Kent Lorry Parks Feasibility Study - Phase 2 Report

17 March 2014

Within the commission AECOM is not giving investment advice. The truck park assessments as set out in this report are based on a series of assumptions as set out in the report and associated technical notes and as agreed between AECOM and Kent County Council. The outcome of assessments are directly driven by the assumptions and the data used for the assessments and subject to uncertainty. Whilst the uncertainty of the assessment can be the subject of a risk analysis, the remit of this work does not include undertaking of risk analysis.

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Kent Lorry Parks Feasibility Study - Phase 2 Report

Rev No	Comments	Checked by	Approved by	Date
1	Draft Kent Lorry Parks Feasibility Phase 2 Report	JE	JH	17 Feb 2014
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Executive Summary

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Introduction

AECOM was commissioned in August 2013 by Kent County Council (KCC) to produce a feasibility study for commercially operated lorry parks in Kent. Following the completion of the Phase 1 Kent Lorry Parks Feasibility Study, AECOM was further commissioned in December 2013 (Phase 2) to address a number of requests as set out by the Council:

- Refine existing demand model to provide site specific, rather than corridor specific demand estimates
- Refine the existing commercial models to update capital costs, land value, construction and other cost elements for each site
- Estimate operational cost and loan repayment cost for two operating models for each site and update the financial and commercial analysis for each site

Three sites are considered as follows:

E1 – Proposed Parking Capacity

PARKING CAPACITY	SITE		
	Site Behind STOP24 Site 8	**Extension of Ashford International Truck Stop Site 6**	**White Cliffs Business Park Site 57**
Oversize	25	13	21
Overnight	527	421	321
Operation Stack	112	100	-
Overall Total	664	534	342
Total for demand/financial model	**552**	**434**	**342**

The revised methodology is split into two key parts:

- Demand modelling
- Financial modelling

The demand methodology aims to provide site specific as opposed to aggregate corridor demand as provided in the Phase 1 demand model for the three shortlisted truck stop locations. The methodology on the financial analysis aims to provide updated and more accurate capital and operational costings for the sites as a result of further research undertaken by Kent County Council (KCC). It also incorporates different grant and loan scenarios and their impact on cash flow together with further sensitivity tests on price elasticity for overnight parking charges and discount rates used in the NPV calculations.

Driver Surveys

In addition AECOM undertook a face-to-face survey of over 120 international freight drivers at Port of Dover, Ashford Truck Stop and STOP 24. The key findings including; willingness to pay; importance of facilities; and willingness to divert from their route in order to find parking, are used to help inform the demand and financial models.

Example Driver Survey Result - If truck parking enforcement was tougher a third of drivers said they would not park in Kent

Demand Analysis

The outcome of the site specific demand forecasts is shown as follows:

E2 – Overnight Parking Demand

Year of operations	Overnight Parking Demand		
	Site 57 White Cliffs	Site 8 STOP 24	Site 6 Ashford
1	44	27	36
2	51	32	45
3	58	38	53
4	65	44	61
5	73	50	70
6	80	57	79
7	88	63	88
8	96	70	98
9	105	77	108
10	115	85	120
11	125	94	132
12	136	103	145
13	147	112	158
14	159	122	172
15	171	132	186
16	182	141	198
17	192	150	211
18	204	159	224
19	215	169	238
20	230	181	255
21	245	194	273
22	261	207	292
23	277	220	311
24	294	235	331
25	312	249	352

In terms of comparison between the Phase 1 corridor based demand forecast and the site based analysis, the level of growth in international freight traffic has obviously not changed, however the volumes of vehicles involved has been disaggregated and with the exception of the Dover site is significantly reduced. On the other hand this means that for the 25 year forecast period none of the sites become space constrained.

Financial Analysis

The financial model calculates annual revenue and costs based on assumptions regarding demand, lorry park utilisation, pricing strategy and lorry park costs. The financial analysis is based on estimating cash flow as a function of these, the rate of return and the present value. A 25 and a 40 year time period has been assumed.

The following table gives the Internal Rate of Return (IRR) and Net Present Value (NPV) outputs of the model taking into consideration a 25 and 40 year investment horizon. In broad terms the higher the IRR and NPV the better the investment is likely to be. It can be seen that across sites and between the 25 year and 40 year investment horizons there is either only a small or no return (indicated as "Not Applicable") on investment. The NPVs are negative in all cases.

E3 - IRR and NPV No Grant No Loan Scenarios

						Average Annual Operational:			
Site	Development Year	Operational Life	Capital Cost	Grant	Loan % of capital costs	Revenue	Op + Main Costs	IRR	NPV
57	2016	25	£12,560,641	£ -	0%	£1,289,273	£817,553	Not applicable	-£10,619,982
57	2016	40		£ -	0%	£1,849,220	£884,442	3.7%	-£8,216,127
8	2016	25	£17,123,208	£ -	0%	£989,054	£1,319,558	Not Applicable	-£22,781,768
8	2016	40		£ -	0%	£1,820,774	£1,427,521	Not Applicable	-£20,897,368
6	2016	25	£19,097,944	£ -	0%	£1,336,148	£1,037,479	Not Applicable	-£19,314,544
6	2016	40		£ -	0%	£2,088,348	£1,122,363	2.0%	-£16,550,948

Grant and Loan Scenarios

There is the possibility of a grant from the LEP and/or a Treasury loan. These would have a significant impact, avoiding the need to pay for construction up front (or at all in the case of a large grant) and in effect discounting the payment of the construction costs over a period of 25 or 40 years with a Treasury loan.

KCC asked for two scenarios to be tested:

- A mix of grant and loan is used to develop and deliver the project with a 40 points discounted interest rate of 3.74% over 25 years
- Full loan utilised to develop and deliver the project with a 40 points discounted interest rate of 4.06% over 40 years

The following summarises the IRR and NPV outcomes for each scenario.

E4 - IRR and NPV Loan and Grant Scenarios

Summary 25 and 40 year loans

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

Site	Development Year	Operational Life	Capital Cost after grant	Grant £10m + uplift 2013-2016	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Average Annual Operational: Op + Main Costs	IRR	NPV
57	2016	25	£2,757,530	Y	100%	£2,911,963	£ -	£1,289,273	£817,553	*8.3%*	*£292,102*
57	2016	40	£13,526,437	N	100%	£14,283,971	£ -	£1,849,220	£884,442	*4.5%*	*-£2,939,076*
57	2016	40	£2,757,530	Y	100%	£2,911,963	£ -	£1,849,220	£884,442	*12.2%*	*£2,877,252*
8	2016	25	£7,670,916	Y	100%	£8,100,518	£ -	£989,054	£1,319,558	*Not Applicable*	*-£10,275,864*
8	2016	40	£18,439,822	N	100%	£19,472,526	£ -	£1,820,774	£1,427,521	*Not Applicable*	*-£13,703,464*
8	2016	40	£7,670,916	Y	100%	£8,100,518	£ -	£1,820,774	£1,427,521	*Not Applicable*	*-£7,887,137*
6	2016	25	£9,797,491	Y	100%	£10,346,189	£ -	£1,336,148	£1,037,479	*Not Applicable*	*-£6,118,815*
6	2016	40	£20,566,397	N	100%	£21,718,197	£ -	£2,088,348	£1,122,363	*Not Applicable*	*-£8,527,407*
6	2016	40	£9,797,491	Y	100%	£10,346,189	£ -	£2,088,348	£1,122,363	*5.1%*	*-£2,711,079*

In comparison with the no grant and loan scenario it can be seen the NPV position is considerably improved but with the exception of the Site 57 25 and 40 year grant and loan scenarios, NPVs are all still negative. IRRs are positive for Site 57 and the IRR for Site 6 under the 40 year grant and loan scenario is also positive.

A grant and 25 year loan scenario offers a useful proposition to taking forward a lorry park, given that in effect a proportion of the cost of the lorry park construction will be 'written off' and the remaining costs will be discounted over a period of 25 years or 40 years, notwithstanding the need to undertake longer term forecasting, planning and risk assessments. However, this is dependent on a number of assumptions and would need to be fully explored if a decision was made to take the analysis further. Given the generally poor IRR and NPVs, even with a grant and 40 year loan, Site 57 would appear the most attractive proposition.

M20 Corridor Single Site Development

Having reviewed the Phase 2 modelling outcomes with particular respect to the relatively poor NPV and IRR values under many scenarios we conclude that a further scenario of a combined site on the M20 corridor should be 'tested' to ascertain its potential viability. This seems a sensible progression of the modelling in Phase 1 that is corridor based and the site specific analysis conducted in Phase 2. In combining the site specific demand the proximity of the sites is already accounted for in the even splitting of demand between the two locations. A 50 year time horizon was also added to the 25 and 40 year scenarios tested previously.

Table E5 provides the results using Site 8 and the following narrative provides an explanation of the model outputs. (Table E6 provides the equivalent results using Site 6).

In combining the two M20 corridor site demand forecasts whilst we still see negative NPV figures in the no grant / no loan scenarios, IRR figures are however positive and show a 4% - 5% return over the 40 and 50 year time line for both sites 8 and 6.

Applying the grant and loan scenarios return far more encouraging outcomes although in the case of the grant this is still an upfront costs to the public sector and should either be included as an upfront cost or subtracted from the benefits.

The following scenarios were tested:

- A mix of grant and loan is used to develop and deliver the project with a 40 points discounted interest rate of 3.74% over 25 years
- Full loan utilised to develop and deliver the project with a 40 points discounted interest rate of 4.06% over 40 years
- Full loan utilised to develop and deliver the project with a 40 points discounted interest rate of 4.08% over 50 years

The first column of Table E5 sets out scenarios A to G. The 25 and 40 years results in Scenario A (no grant and no loan) are identical to those presented in table E3. In addition, the results for 50 years have been included, indicating that there is still no return and a negative NPV.

Scenario B develops this further, but adding in the demand from Site 6 i.e. the combined demand forecast that is the purpose of this chapter. This does have a positive impact, with the increase in annual revenues (but the same annual costs as in Scenario A) resulting in returns of 1.6% - 5.5% over 25 – 50 years.

Scenarios C and D look at the impact of a grant with loan over 25 years (Scenario C) and over 40 years (Scenario D). Revenue and operating costs remain the same as in Scenario B, but annual cash flow is improved. If the IRR and NPV are calculated without taking into the account the grant (as is the case in the table), then the returns will look very high, as is demonstrated in the table.. Scenario F presents a similar set of results, but on the basis of a 50 year loan.

Scenario E examines the impact of a 40 year loan (no grant). This should be compared to Scenario B. The IRR increases, although NPV remains negative. Over 50 years, however, the NPV is almost positive. Scenario G presents a similar set of results, but on the basis of a 50 year loan (no grant); in this scenario there is a positive NPV over 50 years.

E5 - Develop Site 8 (Westenhanger Site behind Stop 24) With Combined Demand Forecast

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Average Annual Operational: Op + Main Costs	IRR	NPV
A: no grant or loan	8	2016	M20	552	25	£18,439,822					£989,054	£1,319,558	Not Applicable	-£22,781,768
	8	2016			40						£1,820,774	£1,427,521	Not Applicable	-£20,897,368
	8	2016			50						£2,362,783	£1,505,901	Not Applicable	-£19,934,121
B: no grant or loan	8 (+6 demand)	2016	M20	552	25	£18,439,822					£2,359,443	£1,319,558	1.6%	-£12,247,021
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	4.9%	-£8,346,648
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	5.5%	-£7,383,401
C: grant and 25 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,359,443	£1,319,558	*7.9%*	*£258,883*
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	*10.8%*	*£4,159,256*
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	*11.1%*	*£5,122,503*
D: grant and 40 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,359,443	£1,319,558	*9.0%*	*£1,062,386*
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	*11.6%*	*£4,663,584*
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	*11.8%*	*£5,626,831*
E: no grant and 40 year loan	8 (+6 demand)	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,359,443	£1,319,558	2.6%	-£4,333,940
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	6.7%	-£1,152,744
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	7.4%	-£189,498
F: grant and 50 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,359,443	£1,319,558	*9.5%*	*£1,347,858*
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	*11.9%*	*£4,961,766*
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	*12.1%*	*£5,868,759*
G: no grant and 50 year loan	8 (+6 demand)	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,359,443	£1,319,558	3.2%	-£3,647,705
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	7.2%	-£435,955
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	7.7%	£392,064

E6 - Develop Site 6 (Extension of Ashford International Truck Stop) With Combined Demand Forecast

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Average Annual Operational: Op + Main Costs	IRR	NPV
A: no grant or loan	6	2016	M20	434	25	£20,566,397					£1,336,148	£1,037,479	Not Applicable	-£19,314,544
	6	2016			40						£2,088,348	£1,122,363	2.0%	-£16,550,948
	6	2016			50						£2,355,010	£1,183,988	2.9%	-£15,843,371
B: no grant or loan	6 (+8 demand)	2016	M20	434	25	£20,566,397					£2,129,455	£1,037,479	1.5%	-£12,702,342
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	4.3%	-£9,823,085
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	4.8%	-£9,115,508
C: grant and 25 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,129,455	£1,037,479	*8.3%*	*£493,387*
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	*10.7%*	*£3,372,644*
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	*11.0%*	*£4,080,221*
D: grant and 40 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,129,455	£1,037,479	*10.0%*	*£1,519,642*
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	*11.9%*	*£4,016,784*
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	*12.1%*	*£4,724,361*
E: no grant and 40 year loan	6 (+8 demand)	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£2,129,455	£1,037,479	2.5%	-£3,876,684
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	6.1%	-£1,799,544
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	6.8%	-£1,091,967
F: grant and 50 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,129,455	£1,037,479	*10.7%*	*£1,884,255*
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	*12.4%*	*£4,397,630*
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	*12.6%*	*£5,033,357*
G: no grant and 50 year loan	6 (+8 demand)	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£2,129,455	£1,037,479	3.4%	-£3,111,308
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	6.7%	-£1,000,091
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	7.2%	-£443,337

Sensitivity Testing

Further sensitivity tests assuming a night time charge of £20 (as opposed to £15) and a discount rate of 3.5% (instead of 7.5%) have been undertaken and the results are set out in Appendix C. The impact of the higher charge and lower discount rate is to significantly improve the revenue line and potential returns and NPV.

Final Remarks

Ultimately, the choice of development may be determined by a multitude of external factors including land availability and willingness of existing or new commercial operators to develop sites. It is noting the point that if the Ashford site (site 6) is developed in the manner described to a capacity of 858 spaces this will cope with predicted demand to beyond 2040, whereas capacity would be exhausted at a combined STOP 24 site by 2035.

The IRR figures presented in this report indicate how much more attractive an investment the truck park becomes for KCC (as opposed to the public sector as a whole) once the proposed grant and loan financial supports are provided. These supports might also be used to incentivise a private sector firm to build and/or operate a truck park. For example, if a private sector firm was able to access these grants and low cost loans, the potential return to it from building and operating a truck park would increase as indicated by these IRR calculations. Alternatively, if KCC built the truck park and sold it to a private sector developer for a price net of the benefit of the grants and loans, the purchase and operation of the truck park would be a more attractive investment for a private sector buyer.

The analysis in this report is based on the commercial viability of additional lorry parks in Kent. However, there are wider costs and benefits that are likely to accrue but which would not be taken into account by a private operator seeking to make an investment decision. The Kent Multi-facility Lorry Park Scoping Strategy (2007)[1] undertook economic impact analysis to estimate a cash equivalent benefit to society resulting from the provision of sufficient overnight lorry parking capacity in Kent and a well managed off-highway alternative to Operation Stack. It suggested that first year benefits would be in the order of £2.5m and a £77m benefit (in 2004 prices) over a 30 year time frame. These benefits took into account impacts on local businesses, policing costs, and congestion.

There are likely to be broader socio-economic costs and benefits involved in the construction and operation of new lorry parks in Kent.

[1] A report by AECOM for the Department for Transport and Highways Agency

Introduction

1 Introduction

1.1 Overview

AECOM was commissioned in August 2013 by Kent County Council (KCC) to produce a feasibility study for commercially operated lorry parks in Kent. As part of the study AECOM undertook an initial evaluation and ranking of some 31 sites and developed a demand model and financial model to determine the feasibility of the top ranked sites. The outcome of this 'Phase 1' study provided a list of possible sites that may be feasible to develop as a lorry park.

In December 2013 AECOM was further commissioned (Phase 2) to address a number of requests as set out by the Council:

- Refine existing demand model to provide site specific, rather than corridor specific demand estimates
- Refine the existing commercial models to update capital costs, land value, construction and other cost elements for each site (information provided by KCC, see below)
- Estimate operational cost and loan repayment cost for two operating models for each site and update the financial and commercial analysis for each site

Following the Phase 1 report KCC undertook to determine addition and refined data and has provided AECOM with the following information:

- Land values
- Construction cost with associated layout drawings
- Market research with existing truck park operators

This information was used to update the existing demand and financial models. The operators market research was used to help further determine the current utilisation at existing truck parks as well as to determine more accurate maintenance and operating costs.

In addition to the above information, AECOM undertook face-to-face interviews with lorry drivers which are further discussed in Chapter 2.

The three sites that are considered are:

- Site behind STOP24 Westenhanger off M20 Junction 11 (Shepway)
- Extension of Ashford International Truck Stop, A2070 near M20 Junction 10 (Ashford) spaces
- White Cliffs Business Park, near A2/A256 junction (Dover)

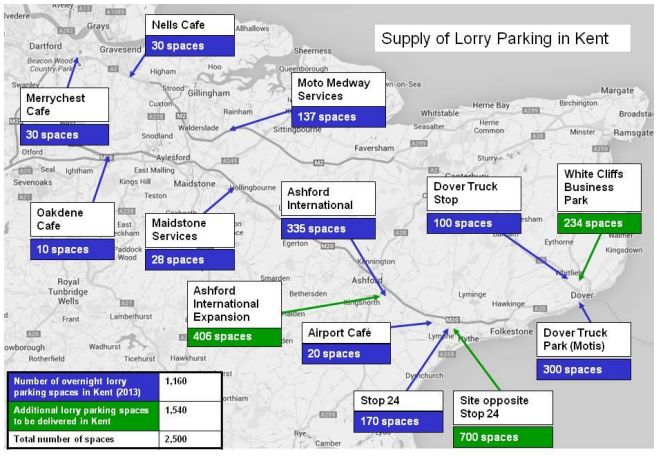

Figure 1.1: Current Truck Parking Provision in Kent and the Three Review Sites (note comments on spaces)

Figure 1.1, as provided by KCC, identifies current supply of truck parking in Kent and the three sites reviewed as part of this Phase 2 study. It should be noted that the parking spaces identified here have been refined as part of the process of KCC developing feasibility layouts for each of the sites. The capacities provided in these layouts are noted as follows:

Table 1.1: Proposed Parking Capacity at the Three Proposed Sites

PARKING CAPACITY	SITE		
	Site Behind STOP24 Site 8	**Extension of Ashford International Truck Stop Site 6**	**White Cliffs Business Park Site 57**
Oversize	25	13	21
Overnight	527	421	321
Operation Stack	112	100	-
Overall Total	664	534	342
Total for demand/financial model	**552**	**434**	**342**

AECOM notes that the layout drawings indicate a standard parking bay size of 15m x 3m, and that oversize spaces are provided (we assume for drawbar vehicles of 18.6m). We advise KCC that a standard international freight vehicle (articulated combination) is 16.5m and that the feasibility layouts should be re-drawn to take this into account. This may affect the parking capacity but a 'herringbone' layout may be adopted to re-optimise capacity.

KCC should also note that whilst we have included the 'oversize' bays in our demand/financial modelling we have not included the spaces reserved for use during Operation Stack as we have assumed that these must be reserved for that specific purpose.

1.2 Report Structure

The structure of the remaining sections of the report is as follows:

Chapter 2 – Model Refinement and Methodology

This chapter describes the methodology and assumptions for Phase 2 of the Kent Lorry Parking Study which refines the previous demand and financial models.

Chapter 3 – Driver Interview Analysis

This chapter sets out the results from the driver interviews.

Chapter 4 – Demand Forecasting

This chapter sets out the changes and new results to the demand model.

Chapter 5 – Financial Modelling

This chapter describes the updates and gives a summary of the new results from the financial model.

Chapter 6 – M20 Corridor Single Site Development

This chapter sets out the results if we combine the demand of the two proposed sites on the M20 corridor but only develop one site.

Appendices include:

Appendix A – HGV Driver Questionnaire

Appendix B – Comparison of Phase 1 and Phase 2 Financial Model Inputs

Appendix C – Sensitivity Testing of Higher Overnight Charge and Lower Discount Rate

Model Refinement and Methodology

2 Model Refinement and Methodology

2.1 Introduction

This section sets out the methodology for Phase 2 of the Kent Lorry Parking Study, which refines the previous demand and financial models and provides site specific analysis. This is achieved through additional and greater levels of information now available as well as the outputs of primary research (face-to-face surveys) undertaken with lorry drivers.

2.2 Methodology

The revised methodology is split into two key parts:

- Demand modelling
- Financial modelling

The demand methodology aims to provide site specific as opposed to aggregate corridor demand as provided in the Phase 1 demand model for the three shortlisted truck stop locations. The finance methodology aims to provide updated and more accurate capital and operational costings for the sites as a result of further research undertaken by Kent County Council (KCC). It will also incorporate sensitivity testing to examine different grant and loan scenarios and their impact on cash flow.

2.2.1 Demand Modelling

The demand model refinement included a survey of truck drivers to understand a number of variables including:

- Driver and Journey Profiles
- Facilities required
- Willingness to pay for truck parking and how much
- The distance they would wish to deviate from their route in order to find secure truck parking

It is this last question, in terms of the level of deviation from routes that was fundamental in determining the demand for truck parking as this consensus allowed us to draw isochrones around the truck stop to determine the area of demand. These isochrones indicate the count points both on Motorways (HATRIS) and Primary routes (AADT) that represent the specific demand for the truckstop. This converts corridor volumes, as in the previous model, into site specific volumes. This was then compared against gatehouse records (from Ashford International Truckstop and Stop 24) in order to add a further layer of validation.

Willingness to pay for truck stops introduced an added dimension that provides further information for KCC in terms of pricing policy and business operating models. It may also be worked into the financial model to provide more accurate revenue expectations. For the demand model, we can use it as a measure of price elasticity, by looking at the proportion of drivers responding to each pay band and change the levels of demand if fees increase or decrease.

Assumptions

- Where demand isochrones overlap, volume within such overlap was split equally amongst the relevant sites
- One count point from each road was taken
- Price preference directly affects demand

In the driver survey we also asked about why drivers are parked where they are as well as the ability to consistently park there and what happens if that particular location is full. This enabled us to gain a picture of latent demand without having to survey drivers in lay-bys.

All other aspects of the demand methodology remained the same as the previous version.

Journey and driver profiles helped to gain a wider picture of demand and driver activities within the region as well as providing an indication of facilities a new truck stop may want to provide.

2.2.2 Financial Modelling

The financial model was updated with new capital, maintenance and operating costs provided by KCC as part of their supporting research, through revision of figures in the costs and revenue sections.

The model was also adapted to take into account inputs from KCC on operating models and loan repayments, within the current structure of the model.

Assumptions

- Inputs as given/ provided by KCC and the demand modelling
- The financial model will work out the IRR and NPV, as previously
- The model incorporates loan repayments, as requested by KCC, to help determine overall cash flow
- The model does not incorporate any risk analysis or quantified risk assessment
- The model assumes a 25 and 40 year operational period *after* construction has been completed
- No assumption is made on asset value at the end of the appraisal period or depreciation
- Refurbishment only includes cost of resurfacing in year 26
- Modelled sites will not close in the refurbishment year, although capacity will be reduced by 10 percent to reflect disruption
- Construction will take place over a one year period (Year 0, followed by 25 or 40 years of operations)
- Ashford, STOP 24 and Dover will have 434, 552 and 342 parking spaces respectively
- Scenarios include:
    - Build without a grant or loan
    - Build with grant of £10m and loan for remaining amount over 25 years
    - Build with loan for full amount over 40 years

2.3 Summary

The following refinements provide KCC with a much better idea of the potential impacts of truck parking behaviour on demand as well as how different operating models may affect revenue and loan repayments.

Driver Interview Analysis

3 Driver Interview Analysis

3.1 Introduction

This section sets out the results from the recent HGV driver surveys. The driver interviews undertaken by AECOM's in-house team were undertaken at:

- Ashford International Truck Stop on the 22nd of Jan 2014, between 4pm and 8pm
- STOP24 on the 23rd of Jan 2014, between 4pm and 8pm
- Port of Dover on the 24th of Jan 2014, between 11am and 4pm

The key findings including willingness to pay, importance of facilities and willingness to divert from their route in order to find parking. Finally it details how the findings can be used in order to influence the demand and financial models for truck parking and driver rest areas in Kent. The questionnaire is contained in Appendix A.

3.2 Results

The survey gained 121 responses, exceeding our target by 21%, and adding greater validation to its conclusions. Samples are split across the survey sites according to Figure 3.1. The largest sample of surveys (42%) was taken from the Port of Dover, with 31% and 27% coming from Ashford and STOP 24 respectively.

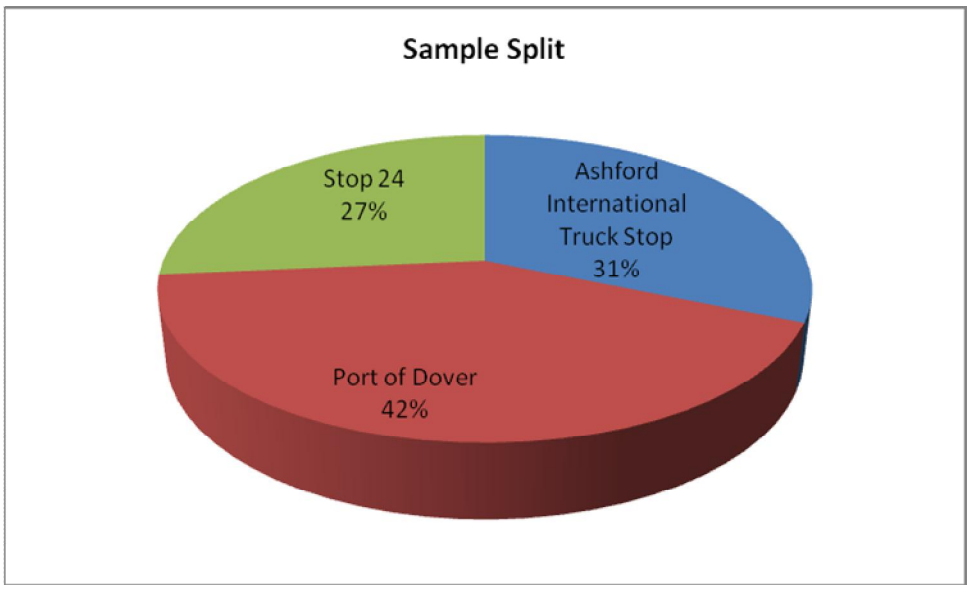

Figure 3.1: Survey Responses by Site

3.2.1 Geography

The origin of trucks varied, with vehicles being recorded from 16 different countries, as shown in Figure 3.2. The most prevalent country was Poland (PL), with 19% of the trucks surveyed. Traditional European logistics nations such as Germany (D) and the Netherlands (NL) featured less prominently with an 8% and 4% share respectively. UK vehicles (GB) accounted for 10% of the sample.

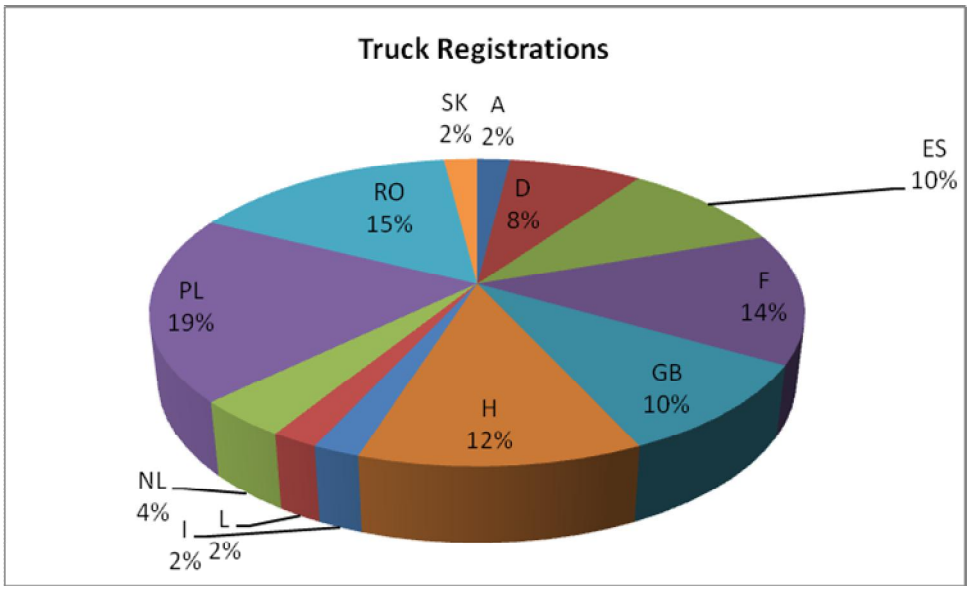

Figure 3.2: Registrations of Sample Vehicles

Should the truck rest areas provide facilities such as food and beverage, as well as information, this may be significant in determining the sort of foods and beverage on offer, language considerations and potentially price comparison, as buyers will inevitably compare costs with equivalent facilities in their home country.

3.2.2 Routing

Figure 3.3 shows the routing options picked by drivers interviewed. It shows that most vehicles use the A20/M20, either on its own or in combination with the A2/M2. Very few vehicles travel only on the A2/M2. From previous AECOM studies (notably the study for the HA on Dover route signing) and from the Phase 1 analysis of traffic volumes on the two corridors we know that the 'combination' element of the route preference identified in our driver survey means that the eastern section of the M20 is heavily utilised by cross-Channel traffic, with cross-over points principally at the A229 and A249 being used to connect to the M2. As such, the eastern end of the A20/M20 corridor seems the more preferable location for significant parking and driver facilities.

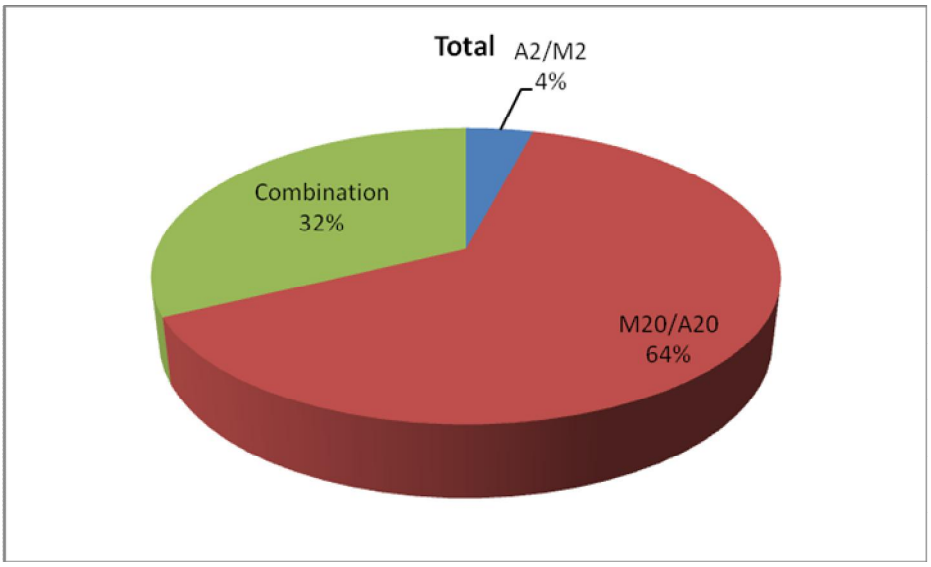

Figure 3 3: Routing Options

3.2.3 Typical Parking Locations

Drivers were asked about their typical parking locations, with an encouraging 61% of drivers responding they parked in an official truck park (Figure 3.4), lay-bys proved the next most popular, followed by industrial sites.

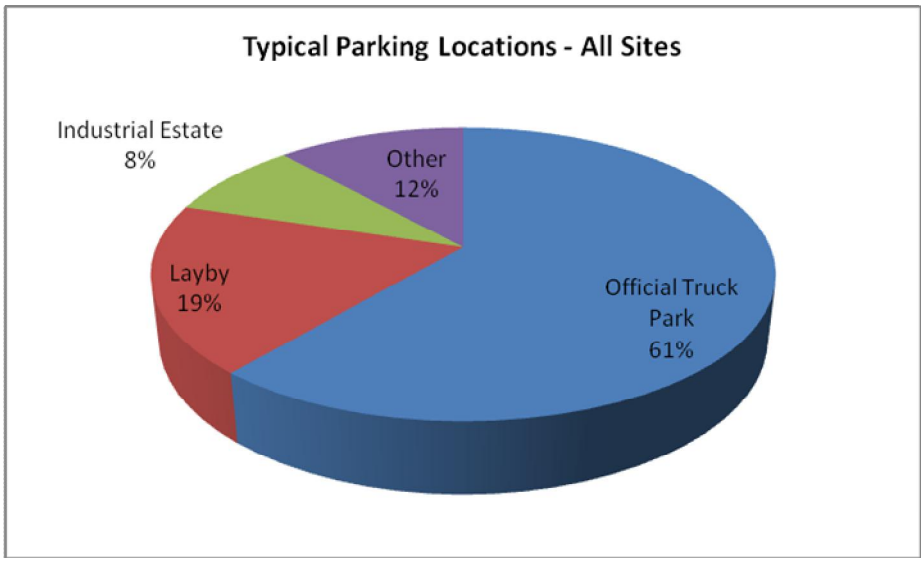

Figure 3.4: Typical Parking Preferences – All Sites

However, it is likely that this is skewed by the fact that 68% of the sample came from drivers parked in such a facility. If we discount these samples, taking only those interviewed at the Port of Dover, this number drops to only 37%, with lay-bys seeming to provide the alternative of choice (see Figure 3.5).

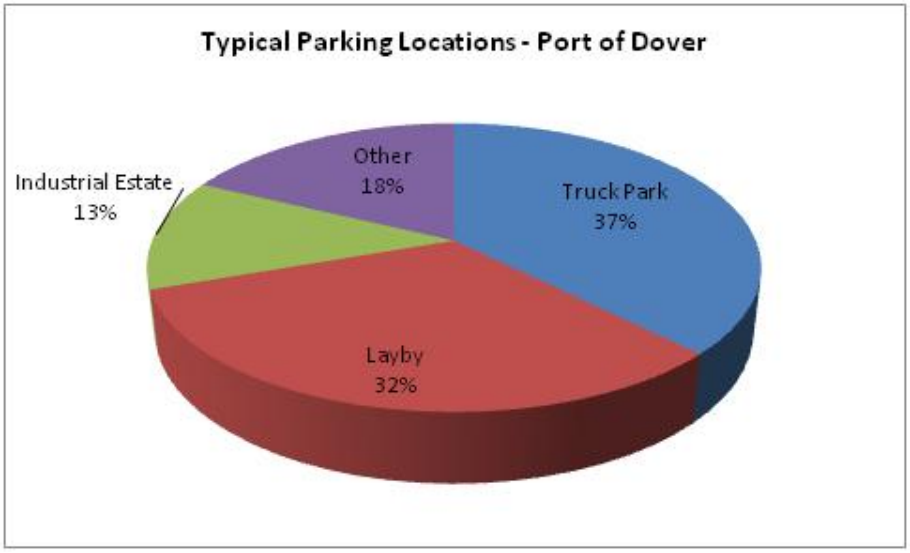

Figure 3.5: Typical Parking Preferences – Port of Dover

As such, it appears that around a third of people are choosing to park in a truck park. Further, 61% of those in a truck park typically park there. There could be a number of reasons for this difference, which may include local traffic, preferring truck stops, though there is little evidence from the interview to support this, with only 7% more UK registered vehicles than seen at truck stops, other possibilities could include Channel Tunnel traffic being more inclined to use truck parking facilities – perhaps if the cargo is typically of higher value than that coming through Dover, which has a slower crossing time. This may also be supported by the route preference data, with far more traffic using the M20/A20 than the M2/A2 as they might when heading from Dover.

Additional traffic may be accounted for through a combination of factors, including what's being carried in the vehicle, though only 14 of the total sample stated they were on company orders in terms of where they parked. Alternatively, they may not normally be able to access the site or parking is influenced by enforcement activity. These latter two are detailed more heavily in later sections.

3.2.4 Motivations

Drivers were asked about the motivations behind parking choices, of which there were several and these are summarised in Figure 3.6. Drivers scored attributes between 1 and 5, 1 being the highest priority, 5 being the lowest. The scores were summed and then taken away from 500 to provide the inverse (so highest score is the more important)

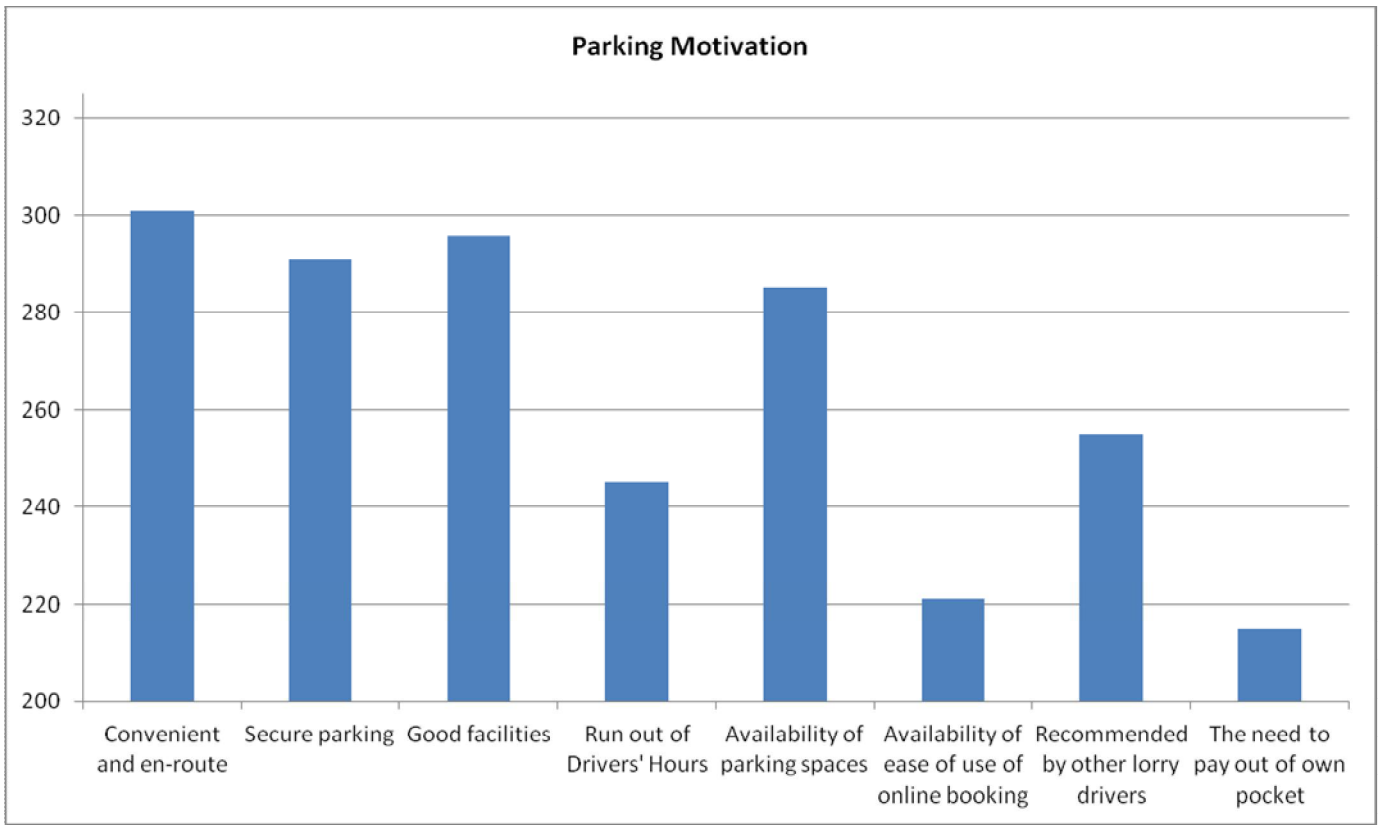

Figure 3.6: Driver Parking Motivations

3.2.5 Parking Availability

Drivers were asked about how much parking was typically available in the locations being surveyed.

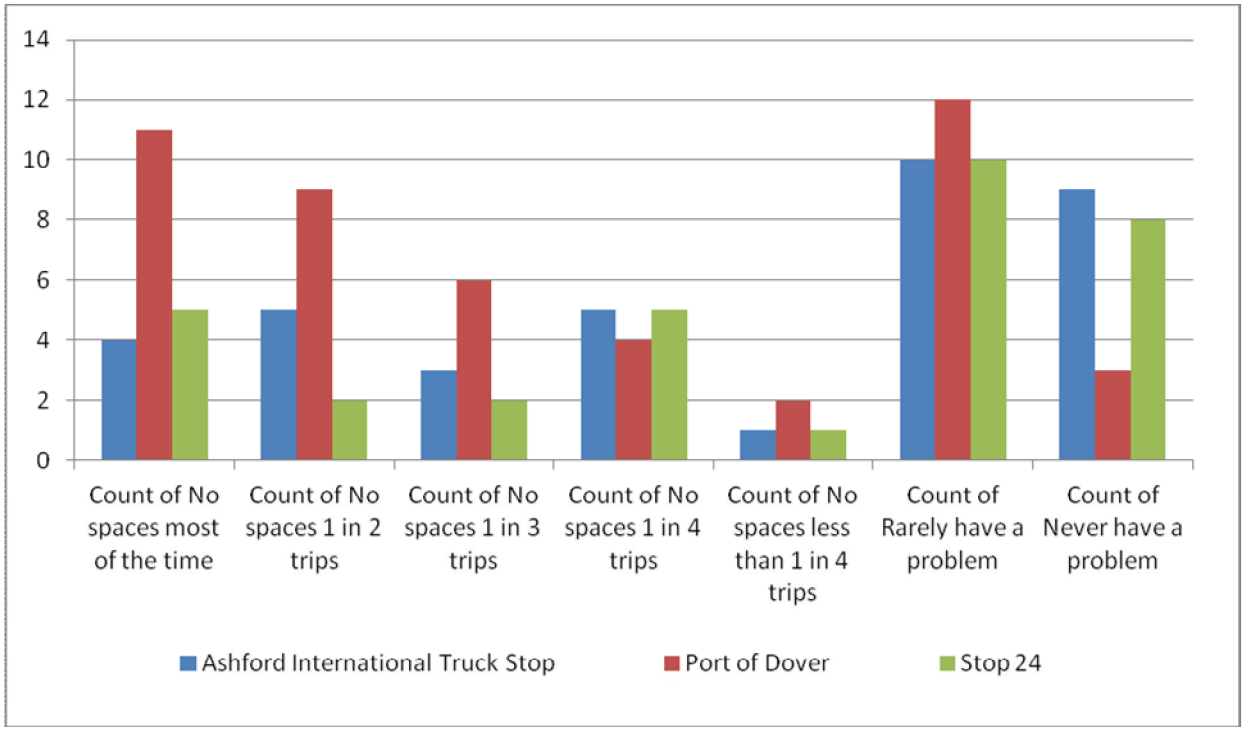

Figure 3.7: Level of Parking Availability

Figure 3.7 shows that whilst there are fewer capacity problems at Ashford or STOP 24, the drivers interviewed at Dover port appear to be having problems much more frequently. In terms of latent demand we can use this data in terms of the likelihood of them finding a space and the number of people affected.

Table 3.1: Latent Demand: Ashford Truck Stop

Times No Spaces	Population	Population (%)	Likelihood of Parking Problem	Latent Demand
Most of the time	4	11%	75%	8%
1 in 2 trips	5	14%	50%	7%
1 in 3 trips	3	8%	33%	3%
1 in 4 trips	5	14%	25%	3%
Less than 1 in 4 trips	1	3%	10%	0%
Rarely have a problem	10	27%	5%	1%
Never have a problem	9	24%	0%	0%
Total	**37**	**100%**	**-**	**23%**

'Likelihood' of a problem was derived by converting the time intervals into percentages (1 in 2 = 50%), 'Most of the time,' 'less than 1 in 4,' 'rarely' and 'never' were assigned likelihood values of 75, 10, 5 and 0% respectively.

'Population' was derived by the number of respondents stating a particular level of problem, as a percentage of the total number of respondents.

Through multiplying the likelihood by the number of people affected we can ascertain the number not being able to find a space (see Table 3.1).

Finally, this can then be summed to ascertain the latent demand for the site, in the case of Ashford, 23%. However, this may be impacted by the priority given to contracted operators as opposed to those that arrive on spec.

Applying the same methodology to the other two sites we can ascertain the following latent demands in Tables 3.2 and 3.3:

Table 3.2: Latent Demand: STOP 24

Times no spaces	Population	Population (%)	Likelihood of parking problem	Latent Demand
most of the time	5	14%	75%	11%
1 in 2 trips	2	5%	50%	3%
1 in 3 trips	2	5%	33%	2%
1 in 4 trips	5	14%	25%	4%
less than 1 in 4 trips	1	3%	10%	0%
Rarely have a problem	10	27%	5%	2%
Never have a problem	8	22%	0%	0%
Total	**33**	**100%**	**-**	**22%**

From Tables 3.2 and 3.3 we can see that latent demand for the STOP 24 site is 22% and 35% for drivers interviewed at Dover Port. As such we can apply these percentages to the demand forecasts as a robust measure of vehicles wanting to access a site but unable to. Checking these figures against gatehouse records will further add to the picture in terms of when the sites are full or not.

Table 3.3: Latent Demand: Drivers Interviewed at Port of Dover

Times no spaces	Population	Population (%)	Likelihood of parking problem	Latent Demand
most of the time	11	23%	75%	18%
1 in 2 trips	9	19%	50%	10%
1 in 3 trips	6	13%	33%	4%
1 in 4 trips	4	9%	25%	2%
less than 1 in 4 trips	2	4%	10%	0%
Rarely have a problem	12	26%	5%	1%
Never have a problem	3	6%	0%	0%
Total	**47**	**100%**	**-**	**35%**

3.2.6 Residual Parking

Given an average level of latent demand of around 27%, it is important to understand where people park if their initial choices are not available. Figure 3.8 shows where driver preferences are.

Figure 3.8: Driver Preference for Alternative Parking

Reassuringly, a third will look for an alternative truck stop, as opposed to opting for a lay-by or areas on industrial estates. Interestingly, many at STOP 24 would use Ashford but no one at Ashford said they would use STOP 24. A few others would look to Folkestone, Maidstone or a Motorway Service Area. This is assuming that the drivers interviewed were parked at their first choice, which may not necessarily be the case.

3.2.7 Facilities

A typical number of facilities, as set out in Table 3.4 were grouped against basic, intermediate and advanced. Drivers were asked which category of facilities they preferred and perhaps more importantly their willingness to pay for them.

Table 3.4: Driver Facilities Grouping

Toilets	**Basic facilities**
Off road parking	
Drinking water	
Showers	**Intermediate facilities (includes the basic facilities)**
Basic security – fence and gate control	
Fuel	
Hot food	
Internet	
Shop	
Very high security e.g. for vulnerable loads	**Advanced facilities (includes the intermediate and basic facilities)**
Plug in points for trailer refrigerators	
Other facilities not shown above	

Figure 3.9 shows their responses, with 46% of drivers wanting an intermediate level of facilities, i.e. a basic level of security, showers and hot food, as is currently supplied by most standard truck stop facilities. A further 35% would have like to see more advanced facilities such as higher security and plug in points. Relatively few, only 19% would have been happy with just basic facilities.

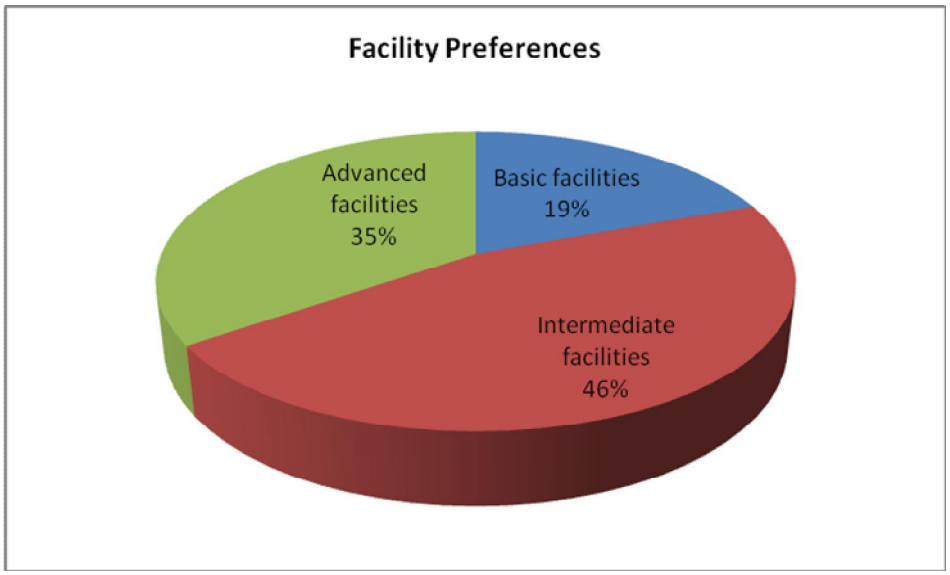

Figure 3.9: Facility Preferences of Drivers

More importantly, drivers were also asked to express how much they'd be willing to pay for such services (though more accurately it is often the company that pays). Figure 3.10 shows their responses.

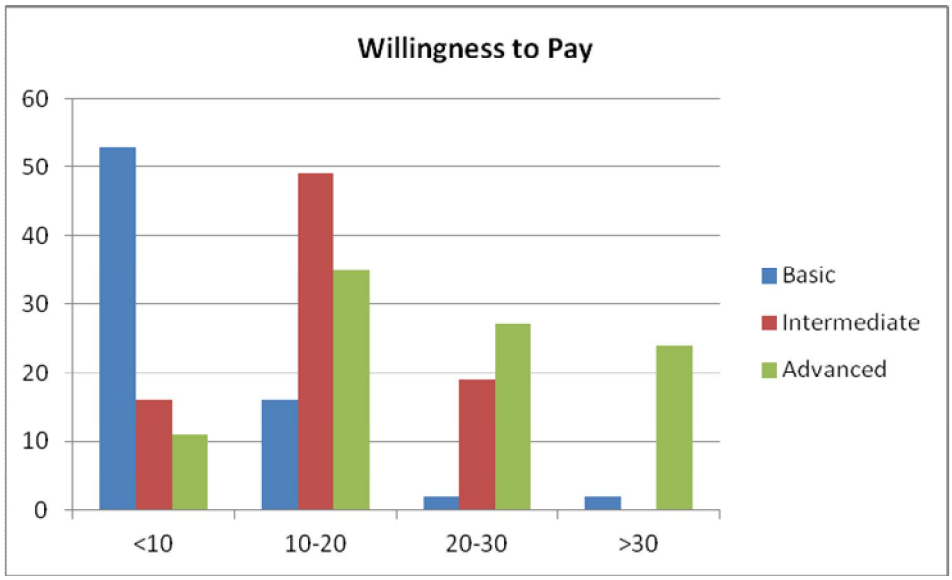

Figure 3.10: Willingness to Pay

Figure 3.10 shows drivers' willingness to pay, It is clear that the majority of drivers, are willing to pay a maximum of €10 for basic services but also that people are prepared to pay more for intermediate services, with most up to a maximum of €20. In terms of advanced services, willingness to pay is more spread out. It is clear that more advanced services are less valued, with many drivers still only willing to pay a maximum of €20 for the more advanced services, whilst a significant minority are willing to pay more than €30. This perhaps reflects the level of charges in Europe, which anecdotal evidence suggests is of lower cost.

This can be incorporated into the demand model as a measure of price elasticity through the following method:

1) Provide the option to specify the level of facilities for each Truck Park
2) Provide the option to specify the fee – linked to revenue in the financial model.
3) Based on the percentage of the sample willing to pay for each, this would be pro-rated to the forecasted volume of traffic, therefore factoring into demand predictions as a proportion of volume, as price is increased/decreased or the level of facilities is altered.

3.2.8 Route Deviation

Every driver will have a certain willingness to deviate from his route in order to find parking, there may be several factors affecting this including company procedures, load contents, drivers hours situation and driver attitude to name a few. Figure 3.11 shows driver preferences:

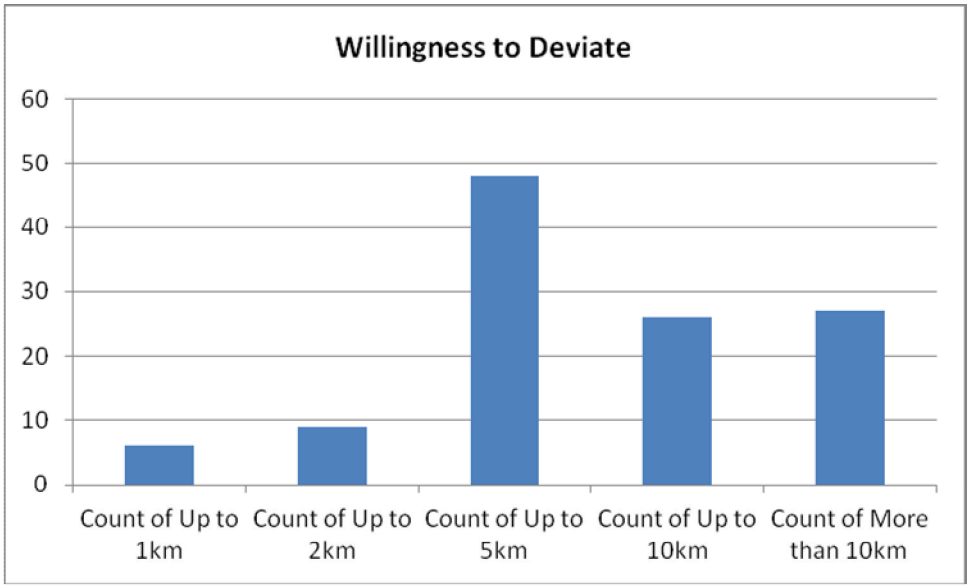

Figure 3.11: Distance Drivers are willing to deviate from their route

It can be seen that the majority of drivers 63/116 (54%) are willing to deviate 5km or less from their route and over three quarters 89/116 (77%) are willing to deviate 10 km or less from their route. As such, this provides a good indication as to the catchment areas of each site, assuming 10 km as a limit provides a safe assumption and if anything will underestimate the demand and therefore provide a robust model financially. As such, 1km, 2km, 5km and 10km Isochrones can be drawn in GIS to ascertain the roads within the catchment area and the through the road traffic counts, the volume of traffic within the demand area. This can be used in support of the gatehouse records in order to verify demand.

The way demand changes as you move further afield can also be reflected within the demand model, only taking into account a proportion of the potential traffic as being likely to use the site.

3.2.9 Enforcement

According to the survey, 82/117 (70%) of drivers who responded have encountered parking enforcement in Kent, suggesting a relatively high effectiveness. Typically, based on those responding, it appears drivers are fined and told to move on (or both). In certain circumstances they are escorted and rarely they are towed. Figure 3.12 shows the survey responses:

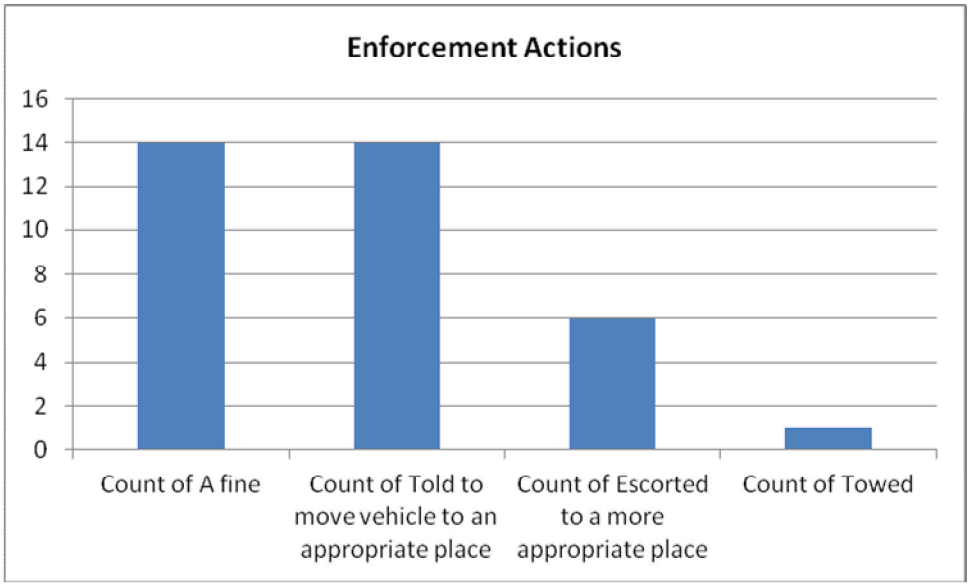

Figure 3.12: Consequences of Enforcement

Given the above, enforcement, ultimately is about changing behaviour, therefore the true indicator of its effectiveness is what drivers intend to do in future to avoid further enforcement, which Figure 3.13 shows.

Figure 3.13: How drivers intend to avoid enforcement

Encouragingly, many drivers (41%) would look to find a lorry park in the future, though it may be positively skewed due to the subject and where the survey was undertaken (however this does not differ substantially when looking at the Port of Dover data). 34% would avoid parking in Kent, and 25%, still a significant proportion, would look to take a risk on being caught. As such it shows that enforcement has significant effect in promoting the use of truck parks and that it can also have the effect of moving the problem onto another County.

The results however, do inform the demand model and we can incorporate its effects as to the additional demand for truck parking created through enforcement.

3.3 Summary

The driver survey has highlighted a number of important insights and considerations into behaviour of truck stops, particularly in the areas of willingness to pay, enforcement and latent demand, which were areas in the previous phase of work that we were only able to use an estimate.

Demand Forecasting

4 Demand Forecasting

4.1 Introduction

This section sets out the changes and new results to the demand model. It should be read in conjunction with the Phase 1 final report to gain a wider understanding of the methodology behind the model. The note also refers to a number of elements from the driver survey that took place in January 2014 and is set out in Chapter 3 of this report. Due to the options available, a large number of scenarios could be tested, however in the interests of time and length of the report, scenarios are often limited to those that will represent reality or client aspirations; e.g. in terms of the level of facilities. Where limited scenarios have been reported, this is clearly stated in both the Key Changes and Results sections.

4.2 Key Changes

In response to client feedback, a number of key changes/enhancements have been incorporated into the demand model. The following section sets out these changes.

4.2.1 Volume

In order to convert the demand model from a corridor based, to a site specific model, changes in the way truck volume were calculated had to be made. Feedback from the driver survey intimated that the majority more than 75% were willing to travel a maximum of 10km off route with the modal average being 7.5km. Use of GIS was made in order to calculate the Isochrones of 1, 2, 5, 7.5 and 10 kilometres away from each site and this can be seen in Figure 4.1. The use of Department for Transport, Annual Average Daily Traffic data (AADT), from count points within the 7.5 and 10km radii was used in order to calculate the level of traffic circulating within the area. This was averaged to avoid issues with double counting. The model is set up to allow the choice between a 7.5 and 10km catchment radius and will adjust the traffic volume accordingly. The results in the next section use a 7.5km radius to avoid excessive overlap between Ashford and STOP 24.

However, it is thought that the AADT data, due to many of the points being on local roads underestimates the HGV traffic accessing the site. As such, the nearest Highways Agency count points to each site (1 in each direction) have been included – bus/coach volumes as provided in the phase 1 model, to provide a better estimate of the level of traffic passing by the sites. The model has been set up so that either dataset can be used. However, this does not fundamentally affect the forecast, as it simply raises or lowers the proportion of trucks wanting to park per traffic volume. As such AADT scenarios are displayed here.

4.2.2 Truck Park Utilisation

In order to refine the overnight parking utilisation rates used in the Phase 1 calculations, additional ‘gatehouse’ data was sought from both Ashford Truck Stop and STOP 24. This has been used to help work out the average occupancy rate for both day and night time, with night assumed to be between 18:00 and 06:00. Again the user can determine if they wish to assess demand for both day or night demand. The results in the following section are for night demand as this is when capacity is at its most critical.

Ashford was able to provide a month’s worth of hour by hour occupancy data for November 2013. In the KCC market research work Ashford reported that they were full 6/7 days a weeks. This is borne out by the gatehouse data that shows for multiple hours during the night on multiple nights of the week there were no available spaces. Using the hour by hour gatehouse records the overall calculated overnight utilisation for the truck park used in the demand model is 84%.

Data for the month of January was provided by STOP 24. However this provides the number of vehicles entering the site and the number exiting by hour of the day. Whilst this is very helpful to determine patterns of arrivals and departures, it needs to be borne in mind that the site also provided Customs clearance services and the 40 new spaces (the bus transfer area) is not within the gated boundary. Having double checked with the site operator, and validated the response against KCC’s own market research exercise where the site reported 98% utilisation, we have used the 98% figure for the demand model.

Turning to the Dover White Cliffs Business Park site there is of course no existing parking profile to help calibrate site specific demand as opposed to corridor demand. In the absence of this we have assumed 100% utilisation at the nearby 100 space Dover Truck Stop site (operated by Priority Freight). The newly installed Dover Motis site (Western Docks) has informed the AECOM study team that as of December 2013 they were offering 300 spaces and were currently 50% utilised. Our demand model therefore assumes a 50% overall utilisation for the White Cliffs site. In response to the KCC market research exercise Motis reported that they expect demand to rise, especially when Dover Truck Park establishes on full site facilities. At present the facility is purely a secure parking facility which charges £10.

Overall it can be summarised that truck parking at the two established sites of Ashford and STOP 24 is nearing or is at capacity. Taking an overall utilisation of 84% for Ashford is, for the purposes of this study a conservative estimate as it masked the very real probability spaces are not available on multiple occasions throughout the week, meaning that drivers will be seeking alternative locations.

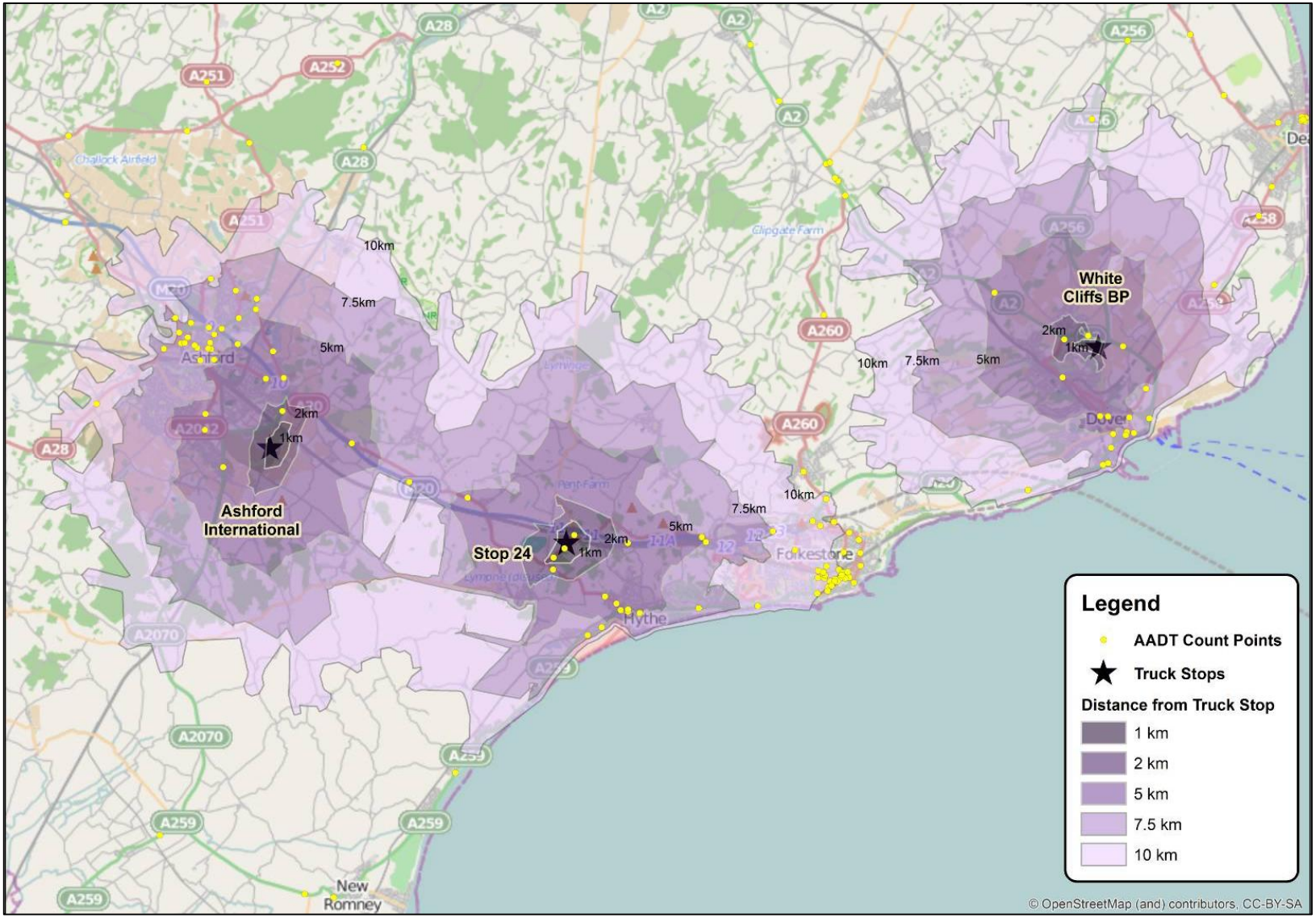

Figure 4.1: AADT Truckstop Isochrones

4.2.3 Price Elasticity

Based on driver feedback, the model now also incorporates an element of price elasticity. This has been incorporated through a cumulative matrix based on rates of charging and the level of facilities set by the user, the relevant proportion of drivers willing to pay is then inputted directly into the demand factor. The model is sensitive to change in multiples of €10. A number of scenarios are displayed in the results for intermediate facilities as this level provides the closest fit to the aspirations of Kent County Council. For the model, demand that is suppressed due to price is assumed to park illegally.

4.2.4 Latent Demand

A measure of latent demand has been ascertained from the driver survey results, based on the number of times drivers state they couldn't get a space. This feedback was incorporated into the model in the form of latent average demand for each site. This was applied to the average utilisation figures to provide an estimate of those wanting to access the site but unable to do so and therefore is added to total demand.

4.2.5 Unauthorised Parking

Unauthorised parking remains difficult to calculate as surveys done in truck stops are evidently not representative since the drivers clearly attempt to park legally. Looking at figures from the Port of Dover may be more accurate but that data cannot be reliably attributed to a site.

As such, to provide some level of estimate of unauthorised parking within the model, an assessment was based on feedback of drivers that attempt to park but cannot, and so park in unauthorised places which equates to 54% of latent demand. However, this invariably underestimates unauthorised parking as it takes no account of those that park in unauthorised locations from the outset, which is estimated to be around 45% of the total population based on driver feedback from the Port of Dover. Further unauthorised demand may come from people that have been captured in truck stops but only be there short term – parking for two hours before leaving to park in a lay-by over night.

As such unauthorised parking is not taken into account in the demand calculations in order to represent a proportion of the truck population that will choose to park elsewhere, when in reality that demand may in fact choose to park in a truck stop if it were available.

4.2.6 Impact of Enforcement

The driver survey results stated that 70% of driver experienced enforcement and that overwhelmingly drivers were fined and moved on. Once moved on, 41% would be inclined to look for an alternative lorry park. As such the model incorporates this number of vehicles, based on demand for unauthorised parking (70% x 41%) and feeds these back into the truck stop raw demand calculations. For the results, the enforcement rate is set at 70%, though this can be altered.

4.2.7 Truck Stop Expansion

As the revised model is site specific, it is assumed no further expansion of the sites will take place within the timeline of the project, as such this is set to zero but can still be altered to reflect further development if necessary.

4.2.8 Summary

The above improvements allow a far greater level of confidence in the data, backed up by raw data from both truck stops, in terms of gatehouse data as well as feedback from drivers as to their considerations in terms of willingness to deviate from their route, willingness to pay fees and levels of enforcement experienced and facilities desired.

4.3 Results

As a consequence of the changes set out in the previous section, a new set of results has been generated. The following table explains the meaning of the components of the graph.

Table 4.1: Legend Definitions

Colour	Title	Definition
Pink	Potential Provision	Planned provision for new truck stops based on technical drawings
Green	Total Parking	All parking demand (authorised, unauthorised & latent) within 7.5 km of the site
Blue	Truck stop Parking	Demand for parking at all truck stops within 7.5 km of the site
Purple	Net Authorised Parking	New demand for authorised parking from traffic growth not catered for by existing capacity at current levels of utilisation
Red	Unauthorised Parking	Vehicles parking in unauthorised areas (lay-bys and industrial estates)

4.3.1 Scenario 1 - Volumes:

- *Intermediate facilities*
- *No price impact (i.e. current prices – approximately €20)*
- *AADT Data at 7.5km*

The following scenario looks at intermediate facilities deemed most likely to reflect the level of facilities being built by KCC. Further to this, the scenario also reflects no change in prices above what is being charged at existing facilities, therefore skewing demand. In later scenarios, we will show how price impacts demand.

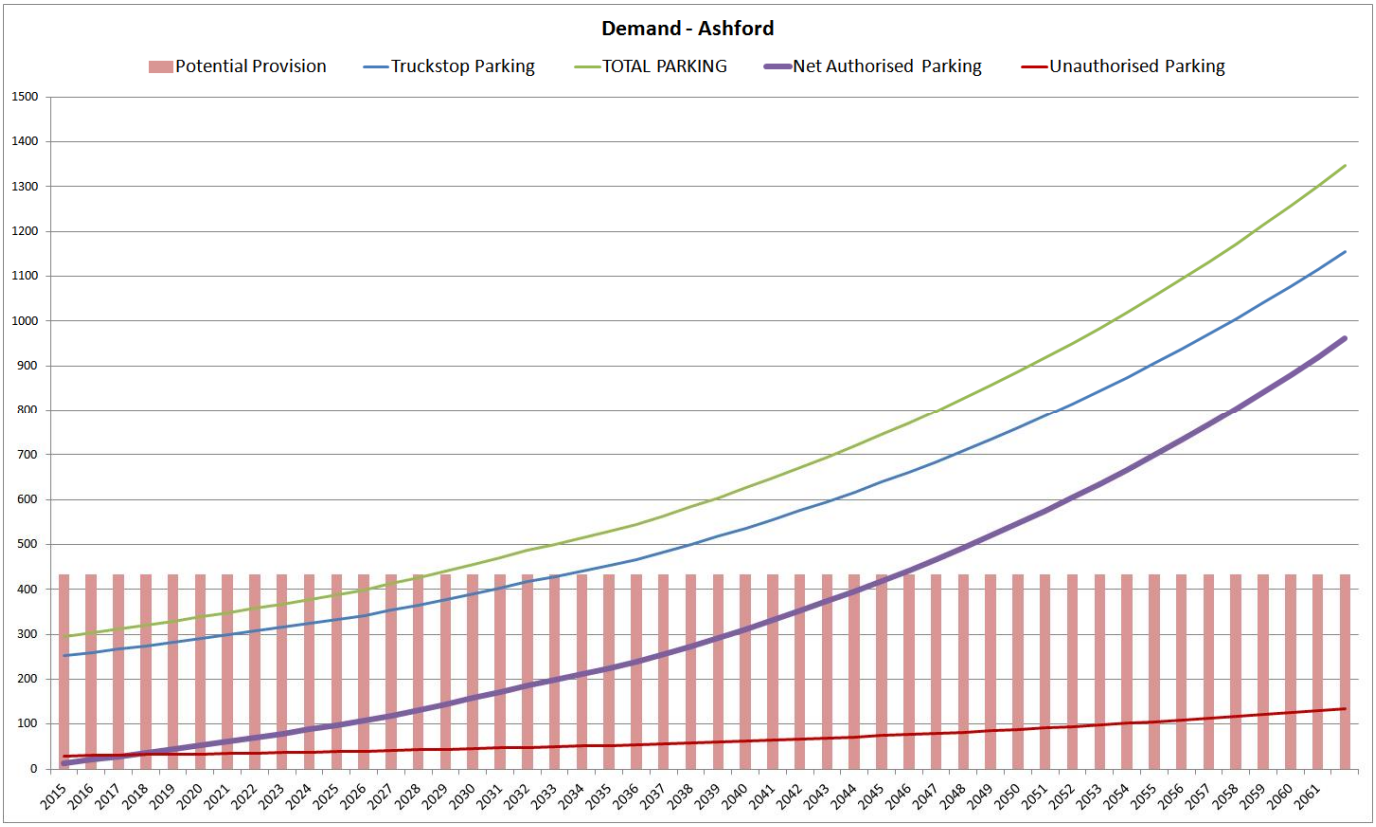

Figure 4.2: Extension of Ashford International Tuck Stop Scenario 1 Results

As can be seen for Ashford from Figure 4.2, similar patterns of demand exist to that seen in the first version of the model. Although the rate of growth is similar (with total demand doubling by 2039) it is from a much lower base due to the much lower AADT volumes and levels of parking provision. Based on current levels of average utilisation of 84%, it would be 2020 before authorised parking demand (purple line) exceeds the current capacity of 300 and the extension of 434 spaces proposed will serve well beyond the 2040 timeline of this forecast.

A similar story can be seen in Figure 4.3 for the site behind Stop 24 thought the rate of growth is slightly slower, just doubling by 2042. Based on current utilisation patterns and a capacity of 550 spaces, the extension to provision would serve until around 2057. Current capacity is full and will be reached by next year.

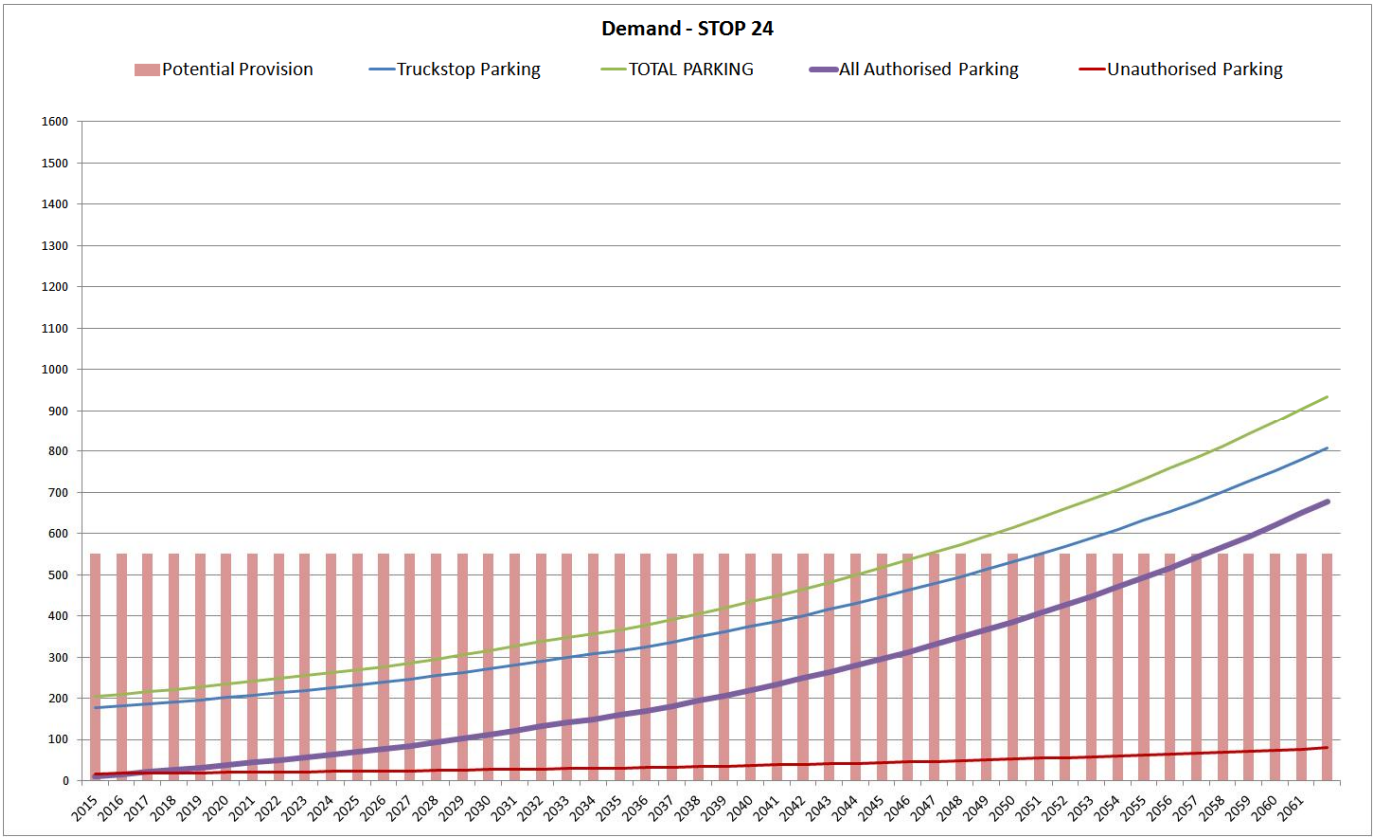

Figure 4.3: Site Behind STOP 24 Westenhanger Scenario 1 Results

Figure 4.4, for White Cliffs shows similar rates of growth to Ashford and from a similar base. Planned developments would be adequate to 2043 assuming all further demand goes to White Cliffs, it is likely therefore that capacity will last longer as other parks within the region cater for a proportion of demand, however, this would negatively impact on the financial case and this is discussed later.

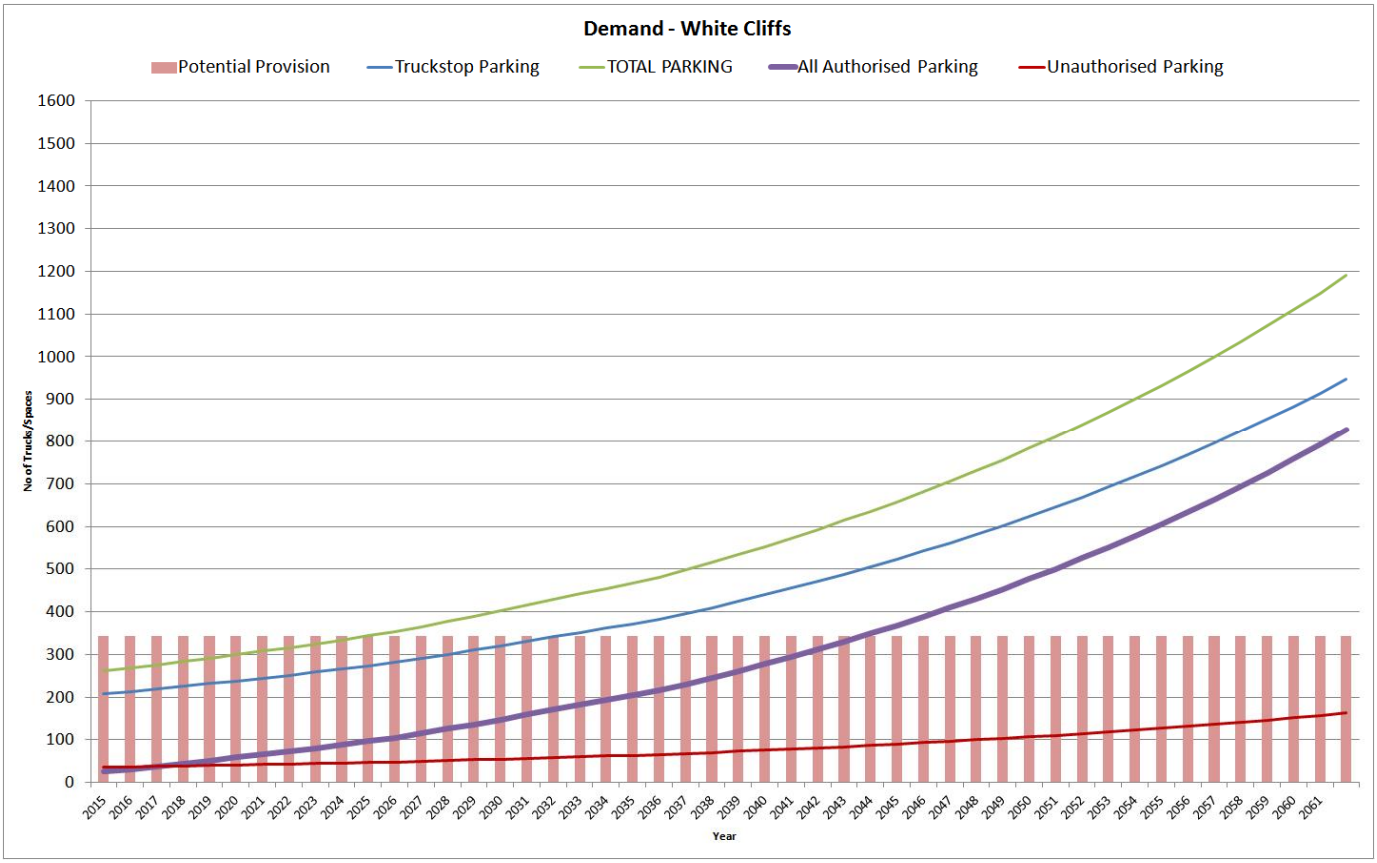

Figure 4.4: White Cliffs Business Park Scenario 1 Results

4.3.2 Scenario 2a - Price Elasticity – Ashford Example Intermediate Facilities

- *Intermediate facilities*
- *Price Increase to €25*
- *AADT Data at 7.5km*

In the following example scenario, simulating a fee increase to €25 per night at Ashford (Figure 4.5) utilisation is significantly reduced and growth declines by 19% with users turning to alternatives. There is a similar pattern of reduce demand at the other sites under this price increase scenario.

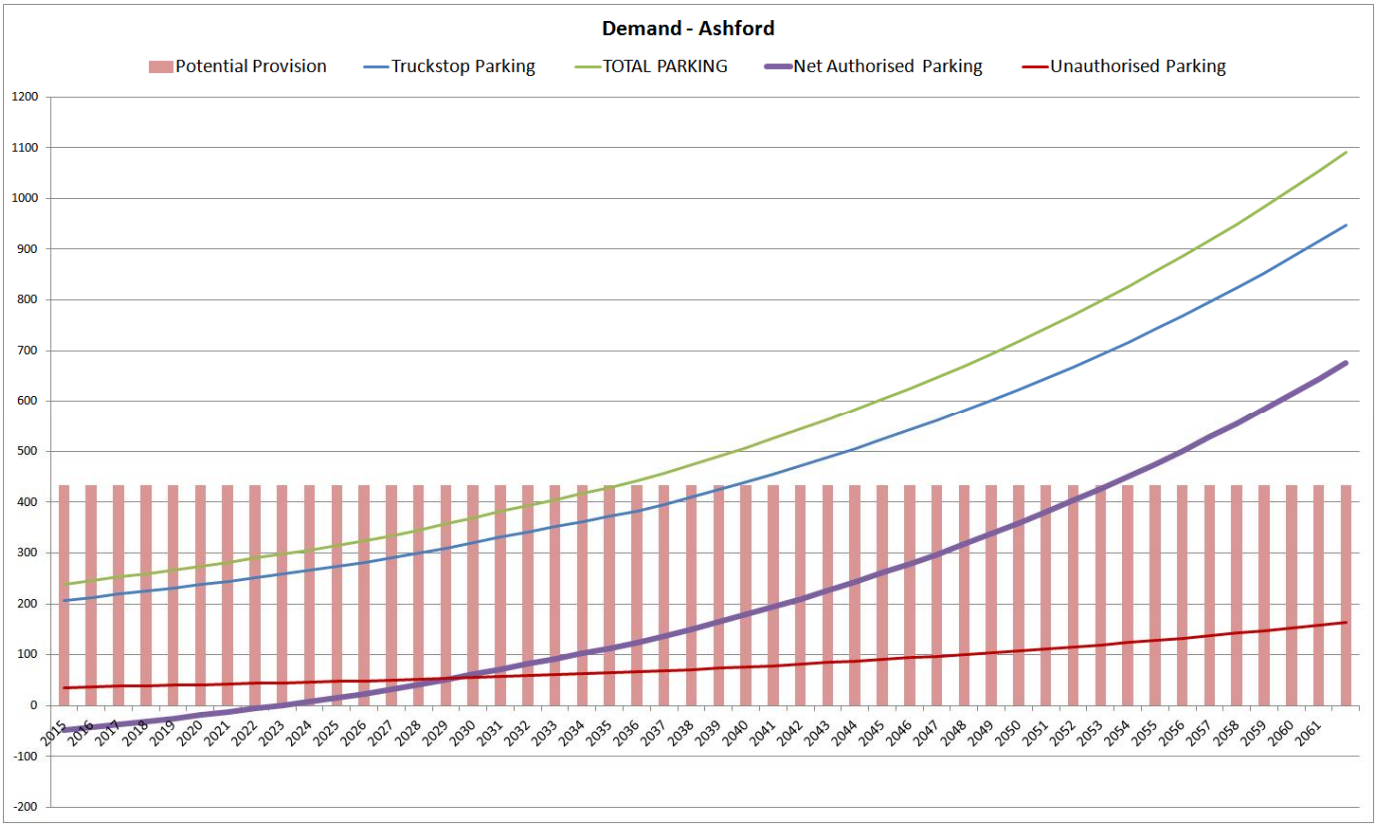

Figure 4.5: Extension of Ashford International Tuck Stop Scenario 2a Results

4.3.3 Scenario 2b - Price Elasticity – Ashford Example Advanced Facilities

- *Advanced facilities*
- *Price increase to €25*
- *AADT Data at 7.5km*

We have seen from the driver interviews that having advanced facilities provides much more scope to increase fees, as drivers are less price sensitive. In the intermediate scenario, demand reduced dramatically when the fee was raised to between €20 and €30.

In this example scenario for Ashford with advanced facilities we can see that demand is reduced by around 17% (Figure 4.6).

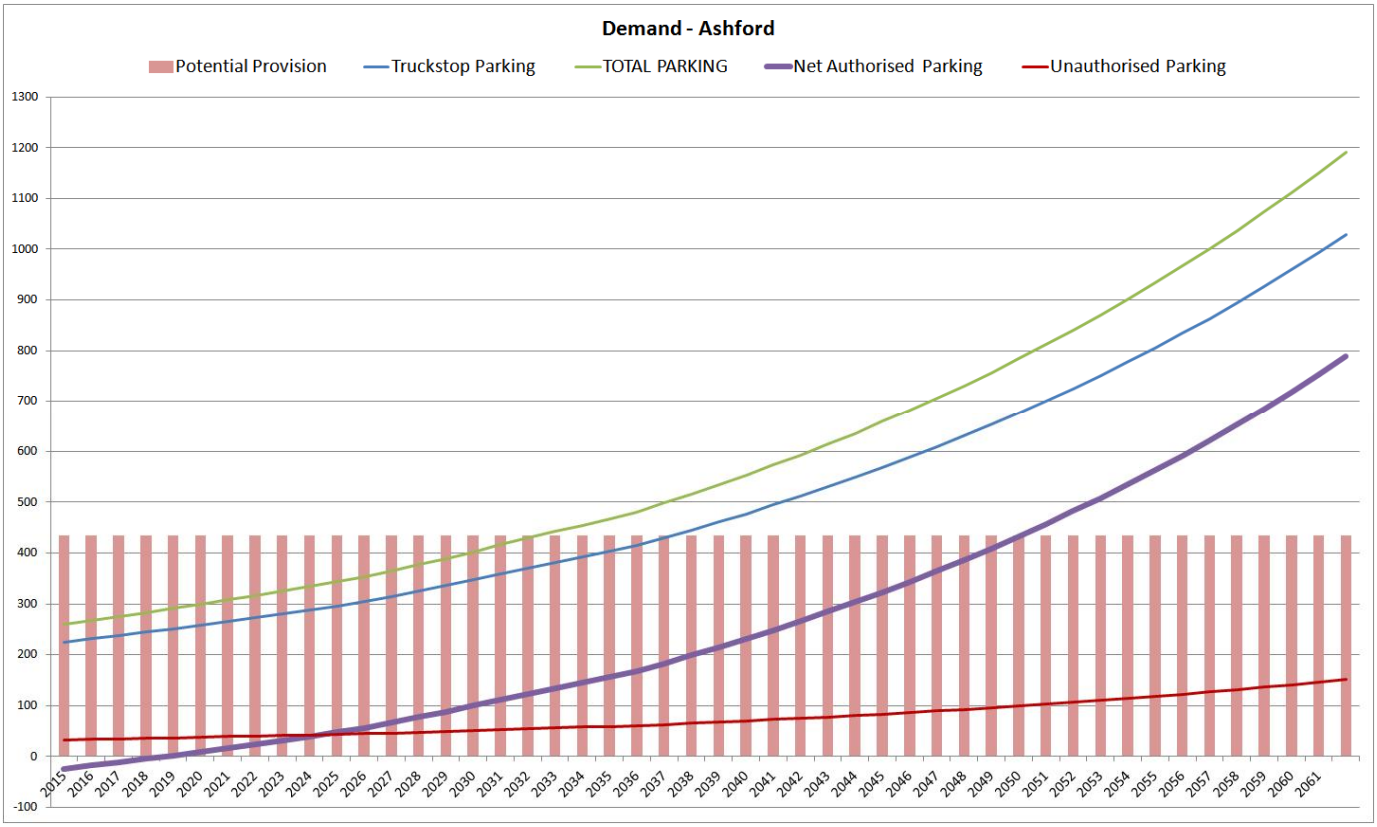

Figure 4.6: Extension of Ashford International Tuck Stop Scenario 2b Results

STOP 24 is in a similar position, losing around 15% of its demand (Figure 4.7). If the level of additional revenue offsets the loss of demand, it may be a solid business case, and a breakeven comparison may be worth undertaking to determine this feasibility. However there is some increase in illegal parking as people start to become displaced.

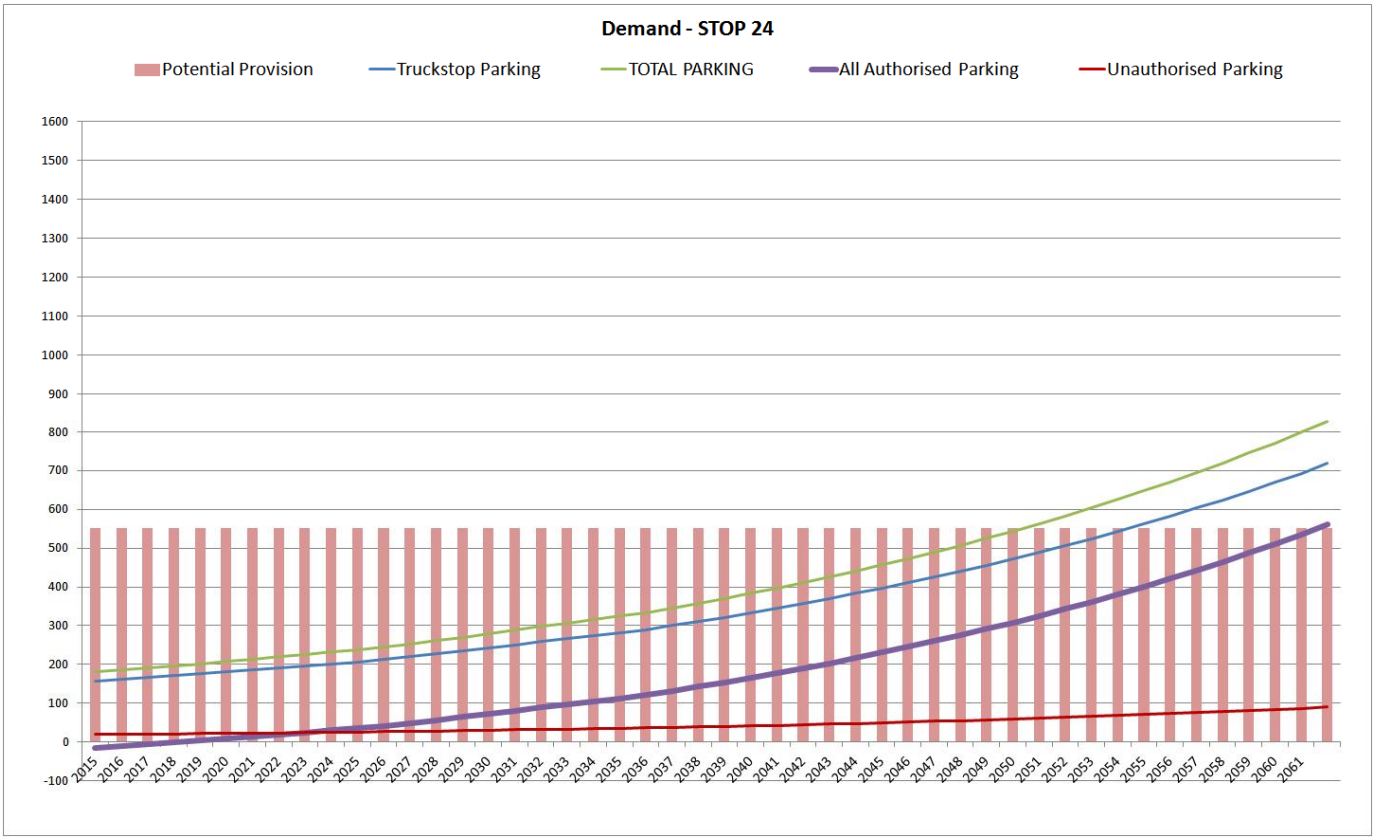

Figure 4.7: Site behind STOP 24 Westenhanger Scenario 2b Results

4.4 Summary

The section provides a number of updates to increase the robustness and flexibility of the demand model, though many of the variables have only a small impact on the overall picture, such as the level of enforcement being undertaken, due to the low levels of unauthorised parking in relation to the very large volume of traffic. The key change has been the move from corridor based to a sited base assessment meaning we can look at each on an individual basis.

In terms of comparison between the Phase 1 and Phase 2 analysis, the level of growth in international freight traffic has not changed, however the volumes of vehicles involved has been disaggregated.

An interesting point, on the assumption that only one site is to be developed, is that the proposed increase of spaces to an overall total of 858 at Ashford would be able to cope with all of Ashford and STOP 24's predicted growth by 2040 (Figure 4.8) whereas the proposed size of development at STOP 24 would not. And another site would have to be developed by around 2035 (Figure 4.9).

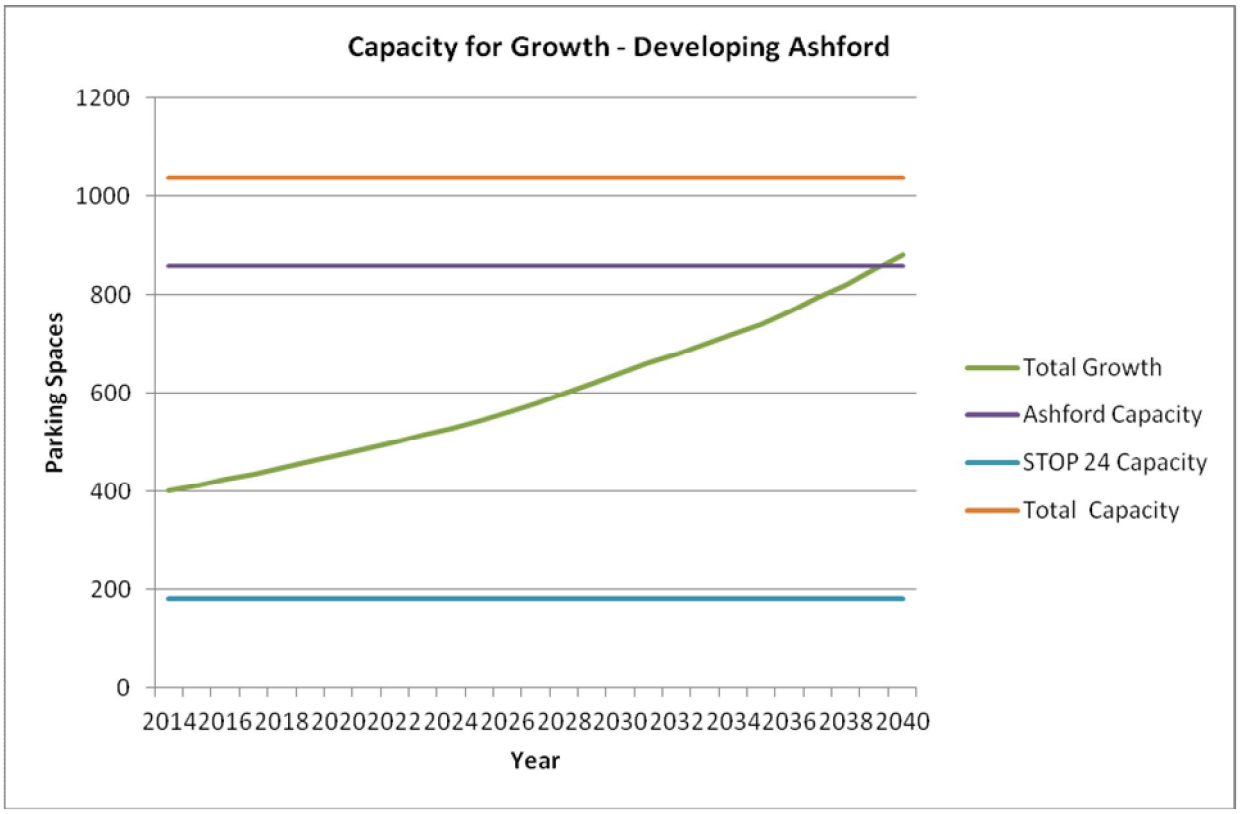

Figure 4.8: Extension of Ashford International Tuck Stop

It shows that even if STOP 24 was to close, capacity at Ashford would only be exceeded in 2039 should the full development takes place. Whereas in Figure 4.9, the STOP 24 site development would be at capacity by 2019 should there be no Ashford, and both sites would be at capacity by 2038.

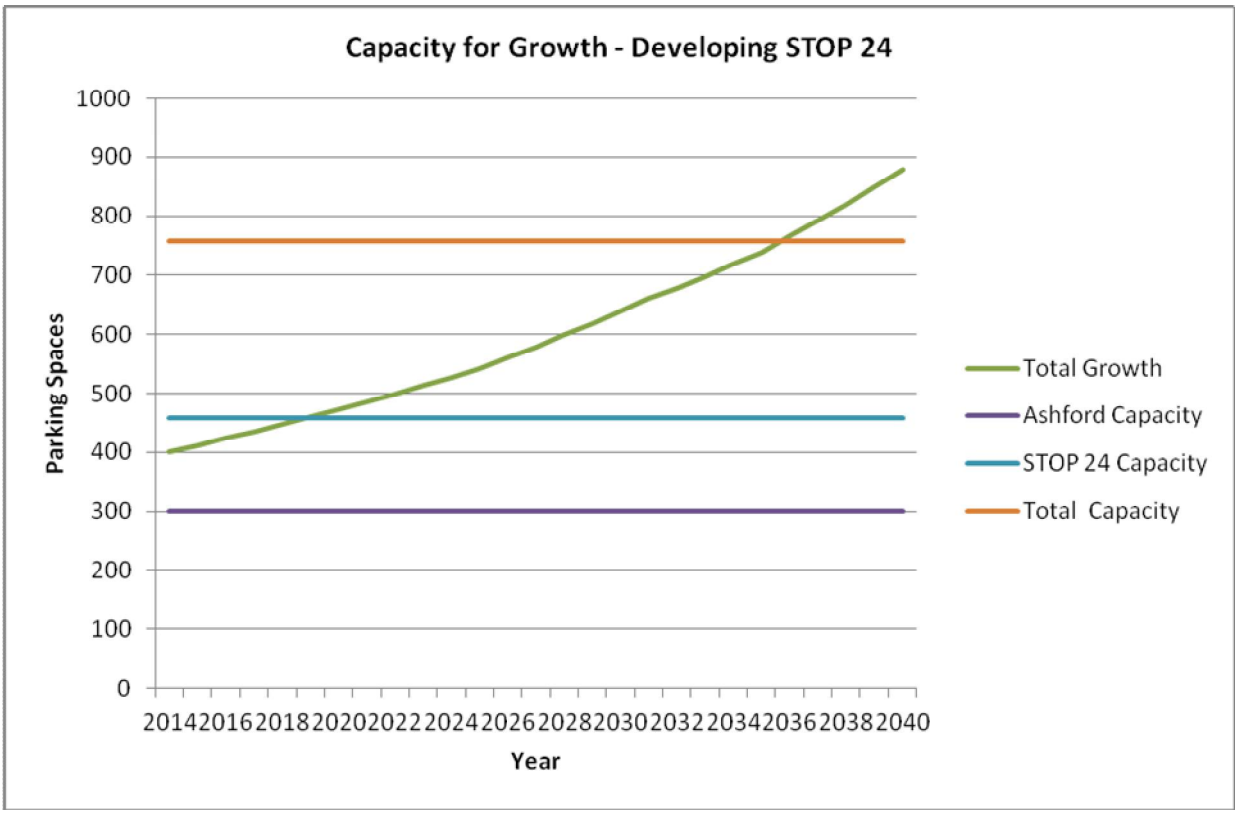

Figure 4.9: Developing Site behind STOP 24 Westenhanger

Following consultation with the Client in concluding this Phase 2 analysis we have further modelled the scenario for a single M20 corridor site and the results are set out in Chapter 6.

Financial Modelling

5 Financial Modelling

5.1 Introduction

AECOM developed a financial analysis tool for KCC to identify the likely internal rate of return for one or more lorry parks based on the assumptions set out in the preceding chapters and costs estimates for building and operating a lorry park. The Phase 1 report set out a number of fundamental issues and caveats, which are not repeated here, that KCC need to understand in order to make the case for promoting a number of new lorry parks and pursuing the most appropriate method of ownership. As with the Phase 1 report, there are a number of assumptions and caveats:

- There has been no risk adjustment to the cost and revenue assumptions. Ideally a quantified risk analysis should be undertaken of revenue and costs to examine the impact on the business case
- There has been no consideration of wider economic or social costs and benefits, as would be the case if putting forward a webTAG compliant business case for investment by the public sector
- The assumptions on demand, utilisation, pricing strategy, discount rates, life of the lorry park/ operating period and costs are all subject to refinement and sensitivity tests
- No assumption has been made on asset value at the end of the appraisal period or depreciation
- Assumptions regarding grants and public sector loans have been provided by Kent County Council

A comparison of the Phase 1 and Phase 2 financial model inputs is shown in Appendix B.

Revenue Derivation

5.1.1 Demand and Lorry Park Utilisation

Revenue within the model is derived as a function of truck parking demand, charges, and added value services such as the restaurant or cafe. Chapter 4 sets out the assumptions on demand and utilisation over time. The main driver of revenue relates to overnight lorry parking. Table 5.1 summarises utilisation over 25 years for each site. It should be noted that Year 1 is the first year of operation and not the construction year. The model is set up for a year ‘0’ build year with operations for the next 25 years / next 40 years and refurbishment in year 26.

Table 5.1: Site Specific Nightly Demand by Year of Operation

Year of operations	Site 57 White Cliffs	Site 8 STOP 24	Site 6 Ashford
1	44	27	36
2	51	32	45
3	58	38	53
4	65	44	61
5	73	50	70
6	80	57	79
7	88	63	88
8	96	70	98
9	105	77	108
10	115	85	120
11	125	94	132
12	136	103	145
13	147	112	158
14	159	122	172
15	171	132	186
16	182	141	198
17	192	150	211
18	204	159	224
19	215	169	238
20	230	181	255
21	245	194	273
22	261	207	292
23	277	220	311
24	294	235	331
25	312	249	352

Demand is calculated using the model from 1 year after construction to the point at which it reaches capacity, whereby growth stops and the site remains full, with the exception of Year 26 (when modelling a 40 year lorry park) when capacity is assumed to decrease by 10% for one year due to refurbishment.

5.1.2 Pricing Strategy

The pricing strategy assumes a charge structure of:

Table 5.2: Pricing Strategy

	£ per lorry
Overnight	£15
Day < 2 hours	Free

It is possible to change these assumptions in the model, for example to bring charges in line with those charged elsewhere. This can have a significant impact on the business case.

Charges are not assumed to change over time, although in practice there may be scope to increase them depending on average returns and wages in the freight industry.

5.1.3 Estimated Added Value Services Revenue

The potential revenue that could be generated from the provision of added value services such as a restaurant and shop may be an important consideration. For the purposes of this study AECOM have been relatively modest in their assumptions and have not taken into account potential revenue that would be generated from other provisions such as fuel. However, these may be necessary to build a stronger business case for a given site.

The average additional spend on value added services e.g. in the restaurant, is assumed to be:

Table 5.3: Average Additional Spend

	£
Overnight	£6
Day	£3

This average additional spend is assumed to apply to all lorry drivers, overnight lorry drivers are expected to spend £6 each with daytime drivers spending much less – around £3 on sundries such as drinks or newspapers. Revenue within the model is therefore the level of overnight demand multiplied by overnight fees added to day time drivers multiplied by daytime fees.

5.2 Costs

5.2.1 Introduction

When modelling development projects, there are a number of key components that need to be considered within the model. These are:

- Capital Costs
- Operating Costs
- Maintenance Costs

The following section looks at these in turn, highlighting the method of estimation and any assumptions and limitations the estimates have in this high level model.

5.2.2 Capital Costs

Capital costs are items such as land purchase, design and construction and facilities.

Purchase/Lease Property Costs
Table 5.4 summarises the assumptions on land costs for the three sites as provided by KCC. It has been assumed that the land will be purchased. This will be a one off payment that will need to be set against the projected revenue of the lorry park in the future.

Table 5.4: Land Value Estimates by Site

Site ID	Name/Description	Located On	Nearest Trunk Road/ Junction	Authority/ District	Number of Truck Parking Spaces	Land Value Estimate £m (Phase 1 estimates)
A2/M2/A2 Corridor						
57	White Cliffs Business Park 1	A2	A2/A256	Dover	234	2.52 (2.75)
M20/A20 Corridor						
8	Westenhanger (site behind STOP 24)	M20	J11 M20	Shepway	552	0.64 (agricultural land) (0.105)
6	Site Adjacent to Ashford Int'l Truck Stop	M2070	J10 M20	Ashford	434	6.47 (10.1)

5.2.3 Construction Costs
The site development, infrastructure and security costs have been provided by KCC and was based on layout drawings for the specific sites. Cost estimates include earthworks, site clearance, and surfacing, with prices factored up to current values.

There may also be considerable professional services costs, dependent on what services are required. The following are likely to be required:

- Architectural services
- Planning Permission and associated fees
- Structural Engineers
- Contractor & Project Manager

Though these costs will be individually tendered, for the purposes of this study the costs for these services have been assumed as factored into the infrastructure and equipment costs.

5.2.4 Operational Costs
Operational costs are incurred when the facilities are open including utilities, labour, tax and insurance and must be accounted for in the outline financial analysis. Based on additional information since the Phase 1 Report, a maintenance cost of £450 per space per year and an operating cost of £1,666 per space per year have been assumed. The updated maintenance and operational costs have been determined from the Market Research outcomes provided by KCC. The annual maintenance and operational cost for each of the existing truck parks have been divided by the number of spaces. The maintenance cost at Ashford International Truck Stop was much lower per space than at Stop 24 and Dover Truck Stop while the operating costs were much higher. It was therefore decided to use similar maintenance and operational costs per space as at Stop 24.

Many of these costs are dependent on the operational model of the truck stop; as such the model only seeks to evaluate the commercial case for a truck park irrespective of its operational model.

Staff

Operational staff costs will be determined by the level of security and the additional services provided. Furthermore, staff may also require relevant training (e.g. health and safety).

Associated Taxes & Insurances

As well as those costs discussed above, it will also be necessary to consider the relevant local/national taxes and insurances. The following should be considered as a minimum:

- Business rate
- Staff taxes
- Public liability taxes
- Contents insurance
- Buildings insurance

Such taxes and insurances have been factored into the business case but should be amended when the correct rates have been determined.

5.3 Model Outputs

This section sets out the results of the financial model runs for the three sites.

This analysis is based on a snapshot of each of the sites being built in 2016 and not on the basis of the sites being built on a sequential basis.

The financial model calculates annual revenue and costs based on assumptions regarding demand, lorry park utilisation, pricing strategy and lorry park costs. The financial analysis is based on estimating cash flow as a function of these, the rate of return and the present value. A 25 and a 40 year time period has been assumed. If necessary, different time periods could be investigated.

The model then determines the **Internal Rate of Return** (or economic rate of return). This is in effect the discount rate that makes the net present value of the cash flows equal to zero. It provides an indication of the efficiency of the investment, which can be compared to the rate of return from other investments and a minimum acceptable rate of return, which will vary by operator, sector and appetite for risk. This can be used as the basis for determining and how and whether to take forward the investment and the most appropriate ownership model.

A **Net Present Value** for the investment is also calculated, providing an estimate of the magnitude of the return. As the construction and operation of the lorry parks is potentially a commercial venture, the social discount rate of 3.5% (3% after 30 years) cited in the Green Book may not be appropriate. Instead, the rate should reflect the potential commercial returns by operators in the market place facing a similar level of risk. This can be assumed to be somewhere between 5 – 10% (7.5% is assumed in the model, but can be changed), although a higher value may be appropriate if cost and revenue risks are considered to be particularly high.

It is important to note that within this commission AECOM is not giving investment advice. The truck park assessments as set out in this report are based on a series of assumptions as set out in the report and associated technical notes and as agreed between AECOM and Kent County Council. The outcome of assessments are directly driven by the assumptions and the data used for the assessments and subject to uncertainty. Whilst the uncertainty of the assessments can be the subject of a risk analysis, the remit of this work does not include undertaking of risk analysis.

Table 5.5 gives the Internal Rate of Return (IRR) and Net Present Value (NPV) outputs of the model taking into consideration a 25 and 40 year investment horizon. In broad terms the higher the IRR and NPV the better the investment is likely to be. It can be

seen that across sites and between the 25 year and 40 year investment horizons there is either only a small or no return (indicated as “Not Applicable”) on investment. The NPVs are negative in all cases.

Table 5.5: IRR and NPV Model Outputs

						Average Annual Operational:			
Site	Development Year	Operational Life	Capital Cost	Grant	Loan % of capital costs	Revenue	Op + Main Costs	IRR	NPV
57	2016	25	£12,560,641	£ -	0%	£1,289,273	£817,553	Not applicable	-£10,619,982
57	2016	40		£ -	0%	£1,849,220	£884,442	3.7%	-£8,216,127
8	2016	25	£17,123,208	£ -	0%	£989,054	£1,319,558	Not Applicable	-£22,781,768
8	2016	40		£ -	0%	£1,820,774	£1,427,521	Not Applicable	-£20,897,368
6	2016	25	£19,097,944	£ -	0%	£1,336,148	£1,037,479	Not Applicable	-£19,314,544
6	2016	40		£ -	0%	£2,088,348	£1,122,363	2.0%	-£16,550,948

Figures 5.1-5.3 show the results of each site in terms of revenue, costs and cash flow. Overnight demand is also shown (using the secondary vertical (y) axis). Construction and land costs have not been included on the charts.

The decrease in Year 26 is due to a 10% decrease in capacity for one year to reflect a more substantial refurbishment or upgrade in that year. Cash flow slowly declines once the park has met capacity, due to the assumption that there are real increases in cost (1% has been assumed) but that the charge for using the park will not rise (in real terms). Both assumptions can be changed.

At Site 57 demand increases to capacity within 27 years, with a concomitant increase in revenue from £364k in year 1 to £2.81m by year 27. Cash flow increases until year 27 (except in year 26 when there is a decrease due to additional refurbishment), before decreasing slightly assuming operating and maintenance costs increase in real terms but revenue (and charging levels) remains constant. At Site 8, revenue increases from £220k in year 1 to £4.45m in year 40 when the park has still not reached capacity. At Site 6, revenue increases from £288k in year 1 to £3.42m in year 29. The charts do not take into account the upfront costs of construction and land, although these are accounted for in the IRR and NPV calculations in Table 5.5.

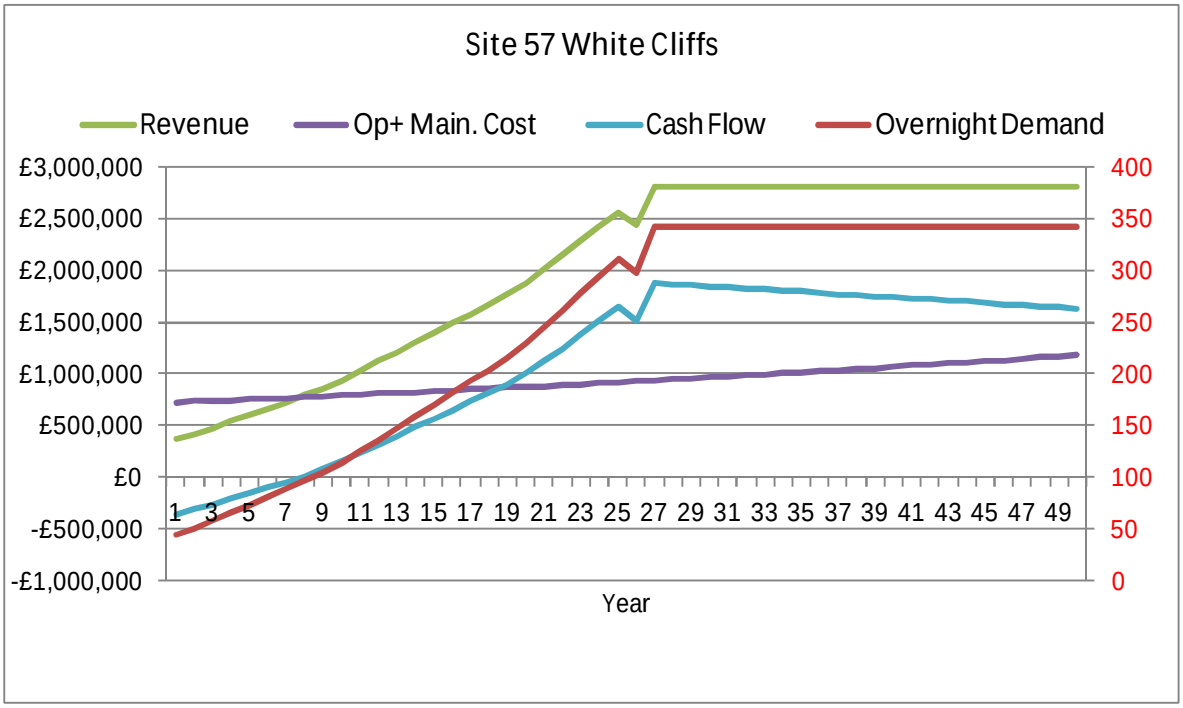

Figure 5.1: Site 57 Revenue, Operating and Maintenance Costs, Cash Flow (primary vertical axis) and Demand (secondary vertical axis) post-Construction

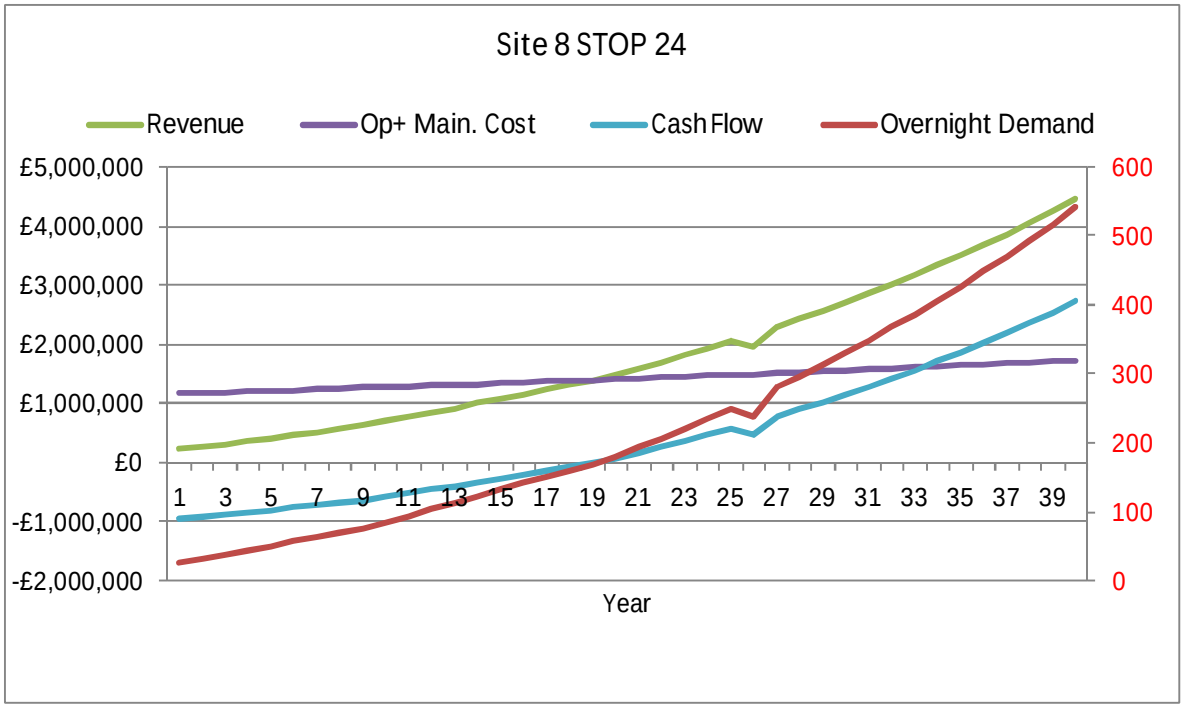

Figure 5.2: Site 8 Revenue, Operating and Maintenance Costs, Cash Flow (primary vertical axis) and Demand (secondary vertical axis) post-Construction

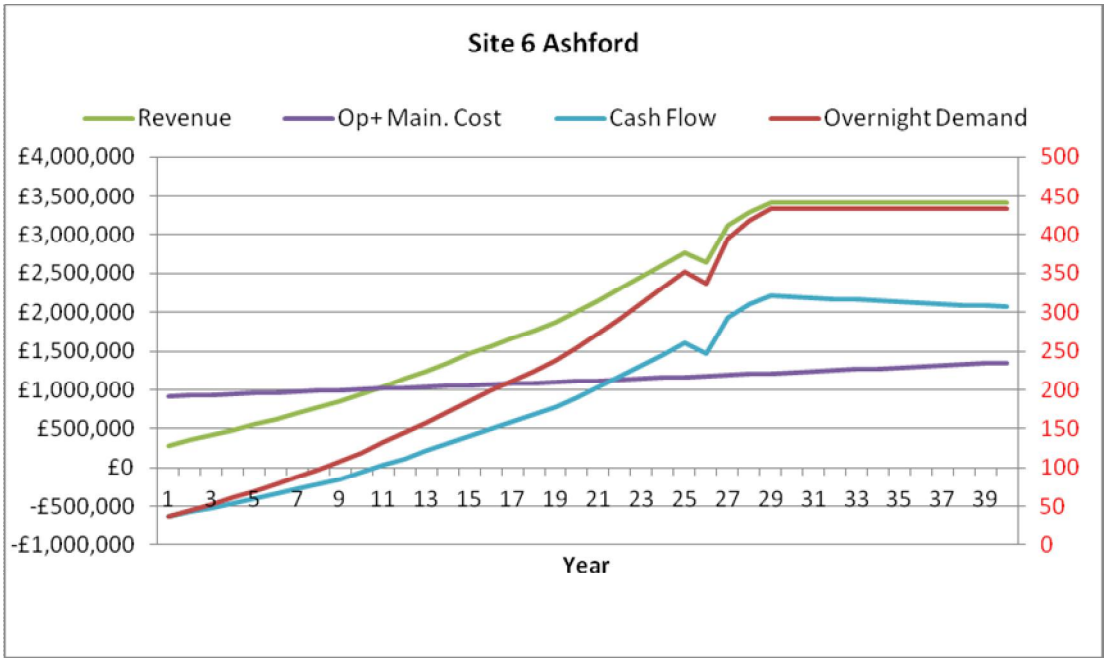

Figure 5.3: Site 6 Revenue, Operating and Maintenance Costs, Cash Flow (primary vertical axis) and Demand (secondary vertical axis) post-Construction

5.4 Grant and Loan

There is the possibility of a grant from the LEP and/or a Treasury loan. These would have a significant impact, avoiding the need to pay for construction up front (or at all in the case of a large grant) and in effect discounting the payment of the construction costs over a period of 25 or 40 years with a Treasury loan.

KCC asked for two scenarios to be tested:

- A mix of grant and loan is used to develop and deliver the project with a 40 points discounted interest rate of 3.74% over 25 years; and
- Full loan utilised to develop and deliver the project with a 40 points discounted interest rate of 4.06% over 40 years.

Tables 5.6 – 5.9 detail the results for each scenario. In comparison with the no grant and loan scenario it can be seen the NPV position is considerably improved but with the exception of the Site 57 25 and 40 year grant and loan scenarios, NPVs are all still negative. IRRs are positive for Site 57 and the IRR for Site 6 under the 40 year grant and loan scenario is also positive.

It should be noted that the loan value takes into account inflation in order to state the actual amount that might need to be borrowed in 2016. However, one caveat is that the calculations assume that the £10m grant will also be linked to inflation (i.e. £10m in 2013 values will be available in 2016). If this is not the case, the total amount borrowed may need to increase slightly. The £10m figure is in any case indicative and could be altered on the basis of other decisions.

The model calculates the IRR and NPV for building and operating a lorry park, assuming that an upfront payment is made to construct the park. By taking a loan, these large upfront costs can be spread out and hence discounted over a number of years. However, whilst there may be a case to determine the IRR and NPV for loan only scenarios, this is not the case for the grant.

In the case of the grant this is still an upfront cost to the public sector, and this should either be included as an upfront cost or subtracted from the benefits.

As such, the IRR and NPV for scenarios with a grant are misleading as currently construed in the attached results. It can be shown that a scenario with no grant will result in the same IRR and NPV as a scenario with a 100% grant - the only difference is that in the latter a source of the funding for the upfront capital costs has been identified, but in the no grant scenario a source of funding has still to be found.

Table 5.6: Summary of Grant and Loan Scenarios

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

Summary 25 and 40 year loans

								Average Annual Operational:			
Site	Development Year	Operational Life	Capital Cost after grant	Grant £10m + uplift 2013-2016	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Revenue	Op + Main Costs	IRR	NPV
57	2016	25	£2,757,530	Y	100%	£2,911,963	£ -	£1,289,273	£817,553	*8.3%*	*£292,102*
57	2016	40	£13,526,437	N	100%	£14,283,971	£ -	£1,849,220	£884,442	*4.5%*	*-£2,939,076*
57	2016	40	£2,757,530	Y	100%	£2,911,963	£ -	£1,849,220	£884,442	*12.2%*	*£2,877,252*
8	2016	25	£7,670,916	Y	100%	£8,100,518	£ -	£989,054	£1,319,558	*Not Applicable*	*-£10,275,864*
8	2016	40	£18,439,822	N	100%	£19,472,526	£ -	£1,820,774	£1,427,521	*Not Applicable*	*-£13,703,464*
8	2016	40	£7,670,916	Y	100%	£8,100,518	£ -	£1,820,774	£1,427,521	*Not Applicable*	*-£7,887,137*
6	2016	25	£9,797,491	Y	100%	£10,346,189	£ -	£1,336,148	£1,037,479	*Not Applicable*	*-£6,118,815*
6	2016	40	£20,566,397	N	100%	£21,718,197	£ -	£2,088,348	£1,122,363	*Not Applicable*	*-£8,527,407*
6	2016	40	£9,797,491	Y	100%	£10,346,189	£ -	£2,088,348	£1,122,363	*5.1%*	*-£2,711,079*

Table 5.7: 25 Year Loan and £10m Grant Scenario

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

25 year loan and £10m grant

								Average Annual Operational:			
Site	Development Year	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Revenue	Op + Main Costs	IRR	NPV
57	2016	25	£2,757,530	£10,000,000	100%	£2,911,963	£ -	£1,289,273	£817,553	*8.3%*	*£292,102*
57	2016	40						£1,849,220	£884,442	*11.6%*	*£2,695,957*
8	2016	25	£7,670,916	£10,000,000	100%	£8,100,518	£ -	£989,054	£1,319,558	*Not Applicable*	*-£10,275,864*
8	2016	40						£1,820,774	£1,427,521	*Not Applicable*	*-£8,391,464*
6	2016	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£1,336,148	£1,037,479	*Not Applicable*	*-£6,118,815*
6	2016	40						£2,088,348	£1,122,363	*4.8%*	*-£3,355,219*

Table 5.8: 40 Year Loan and No Grant Scenario

40 year loan, no grant

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

								Average Annual Operational:			
Site	Development Year	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Revenue	Op + Main Costs	IRR	NPV
57	2016	25	£13,526,437					£1,289,273	£817,553	*Not Applicable*	*-£4,815,382*
57	2016	40		£ -	100%	£14,283,971	£ -	£1,849,220	£884,442	*4.5%*	*-£2,939,076*
8	2016	25	£18,439,822					£989,054	£1,319,558	*Not Applicable*	*-£14,868,687*
8	2016	40		£ -	100%	£19,472,526	£ -	£1,820,774	£1,427,521	*Not Applicable*	*-£13,703,465*
6	2016	25	£20,566,397					£1,336,148	£1,037,479	*Not Applicable*	*-£10,488,886*
6	2016	40		£ -	100%	£21,718,197	£ -	£2,088,348	£1,122,363	*Not Applicable*	*-£8,527,407*

Table 5.9: 40 Year Loan and £10m Grant Scenario

40 year loan and £10m grant

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

								Average Annual Operational:			
Site	Development Year	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Revenue	Op + Main Costs	IRR	NPV
57	2016	25	£2,757,530					£1,289,273	£817,553	*9.3%*	*£580,945*
57	2016	40		£10,000,000	100%	£2,911,963	£ -	£1,849,220	£884,442	*12.2%*	*£2,877,252*
8	2016	25	£7,670,916					£989,054	£1,319,558	*Not Applicable*	*-£9,472,360*
8	2016	40		£10,000,000	100%	£8,100,518	£ -	£1,820,774	£1,427,521	*Not Applicable*	*-£7,887,137*
6	2016	25	£9,797,491					£1,336,148	£1,037,479	*Not Applicable*	*-£5,092,559*
6	2016	40		£10,000,000	100%	£10,346,189	£ -	£2,088,348	£1,122,363	*5.1%*	*-£2,711,079*

Annual cash flows are illustrated in Figures 5.4-5.6. These figures show the cash flow break even points for the various scenarios tested for each of the sites (cash flow break even is indicating where the x-axis is crossed).

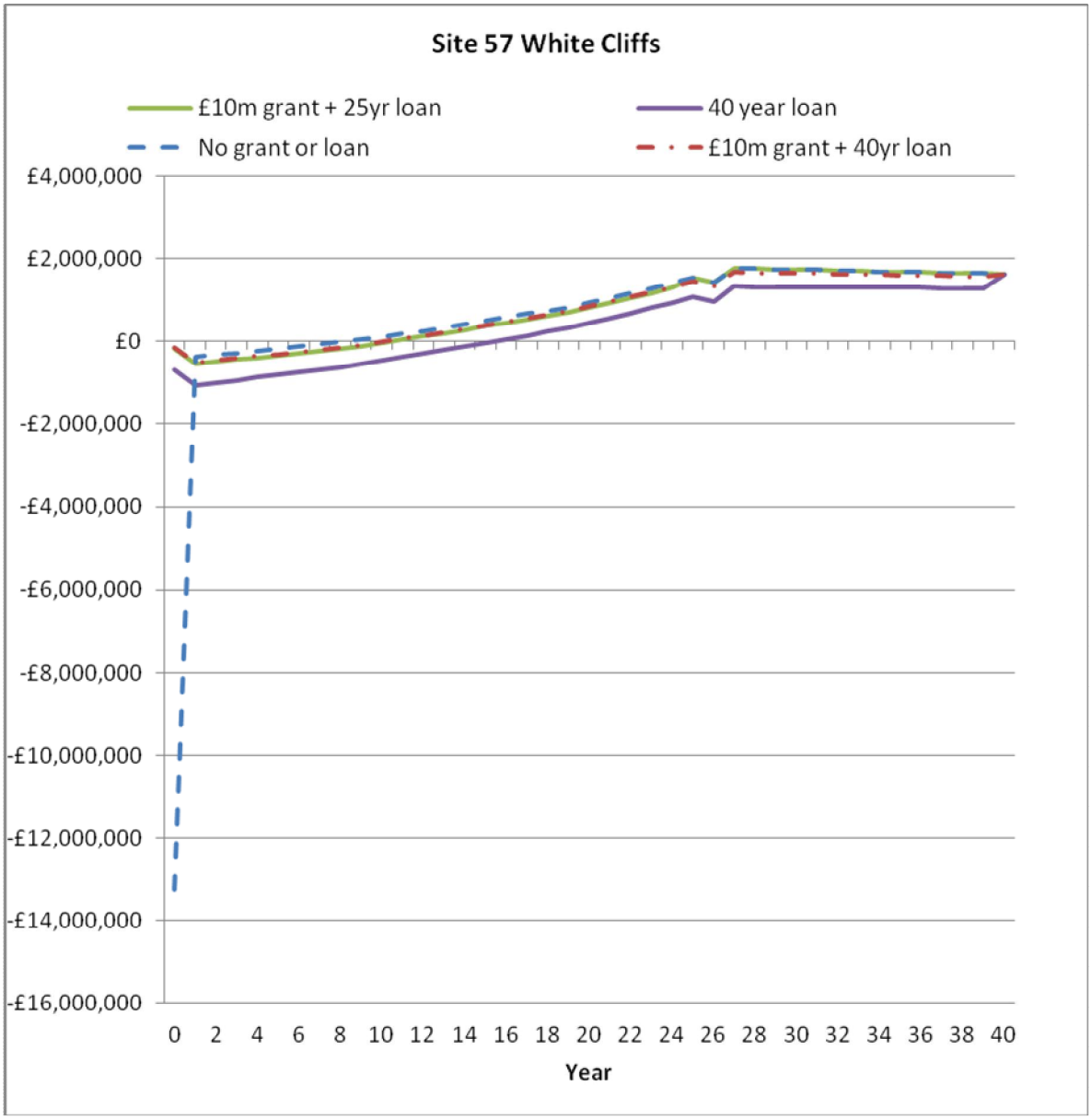

Figure 5.4a: Cash Flow under Different Scenarios for Site 57 White Cliffs Business Park Indicating Break Even Points

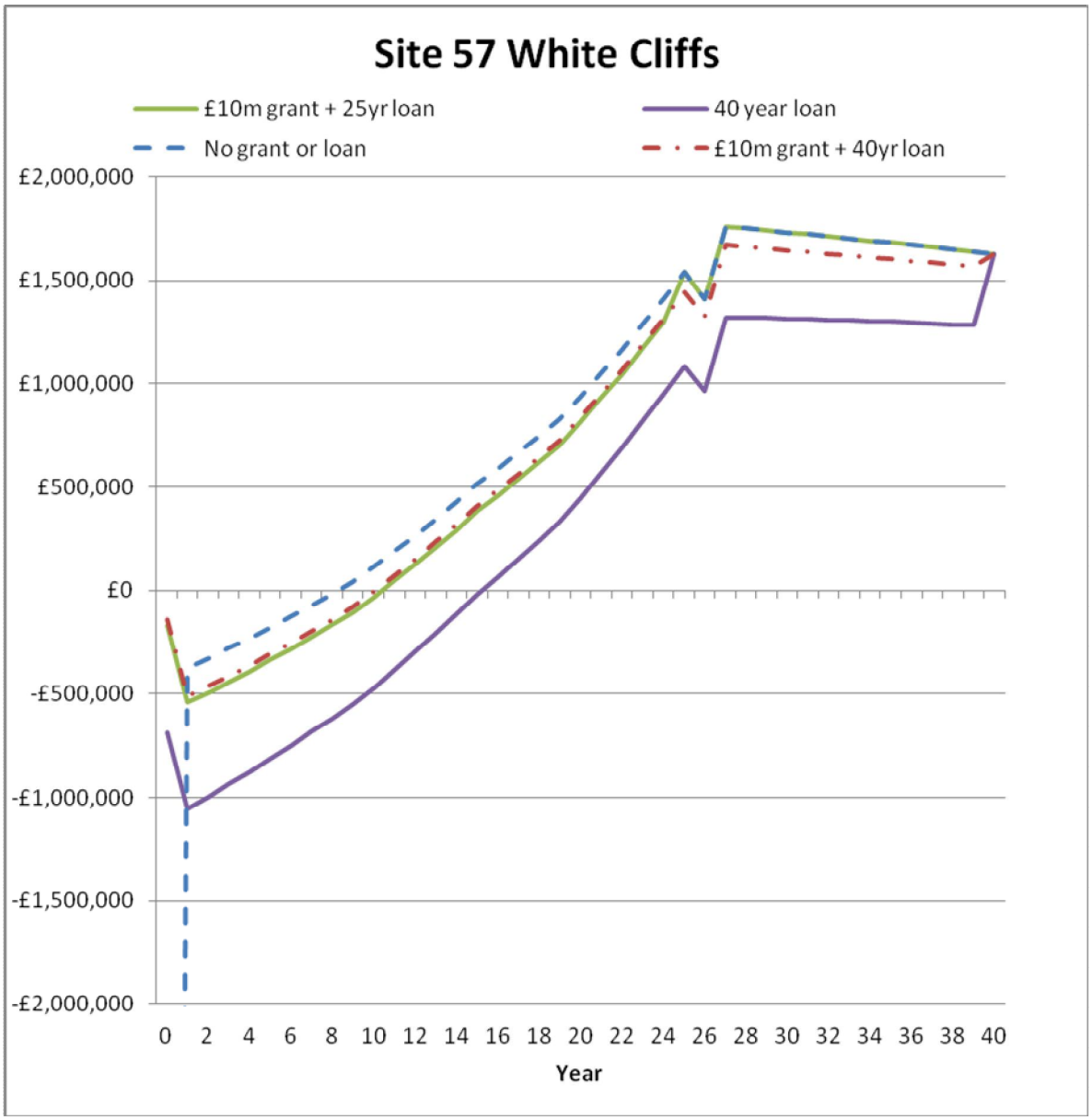

Figure 5.4b: Zoomed In (cash flow break even)

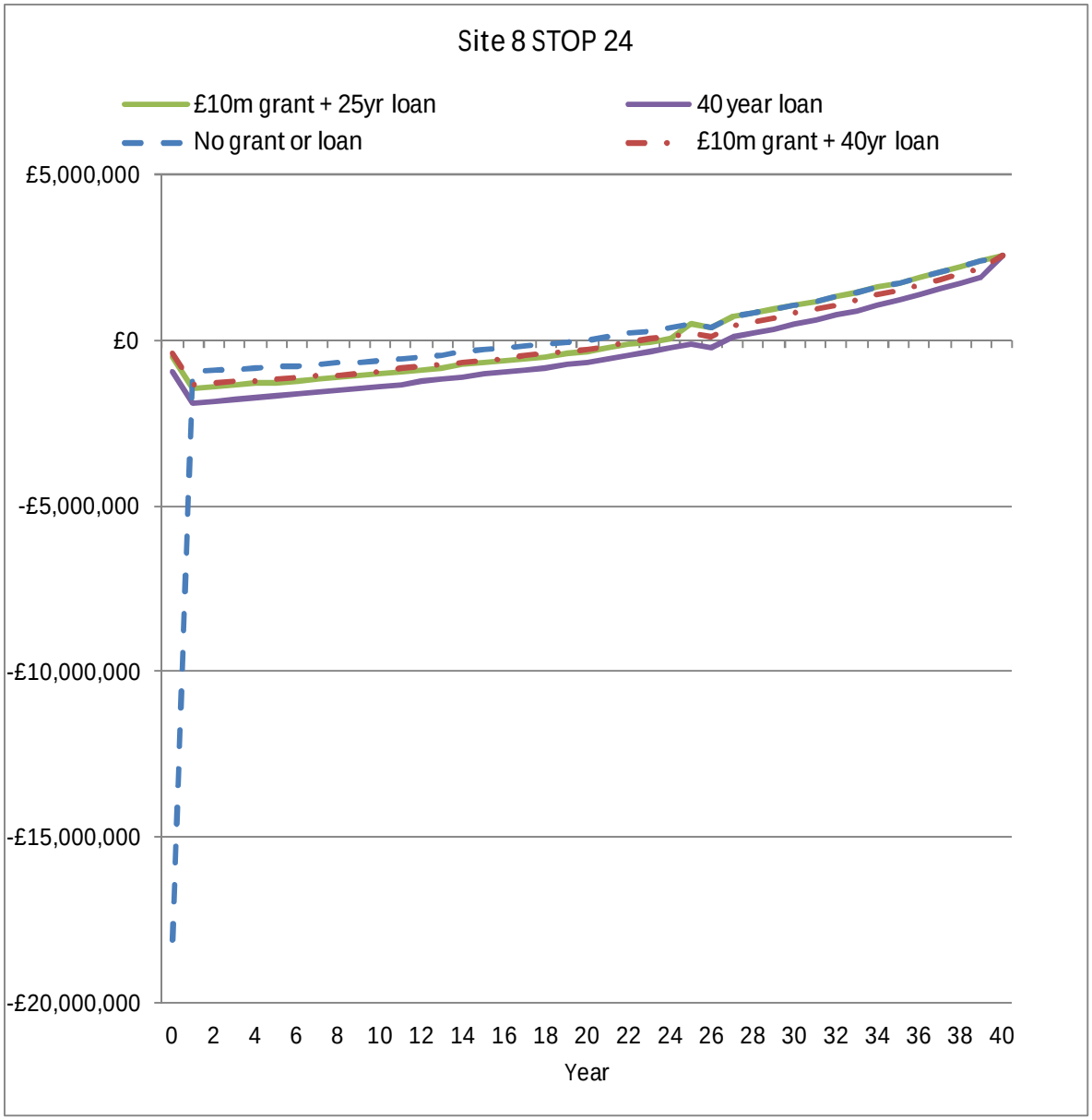

Figure 5.5a: Cash Flow under Different Scenarios for Site 8 Westenhanger Site Behind Stop 24 Indicating Break Even Points

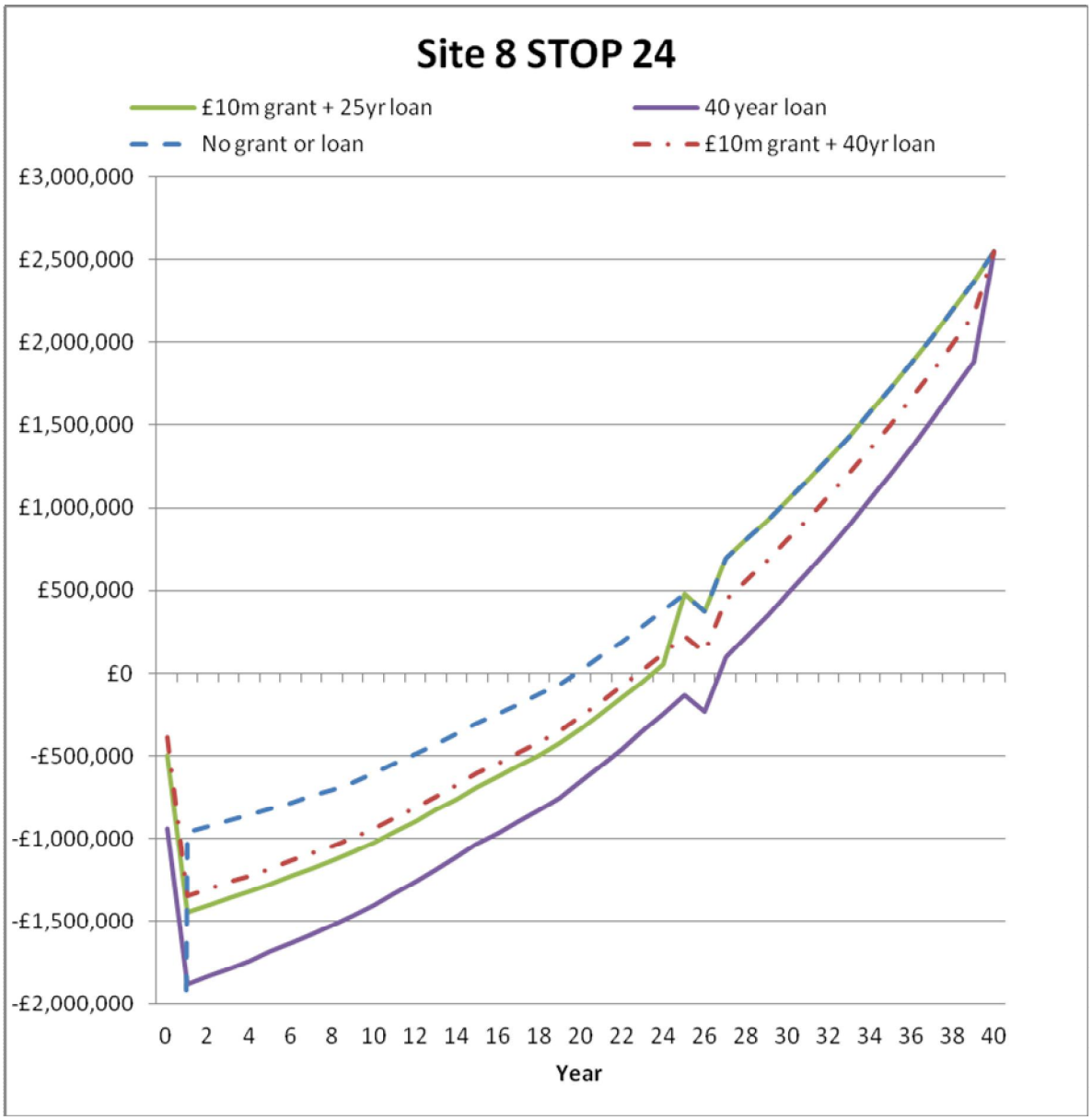

Figure 5.5b: Zoomed In (cash flow break even)

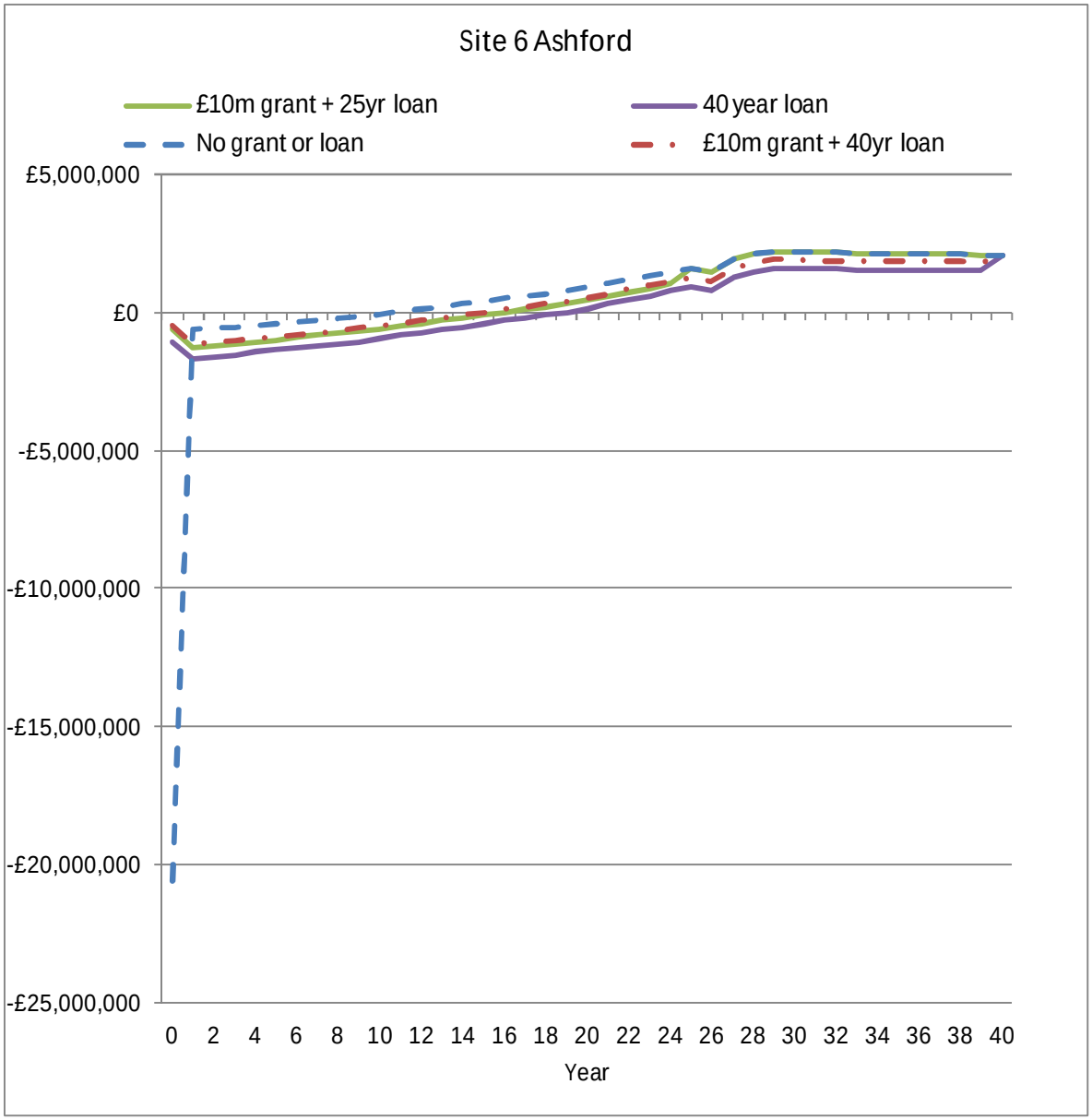

Figure 5.6a: Cash Flow under Different Scenarios for Site 6 Extension of Ashford International Truck Stop Indicating Break Even Point

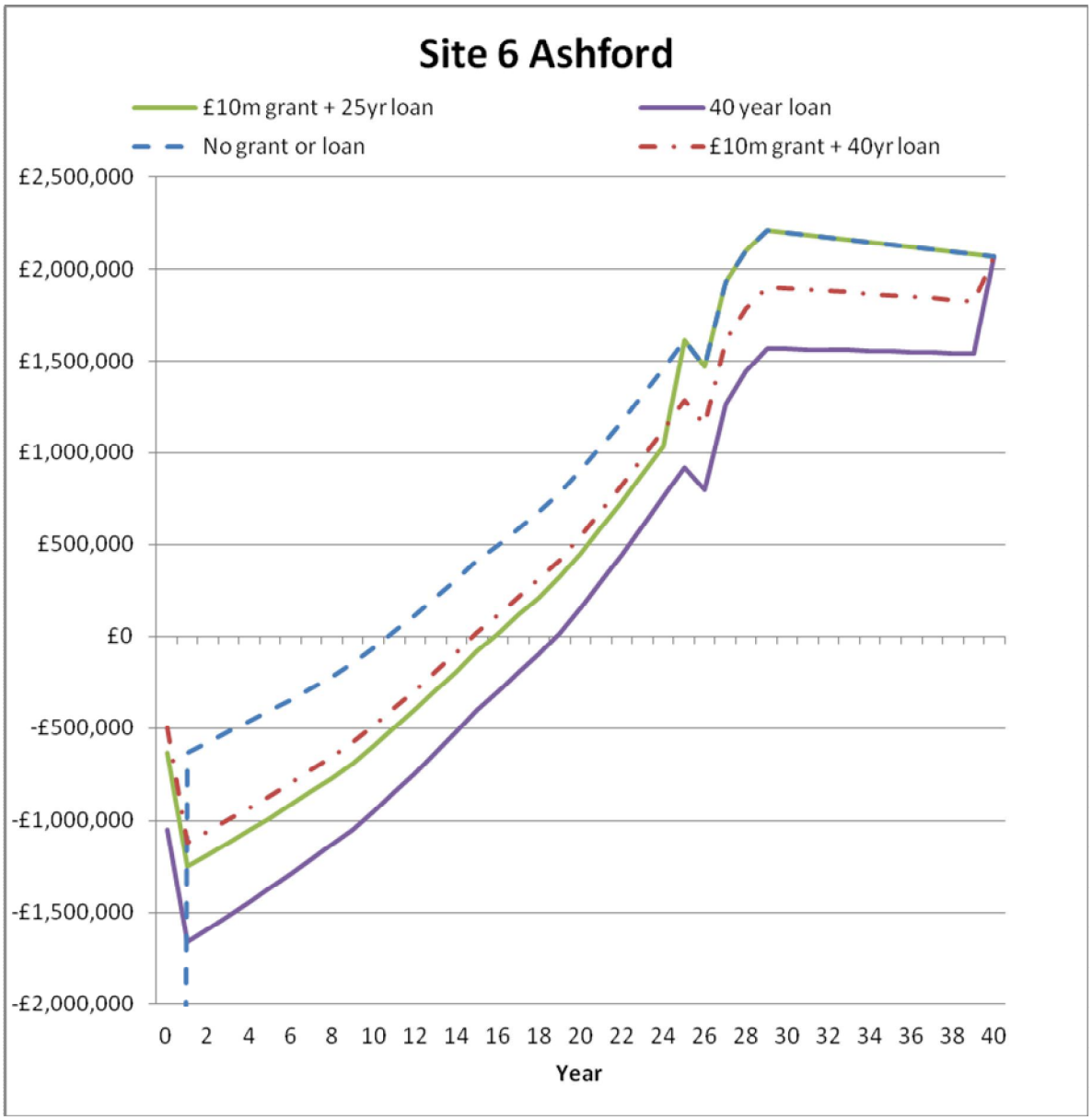

Figure 5.6b: Zoomed In (cash flow break even)

5.5 Implications for Ownership Models

AECOMs initial analysis of the feasibility of truck parks in Kent also examined the options for the structures to put in place to own and operate the truck parks. The potential structures available fall into three broad types:

- Local authority built and operated
- Local authority built and operated by a private company

- Private developer built and operated

Where KCC builds and operates a truck park it will have full control of the level of provision of truck parking, and the standard of facilities available. However it will have to finance the capital cost of building the park itself, and will bear all of the operational risk i.e. the risks that the revenue will be lower or the operating costs higher than forecast.

Where a truck park is built by the local authority and operated by a private company a range of sub-options exist for the basis on which the private company would operate the truck park. Four illustrative models have been identified:

A. Outsourcing. The private company operates the park in return for a fixed fee from KCC. All of the operating risk remains with KCC

B. Risk sharing agreement. An agreement is made with a private company for it to operate the truck park and collect revenue in return for an a fee to be determined at least in part by the revenue or profits earned by the truck park. This results in the private firm and KCC sharing the operational risks of the truck park

C. Concession. A long term agreement with a private firm where the private firm operates the truck park, collects revenues and keeps the resulting profits. All of the operational risk of the truck park is transferred to the private company in this situation

D. Outright Sale. KCC sells the truck park outright to a private firm. All of the operational risk passes to this firm

If a private developer builds and operates the truck park it, rather than KCC, will have to finance the capital costs and bear the operational risks of the truck park. A private firm will only come forward and do this if the expected return from owning and operating the truck park represents attractive compensation for making this investment and bearing this risk.

As described elsewhere in this report, LEP Funding and/or Public Works Loan Board loans may be available for a project to provide a truck park in Kent. As is shown by the modelling work, these could have the effect of significantly increasing the return obtained by KCC or a private firm from a truck park. For example the availability of this support could be used to make participation in a truck park more attractive for a private sector partner.

The IRR figures indicate how much more attractive an investment the truck park becomes for KCC (as opposed to the public sector as a whole) once these financial supports are provided. These supports might also be used to incentivise a private sector firm to build and/or operate a truck park. For example, if a private sector firm was able to access these grants and low cost loans, the potential return to it from building and operating a truck park would increase as indicated by these IRR calculations. Alternatively, if KCC built the truck park and sold it to a private sector developer for a price net of the benefit of the grants and loans, the purchase and operation of the truck park would be a more attractive investment for a private sector buyer.

5.6 Other Costs and Benefits

The analysis in this section is based on the commercial viability of additional lorry parks in Kent. However, there are wider costs and benefits that are likely to accrue but which would not be taken into account by a private operator seeking to make an investment decision. The Kent Multi-facility Lorry Park Scoping Strategy (2007)[1] undertook economic impact analysis to estimate a cash equivalent benefit to society resulting from the provision of sufficient overnight lorry parking capacity in Kent and a well managed off-highway alternative to Operation Stack. Whilst the analysis indicated it did not include all the likely benefits and costs, it suggested that first year benefits would be in the order of £2.5m and a £77m benefit (in 2004 prices) over a 30 year time frame. These benefits took into account impacts on local businesses, policing costs, and congestion.

There are likely to be broader socio-economic costs and benefits involved in the construction and operation of new lorry parks in Kent.

[1] A report by AECOM for the Department for Transport and Highways Agency

5.7 Summary

In this section we have sought to identify the financial attributes of the 3 shortlisted sites, using the Internal Rate of Return and Net Present Value as key metrics. We show revenue, costs and cash flow against demand over a 40 year period. Further to this, we have also examined the impact on cash flow of a mixture of grant and loan. A grant and 25 year loan scenario offers an attractive proposition to taking forward a lorry park, given that in effect a proportion of the cost of the lorry park construction will be 'written off' and the remaining costs will be discounted over a period of 25 years or 40 years, notwithstanding the need to undertake longer term forecasting, planning and risk assessments. However, this is dependent on a number of assumptions and would need to be fully explored if a decision was made to take the analysis further. Given the poor IRR and NPVs, with a grant and 40 year loan Site 57 would appear the most attractive proposition.

M20 Corridor Single Site Development

6 M20 Corridor Single Site Development

6.1 Introduction

This chapter sets out the results of the demand and financial model if we combine the demand of the two proposed sites on the M20 corridor and develop either one of the two sites – Site 6 Extension of Ashford International Truckstop and Site 8 Westerhanger Site behind Stop 24. We also extend the forecast to include a 50 year time horizon.

Having reviewed the Phase 2 modelling outcomes with particular respect to the relatively poor NPV and IRR values under many scenarios and as described in Chapter 5 we conclude that a further scenario of a combined site on the M20 corridor should be 'tested' to ascertain its potential viability. This seems a sensible progression of the modelling in Phase 1 that is corridor based and the site specific analysis conducted in Phase 2. In combining the site specific demand the proximity of the sites is already accounted for in the even splitting of demand between the two locations.

For the M20 single site development with combined demand we have tested the following scenarios:

- A mix of grant and loan is used to develop and deliver the project with a 40 points discounted interest rate of 3.74% over 25 years
- Full loan utilised to develop and deliver the project with a 40 points discounted interest rate of 4.06% over 40 years
- Full loan utilised to develop and deliver the project with a 40 points discounted interest rate of 4.08% over 50 years

6.2 Demand Forecast

Table 6.1 sets out the individual as well as the combined demand forecasts for the proposed sites on the M20 Corridor.

Table 6.1: Combined Demand Forecast

Year of operations	Site 8 STOP 24	Site 6 Ashford	Develop Site 8 (Site 8 and Site 6 Demand Combined)	Develop Site 6 (Site 8 and Site 6 Demand Combined)
1	27	36	63	63
2	32	45	77	77
3	38	53	91	91
4	44	61	105	105
5	50	70	120	120
6	57	79	136	136
7	63	88	151	151
8	70	98	168	168
9	77	108	185	185
10	85	120	205	205
11	94	132	226	226
12	103	145	248	248
13	112	158	270	270
14	122	172	294	294
15	132	186	318	318
16	141	198	339	339
17	150	211	361	361
18	159	224	383	383
19	169	238	407	407
20	181	255	436	434
21	194	273	467	434
22	207	292	499	434
23	220	311	531	434
24	235	331	552	434
25	249	352	552	434

6.3 Financial Modelling

This section sets out the results for the option to develop a single site on the M20 Corridor. Tables 6.2 (Develop Site 8 (Westenhanger Site behind Stop 24) With Combined Demand Forecast) and Table 6.3 (Develop Site 6 (Extension of Ashford International Truck Stop) With Combined Demand Forecast) summarise the assumptions for the various scenarios described in section 6.1. It should be noted that the loan value takes into account inflation in order to state the actual amount that might need to be borrowed in 2016. However, one caveat is that the calculations assume that the £10m grant will also be linked to inflation (i.e. £10m in 2013 values will be available in 2016). If this is not the case, the total amount borrowed may need to increase slightly. The £10m figure is in any case indicative and could be altered on the basis of other decisions. Annual cash flows are illustrated in Figures 6.1-6.4.

The model calculates the IRR and NPV for building and operating a lorry park, assuming that an upfront payment is made to construct the park. By taking a loan, these large upfront costs can be spread out and hence discounted over a number of years. However, whilst there may be a case to determine the IRR and NPV for loan only scenarios, this is not the case for the grant.

In the case of the grant this is still an upfront cost to the public sector, and this should either be included as an upfront cost or subtracted from the benefits.

As such, the IRR and NPV for scenarios with a grant are misleading as currently construed in the attached results. It can be shown that a scenario with no grant will result in the same IRR and NPV as a scenario with a 100% grant - the only difference is that in the latter a source of the funding for the upfront capital costs has been identified, but in the no grant scenario a source of funding has still to be found.

The following provides an explanation of the results, using Site 8 (Table 6.2) as an example. The first column sets out scenarios A to G. The 25 and 40 years results in Scenario A (no grant and no loan) are identical to those presented in the previous chapter. In addition, the results for 50 years have been included, indicating that there is still no return and a negative NPV. Scenario B develops this further, but adding in the demand from Site 6 i.e. the combined demand forecast that is the purpose of this chapter. This does have a positive impact, with the increase in annual revenues (but the same annual costs as in Scenario A) resulting in returns of 1.6% - 5.5% over 25 – 50 years.

Scenarios C and D look at the impact of a grant with loan over 25 years (Scenario C) and over 40 years (Scenario D). Revenue and operating costs remain the same as in Scenario B, but annual cash flow is improved. If the IRR and NPV are calculated without taking into the account the grant (as is the case in the table), then the returns will look very high, as is demonstrated in the table. As previously discussed, care should be taken in such an interpretation, as in practice the loan is still a cost to the public sector. Scenario F presents a similar set of results, but on the basis of a 50 year loan.

Scenario E examines the impact of a 40 year loan (no grant). This should be compared to Scenario B. The IRR increases, although NPV remains negative. Over 50 years, however, the NPV is almost positive. Scenario G presents a similar set of results, but on the basis of a 50 year loan (no grant); in this scenario there is a positive NPV over 50 years.

Table 6.2: Develop Site 8 (Westenhanger Site behind Stop 24) With Combined Demand Forecast

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Op + Main Costs	IRR	NPV
A: no grant or loan	8	2016	M20	552	25	£18,439,822					£989,054	£1,319,558	Not Applicable	-£22,781,768
	8	2016			40						£1,820,774	£1,427,521	Not Applicable	-£20,897,368
	8	2016			50						£2,362,783	£1,505,901	Not Applicable	-£19,934,121
B: no grant or loan	8 (+6 demand)	2016	M20	552	25	£18,439,822					£2,359,443	£1,319,558	1.6%	-£12,247,021
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	4.9%	-£8,346,648
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	5.5%	-£7,383,401
C: grant and 25 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,359,443	£1,319,558	*7.9%*	*£258,883*
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	*10.8%*	*£4,159,256*
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	*11.1%*	*£5,122,503*
D: grant and 40 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,359,443	£1,319,558	*9.0%*	*£1,062,386*
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	*11.6%*	*£4,663,584*
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	*11.8%*	*£5,626,831*
E: no grant and 40 year loan	8 (+6 demand)	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,359,443	£1,319,558	2.6%	-£4,333,940
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	6.7%	-£1,152,744
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	7.4%	-£189,498
F: grant and 50 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,359,443	£1,319,558	*9.5%*	*£1,347,858*
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	*11.9%*	*£4,961,766*
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	*12.1%*	*£5,868,759*
G: no grant and 50 year loan	8 (+6 demand)	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,359,443	£1,319,558	3.2%	-£3,647,705
	8 (+6 demand)	2016			40						£3,162,381	£1,427,521	7.2%	-£435,955
	8 (+6 demand)	2016			50						£3,436,068	£1,505,901	7.7%	£392,064

Table 6.3: Develop Site 6 (Extension of Ashford International Truck Stop) With Combined Demand Forecast

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Average Annual Operational: Op + Main Costs	IRR	NPV
A: no grant or loan	6	2016	M20	434	25	£20,566,397					£1,336,148	£1,037,479	Not Applicable	-£19,314,544
	6	2016			40						£2,088,348	£1,122,363	2.0%	-£16,550,948
	6	2016			50						£2,355,010	£1,183,988	2.9%	-£15,843,371
B: no grant or loan	6 (+8 demand)	2016	M20	434	25	£20,566,397					£2,129,455	£1,037,479	1.5%	-£12,702,342
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	4.3%	-£9,823,085
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	4.8%	-£9,115,508
C: grant and 25 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,129,455	£1,037,479	*8.3%*	*£493,387*
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	*10.7%*	*£3,372,644*
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	*11.0%*	*£4,080,221*
D: grant and 40 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,129,455	£1,037,479	*10.0%*	*£1,519,642*
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	*11.9%*	*£4,016,784*
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	*12.1%*	*£4,724,361*
E: no grant and 40 year loan	6 (+8 demand)	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£2,129,455	£1,037,479	2.5%	-£3,876,684
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	6.1%	-£1,799,544
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	6.8%	-£1,091,967
F: grant and 50 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,129,455	£1,037,479	*10.7%*	*£1,884,255*
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	*12.4%*	*£4,397,630*
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	*12.6%*	*£5,033,357*
G: no grant and 50 year loan	6 (+8 demand)	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£2,129,455	£1,037,479	3.4%	-£3,111,308
	6 (+8 demand)	2016			40						£2,605,477	£1,122,363	6.7%	-£1,000,091
	6 (+8 demand)	2016			50						£2,768,712	£1,183,988	7.2%	-£443,337

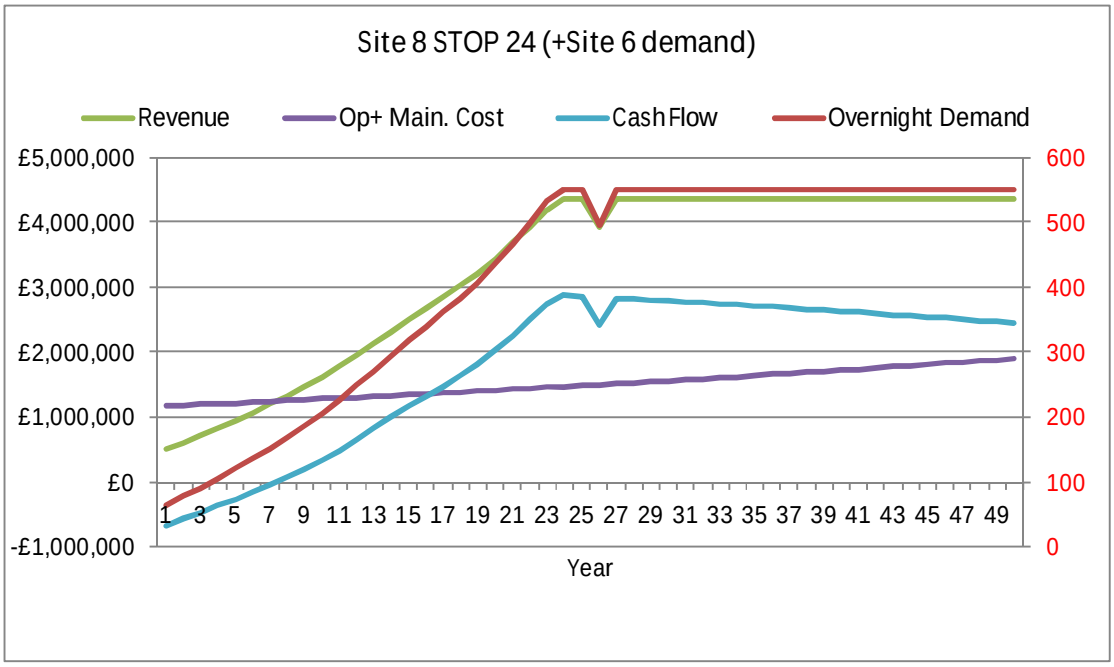

Figure 6.1: Develop Site 8 (Westenhanger Site Behind Stop 24) with Site 6 Demand Combined

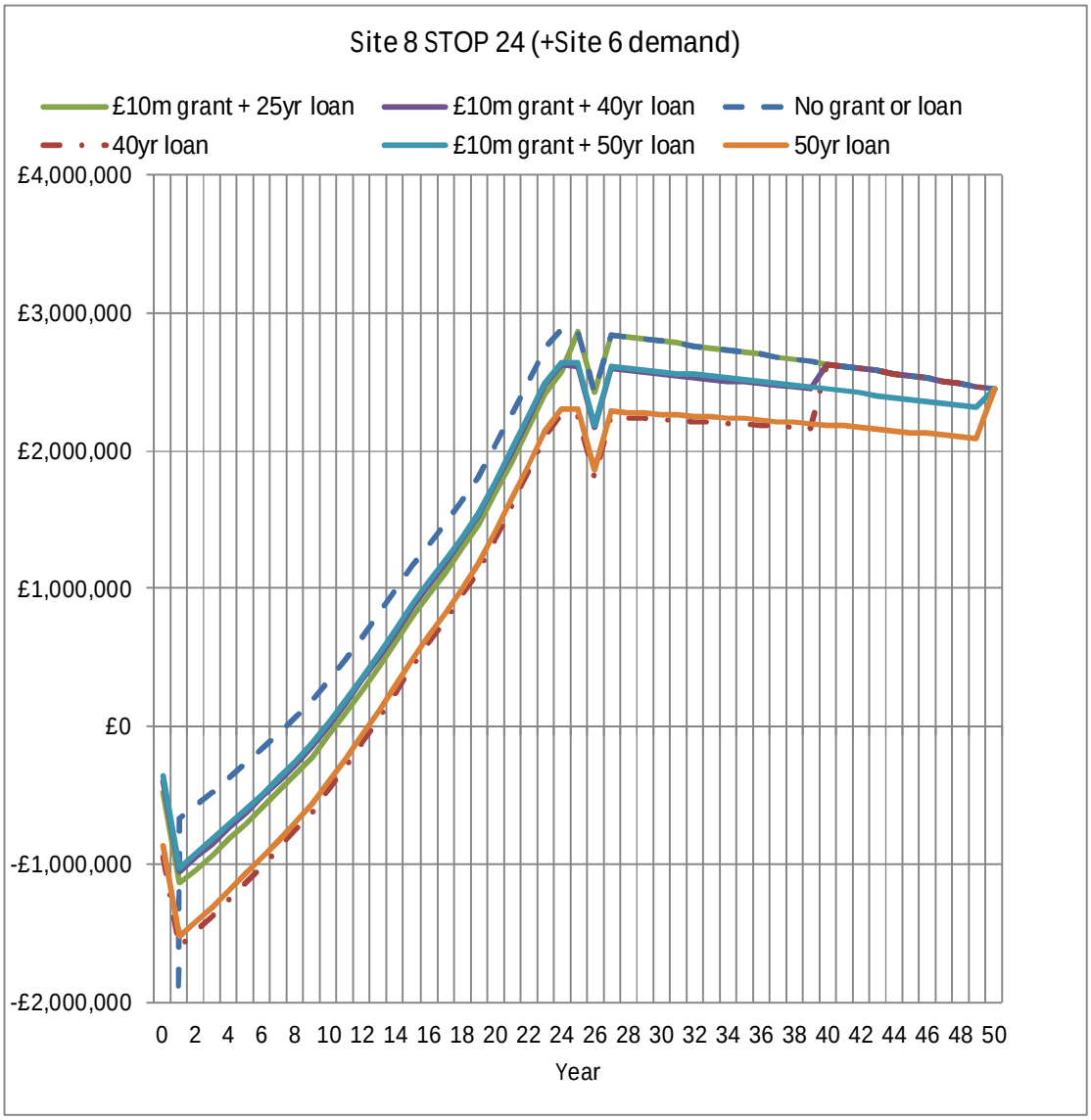

Figure 6.2: Site 8 (Westenhanger Site behind STOP 24) Cash Flow Scenarios

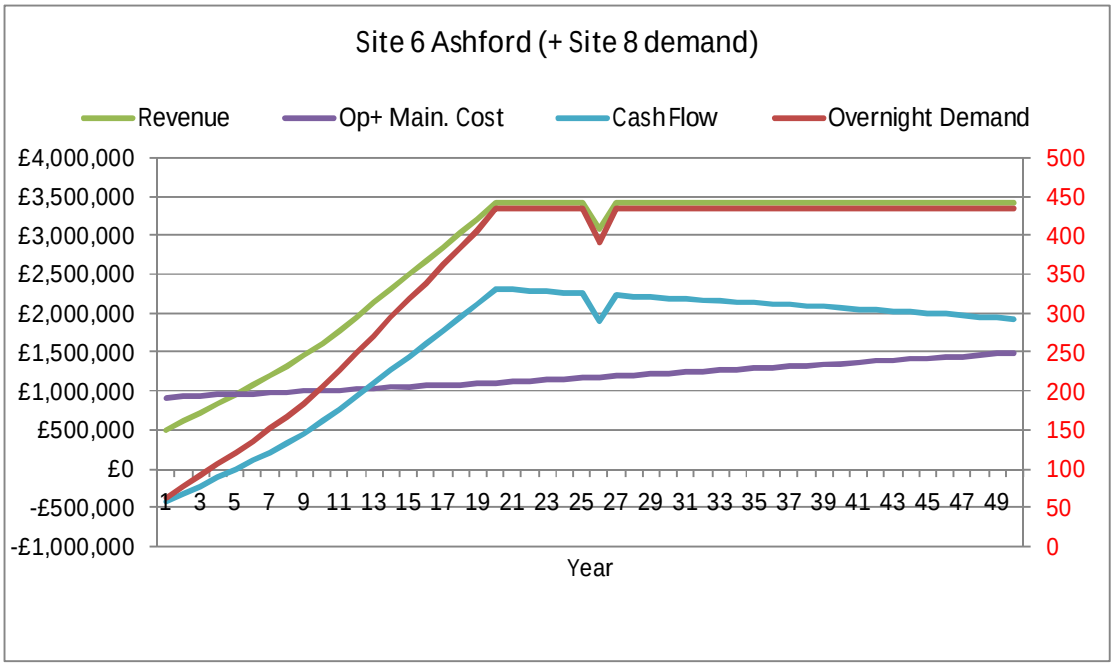

Figure 6.3: Develop Site 6 (Extension of Ashford International Truck Stop) with Site 8 Demand Combined

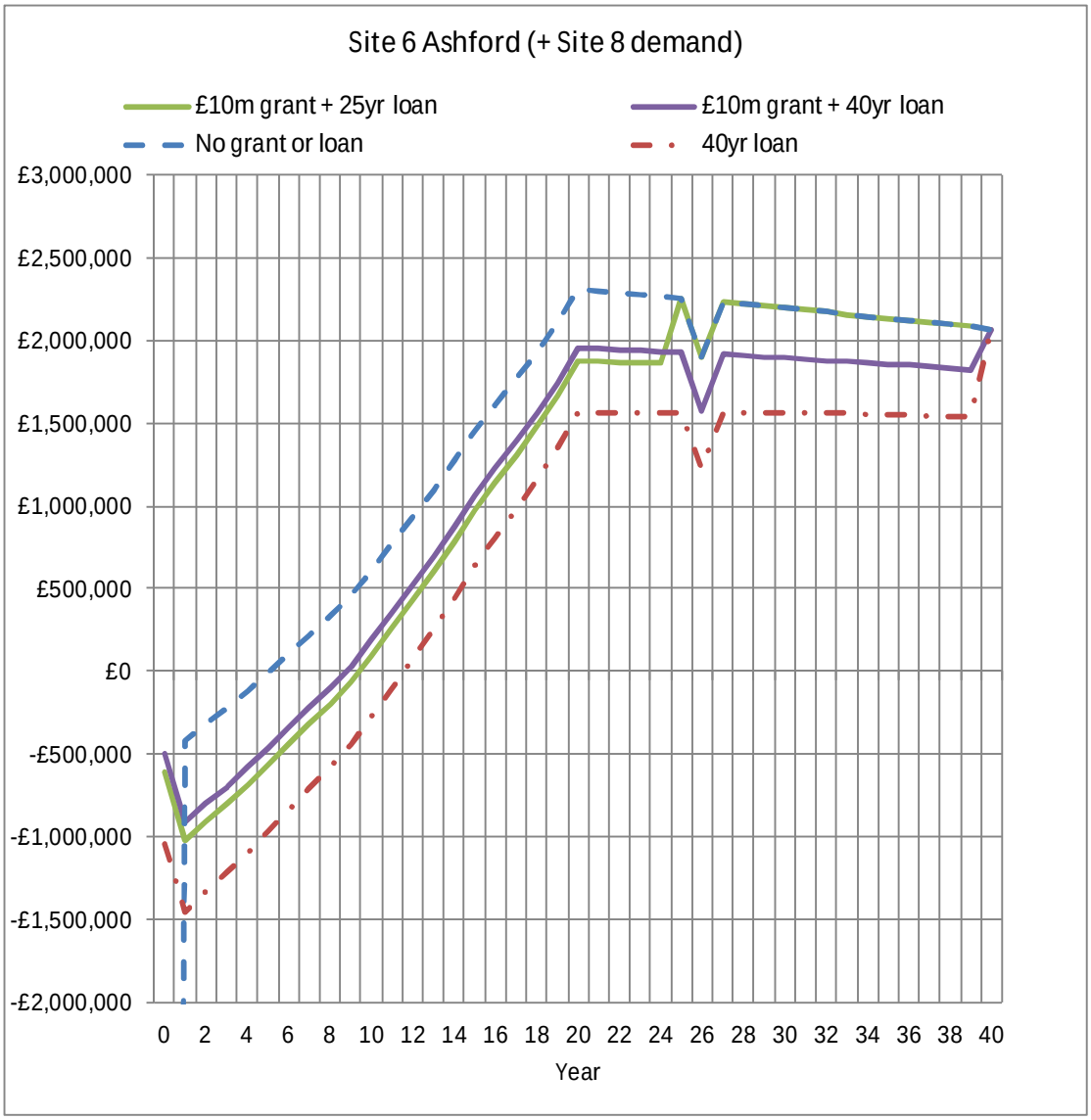

Figure 6.4: Site 6 (Extension of Ashford International Truck Stop) Cash Flow Scenarios

6.4 Summary

In combining the two M20 corridor site demand forecasts whilst we still see negative NPV figures in the no grant / no loan scenarios, IRR figures are however positive and show a 4% - 5% return over the 40 and 50 year time line for both sites 8 and 6. Break-even points for the combined sites in terms of cash flow are around 5 – 12 years.

Applying the grant and loan scenarios return far more encouraging outcomes although in the case of the grant this is still an upfront cost to the public sector and should either be included as an upfront cost or subtracted from the benefits.

Ultimately, the choice of development may be determined by a multitude of external factors including land availability and willingness of existing or new commercial operators to develop sites. It is worth re-iterating the point made in our summary of chapter 4 that if the Ashford site is developed in the manner described to a capacity of 858 spaces this will cope with predicted demand to beyond 2040, whereas capacity would be exhausted at a combined STOP 24 site by 2035.

Further sensitivity tests assuming a night time charge of £20 (as opposed to £15) and a discount rate of 3.5% (instead of 7.5%) have been undertaken and the results are set out in Appendix C.

Appendix A – HGV Driver Questionnaire

Appendix A – HGV Driver Questionnaire

Name of Interviewer	
Location	
Date (DD/MM/YY)	
Time (24 hour)	

1. Truck Registration Origin (check number plate)

2. Company Name

3. What is your usual route to the Channel Crossing? Tick one only ✓

A2 / M2	
M20 / A20	
Combination of both routes	

4. If you park overnight in Kent, where do you normally park? Tick one only ✓

Official Truck Park	
Layby	
Industrial Estate	
Other (Please Specify)	

5. If you park in a truck park, which one(s) do you normally use? Tick relevant boxes ✓

Ashford International Truck Stop	
Stop24	
Dover Truck Stop (within Industrial Estate)	
Port of Dover Truck Stop (Motis)	
Other (Please Specify)	

6. How important are the following factors in influencing why you park at this location? If you have a choice, please use the scale below to identify the importance of each factor.

No choice – specified by company	

Most important 1 2 3 4 Least important 5

Score between 1 and 5	**1-5**
Convenient and en-route	
Secure parking	
Good facilities e.g. food/showers	
Run out of Drivers' Hours	
Availability of parking spaces whenever you arrive	
Availability and ease of use of online booking system	
Recommended by other lorry drivers	
The need to pay out of your own pocket	
Other (please specify)	

7. How often do you find that authorised trucks parks in Kent are full and cannot park there? Tick one only ✓

No spaces most of the time	
No spaces 1 in 2 trips	
No spaces 1 in 3 trips	
No spaces 1 in 4 trips	
No spaces less than 1 in 4 trips	
Rarely have a problem	
Never have a problem	

8. Where do you park if your preferred truck stop is not available? Tick all relevant boxes and add comments ✓

Find another Truckstop (state which one)	
Park in Layby	
Park in an Industrial Estate	
Other Please Specify:	
Further Comments:	

9. In broad terms, which of these boxes best describes your truck parking needs? Tick one only – Basic, Intermediate or Advanced

Toilets	**Basic facilities**	
Off road parking		
Drinking water		

Showers and Toilets	**Intermediate facilities**	
Off road parking		
Drinking water		
Basic security – fence, CCTV and gate control		
Hot food		
Internet		
Shop		

Showers and toilets	**Advanced facilities**	
Off road parking		
Drinking water		
Hot food		
Internet		
Fuel		
Very high security e.g. for vulnerable loads		
Plug in points for trailer refrigerators		
Other facilities not shown above		
Other: (Specify)		

10. What do you think is a reasonable charge for Basic, Intermediate and Advanced facilities? Circle your answer.

Less than €10 per night	BASIC	INTERMEDIATE	ADVANCED
€10-€20	BASIC	INTERMEDIATE	ADVANCED
€20-€30	BASIC	INTERMEDIATE	ADVANCED
More than €30	BASIC	INTERMEDIATE	ADVANCED

11. When paying for parking, who pays? Tick relevant box ✓

Driver	
Company	

12. How far are you willing to travel off route to find appropriate parking facilities? Tick relevant box ✓

Up to 1 km	
Up to 2 km	
Up to 5km	
Up to 10 km	
More than 10 km	

13. Have you ever experience any parking enforcement in Kent?
Tick relevant box ✓

Yes	
No	

14. If yes, what? Tick relevant box ✓

A fine	
Told to move vehicle to an appropriate place	
Escorted to a more appropriate place	
Other: (Specify	

15. If there was more rigorous enforcement of roadside parking in Kent, what would you do? Please use the scale below to identify the probability of each scenario.

Most probable 1 2 3 4 Least probable 5

Score between 1 and 5	1-5
Carry on to park in an inappropriate area running the risk of getting a fine	
Avoid parking in Kent altogether	
Be more inclined to use an official lorry park	
Other: (Specify)	

16. Do you have any other comments?

Appendix B – Comparison of Phase 1 and Phase 2 Financial Model Inputs

Appendix B - Comparison of Phase 1 and Phase 2 Financial Model Inputs

Table 1: Site Size Comparison

Site ID	Land Value Estimate £m	
	Phase 1	Phase 2
Site 57 White Cliffs Business Park	234	342
Site 8 Westenhanger (site behind STOP 24)	468	552
Site 6 Extension of Ashford International Truck Stop	858	434

Table 2: Demand Forecasts Comparison

Year of operations	Site 57 White Cliffs		Site 8 Westenhanger (behind STOP 24)		Site 6 Extension of Ashford International Truck Stop	
Phase	Phase 1 (corridor based)	Phase 2 (site specific)	Phase 1 (corridor based)	Phase 2 (site specific)	Phase 1 (corridor based)	Phase 2 (site specific)
1	16	44	53	27	26	36
2	25	51	81	32	53	45
3	33	58	110	38	81	53
4	42	65	139	44	110	61
5	52	73	170	50	139	70
6	61	80	201	57	170	79
7	71	88	233	63	201	88
8	81	96	265	70	233	98
9	93	105	306	77	265	108
10	106	115	348	85	306	120
11	119	125	391	94	348	132
12	133	136	435	103	391	145
13	147	147	468	112	435	158
14	161	159	468	122	482	172
15	174	171	468	132	529	186
16	187	182	468	141	571	198
17	200	192	468	150	614	211
18	214	204	468	159	659	224
19	232	215	468	169	704	238
20	234	230	468	181	763	255
21	234	245	468	194	824	273
22	234	261	468	207	858	292
23	234	277	468	220	858	311
24	234	294	468	235	858	331
25	234	312	468	249	858	352

Table 3: Land Value Comparison

Site ID	Land Value Estimate	
	Phase 1	Phase 2
Site 57 White Cliffs Business Park	£2,757,000	£2,515,030
Site 8 Westenhanger (site behind STOP 24)	£105,000	£642,335
Site 6 Extension of Ashford International Truck Stop	£10,109,000	£6,468,750

Table 4: Construction Cost Comparison

Site ID	Construction Costs	
	Phase 1	Phase 2
Site 57 White Cliffs Business Park	£4,698,494	£10,045,611
Site 8 Westenhanger (site behind STOP 24)	£7,775,245	£16,480,873
Site 6 Extension of Ashford International Truck Stop	£12,890,939	£12,629,194

Table 5: Capital Cost Comparison (Construction + Land Costs)

Site ID	Capital Costs	
	Phase 1	Phase 2
Site 57 White Cliffs Business Park	£7,455,494	£12,560,641
Site 8 Westenhanger (site behind STOP 24)	£7,880,245	£17,123,208
Site 6 Extension of Ashford International Truck Stop	£22,999,939	£19,097,944

Table 6: Maintenance Cost Comparison

Site ID	Maintenance Costs	
	Phase 1	Phase 2
Site 57 White Cliffs Business Park	£22,366	£153,900
Site 8 Westenhanger (site behind STOP 24)	£23,641	£248,400
Site 6 Extension of Ashford International Truck Stop	£38,060	£195,300

Table 7: Operating Cost Comparison

Site ID	Operating Costs	
	Phase 1	Phase 2
Site 57 White Cliffs Business Park	£585,000	£569,772
Site 8 Westenhanger (site behind STOP 24)	£585,000	£919,632
Site 6 Extension of Ashford International Truck Stop	£585,000	£723,044

Appendix C – Sensitivity Testing of Higher Overnight Charge and Lower Discount Rate

Appendix C - Sensitivity Testing of Higher Overnight Charge and Lower Discount Rate

Introduction

This appendix sets out the results based on a sensitivity test assuming a night time charge of £20 (as opposed to £15) and a discount rate of 3.5% (instead of 7.5%). These tests reflect requests from KCC rather than a realistic assessment of charging structure, rate of return or risks around the investment and returns.

Results

The impact of the higher charge and lower discount rate is to significantly improve the revenue line and potential returns and NPV.

Table C.1 presents the results for Site 57, and indicates that even without a loan or grant the IRR will be over 5% over a 40 or 50 year appraisal period. The NPV would still be negative with an assumed 7.5% discount, but over 40 and 50 years would be positive assuming a 3.5% discount rate.

Site 6 and Site 8 (Tables C.2 and C.3) still have no or very low returns assuming demand is not combined for both sites. At Site 8, assuming only this site operates and includes relevant demand from Site 6, returns range from 3.9% (25 years) to 7.1% (50 years), assuming no grant or loan. The equivalent figures for Site 6 (including Site 8 demand) are 3.7% - 6.4%. At both sites the impact of the low interest loan (no grant) is relatively significant, especially over longer repayment timescales.

The model calculates the IRR and NPV for building and operating a lorry park, assuming that an upfront payment is made to construct the park. By taking a loan, these large upfront costs can be spread out and hence discounted over a number of years. However, whilst there may be a case to determine the IRR and NPV for loan only scenarios, this is not the case for the grant. In the case of the grant this is still an upfront cost to the public sector, and this should either be included as an upfront cost or subtracted from the benefits.

As such, the IRR and NPV for scenarios with a grant are misleading as currently construed in the results. It can be shown that a scenario with no grant will result in the same IRR and NPV as a scenario with a 100% grant - the only difference is that in the latter a source of the funding for the upfront capital costs has been identified, but in the no grant scenario a source of funding has still to be found.

The impact of the grant should not be taken into account in calculating the IRR and NPV, as in effect it is simply identifying a source of money to help pay the costs, and the grant is still a cost to the public sector. Nevertheless, results are presented in the tables which decrease the cost of construction by the grant, as requested by KCC, to demonstrate the returns possible to an operator independent of the cost of the grant (i.e. the operator does not have to worry about the grant or where the money came from, only that the upfront cost of construction and /or the size of loan needed is reduced).

Table C.1: Site 57 White Cliffs Business Park

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

Site 57 White Cliffs	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Op + Main Costs	IRR	NPV
no grant or loan	57	2016	A2/M2	342	25	£13,526,437					£1,572,008	£817,553	1.7%	-£3,863,687
	57	2016			40						£2,254,750	£884,442	5.3%	£7,415,096
	57	2016			50						£2,488,347	£933,004	5.9%	£12,080,257
grant and 25 year loan	57	2016	A2/M2	342	25	£2,757,530	£10,000,000	100%	£ 2,911,963	£ -	£1,572,008	£817,553	*14.6%*	*£6,807,055*
	57	2016			40						£2,254,750	£884,442	*16.5%*	*£18,085,838*
	57	2016			50						£2,488,347	£933,004	*16.6%*	*£22,750,999*
grant and 40 year loan	57	2016	A2/M2	342	25	£2,757,530	£10,000,000	100%	£ 2,911,963	£ -	£1,572,008	£817,553	*15.9%*	*£7,204,188*
	57	2016			40						£2,254,750	£884,442	*17.5%*	*£18,115,851*
	57	2016			50						£2,488,347	£933,004	*17.6%*	*£22,781,012*
grant and 50 year loan	57	2016	A2/M2	342	25	£2,757,530	£10,000,000	100%	£ 2,911,963	£ -	£1,572,008	£817,553	*16.3%*	*£7,352,805*
	57	2016			40						£2,254,750	£884,442	*17.9%*	*£18,275,553*
	57	2016			50						£2,488,347	£933,004	*18.0%*	*£22,827,028*

Table C.2: Site 8 (Westenhanger Site behind Stop 24)

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

Site 8 STOP 24	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Op + Main Costs	IRR	NPV
no grant or loan	8 (+6 demand)	2016	M20	552	25	£18,439,822					£2,876,865	£1,319,558	3.9%	£1,382,940
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	6.6%	£19,656,767
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	7.1%	£27,186,500
no grant or loan	8	2016	M20	552	25	£18,439,822					£1,205,952	£1,319,558	Not Applicable	-£21,782,411
	8	2016			40						£2,220,067	£1,427,521	Not Applicable	-£11,505,016
	8	2016			50						£2,880,937	£1,505,901	Not Applicable	-£3,975,282
grant and 25 year loan	8	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£1,205,952	£1,319,558	*Not Applicable*	*-£10,637,706*
	8	2016			40						£2,220,067	£1,427,521	*Not Applicable*	*-£360,311*
	8	2016			50						£2,880,937	£1,505,901	*5.1%*	*£7,169,423*
grant and 40 year loan	8	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£1,205,952	£1,319,558	*Not Applicable*	*-£9,532,957*
	8	2016			40						£2,220,067	£1,427,521	*Not Applicable*	*-£276,820*
	8	2016			50						£2,880,937	£1,505,901	*5.2%*	*£7,252,914*
no grant and 40 year loan	8	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£1,205,952	£1,319,558	Not Applicable	-£17,347,973
	8	2016			40						£2,220,067	£1,427,521	Not Applicable	-£9,525,542
	8	2016			50						£2,880,937	£1,505,901	Not Applicable	-£1,995,808
grant and 50 year loan	8	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£1,205,952	£1,319,558	*Not Applicable*	*-£9,119,533*
	8	2016			40						£2,220,067	£1,427,521	*Not Applicable*	*£167,440*
	8	2016			50						£2,880,937	£1,505,901	*5.3%*	*£7,380,920*
no grant and 50 year loan	8	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,876,865	£1,319,558	7.8%	£6,811,192
	8	2016			40						£3,855,886	£1,427,521	10.6%	£22,704,179
	8	2016			50						£4,189,592	£1,505,901	10.9%	£29,473,683

Table C.3 Site 6 (Extension of Ashford International Truck Stop)

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

Site 6 Ashford	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Op + Main Costs	IRR	NPV
no grant or loan	6 (+8 demand)	2016	M20	434	25	£20,566,397					£2,615,633	£1,037,479	3.7%	£640,650
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	6.0%	£14,351,543
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	6.4%	£19,986,278
no grant or loan	6	2016	M20	434	25	£20,566,397					£1,641,205	£1,037,479	Not Applicable	-£13,436,160
	6	2016			40						£2,565,140	£1,122,363	3.5%	-£130,025
	6	2016			50						£2,892,683	£1,183,988	4.3%	£5,504,709
grant and 25 year loan	6	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£1,641,205	£1,037,479	*Not Applicable*	*-£2,086,318*
	6	2016			40						£2,565,140	£1,122,363	*7.5%*	*£11,219,817*
	6	2016			50						£2,892,683	£1,183,988	*8.1%*	*£16,854,551*
grant and 40 year loan	6	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£1,641,205	£1,037,479	*2.8%*	*-£675,304*
	6	2016			40						£2,565,140	£1,122,363	*8.0%*	*£11,326,454*
	6	2016			50						£2,892,683	£1,183,988	*8.6%*	*£16,961,189*
no grant and 40 year loan	6	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£1,641,205	£1,037,479	Not Applicable	-£8,490,320
	6	2016			40						£2,565,140	£1,122,363	4.2%	£2,077,732
	6	2016			50						£2,892,683	£1,183,988	5.3%	£7,712,467
grant and 50 year loan	6	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£1,641,205	£1,037,479	*3.3%*	*-£147,268*
	6	2016			40						£2,565,140	£1,122,363	*8.4%*	*£11,893,873*
	6	2016			50						£2,892,683	£1,183,988	*8.9%*	*£17,124,681*
no grant and 50 year loan	6	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£1,641,205	£1,037,479	Not Applicable	-£7,381,895
	6	2016			40						£2,565,140	£1,122,363	4.6%	£3,268,830
	6	2016			50						£2,892,683	£1,183,988	5.5%	£8,055,661

Table C.4: Develop Site 8 (Westenhanger Site behind Stop 24) With Combined Demand Forecast (3.5% Discount Rate and £20 Overnight Charge)

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

											Average Annual Operational:			
Site 8 STOP 24	**Site**	**Development Year**	**Location**	**Capacity**	**Operational Life**	**Capital Cost**	**Grant 2013**	**remaining capital costs**	**Loan needed in 2016**	**Up front capital payment**	**Revenue**	**Op + Main Costs**	**IRR**	**NPV**
no grant or loan	8	2016	M20	552	25	£18,439,822					£1,205,952	£1,319,558	Not Applicable	-£21,782,411
	8	2016			40						£2,220,067	£1,427,521	Not Applicable	-£11,505,016
	8	2016			50						£2,880,937	£1,505,901	Not Applicable	-£3,975,282
no grant or loan	8 (+6 demand)	2016	M20	552	25	£18,439,822					£2,876,865	£1,319,558	3.9%	£1,382,940
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	6.6%	£19,656,767
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	7.1%	£27,186,500
grant and 25 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,876,865	£1,319,558	*13.0%*	*£12,527,645*
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	*14.9%*	*£30,801,472*
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	*15.0%*	*£38,331,205*
grant and 40 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,876,865	£1,319,558	*14.5%*	*£13,632,395*
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	*16.0%*	*£30,884,963*
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	*16.1%*	*£38,414,697*
no grant and 40 year loan	8 (+6 demand)	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,876,865	£1,319,558	7.1%	£5,817,378
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	10.1%	£21,636,241
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	10.4%	£29,165,975
grant and 50 year loan	8 (+6 demand)	2016	M20	552	25	£7,670,916	£10,000,000	100%	£ 8,100,518	£ -	£2,876,865	£1,319,558	*15.0%*	*£14,045,818*
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	*16.5%*	*£31,329,222*
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	*16.6%*	*£38,542,702*
no grant and 50 year loan	8 (+6 demand)	2016	M20	552	25	£18,439,822	£ -	100%	£19,472,526	£ -	£2,876,865	£1,319,558	7.8%	£6,811,192
	8 (+6 demand)	2016			40						£3,855,886	£1,427,521	10.6%	£22,704,179
	8 (+6 demand)	2016			50						£4,189,592	£1,505,901	10.9%	£29,473,683

Table C.5: Develop Site 6 (Extension of Ashford International Truck Stop) With Combined Demand Forecast (3.5% Discount Rate and £20 Overnight Charge)

IRR and NPV do not take into account the 'costs' to the public sector of the grant / loan.

Site 6 Ashford	Site	Development Year	Location	Capacity	Operational Life	Capital Cost	Grant 2013	Loan % of remaining capital costs	Loan needed in 2016	Up front capital payment	Average Annual Operational: Revenue	Op + Main Costs	IRR	NPV
no grant or loan	6	2016	M20	434	25	£20,566,397					£1,641,205	£1,037,479	Not Applicable	-£13,436,160
	6	2016			40						£2,565,140	£1,122,363	3.5%	-£130,025
	6	2016			50						£2,892,683	£1,183,988	4.3%	£5,504,709
no grant or loan	6 (+8 demand)	2016	M20	434	25	£20,566,397					£2,615,633	£1,037,479	3.7%	£640,650
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	6.0%	£14,351,543
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	6.4%	£19,986,278
grant and 25 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,615,633	£1,037,479	*13.7%*	*£11,990,492*
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	*15.2%*	*£25,701,386*
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	*15.3%*	*£31,336,120*
grant and 40 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,615,633	£1,037,479	*15.9%*	*£13,401,506*
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	*17.0%*	*£25,808,023*
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	*17.0%*	*£31,442,757*
no grant and 40 year loan	6 (+8 demand)	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£2,615,633	£1,037,479	7.5%	£5,586,490
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	9.8%	£16,559,301
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	10.2%	£22,194,035
grant and 50 year loan	6 (+8 demand)	2016	M20	434	25	£9,797,491	£10,000,000	100%	£10,346,189	£ -	£2,615,633	£1,037,479	*16.8%*	*£13,929,542*
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	*17.7%*	*£26,375,442*
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	*17.8%*	*£31,606,250*
no grant and 50 year loan	6 (+8 demand)	2016	M20	434	25	£20,566,397	£ -	100%	£21,718,197	£ -	£2,615,633	£1,037,479	8.4%	£6,694,915
	6 (+8 demand)	2016			40						£3,200,334	£1,122,363	10.5%	£17,750,399
	6 (+8 demand)	2016			50						£3,400,839	£1,183,988	10.8%	£22,537,230