the South Western route) is available, post its current resilience works programme, and with at least some of its double track formation re-established.

70. In effect, there will once again be two, broadly parallel, main railway lines, the ‘Great Western’ and the ‘South Western’ pair of lines running Exeter–London. And east of Taunton, there is a third, the (GW) Wales and Western Route via Bristol and Swindon.

71. Adaptation policies here do not require the pan-modal approach needed west of Exeter. Here rail-based route choices are available to best negotiate a way around track resilience work interventions. In practice — although currently stymied by the extensive resilience works on the South Western route, and thereafter by the limitations of a single track main line — parallel railways do exist, and there are diversionary routes that could be used on an ‘as needed’ basis. But contingency arrangements, as with today’s ‘rail replacement bus services, are not popular, generally resulting in delays and late arrival times.

Scheduled services using a wider definition of parallel infrastructure

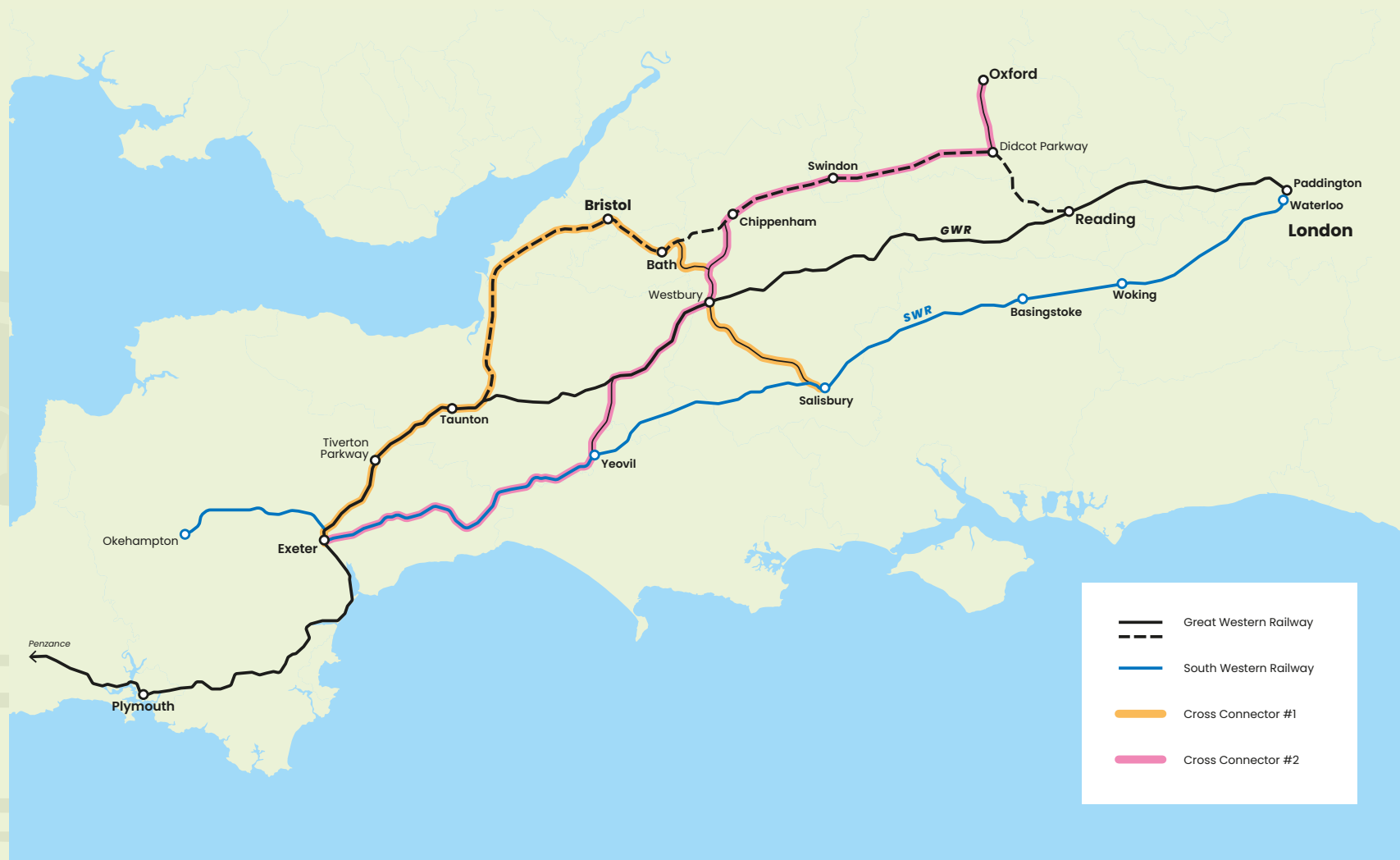
72. With three railway routes available between Devon and London, there would be value in creating a set of cross-connecting rail services that would maximise the opportunity to avoid climate-disrupted sections of line. Some of these options exist today but require unappealing train–train interchanges. Others have existed in the recent past that were clearly attempts to poach revenues by franchise holders, one from another. Now such cross-connecting services need to be re-considered for the flexibility they offer travellers as well as the new direct travel linkages they create.²⁵

73. The alternative rail services we have in mind, are illustrated in Figure 1. They would not be commandeered on the day, but would form part of the national rail timetable. They provide a set of connectivity gains as well as helping to ensure a rail service is available to **connect Devon and Cornwall with the capital and the nation’s major cities even if key sections of the usual route to/from Paddington are unavailable.**

25. This concept has some similarities with current plans for creating a ‘diversionary route’ for a period of major disruption that lies ahead while major works are carried out to create a new station on the Great Western Main Line at Old Oak Common, on the approaches to Paddington. For the duration of these works, GWR trains will operate to/from Euston rather than Paddington and take a much longer (and so slower) route to get there, via Oxford and Milton Keynes. But there is also a key difference: the cross-connecting services proposed in this paper are envisaged as running in addition to today’s rail services, not instead of them. While this may create network capacity challenges, it should be noted that some of these services have operated in the recent past.

**Figure 1: Climate Change
Adaptation in Practice:
Cross-connecting
scheduled rail services**

Source: [Greengauge 21](#)
and [Yellowfields*](#)



74. Besides the benefits for longer distance Devon & Cornwall travellers, there would be service gains across Somerset, Dorset and Wiltshire too. There are significant connectivity improvements for the university/academic, research and defence sectors in particular. And a useful by-product would be same-platform interchange (at Yeovil Pen Mill) created for rail trips along England's south coast (Weymouth-Exeter).

75. Both route suggestions could provide continuity on key high revenue earning connections with the capital and also open up other economic linkages with the 'Ox-Cam arc', the Midlands and North of England.

76. It is not necessary to conceive of such services on an hourly basis. Some of the new connections created will be better than any other travel option, but their primary purposes is to offer linkages that avoid using lines subject to climate-based weather damage, and in particular the disruptive remedial work needed to re-instate them after weather-based damage. The service offer needn't be day-long, hourly, for this concept to work. Instead it might operate on a 2-hourly intervals, or a 3 trains/day (early/mid-day/evening) basis. The point is they could significantly reduce the risk of rail service not being available on any given day, while also vastly improving connectivity across Devon, Somerset, Dorset, Wiltshire, Hampshire and Oxfordshire. The two suggested alternative rail routes are summarised in Table 1.

Service	Routes used	Avoids	Note	Connectivity value
1. Plymouth - Exeter-Taunton-Bristol-Bath-Westbury-Salisbury-Basingstoke-London Waterloo	GW main line, and cross-Wiltshire line, and SW main line into London	SW route limitations Exeter-Salisbury	Bristol-Bath-Salisbury-Basingstoke-London Waterloo route previously operated by franchisee as a competitive entry	Provides new connections if GW main line unavailable east of Bath and avoids SW Main line single track sections
2. Plymouth - Exeter-Honiton-Yeovil-Westbury-Chippenham-Swindon-Oxford	SW and GW main lines and cross-Wiltshire line	GW route via -Bristol; Both Paddington and Waterloo termini and approaches	Route capacity issue Swindon-Didcot	Retains connections for London (via Oxford/Chiltern Railways), and cross-Country connections from Oxford (Birmingham, Manchester etc)

Table 1: Additional, limited frequency, scheduled services to assure rail connectivity for Devon and Cornwall

Conclusions

77. Network Rail's Great Western Line has well-developed Climate Change Adaptation policies in place. But what works today is, sadly, unlikely to be enough in future. Here we sought to examine the established adaptation principle of looking to parallel infrastructure and tested whether it could be taken further, and the implications of doing so.

78. We have suggested how this can be achieved – by two mechanisms that do away with the much unloved use of 'rail replacement bus services':

- i) By creating a pair of scheduled new cross-connecting train services to reduce the chances of Devon & Cornwall being 'cut off' by major adverse weather events. These would bring many benefits besides providing much greater assurance on West Country connectivity with the rest of Britain
- ii) By providing a pair of express coach links to Tiverton Parkway in east Devon from (a) Plymouth and (b) Penzance. We have argued that these would not be made available just on a contingent basis, but would operate like the two new rail services on a scheduled basis, running over 'parallel' highway infrastructure. The services would be contracted by the future GBR, and there are high-performing bus companies available locally, who we would expect to be keen to participate.

79. In the longer term, re-joining the 'broken' rail connection between Okehampton and Tavistock – and so reconnecting once again Exeter and Plymouth by a second main line needs to happen. It can also provide much better connectivity into north east Cornwall (most likely from a station at Sourton, west of Okehampton). It may be that it will then prove unnecessary to retain the suggested express bus/coach links out of Tiverton Parkway. But these are good choices to have for the future.

80. Our approach has been to consider what passengers want and what they really don't like, and to use the Climate Change Adaptation prescription ("use parallel infrastructure") as a means to restore the connectivity that Devon and Cornwall needs, especially as the region is so central to Government's economic and defence policy agendas. We are suggesting a new way to create traveller confidence in the transport network's capability to offer "business as usual", even as Climate Change intensifies, posing fresh challenges to our national transport infrastructure.

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