Date: 04 February 2022
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**BY EMAIL ONLY**

Dear Sir/Madam

**National Infrastructure Commission Consultation The Second National Infrastructure Assessment: Baseline Report**

Natural England welcomes the opportunity to comment on the Second National Infrastructure Assessment: Baseline Report and we would be happy to take part in further events and engagement in the run up to the second assessment.

As the Government's advisor on the natural environment, our purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

There are a few key themes we highlight here reflecting on the document and recent engagement:

- Climate resilience is broader than net zero and low carbon technology**.** It is essential that building new infrastructure including managing the transition to low carbon ensures that we don't put more stresses on the environment. This would make it more difficult to reverse biodiversity decline and improve nature's resilience. We should be striving for low carbon, high nature infrastructure development.
- The potential contribution of Nature Based Solutions needs to be considered more holistically. We think there is a missed opportunity to link between chapter 2 (net zero) and chapter 3 (climate resilience and environment) tackling together the twin crises of nature loss and climate change.
- We welcome the commitment to Environmental Net Gain (ENG) referenced in the document and the inclusion of a chapter on natural capital. We have had some early contact around NIC plans to develop a set of natural capital principles for infrastructure, to complement and expand on the Design Principles. We will be pleased to remain involved as this develops and suggest you contact Andrew Thompson andrew.m.thompson@naturalengland.org.uk.

Detailed answers to the questions are provided in the Annex.:

If you have any queries relating to the advice in this letter please contact me at deborah.hall@naturalengland.org.uk .

Yours sincerely

Deborah Hall, Principal Adviser – Major Infrastructure
Strategy and Government Advice

**Annex – Detailed Comments on Consultation Questions**

**Question 1: Do the nine challenges identified by the Commission cover the most pressing issues that economic infrastructure will face over the next 30 years? If not, what other challenges should the Commission consider?**

There is a gap in the 9 challenges and a missed opportunity to link between chapter 2 (net zero) and chapter 3 (climate resilience and environment) tackling together the twin crises of nature loss and climate change. See further context set out in Nature Positive 2030 | JNCC - Adviser to Government on Nature Conservation. We should be striving for low carbon, high nature infrastructure development.

There are opportunities for infrastructure to play its part delivering environmental outcomes. This should look at shifting from reducing harm to making a positive contribution to the environment, ensuring infrastructure plays its role in addressing the trend of nature decline and the need for climate action (the top two future trends and government commitments highlighted on page 4).

Whilst biodiversity net gain is covered in Question 4, this only addresses the environment in part and further work will be required to deliver environmental net gain which we welcome is supported. Embracing nature based solutions to assist in addressing the NICs cross-cutting challenges can help infrastructure deliver carbon reductions.

Early consideration is needed both at the strategic level and on a case by case basis in order that infrastructure can maximise delivery of natural capital and unlock multiple benefits. This will help avoid development impacting important assets and ensuring any required mitigation / compensation increases key ecosystem services. This would bring this approach more in line with the environmental net gain approach. NICs corporate commitment (box 3.1) currently states *Infrastructure can therefore support growth by minimising its impact on the environment and protecting nature from pollution, waste and hazards.* The challenge is moving from this position to something positive for the environment to deliver environmental outcomes including net gains, not just minimising losses.

Another gap and challenge we note is the role the environment plays for people through infrastructure delivery and operation. With the pandemic and COP26 the value of the natural environment to people's wellbeing has been very clearly expressed. Natural England has a programme devoted to connecting people with nature and we would be happy to engage with you on this. We have also been undertaking further work to consider How Natural England's Green Infrastructure Framework can help create better places to live - Natural England (blog.gov.uk). We have a web portal and introduction to the GI framework here - Home (naturalengland.org.uk). Whilst we welcome the design principles, this could be given greater visibility as a significant challenge. This also links to Challenges 8 and 9 as it is people who will be using the intermodal transport and the environment they are in should be designed to encourage active travel and give greater access to nature and greenspace

We welcome Challenge 6 and the separate call for evidence proposed on surface water management. We will be pleased to be able to feed into the this work looking at surface water flooding alongside coastal and riverine and the potential role that SUDS and other green infrastructure can deliver e.g. slowing the flow and catchment based approaches etc.

**Question 2: What changes to funding policy help address the Commission's nine challenges and what evidence is there to support this? Your response can cover any number of the Commission's challenges.**

We would welcome further contributions from infrastructure into Environmental Net Gain (or at least better alignment of funding) to look at delivering multiple benefits.

We consider that more could be done to investigate how to incentivise inclusion of nature and climate resilience in asset management through strengthening the Environmental, Social and

Governance (ESG) role in private finance. As well as the finance for building, securing ongoing funding for the maintenance of assets is often is more challenging.

There is work underway to explore the role finance can play to further embed biodiversity and natural capital into finance for such assets, including provision of financial incentives to deliver increased nature value. This could include both private finance but also link to the work of the regulators setting 5 year performance goals for the key infrastructure sectors.

**Question 3: How can better design, in line with the design principles for national infrastructure, help solve any of the Commission's nine challenges for the next Assessment and what evidence is there to support this? Your response can cover any number of the Commission's challenges.**

The Environmental Benefits from Nature Tool - Beta Test Version - JP038 (naturalengland.org.uk). has been produced to support Government's 25 Year Environment Plan commitment to expand net gain approaches to include wider natural capital benefits such as flood protection, recreation and improved water and air quality.

Early indications from our Beta Environmental Benefits from Nature Tool evaluation suggest that better understanding of natural capital impacts of development at an early stage can help support better more multi-functional designs. This can assist with the challenge of good asset management (to help mitigate the impact of climate change) and improve the management of surface water flooding by considering both the role that nature is already playing and can play for example through strategically placed habitat creation which can help deliver for Local Nature Recovery Strategies.

We welcome the commitment to Environmental Net Gain (ENG) referenced in the document and inclusion of a chapter on natural capital. We have engaged in early contact around NIC plans to develop a set of natural capital principles for infrastructure, to complement and expand on the Design Principles. We will be pleased to remain involved and feed in as this develops.

It would be beneficial to further incentivise the development of standards and encouraging the use of current and incoming standards e.g. BS8683:2021 the process standard for Biodiversity Net Gain and also the forthcoming GI frameworks How Natural England's Green Infrastructure Framework can help create better places to live - Natural England (blog.gov.uk) Web portal and introduction to the GI framework - Home (naturalengland.org.uk)

In relation to 'landscape' this appears to be absent from the document except for an entry in Fig 3.4, which lifts an objective from the 25 Year Environment Plan which refers to 'Enhancing beauty, heritage and engagement with natural environment' and is about design principles and anticipating that design can allow infrastructure to …'make a positive contribution to local landscapes within and beyond the project boundary'.

We consider this should be balanced with a recognition that significant infrastructure projects like trunk roads, power stations etc are rarely compatible with the statutory purpose of National Parks and AONBs, which is to conserve and enhance the area's natural beauty*. Where major infrastructure has to be located in (or close to) a nationally designated landscape then design mitigation is additionally important, but the priority should be to seek alternative locations because usually no amount of design mitigation is likely to reduce the adverse effect of these schemes on these highly sensitive landscapes to a level below significant, or allow a contribution to enhancing the area's natural beauty.

*The National Infrastructure Commission, as a public body, will be subject to the statutory duty to 'have regard' to the statutory purposes of National Parks and AONBs (s62 of the National Parks and Access to the Countryside Act 1949, and s85 of the Countryside and Rights of Way Act 2000) which should be reflected in studies and reports ensuring NIC they are in compliance with these duties.

Soils and Net Zero: The contribution of the natural environment to Net Zero will rely heavily on soils. Soils influence the sustainability of food production; support biodiversity, both above and below ground; they control flooding and influence water quality, and represent our largest land store of organic carbon. Our soils are effectively a non-renewable resource, and their differing capabilities can be lost completely through inappropriate development, or damaged or wasted through poor handling or misuse.

For all types of National infrastructure, it is equally relevant to make the best use of our finite land and soil resources, and avoid the best agricultural land where possible in line with the NPPF (2021) paras 174/5.

Soils and Climate Change Resilience: Soils have an important role to play in climate change resilience and mitigation. Soils represent both an important store of carbon (a reservoir of over 95% of all terrestrial stores of organic carbon) and a key source of greenhouse gases, and whether they contribute to, or combat, climate change depends on their inherent capabilities, and current land use and management. For example, the potential conversion of soil organic carbon to atmospheric $CO_2$ when soils are disturbed by construction activities has significant implications for climate change.

**Question 4: What interactions exist between addressing the Commission's nine challenges for the next Assessment and the government's target to halt biodiversity loss by 2030 and implement biodiversity net gain? Your response can cover any number of the Commission's challenges.**

As described above, taking a natural capital approach when considering implementation of biodiversity net gain, can help identify opportunities to deliver natural capital benefits linked to the commission's 9 challenges. Early consideration of how associated habitat requirements of biodiversity net gain can be delivered (for example through use of the Environment Benefits for Nature Tool (EBNT The Environmental Benefits from Nature Tool - Beta Test Version - JP038 (naturalengland.org.uk)) to deliver wider benefits) can help contribute to better asset management. For example through:

- strategic location of related tree planting to contribute towards cooling and shading (to reduce heat affects) and prevent erosion
- provision of wetland areas to capture and hold water to reduce surface flooding from future flash flooding events.
- consideration of access provision may also help reduce congestion in certain cases where offering alternative means of transport (for example through provision of cycle paths in urban areas).

A new version of our Climate Change Adaptation Manual - NE751 (naturalengland.org.uk) has been published since the last NIA. We have also published a new report on carbon storage and sequestration by habitat Natural England publishes major new report on carbon storage and sequestration by habitat - Natural England (blog.gov.uk)

Climate resilience is broader than net zero and low carbon technology and needs to be considered holistically and strategically rather than as design on each project**.** It is essential that building new infrastructure including that which manages the transition to low carbon ensures that we don't put more stresses on the environment which will make it more difficult to reverse biodiversity decline and build nature's resilience. Much technology is new and evolving which leads to uncertainty around the environmental issues they will create. For example, floating offshore wind opens up new deeper sea environments which have not been exploited in this way previously. The net zero strategy also notes that Hydrogen technology is water hungry. As recent decisions on offshore wind farms have demonstrated, these developments are now reaching environmental limits and requiring compensation. Considerable work is going on to try and address this including efforts to develop strategic solutions for offshore wind development and to look at this holistically with the transmission network.

The principle of upgrading, reuse and repurposing infrastructure rather than developing new has been seen already within some energy development. This should be further considered in particular with new technology such as hydrogen and CCS. This should minimise the footprint on the environment wherever possible. Additional comments below contained in the specific Q12.

Soils: We welcome the Commission's support of 'environmental net gain'. The Defra 25 Year Environment Plan (25YEP) includes the target that '*by 2030 we want all of England's soils to be managed sustainably, and we will use natural capital thinking to develop appropriate soil metrics and management approaches'*. This target applies to all soils, including those being developed and supports other key 25YEP targets for sustainable land management, nature recovery, resource and waste management, and will also facilitate targets for climate action (Net Zero) and sustainable development.

Sustainable soil management will subsequently contribute to environmental net gain through: improved water quality and reduced flood risk (Challenge 6), improved climate change resilience (Challenge 5), improved air quality and reduced waste (Challenge 7); and supporting biodiversity, both above and below ground.

**Question 5: What are the main opportunities in terms of governance, policy, regulation and market mechanisms that may help solve any of the Commission's nine challenges for the Next Assessment? What are the main barriers? Your response can cover any number of the Commission's challenges.**

In terms of opportunities there is further scope to increase multi-agency working, building on existing work. For example it could be helpful to work with the NIC to further explore the scope to expand net gain to include natural capital approaches and test how doing so can help address the key challenges above. This would build on the commitment to environmental net gain and our EBNT evaluation to date.

Biodiversity net gain for NSIPs as described in the recent Defra consultation Consultation on Biodiversity Net Gain regulations and implementation - GOV.UK (www.gov.uk) could provide an excellent opportunity to pilot ways of implementation that support industry's long-term asset management needs.

In addition specific evidence work on the Nature-based Solutions contributions to the following would be desirable and potential areas for joint work and investment within government include:

- Flood risk management
- Erosion reduction
- Water supply
- Cooling and shading
- Water quality reduction

As noted above there is work being done across Government, regulators and developers particularly in the offshore wind sector to deliver low carbon energy whilst finding ways to avoid, mitigate and compensate for environmental impacts and delivering environmental net gains. This needs to be done at a holistic, strategic level both offshore and onshore. We need to consider how energy is generated and brought to the consumer in the least impactful way. Strategic spatial planning for the marine environment is needed with clear policies reflected within Marine Plans. This needs to also link to terrestrial strategic plans.

Soils: Current regulations don't go far enough for soils. Some elements of soil are currently protected and enforced through a disjointed mix of direct and indirect legislation and which lack in focused ambition. There is an opportunity to strengthen the policy to i) further protect the best agricultural land (BMV) from development; and ii) include requirements to sustainably manage all soils as per the 25YEP objective and give consideration to the wider soil functions, including carbon storage; flood alleviation, nutrient cycling etc (thereby providing consistent regulation across all soils).

Soils: We acknowledge that the Commission will carry out a separate call for evidence on surface water management challenge, however, the following text provides context with regards to the importance of sustainable soil management and surface water management:
Soils influence water quality predominantly through erosion and runoff, which can carry sediment and other pollutants into watercourses, and throughflow, which can carry pollutants into ground water. Both can affect drinking water quality as well as ecological status of water bodies and exacerbating flooding. Land take (i.e. soil sealing), reduces the natural capacity for water infiltration and can therefore increase flood risk. Furthermore, inappropriate soil management, such as the use of heavy machinery during construction, can result in excessive compaction damaging the soil structure, accelerating water run-off, sediment loss and diffuse pollution.
An understanding of soil type, site location and land use can be used to target and inform soil management and soil reuse to improve water infiltration, reduce water run-off and erosion, and improve water quality. Appropriate soil handling mitigation measures for soil conservation as set out in the Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (publishing.service.gov.uk) should be followed at all times.

**Question 6: In which of the Commission's sectors (outside of digital) can digital services and technologies enabled by fixed and wireless communications networks deliver the biggest benefits and how much would this cost?**

N/A

**Question 7: What barriers exist that are preventing the widescale adoption and application of these new digital services and technologies to deliver better infrastructure services? And how might they be addressed? Your response can cover any number of the Commission's sectors outside digital (energy, water, flood resilience, waste, transport).**

N/A

**Question 8: What are the greatest risks to security of supply in a decarbonised power system that meets government ambition for 2035 and what solutions exist to mitigate these risks?**

N/A

**Question 9: What evidence do you have on the barriers to converting the existing gas grid to hydrogen, installing heat pumps in different types of properties, or rolling out low carbon heat networks? What are the potential solutions to these barriers?**

As noted above ensuring principle of upgrading, reuse and repurposing infrastructure to avoid impacts on the environment (as well as cost).

**Question 10: What evidence do you have of the barriers and potential solutions to deploying energy efficiency in the English building stock?**

N/A

**Question 11: What barriers exist to the long-term growth of the hydrogen sector beyond 2030 and how can they be overcome? Are any parts of the value chain (production, storage, transportation) more challenging than others and if so why?**

N/A

**Question 12: What are the main barriers to delivering the carbon capture and storage networks required to support the transition to a net zero economy? What are the solutions to overcoming these barriers?**

Additional infrastructure to support Hydrogen and CCS sectors should be focused to re-use, repurposing existing infrastructure.

There is the need for strategic planning to set out requirements and plan for developments so that mitigation / compensation as well as environmental net gain / can be assessed and delivered on a strategic scale. There is likely development in already constrained and perhaps already heavily developed locations (e.g. coastal areas/marine areas) with high numbers of designated sites and additional pressure from proposed offshore wind farm development. Strategic spatial planning for the marine environment is needed with clear policies reflected within the Marine Plans.
We recognise that the Commission supports the environmental net gain approach and therefore any assessment produced needs to ensure this is recognised upfront.

**Question 13: In what ways will current asset management practice need to improve to support better infrastructure resilience? Your response can cover any number of the Commission's sectors.**

A focus is needed not just on the assets themselves (in terms of their resilience) but also on the associated supply chains and the future maintenance of these assets. This needs to look at how this can be delivered in a way that benefits the natural environment and increases climate resilience would be welcome.

An emphasis on the employment and growth opportunities is needed linked to shifts towards more sustainable asset management/climate resilience (in the same way is emphasised in the net zero pathway) would also be beneficial.

The scope for new and emerging technologies, including AI and machine learning to help inform the 'green' elements of asset management and maintenance.

**Question 14: What are the barriers to and solutions for expanding recycling capacity, both now and in the future to deliver environmental and net zero targets?**

N/A

**Question 15: What is the likely environmental impact of waste streams from construction across economic infrastructure sectors, over the next 30 years, and what are the appropriate measures for addressing it?**

In terms of waste, there is an opportunity around the role biomass harvesting can play in generating financial returns to incentivise appropriate habitat management e.g. work has been done with Network Rail and Highways England and others on pilots looking at how road/rail side estate management could provide a source of biomass for energy and a revenue stream to allow for more sustainable/long-term management. Some detail contained in Natural England NEWP 32 Transport Green Corridors Options Appraisal and Opportunity Mapping 2014, http://publications.naturalengland.org.uk/publication/5485064148221952

It would be beneficial to look at embedded biodiversity impacts in construction and supply chains similarly to embedded carbon with a view to managing and reducing impacts.

Soils disturbed by development are often treated as a waste material and often end up in landfill. Care must be taken to avoid natural and uncontaminated soil being classified as waste at the point of excavation. The reuse of this essentially finite resource should be secured to ensure the sustainable management and use of soils. The early consideration of this resource will be essential to firstly, minimise its disturbance; secondly, ensure its sustainable management to facilitate continued soil function; and lastly, ensure its sustainable and beneficial reuse, so that it can continue to deliver its many ecosystem services.

**Question 16: What evidence is there of the effectiveness in reducing congestion of different approaches to demand management used in cities around the world, including, but not limited to, congestion charging, and what are the different approaches used to build public consensus for such measures?**

N/A

**Question 17: What are the barriers to a decision-making framework on interurban transport that reflects a balanced approach across different transport modes?**

N/A