APPENDIX F: FINANCIAL PROJECTIONS AND VALUATION REPORT

1 Financial Projections & Valuation Report

1.1 Current Financial Projections

Current financial projections are based on a two year period. The main disadvantage with this approach is that it does not identify the long-term funding need required of the highway asset.

An example of this output is shown in the table below, which indicates the Carriageway and Footway Maintenance Budget for last financial year 2007/08(Values in £ '000):

Ward	Carriageway resurfacing and/or reconstruction	Carriageway retread and/or recycle	Footway resurfacing	Highway drainage repair	Planned patching – carriageway	Totals
Bablake	209	0	0	0	0	209
Binley and Willenhall	250	0	129	0	0	379
Cheylesmore	172	50	295	0	0	517
Earlsdon	259	0	22	13	0	294
Foleshill	186	0	337	0	0	523
Henley	0	28	0	0	0	28
Holbrooks	0	0	31	0	0	31
Longford	284	164	50	0	0	498
Radford	0	0	0	0	0	0
Sherbourne	240	0	141	0	0	381
St Michaels	0	0	0	0	0	0
Stoke Lower	45	0	0	0	0	45
Stoke Upper	417	0	0	0	0	417
Wainbody	217	0	80	0	0	297
Westwood	236	0	125	0	0	361
Whoberley	0	94	0	0	0	94
Woodlands	156	112	0	0	0	268
Wyken	298	0	157	0	0	455
City Centre Maintenance						762
Planned patch carriageway and scheme investigations (city wide)						187
Totals	**2969**	**448**	**1367**	**13**	**0**	**5746**

1.2 Current Budget (08/09)

The current financial year has seen a significant reduction in funding for the Highways. This will affect both levels of service and forward programming. Provisional budgets for Capital and Revenue spend are shown in the table below.

	Capital £	Revenue (excl Lighting) £	Total £
Programmed Works			
Highway Programme	3,250,000	1,295,586	4,545,586
Local Transport Plan	1,704,000		1,704,000
Grand Total	**4,954,000**	**1,295,586**	**6,249,586**

The table below indicates the Carriageway and Footway Maintenance Budget for the current financial year 2008/09(Values in £ '000):

Ward	Carriageway resurfacing and/or reconstruction	Carriageway retread and/or recycle	Footway resurfacing	Highway drainage repair	Planned patching – carriageway	Totals
Bablake	0	0	0	12	0	12
Binley and Willenhall	0	0	46	0	0	46
Cheylesmore	0	0	0	0	0	0
Earlsdon	0	0	0	13	0	13
Foleshill	0	0	222	0	35	257
Henley	0	0	0	0	0	0
Holbrooks	0	0	0	0	0	0
Longford	0	69	0	32	0	101
Radford	0	0	0	0	0	0
Sherbourne	190	0	0	0	0	190
St Michaels	0	0	0	0	0	0
Stoke Lower	0	0	0	0	0	0
Stoke Upper	0	0	0	0	0	0
Wainbody	0	0	0	0	0	0
Westwood	43	0	0	0	0	43
Whoberley	0	0	0	0	0	0
Woodlands	0	0	0	76	0	76
Wyken	118	0	0	0	0	118
City Centre Maintenance						760
Planned patch carriageway and scheme investigations (city wide)						32
Totals	**351**	**69**	**268**	**133**	**35**	**1648**

1.3 Future Situation

Long-term (i.e. 10 year) funding need assessments that identify the total cost of asset ownership will be determined from the lifecycle planning and forward works programme development process.

In the future details of funding need assessment will be included in this section of the document.

1.4 Asset Valuation

As part of the introduction of highway asset management practices within Coventry City Council (CCC) following the recommendations of the County Surveyors Society and the draft CIPFA report to the DfT, CCC identified the need to carry out an asset valuation of highway infrastructure owned by the Council.

The objective of the valuation is to provide appropriate information for financial reporting. This work was in part undertaken to satisfy the introduction by the UK Government of Resource Account Budgeting (RAB) and Whole of Government Accounting (WGA) and anticipates a future need to carry out an asset valuation of highway infrastructure.

The full valuation process and results are attached in a report format as part of this appendix.

A summary of the asset valuation as at March 2008 is presented in the table below.

Asset Type	Asset Group	Gross Replacement Cost	Accumulated Consumption	Depreciated Replacement Cost
Roads	Principal Roads	£ 84,927,319	£ 2,771,449	£ 82,155,870
	Classified Roads	£ 90,919,056	£ 3,406,983	£ 87,512,073
	Unclassified Roads	£ 402,780,000	£ 25,801,719	£ 376,978,281
Sub total		£ 578,626,374	£ 31,980,151	£ 546,646,223
Footways & Cycleways	Surveyed footways	£ 223,830,122	£ 37,023,310	£ 186,806,812
Sub total		£ 223,830,122	£ 37,023,310	£ 186,806,812
Structures	Highway Bridges	£ 251,815,585	£ 4,532,681	£ 247,282,904
	Pedestrian Bridges	£ 7,844,939	£ 141,209	£ 7,703,730
	Pedestrian Subways	£ 11,210,021	£ 201,781	£ 11,008,240
	Culverts	£ 7,274,507	£ 130,941	£ 7,143,566
	Retaining walls	£ 3,385,800	£ 60,944	£ 3,324,856
	Gantries	£ 2,200,000	£ 39,600	£ 2,160,400
Sub total		£ 283,730,852	£ 5,107,156	£ 278,623,696
Traffic Management	Traffic signals & Pedestrian signals	£ 17,707,024	£ 11,381,444	£ 6,325,580
Sub total		£ 17,707,024	£ 11,381,444	£ 6,325,580
Highway Trees	All Highway Trees	£ 24,920,538		£ 24,920,538
Sub total		£ 24,920,538		£ 24,920,538
Lighting	Lighting Columns	£ 33,441,770	£ 16,909,675	£ 16,532,096
	Illuminated Signs & Bollards	£ 7,977,910	£ 4,571,366	£ 3,406,544
Sub total		£ 41,419,680	£ 21,481,040	£ 19,938,640
Safety Barrier, Guardrail & Street Furniture	Safety barrier	£ 74,924,800	£ 21,840,677	£ 53,084,123
	Pedestrian Guardrail	£ 6,208,035	£ 4,035,376	£ 2,172,659
	Street Furniture	£ 6,313,058	£ 1,655,358	£ 4,657,699
	Non-illuminated signs	£ 4,817,900	£ 2,326,238	£ 2,491,663
Sub total		£ 92,263,793	£ 29,857,649	£ 62,406,144
Total		**£ 1,262,498,383**	**£ 136,830,751**	**£ 1,125,667,632**

The process of compiling this valuation has highlighted a number of items that should be addressed in future valuations. These actions will assist Coventry City Council to improve the level of confidence in future valuations and also to make the output more meaningful:

- Improve input data quality
- Improve confidence rating methodology
- Undertake audits of input data
- Review carriageway depreciation method
- Calculate annualised depreciation
- Prediction of DRC for planned budget
- Compare unit cost rates with peer groups
- Review componentisation
- Review budgets
- Review and record service lives
- Investigate the need for and method for calculating the depreciation of trees
- Review and update valuation

1.5 Issues / Improvement Actions

Key issues relating to current practices that do not align with an asset management approach and the associated proposed improvement actions are given below:

ISSUES:

F1.1) There is no long-term (i.e. 10 year) assessment of funding need

F1.2) The level of confidence in the current highway asset valuation could be improved

IMPROVEMENT ACTIONS:

IA-F1.1) Determine 10 year funding needs assessment over the whole of the highway asset.

IA-F1.2) Undertake a regular review and update of the highway asset valuation.

Appendix FI

Initial Valuation of Coventry City Council Highway Infrastructure Assets: Valuation Report: September 2008

exp | consulting

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Executive Summary

As part of the introduction of highway asset management practices within Coventry City Council (CCC) following the recommendations of the County Surveyors Society and the draft CIPFA report to the DfT, CCC identified the need to carry out an asset valuation of highway infrastructure owned by the Council.

The objective of the valuation is to provide appropriate information for financial reporting. This work was in part undertaken to satisfy the introduction by the UK Government of Resource Account Budgeting (RAB) and Whole of Government Accounting (WGA) and anticipates a future need to carry out an asset valuation of highway infrastructure.

The valuation process has been performed, where possible, in accordance with the *Guidance document for Highway Infrastructure Asset Valuation, July 2005*. The process used to complete the valuation can be summarised as follows:

1. A valuation schedule was compiled from the council's asset inventory extracted from a number of records held in databases, spreadsheets, GIS systems and from hard copy as appropriate to each asset.

2. Unit replacement cost rates were determined from contract rates and adjusted appropriately to take account of relevant overhead costs.

3. The unit costs were used in combination with the quantities of each asset to compute a gross replacement cost (GRC). The GRC represents what it would cost at today's prices to rebuild the existing asset.

4. An allowance was then computed to take account of the wear and tear and use of the asset to date. In the valuation this is known as the accumulated consumption (AC).

5. The AC is deducted from the gross replacement cost to provide a current value of the asset, the depreciated replacement cost (DRC)

It should be noted that the quality of the input data available for use in this valuation is variable. This has been reflected in the valuation report with a confidence rating given to each item of input data. Future valuation results are likely to change as better data becomes available. The results in this report should be read in the context of these issues with some of the input data.

Summary of Quantities used in the valuation

Asset Type	Asset Group	Quantity
Roads	Principal Roads	Area = 827,550 m² Length = 91,950 m
	Classified Roads	Area = 1,035,672 m² Length = 129,459 m
	Unclassified Roads	Area = 5,600,000 m² Length = 800,000 m
	Total for Roads	Area = 7,463,222 m² Length = 1,021,409 m
Footways & Cycleways	Footways & Cycleways attached to roads, segregated & pedestrian areas	Area = 2,608,000 m² Length = 1,304,000 m
Structures	Highway Bridges	No = 129
	Pedestrian Bridges	No = 49
	Pedestrian Subways	No = 32
	Culverts	No = 51
	Retaining walls	No = 34
	Gantries	No = 18
Traffic Management	Traffic signals	Poles No. = 1285
	Pedestrian signals	Poles No. = 425
	Signal Controllers	No. = 240
Safety Barrier	All types	Length = 40,000 m
Pedestrian Guardrail	All types	Length = 30,385 m
Street Furniture	Bollards non-illuminated	No. = 10,280
	Seats	No. = 150
	Grit Bins	No. = 238
	Litter Bins	No. = 2,292
	Planters	No. = 680
	Cycle Racks	No. = 100
	Boundary Fencing	Length = 3,000 m
	Noise Barriers	Length = 3,000 m
Lighting	Lighting Columns	No = 28,501
	Bracket Mounted Lanterns	No = 2,575
	High mast lighting	No = 89
	Externally illuminated signs	No = 2,641
	Internally illuminated signs	No = 1076
	Illuminated bollards	No = 1,504
Non-illuminated signs	All types	No = 13,538
Highway Trees	All types	No = 13,601

Asset Valuation Summary of Coventry City Council Highway Assets

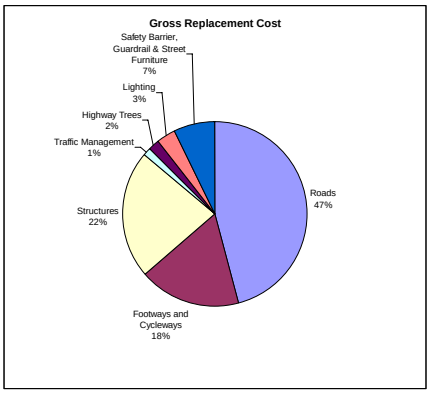
A summary of the asset valuation as at March 2008 is presented in the table below.

Asset Type	Asset Group	Gross Replacement Cost	Accumulated Consumption	Depreciated Replacement Cost
Roads	Principal Roads	£ 84,927,319	£ 2,771,449	£ 82,155,870
	Classified Roads	£ 90,919,056	£ 3,406,983	£ 87,512,073
	Unclassified Roads	£ 402,780,000	£ 25,801,719	£ 376,978,281
Sub total		£ 578,626,374	£ 31,980,151	£ 546,646,223
Footways & Cycleways	Surveyed footways	£ 223,830,122	£ 37,023,310	£ 186,806,812
Sub total		£ 223,830,122	£ 37,023,310	£ 186,806,812
Structures	Highway Bridges	£ 251,815,585	£ 4,532,681	£ 247,282,904
	Pedestrian Bridges	£ 7,844,939	£ 141,209	£ 7,703,730
	Pedestrian Subways	£ 11,210,021	£ 201,781	£ 11,008,240
	Culverts	£ 7,274,507	£ 130,941	£ 7,143,566
	Retaining walls	£ 3,385,800	£ 60,944	£ 3,324,856
	Gantries	£ 2,200,000	£ 39,600	£ 2,160,400
Sub total		£ 283,730,852	£ 5,107,156	£ 278,623,696
Traffic Management	Traffic signals & Pedestrian signals	£ 17,707,024	£ 11,381,444	£ 6,325,580
Sub total		£ 17,707,024	£ 11,381,444	£ 6,325,580
Highway Trees	All Highway Trees	£ 24,920,538		£ 24,920,538
Sub total		£ 24,920,538		£ 24,920,538
Lighting	Lighting Columns	£ 33,441,770	£ 16,909,675	£ 16,532,096
	Illuminated Signs & Bollards	£ 7,977,910	£ 4,571,366	£ 3,406,544
Sub total		£ 41,419,680	£ 21,481,040	£ 19,938,640
Safety Barrier, Guardrail & Street Furniture	Safety barrier	£ 74,924,800	£ 21,840,677	£ 53,084,123
	Pedestrian Guardrail	£ 6,208,035	£ 4,035,376	£ 2,172,659
	Street Furniture	£ 6,313,058	£ 1,655,358	£ 4,657,699
	Non-illuminated signs	£ 4,817,900	£ 2,326,238	£ 2,491,663
Sub total		£ 92,263,793	£ 29,857,649	£ 62,406,144
Total		**£ 1,262,498,383**	**£ 136,830,751**	**£ 1,125,667,632**

Interpretation of the Results

This valuation is an initial valuation based upon currently available data. In a significant number of areas estimates have been used based upon local experience and judgement, a valid method in the absence of data.

Gross Replacement Cost



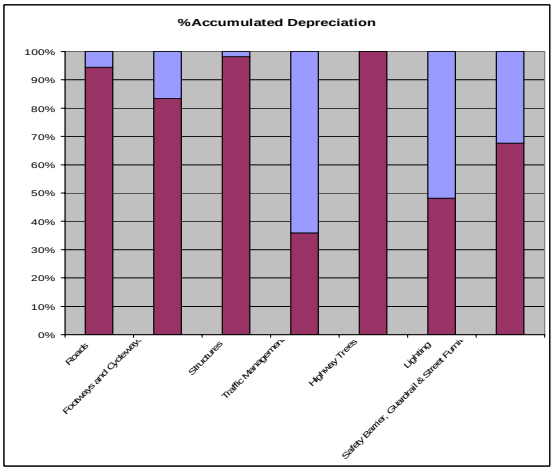
The valuation shows that the highway asset is a very significant asset financially. The estimated cost of replacing the asset with a modern equivalent asset as at March 2008 is £1,262,498,383.

Almost half of the value is made up of roads.

The three major asset groups of roads, footways & cycleways and structures account for more than 85% of the total value.

Depreciated Replacement Cost

The total depreciated replacement cost is £1,125,667,632, which means that 11% of the asset value has been consumed to date.



Depreciation by asset group shows surprisingly low figures for roads (6%) and structures (2%) respectively but much more significant consumption shown for traffic management (64%) and lighting (52%). These latter figures infer that on average these assets are closer to the end of their expected service lives.

Annualised Depreciation

The valuation method used for roads, footways, cycleways and structures (renewals accounting) relies upon calculation of the theoretical cost of the works required to return the asset to an as new condition. This method does not enable calculation of the annualised depreciation.

For the assets valued using a conventional depreciation method an annualised depreciation figure has been computed. These figures represent the theoretical level of money required on average per year to retain the asset at its current value. It should be noted however that the true figure

required in any given period is a function of the age and condition profile of the asset and should be derived from detailed asset management planning rather than from a valuation.

Asset Type	Asset Group	Depreciated Replacement Cost	Annualised Depreciation
Roads	Principal Roads	£ 82,155,870	N/A
	Classified Roads	£ 87,512,073	N/A
	Unclassified Roads	£ 376,978,281	N/A
Sub total		£ 546,646,223	£ -
Footways & Cycleways	Surveyed footways	£ 186,806,812	N/A
Sub total		£ 186,806,812	£ -
Structures	Highway Bridges	£ 247,282,904	N/A
	Pedestrian Bridges	£ 7,703,730	N/A
	Pedestrian Subways	£ 11,008,240	N/A
	Culverts	£ 7,143,566	N/A
	Retaining walls	£ 3,324,856	N/A
	Gantries	£ 2,160,400	N/A
Sub total		£ 278,623,696	£ -
Traffic Management	Traffic signals & Pedestrian signals	£ 6,325,580	£ 1,079,126
Sub total		£ 6,325,580	£ 1,079,126
Highway Trees	All Highway Trees	£ 24,920,538	N/A
Sub total		£ 24,920,538	£ -
Lighting	Lighting Columns	£ 16,532,096	£ 822,694
	Illuminated Signs & Bollards	£ 3,406,544	£ 303,530
Sub total		£ 19,938,640	£ 1,126,225
Safety Barrier, Guardrail & Street Furniture	Safety barrier	£ 53,084,123	£ 1,498,496
	Pedestrian Guardrail	£ 2,172,659	£ 155,201
	Street Furniture	£ 4,657,699	£ 355,827
	Non-illuminated signs	£ 2,491,663	£ 160,597
Sub total		£ 62,406,144	£ 2,170,120
Total		**£ 1,125,667,632**	**£ 4,375,470**

Recommendations for Future Valuations

The process of compiling this valuation has highlighted a number of items that should be addressed in future valuations. These actions will assist Coventry City Council to improve the level of confidence in future valuations and also to make the output more meaningful:

1. Improve input data quality
2. Improve confidence rating methodology
3. Undertake audits of input data
4. Review carriageway depreciation method
5. Calculate annualised depreciation
6. Prediction of DRC for planned budget
7. Compare unit cost rates with peer groups
8. Review componentisation
9. Review budgets
10. Review and record service lives
11. Investigate the need for and method for calculating the depreciation of trees
12. Review and update valuation

Valuation Report Contents

1. Introduction, gives the purpose of the valuation and the output it provides.

2. Scope, explains the scope of the valuation detailing the asset groups that are covered

3. Definition of Terms explains the valuation terminology used

4. Sources of Information, describes the data sources used to compile the valuation

5. Input Data Quality, assesses the input data quality and its affect on the valuation

6. Valuation Method, outlines the valuation method used and how the outputs were calculated

7. Asset Groups, states how the asset has been split into types, groups and components

8. Service Lives, tabulates the expected service lives of the conventionally depreciated assets

9. Asset Valuation Summary, summarises and tabulates the asset valuation

10. Interpretation of Results, gives an interpretation of the valuation figures indicating what they might mean as an asset management tool

11. Recommendations for future valuations, suggests how to update and improve this valuation

Appendix A details the method for determining the Gross Replacement Cost unit rates

Appendix B details the method for determining rehabilitation treatments for carriageways

Appendix C details the method for determining rehabilitation treatments for footways

Appendix D explains the LoBEG methodology for calculating the Structures valuation

Appendix E details Coventry City Council's bespoke highway tree valuation methodology

2 Introduction

2.1 Purpose

As part of the introduction of highway asset management practices Coventry City Council (CCC) identified the need to carry out an asset valuation of highway infrastructure owned by the Council. This report is the output from this valuation.

2.2 Use

There is currently no requirement for the council to conduct a valuation of highway infrastructure however Coventry City Council have decided to use the output from this valuation within the council's accounts. This valuation is intended to provide the City with an initial value of the asset and to enable the council to develop an understanding of the valuation process. An understanding of the assumptions and data used to produce this valuation will enable CCC to plan for data, system and process improvements that will facilitate the production of more accurate valuations in the future.

2.3 Date of Valuation

The Assets have been valued as at March 2008.

2.4 Valuers

This valuation has been carried out by Coventry City Council staff with the assistance of personnel from exp consulting.

2.5 Valuation Principles and Reporting Standards

The valuation is not a statutory requirement on the council. The valuation does not comply with any particular financial reporting standard. The valuation method follows the principles established in the County Surveyors Society "Guidance Document for Highway Infrastructure Asset Valuation" and is based upon the calculation of a depreciated replacement cost. An explanation of this and other terms used in this report is included in section 2 below.

2.6 Valuation Outputs

This report describes the valuation methodology including a full explanation of the assumptions made and input parameters used in the valuation process. Key outputs from the valuation included in this report, summarised by asset type and group, are:

- A summary of the quantity of highway assets owned by the council
- A summary of the standardised unit rates and service lives used in the asset valuation
- The estimated cost of replacing the existing asset (the gross replacement cost)
- The estimated current value of the asset taking into account its current condition/age and state of physical deterioration (the depreciated replacement cost)

2.7 Valuation Spreadsheets

A spreadsheet has been developed to calculate the gross replacement cost and depreciated replacement cost for all highway assets for future asset valuations together with a user guide.

3 Scope

3.1 Asset Groups Included in the Valuation

The assets groups valued are summarised in Table 3-1 below:

Table 3-1: Coventry City Council Highway Assets

Asset Type	Asset Description
Carriageways	Includes the carriageway, lay-bys, markings & drainage associated with the carriageway.
Footways & Cycleways	Segregated footways & cycleways as well as footways adjacent to the carriageway are included.
Structures	Bridges, culverts, gantries, retaining walls, sub-ways, tunnels and chambers are included.
Traffic Management	Traffic & pedestrian signal installations, including all associated controllers and SCOOT equipment is included.
Lighting	All lighting associated with the highway, including columns, bracket mounted lanterns, illuminated bollards and illuminated signs.
Safety Fence, Pedestrian Guardrail & Street Furniture	Safety fence, pedestrian guardrail, non-illuminated signs, non-illuminated bollards, seats, grit bins, litter bins, planters, cycle racks, boundary fencing and noise barriers.
Highway Trees	All trees within the highway boundary maintained by Coventry City Council

3.2 Asset Groups Omitted from the Valuation

Highway drainage assets have been omitted from the valuation as a separate asset group due to the lack of available inventory and condition data. A plan for the collection of the missing data is included in the council's highway asset management plan. Once this plan has been implemented and the missing data collected the drainage assets will be added to the valuation. It should be noted at this stage that the highway gullies, footway gullies and drainage kerbs have been included within the carriageway and footway valuation processes as appropriate.

4 Definition of Terms

The following terms are used in this report.

4.1 Gross Replacement Cost (GRC)

The total admissible cost of replacing the highway asset as part of the existing highway network.

4.2 Depreciated Replacement Cost (DRC)

The calculated current monetary value of the asset, calculated as the gross replacement cost minus accumulated depreciation and impairment.

4.3 Depreciation

The systematic consumption of economic benefits embodied in an asset over its service life arising from use, ageing, deterioration or obsolescence.

4.4 Impairment

A reduction in the depreciated replacement cost due to a sudden or unforeseen decrease in condition and/or performance of an asset, compared to the previously assessed level, which has not been recognised through depreciation.

4.5 Annualised Depreciation Charge (ADC)

The change in the depreciated replacement cost between one year and the next if no investment was made on maintenance of the asset.

4.6 Service Life (SL)

The period of time over which the future economic benefits embodied in an asset are expected to be consumed by the entity.

4.7 Residual Value (RV)

The net amount that could be obtained for an asset at the end of its service life.

4.8 Remaining Life (RL)

The difference between the service life and current age.

4.9 Accumulated Consumption

A measure of the proportion of the gross asset value that has been consumed to date.

5 Sources of Information

The sources listed below have been used to compile this valuation. The information has been taken at face value. A continuing process is being undertaken by Coventry City Council staff to verify the data used in this valuation either by desk top analysis or field verification.

5.1 Asset Inventory and Condition Data

The asset inventory for carriageways, footways, barriers & street furniture, lighting and signs was extracted from Coventry City Council's various databases, spreadsheets & hard copy records. The asset inventory for structures was extracted from Coventry City Council's Term Consultants asset inventory spreadsheet. The asset inventory for signals was extracted from spreadsheets compiled by Coventry City Council's Term Consultant. The asset inventory for highway trees was extracted from the confirm database held by the arboriculture section within Coventry City Council.

5.2 Cost Data

The cost rates used in the valuation were derived from rates in the current term maintenance contracts and from tendered schemes undertaken within Coventry. The unit rates were adjusted to take account of traffic management costs, disposal of existing equipment and materials, preliminaries and design and supervision costs. The method of derivation of rates is included in appendix B.

5.3 Residual Values

For the purposes of this valuation it has been assumed that none of the items valued have any residual value at the end of their service lives.

5.4 Service Lives

Assessment of useful lives has been derived from the experience of relevant CCC staff.

5.5 Remaining Lives

Remaining lives have been calculated by estimating the current age of components and deducting this from the assessed service lives. Where the service life has notionally already expired a nominal default remaining life of 2.5 years has been used in recognition that the asset is still in use and therefore is demonstrably not yet at the end of its service life.

6 Input Data Quality

6.1 Assessment of Input Data Quality

The quality of the input data used in the valuation has been assessed using table 5-1 below:

Table 5-1 Data Quality Ratings and Assessed Accuracy

Data Quality Rating	Description	Inventory/ Quantities	Unit Rates/Costs	Services Lives/Ages/ Deterioration Rates	Assessed Accuracy
A	Accurate	Quantity – based on validated database	Unit rates from items in current contract.	Lives known from reliable data that is regularly corroborated.	±5%
B	Data likely to contain minor inaccuracies	Quantity – based on un-validated database	Unit rates interpolated from similar items in current contract	Lives based upon estimates using known replacement rates and historical data.	±15%
C	Data contains significant estimates	Quantity – based on local knowledge / reports	Unit rates based on comparable items from recent contract for similar work	Lives based on local knowledge.	±30%
D	All data is estimated	Quantities estimated by an experienced person.	Unit rates calculated from first principles.	Lives are estimate from experienced Coventry City Council staff.	±40%

Using these ratings the following assessment has been made of the data used in this valuation:

This exercise was the first time that CCC has estimated the expected service life of the highway assets. The estimated service lives were provided by experienced staff within Coventry City Council.

6.2 Estimated Accuracy of Asset Valuation

Accuracy ratings have been assigned to the base data used to assess the 2008 asset valuation. These are tabulated in table 5-2 for each asset group.

Table 6-2: Asset Valuation Accuracy Ratings

Asset Type	Asset Group	Inventory/ Quantities	Unit Rates/ Costs	Services Lives/Ages/ Deterioration Rates	Estimated DRC Accuracy
C-ways	Principal Roads	A	A	B	B
	Classified Roads	A	A	B	B
	Unclassified Roads	A	A	C	C
Footways & Cycleways	All types	B	A	C	C
Structures	Highway Bridges	A	C	D	D
	Pedestrian Bridges	A	C	D	D
	Pedestrian Subways	A	C	D	D
	Culverts	B	C	D	D
	Retaining walls	C	C	D	D
	Gantries	A	C	D	D
Traffic Management	Traffic signals , Pedestrian signals & SCOOT equipment.	B	A	C	C
Highway Trees	All highway trees	C	A	n/a	C
Lighting	Lighting columns	A	A	B	B
	Illuminated Signs & Bollards	A	B	B	C
Safety Barrier, Guardrail & Street Furniture	Safety barrier	A	A	C	C
	Pedestrian Guardrail	B	B	C	D
	Street Furniture	B	B	D	D
	Non-illuminated signs	B	B	D	D

For the assessment of accuracy of the overall Depreciated Replacement Cost the confidence ratings assigned to the source data, unit rates and other items as shown above were assessed using officers' judgement.

7 Valuation Method

7.1 Valuation Principles

The valuation has been performed broadly in accordance with the CSS Guidance document for Highway Infrastructure Asset Valuation, July 2005.

7.2 Valuation Equation

The valuation has been based on the calculation of a depreciated replacement cost as represented by the following equation.

$$DRC = GRC - (AC + I)$$

Equation 1

Where *DRC* = Depreciated Replacement Cost
AC = Accumulated consumption
I = Impairment

7.3 Depreciation Methods

The following depreciation methods were applied to the highway infrastructure assets:

- **Conventional Method** – applied to traffic management, lighting, safety barriers, pedestrian guardrail, signs and street furniture.
- **Renewals Accounting** – applied to roads, footways & cycleways and structures.
- **Coventry Bespoke Tree Valuation** – a method derived specifically for Coventry City Council to allow the valuation of highway trees. This method values the tree asset without the inclusion of amenity value. (Appendix E)

7.4 Valuation Method Outline

The valuation has been computed using the following basic approach:

1. Compilation of valuation schedules from the various sources of information
2. Calculating the Gross Replacement Cost (GRC)
3. Calculating the accumulated consumption (AC) of the assets; and
4. Calculating the Depreciated Replacement Cost (DRC).

7.5 Assets Valued Using Conventional Depreciation

The conventional method of depreciation uses a straight-line depreciation over the service life of the assets. The depreciated replacement cost has been calculated using the equation:

$$DRC = RV + [(GRC - RV) \times (RL / SL)]$$

Equation 2

Where:

- Gross Replacement Cost (GRC)
- Depreciated Replacement Cost (DRC)
- Service Life (SL)
- Residual Value (RV)
- Remaining life (RL)

For assets with no residual value the equation is simplified to:

$$DRC = GRC \times (RL / SL)$$

Equation 3

For the asset group valued using conventional depreciation the following method has been used to determine the GRC and DRC.

7.6 Asset Valued Using Renewals

For assets valued using renewals the following process has been used:

1. **Valuation Schedule:**
   a. Quantities of asset have been compiled from various databases and hard copy sources by the officers responsible for their management as detailed in 4.1 (These have been assumed to be correct at this stage with ongoing verification of this data being undertaken by CCC personnel either on site or using a desktop study)
   b. The items have been broken down by type, group and component to identify types of asset and components that would be built to a different standard.
   c. Actual Existing Construction details have been used where known, with assumptions derived from officers' knowledge being used where accurate information is not available.

2. **Consider Modern Equivalents**
    a. The asset groups have been reviewed to identify where the replacement asset would differ from existing due to present day standards and construction techniques.
3. **Unit Rates**
    a. A unit rate GRC value has been derived for each item in the valuation schedule to include for removal and disposal of the existing asset, supply and construction of the modern equivalent asset and associated traffic management requirements, staff costs and overheads.
4. **Calculate Gross Replacement Cost**
    a. Quantities have been multiplied by unit rates to compute the GRC figures.
5. **Determine Condition**
    a. Condition information has been gained for the majority of assets from external surveys, and estimated using assumed condition levels based on the council officers' knowledge of the asset where other means were unavailable.
    b. SCANNER and Detailed Visual Inspection (DVI) information completed in 2006/07 was used for carriageways; whilst information from DVI and Coarse Visual Inspection (CVI) surveys undertaken between 2005 and 2007 was used for footways and cycleways.
    c. The condition information required for Structures assets was obtained from general inspections and used to compute Bridge Condition Indices (BCI), which were then assessed using the London Bridge Engineers Group (LoBEG) Methodology. (See appendix D)
6. **Determine Rehabilitation Options & Rates for Each Condition**
    a. Maintenance treatment options were derived, from those currently undertaken by Coventry City Council, to match each of the different asset groups and components.
    b. Unit rates for undertaking each of the identified treatment options were calculated using Coventry City Council's existing maintenance contracts.
    c. The condition ratings were matched against the appropriate treatment options to determine which would be required to enable the particular asset type to be brought up to an "as new" condition. (See appendices B, and C for details)
7. **Calculate Accumulated Consumption**

a. By multiplying the amount of each asset type in a particular condition by the identified rehabilitation treatment rate the cost of "making good" has been calculated. This is equivalent to the accumulated consumption.

8. Calculate Values

a. For each asset a calculation of GRC, DRC and AC has been computed.

8 Asset Groups

The asset classification used by Coventry City Council is shown in the tables below. These have been split into those assets that have been valued on a conventional deprecation basis (for which an explicit estimate of expected service live has been included in the valuation) and those valued on a renewals basis.

8.1 Assets Valued Using Renewals

The assets valued on a renewals basis have been split into the following types, groups and components. This information has been used as the basis for determining unit rates for the gross replacement cost. It has been used as the basis of determining maintenance treatment cost for the calculation of accumulated consumption.

Table 8-1: Highway Assets Classification: Assets Valued Using Renewals

Asset Type	Asset Group	Components covered
Carriageways	• Principal Roads • Classified Roads • Unclassified Roads	• Pavement layers, • sub-base, • geotextiles, • drainage (gullies & pipes), • markings, • anti-skid, • earthworks, • design & supervision fees, • traffic management, • overheads
Footways & Cycleways	• Bituminous • PC Slab • Natural Stone • PC Block • Strengthened Footway • Grass Verge	• Surfacing materials, • sub-base, • kerbs, • edgings, • channels • design & supervision fees, • traffic management,

Asset Type	Asset Group	Components covered
		• overheads
Structures	• Highway Bridges • Pedestrian Bridges • Pedestrian subways • Culverts • Retaining walls • Gantries	All elements identified on the CSS inspection pro forma plus • design & supervision fees, • traffic management, • overheads

8.2 Assets Valued Using Conventional Depreciation

The following assets have been valued using conventional depreciation method. The components selected from each asset group reflect the components that are replaced discretely from one another and thus have different ages and expected service lives. The service lives assumed for these asset and their components are detailed in section 8

Table 8-2: Highway Assets Classification: Assets Valued Using Conventional Method

Asset Type	Asset Group	Components covered
Traffic Management	• Traffic signals • Pedestrian signals • SCOOT equipment	• Signal heads • button assembly • poles and foundation • control equipment • cables • detectors • communications equipment • CCTV
Lighting	• Columns & lanterns, • bracket mounted lanterns, • illuminated bollards • illuminated signs	• Column and foundations • Bracket • Luminaire • Control gear, switching and internal wiring cabling
Safety Fence, Pedestrian Guardrail & Street Furniture	• Safety fence, • pedestrian guardrail, • non-illuminated signs, • non-illuminated bollards, • seats, • grit bins, • litter bins, • planters, • cycle racks, • boundary fencing • noise barriers.	• Asset item • excavation • Foundations • Reinstatement

Asset Type	Asset Group	Components covered
Assets Valued Using A Bespoke Method (Appendix E)		
Highway Trees	• size category (A, B, C, D, E, & P) • Maintenance requirement (high or low)	• Tree • Planting • Establishment • Maintenance

9 Service Lives

The conventional method is has been used for assets with a readily identifiable service life which are routinely replaced. All traffic management, lighting, safety barriers, pedestrian guardrail, signs and street furniture were classified as finite life assets with no residual value.

In order to calculate the depreciation of the asset using the conventional method it was necessary to determine the expected service life for each of the assets. In most cases accurate records were unavailable so expected service lives were assumed using the engineering judgement of the council officers. The assumed service lives for each of the assets is detailed in Table 9-1 below.

Table 9-1: Service Life of Assets / Components

Asset Type	Asset Group	Service Life (SL)
Traffic Management	• Signal heads, • Button assembly, • poles and foundation • control equipment • cables • detectors • communications equipment • CCTV equipment	• 20 years • 20 years • 20 years • 15 years • 20 years • 15 years • 10 years • 10 years
Lighting	• Columns & lanterns, • bracket mounted lanterns, • illuminated bollards • illuminated signs	• 40 years • 30 years • 20 years • 30 years
Safety Fence, Pedestrian Guardrail & Street Furniture	• Safety fence, • pedestrian guardrail, • non-illuminated signs, • non-illuminated bollards, • seats, • grit bins, • litter bins, • planters, • cycle racks, • boundary fencing	• 50 years • 40 years • 30 years • 10 to 50 years type dependent • 10 to15 years type dependent • 5 years • 5 to 50 years type dependent • 10 years • 40 to 50 years type dependent • 50 years

Asset Type	Asset Group	Service Life (SL)
	• noise barriers.	• 20 years

10 Asset Valuation Summary

A summary of the asset valuation as at March 2008 is presented in Table 10-1.

Table 10-1: Asset Valuation Summary of Coventry City Council Highway Assets

Asset Type	Asset Group	Gross Replacement Cost	Accumulated Consumption	Depreciated Replacement Cost
Roads	Principal Roads	£ 84,927,319	£ 2,771,449	£ 82,155,870
	Classified Roads	£ 90,919,056	£ 3,406,983	£ 87,512,073
	Unclassified Roads	£ 402,780,000	£ 25,801,719	£ 376,978,281
Sub total		£ 578,626,374	£ 31,980,151	£ 546,646,223
Footways & Cycleways	Surveyed footways	£ 223,830,122	£ 37,023,310	£ 186,806,812
Sub total		£ 223,830,122	£ 37,023,310	£ 186,806,812
Structures	Highway Bridges	£ 251,815,585	£ 4,532,681	£ 247,282,904
	Pedestrian Bridges	£ 7,844,939	£ 141,209	£ 7,703,730
	Pedestrian Subways	£ 11,210,021	£ 201,781	£ 11,008,240
	Culverts	£ 7,274,507	£ 130,941	£ 7,143,566
	Retaining walls	£ 3,385,800	£ 60,944	£ 3,324,856
	Gantries	£ 2,200,000	£ 39,600	£ 2,160,400
Sub total		£ 283,730,852	£ 5,107,156	£ 278,623,696
Traffic Management	Traffic signals & Pedestrian signals	£ 17,707,024	£ 11,381,444	£ 6,325,580
Sub total		£ 17,707,024	£ 11,381,444	£ 6,325,580
Highway Trees	All Highway Trees	£ 24,920,538		£ 24,920,538
Sub total		£ 24,920,538		£ 24,920,538
Lighting	Lighting Columns	£ 33,441,770	£ 16,909,675	£ 16,532,096
	Illuminated Signs & Bollards	£ 7,977,910	£ 4,571,366	£ 3,406,544
Sub total		£ 41,419,680	£ 21,481,040	£ 19,938,640
Safety Barrier, Guardrail & Street Furniture	Safety barrier	£ 74,924,800	£ 21,840,677	£ 53,084,123
	Pedestrian Guardrail	£ 6,208,035	£ 4,035,376	£ 2,172,659
	Street Furniture	£ 6,313,058	£ 1,655,358	£ 4,657,699
	Non-illuminated signs	£ 4,817,900	£ 2,326,238	£ 2,491,663
Sub total		£ 92,263,793	£ 29,857,649	£ 62,406,144
Total		**£ 1,262,498,383**	**£ 136,830,751**	**£ 1,125,667,632**

11 Interpretation of Results

11.1 Accumulated Asset Consumption (AAC)

AAC measures the proportion of the gross asset value that has been consumed to date. It is calculated as follows:

Accumulated Asset Consumption = *[1 – (DRC/GRC)] x 100* expressed as a %

The results of this calculation are shown below:

Table 10-1: Accumulated Asset Consumption for Coventry City Council Highway Assets

Asset Type	Asset Group	Gross Replacement Cost	Depreciated Replacement Cost	AAC %
Carriageways	Principal Roads	£ 84,927,319	£ 82,155,870	3%
	Classified Roads	£ 90,919,056	£ 87,512,073	4%
	Unclassified Roads	£ 402,780,000	£ 376,978,281	6%
Sub total		£ 578,626,374	£ 546,646,223	6%
Footways & Cycleways	Surveyed footways	£ 223,830,122	£ 186,806,812	17%
Sub total		£ 223,830,122	£ 186,806,812	17%
Structures	Highway Bridges	£ 251,815,585	£ 247,282,904	2%
	Pedestrian Bridges	£ 7,844,939	£ 7,703,730	2%
	Pedestrian Subways	£ 11,210,021	£ 11,008,240	2%
	Culverts	£ 7,274,507	£ 7,143,566	2%
	Retaining walls	£ 3,385,800	£ 3,324,856	2%
	Gantries	£ 2,200,000	£ 2,160,400	2%
Sub total		£ 283,730,852	£ 278,623,696	2%
Traffic Management	Traffic signals & Pedestrian signals	£ 17,707,024	£ 6,325,580	64%
Sub total		£ 17,707,024	£ 6,325,580	64%
Lighting	Lighting Columns	£ 33,441,770	£ 16,532,096	51%
	Illuminated Signs & Bollards	£ 7,977,910	£ 3,406,544	57%
Sub total		£ 41,419,680	£ 19,938,640	52%
Safety Barrier, Guardrail & Street Furniture	Safety barrier	£ 74,924,800	£ 53,084,123	29%
	Pedestrian Guardrail	£ 6,208,035	£ 2,172,659	65%
	Street Furniture	£ 6,313,058	£ 4,657,699	26%
	Non-illuminated signs	£ 4,817,900	£ 2,491,663	48%
Sub total		£ 92,263,793	£ 62,406,144	32%
Total		**£ 1,262,498,383**	**£ 1,125,667,632**	11%

The AAC for carriageways of 6% is lower than we would have expected. In theory this figure implies that an investment of approximately £32 million would return the asset to a completely as new condition.

The AAC for structures similarly appears to be low at 2%. This implies, in theory, that an investment of approximately £5 million would return the structures to an as new condition. This may be a result of the depreciation method. The method used is that proposed by the LoBEG bridges group and appears to assume that the only elements of deprecation are those items of maintenance need that are identified from inspection. Such a method neglects to evaluate the ongoing depreciation of the asset that occurs prior to visible defects being observed.
It is also noted that due to a lack of accurate condition data the Bridge Condition Indices used in the calculation of depreciation were assumed. As a result of this the DRC figure for structures must be viewed with caution.

The traffic management assets show a cumulative AAC of 64% this indicates that nearly two thirds of the asset has already been consumed. This implies that a significant proportion of these assets are nearing the end of their expected service life. This should be apparent from the relevant section of the council's asset management plan.

A similar situation exists for the street lighting assets with 52% AAC, indicating that a significant proportion of the street lighting asset is nearing the end of its expected life.

11.2 In-year Asset Consumption (IAC)

The CSS Guidance recommends the calculation of an in year asset consumption figure and provides the following definition:

IAC measures the proportion of the asset consumed during the accounting period. It is expressed as a percentage and is calculated as follows:

In-year Asset Consumption = [(In-year depreciation & Impairment)/DRC] x 100

This calculation would not in fact provide an estimate of the proportion of the asset consumed and would if plotted over a number of years vary as the denominator of DRC would change year on year.

A more meaningful measure to derive from a valuation is an annualised deprecation figure. This figure represents the amount by which an asset would depreciate each year if there is no investment in asset renewal/replacement. For assets depreciated using the conventional method this figure is computed using the following equation:

Annualised Depreciation = GRC/Service Life

The following figures have been computed

Table 10-2 Annualised Depreciation for CCC Conventionally Depreciated Assets

Asset Type	Asset Group	Depreciated Replacement Cost	Annualised Depreciation
Roads	Principal Roads	£ 82,155,870	N/A
	Classified Roads	£ 87,512,073	N/A
	Unclassified Roads	£ 376,978,281	N/A
Sub total		£ 546,646,223	£ -
Footways & Cycleways	Surveyed footways	£ 186,806,812	N/A
Sub total		£ 186,806,812	£ -
Structures	Highway Bridges	£ 247,282,904	N/A
	Pedestrian Bridges	£ 7,703,730	N/A
	Pedestrian Subways	£ 11,008,240	N/A
	Culverts	£ 7,143,566	N/A
	Retaining walls	£ 3,324,856	N/A
	Gantries	£ 2,160,400	N/A
Sub total		£ 278,623,696	£ -
Traffic Management	Traffic signals & Pedestrian signals	£ 6,325,580	£ 1,079,126
Sub total		£ 6,325,580	£ 1,079,126
Highway Trees	All Highway Trees	£ 24,920,538	N/A
Sub total		£ 24,920,538	£ -
Lighting	Lighting Columns	£ 16,532,096	£ 822,694
	Illuminated Signs & Bollards	£ 3,406,544	£ 303,530
Sub total		£ 19,938,640	£ 1,126,225
Safety Barrier, Guardrail & Street Furniture	Safety barrier	£ 53,084,123	£ 1,498,496
	Pedestrian Guardrail	£ 2,172,659	£ 155,201
	Street Furniture	£ 4,657,699	£ 355,827
	Non-illuminated signs	£ 2,491,663	£ 160,597
Sub total		£ 62,406,144	£ 2,170,120
Total		**£ 1,125,667,632**	**£ 4,375,470**

11.3 In-year Asset Renewal (IAR)

The CSS Guidance also recommends the calculation of "In year asset renewal calculated as follows:

IAR measures the proportion of the asset value that has been restored / renewed during the accounting period. It is expressed as a % and is calculated as follows:

In-year Asset Renewal = [(In-year Maintenance & Renewal Expenditure)/DRC] x 100

The CSS guidance suggests that "In order to preserve an asset, the IAR should at least match the IAC." This is not necessarily the case.

It is however appropriate to compare renewals expenditure with annualised depreciation as this will provide an indication of the likely future effect on the asset value of expected future investment levels.

12 Recommendations for Future Valuations

12.1 Improve Input Data Quality

The input data available for this valuation has scope for improvement. Improving the level of confidence held in the input data has the potential to substantially improve the reliability of the valuation output.

12.2 Improve Confidence Rating Methodology

Develop the method for rating the confidence in the output data empirically from the confidence levels of the input data; this could be included as a calculation within the valuation spreadsheet or database programme.

12.3 Undertake Audits of Input Data

For future valuations include both a desktop and field audit of a random sample of the input information in order to corroborate the accuracy of the data used.

12.4 Review Carriageway Deprecation Method

The carriageway depreciation method relies heavily upon the repeatability of condition data. The repeatability of this data varies between road types. The cost of the depreciation calculated is a function of relating measured condition to remedial maintenance treatments. It is likely that small changes in measured condition may create large changes in the DRC which could cause concern.

The method used in this valuation does not make any allowance for depreciation on roads that are currently identified as requiring no maintenance treatment. In valuation terms these roads have been valued as if they are brand new. A minor improvement to the current valuation method would be to make an allowance for the depreciation of these roads using 50% of the cost of the least cost maintenance treatment, i.e. assume that on average each of these roads is half way to requiring the first type of treatment allowed for in the valuation (surface treatment).

12.5 Calculate Annualised Depreciation

The CSS Guidance document does not explicitly require the calculation of an annualised depreciation figure. This figure if calculated is potentially the most interesting valuation output. An annualised deprecation figure provides an estimate of the amount by which the asset will lose value each year should no renewals maintenance be undertaken on it.

The CSS Guidance document envisages a renewals based method of calculating depreciation for carriageways, footways and structures. Under such a method the future valuations could be calculated by estimating the future renewals required to maintain the asset in its current condition and using an annualised cost of this as the annualised depreciation figure. The adoption of this approach would create a need for a long term projection of maintenance intervention which in itself will provide a useful future maintenance investment requirements project i.e. an output that could be used for asset management planning purposes.

It would be interesting to calculate the annualised depreciation using a comparator of conventional depreciation of the suitably componentised assets, utilising assumed or known service lives for each individual component. (e.g. for carriageways; Sub-base, Base, Binder and Surfacing Courses)

12.6 Prediction of DRC for the planned budget

By using the DRC and annualised depreciation figures it will be possible to predict the changes in the value of the asset over time taking into account the planned renewals maintenance expenditure. This will enable Coventry City Council to better assess their funding needs over time.

12.7 Compare Unit cost Rates with Peer Groups

The cost rates for this valuation have largely been derived from Coventry City Council's existing contracts and as such may be influenced by any changes to the contractual arrangements that are in place within CCC.

It would be beneficial to compare these rates against those of neighbouring or similar authorities to determine their validity for future valuations. It should be noted that CCC do compare their maintenance rates and costs with other authorities as part of a benchmarking process, however the rates provided by other authorities have not been used as part of this exercise.

The rates used for the structures valuation were taken from London authorities and should be reviewed in the light of available local data.

12.8 Review Componentisation

Review the components included as part of the assets within each of the asset groups. In particular there is a need to continually reassess the expected service lives of the individual components and to review the maintenance treatment options available with regard to the affect these will have upon the assets service lives.

12.9 Review Budgets

Review budgets to determine the maintenance expenditure which counts as renewals. It is important to identify the amount from within the maintenance budget that is actually used to renew the infrastructure rather than for other purposes (e.g. Upgrading activities and energy costs).

12.10 Review and Record Service Lives

Review the assumed expected service lives used in the valuation bearing in mind the amount of the asset that has already exceeded the figure used. Record and maintain details of asset installation and removal dates and check these to verify or update the expected service lives for each of the assets or components.

12.11 Investigate the need for a Method to Calculate the Depreciation of Trees

Investigate whether a method for calculating depreciation in trees is required and assess how this could be developed using a renewals accounting methodology based on the forward maintenance requirement projections for the existing tree stock.

12.12 Review and Update Valuation

Determine a frequency and scope for updating. In the next few years we would suggest there is merit in re-running the whole exercise due to the accumulation of new input data that may be of better quality than that used to date.

Once the quality of the input data has been improved it will be possible to run an annual update using the existing information but this should be interspersed with regular reassessments of the valuation process and inputs.

The basic method can continue to be used in subsequent re-valuations and updates although CCC may choose in future to use more detailed data as an input.

Appendix F-1

Derivation of Unit Rates to Calculate Gross Replacement Cost

F1.1 Carriageways

The Gross Replacement cost unit rates for carriageways were derived from the schedule of rates contained within the council's existing term contracts for civil engineering and surfacing works using both internal and external contractors. Based on an assumed scheme size in excess of 3000m2 and using the following criteria.

Table F1-1 Basis for Deriving unit rates for Carriageway Gross Replacement Cost

	Group 1	Group 2	Group 3	Group 4	Components	Existing Construction	Modern Equivalent Construction
Principal	2	A		Bituminous	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, anti-skid, earthworks, design & supervision fees (10%), Traffic Management (3%), overheads (12%)	280mm Bituminous material, 300 sub base	300mm Granular, 200mm DBM base, 60mm DBM binder, 40mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
				Concrete	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	300mm Granular, 200mm DBM base, 60mm DBM binder, 40mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
Classified	3a	B		Bituminous	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	200mm bituminous 200mm subbase	250mm Granular, 150mm DBM base, 60mm DBM binder, 40mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.

	Group 1	Group 2	Group 3	Group 4	Components	Existing Construction	Modern Equivalent Construction
				Concrete	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	250mm Granular, 150mm DBM base, 60mm DBM binder, 40mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
Classified	3b	C		Bituminous	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	180mm bituminous, 150mm subbase	250mm Granular, 150mm DBM base, 60mm DBM binder, 40mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
				Concrete	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	250mm Granular, 150mm DBM base, 60mm DBM binder, 40mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
Unclassified	4a	U	Urban	Bituminous	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	100mm Bituminous, 150mm granular	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
				Concrete	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.

	Group 1	Group 2	Group 3	Group 4	Components	Existing Construction	Modern Equivalent Construction
			Rural	Bituminous	Pavement layers, sub-base, geotextiles, markings, earthworks, design & supervision fees, Traffic Management	100mm Bituminous, 150mm granular	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
	4a	U	Rural	Concrete	Pavement layers, sub-base, geotextiles, markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
Unclassified	4b	U	Urban	Bituminous	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	100mm Bituminous, 300mm granular	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
				Concrete	Pavement layers, sub-base, geotextiles, drainage (gullies & pipes), markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.
			Rural	Bituminous	Pavement layers, sub-base, geotextiles, markings, earthworks, design & supervision fees, Traffic Management	100mm Bituminous, 300mm granular	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.

	Group 1	Group 2	Group 3	Group 4	Components	Existing Construction	Modern Equivalent Construction
				Concrete	Pavement layers, sub-base, geotextiles, markings, earthworks, design & supervision fees, Traffic Management	50mm surface course,200mm concrete,150mm sub base	200mm Granular, 100mm DBM base, 50mm DBM binder, 30mm SMA, 1 gully per 200 m2, 5m pipe per gully, ironwork, 1% anti-skid by area.

F1.2 Footways & Cycleways

The Gross Replacement cost unit rates for footways and cycleways were derived from the schedule of rates contained within the council's existing term contracts for civil engineering and surfacing works using both internal and external contractors. Based on an assumed scheme size in excess of 1000m2 and using the following criteria. Percentage on costs were included for design, supervision, traffic management and overheads.

Table F1-2 Basis for Deriving unit rates for Footway Gross Replacement Cost

Group 1	Group 2	Components	Existing Construction	Modern Equivalent Construction
Bituminous	PC Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 40mm Binder, 20mm Surface	100mm GSB, 50mm Binder, 20mm Surface
	Drainage kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 40mm Binder, 20mm Surface	100mm GSB, 50mm Binder, 20mm Surface
	Stone Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 40mm Binder, 20mm Surface	100mm GSB, 50mm Binder, 20mm Surface
PC Slab	PC Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	50mm GSB, 30mm sand, 50mm slab	100mm GSB, 100mm Binder, 20mm Surface
	Drainage kerb	Surfacing materials, sub-base, kerbs, edgings, channels	50mm GSB, 30mm sand, 50mm slab	100mm GSB, 100mm Binder, 20mm Surface
	Stone Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	50mm GSB, 30mm sand, 50mm slab	100mm GSB, 100mm Binder, 20mm Surface

Natural Stone	Stone Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	50mm GSB, 30mm sand, 50mm stone slab	100mm GSB, 100mm Leanmix, 30mm cementitous bedding, 70mm stone slab
Group 1	**Group 2**	**Components**	**Existing Construction**	**Modern Equivalent Construction**
PC Block	PC Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 35mm sand, 60mm PC block	100mm GSB, 35mm sand, 60mm PC block
	Drainage kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 35mm sand, 60mm PC block	100mm GSB, 35mm sand, 60mm PC block
	Stone Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 35mm sand, 60mm PC block	100mm GSB, 35mm sand, 60mm PC block
Strengthened Footway (inc crossovers)	PC Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 100mm Binder, 20mm Surface	100mm GSB, 100mm Binder, 20mm Surface
	Drainage kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 100mm Binder, 20mm Surface	100mm GSB, 100mm Binder, 20mm Surface
	Stone Kerb	Surfacing materials, sub-base, kerbs, edgings, channels	100mm GSB, 100mm Binder, 20mm Surface	100mm GSB, 100mm Binder, 20mm Surface
Grass verge			100mm soil	100mm topsoil, grass seed

F1.3 Safety Barriers, Pedestrian Guardrail & Street Furniture

The Gross Replacement cost unit rates for safety barriers, pedestrian guardrail & street furniture were derived from the schedule of rates contained within the council's existing term contracts for civil engineering works using the internal contractor. Based on an assumed scheme size in excess of 50 items and using the following criteria.

Table F1-3 Basis for Deriving unit rates for Safety Barriers, Pedestrian Guardrail & Street Furniture Gross Replacement Cost

Asset	Type	Unit	Components
Group 1	**Group 2**		
pedestrian guardrail	visirail	per lin m	Removal and disposal of the existing asset, supply and installation of the new asset including all excavation, foundation & reinstatement plus overheads, design fees & traffic management.
	heritage	per lin m	
bollards	cel bollard	no	
	elephant bollard	no	
	Bangor bollard	no	
	Wooden posts	no	
	stainless steel	no	
seats	wooden	no	
	steel	no	
	concrete	no	
grit bins	standard	no	
litter bins	mounted	no	
	stand alone	no	
	Cov ornamental	no	
planters	Barrier Tubs	no 300	
	Lamp Post Wrap-Round	no 140	
	1Mtr Square Tubs	no 240	
cycle racks	stainless steel	no	
	tubular steel	no	
boundary fencing	pallisade fencing	per lin m	
noise barriers		per lin m	
safety barrier	Barrier & post	per lin m	
	Terminal	no	

F1.4 Street Lighting & Illuminated Signs

The Gross Replacement cost unit rates for street lighting and illuminated signs were derived from the schedule of rates contained within the council's existing term contracts for civil engineering works using the internal contractor. Based on an assumed scheme size in excess of 50 items and using the following criteria.

Unit Cost Item Coverage to include:-

Complete removal of the inventory item to include column / post / attachments and lighting units, supply and installation of the new asset including all excavation, foundation & reinstatement, electrical supply disconnection and reconnection plus overheads, design fees & traffic management.

Table F1-4 Basis for Deriving unit rates for Street Lighting & Illuminated Signs Gross Replacement Cost

Lighting Columns		
Height (Mtrs)	**Material**	**Lantern Type**
5	Galvanised Steel	35W CDMT
6	Galvanised Steel	35W CDMT & 60W CPOT
8	Galvanised Steel	140W CPOT & 100W SONT
10	Galvanised Steel	150W SONT
12	Galvanised Steel	250W SONT
15	Galvanised Steel	250W SONT
Hi Mast	Galvanised Steel	400W SONT

Illuminated Sign Posts	
Sign face area	**Post Material**
0.25 - 0.5	Galvanised Steel
0.5 - 0.75	Galvanised Steel
0.75 - 1	Galvanised Steel
1 - 2	Galvanised Steel
2 - 3	Galvanised Steel
3 - 4	Galvanised Steel
5 - 6	Galvanised Steel
7 - 8	Galvanised Steel
Bracket Mounted Lantern	
Internally illuminated signs (all types)	
Illuminated Bollard (all types)	

F1.5 Non-illuminated signs

The Gross Replacement cost unit rates for non- illuminated signs were derived from the schedule of rates contained within the council's existing term contracts for civil engineering works using the internal contractor. Based on an assumed scheme size in excess of 50 items and using the following criteria.

Unit Cost Item Coverage to include:-

Complete removal of the inventory item to include sign / post / attachments, supply and installation of the new asset including all excavation, foundation & reinstatement plus overheads, design fees & traffic management.

Table F1-5 Basis for Deriving unit rates for Non-illuminated Signs Gross Replacement Cost

Non-Illuminated Sign & Posts	
Sign face area	**Post Material**
0.25 - 0.5	Galvanised Steel
0.5 - 0.75	Galvanised Steel
0.75 - 1	Galvanised Steel
1 - 2	Galvanised Steel
2 - 3	Galvanised Steel
3 - 4	Galvanised Steel
5 - 6	Galvanised Steel
7 - 8	Galvanised Steel
8+	Galvanised Steel

F1.6 Traffic Signals & Pedestrian Crossings

The Gross Replacement cost unit rates for traffic signals & pedestrian crossings were derived from the schedule of rates contained within the council's existing term contracts for civil engineering and electrical works using both internal and external contractors. Based on an assumed scheme size in excess of 50 items and using the following criteria.

Unit Cost Item Coverage to include:-

Complete removal of the inventory item to include Signal Head, pole, button assembly, supply and installation of the new asset including all excavation, foundation & reinstatement, service disconnection & reconnection, plus overheads, design fees & traffic management.

Table F1-6 Basis for Deriving unit rates for Traffic Signals & Pedestrian Crossings Gross Replacement Cost

Group 1	Group2	Group 3		Group 1	Group2	Group 3
Signal Installation	**Item**	**Lamp Type**		**Signal Installation**	**Item**	**Lamp Type**
Traffic Signals	Signal Pole with 1 Ped head & Button Assembly	LED		Pelican Crossing	Crossing Pole with Ped Head & button assembly	LED
		Halogen				Halogen
	Signal Pole with 2 Ped Head & Button Assembly	LED			Crossing Pole with 1 traffic head	LED
		Halogen				Halogen
	Signal Pole with 1 traffic head	LED			Crossing Pole with 1 traffic head, Ped Head & button assembly	LED
		Halogen				Halogen
	Signal Pole with 1 traffic head, Ped Head & Button Assembly	LED			Crossing Pole with 2 traffic heads	LED
		Halogen				Halogen
	Signal Pole with 1 traffic head, 2 Ped Head & Button Assembly	LED			Crossing Pole with 2 traffic heads, Ped Head & button assembly	LED
		Halogen				Halogen

Signal Installation	Item	Lamp Type		Signal Installation	Item	Lamp Type
Traffic Signals	Signal Pole with 2 traffic heads	LED		Pelican Crossing	Crossing Pole with 3 traffic heads, Ped Head & button assembly	LED
		Halogen				Halogen
	Signal Pole with 2 traffic heads, Ped Head & Button Assembly	LED			Crossing Pole with 4 traffic heads, Ped Head & button assembly	LED
		Halogen				Halogen
	Signal Pole with 3 traffic heads	LED			Crossing Pole with wait & button assembly	LED
		Halogen				Halogen
	Signal Pole with 3 traffic heads, Ped Head & Button Assembly	LED			UTC Signal Controller	
		Halogen			Authority Signal Controller	
	Signal Pole with 4 traffic heads	LED			MVD's	
		Halogen			Pedestrian Det	
	Signal Pole with 4 traffic heads, Ped Head & Button Assembly	LED			Traffic Loops per Mtr.	
		Halogen			Cabling per Mtr.	
	Signal Pole with 5 traffic heads	LED				
		Halogen				
	Signal Pole with wait & Button Assembly	LED				
		Halogen				
	UTC Signal Controller					
	Authority Signal Controller					
	MVD's					
	Pedestrian Det					
	Traffic Loops per Mtr.					
	Cabling per Mtr.					

Group 1	Group2	Group 3		Group 1	Group2	Group 3
Signal Installation	**Item**	**Lamp Type**		**Signal Installation**	**Item**	**Lamp Type**
Toucan Crossing	Crossing Pole with 1 traffic head	LED		Puffin Crossing	Crossing Pole with 1 traffic head	LED
		Halogen				Halogen
	Crossing Pole with 1 traffic head, Ped Head & button assembly	LED			Crossing Pole with 1 traffic head, Ped Head & button assembly	LED
		Halogen				Halogen
	Crossing Pole with 2 traffic heads	LED			Crossing Pole with 2 traffic heads, Ped Head & button assembly	LED
		Halogen				Halogen
	Crossing Pole with 2 traffic heads, Ped Head & button assembly	LED			Crossing Pole with wait & button assembly	LED
		Halogen				Halogen
	Crossing Pole with 3 traffic heads, Ped Head & button assembly	LED			UTC Signal Controller	
		Halogen			Authority Signal Controller	
	Crossing Pole with 3 traffic heads, 2 Ped Head & button assembly	LED			MVD's	
		Halogen			Pedestrian Det	
	Crossing Pole with wait & button assembly	LED			Traffic Loops per Mtr.	
		Halogen			Cabling per Mtr.	
	UTC Signal Controller					
	Authority Signal Controller					
	MVD's					
	Pedestrian Det					
	Traffic Loops per Mtr.					
	Cabling per Mtr.					

Group 1	Group2
Signal Installation	**Item**
Other	SCOOT Detectors with Loops
	SCOOT Detector Pack
	PRISM Detectors
	O.T.U
	OMU
	UTC System
	Common Database
	RMS
	FMS
	Other UTC Systems
	Communications Equipment
	CCTV
	VMS

The method used to calculate both the Gross Replacement Cost and Depreciated Replacement Cost for Structures is based on the method developed by the London Bridge Engineers Group (LoBEG) and is fully described in appendix D.

The method to calculate the value of highway trees is a bespoke method developed within Coventry City Council with the assistance of exp consulting and is fully described in appendix E.

Appendix F-2

Identification of Treatments from Scanner and DVI Surveys to get Roads Back to Full Performance

Carriageways

The condition information used for the carriageways was assessed from the SCANNER and Detailed Visual Inspection (DVI) surveys that had been undertaken for all categories of road. This information was fed into a carriageway treatment model that used a simple decision tree based on the UKPMS TTS treatment rules to determine the treatment required to bring the asset back to an as new condition.

Triggers for Strengthening

1. Left wheel track rut >= 20mm and 3m LPV >= 10mm2
2. Right wheel track rut >= 20mm and 3m LPV >= 10mm2
3. Left wheel track rut >= 20mm and whole carriageway cracking intensity >= 4%
4. Right wheel track rut >= 20mm and whole carriageway cracking intensity >= 4%
5. Left wheel track rut >= 20mm and left wheel track cracking intensity >= 4%
6. Right wheel track rut >= 20mm and right wheel track cracking intensity >= 4%
7. 3m LPV >= 10mm2 and whole carriageway cracking intensity >= 4%
8. 3m LPV >= 10mm2 and left WT cracking intensity >= 4%
9. 3m LPV >= 10mm2 and right WT cracking intensity >= 4%

Triggers for Resurfacing

1. Left wheel track rut >= 15mm
2. Right wheel track rut >= 15mm
3. 3m LPV >= 10mm2
4. Whole Carriageway cracking intensity >= 4%
5. Left wheel track rut >= 11mm and 3m LPV >= 4mm2
6. Right wheel track rut >= 11mm and 3m LPV >= 4mm2
7. Left wheel track rut >= 11mm and whole carriageway cracking intensity >= 1%
8. Right wheel track rut >= 11mm and whole carriageway cracking intensity >= 1%
9. Left wheel track rut >= 11mm and left wheel track cracking intensity >= 1%
10. Left wheel track rut >= 11mm and right wheel track cracking intensity >= 1%
11. Right wheel track rut >= 11mm and right wheel track cracking intensity >= 1%
12. Right wheel track rut >= 11mm and left wheel track cracking intensity >= 1%
13. 3m LPV >= 4mm2 and whole carriageway cracking intensity >= 1%
14. 3m LPV >= 4mm2 and left WT cracking intensity >= 1%
15. 3m LPV >= 4mm2 and right WT cracking intensity >= 1%

Triggers for Surface Improvement

TTSSU >= 50

Based on the condition index TTSSU derived from whole carriageway cracking intensity and texture.

Triggers for Reconstruction

In addition it was decided that as the calculation was for returning to an as new condition the small amount of carriageway that required full depth reconstruction should also be included and it was agreed that the trigger for this should be set at:

1. Left wheel track rut >= 50mm
2. Right wheel track rut >= 50mm

The actual treatments undertaken triggered by the above options would differ for each road category as per table F2.1 below.

Table F2.1 Carriageway Rehabilitation Treatment Options				
Road Class	Reconstruction	Strengthening	Resurfacing	Surface Improvement
2	Full depth recon – 2	200mm Inlay	100mm Inlay	Thin surfacing Inlay
3a	Full depth recon 3a & 3b	150mm Inlay	100mm inlay	Thin surfacing inlay
3b	Full depth recon 3a & 3b	150mm Inlay	100mm inlay	Thin surfacing inlay
4a	Full depth recon 4a & 4b	100mm inlay	100mm inlay	Slurry seal
4b	Full depth recon 4a & 4b	75mm retread	75mm retread	Slurry seal

Rates were derived for each of the different treatment options (see table F2.2) and by multiplying the total area requiring each treatment by the rate for the treatment it was possible to determine the accumulated consumption for each road category. The rates calculated for the treatment options listed above were obtained from the Coventry City Council's term contract and were based on a treatment area greater than 500m2 such that no additional on costs were incurred for small amounts of working.

Table F2.2 Carriageway Treatment Options for Calculating Accumulated Consumption		
Treatment	Components to be included	Rate / m2
Slurry Seal	Traffic management, material & application costs, design fees. Pre-patching average 60mm depth 5% of total area.	£8.64
Thin Surfacing inlay	35mm material, cold plane, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£11.93
Resurface 100mm inlay	Cold plane 100mm, 100mm material, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£21.45
Resurface 150mm inlay	Cold plane 150mm, 150mm material, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£30.26

Table F2.2 Carriageway Treatment Options for Calculating Accumulated Consumption		
Treatment	Components to be included	Rate / m2
Resurface 200mm inlay	Cold plane 200mm, 200mm material, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£40.40
Retread	75mm retread & relay, 25mm surface course, tack coat, accommodation works, adjust ironwork, traffic management, & design fees	£21.85
Ex-situ Recycling	Recycling 150mm depth foam bitumen with 35mm close surface course, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£39.29
Full depth reconstruction - 4a & 4b	Remove 380mm depth, replace 200mm granular, 100mm r/b, 50mm binder, 30mm surface course, replace gullies 1 per 200m2, 5m pipe per gully, 1% antiskid by area, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£69.35
Full depth reconstruction - 3a & 3b	Remove 500mm depth, replace 250mm granular, 150mm r/b, 60mm binder, 40mm surface course, replace gullies 1 per 200m2, 5m pipe per gully, 1% antiskid by area, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£92.84
Full depth reconstruction - 2	Remove 600mm depth, replace 300mm granular, 200mm r/b, 60mm binder, 40mm surface course, replace gullies 1 per 200m2, 5m pipe per gully, 1% antiskid by area, tack coat, accommodation works, adjust ironwork, traffic management & design fees.	£107.21

Treatment Model Efficiency

The treatment model was tested using treatment lengths of 10m, 100m and full section lengths. It was found that when using 10m lengths the treatments required were far less than would have been expected this was attributed to the fact that the treatment triggers were very seldom found within a discrete 10m length. Conversely when the full section length was used as a treatment length the results were far higher than would have been expected, it is believed that this was due to the very long section lengths always meeting the strengthening trigger criteria even though much of the carriageway needed less work. However where the 100m treatment lengths were used the model was found to give more appropriate results and although this again uses a round up calculation to determine the works required it is believed that the results obtained from this are comparable or better than any other method investigated.

Appendix F-3

Identification of Treatments from DVI Surveys to get Footways Back to Full Performance

Footway Condition Index

The footway condition index (CI) is based on the collection and analysis of Detailed Visual Inspection (DVI) measurements, using the national Rules and Parameters for UKPMS. The footway condition index ranges in values from 0 to 100 (or just over 100). A value of 0 indicates no defects and 100 indicates a very poor condition.

Triggers for Treatments

Reconstruction

CI > 80

Resurface

80 > CI > 60

Surface Treatment

60 > CI > 15

No Treatment

15 > CI > 0

Rates were derived for each of the different treatment options (see table F3.1) and by multiplying the total area requiring each treatment by the rate for the treatment it was possible to determine the accumulated consumption for each footway category. The rates calculated for the treatment options listed above were obtained from the Coventry City Council's term contract and were based on a treatment area greater than 500m2 such that no additional on costs were incurred for small amounts of working.

Table F3.1 Footway Treatment Options for Calculating Accumulated Depreciation

Treatment	Components to be included	Rate
Reconstruct Bituminous - *Standard Construction*	Excavate bituminous material, sub-base & formation, relay 100mm granular, 50mm binder, 20mm surface, adjust ironwork, renew 100% kerbs, replace 100% edgings, accommodation works, traffic management & design fees.	£78.76
Reconstruct bituminous - *Strengthened Construction*	Excavate bituminous material, sub-base & formation, relay 100mm granular, 100mm binder, 20mm surface, adjust ironwork, renew 100% kerbs, replace 100% edgings, accommodation works, traffic management & design fees.	£96.79

Table F3.1 Footway Treatment Options for Calculating Accumulated Depreciation		
Treatment	Components to be included	Rate
Remove Slab & Reconstruct bituminous - *Standard Construction*	Remove PC Slabs, excavate sub-base & formation, lay 100m granular, 50mm binder, 20mm surface, adjust ironwork, renew 100% kerbs, replace 100% edgings, accommodation works, traffic management & design fees.	£75.85
Remove Slab & Reconstruct bituminous - *Strengthened Construction*	Remove PC Slabs, excavate sub-base & formation, lay 100m granular, 100mm binder, 20mm surface, adjust ironwork, renew 100% kerbs, replace 100% edgings, accommodation works, traffic management & design fees.	£93.14
Reconstruct - natural stone surfacing	Take up surfacing, excavate sub-base, complete formation, lay sub-base, proprietary bedding & jointing, renew surfacing 100%, traffic management & design fees.	£180.50
Resurface bituminous	Remove bituminous surfacing, complete formation, lay two coat bituminous surfacing, adjust ironwork, replace isolated kerbing & edging, accommodation works, traffic management & design fees.	£48.65
Resurface - Flag Renew	Take up flags, Provide and lay new PCC flags on new proprietary bedding, point up, renew isolated kerbs and PCC edgings, accommodation works. Traffic management and design fees	£19.63
Surface treatment - Relay natural stone surfacing	Take up slabs, complete formation, proprietary bedding & jointing, relay slabs 75%, renew slabs 25%, traffic management & design fees.	£30.33
Surface treatment - Flag Relay	Take up flags, relay on new proprietary bedding, point up, renew isolated kerbs and PCC edgings, accommodation works. Traffic management and design fees	£8.00
Surface treatment - Slurry – seal	Masking of ironwork etc, slurry seal, pre-patching average 60mm depth 5% of total area	£3.00

Appendix F-4

Method for the Calculation of the Structures DRC (Based on the LoBEG Technical Note)

Appendix F-5

Coventry City Council Tree Valuation Methodology

Coventry City Council Highway Tree Valuation Method

Develop a rate to include for:

1 Removal and disposal of the existing tree
2 Provision and planting of a replacement tree of the same species to the standard Coventry Arboricultural Specification
3 Establishment costs during the early life of the tree; to ensure the tree takes and is allowed to grow.
4 Maintenance costs over the period required for the new tree to grow to the equivalent size category of the tree removed.

Rate to include for all ancillary costs including traffic management and design.

Rate differentiators are: Size category as per Coventry C.C. Specification and Maintenance requirement dependant on tree species.

Size Categories

	Height	Spread
A	Up to 7m	Up to 5m
B	7m to 14m	5m to 10m
C	14m to 18m	10m to 15m
D	18m to 25m	15m to 20m
E	Over 25m	Over 20m
P	Pollarded tree	To take account of the additional maintenance costs of a pollarded tree where the growth of the tree has been artificially restricted.

High or Low Maintenance Species

A number of species of tree have been identified as requiring a significantly higher maintenance regime than others.

High Maintenance Species are:

Tilia spp (Lime)

Platanus spp (Plane)

Felling and grinding rates are taken from the internal schedule of rates applicable for 2007/8. Planting rates are an average based on purchase cost of the young tree and existing sub-contractors rates for undertaking the planting.

Establishment costs for all trees are based on 1 visit per week for a 22 week period, May through September, for the first 5 years of life. The ongoing maintenance regimes detailed below are dependent on whether the tree is a High or Low maintenance species or if the tree has been pollarded.

Table F5.1 Derivation of Establishment & Maintenance Costs for High Maintenance Trees

category	maintenance period	qty	operation
CAT A	YR 5 TO YR 10	2	Crown lift to 3m
		1	Crown thin by 10%
		1	Inspection
		5	Remove epicormic growth
CAT B	YR 10 TO YR 20	4	Crown lift to 4m
		2	Crown thin by 10%
		1	Crown reduce by 10 %
		1	Inspection
		10	Remove epicormic growth
CAT C	YR 20 TO YR 40	8	Crown lift 6 m
		2	Crown thin by 10%
		2	Crown clean
		2	Crown reduce by 10 %
		6	Inspection
		20	Remove epicormic growth
CAT D	YR 40 TO YR 60	8	Crown lift 6 m
		2	Crown thin by 10%
		2	Crown clean
		2	Crown reduce by 10 %
		6	Inspection
		20	Remove epicormic growth
CAT E	YR 60 ON	8	Crown lift 6 m
		2	Crown thin by 10%
		2	Crown clean
		2	Crown reduce by 10 %
		6	Inspection
		20	Remove epicormic growth

Table F5.2 Derivation of Establishment & Maintenance Costs for Low Maintenance Trees

category	maintenance period	qty	operation
CAT A	YR 5 TO YR 10	2	Crown lift to 3m
		1	Crown thin by 10%
		1	Inspection
		1	Remove epicormic growth
CAT B	YR 10 TO YR 20	4	Crown lift to 4m
		2	Crown thin by 10%
		1	Crown reduce by 10 %
		1	Inspection
		5	Remove epicormic growth
CAT C	YR 20 TO YR 40	8	Crown lift 6 m
		2	Crown thin by 10%
		2	Crown clean
		2	Crown reduce by 10 %
		6	Inspection
		10	Remove epicormic growth
CAT D	YR 40 TO YR 60	8	Crown lift 6 m
		2	Crown thin by 10%
		2	Crown clean
		2	Crown reduce by 10 %
		6	Inspection
		10	Remove epicormic growth
CAT E	YR 60 ON	8	Crown lift 6 m
		2	Crown thin by 10%
		2	Crown clean
		2	Crown reduce by 10 %
		6	Inspection
		10	Remove epicormic growth

Table F5.3 Derivation of Establishment & Maintenance Costs for Pollarded Trees

category	maintenance period	qty	operation
CAT A	YR 5 TO YR 10	2	Crown lift to 3m
		1	Crown thin by 10%
		1	Inspection
		1	Remove epicormic growth
CAT B	YR 10 TO YR 20	4	Crown lift to 4m
		2	Crown thin by 10%
		1	Crown reduce by 10 %
		1	Inspection
		5	Remove epicormic growth
CAT B - C POLLARDS 3 YR CUT	YR 20 TO YR 40	6	Recut Secondary Pollard 3 YR
		20	Barrel Growth Removal
CAT B - C POLLARDS 5 YR CUT	YR 20 TO YR 40	4	Recut Secondary Pollard 5 YR
		20	Barrel Growth Removal

The number of trees used to calculate the overall value has been derived from a tree survey currently being undertaken, using the 38% sample completed as of 1st March 2008.