Thurrock Lorry Parking Study

Technical report

VN40110.1 | March 2012

SKM COLIN BUCHANAN

Thurrock Lorry Parking Study

Document Title:	Thurrock Lorry Parking Study
Version:	Version 12
Date:	March 2012
Prepared by:	David Battershill / Martin Wedderburn
Approved by:	Faiz Nassiri

Sinclair Knight Merz

ABN 37 001 024 095

New City Court
20 St Thomas Street
London SE1 9RS

Tel: +44 (0)
Fax: +44 (0)
Web: www.skmcolinbuchanan.com

Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
Version 1	16/11/11	Faiz Nassiri	Faiz Nassiri	-	Draft. - Not fully reviewed. Model Results to be updated
Version 2	6/12/11	Faiz Nassiri	Faiz Nassiri		Draft Final With updated results for Titan Truck Stop
Version 3	29/12/11	Faiz Nassiri	Faiz Nassiri		Draft Final
Version12	15/3/12	Faiz Nassiri	Faiz Nassiri	15/3/12	Final with TBC comments

Distribution of copies

Revision	Copy no	Quantity	Issued to
Version 1	Electronic	Electronic	Thurrock Borough Council
Version 2	Electronic	Electronic	Thurrock Borough Council
Version 3	Electronic	Electronic	Thurrock Borough Council
Version 4	Electronic	Electronic	Thurrock Borough Council
Version 12	Electronic	Electronic	Thurrock Borough Council

Printed:	16 March 2012
Last saved:	16 March 2012 11:55 AM
File name:	VN40110 1 Thurrock lorry parking report V12RHFN 150312AN.docx
Author:	David Battershill
Project manager:	David Battershill
Name of organisation:	SKM Colin Buchanan
Name of project:	Thurrock Lorry Parking Study
Name of document:	Technical report
Document version:	V12.0
Project number:	VN40110.1

Contents

1 Executive Summary

1.1.1 SKM Colin Buchanan has been commissioned by Thurrock Council to conduct a study of overnight lorry parking in Thurrock. The objectives of the study are to:

- Provide a reliable estimate of existing overnight lorry parking in Thurrock;
- Calculate a robust estimate of future overnight lorry parking; and
- Make recommendations for preferred site locations within the Thurrock area.

1.1.2 Using observed data from lorry parking surveys SKM Colin Buchanan has determined Base Year lorry parking demand across the lorry parks, lay-bys/verges and other car parks in the study area and also ascertained drivers' origins and destinations and the factors affecting their choice of parking location. Using this data, an origin constrained and capacity constrained gravity model was developed and calibrated..

1.1.3 The total existing lorry parking "capacity" is estimated at 616 spaces in lorry parking sites and at least 315 on-street locations (constituting both legal and illegal parking along lay-bys and verges).It is not possible to provide a definitive capacity for lay-bys and other off-site parking locations. Furthermore, it is important to recognise that the capacity figures for lay-bys and verges include both formal and in-formal parking, of which the informal parking should not be encouraged as it is not necessarily acceptable and can cause significant harm.

1.1.4 Overall, in total (i.e. including both Thurrock and Non-Thurrock demand) the Base Year estimate is fora requirement for additional off-street lorry parking capacity in the order of 150-200 spaces in addition to the temporary permission at Titan site, West Thurrock, if no on-street "capacity" is available (constituting both legal and illegal parking along lay-bys and verges). Analysis of the gravity model indicates that this deficit of off –street parking capacity consists of about 115 Thurrock trips and about 70 Non-Thurrock trips.

1.1.5 A 2026 reference case scenario has been developed assuming currently proposed changes in lorry parking capacity and growth in traffic demand. This reference case assumes the closure of the existing Titan Site, West Thurrock, and the closure of Purfleet Truck Wash site. In the reference case growth of Thurrock-based traffic has been based on a maximum growth scenario for B1, B2 and B8 land-uses in Lakeside and growth of non-Thurrock traffic has been based on National Traffic Model (NTM) factors. The reference case assumes lorry parking is provided at Tilbury and London Gateway Port Developments. Compared to the Base case, the 2026 reference case shows a large increase in non-Thurrock lorry parking in the M25 and West Thurrock lay-bys and a decrease in lay-by parking around Tilbury.

1.1.6 Overall the 2026 reference case, in total (i.e. including both Thurrock and Non-Thurrock demand), forecast results in a requirement for further lorry parking capacity in the order of 650 spaces, provided that no on-street "capacity" is available (constituting both legal and illegal parking along lay-bys and verges). Analysis of the reference case scenario modelling results indicates that this deficit of off –street parking capacity consists of about 200 Thurrock trips and about 450 Non-Thurrock trips.

1.1.7 Two further options have also been tested assuming additional new lorry parks containing 360 lorry parking spaces, firstly in the West Thurrock riverside area and secondly near the junction of the M25/M30. Perceived journey costs have been calculated for each new lorry park site using parameters assumed in the modelling of existing lorry park sites. These new sites are forecast to provide relief to parking on lay-bys on the M25/West Thurrock. Overall, in total i.e. including both Thurrock and Non-Thurrock demand), the options forecast a requirement for further lorry parking capacity in the order of 300 spaces (in addition to the 360 spaces capacity in either of the options), provided that no on-street "capacity" is available (constituting both legal and illegal parking along lay-bys and verges). The option testing also shows that the West Thurrock site (with 79% Non-Thurrock-based traffic) is slightly more suitable in catering for Thurrock as opposed to non-Thurrock traffic than the M25 site (with 91% Non-Thurrock-based traffic).

1.1.8 Further future year sensitivities have been modelled to test the impact of a potential increase/decrease in the number of non-Thurrock trips choosing to park in Thurrock. These forecast a potentially large increase in parking demand for lay-bys around the M25 and West Thurrock and show that the Motorway Service Area (MSA) is at capacity under most demand scenarios. The tests show that a reduction of approximately 40% of non-Thurrock trips would be required to keep lorry parking numbers in lay-bys around the M25 and West Thurrock to base year demand levels. However, it should be noted that strategic level changes in freight movements, caused by alterations to the Dartford Crossing Toll system may potentially cause a decrease in non-Thurrock trips.

1.1.9 It is possible that non-Thurrock traffic may simply choose car parks outside the study area when faced with a lack of spaces within Thurrock. This study forecasts that if the strategywas to only to cater for Thurrock traffic, an additional 120-140 lorry parking spaces may be sufficient under either Option 1 or 2.

1.1.10 If there is better enforcement of unauthorised lay-by parking, it may be assumed that the existing on-street parking either displaces into off-street facilities or choose to park elsewhere outside of the study area. The model makes an allowance for this, which reduces the number of lorries parking on lay-bys and verges

1.1.11 In terms of policy approach Thurrock Council state that in addition to the identified Tilbury and London Gateway off-street parking sites, Thurrock Council may choose to either allocate a number of off-street spaces in West Thurrock and continue to allow some on street HGV spaces or in conjunction with more robust enforcement preclude all on-street parking, with correspondingly more off-street facilities to meet demand for spaces. The West Thurrock site/or sites could be either near the M25 or slightly further afield to influence the proportion of non-Thurrock use. Thurrock Council may choose to allocate a significantly smaller facility or facilities with restrictions for Thurrock-only traffic. This would have to be in conjunction with a very robust scheme of on-street enforcement. The commercial realities may mean that a "Thurrock only" facility is not practical unless of course it were a municipal facility; administered by the local authority.

2 Introduction

2.1 Background

2.1.1 SKM Colin Buchanan has been commissioned by Thurrock Council to conduct a study of overnight lorry parking in Thurrock. The objectives of the study are to:

- Provide a reliable estimate of existing overnight lorry parking in Thurrock;
- Calculate a robust estimate of future overnight lorry parking; and
- Make recommendations for preferred site locations within the Thurrock area.

2.1.2 In November 2009, AECOM completed a report outlining their research in to the status of lorry parking in the UK in 2009. This document was designed to be used as a baseline document underpinning the development of a strategy/ action plan for lorry parking in the UK.

2.1.3 Lorry Parking Spaces were classified in to the three following categories:

- Motorway Service Area (MSA)
- Independent Lorry Park
- Local Authority Lorry Park

2.1.4 The AECOM report outlined the characteristics of these categories in some depth. In summary MSA are located next to motorways where, although lorry parking spaces are located separately from other general traffic parking, they essentially share the same facilities as other general traffic. In contrast, Lorry Parks are separate entities, where the only users are HGVs. The AECOM report also described the primary reason for requiring specialised Lorry Parks as a reduction in crime.

2.1.5 The AECOM report also outlined the results of interview surveys across the UK at Lorry Parks, MSA and lay-bys to research lorry drivers parking behaviour. The key findings from this survey were as follows:

- Cost appears to be the primary decision factor with respect to parking decisions
- The survey found that 25% of drivers would usually park in a lorry park overnight, 24% in an MSA and 20% in a lay-by
- Overall, 76% of drivers have their overnight stays paid for them in some form. The 24% who have to pay out of their own pocket are, unsurprisingly, most likely to use lay-bys overnight. Interestingly, 37% of those parked in lay-bys actually receive a tax free cash allowance, and others in this group also receive a contribution towards parking e.g. set amount paid through wages.

2.1.6 In November 2011 DfT published a nationwide overnight lorry parking study, which included surveyed information on the number type and capacity of lorry parks across England. This study was designed to help provide information to aid local authorities and developers in providing additional lorry parking capacity to tackle on-street parking as well as the associated crime. A

strong emphasis, in the DfT report, is placed on the issue of providing secure lorry parking sites to reduce crime rates, which reportedly cost the economy £250m per year.

2.1.7 The final results of the DfT's lorry parking study conclude that both the South Eastern and Eastern regions of England are characterised by high utilisation (>=70%) of on-site lorry parking and total parking levels that exceed capacity. Furthermore the DfT lorry parking study identified that Thurrock's strategic location next to the M25 and the A13, as well as its proximity to Tilbury docks, results in high volumes of freight traffic.

2.1.8 Thurrock ranks as the highest priority area in the Eastern region with significant numbers of lorries parking in lay-bys and a significant number of high value thefts recorded. Specifically it was noted that:

"The lorry parking site at Thurrock Services was over 75% utilised. There is also an unofficial lorry parking site (at the time surveys were conducted) called Titan Lorry Park, which is therefore not shown on the maps. Since surveys were conducted this has now been granted permission to operate for a limited number of years. Anecdotal evidence suggests Titan lorry park is also well utilised with contract parking and approximately 70 ad hoc spaces. This indicates that demand issues around Thurrock will remain."

2.2 Study overview

2.2.1 Evidence of the existing demand for lorry parking in Thurrock has been collated from a number of sources, including the DfT's recent nationwide research and local surveys commissioned by Thurrock Council. Section 3 of this report collates the relevant information and presents an overview of total existing demand.

2.2.2 A bespoke model has been developed to explain the choice of lorry parking locations. The parameters in the model have been selected from published national research and local surveys with lorry drivers parking in Thurrock. Section 4 of this report describes the model development and calibration.

2.2.3 Future demand for lorry parking has been estimated for 2026. The growth in demand for overnight lorry parking will be driven by changes to major trip generators in Thurrock, in particular the Ports, and external factors such as the forecast growth in HGV through-traffic in the area. Section 5 of this report presents the expected growth in demand and the resulting reference case (future year 'do-minimum' scenario).

2.2.4 Two alternative lorry parking options have been identified by Thurrock Council. Section 6 of this report presents these options and compares the predicted pattern of lorry parking demand against the 2026 reference case.

2.2.5 Sensitivity testing has been undertaken to understand how the option modelling results are affected by the predictions and assumptions employed in the model (section 7). The final section of the report summarises the results and presents the conclusions drawn.

3 Existing lorry parking demand

3.1 Overview

3.1.1 This section provides a summary of existing lorry parking capacity and demand for overnight parking in Thurrock. The estimates of demand are broken down by the type of lorries parked.

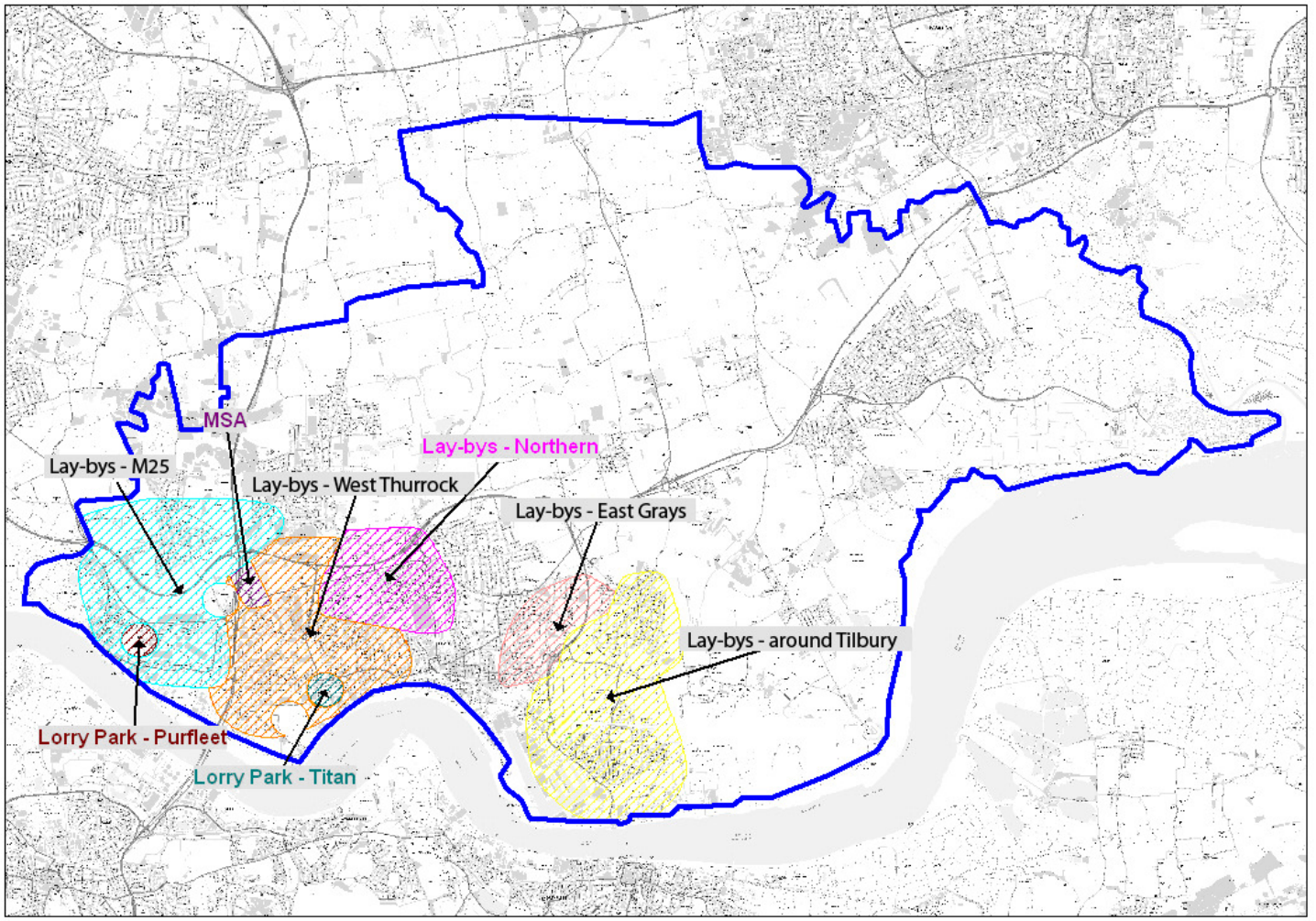
3.2 Existing lorry parking capacity

3.2.1 The total existing lorry parking capacity in Thurrock is estimated at 616 spaces in lorry parking sites and at least 315 on street locations (constituting both legal and illegal parking along lay-bys and verges). It is not possible to provide a definitive capacity for lay-bys and other off-site parking location. Furthermore, it is important to recognise that the capacity figures for lay-bys and verges include both legal and illegal parking, of which the illegal parking should not be encouraged as it is not necessarily acceptable and can sometimes cause significant harm

3.2.2 The figures do not include a variety of other locations such as garages or industrial estates that may be used for parking. The estimated off-site capacity figures are therefore based on the maximum observed number of vehicles parked in any of the surveys. Lastly, it should be noted that a large proportion of the off-street parking provided at lorry park sites are allocated based on long term contracts so are therefore not available for ad-hoc lorry parking.

3.2.3 The lorry parking sites and observed on-street parking locations have been aggregated to nine distinct zones as shown in Figure 3—1.

Figure 3—1:Lorry parking study area and zones



3.2.4 Table 3-1 shows the total available "capacity" at the existing lorry parks and off-site parking areas.

Table 3-1: Existing lorry parking "capacity" in Thurrock

Lorry parking site	Description	Capacity
Motorway Service Area (M25)	Motorway Service Area (MSA) at junction	101
Purfleet Truck Wash	Lorry Park	120
Lay-bys (M25)	Lay-Bys and verges around the M25, Purfleet and Aveley area[1]	95
	Sub-total M25	**316**
Titan Lorry Park	Lorry Park	360
Lay-bys (West Thurrock)	Lay-Bys and verges around the West Thurrock area[1]	117
	Sub-total West Thurrock	**477**
Lay-bys (Northern)	Lay-Bys and verges around the Stifford area[1]	4
	Sub-total Northern	**4**
Lay-bys (Grays)	Lay-Bys and verges around the Grays area[1]	25
Peaceful Row Lorry Park	Lorry Park	35
	Sub-total Grays	**60**
Lay-bys (Tilbury)	Lay-Bys and verges around the Tilbury and Chadwell St Mary area[1]	74
	Sub-total Tilbury	**74**
	Sub-total off-street	**616**
	Sub-total off-street	**315**
	Total	**931**

1) The capacity figures for Verges and Lay-bys include both formal and in-formal parking spaces. These site are not necessarily acceptable and can sometimes cause significant harm

3.3 Existing lorry parking demand

3.3.1 As part of this study, several surveys were undertaken to count the number of lorries parked in the study area as well as to interview drivers to find out information on their origins and destinations. The lorry parking surveys were conducted on the following dates:

- Lorry parking Counts (28th – 29 September 2011)
- Lorry driver Interview Survey (04 – 05 October 2011 and the 29th November 2011)

3.3.2 The lorry parking overnight counts were undertaken by conducting a beat survey around the Thurrock area with surveyors logging the number of HGV's observed parking on roads, lay-bys and verges. The survey hours were from 19:00 until 04:00. During this period of time the survey teams conducted continuous beats of the study area to ascertain existing usage/occupancy and

capacity. The location and the mean number of HGVs observed parking are shown in Figure 3-2 below.

Figure 3—2:Observed Lorry Locations Counts

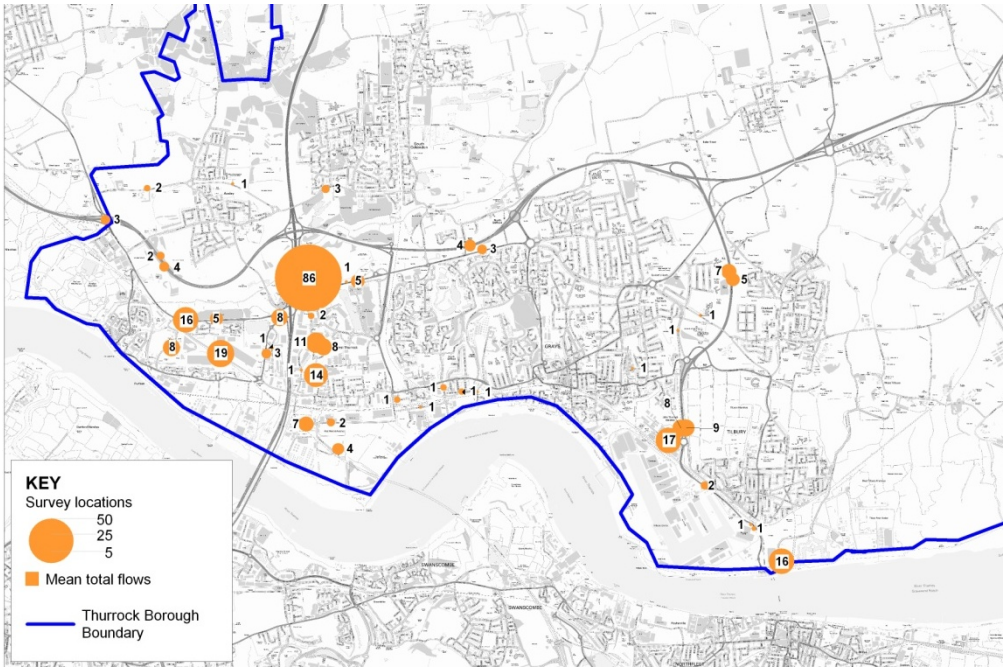
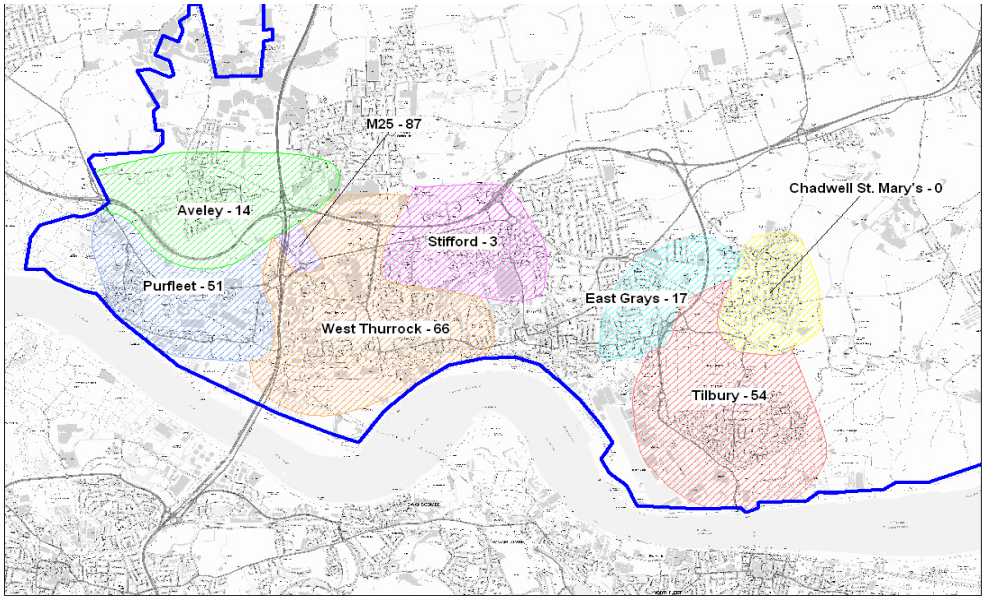
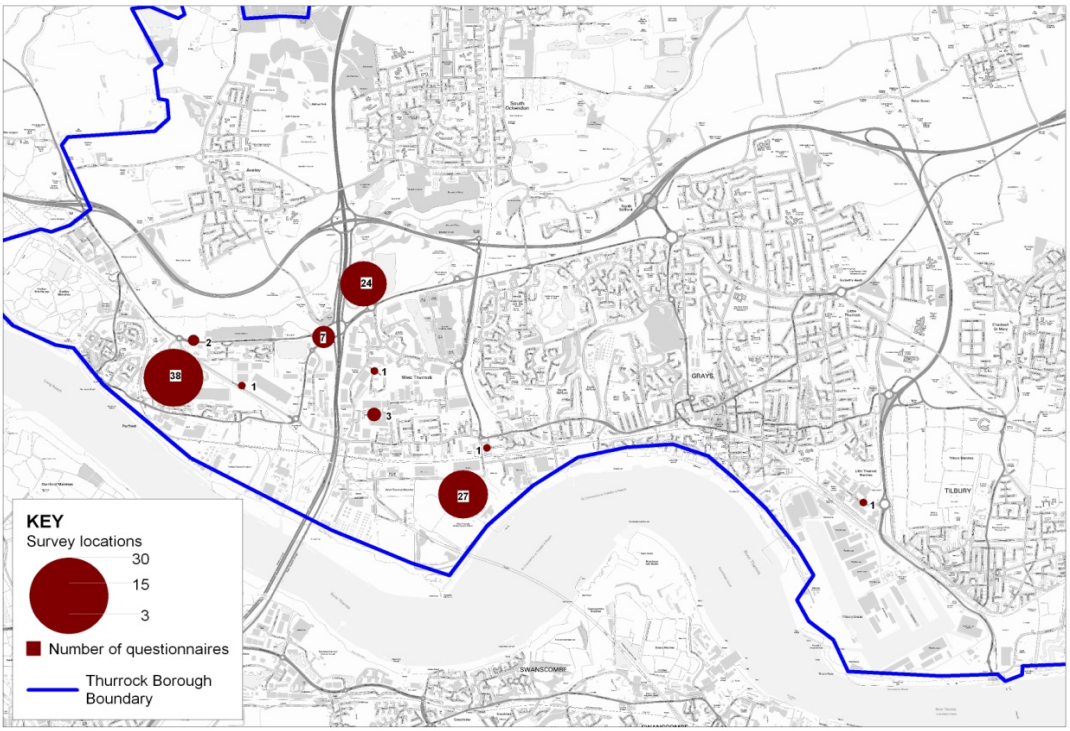


Figure 3—3:Observed Lorry Parking Locations – Area



3.3.3 The lorry driver interview surveys were undertaken at the Motorway Service Area (MSA), the Purfleet Truck Wash, the Titan site as well as a number of the lay-bys located around the M25. The location and number of driver interview surveys undertaken are shown in Figure 3-4 below.

Figure 3—4:Lorry Parking Driver Interview Locations



3.3.4 In January 2009 Mouchel also conducted a beat survey of HGV overnight parking over exactly the same area. Figure 3-5 and Figure 3-6 show the comparison of the SKM-CB and Mouchel results. They show that the level of HGV parking demand is very similar between the two surveys and therefore total demand for lorry parking in Thurrock appears to be relatively stable.

Figure 3—5: Comparison of SKM-CB and Mouchel data by location

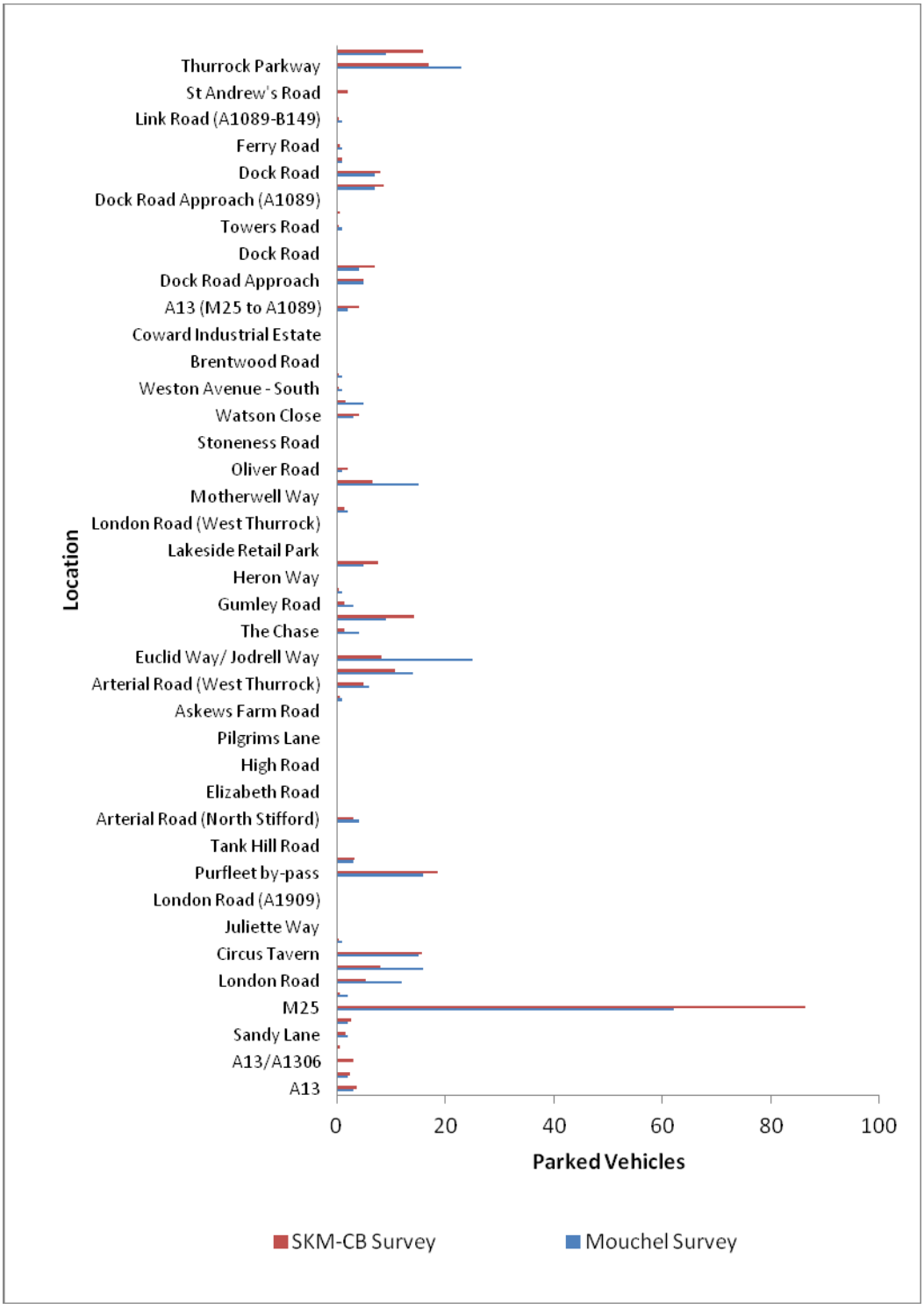
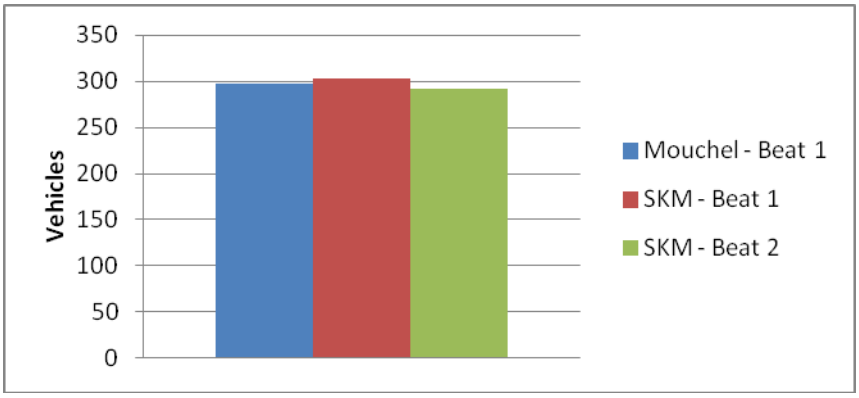


Figure 3—6: Comparison of SKM-CB and Mouchel data – total parked lorries



3.3.5 Total existing observed lorry parking demand has been calculated from both the SKM-CB and Mouchel surveys. These surveys cover the M25 MSA and all of the off-site parking. Occupancy rates for the Purfleet, Titan and Tilbury sites were estimated from the observed parking data, discussions with the operators as well as the excess demand data from the DfT\AECOM Lorry Parking Study 2011.

Table 3-2: Existing observed lorry parking demand in Thurrock

Lorry parking site	Capacity	Demand
Motorway Service Area (M25)	101	87
Purfleet Truck Wash	120	120
Lay-bys (M25)	95[1]	65
	Sub-total M25	**252**
Titan Lorry Park	360	360
Lay-bys (West Thurrock)	117[1]	66
	Sub-total West Thurrock	**426**
Lay-bys (Northern)	4[1]	3
	Sub-total Northern	**3**
Lay-bys (East Grays)	25[1]	17
Peaceful Row Lorry Park	35	35
	Sub-total Grays	**52**
Lay-bys (Tilbury)	74[1]	54
	Sub-total Tilbury	**54**
	Total	**807**

1) The capacity figures for Verges and Lay-bys include both legal and illegal parking spaces. These site are not necessarily acceptable and can sometimes cause significant harm

3.3.6 By comparison, the 2011 DfT lorry parking study only included the M25 MSA with a capacity of 101 on-site lorry parking spaces. On-site parking was estimated at 126 vehicles per night and off-site parking around the M25 site at 57.

3.4 Breakdown of existing lorry parking demand

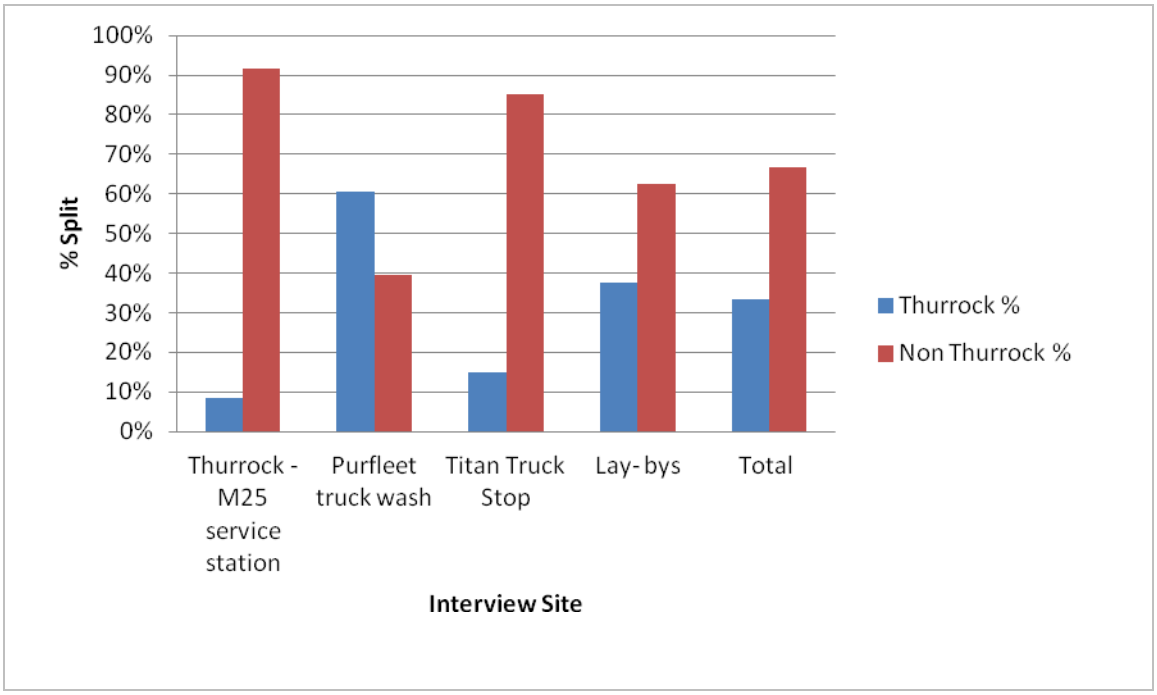
3.4.1 Of the total overnight lorry parking demand in Thurrock consisting of 807 vehicles, around two thirds of vehicles are UK-registered. The proportion of non-UK-registered vehicles is lowest around Tilbury (20%) and highest in the MSA and West Thurrock (>35%).

3.4.2 The above information was collected from number plates observed during the lorry parking surveys. Further information on the types of lorry parking in Thurrock has been obtained from surveys of drivers.

3.4.3 In total 105 driver interviews were undertaken, this equates to approximately a 10% sample of the total estimated overnight parking in Thurrock. Although interviews were carried out with a reasonable sample of drivers of UK-registered vehicles, it should be noted that the number of drivers of non-UK-registered vehicles interviewed is much smaller, mainly due to language barriers encountered by interviewers. Lorry drivers' trip origins and destinations were identified from the interview survey. These were then classified in to either "Thurrock" or "Non-Thurrock" demand segments depending on the surveyed trip destination.

3.4.4 Figure 3-7 shows the distribution of Thurrock and Non-Thurrock trips broken down by parking location. The M25 MSA caters predominantly for HGV's travelling through Thurrock. Conversely, the majority of vehicles parked at Purfleet Truck Wash are related to delivering/picking up goods in Thurrock. Overall about 35% of the overnight lorry parking demand in Thurrock is related to destinations in Thurrock (95% confidence interval: 24% - 42%).

Figure 3-7: Proportion of Thurrock parking and through-traffic



3.4.5 Estimated base year demand totals for the Thurrock study area were derived from the parking counts, aggregated by the areas shown in Figure 3—1, as well as capacity estimates for the Titan Lorry Park (360 vehicles) and Purfleet truck wash (120 vehicles).

3.4.6 The demand estimates shown in Table 3-2 were then separated between two demand segments: “Thurrock” and “Non-Thurrock”. This separation of the demand in to two segments was

calculated based on the observed percentage splits from the lorry driver interview survey. In summary the distribution of Thurrock and Non-Thurrock was based on the following observations\assumptions:

- Lay-bys - M25: based on observations from the interview survey
- Lay-bys - West Thurrock: based on observations from the interview survey
- Lay-bys – Northern: assumed to be 100% Thurrock trips
- Lay-bys – East Grays: assumed to be 100% Thurrock trips
- Lay-bys - around Tilbury: assumed to be 100% Thurrock trips
- MSA: based on observations from the interview survey
- Titan Lorry Park: based on observations from the interview survey
- Purfleet Truck Wash: based on observations from the interview survey
- Peaceful Row Lorry Park: assumed to be 100% Thurrock trips

3.4.7 Table 3-3 shows the Thurrock parking demand segmented by Thurrock trips and Non-Thurrock trips. Table 3-4 shows the total aggregate number of Thurrock and Non Thurrock trips.

Table 3-3: Base Year Demand by Area and Demand Segment

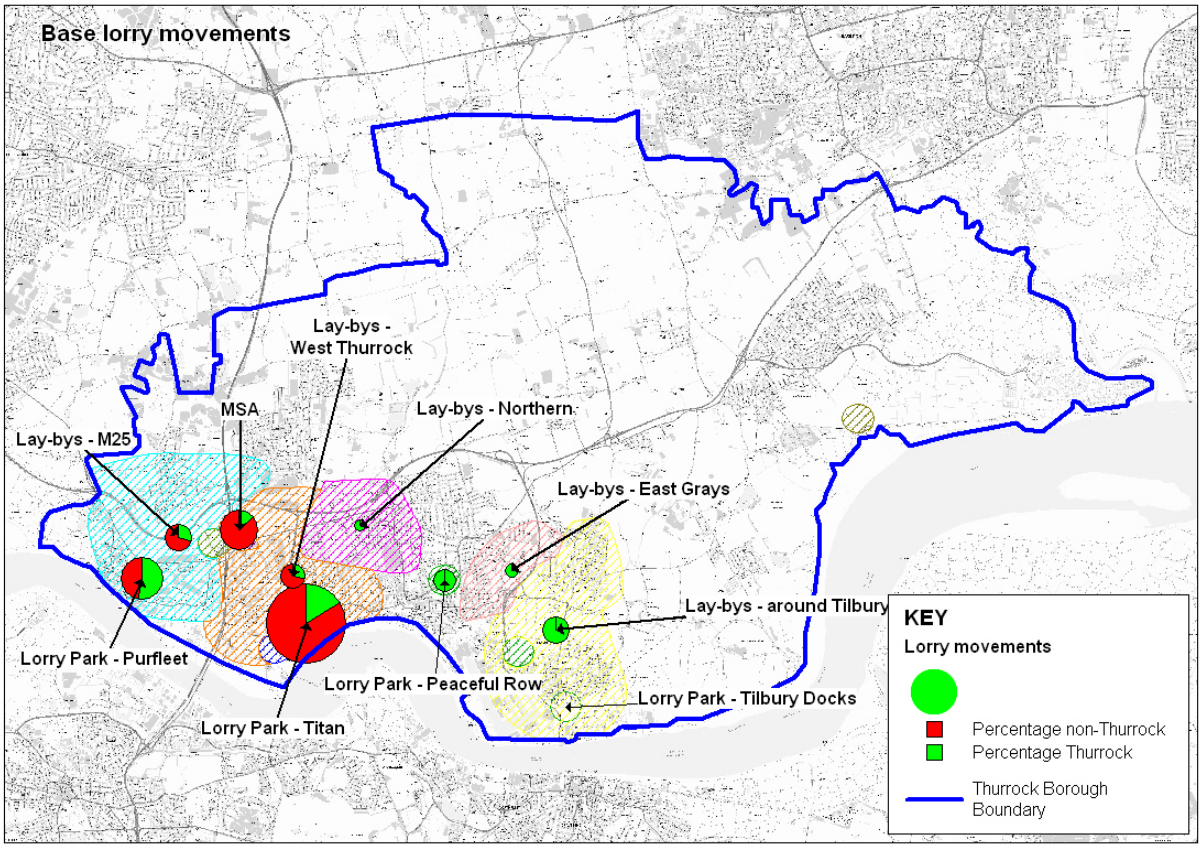
Demand Segment	Parking Area	Vehicles
Non-Thurrock	Lay-bys - M25	41
Non-Thurrock	Lay-bys - West Thurrock	41
Non-Thurrock	Lay-bys - Northern	0
Non-Thurrock	Lay-bys – East Grays	0
Non-Thurrock	Lay-bys - around Tilbury	0
Non-Thurrock	MSA	80
Non-Thurrock	Lorry Park – Titan	307
Non-Thurrock	Lorry Park - Purfleet	47
Non-Thurrock	Lorry Park – Peaceful Row	0
Thurrock	Lay-bys - M25	24
Thurrock	Lay-bys - West Thurrock	25
Thurrock	Lay-bys - Northern	3
Thurrock	Lay-bys – East Grays	17
Thurrock	Lay-bys - around Tilbury	54
Thurrock	MSA	7
Thurrock	Lorry Park – Titan	53
Thurrock	Lorry Park - Purfleet	73
Thurrock	Lorry Park – Peacefull Row	35

Table 3-4: Aggregate Study area level Thurrock\Non-Thurrock percentage splits

Demand Segment	Vehicles	Percentage of vehicles
Through Trips	516	64%
Thurrock	291	36%

3.4.8 From Table 3-4 it can be seen that at an aggregate Thurrock borough level it has been calculated that approximately two-thirds of the lorry parking demand is “Non-Thurrock”. The percentage split for Thurrock and Non Thurrock trips is also shown graphically in Figure 3-8 below.

Figure 3-8: Base year Thurrock\Non-Thurrock percentage splits

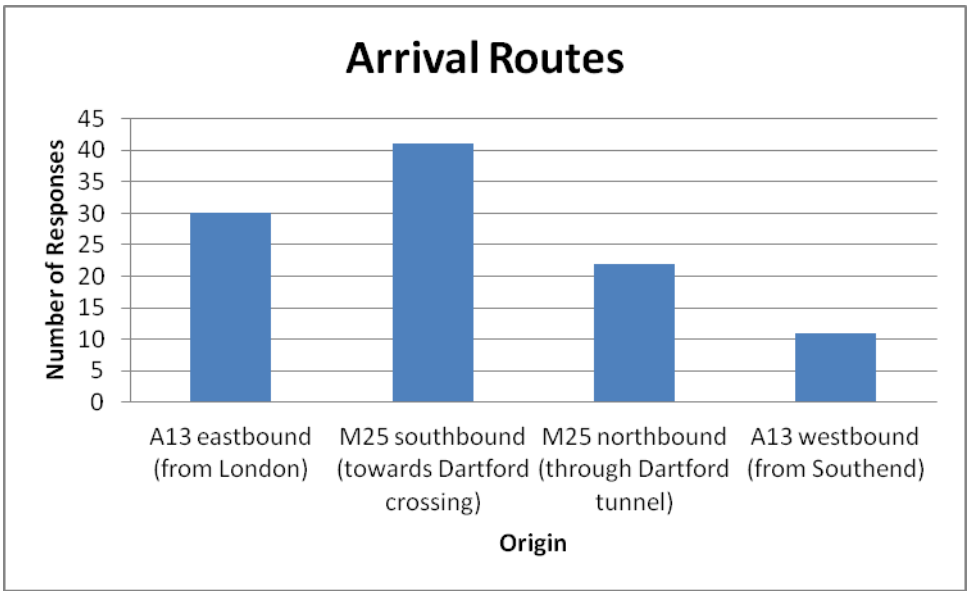


3.4.9 From the Lorry driver interview survey entry routes to the Thurrock borough were also identified. Table 3-5 and Figure 2.9 show the arrival locations recorded in the driver interview survey.

Table 3-5: Lorry Driver Interview Arrival Routes

Arrival Routes	Number of responses
A13 eastbound (from London)	30
M25 southbound (clockwise)	41
M25 northbound (anti-clockwise)	22
A13 westbound (from Southend)	11
Total	104

Figure 3-9: Lorry Driver Interview Arrival Routes



3.4.10 The results of the entry routes were then segregated by the destination, to create a percentage distribution of trips. This percentage distribution is shown in Table 3-6.

Table 3-6: Lorry Driver Interview Arrival Routes breakdown

In -bound route	Thurrock - M25 service station	Purfleet truck wash	Titan Truck Stop	Lay- bys
A13 eastbound (from London)	8%	4%	13%	13%
M25 southbound (clockwise)	63%	52%	50%	50%
M25 northbound (anti-clockwise)	29%	33%	31%	31%
A13 westbound (from Southend)	0%	11%	6%	6%
Total	**100%**	**100%**	**100%**	**100%**

3.4.11 The demand for Thurrock overnight lorry parking was then distributed between the arrival routes identified in the interview survey for both "Thurrock" and "Non-Thurrock" demand. This was done by applying the percentage distribution shown in Table 3-6 as follows:

- Lay-bys : based on observations from the interview survey
- MSA: based on observations from the interview survey
- Titan Lorry Park: based on observations from the interview survey
- Purfleet Truck Wash: based on observations from the interview survey
- Tilbury Docks (Fortland): based on observations from the interview survey
- Peaceful Row: based on observations from the interview survey

3.4.12 Table 3-7 and

3.4.13 Table 3-8 show the distributed trip matrix for the Thurrock and Non Thurrock base year demand.

Table 3-7: Estimated Base Year Matrix – Thurrock

Thurrock Trips- Base year (vehicles)	Lay-bys - M25	Lay-bys - West Thurrock	Lay-bys - Northern	Lay-bys - Grays	Lay-bys - around Tilbury	MSA	Lorry Park - Titan	Lorry Park - Purfleet	Lorry Park – Peaceful Row	Total
A13 eastbound (from London)	3	3	0	2	7	1	1	3	1	**21**
M25 southbound (clockwise)	12	12	2	9	27	5	27	38	18	**148**
M25 northbound (anti-clockwise)	8	8	1	5	17	2	24	24	12	**100**
A13 westbound (from Southend)	2	2	0	1	3	0	1	8	4	**21**
Total	**25**	**25**	**3**	**17**	**54**	**7**	**53**	**73**	35	**291**

Table 3-8: Estimated Base Year Matrix – Non-Thurrock

Non-Thurrock Trips- Base year (vehicles)	Lay-bys - M25	Lay-bys - West Thurrock	Lay-bys - Northern	Lay-bys - Grays	Lay-bys - around Tilbury	MSA	Lorry Park - Titan	Lorry Park - Purfleet	Lorry Park – Peaceful Row	Total
A13 eastbound (from London)	5	5	0	0	0	7	8	2	0	**27**
M25 southbound (clockwise)	20	21	0	0	0	50	153	25	0	**269**
M25 northbound (anti-clockwise)	13	13	0	0	0	23	137	16	0	**202**
A13 westbound (from Southend)	3	3	0	0	0	0	8	5	0	**18**
Total	**41**	**41**	**0**	**0**	**0**	**80**	**307**	**47**	**0**	**516**

3.5 Summary of Chapter 3

3.5.1 Chapter 3 details the findings of the lorry parking count surveys and the lorry driver interview surveys. From these surveys, as well as details of the Titan and Purfleet Truck wash site capacities, observed demand figures were calculated. Based on these observed demand figures an estimated base year demand was calculated using the lorry driver interview data to split the demand between Thurrock and Non-Thurrock demand segments.

3.5.2 Lastly estimated base year demand matrices were then calculated by distributing the estimated base year demand according to the results of the origin and destinations lorry driver interview survey observations.

3.5.3 The key findings from chapter 2 can be summarised as follows:

- Total lorry parking demand for the study area is 807, this is constituted of 291 Thurrock trips and 516 Non-Thurrock trips
- In Thurrock there is currently a total capacity of about 931, including 616 off-street and 315 on-street lorry parking spaces.[1]
- Thus in total there is an excess of approximately 125 parking spaces in Thurrock (931 spaces – 807 trips = 125 available spaces). However if the 315 on-street spaces are removed only 616 on street-spaces will remain, indicating that there will be a deficit in parking capacity of 191 trips (616 off street spaces – 807 trips = - 191 spaces).

1) It is not possible to provide a definitive capacity for lay-bys and other off-site parking location

4 Demand model development

4.1 Overview

4.1.1 This section presents a discussion of the factors affecting the choice of lorry parking locations. The evidence from lorry driver surveys in Thurrock is compared to previous evidence contained in the DfT's *Lorry Parking Baseline Report* (2009).

4.1.2 Following this the process of selecting variables for inclusion in the model and the results of the calibration process are presented.

4.2 Reasons for lorry park selection

Cost

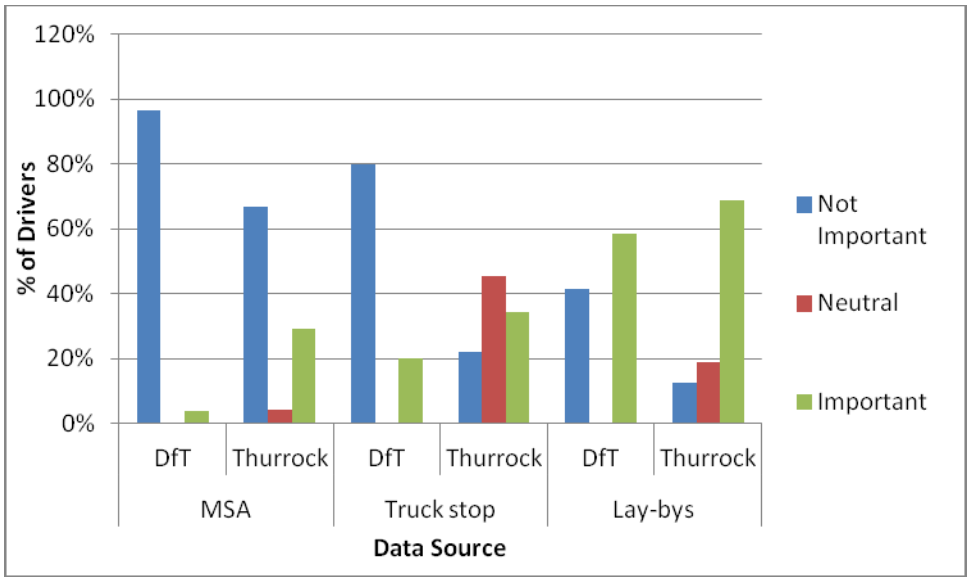
4.2.1 The following figures compare the results of the Thurrock lorry driver survey with the national results obtained in the *Lorry Parking Baseline Report.* Drivers in the DfT surveys were asked about the main reasons for their selection of parking location. The Thurrock questionnaire adopted the same response categories but employed a five point scale:

"Thinking about your decision to park here today, how important were the following factors? Pease rate each on a scale of 1 to 5 (1 = not at all important, 5 = very important)"

4.2.2 The following figures display the proportion of positive responses in the DfT survey compared to the Thurrock scaled response. The responses are broken down by respondents parking in a MSA, a designated truck stop, or a lay-by. Because the DfT survey only asked drivers whether each factor was important or not, responses of 1-2 in the Thurrock survey were classified as being not important whilst responses of 4-5 were classified as being important. Responses of 3 in the Thurrock survey have been retained and represent respondents who had a neutral view as to whether each factor was important; these responses do not have a comparable equivalent in the DfT survey.

4.2.3 Figure 4—1 shows that, as with the national results, cost is a key factor that encourages some drivers to opt for parking in lay-bys. The DfT study suggests that around a quarter of lorry drivers refuse to ever pay for lorry parking.

Figure 4—1: Selection criteria – cost



4.2.4 Table 4-1 shows how company policies on payment of expenses can influence lorry drivers' choice of overnight parking. The choice of formal lorry parks is most commonly associated with drivers of companies who are invoiced directly or who offer tax free cash allowances. The use of lay-bys is most common among drivers who are reimbursed upon presentation of receipts.

Table 4-1: Expense payment by parking location type

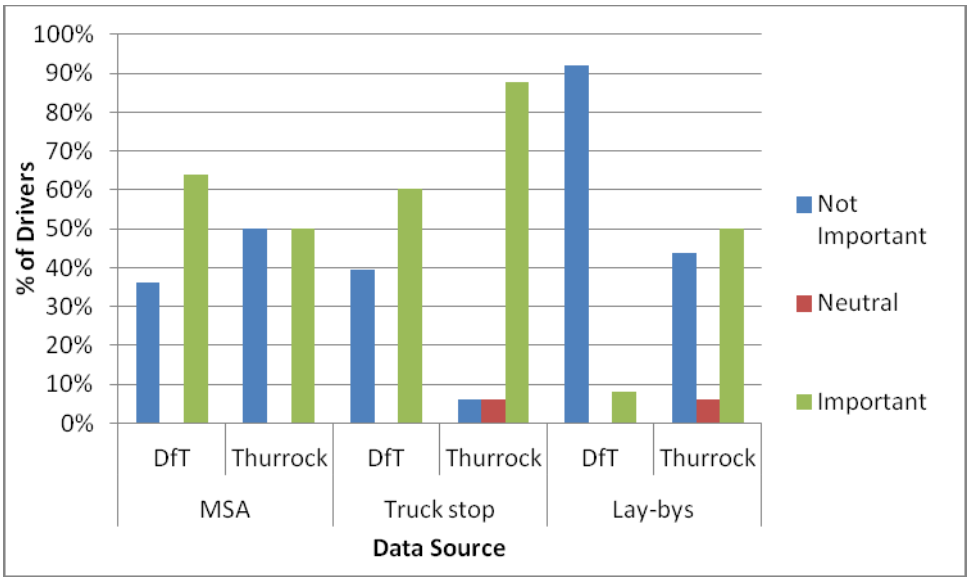
Expense payment	MSA	Truck stop	Lay-bys
At this lorry park, my employer is invoiced directly	10%	66%	-
I have a tax free cash allowance	-	7%	-
I pay out of my own pocket	33%	7%	29%
I receive a set amount paid through my wages	24%	0%	7%
I take a receipt and my employer pays my expenses afterwards	33%	21%	64%

4.2.5 Cost is most commonly cited as a selection criterion by drivers who are reimbursed retrospectively upon submission of a receipt.

Secure parking

4.2.6 The DfT baseline report also identified secure parking as a key issue determining the selection of lorry parking. In Thurrock, security was identified as most important by drivers parking in the formal truck stop (Figure 4—2 overleaf). Contrary to the DfT survey, security featured less heavily as a motivation for drivers parking in the MSA but was frequently mentioned by drivers parking in lay-bys. This suggests that some off-site locations may also be associated with relatively good levels of security.

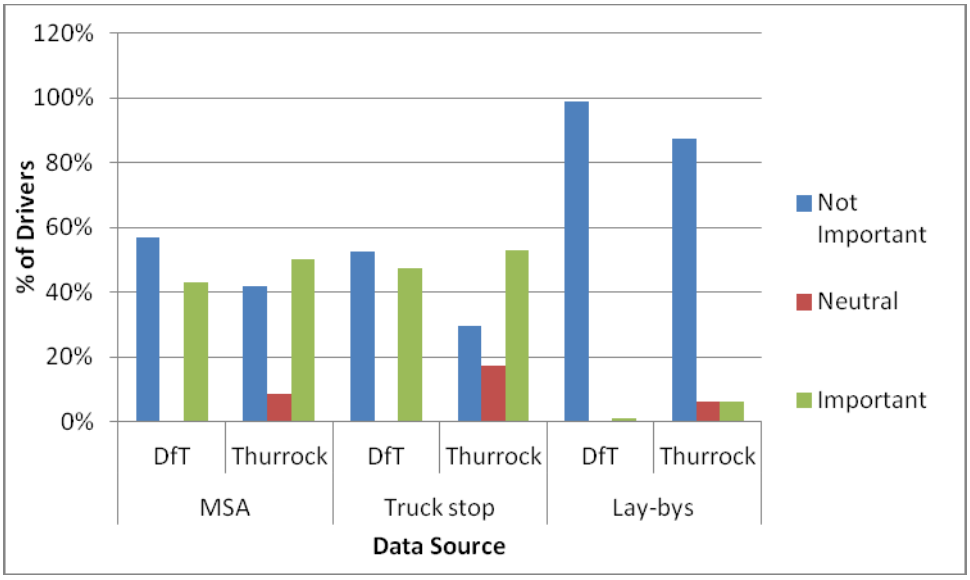
Figure 4—2: Selection criteria – secure parking



Facilities, e.g. showers

4.2.7 The provision of facilities, such as clean toilets and showers is a further important criterion in the selection of lorry parking locations. Figure 4—3 shows that, as in the DfT surveys, this is seen as an important criterion by almost 50% of drivers parking in MSAs and truck stops.

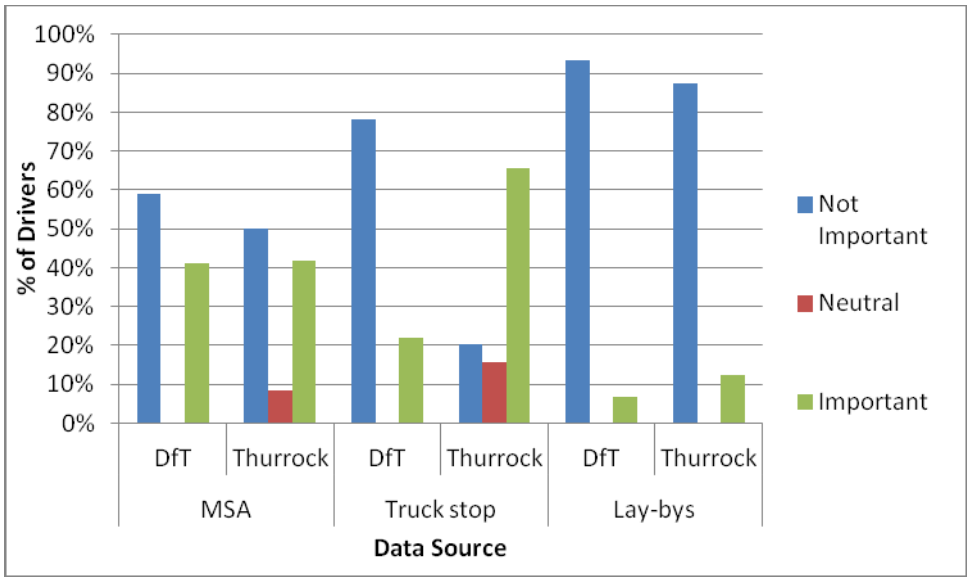
Figure 4—3: Selection criteria – facilities, e.g. showers



Company policy

4.2.8 For some lorry drivers, the choice of lorry parking site may be determined by company policy. For example, companies may have deals with specific providers of secure lorry parking. As shown in Figure 4—4, this plays an important role in the decision to park in the formal lorry parks in the Thurrock area.

Figure 4—4: Selection criteria – Company policy



4.2.9 As shown in Table 4-2, it is internally managed distribution fleets that are most likely to have formal policies of which lorry parks or truck stops to use. Conversely, it is independent hauliers who are most likely to park off-site on lay-bys.

Table 4-2: Parking location choice by company type

Company type	MSA	Truck stop	Lay-bys	Total
Independent haulier	23%	42%	35%	100%
Internally managed distribution fleet	21%	76%	3%	100%
Medium to large logistics provider	17%	66%	17%	100%

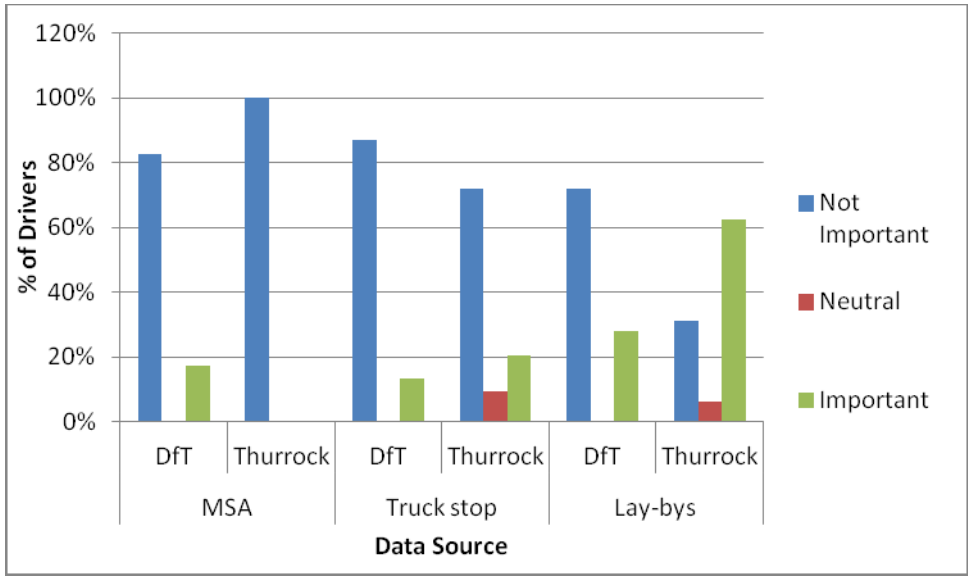
4.2.10 This may affect parking choice in the future. If there is further out-sourcing of distribution capabilities, the proportion of drivers parking in formal truck stops could decrease. Conversely, if formal links between logistics providers and lorry parks continue to increase in the future this could lead to an increased use of lorry parks as opposed to off-site parking. This trend of increasing numbers of drivers parking at sites pre-designated by logistics providers can also be related to the potential for technological improvements, such as Telematics, allowing better co-ordination of driver movements by logistics companies.

Driving hour regulations

4.2.11 There is anecdotal evidence to suggest that many drivers choose to park in the Thurrock area because it fits into their driving hours' schedule. In particular this may be related to the position of Thurrock relative to the Midlands and Dover, and delays to journeys that can occur at the Dartford crossings. As shown in Figure 4—5***, the Thurro***ck lorry driver surveys appear to

support this conclusion. Almost two-thirds of drivers parking in lay-bys cited this as important or very important.

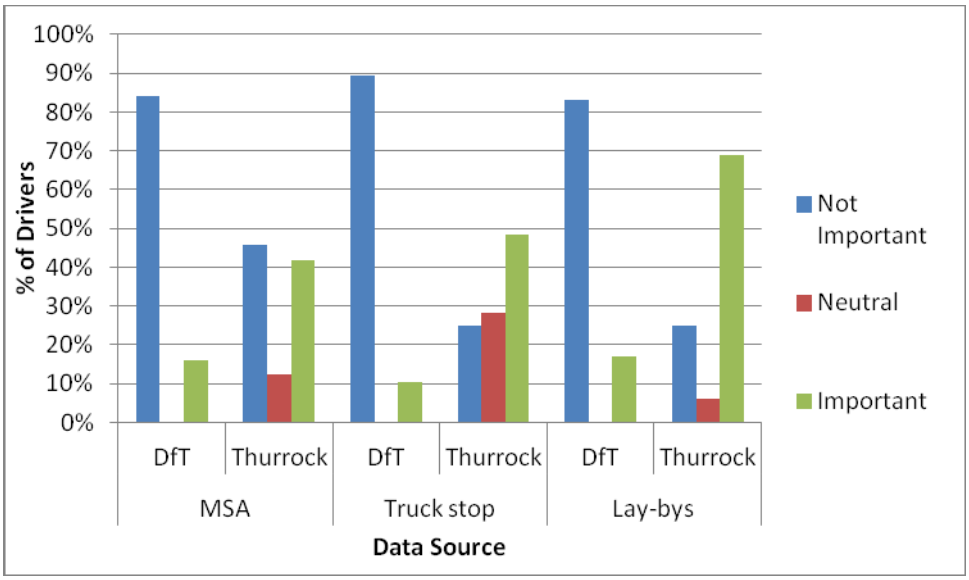
Figure 4—5: Selection criteria – Run out of driving hours



Do not have to detour

4.2.12 As shown in Figure 4—6, a large number of Thurrock respondents in the MSA and in lay-bys cited not having to drive on a detour as a key selection criteria. Particularly for drivers on the M25 there appears to be a strong desire to park in near proximity to the onward journey.

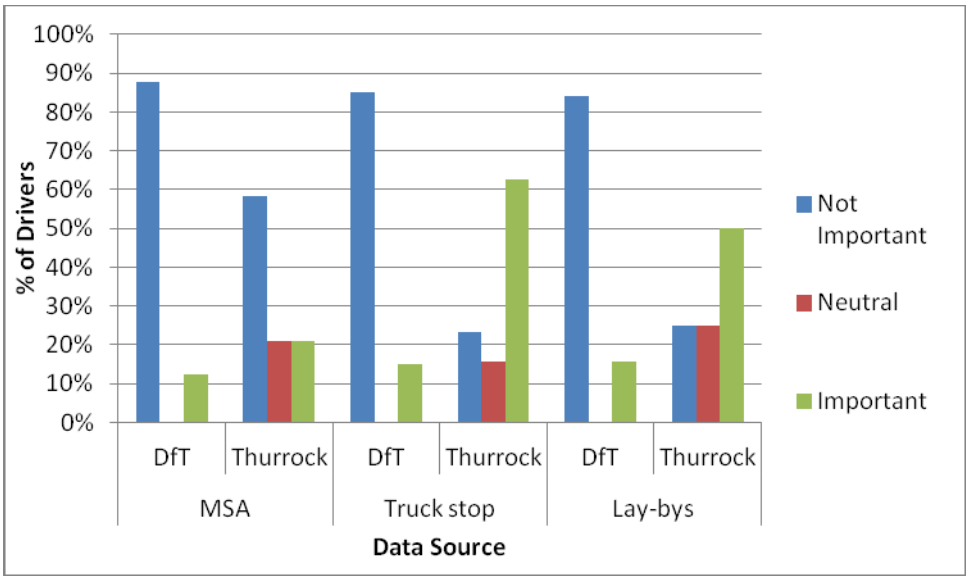
Figure 4—6: Selection criteria – Do not have to detour



Quiet

4.2.13 The selection of overnight parking locations that are quiet is a more important criteria in Thurrock than in the DfT's national survey. As shown in Figure 4—7, a quiet environment is a key motivation for parking in a formal lorry park or indeed some of the lay-bys.

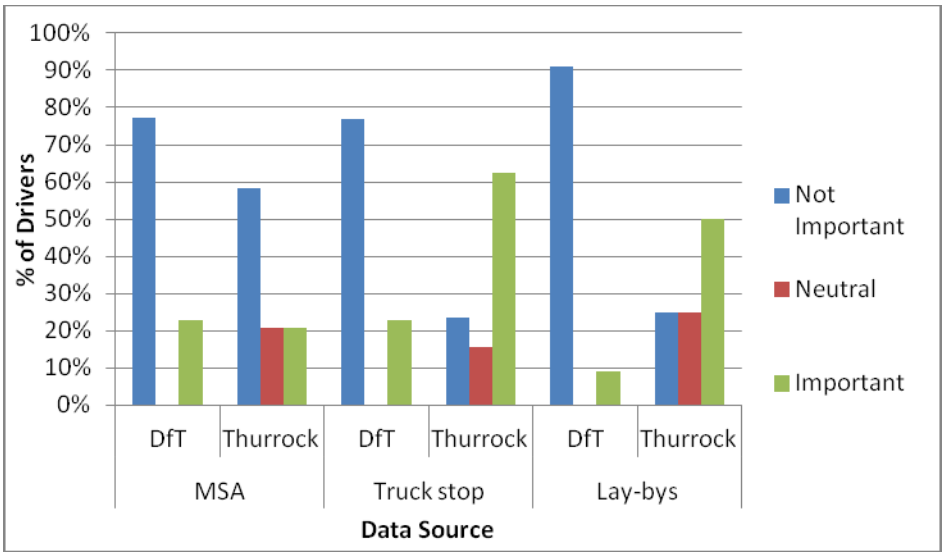
Figure 4—7: Selection criteria – Quiet



24-hour availability

4.2.14 The need for 24-hour availability is another selection criteria cited more commonly by drivers choosing not to park in the Thurrock MSA as shown in Figure 4-8.

Figure 4—8: Selection criteria – 24-hour availability

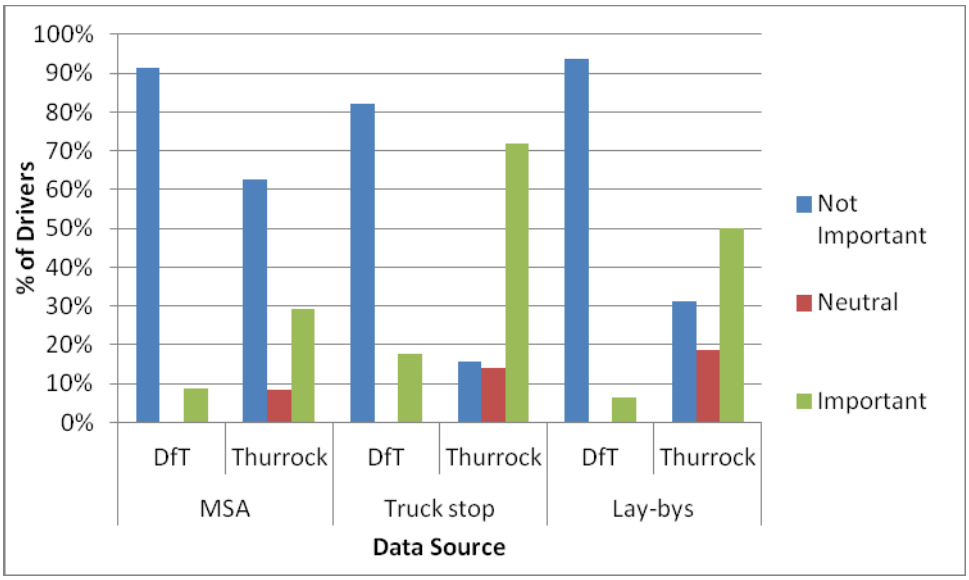


Confidence in space availability

4.2.15 The perceived and actual lorry parking capacity constraints in Thurrock do influence drivers' choice of where to park as shown in Figure 4—9.

4.2.16 In the same survey, when asked if they had initially sought to park elsewhere, 10% of lorry drivers stated that they had not been able to park in their first choice of location. However, the number of drivers who may have chosen to drive further and park in another area outside of Thurrock was not collected as part of the survey.

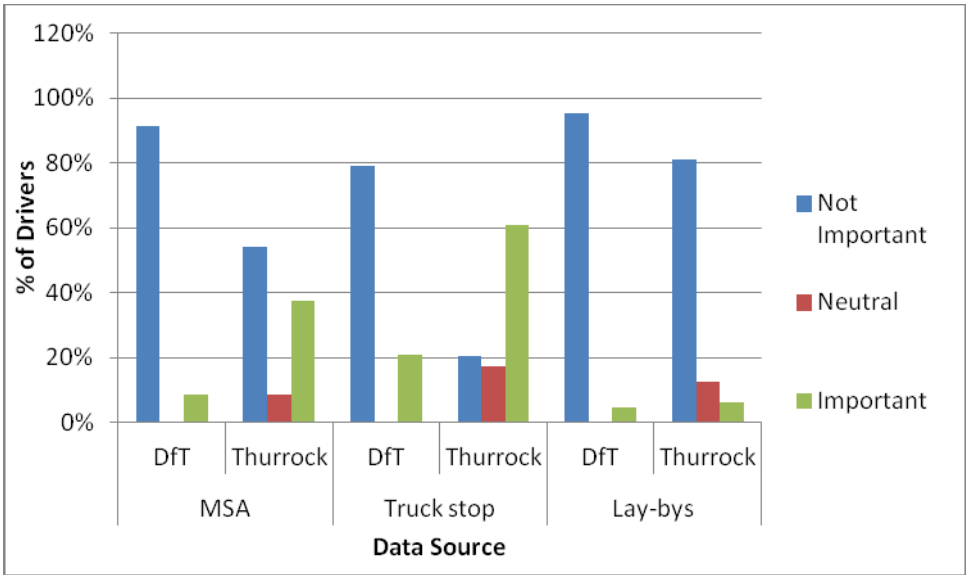
Figure 4—9: Selection criteria – Confidence in space availability



Quality of food

4.2.17 The quality of the food offer can be a key motivation for seeking a particular overnight parking location. In Thurrock, this is a relatively strong location for choosing the MSA or particular lorry parks as shown in Figure 4—10.

Figure 4—10: Selection criteria – Quality of food



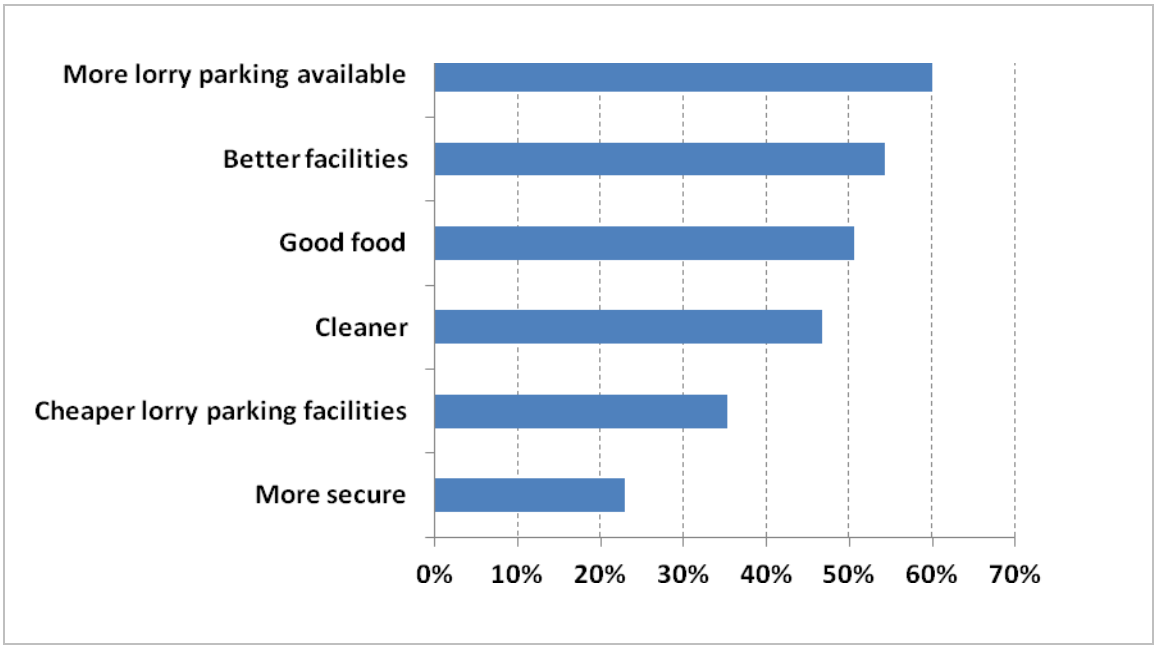
Beds

4.2.18 As with the national DfT survey, the availability of beds only plays a role for a very small number of lorry drivers who will park in the vicinity of suitable overnight accommodation.

Priorities for improvement

4.2.19 The survey of lorry drivers also included a section on how lorry parking could be improved in the Thurrock area. As shown in Figure 4-11, greater provision of lorry parking capacity was mentioned by 50% of all respondents. Price and security are mentioned least often and appear to be less important for many drivers than the quality of the facilities provided.

Figure 4—11: Suggested improvements to lorry parking in Thurrock



4.3 Model development

Overview

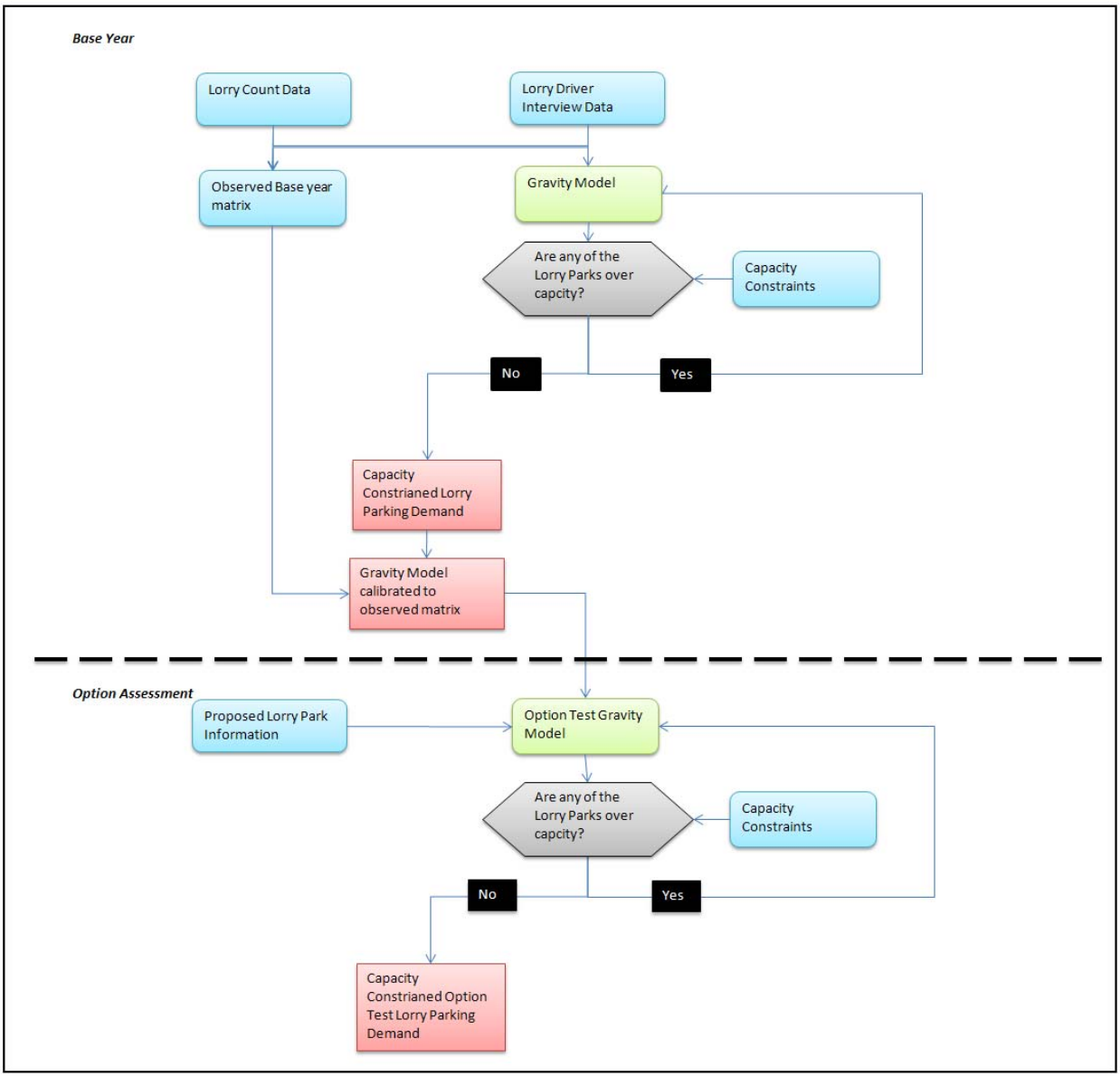
4.3.1 Base demand has been categorised by the route of lorries and whether their destination is in Thurrock or not. An origin constrained gravity model has been developed to explain the choice of lorry parking by these different demand segments. The 2011 base year model aims to fit the observed data with sufficient accuracy and to be able to forecast destination choice by including the appropriate parameters. The capacity constrained origin gravity model was developed so that projected traffic growth could be added to the origin demand trip ends in order that the model will re-distribute traffic to the available parking locations.

4.3.2 It should be noted that the model is capacity constrained as well as origin constrained, as otherwise the model could predict more people parking at a lorry park than would be available

from the actual capacity. Therefore the model was iterated several times until all demand had been distributed and none of the lorry parks were above their available parking capacity.

4.3.3 Figure 4—12 shows a schematic overview of how the model operates.

Figure 4—12: Overview of lorry parking model



Selection of parameters

4.3.4 Table 4-3 discusses the relevant parameters from the surveys of lorry drivers that have been incorporated into the model.

Table 4-3: Lorry parking – important choice parameters

Parameter	Comment
Travel time	Additional travel time from the lorry route is incorporated into the generalised cost calculation.
Cost	Cost is incorporated into the generalised cost calculation.
Facilities / secure parking	Quality of facilities and security are grouped in the model since they tend to be correlated. Types of lorry parking facility can be attributed penalties to reflect user preference for one type or another.
No need to detour	Beyond the immediate travel time impact, the surveys indicate there is a strong desire for through-traffic to remain near to the M25. This may be to avoid the perception of a detour, and for some drivers unfamiliar with the area the ease of finding the way back to the onward route. Therefore, the generalised cost needs to include a penalty to reflect the preference for locations near to the M25.
Company policy	Company policy factors, and the corresponding cost implications for drivers, are a strong motivation with respect to lorry parking choice. This parameter has been included in the model as a pre-load assignment where parking spaces are allocated to drivers before the gravity model is run.
Driving hour regulations	Running out of driving hours is a common reason for parking in lay-bys near the M25. This is a further factor that should be captured in the above penalty reflecting the preference for locations near to the M25.
Confidence of space availability	Having confidence that space will be available can be a factor is deciding upon where to park. The impact of capacity constraints on demand, both in terms of short-term decision-making and medium-term individual or corporate decision-making, is reflected is the nature of the capacity constrained model.
Other qualitative factors	Wider qualitative factors, such as the quality of food, are not captured in the model. These factors can change relatively quickly and it is not possible to forecast the quality of future lorry parks that have not been built yet.

Model calibration

4.3.5 The equation below shows the mathematical formulation of the origin constrained gravity model.

$$T_{ij} = TE_i \times \frac{f(C_{ij})}{\sum_j^n f(C_{ij})}$$

With T_{ij} being the Trips between origin i and destination j, TE_i is the Trip End at origin i, n is the number of zones and $f(C_{ij})$ is the function of cost for origin i and destination j.

$$f(C_{ij}) = {}^{1}/_{C_{ij}}$$

$$C_{ij} = TT_{ij} + F_{ij} + Payment_{ij} + M25_{ij} + Availability_{ij}$$

Where C is cost for origin i and destination j, TT is travel time, F represents facility and M25 represents proximity to the M25.

4.3.6 The generalised cost equation has been broken down in to several factors to represent the various factors which will attract parking at the different Thurrock locations. Table 4-4 summarises the factors applied to the model. It should also be noted that the unit of generalised cost is time in minutes.

Table 4-4: Generalised cost parameters

Parameter	Thurrock traffic	Non-Thurrock traffic
Travel time	Equal to free flow travel time at 30 mph	Equal to free flow travel time at 30 mph
Facilities / security	Set as + 20 for Lay-bys and -20 for Lorry parks	
Cost / payment	Set as 5 for Lorry Parks and the MSA	Set as 5 for Lorry Parks
M25 proximity	0 for all traffic	-15 to -5 for MSA and + 10 for Titan Lorry Park
Availability	Set as 20 for the MSA	Closed Access for Lay-bys around Grays, Tilbury and Northern sites

4.3.7 The availability parameter has been used to close the access to certain sites for Non-Thurrock traffic, and also for the Lay-by sites around the relatively low demand and remote Lay-by sites around Grays, North Thurrock, and Tilbury. In addition a parameter is used to deter Thurrock traffic away from using the MSA due to a lack of available parking. This is based on the survey data indicating that Thurrock based drivers are concerned about parking space availability.

Company Policy Pre-Load

4.3.8 In some instances, information was available about regular lorry parking undertaken at sites by certain companies. The driver interview surveys provided clear evidence for company policy being an important motivation for lorry park site choice (refer to driver interview information presented in sections 3.2.8 to 3.2.10). Since information about these lorries was readily available, there was no need to include this demand within the gravity model, and instead they were 'fixed' within the modelling process. This "preload" demand was added as follows;

- 275 spaces at the Titan truck stop (sourced from the Titan Truck Stop Transport Assessment)
- 60% of lorries at the Purfleet and Peacefull Row lorry parks based on information from the owners of the Purfleet truck site
- Tilbury (off street) Lorry Park – 100% of lorries parking in off-street locations

5 Future lorry parking demand and capacity

5.1 Overview

5.1.1 This section describes the changes forecast for the future year 2026. This is the reference case, in other words a do-minimum scenario, and does not include any of the future lorry park site options to be tested. Forecast changes to lorry parking capacity and demand are explained. The results of the reference are subsequently presented as a comparison with the option results in Section 6.

5.2 Future lorry parking capacity

5.2.1 Table 5-1 shows the total available capacity at the lorry parks (including proposed port capacity) and off-site parking areas. These are the capacity assumptions included in the reference case.

Table 5-1: Future off-street lorry parking capacity in Thurrock (2026 reference case)

Lorry parking site	Description	Capacity
Motorway Service Area (M25)	Motorway Service Area (MSA) at junction	101
Purfleet Truck Wash	Assumed to close	0
	Sub-total M25	**101**
Titan Lorry Park	Assumed to close	0
	Sub-total West Thurrock	**0**
Tilbury Lorry Parking	New lorry park opening around Tilbury Docks	450
Tilbury Port Off – Street Parking (	Assumed that all overnight parking will be moved to the New Tilbury Lorry Park	0
	Sub-total Tilbury	**450**
Peaceful Row Lorry Park	Lorry Park	35
	Sub-total Grays	**35**
DP World	New lorry park opening around the new London Gateway Port	320
	Sub-total DP World	**320**
	Total	**906**

5.3 Future lorry parking demand

5.3.1 Future Year 2026 demand projection for HGVs were based on the following assumptions:

5.3.2 **Thurrock overnight parking traffic**: growth based on the new B1, B2 and B8 developments assumed under the maximum growth scenario for Lakeside. Total traffic for these developments was generated for the AM peak and a percentage proportion of approximately 12% was then applied to the total AM traffic to estimate the amount which would be parking over night. The 12% factor was calculated from the traffic observed for the Base year (291 vehicles) and the total AM Thurrock HGV traffic calculated from planning data based on the 2010 Demand Model (2440 vehicles). Therefore a 12% factor was calculated (i.e. 12% approx = 291/2440). This assumption has been applied to all future year Thurrock traffic including traffic for the DPW site.

5.3.3 **Thurrock port traffic**: Based on evidence from the Tilbury port expansion TA it is expected that about 365 spaces in the new Tilbury lorry park will be occupied by lorries making “Intra – Port” movements. These represent vehicles which currently park in inappropriate off-street places surrounding Tilbury Port, who will be moved to the new Tilbury lorry park. From this information it was assumed that a similar number of spaces will be required for the “intra-port” movements at the DPW site.

5.3.4 **Non-Thurrock traffic**: It has been assumed that 10% growth will be applied to Non-Thurrock Traffic base on NTM growth factors. However it should be noted that this assumption has been sensitivity tested (see Section 6).

5.3.5 It should be noted that although 10% growth has been applied to the Non-Thurrock traffic, as this demand segment essentially represents through trips across the study area. It is therefore likely that the actual parking demand growth for Non-Thurrock traffic willnotbe dependent on planning data, but instead depend on a number of factors such as available parking capacity, as well how easy it is to access any available parking spaces. Due to this consideration it has been decided to consider Non-Thurrock Traffic growth as a sensitivity test rather than as part of the core option testing results.

5.3.6 As the capacity of the DPW lorry park is smaller than the new Tilbury lorry park capacity and that, similar to Tilbury, in addition to any “intra-port” trips there will also be demand for overnight parking (based on B1, B2 and B8 land –uses).It is therefore assumed that all of the DPW lorry parking capacity will be allocated to the DPW site.

5.3.7 Table 5-2 shows the demand growth for Thurrock overnight parking between the base and future years assumed in the option testing assessment.

Table 5-2: Future lorry parking demand in Thurrock (2026 reference case)

Demand Segment		Base	Future	Growth
Thurrock Traffic	Thurrock Overnight Parking Traffic	291	315	24
	Thurrock Port Traffic	365[1]	685	320[2]
Non-Thurrock Traffic		513	567	54
Total		1169[3]	1567	398

1) These trips are off street parking demand at Tilbury, which are not included in the base year model. It is assumed all of these trips will be moved to the new Tilbury lorry park.

2) This growth is due to the DPW site

3) 291 + 513 = 804 which is the base year modelled demand excluding Tilbury Port on-site parking

5.3.8 The future reference case therefore identifies an additional demand of 661 spaces compared to the available future off-street capacity of 906 spaces set out in table 5-1. However this additional demand for spaces assumes that no on–street parking (lay-by and verge) is available.

6 Future lorry parking option assessment

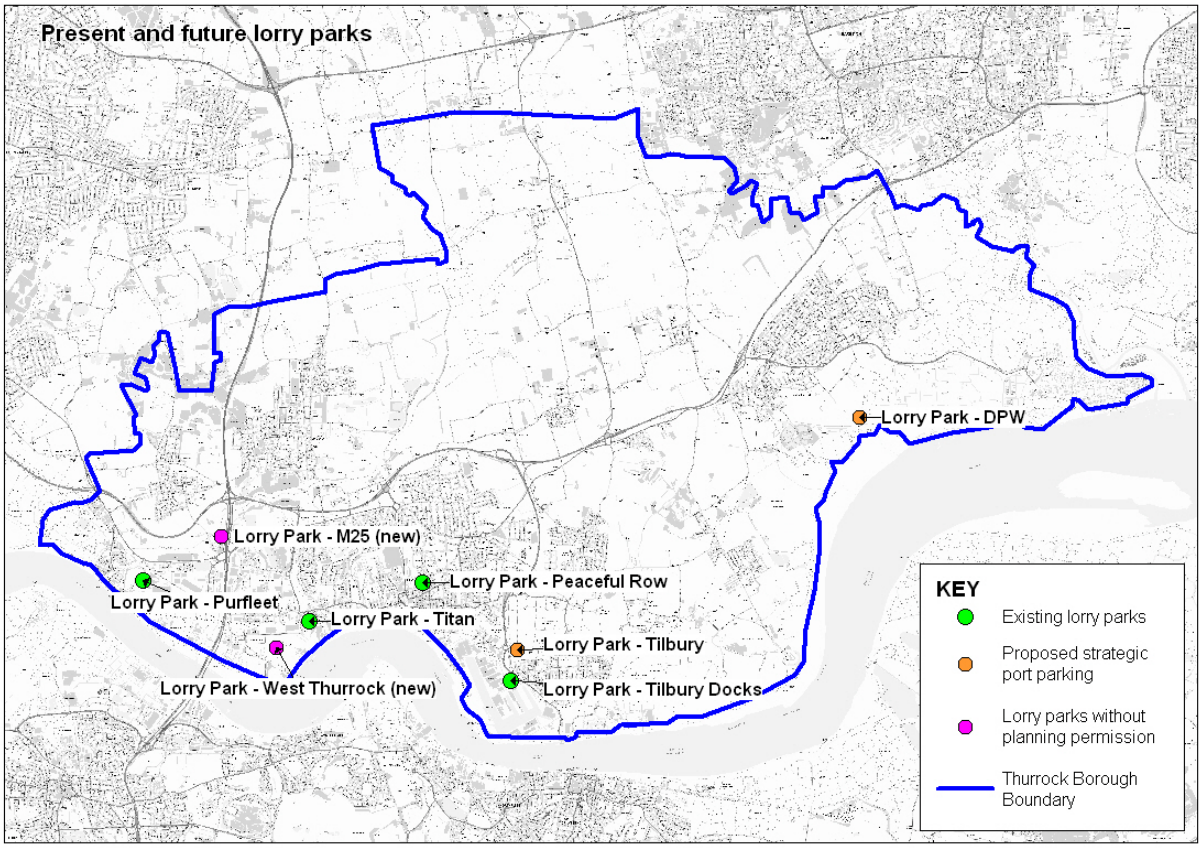
6.1 Overview of options

6.1.1 Three different 2026 future year option tests were conducted, these are outlined as follows:

- Reference Case: Titan and Purfleet Lorry Parks are assumed to close. Lorry Parks at DP World and another at Tilbury Port
- Option 1: As 1) Reference Case, but also including a new Lorry Park in West Thurrock at approximately the same location as the existing Titan Lorry Park
- Option 2: As 1) Reference Case, but also including a new Lorry Park located just next to the M25/J30

6.1.2 Figure 6—1 shows the location of the new Lorry Parks included in the three option tests.

Figure 6—1: Proposed strategic port parking



6.2 Option modelling parameters

6.2.1 In order to model the new lorry parking sites in the three options it was necessary to calculate the generalised cost for each O-D movement. In order to do this, parameters were generated for each of the components of the generalised cost equation. To maintain accuracy with the calibration of the base year model, the parameters for the new lorry park sites have been copied

from an existing site. This process of generating parameter estimates has been completed as follows:

- **Tilbury Port:** Facilitates and payment parameters based on Titan lorry park, other parameters based on Tilbury – Lay-bys
- **DP World:** All parameters based on Titan lorry Park
- **West Thurrock (new):** All parameters based on Titan lorry Park
- **M25 (new):** All parameters based on the MSA

6.2.2 In addition to this a penalty of 60 minutes has been applied to all lay-bys in Thurrock for both Thurrock and Non-Thurrock demand segments for all of the three option tests. This penalty has been included in the model to represent the stricter enforcement of parking regulations that will be imposed by Thurrock Borough Council in 2026, which will reduce the number of lorries parking on lay-bys and verges.

6.2.3 Tables 6-1 and 6-2 show the total available capacity at the future lorry parks and off-site parking areas. These capacity assumptions include the capacity in the reference case plus one new site in each of the options of 360 spaces giving a total of 1266 spaces capacity

Table 6-1: Future lorry parking capacity in Thurrock (2026 Option 1)

Lorry parking site	Description	Capacity
Motorway Service Area (M25)	Motorway Service Area (MSA) at junction	101
Purfleet Truck Wash	Assumed to close	0
	Sub-total M25	**101**
Titan Lorry Park	Assumed to close	0
West Thurrock (New)	New lorry park opening around the West Thurrock in option 1	360
	Sub-total West Thurrock	**360**
Tilbury Lorry Parking	New lorry park opening around Tilbury Docks	450
	Sub-total Tilbury	**450**
Peaceful Row Lorry Park	Lorry Park	35
	Sub-total Grays	**35**
DP World	New lorry park opening around the new London Gateway Docks	320
	Sub-total DP World	**320**
	Total	**1266**

Table 6-2: Future lorry parking capacity in Thurrock (2026 Option 2)

Lorry parking site	Description	Capacity
Motorway Service Area (M25)	Motorway Service Area (MSA) at junction	101
Purfleet Truck Wash	Assumed to close	0
M25 (New)	New lorry park opening around the M25 in option 2	360
	Sub-total M25	**461**
Titan Lorry Park	Assumed to close	0
	Sub-total West Thurrock	**0**
Tilbury Lorry Parking	New lorry park opening around Tilbury Docks	450
	Sub-total Tilbury	**450**
Peaceful Row Lorry Park	Lorry Park	35
	Sub-total Grays	**35**
DP World	New lorry park opening around the new London Gateway Docks	320
	Sub-total DP World	**320**
	Total	**1266**

6.3 Results

6.3.1 Table 6-3 shows the percentage distribution of the Thurrock and Non-Thurrock trips for the new Lorry parks in options 1 and 2. Table 6- 3 shows the models predicted flows for the Base year reference case and the two options. Table 6-4 shows the breakdown of the demand for Thurrock and Non Thurrock for Base, Reference Case and Options 1 and 2.

Table 6-3: Lorry Park Thurrock\Non-Thurrock Demand – options 1 and 2

Option	Location	Thurrock	Non Thurrock
1	West Thurrock (New)	21%	79%
2	M25 (New)	9%	91%

Table 6-4: Lorry Park Thurrock\Non-Thurrock Demand

	Base			Reference			Option 1			Option 2		
Location	**Thurrock**	**Non Thurrock**	**Total**	**Thurrock**	**Non Thurrock**	**Total**	**Thurrock**	**Non Thurrock**	**Total**	**Thurrock**	**Non Thurrock**	**Total**
Lay-bys - M25	15	37	52	50	231	**281**	30	90	**120**	35	80	**115**
Lay-bys - West Thurrock	14	35	48	49	226	**275**	29	88	**118**	34	78	**113**
Lay-bys - Northern	15	0	15	50	0	**50**	30	0	**30**	35	0	**35**
Lay-bys - Grays	19	0	19	55	0	**55**	33	0	**33**	38	0	**38**
Lay-bys - around Tilbury	54	0	54	0	0	**0**	0	0	**0**	0	0	**0**
MSA	15	86	101	12	89	**101**	16	85	**101**	28	73	**101**
Lorry Park - Titan	59	298	357	0	0	**0**	0	0	**0**	0	0	**0**
Lorry Park - Purfleet	63	57	120	0	0	**0**	0	0	**0**	0	0	**0**
Lorry Park – Tilbury (off street)	0	0	0	0	0	**0**	0	0	**0**	0	0	**0**
Lorry Park – Peacefull Row	38	0	38	35	0	**35**	35	0	**35**	35	0	**35**
Lorry Park - Tilbury			0	429	21	**450**	432	18	**450**	441	9	**450**
Lorry Park - DPW			0	320	0	**320**	320	0	**320**	320	0	**320**
West Thurrock (New)			0			**0**	75	285	**360**	0	0	**0**
M25 (New)			0			**0**	0	0	**0**	33	327	**360**
Total	**291**	**512**	**804**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**

6.3.2 From the above tables we can draw the following conclusions:

Reference Case

6.3.3 There is a predicted large increase in Non-Thurrock lorry parking around the M25 and West Thurrock lay-bys. This principally results from the reduction in lorry parking capacity due to the closure of Purfleet and Titan lorry parks. However it should be noted that as the test was completed with a fixed level of demand, in reality the amount of parking in these areas could be less as drivers will may choose to simply by-pass the Thurrock area

6.3.4 Conversely, there is a predicted decrease in lay-by parking around Tilbury due to the opening of the Tilbury Lorry Park

Option 1

6.3.5 There is predicted to be less lorry parking on the M25 and West Thurrock lay-bys compared to the base, due to the increase in available lorry parking space at the new West Thurrock site

6.3.6 The West Thurrock site attracts approximately 79% Thurrock and 22% Non-Thurrock traffic, which is similar to the percentage split reported in the Titan TA.

Option 2

6.3.7 There is predicted to be less lorry parking on the M25 and West Thurrock lay-bys compared to the base, due to increase in available lorry parking space at the new M25 site

6.3.8 The M25 new lorry park has approximately 9% Thurrock and 91% non-Thurrock traffic, which is similar to the percentage observed at the MSA in the base.

6.3.9 The percentage splits between Thurrock and Non-Thurrock traffic for the above three options can also be seen graphically in Figure 6—2 to Figure 6-4 below.

Figure 6—2:Reference Case Thurrock - Non-Thurrock percentage splits

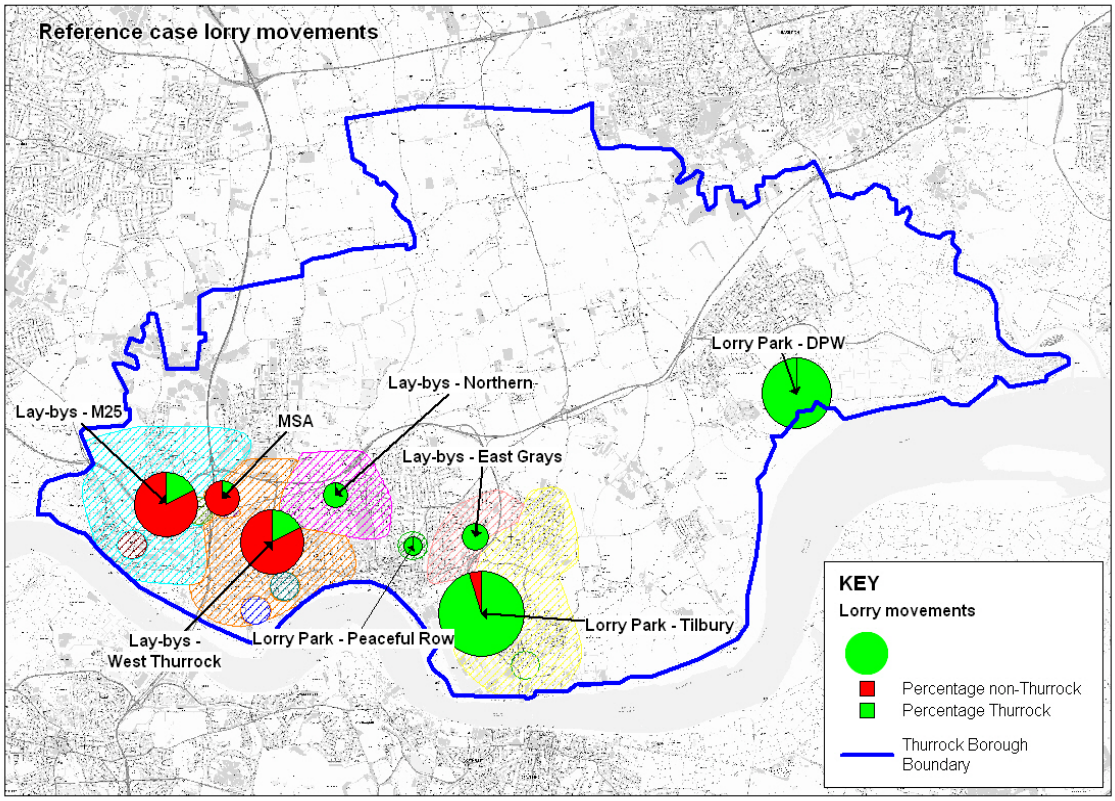


Figure 6—3: Option 1 Thurrock - Non-Thurrock percentage splits

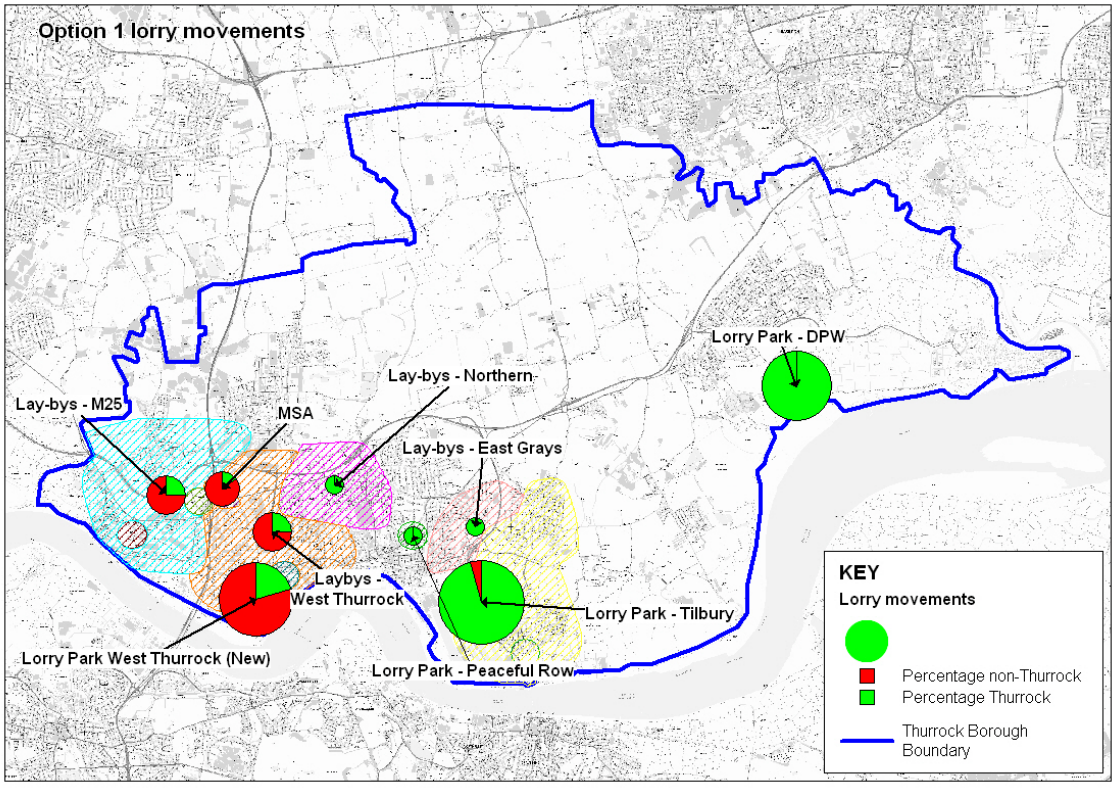
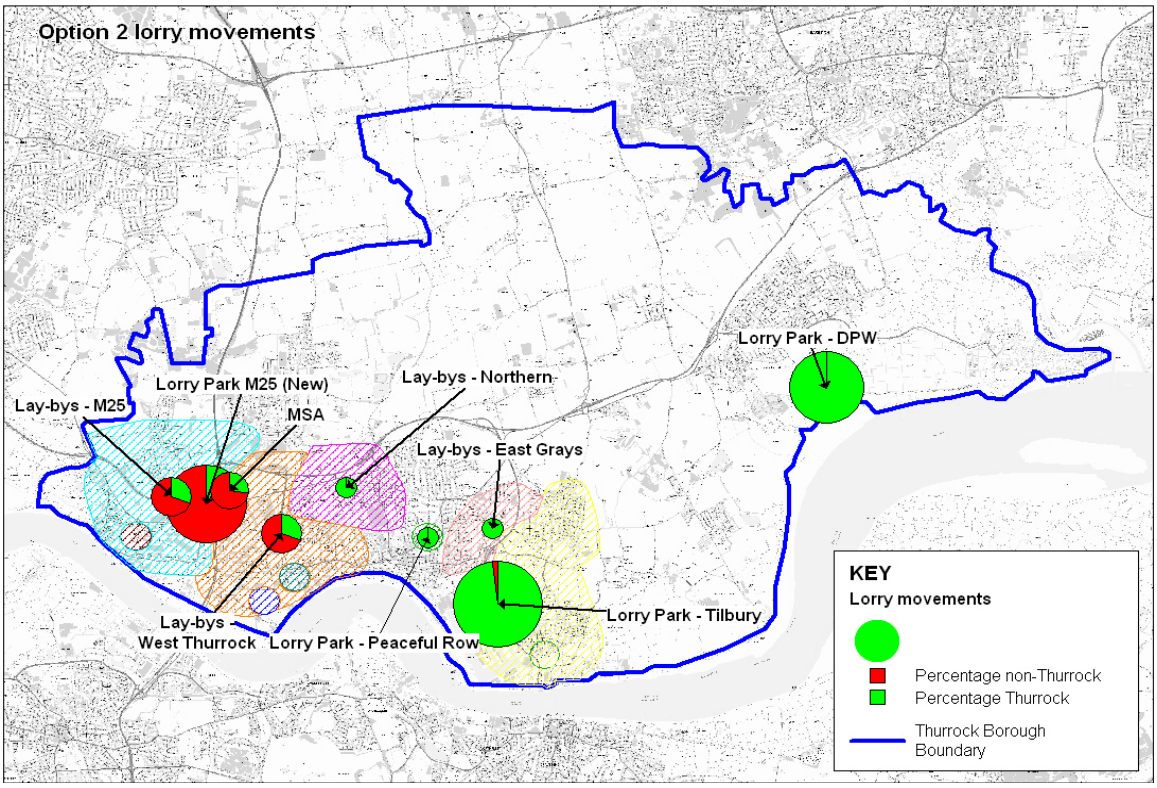


Figure 6—4: Option 2 Thurrock - Non-Thurrock percentage splits



7 Sensitivity testing

7.1.1 In order to test the impact of a potential increase or decrease in the number of Non-Thurrock trips choosing to park in Thurrock a sensitivity test on the three 2026 option tests were completed. This involved applying a global percentage factor to all Non-Thurrock trips. The results of this assessment for the three different options can be seen in Table 7-1 to Table 7-3 and Figure 7—1 to Figure 7-3

Figure 7—3Table 7-1: Non Thurrock Demand Sensitivity Test – Reference Case

Location	Non Thurrock Demand Increment								
	-40%	-30%	-20%	-10%	0%	10%	20%	30%	40%
Lay-bys - M25	154	179	205	230	256	281	307	333	359
Lay-bys - West Thurrock	151	175	200	225	250	275	300	325	350
Lay-bys - Northern	47	48	48	49	50	50	50	51	51
Lay-bys - Grays	51	52	53	54	54	55	55	55	56
Lay-bys - around Tilbury	0	0	0	0	0	0	0	0	0
MSA	101	101	101	101	101	101	101	101	101
Lorry Park - Titan	0	0	0	0	0	0	0	0	0
Lorry Park - Purfleet	0	0	0	0	0	0	0	0	0
Lorry Park - Tilbury Docks	0	0	0	0	0	0	0	0	0
Lorry Park - Peacefull Row	35	35	35	35	35	35	35	35	35
Lorry Park - Tilbury	450	450	450	450	450	450	450	450	450
Lorry Park - DPW	320	320	320	320	320	320	320	320	320
West Thurrock (New)	0	0	0	0	0	0	0	0	0
M25 (New)	0	0	0	0	0	0	0	0	0
Total	**1309**	**1361**	**1412**	**1464**	**1515**	**1567**	**1619**	**1670**	**1722**

Table 7-2: Non Thurrock Demand Sensitivity Test – Option 1

Location	Non Thurrock Demand Increment								
	-40%	-30%	-20%	-10%	0%	10%	20%	30%	40%
Lay-bys - M25	52	63	74	85	97	120	145	169	194
Lay-bys - West Thurrock	51	62	72	83	95	118	141	165	189
Lay-bys - Northern	25	26	27	28	28	30	32	33	34
Lay-bys - Grays	27	28	29	30	31	33	35	36	38
Lay-bys - around Tilbury	0	0	0	0	0	0	0	0	0
MSA	101	101	101	101	101	101	101	101	101
Lorry Park - Titan	0	0	0	0	0	0	0	0	0
Lorry Park - Purfleet	0	0	0	0	0	0	0	0	0
Lorry Park - Tilbury Docks	0	0	0	0	0	0	0	0	0
Lorry Park - Peacefull Row	35	35	35	35	35	35	35	35	35
Lorry Park - Tilbury	450	450	450	450	450	450	450	450	450
Lorry Park - DPW	320	320	320	320	320	320	320	320	320
West Thurrock (New)	248	276	303	331	359	360	360	360	360
M25 (New)	0	0	0	0	0	0	0	0	0
Total	**1309**	**1361**	**1412**	**1464**	**1515**	**1567**	**1619**	**1670**	**1722**

Table 7-3: Non Thurrock Demand Sensitivity Test – Option 2

Location	Non Thurrock Demand Increment								
	-40%	-30%	-20%	-10%	0%	10%	20%	30%	40%
Lay-bys - M25	27	27	46	68	91	115	140	164	189
Lay-bys - West Thurrock	26	27	45	66	89	113	137	161	185
Lay-bys - Northern	22	22	27	30	33	35	36	38	39
Lay-bys - Grays	24	24	29	33	36	38	40	41	42
Lay-bys - around Tilbury	0	0	0	0	0	0	0	0	0
MSA	90	95	101	101	101	101	101	101	101
Lorry Park - Titan	0	0	0	0	0	0	0	0	0
Lorry Park - Purfleet	0	0	0	0	0	0	0	0	0
Lorry Park - Tilbury Docks	0	0	0	0	0	0	0	0	0
Lorry Park - Peacefull Row	35	35	35	35	35	35	35	35	35
Lorry Park - Tilbury	450	450	450	450	450	450	450	450	450
Lorry Park - DPW	320	320	320	320	320	320	320	320	320
West Thurrock (New)	0	0	0	0	0	0	0	0	0
M25 (New)	316	360	360	360	360	360	360	360	360
Total	**1309**	**1361**	**1412**	**1464**	**1515**	**1567**	**1619**	**1670**	**1722**

Figure 7—1: Non Thurrock Demand Sensitivity Test – Reference Case

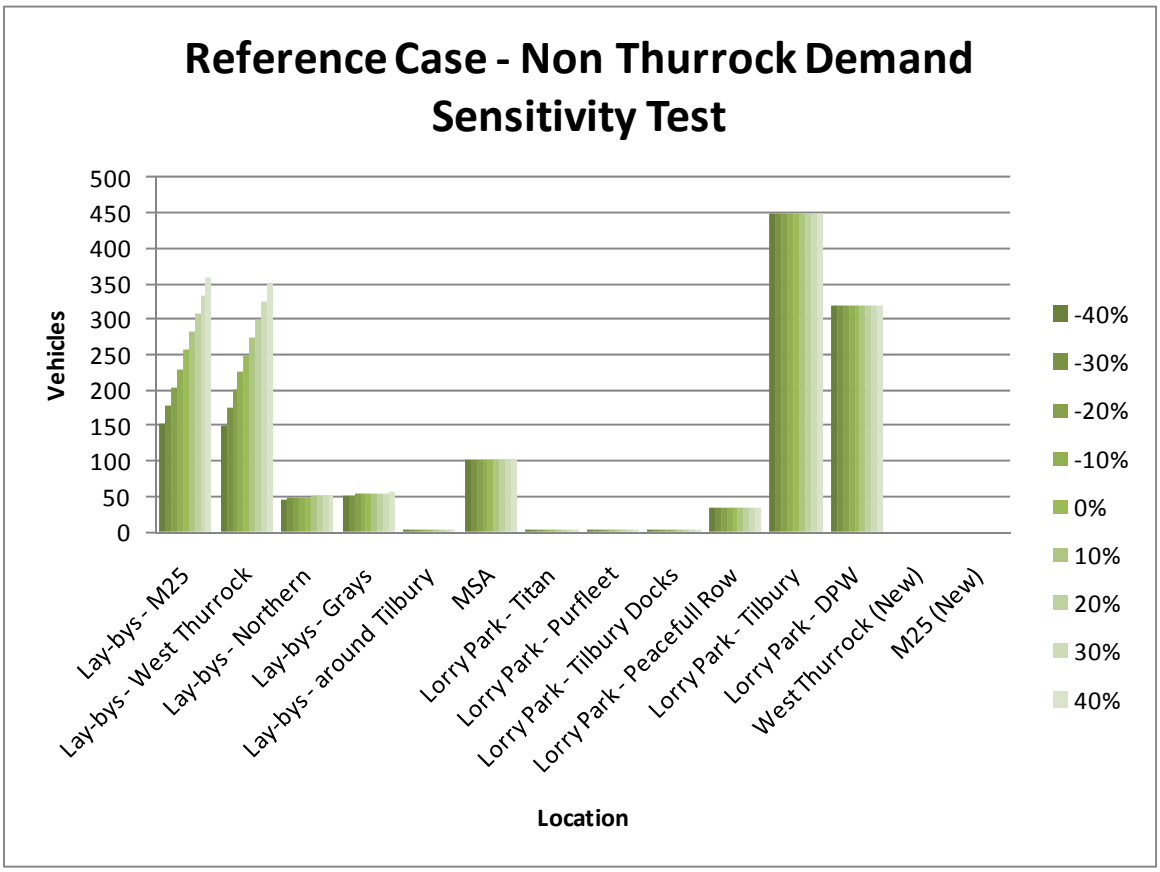


Figure 7—2: Non Thurrock Demand Sensitivity Test – Option 1

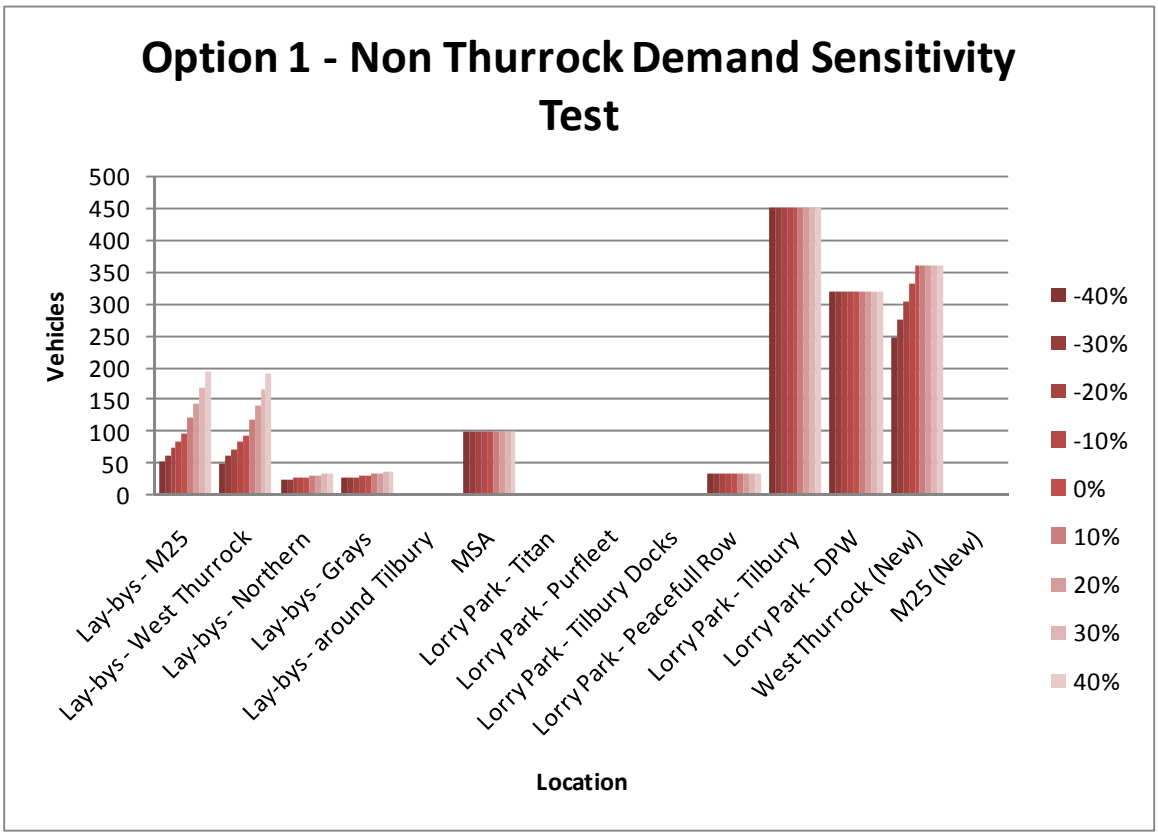
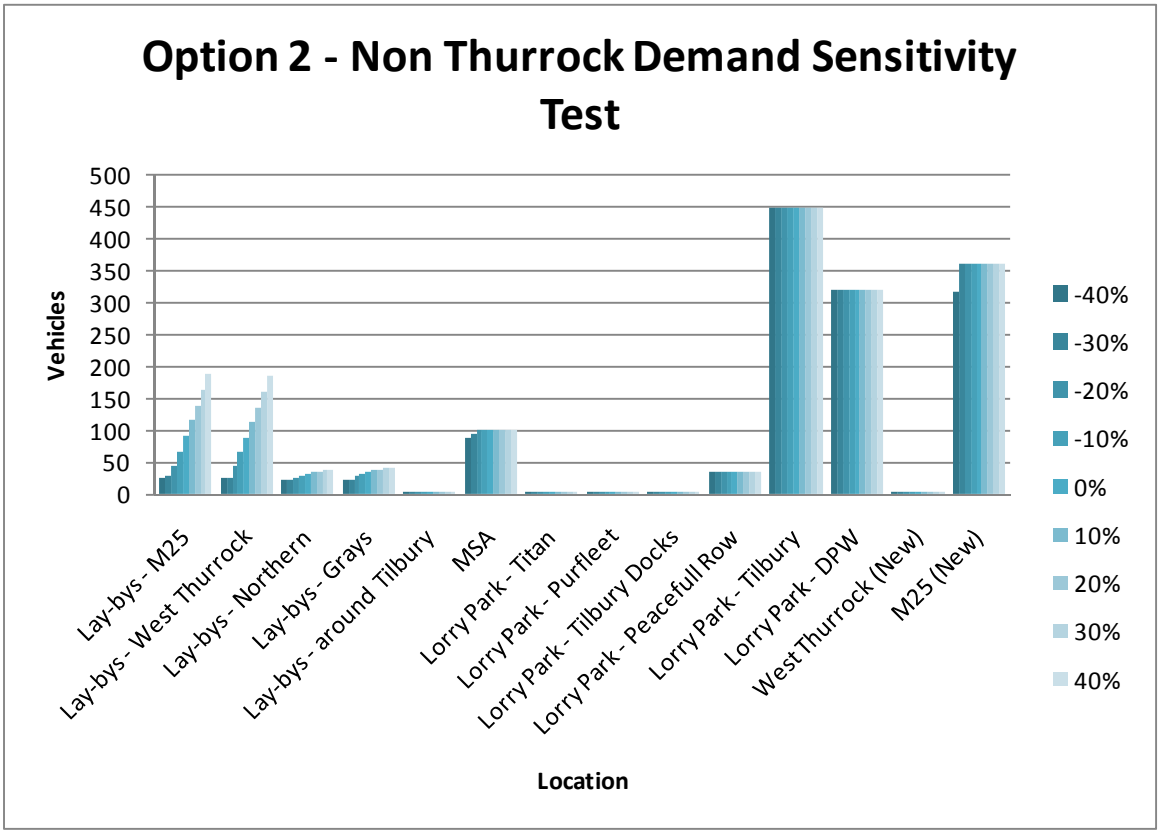

Option 1 - Non Thurrock Demand Sensitivity Test
Vehicles
500
450
400
350
300
250
200
150
100
50
0
Lay-bys - M25
Lay-bys - West Thurrock
Lay-bys - Northern
Lay-bys - Grays
Lay-bys - around Tilbury
MSA
Lorry Park - Titan
Lorry Park - Purfleet
Lorry Park - Tilbury Docks
Lorry Park - Peacefull Row
Lorry Park - Tilbury
Lorry Park - DPW
West Thurrock (New)
M25 (New)
Location
-40%
-30%
-20%
-10%
0%
10%
20%
30%
40%

Figure 7—3: Non Thurrock Demand Sensitivity Test – Option 2



7.1.2 From the analysis in Table 7-1 to Table 7-3 the following conclusions can be drawn.

7.1.3 There is predicted to be a potentially large increase in the parking demand for lay-bys around the M25 and West Thurrock. However, it should be noted that as the test was completed with a fixed level of demand, in reality the amount of parking in these areas could be less as drivers may choose to simply by-pass the Thurrock area. In the reference case a reduction of more than 40% Non-Thurrock Traffic would be required to keep parking at base year levels. In Options 1 and 2 the demand for the M25 and West Thurrock areas is approximately at base year levels in the -30% and -10% sensitivity tests respectively.

7.1.4 The demand for parking in lay-bys around Northern, Grays and Tilbury is predicted to be low in Options 1 and 2 at all Non-Thurrock demand increments.

7.1.5 The MSA is at capacity in the Reference Case and Option 1 at all Non-Thurrock demand increments and at capacity in Option 2 at the 0% to 40% increments.

7.1.6 The Western Thurrock (New) Lorry Park is reaches capacity at the 0% sensitivity test. Whereas the M25 (New) Lorry Park reaches capacity at the -30% demand increment, which indicates that the M25 (new) Lorry Park is more attractive to Non-Thurrock demand. Thus at lower levels of Non-Thurrock demand there would be more available capacity in Option 1 for Thurrock demand.

8 Capacity Planning

8.1.1 A key requirement of the modelling is to be able to make an assessment of present and future demand for parking in Thurrock relative to the amount of parking capacity available.

8.1.2 Table 7.1 shows a summary of this analysis for the total study area, split by Thurrock and Non-Thurrock demand, after assignment in the origin and capacity constrained gravity model. The capacity shortfall has been calculated as lorries which cannot fit into any of the lorry parks because they are full.

8.1.3 The key findings are;

- In the Base Year additional forecast lorry parking capacity in the order of 150-200 spaces is required.
- In the 2026 Reference scenario (i.e. no New West Thurrock or New M25 Sites), additional forecast lorry parking capacity is required, in the order of 660 spaces.
- In Option 1 and 2 an additional forecast lorry parking capacity is required in the order of 140 spaces for Thurrock demand and in the order of 180 spaces for Non-Thurrock demand.

Table 7-8—1: Study Area Lorry Parking Demand compared with Capacity

	Base			Reference			Option 1			Option 2		
	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total
Demand	291	512	**804**	1000	567	**1567**	1000	567	**1567**	1000	567	**1567**
Capacity (off Street Spaces)			**616**			**906**			**1266**			**1266**
Additional Required Spaces	115	68	**188**	204	457	**661**	122	179	**301**	142	158	**301**

8.1.4 It should be noted that the modelling shows that despite the assumed removal of verges/lay-bys and the addition of the new Tilbury Lorry Park in Options 1 and 2, not all of the demand will have available off-street parking spaces.. The demand still forecast to require on-street or off-street parking is;

- In option 1; 122 Thurrock trips and 179 Non-Thurrock trips
- In option 2; 142 Thurrock Trips and 158 Non -Thurrock trips

8.1.5 Another key point to note is that the modelling does not take into account the issue of "suppressed demand" with respect to non-Thurrock trips. Whilst the modelling shows a shortfall

in capacity when catering for these trips, in reality provision for these trips is of low priority given Thurrock's primary concern with Thurrock-based traffic and the possibility that non-Thurrock trips also have the option of using other lorry parks outside the vicinity of Thurrock itself. Faced with a lack of available lorry parking spaces, these trips could choose to avoid Thurrock entirely; further sensitivity testing of the model could identify the propensity of these trips to remain in the Thurrock area.

8.1.6 In summary, the modelling results, indicate that space for approximately another 120-140 Thurrock trips may potentially be required in either of the 2026 Option 1 or 2 scenarios.

8.1.7 Tables 7-2 and 7-3 show demand and capacity by parking area and by off-street/on-street parking respectively. These tables also summarise demand, capacity and capacity shortfall for the whole study area.

Table 7-2: Study Area Lorry Parking Demand compared with Capacity split by Parking Location

		Base			Base No Verge\Lay-by			2026			2026 - No Verge\Lay-by			Opt 1			Opt 1 - No Verge\Lay-by			Opt 2			Opt 2 - No Verge\Lay-by		
		Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total
Demand	Lay-bys - M25	15	37	52	0	0	0	50	231	281			0	30	90	120			0	35	80	115			0
	Lay-bys - West Thurrock	14	35	48	0	0	0	49	226	275			0	29	88	118			0	34	78	113			0
	Lay-bys - Northern	15	0	15	0	0	0	50	0	50			0	30	0	30			0	35	0	35			0
	Lay-bys - Grays	19	0	19	0	0	0	55	0	55			0	33	0	33			0	38	0	38			0
	Lay-bys - around Tilbury	54	0	54	0	0	0	0	0	0			0	0	0	0			0	0	0	0			0
	MSA	15	86	101	15	86	101	12	89	101	12	89	101	16	85	101	16	85	101	28	73	101	28	73	101
	Lorry Park - Titan	59	298	357	61	299	360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lorry Park - Purfleet	63	57	120	63	57	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lorry Park - Tilbury Docks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Lorry Park - Peaceful Row	38	0	38	38	0	38	35	0	35	35	0	35	35	0	35	35	0	35	35	0	35	35	0	35
	Lorry Park - Tilbury	0	0	0	0	0	0	429	21	450	429	21	450	432	18	450	432	18	450	441	9	450	441	9	450
	Lorry Park - DPW	0	0	0	0	0	0	320	0	320	320	0	320	320	0	320	320	0	320	320	0	320	320	0	320
	West Thurrock (New)	0	0	0	0	0	0	0	0	0	0	0	0	75	285	360	75	285	360	0	0	0	0	0	0
	M25 (New)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	327	360	33	327	360
	No Parking Space	*0*	*0*	0	*115*	*68*	184	*0*	*0*	0	*204*	*457*	661	*0*	*0*	0	*122*	*179*	301	*0*	*0*	0	*142*	*158*	301
	Total Demand	**291**	**512**	**804**	**292**	**510**	**803**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**
Off-Street Parking Capacity	MSA			101			101			101			101			101			101			101			101
	Lorry Park - Titan			360			360			0			0			0			0			0			0
	Lorry Park - Purfleet			120			120			0			0			0			0			0			0
	Lorry Park - Tilbury Docks			0			0			0			0			0			0			0			0
	Lorry Park - Peaceful Row			35			35			35			35			35			35			35			35
	Lorry Park - Tilbury			0			0			450			450			450			450			450			450
	Lorry Park - DPW			0			0			320			320			320			320			320			320
	West Thurrock (New)			0			0			0			360			360			360			360			360
	M25 (New)			0			0			0			0			0			0			0			0
	Total Capacity			**616**			**616**			**906**			**1266**			**1266**			**1266**			**1266**			**1266**
Summary	**Total Demand**	291	512	**804**	292	510	**803**	1000	567	**1567**	1000	567	**1567**	1000	567	**1567**	1000	567	**1567**	1000	567	**1567**	1000	567	**1567**
	Total Capacity			**616**			**616**			**906**			**1266**			**1266**			**1266**			**1266**			**1266**
	Lay - Bys	**116**	**71**	**188**	**0**	**0**	**0**	**204**	**457**	**661**	**0**	**0**	**0**	**122**	**179**	**301**	**0**	**0**	**0**	**142**	**158**	**301**	**0**	**0**	**0**
	Available Capacity			**0**			**0**			**0**			**0**			**0**			**0**			**0**			**0**
	Excess Demand	**0**	**0**	**0**	**115**	**68**	**184**	**0**	**0**	**0**	**204**	**457**	**661**	**0**	**0**	**0**	**122**	**179**	**301**	**0**	**0**	**0**	**142**	**158**	**301**

Table 7-3: Study Area Lorry Parking Demand compared with Capacity split by Off-Street/On-Street Parking

		Base			Base No Verge\Lay-by			2026			2026 - No Verge\Lay-by			Opt 1			Opt 1 - No Verge\Lay-by			Opt 2			Opt 2 - No Verge\Lay-by		
		Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total	Thurrock	Non - Thurrock	Total
Demand	Off Street	175	441	**616**	177	442	**619**	796	111	**906**	796	111	**906**	877	389	**1266**	877	389	**1266**	857	409	**1266**	857	409	**1266**
	Verge\Lay-by	116	71	**188**	0	0	**0**	204	457	**661**	0	0	**0**	122	179	**301**	0	0	**0**	142	158	**301**	0	0	**0**
	No Space	***0***	***0***	**0**	***115***	***68***	**184**	***0***	***0***	**0**	***204***	***457***	**661**	***0***	***0***	**0**	***122***	***179***	**301**	***0***	***0***	**0**	***142***	***158***	**301**
	Total Demand	**291**	**512**	**804**	**292**	**510**	**803**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**	**1000**	**567**	**1567**
Off Street Capacity				**616**			**616**			**906**			**1266**			**1266**			**1266**			**1266**			**1266**
Excess Demand		**0**	**0**	**0**	**115**	**68**	**184**	**0**	**0**	**0**	**204**	**457**	**661**	**0**	**0**	**0**	**122**	**179**	**301**	**0**	**0**	**0**	**142**	**158**	**301**

9 Conclusions

9.1.1 In conclusion this report describes the development of a lorry parking choice gravity model, which operates with origin demand and lorry park capacity constraints. This model was calibrated based on the observed lorry park count and interview data collected during late September and early October in 2011.

9.1.2 Subsequent to the calibration of the lorry parking model a series of 2026 future year option tests were completed. These option tests were designed to assess the impact on lorry parking choice with respect to availability of different lorry park locations. It was found from these tests that the reference case option, which involved closing both Titan and Purfleet Truck wash, appears to have insufficient capacity to cater for the existing number of Non-Thurrock trips. Therefore in the reference case there is an increase in Non-Thurrock parking in lay-bys around the M25\West Thurrock area. From a sensitivity test on the parking model it was found that a reduction of approximately 40% of Non-Thurrock trips was required to maintain lorry parking numbers in lay-bys around the M25 and West Thurrock at base year demand levels.

9.1.3 Analysis of Options 1 and 2 showed that with the opening of an additional lorry parking site with 360 spaces in West Thurrock or the M25 the number of people parking around the M25 and West Thurrock lay-bys would be reduced to approximately base year levels. Analysis of the option tests also indicated that the lorry park at the West Thurrock (New) lorry park location would be slightly more suitable to cater for Thurrock rather than Non-Thurrock demand than the M25 (new) lorry park (with 79% of trips being Non-Thurrock at the West Thurrock site as opposed to 91% at the new M25 Lorry Park). In addition, the sensitivity test on Non-Thurrock demand indicated that total parking at the M25 (new) lorry park was more sensitive to Non-Thurrock demand than the West Thurrock (new) Site.

9.1.4 The capacity analysis in chapter 7 has shown that there is presently a shortfall (150 – 200 spaces) in lorry parking capacity in Thurrock and that this shortfall will be exacerbated (more than doubled) by 2026 if no additional lorry parking infrastructure is committed beyond that planned in the 2026 reference case. Testing of Options 1 and 2 has shown that the shortfall can be restricted to between 120-140 spaces (intended for Thurrock-based demand only) under these scenarios but that overall demand could be about 300 spaces if no on-street parking is available.

9.1.5 In terms of policy approach Thurrock Council state that in addition to the identified Tilbury and London Gateway off-street parking sites, Thurrock may choose to either allocate a number of off-street spaces in West Thurrock and continue to allow some on street HGV spaces or in conjunction with more robust enforcement preclude all on-street parking, with correspondingly more off-street facilities to meet demand for spaces. The West Thurrock site/or sites could be either near the M25 or slightly further afield to influence the proportion of non-Thurrock use. The Thurrock council may choose to allocate a significantly smaller facility or facilities with restrictions for Thurrock only traffic. This would have to be in conjunction with a very robust scheme of on-street enforcement. The commercial realities may mean that a “Thurrock only” facility is not practical unless of course it were a municipal facility; administered by the local authority.

Signature	David Battershill
Position	Senior Planner
Company	SKM Colin Buchanan
Date	15 March 2012