

APPENDIX A: Greater Manchester Clean Air Plan: Strategic Outline Case Air Quality Summary Report

Introduction

This air quality summary report provides greater detail on air quality within Greater Manchester and the proposals for the Clean Air Plan. It summarises the available data from monitoring and modelling undertaken previously, compares this with the PCM model and sets out TfGM's approach to developing a more refined and robust evidence base.

Pollution Climate Mapping (PCM) Model Summary

Defra reported the outputs of the full PCM model in July 2017. This identified all road links operated by local authorities (as opposed the Strategic Road Network operated by Highways England, identified separately) in seven of the ten Greater Manchester districts which were predicted to be in exceedance of the NO₂ annual mean EU Limit Value of 40 µg/m³.

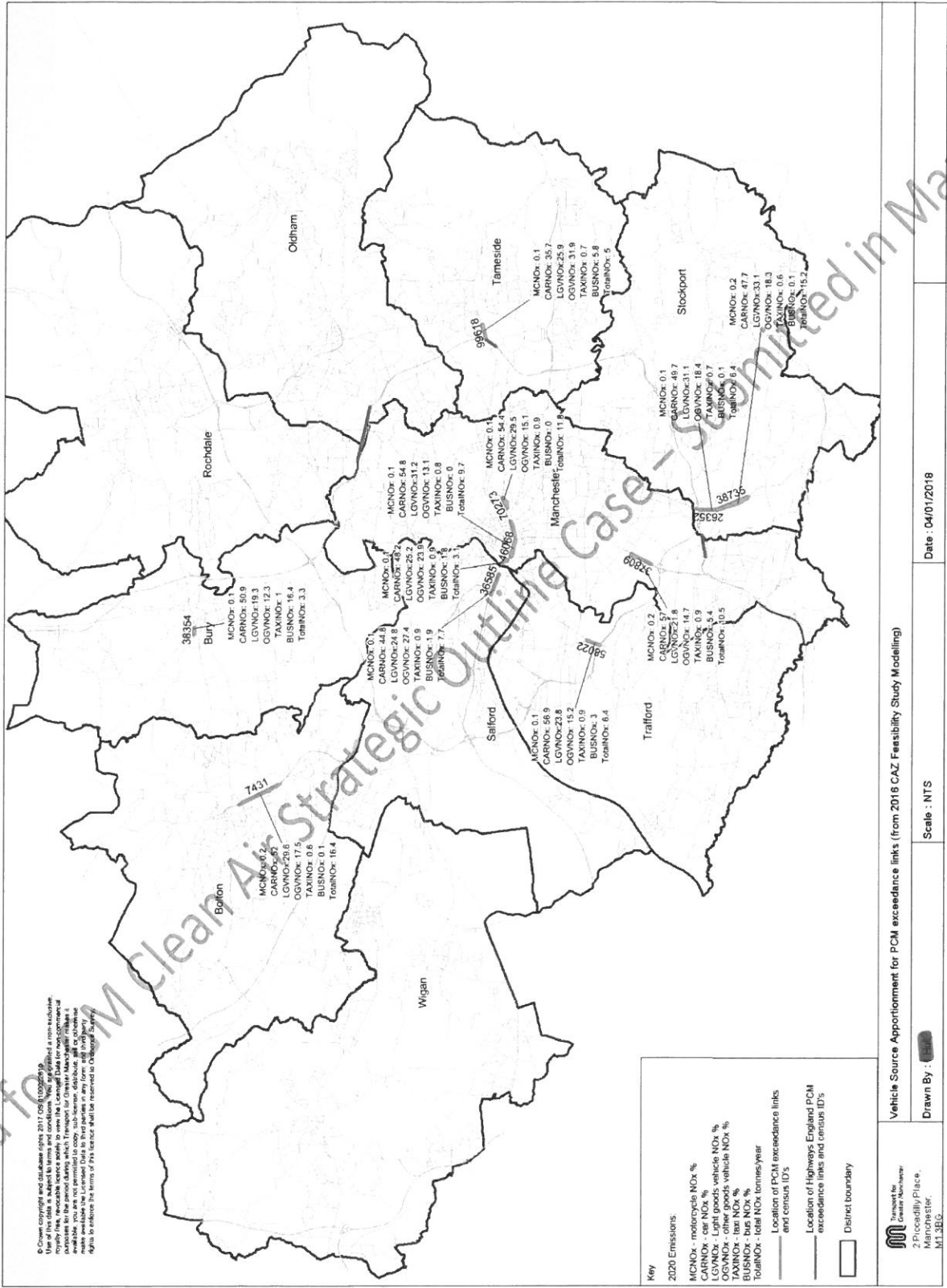
The results from the full PCM model for 2015 (there is not a 2016 PCM output year) for GM are presented in Figure 1. This is the year which can be most directly compared with the GM modelled Air Quality Management Area (AQMA), and available monitoring data.

The road links projected by Defra to be in exceedance in 2020, and which GM local authorities are responsible for are highlighted in Figure 2.

Superseded by Outline Business Case – March 2019



Superseded by Outline Business Case – March 2019



The PCM results in Figure 1 show that the road links in exceedance of the NO₂ EU Limit Value are a relatively small proportion of the total roads in GM, and are located within the GM AQMA.

There are typically three groupings of links modelled as in exceedance in 2015 by the PCM model:

- The arterial routes into the city centre, with the greatest concentrations on links on the south side of the inner ring road in the city centre
- Links on or adjoining the M60 / M56
- Road link in the surrounding district urban centres of Bolton, Bury, Oldham and Ashton-under-Lyne

The spatial extent of the GM AQMA covers many roads not predicted to be in exceedance by the PCM model. There are also a number of roads in the AQMA that are not included in the PCM as sources, most notably the majority of the M60, M62, M602 and M66.

In Figure 2, the roads which are the initial primary focus of the TfGM Clean Air Plan are identified. The vehicle emissions source apportionment data, based on the 2016 GM Clean Air Zone feasibility work, are also presented. These show that whilst on many links, cars (including taxis) and vans are responsible for the majority of emissions, there are links with notable contributions from HGVs (Manchester, Tameside & Salford). The main link with a meaningful contribution from buses is in Bury. This indicates that a range of measures may be necessary to tackle GM's emissions levels due to the diverse spatial context and differing sources. For information, the PCM exceedance links on the Highways England network (which are not part of this feasibility study) are also shown in Figure 2.

The PCM model results for each of the roads in exceedance in 2020, as shown in Figure 2, are provided in Table 1.

Table 1: PCM Model Results for Links in exceedance in 2020

Census ID	Road Name	District	PCM Model NO ₂ Conc. (ug/m ³)	
			2015	2020
38354	A58	Bury	52.9	44.1
7431	A666	Bolton	52.9	43.2
99618	A635	Tameside	56.2	44.9
36585	A57	Salford	51.3	41.1
70273	A635	Manchester	53.4	42.9
56370	A57	Manchester	54.8	44.2
75243	A57M	Manchester	49.8	41.2
58022	A56	Trafford	48.1	40.8
37809	A5103	Manchester	52.9	43.8
26352	A34	Stockport	51.3	42.8
38735	A34	Stockport	52.0	43.1

This shows that the PCM model predicts significant reductions in NO₂ concentrations between 2015 and 2020, typically by 15% to 20%. Previous versions of the LAQM suite of tools, which form the basis for this feasibility study, have predicted significant year on year reductions which have not been observed in roadside NO₂ monitoring trends. It is therefore possible that the modelling process for the 2020 year may also be optimistic and measured concentrations for 2020 could prove to be greater than those predicted. TfGM will seek guidance from JAQU on how to manage this risk to scheme assessment and design.

Local Monitoring Data

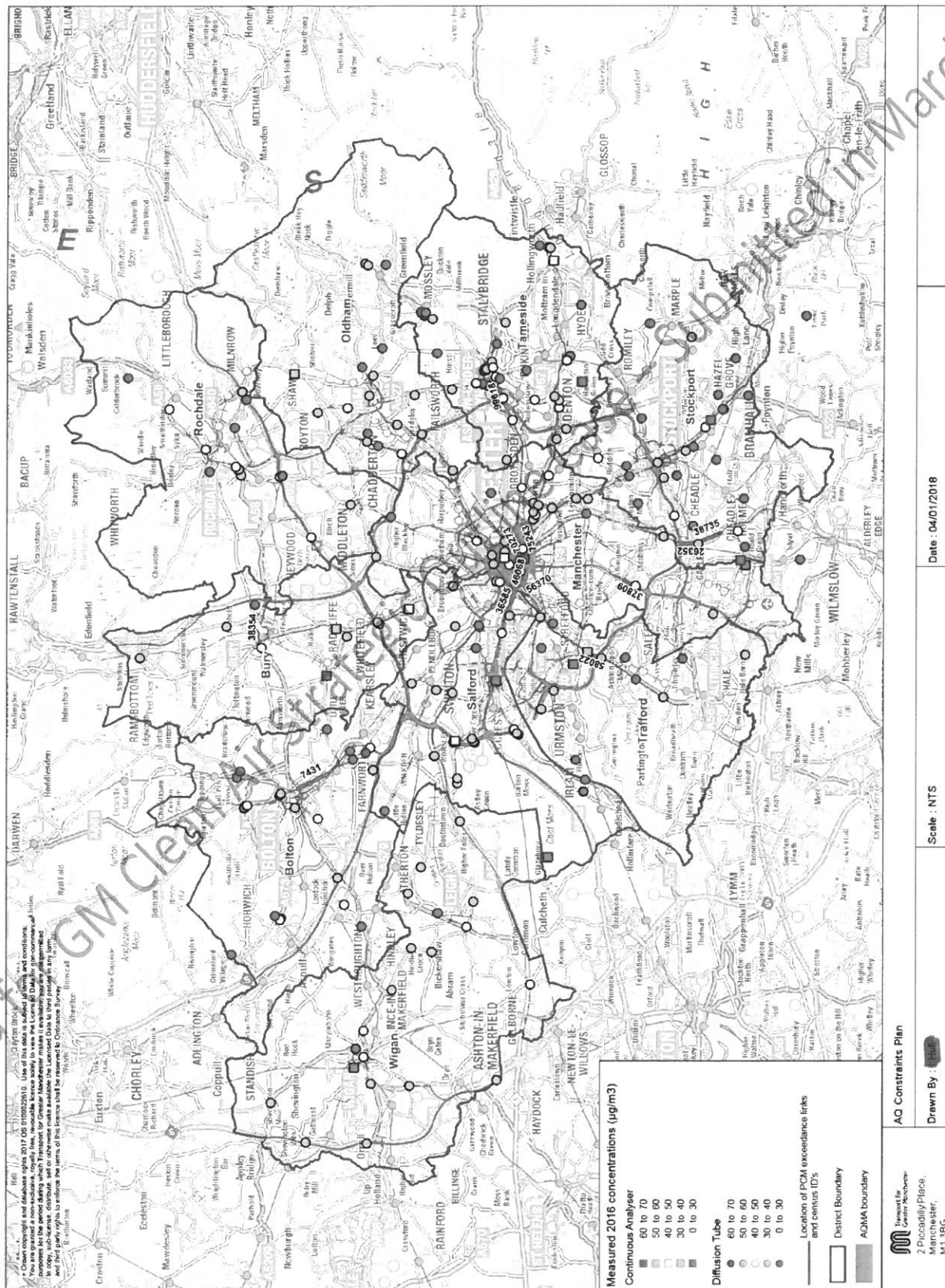
The 2015 Updating and Screening Assessment for Greater Manchester¹ reported that the Air Quality Objectives (AQO) were likely to be achieved in respect of all prescribed air pollutants except NO₂. The Annual Status Report² (ASR) provides updated monitoring results that show a number of sites (both diffusion tubes and automatic sites) are in exceedance for NO₂, with little discernible downward trend at some sites. Results from 2016 annual mean NO₂ diffusion tube monitoring across Greater Manchester indicated that there were many locations within the AQMA where concentrations were more than 40 µg/m³.

A summary of all of the monitoring data within Greater Manchester is provided in Figure 3. This also shows the boundary of the AQMA which was re-declared in 2016, along with the number and type of monitoring sites in each category that will be used in the verification of the GM modelling process.

¹ Greater Manchester Combined Authority, 1 February 2016, *2015 Air Quality Updating and Screening Assessment for Greater Manchester*.

² Greater Manchester Combined Authority, 11 July 2016, *2015 Air Quality Annual Status Report (ASR) for Greater Manchester*
http://www.manchester.gov.uk/download/downloads/id/24305/greater_manchester_air_quality_annual_status_report_asr_2015.pdf

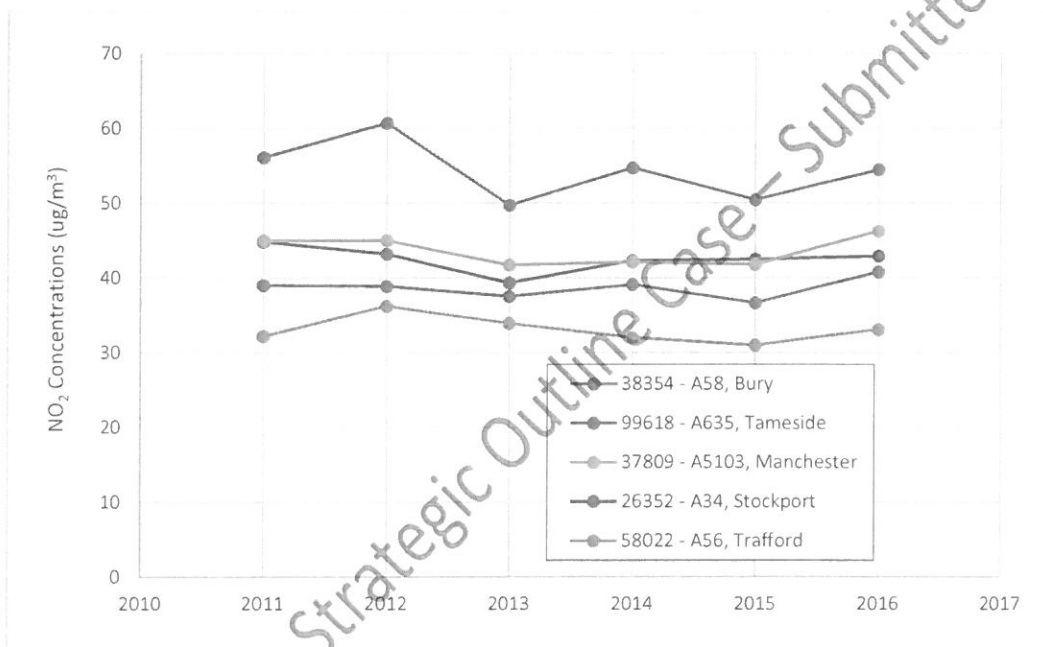
Superseded by Outline Business Case – March 2019



There is not considered to be adequate coverage of air quality monitoring locations at sites representative of Defra's PCM model outputs for those roads predicted to be in exceedance in 2020. TfGM will work with the local authorities to implement air quality monitoring, to better understand local concentrations in key locations relevant to this Clean Air feasibility study. This monitoring data will not be available to feed into the SOC, but may be available to assist in refining decisions relating to potential packages for the Outline Business Case, depending on programme. It is anticipated that in order to enable deployment within the programme these will necessarily be NO₂ diffusion tubes rather than continuous analysers.

Monitoring data adjacent to PCM exceedance links has been reviewed, and the sites where monitoring is within ~10m of the kerb, and therefore reasonable to compare with the PCM outputs (which are modelled at 4m from the kerb) is summarised in Figure 4.

Figure 4: NO₂ Monitoring Trends at PCM Exceedance Links



The monitoring and trend analysis indicates that air quality in these locations is likely to be in exceedance of the NO₂ annual mean objective of 40 ug/m³ in 2020, although the A56 site which is located close to a large roundabout is not.

Air quality is a function of several variables; including meteorology, local traffic emissions, and wider regional scale trends. Therefore, pollution measurements typically exhibit inter-year variability and the underlying trend relating to vehicle emissions cannot readily be interpreted. Overall, measured concentrations at these sites appear stable over the last 5 years, with the decreases that would have been predicted by modelling based on the LAQM.TG suite of tools not apparent.

Transport Modelling

The highway modelling will be undertaken using TfGM's county-wide Saturn model, which covers all of Greater Manchester and the surrounding area.

Modelling will be based on local fleet composition data from ANPR surveys, with ANPR data captured in 2016 and 2017. The ANPR camera information has been supplied by Greater Manchester Police, and the exact location of the cameras is restricted. There are approximately 30 ANPR camera sites which will be used to develop the fleet mix information, half of which are in Manchester city centre, and the remainder selected as the closest and most representative of the PCM exceedance links. However, it is recognised that link specific data for those critical links may be necessary and therefore local surveys will be undertaken in early 2018, and the data from these sites reviewed against the fleet mix calculated from the 2016 ANPR datasets.

The age profile of the bus fleet has been obtained using local data collected during TfGM's (bus service) Punctuality and Reliability Monitoring Survey. Licensing data from each district for Hackney Carriages and Private Hire Vehicles will be used within the ANPR analysis to develop specific fleet mixes for each of these vehicle types so that the effects of targeted measures can be more accurately represented.

Link flows are to be validated on cordons and screenlines at key locations within the study area, separately for car, LGV and HGV flows. Journey times will be validated against TrafficMaster data. Highway model convergence will be monitored using WebTAG convergence criteria and reported in modelling reports.

Emissions and Air Quality Modelling

Air quality modelling will be undertaken using TfGM's EMIGMA (Emissions Inventory for Greater Manchester) software. Procedures combine information about traffic speeds and flows from the Saturn model with road traffic emission factors and fleet composition data from DEFRA's Emission Factor Toolkit (EFT) and the National Atmospheric Emissions Inventory (NAEI) to provide estimates of annual mass emissions for a range of pollutants including oxides of nitrogen (NO_x), primary-NO₂, particulate matter (PM₁₀ and PM_{2.5}) and CO₂.

This will build on the work undertaken by TfGM for the GM AQMA modelling which was also used in the 2016 CAZ Feasibility work. TfGM will update the EMIGMA emissions inventory tool, so that it is consistent with the Emission Factor Toolkit v8.0.

TfGM will use the Greater Manchester emissions dispersion model (GMEDIS) based on the ADMS-Urban model to identify likely exceedances of NO₂ objectives across Greater Manchester. Emissions from point (large industrial stack emissions), line (roads, rail and airport), and grid sources (aggregated total emissions) are included in the model³. The Greater Manchester Combined Authority (GMCA) revised the Air Quality Management Area (AQMA) and it was declared in April 2016. The AQMA indicates areas where annual mean NO₂ is likely to exceed 35 µg/m³ and the 40 µg/m³ limit value. The AQMA encompasses the motorways and main arterial traffic routes. Greater Manchester road transport accounts for 65% of NO_x and 79% of PM emissions⁴.

Health Impacts Assessment

As there is no prescribed methodology for undertaking Health Impact Assessment for air quality interventions, the approach that will be taken draws on best practice and proven techniques drawn from previous assessments of Clean Air Zones including those used for Transport for Greater Manchester (TfGM), and Transport for London's Ultra Low Emission Zone (ULEZ).

³ The Greater Manchester Emissions Dispersion Model – 2016 Model Year, Draft HFAS Report 1794, February 2014.

⁴ Greater Manchester Combined Authority and Transport for Greater Manchester, Greater Manchester Low Emission Strategy and Air Quality Action Plan, Public Consultation.

For the quantitative (monetised) analysis of health impacts (avoided hospital admissions), the Defra impact pathway approach will be applied. The impact pathway approach takes into account variations in pollutant concentrations and population density, and applies pollution concentration response coefficients to assess changes in health outcomes.

For the qualitative analysis, the outputs of the air quality modelling will be used to consider the geographical distribution of changes in air quality. This will be mapped against health indicators (where available) such as obesity and pregnancy rates to draw conclusions as to the distributional spread of potential health impacts (beneficial and adverse).

Summary of the TfGM CAZ Feasibility Study

The 2016 GM Low Emission Strategy (LES)⁵ recognises that a charge-based CAZ could play a key role in reducing emissions across the city. The 2016-21 GM Air Quality Action Plan (AQAP)⁶ goes a step further and commits GM to appraising potential CAZ options via their economic, health and air quality impacts.

In 2016 TfGM commissioned Jacobs to undertake a Clean Air Zone Feasibility study to consider potential charge-based CAZ options⁷. The study was not brought to conclusion due to the publication of the revised National Plan in July 2017, which sets specific requirements for seven GM local authorities. However, a large amount of work was undertaken in the initial feasibility study which will now be used to inform the current feasibility study. The initial study consisted of the following key stages:

- High-level assessment of 12 theoretical charge-based CAZ options (vehicle classes and boundaries)
- Selection of 3 theoretical charge-based CAZ options for more detailed assessment (vehicle classes and boundaries);
- Air quality modelling of each option;
- Economic modelling of each option; and
- Health assessment of each option.

The screening in 2016 CAZ study found that limiting emissions from all relevant vehicles in a CAZ Class A (i.e. buses and taxis) would have a relatively low impact on air quality in most locations assessed, due to the majority of air pollution being produced from other road transport sources. Analysis of the July 2017 PCM National Plan dataset exceedance links has reconfirmed this.

The 2016 CAZ study used existing Greater Manchester wide air quality modelling and initial high-level assessment process to target the CAZ at two general geographical boundaries broadly defined as the city centre (Area 1) and within the M60 (Area 2). Three individual scenarios were developed based on potential air quality impact and fit with existing GM strategies. The three scenarios were – Area 1 Class D, Area 1 Class C and Area 2 Class B. The air quality, economic and health assessments concluded that:

- In terms of overall reduction in the AQMA exceeding the NO₂ AQO, a CAZ in Area 1 for all vehicles (CAZ1D) would be the most effective.
- In terms of net cost to GM a CAZ in Area 2 for buses, HGVs and taxis (CAZ2B) would be the most cost effective, closely followed by a CAZ1D.
- In terms of net overall economic impact, CAZ2B has the least negative economic impact.

⁵ https://www.greatermanchester-ca.gov.uk/downloads/download/79/gm_low-emission_strategy_dec_

- In terms of health benefits, CAZ2B and CAZ1D overall resulted in a modelled similar number of reduction in hospital admissions – note that this was due to a CAZ2B targeting a much larger area, while CAZ1D had much higher location specific improvements.
- All of the options assessed were economically detrimental.

The change in annual mass emissions of NO_x from each of the assessed options is presented in Table 2.

Table 2: Total NO_x Emissions for the GM area in 2020 – Indicative Values from TfGM 2016 CAZ Feasibility Study Modelling Report

Scenario	Annual NO _x Emissions 2020 (Tonnes)		
	Without CAZ	With CAZ	%Change
CAZ2B - M60 Cordon Buses, Coaches, Taxis and HGVs	7,903	7,378	-7%
CAZ1C - City Centre Buses, Coaches, Taxis, HGVs and LGVs		7,653	-3%
CAZ1D - City Centre Buses, Coaches, Taxis, HGVs, LGVs and Cars		7,588	-4%

An initial extension to the air quality modelling domain, re-run to inform the Clean Air Plan SOC, to include the PCM exceedance links beyond the M60 indicates that a charge-based-CAZ may not have a significant impact on those links. This supports the approach of developing a range of options which can be locally applied through the Clean Air Plan assessment process.

It should also be noted that the methodology for this 2016 CAZ Feasibility Study would need to be updated to represent emerging best practice and JAQU guidance, and the most recent datasets, in terms of the traffic, emissions, air quality, economics and health modelling. The modelling domain was also constrained to within the M60. The summary results presented should be treated with caution.

⁶ https://www.greatermanchester-ca.gov.uk/downloads/file/228/gm_air_quality_action_plan_2016-21

⁷ Jacobs, Clean Air Zones Feasibility Study on behalf of Transport for Greater Manchester, 3rd August 2017

Appendix B – Greater Manchester Strategic Policy Context

In this appendix some of the key strategic policy documents referred to in the SOC are described in greater detail.

Greater Manchester Strategy

The Greater Manchester Strategy was published in October 2017 by the Greater Manchester Combined Authority (GMCA). It was written by Greater Manchester's 10 councils, the Mayor, the NHS, transport, the police and the fire service, and sets out the ambitions for the future of the city region.

Improving air quality is one of the key ambitions for Greater Manchester. The document states that Greater Manchester should be 'a place at the forefront of action on climate change with clean air and a flourishing natural environment' and states an ambition of 'reducing congestion and improving air quality'.

The document goes on to explain that:

Reducing the environmental impact of road transport will be critical to supporting our carbon targets and improving air quality, as it accounts for 65% of nitrogen oxide and 79% of particulate emissions. These two dangerous pollutants contribute to respiratory illness, as well as cardio-vascular problems and cancer, leading to around a thousand early deaths in Greater Manchester every year. Urgent action at both national and local levels is required. Locally we are committed to implementing the Greater Manchester Low Emissions Strategy and Air Quality Action Plan to reduce levels of these harmful pollutants generally and in parts of Greater Manchester where emission levels are in breach, or are at risk of breaching, EU legislation.

The document references both the Low Emissions Strategy and the Air Quality Action Plan, both of which set out in more detail approaches to addressing these issues.

The 10 priority areas in the strategy are:

- Children starting school ready to learn;
- Young people equipped for life;
- Good jobs, with opportunities for people to progress and develop;
- A thriving and productive economy in all parts of Greater Manchester;
- World-class connectivity that keeps Greater Manchester moving;
- Safe, decent and affordable housing;
- A green city-region and a high quality culture and leisure offer for all;
- Safer and stronger communities;
- Healthy lives, with quality care available for those who need it; and
- An age-friendly Greater Manchester.

The strategy sets a number of targets for each of the priority areas. These include targets to; increase journeys by none car mode, reduce harmful emissions, and reduce premature mortality.

Greater Manchester Spatial Framework

The Draft Greater Manchester Spatial Framework (GMSF) was published by the GMCA in October 2016. The GMSF is a joint Development Plan Document, which sets out spatial strategy for housing and employment land growth across Greater Manchester for the next 20 years. The overall aim of the GMSF is to provide a sustainable plan for how Greater Manchester will meet the levels of growth expected for the city region in over the period to 2035. Greater Manchester's population is growing rapidly and is expected to grow from 2.7 million people to at least 3 million by 2040. The GMSF will

set the scale and distribution of housing and employment growth across Greater Manchester to support delivery of significant levels of growth over the next 20 years. It is expected that in the period to 2035, Greater Manchester will need at least 227,000 new homes and will have almost 200,000 new jobs.

It is expected that around two-thirds of the planned growth will be in the existing urban area, with a focus on the city centres of Manchester and Salford, and the centres of the main towns (Altrincham, Ashton, Bolton, Bury, Oldham, Rochdale, Stockport and Wigan). This pattern of growth is the most sustainable, because existing centres offer the potential to make many trips on foot or by bike, and can support more options for trips by public transport (although this concentration of activity can also expose more people to poor air quality). However, a number of large new strategic allocations outside the existing urban area have also been identified. Accommodating these new development sites without contributing to increases in numbers of trips by private car – and hence contributing to NO_x emissions – is a major challenge of the GMSF.

The document acknowledges this challenge, and states that

A highly coordinated approach will be taken to transport networks across Greater Manchester, in order to accommodate the high levels of economic growth and the associated increase in journeys whilst reducing the congestion and environmental impacts that could adversely affect growth. This will help to ensure that the whole of Greater Manchester benefits from the huge expansion of employment and leisure opportunities, and the enhanced city to city and global connectivity, in a sustainable way.

The document lists the various planned improvements envisaged to accommodate the planned growth while minimising growth in vehicle numbers and associated emissions. These include, inter alia:

- *Designing development and neighbourhoods so as to encourage journeys to be made by walking, cycling and public transport;*
- *Locating development so as to reduce the need to travel by car and the distance travelled, and maximise accessibility by public transport;*
- *Developing an integrated public transport system, with easy movement between different modes and services;*
- *Delivering a substantial increase in the capacity of suburban rail networks, including through electrification, platform extensions and improved franchise specifications;*
- *From the mid-2030s, major new cross-city transit enhancements, potentially through tunnelled metro services in the City Centre;*
- *Modifying road layouts and junctions, and managing traffic signals, to free buses from congestion and support improvements in the speed, punctuality and reliability of their services;*
- *Significantly enhancing the attractiveness of public transport in terms of the quality of the passenger and waiting environments;*
- *Increasing the uptake of ultra low-emission vehicles, including through a low emissions zone, the major expansion of electric vehicle charging infrastructure, and low emission car clubs that reduce the need for people to own a vehicle;*
- *Increasing the capacity of park and ride facilities served by high frequency rapid transit services where these can reduce the amount of traffic travelling inside the M60;*
- *Providing safe and convenient cycle routes that connect people to jobs, key services and recreation opportunities, supported by cycle hire and sharing schemes; and*
- *Enhancing the capacity, safety and attractiveness of pedestrian routes, particularly to and within the city and town centres, to support a considerable increase in walking for local trips.*

The draft GMSF also sets out approaches to improving air quality.

Major improvements will be secured in air quality across Greater Manchester, helping to minimise the detrimental impacts on human health. There will be a particular focus on tackling air pollution in the locations where most people live. The emission of air pollutants will be minimised by:

1. *Locating and designing new development so as to minimise the need to travel and maximise the use of walking, cycling and public transport for any trips;*
2. *Influencing individual travel behaviour, including through personal travel planning, especially as part of major developments, improved travel information and implementing integrated and smart public transport fares and ticketing;*
3. *Identifying employment sites that enable the movement of a higher proportion of freight by rail and water;*
4. *Reducing the use of polluting vehicles, potentially through the introduction of Clean Air Zones in the areas with lowest air quality and travel demand management measures;*
5. *Stimulating the uptake of low-emission vehicles, including through a significant increase in the provision of electric vehicle charging points in new developments, the expansion of the public charging network and bus franchising contracts;*
6. *Managing the highway network so as to minimise congestion and smooth traffic flow;*
7. *Supporting the development of urban distribution centres and urban consolidation centres served by ultra-low-emission vehicles;*
8. *Delivering major investment in improvements to walking, cycling, public transport and sustainable freight infrastructure, including through the use of planning obligations and the community infrastructure levy; and*
9. *Carefully controlling developments that would generate significant point source pollution such as some types of industrial activity and energy generation.*

It should be noted that the GMSF is still in draft stage, and is therefore subject to further change before adoption. A second draft is expected in June 2018, with the expectation that further work will be done in identifying brownfield sites in the existing urban area. This will assist in reducing the growth in vehicle emissions – since a concentrated settlement generally results in fewer car trips being made – but will increase the priority of improving air quality in Greater Manchester's cities and towns.

Greater Manchester 2040 Transport Strategy

In February 2017, TfGM published the Greater Manchester Transport Strategy 2040, which outlines a vision for Greater Manchester to have 'World class connections that support long-term, sustainable economic growth and access to opportunity for all'. There are four key elements to this vision, representing the goals of the strategy – these are shown in the Figure below.

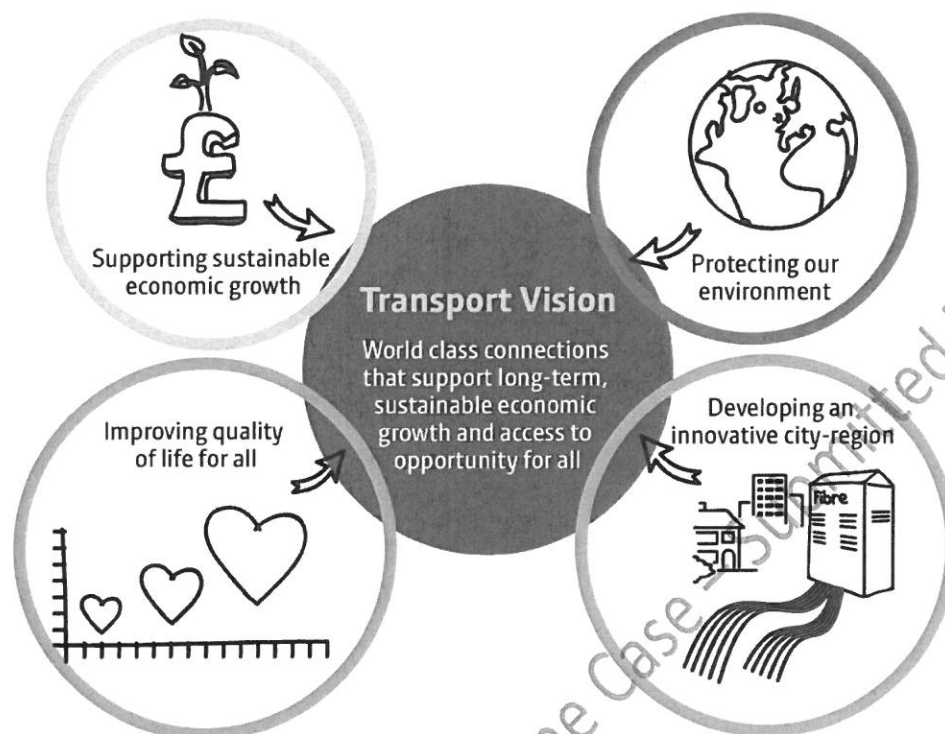


Figure 1 - Key Elements of the 2040 Vision

Clean air is an important consideration for all four of these elements. It is a critical component of both 'protecting our environment' and 'improving quality of life'; and 'developing an innovative city region' is a crucial part of the solution, both in terms of reducing the need to travel through development of digital technology, and in terms of developing cleaner, less polluting transport technologies. The imperative to support economic growth is both an opportunity and a constraint: measures to deliver cleaner air may come with an economic cost – both in terms of the implementation cost and in potentially making journeys more difficult to achieve – but may also result cities and towns which people are keener to invest in or visit.

The document sets out TfGM's ambition for environmental responsibility, which is '*For Greater Manchester to be known for the quality of its urban areas, natural environments with transport emissions reduced to near zero, and new transport schemes delivering environmental enhancements wherever possible.*' Greater Manchester's targets for reductions in emissions of NO_x, CO₂ and PM10 are set out, along with Greater Manchester's breaches of EU limits for NO₂ and the Greater Manchester AQMA.

The document states that:

Existing and planned measures, including the transport proposals in this strategy, are helping/will help to reduce emissions, however the need to reduce emissions in the context of a growing economy means that a concerted and co-ordinated effort, potentially requiring radical actions, is needed by all parties. The latest DEFRA forecasts suggest that Greater Manchester will comply with EU levels for NO₂ by 2020 if action is taken now to implement proposed interventions. We will adopt appropriate measures to reduce significantly the emissions from transport, as set out in the Climate Change Implementation Plan and the Air Quality Action Plan. We have developed a 'Low Emissions Strategy' to identify the types of measure which will have the greatest impact, given the mix of traffic in Greater Manchester. These include:

- *changing travel behaviour;*
- *reducing emissions from HGVs;*
- *stimulating the uptake of ultra low-emission vehicles; and*
- *reducing emissions from buses on key urban corridors.*

Whilst our primary ambition is to encourage a shift to more sustainable modes of travel, we recognise that some journeys will always need to be undertaken on the highway network. In these instances, our priority is to reduce the harmful emissions and population exposure levels. The ambition for smaller vehicles is a shift to a fully electric fleet. GM already has an extensive GMEV network, and we will expand this further as funding allows. For heavy vehicles we will work with the Government and other city regions with the aim of establishing a consistent policy framework to encourage an accelerated uptake of alternatively fuelled vehicles. Within GM we will work with infrastructure providers and fleet operators to encourage and facilitate a shift to alternatively fuelled vehicles or a retrofit of existing vehicles.

Policy 8 of the 2040 Strategy states that:

We will work with partners to reduce, as far as possible, the emissions from transport, particularly CO₂, NO₂, particulates and noise.

The Strategy sets out a range of policies and proposals intended to bring about the vision, with measures intended to enable easier and less polluting journeys. It will be supported by a range of sub-strategies, which will provide more detail in how the vision will be realised.

Greater Manchester Low-Emissions Strategy

The Greater Manchester Low-Emission Strategy was published in December 2016. The Strategy takes a long-term, integrated approach to carbon emissions and air quality, allowing investment to be focused to the greatest effect. It establishes a framework within which detailed action plans will be developed to reduce carbon emissions and improve air quality.

The Low-Emission Strategy gives a framework for policies and measures to:

- reduce air pollution as a contributor to ill-health in Greater Manchester;
- support the UK Government in meeting EU air quality thresholds;
- help reduce Greater Manchester's carbon footprint; and
- encourage a low-emission culture.

The Low-Emission Strategy identifies key actions which can be developed in more detail and may be included in other strategies or plans, including not only the Climate Change Implementation Plan and the Air Quality Action Plan, but also the Freight and Logistics Strategy. Given transport's contribution to emissions, the solutions in the Low Emissions Strategy are fully aligned with the Greater Manchester Transport Strategy 2040 and reflect the city region's climate change targets.

Greater Manchester Air Quality Action Plan

The Greater Manchester Air Quality Action Plan 2016-2021 (AQAP) was published by TfGM and the GMCA in 2016. The document sets out measures which will reduce air pollution while supporting the sustainable economic growth of the city-region.

The primary objectives of the plan are to improve air quality across Greater Manchester and to embed low-emissions behaviours into our culture and lifestyles, whilst supporting the Government in meeting EU thresholds for air pollutants at the earliest date. 'Key Priority Areas' are identified in the AQAP –

locations with the highest levels of air pollution near major roads and areas with heavy traffic in towns and cities – where most work will be focused.

Key Performance Indicators (KPIs) have been set to help track and measure actions:

- Reduce traffic: for example, by encouraging travellers to switch from cars to use public transport, cycle and walk more;
- Increase efficiency: improving traffic flow by reducing congestion and stop-start travel to decrease air pollution peaks and to lower emissions overall; and
- Improve fleet: by encouraging the replacement of older, more polluting vehicles with newer, smaller, cleaner, lower-emission vehicles.

Actions in the AQAP have been divided into seven main areas:

- Development management and planning regulation: including standardisation of regulation and policy across Greater Manchester;
- Freight and HGVs: to reduce emissions associated with the movement of freight and goods by road;
- Buses: buses have a vital role to play in public transport. New legislation and the development of Greater Manchester's 2040 transport strategy will assist in growing bus usage and improving vehicle standards;
- Cycling: building on existing strategies and initiatives to encourage cycling as an attractive and convenient way to travel;
- Travel Choices: encouraging the public and businesses to make sustainable travel choices is essential in improving air quality;
- Cars: measures to reduce emissions from cars and reduce the number of vehicle trips can make real improvements; and
- Information and resources: education and providing information to the public, businesses and policy makers is vital in bringing air quality improvements.

The AQAP includes a commitment to carry out a feasibility study into a Clean Air Zone to assess whether this is a feasible approach to reducing emissions without having a disproportionate impact on businesses and individuals.

A number of policy changes and interventions set out in the plan are already under delivery. Examples include – public transport infrastructure and connectivity improvements; smart ticketing roll out; fleet upgrades and refuelling infrastructure investment; development of a network of active travel infrastructure and the roll out of a supporting package of measures to encourage modal shift; work with freight and logistics operators on general fleet and operations improvements as well as specific intervention pilots.

Climate Change Strategy

Greater Manchester launched its pioneering Climate Change Strategy in 2011, setting out how it will build a greener, more sustainable region.

The strategy sets out Greater Manchester's plan to build a low carbon economy by 2020, reducing carbon emissions by 48% and reacting to the changing climate while creating future jobs and new industries in the 'green' sector. The document co-ordinates the carbon reduction plans already crafted by the ten Greater Manchester local authorities and provides an effective, integrated approach to tackling climate change.

The plan outlines four headline visions for Greater Manchester by 2020:

- A rapid transition to a low carbon economy;
- Collective carbon emissions reduced by 48%;
- Be prepared for and actively adapting to a rapidly changing climate; and

- 'Carbon literacy' will have become embedded into the culture of organisations, lifestyles and behaviours.

Manchester is already contributing to the delivery of GMCCS through Manchester: A Certain Future (MACF) and a number of programmes are being delivered in conjunction with the Association of Greater Manchester Authorities (AGMA).

Greater Manchester Highways Strategy

The Highways Strategy to 2025 is currently being developed but will set out in detail an integrated approach to the management, development and maintenance of the road network that contributes to delivering the 2040 Vision for Transport in Greater Manchester.

Greater Manchester Freight and Logistics Strategy

GM is the origin and destination of significant levels of freight distribution, delivery and servicing activity as well as acting as a through-route for logistics activities across the region.

Logistics is essential to the functioning of the GM economy and touches the lives of all its residents, businesses, workers and visitors, either through the availability of goods and services or through the impact of goods vehicles on the transport network or the wider environment. The economy depends on the efficient movement of freight, supplying goods for manufacturing and stock for retailers.

The purpose of this strategy is to consider current GM freight distribution, delivery, servicing and logistics activities and set out the ambitions of the region to maximise the economic contribution of this industry whilst minimising the social and environmental impacts, as well as balancing the often conflicting needs of freight and passenger demand for our transport network and systems. The supporting intervention plan will offer a way to achieve the objectives through a package of initiatives which carefully balances risk and reward for the region and the industries operating within it. The strategy will consider the activities of all modes of freight transport. Due to the fast-changing pace of this industry and the relative lack of information regarding long-term trends, the strategy will focus on achievements up to 2025.

The logistics objectives and supporting package of measures are designed as a balanced approach in line with the vision and key themes of the overall GM Transport Strategy 2040. There are a large number of individual interventions and packages of measures related to deliveries, servicing and logistics which could be adopted for implementation within Greater Manchester, but these need to be assessed against and adapted to the specific problems, opportunities and aspirations of the conurbation.

The GM Freight & Logistics (F&L) Strategy intends to guide and focus the activities of TfGM as well as local authority districts, partner organisations and private sector operators. Equally, the strategy will assist the private sector to invest in the appropriate assets and develop operations that reduce externalities.

The Greater Manchester Congestion Conversation

Shortly after his election in 2017, the Mayor of Greater Manchester, Andy Burnham, launched the 'Greater Manchester Congestion Conversation' as a first step to the creation of a new Congestion Plan for Greater Manchester. The document introducing the conversation set out the reasons for addressing congestion, concluding that:

Finally, and perhaps most importantly, road traffic emissions are increased by congestion, affecting our health and the environment. In Greater Manchester, road transport accounts for 65% of nitrogen dioxide and 79% of particulate emissions. These dangerous emissions have been linked to serious health conditions including cancer, asthma, heart disease and dementia. The impact on the environment is also significant with road traffic responsible for almost a third of the city region's carbon emissions.

The document discusses possible ways to alleviate congestion by reducing the volume of traffic on the roads, reflecting the approach of the 2040 Transport Strategy.

The plan is due to be published in February 2018. Given the recognised links between congestion and poor air quality, measures identified in the Congestion Plan are expected to have a positive effect on air quality.

The Cycling and Walking Strategy

In September 2017 the Mayor appointed the first GM Cycling and Walking Commissioner. As the ambassador for cycling and walking within GM, part of the Commissioner's role is to drive forward the delivery of the GM Cycling and Walking Strategy and supporting Local Cycling and Walking Infrastructure Plan.

[illegible]

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Task ID	Task Name	Task Description	Task Category	Task Status	Task Priority	Task Owner	Task Start Date	Task End Date	Task Duration	Task Progress	Task Comments
24008	Impact of measures on highway (England) [R]	The GM Clean Air Plan measures have a negative impact on highway (England).	Highway	Completed	High	John Smith	2019-01-01	2019-01-01	1	100%	Task completed successfully.
24009	Interaction with other GM measures	Interact with other measures (e.g. air quality, noise, etc.)	Highway	In Progress	Medium	John Smith	2019-01-02	2019-01-02	1	50%	Task in progress.
24010	Customer consultation required	Customer consultation is required.	Highway	Not Started	Low	John Smith	2019-01-03	2019-01-03	1	0%	Task not started.
24011	Research and evaluation of potential measures	Research and evaluation of potential measures (e.g. air quality, noise, etc.)	Highway	In Progress	Medium	John Smith	2019-01-04	2019-01-04	1	50%	Task in progress.
24012	Technology required within timescale available	Technology required within timescale available.	Highway	Not Started	Low	John Smith	2019-01-05	2019-01-05	1	0%	Task not started.
24013	Additional legal support	Additional legal support required to support the project.	Highway	In Progress	Medium	John Smith	2019-01-06	2019-01-06	1	50%	Task in progress.
24014	Legal challenge	Legal challenge to the proposed measures.	Highway	Not Started	Low	John Smith	2019-01-07	2019-01-07	1	0%	Task not started.
24015	Resource requirements - uncertainty	Resource requirements - uncertainty.	Highway	In Progress	Medium	John Smith	2019-01-08	2019-01-08	1	50%	Task in progress.

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Item ID	Item Description	Category	Phase	Start Date	End Date	Current Status	Final Status
24016	Availability of external staff	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24017	Non-availability of external staff	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24018	Additional areas may need to be included in the study	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24019	Measures do not cover the full range of requirements	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24020	Availability and capability of external resources	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24021	Whole life costs	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24022	Can entering multiple cities on the same day	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24023	Hotel compliance	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24024	Flint deployment	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track
24025	Assurance requirements	Transport Strategy	Pre-development	01/2017	03/2019	On track	On track

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