



Urban Mobility Partnership

Consumers in the driving seat

Taking control and tackling air quality across Greater Manchester

Policy Context

We live in an age of dramatic technological change. What was regarded as “cutting edge” just a few years ago can quickly become part of the accepted landscape. Electric vehicles, public transit, bike share and optimised usage of shared assets are now the key providers of urban transport.

The average age of a car on Britain’s roads is going up. 2018 official statistics released by the Department for Transport revealed that petrol cars on the road are on average 9.1 years old with diesel cars averaging 6.6 years. Almost one in five of the UK’s cars are more than 13 years old. New vehicle registrations were 3.1m in 2017, a 6% drop since 2011. The ageing profile of the UK’s car fleet and the drop in new car registrations suggests that motorists are holding onto older vehicles for longer. There is a significant issue in the UK as many consumers are unwilling or unable to give up their primary form of transport, a private car.

This is in a context where privately owned vehicles in our cities are parked 97% of the time.

Whereas shared daily rental and car club are utilised 95% of the time. Each year in the UK, around 40,000 deaths are attributable to exposure to outdoor air pollution. The health problems resulting from exposure to air pollution have a high cost to people who suffer from illness and premature death, to our health services and to business. In the UK, these costs add up to more than £20 billion every year.

A modern multi-modal transport solution for Greater Manchester

This policy paper sets out a radical approach that will not only improve the environment, congestion and air quality, but also empower citizens to be able to choose the clean, safe, and efficient modes of transport that suit their needs and the needs of their city.

Trading in their old diesel vehicles, local people across Greater Manchester will be given “Mobility Credits” (in excess of the market value of the car) that can be used to choose from a range of clean and efficient modes of transports as flexibly as suits their lives. In the form of a pre-paid card, locals will be able to use credits on trains, buses, car daily rental, boats and bikes (or whatever schemes are locally appropriate).

Not only will this get people out of older polluting vehicles (and off the driveway or the parking space) it will encourage locals to think differently about how they travel – and most importantly, the choice of how to make their journey will be in their hands.

This report, which has been commissioned by a new transport consortium, the Urban Mobility Partnership, makes a powerful case for change:

Air quality monitoring in the Greater Manchester Combined Authority (GMCA) area has shown that many areas are currently breaching annual and hourly objectives for NOx.

The health problems resulting from exposure to air pollution have a high cost to people who suffer from illness and premature death, to our health services and to business. In the UK, these costs add up to more than £20 billion every year;

In the GMCA, it is estimated that approximately 45.8% of all NOx originate from diesel cars;

This paper sets out how a £2,000 and £4,000 'Mobility Credit' scheme could operate in the GMCA area, reducing NOx emissions and encouraging travel behaviour change.

Traditional transport planning measures that encourage the use of more sustainable forms of transport and discourage the use of private car have often relied on penalising the private car user. In contrast, the Mobility Credit Scheme positively rewards the private car user for switching to more sustainable modes.



Overview

1.1 This document, produced on behalf of the Urban Mobility Partnership, provides an indicative review of the potential impact of a 2-year diesel scrappage 'Mobility Credit Scheme' in the GMCA. The scheme applies to Euro 1 to 5 vehicles only and the credits can be spent on shared transport and car hire rather than the purchase of a new vehicles.

1.2 The analysis is indicative and provides a high level overview of the impact of mobility credits with various assumptions based on publicly available data. The results are only indicative. References are included throughout.

1.3 The remainder of this document is set out as follows:

- Section 3 - Context;
- Section 4 - National and regional travel trends;
- Section 5 - Mobility Credit scheme overview;
- Section 6 - Mobility Credit Scheme – GMCA;
- Section 7 - Mobility Credit Scheme Impact - GMCA; and
- Section 8 - Summary



2. CONTEXT

National

2.1 Air pollution and poor air quality presents a great environmental risk to public health. Air pollution is known to exacerbate the impact of pre-existing health conditions, such as respiratory and cardiovascular illnesses, especially for the elderly and infants.

2.2 Each year in the UK, around 40,000 deaths are attributable to exposure to outdoor air pollution. The health problems resulting from exposure to air pollution have a high cost to people who suffer from illness and premature death, to our health services and to business. In the UK, these costs add up to more than £20 billion every year ¹.

2.3 Road traffic is recognised as the single biggest contributor of the two most harmful and widespread sources of air pollution – nitrogen oxides (NOx) and particulate matter (PM). Diesel cars are responsible for a significant proportion of NOx emissions.

2.4 Since the early 1990's, new car models have had to meet increasingly stringent exhaust pollution limits, known as Euro Emission Standards, before they can be put on sale. The Euro Standards are categorised from Euro 1 to Euro 6.



Source: Autocar

Figure 3.1 – Euro NOx Emission Standards

1. Royal College of Physicians, 'Every breath we take: the lifelong impact of air pollution'



2.5 The UK Government is increasingly aware that it must act to curb the high levels of NOx in urban atmospheres. In March 2018, the Government announced a Clean Air Fund worth more than £260 million that will be made available to local authorities to tackle roadside NOx concentrations.

2.6 Local authorities therefore have a vital role to play in tackling poor air quality in urban areas through the decisions they make on transport.

2.7 The reliance on the private car in the GMCA is a leading contributor to air pollution, including harmful NOx. According to a recent report by Transport for Greater Manchester², many locations across the combined authority have recorded annual mean NOx concentrations above or close to the EU limit of 40µg/m³. In fact, annual mean concentrations of the order of 65µg/m³ have been measured, which gives some indication of the challenge the region faces.

2.8 According to Greater Manchester Combined Authority, approximately 45.8% of all NOx emissions from vehicles in Greater Manchester originate from diesel cars, as illustrated in Figure 3.2.

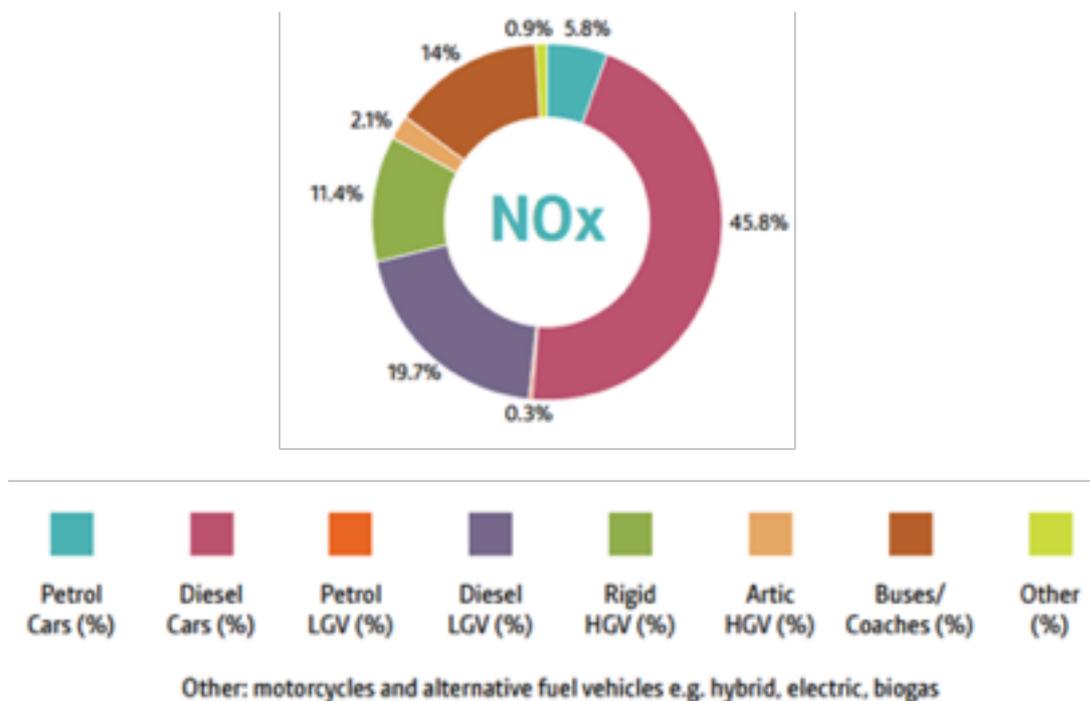


Figure 3.2 – Greater Manchester NOx Emissions

2.9 Office for National Statistics (ONS) car ownership data has been analysed to determine the total number of cars in the GMCA. From this, it is estimated that there are approximately 3,450,000 cars.

2.10 Vehicle Licensing Statistics for 2017 show that nationally, 40% of cars licensed in the UK are diesel, which, when applied to the estimated number of cars in the GMCA, corresponds to approximately 1,380,000 diesel cars.

2. Greater Manchester Air Quality Action Plan 2016 - 2031

3. DfT Vehicle Licensing Statistics 2017 Table VEH0211a



3. TRAVEL TRENDS

National

3.1 Whilst the private car remains the primary mode of transport within the UK, as a society we are becoming more concerned about the adverse impacts of transport on climate, health and quality of life and about our own travel experience as congestion mounts.

3.2 This is supported by results of the National Travel Survey 2005-2015 (Figure 4.1), which demonstrates that the average distance travelled by car has decreased by nine percent over the 10 year period, whilst the distances travelled by sustainable transport modes, such as cycling, bus and train, have increased by up to 50%.

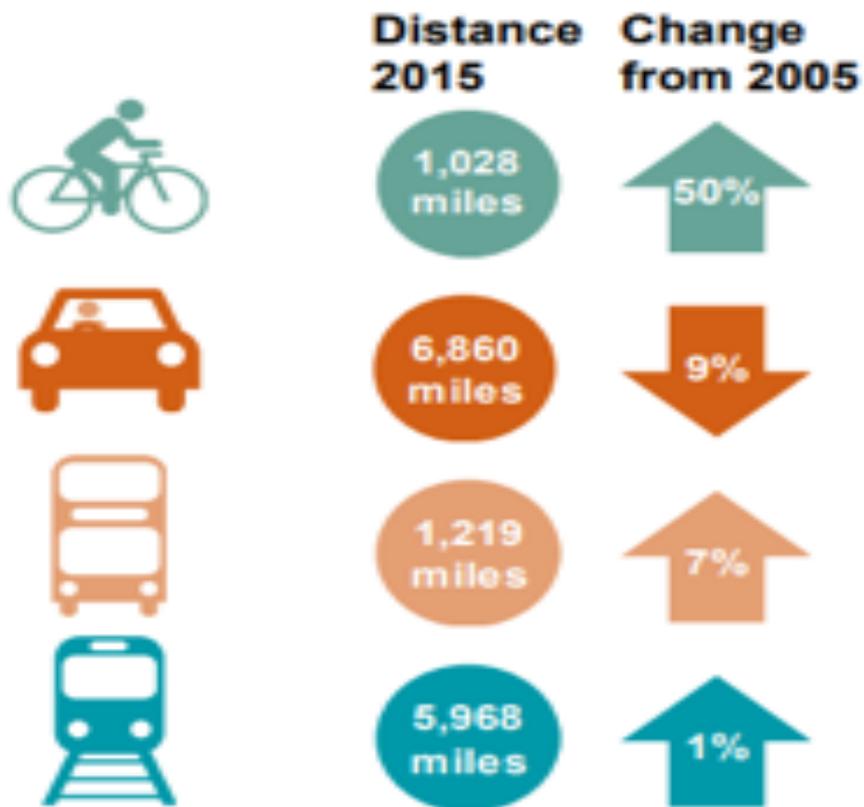


Figure 4.1 – National Travel Survey 2005-2015 Results

4. National Travel Survey, Mode Use 2005 - 2015



Greater Manchester Combined Authority

3.3 The majority of car trips occur during the peak commuting hours. 2011 Census travel to work data has been interrogated and the results presented in Figure 4.2 illustrate the reliance on the private car for employment based trips in the GMCA.

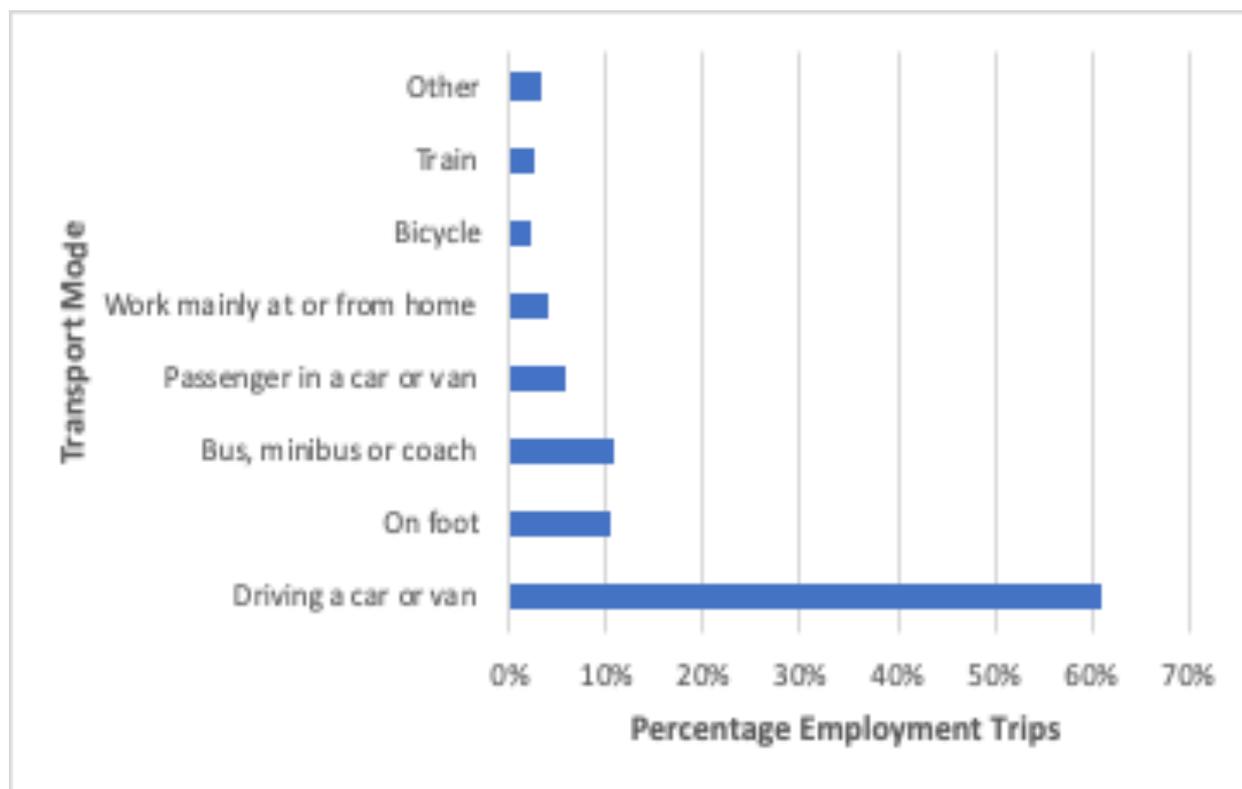


Figure 4.2 – 2011 Census Data, Existing GMCA Employment Trips Mode Split

3.4 Across the GMCA it is the vision of the Greater Manchester Transport Strategy 2040 to provide 'world class connections that support long-term, sustainable economic growth and access to opportunity for all'. Specifically, the vision aims to support economic growth, develop an innovative city region, improve quality of life for all and protect the environment.

3.5 Furthermore, the Greater Manchester Air Quality Action Plan (2016-21) sets out measures which will reduce air pollution whilst supporting economic growth in the area. Key Performance Indicators of the Air Quality Action Plan include reducing traffic by encouraging sustainable travel uptake and encouraging the replacement of older, more polluting vehicles with cleaner, low emission vehicle.

3.6 Achieving the vision of the Greater Manchester Transport Strategy and Air Quality Plan will require behavioural change through the promotion of shared transport which is the aim of the proposed Diesel Scrapage Mobility Credit Scheme.



4. MOBILITY CREDITS SCHEME OVERVIEW

Previous Diesel Scrappage Schemes

4.1 The first diesel car scrappage scheme was enrolled in 2009. The Government agreed to provide £1,000 towards the cost of a new car, in return for scrapping of a diesel car that was greater than 10 years old. Whilst this scheme promoted a switch to less polluting cars, it also promoted private car ownership.

Proposed Diesel Scrappage Mobility Credit Scheme

4.2 The proposed Mobility Credit Scheme would ask participants to scrap their diesel cars Euro 1 to 5 to access Government funding over a period of two years. Whilst previously the scrappage funding was provided as a contribution towards a new car, the Mobility Credit Scheme will provide funds for participants to expend on shared transport and car hire.

4.3 It is considered that the proposed Mobility Credits scheme presents a cost-effective use of the Clean Air Fund as, not only will the scheme remove some of the most polluting diesel cars from the roads, but it will also provide greater additionality through behavioural change – which could over time reduce the number of private vehicles on UK roads.

4.4 This report continues to assess the effects on NOx emissions on a £4,000 and £2,000 Mobility Credit Scheme in the GMCA.



5. MOBILITY CREDITS SCHEME - GMCA

Push Factors

- Potential implementation of a charging Clean Air Zone in the GMCA2;
- Depreciation of diesel cars as consumers anticipate Government restrictions
- Lower Euro rated diesels will have a market value of considerably less than £4,000

Push Factors

- Mobility Credits worth £2,000 or £4,000 (scheme dependent) that can be redeemed on bus and rail travel as well as shared ownership schemes.

Mobility Credits and Shared Transport Equivalent Cost

5.4 Census 2011 Journey to Work data has identified that over 85% of GMCA residents work in the GMCA area. The current costs of travel by rail, bus and shared transport schemes within the GMCA area has been compared against the value of the Mobility Credit Scheme and summarised in Table 6.1 below.

Journey	Trip Classification	Likely Travel Mode	Price per Annum	£4,000 Mobility Credit	£2,000 Mobility Credit
GMCA - Unrestricted	Employment & Non-Employment	Bus	£540 ⁷ or 600 ⁸	7.4/6.7	3.7/3.3
Unrestricted	Non-Employment	Car Club and Daily Rental	£1,600 ⁹	2.5	1.3
GMCA - Unrestricted	Employment & Non-Employment	Rail	£990 ¹⁰	4.0	2.0

Table 6.1 – Mobility Credits and Shared Transport Equivalent Cost

6. Research undertaken by Motorway.co.uk





5.5 It is demonstrated in Table 6.1 that, for a typical GMCA commuter, a £4,000 Mobility Credit Scheme could provide the participant with over seven years of free travel if using the bus to commute to work within the GMCA.

5.6 However, the true benefit of the Mobility Credit Scheme is the flexibility it provides to the user, allowing them to choose a mode of travel that is appropriate for the occasion. In addition, the participant will benefit from no longer having to finance a car that, for the average city resident, remains stationary for 97% of the time.

5.7 It is assumed that the Mobility Credit Scheme will be more economically attractive to owners of older diesel cars, which have a lower market value. A summary of diesel car standards is provided in Table 6.2 below.

Euro Standard	Year of Implementation
1	1992
2	1996
3	2000
4	2005
5	2009
6	2014

Table 6.2 – Diesel Car Standards

7. Arriva – Greater Manchester Area (Annual Adult)

8. First Greater Manchester (Annual Adult)

9. Enterprise Car Club – Standard Plan Annual Membership plus 6 hours use per weekend (excl. mileage cost)

10. National Rail Enquiries (http://www.nationalrail.co.uk/times_fares/pr93c0eae9d4653b48ac9b0307154fb.aspx)

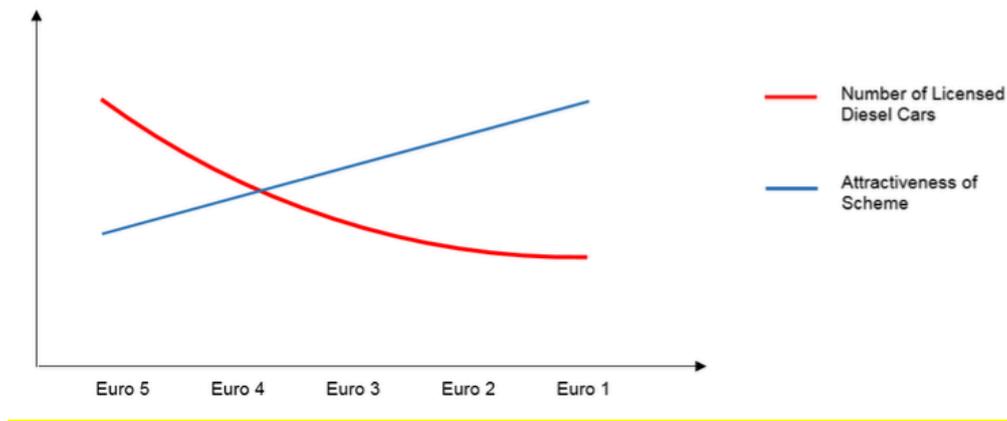
11. Europcar (2010) Stress and the Chassis – The Cost of Dormant Urban Motors to Our Pockets



Euro Standard	Year of Implementation
1	1992
2	1996
3	2000
4	2005
5	2009
6	2014

Table 6.2 – Diesel Car Standards

5.8 Figure 6.1 illustrates the forecast relationship between the attractiveness of a Mobility Credit Scheme to owners of Euro 1 – 5 category diesel cars.



£4,000 Mobility Credit Scheme

Figure 6.1 – Mobility Credit Scheme Uptake

5.9 It has been assumed that £4,000 worth of Mobility Credits is equivalent to the market value of the majority of Euro 1 – 4 diesel cars (diesel cars registered between 1992 and 2009).

5.10 Chapter 3 identified that there are approximately 1,400,000 diesel cars in the GMCA.

5.11 The Department for Transport (DfT) vehicle licensing statistics has been interrogated to determine the percentage of diesel Euro 1 – 4 cars licensed in the UK in 2017. This percentage has then been applied to the number of diesel cars licenced in the GMCA to determine the number of diesel Euro 1- 4 cars in the GMCA.



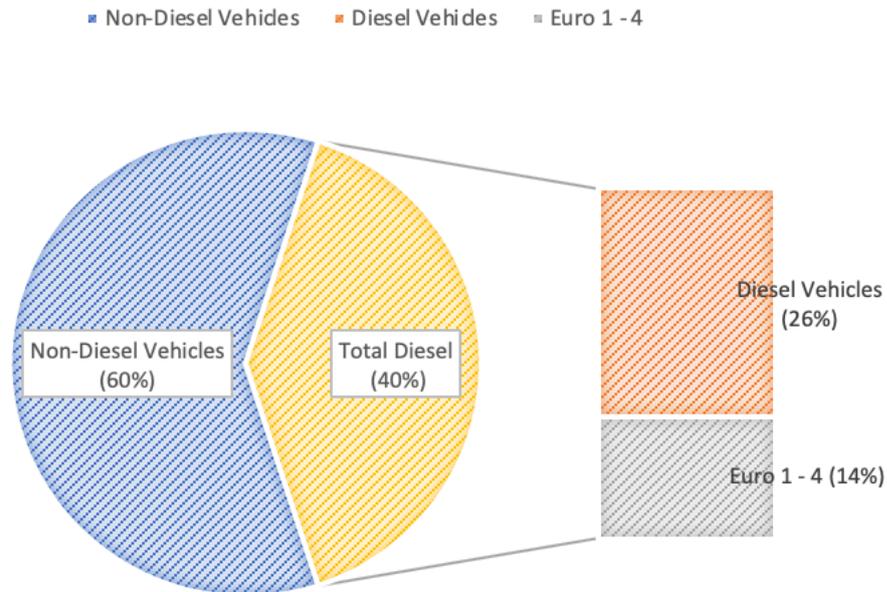


Figure 6.2 – GMCA Registered Diesel Cars

5.12 In accordance with Figure 6.2, it is estimated that there was approximately 480,000 Euro 1 – 4 diesel cars registered in the GMCA in 2017.

£2,000 Mobility Credit Scheme

5.13 It is assumed that £2,000 worth of Mobility Credits is equivalent to the market value of the majority of Euro 1 – 3 diesel cars (diesel cars registered between 1992 and 2005). By using the DfT vehicle licensing statistics, it is estimated that approximately 190,000 diesel cars licensed in the GMCA are Euro category 1 – 3.



6. MOBILITY CREDITS SCHEME IMPACT - GMCA

Forecast GMCA NOx Emission Savings

6.1 Average NOx emissions for each Euro standard, as set out in Chapter 1, have been applied to the estimated number of diesel cars in the GMCA that could participate in either the £2,000 or £4,000 Mobility Credit Scheme.

6.2 Estimated NOx emissions resulting from a 100%, 70% and 50% uptake of the £2,000 and £4,000 Mobility Credit Schemes have been calculated and the results summarised in Table 7.1 and Table 7.2 below. As a worst case assumption it has been assumed that no Euro 5 car owners participate in the scheme and that the participating vehicles have an annual average mileage of 10,400 miles .

£4,000 Mobility Credit Scheme (Euro Standard 1-4)		
% Uptake	Number of Cars in the GMCA	NOx Emission Savings (kg/year)
100%	483,601	2,993,914
70%	338,520	2,095,739
50%	241,800	1,496,957
30%	145,080	898,174
20%	96,720	598,783
10%	48,360	299,391
5%	24,180	149,696

Table 7.1 - £4,000 Mobility Credits Scheme NOx Emissions Savings

£2,000 Mobility Credit Scheme (Euro Standard 1-3)		
% Uptake	Number of Cars in the GMCA	NOx Emission Savings (kg/year)
100%	185,747	1,747,098
70%	130,023	1,222,969
50%	92,873	873,549
30%	55,724	524,129
20%	37,149	349,420
10%	18,575	174,710
5%	9,287	87,355

Table 7.2 - £2,000 Mobility Credits Scheme NOx Emissions Savings

13. BVRLA/Ecuity Mobility Credits: economic analysis (2017)



6.3 Table 7.1 illustrates that, assuming a 100 percent uptake, a £4,000 Mobility Credit Scheme in the GMCA could be associated with approximately 2,993,914kg/year NOx emission savings. Comparatively, a £2,000 Mobility Credit Scheme could result in approximately 1,747,0989kg/year NOx emission savings.

Forecast GMCA Mode Shift

6.3 Table 7.1 illustrates that, assuming a 100 percent uptake, a £4,000 Mobility Credit Scheme in the GMCA could be associated with approximately 2,993,914kg/year NOx emission savings. Comparatively, a £2,000 Mobility Credit Scheme could result in approximately 1,747,0989kg/year NOx emission savings.

6.4 To forecast the effect of the Mobility Credit scheme on other modes of transport the effect on modal shift and mode share has been analysed.

6.5 By distributing the estimated number of diesel cars removed by a £4,000 Mobility Credit Scheme under 100%, 70% and 50% uptake scenarios, and distributing these trips across more sustainable modes of transport, in accordance with the existing mode share, the forecast mode shift across the GMCA for employment based trips has been forecast.

6.6 The results indicate that a GMCA Diesel Scrappage Mobility Credit scheme could:

- Decrease peak hour travel to work by car trips by approximately 156,000 – 313,000;
- Increase peak hour travel to work by bus by approximately 86,000 – 43,000;
- Increase peak hour travel to work by train trips by approximately 10,000 – 21,000; and
- Increase peak hour travel to work by category 'other' which for this purpose includes car club and daily rental trips by approximately 52,000 – 104,000.

6.7 This is demonstrated on Figure 7.1 below.

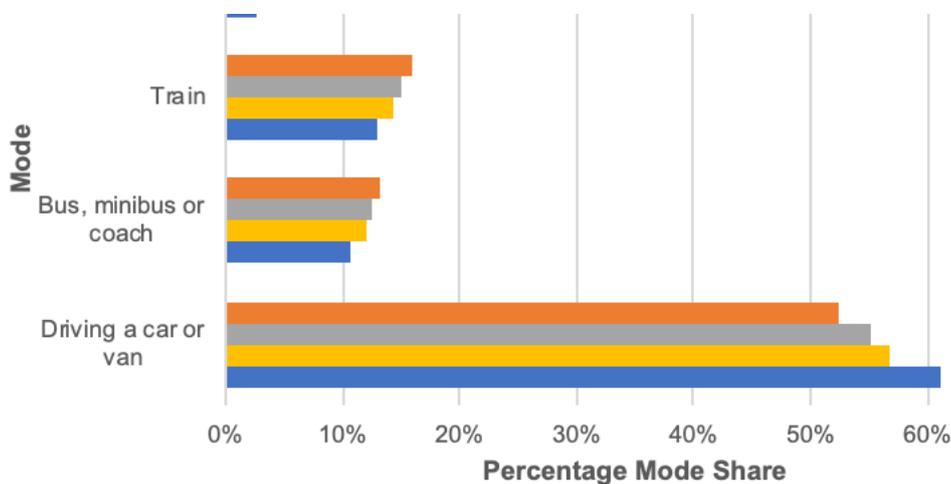


Figure 7.1 – Forecast GMCA Mode Shift



7. SUMMARY

7.1 The indicative analysis presented in this report suggest that a £4,000 GMCA Diesel Scrappage Mobility Credit scheme could result in a 1-2% increase in bus mode share, 1-3% increase in train mode share and a 1% increase in car club, daily rental and other shared transport use modes.

7.2 A summary of the effects of the different take up percentages for a £2000 and £4000 GMCA Diesel Scrappage Mobility Credit scheme compared against the EU emissions limit are included in Table 8.1 and Table 8.2 below.

7.3 The indicative results show that a 100% uptake of the £4000 mobility credit scheme would result in the GMCA reaching within 42% of the EU limit of 40µg/m3. However, it is noted that these results are based on the highest recorded average annual NOx concentrations in the GMCA of 66µg/m3. As set out in the Greater Manchester Air Quality Action Plan 2016 – 2031, the majority of sample locations within the GMCA are closer to the 40µg/m3 limit. Therefore, it is considered that applying the same reductions to these locations will result in the NOx target being achieved or exceeded.

Assumed Mobility Credit Take-up (Euro 1-4)	% Difference in annual NOx from EU Target
0%	63%
5%	61%
10%	60%
20%	58%
30%	56%
50%	52%
70%	48%
100%	42%

Table 8.1 - £4,000 Mobility Credits Scheme Impact on Maximum Annual Mean EU NOx Emission Limit

Assumed Mobility Credit Take-up (Euro 1-3)	% Difference from EU Target annual NOx
0%	63%
5%	62%
10%	61%
20%	60%
30%	59%
50%	56%
70%	54%
100%	50%

Table 8.2 - £2,000 Mobility Credits Scheme Impact on Maximum Annual Mean EU NOx Emission Limit

