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# International Journal of Electronic Government Research

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# A User Satisfaction Study of London's Congestion Charge e-Service: A Citizen Perspective

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## ABSTRACT

*The importance of evaluation and optimization of electronic government (e-government) services is imperative if the government organisations are to have an effective impact on the success and take-up of the services offered. Transport For London's (TFL) London Congestion Charging (LCC) is one of the innovative electronic services (e-services) introduced by the United Kingdom (UK) government to the citizens. While some studies have addressed the impact of the introduction of the congestion charge there has been a dearth of research performed to address user (citizen) satisfaction of the online LCC system. Therefore, this research seeks to measure the citizen satisfaction of using the LCC online payment system offered by TFL. The citizen satisfaction in this context is measured using the four dimensions from the COBRA framework that comprise the cost, opportunity, benefits and risk assessment constructs. This paper presents the findings of a survey of 500 users of the TFL LCC online payment system. It also reports the qualitative feedback obtained from the participants that can be used to determine the areas that need further improvement in the current LCC e-service and potential influences on user satisfaction.*

*Keywords: Benefits, Costs, E-Service, London Congestion Charging (LCC), Opportunities, Risks, User Satisfaction*

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## 1. INTRODUCTION

The evaluation of electronic government (e-government) services is not only significant but also complex. There are many factors

(e.g. involvement of multiple stakeholders, ability to quantify benefits and inefficiencies, etc.) that add to the complexity of evaluating e-government services. A key significance of e-government services lies on the ability of

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governments to transform public administration and reduce administrative and financial burdens by delivering public services online. The user (i.e. citizens) satisfaction with e-government services has a vital influence on their large scale adoption (Osman et al. 2014). It has to be assessed at different points in time and if necessary measures have to be taken to be improved, as citizens expectations are changing constantly (Verdegem and Verleye, 2009). The feedback of the citizens using these electronic services (e-services) is also an important aspect to be assessed and taken into account when improving existing services or designing new ones. Despite citizen satisfaction being such an essential element in the sustainability and viability of e-government services, little research has been performed on understanding it.

Transport For London's (TFL) London Congestion Charging (LCC) is one of the innovative e-services introduced by the UK government to the citizens. LCC was imposed with the aim of reducing congestion by having commuters who travel during peak hours pay a fee, otherwise being liable to a penalty charge. In stark contrast to the conventional road charging schemes, the LCC does not involve any toll booths or barriers (Santos and Bhakar, 2006). The method of enforcing the charge is in fact the most innovative part of the scheme. It uses a video-based system which relies on accurate reading of license plates as a means of identifying, charging and enforcing vehicles (Blythe, 2005). There are several payment methods for the LCC; Auto Pay (automated payment following an initial online registration), Online, SMS, Phone and Post. The LCC e-service system allows two options in terms of registering as an individual or as an organization (TFL, 2014). As an individual, one can register up to a maximum of 10 vehicles, also allowing discounted charges if using the Auto Pay option for up to 5 vehicles. Once registered, users can pay via the automated telephone service, or SMS as well as being able to manage their payments and vehicles online.

Organisations with 6 vehicles or more can also register with special functions to this account such that multiple users can manage a vehicle fleet to allow easier administration.

Although some studies have addressed the implications of the introduction of the congestion charge (Givoni, 2012; Janson, 2008; Santos and Bhakar, 2006), there has been a lack of research performed to address user (citizen) satisfaction of the online LCC e-service system managed by the TFL. In this research, the authors' seek to address this gap by adding to the state of the art by focusing on evaluating the user satisfaction of the LCC e-service system. In doing so, this paper presents the results of this study assessing the citizen satisfaction of the system, across four dimensions: cost, benefit, opportunities and risk. These constructs are drawn from the research performed in the Integrated Model for Evaluating E-government Services Transformation (I-MEET) and are hypothesised to be the main constructs for evaluating the citizen and providers' perspective of e-government services (Osman et al., 2011). Moreover this paper presents the analysis of whether the LCC e-service meets the citizens' needs and how it can be improved.

The rest of this paper is organised as follows. First, the paper presents the research context of London congestion charging schemes in UK focusing on the citizen's satisfaction of the existing e-service system provided online. This is followed by the research design section that sets out the questionnaire design, distribution and data handling. The subsequent sections provide details regarding the survey participants' demographic information followed by a discussion of the study findings on participant satisfaction with the online LCC service. The paper concludes by presenting the theoretical and practical implications of the study and acknowledging the research limitations and next steps for the study.

## 2. LONDON CONGESTION CHARGING SCHEME IN THE UK: AN OVERVIEW

### 2.1. Overview

The concept of urban congestion pricing was introduced in London in the early 1960s (Walters, 1961). City of London in the United Kingdom became one of world's first major cities to introduce a congestion charge to reduce the flow of traffic into and around the city centre. In February 2003, the former Mayor introduced the London Congestion Charge (LCC) within London (Kaparias and Bell, 2012; Blow et al., 2003). The LCC translates as a fee levied on all vehicles entering a specified zone of Central London. This was a significant change introduced as part of the Mayor's Transportation Strategy, the main priorities of which were to: reduce congestion, improve bus service, improve travel time reliability for drivers and increase the efficiency of the distribution of goods and services (TfL, 2014).

The LCC addresses this with the aim to reducing congestion and avoidable traffic particularly during the working week (Berman, 2012). The charging zone is in effect on weekdays between 07:00-18:00 hours (excluding public holidays) and all vehicles entering and leaving the zone during this time are recorded through cameras using an automatic number plate recognition system. Transport for London, which is the public transport agency, is responsible for the enforcing the charges as well as offering discounts and exemptions to certain types of vehicles and drivers. Currently a charge of £10 is levied if the fee is paid in advance or on the day the driver passes through the charging zone, which then increases to £12 if paid on the next day. If a payment is not made by midnight on the next day, there is a penalty charge of £130 (AA, 2013). Registered disabled drivers and motorcycles are however exempt from these charges.

The revenue collected from the congestion charges is then invested on relevant transport related purposes by the Greater London Author-

ity (GLA), TfL or London Borough Council for a period of 10 years; a condition that was stipulated as part of the legislation that allowed the introduction of congestion charging (Blow et al., 2003). Over the 10 year period between 2003 to 2013, over £1.2 billion has been invested in transport, including £960 million on improving the bus network, £102 million on roads and bridges, £70 million on road safety, £51 million on local transport/borough plans and £36 million on sustainable transport and the environment (Sunderland, 2014).

### 2.2. Proposed Changes to the LCC

Since the introduction of the LCC in 2003, there have been a number of modifications to the scheme. One of the current proposed changes is increasing the daily charge from £10 to £11.50 in June 2014 in line with inflation (TfL, 2014). TfL believes that this increase would also help maintain the financial deterrent effect of the charge in comparison to the costs of the other public transportation options. Some other proposed changes to the LCC include enabling discount applications and renewals to be made online, allowing direct debit payments for the "Auto Pay" option, changes to the National Health Service (NHS) reimbursement scheme and other minor administrative changes (*ibid*). According to TfL (2014), the proposed changes are believed to have a small positive economic impact through:

- Increase in congestion charges in keeping with inflation and other transport costs would ensure that traffic volumes and congestion do not increase causing delays, which in turn could have a negative impact on economic productivity.
- Maintenance of the congestion charging ensures that all revenue from this continues to be used for transport improvements as required by Schedule 23 to the GLA Act 1999. This is beneficial to all in the form of efficient transport links thus boosting the economy.

- Improvisations to the current LCC system to better meet user requirements e.g. introduction of different methods of payment to suit the needs of different users.

### 2.3. Implications of LCC

The introduction of the LCC is thought to have brought about significant implications in travel behaviour. Givoni (2012) published a study that estimated that as a direct result of the congestion charge, 60-70% of previous drivers had switched to an alternative mode of transportation (40% to buses, 50% to trains and 10-20% to walking, cycling, taxi's or motorcycles. It is however important to note that Central London being a dense area with robust public transportation systems and facilities for walking and cycling which while being supported by the congestion charge, have also been key in the congestion charge strategy being successful. Although congestion in Central London decreased significantly in the first two years after the introduction of the LCC, it then stabilized and subsequently returned to the same levels as before (Berman, 2012). However, it has also been argued that if LCC had not been introduced, it is likely that the congestion would have continued to increase by the same proportion as well (Givoni, 2012). An attempted Western extension to the LCC was ineffective in bringing about any reductions in congestion, thus highlighting its ineffectiveness in areas where alternative transport links were not as strong (Berman, 2012).

In London, the revenue from the congestion charge is used towards improvements in other transport options thus strengthening the effectiveness of the scheme (Sunderland, 2014). Since its introduction, a significant proportion of the funds were used towards improving the bus service including increasing the frequency and coverage of buses and introduction of more bus lanes to speed up the service. In addition, speedier payment methods were introduced including the "out of bus" ticket sales as well as being able to use the "Oyster" smart card for payment (Givoni, 2012). All of this has resulted in being able to provide an efficient

alternative road transport system to previous car commuters.

In addition to improving transportation, reduced congestion comes with other benefits including reduced air pollution, reduced traffic noise and safety for pedestrians (Kaparias and Bell, 2012). Whilst reducing air pollution was not a motivating factor for the introduction of the LCC, it was indeed a pleasant side effect (Berman, 2012). As fewer cars are sat idling for long periods, it is suggested that there has been an overall decrease in air pollution – which would not have occurred had the congestion charge not been introduced. In general, emissions both inside and outside of the zone have been steadily decreasing but it is difficult to quantify exactly what proportion of this is a direct result of congestion charging.

Overall, the LCC is widely considered a success as an effective way to reduce congestion and encourage use of alternative transport options in a central city (Kaparias and Bell, 2012; Berman, 2012). This strategy has been replicated in other cities, including Stockholm and Singapore, with London researcher's even encouraging U.S cities to follow suit as it encourages commuters to switch to more sustainable modes of transportation (Booth, 2008).

### 2.4. User Satisfaction Studies with LCC e-Service System

To the best of the authors' knowledge there haven't been any studies that have focused on user satisfaction with the Online LCC e-service so far. However there were some reports in the media regarding the users' dissatisfaction and the glitches in the online payment system such as fines given incorrectly and difficulties in using the system (Ritter, 2010). Other studies that were conducted on different aspects of the LCC include Santos and Bhakar (2006) who looked at the impact of the LCC on commuters from a value of travel time savings perspective and show that savings can be obtained through LCC. Janson (2008) discussed the possibilities of a zero-fare (i.e. free public transport) policy on the basis of new experiences of congestion

charging in London and Stockholm. More recently, Givoni (2012) conducted a study looking at the degree to which observed effects (e.g. congestion, traffic levels, change in travel behaviour and air pollution) could be attributed to congestion charging, raising questions about the practical effectiveness despite the evident theoretical rationale. The author argues that it is important to provide a better review of the charging schemes and signals a need to better understand the long term effects of charging schemes in general, and LCC in particular.

Vonk Noordegraaf et al. (2014) studied the implementation factors of six of the congestion charging schemes: Singapore, London, Stockholm, Norway, Edinburgh and Hong Kong based on a review of literature and ranking the most frequent factors listed in the study. They have found that political support, public support, information campaign, stakeholders' perceptions, transport system characteristics and marketing of the scheme affect all six case studies. Transport policy was found to be the most frequent factor for the LCC. In this case the congestion charging scheme was integrated into a well organised transport strategy. Moreover, the scheme has led to further investment into public transport (Dix, 2002; Livingstone, 2004). The key role the mayor of London plays and the fact that "the mayor of London had sufficient power to forge ahead with road pricing without the need to build a political coalition" (Anas and Lindsey, 2011), was a distinct feature of including the scheme in London and considered to have positively contributed to the implementation. This was followed by political and public support and the fact that the stakeholders were consulted and their views were taken into account when changing the charging scheme.

A survey of businessmen and the people living in London showed that the benefits of the scheme on traffic and environment are acknowledged and there is some change in people's attitudes towards the scheme (Livingstone, 2004). Several studies have focused on the usability aspects of the SMS payment (Inglesant and Sasse, 2007). These studies were

conducted in 2005 using a structured interview with 50 citizens who use the congestion charges payers and 10 in-depth interviews with both drivers and non-drivers. Results showed that usability was an issue when using this service and together with the short time-scale enforced with the penalties resulted in the citizens perceiving this system as adversarial. Although some of the drivers in the study used the online service for the convenience, the usability issues were solely focused on SMS as a method of payment.

This research study differentiates from the above studies by assessing the user satisfaction with the LCC e-Service payment system. As highlighted in the introduction, despite citizen satisfaction being a key element in the sustainability and viability of e-government services, there has been a lack of research performed on understanding it. Therefore, in this study, the authors seek to add to the existing literature by measuring TFL's LCC e-service system's overall user satisfaction as well as the satisfaction across the four dimensions described in the COBRA framework: cost, risk, benefits and opportunity. In addition, it also looks at whether the LCC e-Service system meets the needs of the average user.

### 3. RESEARCH DESIGN

The study conducted involved three stages to gather empirical data which included research design, data collection and finally data analysis and synthesis. In the first phase, the authors reviewed the normative literature and performed desk research of secondary sources to acquire background knowledge on the research area under investigation (i.e. the user satisfaction with using TFL's online payment system of LCC). This allowed the authors to identify and report the progress and implications of the LCC e-service system and an analysis of the studies conducted on the LCC. In the second phase, as part of the data collection strategy, the authors decided to utilise a quantitative approach based on a survey research as the appropriate methodology (Saunders et al., 2003; Creswell, 2003) to

follow to meet the research aim. A questionnaire was used as a survey instrument that included both closed questions (to help investigate user satisfaction across a given analysed dimension) and qualitative questions (to help assess why the participants were satisfied or not and whether the LCC met (or not) the survey responders' needs).

### 3.1. Design and Questionnaire Development

The questionnaire used for this study was designed based on the COBRA framework (Osman et al., 2011). The COBRA framework provides a holistic evaluation for stakeholders by considering "the most successful factors that impact the satisfaction of users within an e-government service" as opposed to other evaluation models that aim to assess e-government services from a general perspective (Osman et al., 2011). The framework comprises of four main constructs (i.e. cost, opportunity, benefit and risk) and the factors affecting e-services are organised around these main constructs in order to analyse user satisfaction. The *cost* construct encompasses tangible (e.g. cost of internet subscription) and intangible cost factors (e.g. time needed to find certain information). The *opportunity* construct comprises of factors that account for instances that arises when the user can take advantage of a service, such as providing flexibility in doing certain transactions (e.g. accessibility, service support). The *benefit construct* is the value that the user gains as a result of utilising the service. These benefits include money or time saved, information accuracy etc. The *risk construct encompasses factors that capture instances that arise when certain conditions could make the system vulnerable, such as the potential for fraud. The risks construct includes factors that are often uncontrollable and which can be personal (e.g. social isolation) or financial (e.g. hidden costs, payment mistakes).*

By using the constructs from the COBRA framework, an online survey was developed to include questions based on these constructs in addition to questions on demographics and

experience with the internet and the usage of the e-prescription system. The questionnaire used was assessed by five experts in the area of e-government for readability and language clarity, consistency of style and layout and further validated by 25 experts in the field of public sector and e-government research at a public conference.

The questionnaire comprised of two sections. The first section contained 49 closed multiple-choice questions focusing on the four main constructs of the COBRA framework and eight questions on the users' overall opinion: five about the cost, risk benefits, opportunity, and value; two about how the service meets user needs (one closed multiple-choice and one open); and another on collecting users' general comments. For the multiple-choice questions a seven-point Likert scale was used, where 7 was labelled as "Strongly Agree" and 1 as "Strongly Disagree" except on the last multiple choice questions assessing how the service meets user needs, where 1 was labelled as "Strongly meets my essential needs" and 7 was labelled as "None of my essential needs". The second section comprised of multiple-choice questions assessing demographic data, user internet usage and experience with the service.

### 3.2. Distribution of the Questionnaire

The questionnaires of this study were distributed with the help of an international market research and survey company that recruited UK users of the online TFL LCC. The participants were surveyed from 10 to 23 July 2013. The survey was distributed to 530 citizens who were regular users of the TFL online system through selective sampling. Of these 500 valid responses were selected for the analyses after eliminating 30 questionnaires that were incomplete. The participants filled in the anonymous questionnaire online using an existing survey tool (SurveyMonkey). The questionnaires used made it clear from the beginning that the completion of the survey was voluntary and the survey took between 10 - 15 minutes to complete. A



Table 1. Participants' information

Age Group		Education Level		Income		Internet Usage		LCC Use	
<24	12%	Secondary or less	7%	> £10,000	8%	Beginner (less than 3 Years)	2%	Everyday	17%
25-34	35%	High school	22%	£10,000 – £19,999	17%	Fair (3-6 Years)	10%	Several times weekly	17%
35-44	23%	Undergraduate Education	38%	£20,000-£39,999	36%	Good (6-10 Years)	30%	Once a month	21%
45-54	18%	Postgraduate Education	21%	£40,000-£69,999	22%			Several times a month	12%
55-64	12%	Doctorate	3%	£70,000 – £99,999	4%	Excellent (over 10 Years)	58%	Once a year	14%
>65	0%	Other Professional Qualifications	9%	>£100,000	5%			Several times a year	19%

random sampling in this case was not deemed appropriate as the focus of the research was to examine citizen satisfaction with the electronic LCC system and only selected citizens would have used this service. As a result a specialist survey company had to be used to gather the required data.

### 3.3. Data Handling and Statistical Analysis

The data gathered were transferred into a spreadsheet tool (Microsoft Office Excel) for the quantitative analysis, storage and retrieval purpose. Descriptive statistics were used to present the quantitative results and a thematic analysis process (Boyatzis, 1998) was used to analyse qualitative data obtained from the open-ended questions. Qualitative analysis was conducted using NVivo software (QRS International Pty Ltd., Victoria, Australia).

### 3.4. Demographics

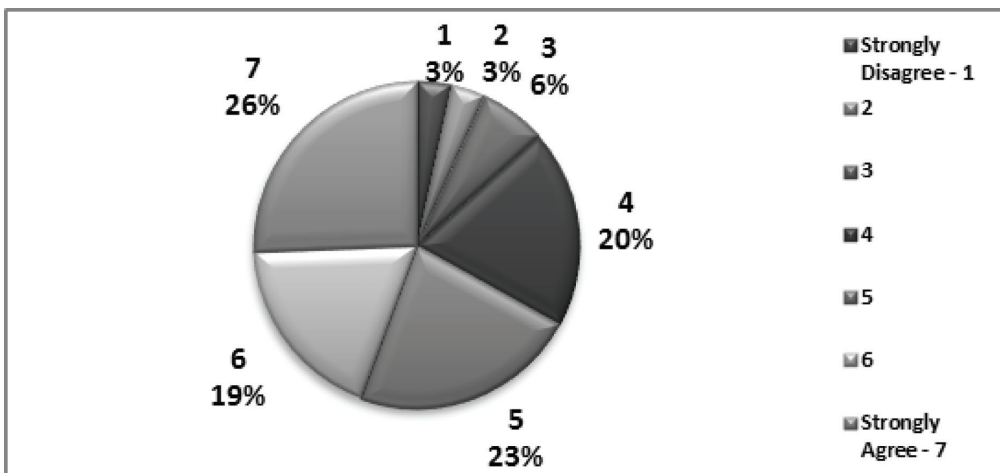
The survey resulted in 500 respondents who were users of the TFL LCC e-service. The participants had varied levels of experience with using the TFL LCC e-service. Of the par-

ticipants, 51% were male and 49% female and the age and income of the participants varied. Table 1 presents in details the participants' age group, education level, income, Internet usage and usage of the LCC e-service. Most of the participants, 58%, declared having excellent skills in using the internet and very few were beginners (2%). The usage of the TFL LCC e-service varied from every day usage to several times a month. A total of 8% of the participants preferred not to disclose their income. Apart from declaring the income, the rest of the questions were mandatory and as a result all participants answered them.

## 4. STUDY FINDINGS

This study measures citizens' satisfaction of the electronic LCC system across four constructs: cost, risk, benefits and opportunity, as described in the COBRA framework. The questionnaire used was designed to collect detailed data across the four dimensions of the COBRA framework; however this paper presents the results only on the questions in which the users' overall opinion across these four constructors is assessed. In addition, it presents the results of

Figure 1. Satisfaction with the overall cost of the service



the user’s perceived overall generated value by using the online service, how well this service meets their essential needs and the qualitative feedback of the participants who filled in the survey left. The cost, risk, benefits, opportunities and overall generated value are assessed using a 7 point Likert scale, with 1 being labeled as *Strongly Disagree* and 7 as *Strongly Agree*. How well the e-service meets the essential needs was measured also on a 7 point Likert scale, however in this case 1 was labelled as *Strongly Meets my most Essential Needs* and 7 was labelled as *None of my Essential Needs*. The qualitative feedback was collected through open ended questions, one of them asking the user to provide details on how the service meets their needs and another one to leave general comments. Open ended questions provided the necessary flexibility for unexpected results and to better understand the citizens’ experience with LCC. The evaluation findings are reported in the subsequent sections.

#### 4.1. Cost

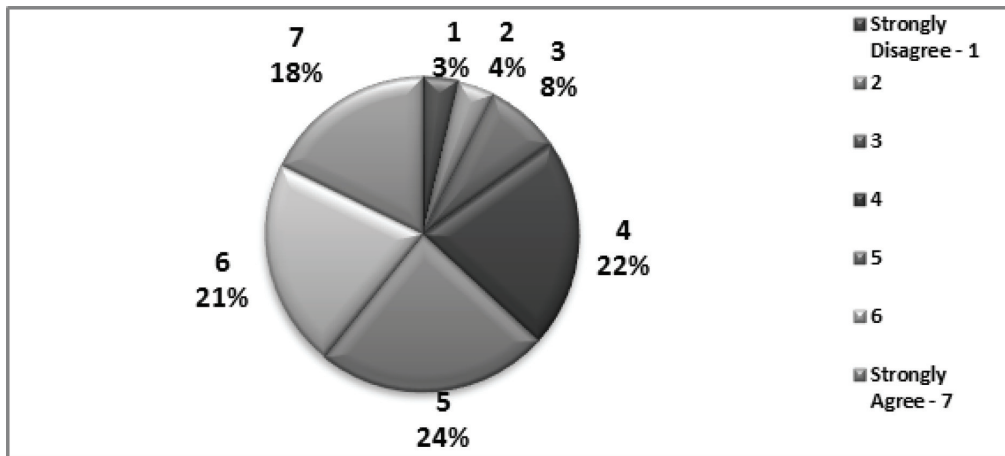
In order to evaluate the impact of cost (of using the system) on user satisfaction, there were 10 variables: time to find the e-service, time needed to up/download information, time to receive acknowledgement, effort (in terms of time and

cost) needed to complete the task, time to find information, number of steps to complete the e-service, registration cost, internet subscription cost and cost of renewing the prescription were measured. Citizen satisfaction with the overall cost incurred as a result of using LCC only service is presented in Figure 1. A total of 26% of citizens using this service strongly agreed with being satisfied with the cost of the service, 19% selected 6, 23% selected 5 and 20% selected 4 respectively on the given seven-point Likert scale. Some 3% of users strongly disagreed with being satisfied with the cost of this service.

#### 4.2. Risk

The risk section in the survey comprised eight multiple-choice, close-ended questions. The following variables were assessed: fraud, payment mistakes, hidden cost, audit by government/agency, future audit, social isolation, usage of the data by e-government for other purposes, and data privacy. The participants were afterwards asked to rate their overall satisfactions with the risk this services poses. Figure 2 presents the results. A total of 18% of the participants strongly agreed with being satisfied with the risk that occur when using this service, 21% selected the 6, 24% selected 5 and 22% selected

Figure 2. Satisfaction with the overall risk of the service



4 as an option on the seven-point Likert scale. As in the previous case, 3% strongly disagreed with the statement.

#### 4.3. Benefit

The benefits of the system were assessed through 17 questions: time savings, reductions in overall cost, reductions in transportation cost, money savings, service security, ease of finding the contact information for support, ease of understanding, ease of use, information presentation, information sufficiency, ease of navigation, information accuracy, up-to-date information, information relevance, ease of searching for information, necessity of training and the steps that needed to be completed offline. Figure 3 presents the participants' options when asked to assess their satisfaction with the overall benefits of the PPC e-service on a seven-point Likert scale. A total of 27% of participants strongly agreed with the statement: "I am satisfied with the overall benefit of this e-service", 24% selected 6 on the Likert scale and 21% selected 5 as an option. Only 2% strongly disagreed with the above statement.

#### 4.4. Opportunity

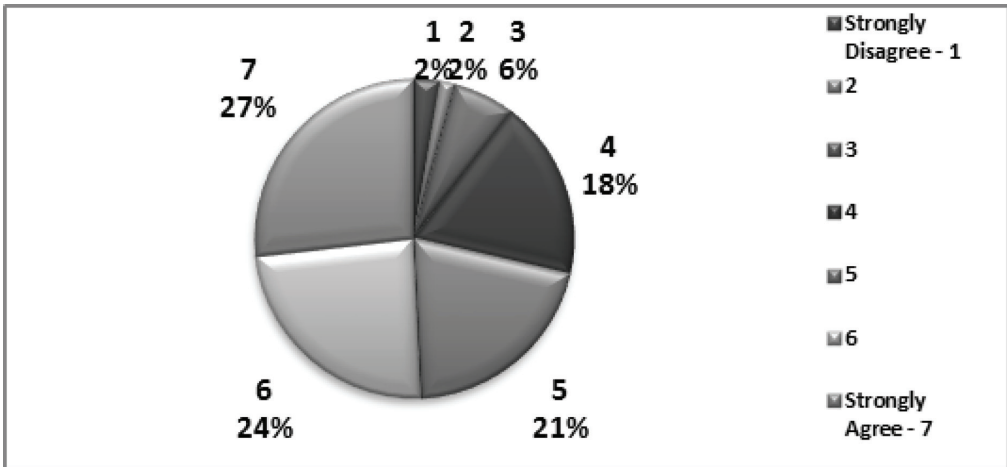
The opportunity offered by the LCC e-service was assessed through 14 variables: potential for

corruption, access at any time, customisation, delivery options, error alerts, options for getting support, support from e-service officers, options for receiving update alerts, payment methods, transaction history access, ability to recommend the service, language translation, information updates, and directions for completing it. Figure 4 highlights the results obtained when asking the respondents to rate which options best on the given seven point Likert scale best describe their opinion on the following statement: "I am satisfied with the overall opportunity of this e-service". As it was the case with the risk, benefit and cost, most of the participants were satisfied with the overall opportunity offered by this service. A total of 23% strongly agreed with the above affirmation", 26% selected 6 as their option and 21% selected 5 on the seven-point Likert scale. Some 4% strongly disagreed with the above affirmation.

#### 4.5. Overall Generated Value

The results reported when assessing the participant's opinion with the overall satisfaction with the LCC online service are presented in Figure 5. The results are similar to the ones presented for each of the four constructs above. A total of 25% of participants strongly agreed with being satisfied with the overall value of this service,

Figure 3. Satisfaction with the overall benefits of the service



22% selected 6 as an option, and 23% selected 5 on the seven-point Likert scale.

#### 4.6. Essential Needs

Figure 6 summarises the respondents' view on whether the LCC online system meets their needs. 20% strongly agreed that their essential needs are satisfied by using this system, 17% of the participants selected 6, and 12% selected 3. A total of 4% of participants strongly disagree

that their essential needs are met through this system.

#### 4.7. Qualitative Feedback

Two open-ended questions were used to collect qualitative feedback on how the service meets or does not meet the participants needs and another one asking for general comments. Only the comments for which the information presented made sense were coded (e.g. when an answer "n/a" was not provided this comment was not

Figure 4. Satisfaction with the overall opportunities offered by the service

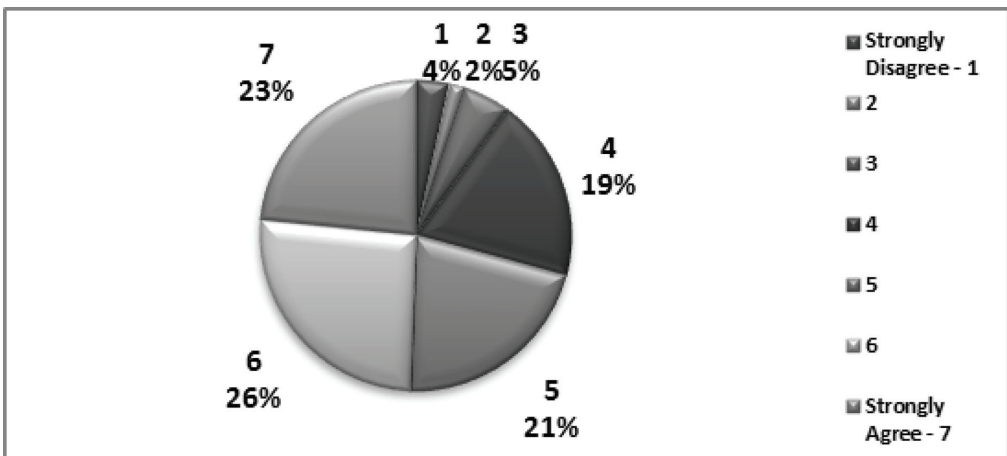
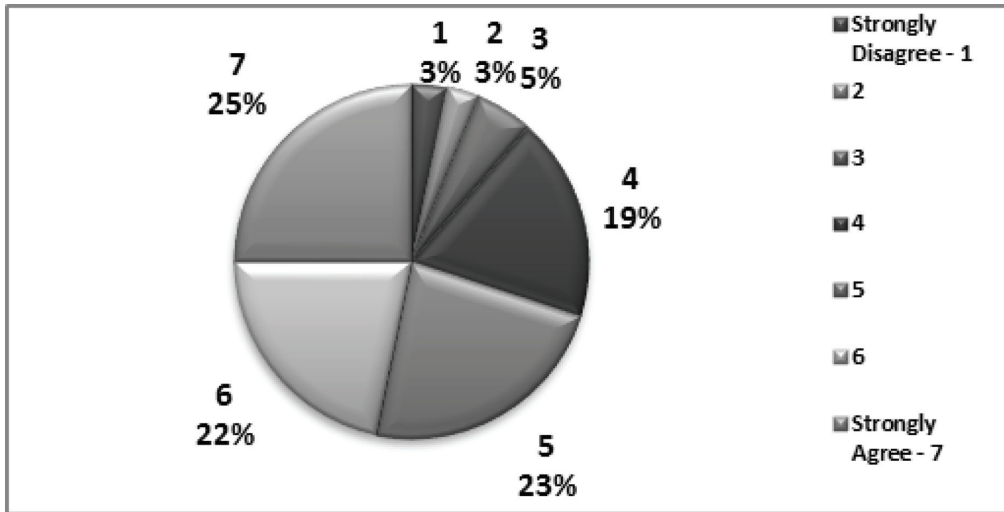


Figure 5. Satisfaction with the overall value of the service



considered). Two main themes resulted from the analysis: positive feedback regarding the system (e.g. easy to use) or positive outcomes as a result of using LCC e-service (e.g. time saving) (70%) and frustrations and overall negative feedback on using the online system (20%). The remaining 10% were either providing mixed experiences with the system (“It was fairly

straightforward to navigate through but it was very difficult to know exactly how I was supposed to supply the necessary information.”), a neutral opinion about the system (“nothings perfect”; “Does a good job but could be better”; “its just a standard service”), provided comments about the congestion charge in general but they do not refer to the online payment system, mostly

Figure 6. How well the service meets user needs

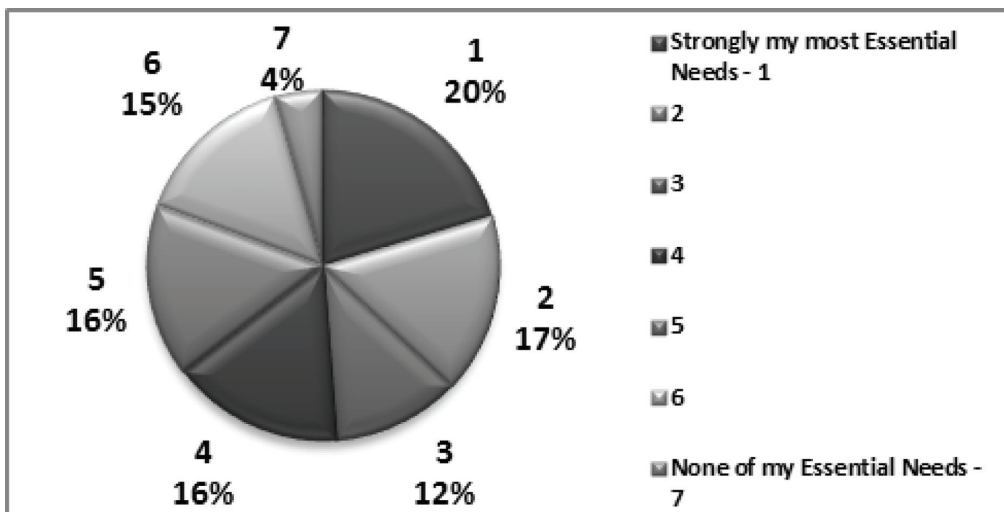
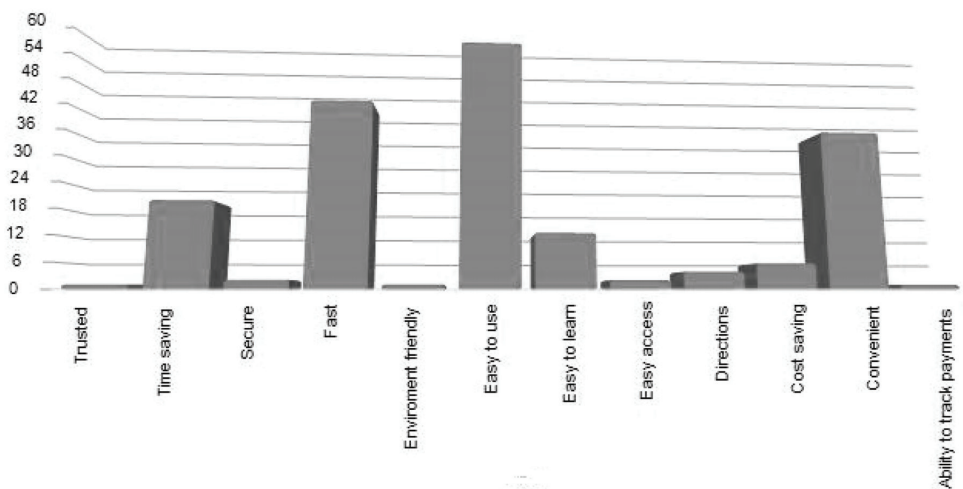


Figure 7. Positive features of the system or positive outcome when using the system



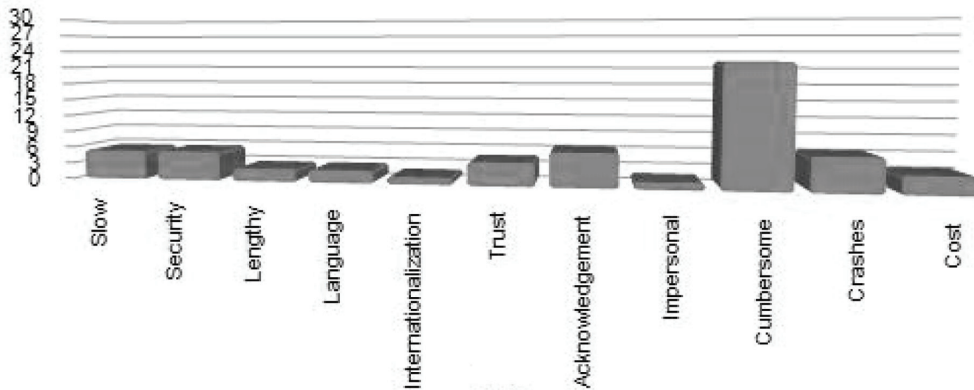
referring to the price paid for the congestion (e.g. “Should be a reduction in cost in using it”; “should remain free”; “the costs could be lower”; “I believe as road tax is already paid for ones vehicle no additional congestion should be left to pay”) or present people’s preferences towards other methods of payment available, typically dealing directly with a person (“I would rather deal with a local office in person”) or provide feedback for improvement (“It would have benefited from a main hub where I could access all of the services”).

**Positive feedback:** The respondents reported both positive features about the systems (e.g. easiness to use) but also positive outcomes as a result of using the system (e.g. time savings). These were all presented in Figure 7 which is based on the coding references count. Most often reported was the easiness to use of the online payment systems and its user friendliness (both coded under easy to use). The respondents also considered the online system as a fast and convenient way to pay “the irritating fine”. Some of the participants found this method convenient as they were suffering from certain conditions (“because I am disabled it is so much easier for me”) or because of their busy schedules (“useful to a busy person such

as myself”). The ability to pay it whenever it is convenient for them (“any time day or night”) and from any locations (“without leaving my loungeroom”) was also noted. Time savings were also reported both in terms of not needing to wait on the phone or travelling to the post office. Other positive features of the systems or outcomes were the ability to learn it quickly and the directions offered by the payment systems, easiness to track the payments once done, the cost savings of not having to travel to the post office, the easiness to access, the fact that it is more environmentally friendly as the citizens do not need to consume fuel to travel and pay the fine in the office and the fact that the system is considered secure and comes from a trustworthy source.

**Negative feedback:** The main problem with the system for the participants was that it was cumbersome to use (“very complicated”, “bad design and confusing”, “unclear navigation”, “poor interface”). Although the system being too complicated was the main negative feedback reported, fewer participants reported being difficult to use than the ones saying it was easy to use. Crashes of the systems and lack of acknowledgement when submitting the application was reported an equal number

Figure 8. Problems with the system



of times. The participants reported that they system either crashed, was not available or could not handle their payment and they had to either phone (“*I had to deal directly with a real person who was very pleasant and helpful*”) or email (“*I had to have email conversations over the following days to sort it out.*”). The lack of a confirmation or an electronic receipt made the respondents felt unsure the payment was processed (“*you are never sure your payments went through like you would over the phone or at a post office*”) and provided concerns for the cases of fraud or mistakes (“*They do not send back any acknowledgement, it case there is a fraud or mistakes, wither on their side or on mine, it is very hard to chase or reverted back.*”). The third most reported issue was the system being slow and concerns about the security or using an online system. One of the participant commented that the system is “*full of security holes that could be exploited!*”. Trust in the government and where the data provided will be used (“*I don’t trust the government - all the information we give them by these means will be used against us in the future.*”) as well as a lack of trust in the technology was also mentioned. Some participants mentioned that it was more costly to use the online service than the service provided in person, one of them commenting that s/he “*felt ripped off*” after using the online option to pay. Other issue mentioned was the

length of the form to fill in, the language used containing too many jargons and being difficult to understand, the necessity for the website to provide access in more languages and the service being perceived as too impersonal.

Although the positive comments were more than the negative ones, the latter (see Figure 8) could provide new avenues for improvement by providing a more reliable easy to use website, personalized, free of jargons, minimizing the forms that need to be filled in, solving the security issues (if any) and better informing the citizens both about them and about what is happening with the data stored about them.

## 5. CONCLUSION

The evaluation of e-government services can often be challenging with varying stakeholders interests and objectives that would have an impact on the success of e-services. Citizens are an important stakeholder of e-government activities and their satisfaction plays a key role in e-service success. This research has therefore focused on the general satisfaction of the citizens with their use of LCC e-service system across four dimensions: cost, risk, benefits and opportunity, as described in the COBRA framework. A large sample study (n=500) of the online LCC system was used to study citizen user satisfaction. The results showed that the

people are generally satisfied with the LCC. In-depth qualitative feedback from the users suggests areas for improvements to the service.

From a theoretical perspective, the study adds to the body of knowledge in user satisfaction studies with e-services by evaluating the satisfaction of a key public service offered by the UK government (the LCC e-service). In this respect, this paper has evaluated the opinion of citizens using four constructs that have not been applied before in the UK when studying government e-services. To the best of our knowledge this is also one of the first studies that assess the usability of LCC e-service in UK.

In terms of practical contribution, the findings offer valuable insights to public sector policymakers and ICT managers who are responsible for developing and maintaining online systems such as the LCC. While detailing user satisfaction in terms of cost, risk, benefits and opportunities of using the system, the results also point to further improvements that can be addressed across these dimensions. The descriptive statistics presented in the article could be used to prioritise the areas of importance in addressing issues that are perceived of importance from the user point of view. The qualitative feedback provides valuable insights on the areas that need attention. The feedback can be used to further improve the LCC website functionality, user support, and increase citizens' trust and awareness both in the governmental agencies providing these services and in the online services provide.

One of the limitations of this study is that the data for this research were collected using a cross-sectional design and consequently the findings present the user satisfaction with the LCC online service at a single point in time. Therefore, future research could explore user satisfaction through a longitudinal study, gaining a deeper understanding in this way. Furthermore, the survey was targeted towards users of the system through selective sampling and thus it would be interesting to study other users who are aware of the e-service, but have not used the online payment system but other method

of payments (e.g. mobile) and understand why they have not used the online system.

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