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Manchester Urban Institute

Governing Urban Transformation

Introducing Congestion Charging in Manchester.

Lessons Learnt from London and Stockholm.

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Author declaration:

I Alex Miller confirm that this report is based on my own work and that I am happy with both my own and my partner's Connor Wigley contribution to the final submitted version.

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Executive Summary

In 2008 the citizens of Greater Manchester voted unanimously against introducing a congestion charge across the region. Almost 10 years on from this referendum and in line with the city's rapidly expanding sustainable agenda there is scope for reassessing the feasibility of carrying out a second referendum. This report recommends that based on the lessons learnt from Stockholm, Manchester should carry out a 6 month trial of congestion charging in a newly defined central zone, before re-opening the question to its citizens. This is advised as it was found that initially voters tend to be against implementing such charges but after experiencing the benefits of a calmer city centre there tends to be a swing in general opinion. Secondly, this report reveals that despite the logic that taking cars off the road via congestion charging should improve air quality, in London it was uncovered that congestion charging had very little effect on improving air quality. It is recommended that further study be undertaken to assess the feasibility of Greater Manchester implementing a Low Emissions Zone that covers a much wider area than the congestion charging zone, just as in London. It is thought that by exploring the possibility of introducing these measures Manchester can become a more people-friendly, sustainable and crucially, liveable city.

Introduction

In recent times, there has been an increasing culture of using road charging schemes to reduce congestion and improve air quality in city centres (Eliasson,2014). The successes in many of these places are undeniable, although as figure 1 highlights, proposals for similar schemes have been rejected in some instances (Borjesson et al. 2012).

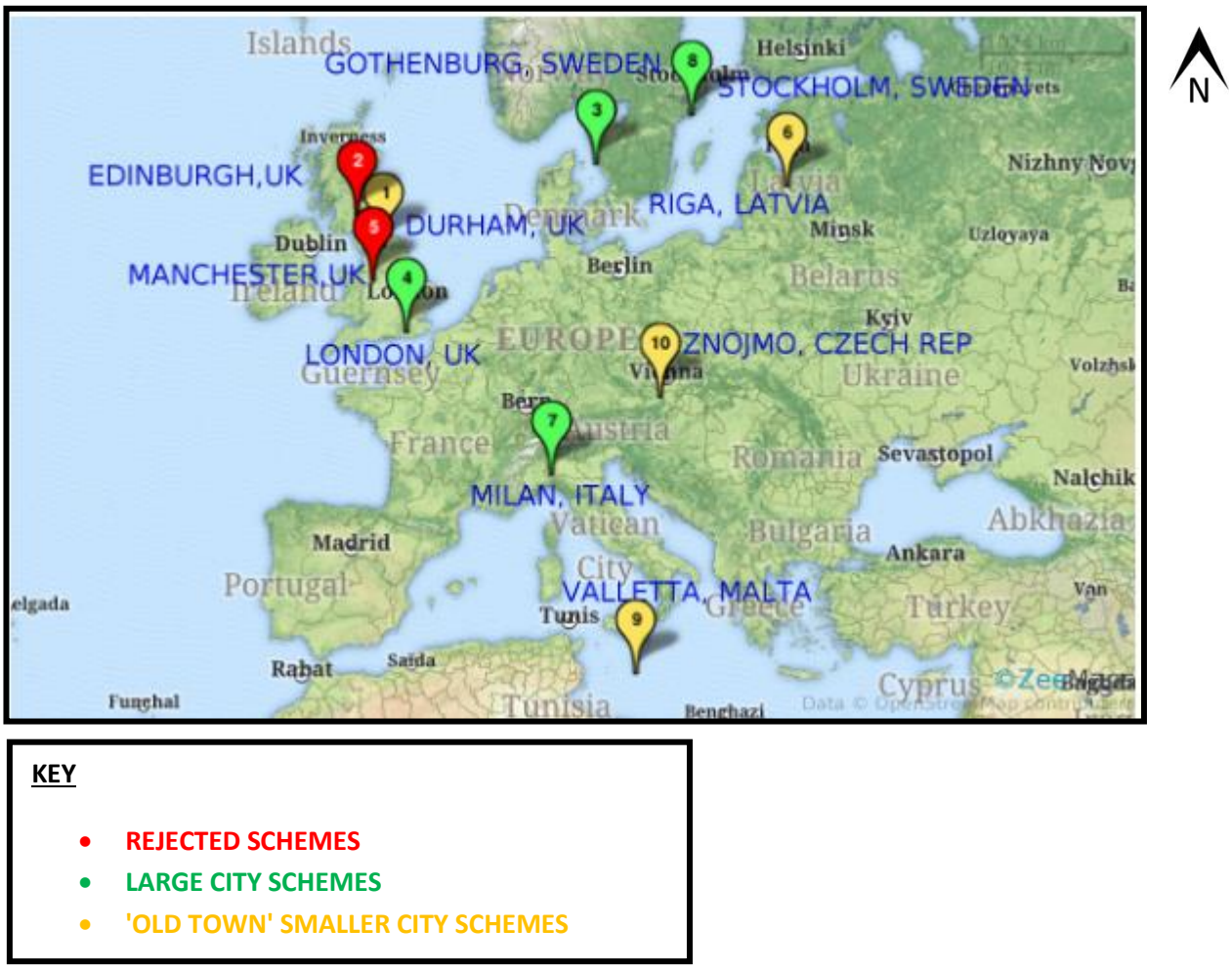

Figure 1. Congestion Charging Scheme in Europe

Though it was long believed that both a lack of funding and technology were the main barriers to the implementation of charging schemes, recent studies have found that a lack of acceptability from both the public and politicians in the planning phase of such projects have proved to be the main cause of prevention (Ahmed, 2011). Despite this, in many cases initial opposition to plans has turned into support once systems have been trialled and established.

With issues of congestion (MEN, 2014) and air pollution (MCC, 2017) both posing challenges for Greater Manchester at this moment in time, this report seeks to recommend to the Greater Manchester Combined Authority (GMCA) that it should reconsider the potential to introduce a Congestion Charge(CC) within the region, in spite of the 2008 referendum where plans for a charge were met with overwhelming opposition. Specifically, it will advise an initial trial period of 6 months within Manchester city centre, before offering a second referendum on the scheme for the people of Greater Manchester. The following two questions will be explored to discover how such a trial could be implemented successfully, based on the lessons learned in cities where a charge already exists in order to tackle the issues of congestion and air pollution.

1. **How was a congestion charge introduced in the cities of London and Stockholm, and has this charge been successful in reducing traffic and air pollution?**
2. **What lessons could Manchester learn from the experiences to date in these places?**

With council chief Sir Howard Bernstein recently admitting that the 2008 policy had been a mistake as it had not accommodated the 'day to day political and practical implications' of such a radical move, it is unsure whether the scheme would have succeeded at the time (MEN, 2017). However, nearly 10 years on, Manchester has a renewed focus with regards to the environment and its transport system. In order to achieve commitments on climate change set out in *Our Manchester Strategy* (manchesterclimate.com,2017) and to meet GMCA's own vision of a transport network that supports sustainable growth in the city by 2040 (TfGM, 2015), it is believed that trialling a charge is necessary to garner public, and indeed, political support. The report will briefly profile both London and Stockholm before going on to discuss lessons that could be useful for the GMCA when considering proposing a second congestion charge referendum in Manchester.

Context

2008 Referendum

In 2008, GM outlined plans for a congestion charge (CC) to be implemented in certain areas of the region. Figure 1 shows the plans for the 80sq mile zone, which consisted of an outer ring, following the M60 orbital motorway of the city, and a second inner ring, surrounding the city centre (BBC, 2008a). Charges were suggested for peak times in the morning (7:00-9:30) and evening (16:00-18:30). In total, a maximum of £5 per day was the suggested charge for commuters entering and leaving the inner ring from outside the boundary of the M60 during the listed times (roadtraffic-technology, 2008).

Despite the project showing early promise for commission with the backing of seven out of ten local metropolitan borough councils, the people of GM voted unanimously against the proposed congestion charge, with a total of 79% of the turnout voting no. It was suggested that the result of the vote was skewed by the economic recession in Britain, with people unwilling to pay a charge during times of economic downturn (BBC, 2008a). Ahmed's (2011) review of the scheme tended to this belief, additionally suggesting that the preconceived negative thoughts around road charging in general lead to such a large proportion of no votes. The behaviour of political actors, especially from the then-opposing Conservative party, was also cited as a key factor for the region's rejection of the scheme, as the Labour government's ambitious plans were stated as "ill thought out" (Guardian, 2008).

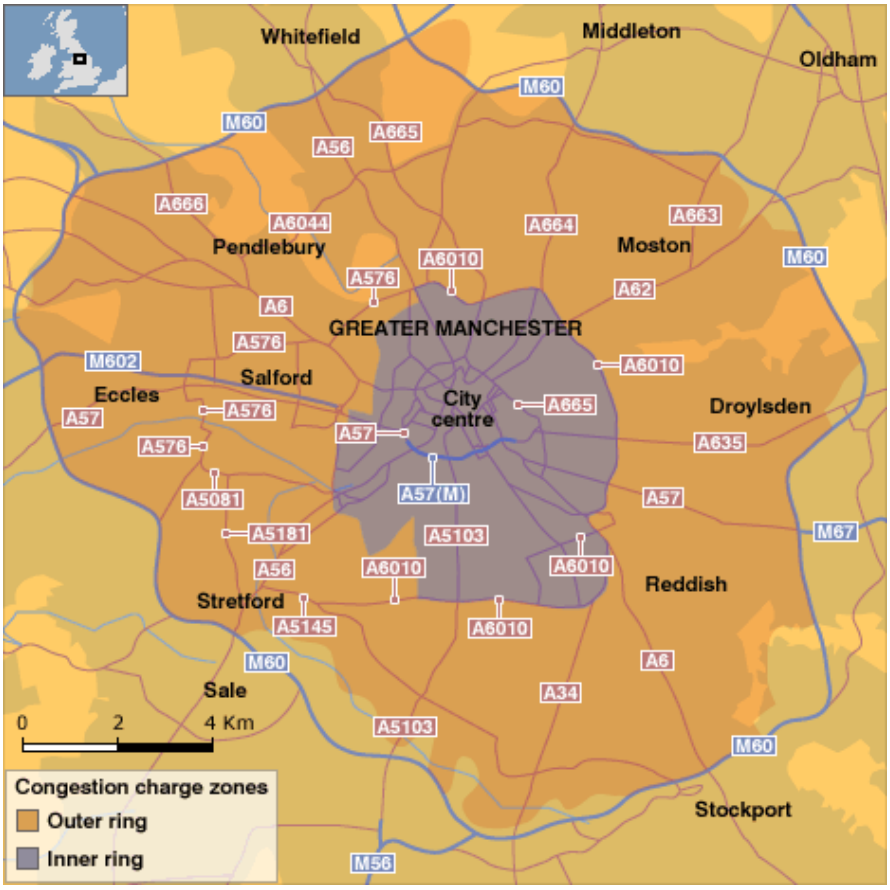

Figure 2: A map showing initial plans for a CC within GM (BBC,2008a).

Manchester congestion and air quality issues

Congestion is currently a huge issue in GM. Traffic information company Inrix found that Manchester was the second most congested city in the UK behind London (ITV, 2017), with hold-ups in 2016 reaching direct and indirect costs of £31 billion. As figure 3 highlights, the issue has become more prominent in recent times, with congestion levels in the city increasing gradually year on year since 2008. TfGM (2016) recognise that congestion and early economic growth generally correlate, and hence have stressed the need to decouple the two in order to prevent hindering economic development in the future. As TfGM (2016) realises the potential for an extra 100,000 jobs to be created in Manchester city centre by 2040, it is evident that road traffic could present a serious challenge to economic and growth aspirations in the region, and as such a strategy is needed to mitigate the possible impacts.

Figure 3 A graph showing the increase in congestion levels in Manchester, 2008-2016. (tomtom.com,2016)

Air pollution from road traffic has too proved problematic in the GM region. In 2015, around 4.3% of all deaths in people aged 30+ in Manchester could be attributed to long-term exposure to the current levels of man-made PM10 air pollution (MCC, 2017.p4), ranking third out of the Core Cities. The region also currently exceeds UK NO_2 limits (TfGM, 2017), and with associated health risks from both including cardio-vascular problems and cancer (Defra, 2007), the need to reduce both is greater than ever. With the majority of both PM_{10} and NO_2 resulting from road traffic within GM, reducing the amount of cars on the region's roads could significantly improve the health of residents.

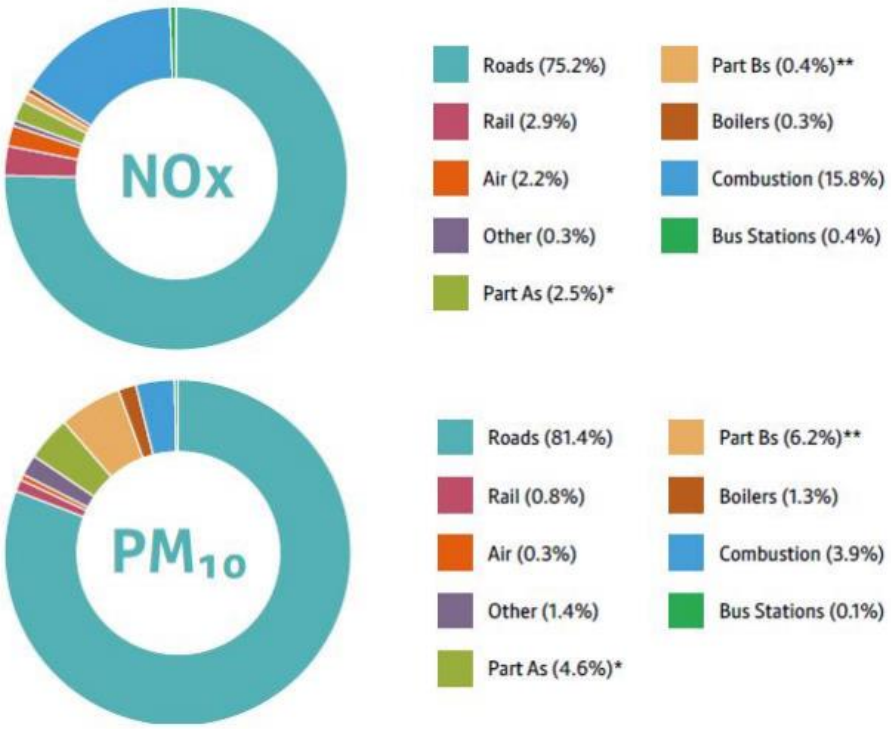

Figure 4: ***Contribution by GM transport to PM10 and NO_x levels. (TfGM,2016)***

Methodology

At the most basic level, secondary data analysis is concerned with the analysis of data or information that was collected by someone else or for a different purpose (Cnossen, 1997). By taking such an approach, questions of *what, where* and *why* something is happening can be answered to provide context for a new study in to a similar research topic (McCaston, 2005). In this instance, data and information on existing schemes to reduce traffic congestion and air pollution in cities which were deemed "similar" to Manchester was reviewed. London and Stockholm were identified as two notable examples for the context of this study; the former providing the only existing example of a congestion charge in the UK context, while the latter provided an example of an area with a similar metropolitan population to that of Manchester. The longevity of both existing schemes also provided a strong base for comparison for a possible similar strategy for Manchester city centre, with the evidence reviewed being based on 12 years of previous studies in London and 7 years in Stockholm. Though it was realised that certain demographics between the three places would vary slightly, early research dispelled other cities (Singapore, Milan) that may have substantially impaired making a reasonable judgement for Manchester. Hence, given the availability of existing data and time constraints on this particular study, basing judgements on only two similar contexts can be justified.

Findings 1: Lessons From London

Congestion Charging Profile

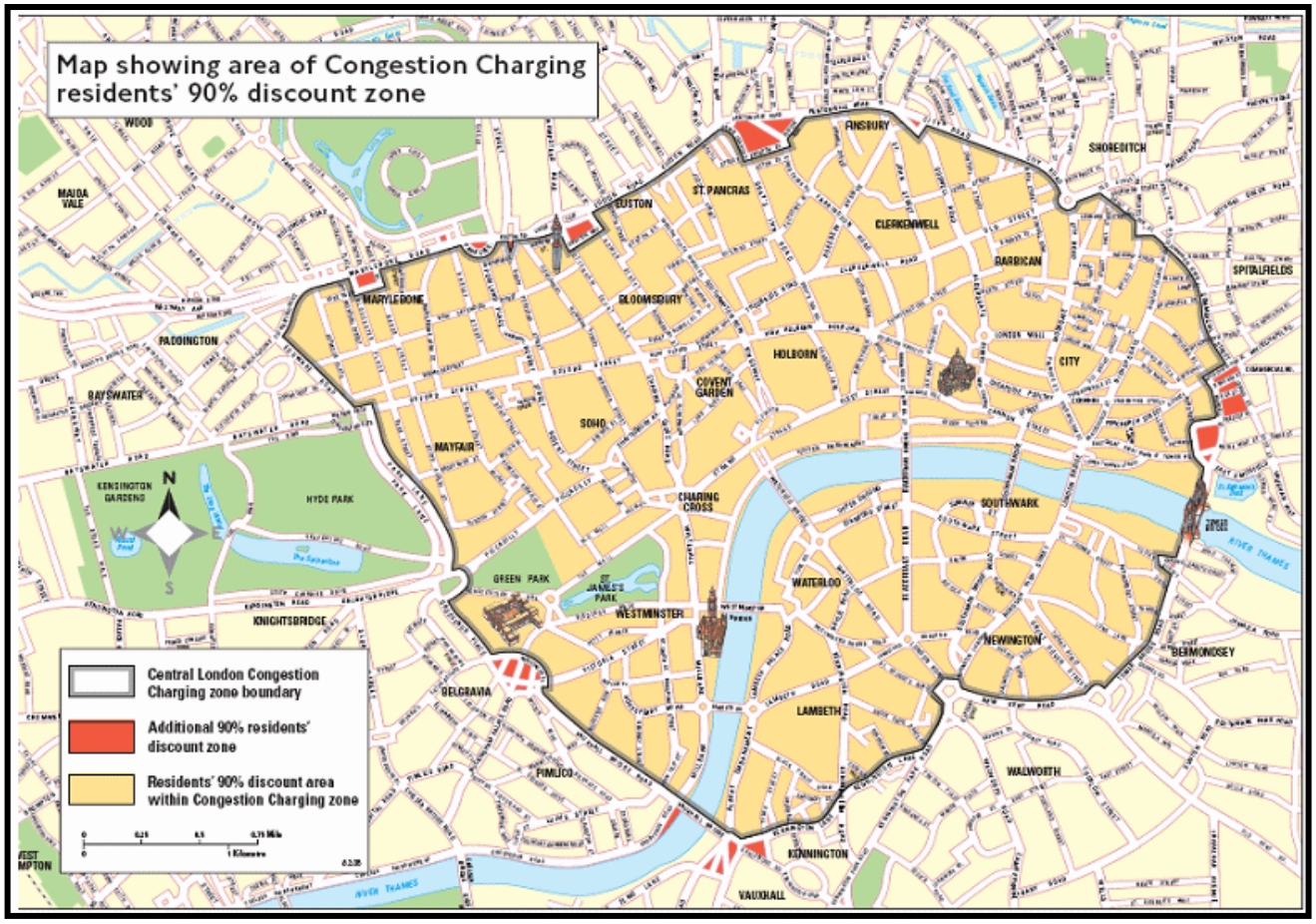

Figure 5: The London Central Congestion Charging Zone(Institute for Transport Studies at the University of Leeds,2005)

Population of Greater Metropolitan Area	8.6 million
Date Introduced	February 2003
Daily Charge at introduction (£)	£5
Change in all traffic entering charging zone in first year (%)	-14%
Change in traffic entering charging zone against baseline figure after 5 years (%)	-16%
Initial Cost of Installation (£)	£161.7 Million
Revenue generated after first year (£)	£190 Million
Change in NO_X emissions (after first year) (%)	- 16% *
Change in PM10 emissions (after first year) (%)	- 16% *

Table 1: Statistics relating to the London Congestion Charge (TfL, 2004;2008, BBC,2006)

Discussion Points

The London CC was introduced by then Mayor Ken Livingston in 2003, noticeably without a public referendum. The report (TfL,2002,p.9) discussed the intended outcomes of the initiative; it was thought the CC would reduce congestion whilst also procuring the much needed funds to upgrade the city's public transport options. The report however does make it explicitly clear that the "expected impact of congestion charging on air quality would be barely discernible" (p.81). It was stated that changes to primary emissions "do not inevitably translate into the equivalent improvements in air quality" (ibid).

Despite TfL (2004,2008) quantifying that the CC had produced a 16% reduction in both NO_X and PM10 emissions, as predicted this did not result in any significant improvement to air quality in the central zone as a whole. A number of studies have attempted to uncover why there has been little improvement in air quality despite 1 in 5 cars being taken off the road in the central zone. Callaway (2008) discusses how that the decrease in car traffic was partly offset by the increased numbers of busses and taxis in the zone. Reduced flows do however contribute to a be 'significant reduction' in NO_X and PM10 due to the increased speed at which vehicles can travel, this factor is found to be as important as actual change in vehicle numbers (Beevers and Carslaw,2005).

London however has taken action to tackle the emissions of its public transport alongside the CC. The London Routemaster was identified as a key culprit in polluting the city environment as its filter traps diesel soot yet fails to capture NO_X and CO (Callaway,2008). Coyle (2009) presents a number of initiatives which have been introduced to tackle this problem. From 2009 all diesel busses will be retrofitted with Diesel Particulate Filters which reduce the emissions of PM10 by up to 90% and as such brings the busses in line with EU emissions standards. Coyle (ibid) also reports how TfL will start introducing a fleet of Hydrogen Fuel Cell busses in 2010 which will contribute to the city's attempts to be carbon neutral at source across the entire bus network. Figure 6 below reveals the predicted reductions in emissions of NOx and CO_2 from busses in London as a result of the new environmental initiatives rolled about by TFL. In 2008/09 emission levels are high for both pollutants but sharply reduce by 19% and 11% for NO_X and CO_2 respectively. This reveals

that expected improvements to public transport can do much for improving the air quality of the city that a standalone CC.

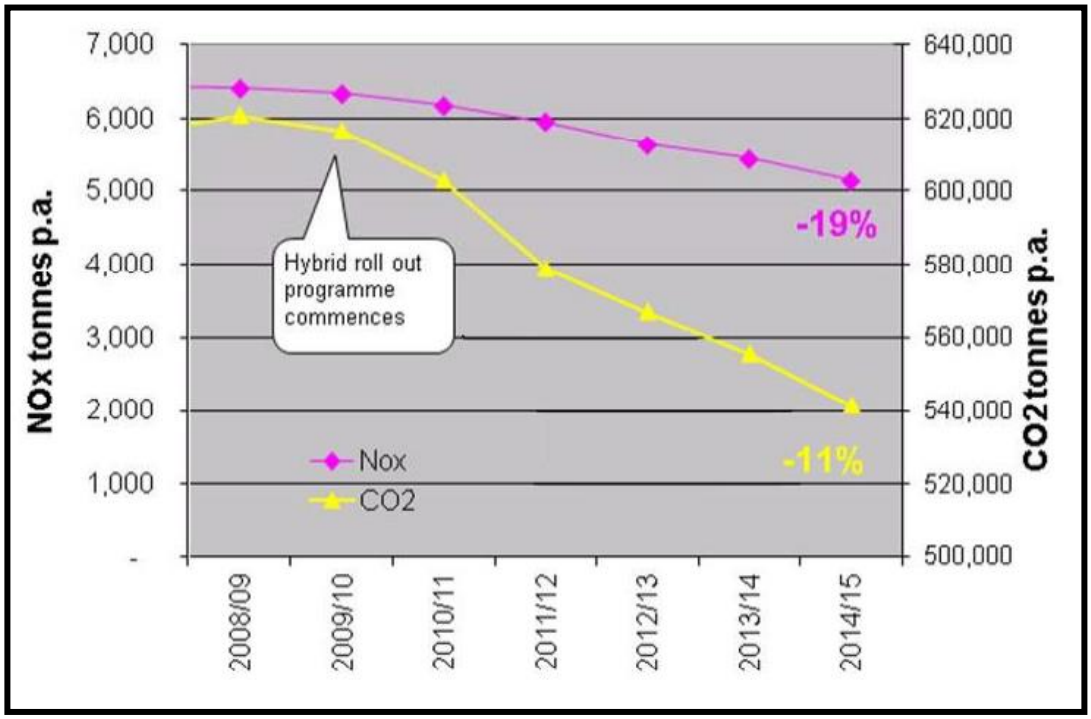

Figure 6: Predicted Implication of Environmental Initiatives on London Bus Emissions (Coyle,2009)

Since 2008 London has been operating an extension to its CC scheme which aims to improve air quality across the city. The 'Low Emissions Zone' (LEZ) operates across the whole of Greater London, an area significantly larger than the central congestion zone (see figure 7). The LEZ was needed as in 2005 the London Air Quality Network (Fuller and Green,2006,p.3) reported that 'almost all roadside monitoring points across Greater London exceeded average limits for NO_X'. The scheme required all vehicles to reduce its emissions in line with the European emission standards relating to PM (European Commission,2017) or pay a fine of £100 for every day its driven. Studies have proven the success of this zone in improving air quality and thus the associated health benefits, Jones (et al.2012) report that at one site on Marylebone Road emissions of PM had reduced by as much as 65%. If Manchester has real ambitions to improve the air quality it must seriously consider the possibility of introducing a LEZ similar to London. Understandably, this would require a large amount of

public education and engagement and considerable financial commitment. It is recommended that a report be commissioned that looks into the feasibility of this initiative.

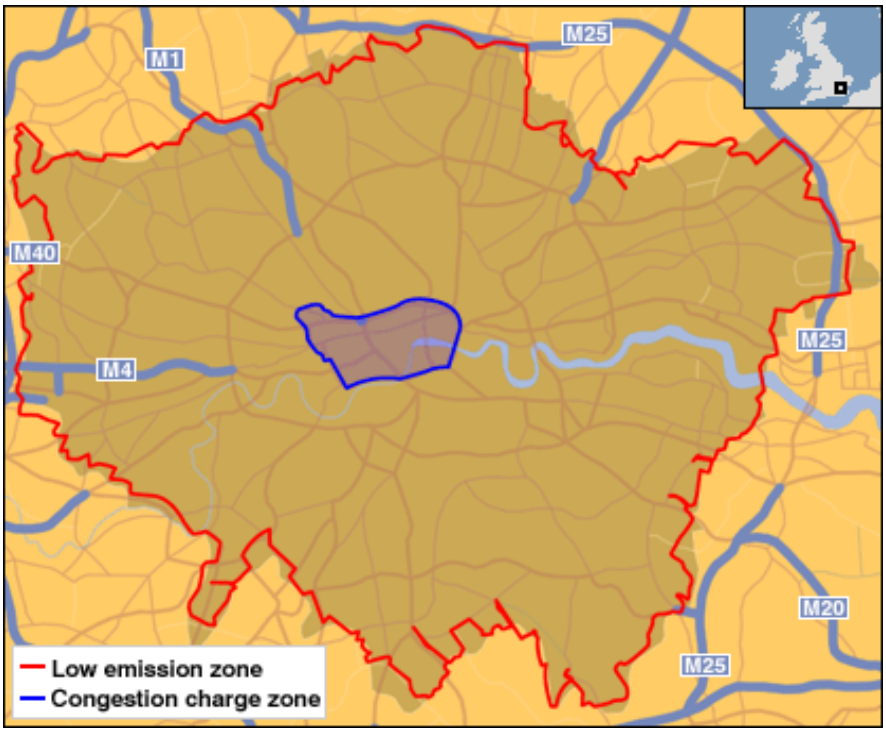

Figure 7: The London CCZ and LEZ (BBC,2008b)

Findings 2: Lessons From Stockholm

Congestion Charging Profile

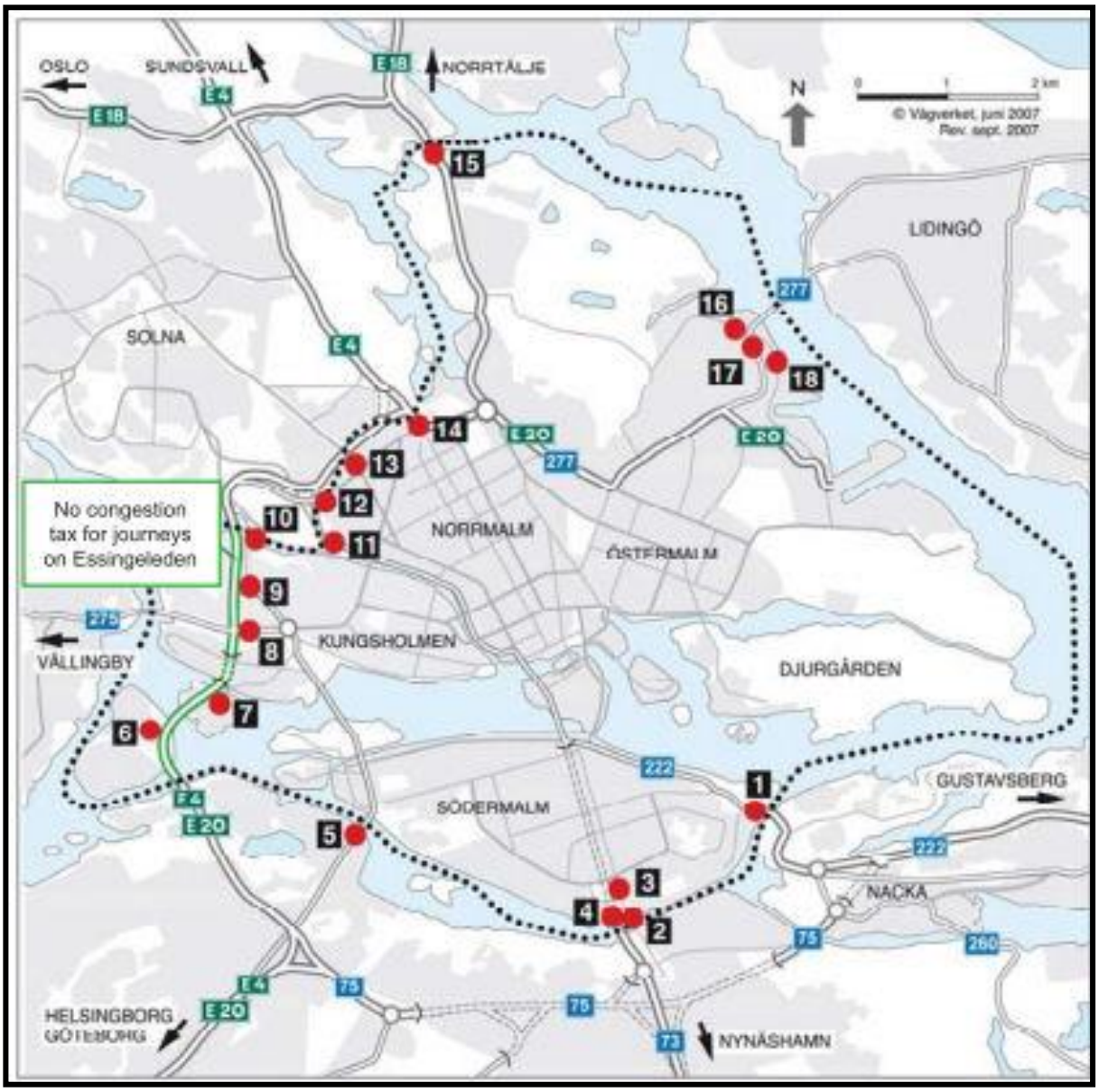

Figure 8: The Stockholm Congestion Charging Zone (Swedish Transport Agency,2016)

Population of Metropolitan Area	2.3 Million
Date Introduced	August 2007
Daily Charge at introduction (£)	£4.40
Change in all traffic entering charging zone in first year (%)	-18.7%
Change in traffic entering charging zone against baseline figure after 5 years (%)	- 22 %
Initial Cost of Installation (£)	£130.8 Million
Revenue generated after first year (£)	£70.1 Million
Change in NO_X emissions (after first year)(%)	-8.5%
Change in PM10 emissions (after first year)(%)	- 13%

Table 2: Statistics relating to the Stockholm Congestion Charge (European Commission,2009; Elliason,2014; Schlesinger,2016)

Discussion Points

Voting patterns before and after a CC was trialled in Stockholm provides valuable lessons for reassessing the potential of introducing a congestion charge in Manchester. In Stockholm, prior to the referendum, there was a 7 month trial period between January and July 2006, this period was crucial as it allowed the general population to see firsthand the benefits of CC and helped them to overcome their initial scepticism (Ellisaon,2014). Before the trial period the initiative faced an initial wave of fierce hostility from the general population and Swedish press (ibid), just as in Manchester. Analysis of Swedish newspaper reports from before the trial period clearly display the overarching narrative being published by the media as being against the CC, 39% of the articles analysed were negatively portraying the charge, while just 3% were in favour of it (Winslott-Hiselius et al.2009).

However, after the trial period Stockholmers voted 52.5% vs 47.5% in favour of introducing permanent congestion charging (76.4% turnout)(City of Stockholm,2006). Winslott-Hiselius (et al.2009) reported that almost half of those who responded to their survey changed their attitudes towards CC during the trial period. It was explained by the research team that personal experience of the altered city environment gave citizens a new understanding of how the changes affected their personal wellbeing rather than objecting the charge on wider senses of injustice centred around questions of 'why should I pay?'. This reveals that overwhelming changes in public opinions are possible and the fact that congestion charging was rejected at a 80/20 swing in 2004 should not influence debate upon whether a second referendum is needed.

From day one Stockholmers embraced the trial and roads were visibly calmer. Figure 9 below displays a section from a Swedish newspaper which shows the day before the charge was introduced for the first time and compares it to one day after, and a week after.

Figure 9: Image from Stockholm's Mass Media (Toolsofchange, 2013)

The key message to be learn from the introduction of a CC in Stockholm is that any referendum put to citizens must take place after an initial trial period. During this time the debate over whether congestion charging is a fair, legitimate and democratic way to allocate responsibility for congestion and pollution appears to wither away and is instead replaced by a new wave of optimism attached to a cleaner, more efficient central zone (Eliasson,2014). Evidence from Eliasson's study (ibid) can be seen in Figure 10 below. It reveals that all the road user groups interviewed experienced a u-shaped curve similar to model of road traffic price elasticities predicted by Goodwin (2006). The dip in the curve shows an initial reluctance and negative attitudes towards congestion charging as it is debated before the trial commences. Contrastingly, post 2006 when the trial has been undertaken support for charging booms. Approval of the charge reached as high as 52% in the group of drivers who 'pay often', a significant 31% increase in the space of two years, with the majority of attitude changes taking place during the 7 month trial period in January 2006.

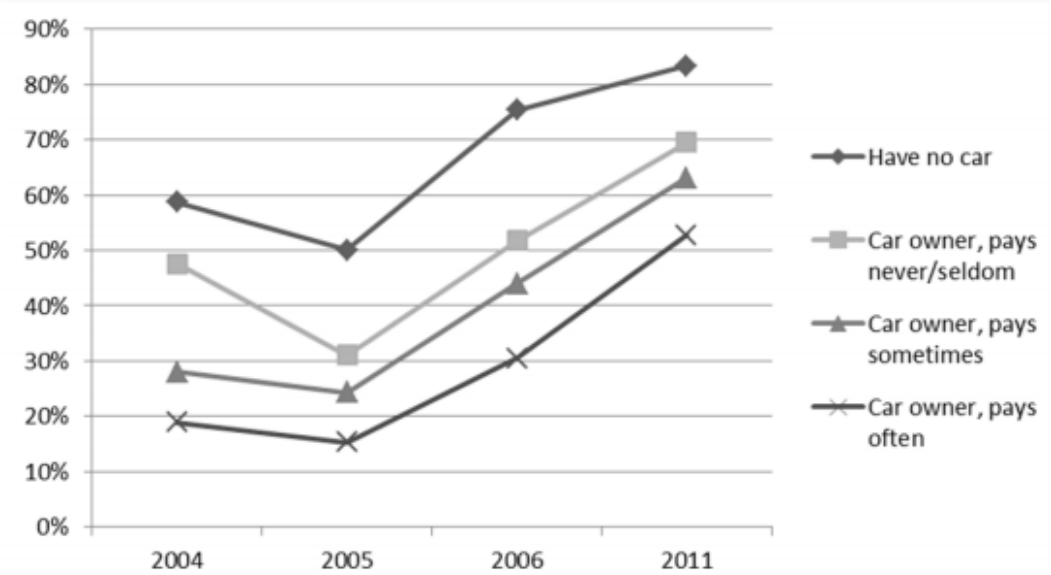

Figure 10: support for congestion charging depending on car ownership and paid charges (Elliason,2014)

Recommendations and Conclusions

Based on the experience seen in Stockholm, if the people of Manchester are able to see for themselves the benefits of a CC through a trial period, it is likely support for the scheme would see large positive changes from the views of 2008. Eventually, this may lead to the permanent installation of a charge, which would bring a much needed overhaul of the current central zone. Therefore, this report recommends that a 6 month trial period be implemented within Manchester city centre, following roughly the circle of the A57 (M), Ring Road, A635 and Trinity Way, as highlighted by figure 11. It is vital that the charge in the trial period is high enough to deter people from driving within the zone, and should also provide ample funds for improvements to other public transport initiatives. At the end of the trial period, as in Stockholm, a second referendum should be offered to the people of GM, who can then express their views based on a real-life experience of having to live with the zone for a sustained period of time.

Figure 11 A map showing the proposed congestion zone for Manchester city centre

If Manchester wishes to achieve the dual policy objectives of reduced congestion and improved air quality, it is imperative the city go beyond merely introducing a CC. It is recommended that, as in London, Manchester makes technological upgrades to its fleet of busses and other public transport options such as Metrolink. The Wilmslow Road Corridor can be identified as a point of particular importance here, as it is often claimed the route is 'amongst the busiest in Europe' (Select Committee on Transport, 2006) and hence offers an opportunity to reduce emissions on a considerable scale. Manchester, unlike London, does not run its own bus services, instead being operated by a number of private companies such as Stagecoach and FirstGroup. Therefore, it is also crucial that the council communicates with these service providers in order to establish a timetabled programme of upgrades to the bus fleet in conjunction with the introduction of the congestion charge. Finance grants could even be provided from the revenue generated from the scheme itself.

If Manchester has real ambitions to improve its air quality, it must also seriously consider the possibility of introducing a LEZ within its metropolitan borough in addition to the CC, similar to London. The initially suggested outer M60 ring for the 2008 CC may provide a favourable boundary for this zone, where once more polluting vehicles should face considerable sanctions for entering the boundary. Understandably, this would require a large amount of public education and engagement, and considerable financial commitment. It is recommended that a report be commissioned that looks into the feasibility of this initiative.

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