ISLE OF WIGHT COUNCIL

DIRECTORATE OF NEIGHBOURHOODS

ISLE OF WIGHT COUNTY PERMIT SCHEME

(IWCPS)

COST BENEFIT ANALYSIS REPORT

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Service Area:	Isle of Wight Council Highway Network
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Authors:	Richard Pelham, Technical Consultant Jason Setford-Smith, Scheme Consultant
Project Lead:	
SRO:	
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Contents

EXECUTIVE SUMMARY

The Isle of Wight City Council is a major investor of public resources and as such, should ensure that new initiatives make a positive contribution to the local economy and society.

Any new proposal should always answer these two basic questions:

- What are the specific outcomes sought?
- Will these outcomes deliver a positive benefit to the local economy and society?

Cost Benefit Analysis (CBA) is a decision-making tool that helps provide assurance around these questions by quantifying all costs and benefits in monetary terms.

The Isle of Wight's Highways Team has been working on just such a new initiative and this CBA supports its introduction by demonstrating the positive financial outcome delivering its objectives will provide.

Minimising congestion is a key transport challenge for any Council and especially for a busy Authority like the Isle of Wight.

The ability of people and goods to move freely around the Authority area, meeting the needs of business, accessing essential services and for social and leisure purposes depends largely on the Isle of Wight's road network operating effectively.

The proposed Permit Scheme tackles head-on one the major causes of congestion, road and street works, in a robust and positive way and is a major opportunity to positively reduce road and street works and the disruption they cause on the road network.

The proposed Permit Scheme is designed to deliver effective co-ordination and management of essential road works by introducing a new Permit Authority in Isle of Wight.

The new Permit Authority is not intended to prevent activities necessary for the maintenance or improvement of the road network or the services running underneath it. It is designed to make available the necessary resources to achieve an appropriate balance between the interests of the various parties and where possible, bring about effective co-ordination between all the different competing interests.

Summary findings of the Isle of Wight Permit Scheme Cost Benefit Analysis

Values based on 25 Year Operation of the proposed Scheme (2010 prices)	
(Estimated) Value of benefits to economy and society	£100,090,759
Operating costs	£4,594,405
(Estimated) Financial benefit to the local economy from introducing the Scheme	£95,496,353
Benefit to Cost Ratio	**21.79**

INTRODUCTION

1.1 OBJECTIVES

Swift Argent Ltd was commissioned by the Isle of Wight City Council in 2019 to review and analyse the impact of introducing a road works Permit Scheme known as the Isle of Wight Permit Scheme (IOWPS), part of which includes the development of a detailed Cost Benefit Analysis (CBA).

The principal objective of the IOWPS is to improve the strategic and operational management of the entire highway network through better planning, scheduling and management of activities to minimise disruption to road users.

The IOWPS will enable better co-ordination of activities throughout the highway network, ensuring those competing for space or time in the street, including traffic, to be resolved in a positive and constructive way.

The objectives and benefits of the IOWPS are:

- Reduced congestion on the road network
- Improvements to overall network management
- A reduction in delays to the travelling public
- A reduction in costs to businesses caused by delays
- Promotion of a safer environment
- Reduced carbon emissions

1.2 SCOPE OF WORK

The development of a detailed Cost Benefit Analysis (CBA) is a requirement for making a Permit Scheme Local Order.

The analysis assesses the impact of Permits over the full range of required social and economic variables that have been specifically agreed in consultation with the UK Department for Transport (DfT).

An effective Cost Benefit Analysis is a mechanism to assess the benefits and costs of an investment both in terms of its overall viability and in relation to other options.

In this analysis, all benefits and costs are quantified in monetary terms and discounted over the length of the proposal to allow comparison on a common basis.

The output of the Cost Benefit Analysis is the presentation of a Benefit to Cost Ratio (BCR) which presents a scale of the Scheme benefits over costs and a Net Present Value (NPV) that is the sum total of the discounted benefits and costs.

This report will identify the additional costs of operating the Scheme, which are to be met by the Permit fees charged to Utility companies and from Isle of Wight's existing budget, against the value of the benefits it will deliver to the wider Authority.

It will identify the data used and the methodology undertaken to prepare the Cost Benefit Analysis and present the statutory outputs including the BCR and NPV of the Scheme.

1.3 REPORT STRUCTURE

After this introduction, the report is set out as follows:

- Section 0 Analysis and Context;
- Section 0 Input Data;

- Section 5 Delay Modelling;
- Section 6 Operation;

- Section 7 Financial Calculations;
- Section 8 Statutory Outputs; and
- Section 9 Isle of Wight Permit Scheme CBA Results

ANALYSIS AND CONTEXT

1.4 INTRODUCTION

This section presents the legislative and research context for the Isle of Wight Permit Scheme Cost Benefit Analysis.

1.5 LEGISLATIVE CONTEXT

The legislative guidance used for this study is contained within:

- Statutory Guidance for Highway Authority Permit Schemes October 2015
- The Traffic Management Permit Scheme (England) (Amendment) Regulations 2015
- WebTAG user and provider impacts (TAG Unit A1-3 May 2019).
- Department of Transport's (DfT) Halcrow study "Assessing the Extent of Streetworks and Monitoring Effectiveness of Section 74 in Reducing Disruption Volume 3 – Estimation of Cost of the Delay from Utilities' Street Works, June 2004"
- Chapter 8 of the Traffic Signs Manual DfT 2009
- Quadro User Manual October 2018
- DfT Advice Note For Local Highway Authorities Developing New or Varying Existing Permit Schemes June 2016

1.6 TRAFFIC MANAGEMENT ACT 2004

The Traffic Management Act 2004 (TMA 2004) establishes the guidelines for street works. It has been in operation since April 2008 throughout the United Kingdom. The second edition states that any parties wishing to work on a road will require a Permit from the Highway Authority, who in turn will have additional powers to refuse or specify conditions associated with Permit permission for the overall efficiency of the operation of the road network.

1.7 WEBTAG

WebTAG was first issued by the UK Department for Transport in 2003. It is based upon the 'New Approach to Appraisal' developed in the late 1990s and is an internet based multimodal guidance on appraising transport projects. WebTAG was updated in May 2019 and includes value of time and operating costs, accident costs, carbon emissions and traffic growth forecasts as described in Road Transport Forecasts 2018.

1.8 RESEARCH

The benchmark study for Permit Scheme appraisal was produced by the Halcrow Consultancy at the time of the TMA in 2004.

1.9 HALCROW STUDY

In July 2004, Halcrow produced a report for the DfT on the impact of road works. The results (

Table 1) estimate an overall cost of disruption caused by Utility works in England in 2002/03 at £4.36 billion.

Table 1 Halcrow study results summary

Impact of Roadworks	Electric	Gas	Telco	Water	Total
Number of Roadworks (000s)	234	223	244	499	1200
Average cost (£000) per Roadworks	£5.30	£5.40	£2.20	£2.80	£15.70
Annual Roadwork Disruption cost (£bn)	£1.24	£1.20	£0.54	£1.40	£4.38

Source: Halcrow Group, quoted in DfT draft s Regulatory Impact Assessment (RIA), July 2007

1.10 IMPLICATIONS FOR THE ISLE OF WIGHT PERMIT SCHEME

Using the DfT sanctioned report, it is possible to get an idea for the likely implication of the IOWPS either using a 'top down' approach from the overall saving or a 'bottom up' calculation based upon the implied rate per road works.

From a top down perspective, with an estimated 0.25% of utility road works occurring in Isle of Wight and a 5% reduction in road works associated with the Permit Scheme, it may be expected to produce annual savings of £0.55m in 2002 prices (£0.92m in 2010 prices) (Table 2).

Table 2 Forecast Benefits – Top Down approach

Halcrow Study	£
Annual UK cost of roadworks (£bn)	£4.36
Proportion of roadworks in Isle of Wight	0.25%
Annual Isle of Wight cost of roadworks (£m)	£11.00
Roadwork Reduction from Permit Scheme	5%
Estimated Permit Scheme saving (2002 prices) (£m)	**£0.55**
Estimated Permit Scheme saving (2010 prices) (£m)	**£0.92**

However, working up from the actual number of Noticed Works in Isle of Wight and using the 'rule of thumb' estimate from the DfT report of £600 per works per day and an average 6 days, the projected annual savings would be £0.55m in 2002 prices (£0.91m in 2010 prices) (Table 3).

Table 3 Forecast Benefits – Bottom up approach

Annual Number of Utility Works	Total
Pre-scheme Number of Utility Works	3,028
Utility Works after 5% reduction	2,877
Total Utility Permit reduction	151
Average Days Duration from Halcrow Study	6
Number of road work days saved	908.40
Total Cost at £600 per works per day (£ m) (2002 prices)	**£0.55**
Total Cost at £600 per works per day (£ m) (2010 prices)	**£0.91**

The figures above give an estimate of the upper and lower expectations from the IOWPS of between £0.91m and £0.92m in 2010 prices. As the two methods are within 5% this is considered a reliable estimate. Both methods do have a degree of uncertainty as they are based on sample national data which may not be a correct representation at a local level as this is dependent on the level of congestion. On a heavily congested network this can increase exponentially.

Since the study was carried out, INRIX, a leading international provider of real-time traffic information, transportation analytics and connected driver services estimated the level of congestion in the UK as £13.1 billion in 2013 prices (£11.7bn in 2010 prices) giving a value 2.34m and 5% saving.

INPUT DATA

1.11 INTRODUCTION

This section outlines the information sources and assumptions used in the IOWPS Cost Benefit Analysis. The Cost Benefit Analysis has been prepared with 2010 as the price base year for presentation values as set out in WebTAG.

1.12 COST BENEFIT ASSUMPTION

The objective of the IOWPS is a reduction in the disruption caused by road works through improved control and co-ordination.

The central assumption of the analysis is that the introduction of the Permit Scheme will cause a 5% fall in Permit applications and have a commensurate effect on roadwork activity and all associated aspects of the analysis. This 5% reduction is known as the Permit Scheme reduction factor.

Table 4 Central Assumptions

CBA modelled variable	Rate
Reduction Factor	5%
Target year for reduction in works	1
Ratio of Utility permits to overall permits	50%

The analysis worked on the operating assumption that the effects of the Permit Scheme will start on Scheme opening with reductions occurring after operational lead-time in the second month. The breakdown of annual Permit numbers are presented in Table 5 below.

Table 5 Annual Permit Summary

Annual Permits	Total
Pre-scheme Number of Utility Notices	3,028
Utility Permits after 5% reduction	2,877

1.13 DATA SOURCES

The Cost Benefit Analysis has been produced from four sources of information:

- Government guidance;
- A completed Permit Fees Matrix in a format provided by the DfT;
- Local data provided by Isle of Wight; and
- DfT Traffic Flow Data

Standard Cost Benefit Analysis assumptions and sensitivity factors have been used in line with recommendations in the DfT Advice Note for Local Highway Authorities Developing New or Varying Existing Permit Schemes June 2016.

The Local data provided by Isle of Wight contained both the number of permits by type and specific information on Scheme operation and costs.

1.14 DISCOUNT AND RISK FACTORS

The study uses the DfT recommended discount rate for assessment periods under 30 years of 3.5%.

The risk factors are applied to capital expenditure costs and are taken from standard values in the DfT Advice Note For Local Highway Authorities Developing New or Varying Existing Permit Schemes June 2016 and shown in Table 6 below.

Table 6 Discount and Risk Factors

CBA modelled variable	Rate
Discount Rate	3.5%
Risk Bias Factor	20%
Optimism Bias Factor	15%
Combined Risk-Optimism Bias Factor	38%

1.15 MODEL VARIABLE SPECIFICATION

This section identifies the treatment of costs in the period after Scheme implementation. All values used are standard values taken from the DfT Advice Note for Local Highway Authorities Developing New or Varying Existing Permit Schemes June 2016 and shown in Table 7.

Table 7 Model Variable specification

CBA modelled variable	Rate
Cost reduction based on permit reduction	50%
Reliability benefit factor	20%
Allowance for Phased Works	20%
Proportion of Annually recurring set up costs	0%

The introduction of the Permit Scheme will bring about a reduction in Permit applications, which in turn will mean lower Scheme costs. The TMA 2004 suggested 50% proportion used means that the reduction in Permit numbers of 5% will produce a 2.5% reduction in Scheme costs.

The reliability benefit factor is an approved standard uplift to the time benefit attributed to the reduction of road works on urban roads. The allowance for phased works is a factor applied to the number of Permits applications to get a total number of Permits upon which the calculations are based.

No costs associated with the establishment of the Permit Scheme are projected to extend beyond the Scheme opening.

1.16 STATUTORY INFORMATION ASSOCIATED WITH PERMIT SCHEMES

This study uses the guidance outlined in the TMA 2004 at the time of the study. The maximum charge per Permit type is shown in Table 8 below.

Table 8 Statutory Permit Fee rates

Revised Maximum fee structure for each category of works and for a hierarchy of main and minor roads - Road category refers to the reinstatement category of the street under the New Roads and Street Works Act 1991		
Work Type	**Road Category 0-2 or Traffic-sensitive**	**Road Category 3-4 and non traffic-sensitive**
Provisional Advance	£105	£75
Major works – over 10 days and all major works requiring a traffic regulation order.	£240	£150
Major works – 4 to 10 days	£130	£75
Major works – up to 3 days	£65	£45
Activity Standard	£130	£75
Activity Minor	£65	£45
Immediate Activity	£60	£40
Permit Variation	£45	£35

1.17 ISLE OF WIGHT DATA

Isle of Wight supplied the following data and policy decisions:

- Policy data; and
- Road works Data.

1.18 POLICY DATA

The policy decisions related to the Permit Scheme operation outlined in Table 9 were obtained from Isle of Wight.

Table 9 Operational Variables

CBA modelled variable	Period
Number of months to establish	1
Number of months to implement	1
Debtor days	30

1.19 ROAD WORKS DATA

Isle of Wight provided the information on the number of road works and shown on Table 10 below.

Table 10 Roadwork Totals

Isle of Wight Notice Volumes						
Work Type	RC 0-2		RC 3-4		Total Volume	
	Number	%	Number	%	Number	%
Major	36	3%	68	3%	104	3%
Standard	107	10%	191	10%	298	10%
Minor with Exc	264	25%	346	18%	610	20%
Minor without Exc	85	8%	61	3%	146	5%
Urgent	498	46%	1,110	57%	1,608	53%
Special Urgent	-	0%	-	0%	-	0%
Emergency	81	8%	181	9%	262	9%
Totals	1,071	35%	1,957	65%	3,028	

The table expresses work type by two types RC 0-2 Traffic Sensitive Streets and RC 3-4 Non-Traffic Sensitive Streets. RC is an abbreviation of Reinstatement Category which is a function of Commercial Vehicles (CV) traffic volumes.

1.20 DFT DATA

The following data was obtained from the Halcrow Study, traffic management requirements and published traffic count data:

1.21 WORKS DATA

The Halcrow Study found that the average size of carriageway works is 2 metres width by 20 metres length. Data was collected from 25 authorities across the whole of England on Notices and the percentages of notices by reinstatement category and excavation length is summarised on Table 11 below. This shows that there is a very high proportion of works on minor roads RC 3-4.

Table 11 Percentage of Notices by Reinstatement Category and Excavation Length

DfT Study Table 2 - Percentages of Notices by RC and Excavation Length Vol 3: Extents of Street Works and Monitoring Disruption						
RC		10m	30m	50m	100m	200m
RC 0-2	% of all works	16.3%	0.1%	1.0%	0.8%	1.0%
	% of RC 0-2	85%	1%	5%	4%	5%
RC 3-4	% of all works	70.0%	4.2%	2.6%	2.1%	1.7%
	% of RC 3-4	87%	5%	3%	3%	2%

The study also reported the average duration by work type and utility. The average for each utility was proportioned by the number of notices to derive an average duration by work type and is summarised in Table 12 below. It was noted that there was a high percentage of water utility works.

Table 12 Average duration by work type by utility

DfT Study Average duration by work type by utility					
Work Type	**Elec**	**Gas**	**Telecom**	**Water**	**Avg Duration All Utilities**
Major	41	40	23	30	33
Standard	7	7	9	15	9
Minor with Exc	3	4	2	2	2
Minor without Exc	3	4	6	2	3
Urgent	6	5	3	3	4
Special	3	3	3	2	2
Emergency	6	7	2	3	7

Works require traffic management to keep workers safe and the requirements are detailed in Chapter 8 of the Traffic Signs Manual DfT 2009 and is summarised in Table 13 below for different road types.

Table 13 Traffic Management for Street works

Traffic Management for Street works Traffic Signs Manual Chapter 8							
Road Type	**Single 30mph or less (m)**	**Single 40mph (m)**	**Single 50mph or more (m)**	**Dual 40mph or less (m)**	**Dual 50mph or 60mph (m)**	**Dual NS (m)**	**Dual NS Congested (m)**
Taper	50	80	100	100	150	200	200
Approach signs	45	110	450	300	800	1609	3218
Min vis to sign	60	60	75	60	75	120	120
End of works sign from end	30	45	45	45	90	90	90
Totals excl works	185	295	670	505	1115	2019	3628

The Halcrow study reported the daily cost of street works by road type and excavation length and is summarised in Tables 14 and 15 below.

Table 14 Daily Cost of Rural Works

DfT Study Table 4					
Daily Cost of Rural Works (£) by Reinstatement Category and Length					
Reinstatement Category	**Typical AADT**	**10m**	**50m**	**100m**	**200m**
0	<32,000	2,500	3,000	3,300	4,000
1	16000	7,850	9,050	10,250	11,000
2	12000	1,610	2,100	2,600	3,530
3	8000	780	970	1,200	1,625
4	4000	335	415	515	700

Table 15 Daily Cost of Urban Works

DfT Study Table 5 Daily Cost of Urban Works (£) by Reinstatement Category and Length					
Reinstatement Category	**Typical AADT**	**10m**	**50m**	**100m**	**200m**
0	40000	25,000	25,000	25,000	25,000
1	24000	9,000	12,000	15,000	17,000
2	16000	3,450	5,150	7,000	8,800
3	10000	385	535	710	1,025
4	6000	200	280	375	550

1.22 TRAFFIC DATA

Traffic data for a full CBA will be obtained from the DfT who monitor annual traffic flows for all authorities in the UK,

Isle of Wight Permit Scheme – Cost Benefit Analysis

For Isle of Wight there are 46 site locations on ‘A’ principal roads and minor roads for Annual Average Daily Flow (AADF) classified by vehicle type.

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Isle of Wight Permit Scheme – Cost Benefit Analysis

Table 16 DfT Traffic Flow Site Data 2018

Isle of Wight	DfT Traffic Flow Site Data 2018 (Sheet 1 of 4)						
Ref No	Road	Start Junction	End Junction	All Motor Vehicles	%Lights	%Heavy	% Ca
1	A3021	Well Rd	B3321	6771	0.968	0.032	0.78
2	A3055	A3054	High St/Albert St	2049	0.988	0.012	0.83
3	A3054	River Road roundabout	Standen Ave, Newport	7002	0.980	0.020	0.80
4	A3056	A3020	Whitecross Lane, Shanklin	14222	0.969	0.031	0.81
5	A3020	A3054	A3054	34292	0.981	0.019	0.85
6	A3020	Windsor Drive, Shanklin	A3056	8206	0.990	0.010	0.82
7	A3055	A3020	A3056	8083	0.992	0.008	0.84
8	A3021	Crossways Rd, Cowes	A3054	16755	0.971	0.029	0.82
9	A3020	Three Gates Rd	End of Road	5149	0.991	0.009	0.72
10	A3054	A3055	A3055	6342	0.988	0.012	0.74
11	A3054	A3055	River Road roundabout	3506	0.982	0.018	0.84
12	A3055	Great Preston Rd	A3054	8991	0.992	0.008	0.87
13	A3020	A3020	St George's Appproach, Newport	18578	0.968	0.032	0.79
14	A3054	Halberry Lane, Newport	A3021	19330	0.979	0.021	0.77
15	A3054	A3021	B3731	16271	0.982	0.018	0.81
16	A3054	B3731	Newnham Rd, Ryde	15647	0.984	0.016	0.80
17	A3054	Queens Rd	A3055	6617	0.993	0.007	0.85
18	A3054	Queens Rd	A3055	6617	0.993	0.007	0.85
19	A3055	A3054	Esplanade	5154	0.992	0.008	0.80
20	A3055	A3055 Church St	A3055 Victoria St	3496	0.995	0.005	0.78
21	A3055	A3055 Church St	A3055 High St	3259	0.993	0.007	0.78
22	A3055	A3055 Victoria St	B3328 Chine Avenue, Shanklin	4646	0.990	0.010	0.80
23	A3021	Castle St	York Ave	6770	0.980	0.020	0.83
24	A3021	Castle St	York Ave	1356	0.978	0.022	0.83
25	A3021	Ferry Rd	Castle St	4009	0.980	0.020	0.80
26	A3021	Ferry Road	Well Rd	4009	0.980	0.020	0.80
27	A3020	Lonsdale Ave, Newport	Three Gates Rd, Cowes	18750	0.974	0.026	0.81
28	A3021	B3321	Crossways Rd	7516	0.968	0.032	0.78
29	A3020	B3341 St George's Approach	B3401	20625	0.968	0.032	0.79
30	A3054	Standen Avenue	A3020	7772	0.980	0.020	0.80
31	A3020	A3054	Lonsdale Avenue	21958	0.981	0.019	0.81
32	A3055	Perowne Way, Sandown	Great Preston Rd, Ryde	13328	0.986	0.014	0.82
33	A3054	Newnham Rd	West St	15436	0.983	0.017	0.83
34	A3055	B3328 Chine Avenue	A3020	4925	0.990	0.010	0.80
35	A3020	Windsor Drive	A3055	5248	0.995	0.005	0.81
36	A3056	Whitecross Lane	A3055	15786	0.969	0.031	0.81
37	A3055	A3056	Perowne Way	14963	0.984	0.016	0.81
38	A3054	A3020	Halberry Lane	21456	0.979	0.021	0.77
39	B3323	B3399	B3401	2262	0.977	0.023	0.83

Table 17 DfT Traffic Flow Site Data 2018

Isle of Wight	DfT Traffic Flow Site Data 2018 (Sheet 2 of 4)							
Ref No	Road	Start Junction	End Junction	Type	2-way/1-way/bus lane	Speed Limit (mph)	Road Class	RC
1	A3021	Well Rd	B3321	S2AP	2-way	30	8	4
2	A3055	A3054	High St/Albert St	S2AP	2-way	60	1	4
3	A3054	River Road roundabout	Standen Ave, Newport	S2AP	2-way	30	1	3
4	A3056	A3020	Whitecross Lane, Shanklin	S2AP	2-way	50	1	1
5	A3020	A3054	A3054	D2AP	2-way	70	8	1
6	A3020	Windsor Drive, Shanklin	A3056	S2AP	2-way	40	1	3
7	A3055	A3020	A3056	S2AP	2-way	30	8	3
8	A3021	Crossways Rd, Cowes	A3054	S2AP	2-way	60	1	1
9	A3020	Three Gates Rd	End of Road	S2AP	2-way	30	8	4
10	A3054	A3055	A3055	S2AP	1-way	30	7	4
11	A3054	A3055	River Road roundabout	S2AP	2-way	30	1	4
12	A3055	Great Preston Rd	A3054	S2AP	2-way	30	1	3
13	A3020	A3020	St George's Appproach, Newport	S2AP	2-way	40	1	1
14	A3054	Halberry Lane, Newport	A3021	S2AP	2-way	50	1	1
15	A3054	A3021	B3731	S2AP	2-way	30	10	2
16	A3054	B3731	Newnham Rd, Ryde	S2AP	2-way	40	10	2
17	A3054	Queens Rd	A3055	S2AP	1-way	30	7	4
18	A3054	Queens Rd	A3055	S2AP	1-way	30	7	4
19	A3055	A3054	Esplanade	S2AP	1-way	30	7	4
20	A3055	A3055 Church St	A3055 Victoria St	S2AP	1-way	30	7	4
21	A3055	A3055 Church St	A3055 High St	S2AP	1-way	30	7	4
22	A3055	A3055 Victoria St	B3328 Chine Avenue, Shanklin	S2AP	2-way	60	1	4
23	A3021	Castle St	York Ave	S2AP	2-way	30	7	4
24	A3021	Castle St	York Ave	S2AP	2-way	30	7	4
25	A3021	Ferry Rd	Castle St	S2AP	1-way	30	7	4
26	A3021	Ferry Road	Well Rd	D2AP	1-way	30	7	4
27	A3020	Lonsdale Ave, Newport	Three Gates Rd, Cowes	S2AP	2-way	40	1	1
28	A3021	B3321	Crossways Rd	S2AP	2-way	30	8	4
29	A3020	B3341 St George's Approach	B3401	S2AP	2-way	30	7	1
30	A3054	Standen Avenue	A3020	S2AP	2-way	30	8	4
31	A3020	A3054	Lonsdale Avenue	S2AP	2-way	40	8	1
32	A3055	Perowne Way, Sandown	Great Preston Rd, Ryde	S2AP	2-way	40	1	2
33	A3054	Newnham Rd	West St	S2AP	2-way	30	8	2
34	A3055	B3328 Chine Avenue	A3020	S2AP	2-way	30	7	4
35	A3020	Windsor Drive	A3055	S2AP	2-way	30	8	4
36	A3056	Whitecross Lane	A3055	S2AP	2-way	30	8	2
37	A3055	A3056	Perowne Way	S2AP	2-way	30	8	2
38	A3054	A3020	Halberry Lane	S2AP	2-way	30	8	1
39	B3323	B3399	B3401	S2AP	2-way	60	1	4

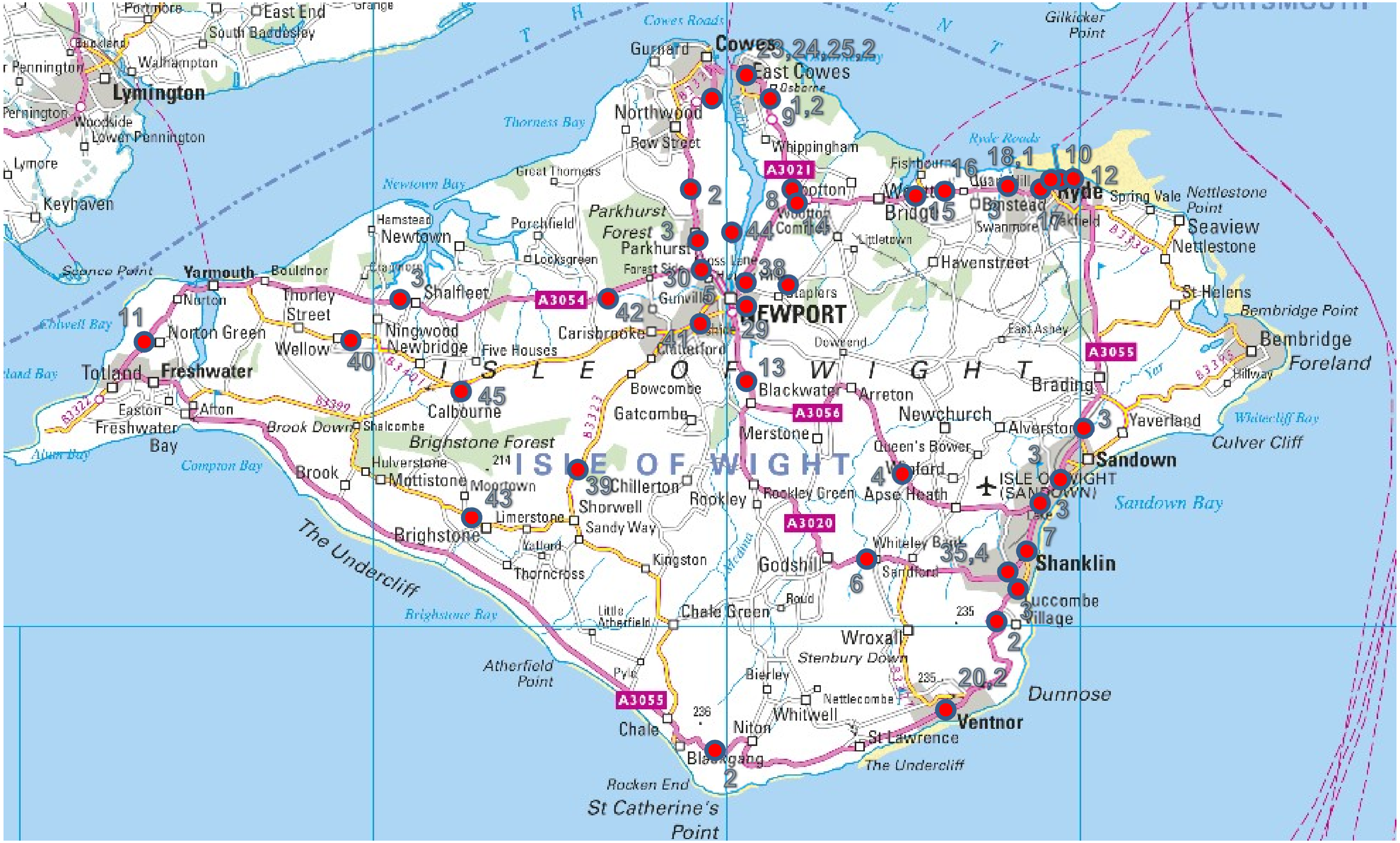
Table 18 DfT Traffic Flow Site Data 2018

Isle of Wight	DfT Traffic Flow Site Data 2018 (Sheet 3 of 4)											
Ref No	Road	Start Junction	End Junction	All Motor Vehicles	%Lights	%Heavy	% Car	% LGV	%OGV1	%OGV2	%PSV	Data Type
40	B3401	Station Road	Hill Place Lane	569	0.988	0.012	0.838	0.125	0.012	0.000	0.037	RURAL
41	B3323	Wellington Road	Pyle Street	12345	0.990	0.010	0.829	0.131	0.008	0.002	0.017	URBAN
42	Betty Haunt Lane	A3054	Calbourne Road	1292	0.992	0.008	0.830	0.149	0.005	0.003	0.000	RURAL
43	North Street	Upper Lane	B3399	251	1.000	0.000	0.849	0.151	0.000	0.000	0.000	URBAN
44	Dodnor Lane	A3020	End of Road	269	0.981	0.019	0.717	0.260	0.019	0.004	0.000	URBAN
45	Lynch Lane	B3401	Unnamed Road	839	0.988	0.012	0.808	0.179	0.013	0.000	0.000	RURAL
46	Albert Road	A3020	Hatherton Road	355	0.989	0.011	0.873	0.101	0.011	0.000	0.000	URBAN

Table 19 DfT Traffic Flow Site Data 2018

Isle of Wight	DfT Traffic Flow Site Data 2018 (Sheet 4 of 4)							
Ref No	Road	Start Junction	End Junction	Type	2-way/1-way/bus lane	Speed Limit (mph)	Road Class	RC
40	B3401	Station Road	Hill Place Lane	S2AP	2-way	50	1	4
41	B3323	Wellington Road	Pyle Street	S2AP	2-way	30	8	3
42	Betty Haunt Lane	A3054	Calbourne Road	S2AP	2-way	60	1	4
43	North Street	Upper Lane	B3399	S2AP	2-way	30	10	4
44	Dodnor Lane	A3020	End of Road	S2AP	2-way	30	7	4
45	Lynch Lane	B3401	Unnamed Road	S2AP	2-way	30	1	4
46	Albert Road	A3020	Hatherton Road	S2AP	2-way	30	7	4

Figure 1 DfT AADT Locations Isle of Wight



DELAY MODELLING

1.23 DELAY MODELLING METHODOLOGY

The estimation of delay is detailed in the Halcrow study. Two methods of measurement are listed

(a) live site measured method; and

(b) modelling techniques to replicate works on the ground.

The measured method is described as a restricted illustrative example of the impact at works and a general model is more industry recognised as the more robust technique that can be audited and validated.

There are three types of modelling software that can be used to model delay at works namely;

QUADRO – models queues and delays at road works;

SATURN – macro assignment;

and VISSIM – micro simulation.

The Halcrow study stated in Section 2.1 that on evaluation there were inconsistencies with the latter two types and that QUADRO would give the most consistent results although it is suited more to rural locations with little diversion routes but it is able to model the additional delay on diversion routes when the maximum queuing delay on the main route is exceeded.

QUADRO is able to appraise individual works that are planned in the future on different types of road by modelling the delay experienced by road users, quantify the delay and estimate the cost of the delay.

The software is able to calculate and convert delays into monetary figures as detailed in WebTAG Unit A1.3. with assumptions in regard to valuation of time, operating costs and accidents.

Users are required to input base link specific details including network classification, traffic flows, road type characteristics and any diversion routes. Works details including site length, works type such as lane closures and shuttle working. The latest version released on 18th October 2018 Version 4 release 16 will be used for the CBA. The QUADRO Manual was included in the Design Manual for Roads and Bridges Volume 14 Economic Assessment of Road Maintenance DfT 2002.

1.24 THE VALUATION OF COSTS IN QUADRO

1.24.1 The Valuation of Time

QUADRO calculates the delays at works and translates these into monetary figures using standard values of time.

The latest values are provided in WebTAG Unit A1.3 and is shown in Table 20 and 21 below. QUADRO converts the resource cost to market price to be consistent with the Economic Efficiency of the Transport System (TEE) table. The market price is calculated by multiplying the resource value by (1 + *t*) where *t* is the average rate of indirect taxation in the economy.

Table 20 WebTAG - Value of Time by Mode and Trip Purpose

Table A 1.3.1: Values of Working (Employers' Business) Time by Mode (£ per hour, 2010 prices, 2010 values)			
Mode	**Resource Cost**	**Perceived Cost**	**Market Price**
Car driver	14.86	14.86	17.69
Car passenger	14.86	14.86	17.69
LGV (driver or passenger)	10.24	10.24	12.18
OGV (driver or passenger)	12.06	12.06	14.35
PSV driver	12.32	12.32	14.66
PSV passenger	8.42	8.42	10.02
Taxi driver	10.89	10.89	12.96
Taxi / Minicab passenger	14.86	14.86	17.69
Rail passenger	24.52	24.52	29.18
Underground passenger	8.42	8.42	10.02
Walker	8.42	8.42	10.02
Cyclist	8.42	8.42	10.02
Motorcyclist	14.86	14.86	17.69
Average of all working persons	16.19	16.19	19.27
Values of Non-Working Time by Trip Purpose (£ per hour, 2010 prices, 2010 values)			
Trip Purpose	**Resource Cost**	**Perceived Cost**	**Market Price**
Commuting	8.36	9.95	9.95
Other	3.82	4.54	4.54

Table 21 WebTAG - Value of Time per Vehicle per hour

Table A 1.3.5: Market Price Values of Time per Vehicle based on distance travelled (£ per hour, 2010 prices and 2010 values)								
Vehicle Type		**Weekday**					**Weekend**	**All Week**
	Journey Purpose	**7am – 10am**	**10am – 4pm**	**4pm – 7pm**	**7pm – 7am**	**Average**		
Car	Work	20.00	20.49	20.29	20.67	20.32	23.23	20.53
	Commuting	11.27	11.45	11.31	11.48	11.35	12.01	11.40
	Other	7.78	8.28	8.14	8.11	8.13	9.63	8.66
	Average Car	11.33	10.67	10.88	11.03	10.95	10.29	10.79
LGV	Work (freight)	14.62	14.62	14.62	14.62	14.62	15.35	14.62
	Commuting & Other	8.92	8.92	8.92	8.92	8.92	12.41	9.72
	Average LGV	13.93	13.93	13.93	13.93	13.93	14.99	14.03
OGV1	Working	14.35	14.35	14.35	14.35	14.35	14.35	14.35
OGV2	Working	14.35	14.35	14.35	14.35	14.35	14.35	14.35
PSV (Occupants)	Work	16.35	16.69	17.46	17.45	16.82	15.32	16.45
	Commuting	22.39	7.85	31.48	43.04	19.43	7.36	16.45
	Other	44.44	50.92	39.78	34.52	45.58	51.76	47.10
	Total	83.18	75.46	88.73	95.00	81.82	74.44	80.00

1.24.2 The Valuation of Vehicle Operating Costs

QUADRO calculates the vehicle operating costs (VOC) incurred by traffic with and without works.

VOC may increase during works if speeds are reduced or a long diversion route. The effects of temporary blockages caused by accidents are solely assessed on journey time and operating costs are not calculated. As the resource cost of fuel, fuel efficiency and fleet composition change independently, the relationship of resource cost (per kilometre) to market prices changes annually.

The programme is informed of changes in tax rates over time and are shown in Tables 22 to 24 below.

Values for 2010 VOC are shown in Table 25 below.

Carbon emissions are considered in terms of the change in the equivalent tonnes of carbon Table 26 and estimated from fuel consumption Table 27 below.

Table 22 Taxation Rates Base

TAXATION RATES (%)					
FUEL TYPE	AVERAGE FINAL	FUEL		NON-FUEL	
		FINAL	INTER	FINAL	INTER
PETROL	19	339.7	274.2	20	0
DIESEL	19	310.1	249.1	20	0

Table 23 Changes to Taxation Rates % Petrol

CHANGES TO TAXATION RATES (%) PETROL						
AVERAGE FINAL	FUEL		NON-FUEL		FROM YEAR	TO YEAR
	FINAL	INTER	FINAL	INTER		
0	-9.87	-10.41	0	0	2002	2003
0	-9.73	-10.32	0	0	2003	2004
0	-19.56	-20.88	0	0	2004	2005
0	-11	-11.94	0	0	2005	2006
0	0.63	0.69	0	0	2006	2007
0	-18.64	-20.19	0	0	2007	2008
0	29.04	36.78	0	0	2008	2009
0	-16.11	-20.38	0	0	2009	2010
0	-13.72	-18.56	0	0	2009	2010
0	-3.34	-3.85	0	0	2010	2011
0	-1.94	-2.24	0	0	2011	2012
0	-1.6	-1.85	0	0	2012	2013
0	0.53	0.62	0	0	2013	2014
0	0.81	0.95	0	0	2014	2015
0	1.19	1.39	0	0	2015	2016
0	0.98	1.14	0	0	2016	2017
0	0.79	0.92	0	0	2017	2018
0	0.61	0.71	0	0	2018	2019
0	0.43	0.49	0	0	2019	2020
0	0.25	0.29	0	0	2020	2021
0	0.25	0.28	0	0	2021	2022
0	0.29	0.34	0	0	2022	2023
0	0.35	0.4	0	0	2023	2024
0	0.31	0.36	0	0	2024	2025
0	0.36	0.42	0	0	2025	2026
0	0.31	0.35	0	0	2026	2027
0	0.32	0.36	0	0	2027	2028
0	0.32	0.37	0	0	2028	2029
0	0	0	0	0	2030	2099

Table 24 Changes to Taxation Rates % Diesel

CHANGES TO TAXATION RATES (%) DIESEL						
AVERAGE	FUEL		NON-FUEL		FROM	TO
FINAL	FINAL	INTER	FINAL	INTER	YEAR	YEAR
0	-7.7	-8.16	0	0	2002	2003
0	-8.4	-8.95	0	0	2003	2004
0	-23.5	-25.18	0	0	2004	2005
0	-9.53	-10.44	0	0	2005	2006
0	3.85	4.26	0	0	2006	2007
0	-27.29	-29.85	0	0	2007	2008
0	37.84	48.13	0	0	2008	2009
0	-10.45	-14.64	0	0	2009	2010
0	-16.24	-21.43	0	0	2009	2010
0	-4.42	-5.14	0	0	2010	2011
0	-3.49	-4.09	0	0	2011	2012
0	-1.56	-1.84	0	0	2012	2013
0	0.54	0.64	0	0	2013	2014
0	0.81	0.96	0	0	2014	2015
0	1.2	1.41	0	0	2015	2016
0	0.98	1.15	0	0	2016	2017
0	0.79	0.93	0	0	2017	2018
0	0.62	0.73	0	0	2018	2019
0	0.45	0.53	0	0	2019	2020
0	0.26	0.3	0	0	2020	2021
0	0.26	0.3	0	0	2021	2022
0	0.31	0.36	0	0	2022	2023
0	0.35	0.41	0	0	2023	2024
0	0.32	0.38	0	0	2024	2025
0	0.35	0.41	0	0	2025	2026
0	0.34	0.39	0	0	2026	2027
0	0.32	0.37	0	0	2027	2028
0	0.32	0.38	0	0	2028	2029
0	0	0	0	0	2030	2099

Table 25 WebTAG – Non-Fuel Resource Vehicle Operating Costs

Table A 1.3.14: Non-Fuel Resource Vehicle Operating Costs (2010 prices and 2010 values)			
Vehicle Category		Parameter Values	
		a1 p / km	b1 p / hr
Car	Work Petrol	4.966	135.946
	Work Diesel	4.966	135.946
	Work Electric	1.157	135.946
	Non-Work Petrol	3.846	0.000
	Non-Work Diesel	3.846	0.000
	Non-Work Electric	1.157	0.000
LGV	Work	7.213	47.113
	Work Electric	2.170	47.113
	Non-Work	7.213	0.000
	Non-Work Electic	2.170	0.000
OGV1	Work	6.714	263.817
OGV2	Work	13.061	508.525
PSV	Work	30.461	694.547

Table 26 WebTAG – Carbon dioxide emissions per litre of fuel burnt / kWh used

Table A 3.4: Non Traded Values, £ per Tonne of CO2e (2010 prices)			
Year	**Low**	**Central**	**High**
2010	26.20	52.41	78.61
2011	26.20	53.28	79.48
2012	27.08	53.28	80.36
2013	27.08	54.15	82.10
2014	27.95	55.03	82.98
2015	27.95	55.90	83.85
2016	28.82	56.77	85.60
2017	28.82	57.65	86.47
2018	29.70	58.52	88.22
2019	29.70	59.39	89.09
2020	30.57	60.27	90.84

Table 27 WebTAG – Fuel consumption parameter values

Table A 1.3.8: Fuel consumption parameter values (litres per km, 2010)				
	Parameters			
Vehicle Category	**a**	**b**	**c**	**d**
Petrol Car	0.45195	0.09605	-0.00109	7.24599E-06
Diesel Car	0.48191	0.06909	-0.00066	5.23793E-06
Petrol LGV	0.34435	0.19309	-0.00303	1.95736E-05
Diesel LGV	0.46348	0.11328	-0.00163	1.38355E-05
OGV1	2.69628	0.14306	-0.00103	1.12932E-05
OGV2	5.66560	0.29422	-0.00195	1.16192E-05
PSV	3.36019	0.29525	-0.00321	2.35400E-05
Energy consumption parameter values (kWh per km, 2011)				
Electric Car	0.15077			
Electric LGV	0.33636			
Electric OGV1				
Electric OGV2				
Electric PSV				

1.24.3 The Valuation of Accidents

Additional accidents may be expected in works and there are two types of cost incurred the cost of delay and the direct cost.

The direct cost includes the casualty, damage to property, insurance administration, police time and an allowance to damage only accidents. QUADRO calculates these values on the network using DfT standard values for average personal injury accidents on various types of road.

Values of most elements are proportional to national income and for 2010 are shown in Table 28 and 29 below. Accident values increase in line with GDP as shown in Table 30 below. Accident rates are calculated with and without works, combined link and junction rates are used in QUADRO,

Table 31 shows accident rates for 15 road types without works. Local data can be used only if available for both the without and with works in this CBA these default values are used.

Table 32 shows the number of casualties per accident.

Table 28 WebTAG – Cost per Casualty

Cost per Casualty	
Severity	**Cost £**
Fatal	1,554,395
Serious	174,671
Slight	13,465

Table 29 WebTAG – Cost per Accident

Cost per Accident							
Severity	**Insurance Administration**	**Damage to Property**			**Police Cost**		
		Urban	**Rural**	**Motorway**	**Urban**	**Rural**	**Motorway**
Fatal	285	7,432	12,606	16,035	16,719	17,169	17,369
Serious	177	3,983	5,747	13,682	1,846	2,305	2,434
Slight	108	2,350	3,809	6,922	477	655	546
Damage	51	1,680	2,512	2,414	35	20	17

Table 30 WebTAG – Accident Growth Rates

Annual Rates of Growth of Accident Values	
Range of Years	**Growth Rate (% p.a.)**
2010 - 2011	0.80
2011 - 2012	0.78
2012 - 2013	1.41
2013 - 2014	2.16
2014 - 2015	1.54
2015 - 2016	0.95
2016 - 2017	1.22
2017 - 2018	0.77
2018 - 2019	0.62
2019 - 2020	0.86

Table 31 WebTAG – Accident Without Works

Combined Link / Junction: Accident Rates and Change Factors 2000 Base				
Road Type	Speed Limit (mph)	Accident Rate	Beta Factor	Road Description
1	50/60/70	0.08	0.956	Motorways
2	50/60/70	0.067	0.956	Motorways
3	50/60/70	0.079	0.956	Motorways
4	30/40	0.532	0.959	Modern S2 Roads
4	>40	0.244	0.955	Modern S2 Roads
5	30/40	0.532	0.959	Modern S2 Roads with HS
5	>40	0.244	0.955	Modern S2 Roads with HS
6	30/40	0.863	0.959	Modern WS2 Roads
6	>40	0.163	0.955	Modern WS2 Roads
7	30/40	0.863	0.959	Modern WS2 Roads w. HS
7	>40	0.163	0.955	Modern WS2 Roads w. HS
8	30/40	0.863	0.959	Older S2 A Roads
8	>40	0.244	0.955	Older S2 A Roads
9	30/40	0.559	0.951	Other S2 Roads
9	>40	0.233	0.933	Other S2 Roads
10	30/40	0.553	0.967	Modern D2 Roads
10	>40	0.107	0.956	Modern D2 Roads
11	30/40	0.599	0.967	Modern D2 Roads with HS
11	>40	0.072	0.956	Modern D2 Roads with HS
12	30/40	0.599	0.967	Older D2 Roads
12	>40	0.107	0.956	Older D2 Roads
13	30/40	0.62	0.951	Modern D3+ Roads
13	>40	0.123	0.946	Modern D3+ Roads
14	30/40	0.62	0.951	Modern D3+ Roads w. HS
14	>40	0.123	0.946	Modern D3+ Roads w. HS
15	30/40	0.62	0.951	Older D3+ Roads
15	>40	0.123	0.946	Older D3+ Roads

Table 32 WebTAG – Casualties per P.I.A.

Combined Link / Junction: Casualty Rates					
Road Type	Speed Limit (mph)	Casualties per P.I.A.			Road Description
		Fatal	Serious	Slight	
1 – 3	50 / 60 / 70	0.020	0.1230	1.455	Motorways
4 – 8	30 / 40	0.009	0.132	1.176	S2 A Roads
4 – 8	>40	0.038	0.238	1.3	S2 A Roads
9	30 / 40	0.007	0.134	1.132	Other S2 Roads
9	>40	0.026	0.222	1.218	Other S2 Roads
10 – 15	30 / 40	0.009	0.112	1.238	Dual Carriageways
10 – 15	>40	0.025	0.151	1.297	Dual Carriageways

1.25 DELAY MODELLING IN QUADRO

1.25.1 Elements of Delay

The delay at works are made up of a number of elements that include the reduce running speeds through the site, traffic signal control for shuttle working, insufficient capacity causing queuing and diversion and are calculated by the General Delay Sub-Model.

Accidents and breakdowns can cause further delay and will depend on location, amount of width and time of day and if alternative routes are available and are calculated by the Incident Delay Sub-Model.

1.25.2 The General Delay Sub-Model

This model is run in each direction and for the four day types Monday to Thursday, Friday, Saturday and Sunday for each hour, the remaining queue is added to the following hour.

The assumption is that regular drivers would travel on the route that minimises the journey time. A driver may minimise journey time by diverting to an alternative before the work site and re-join past the site or divert the route completely.

If traffic is not expected to divert at a particular site and instead queue this implies there are unattractive routes. It can be found that a specification of a diversion route can be particularly difficult and QUADRO is able to be run with a maximum queuing delay.

For the purpose of the CBA this has been used, sample run data is included in the QUADRO manual for different types of road for maximum queuing delay and shown on Table 33 below. Once the maximum queue time is exceeded drivers will divert to a route and assumed that this would equal the journey time through the work site.

Table 33 Max-Q-Delay

Typical Max-Q-Delay QUADRO	
Type of Road	**Max-Q-Delay (mins)**
S2	5
WS2	5
D2AP	10
D3AP	15

1.25.3 The Incident Delay Sub-Model

If a breakdown or accident occurs within the site length this will restrict the capacity further.

Unlike the General Model drivers will not divert as this would not be a common event. This model is not run for shuttle working sites as it is assumed that the obstruction would be speedily removed.

This sub model is run twice once for breakdown and once for accidents. The sub model assumes that breakdowns occur at a rate shown in Table 34 below. Accident Rates were tabled earlier in Section 4.2.

Table 34 Breakdown Rates

Default Breakdown Rates QUADRO	
Vehicle Type	**Rate (vkm)**
Light	10 per 10^6
Heavy	5 per 10^6

1.26 TRAFFIC INPUT

1.26.1 Network and Route Type Description

For each of the work sites certain characteristics are required by QUADRO including the length of the works site, adjoining sections up and downstream of the site (both directions) and the diversion route.

For the purpose of this CBA the diversion length is not modelled as the maximum queue delay method has been used.

The main route is considered to be consistent along its length and no flow variations. A road class is specified as shown on Table 35 below to calculate a speed/flow relationship with default values shown on Table 36 and 37.

For each road class the user is able to input geometric parameters such as road width, hilliness, accesses along route, visibility, for the purpose of this CBA, typical values have been applied as set out in Table 38 below. The work site type is defined by the number of lanes open or shuttle working as shown on Table 39 below that selects a default capacity.

QUADRO contains values for average duration of incidents and are shown on Table 40 below.

Table 35 Road Classes

QUADRO Road Classes	
Road Class	**Description**
Class 1	Rural single carriageway
Class 2	Rural all-purpose dual 2 lane carriageway
Class 3	Rural all-purpose dual 3 or more lane carriageway
Class 4	Motorway (urban or rural), dual 2 lanes
Class 5	Motorway (urban or rural), dual 4 or more lanes
Class 6	Motorway (urban or rural), dual 3 lanes
Class 7	Urban road, Central, single or dual carriageway
Class 8	Urban road, Non-central, single or dual carriageway
Class 9	Small town road, single or dual carriageway
Class 10	Suburban Main Road, single carriageway
Class 11	Suburban Main Road, dual carriageway

Table 36 Minimum Speeds

Default minimum speeds QUADRO	
Road Class	**Minimum speed (kph)**
Classes 1 to 6	45
Class 7	25
Class 8	15
Class 9	30
Class 10	25
Class 11	35

Table 37 Speed/Flow

Default Speed/flow Parameters QUADRO									
CLASS	LIGHT-V (kph) kph	GRAD-A reduction (kph) per 1000 veh	GRAD-B reduction (kph) per 1000 veh	HEAVY-V kph	GRAD-A reduction (kph) per 1000 veh	GRAD-B reduction (kph) per 1000 veh	CHANGE Factor or vph per lane	MINS Kph	Qc vph per lane
1	72.1	15	50	78.2	5.2	5.2	1920	45	2400
2	108	6	33	86	0	0	1080	45	2100
3	115	6	33	86	0	0	1080	45	2100
7	64.5	30	30	64.5	30	30		25	800
8	39.5	30	30	39.5	30	30		15	800
10	70	10	45	64	10	45	1200	25	1500
11	80	10	45	74	10	45	1200	35	1500

Table 38 Geometric Parameters

Default Geometric Parameters QUADRO													
CLASS	TYPE	DESCRIPTION	CWID	HILLS	DEVEL	INT	BEND	MAXS	SWID	VWID	JUNC	VIS	AXS
1	RURAL	Single Carriageway	7.3	15			75	96	0	1	0.6	200	
2	RURAL	Dual 2 lanes	14.6	15			30	113					
3	RURAL	Dual 3 lanes	22	15			30	113					
7	URBAN	Non-central	10	15	70								
8	URBAN	Central	11	15		4.5							
10	URBAN	Suburban Single	10	15		0.8		64					30
11	URBAN	Suburban Dual	14.6	15		0.8		64					30

Table 39 Work Types

QUADRO Work Types	
Works Type	**Description**
0	No lanes open in this direction
1	One lane open in this direction
2	Two lanes open in this direction
3	Three lanes open in this direction
4	Four lanes open in this direction
5	Five lanes open in this direction
9	Shuttle working
add 10	if layout features contra-flow working

Table 40 Incident Duration

Default Breakdown and Accident Durations in QUADRO		
Type of Road	**Breakdown Duration (mins)**	**Accident Duration (mins)**
Motorway	25	30
Single and Dual AP	40	45

1.26.2 Variation in Traffic Flow

Traffic flows vary by hour, day, week and month and different type of vehicles.

QUADRO calculates user costs daily and normally for a 7 day week using the four day types. For the purpose of this CBA AADT flows have been used and QUADRO converts this to Annual Average Hourly Traffic (AAHT) to generate an hourly flow profile.

The QUADRO model uses directional flow as each direction is modelled separately.

Two-way input flows are split by tidal behaviour for example the direction into town in the morning peak and the direction is specified by the user.

1.26.3 Vehicles in Work Time and Vehicle Occupancies

QUADRO considers the disaggregation of time spent in work and non-work mode for each vehicle type.

The National Travel Survey (NTS) showed the average car mileage in work mode, commuting mode and non-working mode and are further disaggregated by average hourly percentages.

Averages for weekdays and weekends, vehicles and journey types are shown on Table 41 below.

Table 41 WebTAG – Trip Proportions

Table A 1.3.4:		Proportion of travel in work and non-work time							Proportion of trips made in work and non-work time						
Mode / Vehicle Type & Journey Purpose		Weekday					Weekend	All Week	Weekday					Weekend	All Week
		7am – 10am	10am – 4pm	4pm – 7pm	7pm – 7am	Average	Average	Average	7am – 10am	10am – 4pm	4pm – 7pm	7pm – 7am	Average	Average	Average
		Percentage of Distance Travelled by Vehicles							Percentage of Vehicle Trips						
Car	Work	16.5	16.5	11.8	12.9	14.8	3.5	12.1	7.0	7.2	5.1	4.3	6.2	2.0	5.3
	Commuting	44.1	11.8	41.3	38.5	31.2	7.9	25.5	38.3	11.3	32.6	28.8	25.2	8.4	21.3
	Other	39.5	71.7	46.9	48.6	53.9	88.6	62.5	54.7	81.5	62.3	66.9	68.6	89.6	73.4
LGV	Work (freight)	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0	88.0
	Non – Work	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
OGV1	Work	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
OGV2	Work	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Percentage of Distance Travelled by Occupants							Percentage of Person Trips						
Car	Work	13.7	11.7	9.4	10.4	11.5	2.2	8.6	5.3	5.1	3.9	3.4	4.7	1.3	3.8
	Commuting	36.1	8.1	32.1	30.1	23.5	4.4	17.7	31.0	8.4	25.8	23.7	19.7	6.0	16.1
	Other	50.2	80.2	58.5	59.5	65.0	93.4	73.7	63.6	86.5	70.3	72.8	75.6	92.7	80.1
PSV	Work	1.4	1.7	2.3	2.3	1.8	0.5	1.5	2.1	1.7	2.6	3.1	2.0	1.0	1.9
	Commuting	18.4	6.5	25.9	35.4	16.0	6.1	13.5	25.6	7.2	33.5	46.3	19.6	10.6	18.0
	Other	80.2	91.9	71.8	62.3	82.2	93.4	85.0	72.3	91.1	64.0	50.6	78.4	88.4	80.1

1.27 SITE SPECIFIC QUADRO INPUT DATA

1.27.1 Sample Site Data

For each site, data files will be created, and works will be run for the site lengths carried out with the Halcrow Study 10, 30, 50, 100 and 200 metres.

The number of samples used for the CBA is required to be proportioned to the actual number of works and statistically confident in the data.

In total 230 outputs were created and are provided in Appendix A. The Daily Cost of all sites was averaged for Rural and Urban roads by RC and excavation length and is shown on Table 42 and 43 below.

The number of samples used for the CBA is required to be proportioned to the actual number of works and statistically confident in the data.

The number of samples used for each work type are shown on Table 44 below with the percentages matching the proportions of actual works shown in Table 10. This has been statistically verified at a 95% confidence level with a confidence interval of 5%. A confidence interval within +/- 5% is considered to be reliable.

The samples used for the CBA were selected by separating the sites into the two types RC 0-2 and 3-4 and ranking the sites by impact and making the average cost of sites selected close to the mean. The sample sites were also proportioned by excavation length so that the percentages match the Halcrow study and are shown on Table 45 below.

The sample sites average duration for each work type was matched to the Halcrow Study as shown in Table 11. For example, for Major Works the average duration was 33 days, duration were run between 41 and 23 days and compares to values in the Halcrow Study. High and Low cost forecasts were derived, for High the highest duration of days was applied to the highest ranking site by impact, for Low the highest duration of days was applied to the lowest ranking site by impact. The average of the two forecasts was used to obtain the Total Delay of Works. Summarised impacts are provided in Appendix B.

Table 42 Isle of Wight Delay Modelling Daily Cost of Rural Works

Isle of Wight							
Daily Cost of Rural Street Works (£) by Reinstatement Category and Length							
Reinstatement Category	Typical AADT	Average AADT	10m	30m	50m	100m	200m
0	<32,000	N/A	N/A	N/A	N/A	N/A	N/A
1	16,000	17,527	7,365	7,365	13,061	27,317	43,192
2	12,000	13,328	363	363	749	1,878	3,732
3	8,000	8,066	165	194	231	535	1,028
4	4,000	2,166	37	37	61	120	233

Table 43 Isle of Wight Delay Modelling Daily Cost of Urban Works

Isle of Wight							
Daily Cost of Urban Street Works (£) by Reinstatement Category and Length							
Reinstatement Category	Typical AADT	Average AADT	10m	30m	50m	100m	200m
0	40,000	N/A	N/A	N/A	N/A	N/A	N/A
1	24,000	24,582	22,240	15,095	37,125	62,963	74,566
2	16,000	15,620	1,597	1,597	2,632	5,348	10,972
3	10,000	10,214	185	185	305	679	1,427
4	6,000	4,520	39	40	65	125	196

Table 44 Isle of Wight Work Samples

Isle of Wight	Street Work Samples			
Work Type	RC 0-2		RC 3-4	
	Sample Size	%	Sample Size	%
Major	10	3%	11	3%
Standard	28	10%	31	10%
Minor with Exc	70	25%	57	18%
Minor without Exc	22	8%	10	3%
Urgent	132	46%	182	57%
Emergency	21	8%	30	9%
Totals	**283**		**321**	

Table 45 Isle of Wight Delay Modelling Percentage of Works by RC and Excavation Length

Isle of Wight	CBA Percentages of Works by RC and Excavation Length						
RC		10m	30m	50m	100m	200 m	Total Samples
RC 0-2	Sample Nos	239	2	15	12	15	283
	Sample %	84.5%	0.7%	5.3%	4.2%	5.3%	
	Halcrow Study %	84.7%	0.7%	5.2%	4.2%	5.2%	
RC 3-4	Sample Nos	279	17	10	8	7	321
	Sample %	86.9%	5.3%	3.1%	2.5%	2.2%	
	Halcrow Study %	86.8%	5.2%	3.2%	2.6%	2.1%	

1.28 MONETIZED COSTS AND BENEFITS

The socio-economic benefits derived from a 5% and 10% Permit Scheme reduction are shown for the opening year in summary on Table 46.

The statutory guidance on reliability benefits achieved from a reduction in the variability in travel times for road users is provided by WebTAG Unit A1.3, which recommends a mark-up on travel time-savings for urban roads of between 10% to 20%.

Recent research from Transport for London (TfL) GPS data for inner and central London estimated an uplift figure of 22% for changes in the mean journey time (Modelling journey time variability to assist in designing a journey time variability performance indicator for the transport for London Road Network, Jonathan Turner 2008). This supports the use of the upper end value of 20% for this study and is included as a reliability adjustment in the monetized costs and benefits.

The User Benefits are proportioned between consumer and business users for Vehicle Operating Cost and Travel Time Cost.

The QUADRO rates demonstrate much higher incidents of accidents within road works. The introduction of the Permit Scheme will bring about a proportionate reduction in road works, which will lead to accident cost savings.

Table 46 Isle of Wight Monetized Costs and Benefits

Isle of Wight	Sample Sites QUADRO Results Summary		
Delay Modelling Totals			
	Total Impact	**Consumer Vehicle Operating Cost**	**Consumer Travel Time Cost**
High	£ 90,395,668	£ 7,120,083	£ 49,526,957
Low	£ 69,749,546	£ 5,423,140	£ 38,298,667
Average	£ 80,072,607	£ 6,271,612	£ 43,912,812
Cost Saving 5%	£ 4,003,630	£ 313,581	£ 2,195,641
Cost Saving 10%	£ 8,007,261	£ 627,161	£ 4,391,281
	Business Vehicle Operating Cost	**Business Travel Time Total**	**PSP Bus & Coach Operating Cost**
High	£ 4,814,557	£ 32,162,835	£ 1,134,076
Low	£ 3,635,431	£ 24,851,225	£ 852,578
Average	£ 4,224,994	£ 28,507,030	£ 993,327
Cost Saving 5%	£ 211,250	£ 1,425,352	£ 49,666
Cost Saving 10%	£ 422,499	£ 2,850,703	£ 99,333
	Total Business	**Accident Cost**	**Carbon**
High	£ 38,111,468	-£ 162	-£ 46,773
Low	£ 29,339,235	-£ 186	-£ 46,371
Average	£ 33,725,352	-£ 174	-£ 46,572
Cost Saving 5%	£ 1,686,268	-£ 9	-£ 2,329
Cost Saving 10%	£ 3,372,535	-£ 17	-£ 4,657

OPERATION

1.29 INTRODUCTION

This section assesses the process tasks required to establish and operate the Isle of Wight Permit Scheme. It will consist of the following sections:

- Fees Matrix, presentation of anticipated Permit applications by type
- Scheme Costs, presentation of staff costs associated with the level of Permit variations

1.30 FEES MATRIX

The fees matrix is a DfT prescribed format for presenting the volume and type of Permit applications and anticipated variations. The estimated number of Permits by type was provided by Isle of Wight and is shown on Table 47 below. The Fees Matrix is attached in Appendix C.

Table 47 Utility Permit Volume before Scheme opening

Isle of Wight	Notice Volumes					
Work Type	**RC 0-2**		**RC 3-4**		**Total Volume**	
	Number	**%**	**Number**	**%**	**Number**	**%**
Major	36	3%	68	3%	104	3%
Standard	107	10%	191	10%	298	10%
Minor with Exc	264	25%	346	18%	610	20%
Minor without Exc	85	8%	61	3%	146	5%
Urgent	498	46%	1,110	57%	1,608	53%
Special Urgent	-	0%	-	0%	-	0%
Emergency	81	8%	181	9%	262	9%
Totals	1,071	35%	1,957	65%	3,028	

The Utility Permit volumes by road categories are shown in Table 48 and Table 49 and with costings based upon statutory fee rates outlined in Table 8.

Table 48 Permit Volume on Category 0-2 roads

Category 0-2 and Traffic Sensitive Streets					
Activity Type	**Estimated No. of Permits**	**Estimated No. of Permit Variations**	**Total Cost per Activity Type**	**Activity Type**	**Cost per Permit**
Provisional Advance Authorisation	43	157	N/A	N/A	6,795
Major	42	305	8	45	13,199
Standard	122	179	12	45	22,495
Minor	398	90	20	45	36,555
Immediate	660	62	33	45	42,525
Sub Total	1,266	N/A	74	45	121,569

Table 49 Permit Volume on Category 3-4 roads

Category 3-4 Non-Traffic Sensitive Streets					
Activity Type	**Estimated No. of Permits**	**Estimated No. of Permit Variations**	**Total Cost per Activity Type**	**Activity Type**	**Cost per Permit**
Provisional Advance Authorisation	82	81	N/A	N/A	6,575
Major	78	134	16	35	11,018
Standard	217	66	22	35	15,130
Minor	464	34	23	35	16,624
Immediate	1,471	37	74	35	57,509
Sub Total	2,312	N/A	134	35	106,856

Permit fees are excluded from Public Accounts reporting in line with the DfT guidance. The volume of Utility Permit by road type will fall by 5% across all road types.

1.31 SCHEME COSTS

1.31.1 Operational costs

The Permit Scheme required three specific job roles:

- Street Works Officers;
- Street Works Co-ordinators; and
- Traffic Managers.

The overall staffing costs of the Permit Scheme operation are based on information from Isle of Wight and statutory rates and are outlined in Table 50.

Table 50 Staff Costing

Staff Costing			
Personnel Type	**Annual Salary**	**Final Hourly Rate**	**Total Annual Cost**
Street Works Officer	£27,000	£36.72	£56,181.60
Street Works Coordinator	£38,000	£51.68	£79,070.40
Traffic Manager	£49,000	£66.64	£101,959.20

National Insurance (%)	7.5
Pension (superannuation) (%)	14.9
Working hours/annum	1530
Employee Overhead Rate	1.7

Isle of Wight Permit Scheme – Cost Benefit Analysis

The breakdown of costing per task for each of the three grades of Permit Scheme workers is shown in Table 51 below.

Table 51 Breakdown of Employer Costing per Permit Task

Employee Costing per Permit Task						
Category 0-2 and Traffic Sensitive Streets						
Street Works Officers						
	PAA	**Major**	**Standard**	**Minor**	**Immediate**	**TOTAL**
Hours per Permit	0.46	1.20	0.84	0.47	0.47	3.24
Total Permits	43.20	42.00	122.40	398.40	398.40	1266.00
Total Hours	20.05	50.47	102.20	186.25	186.25	4097.62
No. of Posts Required	0.01	0.03	0.07	0.12	0.12	0.35
Employee Costs	736.31	1853.26	3752.93	6839.17	6839.17	19684.78
Street Works Coordinators						
	PAA	**Major**	**Standard**	**Minor**	**Immediate**	**TOTAL**
Hours per Permit	0.99	1.74	1.04	0.46	0.46	4.68
Total Permits	43.20	42.00	122.40	398.40	398.40	1266.00
Total Hours	42.91	72.98	127.19	181.94	181.94	5929.10
No. of Posts Required	0.03	0.05	0.08	0.12	0.12	0.47
Employee Costs	2217.69	3771.35	6573.39	9402.45	9402.45	37541.23
Traffic Managers						
	PAA	**Major**	**Standard**	**Minor**	**Immediate**	**TOTAL**
Hours per Permit	0.50	0.95	0.47	0.17	0.17	2.19
Total Permits	43.20	42.00	122.40	398.40	398.40	1266.00
Total Hours	21.46	39.73	57.49	69.06	69.06	2766.84
No. of Posts Required	0.01	0.03	0.04	0.05	0.05	0.17
Employee Costs	1429.83	2647.27	3830.95	4601.89	4601.89	16908.18
Category 3-4 Non-Traffic Sensitive Streets						
Street Works Officers						
	PAA	**Major**	**Standard**	**Minor**	**Immediate**	**TOTAL**
Hours per Permit	PAA	Major	Standard	Minor	Minor	TOTAL
Total Permits	0.36	0.56	0.36	0.26	0.26	1.80
Total Hours	81.60	78.00	217.20	464.40	464.40	2312.40
No. of Posts Required	29.10	43.36	79.10	118.42	118.42	4170.03
Employee Costs	0.02	0.03	0.05	0.08	0.08	0.44
Street Works Coordinators						
	PAA	**Major**	**Standard**	**Minor**	**Immediate**	**TOTAL**
Hours per Permit	PAA	Major	Standard	Minor	Minor	TOTAL
Total Permits	0.47	0.82	0.39	0.19	0.19	2.10
Total Hours	81.60	78.00	217.20	464.40	464.40	2312.40
No. of Posts Required	38.08	64.22	83.98	89.78	89.78	4846.41
Employee Costs	0.02	0.04	0.05	0.06	0.06	0.40
Traffic Managers						
	PAA	**Major**	**Standard**	**Minor**	**Immediate**	**TOTAL**
Hours per Permit	PAA	Major	Standard	Minor	Minor	TOTAL
Total Permits	0.22	0.36	0.14	0.04	0.04	0.79
Total Hours	81.60	78.00	217.20	464.40	464.40	2312.40
No. of Posts Required	18.09	27.69	30.41	18.19	18.19	1832.58
Employee Costs	0.01	0.02	0.02	0.01	0.01	0.10

The overall costs associated with the operation of the Permit Scheme are summarised in Table 52 below.

Table 52 Staff costing summary

Total Number of Employees and Costs		
Personnel Type	**No.**	**Salaries**
Street Works Officers	0.10	£44,274
Street Works Coordinators	0.15	£68,979
Traffic Managers	0.11	£26,792
TOTAL	**0.36**	**£140,046**

With the addition of a provision for the cost of Permit variations, the final Permit Scheme cost is shown in Table 53.

Table 53 Permit Scheme costing summary

Permit Scheme Cost Breakdown	
Cost Type	**Cost**
Permit Application Employee Costs	£140,046
Permit Application Operational Factor Costs	£77,025
Total Permit Application Costs	£217,071
Permit Variation Employee Costs	£3,602
Permit Variation Operational Factor Costs	£4,402
Total Permit Variation Application Costs	£8,004
TOTAL PERMIT SCHEME COSTS	**£225,074**

FINANCIAL CALCULATIONS

1.32 INTRODUCTION

This section will present the calculation of financial benefits for the statutory outputs:

- Public Accounts - Local Government Funding
- Public Accounts - Central Government Funding
- Transport Economic Efficiency
- Monetized Costs and Benefits

The calculations will be presented for the opening year and for the 25-year Scheme horizon and will be discounted where required.

1.33 PUBLIC ACCOUNTS - LOCAL GOVERNMENT FUNDING

The Local Government public account reporting has the following categories:

- Revenue
- For the purposes of this Cost Benefit Analysis, the Permit fee income is calculated by the multiplication of the estimated Permit fee volume and the average Permit fee, which is derived using the maximum permit fee structure as shown on Table 8. The full cost of the Scheme in the opening year is comprised of the set up costs and the Scheme operating costs summarized in Tables 54 and 60. The average cost-recovery price of Permits is generated by dividing the total cost in the opening year by the estimated number of Permit volumes at the start of the year. The number of Permits in the opening month is a monthly pro-rata value based upon the estimated number of Permits in the opening year along with the 20% uplift for phased works. The Permit Scheme is scheduled to become fully operational in the opening month of the opening year of the

assessment and from the second and subsequent months, the 5% reduction in Permit volume will come into effect.

- Operating costs
- **Error! Reference source not found.**
- Developer and other contributions
- Grant / subsidy payments

1.33.1 Revenue

For the purposes of this Cost Benefit Analysis, the Permit fee income is calculated by the multiplication of the estimated Permit fee volume and the average Permit fee, which is derived using the maximum permit fee structure as shown on Table 8. The full cost of the Scheme in the opening year is comprised of the set up costs and the Scheme operating costs summarized in Tables 54 and 60. The average cost-recovery price of Permits is generated by dividing the total cost in the opening year by the estimated number of Permit volumes at the start of the year. The number of Permits in the opening month is a monthly pro-rata value based upon the estimated number of Permits in the opening year along with the 20% uplift for phased works. The Permit Scheme is scheduled to become fully operational in the opening month of the opening year of the assessment and from the second and subsequent months, the 5% reduction in Permit volume will come into effect.

1.33.2 Operating costs

The operating costs for the Scheme are comprised of:

- Staff and operation costs;
- Asset maintenance costs; and
- Unrecoverable fees

No provision has been made for on-going asset maintenance of the Permit Scheme.

The Operational Costs of £19,264 (5%) and £18,678 (10%) in the first month are a pro-rata apportionment of the opening year total of £229,185 (5%) and £220,175 (10%) contained within Tables 55 and 61.

It has been assumed (Table 7 Model Variable specification) that half of the percentage reduction in Permit volume would be applied to the Scheme costs giving a 2.5% reduction. The full reduction is applied for costs starting in the second year, with a pro-rata increase throughout the opening year.

Non recoverable costs for Highway permits for the Council's on schemes has been included as an administration charge and is carried out by a Highway Administrative Officer based on approximately 5 minute extra administrative time for each work requiring a permit:

Salary - £18,500 per annum and 1,628 hours worked per year.

With pensions and overheads etc this equates to £22 per hour.

£22 / 60mins x 5mins = £1.83 of cost per Permit Application.

Financial calculations for year 2 to 25 are shown on Table 56 to 59 (5% saving) and 62 to 65 (10% saving).

Table 54 Financial Calculations 5% Reduction in Works Annual Cost

Isle of Wight Financial Calculations 5% Reduction in Street Works											
	Opening	Closing Values									
Annual Cost of Permit Scheme - Closing Values	Year-0	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
Reduction Factor less Permit flex		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
Permit Costs	225,074	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Annual Cost For Recovery		222,625	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Cost Recovery Price Permit fee income		221,018	225,014	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Cost Recovery Price Permit fee income (prior year data)		65	67	63	65	65	65	65	65	65	65
(Over) / under-recovery £		1,607	-5,566	-	-	-	-	-	-	-	-
(Over) / under-recovery £ (prior year)	-	1,607	-5,566	-	-	-	-	-	-	-	-
Annual Cost Highway permits (non recoverable)	6,560	6,560	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232
Annual Income Max Permit Fee	217,884	212,891	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437
Overall Scheme Cost	231,635	227,614	213,881	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Profit/Loss	-13,751	-14,724	-1,444	-7,011	-7,011	-7,011	-7,011	-7,011	-7,011	-7,011	-7,011

Table 55 Financial Calculations 5% Reduction in Works First Year Cost

Financial Calculations 5% Reduction in Street Works	Year	Year-1											
Annual Cost of Permit Scheme - Closing Values	**Month**	**Month-1**	**Month-2**	**Month-3**	**Month-4**	**Month-5**	**Month-6**	**Month-7**	**Month-8**	**Month-9**	**Month-10**	**Month-11**	**Month-12**
Permit Cost	18,756	18,717	18,681	18,648	18,618	18,591	18,565	18,542	18,521	18,502	18,484	18,467	18,287
Permit Volumes	-	298	283	283	283	283	283	283	283	283	283	283	283
Cost Recovery Price Permit fee income	-	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73
Multiplied by number of Permits	-	19,303	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338
Income derived on Cost recovery basis	-	19,303	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338	18,338
Cost Highway permits (non recoverable)	547	547	547	547	547	547	547	547	547	547	547	547	547
Income derived from Max Permit Fee	18,157	18,157	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703
Permit Scheme - Operational Costs		-19,264	-19,228	-19,195	-19,165	-19,137	-19,112	-19,089	-19,068	-19,048	-19,030	-19,014	-18,834

Table 56 Financial Calculations 5% Reduction in Works Second Year Cost

Financial Calculations 5% Reduction in Street Works		Year	Year-2										
Annual Cost of Permit Scheme - Closing Values	**Month**	**Month-1**	**Month-2**	**Month-3**	**Month-4**	**Month-5**	**Month-6**	**Month-7**	**Month-8**	**Month-9**	**Month-10**	**Month-11**	**Month-12**
Permit Cost	-	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287
Permit Volumes	-	283	283	283	283	283	283	283	283	283	283	283	283
Cost Recovery Price Permit fee income	-	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66	66.66
Multiplied by number of Permits	-	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885
Income derived on Cost recovery basis	-	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885	18,885
Cost Highway permits (non recoverable)	547	547	547	547	547	547	547	547	547	547	547	547	547
Income derived from Max Permit Fee	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703
Permit Scheme - Operational Costs	-	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834

Table 57 Financial Calculations 5% Reduction in Works Third Year Cost

Financial Calculations 5% Reduction in Street Works	Year	Year-3											
Annual Cost of Permit Scheme - Closing Values	Month	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12
Permit Cost	-	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287	18,287
Permit Volumes	-	283	283	283	283	283	283	283	283	283	283	283	283
Cost Recovery Price Permit fee income	-	62.92	62.92	62.92	62.92	62.92	62.92	62.92	62.92	62.92	62.92	62.92	62.92
Multiplied by number of Permits	-	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823
Income derived on Cost recovery basis	-	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823	17,823
Cost Highway permits (non recoverable)	547	547	547	547	547	547	547	547	547	547	547	547	547
Income derived from Max Permit Fee	-	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703	17,703
Permit Scheme - Operational Costs	-	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834	-18,834

Table 58 Financial Calculations 5% Reduction in Works 4-14 Year Cost

Financial Calculations 5% Reduction in Street Works	Year	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10	Year-11	Year-12	Year-13	Year-14
Annual Cost of Permit Scheme - Closing Values												
Permit Cost	-	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Permit Volumes	-	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399
Cost Recovery Price Permit fee income	-	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55
Multiplied by number of Permits	-	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Income derived on Cost recovery basis	-	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Cost Highway permits (non recoverable)	-	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232
Income derived from Max Permit Fee	-	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437
Permit Scheme - Operational Costs		-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680

Table 59 Financial Calculations 5% Reduction in Works 15-25 Year Cost

Financial Calculations 5% Reduction in Street Works	Year	Year-15	Year-16	Year-17	Year-18	Year-19	Year-20	Year-21	Year-22	Year-23	Year-24	Year-25
Annual Cost of Permit Scheme - Closing Values												
Permit Cost	-	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Permit Volumes		3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399	3,399
Cost Recovery Price Permit fee income		64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55	64.55
Multiplied by number of Permits		219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Income derived on Cost recovery basis		219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447	219,447
Cost Highway permits (non recoverable)		6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232	6,232
Income derived from Max Permit Fee		212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437	212,437
Permit Scheme - Operational Costs		-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680	-225,680

Table 60 Financial Calculations 10% Reduction in Works Annual Cost

Isle of Wight Financial Calculations 10% Reduction in Street Works											
	Opening	Closing Values									
Annual Cost of Permit Scheme - Closing Values	Year-0	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
Reduction Factor less Permit flex		5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Permit Costs	225,074	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Annual Cost For Recovery	-	220,175	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Cost Recovery Price Permit fee income	-	210,402	218,269	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Cost Recovery Price Permit fee income (prior year data)	-	65	71	65	66	66	66	66	66	66	66
(Over) / under-recovery £	-	9,774	-4,449	-	-	-	-	-	-	-	-
(Over) / under-recovery £ (prior year)	-	9,774	-4,449	-	-	-	-	-	-	-	-
Annual Cost Highway permits (non recoverable)	6,560	6,560	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904
Annual Income Max Permit Fee	217,884	207,897	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990
Overall Scheme Cost	231,635	230,155	209,372	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Profit/Loss	-13,751	-22,257	-2,382	-6,831	-6,831	-6,831	-6,831	-6,831	-6,831	-6,831	-6,831

Table 61 Financial Calculations 10% Reduction in Works First Year Cost

Financial Calculations 10% Reduction in Street Works	Year	Year-1											
Annual Cost of Permit Scheme - Closing Values	Month	Month -1	Month -2	Month -3	Month -4	Month -5	Month -6	Month -7	Month -8	Month -9	Month -10	Month -11	Month-12
Permit Cost	18,756	18,678	18,606	18,541	18,481	18,425	18,375	18,328	18,286	18,247	18,211	18,178	17,818
Permit Volumes	-	298	268	268	268	268	268	268	268	268	268	268	268
Cost Recovery Price Permit fee income	-	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73	64.73
Multiplied by number of Permits	-	19,303	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373
Income derived on Cost recovery basis	-	19,303	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373	17,373
Cost Highway permits (non recoverable)	547	547	547	547	547	547	547	547	547	547	547	547	547
Income derived from Max Permit Fee	18,157	18,157	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249
Permit Scheme - Operational Costs	-	-18,678	-18,606	-18,541	-18,481	-18,425	-18,375	-18,328	-18,286	-18,247	-18,211	-18,178	-17,818

Table 62 Financial Calculations 10% Reduction in Works Second Year Cost

Financial Calculations 10% Reduction in Street Works	Year	Year-2											
Annual Cost of Permit Scheme - Closing Values	Month	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12
Permit Cost	-	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818
Permit Volumes	-	268	268	268	268	268	268	268	268	268	268	268	268
Cost Recovery Price Permit fee income	-	70.81	70.81	70.81	70.81	70.81	70.81	70.81	70.81	70.81	70.81	70.81	70.81
Multiplied by number of Permits	-	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004
Income derived on Cost recovery basis	-	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004	19,004
Cost Highway permits (non recoverable)	547	547	547	547	547	547	547	547	547	547	547	547	547
Income derived from Max Permit Fee	-	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249
Permit Scheme - Operational Costs	-	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818

Table 63 Financial Calculations 10% Reduction in Works Third Year Cost

Financial Calculations 10% Reduction in Street Works	Year	Year-3											
Annual Cost of Permit Scheme - Closing Values	Month	Month-1	Month-2	Month-3	Month-4	Month-5	Month-6	Month-7	Month-8	Month-9	Month-10	Month-11	Month-12
Permit Cost	-	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818	17,818
Permit Volumes	-	268	268	268	268	268	268	268	268	268	268	268	268
Cost Recovery Price Permit fee income	-	65.01	65.01	65.01	65.01	65.01	65.01	65.01	65.01	65.01	65.01	65.01	65.01
Multiplied by number of Permits	-	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448
Income derived on Cost recovery basis	-	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448	17,448
Cost Highway permits (non recoverable)	547	547	547	547	547	547	547	547	547	547	547	547	547
Income derived from Max Permit Fee	-	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249	17,249
Permit Scheme - Operational Costs	-	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818	-17,818

Table 64 Financial Calculations 10% Reduction in Works 4-14 Year Cost

Financial Calculations 10% Reduction in Street Works	Year	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10	Year-11	Year-12	Year-13	Year-14
Annual Cost of Permit Scheme - Closing Values												
Permit Cost	-	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Permit Volumes	-	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221
Cost Recovery Price Permit fee income	-	66.39	66.39	66.39	66.39	66.39	66.39	66.39	66.39	66.39	66.39	66.39
Multiplied by number of Permits	-	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Income derived on Cost recovery basis	-	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Cost Highway permits (non recoverable)	-	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904
Income derived from Max Permit Fee	-	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990
Permit Scheme - Operational Costs	-	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821

Table 65 Financial Calculations 10% Reduction in Works 5-25 Year Cost

Financial Calculations 10% Reduction in Street Works	Year	Year-15	Year-16	Year-17	Year-18	Year-19	Year-20	Year-21	Year-22	Year-23	Year-24	Year-25
Annual Cost of Permit Scheme - Closing Values												
Permit Cost	-	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Permit Volumes	-	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221	3,221
Cost Recovery Price Permit fee income	-	66	66	66	66	66	66	66	66	66	66	66
Multiplied by number of Permits	-	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Income derived on Cost recovery basis	-	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821	213,821
Cost Highway permits (non recoverable)	-	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904	5,904
Income derived from Max Permit Fee	-	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990	206,990
Permit Scheme - Operational Costs	-	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821	-213,821

1.33.3 Developer and other contributions
There are no developer or other contributions in the Local Government Public accounts reporting.

1.33.4 Grant / subsidy payments
There are no grant or subsidy payments in the Local Government Public accounts reporting.

1.34 PUBLIC ACCOUNTS - CENTRAL GOVERNMENT FUNDING
The Central Government public account reporting has the following categories:

- Revenue
- Operating costs
- Investment costs
- Developer and other contributions
- Grant / subsidy payments
- Indirect tax revenues

1.34.1 Revenue
There is no revenue in the Central Government Public accounts reporting.

1.34.2 Operating costs
There are no operating costs in the Central Government Public accounts reporting.

1.34.3 Investment costs
There are no investment costs in the Central Government Public accounts reporting.

1.34.4 Developer and other contributions
There are no developer or other contributions in the Central Government Public accounts reporting.

1.34.5 Grant / subsidy payments
There are no developer or other contributions in the Central Government Public accounts reporting.

1.34.6 Indirect tax revenues
The indirect tax revenue calculation is based upon the loss of fuel taxation revenues to Central Government from the more efficient functioning of the highway network from the reduction in road works.

1.35 TRANSPORT ECONOMIC EFFICIENCY
The Transport Economic Efficiency (TEE) table reports on user benefits by consumer and business sections for time, fuel and non-fuel vehicle operating impacts.

1.35.1 Consumer User Benefits
The consumer user benefit consists of private car and bus travel time, and vehicle operating costs.

1.35.2 Business User Benefits
The business user benefits are for commercial car travel and private sector providers for Travel time and vehicle operating costs.

STATUTORY OUTPUTS

1.36 INTRODUCTION

This section presents the statutory outputs required for the Isle of Wight Permit Scheme Cost Benefit analysis.

The results are presented in the opening year and over the 25-year horizon in 2010 prices as advised in WebTAG.

The discounted totals are presented at the bottom of each table. The calculation basis of each category has been presented in Sections 5, 6 and 0.

The statutory outputs consist of three categories:

1.37 TRANSPORT ECONOMIC EFFICIENCY (TEE)

The TEE table presents the net user benefits of travel time, fuel and non-fuel vehicle operating costs disaggregated by trip purpose between non-business consumers and business users, including transport operators and are below on Tables 66 to 69.

1.38 PUBLIC ACCOUNTS

The Public Accounts tables show the net impact to Local and Central Government and are below on Tables 70 to 73.

1.39 COST BENEFIT ANALYSIS

The items for inclusion in the central case Cost Benefit Analysis BCR and NPV are based upon the guidance specified in the DfT Advice Note For Local Highway Authorities Developing New or Varying Existing Permit Schemes June 2016.

Revenue received from Permit Fees has been assumed to be reinvested in the authority and therefore offset in the economic appraisal as a capital cost.

Tables 74 to 77 are below.

1.40 STATUTORY COST BENEFIT ANALYSIS

The study has addressed all aspects of the implementation of the Isle of Wight Permit Scheme through both the direct financial and socio-economic criteria to quantify the overall economic merit of the Scheme.

The Scheme has a Benefit Cost Ratio of and Net Present Value of in current prices (2010 prices). The appraisal results demonstrate that the introduction of the Permit Scheme will have a net positive economic benefit

Table 66 TEE Table 5% Work Saving Year 1

Transport Economic Efficiency (TEE) Table (5% Work Saving) Year 1

Consumers	**ALL MODES**		**ROAD**	**Bus & Coach**	**RAIL**	**Other**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	2,195,641		1,988,469	207,172	-	-
Vehicle operating costs	313,581		313,581			-
User charges	-		-	-	-	-
During Construction & Maintenance	-		-	-	-	-
NET CONSUMER BENEFITS	2,509,221	*-1*	2,302,049	207,172	-	-

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	1,425,352		710,369	631,897	83,085	-	-	-
Vehicle operating costs	211,250		172,629	38,621				-
User charges	-		-	-	-	-	-	-
During Construction & Maintenance	-		-	-	-	-	-	-
Subtotal	1,636,601	*-2*	882,998	670,518	83,085	-	-	-
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	-				-	-	-	-
Operating costs	49,666				49,666	-	-	-
Investment costs	-				-	-	-	-
Grant/subsidy	-				-	-	-	-
Subtotal	49,666	*-3*			49,666	-		-
Other business impacts								
Developer contributions	-	*-4*	-		-	-	-	-
NET BUSINESS IMPACT	1,686,268	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits	4,195,489	*(6) = (1) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers. All entries are discounted present values, in 2010 prices and values. All values £s.

Table 67 TEE Table 10% Work Saving Year 1

Transport Economic Efficiency (TEE) Table (10% Work Saving) Year 1

Consumers	**ALL MODES**		**ROAD**	**Bus & Coach**	**RAIL**	**Other**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	4,391,281		3,976,937	414,344	-	-
Vehicle operating costs	345,258		345,258			-
User charges	-		-	-	-	-
During Construction & Maintenance	-		-	-	-	-
NET CONSUMER BENEFITS	4,736,539	*-1*	4,322,195	414,344	-	-

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	2,850,703		1,420,739	1,263,795	166,169	-	-	-
Vehicle operating costs	422,499		345,258	77,242				-
User charges	-		-	-	-	-	-	-
During Construction & Maintenance	-		-	-	-	-	-	-
Subtotal	3,273,202	*-2*	1,765,996	1,341,037	166,169	-	-	-
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	-				-	-	-	-
Operating costs	99,333				99,333	-	-	-
Investment costs	-				-	-	-	-
Grant/subsidy	-				-	-	-	-
Subtotal	99,333	*-3*			99,333	-	-	-
Other business impacts								
Developer contributions	-	*-4*	-		-	-	-	-
NET BUSINESS IMPACT	3,372,535	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits	8,109,074	*(6) = (1) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers. All entries are discounted present values, in 2010 prices and values. All values in £s.

Table 68 TEE Table 5% Work Saving 25 Years

Transport Economic Efficiency (TEE) Table (5% Work Saving) 25 Years

Consumers	**ALL MODES**		**ROAD**	**Bus & Coach**	**RAIL**	**Other**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	54,891,015		49,711,717	5,179,298	-	-
Vehicle operating costs	7,839,515		7,839,515			-
User charges	-		-	-	-	-
During Construction & Maintenance	-		-	-	-	-
NET CONSUMER BENEFITS	62,730,530	*-1*	57,551,232	5,179,298	-	-

Business							
User benefits		**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	35,633,788	17,759,235	15,797,437	2,077,116	-	-	-
Vehicle operating costs	5,281,243	4,315,719	965,523				-
User charges	-	-	-	-	-	-	-
During Construction & Maintenance	-	-	-	-	-	-	-
Subtotal	40,915,031 *-2*	22,074,954	16,762,961	2,077,116	-	-	-
					Freight	**Passengers**	
Revenue	-			-	-	-	-
Operating costs	1,241,659			1,241,659	-	-	-
Investment costs				-	-	-	-
Grant/subsidy				-	-	-	-
Subtotal	1,241,659 *-3*			1,241,659	-	-	-
Developer contributions	- *-4*	-		-	-	-	-
NET BUSINESS IMPACT	42,156,689	*(5) = (2) + (3) + (4)*					

TOTAL

Present Value of Transport Economic Efficiency Benefits	104,887,219	*(6) = (1) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers. All entries are discounted present values, in 2010 prices and values. All values in £s.

Table 69 TEE Table 10% Work Saving 25 Years

Transport Economic Efficiency (TEE) Table (10% Work Saving) 25 Years

Consumers	**ALL MODES**		**ROAD**	**Bus & Coach**	**RAIL**	**Other**
User benefits	**TOTAL**		**Private Cars and LGVs**	**Passengers**	**Passengers**	
Travel time	109,782,030		99,423,435	10,358,595	-	-
Vehicle operating costs	8,631,439		8,631,439			-
User charges	-		-	-	-	-
During Construction & Maintenance	-		-	-	-	-
NET CONSUMER BENEFITS	118,413,469	*-1*	108,054,873	10,358,595	-	-

Business								
User benefits			**Goods Vehicles**	**Business Cars & LGVs**	**Passengers**	**Freight**	**Passengers**	
Travel time	71,267,576		35,518,469	31,594,875	4,154,231	-	-	-
Vehicle operating costs	10,562,485		8,631,439	1,931,047				-
User charges	-		-	-	-	-	-	-
During Construction & Maintenance	-		-	-	-	-	-	-
Subtotal	81,830,061	*-2*	44,149,908	33,525,922	4,154,231	-	-	-
Private sector provider impacts						**Freight**	**Passengers**	
Revenue	-				-	-	-	-
Operating costs	2,483,318				2,483,317.65	-	-	-
Investment costs	-				-	-	-	-
Grant/subsidy	-				-	-	-	-
Subtotal	2,483,318	*-3*			2,483,317.65	-	-	-
Other business impacts								
Developer contributions	-	*-4*	-		-	-	-	-
NET BUSINESS IMPACT	84,313,379	*(5) = (2) + (3) + (4)*						

TOTAL		
Present Value of Transport Economic Efficiency Benefits	202,726,847	*(6) = (1) + (5)*

Notes: Benefits appear as positive numbers, while costs appear as negative numbers. All entries are discounted present values, in 2010 prices and values. All values in £s.

Table 70 PA Table 5% Work Saving Year 1

Public Accounts (PA) Table (5% Work Saving) Year 1

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	-169,042		-			-169,042
Operating Costs	181,981		-			181,981
Investment Costs	280,207		-			280,207
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	293,146	*-7*	-	-	-	293,146
Central Government Funding: Transport						
Revenue	-		-			-
Operating costs	-		-			-
Investment Costs	-		-			-
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	-	*-8*	-	-	-	-
Central Government Funding: Non-Transport						
Indirect Tax Revenues	0	*-9*	0	-	-	-
TOTALS						
Broad Transport Budget	293,146	*(10) = (7) + (8)*				
Wider Public Finances	0	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values. All values in £s.

Table 71 PA Table 10% Work Saving Year 1

Public Accounts (PA) Table (10% Work Saving) Year 1

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	-165,078		-			-165,078
Operating Costs	174,827		-			174,827
Investment Costs	276,242		-			276,242
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	285,991	*-7*	-	-	-	285,991
Central Government Funding: Transport						
Revenue	-		-			-
Operating costs	-		-			-
Investment Costs	-		-			-
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	-	*-8*	-	-	-	-
Central Government Funding: Non-Transport						
Indirect Tax Revenues	0	*-9*	0	-	-	-
TOTALS						
Broad Transport Budget	285,991	*(10) = (7) + (8)*				
Wider Public Finances	0	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values. All values in £s.

Table 72 PA Table 5% Work Saving 25 Years

Public Accounts (PA) Table (5% Work Saving) 25 Year

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	-4,217,408		-			-4,217,408
Operating Costs	4,483,241		-			4,483,241
Investment Costs	4,328,573		-			4,328,573
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	4,594,405	*-7*	-	-	-	4,594,405
Central Government Funding: Transport						
Revenue	-		-			-
Operating costs	-		-			-
Investment Costs	-		-			-
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	-	*-8*	-	-	-	-
Central Government Funding: Non-Transport						
Indirect Tax Revenues	0	*-9*	0	-	-	-
TOTALS						
Broad Transport Budget	4,594,405	*(10) = (7) + (8)*				
Wider Public Finances	0	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values. All values in £s.

Table 75 PA Table 10% Work Saving 25 Years

Public Accounts (PA) Table (10% Work Saving) 25 Year

	ALL MODES		ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	**TOTAL**		**INFRASTRUCTURE**			
Revenue	-4,109,639		-			-4,109,639
Operating Costs	4,249,566		-			4,249,566
Investment Costs	4,220,804		-			4,220,804
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	4,360,731	*-7*	-	-	-	4,360,731
Central Government Funding: Transport						
Revenue	-		-			-
Operating costs	-		-			-
Investment Costs	-		-			-
Developer and Other Contributions	-		-	-	-	-
Grant/Subsidy Payments	-		-	-	-	-
NET IMPACT	-	*-8*	-	-	-	-
Central Government Funding: Non-Transport						
Indirect Tax Revenues	0	*-9*	0	-	-	-
TOTALS						
Broad Transport Budget	4,360,731	*(10) = (7) + (8)*				
Wider Public Finances	0	*(11) = (9)*				

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2010 prices and values. All values in £s.

Table 74 AMCB 5% Work Saving Year 1

Analysis of Monetised Costs and Benefits (5% Work Saving) Year 1

Noise	-	*-12*
Local Air Quality	-	*-13*
Greenhouse Gases	-2,329	*-14*
Journey Quality	-	*-15*
Physical Activity	-	*-16*
Accidents	-9	*-17*
Economic Efficiency: Consumer Users (Commuting)	2,509,221	*(1a)*
Economic Efficiency: Consumer Users (Other)	-	*(1b)*
Economic Efficiency: Business Users and Providers	1,686,268	*-5*
Wider Public Finances (Indirect Taxation Revenues)	189,521	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	4,003,630	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	293,146	
Present Value of Costs (see notes) (PVC)	293,146	
OVERALL IMPACTS		
Net Present Value (NPV)	3,710,485	
Benefit to Cost Ratio (BCR)	13.66	

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions. All values in £s.

Table 75 AMCB 10% Work Saving Year 1

Analysis of Monetised Costs and Benefits (10% Work Saving) Year 1

Noise	-	*-12*
Local Air Quality	-	*-13*
Greenhouse Gases	-4,657	*-14*
Journey Quality	-	*-15*
Physical Activity	-	*-16*
Accidents	-17	*-17*
Economic Efficiency: Consumer Users (Commuting)	4,736,539	*(1a)*
Economic Efficiency: Consumer Users (Other)	-	*(1b)*
Economic Efficiency: Business Users and Providers	3,372,535	*-5*
Wider Public Finances (Indirect Taxation Revenues)	379,042	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	8,483,442	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	285,991	*-10*
Present Value of Costs (see notes) (PVC)	285,991	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	8,197,450	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	29.66	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions. All values in £s.

Table 76 AMCB 5% Work Saving 25 Years

Analysis of Monetised Costs and Benefits (5% Work Saving) 25 Years

Noise	-	*-12*
Local Air Quality	-	*-13*
Greenhouse Gases	-58,215	*-14*
Journey Quality	-	*-15*
Physical Activity	-	*-16*
Accidents	-217	*-17*
Economic Efficiency: Consumer Users (Commuting)	62,730,530	*(1a)*
Economic Efficiency: Consumer Users (Other)	-	*(1b)*
Economic Efficiency: Business Users and Providers	42,156,689	*-5*
Wider Public Finances (Indirect Taxation Revenues)	4,738,028	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*
Present Value of Benefits (see notes) (PVB)	100,090,759	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*
Broad Transport Budget	4,594,405	*-10*
Present Value of Costs (see notes) (PVC)	4,594,405	*(PVC) = (10)*
OVERALL IMPACTS		
Net Present Value (NPV)	95,496,353	NPV=PVB-PVC
Benefit to Cost Ratio (BCR)	21.79	BCR=PVB/PVC

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions. All values in £s.

Table 77 AMCB 10% Work Saving 25 Years

Analysis of Monetised Costs and Benefits (10% Work Saving) 25 Years

Noise	-		*-12*
Local Air Quality	-		*-13*
Greenhouse Gases	-116,429		*-14*
Journey Quality	-		*-15*
Physical Activity	-		*-16*
Accidents	-434		*-17*
Economic Efficiency: Consumer Users (Commuting)	118,413,469	*(1a)*	
Economic Efficiency: Consumer Users (Other)	-	*(1b)*	
Economic Efficiency: Business Users and Providers	84,313,379		*-5*
Wider Public Finances (Indirect Taxation Revenues)	9,476,057	*- (11) - sign changed from PA table, as PA table represents costs, not benefits*	
Present Value of Benefits (see notes) (PVB)	193,133,927	*(PVB) = (12) + (13) + (14) + (15) + (16) + (17) + (1a) + (1b) + (5) - (11)*	
Broad Transport Budget	4,360,731		*-10*
Present Value of Costs (see notes) (PVC)	4,360,731	*(PVC) = (10)*	
OVERALL IMPACTS			
Net Present Value (NPV)	188,773,196	NPV=PVB-PVC	
Benefit to Cost Ratio (BCR)	44.29	BCR=PVB/PVC	

Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions. All values in £s.

ISLE OF WIGHT PERMIT SCHEME CBA RESULTS

1.41 INTRODUCTION

This section will summarises the findings of the Isle of Wight Permit Scheme Cost Benefit Analysis and consider the impact on the Highway Authority.

1.42 ISLE OF WIGHT HIGHWAY AUTHORITY COST BENEFIT ANALYSIS

In addition to the statutory results presentation, an additional BCR and NPV is presented from the perspective of the Highways Authority (Table 78), which includes the cost recovery from Permit Fee income and includes the effect of indirect taxation. The summary of benefits is presented in Table 79.

Table 78 Highway Authority Isle of Wight Permit Scheme Cost Benefit results

Highway Authority Assessment 5% reduction in works impact	Opening Year	25 Year
Net Present Value of Benefits	£4,003,630	£100,090,759
Net Present Value of Costs	£293,146	£4,594,405
Net Present Value of Permit Scheme	£3,710,485	£95,496,353
Benefit to Cost Ratio	**13.66**	**21.79**

Highway Authority Assessment 10% reduction in works impact	Opening Year	25 Year
Net Present Value of Benefits	£8,483,442	£193,133,927
Net Present Value of Costs	£285,991	£4,360,731
Net Present Value of Permit Scheme	£8,197,450	£188,773,196
Benefit to Cost Ratio	**29.66**	**44.29**

Table 79 Benefits Summary Values and Percentage 5% reduction in works impact 25 Years

Benefits	Value	Percentage of Total Benefit
Consumer Travel Time	£54,891,015	55%
Consumer Vehicle Operating Costs	£7,839,515	8%
Business Travel Time	£35,633,788	36%
Business Vehicle Operating Costs	£5,281,243	5%
Private Sector Provider Operating Costs	£1,241,659	1%
Reduction in Fuel Revenue	£4,738,028	5%
Greenhouse Gases	-£58,215	0%
Accidents	-£217	0%
Net Present Value of Benefits	**£100,090,759**	

The Scheme has a Benefit Cost Ratio of 21.79 and Net Present Value of £95.5m 2010 prices and 5% reduction in works which suggest the Isle of Wight Permit Scheme would be both viable and beneficial for the Highway Authority and the population of Isle of Wight.

The Net Present Value of Benefit has been estimated from a review of recent Permit Scheme CBA's and comparing these estimated values from the DfT report described in Section 3.7.

The projected discounted benefits in the opening year are estimated as £4.0m includes a reliability adjustment of 20% and has been assessed at a local level. This is an increase in the estimated suggested benefit in the DfT report in Section 3.7. Table 16 and 21 and cross referencing the results in Appendix B shows that single carriageway roads with high traffic flows have higher than average congestion.

1.43 SENSITIVITY ANALYSIS

A series of sensitivity tests have been performed on the 25-year appraisal to further understand the economic performance of the Scheme and its effects at different policy levels. The Highway Authority central case assumption of a 5% reduction in works activity produced a BCR of 21.79.

The results in Table 80 below shows the standard sensitivity test of the level of works reduction required to produce a BCR of 2.0 and a BCR of 1.0.

Table 80 Standard Sensitivity

Standard Sensitivity		
BCR	1%	2%
Works Reduction	0.22%	0.43%

Table 81 below presents the BCR achieved based upon the level of works reduction achieved.

Table 81 Works Reduction Sensitivity

Works Reduction Sensitivity	
Works Reduction	**BCR**
1% Saving	4.68
2% Saving	9.4
3% Saving	14.17
4% Saving	18.98
5% Saving	23.85
6% Saving	28.76
7% Saving	33.72
8% Saving	38.74
9% Saving	43.8
10% Saving	48.92

Table 82 shows the level of roadwork reduction achieved at different BCR levels.

Table 82 BCR Sensitivity

BCR Sensitivity	
BCR	**Works Reduction**
1	0.22%
2	0.43%
3	0.64%
4	0.86%
5	1.07%
6	1.28%
7	1.49%
8	1.71%
9	1.92%
10	2.13%

APPENDIX A

QUADRO Data

APPENDIX B

Sample Sites QUADRO Results Summary

APPENDIX C

Permit Fees Matrix

See attached