

Union Connectivity Review

Submission from Greengauge 21

Introduction

The following is a response to the call for evidence from the Union Connectivity Review. It is submitted by Greengauge 21. We are available to assist the Review in whatever way is helpful, noting its wide remit and challenging timescales.

The Greengauge 21 consultation response

Greengauge 21 is an independent not-for-profit organisation that has developed a lot of evidence on the value of high-speed rail investment for the UK. It has also undertaken research into a broader set of public transport policy options. All of our work is freely available at www.greengauge21.net.

Over the last two years, we have examined the underlying social and economic conditions across the UK, seeking to establish a basis for a new transport policy, and an associated programme of action. The policy is inevitably guided by the drive towards net zero carbon and by the need to address very marked regional and social imbalances. The latter are expressed in terms of health, quality of life, social mobility and earnings outcomes. Much of the analysis has drawn on an examination of the detailed findings of the Social Mobility Commission. Several reports have been prepared at the prompting of the UK2070 Commission, who have provided us with an informal peer review of our work for them.

The Union Connectivity Review consultation is quite rightly seeking evidence on 'why' action should be needed. Some of the best evidence we adduce has come from a perhaps unlikely source, writing now, at the end of the transition period of Brexit: from research in Europe on the benefits of the single market and from German unification, and the connectivity across the German Länder. These are more dramatic circumstances than those facing the UK which of course already free-trades across the constituent four nations' boundaries. But they serve a purpose in helping to establish the mechanisms that underly questions of connectivity and economic impact.

Our view is that the questions on 'how' to improve connectivity are also important and that the review provides a rare opportunity to look at the interplay between various possible transport infrastructure and service developments, to help the circular process of 'shaping' a suitable way forward.

Answers to the consultation questions

3. In general terms, is there a need for new or improved transport links between the nations of the United Kingdom?

Yes. If the ambition is to strengthen economic growth across the whole of the UK, rather than just in its economic core which centres on the 'golden triangle' of London-Oxford-Cambridge (i.e., the wider English South East). What might be termed special measures will be needed to improve connectivity across the borders between England Wales, Northern Ireland and Scotland: these areas that have been little studied in the past.

The imbalance in economic strength of the four nations is of course very large. In 2018, England's GDP was £1,839bn; that of Scotland, Wales and Northern Ireland combined was only £285bn.

As the ONS statistics below indicate, in the last quarter before the UK economy was affected by Covid-19, England and Scotland registered virtually no GDP growth but Wales and Northern Ireland lost around 1% of output in terms of GDP. While this provides only a snapshot, the work of the UK20270 Commission shows that these variations in performance across the UK are deep-seated and of a long-term nature.¹

¹ UK2070 Interim Prospectus 2017

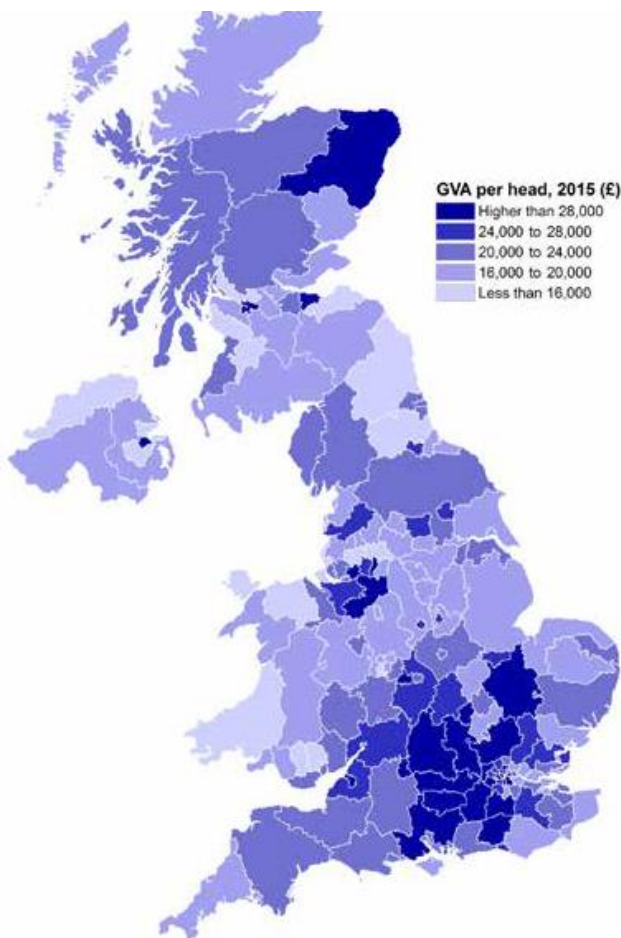
Percentage growth in the countries the UK, seasonally adjusted, Quarter 4 (Oct to Dec) 2019²

| Country | Growth in 2019 Quarter 4 (Oct to Dec) |
|------------------|--|
| England | 0.0% |
| Wales | -1.1% |
| Scotland | 0.1% |
| Northern Ireland | -1.0% |

Income and GDP levels in areas surrounding four-nation borders are low. This reflects the tendency for productivity and income to be highest towards the south east and in and around major cities (see figure below).

Since measures to improve connectivity across 4-nation borders may well feature local as well as longer distance connectivity gains, this suggests that a levelling up component of the Union Connectivity Review could comprise two elements, addressing:

- (i) The imbalance between the economic output levels of the 4 nations; and
- (ii) The economic weakness of those border areas that suffer the adverse effects of peripherality.³



Source: UK2070 Commission

No significant investment has been made in surface cross-border roads and railway lines for decades.⁴ Over the last 25 years, HGV traffic in particular has grown substantially on cross-border routes using roads with poor accident statistics (A75) and growing levels of congestion (e.g. A55-M56).

² <https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/gdpukregionsandcountries/januarytomarch2020>

³ See PRODUCTIVITY AND WIDER ECONOMIC IMPACT STUDY *Peninsula Rail Task Force*, Parsons Brinckerhoff, April 2015

⁴ A key exception should be noted, which is the Bristol-South Wales connection, where the second Severn Bridge has opened, tolls have been removed and the GW Main Line between Bristol Parkway and Cardiff was electrified in 2019. But the M4 remains a serious bottleneck through Newport.

4. What are the main obstacles and challenges in improving transport connectivity between the nations of the UK?

The good intentions between Ministers in Westminster and devolved Governments (agreement between Ministers Brown and Goodwill (see photo) do not seem to be enough. Nothing substantive has emerged from the meeting between Westminster and Holyrood transport Ministers four years ago.



Photo: Greengauge 21. Date 21st March 2016

*True, there seems to be no difficulty in collaboration at the operational and engineering level. But at Governmental levels, **mutual trust needs to be re-built**. It was unfortunate that the Union Connectivity Review was initiated without consulting the devolved administrations, potentially creating an initial obstacle to be overcome.*

5. What evidence exists to demonstrate the potential impacts of improved transport connectivity between the nations of the United Kingdom?

There is a substantial body of evidence that there is a strong case for better connectivity between the four nations.

(i) England-Scotland

Our report 'High Speed Rail and Scotland' summarises work by ourselves, Network Rail and others who have examined the case for investment in rail across the Anglo-Scottish border.⁵

This work shows that studies over an 11-year period have identified very strong economic cases for investment, especially over the northern section of the West Coast Main Line. These benefits derive from capacity pressures and connectivity gains and cover both person-travel and freight. They need to be prioritised because of the upcoming impact of additional trains operating over the West Coast Main Line north of Crewe when HS2 Phases 1 and 2a open. Without investment in additional track capacity and ECTS, there is a risk of poor performance undermining HS2 operations and market demand growth being stifled. Put positively, investment here will ensure better value from the investment in HS2.

(ii) England-Wales

The case for cross-border rail investment between North Wales and England has been examined by the North Wales Economic Ambition Board.

The NWEAB concluded that:

"The rail network in North Wales has seen little investment in recent decades and lags behind the rail network in other parts of the United Kingdom, especially with regard to current and planned investment in the North West of England. The result is a rail infrastructure in North Wales that does not deliver a service that meets current market requirements; it acts as a brake on economic development on both the Welsh and English sides of the border and contributes to increased congestion on an already overburdened cross border road network. The rail offer is not competitive with road and fails to encourage modal shift from private to public transport. This is a situation that cannot continue. To stimulate the full economic potential of the

⁵ <http://www.greengauge21.net/wp-content/uploads/High-Speed-Rail-and-Scotland.pdf>

entire region the rail network needs to deliver faster more frequent services offering more capacity so that it becomes a more attractive transport offer. Rail must offer better services that improve connectivity with key destinations important to the economy of North Wales including the international gateways at Manchester, Liverpool, and Birmingham airports. In order to achieve this, we need a broad package of investments which includes the electrification of the network as the backbone of the transformation of our network".⁶

(iii) Britain-Northern Ireland

The Greengauge 21 report of February 2020 sets out how a fixed link could establish fast surface/tunnelled connections between England/Scotland and Northern Ireland.

6. When making transport investment decisions that aim to improve connectivity between the different nations of the UK, does the current appraisal framework capture all the potential impacts?

No, it doesn't.

In general, current transport appraisal systems (WebTAG in England, STAG-2 in Scotland), have the virtues of consistency (except of course, if they need to be applied together to assess cross-border investments!). Common critiques that propose that these methodologies are obsessively based on journey time savings appear unaware of the sound welfare economic theory under-pinning the use of disutility functions measured as generalised cost of travel) in analysing demand responses to supply side changes.

The really fundamental analytical problem is a failure to consider distributional questions which may lie at the heart of Government policy ambitions (as they most certainly do in the case of the Union Connectivity Review (UCR)). This problem has partly been recognised in the latest update to the Treasury Green Book. This calls for an emphasis on Strategic Cases (rather than Benefit Cost ratios) – helpful in respect of the UCR which is inescapably strategic. But its proposed remedy of admitting BCR evidence on a geographically constrained basis is problematic in respect of the UCR: London and the South East can hardly be left out of UCR appraisals of impacts on the UK economy. Nevertheless it pints the way towards a geographic breakdown of impacts that we would recommend the UCR adopts.

There is also the (as yet) inadequate valuation of carbon impacts which at current price settings have only a marginal impact on appraisal results. Carbon prices in appraisals will need to be radically re-adjusted if the UCR is to deliver sensible outcomes for the century ahead.

More generally, it should be noted that the Strategic Case for cross-border connectivity improvements is more likely to depend on producing economic re-balancing benefits (for which no specific metric has yet been devised), than on more conventional transport sector benefits, from increased capacity, fewer accidents etc.

Evidence on the impacts of easing cross-border travel and economic re-balancing comes from European sources. These cases are situations where real restrictions on connectivity are removed. Clearly, right now there are no border restrictions within the UK (although, of course, some border checks are envisaged between Northern Ireland and GB, post-Brexit, and there are weaknesses in cross-border transport provision).

The first source is from German unification, which provides European evidence on labour and capital mobility unimpeded by national boundaries, trade barriers, or culture, tradition and institutions after 1990.⁷ Although there is no border within GB as there was in Germany, it has been observed elsewhere that Britain's north-south economic performance divide is of a similar scale to Germany's east-west divide prior to unification.

Incomes per capita and standards of living did indeed converge across the German Länder (regions) after 1990, when not only was the border removed but transport connections across it which had been neglected for 50 years were improved. However, value added per capita measures across the Länder did not converge. The agglomeration of economic activity led to persistent variation of value added and income per capita. It was concluded that:

⁶ <https://business.senedd.wales/documents/s48064/WRI%2015%20North%20Wales%20Economic%20Ambition%20Board.pdf>

⁷ <https://www.intereconomics.eu/contents/year/2019/number/1/article/convergence-of-the-german-bundeslaender-lessons-for-the-eu.html>

*“A crucial element is the distinction drawn...[...]. between absolute and conditional convergence. On the metric of productivity, is it reasonable to expect countries **or regions within countries** (our emphasis added) to converge at all? In my assessment...[...].the answer is no. Rather than imposing the same aggregate production possibilities on the nations or regions of Europe, it is more reasonable to consider each as producing with an individualised level of total factor productivity that is as much predetermined by technical progress as by the cumulative forces of history, economic geography and luck. This, in turn, has implications for the persistence of long-term inequality that can be expected in Europe without explicit transfers.”⁸*

Second, perhaps the most substantive piece of work on the economic effect of national borders was carried out at the instigation of Lord Cockfield in the 1980s, when the European Commission was examining the case for the creation of the Single Market. The work he commissioned showed the expected benefits of removing tariff and other barriers, but it also identified a similarly large impact from simply creating larger markets. This second effect, which is entirely relevant to the UCR, was estimated to add over 2% to GDP.⁹

Of course, the four nations of the UK do not experience the border effects on their economies in the way that affected pre-single market European nation states. But the southern highlands of Scotland and the fells of northern England leave a 100 mile+ gap between cities (Glasgow-Carlisle and Edinburgh-Newcastle) on each side of the country. This is sufficient to diminish the ability of many businesses in northern English cities to readily serve the Scottish market and vice versa, leaving to one side any cultural impacts¹⁰ that may affect such business activities.

The economic benefit described in the EU research is an agglomeration effect, but much of the research and application of this factor in the UK has focused on labour markets, rather than business travel (it was used to some effect in the appraisal of Crossrail). The recent report on the transport needs of the Midland and North¹¹ makes some useful advances in this area that might usefully be adopted in the UCR.

A further issue is the question of spatial strategies, to which DfT’s current appraisal framework makes no reference. Where they exist, they have generally been devised with an aim to help foster economic growth. Transport links are a key factor that determines their effectiveness.

Scotland is on its third revision of a national spatial strategy having produced the first in 2004. This identified a major arc of economic opportunity along Scotland’s East coast/England’s NE coast. Wales has now prepared one. The UK2070 Commission has considered this specific issue and concluded in its first report that:

“There is ... a complementary need for a UK Spatial Reference Framework agreed between the administrations of the UK that sets out a common understanding of overarching spatial priorities (e.g. energy) and matters requiring cross-border collaboration in the United Kingdom”¹²

and in its second report, under the heading of Aligning the Nations, it noted the existence of:

“the Borderlands Partnership between authorities in the North of England and the South of Scotland, and between England and North/South Wales. It proposed that this alignment of the nations could be through a UK Spatial Framework agreed between the administrations of the UK. The British Irish Council already has a Working Group on Collaborative Spatial Planning that facilitates discussion on matters of common interest across the UK and Ireland.”

7. Which specific journeys would benefit from new or improved transport links?

We identify the following six specific border areas and crossings where improved transport links would be beneficial:

⁸ *Ibid*

⁹ <https://op.europa.eu/en/publication-detail/-/publication/de6e9bed-bb51-456d-9830-b12debb83019/language-en/format-PDF/source-search>

¹⁰ We found no evidence of the existence of these but we speculate that perhaps some English-based businesses feel inhibited by any Welsh language obligations arising from serving markets in Wales

¹¹ <https://nic.org.uk/studies-reports/rail-needs-assessment-for-the-midlands-and-the-north/>

¹² <http://uk2070.org.uk/publications/>

- I. **Anglo-Scottish** – to connect the major cities of England and Scotland and improve their economic productivity; improve international connectivity; to reduce transport related carbon emissions to net zero
- II. **Northern Ireland-GB** – to address the existing and new connectivity challenges for Northern Ireland going forward in a sustainable way
- III. **North Wales-England** –)and through the sea crossings from Holyhead, Northern Ireland too)¹³. This would provide better connections for North Wales to NW England and to key English cities beyond (as well as Scotland)
- IV. **Anglo-Scottish borderlands**
- V. **English-Welsh borders**
- VI. **Northern Ireland-Republic of Ireland border area**¹⁴

The first three (I-III) categories concern long distance flows that cross UK internal borders. The second three (IV-VI) address weaknesses in transport provision and local connectivity needs in border areas, some of which may not entail crossing the border itself.

a) What would be the benefits of improvements to these specific journeys?

I. **Anglo-Scottish**

The major cities of Great Britain are connected by rail, road/motorway and air services; there is also coastal shipping for freight. Cross border travel distances are long. As far as major city connections are concerned, they typically lie in the range 125 miles (Newcastle-Edinburgh) to 500 miles (Bristol-Aberdeen).

A particular area of benefit from transport improvements would be to the economies of the cities of northern England and those of the central belt of Scotland where business catchments would be expanded, trade increased, and productivity increased. Some types of transport investment could also increase capacity for Anglo-Scottish freight (including to/from the ports of south east England) and some could increase city labour market catchments. A balanced programme of investment could help address challenges of network resilience and mitigating the impacts of climate change. Depending on measures selected, it should also be possible to make a significant contribution to the UK's transport sector carbon emissions.

II. **Northern Ireland-GB**

Here the benefits would be to mitigate the effects of border checks, and if radical solutions are adopted (a cross-Irish Sea fixed link), transformational connectivity between N Ireland and 'the mainland', removing dependence on either air or sea travel, and – subject to the measures elected – reduced carbon emissions. A fixed link could also open up wider connectivity gains with the Irish Republic. To meet Government environmental aims a fixed link across the Irish Sea would need to offer fully electrified connectivity, and there would need to be investment in access facilities too.¹⁵

III. **North Wales-England**

In this corridor can be found – from west to east – a key port (which is likely to lose trade post-Brexit completion), an area of major tourism attraction (Snowdonia), an area with significant social deprivation (declining coastal towns), Britain's biggest industrial cluster (straddling the English-Welsh border), and the large cities of Liverpool and Manchester (and their international airport gateways). The economic benefits of improving connectivity are accordingly rich and diverse.

The port of Holyhead currently plays a major role in handling Irish-Mainland Europe freight carried by HGV. There is a risk that these flows will switch to new routes direct to the continent, weakening cross Irish Sea ferry links which are also used to access Northern Ireland. In a Greengauge 21 discussion with the transport authorities in the Irish Republic (pre-Brexit referendum), satisfaction was expressed about current transport facilities and especially the A55, which form for Ireland a 'land bridge' with the European continent. But concerns were raised about the ability of the motorway network in NW England and to the ports in south east England to accommodate growing demand levels.

¹³ There are no direct ferries from Holyhead to Northern Ireland

¹⁴ Beyond the scope of the UCR but included for completeness

¹⁵ See [Connecting-Great-Britain-and-Northern-Ireland.pdf \(greengauge21.net\)](https://www.greengauge21.net/Connecting-Great-Britain-and-Northern-Ireland.pdf)

A key benefit from investment would arise if a lower (ultimately net zero) carbon means of shifting Irish freight that uses HGVs for lengthy journeys could be found.

Specific challenges to address are:

- The risk of losing N Wales – London direct rail connections following HS2 completion (which can be overcome by electrification of Crewe-Holyhead)
- The absence of a rail connection from N Wales/Chester to Manchester Airport (limiting inwards tourism potential, and the internationalisation of Bangor University)
- The absence of rail services from N Wales/Chester to destinations in Yorkshire and the East Midlands
- Congestion on the M56/M6 motorways
- The risk of losing Holyhead-Dublin ferry services. In 2021, Rosslare Europort will offer more sailings direct to the European continent (30/week) than to the UK (28/week) for the first time.

Overall

Improvements to each of these three specific cross border movements (I-III) would bring a tourism boost (both international and domestic).

It will also be worth examining the combined impact of investments in transport across to examine network synergy and resilience effects.

IV. Anglo-Scottish borderlands area

The rural area on the England-Scotland border has many long established cross-border traditions, but thin road and rail connections. A key weakness is the lack of rail connectivity southwards from Tweedbank. The benefits of addressing this network limitation are:

- Improved rail service economics from a through service capability
- Added network resilience by creating an alternative route between Carlisle and Edinburgh
- Connections for the Border Towns with Manchester, Leeds, Birmingham and London.

This is an area of historic interest which is less able to develop its tourism potential because of poor access from its major potential markets. This would also help the surviving cloth/tweed and other local industries.

V. English-Welsh borders

The central section of the English side of the Welsh borders includes the least urbanised county in England (Herefordshire) and has low economic performance indicators. It is poorly served by road and rail. East-west road connections to the national motorway network (M4 and M40) are largely absent. Rail access is slow (London-Hereford is approximately 3 hours). This is beyond the access time necessary to make ten borders an attractive location for new business start-ups, as earlier Greengauge 21 studies evidenced.¹⁶ It makes Mid Wales unnecessarily remote and a poor business prospect too.

North-south connections are also inadequate. The A49 has seen piecemeal upgrades but is nearly all still single carriageway but well-used by HGVs. The Newport-Crewe railway is in effect a downgraded main line, with an historic signalling system. But these routes provide in many cases the fastest surface connections between South and North Wales (through England). Journey times are slow. Their development appears to have been overlooked by the relevant agencies, (Highways England and DfT/Network Rail).

VI. Northern Ireland-Republic of Ireland border area

This border and its surrounding area is relevant because (i) it could provide through routes of value (for instance, surface connections between Dublin, Belfast and Glasgow, Edinburgh; and (ii) the border area has suffered from under-investment for many decades. Its deep rural residential population has poor access to the higher education and employment opportunities that are only available in the largest cities. This weakness was examined in detail by

¹⁶ <http://www.greengauge21.net/great-western-conditional-output-statement/>

*Greengauge 21 in a study for the UK2070 Commission (which also sets out more widely the challenges facing the UK in improving Social Mobility and the role that better transport can play in achieving it).*¹⁷

b) Are you aware of any work that has been done to assess the need or feasibility of improvements to all or part of these specific journeys

For feasibility work, we would refer the Review team as follows:

- I. Anglo-Scottish** *Greengauge 21 research is comprehensive in this area, as noted. Network Rail's New Lines study of 2009 should also be examined.*
- II. Northern Ireland-GB** *James Barton's 1901 paper (can be sourced via Greengauge 21 if needed) and papers held by the ICE library and Edinburgh University. Robert Salkeld is an authority on the subject of the feasibility of the tunnelled fixed link studies and also has an informed view on the feasibility of restoring/creating new rail connections across Galloway/Kirkcubright/Dumfries (contact details available on request)*
- III. North Wales-England** *North Wales Economic Ambition Board, Growth Track 360, & the Mersey Dee Partnership hold most of the relevant research*
- IV. Anglo-Scottish borderlands** *Borders Rail Extension Campaign*
- V. English-Welsh borders** *Network Rail and Highways England*
- VI. Northern Ireland-Republic of Ireland border area** *This has been the subject of TEN-T studies and funding.¹⁸ For example, road links between villages and towns such as Ballybofey and Stranorlar, Letterkenny and Manorcunningham and Lifford-Strabane have been subject to investigatory studies.*

c) How would the costs and benefits of the identified improvements be distributed?

We have found insufficient evidence available to answer this meaningfully .

d) How will demand for these journeys change in the future?

The Next 20-30 Years and Covid-19 Impacts

Th significant year-on-year growth in business and leisure travel is expected to return once the Covid-19 pandemic is over. Digital offerings in theory offer a substitute to many trips, but longer distance journeys tend to assume a higher level of importance to those making them.

Commuting travel behaviours appear set for a change with many of those able to work from home (which, at times has been under Government direction) expected to seek to retain that modus operandi, but only in general for a proportion – perhaps 40-50 – of their working week.

Only in a few places (N Wales-NW England, in particular) is commuting a significant part of the overall market for cross-border travel.

e) In your opinion, what is the preferred means by which to improve these journeys?

I. Anglo-Scottish

A programme of upgrades to existing rail lines (both East and West Coast Main Lines), combined with new dedicated sections of high speed line joining HS2 to Scotland will boost capacity and meet the projected demand for both freight and passenger travel.¹⁹

Current plans for HS2 infrastructure do not extend north of the Manchester-Leeds-York axis, whence instead HS2 services are expected to operate over existing railways lines (the East and West Coast Main Lines). Studies into options for the nation's high-speed rail network have found that adding a high-speed line northwards from

¹⁷ <http://www.greengauge21.net/wp-content/uploads/The-UKs-2070-Transport-Infrastructure-Requirement-.pdf>

¹⁸ <http://www.donegal-ten-t.ie/>

¹⁹See <http://www.greengauge21.net/wp-content/uploads/High-Speed-Rail-and-Scotland.pdf>

Manchester to Glasgow/ Edinburgh had a strong economic case with a benefit: cost ratio of 7.6:1, a much higher return than all other routes studied. In addition, as the economy recovers, so too will any short-term loss of freight demand and there is considerable scope to move more freight onto rail.

No other option can match the carbon credentials of this solution.

II. Northern Ireland-GB

The obvious approach here is a tunnel connection, with the capabilities offered by Eurotunnel between England and France. The distances involved are not dissimilar. There should be a greater emphasis on through railfreight than has been achieved with the channel tunnel.

*The need to create a new rail link between the west of Galloway and the West Coast Main Line is evident. It should **not** follow the route of the one-time 'Port Road', the railway closed in the 1960s which, against the better judgement of the local population when it was built, set out across the higher ground and failed to serve Kirkcubright. A 'Euroshuttle-style' facility might extend over this route to an inland terminal on the M74 to obviate the need to create a motorway to replace the A75. This would require the railway to be built to a larger structure gauge and would preclude the use of the existing line between Dumfries and Gretna. Either gauge changing technology or a revised track gauge in Northern Ireland would be needed – the latter making much more sense given the limited rolling stock fleet size in Northern Ireland.*

The costs involved would be substantial but it would make no sense to seek recourse to private sector funding. On the other hand, the facility will generate a substantial positive cash flow once built and could be concessioned (in the same way as the Channel Tunnel Rail Link) offering a cash payback to HM Treasury. Given the scale of investments being made in Denmark, Norway and the Faroes Islands in transport infrastructure schemes to much smaller and remoter areas, it cannot be said that the costs would be disproportionate to the connectivity needs of Northern Ireland.

*There is a risk that neither the Scottish Parliament nor the Northern Ireland Assembly would fully welcome such a scheme. But it could be the vehicle to create much better transport links within both southern Scotland and in deep-rural parts of Ireland (see **IV** and **VI** below). A new rail link to the West Coast Main Line should be built to a good modern standard (say 125 mile/h), but it could also serve intermediate stations en route and have a connection to Dumfries. With a new chord north of Gretna it would then be possible to offer a fast connection from Dumfries and Lockerbie to Edinburgh.*

The project would also offer a link through Belfast to Dublin. In Ireland, a cross-border agreement has recently been signed to look into creating a faster Belfast-Dublin link and indeed to examine the case for a much wider rail upgrade. These connections may lie beyond the UCR's remit, but the essential point is that the market available to an Irish Sea fixed link could serve is in fact bigger than just Northern Ireland itself. Besides creating a capital cities axis (Dublin-Belfast-Glasgow-Edinburgh), the connection would create the scope for significant expansion of sustainable and enjoyable train-based leisure travel across these islands. This is a zero-carbon travel sector expected to grow, post-Covid. Carlisle would become a key border town hub, with its important connections to Leeds and Newcastle over lines that would also benefit from enhancement.

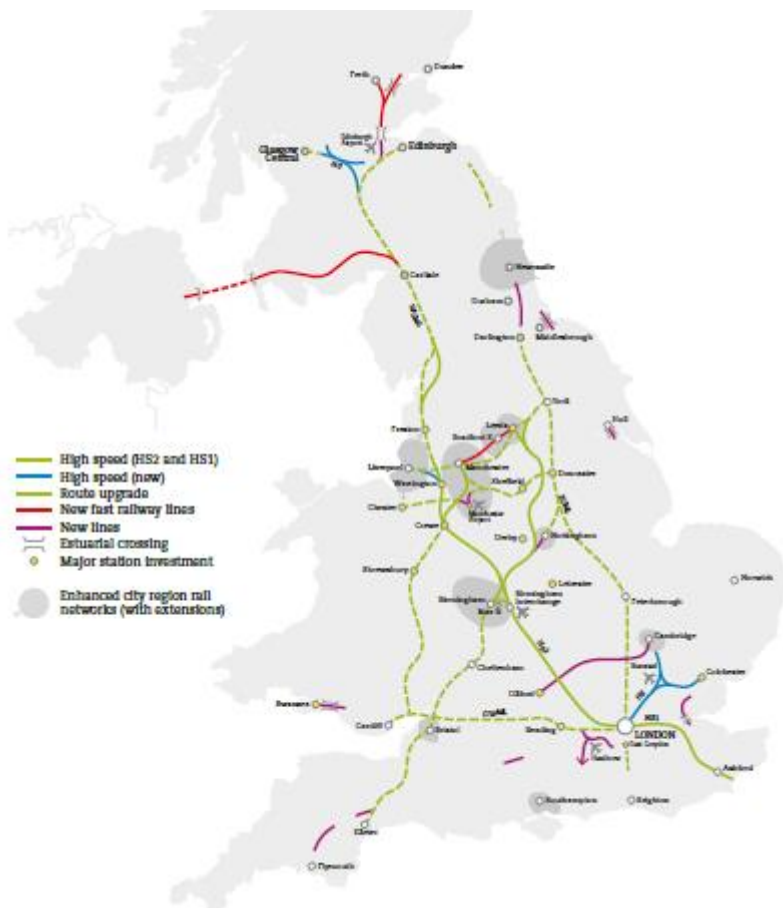
*If built, Northern Ireland could become as dependent on this connection as the UK is on the channel tunnel. A good resilience measure would be an expansion of the role of Holyhead (see **III** below).*

III. North Wales-England

We suggest that the Holyhead-Chester-Crewe railway line has the potential to form the sustainable core of North Wales' transport infrastructure, if electrified. It could then provide a key element in addressing two border crossings: between England and Wales and between Wales and the Republic of Ireland/Northern Ireland. Besides the passenger travel connectivity gains visible to the NWEAB 5 years ago, given the need to set in train a programme to achieve net zero carbon emissions, and in the absence of a viable means of replacing diesel fuel for long distance HGV movements, this route creates a sustainable solution to cross-Irish Sea connectivity. This investment would also support an HS2 service London-Crewe-Chester-Bangor-Holyhead.

Manchester Airport has no connection to Chester and North Wales; its absence can readily be addressed by building a short (protected) extension from the existing airport rail station to the mid-Cheshire line (a development that has much wider benefits for the problems of Greater Manchester rail network).

The three investments identified here (I-III) could be considered together as part of a programme of pan-UK connectivity improvements, each adding to the value of the HS2 investment in England and extending its benefits across the whole UK. This is illustrated below²⁰.



Source: Greengauge 21 for UK2070 Commission, 2020

IV. Anglo-Scottish borderlands area

Completion of the Borders Railway from Tweedbank south through Hawick to Carlisle would dramatically improve the connectivity of the Borders region and several of its key towns. It can feed into (and from) the Anglo-Scottish HS2 service that is now planned to serve Carlisle from Euston (as well as a service from Birmingham).

The Borders railway should be electrified throughout. It can then also serve as a backup facility if there is disruption on the line north of Carlisle via Beattock. It can add to overall national rail network resilience.

One particular measure that could help gain support for the link from SW Scotland to Northern Ireland would be a short new cross connection from the extended Borders railway to the new railway across Galloway. It would then be possible to inter-connect a series of southern Scottish towns and provide them with a direct link to the capital: Stranraer-Newton Stewart-Kirkcudbright-Dumfries-Hawick-Galashiels-Edinburgh.

V. English-Welsh borders

²⁰ Note that electrification schemes are not illustrated so the Holyhead-Crewe scheme is absent from this diagram

Cardiff, we found in *Beyond HS2*,²¹ is the least well interconnected city in Britain, and it should be a key destination in the development of HS2 into an 'X' rather than 'Y' shaped network. Adding South Wales to the set of places that have HS2 services – in this case on a SW-NE axis – requires completion of the Midlands Rail Hub and its use to accommodate long distance cross-country services as well as regional trains.

There is also an opportunity to improve rail links from Cardiff to the North using the Newport-Crewe ('North & West') line. This would have a dual strategic purpose: speeding up journeys between South Wales and North West England/Scotland that currently travel via Birmingham; and speeding up journeys between North, Mid and South Wales for which there is no direct rail link across Wales. This would entail a mix of measures to increase line speeds and ensure that a mix of stopping and non-stopping services can be accommodated.

In general, in the face of dramatic climate change, it is impossible to support expansion of the strategic highway network that would encourage more road based travel given its adverse environmental impacts (some of which will survive even the switch to electrically-powered vehicles, when that arrives). But highway schemes that carry other specific environmental benefits can be supported. New roads which short-cut existing convoluted routes are a case in point, since they may reduce overall vehicle-miles.

In the England-Wales border region, for instance there is the possibility of creating a new road link (single or dual carriageway) between the A466/A45 junction at Chepstow and the A40/A449 junction at Raglan. This would have the effect of halving the travel distance for vehicles headed between the M48 Severn Bridge crossing from England and the A465 Heads of the Valleys road and the A40 into Brecon and Mid Wales. This would take some pressure off the capacity constrained section of the M4 motorway through Newport, that would otherwise reach towns in the Welsh Valleys from the south rather than the A465 to the north.

It would also allow journeys from Hereford, Ross-on-Wye and Monmouth access to the Severn crossing and the M4 motorway to London without traversing the highly scenic but slow route between Monmouth, past Tintern to Chepstow – see indicative map, below.



VI. Northern Ireland-Republic of Ireland border area

Recent work by Greengauge 21 for the UK 2070 Commission²² revealed a serious social mobility problem along the Northern Ireland/Republic of Ireland border. Education achievement levels are very low, and job prospects poor. Lack of access to cities with higher education establishments is key factor. Providing this connectivity requires rail links and the western part of Northern Ireland has very few: all its lines bar one were closed in the 1960s. Re-instating such rail links could also serve the wider purpose of creating a sustainable tourism infrastructure for this part of Ireland and link key destinations either side of the border: Derry/Londonderry, Sligo, Enniskillen, Omagh, Armagh and Belfast. Such links would of course feed into the new Irish Sea fixed link.

²¹ http://www.greengauge21.net/wp-content/uploads/Beyond_HS2WEB.pdf

²² <http://www.greengauge21.net/wp-content/uploads/The-UKs-2070-Transport-Infrastructure-Requirement-.pdf>



f) What would be the environmental impact of improving these journeys in the way that you have identified?

In general, these proposals are for new and enhanced rail links. Because of their strategic nature, supporting long and medium distance travel that would otherwise be made by car and HGV (and in some cases short-haul air services) all should be electrified.

The greenest option for Anglo-Scottish travel is rail which produces a fifth of the climate emissions that comes from air travel. Analysis by Transform Scotland shows that total carbon emissions from air and rail travel between Edinburgh/Glasgow and London have fallen by 12%, saving 98,000 tCO₂e in total. 60,000 tCO₂e of the total savings were made on the Glasgow to London route.²³ This work looked at the carbon savings achieved in recent years by shifting travel from air to rail between Central Scotland and London and highlights the additional emissions that would be saved should rail continue its progress towards a 50% share of the travel market. The benefits of reducing long distance journeys across the border by car (and especially by HGV) would be very significant too.

g) Are there any interdependencies with other policies that may impact the deliverability of the identified improvements?

There should be a link with spatial development plans and with place-based industrial strategies. But this interdependency is hardly likely to be an impediment, where such plans exist. Unfortunately, for England as a whole these plans and strategies are entirely absent, although useful efforts have been advanced at regional levels, for instance in the Northern Independent Economic Review. Where such national plans exist (as they do in Scotland and Wales) they will provide a very useful validation of the strategic case for transport-based connectivity improvements.

8. Is there a need for the development of a national strategic transport network to replace the European Trans-European Transport (TEN-T) network following the end of the UK-EU transition period?

High profile infrastructure projects in the UK—such as ground investigations for HS2 and new underground stations along the Crossrail (Elizabeth) tube line—have received funding within the framework of the Trans-European Network for Transport TEN-T.²⁴ The existence of TEN-T and its use of a range of funding sources – some but not all drawn from EU programmes – also has the effect of channelling some investment into areas that are remote from major cities (as is often the case with border areas) and into projects that wouldn't otherwise score as highly as major urban projects in terms of benefit cost ratio performance. A good summary of how this works in practice can be found in a book by Janice Morphet.²⁵

The parallels between the aims of the TEN-T proposition and the situation of the UK post-Brexit and its domestic connectivity needs across the four nations are notable. We believe that adopting an equivalent format to the TEN-T

²³ <https://transform.scot/a-green-journey-to-growth/>

²⁴ See 2018 article - <https://www.sciencedirect.com/science/article/pii/S2213624X1730247X#b0065>

²⁵ <https://policy.bristoluniversitypress.co.uk/how-europe-shapes-british-public-policy>

programme would help instigate new investment funds that would improve pan-UK connectivity, funds that would not be applied under any existing UK programme.

It could also work well with European partners going forward. The HS1/Eurotunnel infrastructure is critical for UK business and tourism travel. And investment in Dublin-Belfast rail could well help make the case for investment a cross-Irish Sea tunnelled rail route.

a) How should such a network be defined?

The EU's TEN-T criteria form a good starting point. They are multi-modal and reflect wider policy aims. An explicit 'cross 4-nation boundaries' aim would need to be added, to mimic the Single European Market so strongly promoted by Prime Minister Thatcher in the 1980s.

A key driver needs to be sustainability and carbon reduction, alongside economic improvement as part of the Government's levelling up agenda. As the responses above have shown, this is also an opportunity to address issues of peripherality.

b) What would be the potential impact of such a network?

Besides the obvious benefits, addressing the needs of cross-border travel and connectivity will:

- *Assist with 'domestic' network development decision-making*
- *Help ensure that the benefits of within-nation investments are optimised*
- *In addition to helping the economies of Wales, Scotland and Northern Ireland in particular, a properly funded UK 'TEN-T' network would – at least in the case of rail – potentially help the large parts of the North of England share in the connectivity gains that HS2 offers south of Leeds-Manchester*

c) How should a network of this nature be managed or financed?

It will need to be majority funded by the UK Government. Cross-border links, as we have shown, tend not to be the highest priority at nation level. Greater devolved funding to Wales, Scotland and Northern Ireland with an expectation that this would partially be used to support cross-border initiatives would help achieve commonality of purpose between the administrations. But strong leadership with a guiding mind that is able to take on board valid concerns and ambitions at individual nation level would be needed.

An arms-length organisation with strong and passionate leadership and an integrated team of staff drawing on the expertise and knowledge of the Scottish, Welsh and Northern Ireland Parliaments/Assemblies, combined with expertise drawn from the nascent regional English transport bodies, would seem appropriate.

d) Do you have any further comments on the development of a national strategic transport network?

This will be a long term programme. The current fashion is for projects, often of such a scale that they can be implemented quickly. Government needs to be persuaded of the value and essential nature of longer term plan commitments, even though it will be recognised that delivery will sometimes have to await funding availability, and that the details of individual schemes will vary. The advantage for Government will be profound if the programme can come to be seen as genuine nation-building, rather than another English-dominated approach (which is the typical view of HS2, for instance, outside England even though it benefits parts of Wales and Scotland).

The pay-off for Treasury, whose funds will inevitably be stretched, is two-fold:

- *a diminished burden in public finances going forward, as economic performance, health levels and social mobility weaknesses are alleviated. These will need to be quantified in appraisals – an innovation in transport the sector*
- *the opportunity for ongoing piece by piece concessioning of new rail infrastructure with the prospect of cash returns. This opportunity simply does not exist in other sectors.*

9. With reference to the unique geographical position of Northern Ireland, please set out how best to improve cross-border transport connectivity with other UK nations

Any scheme to successfully connect mainland Britain and Northern Ireland via a fixed link has to be developed and considered as a combined package of substantial improvements and new transport connections, both in Northern Ireland, in South West Scotland and in North West England. So reinstating rail links between Portadown, Armagh, Enniskillen and both Sligo in the Irish Republic and Derry/Londonderry; as a complement to a new Irish Sea crossing, would extend and deepen the transformational effect on the Ulster economy. Similarly, enhancements though northern England will be that much stronger if the Northern Ireland market is added to the service mix. Key places such as Workington and West Cumbria as a whole would benefit from the extra rail network capacity and faster speeds needed to get full value out of the Northern Ireland-Britain fixed link. The new link would also foster a case to electrify and improve the Newcastle – Carlisle rail link to ensure that the eastern side of England has access to the new cross-Irish Sea facility.

The work noted earlier (the paper by James Barton dating from over 100 years ago) established a feasible sea crossing tunnel route that avoids the Beaufort Dyke. It is important that this review goes further than identifying the feasibility of such a facility and demonstrates that:

- *in strategic terms there is no better option*
- *that it carries the support of the Northern Ireland Assembly and the Scottish Parliament*
- *there is a feasible path to its funding from the UK Exchequer that does not adversely impact on other transport funding.*

10. Other than geographic, are there any other specific restrictions to improving connectivity between Northern Ireland and other UK nations?

Ireland has a 5'3 track gauge unlike the railways of Great Britain. Either the short connecting routes in Northern Ireland should be converted to GB (standard European) gauge or gauge-changing technology should be deployed. This technology has now progressed (China has manufactured a 400km/h high-speed trainset capable of changing gauge en route).

11. What else can be done to support greater transport connectivity between the nations of the UK?

Put Government colleagues on notice that this is a national priority and seek to gain cross-party support for its implementation, which will span many Parliaments.

ENDS