

APPENDIX 1 – GM RESPONSE TO DFT’S DECARBONISING TRANSPORT – SETTING THE CHALLENGE

1. Greater Manchester welcomes the opportunity to feedback on DfT’s Decarbonising Transport – Setting the Challenge [‘the document’] and give our views on the actions required to put the UK’s entire transportation system on a plausible pathway to deliver the greenhouse gas reductions urgently needed to achieve carbon neutrality. GM broadly agrees with the 6 strategic priorities and welcomes the opportunity to participate in the workshops to help develop these further.
2. Greater Manchester agrees with the acknowledgement in the document that the decarbonisation of transportation is not optional and that urgent action is needed to put the UK on a trajectory of becoming carbon neutral by 2050. It is encouraging that Government, in addition to identifying freight and logistics as playing a key role, has recognised within its strategic priorities the need to accelerate modal shift to public transport and active travel and that many of the solutions lie within the localities where unique opportunities and challenges lie. As mentioned throughout the document, delivering carbon neutrality will not be possible without a major change in travel behaviours and a fundamental shift in the way people and goods are moved.
3. Greater Manchester aims to be a carbon neutral city-region by 2038. The pathway to the Greater Manchester 2040 Transport Strategy’s Right Mix vision focuses on changing travel behaviour towards public transport, active travel, more local travel, and more travel to town and city centres in order to reduce car mode share from 61% of trips in 2017 to no more than 50% of trips in 2040. Although the Right Mix takes us some way towards Greater Manchester’s carbon neutral target, more challenging reductions in car travel are likely to be necessary if Greater Manchester is to meet the carbon budgets that underlie the target. Central Government will need to take the lead if Greater Manchester is to achieve those major changes in travel behaviour.
4. It is disappointing to note that Government policies and strategies do not appear at present to be joined up. The document explicitly states that embodied carbon is out of scope, as is that of the power generation and distribution for transport and construction of infrastructure, as these are considered elsewhere by Government. Whilst GM recognises that travel energy carbon costs are often most easily understood and addressed in the near-term, the carbon costs of infrastructure is a necessary component for a coherent decarbonisation strategy. The need for joined-up thinking was identified in HMT Infrastructure Carbon Review¹ which states “the overarching recommendation is that Government and industry clients should work together to make carbon reduction a requirement on all infrastructure projects and ...real value will come from joining up the value chain and unleashing innovation”. PAS 2080² mirror these aspirations and promote carbon reduction in the value chain and it is recommended that a similar PAS be developed for transport.
5. The apparent lack of a joined-up approach may lead to inappropriate technologies and solutions being pursued and implemented; as was the case with the promotion of diesel

1

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/260710/infrastructure_carbon_review_251113.pdf

² PAS 2080:2016 Carbon Management in Infrastructure – BSI Group

vehicles over petrol to help reduce carbon emissions where siloed decision-making resulted in much higher traffic-generated emissions of nitrogen dioxide (NO₂) and contributed to the UK Government's failure to meet the 2010 legal limit for roadside NO₂. In addition, an urgent review of the Bus Service Operators' Grant³ (BSOG) is needed, as it is based on annual fuel consumption and therefore is actively encouraging the use of fossil fuels: instead, subsidy ought to be encouraging and stimulating the adoption and use of electric vehicles for bus, the most heavily used public transport mode in GM and throughout the country. Additionally the 2011 Budget saw a freeze on fuel duty which has meant that its real value is currently the lowest since November 1994.⁴

6. Finally, the valuation of carbon in transport appraisal is not raised within the consultation document. The economic value of reducing carbon as contained in the DfT Transport Appraisal Guidance is in need of urgent revision to ensure that it plays a driving role in the economic case for transport interventions and investments. Indeed, it is questionable whether we have sufficient information about the social costs of carbon emissions to justify trading-off those costs against other benefits in a transport appraisal. If that practice is to continue, a precautionary approach should be used to valuing carbon, reflecting uncertainty about its true long-term costs.

Moving People

7. The principle focus of the document in its discussion of carbon neutrality by 2050 is around the shift to the use of electric vehicles. Although it accepts that car travel will need to be reduced, the work undertaken for the GM Environment Plan by the Tyndall Centre has demonstrated that it is not plausible that such a reduction in carbon could be achieved without a substantial reduction in total kilometres travelled, if the UK is to remain within its carbon budgets. The omission of a range of impactful actions that realistically will enable the carbon reductions to be made is a serious shortcoming and must be addressed in the Plan. Changes to mode of transport alone will not be enough; changes to the pattern of trip origins and destinations will also be needed. It is surprising that in fig 6 an EV is identified as zero carbon yet an electric train is not.
8. Greater Manchester has a significant strategic road network comprising approximately 170km of mostly motorway, carrying around 5.5million kilometres of vehicle traffic per annum. There is a greater length of strategic road network in GM than in any other City Region area. It is for this reason that GM needs a joined-up approach to managing local and strategic roads and clear policy alignment around highway capacity enhancements which could lead to more car travel. The cost of travel plays an important role in the choice of transport mode and as a result of freezing fuel duty, this has meant that once a vehicle has been purchased it is relatively cheap to run, making this a challenge for public transport to compete.
9. It is also important to recognise that there is concern over the potential increase in non-exhaust fine particulate matter generated by EVs, when compared to the equivalent conventional vehicle. The Air Quality Expert Group (AQEG) identified that EV's can weigh up to 24% more than a conventional ICE equivalent, resulting in more brake, tyre and road wear⁵. The AQEG have recommended an immediate priority that non-exhaust emissions are recognised as a source of ambient concentrations of airborne particulate matter, even

³ BSOG is a grant paid to operators of eligible bus services and community transport organisations to help them recover some of their fuel costs.

⁴ Petrol and diesel prices – House of Commons Briefing Paper, Number 4712, 16 June 2020

⁵ Air Quality Expert Group – Non-Exhaust Emissions from Road Traffic

for zero exhaust emissions vehicles.⁶ It is these fine particulates that have been linked to the poor health outcomes and loss of life years.

10. The document identifies the fact that most journeys are made for leisure purposes and that for 87% of car users, their current lifestyles mean that they need to own a car. Again, it is not realistic that simply nudging people into “the purchase of a new type of vehicle, moving to greater sharing of transport to increase utilisation, or switching modes” will be sufficient to achieve the behaviour changes that in turn will enable the very challenging carbon reduction targets to be met. In the short term there may be merit in providing more information to the public on the real cost of vehicle ownership and comparing this to other more sustainable modes of transport. Beyond this, the Transport Select Committee and others have identified the need for future policies, as the shift to electromobility will no longer provide even the limited road transport pricing impact that fuel duty currently provides to encourage behaviour change. Any national policy to encourage more journeys by active travel or public transport modes will need to consider how best to shift the relative pricing of transport to more fully take into account the carbon costs in the absence of current motoring duties and taxes. A similar approach is also required in the context of future transport interventions, particularly for large scale transport infrastructure.
11. For Greater Manchester to decarbonise transport to meet its 2038 target, it is estimated that 63% of cars will need to be zero-tailpipe-emission by 2025. Based on current car ownership, that is a shortfall of 800,000 vehicles, out of a current car/van fleet of 1.3 million. With global production of passenger EVs projected to be 8.5m by 2025 (10% of total vehicle sales) and 54m (58% of sales) by 2040⁷, the carbon neutral aspirations of GM and the UK Government cannot rely on only EVs as the solution. Work undertaken by Anthesis⁸ for GM has suggested that by 2030 a reduction of 25% in passenger-kms travelled is needed in addition to decarbonising transportation by 51%. Place-based solutions are fundamental to delivering this, creating attractive walkable residential areas that encourage shorter walk-trips instead of longer car-trips.
12. Rapid and urgent action is needed to put the UK on the trajectory necessary to achieving carbon neutrality in 2050 and meeting its agreed carbon budgets. Early work undertaken by Greater Manchester has shown that delaying action by 5 years would adversely affect the achievement of its cumulative carbon budget to the extent that our target would not be met.
13. The infrastructure needed to support the decarbonisation agenda of both transportation and heat requires the electricity grid to be fit for purpose. The document refers to installing EV charging points in new-build, however there is no reference to retrofitting these to existing property other than by grants applied for by EV owners, nor the ability of the substations to sustain the power needed to charge EVs and the projected electricity needed to heat homes. The document makes no reference to the insight used to determine the best location for EV charging points and the suitable mix of fast/rapid and ultra-rapid chargers. There needs to be joined up thinking to ensure that suitable locations are chosen, particularly given the heavy reliance on on-street parking in many residential areas. Research underpinning our draft Electric Vehicles Charging Infrastructure (EVCI) strategy identifies that whilst the private sector contribution to the network will be valuable, there is limited evidence of it delivering the network needed to meet our clean air and low carbon

⁷ Bloomberg's New Energy Finance – Electric Vehicle Outlook 2019 <https://about.bnef.com/electric-vehicle-outlook/>

⁸ Scatter for GMCA – Technical Annex June 2019

targets and to support the ambitions of the 2040 transport strategy. Government must support a robust and widespread network of alternative fuel infrastructure necessary to accelerate the uptake of zero tailpipe emission vehicles, to facilitate the move away from ICE vehicles.

14. Furthermore, if active travel and public transport are to be the first, natural choice, then it must also be the most convenient and cost-effective method to travel. Insight is needed to determine the appropriate mix of EV charger types and location to ensure the early uptake of EVs but also support the promotion of modal shift to active and sustainable transport. EVs are not carbon neutral, with embodied carbon accounting for 50% less life-time carbon than a typical internal combustion engine car⁹. Therefore, it is important to achieve the right mix of modes of transport early on, to ensure future carbon budgets are not put at risk.
15. It is disappointing that Government does not have a current carbon target for buses and that it has left that to the Confederation for Passenger Transport CPT). The Document misquotes the CPT's strategy, suggesting that all buses are to be ultra-low or zero emission by 2025 (2023 in some urban areas), when in fact the commitment from the CPT is only to purchase next generation ultra-low or zero emission buses from 2025 (but starting from 2023 in some urban areas). With buses operating for at least 15 years from purchase, this risks excessive delay and further carbon costs. Moreover, with buses providing the primary source of NOx emissions in a number of our town centres and contributing an average of 822g/km¹⁰; GM is very concerned about the very slow adoption of zero emission vehicles in the bus industry. At the current rate of progress it will take 300 years before the UK bus fleet is fully composed of zero emission vehicles, according to the Low Carbon Vehicle Partnership¹¹.
16. If a shift to public transport is a strategic priority, then it is concerning to see that Government is waiting for a natural renewal of the fleet; and that is even more the case given the likely impact of the Covid pandemic on fleet replacement plans. Additionally, current policies that support retrofitting buses to Euro VI are also counter-intuitive and although they will help improve the quality of the air locally, they will not improve the efficiency of the vehicles, instead reducing their efficiency by up to 3%¹² in an urban setting and consequently increasing carbon emissions. Carbon emissions need to be considered holistically together with local air quality. Furthermore, the current policy to subsidise bus operators' use of fuel through the Bus Service Operators Grant (BSOG) is counter-intuitive. It is however encouraging that a National Bus strategy is to be launched in 2020 and that the BSOG is to be reviewed by Government to ensure that it supports the environment.
17. The Greater Manchester 2040 Transport Strategy identifies that the bus network plays a vital role in tackling congestion and providing access to work, leisure and other destinations and that there is a need to increase bus patronage. The Strategy proposes Quality Bus

⁹ ICCT – Effects of battery manufacturing on electric vehicles life-cycle greenhouse gas emissions - February 2018

¹⁰ [Carbonindependent.org using DEFRA's carbon calculator](https://www.carbonindependent.org/20.html#:~:text=the%20CO2%20emissions%20relate%20purely,buses%20is%20822%20g%20%2F%20km)
<https://www.carbonindependent.org/20.html#:~:text=the%20CO2%20emissions%20relate%20purely,buses%20is%20822%20g%20%2F%20km>

¹¹ TfGM research

¹² Bus retrofitting with diesel particulate filters: Real world fuel economy and road worthiness.

<https://www.sciencedirect.com/science/article/pii/S1001074217317643>
https://ars.els-cdn.com/content/image/1-s2.0-S1001074217317643-fx1_lrg.jpg

Transit corridors where whole-route upgrades of key bus corridors, with a strong focus on quality and reliability will attract new users.

18. There is also no reference to the role that light rail or long-distance bus/coach travel can play in decarbonising leisure travel, especially (in the latter case) since the majority of long-distance journeys are for leisure purposes.
19. The document does little to progress the decarbonisation agenda for rail and largely reflects a direction of travel set by existing Government policy. Despite a clear manifesto commitment by the Government for “more electrification”, details on the scale, design and location of such programmes remain vague, although there is an industry expectation that more will be known following the publication of the Traction Decarbonisation Strategy, which Network Rail are leading, later this year. The document is right to state that rail is a relatively low-carbon form of transport and efficient in moving high volumes into city centres and for long distance trips. Heavy rail moves the highest volume of people into Greater Manchester’s regional centre during the am peak. Data on carbon dioxide (CO₂) emissions per passenger km in GM estimated that rail produces 60.9g CO₂ per passenger kilometre, bus in comparison was estimated at 102.9g CO₂ per passenger kilometre¹³. However, rail tends to have longer term investment requirements for rolling stock and infrastructure compared to other modes, so there is a risk that technological development in other modes of transport could undermine rail’s comparative advantage in relation to carbon if decisions regarding the decarbonisation of rail are not made soon.
20. The document highlights the need for coordinated investment in both rail infrastructure and rolling stock which will be key to meeting decarbonisation targets. Crucial to this will be the ability to identify the right interventions for the right locations as innovation in hydrogen and battery power cannot be relied upon to deliver the scale and pace of change needed.
21. There is widespread support for electrification both politically and within the rail industry, as it is considered a proven technology and has several benefits, such that electrification¹⁴:
 - means 60% lower carbon emissions than diesel trains;
 - is 35% cheaper than diesels to operate;
 - has 20% lower lease costs;
 - offers better reliability - between 140% and 230% increase in distance travelled between failures;
 - delivers improved passenger comfort;
 - enables faster journey times due to superior braking and acceleration; and
 - ensures quieter operation¹⁵.
22. Government must also consider that the UK finds itself with a shortage of suitable diesel trains and electrics are available for cascade from other franchises. Given the Government’s aspiration to reduce, and ultimately end, the use of diesel trains by 2040, companies will struggle to justify investment in diesel stock even where the lack of infrastructure requires them. Conversely, electrification could allow for a closer alignment between the banning of diesel and petrol cars by 2035 and new diesel trains in a similar timeframe.

¹³ Carbon Footprinting of Policies, Programmes and Projects – AEA Technology 2009

¹⁴ RIA electrification Cost Challenge (2019)

¹⁵ RIA electrification Cost Challenge (2019)

https://www.riagb.org.uk/RIA/Newsroom/Stories/Electrification_Cost_Challenge_Report.aspx

23. Government must reconsider the role of cycling and walking if they are to be a serious contender to replace car journeys. The transport authorities have been implementing the activities discussed within the document to promote these modes of transport for many years and appreciates that much more is needed to support carbon neutrality. Greater Manchester's Bee Network contributes is one such activity with a vision for the city region to become the very first to have a fully joined up cycling and walking network, covering over 1000miles.
24. Government need to actively introduce policies to enable significant and rapid change at levels that we have not seen to date. The light touch approach taken throughout the document may not be enough to ensure that cycling and walking are the preferred option. Policies, strategies and decision-making need to be joined up with comprehensive, interlinked, cross- boundary infrastructure that is suitable to make cycling and walking the easiest option for travel; where people are given priority over cars, rather than the other way around. In this context, regulatory reform that equips local transport and highway authorities with the right powers to plan and deliver safe walking and cycling routes is crucial, for example in terms of innovative road layouts including measures such as implied zebra crossings, and enforced where appropriate, for example in relation to moving traffic offences. Most importantly, holistic land-use and transport planning is needed in order to create the conditions suitable for the shorter journeys for which active travel is relevant and not designed around the car. Will the Government's proposed speeding-up of the planning system in England reflect the need for holistic planning of land-use and transport to achieve rapid reductions in GHG emissions from transport? Or will it accelerate the creation of car-dependent development, undermining alternatives to car travel?

Moving Goods

25. Although freight is identified as a key player in decarbonising transport, there is no clear direction on how this will be achieved. The current approach to voluntary reductions in GHG emission of 15% by 2025 and the introduction of regulations to set binding CO2 emission reductions, are too little too late. As identified earlier, to meet the targets set by Government, urgent action is necessary. Investing in technology that only reduces emissions by 15% risks locking those vehicles into the fleet for 10-15 years to come. Rather, the accelerated advancement in alternative technologies such as hydrogen is necessary or, alternatively, the acceptance that in the short term there is no alternative to diesel power for freight vehicles and that the associated carbon emissions must be offset elsewhere. E-cargo bikes for last mile delivery are a sustainable solution to the increased popularity of vans. Micro-consolidation centres do not appear within the document, nor the recognition that out-of-town consolidation centres give the opportunity of greater efficiency for the distribution of goods to the final customer by low carbon means. This leads to the need for a national freight strategy with enough resilience to make a difference and reduce -tonne-km moved.
26. Freight trains make a significant contribution to the economy and environment of Greater Manchester because each freight train replaces up to 60¹⁶ HGVs that would need to be operated in their place, according to the Rail freight Group (RfG). The RfG also highlights that rail freight reduces CO2 emissions by up to 76% compared to road transport, produces ten times less small particulate matter and as much as fifteen times less nitrogen oxide for the equivalent mass hauled.
27. Rail freight is wholly in the private sector and operated on purely commercial terms (by independent businesses with long term investments and commitments in capital, people,

¹⁶ <http://www.rfg.org.uk/rail-freight/facts-figures/>

terminals and rail network access); therefore, the aspirations of the industry are not always shared in a wider strategy domain. The vast majority of freight trains are currently hauled by diesel locomotives. Only a very few freight trains operated into Greater Manchester are hauled by electric locomotives and the freight terminals and routes are largely not electrified and historically it has made more economic sense for the Freight Operating Companies (FOCs) or Rolling Stock Companies (ROSCOs) to invest in diesel locomotives.

28. If the Government commits to greater electrification, then the sector will be incentivised to invest in new equipment (circa £3 million per loco). Electric locomotives are a tried and tested existing technology. They are able to haul longer aggregates trains, thereby improving the economics for both FOCs and ROSCOs and potentially mitigate the need for some additional paths; there appears to be no reason railways serving quarries might not also be electrified. Government must work closely with the freight industry to provide assurance for the long-term investment in electric locomotives and to ensure the business is viable by guaranteeing freight paths under a mixed-use network.
29. Neither of the alternative technologies of battery or hydrogen have the energy density, range or sustained power capability to match the performance of diesel trains on freight services. This means that it is essential that electrification is extended to include all freight routes if there is any chance of achieving decarbonisation. With the small profit margins of the freight operators and limited network capacity, there is no option to reduce the length or weight of freight services to match other technologies. There is a possibility that battery technology may be suitable for last mile haulage or for shunting in freight terminals, but this will need to support rather than replace the need for electrification.

Aviation & Maritime

30. Greater Manchester recognises the challenges faced by both the aviation and maritime sectors in decarbonising their fleet, from both a weight and range perspective and that further research and development is needed. Regarding aviation, Greater Manchester's five-year Environment Plan recognises the carbon emissions as a national issue, with an assumption that emissions nationally from all flights should hold steady to 2030 and then reduce to zero by 2075 and that such emissions are monitored.

Summary

31. Whilst new vehicle technologies are important, delivering carbon neutrality will not be possible without a significant change in travel behaviours and a fundamental shift in the way people and goods are moved. The DfT Plan to Decarbonise Transport, whilst a welcome initiative in principle, does not yet set out a set of measures that are realistically capable of achieving the changes in the required timeframe.
32. Rapid and urgent action is needed to put the UK on the trajectory necessary to achieving carbon neutrality in 2050 – the next five years are critical to set us on the right path to meet our carbon budgets.
33. If active travel and public transport are to be the first, natural choice, then they must also be the most convenient and cost-effective ways to travel.
34. A reduction of passenger kms travelled is needed and whilst local polices can influence this, it is Government policy that will underpin its delivery. We need the Transport Decarbonisation Plan to set a consistent National Policy aligned with international agreements, that regions and localities can deliver to make rapid, meaningful progress in reducing transport's contribution to the climate emergency.

35. Policies to tackle carbon emissions must be integrated into wider policy-development to reduce the possibility of unintended consequences and to ensure a holistic approach is taken. Embodied carbon in infrastructure and vehicles; and the need for low-carbon electricity generation must all be included in the final strategy.
36. The next stage in the Government's approach to decarbonising transport, scheduled for autumn 2020, will be crucial. Whilst Government may have fairly assessed the scale of the challenge to date, the response outlined in their approach to date is insufficient. The final plan will need to set out a clear set of tangible actions and measures of the scale and impact required for implementation in the shortest time possible, so all stakeholders can play their full role in the challenge to decarbonise transport.

Actions GM recommends are needed to be addressed in the Transport Decarbonisation Plan

Policy

- A clear and binding framework is needed for joined up policy and strategic decisions, where whole life carbon is considered, to include embodied carbon and carbon from power production not just carbon in use, together with a review of the national roads investment strategy to take into account the impact on carbon.
- Planning policy must change to ensure that future developments do not encourage the increased need to travel, particularly by car. (There are worrying signs that proposed changes in planning policy by the Government could have the opposite effect).
- National plans are needed to ensure that investment in cycling and walking infrastructure is joined up and effective.
- Policies that encourage employers to allow employees to work from home.
- Policies that make the cost of travelling by car relatively more expensive than sustainable and public transport modes.
- The economic value of reducing carbon as contained in the DfT Transport Appraisal Guidance is in need of urgent revision to ensure that it plays a driving role in the economic case for transport interventions and investments.

Behavioural

- There needs to be less travel, with active and sustainable transport becoming the first choice because it is easier, cheaper, or faster than non-sustainable modes. This may only be possible by increasing the cost of using non-sustainable modes of transport or reducing the relative cost of sustainable modes.
- Active Travel must be convenient with due regard given to the need for shower facilities at places of work and difficulties of storing bikes at home, when living in high rise buildings. In addition, means of securing valuable e-bikes at transportation hubs need to be available when using mixed-mode travel options.
- E-bikes can play an important role in filling the gap in suburban areas where public transport may not be an option. Carefully planned and robust EV charging infrastructure will help support and encourage the uptake.
- New and emerging modes such as E-scooters are also important in bridging gaps and connecting transport modes.

Rail

- Emerging technologies (battery and hydrogen) might help with the reach of the solutions but will not act as a silver bullet to the problems and will not replace the need for significant additional electrification.
- Evidence from the rail industry suggests that electrification can be delivered at a lower cost if design and funding methods are improved.

- A national rolling programme of electrification is needed to enable the rail industry to deliver schemes at significantly lower cost, through supply chain certainty, while retaining learning and skills and incentivising investment and innovation.
- Replace bi-mode trains with full electric trains where possible and cascade bi-modes to other routes without continuous electrification as a medium-term solution.
- Don't forget the significant commercial incentives required to attract longer term sustainable investment in the freight industry.
- This needs to happen quickly to meet the timescales – lots of network still to be electrified.

Car

- Appreciation that EVs alone are not the solution and that a reduction in miles travelled is also necessary.
- Early and rapid electrification of the car fleet is needed.
- Sustainable infrastructure that allows recharging of vehicles in a way that supports behaviour and transport mode change and the reduction in distance travelled.
- There is a need for standardisation of charging connectors (Universal Plug/socket) for EV charging to simplify charging and make all charging points suitable for any vehicle – at the moment there are several types in use.

Bus

- The consultation paper notes that 5% of journeys were made by bus in the UK but that these journeys only accounted for 3% of GHG emissions. (Paragraph 2.21 of the consultation document). Bus is already comparatively green and Battery Electric Bus technology is now a reality on our streets that can make the industry even greener. Unfortunately, up-front costs of investment are far higher than for diesel buses while the BSOG system reduces the operating cost differential in favour of retaining diesel operation. As a result, at the current rate of conversion, it will take over 300 years before the entire UK fleet is converted.
- Therefore, the investment announced so far (funding for 4,000 zero emission buses) is very welcome, GM would like to see more details on how this money will be made available to the industry and over what time period.