

Transport related Technical & Engineering Advice and Research – Lot 2 Roads

Task 061: Local Residents Discount
Scheme and Dart-Tag Review

Package Order Ref: 061
(4/45/12)ATK

Final Report

August 2013

Notice

This document and its contents have been prepared and are intended solely for The Department for Transport's information and use.

ATKINS assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

Document history

Job number:			Document ref: DfT_LRDS_Final Report V4 230113			
Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
Rev 1.0	Draft Final Report issue to DfT	AHM/AB/NP	AB	AB	AHM	22/10/12
Rev 2.0	Final Report issue to DfT	AHM/AB/NP	AHM	AHM	AHM	26/11/12
Rev 3.0	Final Report issue to DfT with Option 3C	AHM/AB	AB	AHM	AHM	17/12/12
Rev 4.0	Final Report with DfT comments	AHM/AB	AB	AHM	AHM	23/01/13
Rev 5.0	Final Report with additional DVLA data	AHM/AB	AB	AHM	AHM	19/08/13

Table of contents

Chapter	pages
Executive Summary	5
1. Introduction	11
1.1. The Dartford-Thurrock Crossing	11
1.2. Revisions to Charges at the Crossing	11
1.3. The Review of the LRDS and Dart-Tag	11
1.4. Study Scope	12
1.5. Approach to the Study	12
2. The Current Local Residents Discount Scheme and Dart-Tag Scheme	13
2.1. Overview of Operation of Dartford Crossing and Charges	13
2.2. Current Administration and Operational Arrangements	16
2.3. Review of Current Administrative and Operational Processes	16
2.4. Marketing and Promotion of LRDS and Dart-Tag	17
2.5. Comparison with Other Schemes	18
2.6. Understanding of Future Plans	20
2.7. Summary	20
3. Baseline - Existing levels of use of Dart-Tag and LRDS	22
3.1. Volumes of Account Tags	22
3.2. Present number of transactions and total revenue	22
3.3. Summary	29
4. The Department's Objectives	30
4.1. The Government's Strategic Objectives for the Crossing	30
4.2. Local Objectives	30
4.3. Local Issues raised by the 2011 Consultation	31
4.4. Additional Consultation	31
5. Potential Interventions: Improved Customer Channels and Marketing	32
5.1. Overview	32
5.2. Changes to LRDS Website	33
5.3. Potential Marketing Measures	36
5.4. Potential Impact of Free-flow tolling	36
6. Potential Interventions: Expanding Local Discount Scheme Eligibility	38
6.1. Overview	38
6.2. Including Other Nearby Boroughs	38
6.3. Changing the definition of Local to be based on distance from the Crossing	39
6.4. Extending Eligibility to Local Businesses	42
7. Assessment of Interventions	46
7.1. Options for Change	46
7.2. Multi-Criteria Assessment of Intervention Scenarios	48

8.	Conclusions	56
8.1.	Effectiveness and efficiency of the administrative process for scheme application, renewal and on-going membership of the scheme	56
8.2.	Levels and range of discounts offered to scheme members	56
8.3.	Potential for improvements to marketing, publicity and awareness of the scheme in increasing take up	56
8.4.	Potential for changes to current eligibility criteria for local residents	57
8.5.	Case for the inclusion of local businesses	57
8.6.	Assessment of Options for Change	57

Tables

Table 2.1:	Toll Lane Arrangements	13
Table 2.2:	Crossing Charges prior to 7/10/12 (Excluding Exempt and Local Residents)	13
Table 2.3:	Crossing Charges from 7/10/12 (Excluding Exempt and Local Residents)	13
Table 2.4:	Payment Methods	14
Table 2.5:	Charges from 7 Oct for Using Dartford Crossing (Excluding Exempt and Local Residents)	16
Table 2.6:	Account Processing Metrics	16
Table 2.7:	Potential Areas for Reducing Compliance Costs for LRDS User Registration and Renewals	17
Table 3.1:	Take-Up of LRDS since 2008 Charging Order (Source: Connect Plus)	22
Table 3.2:	Snapshot of Active Tags on 26/9/12	22
Table 3.3:	Summary of Actual Transactions 2011/2012	23
Table 3.4:	Summary of Annual Revenue 2011/2012	23
Table 3.5:	LRDS and Dart -Tag– Summary of Frequency of Crossing by Vehicle Type (2010 to 2012)	24
Table 3.6:	LRDS / Dart-Tag Users by Origin and Distance Band (km)	26
Table 3.7:	LRDS accounts and registered cars by Local Authority	26
Table 3.8:	Journey to Work trips by Local Authority (2001 Census)	28
Table 3.9:	Breakdown of trips using Crossing by distance (16 hour flows)	28
Table 6.1:	Options for Extension to Local Businesses	44
Table 7.2:	Summary of Estimated LRDS and Dart-Tag users (2014/15)	48
Table 7.3:	Multi-Criteria Analysis of Intervention Scenarios	52
Table 8.1:	Summary of Impacts of Options for Change (2014/15 compared to Reference Case)	58

Figures

Figure 3.1:	Proportion of Transactions by Payment Channels	24
Figure 3.2:	LRDS – Cumulative Frequency of Use (2010 to 2012)	25
Figure 3.3:	Dart-Tag – Cumulative Frequency of Use (2011 to 2012)	25
Figure 3.4:	LRDS and Tag Accounts by Post Code Districts	27
Figure 6.1:	Potential area for expansion of the LRDS by Local Authority District	39
Figure 6.2:	Illustration of 20km Radius for Eligibility (by 5km crow-fly distance band from the Crossing)	41
Figure 6.3:	Illustration of 10km Radius for Eligibility (including Thurrock and Dartford)	42
Figure 7.1:	Estimated number of Transactions by Scenario	49

Appendices

Appendix A. Current Operations

A.1. Customer Channels

Appendix B. Cost Table Marketing and Back Office Enhancements

B.1. Cost Table Marketing and Back Office Enhancements

Appendix C. Consultation Responses

C.1. Thurrock Consultation Notes

C.2. Dartford Consultation Notes

Appendix D. Model Development Note

- D.1. Introduction
- D.2. Developing the Benchmark
- D.3. Developing the Reference Case

Executive Summary

The Dartford-Thurrock Crossing

The Dartford-Thurrock Crossing (the Crossing) is a key part of the strategic road network, which facilitates the movement of goods and people. It consists of two two-lane tunnels carrying traffic to the north, and the four lane Queen Elizabeth II (QEII) Bridge carrying traffic to the south.

The Crossing opened in 1963 with a single tunnel when a cash toll was levied. A second tunnel was added in 1980 to separate north and southbound traffic and increase capacity. Automated cash processing bins were also introduced at that time. In 2003 the toll was changed into a charge under the road user charging provisions of the Transport Act 2000.

There are two discount options available for users as an alternative to paying the cash charge, both using Dart-Tag; the system involves an electronic tag carried on a vehicle being detected at the toll booth and then deducting payment from a pre-paid account before opening the barrier to allow the vehicle to pass. There are two types of Dart-Tag users: those that receive a discount on the cash charge of around 33%; and those that are members of the Local Residents Discount Scheme (LRDS) that pay zero charge for 50 crossings a year, and then £0.20 per crossing once the annual free limit is exceeded. The LRDS eligibility is defined as persons permanently resident in the borough of Dartford or Thurrock.

On 30 June 2011 the Department for Transport (DfT) published for consultation the details of proposed revisions to the road user charge at the Crossing which included increasing the level of charge. Following consideration of the representations made the Department decided that charges would increase in two stages: the first in October 2012; and a second increase at the same time as the introduction of free-flow charging technology scheduled for October 2014. Discount rates for those paying in advance via Dart-Tag will remain unchanged and the charges offered under the LRDS will not be increased and the eligibility for the scheme will not be reduced in scope from that previously established in 2008.

The Department also concluded that it should: consider the effectiveness of the current LRDS; and review the effectiveness of the Dart-Tag scheme in providing discounts to regular users. The Department commissioned Atkins in September 2012 to undertake an evidence-based study to support any further decisions on the schemes.

Present number of transactions and total revenue

Tables E.1 and E.2 present a summary of annual Crossing transactions and revenue respectively, for the 2011/12 financial year. This is categorised by the different payment channels.

Table E.1: Summary of Actual Transactions (Crossing in both directions) 2011/2012

Payment Type	Annual Transactions ('000s)	% of total
LRDS	1,650	4%
Dart-Tag	13,049	29%
Cash	28,766	65%
Total Transactions	43,464	98%
Incl. Exemptions	44,509	100%

Table E.2: Summary of Annual Revenue 2011/2012

Payment Type	Revenue (£000s)	% of total
LRDS	194	0%
Dart-Tag	22,920	32%
Cash	48,048	68%
Total Transactions	71,162	100%

Most (66%) LRDS account holders use less than their allocated 50 free journeys per year. Only 4% of LRDS holders make over 400 crossings per year, suggesting a relatively low proportion of commuters in Dartford and Thurrock rely on the crossing for regular commuting to and from work.

Available evidence indicates that no more than 5% of the total journey to work trips made by residents of any of the local authority areas in the vicinity of the Crossing are likely to be using the Crossing. However, about a third of Crossing traffic over the day is travelling to or from Dartford and Thurrock, though this includes a mixture of different types of trips including local and longer-distance movements and not just those made by Dartford and Thurrock residents.

The Government's Strategic Objectives for the Crossing

The aim of the Government's proposals to revise the charging regime, as set out in the May 2012 Consultation Response, is to reduce congestion at the Crossing. The Department's Impact Assessment of the revised charging regime states that the policy objective is to reduce congestion at the Crossing (by improving traffic flow) to support economic activity and improve social well being. The stated objectives of the policy are to:

- Continue to manage demand for the use of the Crossing and reduce the impacts caused by levels of congestion at the Crossing; and
- Provide Government with additional revenues to allow the Department for Transport to continue to prioritise development and funding of proposals, particularly provision of additional crossing capacity in the Lower Thames.

Local Issues raised by the 2011 Consultation

In addition the Department's 2011 consultation on the proposals to revise the charging regime raised a range of local issues. The extent to which changes to LRDS or Dart-Tag would address the issues raised has also been considered. In summary the key local issues raised were:

- there is insufficient discount available to local businesses – and that the LRDS should be extended to local businesses.
- the eligibility criteria for residents is too narrowly defined – with suggestions that the boundary should be extended to allow more residents from a wider area to benefit e.g. Bexley, Havering, Gravesham and Basildon; and
- the deterrence effect of the LRDS administration and renewal processes on scheme take-up.

Effectiveness and efficiency of the administrative process for scheme application, renewal and on-going membership of the scheme

Based upon a review of existing processes we conclude that, in general, the LRDS account registration and renewal processes are not unnecessarily onerous, though a detailed customer survey has not been undertaken and was outside the scope of this study. The administration and operation of the processes appear to be efficient and proportionate to the level of use of the LRDS, though it is noted that a detailed benchmarking exercise was outside the scope of this study.

LRDS applications require proof of residence and vehicle ownership in line with schemes such as local resident's parking permit schemes. The need for paper-based submission of documents for LRDS may be acting as a barrier to take up of the scheme – though it is noted that the number of scheme members is increasing annually. The supporting administrative systems lack features which could improve back office processes and efficiency – this may be in part due to lack of budget for system enhancements.

A set of improvements to administrative processes that could feasibly be implemented has been identified and indicative costs estimated, though these would need to be subject to detailed design and engagement with suppliers. These improvements could reduce the burden on users in applying for and renewing their LRDS membership and could thereby increase scheme take up. However, the introduction of free-flow planned for October 2014 may substantially change how LRDS and Dart-Tag accounts and customer facing channels operate, potentially reducing the value of investment in changes to administration and systems that may have a life of only one year.

Levels and range of discounts offered to scheme members

LRDS and Dart-Tag users receive discount benefits that substantially exceed those available from comparable schemes within the UK. The majority of LRDS users do not take up their “free” trip allowance – we conclude there is no need to increase the level of discount.

The estimated discount benefit of the LRDS to residents of Dartford and Thurrock is c£1.5-£2.3 million per annum (for 2011/12) based on the charges (cash or Dart-Tag) that scheme members would otherwise have to pay for the journeys made. Under the charging regime in place from October 2012 the level of this benefit is expected to be higher, c£2.0-3.1 mill per annum. Overall this is a similar magnitude to the £2 million per annum that was, prior to the LRDS implementation in 2008, provided to Dartford and Thurrock from Crossing revenues as additional local transport funding.

We have therefore not considered options to provide additional discount benefits.

Potential for improvements to marketing, publicity and awareness of the scheme in increasing take up

LRDS and Dart-Tag are not marketed in line with other typical tolled or charged crossings and little is spent on marketing – approximately 0.07% of the LRDS and Dart-Tag related revenue is spent on marketing.

There are no dedicated tag-lanes to demonstrate the time-saving advantages to cash payers, though a trial of dedicated lanes is planned for February 2013. Signage at the Crossing regarding the availability of LRDS and Dart-Tag is poor and cash payers may not become aware of those options as they approach or pass through the toll plaza. We have proposed additional marketing and signage measures to increase customer awareness.

Potential for changes to current eligibility criteria for local residents

We have reviewed the eligibility criteria and considered interventions including: allowing residents in neighbouring districts to Thurrock and Dartford (as proposed by respondents to the Department’s 2011 consultation) to be eligible for LRDS; and eligibility based on distance from the Crossing.

Both options are considered technically feasible in that they could be implemented and operated through extending the current LRDS application, renewal and enforcement mechanisms.

Replacing the existing Dartford and Thurrock local authority-based residency eligibility criteria with a solely distance-based criteria would be problematic as a very large area would become eligible for a discount. For this reason it is not recommended as an option to take forward unless, perhaps, considered as part of a wider sub-regional approach to providing discounts at other crossing locations.

Potentially a hybrid option could be pursued whereby: existing scheme eligibility as defined by residency within the districts of Dartford and Thurrock is retained; and supplemented by additional eligibility for those locations outside Dartford and Thurrock which are within a set distance of the Crossing. It is this hybrid option that has been assessed further by the review.

However, any form of geographic extension of eligibility would generate new issues of equity and understanding of the rationale for a discount scheme.

Case for the inclusion of local businesses

We have considered the option of extending the LRDS to businesses located in communities in the vicinity of the Crossing and concluded this it would be technically feasible to operate and could be incorporated within the existing LRDS application, renewal and enforcement mechanisms using payment of business rates in Dartford and Thurrock as the evidence of eligibility. Further development would though be required to confirm detailed feasibility and costs, the geographic scope of the scheme, the level of discount and the number of tags that should be made available to each individual business. This is also likely to require further consultation. We have considered the option of extending the LRDS to Light Goods Vehicles (LGVs) for businesses located in communities in the vicinity of the Crossing so as to focus benefits on small businesses. However, advice from the Department’s legal team indicates that it would not be possible to charge LGVs without also including other 2-axle goods vehicles because of the definition of vehicle categories used for charging at the Crossing. A discount for 2-axle goods vehicles would be technically feasible to operate and could be incorporated within the existing LRDS application, renewal and enforcement mechanisms. This could use payment of business rates in Dartford or Thurrock as the basis for determining

eligibility. Further development would though be required to confirm detailed feasibility and costs, the geographic scope of the scheme, the level of discount and the number of tags that should be made available to each individual business. We have also considered an option that would include small businesses that would be excluded from scheme eligibility based on payment of business rates; this option could be based on extending the existing car-based LRDS to include 2-axle goods vehicles providing eligibility of the vehicle owner's residency in Dartford and Thurrock could reasonably be established. These options are also likely to require further consultation should implementation be considered.

Options for Change

A set of potential interventions, or options for change, that could be implemented to increase take up and extend availability of Dart-Tag and discounts for local residents and businesses has been identified. These options are summarised in Table E.3.

An assessment of each of the options has been undertaken multi-criteria analysis. The results of the assessment are presented in Table E.4.

Table E.3: Options for Change

Options for Change	Description
Option 1 – Improved Customer Channels (i.e. mechanisms by which users can make contact regarding and make payment for LRDS and Dart-Tag) and Marketing	Comprising: <ul style="list-style-type: none"> • Changes to LRDS website to allow web-based applications and renewals for LRDS • Improved marketing of LRDS and Dart-Tag via improved signage, improved media channels to LRDS and Dart-Tag web-site, improved targeting of cash payers at toll plazas through leaflets, improved customer contact channels to improve email marketing and promotion
Option 2a – Extend local resident discount scheme to residents outside Dartford and Thurrock based on adjacent local authority districts	These comprise: Dartford, Thurrock, Gravesham, Bexley, Havering, Brentwood, Basildon and Castle Point as the districts that are immediately adjacent to Dartford and Thurrock and which are identified in the response to the consultation.
Option 2b – Extend local resident discount scheme to residents outside Dartford and Thurrock based on within 10 km distance from Crossing	Comprising: <ul style="list-style-type: none"> • Residents of Dartford or Thurrock; and • Residents of properties within postcode areas where any part of the postcode area is within 10 kms of the Crossing
Option 3a – Extend local discount scheme to include businesses in Dartford and Thurrock	To include businesses in Dartford and Thurrock that: <ul style="list-style-type: none"> • pay business rates in Dartford or Thurrock • cars and 2-axle goods vehicles only • scheme limited to 5 nominated vehicles • transaction charge of £0.50
Option 3b – Extend local discount scheme to include businesses in Dartford and Thurrock or within 10 km distance from Crossing	Comprising businesses that: <ul style="list-style-type: none"> • pay business rates in Dartford or Thurrock; or • pay business rates within postcode districts where any part of that postcode district falls within 10 kms of the Crossing. and based on: <ul style="list-style-type: none"> • cars and 2-axle goods vehicles only • scheme limited to 5 nominated vehicles • transaction charge of £0.50

Options for Change	Description
Option 3c – Extend local discount scheme to include 2-axle goods vehicles registered to residents of Dartford and Thurrock	Comprising: <ul style="list-style-type: none"> • 2-axle goods vehicles that are registered to residents of Dartford and Thurrock; or • 2-axle goods vehicles that are registered to businesses in Dartford and Thurrock that do not pay business rates, but where the vehicle is registered to a resident of Dartford or Thurrock. and based on: <ul style="list-style-type: none"> • 2-axle goods vehicles only • scheme limited to 1 vehicle per resident same transaction charges as car-based LRDS (i.e. 50 free transactions a year with subsequent transactions charged at £0.20 each)

The impact of potential interventions to change the operation and eligibility criteria for the LRDS and Dart-Tag schemes has been assessed using estimates of changes in the number of transactions at the Crossing, net revenues, congestion and the costs of operating the LRDS and Dart-Tag schemes. Impacts have been assessed against a reference case assuming the charging regime that will be in place in 2014/15. Qualitative assessments have been made of operational feasibility and the extent to which the interventions would support the Department's strategic and local objectives for the Crossing. A summary of the headline conclusions is provided in Table E.4.

The analysis indicates that the level of take up of both LRDS and Dart-Tag can be increased. However, the impact of each of the options considered is not forecast to significantly change total Crossing transactions but changes the distribution of payment channels.

Table E.4: Summary of Impacts of Options for Change

Options for Change	Estimated additional number of users with tags paying via Dart-Tag or LRDS	Estimated change in Crossing Revenue £ mill pa	Estimated Additional operating cost per annum £ mill pa
Option 1 – Improved Customer Channels and Marketing	11000	-2.4	0.5
Option 2a – Extend local resident discount scheme to residents outside Dartford and Thurrock based on adjacent local authority districts	10000	-2.9	0.4
Option 2b – Extend local resident discount scheme to residents outside Dartford and Thurrock based on within 10 km distance from Crossing	4200	-1.9	0.2
Option 3a – Extend local discount scheme to include businesses in Dartford and Thurrock	2400	-2.2	0.1
Option 3b – Extend local discount scheme to include businesses in Dartford and Thurrock or within 10 km distance from Crossing	5500	-2.5	0.2
Option 3c – Extend local discount scheme to include LGVs registered to residents of Dartford and Thurrock	2300	-1.4	0.1

With Option 1, improving existing customer channels and increasing marketing, the projected impact is for a transfer of existing cash payers to discounted Dart-Tag and LRDS charges. Options 2a and 2b – extending the residency eligibility criteria for the LRDS beyond Dartford and Thurrock – are projected to result in both cash payers and existing Dart-Tag users transferring to the LRDS. The same effect is projected for Options 3a, 3b and 3c with the local discount scheme extended to businesses.

The impact of users transferring to either local discount schemes or Dart-Tag is projected to result in reduced revenues from Crossing charges compared to the reference case. The level of revenue reduction depends on the option considered, but ranges between £1.4 and £2.9 mill per annum. Combining the options would reduce revenue further, up to £6.6 mill p.a. if eligibility for discounts was extended across a much wider geographic area. Additional operating costs for changing existing scheme operation would also apply and could also be expected to impact on net revenues.

All options are forecast to result in slightly increased traffic levels on the Crossing as a result of lower travel costs given the discounts available to certain users. Even though these increases are small, the impact would be slightly increased congestion levels.

None of the options therefore support the Department's strategic objectives for the Crossing as they do not reduce congestion levels at the Crossing and they do not contribute to providing additional revenues to fund other proposals.

All options are considered technically feasible in that existing operational mechanisms could reasonably be extended to accommodate the changes required for each of the options, though further work would be required to specify detailed operating regimes. However, issues would need to be addressed to ensure that: users understood and accepted the rationale for expanding eligibility for discounts beyond that defined for the current LRDS; and that users understand and accept processes of determining eligibility. In addition, the move to free-flow tolling at the Crossing could also impact on the value for money and practical feasibility of making changes to the existing LRDS and Dart-Tag schemes.

1. Introduction

1.1. The Dartford-Thurrock Crossing

The Dartford-Thurrock Crossing (the Crossing) is a key part of the strategic road network, which facilitates the movement of goods and people. It consists of two two-lane tunnels carrying traffic to the north, and the four lane Queen Elizabeth II (QEII) Bridge carrying traffic to the south. The Crossing spans the River Thames between Dartford and Thurrock, forming a trunk road link (the A282) in the M25 orbital motorway.

The Crossing opened in 1963 with a single tunnel when a cash toll was levied. A second tunnel was added in 1980 to separate north and southbound traffic and increase capacity. Automated cash processing bins were also introduced at that time. When the QEII Bridge was opened in 1991 an automated tag and beacon based tolling system (Dart-Tag) with pre-paid accounts was introduced to reduce the need for cash payments.

In 2003 the toll was changed into a charge under the road user charging provisions of the Transport Act 2000¹. Charges are levied in both directions and different charges are levied according to vehicle category. The charging regime was reviewed and amended in 2008 setting new charge levels for cash payments that range from £1.50 for cars up to £3.70 for Heavy Goods Vehicles (HGVs) and introducing a Local Resident Discount Scheme (LRDS) which also relies on Dart-Tag.

There are two discount options available for users as an alternative to paying the cash charge, both using Dart-Tag; the system involves an electronic tag carried on a vehicle being detected at the toll booth and then deducting payment from a pre-paid account before opening the barrier to allow the vehicle to pass. There are two types of Dart-Tag users: those that receive a discount on the cash charge of around 33%; and those that are members of the LRDS that pay zero charge for 50 crossings a year, and then £0.20 per crossing once the annual free limit is exceeded. The LRDS costs £10 membership with eligibility defined as persons permanently resident in the borough of Dartford or Thurrock. There are also exemptions from the charge for certain vehicle types (such as emergency and military vehicles) and for certain categories of blue badge holders.

1.2. Revisions to Charges at the Crossing

On 30 June 2011 the Department for Transport (DfT) published for consultation the details of proposed revisions to the road user charge at the Crossing which included increasing the level of charge². The Department published its response to the consultation in June 2012³. In summary, following consideration of the representations made the Department decided that:

- charges would increase in two stages: the first in October 2012; and a second increase at the same time as the introduction of free-flow charging technology scheduled for October 2014. This proposal, for example, means charges for cars increase from £1.50 to £2.00 in October 2012, and then to £2.50 in the second stage. Broadly the increases are equivalent for all vehicle classes;
- the current exemptions would remain largely unchanged (with only minor amendments related to visiting armed forces);
- discount rates for those paying in advance via Dart-Tag will remain unchanged; and
- the charges offered under the LRDS will not be increased and the eligibility for the scheme will not be reduced in scope from that established in 2008.

1.3. The Review of the LRDS and Dart-Tag

Having considered the consultation findings the Department also concluded that it should:

- consider the effectiveness of the current LRDS in providing residents with additional “benefits” in offsetting the impacts of the current Crossing, and ensuring that the scheme provides an easy to use and customer focused service for those who are members – specifically why the take up of

¹ Prior to 2003 a toll was levied for the use of the Crossing; with the toll revenues used to fund the operation and maintenance of the Crossing and discharge the debts associated with the construction of the bridge and the tunnels.

² Revising the Charges at the Dartford-Thurrock River Crossing: Consultation Document, Department for Transport, June 2011

³ Revising the Charges at the Dartford-Thurrock River Crossing: Consultation Response, Department for Transport, June 2012

the current scheme is low, whether the LRDS registration and renewal process is a barrier to take up and whether the scheme's eligibility criteria should be extended; and

- undertake a review of the effectiveness of the Dart-Tag scheme in providing discounts to regular users to ensure that it remains effective and provides the users of the scheme with an easy to use service – specifically to understand the challenges to greater take up of the discount regime.

1.4. Study Scope

The Department commissioned Atkins in September 2012 to undertake an evidence-based study to support any further decisions on the schemes, with the following scope:

- Objective 1: Appraise the effectiveness and efficiency of the administrative process for LRDS application, renewal and on-going membership of the scheme.
- Objective 2: Review the levels and range of discounts offered to LRDS members, though noting that existing members are to be no worse off, and to Dart-Tag users.
- Objective 3: Assess and scale the potential for improvements to marketing, publicity and awareness of the LRDS and Dart-Tag schemes in increasing take up.
- Objective 4: Review the current LRDS eligibility criteria for local residents.
- Objective 5: Quantify the case for the inclusion of small local businesses and their employees in the LRDS.
- Objective 6: Quantify the financial implications of changes to the criteria of LRDS eligibility and the levels of discounts offered.
- Objective 7: Assess the operational implications of changes to the criteria of LRDS eligibility and the levels of discounts offered.

This report presents the findings of the study, including a multi-criteria analysis of the impact and feasibility of different interventions, and makes recommendations to inform the Department's review of the LRDS and Dart-Tag.

1.5. Approach to the Study

The report consists of the following sections:

- Chapter 2 provides an overview of the operation of the crossing charges and the current LRDS and Dart-Tag schemes in terms of the operational and administrative arrangements. The Highways Agency and the operator of the Crossing, Connect Plus have provided information on current operational arrangements.
- Chapter 3 presents a summary of the baseline conditions, identifying the volume of Account Tags, existing levels of use of LRDS and Dart-Tag and revenue generated. The Chapter aims to provide a better understanding of the scale of use, origins of users and establish the dependency on the Crossing. Data has been provided by the Highways Agency and Connect Plus.
- Chapter 4 draws upon previous sections and defines strategic and local objectives for the Crossing.
- Chapters 5 and 6 draws together a list of potential interventions that address the objectives identified in Chapter 4.
- Interventions identified in Chapters 5 and 6 have been developed into a variety of Scenarios in Chapter 7. These are broadly based on improved marketing / administration, expanding the scope of LRDS eligibility and increasing the discount for business users. Chapter 7 assesses each scenario against a set of indicators – comprising financial and operational aspects - to enable an objective view to be taken of whether changes to the scheme would meet the Department's objectives for the Crossing.
- Chapter 8 provides conclusions.

2. The Current Local Residents Discount Scheme and Dart-Tag Scheme

2.1. Overview of Operation of Dartford Crossing and Charges

2.1.1. Toll Lanes and Plazas

The Crossing currently operates on a barrier basis with toll lanes and toll plazas located on the south of the river. To pay the charge, traffic moves as follows:

- Northbound traffic enters into a 14-booth plaza before separating into two tunnels (West and East).
- Southbound traffic exiting from the Queen Elizabeth Bridge enters a 13-lane plaza.

The booths are the primary payment channel by volume of payments collected, cash being paid to the operators or thrown into the cash bins in the automated lanes. The Crossing collects approximately £70m per annum of which 68% of payments are cash-based. Table 2.1 summarises the staffing of the toll lanes.

Table 2.1: Toll Lane Arrangements

	Northbound	Southbound
Staffed	9	9
Automated	5	4
Total	14	13

Vehicles with tag accounts (LRDS and Dart-Tag) can use the automatic transponders to raise the barriers. Exempt vehicles have to present their exemption account cards. Some vehicles do not have to pay – e.g. motorcycles, and must use the staffed lanes. All lanes are equipped with automatic number-plate recognition (ANPR) cameras which are used to check the vehicle registration plates of LRDS users against the vehicle which is identified on the account. The Crossing is operated on behalf of the Highways Agency (HA) by Connect Plus. This includes the collection of charges and the administration of Dart-Tag and LRDS,

2.1.2. Charges

To use the Crossing motorists must pay a fee (unless they are exempt or local residents). Charges up to 7th October 2012 are as set out in Table 2.2. The charges increased on 7 October 2012 to those set out in Table 2.3

Table 2.2: Crossing Charges prior to 7/10/12 (Excluding Exempt and Local Residents)

Vehicle Category	Day (06:00-22:00)		Night (22:00-06:00)	
	Cash	Dart Tag	Cash	Dart Tag
Motorcycles	Free	Free	Free	Free
Cars	£1.50	£1.00	Free	Free
2 Axle Goods	£2.00	£1.75	Free	Free
Multi-axle Goods	£3.70	£3.20	Free	Free

Table 2.3: Crossing Charges from 7/10/12 (Excluding Exempt and Local Residents)

Vehicle Category	Day (06:00-22:00)		Night (22:00-06:00)	
	Cash	Dart Tag	Cash	Dart Tag

Motorcycles	Free	Free	Free	Free
Cars	£2.00	£1.33	Free	Free
Axle Goods	£2.50	£2.19	Free	Free
Multi-axle Goods	£5.00	£4.33	Free	Free

2.1.3. Accounts and Payment Mechanisms

Payment for use of the Crossing can be done through the mechanisms shown in Table 2.4:

Table 2.4: Payment Methods

Method/Status	Mechanism	Notes
Cash	Coins into the payment bins or to the lane operator	Can use automated or staffed lanes
Dart-Tag	Debited from the pre-pay account	Can use automated or staffed lanes
Exempt	No fee due	Must use staffed lanes and present exemption card
LRDS tag account	Free trip or charged at 20 pence from pre-pay account	Can use automated or staffed lanes
Free	No fee due	Must use staffed lanes

2.1.4. Contact and Payment Channels

The channels by which payment can be made are:

- Web based account top-up (for Dart-Tag and for LRDS top-up beyond the free annual allocation)
- Postal top-up and payment (cheques, cash to a minimum of £10)
- In person visit to the offices at Dartford (typically for selected foreign users who call in)
- Toll-lane cash payment for the fee due.

There are no retail payment channels. Payment can be made through the call centre by credit card. The minimum payment transaction through all channels except the cash lanes is £10. There is no facility to pay by credit card at the toll lanes. A single payment service provider is used for credit card transactions processed in the back office and on the web site. The contact channels operated are:

- Web for downloads, forms, account top up and information
- Call centre for queries about individual accounts, application status, tags, general information, but not payment
- Post for tags, cash and cheque payments, forms and other correspondence
- In person visit to the offices at Dartford
- Toll lane operator/cash collector who also issues "IOUs" and can also issue leaflets.

2.1.5. The LRDS scheme

The LRDS provides residents who have successfully applied for the scheme with 50 free trips and subsequent trips charged at 20 pence, subject to a £10 administrative fee. The LRDS is open to residents in Dartford and Thurrock local authorities on the basis that they are council tax payers. The LRDS was introduced in 2008. No changes to these charges were introduced on 7th October 2012.

The LRDS application process is found as a link located in the top right of the Dart-Tag website home page; it also provides a link for Frequently Asked Questions.

Once registered, an account will be set up and a free tag provided. The tag is registered to one specified car and cannot be transferred between cars. There is no limit to the number of cars that can be registered for LRDS per household providing that sufficient evidence of address is provided.

To apply for LRDS it is currently necessary to submit the following documents:

Proof of Vehicle Ownership	Proof of Residence
<ul style="list-style-type: none"> • A copy of pages 1 and 2 of the vehicle registration certificate issued by the Driver and Vehicle Licensing Agency (DVLA) – referred to as certificate V5; OR • For a leased or company vehicle evidence that it is for the applicant's private use in the form of a letter from the lease or employer company 	<ul style="list-style-type: none"> • A copy of Council tax bill: PLUS • A copy of one of: <ul style="list-style-type: none"> ○ Driving licence ○ Bank or credit card statement < 3 months old ○ Utility bill < 3 months old ○ Income support book/rent document

Note that existing Dart-Tag holders can complete an LRDS Application form to convert their account.

Initial payments can be cheque or credit/debit card. Future payments can be made by cheque, credit / debit card, regular payments by direct debit (note that no link is provided unlike for Dart-Tag) or cash payments in person at the Connect Plus Customer Centre in Dartford. The user must ensure that sufficient funds are held on their account to continue to receive the discount; otherwise they will have to pay the full charge at the booth. If the user has no balance and also no cash, an IOU is issued by the lane operator.

To mitigate against low running funds:

- lane displays indicate "Trips Low" when the balance of free journeys falls below 10;
- the user can specify at application to set a "Low Credit" warning level (minimum £2);
- account activity can be monitored through the website; and
- a monthly paper statement can be requested (although an administration charge may apply).

Furthermore, an advance notice reminder is sent by post indicating a specific renewal date with instructions of how to reapply along with a renewal form. Renewals that lapse will be automatically changed to a Dart-Tag account after the specified renewal date.

2.1.6. The Dart-Tag scheme

The Dart-Tag scheme entitles all users to reduced crossing charges. These reductions vary depending on vehicle type. Between 06:00 and 22:00, a car driver gets a 33% discount compared to the cash charge. Two-axle goods vehicle drivers get a 12.5% reduction and multi-axle goods vehicle drivers get a 13.5% reduction.

Potential users can access information about Dart-Tag from the following website, <http://www.Dart-Tag.co.uk>

Dart-Tags are available for both commercial and private use. An account application can be completed online, or by downloading and submitting an application form. Applicants must specify their vehicle classification; i.e. car, 2-axle goods or multi-axle goods vehicle.

A website link is also provided with some Frequently Asked Questions and Terms and Conditions (which apply also to the LRDS scheme but are not directly linked to that section of the website).

Once registered, an account will be set up and a free tag provided. Users with more than one vehicle can all make multiple applications on one account.

Initial payments can be cheque or credit/debit card. Future payments can be made by cheque, credit / debit card, regular payments by direct debit (a direct debit form is provided on the website) or cash payments in person at the Connect Plus Customer Centre in Dartford.

The user must ensure that sufficient funds are held on their account to continue to receive the discount, otherwise will have to pay the full charge at the booth. There is no expiry date for the Tag however users must use it at least once a year or it may be forfeited.

To mitigate against low running funds the user can specify at application to set a “Low Credit” warning level (note the downloadable form indicates this is a minimum £5 whilst the online application form specifies a minimum of £2). Account activity can be monitored through the website. Also a monthly statement can be requested by paper (although an administration charge may apply) or e-mail.

2.2. Current Administration and Operational Arrangements

2.2.1. Resources and Costs

There are approximately 106 staff (in terms of Full Time Equivalents (FTEs)) employed as cash collectors staffing the toll booths on a shift basis. Staff operate the toll lanes during charged hours 0600 – 2200 on a shift system seven days per week. The back office has a team of 24 staff working Monday-Friday 8.30-17.30. The team is multi-skilled working across the back office work areas, though specific team members have defined main activities as indicated in Annex A.

Operating Costs for LRDS and Dart Tag

The costs for operating the cash collection and back office are estimated at £5.2m in 2011/12, of which an estimated £1.8m relates to the opening, operation and management of both LRDS and Dart-Tag accounts. It is estimated that the costs for supporting LRDS and Dart-Tag accounts are as set out in Table 2.5. Appendix B provides the basis for the cost estimates.

Table 2.5: Charges from 7 Oct for Using Dartford Crossing (Excluding Exempt and Local Residents)

Account	Annual Operating Cost/Account	New Account Setup
LRDS	£7-£8	£30-£35
Dart-Tag	£5	£20-£25

2.2.2. Performance Metrics

The performance metrics provided for processing of new accounts are as shown in Table 2.6

Table 2.6: Account Processing Metrics

New Account Turnaround	LRDS Account	Dart-Tag Account
New Account Turnaround	Within 5 days	Within 5 days
Customer Service Representative typical application processing time	12 minutes	8 minutes

2.3. Review of Current Administrative and Operational Processes

There have been questions raised by consultees about the cost of compliance and onerous nature of the current process for LRDS account operation. From the review undertaken for this study we have, drawing on experience of similar types of operations, concluded that:

- In general, the account registration and renewal processes are not unnecessarily onerous, though a detailed customer survey has not been undertaken and was outside the scope of this study; and
- The administration and operation of the processes appear to be efficient and proportionate to the level of use of the LRDS, though it is noted that a detailed benchmarking exercise was outside the scope of this study.

However, there are areas where consideration could be given to reducing the compliance burden placed on users through small changes in the registration and renewals processes, though these would be likely to result in some additional one-off or on-going operational costs. There are also potential efficiency improvements that could be considered. These areas are summarised in the tables below.

Table 2.7: Potential Areas for Reducing Compliance Costs for LRDS User Registration and Renewals

LRDS Processes	Comment	Impact on Users
Requirement for copy of V5, Council Tax Bill, Utility bill within 3 months	Consistent with typical good practice for verifying residency and vehicle ID. However, the requirement for the Council Tax Bill and utility bill or bank statement to be in the same name means that many residents who are not named on the Council tax bill may not be able to apply	These issues increase the burden on the applicant to make sure services and vehicle registration are in the same name.
Inspection of Documents for LRDS	It may be feasible to have the key documents for an LRDS application submitted electronically and/or verified through other information sources.	The requirement to submit paper copies by post rather than scanned versions makes the process more cumbersome.
Annual renewal of LRDS (where address and VRM do not change)	Process could be web-based subject to being able to check residency status – good practice for residents parking renewals and electoral roll updates uses web-based confirmation through a password. The same could be delivered for LRDS.	Submission of paper copies increases the burden on the applicant

Table 2.8: Areas Where Efficiency could be Improved

LRDS Processes	Comments
Manual forms handling	Manual handling of paper forms generates significant re-keying effort. Given size of operation and multi-skilled resource pool, manual paper forms handling may be appropriate, but improvements in processing may be possible using electronic forms, scanning of correspondence and workflow

2.4. Marketing and Promotion of LRDS and Dart-Tag

LRDS and Dart-Tag are promoted as follows:

- On the Highways Agency's www.Dart-Tag.co.uk website
- Through a link from the Agency's website, www.highways.gov.uk
- Through a link from Thurrock Council's Travel Thurrock smarter choices website: www.thurrock.gov.uk
- On a small number of local community forum websites.

From a cursory check, as of October 2012 there is no clearly available information promoting either Dart-Tag or the LRDS, or links to the Agency's Dart-Tag website, on the Dartford Borough Council or Kent County Council websites.

A discussion with Connect Plus indicated that the only marketing for Dart-Tag and LRDS which is undertaken is issuing of leaflets to cash paying drivers at the staffed toll booths. The leaflets advertise LRDS and Dart-Tag. There are only 2 information boards north and south of the Crossing which require drivers to leave the main highway to inspect them. There is also a poster board at the toll plaza.

Given the revenue collected for LRDS and Dart-Tag – some £23m/annum – one might expect spend on marketing to be commensurate with that level of revenue. Marketing spend for Dart-Tag is understood to be of the order of £15k per annum; based on a Dart-Tag revenue base of £22m (cash payments of ~£52m out of £74m total annual revenue are excluded) that represents 0.07% of turnover which is well below typical spend metrics.

There is a wide range of "marketing spend" benchmarks for different types of commercial businesses, for example:

Indicative Benchmarks for Marketing Spend as a % of Turnover

- 3-5 (for 30% of businesses)
- 6-10 (for 45% of businesses)
- 20 in the case of a new product launch in a new territory
- 0.8% for in services sector
- 5.1% in software sales

Source

Go to Market Strategies,
Seattle Dec 2007

IDC, 2008

We are not aware of any publicly accessible marketing spend benchmarks for charged or tolled crossings, or more specifically those operated in the public sector. So there is no direct comparison that can be made to determine whether the current 0.07% is out of line with good practice. However, good practice for tag account promotion could typically be expected to include:

- Advertising the availability of the accounts on the highway with appropriate signage well in advance of drivers arriving at the toll plaza.
- Advertising the accounts through signs as drivers approach the toll lanes and also in the toll lanes
- Having dedicated tag lanes so that drivers without tags can see the benefits for those with tags who pass through more quickly
- Taking measures to reduce the risk that queuing traffic for other lanes blocks vehicles seeking to get to the dedicated tag lanes.

We understand that the M25 DBFO contract requires Connect Plus to coordinate marketing with the HA. There is no incentive for the operator to promote Dart-Tag or LRDS take up.

A discussion with HA identified a number of constraints on marketing and promotion of tag accounts, which are in part due to lack of marketing budget within DfT:

- HA must abide by DfT rules on publicity and engagement which are not the same as a commercial tolling operation and limit how engagement with the public can be undertaken except for operational or safety purposes
- There is a poster board already in place at the crossing – HA acknowledge that it needs updating
- Marketing budgets for DfT and HA were cut when new limits were applied in May 2010 to reduce spend by the Department because:
 - Promoting tags and LRDS reduces HA net revenue and creates back office workload – as a result there may be no clear business case for promotion
 - Budget and funding was prioritised by DfT so there was no spend on marketing.

2.5. Comparison with Other Schemes

One of the questions raised in the consultation related to whether Dart-Tag represented good value for money for customers and whether only frequent users would receive a benefit. To provide an indication of the relative benefits and value for money for customers of Dart-Tag, we provide a brief comparison with selected UK account based charging schemes is provided in Table 2.9 below.

Table 2.9. Comparison of Costs and Payment Channels for Dart Tag and Other UK Account Schemes

	Dart Tag	Severn Tag	M6 Toll	Mersey Tunnel Fast Tag	London Congestion Charge Autopay
Vehicle detection	Tag	Tag	Tag	Tag	Number-plate read
Monthly charge	No charge	No charge	£1	No charge	No charge
Deposit	No charge	£30	£5 returnable	No charge subject to initial balance	No charge
Application Fee	£10 (though this becomes the initial balance)	£0	£25 (Quickstart) or £30	0	£10
Initial Balance	£10 free credit on successful application	£0	Quickstart - £40	Sufficient to meet estimated monthly spend	£0
Payment Event	Pre-pay	Pre-pay	Pre-pay	Pre-pay	Post-pay
Discount from Cash Toll	33% for cars 13% for HGVs	0%	5%	13% for all vehicle classes	10%
Other Payment Channels	Cash	Cash	Credit card Contactless card Cash	Cash	Web, telephone, retail

Dart-Tag represents excellent value for money when compared to other account schemes, particularly for users of private cars with the 33% discount. However, in comparison with paying the cash charge:

- For cars, the charge of £2 is significantly lower than minimum £10 required for Dart-Tag application – only frequent users (payback in 5 or more trips) are likely to adopt tag accounts
- For HGVs the cash charge of £5 is a much higher proportion of £10 therefore a more attractive business case for users (payback in 2 trips)

A further issue raised in the consultation concerns interoperability with other schemes.

Currently, customers' accounts are not interoperable between Dart-Tag, Severn tag, M6 Toll and Mersey Fast Tag. Hence users of multiple toll roads/crossings need to have separate tag accounts, each with pre-pay balances, separate physical tags in their vehicle, or pay in cash, for each scheme. Though there have been plans in place in the UK since 2005 to deliver interoperability between these accounts, only some technical elements have been achieved. This is primarily due lack of compatibility between the schemes, customer terms and conditions, how pre-paid balances are managed and the legislative powers to collect a toll/charge or enforce. There are also differences in how data is held on the tag, though the underlying tag and beacon technology is compatible and meets European standards.

The precise number of users of two or more of these schemes is not known. However, lack of interoperability between schemes in the UK could be contributing to reduced take up of Dart-Tag, even though the scheme already represents good value for money.

It is intended to introduce a toll on the new Mersey Gateway Bridge and Runcorn Bridge. It is also possible that tag based accounts may be introduced on the Humber Bridge in the future; there are also plans to introduce charges for HGVs in the UK.

Dart-Tag is widely adopted by HGVs (~75% take up based on trip volume). The Crossing is also one of the major through routes for European vehicles passing through Dover and Folkestone. Interoperability could bring greater benefits for HGVs in the UK and potentially with Europe.

There is also no interoperability with the London Congestion Charging Scheme (LCCS), the proximity of which to Dartford means that there may be a more significant number of users of both schemes. LCCS uses number-plate recognition to detect vehicle movements and introduced an account-based scheme, CC Autopay, in Jan 2011.

Addressing this lack of interoperability could improve take up of accounts.

2.6. Understanding of Future Plans

We understand that there are two significant forthcoming initiatives that will impact current operations for LRDS and Dart-Tag users:

1. A trial of dedicated tag lanes.

Connect Plus has proposed a trial of dedicated tag lanes. Lanes 7-9 Northbound will be used. The primary justification for the trial focuses on safety improvements for the toll lane cash collectors, but we understand that there are also benefits anticipated for tag account customers (LRDS and Dart-Tag) who are expected to be able to pass through the plaza more quickly than at present where mixed cash and tag users queue together. Lanes 7-9 have been chosen to enable access to either the West or East tunnels Northbound; vehicles need to be in the West tunnel to be able to exit at Junction 31 to Thurrock.

2. A plan to remove the barrier-based operation.

HA is currently undertaking a project to migrate the existing barrier-based operation to free-flow. It is envisaged that the current toll plazas north and southbound will be removed and that the new operation will go live in October 2014.

HA has started the procurement for an operator to implement free flow and intends to award a contract in 2013 which will supersede the current operations by HA and Connect Plus.

The intended approach to detecting vehicles to enable payment collection or enforcement is yet to be defined. However, good practice typically involves:

- Tag and beacon detection to enable reliable debiting of accounts
- Use of automatic number plate recognition to validate that the correct registered vehicles and vehicle classes are being used in line with the rules on account operation, and also for enforcement against non-payers.

The potential impact on customer account operation and also the back office is also yet to be determined.

2.7. Summary

- In general, the account registration and renewal processes are not unnecessarily onerous, though a detailed customer survey has not been undertaken and was outside the scope of this study; and
- The administration and operation of the processes appear to be efficient and proportionate to the level of use of the LRDS, though it is noted that a detailed benchmarking exercise was outside the scope of this study.
- LRDS applications require proof of residence and vehicle ownership in line with most similar schemes
- The need for paper-based submission of documents for LRDS may be acting as a barrier to entry
- The supporting administrative systems lack features which could improve back office processes and efficiency – this may be in part due to lack of budget for system enhancements
- LRDS and Dart-Tag are not marketed in line with other typical tolled or charged crossings and little is spent on marketing
- There are no dedicated tag-lanes to demonstrate the time-saving advantages to cash payers, though a trial is planned for Feb 2013
- We conclude that Dart-Tag represents good value for money in comparison with other UK account based schemes. However, for cars “payback” requires at least 5 trips over the life of the Dart Tag

account, so it is not as attractive for occasional users; for HGVs payback requires only 2 trips so is much more attractive.

- Lack of interoperability with other UK tolled/charging schemes may be contributing to lack of take up – subject to data being available on the actual proportion of users who would benefit from interoperable accounts.
- The introduction of free-flow charging planned for October 2014 may substantially change how accounts and the customer facing channels operate.

3. Baseline - Existing levels of use of Dart-Tag and LRDS

3.1. Volumes of Account Tags

The new Charging Order in 2008 prompted the introduction of the LRDS and a step change in the number of Dart-Tag accounts, which had only numbered 50,000 active tags. Table 3.1 illustrates the take-up of accounts.

Table 3.1: Take-Up of LRDS since 2008 Charging Order (Source: Connect Plus)

Date	LRDS		Notes
	Accounts	Users	
July 2008	0	0	LRDS started in Aug 2008
Dec 2008	13,352	13,384	
Dec 2009	19,057	19,251	
Dec 2010	20,774	21,187	
Dec 2011	22,652	23,339	
Aug 2012	23,177	23,945	

Notes:

- I. LRDS accounts are intended to relate to a specific VRM, but there is a continual volume of vehicle changeover as residents acquire and dispose of vehicles (DVLA can take 6 weeks to issue a new V.5 when a vehicle changes keeper) hence for many LRDS accounts there is more than one vehicle linked to the account.

The changes in LRDS accounts on a month by month basis, is quite variable but generates a net increase each year. After a significant first year increase from 13,000 to 19,000, the number of resident tags has risen typically at 50-100 per month. Dart-Tag is rising at approximately 500-1,500 per month.

There are currently some 24,000 LRDS tags and 330,000 active Dart-Tags in circulation (see Table 3.2), of which a proportion are "hot-listed" for many different reasons. Hot-listing denotes the tag is of interest, because it may be lost, stolen, misused or have some other unusual account situation which would warrant inspection and potentially intervention at the toll lanes. In many cases the lane operator will take back the tag.

Table 3.2: Snapshot of Active Tags on 26/9/12

Account Type	Live Tags	Hotlisted Tags	Active Tags
Dart-Tag	231,596	103,228	334,824
LRDS tag	23,485	809	24, 294

3.2. Present number of transactions and total revenue

Tables 3.3 and 3.4 present a summary of annual transactions at the Crossing (i.e. vehicles) and revenue respectively, for the 2011/12 financial year. This is categorised by the different payment channels and vehicle category. In summary:

- LRDS users (car only) account for only 1,650 (4%) of total transactions at the crossing. Revenue for these transactions is less than 1% of the total.
- Dart-Tag users account for 29% of transactions, however there are significant differences between vehicle categories. Dart-Tag accounts for 32% of total revenue.
- A substantial proportion of crossings (65%) still utilise cash by means of payment. 68% of total revenue is from cash payments.

Table 3.3: Summary of Actual Transactions 2011/2012

Payment Type	Vehicle Type	Annual Transactions ('000s)	% of total
LRDS	Cars	1,650	4%
	2 axle goods	-	-
	Multi axle goods	-	-
	Total	1,650	4%
Dart-Tag	Cars	6,713	15%
	2 axle goods	2,805	6%
	Multi axle goods	3,531	8%
	Total	13,049	29%
Cash Payment	Cars	23,522	53%
	2 axle goods	3,904	9%
	Multi axle goods	1,340	3%
	Total	28,766	65%
Total Transactions		43,464	98%
Incl. Exemptions		44,509	100%

Table 3.4: Summary of Annual Revenue 2011/2012

Payment Type	Vehicle Type	Revenue (£000s)	% of total
LRDS	Cars	194	0%
	2 axle goods	-	-
	Multi axle goods	-	-
	Total	194	0%
Dart-Tag	Cars	6,713	9%
	2 axle goods	4,909	7%
	Multi axle goods	11,298	16%
	Total	22,920	32%
Cash Payment	Cars	35,282	50%
	2 axle goods	7,808	11%
	Multi axle goods	4,958	7%
	Total	48,048	68%
Total Revenue		71,162	100%

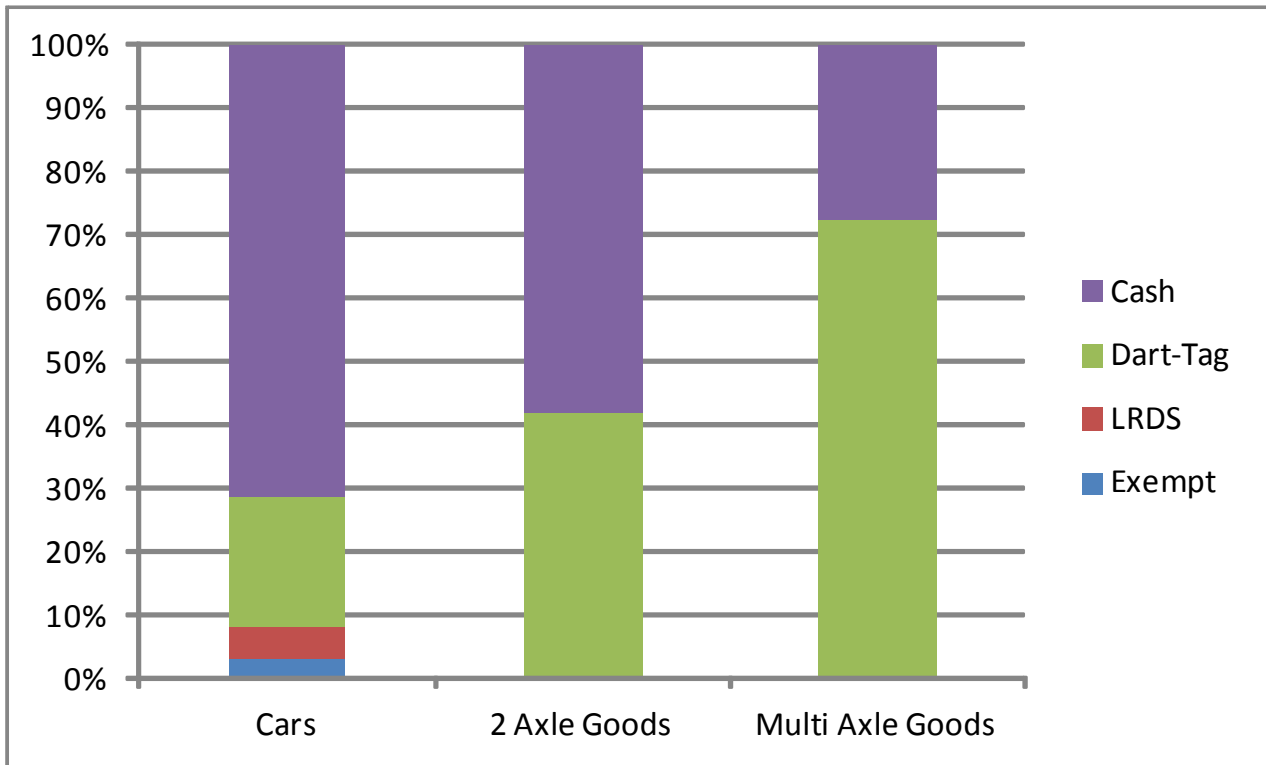
The provision of the LRDS can be viewed as a benefit to local residents (on the basis that they would otherwise have to pay the cash charge or the discounted Dart-Tag charge) and revenue foregone to the Department (on the basis that users would otherwise pay higher cash or Dart-Tag charges). Based on the charges in force in 2011/12 the indicative value of the LRDS discount to Dartford and Thurrock residents is estimated to be between £1.5 and £2.3 mill per annum; the lower estimate assumes they would pay the Dart-Tag charge and the higher estimate is based on the cash charge. The indicative revenue foregone to the Department is estimated to be slightly higher (due to savings that would be made by not having to operate the LRDS) at between £1.6 and £2.5 mill per annum.

Based on the charges introduced in October 2012, the estimated benefits/revenue foregone will be higher: an indicative range of the LRDS benefits to Dartford and Thurrock residents is between £2.0 and £3.1 mill per annum; and the indicative revenue foregone to the Department is between £2.2 and £3.3 mill per annum. These estimates exclude consideration of behavioural change that might occur if LRDS were not available. It is also noted that, in principle, the discounts provided by Dart-Tag - excluding LRDS - also represent a benefit to users and revenue foregone for the Department; this has not been estimated and is excluded from the above figures).

Figure 3.1 shows the proportion of transactions according to different payment channels by vehicle category and for all transactions. In summary:

- For Dart-Tag users there is a significant difference between vehicle categories; Dart-Tag accounts for 20% of total car transactions, for 2 axle goods 42% and for multi-axle goods 72%.
- The proportion of cash users for cars is 73%, for 2 axle goods is 58% and for multi axle goods is 28%.

Figure 3.1: Proportion of Transactions by Payment Channels



3.2.1. Frequency of use analysis

Every time a tag is used to make a payment by passing a toll booth the data is recorded to enable the pre-paid account to be charged. Data is therefore available on frequency of use of each live tag. Data for the 2011/12 financial year for LRDS and Dart-Tag users are shown in below. Note that LRDS users are car-only and that there is a requirement for the tag to be matched to a single VRM. For non-LRDS Dart-Tags there is no unique vehicle restriction.

Within each transaction number category, for cars LRDS and Dart-Tag usage is similar. As can be seen, the multi-axle goods Dart-Tag frequency of use is much higher than for cars. Some 2 axle and multi axle goods accounts demonstrate a very high activity of over 500 crossings per year.

Table 3.5: LRDS and Dart-Tag – Summary of Frequency of Crossing by Vehicle Type (2010 to 2012)

Annual Number Transactions	No. of active accounts*				As a % of all accounts			
	LRDS	Dart-Tag			LRDS	Dart-Tag		
	Cars	Cars	Two-Axle goods	Multi-Axle goods	Cars	Cars	Two-Axle goods	Multi-Axle goods
<50	12,760	58,470	3,100	1,230	66%	63%	44%	37%
50-100	2,850	14,110	1,340	460	15%	15%	19%	14%
100-150	1,020	5,540	740	280	5%	6%	11%	8%
150-200	570	3,240	490	200	3%	3%	7%	6%
200-250	430	2,590	310	160	2%	3%	4%	5%
250-300	410	1,880	200	100	2%	2%	3%	3%
300-350	310	1,640	160	100	2%	2%	2%	3%
350-400	320	1,560	130	80	2%	2%	2%	2%
400-450	340	1,580	100	60	2%	2%	1%	2%
450-500	250	900	60	60	1%	1%	1%	2%
>500	100	1,200	350	600	1%	1%	5%	18%
Total	19,360	92,710	6,980	3,330			-	

*an active account has been classed as one that was open for the entire 2011/12 period and has been used at least once during that period. As such these values will not exactly match those presented in Table 6.

Figure 3.2: LRDS – Cumulative Frequency of Use (2010 to 2012)

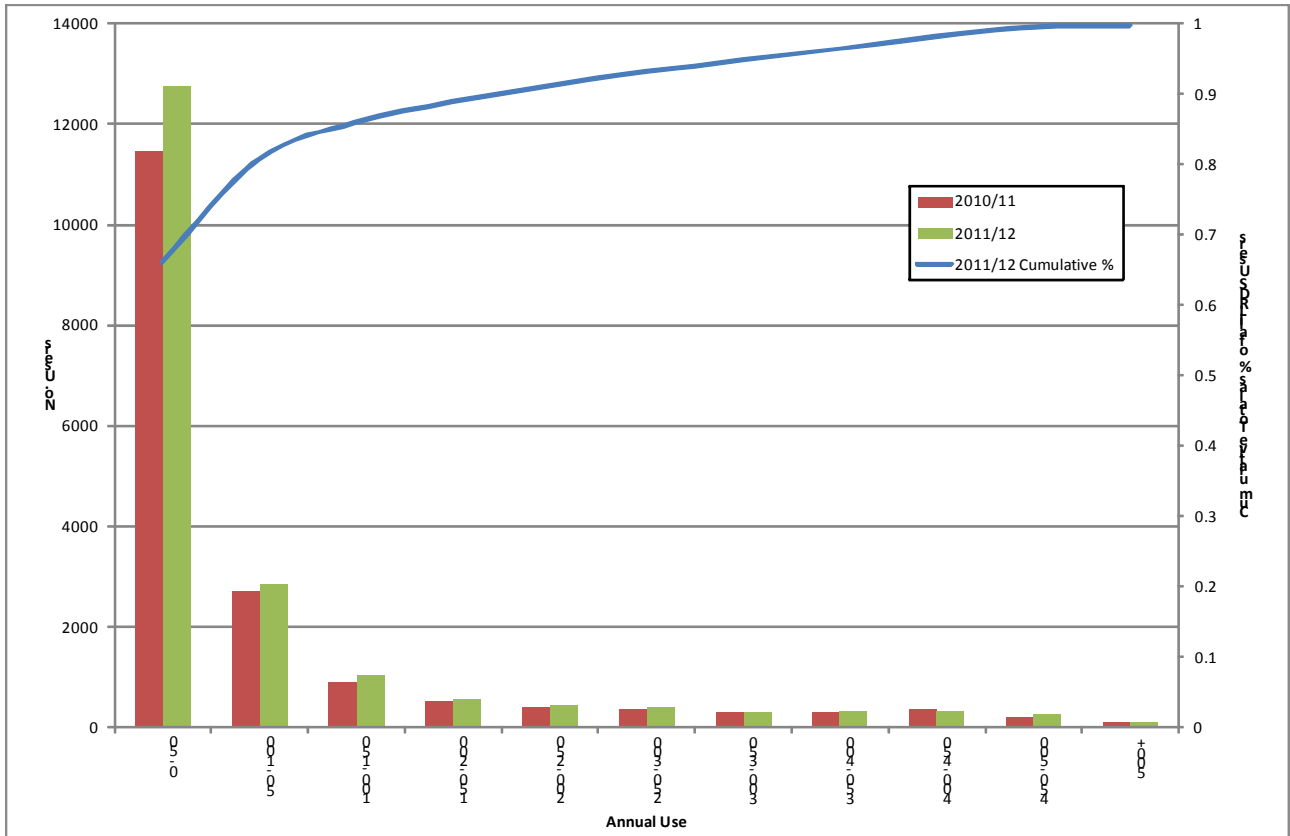


Figure 3.3: Dart-Tag – Cumulative Frequency of Use (2011 to 2012)

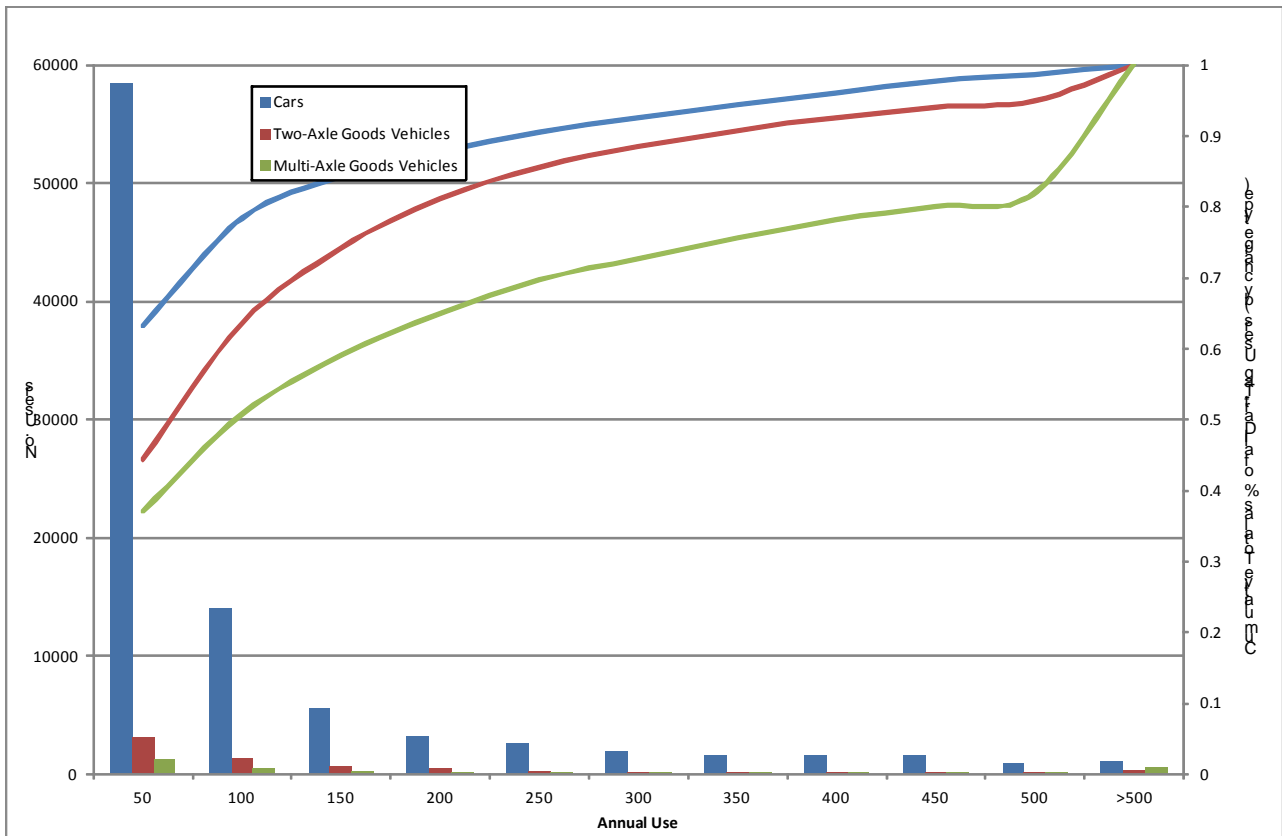


Figure 3.2 indicates that 66% of LRDS account holders use less than the allocated 50 free journeys per annum. Typically, for regular commuting journeys it would be expected that total number of transactions per tag would be > 400 per annum. For LRDS users this represents 4% of total LRDS tags.

For Dart-Tag car users around 63% of account users make less than 50 crossings per year, and only 4% make > 400 transactions per year (though noting that for these users there is no restriction on using the tag for a specified VRM).

Commercial vehicles – i.e. van and HGVs with 2 axles and HGVs with multi-axles have substantially higher frequency of Dart-Tag use than cars as well as forming a substantial component (over 10%) of total tag take-up.

3.2.2. User location analysis

Table 3.6 shows the local authority areas where LRDS and Dart-Tag users have their registered address. This information was obtained from the Highways Agency and Connect Plus but with detailed information on location removed to ensure confidentiality. Figure 3.4 shows the geographical spread of LRDS Accounts and Dart-Tag accounts by post code district.

Table 3.6: LRDS / Dart-Tag Users by Origin and Distance Band (km)

Account Type	LA/County	Distance From Crossing (kms)						Total
		0-5km	5-10km	10-15 km	15-20 km	20-25 km	>30km	
LRDS	Dartford	7,170	3,540	950	40	0	0	1,700
	Thurrock	930	7,670	1,180	2,460	10	0	12,250
	Total	8,100	11,210	2,130	2,500	10	0	23,950
Dart-Tag	Kent	3,780	7,860	7060	5,000	8,210	4,500	36,410
	Essex	800	5,290	6,540	7,920	5,150	5,430	31,130
	London	0	140	1,310	1,630	1,120	980	5,180
	Surrey	0	0	0	0	0	1,170	1,170
	Total	4,580	13,290	14,910	14,550	14,480	12,080	73,890

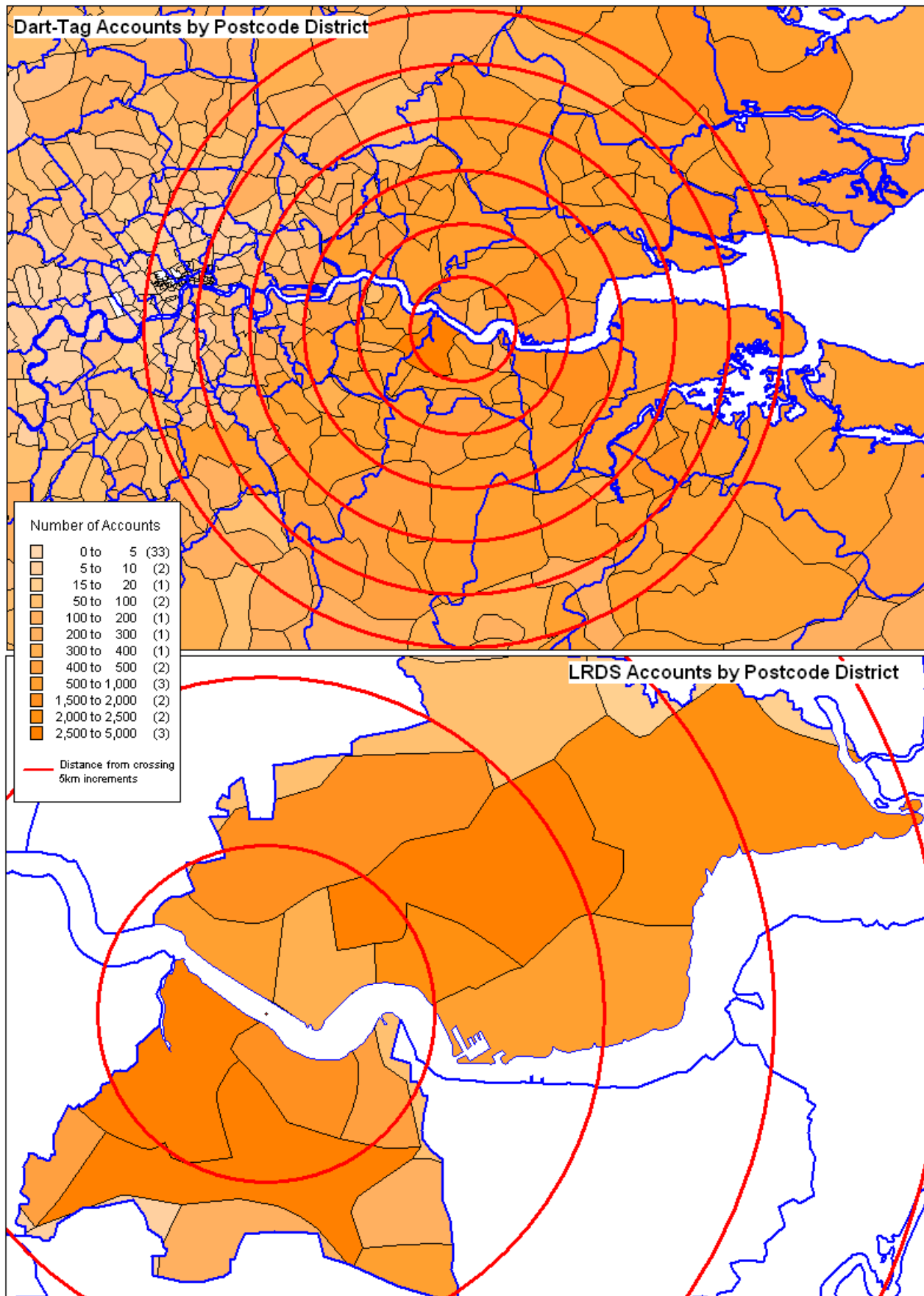
* Note that this is the total Dart-Tag accounts within 30km of the Crossing, not total accounts.

In addition, Table 3.7 shows the estimated proportion of total cars registered in the Boroughs of Dartford and Thurrock, obtained from DVLA, and the number of members (in July 12) of the LRDS. This shows that a small proportion of potentially eligible vehicles are registered, 23% in Dartford and 15% in Thurrock.

Table 3.7: LRDS accounts and registered cars by Local Authority

Local Authority	Registered Cars	No. LRDS Accounts	Uptake
Dartford	49,880	11,700	23%
Thurrock	80,370	12,250	15%

Figure 3.4: LRDS and Tag Accounts by Post Code Districts



3.2.3. Travel pattern analysis

An analysis of travel patterns has been undertaken to better understand existing movements using the Crossing. This has drawn from a number of sources: the 2001 census journey to work data (equivalent 2011 data is not yet available); and information from the Highway Agency's M25 traffic model (though this is based on origin-destination survey data from 2004); and data from the Department's national trip end model (as embodied in TEMPRO). None of the data sources analysed provides information specific to LRDS users; new primary data collection and further analysis is required to fully understand travel characteristics and travel patterns of this group.

As per the analysis of existing LRDS accounts, the analysis of available data suggests that a small proportion of residents of Dartford and Thurrock make use of the Crossing for commuting purposes. Table 3.8 provides an indicative analysis of journey to work patterns from 2001 census data. It presents an estimate of the proportion of total journey to work trips made by residents of each local authority area considered likely to use the Crossing. It is noted that the data does not indicate whether drivers used the Crossing or not; merely whether their home and work locations suggest that it is likely. Analysis of the travel patterns of traffic using the Crossing (available from data included in the M25 traffic model) is shown in Table 3.9. This gives an estimated breakdown of trips using the Crossing according to origin and destination. This information relates to a 16 hour period (06.00 – 22.00) for an average day in 2011/12.

Table 3.8 indicates that no more than 5% of the total journey to work trips made by residents of any of the local authority areas in the vicinity of the Crossing are likely to be using the Crossing. However, Table 3.9 indicates that about a third of Crossing traffic over the day is travelling to or from Dartford and Thurrock, though this includes a mixture of different types of trips including local and longer-distance movements and not just those made by Dartford and Thurrock residents. Overall this suggests that the Crossing is a relevant factor in the economic health of the neighbouring communities and future consideration about Crossing capacity and charges will need to take this into account. In considering potential changes to the LRDS the available evidence does not suggest that there is a strong case for expanding the scheme beyond its current scope and structure.

Table 3.8: Journey to Work trips by Local Authority (2001 Census)

Local Authority	Journey to Work trips likely to use crossing (car driver – 2001 Census)	All Journey to work trips	% use of Crossing
Dartford	1100	23200	5%
Thurrock	1400	39000	4%
Basildon	900	41100	2%
Bexley	1400	47600	3%
Brentwood	300	16700	2%
Castle Point	400	23600	2%
Gravesham	1000	24300	4%
Havering	800	48000	2%

Table 3.9: Breakdown of trips using Crossing by distance (16 hour flows)

16hr ADT	Cars	Vans	HGVs	Total
	88,370	10,540	20,170	119,080
Trips with origin <u>or</u> destination in Dartford or Thurrock	32,160 (36%)	3,440 (33%)	5,440 (27%)	41,040 (34%)
Trips with origin <u>or</u> destination within approx 10kms of the Crossing	38,880	4,060	7,170	50,110 (42%)
Trips with origin <u>or</u> destination within approx 20kms of the Crossing	55,740	6,180	10,950	72,870 (61%)
Trips with origin <u>and</u> destination beyond approx 20kms of the Crossing	32,630	4,360	9,220	46,210 (39%)

3.3. Summary

- LRDS accounts are increasing at approximately 10% per year.
- Currently LRDS users account for a relatively low 4% of total Crossing transactions and less than 1% of total revenue.
- Dart-Tag users account for 29% of all transactions and 32% of revenue.
- Most (66%) LRDS account holders use less than their allocated 50 free journeys per year.
- Only 4% of LRDS holders make over 400 crossings per year, suggesting a relatively low proportion of commuters in Dartford and Thurrock rely on the crossing for regular commuting to and from work.
- The available evidence suggests that the Crossing is a relevant factor in the economic health of the neighbouring communities and future consideration about Crossing capacity and charges will need to take this into account. In considering potential changes to the LRDS the available evidence does not suggest that there is a strong case for expanding the scheme beyond its current scope and structure.

4. The Department's Objectives

4.1. The Government's Strategic Objectives for the Crossing

As set out in the Department's May 2012 Consultation Response, the Crossing suffers from significant levels of congestion with traffic levels already exceeding the design capacity. The 2009 Dartford-Thurrock Capacity Study, undertaken for the Department by consultants, concluded that: the existing Crossing had been operating at its design capacity over a number of years; provided poor journey time reliability for its c50 million annual users; and that with the charge levels then in place that the Crossing would be unable to cater for forecast increases in travel demand and that the level of performance would deteriorate.

The aim of the Government's proposals to revise the charging regime, as set out in the May 2012 Consultation Response, is to reduce congestion at the Crossing. The Department's Impact Assessment of the revised charging regime states that the policy objective is to reduce congestion at the Crossing (by improving traffic flow) to support economic activity and improve social well being. The stated objectives of the policy⁴ are to:

- Continue to manage demand for the use of the Crossing and reduce the impacts caused by levels of congestion at the Crossing; and
- Provide Government with additional revenues to allow the Department for Transport to continue to prioritise development and funding of proposals, particularly provision of additional crossing capacity in the Lower Thames.

The impact of any changes to the charging regime – as considered by this study – has been considered with reference to these overarching strategic objectives.

4.2. Local Objectives

As described in Chapter 2, the LRDS was introduced in 2008. This followed a consultation by the Department, first in 2006 and subsequently in February 2008⁵. This describes the LRDS proposal as a mechanism for replacing arrangements whereby a proportion of revenue from the Crossing was made available to deliver integrated transport policies in Dartford and Thurrock in recognition of the impact of the Crossing on residents. Prior to the LRDS, Kent County Council (for Dartford) and Thurrock Council received £1 million per annum and £0.75 million per annum respectively on top of their Local Transport Plan capital allocations. The policy objective of the LRDS is to reflect the impact of additional traffic and pollution that the Crossing attracts to these areas by offering discounts to the residents of Dartford and Thurrock⁶.

The Impact Assessment (included as Annex A of the 2008 consultation document) suggested that LRDS may result in an annual benefit to residents of c£2 million per annum based on the number of car journeys made, noting that the benefits will only be realised by those who choose to take up the scheme and use the Crossing. As shown in Chapter 3, based on LRDS data for 2011/12 the benefit received by local residents (in terms of savings on the equivalent Dart-Tag or cash charge for using the Crossing and taking into account the £10 administration fee) is estimated as between £1.5m and £2.3m per annum.

The Department's May 2011 response to the revised charging regime consultation reinforces the rationale for the LRDS, stating that the scheme was established in recognition of the impacts the Crossing has on local communities in the vicinity of the Crossing.

The impact of any changes to the charging regime – as considered by this study – has therefore also been considered with reference to this local objective of reducing the impact of the Crossing on local communities in the vicinity of the Crossing. The detailed scoping of potential impacts of the Crossing on local communities was outside the remit of this study. However, based on evidence available from research undertaken by the

⁴ Dartford-Thurrock River Crossing Revised Charging Regime, Impact Assessment, Department for Transport, March 2012, p 10

⁵ Dartford – Thurrock River Crossing, Discounted Charges for Local Residents using the Crossing, Department for Transport, February 2008

⁶ Annex A p17, Dartford – Thurrock River Crossing, Discounted Charges for Local Residents using the Crossing, Department for Transport, February 2008

Department in support of the various consultations on the Crossing, the impacts may be summarized as follows:

- Economic – the Department undertook an economic impact assessment of the user benefits arising from changes to the charging regime, including looking at the distribution of user benefits by geographical area. This showed that all areas benefited, with the top areas benefitting being Thurrock, Bexley and Dartford, followed by Havering, Brentwood, Bromley and Sevenoaks. The consultation raised concerns about the impact of the increase in charges on business, especially on small businesses. However, the Department's analysis does indicate that the increase in charge would result in a net benefit to all business users of the Crossing.
- Environmental impact of local air quality and noise due to traffic levels – the Department's March 2012 impact assessment did not undertake a detailed assessment in relation to air quality and the number of people exposed to noise, but concluded that the revised charging regime would, because of reduced traffic levels with a higher charge, result in positive improvements to noise and air quality impacts. It is noted that Local Air Quality Management areas do not exist in the vicinity of the Crossing.
- Social impact due to impact of air quality and impact on statutorily protected groups. As above, the Department's analysis concluded that there would be likely to be air quality benefits from the change to the charging regime. The Department's assessment concluded that there would be no specific impacts on statutorily protected groups given that the charge exemption regime was to remain.
- Impacts of diverted traffic – the Department concluded that the scale of traffic diversion onto other routes as result of the change to the charge regime would be minimal in comparison with the existing traffic flows already on these other routes.

Each of these above local impacts has been considered by this study in assessing the case for changes to the LRDS.

4.3. Local Issues raised by the 2011 Consultation

In addition the Department's 2011 consultation on the proposals to revise the charging regime raised a range of local issues. The extent to which changes to LRDS or Dart-Tag would address the issues raised has also been considered. In summary the key local issues raised were:

- there is insufficient discount available to local businesses – and that the LRDS should be extended to local businesses (Thurrock Borough Council, the South East Local Enterprise Partnership, the Federation of Small Businesses, the Essex Chambers of Commerce and the Road Haulage Association).
- the eligibility criteria for residents is too narrowly defined – with suggestions that the boundary should be extended to allow more residents from a wider area to benefit e.g. Bexley, Havering, Gravesham and Basildon; and
- the deterrence effect of the LRDS administration and renewal processes on scheme take-up.

4.4. Additional Consultation

As part of this study, additional views in relation to the LRDS were sought from officers of Thurrock Council and Dartford Borough Council. These are provided in Annex C. In summary, Thurrock indicated it was opposed to extension of the LRDS beyond its existing boundaries on grounds that this would increase congestion on their network and result in economic disbenefits to the district. The Council also strongly supports the extension of the scheme to local businesses.

Views were additionally provided by the Federation of Small Businesses, who provided estimates of the number of small businesses using the Crossing.

5. Potential Interventions: Improved Customer Channels and Marketing

5.1. Overview

Drawing upon the review of existing administration and operation of the LRDS and Dart-Tag scheme (in Chapter 2) potential interventions that could improve the customer experience and encourage greater levels of take up have been identified in four areas:

- Enabling web-based applications and renewals for LRDS applicants, with a set of supporting measures to validate the applications, which have further benefits for other back office functions
- Improving the automation of some elements of the customer channels and back-office operated by Connect Plus
- Improvements to how LRDS users vehicle registration marks (VRMs) are verified – LRDS relies on a nominated vehicle being used by a customer; automatic number plate reading is used at the barrier to check the VRM of the vehicle using the crossing and detect misuse
- Improvements to marketing and visibility of Dart-Tag and LRDS to encourage wider take up.

We make the following proposals:

- To allow web-based applications for LRDS by automating Connect Plus access to DVLA V.5 data, DVLA driving licence data and Dartford and Thurrock council tax and electoral roll data
- To enable submission of scanned documents to support the application
- Only in a few exceptional circumstances require paper-based submission: e.g. foreign registered vehicle not visible on DVLA databases, foreign driving licence, customer has no access to scanner, customer has no internet access
- Where a vehicle VRM and the residents address does not change, renewal should be possible without having to resubmit proof of residence and a recent bill/statement
- Instead, it should be possible to renew through Connect Plus sending out a renewal letter to the resident with a onetime code, password or similar security mechanism inviting renewal over the internet (as is already done for VED renewals by DVLA and residents parking renewals by many councils).

The risks perceived by Connect Plus of this approach and also potential mitigations include the following:

Scenario	Potential Impact	Potential Mitigation
The resident may have moved house to another borough and have post redirected to the new address	Resident could renew fraudulently over the internet	Provide access for Connect Plus to council tax payer and electoral roll data in Dartford and Thurrock so renewal eligibility can be checked Provide access to driving licence data on DVLA to allow residence to be checked
The resident may not still own the same vehicle and may have sold it without notifying Connect Plus	Resident may renew fraudulently on behalf of the new keeper who may live outside the borough	Provide access for Connect Plus to DVLA V.5 registration data to check vehicle keeper data

There may be other areas which could be open to fraudulent applications over the web – the proposed approaches still need to be reviewed and challenged to check their integrity.

5.2. Changes to LRDS Website

The functionality required will need to be fully scoped through a specification. Estimating the costs of this potential change is not straightforward for the following reasons:

1. **LRDS Account Website design and costs:** The Dart-Tag website owned by HA which manages LRDS accounts would need to be changed. Achieving an optimum cost for this change may be problematic because of the current design and procurement arrangements in place. For example, we understand that functionality to enable the LRDS was requested as an “addition” to the already commissioned Dart-Tag account website in 2008. The supplier CS (now Sanef ITS) originally based its system design on there being no requirement to store tag user VRM data, but the LRDS scheme now required matching between the VRM and tag ID. As the data structure had not allowed for this, it was considered to be a major change. We understand that the quotation for the additional functionality for LRDS was originally costed at ~ £130,000, but that this amount far exceeded the available DfT budget which was of the order of £30,000. As a result, CS were asked to provide the minimum functionality as a very basic “bolt-on” at minimum cost which means the system data structures and account functionality for LRDS is far from optimised. Changes to enable the proposed enhancements may be costly as a result.
2. **Impact on Operating Cost:** the website and systems are hosted and maintained by Sanef ITS at a cost of ~£300,000 per annum. The change may impact these costs.
3. **Remaining Period of Operation:** The Dartford Free-flow project, due to go-live in 2014, is likely to introduce substantial changes to the existing tolling system and Dart-Tag website. If changes to LRDS functions were introduced in 2013, the updates may have a life of only a year which could make the change poor value for money and only serve renewals over a single year.
4. **Complication of System Cutover to free-flow:** If a new service provider is selected to operate free-flow it is likely that the existing systems and processes operated by Connect Plus and HA will be transferred to the new operator who may migrate them to a new system platform. If there are significant system changes ongoing for LRDS during the procurement, and then also in the build-up period to cutover, this may impose additional risks and costs for the contracting process and migration. The free-flow procurement process is using a Restricted procedure which leaves little room for changes in service scope following ITT issue; it may be necessary to seek quotations for a number of different system change cutover scenarios within the ITT, and then clarify the final requirement downstream.

If the cost of the proposed change was estimated assuming typical good practice for systems development, a capital sum of the order of £30k-£40k may be suitable for such a change. However, the current supply arrangements, design of the original “LRDS bolt on” and potentially short system life may inflate this cost. It has not been within the scope of this review to seek a quotation from the system provider. An exploratory meeting should be held with Sanef ITS to understand the potential impact of such a change.

5.2.1. Access to Council Tax Payer and Electoral Roll Data

The costs of providing on-line access are primarily concerned with ensuring the security and privacy of the council tax payer and electoral roll data and potential “per user/seat” charges by the council. We make the assumption that access could be provided through a secure logon ID through a portal over the internet that would satisfy Thurrock and Dartford Council security and data protection policies. The cost items may be of the order of:

- | | |
|--|---------------|
| • Per transaction cost of £0.50 per lookup for 24,000 LRDS users | £12,000/annum |
| • Training for 2 users – 0.5 day training course fees@£400/person | £800 |
| • Training time 1 day of staff time | £100 |
| • Implementation of security policy and procedures 1 day of staff time | £100 |

On this basis, the one off costs could be of the order of £1,000 with operating costs of £12,000/annum. In practice costs would need to be worked through with the authorities concerned who would also need to agree to provide data access and specify the security regime applied. If the council has outsourced its systems to a service provider there may be contract changes required and additional costs. There may need

to be an MoU or contract put in place between the Council and HA to enable this access to protect each parties interests and make clear the service levels that are provided for the system.

5.2.2. Access to DVLA V.5 Registration and Driving Licence Data Records

Connect Plus can already gain access to V.5 keeper data for enforcement purposes using a manual form-based process (Form VQ616). This takes a number of days to return keeper details. DVLA developed a Web Enabled Enquiry (WEE) service in 2002. This service has been used by a wide range of local authorities, police forces and the Highways Agency to lookup keeper records. In the past few years there have been concerns that the service has been abused and that unauthorised lookups of keeper data have been performed; this has led to some “tightening” of the policy for allowing access. We understand that current policy focuses on such data being used for enforcement purposes; however, DfT and HA may decide that the intended use proposed here, to validate LRDS resident applications and guard against misuse of the LRDS, is a suitable application given the secure, controlled and auditable environment in which LRDS applications are processed by Connect Plus. DVLA has also published a guide on who may have access to V.5 data (see DVLA MIS546). This guide may need to be updated.

Exceptions

The V.5 data held by DVLA is not always current as it can take up to 6 weeks to update keeper details when a vehicle is sold or transferred to another keeper; also motor traders do not typically register a vehicle in their name on the basis the vehicle will soon be bought by a customer; additionally lease or company vehicles may be registered in the name of a finance company or employer. We assume that in these circumstances LRDS renewals would need additional follow up with the applicant or scanned forms to be submitted. Driving licence data updates similarly have a lead time for changes, when a person moves residence and may not immediately inform DVLA, and for DVLA to process the update.

Cost Assumptions

The potential costs of the service are substantially dependent on how DVLA chooses to price the service for this application – there are no publicly available pricing references which could act as a guide. DfT as the data owner for the V.5 and licence data may choose to make no charge for the data as is already the case for Connect Plus requests for keeper data (submitted on form VQ616). We understand that HA is already a user of the Web Enabled Enquiry service. For the purposes of costing access, we make the assumption that the data access could be provided at no cost per keeper and licence lookup event and would be web-based. In practice the costs might be higher depending on how DVLA decides to charge for its services to other agencies of the DfT (for example, we understand that DVLA has contracted with commercial operators to provide lookup data – such as Experian’s Autocheck service – which has a cost per transaction). We also assume there will need to be an allowance for training and implementation of security policies.

- | | |
|---|--------|
| • Training for 2 Connect Plus users – 0.5 day training course fees@£400/person = | £800 |
| • Training time 1 day of staff time | £100 |
| • Implementation of security policy and procedures 1 day of Connect Plus staff time | £100 |
| • Implementation of security policy and procedures 5 days of DVLA staff time | £1,500 |

On this basis the one off costs may be of the order of £2,500. Operating costs would relate to staff training and DVLA audit and inspection needs which we assume could be < £1,000/annum.

There may need to be an MoU or contract put in place between the DVLA and HA to enable this access to protect each parties interests and make clear the service levels that are provided for access to the system. We have not costed the effort that may be needed to put the MoU or contract in place. DVLA may also regard this access as a “new project” which may generate additional project management requirements which we have also not costed.

Additional Benefits for Exempt Vehicle Checks and Enforcement

Connect Plus also process applications for Exempt Vehicles; for example, the following are exempt from the charge:

- Vehicles which are exempt from paying Vehicle Excise Tax on the grounds of disability
- Vehicles listed in Schedule 4 of the A282 Trunk Road (Dartford-Thurrock Crossing Charging Scheme) Order
- Invalid carriages that do not exceed 508 kilograms in unladen weight.

Applicants currently have to submit a V.5 with a registration form, by post, to gain an exemption. The vehicle’s registration is then stored and checked using ANPR at the toll plaza. The additional benefit of the proposals above is that it may be also possible for Connect Plus staff to use the proposed DVLA data access

to check vehicle registration details on-line to validate exemptions, rather than require paper based V.5 submission from the customer.

To recover unpaid charges and enforce (IOUs for account holders with insufficient funds, “flyers” who tailgate another vehicle passing through the barrier) Connect Plus request keeper data from DVLA using form VQ616. This process is manual and time consuming. If instead, the proposed on-live access to keeper data was provided the enforcement process could be made more efficient and responsive.

Risk of Fraudulent Applications

The proposed measures above may increase the risk of fraudulent LRDS applications and need to be reviewed and challenged with current back office representatives and other stakeholders. In particular, the reasoning for the current approach to paper applications set out in an internal policy paper, needs to be retrieved from DfT project records (Charging Order Review 2006-2008) – we understand that the policy for submitting paper records for LRDS applications is set out in a project deliverable which interprets the legislation that introduced LRDS into practice. The on-line forms to be completed by applicants, and terms and conditions for acceptance will also need to be revised to be consistent with the new process and level of reliance on the data being submitted and scanned documents provided.

Potential for Greater Automation of Application Processing Channels for LRDS

Though incoming post is currently scanned, the current processing mechanisms for LRDS and Dart-Tag accounts are largely manual. Given the extent of cash payments (typically £10 notes attached to payment forms) and physical tag processing there is naturally a significant amount of manual processing. However, some processes might benefit from a greater degree of automation which may better enable volume scaling (for example as Dart-Tag and LRDS demand increases) and reduce the time required to complete them and also avoid keying errors, for example:

- by using screen-based forms rather than paper forms for data capture, payments and account queries
- using workflow to distribute the already scanned incoming correspondence
- holding pending applications in an electronic file rather than a paper file
- storing emailed scanned documents which are submitted by residents as proposed above
- allowing top-up payments through the interactive voice response (IVR) system
- enable more efficient processing of IOU payments (IOUs are issued to customers where they do not have sufficient account balances).

As the current volume of LRDS users is low and there are relatively few LRDS top ups, there may be no business case for these changes for LRDS only; however, there may be a wider case if Dart-Tag, exempt vehicle administration and other back office processes are also included. We have not performed a detailed analysis of time and resources used to conduct all transactions within the back-office so cannot estimate the benefits.

The above measures will also require the account processing system (provided by CS) to be updated which will have a cost that can only be sized through requesting a quotation from Sanef ITS.

Verification of LRDS Vehicle Usage and Misuse Management

LRDS users have their vehicle number plate (captured on all 27 toll lanes) compared with the registration linked to their account to detect potential misuse – only the specified vehicle can be used with an LRDS account. The number-plate reading system captures the image and then the automatic tolling system compares the two data sets: if the ANPR read does not match the registered vehicle for that LRDS tag account then the system generates an alarm and routes the images of the vehicle concerned for a verification check.

Though ANPR can be a very accurate capture mechanism for many purposes, it seems that in this instance the vast majority of alerts (potentially 20-30 x as many) are generated through ANPR reading errors, rather than the VRM being incorrect. As a result Connect Plus operates 2 stages of verification to detect potential misuse:

- A 1st line check to view the vehicle plate image as captured by the camera and compare it with the ANPR interpretation of the VRM – in most cases the alert is from misread VRMs;
- A 2nd line check to validate the misuse and detect whether the customer is a repeat misuser and issue warning letters. If a customer misuses the LRDS account 5 or more times within a year their LRDS account is automatically converted to Dart-Tag.

We propose that the quality of the ANPR processing and the algorithms used to “clean” the ANPR reads is reviewed to assess whether this process can be improved.

5.3. Potential Marketing Measures

We make a conservative assumption that marketing spend might be increased to 0.5% of Dart-Tag revenue (~ £110k) and identify the types of measures that could be applied.

The table below summarises key measures that could be adopted. These interventions are considered as Option 1 in Chapter 7.

Measure	Description	Notes/References
Dedicated tag lanes	Provide dedicated tag lanes so customers can see the time savings in moving through the toll lanes quickly	Dedicated tag lanes were previously in operation Connect Plus is already planning a trial of dedicated tag lanes (lanes 7,8 & 9 Northbound only) in 2013
On plaza measures	Updated Poster Board Overhead signage indicating tag lanes and establishing tag product identify and branding	The overhead signage in place until 2008 had a distinctive branding and directed tag users to dedicated tag lanes
Media Channels	Links from Kent County Council and Dartford council websites to Dart-Tag	Only Thurrock council has a link to the Dart-Tag website
Signage on approach roads	Provide additional signage about Dart-Tag and LRDS on the strategic road network in the vicinity of the crossing (say 20 miles either side) – there would need to be some development of the existing strategy and limitations on signage that can be deployed to permit promotion of Dart-Tag on signs. The Traffic Signs Regulations and General Directions may require amendment – we have not sought to design the signage that may be needed. Discussions may be needed with HA Netserv team.	Scope of additional signage may be gathered from a signing review which was conducted some years ago by HA.
Targeting Cash Payers	Convert them to Dart-Tag through: <ul style="list-style-type: none"> An information campaign at the toll plaza through signage and leafleting Offering to convert a cash payment into a Dart-Tag payment if the user signs up within a limited period 	These types of tag promotion measures are already used by toll road operators in Europe. We understand, for example, that for SANEF some 43% of transactions are tag-based
Customer contact and improved CRM data	Improving the customer contact database to enable <ul style="list-style-type: none"> email based marketing and promotion of Dart-Tag and LRDS. reduce the volume of churn 	Email addresses are not currently used for marketing, only issuing of account statements where the customer has confirmed an email address. There are concerns that email address data is not accurate.

An improved contact database could also potentially reduce the volumes of tags lost by encouraging account holders to better manage their tags – lost tags is a substantial cost to the operation – the current Dart-Tag scheme does not incentivise account holders to manage tags carefully, for example when hire or lease vehicles are introduced and returned or when vehicles sold, tags can be lost. The contact database could also better enable frequent user communications. We understand that most tag accounts have a very low level of usage with ~ 80% of transactions being performed by ~20% of account users.

5.4. Potential Impact of Free-flow tolling

As noted in Chapter 1, the Department expects free-flow tolling to be implemented at the Crossing by 2014. The Highways Agency is currently progressing with the planning, design and procurement of the free-flow scheme. The consideration of potential options to improve LRDS and Dart-Tag operation and take-up has been undertaken independently of the transition to free-flow. However, it is recommended that the deliverability and value for money of any changes to the LRDS or Dart-Tag schemes that be considered alongside the free-flow scheme proposals and procurement process. The potential linkages – which could

be enablers or barriers to implementing certain of the LRDS/Dart-Tag improvements described above are summarised in the table below.

Area of Impact	Impact on Potential Enhancements to LRDS and Dart tag
Customer accounts and channels	<p>It is not clear that free-flow will implement DSRC tag based accounts. Instead number-plate recognition may be used. If that is the case, then</p> <ul style="list-style-type: none"> the current Dart-tag operation will cease and all charging/tolling will be on the basis of number-plates. Account holders will therefore need to register their VRMs – which is currently not the case for Dart-tag customers LRDS accounts could rely on just the VRM for detection – users currently have to declare their VRMs to receive the discount
Proposed changes to website to ease how LRDS applications and renewals are made	<p>Free-flow is expected to change customer account processes requiring a new website – life of enhancements to the existing website may be very short – 2013-2014 – 1 year. Hence:</p> <ul style="list-style-type: none"> The number of LRDS renewals and new applications processed may be very small (~1 years worth) before free-flow is introduced in Oct 2014 – this may deliver minor efficiencies for the customer if it only operates for one year The website is provided by and hosted by Sanef ITS – they have unique design knowledge of the system and it would be difficult for HA to procure enhancements elsewhere - Sanef ITS may therefore quote a high cost for the changes to automate LRDS applications and renewals. If this is replaced by free-flow in 2014 the system change costs are likely to be disproportionately high given the short system life.
Change to business processes in back office	<p>The proposed enhancements to the back office may only have a life of one year and then be replaced by free-flow. The one off capital costs and operating costs of the change would only be amortised over 1 year and may therefore be poor value for money.</p>
Procurement process	<p>The procurement process for the free-flow operator is using a Restricted procedure which does not allow for negotiation of the contract. Hence the free-flow ITT will need to specify the operating requirements, customer account mechanisms, back office processes, systems and other elements to be migrated into free-flow operation. If there are significant changes being made to the scope of the existing operation to improve LRDS and Dart tag, beyond what the ITT can reliably predict, the additional processes, systems and changes will need to be priced under change control which may present a risk for getting value for money from the operation</p>
Vehicle detection approach	<p>This review has been undertaken on the basis that vehicle detection using tags improves the operation of customer accounts and reduces back office workload – hence we have proposals to improve marketing of tag accounts and implementing dedicated lanes for tag users. Free-flow may change this substantially reducing the benefits of the intended changes.</p>
Charge and vehicle classification process	<p>The current charge (and account mechanisms) are based on differentiating between multi-axle, 2-axle and other vehicles. Free-flow may change the classification of the vehicles to be charged to aid how VRM lookup can be used to apply the correct charge.</p>
Marketing	<p>The proposed marketing for tag accounts may be redundant if free-flow does not adopt tags.</p>
Dedicated lane operation	<p>Free-flow is intended to remove the toll plaza – the investment in dedicated lanes proposed here may therefore be amortized over a year and therefore be poor value for money.</p>

6. Potential Interventions: Expanding Local Discount Scheme Eligibility

6.1. Overview

A range of possible interventions have been developed in line with the objectives of this review set out in Chapter 1. Interventions have been developed drawing upon the Department's consultation conclusions, the findings of a review of existing LRDS and Dart-Tag operations (Chapter 2), the analysis of current users (Chapter 3) and the understanding of the strategic and local objectives for the Crossing (Chapter 4).

The approach adopted has been to identify potential options that, subject to a known level of uncertainty:

- fall within the objectives of the review and address an element of the local objectives for the Crossing defined in Chapter 4;
- can be understood by the Crossing users – recognising that understanding the basis of the discount is a key driver of end-user's attitudes; and
- are feasible to implement and operate.

Inputs to options have been considered from the Department (including Highways Agency and Connect Plus, the HA's operator), from review of arguments put forward during the previous consultation process, from interaction with key stakeholders and from a review of the current operation of LRDS and Dart-Tag. This has resulted in a long list of potential measures to increase the number of potential users of the Crossing who could be eligible for a discount on the basis of geographic location. In summary these measures considered comprise:

- including residents of other nearby boroughs – beyond Dartford and Thurrock whose residents currently are eligible for the LRDS - within LRDS;
- changing the basis for the definition of "local" so it is related to distance from the Crossing rather than simply on the basis of residency of a local authority area; and
- expanding eligibility for a local discount scheme to include local businesses.

Each of these potential interventions is considered further below.

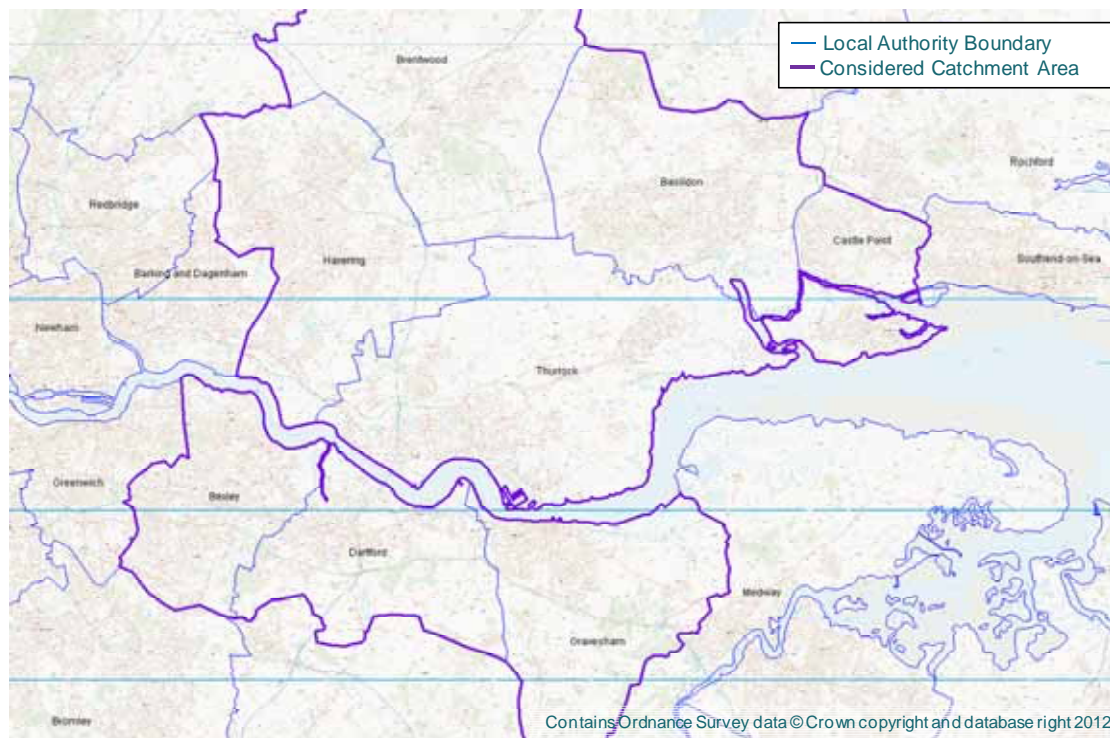
6.2. Including Other Nearby Boroughs

As discussed in Chapter 2, eligibility for LRDS is restricted to residents of Dartford Borough (in Kent) and Thurrock Council. A key objective of this review is to consider whether the eligibility should be expanded beyond these two local authority areas. In addition, consultation representations to the 2011 consultation on revisions to the charging regime suggested that eligibility should be extended to residents of neighboring local authority areas. Figure 6.1 shows the local authority areas that could, in principle, be included. The areas have been selected on the basis that they have a boundary with either Dartford or Thurrock and were identified as potential areas for expansion of the scheme in the Department's 2012 consultation response. As well as Dartford and Thurrock these areas comprise: the London Boroughs of Bexley and Havering; the districts of Basildon, Brentwood and Castle Point in Essex; and the district of Gravesham in Kent.

This intervention therefore falls within the objectives of the review and aligns with local objectives in that it would address issues raised in the 2011 consultation.

In principle expanding the LRDS to cover these areas would be understood by users of the Crossing, in that the rationale for eligibility would be related to residency within a defined local authority area and could be evidenced by payment of council tax. Applicants would need to present council tax bills and other required proof of residency to qualify.

In principle the administration and operation of the scheme would be a simple expansion of the processes already employed to administer and operate the existing LRDS, with the same level of evidence of residency



required. The Connect Plus back office would need to expand its resources to process the additional applications and renewals – assumed to be at marginal cost to the existing operation.

Figure 6.1: Potential area for expansion of the LRDS by Local Authority District

However, in the same way that the equity of the existing LRDS is challenged by those users of the Crossing resident outside Dartford and Thurrock, the same challenge would exist for an expanded scheme. For example, arguments could feasibly be made to expand the scheme further to, say, Bromley or Sevenoaks. The case for expanding the LRDS beyond Dartford and Thurrock is, though, not strong for a number of reasons, as follows.

As evidenced in Chapter 3, the take up of the LRDS amongst Dartford and Thurrock residents is low. Only 23% of cars registered in Dartford and 15% of cars registered in Thurrock have LRDS accounts. Additionally, the evidence shows (Table 3.5) that less than 35% of LRDS members make use of more than their 50 free crossings per annum, and only 4% make the number of journeys that would be consistent with regular commuting to/from work during the charging period, despite the high level of discount compared to the cash or Dart-Tag charge. In addition, based on the analysis of traffic patterns (in 3.2.3) there does not appear to be a strong case on the grounds of demand for additional discounts for residents in order to support the functioning of local economies.

6.2.1. Intervention taken forward for assessment

Despite the above concerns regarding demand, this option would be operationally feasible as it just requires increased volumes of a process that is already in place and it does address issues raised in the consultation on the revised charging regime. On this basis it has been considered further and, as described in Chapter 7 as Option 2a, its potential impacts quantified.

6.3. Changing the definition of Local to be based on distance from the Crossing

A key concern that has emerged from the consultation is the view that the current definition of “local” is inequitable; many locations which are nearer to the Crossing than parts of Dartford or Thurrock are not currently eligible for the LRDS. A potential intervention is to change the local residency criteria to be based on some measure of distance from the Crossing.

Considering feasible operational models, eligibility would need to be based on a linear distance of the customers address “as the crow flies” from the Crossing. It would be necessary to identify a measuring point for this assessment which could be:

- At the centre point of the crossing;
- On the south bank;
- On the north bank; and
- Both north and south bank locations.

In addition, there would need to be a gazetteer utility which allowed the operator's back office and the customer to assess the radial distance. The simplest means of doing this might be through postcodes. However, some postcodes might straddle a boundary radius and would therefore be likely to require all addresses within a postcode to be considered eligible if any part of that postcode area is within the specified distance band.

It is not clear that customers would really understand this definition of local, since:

- There would be no natural boundary – such as a highway or river
- There would be no clear administrative boundary such as an authority, constituency, ward or parish.
- At the radial limit one residence might be within the boundary and the next door residence may be outside it. As noted above, if the measurement is based on postcode then circumstances are likely to arise where properties may actually be physically outside the distance band based on measured distance, but the postcode area considered as eligible because parts of the postcode area are within the distance band. This may lead to challenge and new equity issues.

Good practice for eligibility is based on their being a clear differentiator between addresses – usually through an administrative boundary. Though there are examples of eligibility being distance-based – e.g. for nearest local school – in many instances this is based on length of journey travelled to school not radial distance and is typically over a much smaller geographic distance (<4 km) than is being contemplated here. The effort required to establish eligibility for a radius based scheme would be substantial and would be open to misunderstanding by the customer, and potential challenge.

In addition, the Department's consultation response has committed to maintain the existing LRDS. The furthest point of Thurrock is around 20km distance from the centre of the Crossing. On this basis, the minimum distance that a revised local residency definition could apply, while still preserving the existing discount for Thurrock and Dartford residents, would be 20km. Figure 6.2 illustrates the radius based on a 20km distance from the centre of the crossing; the 20km radius extends into Lewisham in the west and includes much of London Docklands; drivers here would more naturally use Blackwall or Rotherhithe tunnels to cross the river.

A potential hybrid option would be to retain the current definition of local residency (i.e. Dartford and Thurrock) but to extend eligibility into other districts based on distance from the Crossing. This could, in principle, be operated alongside the existing scheme.

6.3.1. Interventions taken forward for assessment

On this basis there are two potential distance-based options that could be taken forward, as follows:

- one based on replacing the current LRDS with a distance-based eligibility criteria set such that all parts of Dartford and Thurrock remain eligible; and
- another that retains the Dartford and Thurrock district-based eligibility and includes a distance-based eligibility for residents of other districts.

Considering these potential interventions against the feasibility criteria described in 5.1 above, it is considered that the basis of the distance-based component of either option may not be easily understood or rationalised by users as it would be difficult for the customer to understand the boundary for eligibility. In addition, a simple distance-based eligibility criteria would not take into account that travel times (rather than distance) are more likely to be a realistic determinate of whether residents consider themselves local to the Crossing.

Additionally, there could be significant complexity of having to make a case by case assessment of the radial distance for each application, with a high potential operating cost and potential for disputes.

There is also a challenge in setting the appropriate distance band, In the case of the distance-only option the minimum distance band would need to be c20kms (as shown in Figure 6.2) so as to include the extremities of Thurrock (on the basis that existing residents of Thurrock need to still be eligible). The case for providing discounts across such a wide area is weak given a low level of demand for using the Crossing for trips from these areas and the low level of dependency on the Crossing beyond a radius of c10kms.

On this basis the hybrid option - that retains the Dartford and Thurrock district-based eligibility and includes a distance-based eligibility for residents of other districts – has also been taken forward and assessed in Chapter 7 (as Option 2b). For the purposes of assessment a distance band of 10kms has been used (see Figure 6.3) – though clearly different distance-bands could be selected. Evidence suggests that the level of dependence on the Crossing reduces significantly after 10 kms. However, selecting an appropriate distance band that adequately addresses need and equity would be a significant challenge in implementing such a scheme and would require further more detailed surveys and other evidence gathering as well as consultation.

Figure 6.2: Illustration of 20km Radius for Eligibility (by 5km crow-fly distance band from the Crossing)

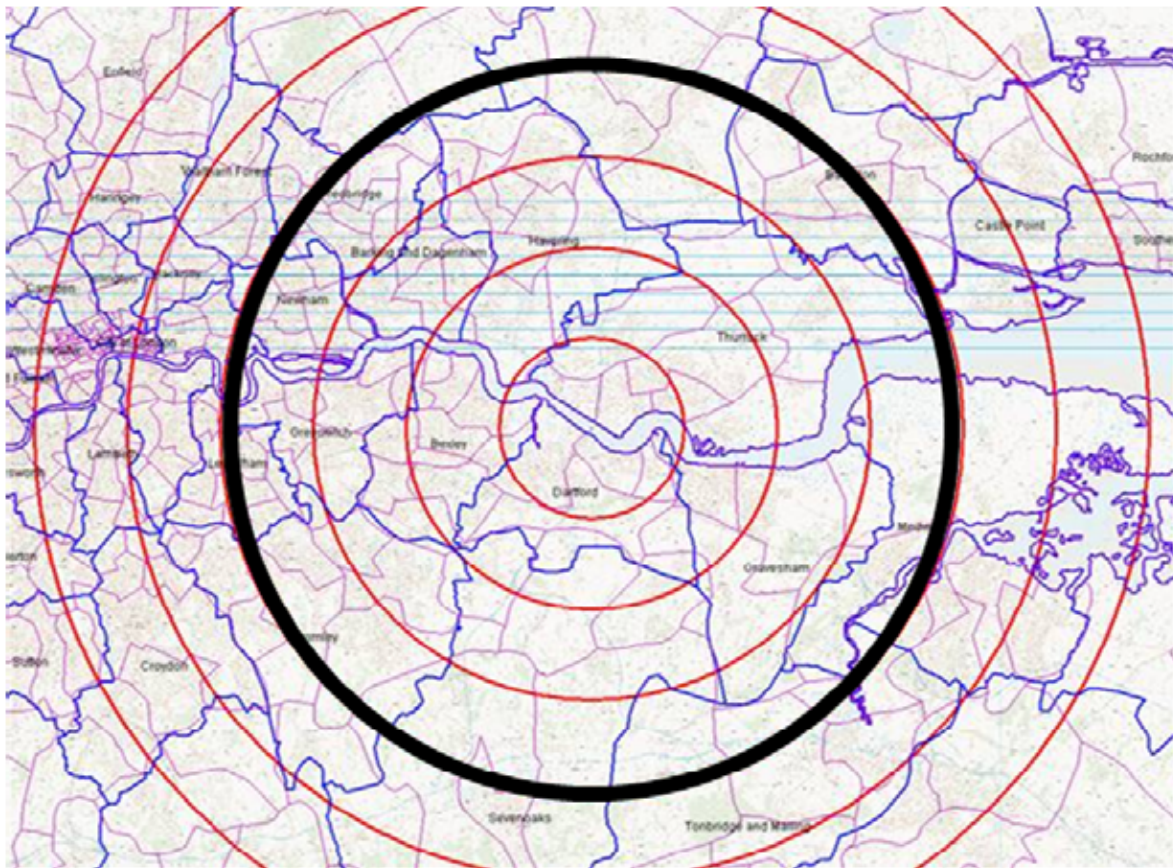
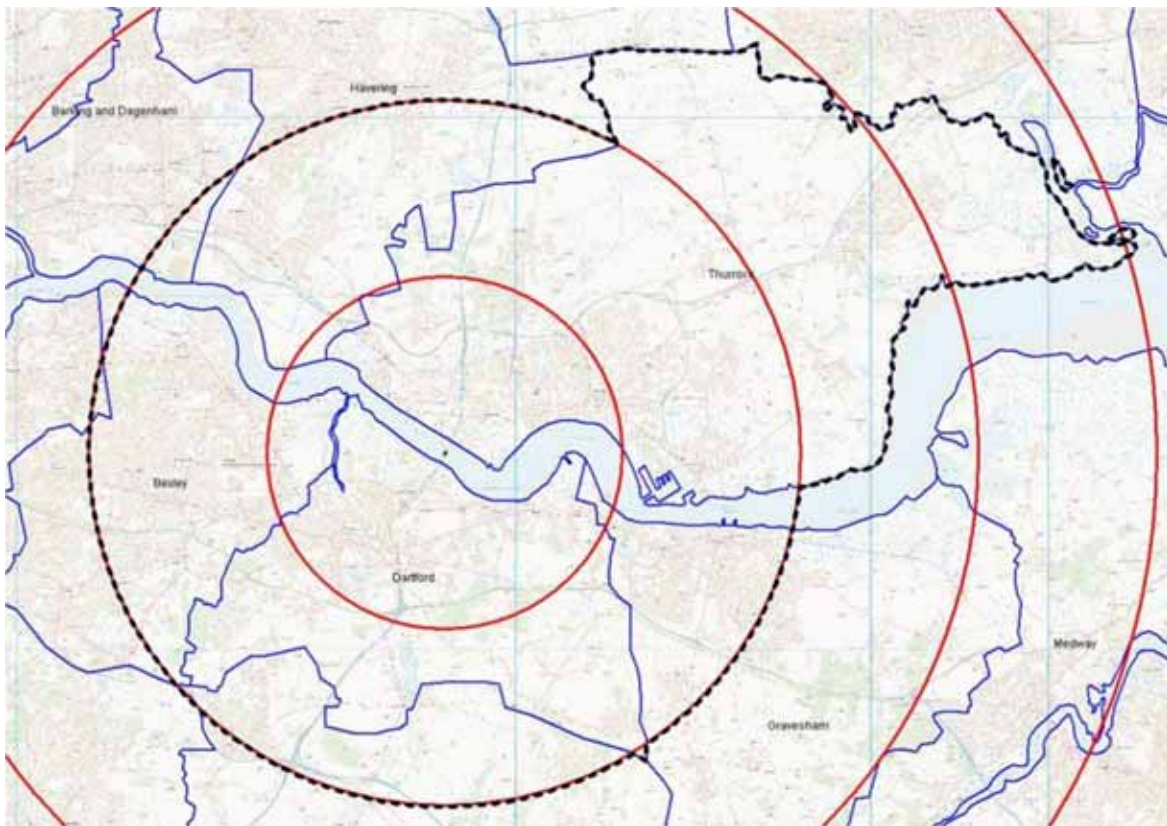


Figure 6.3: Illustration of 10km Radius for Eligibility (including Thurrock and Dartford)

6.4. Extending Eligibility to Local Businesses

A further issue that emerged from the consultation is the view that the local businesses should be eligible for discounts. As discussed in Chapter 4, the Department's analysis of the impact of the revisions to the charging regime is expected to be a net benefit in social cost-benefit analysis terms. On this basis, providing discounts to local businesses could work against achieving the wider net economic benefits predicted. However, the key issue relates to distributional impacts; potentially smaller businesses in the vicinity of the Crossing could suffer disproportionately from the increased charge even though the overall net economic benefits are positive. This is certainly the view expressed by the Federation of Small Businesses, though without more detailed research and business surveys (which were outside the scope of this study) it is not possible to determine conclusively that this would be the case. It is, though, noted that the impact of the charge on the performance of the economies of areas in the vicinity of the Crossing was not directly the primary objective of establishing the LRDS in 2008; the primary objective was to compensate for impacts of additional congestion and pollution.

Nevertheless, extending the local discount scheme to include small local businesses in Dartford and Thurrock could be considered as consistent with the local objectives identified in Chapter 4 and certainly consistent with addressing issues raised in the consultation. An intervention that meets these objectives and would be readily understood by users could be focused on:

- Serving local businesses in Thurrock and Dartford as they are impacted by the traffic and environmental impacts of the Crossing; and
- Focusing on small businesses, by extending the existing LRDS tag-based scheme to include Light Goods Vehicles (LGVs) and by limiting the number of vehicles that are eligible for a single business and, unlike existing the existing Dart-Tag scheme used by businesses, ensuring that tags are specific to a single VRM.

There are a number of key issues that determine the feasibility of implementing and the design of such a scheme.

First, there is the requirement to determine the vehicle class that would be eligible for a discount. As described in Chapter 2, the charging categories for the Crossing relate to the number of axles for a vehicle.

LGVs fall into the 2-axle goods category. In addition, the current approach determines that small vans fit into this category by considering the attributes of the vehicle; vehicles without full-size facing windows fitted to the rear of the driver are treated as vans and thereby in the goods vehicle charging categories. For the purpose of determining eligibility for a business discount scheme restricted to LGVs it would be necessary to determine the vehicle type from the DVLA vehicle categorisation; this comprises category N1 for 2 axle goods vehicles less than 3.5 tonnes weight which is recorded on the V5 vehicle registration certificate. However, advice from the Department's legal team indicates that the charging order does not permit different charges for 2-axle goods vehicles according to DVLA vehicle classification. On this basis any discounts aimed at LGVs would need also to be available to both LGVs and non-LGVs in the 2-axle goods vehicle category (i.e. 2-axle goods >3.5 tonnes as well as those <3.5 tonnes).

Second, there is the requirement to determine business eligibility and process and administer new accounts. The most obvious means of determining local business eligibility is to permit accounts only for businesses that pay uniform business rates in the two boroughs. We believe it would be feasible for the Connect Plus back-office to process applications; feasibility is therefore subject to the uniform business rate data being available. The verification function within the back office would have an increased workload from business vehicle VRMs being checked against the account identifiers, on the basis that the same restriction would apply as for the existing LRDS that accounts would need to be matched to individually registered vehicles. Without this requirement the scheme could potentially be open to abuse as vehicles not registered to local businesses would be able to receive discounts. The back-office system would need to be enhanced to process the applications from businesses and support attaching multiple VRMs per account ID – the costs of this change would need to be established with Sanef ITS.

However, using the business rates as a means of determining eligibility could potentially exclude those small businesses that do not pay business rates; typically these will be sole-traders that operate LGVs. An alternative option would therefore be to extend the existing LRDS to include 2-axle goods vehicles that are registered to residents of Dartford and Thurrock. Evidence of eligibility could be determined in the same way as for cars through the registered owner of a 2-axle goods vehicle (as evidenced by the V5) demonstrating residency via council tax bill and supporting personal documentation. In instances where vehicles are registered to the resident's business then, in principle, evidence that the business address and council tax bill match could be considered sufficient. Such a system could be processed using the existing back-office systems as an extension of the current LRDS. Providing that the restriction of one vehicle per person and the link between tag and VRM is enforced any potential abuse of this system could be restricted, though potentially residents with their businesses outside Dartford and Thurrock could benefit.

Third, there is the requirement to define the level of discount available to business users. Currently there is no reference point for this and it is likely that any discount level would need to be subject to further consultation prior to implementation. A number of approaches would be possible: the same basis as the LRDS where local businesses receive 50 free trips per tag per annum and then an additional though substantially discounted charge (relative to the cash charge) for additional crossings; or no free trips per annum but simply a substantially discounted (relative to the cash charge and regular Dart-Tag charge) for crossings.

6.4.1. Intervention taken forward for assessment

Recognising that there are many areas of definition that would need to be resolved through further research, some form of local business discount scheme is considered potentially operationally feasible and consistent with the local objectives described in Chapter 4. Three illustrative alternative options – Options 3a, 3b and 3c - have been developed and are described in Table 6.1 below. These options are assessed in Chapter 7.

Table 6.1: Options for Extension to Local Businesses

Option	Description
<p>Option 3a – Extend local discount scheme to include businesses in Dartford and Thurrock</p>	<p>To include businesses in Dartford and Thurrock based on businesses paying business rates in Dartford or Thurrock. It is assumed that the back office will require on-line access to payers of Uniform Business Rates in Dartford and Thurrock to validate new applications, and that this facility will have a similar cost to the access propose to Council Tax Payer data (Option 1)</p> <p>Scheme for cars and 2-axle goods vehicles only – with tags linked to individual VRMs.</p> <p>Because the scheme would be focused on benefitting small businesses and to limit the risk of abuse of the scheme, it is considered reasonable that the number of vehicles that a business account holder can register should be limited. For the purposes of illustrating potential impacts a limit of 5 tags per business has been assumed, with tags related to specific vehicles as per the residents’ scheme. It is noted that the case for higher or lower numbers of tags per business would need to be considered further if implementation is to progress; ideally supported by business surveys and consultation.</p> <p>Payment of £10 annual fee and transaction charge of £0.50 – noting that other charging regimes could reasonably be defined.</p>
<p>Option 3b – Extend local discount scheme to include businesses in Dartford and Thurrock or within 10 km distance from Crossing</p>	<p>To include businesses that:</p> <ul style="list-style-type: none"> • pay business rates in Dartford or Thurrock; or • pay business rates within postcode districts where any part of that postcode district falls within 10 kms of the Crossing. <p>This is equivalent to the expansion of the local residency eligibility described above (as Option 2b). Eligibility would be determined based on business postcode, noting the same issues about potential challenge and equity as for the resident’s scheme would apply.</p> <p>Scheme for cars and 2-axle goods vehicles only – with tags linked to individual VRMs.</p> <p>As for 3a a limit of 5 tags per business has been assumed.</p> <p>As for 3a, payment of £10 annual fee and transaction charge of £0.50 – noting that other charging regimes could reasonably be defined.</p>
<p>Option 3c – Extend local discount scheme to include 2-axle goods vehicles registered to residents of Dartford and Thurrock</p>	<p>Comprising:</p> <ul style="list-style-type: none"> • 2- axle goods vehicles that are registered to residents of Dartford and Thurrock with eligibility defined according to vehicle category N1 (on DVLA V5 certificate) and evidence of residency status as per existing LRDS; or • 2- axle goods vehicles that are registered to businesses in Dartford and Thurrock that do not pay business rates, but where the business is registered to an address in Dartford or Thurrock defined according to vehicle category (on DVLA V5 certificate) and evidence that the residency address (as per the existing LRDS) is the same as the business address. • scheme limited to 1 vehicle per resident • same transaction charges as car-based LRDS (i.e. 50 free transactions a year with subsequent transactions charged at £0.20

Option	Description
	each) with payment of £10 annual fee.

7. Assessment of Interventions

7.1. Options for Change

Chapters 5 and 6 identified a set of potential interventions, or options for change, that could be implemented to increase take up and extend availability of Dart-Tag and discounts for local residents and businesses. These options are summarised in Table 7.1.

An assessment of each of the options has been undertaken using multi-criteria analysis; options have been assessed individually and in combination to define a set of potential intervention scenarios. The definition of the scenarios and the results of the assessment are presented in Table 7.3.

Table 7.1: Summary of Options for Change

Options for Change	Description
Reference Case	<i>Charge and operational regime assumed in place in 2015</i>
Option 1 – Improved Customer Channels and Marketing	Comprising: <ul style="list-style-type: none"> Changes to LRDS website to allow web-based applications and renewals for LRDS Improved marketing of LRDS and Dart-Tag via improved signage, improved media channels to LRDS and Dart-Tag website, improved targeting of cash payers at toll plazas through leaflets, improved customer contact channels to improve email marketing and promotion
Option 2a – Extend local resident discount scheme to residents outside Dartford and Thurrock based on adjacent local authority districts	These comprise: Dartford, Thurrock, Gravesham, Bexley, Havering, Brentwood, Basildon and Castle Point as the districts that are immediately adjacent to Dartford and Thurrock and which are identified in the June 2012 Consultation response.
Option 2b – Extend local resident discount scheme to residents outside Dartford and Thurrock based on within 10 km distance from Crossing	Comprising: <ul style="list-style-type: none"> Residents of Dartford or Thurrock; and Residents of properties within postcode areas where any part of the postcode area is within 10 kms of the Crossing
Option 3a – Extend local discount scheme to include businesses in Dartford and Thurrock	To include businesses in Dartford and Thurrock based on: <ul style="list-style-type: none"> businesses paying business rates in Dartford or Thurrock cars and 2-axle goods vehicles only scheme limited to 5 nominated vehicles transaction charge of £0.50
Option 3b – Extend local discount scheme to include businesses in Dartford and Thurrock or within 10 km distance from Crossing	Comprising businesses that: <ul style="list-style-type: none"> pay business rates in Dartford or Thurrock; or pay business rates within postcode districts where any part of that postcode district falls within 10 kms of the Crossing. and based on: <ul style="list-style-type: none"> cars and 2-axle goods vehicles only scheme limited to 5 nominated vehicles transaction charge of £0.50

Options for Change	Description
Option 3c – Extend local discount scheme to include 2-axle goods vehicles registered to residents of Dartford and Thurrock	Comprising: <ul style="list-style-type: none"> • 2-axle goods vehicles that are registered to residents of Dartford and Thurrock; or • 2-axle goods vehicles that are registered to businesses in Dartford and Thurrock that do not pay business rates, but where the vehicle is registered to a resident of Dartford or Thurrock. and based on: <ul style="list-style-type: none"> • scheme limited to 1 vehicle per resident same transaction charges as car-based LRDS (i.e. 50 free transactions a year with subsequent transactions charged at £0.20 each)

Estimates have been made of the number of residents or business that would come within scope of each of the options for change. 2011 census figure for Dartford and Thurrock give an estimate of 0.26 million residents, of which c 0.18 million are of driving license age.

Expanding the scheme in either Option 2a or Option 2b would increase the number of residents in scope making approximately 0.6 and 0.2 million additional drivers respectively eligible for the scheme – though not all drivers would be expected to join.

Estimates from business registrations from ONS data show that there are approximately 9000 businesses in Dartford and Thurrock – and these would come in scope for the discount scheme under Option 3a. By expanding the geographical scope of the scheme under Option 3b it is estimated that this would increase by c9,000. For Option 3c, 2012 vehicle registration data obtained from DVLA indicates that c8,200 2-axle goods vehicles were privately registered in Dartford and Thurrock. These vehicles could therefore potentially become eligible for the scheme under Option 3c noting that the residents owning these vehicles are currently eligible for discount through the existing LRDS for cars.

7.1.1. Indicators used in the Multi-Criteria Assessment

For each option for change/ scenario quantified indicators have been developed to define:

- the estimated number of new LRDS and Dart-Tag users;
- the estimated number of additional LRDS and Dart-Tag transactions – and the impact on cash transactions and total Crossing transactions;
- the estimated additional operating costs;
- the estimated change in net charging revenue (i.e. lost or 'foregone' revenue that would otherwise be received by the Department) as a result of the interventions in the scenario; and
- the approximate change in congestion levels on the Crossing as a result of the change in the number of users – using change in speeds as a proxy indicator.

Qualitative assessments have also been made of:

- the operational feasibility of the interventions – noting that this is considered also in the context of the anticipated introduction of free-flow charging at the Crossing in 2014;
- the extent to which the interventions support the Department's strategic objectives for the Crossing (described in Chapter 4); and
- the extent to which the interventions support the local objectives for communities (described in Chapter 4) in the vicinity of the Crossing and address the issues raised through the 2011 consultation on proposed changes to the charging regime.

For the quantitative indicators a spreadsheet model was used to forecast changes in users and traffic conditions. This is based on data from a traffic model of the M25 and from Dart-Tag/LRDS data obtained from the Highways Agency and Connect Plus. The model is described further in Annex D. Operating cost and set up costs were estimated using a spreadsheet cost model developed from information provided by Connect Plus – with unit cost information presented in Annex B. It is noted that all impacts and costs are indicative and have not been based on detailed traffic modelling and cost estimation studies or from new data collection.

7.1.2. Reference Case

All indicators are presented relative to a reference case based on the charges assumed to be in place in 2015, i.e. the second phase of the proposed increase in charges that will be implemented in conjunction with free-flow charging. For the purposes of the assessment all forecasts are for traffic flows and revenues made by the HA based on the October 2015 charges in the 2014/2015 financial year. All costs and revenues are presented as present day (2012) values and prices. Completion of a full economic evaluation was outside the scope of this study and would require more detailed traffic modelling, cost estimation and application of user benefit calculation methods to be suitably robust.

7.2. Multi-Criteria Assessment of Intervention Scenarios

Table 7.3 presents the indicators for each of the scenarios considered. A commentary of the performance of each scenario is provided below according to each of the indicators.

7.2.1. Number of users (Indicators 1-2)

An estimate has been made of the number of additional Dart-Tag and LRDS (or business equivalent) users. Users are defined in terms of numbers of tags, noting that Dart-Tag accounts are not related to specific vehicles whereas LRDS accounts are. Table 7.2 provides a side-by-side comparison of the estimated number of tags compared to those projected in the reference case.

Table 7.2: Summary of Estimated LRDS and Dart-Tag users (2014/15)

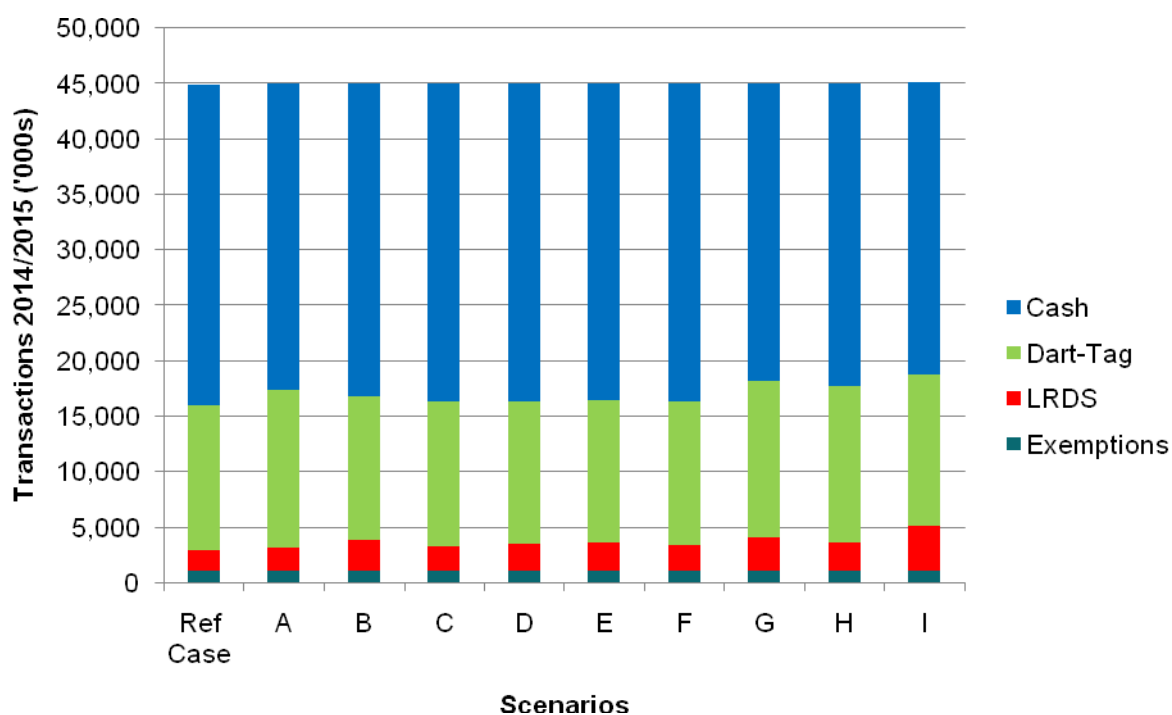
Options for Change	Dart-Tag users (000s)	LRDS users (000s)	% of total Crossing transactions made by either Dart-Tag or LRDS
<i>Reference Case</i>	96.1	24.3	33%
Option 1 – Improved Customer Channels and Marketing	104.8	26.6	36%
Option 2a – Extend local resident discount scheme to residents outside Dartford and Thurrock based on adjacent local authority districts	94.4	36.0	35%
Option 2b – Extend local resident discount scheme to residents outside Dartford and Thurrock based on within 10 km distance from Crossing	95.3	29.3	34%
Option 3a – Extend local discount scheme to include 2-axle goods vehicles for businesses in Dartford and Thurrock	94.6	28.2	34%
Option 3b – Extend local discount scheme to include 2-axle goods vehicles for businesses in Dartford and Thurrock or within 10 km distance from Crossing	94.3	31.6	34%
Option 3c – Extend local discount scheme to include 2-axle goods vehicles registered to residents of Dartford and Thurrock	94.6	28.1	34%

7.2.2. Number of transactions (Indicators 3-6)

The number of transactions relates to the number of one way Crossing trips; so a typical home to work and return home daily commuting journey using the Crossing would comprise two transactions. Estimates of the impact of the different interventions have been made using the model described in Annex D to derive the estimates shown. Figure 7.1 presents these estimates relative to the 2014/15 reference case (i.e. it assumes only the first phase of the increase in charges). It is noted that the impact of the interventions is not forecast to significantly change total transactions but changes the distribution of payment channels.

In all scenarios (see table 7.3 for scenario definition) the total number of additional transactions (i.e. one way trips using the Crossing) is forecast to increase slightly. The primary impact of the options is to increase the number of Dart-Tag or LRDS transactions, while reducing the number of cash transactions. For example, scenario A (Option 1) is forecast to result in a reduction of 1.36 million cash transactions per annum (compared to the reference case) with increases in Dart-Tag (1.21 million transactions per annum) and LRDS (0.18 million transactions per annum). There is a small traffic generation effect forecast (of 0.03 million) additional transactions per annum (in scenario A) as a result of lower charges experienced by those users switching from cash payers. Similar effects are shown for the other scenarios.

Figure 7.1: Estimated number of Transactions by Scenario



7.2.3. Change in net revenues (Indicator 7)

Estimates of revenue have also been calculated using the model described in Annex D. This shows that the impact of all scenarios is to reduce the total net revenue received by the Department. This revenue reduction can be interpreted as 'revenue foregone' as a result of changes to LRDS/Dart-Tag.

As discussed in Chapter 4, the impact of the existing LRDS based on 2011/12 transactions and revenues has been estimated as a c£1.6-£2.5 million of revenue that the Department is already forgoing - rising to c£2.0-£3.1 per annum with the higher Crossing charges in force from October 2012. The level of annual benefits of the discount to Dartford and Thurrock residents is also broadly similar.

Indicator 7 shows the estimated impact on Crossing revenues from the various options or combinations of options in each scenario. The revenue foregone represented by indicator 7 is therefore in addition to that already foregone as a result of the existing LRDS. It also gives an indication of the level of additional annual discount benefit that residents or local business might receive. The revenue foregone is forecast to range from the lowest in scenario F (£1.4 million) to the highest (£6.6 million) in scenario I. It is also noted that total impact on the Department's revenues need also to consider additional operating costs (Indicator 8).

For scenarios D (Option 3a) and E (Option 3b) that comprise extending the residents discount scheme to local business, the level of revenue foregone is dependent upon the number of tags assumed available to each local business. As discussed in Chapter 6, a maximum of five tags have been assumed in order to

assess the impacts of such a scheme. Broadly, the magnitude of the foregone revenue can be considered proportionate to the number of tags – so if the scheme was based on just two tags per business the approximate level of revenue foregone would be 20% of the values shown.

None of the scenarios therefore support the wider strategic objective of raising revenue to contribute to funding of an additional crossing of the Lower Thames. The reduction in net revenue is dependent on the balance between Dart-Tag and LRDS (or business equivalent) take up; scenarios with greatest take up of LRDS have the largest net revenue reduction. For scenarios D and E, which includes local businesses, the level of revenue reduction is also dependent on the discount structure; an illustrative structure has been assumed and this could feasibly be fine tuned to minimise revenue loss while still maintaining an attractive level of discount.

7.2.4. Change in operating costs (Indicator 8)

Operating costs shown comprise two components. First, they include the marginal cost of processing and administering additional Dart-Tag or LRDS accounts. This is estimated from the unit cost information provided by Connect Plus, and does not include additional one off set up costs that may be required or factor in any volume efficiencies that potentially could be made given a higher level of scheme take up. These costs are illustrative only. The additional costs would be expected to fall on the Crossing operator and it is presumed that these would need to be recovered from revenues.

Second, where additional marketing is assumed (Scenarios A and G-I) an allowance of £0.2 mill per annum has been included – though as noted in Chapter 5 additional capital expenditure could also be required.

Overall the impact on operating costs is small in absolute terms but these estimates do represent significant proportionate increase in annual operating costs ranging between 60% increase (scenario C) to 150% increase (scenario G).

It is assumed that the increases in operating costs would need to be recovered from the Crossing revenues – so an increase in operating cost does not therefore support the wider strategic objective of raising revenue to contribute to funding of an additional crossing of the Lower Thames.

Implementation of changes to Dart-Tag/LRDS would also be expected to result in one off capital expenditure for certain elements of marketing and to modify systems. It is not possible to estimate these in detail as this would require more detailed engagement with potential suppliers but broad indicative one-off costs could be expected to be in the range of c£0.4 - £1 mill.

7.2.5. Change in congestion (Indicator 9)

The effect of the LRDS/Dart-Tag options in each of the scenarios is to slightly increase traffic levels; this is expected to translate into slightly increased journey times against this reference case. The impact of the additional traffic on average journey speeds has been used as a proxy for impact of congestion. All scenarios are forecast to result in increased traffic levels and thereby reduced journey speeds. The negative values shown in Table 7.3 therefore indicate journey time disbenefits relative to the reference case; and can therefore be interpreted as increased congestion. It is noted that, with a higher proportion of tag-users, some of the impacts of additional congestion would be mitigated by the reduced time required to pass through the toll booths using a tag compared to paying cash

Overall the level of forecast increase in traffic in each scenario is small. Nevertheless this is forecast to result in marginally increased congestion with greatest impact at peak times, though without more detailed traffic modelling it is not feasible to quantify this with greater precision. Clearly, the scenarios with the greatest impact in terms of additional transactions are expected to result in the greatest increase in congestion. Although considered marginal, the increase in congestion works against the wider strategic objectives for the crossing to reduce congestion levels and improve journey time reliability.

7.2.6. Operational feasibility – current regime (Indicator 10)

As discussed in Chapters 5 and 6 each of the interventions for which quantified indicators have been derived are considered operationally feasible. However, there are issues that could impact on feasibility. In summary these are:

- For Option 1 – improved customer channels and marketing – the feasibility of enabling changes to back office systems at acceptable cost is presently unknown. In addition, there are potential barriers in enabling certain of the proposed marketing measures (e.g. signage).

- For Options 2a and 2b – expanding the LRDS beyond Dartford and Thurrock – the main barrier would be feasibly demonstrating the equity of extending to certain districts and not to others or to certain postcode areas. The operational mechanisms to achieve this are feasible as they are simply an extension of existing processes.
- For Options 3a – 3c – expansion to local businesses – the administrative processes are, in principle, not fundamentally different to those applied for residents. However, the level of potential abuse of the scheme is uncertain and this could affect enforcement costs. For Option 3b – expanding the scheme on a post-code basis is considered technically feasible but could face issues of challenge and equity.

7.2.7. Operational feasibility – with free-flow (Indicator 11)

The operational feasibility of each of the interventions has not been assessed against the planned introduction of free-flow (in 2014). Changes to administration and operational arrangements would necessarily be changed as part of the move to free-flow. As such, the value for money of introducing changes which would then be superseded by a new operational regime in 2014 would need to be considered. The potential impacts of free-flow are:

- The life of changes to the Dart-Tag website may be limited to only 1 year on the basis free-flow goes live in October 2014 – this may make the introduction more costly than for a system with a typical life of ~5 or more years.
- The additional registration of customers may enable existing customer contact data to be substantially improved and used for communicating the changes involved in free-flow – this could mitigate some of the cutover risks at free-flow.
- The procurement of the free-flow operator may be made more complex by the evolution of systems and processes required to deliver this option during the procurement process (as described in Chapter 5).
- The additional registration of commercial business customers may enable existing contact data to be substantially improved and used for communicating the changes involved in free-flow to businesses – this could mitigate some of the cutover risks, though the procurement of the free-flow operator may be made more complex by the evolution of systems and processes required to deliver this option during the procurement process.

7.2.8. Extent to which scenarios support strategic objectives (Indicator 12)

In all scenarios the fact that revenues are forecast to be lower than the reference case, and congestion slightly higher, means that the scenarios do not support the Department's strategic objectives for the Crossing.

7.2.9. Extent to which scenarios support local objectives (Indicator 13)

All scenarios support local objectives in that they address issues raised by the consultation on the proposals to revise the charging regime. However, drawing on the local objectives identified in Chapter 4 none of the scenarios are considered to support overall economic growth because they increase traffic impacts in Dartford and Thurrock. This works against reducing air quality impacts (which was one of the primary reasons for the LRDS being established as set out in the Department's 2008 consultation) and could be judged as marginally increasing congestion and thereby impacting on local economic performance.

Table 7.3: Multi-Criteria Analysis of Intervention Scenarios

Indicator	A – Option 1 - Improved Customer Channels and Marketing	B – Option 2a Extend local discount scheme to residents outside Dartford and Thurrock based on adjacent districts	C – Option 2b Extend local discount scheme to residents outside Dartford and Thurrock + residents in other districts who live within 10 kms of Crossing	D – Option 3a Extend local discount scheme to include businesses in Dartford and Thurrock	E – Option 3b Extend local discount scheme to include businesses in Dartford and Thurrock + businesses in other districts within 10 kms of Crossing	F – Option 3c Extend local discount scheme to include LGVs registered to residents of Dartford and Thurrock	G = Option 1 + Option 2a (Improved channels and marketing + extension of LRDS outside Dartford and Thurrock based on adjacent districts)	H = Option 1 + Option 3a (Improved channels and marketing + extension of LRDS to local businesses in Dartford and Thurrock)	I = Option 1 + Option 2a + Option 3a
(1) Estimated number of additional Dart-Tag users (= numbers of tags) (000s)	8.7	-1.7	-0.8	-1.5	-1.8	-1.5	6.8	7.1	3.5
(2) Estimated number of additional LRDS tags (000s)	2.3	11.7	5	3.9	7.3	3.8	15.1	6.2	22.9
(3) Estimated number of additional Dart-Tag transactions (excl LRDS) - (000 per annum 2015)	1214	-169	-73	-195	-205	-193	1011	1000	585
(4) Estimated number of additional LRDS transactions - (000 per annum 2015)	177	890	383	517	677	512	1153	694	2186
(5) Estimated number of total additional cash transactions - (000 per annum 2015)	-1356	-632	-272	-271	-404	-268	-2032	-1609	-2536
(6) Estimated number of total additional Crossing transactions - (000 per annum 2015)	35	89	38	52	68	51	132	86	235
(7) Estimated change in net charging revenue - (£ mill in 2015)	-2.4	-2.9	-1.9	-2.2	-2.5	-1.4	-4.3	-3.6	-6.6

Indicator	A – Option 1 - Improved Customer Channels and Marketing	B – Option 2a Extend local discount scheme to residents outside Dartford and Thurrock based on adjacent districts	C – Option 2b Extend local discount scheme to residents outside Dartford and Thurrock + residents in other districts who live within 10 kms of Crossing	D – Option 3a Extend local discount scheme to include businesses in Dartford and Thurrock	E – Option 3b Extend local discount scheme to include businesses in Dartford and Thurrock + businesses in other districts within 10 kms of Crossing	F – Option 3c Extend local discount scheme to include LGVs registered to residents of Dartford and Thurrock	G = Option 1 + Option 2a (Improved channels and marketing + extension of LRDS outside Dartford and Thurrock based on adjacent districts)	H = Option 1 + Option 3a (Improved channels and marketing + extension of LRDS to local businesses in Dartford and Thurrock)	I = Option 1 + Option 2a + Option 3a
(8) Estimated change in Dart-Tag/LRDS annual operating costs - (£ mill pa in 2015)	0.5	0.4	0.2	0.1	0.2	0.1	0.9	0.6	1.1
(9) Estimated change in average traffic speeds on the Crossing (% change from Reference Case)	-0.1%	-0.3%	-0.1%	-0.2%	-0.2%	-0.2%	-0.4%	-0.3%	-0.8%
(10) Operational feasibility – compared to current October 2012	Feasible	Feasible – subject to equity of eligibility definition	Feasible – subject to equity of eligibility definition	Feasible – subject to impact of potential abuse of scheme	Feasible – subject to impact of potential abuse of scheme and equity of eligibility definition	Feasible – subject to equity of eligibility definition and potential abuse of scheme	Feasible – subject to equity of eligibility definition	Feasible – subject to impact of potential abuse of scheme	Feasible – subject to impact of potential abuse of scheme and equity of eligibility definition
(11) Operational feasibility – given introduction of free-flow charging in 2014	Feasible in principle but may not be value for money given progression of free-flow charging and could potentially make free-flow procurement more complex								

Indicator	A – Option 1 - Improved Customer Channels and Marketing	B – Option 2a Extend local discount scheme to residents outside Dartford and Thurrock based on adjacent districts	C – Option 2b Extend local discount scheme to residents outside Dartford and Thurrock + residents in other districts who live within 10 kms of Crossing	D – Option 3a Extend local discount scheme to include businesses in Dartford and Thurrock	E – Option 3b Extend local discount scheme to include businesses in Dartford and Thurrock + businesses in other districts within 10 kms of Crossing	F – Option 3c Extend local discount scheme to include LGVs registered to residents of Dartford and Thurrock	G = Option 1 + Option 2a (Improved channels and marketing + extension of LRDS outside Dartford and Thurrock based on adjacent districts)	H = Option 1 + Option 3a (Improved channels and marketing + extension of LRDS to local businesses in Dartford and Thurrock)	I = Option 1 + Option 2a + Option 3a
(12) Extent to which the interventions support the Department’s strategic objectives for the Crossing	Does not support as reduces net revenues and marginally increases congestion								

Indicator	A – Option 1 - Improved Customer Channels and Marketing	B – Option 2a Extend local discount scheme to residents outside Dartford and Thurrock based on adjacent districts	C – Option 2b Extend local discount scheme to residents outside Dartford and Thurrock + residents in other districts who live within 10 kms of Crossing	D – Option 3a Extend local discount scheme to include businesses in Dartford and Thurrock	E – Option 3b Extend local discount scheme to include businesses in Dartford and Thurrock + businesses in other districts within 10 kms of Crossing	F – Option 3c Extend local discount scheme to include LGVs registered to residents of Dartford and Thurrock	G = Option 1 + Option 2a (Improved channels and marketing + extension of LRDS outside Dartford and Thurrock based on adjacent districts)	H = Option 1 + Option 3a (Improved channels and marketing + extension of LRDS to local businesses in Dartford and Thurrock)	I = Option 1 + Option 2a + Option 3a
(13) Extent to which the interventions support the local objectives and address the issues raised in consultation	Supports by increasing take up for the scheme but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion	Supports by increasing number of users potentially eligible for discount but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion	Supports by increasing number of users potentially eligible for discount but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion	Supports by increasing number of users potentially eligible for discount but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion	Supports by increasing number of users potentially eligible for discount but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion	Supports by focusing on small businesses in Dartford and Thurrock by increasing existing LRDS eligibility	Supports by increasing number of users potentially eligible for discount but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion	Supports by increasing take up for the scheme and by increasing number of users potentially eligible for discount in Dartford and Thurrock	Supports by increasing take up for the scheme and by increasing number of users potentially eligible for discount in Dartford and Thurrock - but potentially gives rise to additional disbenefits in Dartford and Thurrock through increased traffic and congestion

8. Conclusions

8.1. Effectiveness and efficiency of the administrative process for scheme application, renewal and on-going membership of the scheme

Based upon a review of existing processes we conclude that, in general, the account registration and renewal processes are not unnecessarily onerous, though a detailed customer survey has not been undertaken and was outside the scope of this study. The administration and operation of the processes appear to be efficient and proportionate to the level of use of the LRDS, though it is noted that a detailed benchmarking exercise was outside the scope of this study.

LRDS applications require proof of residence and vehicle ownership in line with most similar schemes. The need for paper-based submission of documents for LRDS may be acting as a barrier to take up of the scheme – though it is noted that the number of scheme members is increasing annually. The supporting administrative systems lack features which could improve back office processes and efficiency – this may be in part due to lack of budget for system enhancements.

A set of improvements to administrative processes that could feasibly be implemented has been identified and indicative costs estimated, though these would need to be subject to detailed design and engagement with suppliers. These improvements could reduce the burden on users in applying for and renewing their LRDS membership and could thereby increase scheme take up. However, the introduction of free-flow planned for October 2014 may substantially change how LRDS and Dart-Tag accounts and customer facing channels operate, potentially reducing the value of investment in changes to administration and systems that may have a life of only one year. Consideration could, however, be given to relaxing the requirement for existing LRDS members to re-provide vehicle registration and proof of residency documentation at each annual renewal, switching instead to providing this documentation every two years. This would ease some of the compliance burden on existing users. Scheme members would still be required to pay the £10 annual fee.

8.2. Levels and range of discounts offered to scheme members

LRDS and Dart-Tag users receive discount benefits that substantially exceed those available from comparable schemes within the UK.

The majority of LRDS users do not take up their “free” trip allowance – we conclude there is no need to increase the level of discount.

The estimated discount benefit of the LRDS to residents of Dartford and Thurrock is c£1.5-£2.3 million per annum (for 2011/12) based on the charges (cash or Dart-Tag) that scheme members would otherwise have to pay for the journeys made. Under the charging regime in place from October 2012 the level of this benefit is expected to be higher, c£2.0-3.1 mill per annum. Overall this is a similar magnitude to the £2 million per annum that was, prior to the LRDS implementation in 2008, provided to Dartford and Thurrock from Crossing revenues as additional local transport funding.

We have therefore not considered options to provide additional discount benefits.

8.3. Potential for improvements to marketing, publicity and awareness of the scheme in increasing take up

LRDS and Dart-Tag are not marketed in line with other typical tolled or charged crossings and little is spent on marketing – approximately 0.07% of the LRDS and Dart-Tag related revenue is spent on marketing.

There are no dedicated tag-lanes to demonstrate the time-saving advantages to cash payers, though a trial of dedicated lanes is planned for February 2013. Signage at the Crossing regarding the availability of LRDS and Dart-Tag is poor and cash payers may not become aware of those options as they approach or pass through the toll plaza. We have identified additional marketing and signage measures to increase customer awareness. It is recognised that the Department’s budget for marketing is limited and that this may constrain marketing enhancements. However, consideration could be given to low cost enhancements to signs in the vicinity of the toll booths (the on-plaza measures identified in section 5.3).

8.4. Potential for changes to current eligibility criteria for local residents

We have reviewed the eligibility criteria and considered interventions including: allowing residents in neighbouring districts to Thurrock and Dartford (as proposed by respondents to the Department's 2011 consultation) to be eligible for LRDS; and eligibility based on distance from the Crossing.

Both options are considered technically feasible in that they could be implemented and operated through extending the current LRDS application, renewal and enforcement mechanisms.

Replacing the existing Dartford and Thurrock local authority-based residency eligibility criteria with a solely distance-based criteria would be problematic as a very large area would become eligible for a discount. For this reason it is not recommended as an option to take forward unless, perhaps, considered as part of a wider sub-regional approach to providing discounts at other crossing locations.

Potentially a hybrid option could be pursued whereby: existing scheme eligibility as defined by residency within the districts of Dartford and Thurrock is retained; and supplemented by additional eligibility for those locations outside Dartford and Thurrock which are within a set distance of the Crossing.

However, any form of geographic extension of eligibility would generate new issues of equity and understanding of the rationale for a discount scheme.

8.5. Case for the inclusion of local businesses

We have considered the option of extending the LRDS to businesses located in communities in the vicinity of the Crossing and concluded this it would be technically feasible to operate and could be incorporated within the existing LRDS application, renewal and enforcement mechanisms. Further development would though be required to confirm: detailed feasibility and costs; the geographic scope of the scheme; the level of discount; the number of tags that should be made available to each individual business; and mechanisms to limit potential abuse of the scheme. This is also likely to require further consultation and a change to the statutory charging order.

8.6. Assessment of Options for Change

The impact of potential interventions to change the operation and eligibility criteria for the LRDS and Dart-Tag schemes has been assessed using estimates of changes in the number of transactions at the Crossing, net revenues, congestion and the costs of operating the LRDS and Dart-Tag schemes. Qualitative assessments have been made of operational feasibility and the extent to which the interventions would support the Department's strategic and local objectives for the Crossing. A summary of the headline conclusions is provided in Table 8.1.

The analysis indicates that the level of take up of both LRDS and Dart-Tag can be increased. However, the impact of each of the options considered is not forecast to significantly change total Crossing transactions but change the distribution of payment channels.

Table 8.1: Summary of Impacts of Options for Change (2014/15 compared to Reference Case)

Options for Change	Estimated additional number of users with tags paying via Dart-Tag or LRDS	Estimated change in Crossing Revenue £ mill pa	Estimated Additional operating cost per annum £ mill pa
Option 1 – Improved Customer Channels and Marketing	11000	-2.4	0.5
Option 2a – Extend local resident discount scheme to residents outside Dartford and Thurrock based on adjacent local authority districts	10000	-2.9	0.4
Option 2b – Extend local resident discount scheme to residents outside Dartford and Thurrock based on within 10 km distance from Crossing	4200	-1.9	0.2
Option 3a – Extend local discount scheme to include businesses in Dartford and Thurrock	2400	-2.2	0.1
Option 3b – Extend local discount scheme to include businesses in Dartford and Thurrock or within 10 km distance from Crossing	5500	-2.5	0.2
Option 3c – Extend local discount scheme to include LGVs registered to residents of Dartford and Thurrock	2300	-1.4	0.1

With Option 1, improving existing customer channels and increasing marketing, the projected impact is for a transfer of existing cash payers to discounted Dart-Tag and LRDS charges. Options 2a and 2b – extending the residency eligibility criteria for the LRDS beyond Dartford and Thurrock – are projected to result in both cash payers and existing Dart-Tag users transferring to the LRDS. The same effect is projected for Options 3a, 3b and 3c with the local discount scheme extended to businesses.

The impact of users transferring to either local discount schemes or Dart-Tag is projected to result in reduced revenues from Crossing charges compared to the reference case. The level of revenue reduction depends on the option considered, but ranges between £1.4 and £2.9 mill per annum. Combining the options would reduce revenue further, up to £6.6 mill p.a. if eligibility for discounts was extended across a much wider geographic area. Additional operating costs for changing existing scheme operation would also apply and could also be expected to impact on net revenues.

All options are forecast to result in slightly increased traffic levels on the Crossing as a result of lower travel costs given the discounts available to certain users. Even though these increases are small, the impact would be slightly increased congestion levels.

None of the options therefore support the Department's strategic objectives for the Crossing as they do not reduce congestion levels at the Crossing and they do not contribute to providing additional revenues to fund other proposals.

All options are considered technically feasible in that existing operational mechanisms could reasonably be extended to accommodate the changes required for each of the options. However, issues would need to be addressed to ensure that: users understood and accepted the rationale for expanding eligibility for discounts beyond that defined for the current LRDS; and that users understand and accept processes of determining eligibility. In addition, the move to free-flow tolling at the Crossing could also impact on the value for money and practical feasibility of making changes to the existing LRDS and Dart-Tag schemes.

Appendices

Appendix A. Current Operations

A.1. Customer Channels

Table A1 summarises the functions performed by the front and back office operations.

Table A1: Overview of Front and Back Office Processes and Responsibilities

Work Area	Processes Operated	Responsibility
LRDS dedicated processes	<ul style="list-style-type: none"> • Local Resident Application • Local Resident Renewal • Vehicle registration Change • Address Change • LR account expiry- no renewal - conversion to Dart-tag • LR Verification • Misuse management – issuing warning letters • Misuse -conversion to Dart-tag after 5 misuses • No funds – payment debit note • No funds – conversion to Dart-tag Dart-tag back to LR on payment/extenuating circumstances	Back Office
Local Resident Verification	<ul style="list-style-type: none"> • Reviewing ANPR checks of LR tag usage • Verifying ANPR match failures 2nd stage verification of ANPR failures and misuse confirmation	Back Office
Dart-tag Processes	<ul style="list-style-type: none"> • Process paper application • Process web-based application[Back Office
Payment processing	<ul style="list-style-type: none"> • Cash payment • Credit card payment • Cash payment 	Back Office Lane Operators
Incoming tag	<ul style="list-style-type: none"> • Failed tag replacement • Found tags 	Back Office
Outgoing tags	<ul style="list-style-type: none"> • Issuing tags to LRDS customers • Issuing tags to Dart-tag customers 	Back Office
Outgoing tags	<ul style="list-style-type: none"> • Issuing tags to LRDS customers • Issuing tags to Dart-tag customers 	Back Office
Customer call handling	<ul style="list-style-type: none"> • Account status and update queries • Questions on process • General questions • Lost or stolen tag reports • Hotlisting of lost or stolen tags 	Back Office
Toll lane management	<ul style="list-style-type: none"> • Verifying vehicle classification and charge due • Managing exceptions • Issuing debit notes to LR without credit 	Toll Lane Operators
Exemptions	<ul style="list-style-type: none"> • Procession of applications 	Back office

Table A2 summarises the main activity focus of the existing back office staff.

Table A2: Overview of Front and Back Office Processes and Responsibilities

Main Activity Focus	Staff
Incoming tags	2
Outgoing tags – new accounts/replacement	2
Application processing	3
LRDS Verification	2
Contact Centre	10
Payment Processing	2
Supervisors	2
Manager	1
Total	24

Table note: excludes back office effort processing exemptions

Appendix B. Cost Table Marketing and Back Office Enhancements

B.1. Cost Table Marketing and Back Office Enhancements

Cost Assumptions - Option 1		Costs (£k)		Notes/Assumptions/Source
		Capex	Opex	
Item				
1	Website Changes to enable electronic submission of LRDS documents	50	10	Provisional budget for changes subject to quotation from Sanef ITS for upgrades
2	DVLA - Access to V.5 and Driving Licence Data	3	1	Provisional budget for services subject to engagement with DVLA
3	Council tax and electoral roll data access	1	12	Provisional budget for data access subject to engagement with Dartford and Thurrock Councils
4	Marketing		110	Assumption based on spending 0.5% of £22m Dart tag/LRDS revenue
5	Automated back office processing	50	20	Provisional budget subject to detailed design and quotation from Sanef ITS for changes
6	Signage	100	10	Assumption without consultation with NetServ and subject to detailed design
7	Dedicated tag lanes (3) in each direction	200	20	Cost assumption to be validated by Connect Plus who have defined a budget for a trial in lanes 7-9 Northbound
8	Customer contact database	10		Assumption subject to review of database and detailed design
9	On plaza signage	10		Assumption without consultation with NetServ and subject to detailed design
Sub-total		424	183	
Unit Costs Per additional account processed		Costs/Account (£)		
10	LRDS	30	7	Based on apportionment of current costs provided by Connect Plus
11	Dart tag	20	5	Based on apportionment of current costs provided by Connect Plus
Cost Assumptions - Option 2				
12	Same as Option 1			Scaling to other boroughs assumed to be within marginal costs per account processed, subject to engaging with each borough re access to council tax/electoral roll data
Cost Assumptions - Option 3		Costs (£k)		
		Capex	Opex	
13	On-line access to UBR Data in Dartford and Thurrock	1	10	Provisional budget for data access subject to engagement with Dartford and Thurrock Councils
14	Assumed to Include Option 1			
Unit Costs Per additional account processed		Costs/Account (£)		
15	Local Business	50	14	
Costs exclude:				
	Project management for implementation			Subject to the sourcing of project management, a budget of £100k may be required
	Any changes to premises or offices to improve security or access control			
	Recruitment costs			
	Overheads within HA or Connect Plus			
	Impacts associated with Freeflow			

Appendix C. Consultation Responses

C.1. Thurrock Consultation Notes

Project:	LRDS and Dart-Tag Review		
Subject:	Consultation - Thurrock Council		
Date and time:	26 th September 2012	Meeting no:	1
Meeting place:	By telephone	Minutes by:	Sunil Gogna
Present:	Mat Kiely Sunil Gogna	Representing:	Thurrock Council Atkins

QUESTION DESCRIPTION & ACTION

1a	Should the LRDS be extended beyond its current boundary?
1b	If yes, what is the rationale and evidence for a scheme extension covering a wider population? <ul style="list-style-type: none"> • Whether a geographically wider scheme would deliver wider benefits needs to be discussed with Essex County Council. Essex County Council is keen to see the scheme extended. • Thurrock would support a widening of the scheme if there was no detriment to Thurrock residents (i.e. the number of free crossings followed by the cost of subsidised crossings should not be watered down in order to maintain tolling revenues). A wider scheme could result in extra congestion on Thurrock's road network and economic benefits to Kent. • The difficult question of an extended scheme is where do you draw the cut off line? Should there be different discount levels determined by proximity to the crossing? • Evidence is anecdotal rather than quantitative
2a	What are the wider benefits of LRDS to your local authority area?
2b	What would be the benefits of extending LRDS to cover local businesses? Can you support this with evidence? <ul style="list-style-type: none"> • Most users of the scheme use the crossing for commuting rather than leisure. • There is a concern that if residents started using it for leisure then economic benefits may go to other local authorities. For example, Thurrock residents may shop in Bluewater rather than Lakeside. • Extending the scheme geographically could compound this economic disbenefit to Thurrock; however, users of the scheme would need to balance the low cost of the toll against the potential for sitting in congestion on the crossing. • Thurrock strongly supports extending the LRDS to local business. There is strong support amongst business for their inclusion in the LRDS as evidenced by comments in meeting between the council and local business organisations. The question often posed to the council is "when will businesses be included in the LRDS?" • However, the practicalities of how this would work are not an easy question to answer. For example, a business may be registered in Thurrock, but its vehicles may not be. Should all vehicles in a business fleet be eligible for LRDS or a particular number? How would the scheme distinguish between businesses of different sizes (e.g. partnerships vs. SMEs)? Would it have to be implemented on an analysis of business need?
3a	Take-up of the LRDS has been regarded as being low; what do you think are the key barriers for low take-up?
3b	What measures do you think would increase take-up of LRDS when charges for using the crossing are increased and the free-flow scheme is implemented? E.g. what is the council view on streamlining the application process, for example in combination with resident parking permits?

QUESTION DESCRIPTION & ACTION

3c	<p>What impact do you think that the increased crossing charge, (in October 2012 and again in October 2014 in conjunction with free-flow), will have on LRDS and Dart-Tag membership?</p> <ul style="list-style-type: none"> • Uptake of LRDS is important, but it is unknown. If it is low, then LRDS is of little benefit to Thurrock. • The main issue is a lack of local knowledge of LRDS. • When the scheme was announced there was a lot of interest from local residents; the council took hundreds of telephone calls enquiring about it. • But the scheme is not well promoted by its operator and residents are generally unaware of FAQs that are available about the scheme. • The application process also appears to be rather cumbersome and not at all user friendly. • Payment method is credit card or direct debit, either on-line or via the operator's customer services line for their office in Dartford, or in person at the office. There is no option to pay at a local post office or at the council office. Cuts to LA funding meant the council removed any payment facilities at its offices. • Another issue is that, in spite of numerous requests from the council, neither the toll operator nor DfT has been able to provide any data showing how many residents have taken up the scheme. If it is just a few residents then the benefit to Thurrock of LRDS will be low. • To improve take-up there needs to be better information about the scheme; better promotion and awareness raising; residents need to better understand the benefits offered by LRDS; be shown how easy it is to sign up for it; and be shown how easy it is to use it. • The toll operator should have contacted Thurrock Council's communications team to develop a specific approach tailored to Thurrock residents to promote the LRDS and ultimately improve take-up. But it has not happened; there has been little communication with residents from the toll operator. • Residents parking schemes are few in Thurrock hence an application process on the back of this would not work in the borough. • The increase in toll charges could encourage more residents to take-up the LRDS. • Implementing free-flow conditions will make it easier / quicker for residents to use the crossing. However, this combined with a greater take-up of LRDS could potentially lead to businesses in Kent enjoying an economic boost as residents travel to Bluewater rather than Lakeside. • Hypothecation of tolls was removed some time ago. Under that system Thurrock received £1m pa for transport. However under the LRDS the benefits to Thurrock do not equate to anywhere near £1m pa under the previous system. <p>The main concern to Members is a loss of economic benefit to other areas under the proposed measures.</p>
4	<p>Have there been any registered viewpoints regarding revised charges and more specifically the LRDS since the DfT consultation was completed (i.e. September 2011)?</p> <ul style="list-style-type: none"> • Thurrock's leader thinks the crossing should be free to residents. • Thurrock has not had time to get Members views on these questions, but will endeavour to do so and send them separately to Atkins.
5	<p>Are you aware of any available journey to work data that supersedes that provided in NOMIS (i.e. 2001) that could be used to support this study?</p> <ul style="list-style-type: none"> • No. Public sector funding cuts have resulted in reduced monitoring and study work at the council. • However, work place travel planning work being conducted as part of LSTF delivery may yield some useful data, but not in time to inform this review.

C.2. Dartford Consultation Notes

Project:	LRDS and Dart-Tag Review		
Subject:	Consultation - Dartford Council		
Date and time:	29th October 2012	Meeting no:	1
Meeting place:	Comments received by e-mail	Minutes by:	Alistair Bradley
Present:	N/A	Representing:	Dartford Council Atkins

QUESTION DESCRIPTION & ACTION

Introduction	<ul style="list-style-type: none"> The Council has consistently made the case that the continuation of a charging policy at the Dartford River Crossing is both unjustified and harmful. It perpetuates economic, social and environmental impacts arising from the severe congestion which it causes, and there is no clear evidence of any benefits. The Council therefore continues to oppose the charges in principle, but considers that any charge should not be levied on local residents, who bear the brunt of the impacts arising from the congestion caused by the charging policy.
1a	<p>Should the LRDS be extended beyond its current boundary?</p> <ul style="list-style-type: none"> The Council has no reason to propose an extension of the boundary of the LRDS.
1b	<p>If yes, what is the rationale and evidence for a scheme extension covering a wider population?</p> <ul style="list-style-type: none"> Not applicable
2a	<p>What are the wider benefits of LRDS to your local authority area?</p> <ul style="list-style-type: none"> The LRDS provides a concession to local residents, rather than a benefit. The crossing continues to create problems for residents and businesses alike as a result of congestion, air quality and periodic severe disruption. The LRDS does not alleviate any of these problems, but it provides residents with a modest concession by not having to pay a charge.
2b	<p>What would be the benefits of extending LRDS to cover local businesses? Can you support this with evidence?</p> <ul style="list-style-type: none"> Dartford's businesses would benefit significantly from not having to pay a charge. For commercial vehicles the charge is a deterrent to cross-river movement, making it difficult for local businesses to expand their markets north of the river, or develop supply chains with other businesses north of the river. Many of Dartford's businesses have located here because of its good transport links, and are therefore particularly sensitive to transport costs. Dartford is also at a disadvantage when seeking to attract new businesses to the area, compared with other locations where road charges do not apply. The Council does not have empirical evidence to quantify the benefits to local businesses from a discount scheme. However complaints from the business community about the crossing charges and the congestion are a recurring feature in the Council's consultations with the local business community.
3a	<p>Take-up of the LRDS has been regarded as being low; what do you think are the key barriers for low take-up?</p> <p>The process for obtaining a Dart-Tag and the restrictions applying may deter take up of the scheme. For example:</p> <ul style="list-style-type: none"> The Dart-Tag website does not appear to offer an online registration option for the

QUESTION DESCRIPTION & ACTION

Local Residents Discount Scheme;

- Applications in person can only be made at the Dartford River Crossing Customer Centre at South Orbital Road, which is inaccessible;
- The level of documentary proof of residency (two documents) and car ownership (one document) is unnecessary and burdensome, as car ownership can be verified via DVLC;
- The requirement to restrict entitlement to one car per applicant is unjustified, as many local residents are likely to have use of more than one vehicle; a residency qualification should be sufficient;
- The application instructions ask for copies of documentation, but there are anecdotal reports that copies have been rejected, and that originals have been required;
- The £10 registration fee may deter some applicants, particularly infrequent users of the crossing for whom the benefits will be offset by the fee;

Better publicity on the availability of the scheme may also assist.

3b What measures do you think would increase take-up of LRDS when charges for using the crossing are increased and the free-flow scheme is implemented? E.g. what is the council view on streamlining the application process, for example in combination with resident parking permits?

- Options to streamline the application process would assist. However combining the application process with the issue of residents parking permits is unlikely to assist in view of the small number of parking schemes operating in Dartford.

3c What impact do you think that the increased crossing charge, (in October 2012 and again in October 2014 in conjunction with free flow), will have on LRDS and Dart-Tag membership?

- The increase in the charge is likely to motivate more local residents to apply for the discount scheme.

4 Have there been any registered viewpoints regarding revised charges and more specifically the LRDS since the DfT consultation was completed (i.e. September 2011)?

- There are numerous sources of viewpoints in relation to the charges and the discount scheme, including at KentOnline, online national newspapers and related blogsites.
- The Council has itself registered its views in relation to the scheme on three previous occasions. Copies of the relevant reports and minutes are attached.

5

1.1.1. Are you aware of any available journey to work data that supersedes that provided in NOMIS (i.e. 2001) that could be used to support this study?

- The National Travel Survey may provide relevant information.

Dartford also note that previous reports and minutes (also provided) set out viewpoints previously registered by Dartford Borough Council in respect of the Local Residents Discount Scheme.

Appendix D. Model Development Note

D.1. Introduction

This note details the development of the spreadsheet model used in the Local Residents' Discount Scheme (LRDS) and Dart-tag Review. The model has been developed in three key stages:

- The Benchmark – establish the current users of the crossing, by payment type, vehicle type and geographical distribution.
- The Reference Case – estimate the annual transactions and revenue for the appraisal year (2014/15) without any change to the discount scheme.
- The Scenarios – introduce a mechanism for testing each of the options and combinations of these options.

D.2. Developing the Benchmark

The Benchmark has been developed from two key sources of the data: a SATURN highway model of the M25 and transaction data for the Dartford Crossing for the 2011/12 period.

SATURN Model

The B602 M25 2004 base model has been analysed to understand the distribution of trips using the crossing. By completing select link analyses on the crossing links, the origins and destinations of all vehicles using the crossing have been found for the AM peak, the inter-peak and the PM peak. The results of this analysis have been aggregated by Local Authority within our study area, and then by geographical region beyond this.

Traffic flow data for the crossing has been used to develop an average daily profile for the benchmark period (2011/12). From this profile, annualisation factors have been calculated to convert the SATURN AM, IP and PM flows to a 16 hour annual average daily traffic (AADT). A 16 hour period has been chosen for consistency with the times during which the charge is in place (6am-10pm).

The SATURN model has the following user classes:

- Cars: Business, Commuter and Other;
- Light Goods Vehicle (LGVs); and
- Heavy Goods Vehicles (HGVs).

As the charging structure splits goods vehicles by axle type, the follow process has been used to convert the SATURN goods vehicle classes to match the charging structure:

$$\begin{aligned} \text{SATURN}_{\text{HGV}} - \text{TRANSACTION}_{\text{Multi-Axle Goods Vehicle}} &= \text{Two - Axle HGV} \\ \text{SATURN}_{\text{LGV}} + \text{Two - Axle HGV} &= \text{Two - Axle Goods Vehicle} \end{aligned}$$

For the purposes of this modelling exercise it has been assumed that all LGVs in the SATURN model have a business purpose.

Transaction Data

Transaction and revenue data for the 2011/12 period has been used to provide the number of transactions by:

- Payment Type – LRDS, Dart-tag or cash.
- Vehicle Type – Car, two-axle goods vehicle, multi-axle goods vehicle.

The 16 hr AADT calculated from the SATURN model analysis has been uplifted to match the transaction data. This makes the assumption that the geographical distribution of demand and the split by vehicle type will remain unchanged from the base SATURN model.

D.3. Developing the Reference Case

The crossing charge increased in October 2012 and will rise again in 2014. In addition to this, free-flow charging will be in place by 2014. A Reference Case for comparison with the different scenarios has been

developed in two stages: (i) uplift the Benchmark demand to reflect traffic growth and (ii) account for the impact of the charge increase and introduction of free-flow charging.

Forecast traffic flows have been taken from the Impact Assessment of the revised charging scheme⁷. This note provides a 2015 traffic flow both with and without the revised charging scheme. The Do Nothing flow has been used to uplift the Benchmark to 2015 flows.

The Impact Assessment stated that the impact of the revised charges was a reduction in traffic flows of 15%. Data provided by the Highways Agency from the Dartford Free Flow Charging Outline Business Case indicates that traffic volumes increase by 5% once free-flow charging is in place. It has therefore been assumed that the net impact of revised charges and free-flow charging is a 10% reduction in flow from the 2015 Benchmark.

Developing the Scenarios

Each of the scenarios tested are a combination of the following options:

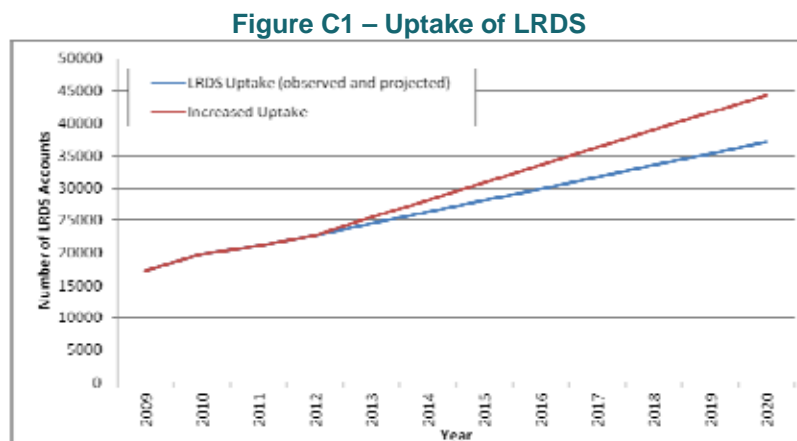
- Improved marketing and administration processes of LRDS and Dart-tag.
- Extending the catchment area/eligibility of LRDS.
- Introduce the Local Business Discount Scheme (LBDS) to the same areas that are eligible for LRDS.

As the scenarios are simply a combination of these options, explanations are only given for how the options have been modelled.

Impact of Marketing

Improved marketing and administration has been assumed to increase the uptake of LRDS and Dart-tag. The increase has been modelled by projecting the future uptake of LRDS and Dart-tag based on historic trends and uplifting this increase by a given amount. It has been assumed that the impact will be a 50% increase in uptake rate. It should be noted that this value has been assumed to provide an indicative estimate of the impact of increase uptake, rather than this being a forecast of the impact of improved marketing.

Figure C1 shows the projected uptake of LRDS (in Dartford and Thurrock) and the uplifted uptake with improved marketing in place. Local authorities that become eligible for LRDS have been assumed to benefit from a proportionate increase in uptake in the relevant scenarios.



An increase in LRDS users from improved marketing is offset by a reduction in Dart-tag users and cash payers. An increase in Dart-tag transactions is assumed to come directly from cash transactions.

Impact of Extended to Geographical Area

The extension of LRDS to other Local Authorities (LAs) has been modelled by assuming that crossing transactions from the relevant LAs will follow the same uptake profile as Dartford and Thurrock (see Figure C1). It has been reflected that LAs further from the crossing could be expected to have a lower uptake of LRDS than those closer to the crossing. Transactions that have switched to LRDS are taken from Dart-tag and cash payers proportionately by LA.

⁷ <http://assets.dft.gov.uk/consultations/dft-2011-08/dft-2011-08-final-ia.pdf>

Impact of Local Business Discount Scheme

The LBDS has been included in the spreadsheet using the following assumptions:

- Cars with a business purpose and Lights Goods Vehicles are eligible for the scheme.
- A standard charge of £0.50 is assumed per vehicle.
- Each business is eligible for five discount units.

An uptake in LBDS transactions is reflected by a decrease in Dart-tag and cash transactions for the relevant LA. This mechanism is applied in the same way as an increase in LRDS resulting from marketing and area extension as described above.

The average business size has been calculated from available planning data⁸. The uptake of LBDS has then been applied by assuming that the uptake will be similar to that of Dart-tag but factored down to reflect the fact that each business will only have five discount accounts.

Comparison of the Scenarios to the Reference Case

It is noted that all scenarios pivot from the uplifted Benchmark and that the results are then compared to the Reference Case. The flow reduction of 10% that is described above is applied to remaining Dart-tag and cash transactions after the relevant option has been applied.

The impact on revenues has been determined by calculating the appropriate revenue and operating costs from the number of transactions and accounts for each scenario.

The impact on speeds has been estimated by developing a relationship between average daily speeds and flows on the crossing from data available from the Highways Agency's Journey Time Database. The forecast increase in traffic flows for each scenario has then been translated into the resulting decrease in average daily speeds.

⁸ UK Business: Activity, Size and Location – 2011. Office for National Statistics. Table A1.2.