# CREATING PUBLIC ACCEPTANCE OF CONGESTION CHARGES: REVISITING THE EVIDENCES

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# ANDRÉ LUIZ CAMPOS DE ANDRADE

Supervisor: Dr. Ping Huang

The Bartlett Development Planning Unit

University College London

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## ABSTRACT

Congestion is one of the main problems faced by urban centres. In the last few decades, policy makers have being combining traditional policies to address this issue such as investments in public transport and the building of roads, with a new "demand" side approach to policy for congestion. Within this new perspective, congestion charge schemes appear as one of the most prominent instruments used since they reduce traffic congestion and induce changes in people's travel behaviour towards the use of more sustainable means of transport. Nevertheless, few cities in the world have successfully implemented this tax owing to the low public acceptability which these charges tend to face.

To understand what underpins such acceptance, this research has investigated what the approach taken by governments should be in order to guarantee public acceptance of congestion charges. To do so, it has run a comparative study in four cities where the congestion charge was attempted: London, Stockholm, Manchester and Gothenburg by employing an analytical framework known as "threefold typology of public policy instruments". According to this theory, the combination of three categories of policies: regulation ("stick"), economic means or incentives ("carrots"), and information ("sermon") help to build legitimacy and acceptance of public initiatives. In this sense, the research investigated how the acceptance of congestion charge ("stick") was influenced by the other two types of policies in the four chosen cities.

Based on the evidence, this research concludes that governments should adopt a policy strategy which includes different types of "carrots", such as improvements in public transport, revenue hypothecation and tax exemption, as well communication strategies like public hearings and media campaigns in order to develop higher levels of congestion charge acceptability within society.

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#### 1. Introduction

Traffic congestion is one of the main concerns in metropolitan areas around the world and it is responsible for major economic and productivity losses in urban centres (UN-Habitat, 2013). These losses are related to many factors such as delays in commuting, air quality degradation, higher energy consumption and even human stress (Texas, 2015). Traffic congestion can lower a country's GDP between 3% and 6%, with the highest figures observed in fast-growing cities (UN-Habitat, 2015). Even in developed countries, it has a considerable economic impact: as suggested by INRIX (2014), for the period between 2013 and 2030, France, Germany, the US, and the UK will incur a cumulative cost of USD 4.4 trillion related to traffic congestion issues. This amount is almost five times the UK's public revenue in 2015.

In recent years, many actions were pushed by public authorities to address such issue: improvement in public transportation and other means of mobility (e.g. cycling and "walkability") and expansion of road infrastructure. These are commonly seen as obvious initiatives carried out by mayors in different cities over the world. In addition, looking at the demand side, road pricing schemes (also known as congestion charge) emerge as one of the most prominent initiatives to tackle the problem.

Based on Pigovian taxation to correct negative externalities (Leape, 2006), road pricing can be seen as a double dividend solution in the policy mix (Jaeger, 2012) to tackle congestion in urban centres as this is not only a means to reduce congestion and increase fiscal revenue but also a way to stimulate a shift from private transport use to public transportation or to other displacement alternatives that are more environmental friendly.

Despite the economic rationality and fairness of congestion charges (Eliasson, 2010), few cities in the world have tried to implement this policy and it has won public acceptance only in a handful of cities, such as London, Stockholm, and Milan (Leape, 2006; Hysing and Isaksson, 2015; Schade and Baum, 2007), whereas other cities such as Manchester and, Edinburgh and Gothenburg

struggled to pass such a tax policy owing to low public acceptability (Hensher and Li, 2013; Borjesson and Kristofferson, 2015). Despite the low acceptability in the referendum held, Gothenburg kept its congestion charge whereas Manchester and Edinburgh did not succeed in implementing the scheme owing to public rejection in local referendums.

As every policy which aims to implement a new tax, congestion charge schemes might face some difficulties in gaining public acceptance. This is especially true in cases like the one investigated here owing to many aspects such as the fact that drivers tend to take the right to freely use the road infrastructure in urban central areas for granted (Dudley, 2013) as well as doubts about the effectiveness of such a measure to reduce congestion levels.

To overcome the acceptance barrier which is likely to be the main threat to congestion charge schemes (OECD, 2010; Hysing and Isaksson, 2015), governments should develop a set of actions and coherent arguments in order to raise awareness and ensure acceptance of the policy.

For instance, as seen in the cases of London and Stockholm, in the polls running before the introduction of the charge, the local population was against the measure (Leape, 2006; Hysing and Isaksson, 2015). However, after the policy was implemented, the majority of the locals started to support the scheme owing to the initial results of congestion reduction and traffic improvement in these cities. In fact, in the case of London, the mayor, Mr. Ken Livingstone, who implemented the scheme used this policy as one of the main platforms for his re-election in 2004 (Dudley, 2013).

Thus, to understand what underpins the process of public acceptance of congestion charge as well as determine the strategy that needs to be adopted by governments to get public support for this policy, this research addresses the following research question:

# What should be the approach taken by governments in order to guarantee public acceptance of congestion charge?

To answer this question, this research will be divided into seven sections. The second section presents a literature review based on the economic rationale and the main reasons which underpin congestion charge acceptability. The third section presents the analytical framework that will be used to analyse how the four cities framed their congestion charging initiatives in the public policy setting. The fourth section presents the methodology that this research will be applying. In the fifth section, the experiences of congestion charge schemes in the selected cities (London, Manchester, Stockholm and Gothenburg) are analysed from the analytical framework lens to assess whether this approach can be useful to build acceptability. Finally, the sixth section presents the conclusions of this research and answers the question raised in this introductory section.

#### 2. Literature Review

#### 2.1 Congestion Charging: The rationale

The use of road pricing schemes to address traffic congestion is not a new subject in the literature. Its first application dates back to 1975, when Singapore started its first successful experience (Richard, 2006). The main principles were based on the concept of marginal utility introduced in the economic theory during the 19<sup>th</sup> century by economists such as Jevons, Menger and Walras (Spengler, 1972). According to them, rational economic agents tend to maximise their utility from the consumption of goods and when doing so their willingness to pay is based on whether the consumption of one more unity increases or decreases their utility (negative or positive marginal utility). If one more unity increases his utility (private benefits exceeding private costs), they will take this additional unity; otherwise, they will stop consuming. As utilities and willingness to pay vary between individuals, it is possible to create a demand curve of every good based on its utility.

In the case of road use ("road consumption"), the drivers usually consider their direct costs (such as gasoline and car license) to decide whether they will drive their cars or not. They do not take into account how each of these individual decisions might affect the overall traffic condition (Richards, 2006), like the

congestion that might occur and the economic costs of it, such as reduction of travel speed (for instance, not only for the private drivers but also for bus users), delays, noise, emission of pollutants, etc., for the entire community. Thus, a situation is generated where the social costs caused by individual decisions become higher than the benefits that each person can take individually (social costs higher the private benefits).

To address such an issue where social costs exceed the private benefits of use of roads, many economists have proposed road pricing schemes over the decades to achieve the efficient use of roads and address issues such as traffic congestion. As Santos and Verhoef suggested:

"Road pricing has long been viewed as a potentially efficient instrument for dealing with traffic congestion. In 1920, Arthur Pigou used the example of a congested road to explain the economics of external effects, and in particular how a corrective tax can be used to restore efficiency when some goods are not optimally priced at marginal cost". (2013, p.561)

However, congestion charging schemes did not receive enough attention of policymakers until the '50s, when the first environmental problems became evident in the developed world. According to Whittles (2003), it was only with the works of William Wicrey that congestion pricing start to be looked at as a policy measure to tackle congestion. In 1962, this policy instrument gained a new boost, when the British Ministry of Transport created a committee to discuss pricing schemes to reduce congestion. Known by the surname of its chair, the Smeed Report stated:

"...charges would be in the nature of prices for using the roads, the prices varying from one place and time to another according to the costs – notably the congestion costs – involved in driving in a particular area at a particular time". (Ministry of Transport 1964 apud Burchell et al., 2015, p. 62)

Despite the economic rationale which underpins the congestion charge, this also could be seen in a broader context, which Richard (2006) defines as "the wider rationale", also justifying its implementation:

- The policy rationale points out how harmful traffic congestion would be for the citizens' quality of life and for the economy as whole.
- ii) The environmental rationale claims the importance of tackling congestion in order to reduce air pollution.
- iii) The planning rationale points out to the fact that in many cases the expansion of road infrastructures is financially unfeasible, especially in historical city centres. Furthermore, a new road might attract new users leading to more congestion in the long term.
- iv) The fiscal rationale suggests that even when physical and local conjunctures allow, any intervention to build new roads tends to be expensive.
- v) The financial rationale highlights the role of the charging as a new revenue source to undertake investment in the transport and mobility sectors.

In addition, Whittles (2006) points out to the link between road pricing schemes and land use development owing to its potential to influence the demand and the real estate market for increasing accessibility through the improvement and development of public transport alternatives for those who will not bear the costs of the charge.

Even though there are plenty of economic and policy-related reasons which justify congestion charging schemes, some criticisms are found in the literature. The main issue is related to the equity effects that this tax may cause such as different budgetary impacts on people with distinct income levels (Buton and Verhoef, 1998). However, Albalate and Germa (2009) argue that this issue should be analysed in a broader context which includes the distributive impacts of the revenue raised with the tax, the increase in time saved in travel and reliability of public transport, and the improvement in air quality. For instance, if the revenue is used to expand or improve the local public transport system and the urban mobility as a whole, the net effects of this charge will be positive, thereby making it a progressive tax rather than regressive.

Despite these positive economic and policy rationales behind congestion charging schemes, policymakers still struggle to push this policy instrument in their cities owing to lack of public acceptance. To have a general understanding about what usually undermines such acceptability, the next subsection highlights some of the main aspects of public support of congestion charging schemes.

#### 2.2. Acceptability issue

Even though congestion charge schemes seem to be an appropriate measure to help urban centres address traffic jams, when they transition from theory to practice, it is public acceptance that forms one of the main obstacles to the charges being implemented (Albalate and Germa, 2009). In this sense, Jones (1998) recommends that two major issues should be addressed in advance of any charge attempt: Firstly, it should be specified whether the charge is the most suitable instrument in the existent context and, secondly, what additional measures can be used to tackle the problem.

Compared with the economic aspects of congestion charging, the literature on acceptability is relatively new (Jaensirisak et al., 2005). Overall, the literature does not prescribe a specific measure to increase public approval of congestion charges, but it highlights a set of factors that can influence the public willingness to accept the tax.

The most obvious aspect is if the tax was aimed to tackle congestion in a region where this is considered a real issue by the citizens, this charge would give more appeal to the proposal (Hysing and Isakson, 2015). Actually, this is a very sensitive matter because in some cases, the main purpose of the tax is not to reduce congestion but instead to raise revenue for investment in transport packages, like in the Norwegian cities of Bergen, Oslo, and Trondheim (Whittles, 2003).

Although the revenue should not be considered the main objective of the charge, the application of such an aspect plays an important role in

acceptability. Jones was very persuasive when mentioning the British cases: *"road pricing will not be publicly acceptable unless the money raised is hypothecated for local transport and environmental projects"* (Jones, 1998 apud Jaensirisak et al., 2005, p. 129). In this sense, the use of this revenue should be linked with mobility projects, such as urban transport packages; otherwise, the revenue and the charge might be considered useless, e.g. in Hong Kong, people assumed the local policy package would be delivered independently of the road charge (Whittles, 2003).

An interesting point made by Jones (1998) is related to the different perceptions that people have regarding motorway tolling and urban road pricing. While the former tends to be more acceptable for drivers owing to the traditional relation between toll revenues and road improvement, the latter tends to be seen as a punitive and unfair measure once the drivers usually see themselves as victims of the congestion, which might affect its acceptability.

Doubts about the effectiveness of the charge might also affect people's support. As highlighted by many authors (Jaensirisak et al., 2005; OECD, 2010; Sherriff, 2015), the public belief that the pricing scheme will be capable of reducing congestion is an important aspect, already evidenced in cities where similar charges were introduced.

The possible invasion of privacy is pointed out as another issue that might raise concerns regarding road pricing. Jones (1998) and Lewis (1993 apud Whittles, 2003) agreed that tracking and controlling access of cars within the congestion charge zone might cause discomfort to some individuals that do not wish to have their cars and trips monitored by third parties, as evidenced in the surveys conducted by the cited authors.

The timing when the acceptability is assessed (if before or after the tax implementation) is other key variable. In some cases, such as Stockholm (Schuitema et al., 2010) and London (Leape, 2006), the acceptability increased after the charge implementation. This growth in public support can be explained by the reduction in the level of congestion as well as by other improvements

such as reduction in pollution levels and parking issues, evidenced after that tax came into force. In the same way, familiarity is another key variable which increases over time and has positive effects on the charge acceptability (Eliason and Jonsson, 2011).

Clear and widespread communication about the charging scheme, explaining how issues will be addressed, the benefits of the scheme, and how the scheme will work are fundamental aspects to increase acceptability, as Dieplinger and Furst (2014) point out in a case study of five European cities. In order to ensure citizens support the scheme, it is important that people understand the practical benefits of the charge, such as time saved in the commute or even improvement in the air quality owing to fewer vehicles in the streets.

Hysing and Isaksson (2015) refer to other procedural acts, such as the consistency of goals in the policy and the adoption of participatory mechanisms, referendums, and public hearings, to legitimize the policy. These factors are important for reducing the uncertainties about the scheme's effectiveness, improving transparency, avoiding misunderstanding, and ensuring community involvement which are vital to public support (Hensher and Li, 2013; Sheriff, 2015).

Finally, the local setting, which includes urban infrastructure, geography, level of income, education, and political support, is also key to the success of the charge. Car dependence, urban form, and public transport provision are some other features highlighted in the literature (Eliason and Jonsson, 2011; Hysing and Isaksson, 2015). For instance, public transport can make a noticeable contribution by helping people shift from private to collective means of transportation, further improved with the money collected with the tax, and alleviating the budgetary impacts that people may face with the new taxation (Kottenhof and Freij, 2009).

The table below summarises some issues that might affect the acceptability of the congestion charge, namely adequacy of infrastructure provision, policy design, and governance aspects.

# Table 1 – Summary of main aspects that may affect public acceptability of congestion charges

Issue	Source
Congestion should be a matter of concern to the citizens.	Hysing and Isakson, 2015.
The use of revenue (hypothecation) for transport/environmental improvement.	Jones 1998 apud Jaensirisak et al., 2005; Whittles, 2003.
Peoples' perception about fairness and justice of congestion pricing.	Whittles, 2003.
Doubts about the effectiveness of the charging scheme.	Jaensirisak et al, 2005; OECD, 2010; Sherriff, 2015.
Invasion of privacy.	Jones, 1998; Lewis 1993 apud Whittles, 2003.
Timing when acceptability is assessed.	Schuitema et al, 2010; Leape, 2006.
Familiarity with the charge.	Eliason and Jonsson, 2011.
Clear communication about the scheme.	Dieplinger and Furst, 2014.
Coherence of goals and objectives.	Hysing and Isaksson, 2015.
Public participation.	Hysing and Isaksson, 2015.
Transparency.	Hensher and Li, 2013; Sherriff, 2015.
Local setting (e.g. public transport availability, dependency on cars, environmental awareness).	Eliason and Jonsson, 2011; Hysing and Isaksson, 2015; Kottenhof and Freij, 2009.

Overall, this literature review has shown how congestion charging, a policy instrument considered good enough from the economic and planning view point, may face different obstacles in terms of public acceptability and become a more ordinary instrument to help cities address traffic congestion.

By identifying the best possible approach that can be taken by governments to increase acceptability, which obviously includes addressing part of the issues raised in this section, this work expects to contribute to the related literature to rethink the way congestion charges are implemented within the urban policy context. Furthermore, by providing evidences about how different policy instruments can be combined in order to increase the acceptability of the congestion charges, this study might help increase the adoption of such an instrument introduced by city governments in order to address the traffic congestion challenge.

Despite the existence of an extensive body of literature related to congestion charging acceptability, few studies have analysed the policy choice perspective to understand how governments build their strategies focusing on effectiveness and legitimacy. In general, the effects of some incentives, such as public transport improvements and good communication are highlighted in some studies; however, the discussion about the extent to which governments combine their different policy instruments to build acceptability is still absent in this debate.

# 3. Analytical Framework: Stick, carrots, and sermons in the congestion charging context

To fill the gap in the literature on how governments combine different policy instruments to build congestion charge acceptance, this research will use as an analytical framework the theory of public policy choice and evaluation presented by Bemelmans-Videc et al. (1998) based on the three-dimensional lenses, known as the "threefold typology of public policy instruments". Different from other analytical frameworks such as the one employed by Albalate and Germa (2009) which only allows a limited analysis of the combination of different instruments, the chosen framework permits a broader understanding of how the use of different policy instruments can help build the legitimacy and acceptance of policies. In this sense, this analytical lens matches the aims of this research and it will be useful to answer the research question.

According to this framework, any policy instrument forms part of a wide context composed of three categories of policies: regulation ("stick"), economic means or incentives ("carrots"), and information ("sermon"). As highlighted by Vedung (1998), this triad is parallel with Amitai Etzoni's taxonomy of power, which refers to coercive, remunerative and normative means.

The transport policy literature has a few works where the use of carrots and sticks as instruments is debated. Ben-Elia and Ettem (2009) discussed the creation of reward schemes to avoid peak hour driving in the Netherlands while Petrunoff et al. (2015) conducted a survey to examine whether incentives and disincentives can help change people's travel plans. Outside the body of transport research, the threefold typology was employed by Serbruyns and Luyssaert (2006) who discussed the acceptability of these different policies (carrots, sticks, and sermons) within the context of private forest management initiatives in Belgium.

What separates these three categories is the degree of constraint that each of them could bring to the society. The sticks (regulation) are more restrictive than the carrots (policy and economic instruments) whereas the sermon (information) which attempts to present arguments and to persuade people are less constraining within the three categories (Vedung, 2007). Also, the sticks can be understood as repressive instruments whereas carrots, as stimulatory ones.

The stick is usually linked with the regulatory role of governments and it is commonly seen as the power to define norms and acceptable behaviour within the society. Its supporters usually justify the use of regulation when the context claims for a more incisive attitude of the state to promote wellbeing. In a rational policy-making process, a regulation will be employed only when the available evidences imply its efficiency and effectiveness (Lemaire, 2007). An example where stick policies are applied is when industrial pollutants are emitted in the air or released in the rivers and the state uses restrictive legislation or fines to punish the companies responsible for such action.

Among the wide range of public policies, subsides and grants are usually characterised as "affirmative economic policy instruments" (Leeuw, 1998) that can be classified as "carrots" or incentives in a less colloquial way. According to Leeuw (1998):

"A subsidy is defined as the conditional transfer of funds by governments to *(or for the benefit* of) another party for the purpose of influencing that party's behaviour with a view to achieving some level of activity or provision". (Leeuw, 1998, pp. 77-79)

To understand the impact of government's incentives (carrots) in a more broad sense than the financial one implied by subsidies, one can borrow Leeuw's concept of subsidy to define carrots (financial and non-financial) as the incentives created by the governments for influencing people's behaviour to achieve an established objective or goal. This is exactly what should be done to investigate the role of carrots in the analysis of congestion charging (the stick) within the threefold typology of public policy instruments.

Information (sermons) is the third type of public policy within the threefold typology. Less costly than the other elements, information can help governments influence people through the transfer of knowledge as well as by increasing the accountability and transparency of the real intents and results of the policy package. Vedung and Doelen (1998) raise plenty of arguments to explain why information, which is usually neglected in the public policy intervention design, should be taken as policy instrument:

"There are several reasons for choosing information as a policy instrument...when universal compliance is not necessary, when private interests are in line with the public interests, in paternalistic situations, in sudden crises situation, when compliance with other instruments cannot be monitored, when counter information is not present, to legitimate the use of more intrusive instruments, and to give an appearance of concern". (Vedung and Doelen, 2007, p. 125).

The lack of public understanding about some unpopular interventions, such as congestion charges, would be one of the most reasonable arguments to justify why sermons should be employed to increase acceptability. Furthermore, where there are very few cases showing people the practical effects of the policy, the provision of information reduces the lack of uncertainty and overcomes information asymmetries (Howlett, 2009).

As this research intends to understand how "carrots" and "sermons" can influence the acceptability of a specific "stick" (the congestion charge), the framework was slightly adapted. In that sense, it will be employed not to understand how the three types of policies can address the congestion issue but instead to understand how the acceptability of one type of policy (congestion charge) can vary according to the use of the other two kinds of policies. From the previous literature review section, the way in which this framework will be applied is exemplified in the table below.

As the table below summarizes, one single stick (the congestion charge) will be analysed in a broad context, which includes different types of carrots and sermons. Among the types of carrots usually used with congestion charge schemes there are investments in public transport and tax exemptions for certain groups, such as taxi drivers and emergency service vehicles. In its turn, sermon initiatives can be related to actions such as public hearings and media campaign.

Policy Instrument	Туре
Stick (Regulation)	Congestion charge
	Investments in public
	transports
	Tax Exemptions and
	discounts
Carrots (Stimulus)	Fairness of fees
	Familiarity
	Public transport improvement
	Strategy of communication
	about the scheme
	Building awareness about
	congestion
	Provision of information about
Sermons (Information)	the results of the congestion
	charge scheme
	Media campaigns
	Public hearings

Table 2 – Types of policies in the threefold typology in the context of congestion charges

In summary, when policymakers decide to intervene in a specific issue they should bear in mind that the effectiveness of their intervention will partially depend on the legitimacy of such an action. When the state adopts a strategy of "give and take" packaging of policy instruments, including different kinds of actions, it is working not only to improve effectiveness but also to provide better conditions to reach legitimacy and acceptance (Doelen, 1998). This is the understanding that has lead this research to employ the threefold typology to analyse how congestion charge acceptability is built.

#### 4. Methodology

To analyse how the acceptance of congestion charging schemes would be framed from the threefold typology detailed in the last section, a case review of four European cites, London, Manchester, Stockholm and Gothenburg will be carried out. The choice for a case review approach is justified since it will facilitate the comparison of different strategies and levels of acceptability that these cities had with regard to congestion charging schemes. In addition, it will permit to verify if there are common trends regarding the construction of acceptability within these four cities.

These cities were chosen for the following reasons. First of all, they were chosen for the level of congestion. According to the ranking of 20 most congested cities in Europe provided by the navigation company TomTom, London, Manchester, Stockholm and Milan are the only cases in this ranking where congestion charging schemes were implemented. As there is not enough literature available on the Milanese congestion charging scheme, probably because it is relatively new (dating back to 2012), this Italian city was not considered in this research. Secondly, the political context was also taken into account when choosing these cities. Rather than an ambience of low public participation in the decision-making process, as seen in the case of Singapore, the cities chosen have had some kind of public involvement during the process of discussions and decision regarding whether the tax would succeed or not. Finally, to understand if the acceptability would be undermined when the scheme is tried in small cities where congestion is not a major concern, the Swedish city of Gothenburg, which has a population of 500,000, was picked to be analysed.

By using this case review approach, it will be possible to figure out to what extent complementary policy instruments (carrots and sermons) were used to build the acceptance of congestion charging (stick) in the different cities in different conditions. Thus, this method will present more evidences about the mixing of policy instruments to build acceptance rather than the examination of a single example. In addition, it provides a more holistic view about congestion charging acceptability, avoiding conventional analyses of charge acceptability, which usually tend to analyse the matter from a single perspective without considering the local setting.

To evaluate the acceptability of congestion charge over its lifetime, the best approach would be the use of interviews with people affected by it through the years; however, as this research did not have enough time and budget to run surveys in the selected cities, it employed secondary sources. This was done by using terms related to the research topic such as "congestion charging", "congestion charging acceptability", and "urban road pricing" in the bibliographic online databases *Scopus* and *Web of Science*. The search resulted in 21 publications, including academic articles, government reports, and books where the acceptability issue was discussed for at least one of the cities investigated. London and Stockholm were the more discussed cases in this set of papers with 9 and 8 cases, respectively, while Gothenburg and Manchester had 6 and 5 appearances, respectively. By analysing these cases from the literature, it will be possible to evaluate whether the congestion tax acceptance can be framed within the analytical lens chosen for this research. From these papers, it was possible to draw the table below, which highlights the major carrots and sermons that were employed in the four cities investigated.

 Table 3 – Examples of "carrots" and "sermons" which might increase congestion

 charge ("stick") acceptability

City	Carrots	Sermons
London	□ Improvements in public	Public hearings;
	transport;	Media debate;
	□ Level of tariffs;	
	□ Revenue hypothecation;	
	□ Simple scheme (allowing	
	an easy understanding	
	about the charge);	
	□ Tax exemptions.	
Stockholm	□ Improvements in public	Informative campaign;
	transport;	Media debate;
	□ Level of tariffs;	□ Referendum.
	<ul> <li>Revenue hypothecation;</li> </ul>	
	□ Simple scheme (allowing	
	an easy understanding	
	about the charge);	
	□ Tax exemptions;	
	□ Trial period.	
Manchester *	□ Level of tariffs;	Media debate;
	□ Revenue hypothecation.	□ Referendum.
Gothenburg	<ul> <li>Level of tariffs;</li> </ul>	Informative campaign;
	<ul> <li>Revenue hypothecation;</li> </ul>	Media debate;
	□ Tax exemptions.	Referendum.

\*The city of Manchester did not implement its policy package which would implement the congestion charge scheme.

## 5. Case review: Discussion and analysis

Even though there are plenty of reasons to support the introduction of congestion charge as a policy instrument to tackle congestion, few cities in the world have implemented this initiative. In some cases, citizens refused the introduction of the charge in referendums, such as Manchester and Edinburgh,

whereas in other cities, the charge was implemented despite an initial low acceptability, as in the cases of London and Gothenburg.

Given the analytical framework chosen, this section discusses and analyses the strategies used to implement congestion charge in the following four cities: London, Manchester, Stockholm, and Gothenburg. The reasons why these specific cities were chosen are explained in the methodology section and it is expected that the analysis of these cases would highlight the feasibility of using the threefold typology of policy instruments to build congestion charge acceptance.

#### 5.1. Cases description

As depicted in the table below, London introduced its congestion charge in 2003. The discussion about congestion charging in London started in the 1960s when the Smeed Report (1964) recommended the use of road pricing mechanisms to reduce congestion in the city (Richards, 2006). However, it was only in the 1990s that two important governmental initiatives, the "London Congestion Charging Research Program (LCCRP)" and the "Review of Charging Options for London (ROCOL)" put the topic into the political agenda. These two initiatives highlighted the importance of congestion charge as a powerful instrument to tackle congestion and were fundamental to bringing the charge discussion into the first London mayoral election campaign in 2000 (Leape, 2006).

The mayoral race winner was Mr. Ken Livingstone, a very prominent English politician and one of the main supporters of the charge. When he took office, he decided to implement the tax which came into force on 17 February 2003. Facing an initial lack of public support, the London congestion charging gained acceptability throughout the months. One year after the charge implementation, the average congestion dropped by 30% in central London, and even in inner Ring Road (outside the congestion charging zone), the congestion showed a slight reduction despite the increase in traffic in this region due to deviations from the charging zone (TfL, 2004). Today, with more than £1.2 billion from

revenue invested in transport improvement, the tax is a synonym of success and has become a default input in the local urban policy context.

City	Date of implementation	Initial area of Congestion Zone	Main objective	Current situation
London	February 2003	22 km <sup>2</sup>	Reduce congestion	On going
Stockholm	January to July 2006 (trial period); August 2007	35 km <sup>2</sup>	Reduce congestion	On going
Manchester	-	207 km <sup>2</sup>	Raise revenue for transport packaging investments	People refused the proposal in a referendum on December 2008.
Gothenburg	January 2013	-	Raise revenue to packaging investments	On going

Table 4 – Summary of Congestion Charge Schemes.

Source: Borjesson and Kristofferson (2015), Leape (2006), Schuitema et al. (2010), Sherriff (2015)

The city of Stockholm introduced its congestion charge in August 2007. The debate about the use of pricing mechanisms to tackle congestion started in 1992 with the "Dennis Package" which set proposals to manage the city's car traffic; however, owing to low public acceptance and lack of political agreement, the plan did not succeed. It was in 2002 that the local political agreements established the necessary conditions for the charge implementation to move forward (Schuitema et al., 2010).

Different from London, Stockholm first introduced a trial period of congestion charging which ran from July 2006 to January 2016. This was followed by a referendum, held together with the local elections, where people were called to

decide whether the tax should be permanent or not. In the referendum, the citizens of Stockholm approved the scheme, whereas the other cities which integrated into the county refused it. According to Hysing and Isaksson (2015), the refusal observed in other cities was due to the political conditions as they were controlled by a political party that was initially against the tax.

The winner of the election was a right wing party that was initially against the tax; however, when it took office, it decided to reintroduce the tax and use the revenue in a comprehensive transport infrastructure investment package rather than to invest the money exclusively in the public transport system within the city of Stockholm (Eliasson and Jonsson, 2011). Therefore, in August 2007, the congestion charging was permanently introduced.

Regarding the acceptability of the charge, Eliasson and Jonsson (2011) point out that a growing approval was observed since the charge came into force. The approval started with 30% before the trial period and reached 70% at the end of 2007. This support seems to be related to the success of charging in reducing the congestion in the city. For instance, one year after the tax trial introduction, the car traffic within the congestion charging zone showed an overall reduction of 20% and the use of public transport increased by 9% (Stockholmforsoket, 2006a).

In December 2008, the Manchester congestion charging was refused by the citizens in a referendum ballot. Different from the "congestion reduction" approach seen in London, the Manchester charge was thought in a context were the national government was stimulating regional governments to generate revenue from congestion charging schemes to cover the Transportation Innovation Fund (TIF), a component of the national strategy: "The Future of Transport: A network for 2030". This strategy, which aimed to unlock transport investments clearly stated the role of congestion pricing:

<sup>&</sup>quot;We will give delivery partners incentives to develop and deploy coherent, innovative, local and regional transport strategies that rise to the challenges set out in this document. We will establish a <u>new Transport</u>

# <u>Innovation Fund</u>, to support the costs of innovative and coherent transport measures – which will <u>include road pricing</u>, modal shift, and better bus services". (DfT, 2004)

With an unreliable, expensive, and disjointed public transport system and heavy car dependence (Sheriff, 2015), the Association of Greater Manchester Authority<sup>1</sup> (AGMA) tendered for the money offered by the British Government to invest in infrastructure through the Great Manchester Transport Innovation Fund (GMTIF) by presenting a proposal, which was based on demand management and congestion reduction. This submission was done in July 2007, after an initial consultation within the community.

As Sherriff (2015) states, despite all the benefits that the proposed investments would bring to the region, the congestion charging scheme was the main issue in the whole public debate about the proposal, especially from the moment when the bid was accepted by the national government, in June 2008, until the referendum, in December 2008, when the citizens refused the policy package.

With a population of 500,000, Gothenburg is the second largest city of Sweden. Congestion is not a major issue, being restricted to specific areas of the city at certain times of the day. Nevertheless, the city decided to implement its congestion charge scheme on January 2013 (Borjesson and Kristofferson, 2015). As in the case of Manchester, one of the main reasons behind the introduction of the charge in Gothenburg was the local politicians' ambition to generate revenue that could be applied to its transport package called as West Sweden Package. No quantitative goal was set to lower congestion, as Stockholm did years before (Hysing and Isaksson, 2015).

The interest to bring into the city of Gothenburg a huge amount of investments to infrastructure united political parties and the business sector in support of this tax and this fact can be considered the main explanation behind the tax implementation (Hysing and Isaksson, 2015). Because it was a people's

<sup>&</sup>lt;sup>1</sup> The Association of Greater Manchester Authorities (AGMA) is a group of ten Greater Manchester councils (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan) which aims to work together to tackle common urban issues which affect the region (AGMA, 2016).

petition, a referendum was held in September 2014. The majority of the citizens (57%) voted against the charge, but as this referendum had only an advisory status, the city government decided to keep the charge under the argument that there was no funding alternative to the West Sweden Package.

Despite the referendum's result, the traffic volume within the congestion charging zone reduce by 12% after the tax introduction as compared to the previous year. Borjesson and Kristofferson (2015) argue that it had a flourishing acceptance from its start until the date of the referendum and the result of referendum can be explained by the declining approval of the Swedish west package during the same period (Borjesson and Kristofferson, 2015).

The table below summarises the figures on traffic reduction and public acceptance in the cities analysed in this research. Regarding the traffic reduction, all of the figures suggest that congestion charging was effective. Furthermore, this effectiveness in traffic reduction and consequently congestion reduction is reflected in the percentage of congestion tax approval which grew in the three cities, with a more noticeable growth in Stockholm where the tax acceptance reached 70% in December 2007.

City	Average traffic reduction (Percentage of all types of vehicles crossing the congestion charging zone one year after the charge introduction)	Public acceptance before the introduction	Public acceptance one year after the introduction
London	16%	40%	50%
Stockholm	19,4%	30%*	70%**
Gothenburg	12%	28%	50***

# Table 5 – Summary of traffic reduction and public acceptance

\*Right before the trial period (January 2006). \*\* December 2007 (year of the permanent introduction). \*\*\* In the month of the Referendum (September 2014).

Source: Borjesson and Kristofferson (2015), Eliasson and Jonsson (2011) and Liu and Zheng (2013)

## 5.2. Using "carrots" to build acceptance of the stick: Some evidences

Different policy instruments identified as carrots can be seen in the cases reviewed, ranging from actions that were combined with the charge (e.g. public transport improvements) to measures which integrated the tax design (e.g. exceptions for residents and taxi drivers). Also, different momentums were noticed when these carrots were introduced: some before the tax and others after charge implementation.

#### 5.2.1. Improvements in public transport

The existence of a public transport system that is reliable and accessible would be a powerful incentive to build acceptance, as it can encourage people affected by the charge to use public transport more often than their private vehicles. In populated cities where the commercial and economic centres are concentred within the congestion charge zone, the need for good transportation becomes even more vital to the success of the charge, as seen in the three cities investigated, i.e. London, Stockholm, and Manchester.

Implemented in parallel to the congestion charging scheme, the improvements in London's bus service enhanced its reliability and made it a good alternative for Londoners affected by the charge, thereby reducing their concern about this new taxation. For instance, almost 50% of car traffic reduction was the result of a shift to public transport. In Stockholm, the planners adopted a similar strategy by adding 197 buses and 16 new lines into the local transport system towards the city centre (within the charge cordon) six months before the charge trial start (Albalate and Germa, 2009). On the other hand, the absence of a good transportation system is one of the main reasons why Manchester did not succeed in implementing the congestion charge. Interestingly, in the case of Manchester, the charge was to be implemented only after 80% of the transport investment package be completed, what was supposed to happen in 2013; however, the referendum refused the package and the congestion charge in 2008 when the city was facing an expensive and disjointed public transport system and was highly dependent on private vehicles (Sherriff, 2015).

Gothenburg showed no noticeable improvement in public transport before the tax implementation; however, for the Swedish city, congestion was not a major urban issue. This fact combined with a high car use rate, low population density, and decentralised system of working (Borjesson and Kristofferson, 2015) suggests that the pre-existence of a good public transport system was not essential to the growing acceptability verified in this specific case.

Overall, these evidences suggest that improvements in the public transport system might help cities build charge acceptability since a better public transport will reduce the hardships the people might face when changing their trips habits in order to avoid or reduce the impact of the tax on their household budgets. Furthermore, when people realise that the charge was accompanied by "positive" measures, such as public transport improvement, their willingness to accept the charge tends to increase, as they associate the charge with the measures.

#### 5.2.2. Scheme design

Support for the congestion charges is also the result of incentives existing within the charge scheme. Many variables can be used as carrots to change people's mind-set about the charge and improve the likelihood of them accepting the charge. The value of the charge, use of exemptions, geographic area subjected to the charge, transparency and simplicity of the scheme can be considered such types of incentives.

It is not easy to choose the proper amount for the charge. If it is overpriced, it will reduce the traffic of vehicles faster but might not gain widespread acceptance since the people might consider the tax unfair; on the other hand, if it is under priced, it might fail to reduce congestion and the scheme may not work as expected. Discussions about tariff structure were carried out in London, where the Mayor decided the intermediate daily charge of £5.00, as proposed by the ROCOL report (£2.50; £5.00; £ 10.00), since the report suggested that the net social benefit would barely increase with a charge of £10.00 and that £5.00 would have a noticeable impact on the people's perception of the fairness of the charge (Leape, 2006). A similar concern is seen in Manchester's proposal, which included a £10/day pass that would allow drivers to cross the congestion cordon multiple times in a day (Manchester, 2008b). Furthermore, Stockholm and Gothenburg which had variable fees during the day also established a limit to be paid per day per vehicle of 60 Swedish Krona (£5.30) (Stockholmsforsoket, 2006c). No matter how difficult it was to determine the appropriate fee, all the cases limited their daily fee by using a price cap as a default instrument to avoid negative perceptions about the unfairness of the charge.

The theory on congestion charges suggests avoiding discounts and exemptions within the scheme (Oehry, 2010); however, this should not be taken for granted. Of note, it is important to prevent some groups from being charged, such as emergency and police vehicles (for social reasons), taxis (for planning reasons, since this might allow people to leave their cars at home as well as mitigate the risk of price increase in taxi fares), and low-emission vehicles, such as hybrid

and electric vehicles (for environmental reasons). The concessions and discounts might be also important to reduce unfairness in cases where people simply cannot avoid the charge, such as the permanent residents of congestion charging zones. This practice was seen in London, where groups as emergency service vehicles, vehicles used by disabled people, and two-wheelers were exempted from the charge. In addition, permanent residents and electric car and motor tricycle users were exempt from the London congestion charge (TfL, 2016b). In the case of Stockholm, the list of exemptions includes emergency vehicles, taxis, eco-friendly autos, and motorcycles, and similar groups were exempted in Gothenburg. In both Swedish cities, disabled people were eligible for exemptions (Stockholmsforsoket, 2006c; Goteborg, 2016). All of these evidences regarding exemptions and discounts suggest that policymakers are aware of the impacts of such issues in the people's perception and willingness to accept congestion charges.

The geographic area where the scheme is enforced also plays an important role. It should be simple, easily understandable by the population and located in an area where congestion is a major concern. Not surprisingly, London, Stockholm and Manchester proposed congestion charging zones which encircled the city centres, where congestion was the worst. On the other hand, Manchester proposed a dual cordon (city centre and outer areas) 10 times larger than the Londoner congestion charge zone, where drivers would be charged separately according to the cordon they were crossing (Park et al, 2014). These evidences show the importance of designing simple schemes initially focusing on the most congested area of the city since complicated schemes, as seen in the Manchester proposal, might undermine the public understanding and, consequently, the overall acceptability of the scheme.

Finally, the acceptance might increase if the schemes explicitly specify operational details, e.g. the amount to be paid and how and where they can pay the charge. The more transparent the scheme the more acceptable it will be as people will have a better understanding of the policy. In this sense, the cases of London and Stockholm where the authorities made efforts to offer different means of payment, indicated the congestion zone well, and provided

information about the scheme through different means of communication can be seen as an initiative which allowed growing acceptability.

#### 5.2.3. Revenue use

As highlighted in the literature review, one of the most sensitive issues related to acceptability is the application of the revenue which comes from road pricing. This should not be a hidden agenda of congestion charging schemes (Oehry, 2010), however, in some cases public debate neglects this topic, possibly preventing people from understanding how this money could bring personal and social benefits to the city they live in (Marcucci and Marini, 2005).

In London, the use of this revenue to improve the city public transport system was a premise since the beginning of policy-related talks. Actually, the application of such revenue in transport improvement for at least 10 years after the tax introduction was stated by the Great London Authority in 1999 (Santos, 2005). This declaration enhanced the people's confidence that the money will be employed in actions which would help the city reduce its level of congestion. In the first year of the scheme, these revenues allowed £80 million to be spent in bus network improvement. Since the tax introduction, more than £1.2 billion was invested in transport improvement with the bus network receiving up to 80% of this total amount (TfL, 2016). All of these figures allowed people to understand that such revenue would be converted in benefits for them, thus easing the charge acceptability.

In the Swedish cases, revenue of congestion charges was also important in the decision-making process, but they had a different focus from that of London. In Stockholm, the money collected was supposed to be employed in public transportation improvement; however, when the permanent scheme was implemented, the revenue was earmarked for a new road infrastructure in the west of the city (Hysing and Isaksson, 2015). While this change facilitated high support among the road users (Borjesson et al., 2012), from the planning perspective, this can be considered a questionable decision since it would stimulate car demand in the city instead of reducing it, as the congestion charge

scheme aimed initially. In Gothenburg, the main objective of the congestion charge was to collect funds for the West Swedish package, as already mentioned. The local authorities were not clear about their real interest when framing the tax as a measure to improve the environment and to reduce congestion; however, Borjesson and Kristoffersson (2015) argue that people's perception about the real aims of the proposal might be one of the reasons explaining the low charge acceptability in the city. Furthermore, as in Stockholm's case, the use of part of the resources to make investments in road infrastructure can also be considered doubtful since it might address congestion in the short term but could stimulate the demand of vehicles and worsen congestion in the long run.

In summary, both theory and practice have plenty of references suggesting the importance of revenue when generating acceptance. When applied to mass transportation, such as buses and tram networks, these revenues would not only help governments create a better urban mobility in the city but also encourage people to increase their level of acceptance of the charge, as inferred from London's case. However, policymakers should be aware about the risks involved in using this financial resource to finance road infrastructure since it could stimulate more car use and work against congestion reduction, thus reducing the public willingness to accept the charge.

#### 5.2.4. Familiarity

People fear the unknown and this might undermine the chances of success of a new policy. This could be more accentuated in the case of innovative policies as congestion charges/schemes. To overcome such a barrier and increase public support, people will need to get familiar with the tax and its practical effects. Three aspects can support this understanding: Firstly, the perceived effectiveness of the charge, such as reduction of congestion and the growth of parking availability. Secondly, the fact that people do not face considerable changes in their travel costs after the tax introduction as they assumed before the charge implementation. Thirdly, the cognitive dissonance effect, which states that people tend to accept what is unavoidable (Eliasson, 2010).

The government of Stockholm followed these rules when it came up with a trial charge period between January and July 2006. During that period, congestion was lowered by 20% within the charging zone and people found many benefits, such as reduction in the time taken to travel and improvement in transport reliability (Eliasson, 2008; Henser and Li, 2013). These benefits made the public support increase from 30% to 52% between the beginning and end of the trial period. Thus, when the citizens of Stockholm went to the referendum, the result was in favour of the charge.

A referendum also took place in the city of Manchester to decide whether the transport investment package and its congestion charging should proceed or not. This referendum was not in the initial plans of the authorities; however, the fierce campaign between supporters and opponents of the charge forced them to hold a poll. With a campaign on the simplification of the proposal and some evidences of misinformation (Sherriff, 2015), the citizens of Manchester rejected the proposal by a strong majority without experiencing it in practice.

It is important to highlight that familiarity cannot be considered a type of policy instrument, however a strategy to develop it can be seen as policy initiative, especially in cases where people will be called through a referendum the destination of the proposal. If they do not know how the congestion charge will benefit their lives in the short term in practice, it is likely that they will vote against a measure that looks more like a fee that will constrain their household budgets even more. In the sense, developing a strategy to improve familiarity, as Stockholm did, can be considered a powerful carrot to get approval in congestion charges referendums.

In summary, many incentives and policy initiatives can be applied to build or improve acceptability. The effectiveness of these "carrots" may differ according to the local context and other variables, but overall, it can be said that the government has plenty of opportunities to introduce incentives that can foster acceptability. Overall, these carrots can be initiatives within or outside the congestion charging design and might also vary according to the time when they appear in the policy context, as summarised in the diagram below.



## Figure 1 - Examples of carrots in congestion charge schemes

### 5.3. Using "sermons" to build acceptance of the stick: Some evidences

Another important component to increase public support is the use of communication and marketing strategies to "sell" congestion charge to the citizens. Being an intrusive measure which lacks practical evidences to allow people to develop their opinions, congestion charge schemes needs to clearly communicate about issues like what their objectives are, how people will be benefited, and how the revenue will be employed. Furthermore, the use of sermons might be important to build a better scheme through the use of public hearings and by highlighting the importance of people's behaviour towards the use of more environmental friendly means of transport, such as public transportation, bicycles, and walking instead of private vehicles.

In the case of London, an 18-month public hearing about the charge introduced the charge. This was used by the Mayor Ken Livingstone to discuss the charge as well as to create awareness about the convenience to use the charge to tackle congestion and to make improvements in the public transport network. The debate was fierce, many stakeholders backed the charge such as business organisations and environmental groups; however, charge opponents were voicing their concerns very firmly, as highlighted by Richards (2006). In addition, many media vehicles speculated about the unfairness and the chaos that the charge would bring to the city. Even in the environment of fierce debate, Leape

(2006) highlights that this 18-month period was essential to make the scheme acceptable. Thus, on 17 February 2003, Mr. Livingstone launched the scheme which rapidly lowered the traffic vehicles and the level of congestion within the congestion zone. The successful achievements of the charge were highlighted in successive annual reports and other official assessment which followed the charge introduction allowing people have a comprehensive understanding about the scheme.

A positive use of communication tools was also seen in Stockholm. Aware about the asymmetrical information which surrounds the debate on congestion charges, the city authorities not only started an informative campaign about the charge but also used the trial period to communicate the positive impact in terms of congestion alleviation which the charging would cause in the city (Isaksson and Richardson, 2009). Another interesting point in persuasive communication is the media's role: Before the charge implementation, there were no positive articles about the charge while during the experimental period, this figure reached 25%, a change that Winslott-Hiselius et al. (2009) attribute to the local government's information strategy.

On the other hand, a misuse of communication was one of the main problems which prevented Manchester from implementing its strategy. As Sherriff (2015) suggests, the project GMTIF had a very difficult message to transmit to the citizens (e.g. massive transport investments before charge introduction, dual congestion cordon applied at specific times and in the direction of the congestion peak, and distinct tariff levels). This led to a simplification of the debate which undermined people's understanding and support to the proposal. Instead of focusing on the debate about what the GMTIF would bring to the city, the authorities concentrated their strategy in the congestion charge component focusing on issues such as the maximum amount the citizens would pay per month and per year, which allowed a distorted debate during the campaign and in the media (Vigar et al., 2011). For instance, after the referendum which rejected the GMTIF bid, some authorities recognised that only a few citizens recognised the massive transport investments as the main component of the

project. Moreover, they missed the fact that the full implementation of such investments was a necessary condition for the charge be set up (Sherriff, 2015).

The cases of London, Stockholm, and Manchester show us that the use of communication to persuade people can be a useful tool in the policy mix to build congestion charge acceptance. Moreover, it clarify the real aims of the scheme avoiding eventual misunderstanding and misinformation that might undermine the whole project and its support, as seen in the case of Manchester. In this sense, policymakers who wish to build or increase the acceptance of their congestion charge proposals must invest time and resources to build strong sermons and communication strategies.

### 6. Conclusion

The public acceptance of congestion charge schemes is one of the main barriers that policymakers face when implementing such an initiative. To address such an issue, congestion charges need to be accompanied by different actions, which will help governments raise the acceptability. By asking "What should be the approach taken by governments in order to guarantee congestion charge public acceptance" this research aimed to contribute to the debate on the politics of congestion charge with regard to its acceptability.

To understand how governments usually frame all these matters within the public policy context, this research employed an analytical framework known as the "threefold typology of public policy instruments". According to this approach, which is rarely referred to in the literature on congestion charge acceptability, any policy instrument should be combined with other policy initiatives in order to be more legitimate and effective. Mainly, three categories of policies can be used: sticks (regulation), carrots (incentives), and sermons (communication). Being considered a stick, congestion charge must be combined with other policy instruments in order to improve its level of acceptability among the citizens.

Aiming to find evidences in different contexts and policy moments, a comparative study was employed to analyse the matter. Thus, many evidences were found in London, Manchester, Stockholm and Gothenburg which confirm that governments tend to run different policy instruments to enhance public acceptability. The improvements undertaken in the public transport network of London and Stockholm before and after the charging implementation are evidences of this point. Evidence of "carrots" was also seen in the scheme design (e.g. use of exemptions, awareness about overpriced tariffs, geographic limits of congestion charging zones, and transparency) as well as the so-called hypothecation of revenues for public transport. Moreover, in Stockholm, the use of a trial period was essential to help people realise the practical effects of the charge in the congestion level before they vote in the referendum. The use of communication and sermons also played an important role in acceptability, as demonstrated by public hearings run in London. On the other hand, the lack of proper communication between authorities and society can be seen as one of the main reasons why Manchester's citizens refused the charge and investment package that would bring a better transport network for this English city.

Taking all these considerations together, the conclusion of this research is that to gain acceptability of congestion charges, governments should adopt a policy strategy which includes different types of incentives and communication approach in order to guarantee evidences that the congestion charge will bring more benefits than disadvantages to the society. Moreover, the evidences found in this dissertation suggest that the acceptability of congestion charges tend to increase over the time as soon as people start to notice some charge's results, such as traffic reduction and time saved in travel what suggest that governments should be permanently aware about the charge effectiveness to tackle congestion in order to keep a continuous growth of the acceptance rates within the community.

Since this study was based on secondary data, future empirical research applying a quantitative approach with primary data on future schemes can improve these research findings. In addition, further debate about the congestion charging acceptability in cities that are trying to replace or improve

their current strategies to manage traffic demand, such as São Paulo, Santiago and Mexico City, would also bring an important theoretical contribution about the transferability of congestion charge from developed to developing countries.

# Bibliography

Albalate, D., Germa, B. 2009. What local policy makers should know about urban road charging: lessons from worldwide experience. *Public Administration Review* [online]. 69 (5), pp. 962-975. Available from: http://www.jstor.org/stable/40468975 [Accessed 23 March 2016].

Anderson, D., Nassén, J. 2016. The Gothenburg congestion charge scheme: A pre-post analysis of commuting behaviour and travel satisfaction. *Journal of Transport Geography* [online]. 52, pp. 82-89. Available from: http://www.sciencedirect.com/science/article/pii/S0966692316000430 [accessed 27 June 2016].

Association of Greater Manchester Authorities (AGMA). 2016. *Who we are* [online]. Available from https://www.greatermanchester-ca.gov.uk/info/20071/who\_we\_are [accessed 3 June 2016].

Bemelmans-Videc, M., Rist, R., Vedung, E. 1998. *Carrots, sticks and sermons: Policy instruments and their evaluation*. New Jersey: Transaction Publishers.

Ben-Elia, E., Ettema, D. 2009. Carrots versus sticks: Rewarding commuters for avoiding the rush hour – a study of willingness to participate. *Transport Policy* [online]. 16, pp. 68-76. Available from:

http://www.sciencedirect.com/science/article/pii/S0967070X09000250 [accessed 29 June 2016].

Borjesson, M., Eliasson, J., Hugosson, M., Brundel-Freij, K. 2012. The Stockholm congestion charges – 5 years on. Effects, acceptability and lessons learnt. *Transport Policy* [online]. 20, pp. 1-12. Available from: http://www.sciencedirect.com/science/article/pii/S0967070X11001284 [accessed 16 July 2016].

Borjesson, M., Kristofferson, I. 2015. The Gothenburg congestion charge. Effects, design and politics. *Transportation Research Part A* [online]. 75, pp. 134-146. Available from:

http://www.sciencedirect.com/science/article/pii/S0965856415000531 [accessed 23 June 2016].

Burchell, J., Ison, S., Enoch, M. 2015. The Smeed Report 50 years on: a role for the workplace parking levy? *Transportation Planning and Technology* [online]. 38(1), pp. 62-77. Available from: http://www-tandfonline-com.libproxy.ucl.ac.uk/doi/pdf/10.1080/03081060.2014.976986 [accessed 13 June 2016].

Richardson, H., Bae, C. 1998. The equity impacts of road congestion pricing. In Button, K., and Verhoef, E. *Road pricing, traffic congestion, and the* 

*environment: issues of efficiency and social feasibility*. Cheltenham: Edward Elgar Publishing Limited, pp. 247-262.

Department for Transport (DfT). 2004. *The Future of Transport: a network for 2030* [online]. Available from:

http://webarchive.nationalarchives.gov.uk/20091203100850/http://www.dft.gov.u k/about/strategy/whitepapers/previous/fot/utureoftransportwhitepap5710.pdf [accessed 23 June 2016].

Dieplinger, M., Furst, E. 2014. The acceptability of road pricing: evidence from two studies in Vienna and four other European cities. *Transport Policy* [online]. 36, pp. 10-18. Available from:

http://www.sciencedirect.com/science/article/pii/S0967070X14001462 [accessed 18 June 2016].

Doelen, F. 1998. The give-and-take packaging of policy instruments: optimizing legitimacy and effectiveness. In Bemelmans-Videc, M., Rist, R., Vedung, E. *Carrots, sticks and sermons: policy instruments and their evaluation*. New Jersey: Transaction Publishers, pp. 129 - 146.

Dudley, G. 2013. Why do ideas succeed and fail over time? The role of narratives in policy windows and the case of the London congestion charge. *Journal of European Public Policy*. 20 (8), pp. 1139 -1156.

Eliasson, J. 2008. Lessons from the Stockholm congestion charging trial. *Transport Policy* [online]. 15 (6), pp. 395-404. Available from: http://www.sciencedirect.com/science/article/pii/S0967070X0800053X [accessed 24 November 2016].

Eliasson, J. 2010. So you're considering introducing congestion charging? Here's what you need to know. In Organization for Economic Cooperation and Development (OECD). *Implementing Congestion Charging – Round Table 147* [online]. Available from: http://www.oecd-ilibrary.org/transport/implementingcongestion-charging\_5km4q8jw1vzp-en [accessed 20 June 2016].

Eliasson, J., Jonsson, L. 2011. The unexpected "yes": Explanatory factors behind the positive attitudes to congestion charges in Stockholm. *Transport Policy.* 18, pp. 636-647.

Goteborg. 2016. *Om trängselskatt* [online]. Available from: http://goteborg.se/wps/portal/ [accessed 14 July 2016].

Greater Manchester's Future Transport (GMFT). 2008a. What the transport innovation fund package includes – An analysis of the rationale behind the Greater Manchester TIF package. *Information Pack Document no.1* [online]. Available from:

http://www.manchester.gov.uk/egov\_downloads/Background\_1\_.pdf [accessed 23 June 2016].

Greater Manchester's Future Transport (GMFT). 2008b. What the transport innovation fund package includes – A description of the proposed improvements to public transport and the congestion charging scheme in Greater Manchester. *Information Pack Document no.2* [online]. Available from: http://www.manchester.gov.uk/egov\_downloads/Contents\_1\_.pdf [accessed 23 June 2016].

Hensher, D., Li, Z. 2013. Referendum voting in road pricing reform: A review of the evidence. *Transport Policy*. 25, pp. 186-197.

Howlett, M. 2009. Government Communication as a policy tool: a framework for analysis. *The Canadian Political Science Review* [online]. 3, pp. 23-37. Available from: http://ojs.unbc.ca/index.php/cpsr/article/viewFile/134/184 [accessed 29 June 2016].

Hysing, E., Isaksson, K. 2015. Building acceptance for congestion charges – the Swedish experiences compared. *Journal of Transport Geography*. 49, pp. 52-60.

Hysing, E., Frändberg, L., Vilhelmson, B. 2015. Compromising sustainable mobility? The case of the Gothenburg congestion tax. *Journal of Environmental Planning and Management* [online]. 58, pp. 1058-1075. Available from: http://www.tandfonline.com/doi/pdf/10.1080/09640568.2014.912615 [accessed 27 June 2016].

INRIX. 2014. *Economic and environmental impact of traffic congestion in Europe and the US* [online]. Available from: http://inrix.com/economic-environment-cost-congestion/ [accessed 26 March 2016].

Isaksson, K., Richardson, T. 2009. Building legitimacy for risky policies: the cost of avoiding conflict in Stockholm. *Transportation Research Part A: Policy and Practice* [online]. 43 (3), pp. 251-257. Available from: http://www.sciencedirect.com/science/article/pii/S0965856408001614 [accessed 17 July 2016].

Jaensirisak, S., Wardman, M., May, A. 2005. Explaining variations in public acceptability of road pricing schemes. *Journal of Transport Economics and Policy.* 39(2), pp. 127-153.

Jaeger, W. 2012. The double dividend debate. In Andersen, M., Milne, J. (editors). *Handbook of research on environmental taxation*. Northampton (USA): Edward Elgar, pp.211-229.

Jones, P. 1998. Urban road pricing: public acceptability and barriers to implementation. In Button, K., and Verhoef, E. *Road pricing, traffic congestion, and the environment: issues of efficiency and social feasibility*. Cheltenham (UK): Edward Elgar, pp. 263 - 284.

Kottenhoff, K., Freij, K. 2009. The role of public transport for feasibility and acceptability of congestion charging – the case of Stockholm. *Transportation Research Part A* [online]. 43, pp. 297-305. Available from: http://www.sciencedirect.com/science/article/pii/S0965856408001602 [accessed 18 June 2016].

Leape, J. 2006. The London Congestion Charge. *Journal of Economic Perspectives.* 20 (4), pp. 157 - 176.

Leeuw, F. 1998. The carrot: subsidies as a tool of government – theory and practice. In Bemelmans-Videc, M., Rist, R., Vedung, E. *Carrots, sticks and sermons: policy instruments and their evaluation*. New Jersey: Transaction Publishers, pp. 77 – 101.

Lemaire, D. 1998. The stick: regulation as a tool of government. In Bemelmans-Videc, M., Rist, R., Vedung, E. *Carrots, sticks and sermons: policy instruments and their evaluation.* New Jersey: Transaction Publishers, pp. 59 - 76.

Liu, C., Zheng, Z. 2013. Public Acceptance towards congestion charge: a case study of Brisbane. *Procedia – Social Behavioural Sciences* [online]. 96, pp. 2811-2822. Available from: http://www.sciencedirect.com/science/article/pii/S1877042813024403

[accessed 12 July 2016].

Marcucci, E., Marini, M. 2005. Road pricing as a citizen-candidate game. *IDEAS Working Paper Series* [online]. Available from https://mpra.ub.uni-muenchen.de/29293/1/MPRA\_paper\_29293.pdf [accessed 16 July 2016].

Nilsson, A., Schuitema, G., Bergstad, C., Martinsson, J. 2016. The road to acceptance: attitude change before and after the implementation of a congestion tax. *Journal of Environmental Psychology* [online]. 46, pp. 1-9. Available from http://www.sciencedirect.com/science/article/pii/S0272494416300111

[accessed 27 June 2016].

Oehry, B. 2010. Critical success factors for implementing road charging systems. In Organization for Economic Cooperation and Development (OECD). *Implementing Congestion Charging – Round Table 147* [online]. Available from: http://www.oecd-ilibrary.org/transport/implementing-congestion-charging\_5km4q8jw1vzp-en [accessed 20 June 2016].

Office for National Statistics (ONS). 2014. *Regional gross disposable household income – GDHI: 1997 to 2014* [online]. Available from:

https://www.ons.gov.uk/economy/regionalaccounts/grossdisposablehouseholdin come/bulletins/regionalgrossdisposablehouseholdincomegdhi/2014 [accessed 23 November 2016].

Organization for Economic Cooperation and Development (OECD). 2010. *Implementing Congestion Charging – Round Table 147* [online]. Available from: http://www.oecd-ilibrary.org/transport/implementing-congestion-charging\_5km4q8jw1vzp-en [accessed 20 June 2016].

Park, C., Wilding, M. and Chung, C. 2014. The importance of feedback: Policy transfer, translation and the role of communication. *Policy Studies* [online]. 35, pp. 397-412. Available from:

http://www.tandfonline.com/doi/full/10.1080/01442872.2013.875155 [accessed 24 May 2016].

Petrunoff, N., Rissel, C., Wen, L., Martin, J. 2015. Carrots and sticks vs. carrots: Comparing approaches to workplace travel plans using disincentives for driving and incentives for active travel. *Journal of Transport and Health* [online]. 2, pp.563-567. Available from:

http://www.sciencedirect.com/science/article/pii/S2214140515006544 [accessed 29 June 2016].

Richards, M. 2006. *Congestion Charging in London: the policy and the politics*. London: Palgrave Macmilland.

Santos, G. 2005. Urban congestion charging: a comparison between London and Singapore. *Transport Reviews* [online]. 25, pp. 511-534. Available from: http://www.tandfonline.com/doi/abs/10.1080/01441640500064439#.V3qwjPmL Rkg [accessed 28 February 2016].

Santos, G., Verhoef, E. 2013. Congestion pricing: an introduction. In Palma, A., Lindsey, R., Quinet, M., Vickerman, R. (editors). *A handbook of transport economics*. Northampton (USA): Edward Elgar Publishing.

Schade, J., Baum, M. 2007. Reactance or acceptance? Reaction towards the introduction of road pricing. *Transportation Research Part A.* 41, pp. 41-48.

Schuitema, G., Steg, L. and Forward, S. 2010. Explaining differences in acceptability before and acceptance after the implementation of a congestion charge in Stockholm. *Transportation Research Part A.* 44, pp. 99-109.

Sheriff, G. 2015. Voting on sustainable transport: communication and governance challenges in Greater Manchester's congestion charge' referendum. *Local Environment.* 20, pp.1507-1530.

Spengler, J. 1972. The marginal revolution and concern with economic growth. *History of Political Economy* [online]. 4 (2), pp. 469-498. Available from: http://hope.dukejournals.org/content/4/2/469.full.pdf [accessed 12 June 2016].

Stockholmsforsoket. 2006a. *Facts and results from the Stockholm trial* [online]. Available from http://www.stockholmsforsoket.se/upload/hushall\_eng.pdf [accessed 25 June 2016].

Stockholmsforsoket. 2006b. *Facts and results from the Stockholm trial: Final Version* [online]. Available from:

http://www.stockholmsforsoket.se/upload/Sammanfattningar/English/Final%20R eport\_The%20Stockholm%20Trial.pdf [accessed 25 June 2016].

Stockholmsforsoket. 2006c. *Leaflet – The Stockholm trials start on 22 August* [online]. Available from:

http://www.stockholmsforsoket.se/upload/FaktabladEng050615.pdf [accessed 25 June 2016].

Texas A&M Transportation Institute (Texas). 2015. *Traffic gridlock sets new records for traveller misery* [online]. Available from: http://mobility.tamu.edu/ums/media\_information/press\_release/[accessed.on/

http://mobility.tamu.edu/ums/media-information/press-release/ [accessed on 26 March 2016].

Tochtermann, L. 2008. *Congestion Charging: A tool to tackle congestion in UK cities* [online]. Available from: http://www.centreforcities.org/wp-content/uploads/2014/09/08-10-02-Congestion-Charging.pdf [accessed 24 June 2016].

Transport for London (TfL). 2003. *Impacts Monitoring – First annual report* [online]. Available from: http://content.tfl.gov.uk/impacts-monitoring-report1.pdf [accessed 21 June 2016].

Transport for London (TfL). 2004. *Impacts Monitoring – Second annual report* [online]. Available from: http://content.tfl.gov.uk/impacts-monitoring-report-2.pdf [accessed 22 June 2016].

Transport for London (TfL). 2014. *Congestion Charge – Factsheet* [online]. Available from: http://content.tfl.gov.uk/congestion-charge-factsheet.pdf [accessed 23 June 2016].

Transport for London (TfL). 2016a. *Changes to the Congestion Charge* [online]. Available from: https://tfl.gov.uk/modes/driving/congestion-charge/changes-to-the-congestion-charge [accessed 23 June 2016].

Transport for London (TfL). 2016b. *Discounts and exemptions* [online]. Available from: https://tfl.gov.uk/modes/driving/congestion-charge/discounts-and-exemptions [accessed 14 July 2016].

Serbruyns, I., Luyssaert, S. 2006. Acceptance of sticks, carrots and sermons as policy instruments for directing private forest management. *Forest Policy and Economics* [online]. 9, pp. 285-296. Available from: http://www.sciencedirect.com/science/article/pii/S1389934105000936 [accessed 28 June 2016].

United Nations Human Settlement Programme (UN-Habitat). 2013. *Planning and design for sustainable urban mobility: global report on human settlements 2013* [online]. Oxford: Routledge. Available from: http://unhabitat.org/planning-and-design-for-sustainable-urban-mobility-global-report-on-human-settlements-2013/ [accessed 8 November 2015].

Vedung, E. 1998. Policy instruments: typologies and theories. In Bemelmans-Videc, M., Rist, R., Vedung, E. *Carrots, sticks and sermons: Policy instruments and their evaluation.* New Jersey: Transaction Publishers.

Vedung, E., Doelen, F. 1998. The sermon: information programs in the public policy process – choice, effects and evaluation. In Bemelmans-Videc, M., Rist, R., Vedung, E. *Carrots, sticks and sermons: Policy instruments and their evaluation*. New Jersey: Transaction Publishers.

Vigar, G., Shaw, A., Swann, R. 2011. Selling sustainable mobility: The reporting of the Manchester Transport Innovation Fund bid in UK media. *Transport Policy* [online]. 18 (1), pp. 468-479. Available from:

http://www.sciencedirect.com/science/article/pii/S0967070X10001149 [accessed 20 July 2016].

Whittles, M. 2003. *Urban road pricing: public and political acceptability*. Hants (UK): Ashgate Publishing Limited.

Winslott-Hiselius, L., Brundell-Freij, K., Vagland, A., Bystrom, C. 2009. The development of public attitudes towards the Stockholm congestion trial. *Transportation Research Part A: Policy and Practice* [online]. 43 (3), pp. 269-282. Available from:

http://www.sciencedirect.com/science/article/pii/S0965856408001638 [accessed 17 July 2016].