

Greater Manchester Combined Authority response to questions in the National Infrastructure Assessment Baseline Report

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?

No comment.

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.

- One of the main barriers to achieving our ambitions in Greater Manchester is (a) funding uncertainty – stop-start competitive bidding processes leave us without the certainty to make long-term plans and (b) the challenge of multiple funding pots with different rules being applied by different departments that don't align.
- The [first National Infrastructure Assessment](#) was launched on 10 July 2018 states that 'despite the many challenges, cities across the country have shown that when they are given the funding and freedom they are capable of designing and delivering infrastructure programmes that change the shape of the city for the better.' This supports the need for further devolution and greater control over sub regional funding to enable stronger alignment with existing funding mechanisms, improvements in places resilient to the impacts of climate change. As an example, GM housing investment loan fund surpluses have been utilised to operationalise the housing strategy by supporting the creation of a housing delivery team that provides direct assistance to the GM districts.
- Greater Manchester has significant viability challenges across much of its area and has identified a significant proportion of our land supply which will require some intervention to bring forward. Our experience and track record of delivery has demonstrated the benefits of multiple year funding streams. This could be extended by creating capacity to invest in places by drawing the Housing Investment Fund up to its maximum capacity of £300m and retaining the interest generated (worth £127m), relaxing City Deal receipts criteria (worth £21m), confirmation of post-2025 Earnback funding, frontloading, and flexibility in revenue and capital split (worth £130m) and extending existing Enterprise zones (worth £175m). This would create a virtuous cycle of proceeds to drive further investment.
- Local Government and Mayoral Combined Authorities have a crucial enabling and delivery role which has been hampered by austerity over the last 11 years. A sense of the impact can be obtained from the LGA's submission to 2022/23 provisional local government finance settlement: <https://www.local.gov.uk/about/news/lga-responds-provisional-local-government-finance-settlement>
- The government has published a Levelling Up White Paper, we're aware of the 12 missions coming out of the levelling-up white paper and there is an opportunity for the Commission to explore the relationship between the mission and the nine infrastructure challenges.
- Our experience is that we need devolved mechanisms for local funding pots that have an ability to take a long-term patient investment approach to support regeneration, place making and levelling up. Local authorities need to be able to benefit from the returns

generated to fund future project development to support regeneration and infrastructure alignment given the lack of revenue resources.

- Another example (flood risk management):
 - The Government doubled the funding to £2.3bn over 6 years. This investment can support delivery of a more integrated and sustainable place-based approach through green and blue infrastructure making area at risk of flooding more resilient however it is difficult to plan long term and develop projects as this requires Local Government revenue support and Local Government is limited by a year-on-year funding approach.
 - Local Authorities are managing competing priorities, further devolution would help facilitate funding to deliver flood and water management locally. Greater control over sub regional funding would enable stronger alignment and blending of existing funding mechanisms that be invested in the wider benefits of blue and green infrastructure.

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 design principles for national infrastructure published in 2020 are supported and align with the Greater Manchester Strategy and aspirations for climate, people, places, and value.
- Improved design can also help mitigate or manage social issues to improve resilience. In response to terror incidents, public realm infrastructure has been altered to improve safety, becoming semi-permeant, but non holistically designed into the wider landscape. i.e., barriers for safety could be integrated into drainage systems, which in turn is integrated into the wider public realm.
- There is a need for PAS2080 standard to be applied to all new infrastructure to minimise the carbon impacts, from very early concept design stage through to detailed design and delivery. This will ensure that Government Strategies such as Transport Decarbonisation are effective in delivering against stated aims, as well as the wider green agenda post-COP26.
 - Example from Greater Manchester: Interchanges
- Better design can help mitigate or improve management of weather challenges. Rail and road assets can be prone to damage from inclement weather, either though older highways infrastructure in cities, or older rail infrastructure between cities. Integrating sustainable drainage systems and soft landscaping into new infrastructure can help minimise impacts, through improved water management. There is a consideration here as to the need for agreed standards and better co-ordination of water management at a national level.

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.

- Planning at the appropriate scale and geography enables wider engagement with the infrastructure providers and a better chance to deliver more strategically. Nine of the Local Authorities in Greater Manchester have worked together voluntarily on a joint Development Plan Document (Places for Everyone). Through this process policies were developed for

housing, economic development, climate resilience, net zero buildings and the natural environment (green infrastructure, biodiversity net gain and local nature recovery).

- GMCA officers have been exploring the interactions between objectives for strategic growth locations, the associated infrastructure required and implications for delivering environmental outcomes (carbon neutrality, net gain for biodiversity, reduced flood risk). This has been informed by a range of national pilots and initiatives (e.g., Natural Capital Accounting, Green Infrastructure Standards, Biodiversity Net Gain, Local Nature Recovery that can help inform the Commissions thinking.

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

- The main opportunity centres on place making with the goal of levelling up and the achievement of inclusive and sustainable growth. The GMCA approach to strategic growth locations, role of Mayoral Development Corporation (Stockport) and place-based pilots with United Utilities, Environment Agency, local authorities working across catchment boundaries is an example that could be explored with the commission.
- There is a role for the geospatial commission to extend it’s work on [planning and housing](#) to bring in place specific challenges.
- The barriers are well known different timescales, different reporting lines, complex roles, responsibilities, utilities operating at a regional scale and not understanding local priorities. Availability of data and it’s use with stakeholders to provide insights and intelligence.
- One area where policy and regulation can help is to support the application of uncertainty mechanisms being adopted by distribution network operators (DNOs) as this enable them to react to local priorities. A similar approach is required within the water industry.

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?

- Digital services and technologies are fundamental to delivery of pre-emptive management and operation of all the commissions sectors: water, flooding, energy, transport, and waste management. Digital – and the data and intelligence it provides is critical to ensuring the UK is resilient to weather challenges brought out by climate change and deliver the efficiencies we need to meet our net zero targets.
- There is the opportunity to further advance the sharing of utility infrastructure with digital infrastructure providers. The recent pilot work to explore the use of water infrastructure for fibre roll out is very welcome. Equally there is the opportunity for energy providers to work closely with mobile operators to use substation sites to improve local 4G and 5G coverage.
- The development of digital twins, as a data driven digital representation of assets, processes and systems which provides an evolving real time picture of current performance will be a prerequisite for the effective management of all key infrastructure. For example, in Salford, we are undertaking a 5G create pilot along the Chapel Street corridor where data will be captured to enable more effective real time traffic management. In due course we want to

roll this out across the city region, but it becomes far more powerful as part of the development of a digital twin will would enable combination with data across all utilities, e.g., advance flood warnings for transport corridors etc.

- These would be more than just models or visualisations. A digital twin would convert data from assets into valuable insights to help leaders across all utilities make better collective strategic decisions and interventions and improve future investment plan decision making.
- In Greater Manchester we would have the opportunity to build on the work we have already undertaken in mapping our assets to support the development of a digital twin. Initial costs to undertake this work and scope the wider potential would be in the region of £500,000.

Question 7: What barriers exist that are preventing the widescale adoption and application of 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).

- Effective integrated working across utility providers is not an issue in Greater Manchester, where the GM Infrastructure Board have convened all providers on a regular basis to share investment plans and challenges for the past five years. All utility providers have ambitious plans to integrate digital into their operations. The role of the GM City Region has been to explore opportunities for collective working in this space. Good progress has been made in exploring the potential to share infrastructure to advance fixed and mobile roll out in GM – but there is more significant opportunity using data to enable all utilities to make better real time decisions collectively.
- Where barriers exist, they are those set out in the response to question 5.

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?

- When considering the security of supply in decarbonised power systems, it is important to differentiate between, security at a nation state level and security at the home/business user level.
- At the nation state level any increased energy independence from imported fossil fuels, and the associated global price fluctuations caused by market and or geopolitical drives will reduce supply risks. The counterfactual to this can be observed currently where high wholesale gas prices impact both the gas price to consumers and due to its use in electricity generation, electricity prices too.
- At the home and business level the move to decarbonisation will result in an increased dependence on electricity supply and distribution of electricity. We are already seeing this increased dependence with the increase in electric vehicles, heat pumps and the wider digitalisation of society. As such the value individuals and business put on lost load (time without electricity), which is used by Transmission and Distribution network Operators is increasing and is different for different consumers resilience to lost load.
- The risk of lost load comes from two sources, lack of electricity supply, and failure in the distribution network due to faults (storm damage, asset failure), these need to be viewed separately.
- Supply side risks can mean mitigated by reducing peak demand through price signals (time of use tariffs) and EV Vehicle to Grid battery discharges, in addition to network scale energy storage solutions, although a “flexibility first” approach will be the cheapest way to increase resilience.

- The UK Transmission and distribution networks are by international standards very reliable but as was made abundantly clear from storm Arwen, it is not possible to make networks 100% resilient at an affordable cost. Such ‘extreme’ events will be more frequent going forward as the impact of our climate emergency on weather patterns continues to deteriorate. As such focus needs to be on making individuals, business, and local communities more resilient to lost load, through local energy generation and storage including photovoltaics, heat pumps with heat storage, electric vehicles (V2G) and mobile assets which can be deployed in such circumstances.

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?

- There are numerous examples within Greater Manchester where BEIS funded feasibility studies have been undertaken for heat network, projects have been listed on the BEIS heat [network delivery unit project](#) list for many years. Policies requiring connections to heat networks have been in place since 2013 in several Local Plans within Greater Manchester. However, heat network delivery is limited to two sites (1) The Civic Quarter in Manchester and (2) Media City UK. A 3rd is close to delivery – [triple point energy](#)).
- Last year the Government consulted on [heat network zoning](#). The consultation noted that: “There is significant potential for the number and scale of heat networks to increase dramatically. However, heat networks, like other strategic energy infrastructure, are characterised by high upfront capital costs with long payback periods. Successful deployment also requires coordination between a range of parties and identifying where heat networks are best suited is not straightforward. These factors, amongst others, deter investors and result in fewer, smaller and less strategically placed heat networks which means that the sector isn’t likely to achieve its potential without strategic interventions by government”.
- The [decarbonisation pathways](#) produced jointly by Cadent and Electricity North West is an excellent example of collaborative working and the Government should support the implementation of the Local Area Energy Plans (LAEPs) which have been developed for all parts of Greater Manchester in partnership with Electricity North West and Cadent.
- For heat pumps (HPs):
 - It is important to differentiate between whether it is technically possible to install a HP, whether planning permission will be granted and the affordability of running a HP.
 - The Energy System Catapult has just published research that show that all housing types are suitable for heat pumps.
 - While the installation of a heat pump is classed as a permitted development. In many circumstances planning permission is needed due to a range of factors such as location, size of the unit, or in multi occupancy low rise buildings where multiple units will be under the same roof or where the environment health team have raised a noise issue. There is no standard guidance to Planning and Environmental Health Officers, who look at noise, as to how to view HPs. This is causing an inconsistency in approaches, with some areas requiring Noise Impact Assessments which can be prohibitively expensive for homeowners.
 - The affordability of running a heat pump is based on behaviours, a properties thermal efficiency and air tightness (currently poorly measured via Energy Performance Certificates and Display Energy Certificates), and the relative price difference between

gas and electricity, known as the Spark gap. As most of the environmental taxation sits on cleaner electricity not gas, this acts as a barrier to installation of a HP, if this gap was less or reversed the economics of HPs would be strengthened.

- The final challenge is a lack of understanding of the role and likely cost per kWh of hydrogen and when it will be deployed. It is often presented as something that will need little change from users, but as the cost of hydrogen will be higher than methane, affordability will also play a significant role. This lack of policy clarity leaves some to believe a hydrogen solution for domestic heating is much closer than the evidence indicates, creating a “wait and see” culture, pushing back decisions on how homes will be decarbonised in the hope a simple cheap solution is about to become a reality which it is not.
- Low carbon heat networks – the issues for this in new build are often simpler than for retrofit when street works can be complicated, and permissions protracted. It is unclear how effective heat networks are in contributing to the climate emergency in terms of reducing carbon emissions, when the ‘full life’ carbon emissions are calculated, including the installation of the network and the use of fossil fuel in the associated energy centres.
- When looking at heat networks to support the decarbonisation of existing buildings the considerable protracted timescales from project conception to completion need to be considered as carbon emissions need to be reduced drastically over the next 6 years if we are to keep global temperatures to +1.5°C.

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

- The issue of retrofitting building stock should be split into domestic and commercial as the approach is very different depending on the end use.
- Energy efficiency within buildings can be viewed in two ways:
- Efficiency of the equipment used in the building and
- Measures which improve the efficiency of heating and cooling a building.

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- Research has been undertaken on the barriers to adopting efficiency technology within the private sector, and while policy makers often identify information failure, the [Research to Assess the Barriers and Drivers to Energy Efficiency in Small and Medium Sized Enterprises](#).
- Improving the ability of a building to be heated, or cooled, efficiently requires building fabric and air tightness improvements, this in turn will also likely require some form of mechanical ventilation. Such building works are commonly known as retrofit. The key barriers to the uptake of retrofit are widely recognised as being:
 - Most people do not know they need to heat their homes differently
 - Most people are unaware of what they can do to make renewable heating an affordable reality
 - The current supply chain is too small, with most potential suppliers having a limited or an incorrect understanding of what can be achieved.
 - Due to a lack of demand, the unit costs are too high, and we are lacking a suitably sized and skilled workforce

- Due to the failings of past initiatives, the supply chain has limited confidence that the market will take off
- Changing heating systems is not a priority for most people and is often an emergency purchase. As such, little thought is given to the options available.
- There are limited suitable financial products available, especially for rented properties
- The capital costs of retrofitting a building are not reflect in a corresponding uplift in the value of the property.
- Minimum Energy Efficiency Standards are low with very limited enforcement with limited if any incentives for improvements e.g., stamp duty.
- Energy taxation policy, where most of the tax is on lower carbon electricity than gas discourages the adopting of efficiency heat pump technology.
- Number of reports have been produced, including the soon to be published Greater Manchester retrofit Task Force report “Accelerating the Renovation of Greater Manchester Buildings”. Key reports include:
 - [A-housing-market-catalyst-to-drive-carbon-emission-reductions.pdf \(ukgbc.org\)](#)
 - [CLC-National-Retrofit-Strategy-final-for-consultation.pdf \(constructionleadershipcouncil.co.uk\)](#)
 - [20200365-Retrofit London Housing Action Plan-Rev N \(cityoflondon.gov.uk\)](#)
 - [UKGBC-Whole-Life-Carbon-Roadmap-A-Pathway-to-Net-Zero.pdf](#)
 - [UKGBC-Whole-Life-Carbon-Roadmap-Summary-for-Policy-Makers.pdf](#)

Looking ahead the government should confirm that:

- Provide non-competitive, long-term funding for whole house retrofit works, to avoid the current piecemeal approach which is less effective and more costly.
- Create a Heat Pump Sector Deal (cf Offshore Wind Deal) located in GM (hub and spoke across North of England) to significantly increase the replacement of gas boilers with heat pumps.
- DLUHC – programmes for affordable housing (managed by Homes England) grant funding should include support for net zero social housing.

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?

Uncertainty is a barrier, and the Government should:

- Confirm the UK policy position to support hydrogen use for HGVs (and other industrial heat applications) before 2026 and
- enable blending up to 20% hydrogen (by volume) into the existing natural gas grid is a low-regrets way to create significant baseload demand that would effectively underpin investment in hydrogen production. Doing so would also reduce carbon emissions from heat by c.6%. However, at present Gas Safety Management Regulations (GSMR) only allow a maximum of 0.1% hydrogen by volume to be transported in the gas grid.
- From 2025 there is no place for fossil fuelled boilers for space and water heating in new buildings with new heating installations in all buildings being via electric, heat pumps, heat networks or hydrogen ready boilers as appropriate, with installation location being guided by Local Area Energy Plans.

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?

- No Comment

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.

Greater Manchester is part of two worldwide movements that are fostering new approaches to resilience, these are (1) United Nation's Making Cities Resilient 2030 and (2) Resilient Cities Network.

Urban resilience is arguably a function of the shocks/hazards that a city faces, together with the underlying stresses (e.g., poverty, poor housing, digital exclusion etc.) that can amplify the impacts and consequences of emergencies. The critical role of infrastructure in creating resilient places that recognise future risks is outlined in Greater Manchester's Resilience Strategy and GM works with partners across the sub-region, nationally and internationally to draw on best practice.

Greater Manchester has previously submitted evidence on the theme of resilient infrastructure to the NIC in both the Commission's study on resilience in 2020 and its Call for Evidence around surface water flooding in 2021. The following summarises some themes relevant to infrastructure resilience that GM is happy to discuss further with the Commission:

- National decisions in relation to infrastructure, its financing and design, play a key role in the levelling up agenda which, in turn, is core to addressing the stresses that undermine the city region's resilience. These investments are most effective if co-determined between national and local government, with local control of scheme particulars ensuring maximised benefits.
- Statutory and regulatory frameworks could be strengthened to ensure all major investment decisions address future hazards and drive sustainable future outcomes, supporting ambitions such as net zero, implementation of nature-based solutions, ensuring infrastructure meets the standards required for climate change adaptation etc.
- Regulatory and department assessments of spend should explicitly include resilience measures and assess the impact of future risk and resilience.
- Credible national approaches to flood risk, including surface water flood risk, and to potential future heat stress, should be formulated that ensure infrastructure providers adequately reduce risk (e.g., through implementing nature-based solutions, adopting flood defence measures modelled to the upper end of climate change projections, building-in sustainable mechanisms for cooling etc).
- Digital infrastructure and services need to be recognised as a fundamental right, in much the same way as water and energy, since digital exclusion can drive inequality and potentially also mean citizens have poorer outcomes in emergencies (e.g., through problems accessing timely information and support).
- A focus needs retaining on effective support to communities in wide area, low likelihood but high impact emergencies. This needs to recognise the critical role of infrastructure and the functions it supports, but also how services are maintained through effective alternative means and are restored to people in a timely manner when something goes wrong.
- Alongside the Commission we support the recent commitment by water companies to act together to secure long term water supplies for consumers and businesses in England.
- At the sites/development scale developers and project managers should account for resilience with lifetime costs considered when procuring / designing assets rather than initial capital costs. Consideration of risks should be undertaken at the project conception stage. A thorough multiagency assessment would allow consideration for dual purpose infrastructure.

- The importance of not always looking at this through a capital-intensive engineering lens – there needs to be an incentive for behavioural change.

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?

- The main barrier is the long-term policy vacuum which is preventing local authorities from committing to collection methods and stopping private sector investment in infrastructure.
- Packaging industry – has a strong lobbying presence which is preventing/delaying changes the packaging stream that would encourage/facilitate recycling and development of sustainable markets for material.
- Lack of cohesion between each step in the chain of utility prevents the implementation of a cradle to grave system that enhances recycling. This requires all sectors – packaging producers, suppliers, retailers, local authorities, waste management sector, manufacturers to work effectively together for the same end of improving recycling

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?

- No comment.

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?

- GM experience through the Transport Innovation Fund process in 2007/08 demonstrates the importance of significantly improving public transport and active travel modes prior to consideration of introducing more radical demand management approaches, such as congestion charging.
- Efforts to shift long standing travel behaviours across large populations require a secure public consensus, and that in turn requires non-congesting alternatives to travel to be seen as viable, attractive, and affordable, and continually improving. It is unlikely that referenda on implementation of policies such as congestion charging are unlikely to be successful, even with a coherent vision/narrative.
 - Example from GM: GMTIF
- There are also delivery issues in the implementation of Clean Air Zones, with the public often conflating them with Congestion Charging Zones. Further consideration will need to be given to road pricing and how this would fit with wider policies on demand management and the environment.
- There needs to be leadership at a national level to ensure a joined-up approach across networks.
- At the place level - too often the narrative centres on huge capital spend. The commission needs to amplify messages on ensuring accessibility, affordability, incentivisation, ease of use, the important role of bus service improvement plans and active travel. The new Executive Agency Active Travel England (led by Chris Boardman) is a welcome step forward.

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

- There is a lack of strategic oversight at a national level – national bodies, agencies, departments, and the structure within the DfT itself does not lend itself to developing a holistic approach to decision making in relation to interurban transport.
- Planning and frameworks tend to be organised modally, with severe institutional silos preventing fuller and more holistic consideration of interurban transport infrastructure requirements. This also hinders joined-up approach to key environmental challenges, e.g., Clean Air, and the need to rapidly decarbonise transport networks. For example, about one third of Greater Manchester’s transport carbon emissions are emitted by vehicles on the strategic road network, there is a need for a joined-up approach to tackling transport carbon emissions across GM authorities and the national agencies, particularly national highways.
 - Example from GM: NW Quadrant
 - Example from GM: Clean Air Plan
- Linked to this, funding is also siloed between local and national levels, as well as between modes such as rail and road. There needs to be greater joined up consideration and spend when developing corridors, especially when considering how interurban travel can be more than arterial highways and long-distance rail.
 - Examples from GM: IRP upgrades to Hope Valley Line coinciding with National Highways upgrades on the same corridor.
- The assessment could be an opportunity to revise the role of Transport for the North, as this is currently under review due to the changing role in relation to NPR.
- There is an opportunity to state that the Government initially responded well to the NIC recommendation about stable long-term funding for cities, but the reality of how CRSTS is being implemented is not the evolution of devolution GM were expecting, though consideration needs to be given to whether GM wishes to state this publicly considering the limited progress of the local funding element of the deal due to Covid-19.