

**GREATER MANCHESTER TRANSPORT COMMITTEE**

Date: 17 January 2020

Subject: Climate Change and Transport

Report of: Transport Strategy Director

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**PURPOSE OF REPORT**

Achieving Greater Manchester's carbon targets will require substantial reductions in carbon emissions from transport. This report sets out the scale of the challenge and the transport-related actions that that GM needs to take and influence to meet its ambition to be a carbon neutral city-region by 2038.

**RECOMMENDATIONS:**

The GMTC is requested to:

1. Note the content of the report; and
2. Discuss the scale of the challenge to reduce carbon emissions from transport for GM to meet its ambition to be a carbon neutral city-region by 2038.

**CONTACT OFFICERS:**

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**Equalities Implications:**

No implications identified to-date.

**Climate Change Impact Assessment and Mitigation Measures –**

The report provides a high-level overview of the challenge for the transport sector in supporting achievement of Greater Manchester’s target to become carbon neutral by 2038.

**Risk Management: N/A**

**Legal Considerations: N/A**

**Financial Consequences – Revenue: N/A**

**Financial Consequences – Capital: N/A**

Number of attachments to the report:

Appendix A: Examples of interventions and plans that will support the 5-year Environment Plan

**BACKGROUND PAPERS:**

Greater Manchester Five Year Environment Plan

Greater Manchester Transport Strategy 2040: Delivery Plan (2020-2025)

Greater Manchester Transport Strategy 2040

<b>TRACKING/PROCESS</b>	
Does this report relate to a major strategic decision, as set out in the GMCA Constitution	No
<b>EXEMPTION FROM CALL IN</b>	
Are there any aspects in this report which means it should be considered to be exempt from call in by the relevant Scrutiny Committee on the grounds of urgency?	N/a
GMTC	Overview & Scrutiny Committee
N/a	N/a

# 1 INTRODUCTION

## Policy Background

- 1.1 The Greater Manchester Strategy sets out a future for Greater Manchester as a place where people live healthy lives, and a place that is at the forefront of action on climate change with clean air and a flourishing natural environment.
- 1.2 Building on this, the 5-year Environment Plan for Greater Manchester set an ambitious target to be carbon neutral by 2038, and a vision for Greater Manchester to be a clean, green, carbon-neutral resilient city region, with a thriving natural environment and zero-waste economy.
- 1.3 Although these targets are in the future, action must be taken now if we are to make them a reality, and significant reductions in carbon emissions from transport are vital in achieving these ambitions.

## GMCA declaration of climate emergency

- 1.4 In July 2019, the Greater Manchester Combined Authority (GMCA) declared a climate emergency. As part of the declaration, GMCA noted the findings of the Intergovernmental Panel on Climate Change (IPCC) report 'Global warming of 1.5°', in particular:
  - That human activities are estimated to have already caused approximately 1.0°C of global warming above pre-industrial levels;
  - That if we continue at the current rate, we are likely to surpass the Paris Agreement target of 1.5°C as early as 2030; and
  - That at the current level of commitments, the world is on course for 3°C of warming with irreversible and catastrophic consequences for humans and the natural world.
- 1.5 GMCA also affirmed its belief that:
  - The impacts of global temperature rise above 1.5°C are so severe that governments at all levels must work together and make this their top priority;
  - As well as large-scale improvements in health and wellbeing around the world, bold climate action can deliver economic benefits in terms of new jobs, economic savings and market opportunities;
  - As urban populations increase, greater consideration of how urban systems can develop sustainability will be required; and
  - Tackling climate change is everybody's responsibility.

## **Size of the carbon emissions problem**

- 1.6 In the UK, the overall total CO<sub>2</sub>e<sup>1</sup> emissions have been falling. They now stand at 42% below the 1990 baseline level. This progress means the UK has outperformed the target emissions reductions of first national carbon budget (2008 to 2012) by one per cent. Government projections show that the UK will outperform against the second and third carbon budgets, covering the years 2013 to 2022, by almost five per cent and four per cent respectively.
- 1.7 These reductions in CO<sub>2</sub>e emissions over the last three decades have been largely attributable to a transition in electricity generation, as a result of a consistent national policy to reduce emissions. The UK grid has moved away from coal to gas and has seen a significant growth in renewable generation, mainly wind power. However, this source of emissions savings has been largely exhausted, with coal generation now below 5% of the UK total.
- 1.8 This means that the most challenging sectors, such as heat and transport, must now be given urgent attention to reduce emissions, in order to stay within budgets.
- 1.9 Greater Manchester's CO<sub>2</sub>e emissions have broadly reflected the national trend, with a reduction of 39%, against the 1990 baseline level.

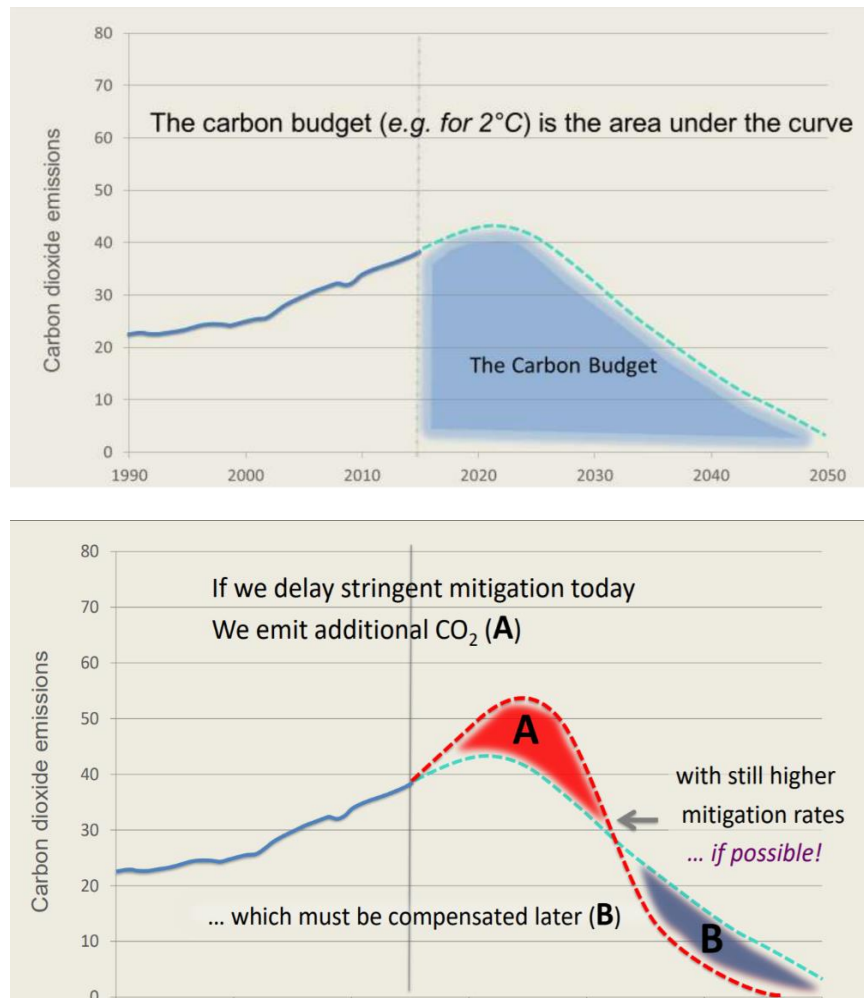
## **2 UNDERSTANDING CARBON BUDGETS**

- 2.1 The principle of a carbon budget is a powerful way of considering the carbon reduction challenge. This concept takes account of the cumulative amount of CO<sub>2</sub>e emissions permitted over a period of time. To stay within budget, a rise in emissions from one activity (or a reduction that does not meet target) will require emissions to fall in another. And an 'overspend' in one year will require greater cuts in emissions in future years.
- 2.2 In reality, this means that reductions must happen from the very first budget periods to avoid even steeper cuts to emissions being required in subsequent budgets. The principle of a carbon budget is illustrated below:

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<sup>1</sup> Green House Gases figures in this report will be stated as CO<sub>2</sub> equivalent, this means that other gases such as Methane and Nitrogen Oxide have their global warming potential converted to a carbon dioxide equivalent.

**Figure 1: Carbon Budgets <sup>2</sup>**



### 3 GREATER MANCHESTER'S CARBON REDUCTION PATHWAY

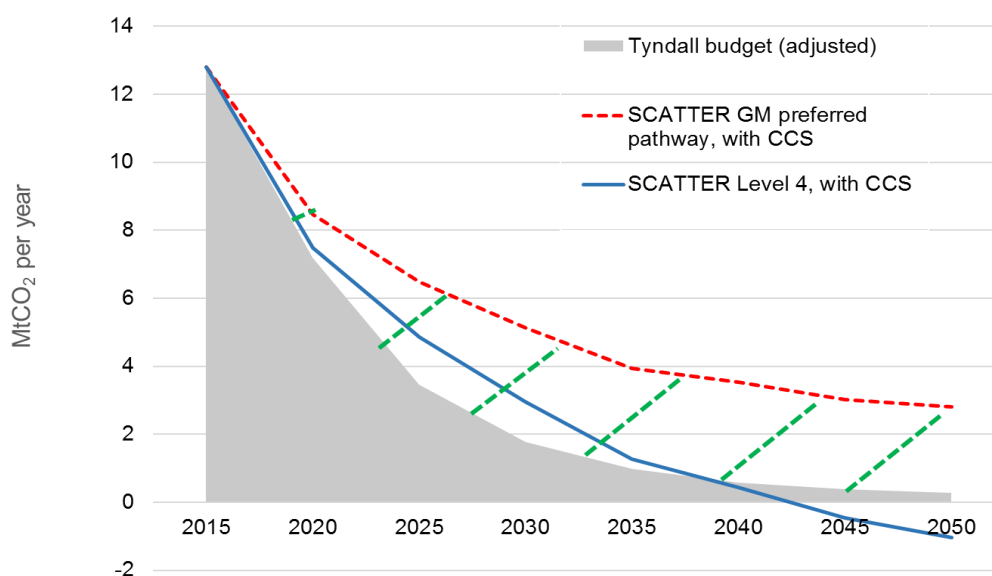
- 3.1 GMCA has taken a scientific, evidence-based approach, using models to understand potential pathways to achieving what is required for the City-Region to, in turn, meet international commitments to carbon reduction.
- 3.2 Research by the "Tyndall Centre for Climate Research"<sup>3</sup> (Tyndall Centre) to calculate what a fair contribution looks like for Greater Manchester concluded that urgent action was needed to put the City-Region on a path to 'carbon neutrality' by 2038.

<sup>2</sup> Illustration of a carbon budget, Anderson K, Tyndall Centre for Climate Change

<sup>3</sup>[https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall\\_Quantifying\\_Paris\\_for\\_Manchester\\_Report\\_FINAL\\_PUBLISHED\\_rev1.pdf](https://www.research.manchester.ac.uk/portal/files/83000155/Tyndall_Quantifying_Paris_for_Manchester_Report_FINAL_PUBLISHED_rev1.pdf)

- 3.3 The carbon budget developed by Tyndall Centre for Greater Manchester (in grey, Figure 2) is derived from projections of global temperature change based on the Paris climate agreement's maximum rise of 2°C.
- 3.4 In addition, GMCA has used another model (SCATTER)<sup>4</sup> to estimate how this level of carbon ambition can be achieved. The model has 40 interventions which can each be adjusted to four different possible levels to create a range of scenarios for achieving our carbon budgets. Two of these scenarios are displayed in blue and red pathways in Figure 2, below. The reality is that all of the trajectories are extremely challenging, and indicate the scale of the task if Greater Manchester is to secure carbon neutrality within just two decades.

**Figure 2: Modelling the GM emission budget <sup>5</sup>**



- 3.5 The Tyndall budget indicates that to meet the requirements of the Paris Agreement, Greater Manchester would need to initiate an immediate programme of mitigation, delivering an annual average of 15% cuts in emissions (range of 10-20%).
- 3.6 The total carbon budget available for GM between 2015 and 2050 to achieve carbon neutrality by 2038 is 94.5MtCO<sub>2</sub>e and under the “GM preferred” pathway (191.8 MtCO<sub>2</sub>). It is recognised that there is currently a gap between what Greater Manchester needs to achieve to be carbon neutral and what we are currently able to achieve. This gap needs to be filled through technical, social and financial innovation. In the preferred pathway, the transport sector must reduce from 3.45MtCO<sub>2</sub>e in 2015 to 2.3MtCO<sub>2</sub>e this year and to 1.35MtCO<sub>2</sub>e in 2025. This equates to cuts of approximately one-third every five years. Paragraph 5.4 provides an illustration of the sorts of interventions, and their scale of effect in the transport sector that would be required in the next five years to meet the carbon budget.

<sup>4</sup> Setting City Area Targets and Trajectories for Emissions Reductions

<sup>5</sup> SCATTER for GMCA –Technical Annex, June 2019

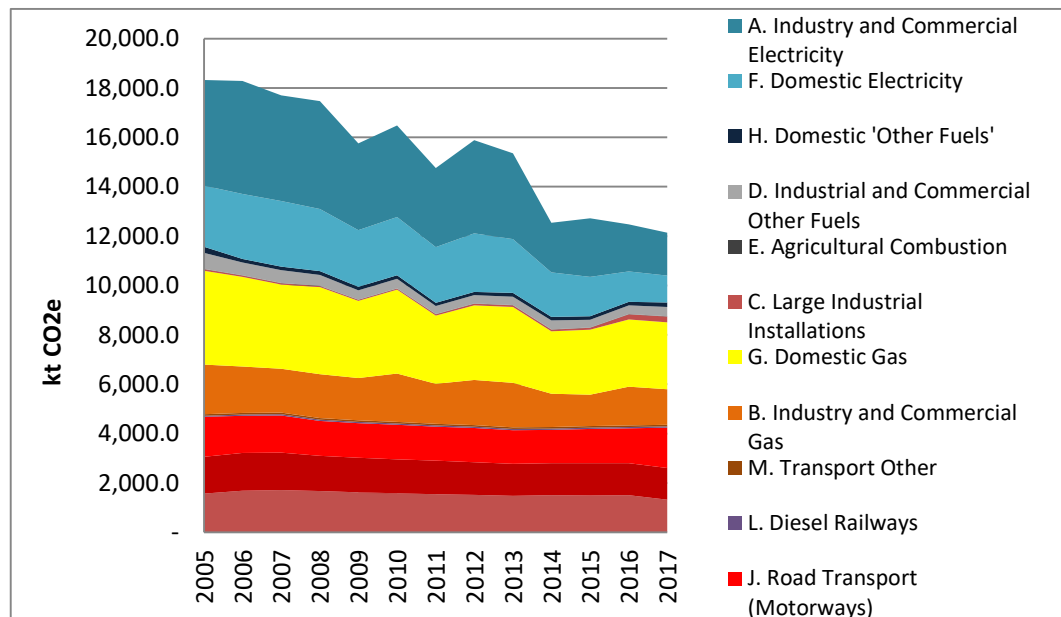
## 4 UK AND GREATER MANCHESTER'S SURFACE TRANSPORT EMISSIONS

- 4.1 As noted above, whilst other sectors have achieved significant carbon reductions, surface transport emissions (i.e. not including aviation) have barely fallen in the UK. In 2017, transport emissions had reduced by just 3% on 1990 levels (road transport emissions have in fact increased 6%). In 2017, transport overtook energy as the sector emitting the largest amount of CO<sub>2</sub>e.
- 4.2 Overall, transport now accounts for 27% of UK greenhouse gas emissions, with the vast majority deriving from petrol- or diesel-fuelled road transport. Just over three quarters of road traffic was from cars and taxis. There are numerous reasons for this, including population and disposable income growth; growth in the length of trips being made; and a significant shift towards large vehicles (e.g. SUVs), which now represent 31% of new car sales, compared to 21% in 2010.<sup>6</sup>
- 4.3 Road transport emissions have increased by 6% over the past three decades as UK traffic mileage has risen from 255 to 328 billion miles travelled in 1990 and 2018 respectively, an increase of 29%.
- 4.4 The slower growth in emissions is due to technical improvements made by manufacturers to increase vehicle efficiency: for example, the 2015 European fleet average CO<sub>2</sub> targets for new passenger vehicles (130g/km) was met two years early, however progress towards the 2021 (95g/km) target has now stalled.
- 4.5 This demonstrates that technical achievements have been successful in mitigating traffic emission growth but have not been sufficient to decrease road emissions as required. This indicates that policy makers should be cautious in over-reliance on technical solutions.
- 4.6 Figure 3 displays the trend data in Greater Manchester. In summary, transport emissions have remained steady, with road transport responsible for 97% of total surface transport emissions in 2017. (This data does not include aviation emissions. Transport “other” includes emissions from LPG vehicles, inland waterways, coal combustion in the rail sector and aircraft support vehicles.)

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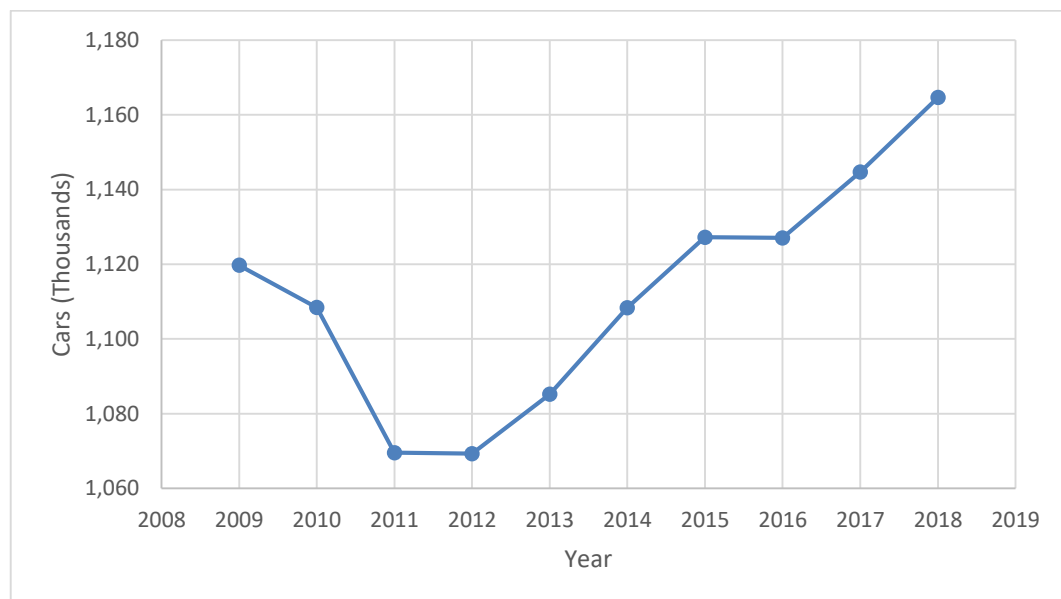
<sup>6</sup> Reducing UK emissions, 2019 Progress Report to Parliament, Committee on Climate Change, July 2019

**Figure 3: GM CO2e by sector<sup>7</sup>**



4.7 Figure 4 demonstrates the growth in licensed cars in GM over the past decade, this amounts to approx. 4%. This period contains a recession related dip, the long-term trend tracks steady growth. In the UK over the last 20 years, the typical annual growth in licensed vehicles has averaged 630,000 per year, although the 2008/09 recession slowed this rate to average to 230,000 between 2008 and 2013.

**Figure 4: Licensed vehicles in Greater Manchester<sup>8</sup>**



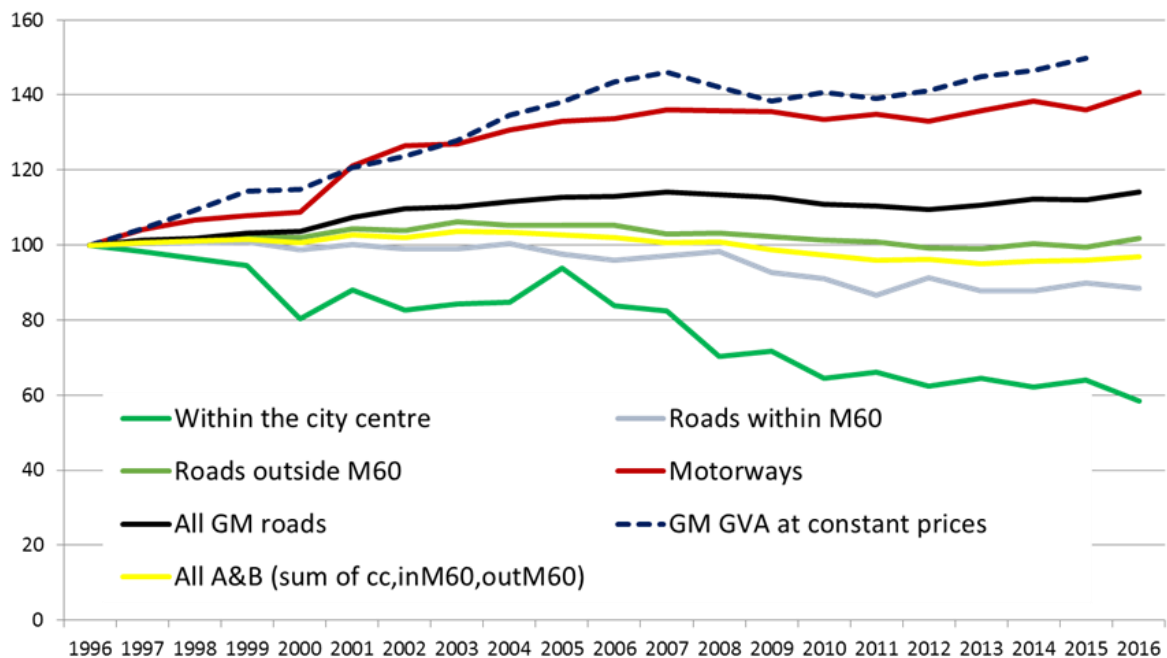
<sup>7</sup> Department of Business Energy and Industrial Strategy, Emissions of carbon dioxide for Local Authority areas, 2019

<sup>8</sup> Department for Transport vehicle licensing statistics, 2018



- 4.8 Whilst the number of vehicles continues to increase it should be noted that average mileage driven in each vehicle has decreased, this was 7,134 miles in 2017, down from 7,250 in 2016 and 7,334 miles the year before that.<sup>9</sup>
- 4.9 Figure 3 and Figure 5 also demonstrate that there is also a notable divergence in where traffic growth has taken place. Figure 5 shows traffic trends on GM's roads since 1996 and highlights that GM Motorway traffic has continued to increase over the past 2 decades, whilst traffic on roads within the M60 and within Manchester city centre has fallen significantly over the same time period.
- 4.10 Economic and population growth has been higher within the M60 than outside the M60. So, against expectations, overall volumes of car travel in Greater Manchester have been broadly stable over the past fifteen years.

**Figure 5 : Recent trends in motor vehicle traffic in Greater Manchester based on traffic-count data (all values indexed to 100 in 1996)**



- 4.11 The reasons for this are complex but some factors include:
- The change toward a “digital economy” in which some shopping trips and commuting trips may have been replaced by e-commerce (i.e. online shopping) and an increase in home working respectively.
  - A strong increase in rail-based public transport, which can partly be explained by improved services and extensions to the Metrolink network.

<sup>9</sup> Department for Transport, anonymised MOT test and results, 2019

- A cultural shift towards urban living means population densities in the urban centre have increased, which has changed travel preferences and in turn travel demand for some, e.g. ability to walk to desired destination.
- Transport and land use policy, with minimal new road construction and a gradual shift towards pedestrian and cycling infrastructure improvements and prioritisation on local roads.

## 5 GM TARGET TO MEET CARBON NEUTRALITY IN 2038

5.1 In common with an increasing number of localities in the UK, Greater Manchester has set an ambitious target to be carbon neutral by 2038. At the Mayor's Green Summit in April, the 5-year Environment Plan (5YEP) was launched which set out a pathway toward this target, using the initial modelling work undertaken by the Tyndall Centre.

5.2 The 5YEP sets out five challenges to realise the vision for Greater Manchester to be a clean, green, carbon-neutral resilient city region, with a thriving natural environment and zero-waste economy. These are:

- **Climate Change Mitigation** – To accelerate action to reduce CO<sub>2</sub>e.
- **Air Quality** – To reduce health impacts of NO<sub>x</sub> and particulates, which are currently at illegal levels.
- **Production and consumption of resources** – To reduce embedded and imported emissions and tackle a throwaway society (particularly for plastics and food waste).
- **Natural Environment** – To plan and mitigate an increasing risk of extreme weather events, in particular flooding and heat stress.
- **Climate Change resilience and adaptation** – To plan for and mitigate an increasing risk of extreme weather events, in particular flooding and heat stress.

5.3 The 5YEP also sets out five specific decarbonisation priorities for transport, which align with Greater Manchester's Transport Strategy for 2040:

- Increasing use of public transport and active travel modes;
- Phasing out fossil-fuelled private vehicles and replacing with zero emission alternatives;
- Tackling the most polluting vehicles on our roads;
- Establishing a zero-emissions bus fleet; and
- Decarbonising road freight and shifting more freight movement to rail and water.

5.4 The SCATTER analysis within the 5YEP provides a useful illustration of the sorts of interventions, and their scale of effect in the transport sector that would be required in the next five years to meet the carbon budget. It suggests that by 2025 Greater Manchester will require:

- 51% of all vehicles to be zero emission (full battery or hydrogen electric) and 12% Plug in Hybrids;

- 51% of buses to be zero emission (full battery or hydrogen electric) and 31% hybrid
- 82% of the rail network electrified;
- More journeys by public transport, cycling and walking which together result in a 6% reduction in car travel (baseline 2015);
- Of the remaining car journeys, a 25% reduction in km done by car, per person; and
- A 10% reduction in road freight emissions.

5.5 It is important to stress that whilst the SCATTER model provides a useful tool to understand the likely scale of challenge and to guide early intervention, further work is required to refine the approach and our understanding of which interventions would have greatest impact on carbon emissions in GM.

5.6 Many of the interventions that support these priorities, as set out in the Greater Manchester Transport Strategy for 2040 and the supporting Draft 5-Year Delivery Plan, are in development or being implemented. However, the SCATTER model outputs indicate the need for a substantially greater scale and scope of intervention than presently planned to achieve the priorities in the 5YEP. The remainder of this report sets out the process underway to review current plans in this context.

## **6 THE GREATER MANCHESTER TRANSPORT STRATEGY 2040 AND RIGHT MIX VISION**

6.1 Through the GM Transport Strategy for 2040, Greater Manchester has articulated a transport strategy that looks to build on the success of the past 20 years in focusing on improving and integrating public transport and active travel modes to offer an alternative to car travel.

6.2 This has been an effective strategy, where GMCA and Districts have invested in a range of successful schemes, such as the Metrolink expansion programme, the Leigh Salford Manchester busway and the progressive programmes of cycling and walking interventions. This has resulted in a significant growth in travel by non-car modes, particularly commuter travel to the Regional Centre.

6.3 However, a far broader and deeper travel change will be required to achieve the decarbonisation target outlined above, whilst also providing Greater Manchester residents and businesses with the mobility and access to opportunities they need.

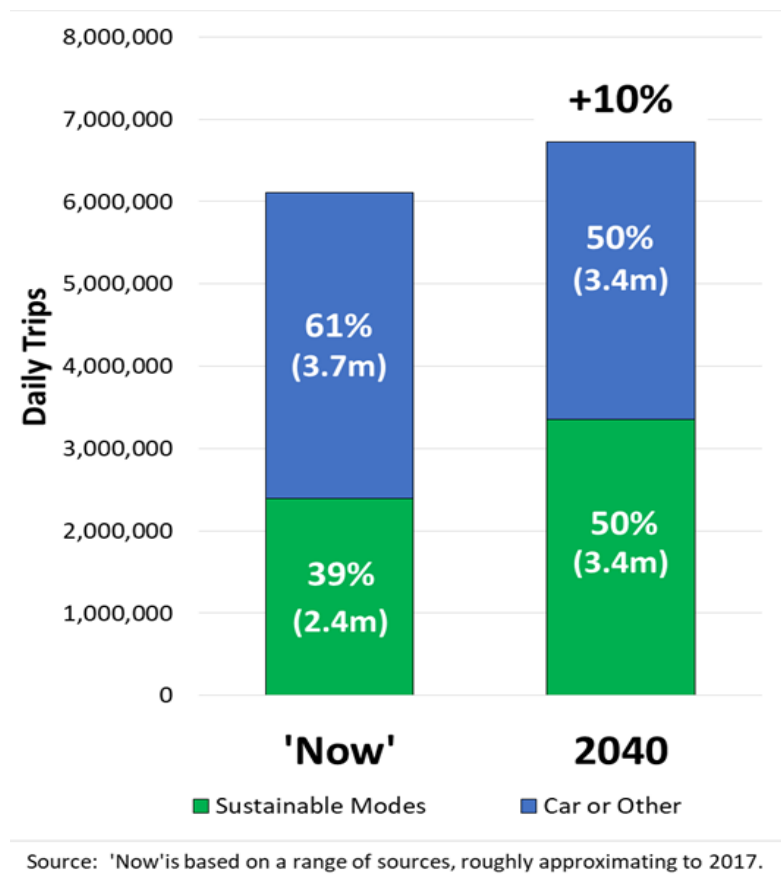
6.4 An initial 'Right Mix' vision for 2040 was published in January 2019 in the draft Greater Manchester Transport Strategy 2040: Delivery Plan (2020-2025). The Right Mix vision provides a clear set of targets for the mix of non-car travel needed at future stages of development in Greater Manchester. The proposed pathway to the Right Mix was published at the same time in the Evidence Base Update of the 2040 Transport Strategy<sup>10</sup>.

1.1 The ultimate Right Mix vision is to achieve a travel offer whereby no more than 50% of daily trips are made by car, with the remaining 50% made by public transport, walking and

<sup>10</sup>[https://downloads.ctfassets.net/nv7y93idf4jq/3ryONeNzmuSAsPDzgtB3jt/489fbefed35227ba4bad46c89f0e210a/2040\\_Evidence\\_Base\\_Update\\_Collated.pdf](https://downloads.ctfassets.net/nv7y93idf4jq/3ryONeNzmuSAsPDzgtB3jt/489fbefed35227ba4bad46c89f0e210a/2040_Evidence_Base_Update_Collated.pdf)

cycling. This will mean approximately one million more trips each day using active travel or public transport in Greater Manchester by 2040, with no net growth in motor vehicle traffic

**Figure 6: Greater Manchester’s “Right Mix” Vision Target**



- 6.5 Achieving this target will not just be about delivering the right transport interventions; it will rely on significant changes in land use patterns (as proposed in the draft Greater Manchester Spatial Framework<sup>11</sup> (GMSF)), for example, to enable people to access day to day services and leisure opportunities more locally, or within our Regional Centre and other key centres, to reduce the numbers of long car trips. Similarly, improvements to digital infrastructure and access to services could also reduce the need to travel and therefore support carbon reduction targets.
- 6.6 The 2040 Transport Strategy refers to a target of reducing carbon emissions by 80% from 1990 to 2050, reflecting the Climate Change Act 2008. The declaration by the GMCA of a Climate Emergency and the adoption of a much more ambitious target of zero carbon emissions by 2038 (see above) means that the Right Mix vision needs to be reviewed in light of a need to achieve substantial reductions in carbon emissions from transport well before 2040.
- 6.7 Section Two of this report noted the need for rapid reductions in carbon emissions and that transport will need to account for a significant proportion of that reduction. There are a

<sup>11</sup> <https://www.greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework/>

number of variables that will influence whether the 'zero net growth in motor-vehicle traffic' ambition in the Right Mix vision will be sufficient.

6.8 These include:

- The speed with which electric vehicles can be adopted, which will be heavily dependent on national policy interventions (including full financial support for the GM Clean Air Plan) to accelerate the uptake of Electric Vehicles;
- The extent to which different sectors work together in a co-ordinated way to reduce carbon emissions in Greater Manchester (e.g. the planning of different public services to minimise the need to travel by car); and
- The extent to which sectors normally considered to be outside the Greater Manchester economy – e.g. aviation – can reduce their carbon emissions.

6.9 It is intended to undertake this work over the coming months, with the aim of publishing an updated Right Mix vision alongside the final version of the 5-year Delivery Plan in the summer of 2020.

## **7 CONCLUSIONS AND RECOMMENDATIONS**

7.1 Achieving Greater Manchester's carbon targets will require substantial reductions in carbon emissions from transport well before 2040, which is likely to require action above and beyond that currently set out in the GM Transport Strategy for 2040. Greater Manchester will need to be clear on what levels of travel change will be needed over each five-year period to focus activity and to ensure that Government support is forthcoming.

7.2 The following actions are recommended:

- Further work with the Tyndall Centre for Climate Change Research and others to clarify targets and assess the relative impacts of different forms of intervention;
- Review of the interventions proposed in the draft Delivery Plan of the 2040 Transport Strategy in the light of any changes to the Right Mix vision to reflect carbon targets. The final version of the 5-year delivery plan is due to be published in the summer alongside the GM Spatial Framework;
- Urgent engagement with Government regarding their proposals for reducing carbon emissions from transport, and how they could fit with Greater Manchester's proposals; and
- Urgent engagement with Government in relation to additional powers, policies and funding (both revenue and capital) that might be needed if it were concluded that substantial reductions in motor-vehicle traffic were necessary to meet carbon targets.