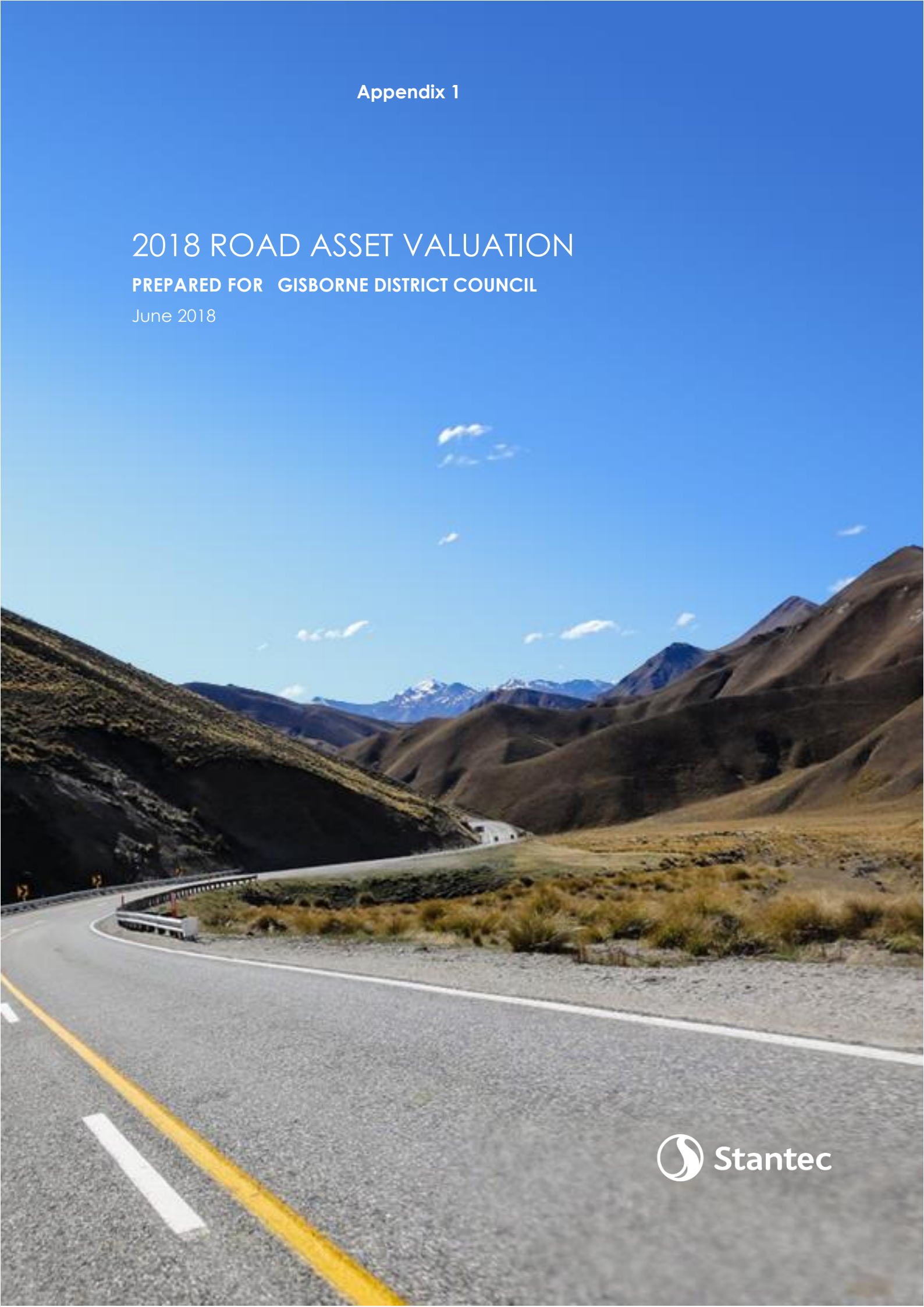
Appendix 1

2018 ROAD ASSET VALUATION

PREPARED FOR GISBORNE DISTRICT COUNCIL

June 2018



Stantec

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REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
1	18/07/18	Draft for Review	P True	L Crawford	B Smith	P True
2	23/07/18	Final	P True	L Crawford	B Smith	P True

Abbreviations

AD	Annual Depreciation
AMP	Asset Management Plan
DRC	Depreciated Replacement Cost
LA	Local Authority
LTP	Long Term Plan
NAMS	National Asset Management Steering Group
NZTA	New Zealand Transport Authority
RAMM	Road Assessment and Maintenance Management software
RAVM	Road Asset Valuation Module
RC	Replacement Cost
TUL	Total Useful Life

Glossary

Annual Depreciation

The Annual Depreciation is the amount the asset depreciates in a year. It is defined as the replacement cost minus the residual value divided by the estimated total useful life for the asset.

Depreciation

Depreciation is a measure of the consumption of the economic or service potential benefits embodied in an asset. It distributes the cost or value of an asset over its estimated useful life. Thus depreciation only applies to those assets with finite lives. Assets with indefinite lives (e.g. Land, Formation and Subbase) are not depreciated. Straight-line depreciation is used in this valuation.

Depreciated Replacement Cost

Depreciated Replacement Cost is the current replacement cost less allowance for physical deterioration and optimisation for obsolescence and relevant surplus capacity.

Where the remaining life of an asset can be assessed, the Depreciated Replacement Cost has been calculated as:

$$\frac{\text{Remaining useful life}}{\text{Total useful life}} \times (\text{replacement cost} - \text{residual value}) + \text{residual value}$$

Note: That for assets that have exceeded their Total Useful Lives (TUL) the Adjusted Total Useful Life is calculated as the age of the asset plus the Minimum Remaining Useful Life (RUL).

Minimum Remaining Useful Life (MRUL)

The Minimum Remaining Useful Life is applied to assets that are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the standard useful life and used in the calculation of the depreciated replacement value. The minimum remaining useful lives of assets in this valuation are included in the asset assumption tables.

Optimised Replacement Cost

The Optimised Replacement Cost is the cost of building the asset "today". In arriving at the value, it is assumed that modern construction techniques and modern equivalent materials are used but that the physical result replaces the asset as it exists.

Residual Value

The Residual Value is the value of the asset when it reaches the end of its life. For the purposes of this valuation we have assumed that all assets have no residual value. The residual value has been removed due to the minimum remaining useful life being a more appropriate way of valuing assets that have reached the end of their TUL.

Total Useful Life (TUL)

The period over which an asset is expected to be available for use by an entity

Gisborne District Council

2018 Road Asset Valuation

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. Declaration of Valuation

Stantec New Zealand Ltd was commissioned by Gisborne District Council (GDC) to value its roading infrastructure assets as at 30 June 2018.

We certify that the valuations summarised below have been completed in accordance with the following:

- NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0;
- Accounting Standards PBE IPSAS 17 and PBE IPSAS 21, and
- The Local Government Act 2002.

1.1 Summary of Asset Valuation Results

Table 1-1 shows the total valuation results for all assets. This shows an annual depreciation cost of **$11,190,241**.

Table 1-1: Summary of 2017/2018 Asset Valuation as at 30 June 2018

Asset Description	Replacement Cost	Total Accumulated Depreciation	Depreciated Replacement Cost	Annual Depreciation
Land	$890,929,260	$0	$890,929,260	$0
Formation	$412,842,046	$0	$412,842,046	$0
Sealed Pavement Surface	$43,878,707	$25,239,601	$18,639,106	$2,922,300
Sealed Pavement Layers	$186,719,581	$61,986,715	$124,732,866	$2,897,111
Unsealed Pavement Layers	$38,777,200	$9,394,212	$29,382,988	$676,409
Drainage	$55,853,067	$27,763,767	$28,089,300	$800,316
Surface Water Channels	$42,680,628	$19,504,063	$23,176,565	$569,075
Footpath	$45,736,553	$18,831,298	$26,905,255	$633,432
Traffic Facilities	$7,689,889	$4,125,080	$3,564,810	$160,291
Minor Structures	$179,192	$89,596	$89,596	$2,240
Signs	$1,592,206	$1,038,594	$553,612	$120,974
Railings	$6,902,466	$5,388,160	$1,514,306	$277,531
Street Lights	$5,911,811	$2,770,182	$3,141,630	$307,143
Car Parks	$1,835,875	$917,938	$917,938	$45,431
Bridges and Major Culverts	$133,065,355	$86,265,419	$46,799,937	$1,777,988
Total	**$1,874,593,836**	**$263,314,623**	**$1,611,279,213**	**$11,190,241**

We are not aware of any reason why GDC auditors should not place reliance in the valuation prepared.

The valuations are based on accurate and substantially complete asset registers and appropriate replacement costs and effective lives. The basis of the data inputs used is described in detail in the report.

(a) The lives are generally based upon NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0. In specific cases these have been modified where, in the opinion of Stantec and GDC, a different life is appropriate. The changes are justified in the valuation report.

(b) The component level of the data used for the valuation is sufficient to calculate depreciation separately for those assets that have different useful lives.

The following personnel with relevant experience in road engineering completed this valuation:

Name	Role	Qualifications	Years of Relevant Experience
Lachlan Crawford	Valuation Technician	DipEng (Civil)	10
Pauline True	Valuer	BBS Economics, PGDipArts (GIS)	20
Brian Smith	Peer Review	B Com CA	30

Signatures of Valuers:

.....
Pauline True

.....
Brian Smith

.....
Lachlan Crawford

2. Disclosure Requirements

Consistent with NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0, Section 6.2.1, it is prohibited to publish any of the following without the written approval of the valuer as to the form and context in which it is to appear:

- The report in whole or in part or any reference thereto.
- The valuation figures contained within the report.
- The names and professional affiliations of the valuers.

The valuation has been prepared in accordance with appropriate guidelines and standards, that the engagement was performed independently and without bias towards the clients or others.

3. Comparison

3.1 Introduction

This section shows the comparison between the 30 June 2017 and 30 June 2018 valuations with a summary comparison and an individual comparison of each asset type with explanations for the differences.

Table 3-1 shows the results from the 30 June 2017 valuation for all assets.

Table 3-1: Summary of 30 June 2017 Asset Valuation

Asset Description	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Land	$745,709,300	$745,709,300	$0
Formation	$400,188,338	$400,188,338	$0
Sealed Pavement Surface	$42,644,828	$17,635,738	$2,789,836
Sealed Pavement Layers	$180,507,218	$124,373,675	$2,800,592
Unsealed Pavement Layers	$37,591,086	$29,042,764	$650,966
Drainage	$50,021,554	$25,858,116	$716,919
Surface Water Channels	$41,163,812	$22,855,871	$548,851
Footpath	$43,958,809	$26,334,259	$609,906
Traffic Facilities	$14,158,529	$6,916,558	$240,258
Minor Structures	$173,258	$86,629	$2,166
Signs	$1,494,281	$492,348	$122,974
Railings	$6,531,039	$1,557,853	$264,309
Street Lights	$5,528,181	$3,046,982	$300,891
Car Parks	$1,774,870	$887,435	$43,935
Bridges and Major Culverts	$127,608,855	$45,922,472	$1,708,877
Total	**$1,699,053,956**	**$1,450,908,338**	**$10,800,479**

Table 3-2: 30 June 2017 and 30 June 2018 Valuation Comparison

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$1,699,053,956	$1,450,908,338	$10,800,479
30 June 2018	$1,874,593,836	$1,611,279,213	$11,190,241
% Change	**10.33%**	**11.05%**	**3.61%**

In summary the 2018 RAMM valuation aligns well with the 2017 RAMM valuation, with some notable exceptions that will be explained in this report. Council continues to better utilise RAMM, continuing to grow and invest time in collection and auditing of assets. This year CJN tech who host RAMM have moved to accept the Core logic road centrelines for all networks, where in the past these were supplied by Critchlow. This has instigated a larger inspection of assets and locational data. Due to this change Council has started a larger project validating centreline movements along with the location of physical assets such as bridges, rails, signs and drainage. This will see some movement of council's assets tables as existing assets are captured and those that are no longer in service are removed. This should ensure a more robust valuation process and better asset management planning.

3.2 Comparison by Asset Type

3.2.1 Land under Roads

Table 3-3: 30 June 2017 and 30 June 2018 Land Under Roads Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$745,709,300	$745,709,300	$0
30 June 2018	$890,929,260	$890,929,260	$0
% Change	**19.47%**	**19.47%**	

The increases in Replacement Cost and Depreciated Replacement Cost are due to an increase in land values in the Gisborne Region.

3.2.2 Formation

Table 3-4: 30 June 2017 and 30 June 2018 Formation Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$400,188,338	$400,188,338	$0
30 June 2018	$412,842,046	$412,842,046	$0
% Change	**3.16%**	**3.16%**	

The increases in Replacement Cost and Depreciated Replacement Cost are due to an increase in unit rates.

3.2.3 Sealed Pavement Surface

Table 3-5: 30 June 2017 and 30 June 2018 Sealed Pavement Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$42,644,828	$17,635,738	$2,789,836
30 June 2018	$43,878,707	$18,639,106	$2,922,300
% Change	**2.89%**	**5.69%**	**4.75%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for resealing, and 398m increase in the sealed network.

3.2.4 Sealed Pavement Layers

Table 3-6: 30 June 2017 and 30 June 2018 Sealed Pavement Layers Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$180,507,218	$124,373,675	$2,800,592
30 June 2018	$186,719,581	$124,732,866	$2,897,111
% Change	**3.44%**	**0.29%**	**3.45%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates pavement. There has been a 398m increase in the length of the sealed network.

3.2.5 Unsealed Pavement Layers

Table 3-7: 30 June 2017 and 30 June 2018 Unsealed Pavement Layers

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$37,591,086	$29,042,764	$650,966
30 June 2018	$38,777,200	$29,382,988	$676,409
% Change	**3.16%**	**1.17%**	**3.91%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for unsealed pavement layers. The audit currently underway has reduced the unsealed network by 2.437Km, or 0.2%.

3.2.6 Drainage

Table 3-8: 30 June 2017 and 30 June 2018 Drainage Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$50,021,554	$25,858,116	$716,919
30 June 2018	$55,853,067	$28,089,300	$800,316
% Change	**11.66%**	**8.63%**	**11.63%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for drainage. The audit process has identified 3145 sumps on rural roads which up till now had not been in RAMM. It also validated the lengths of culverts which reduced their length by 241m. This validation of the network is currently only a third of the way through the rural network.

3.2.7 Surface Water Channels

Table 3-9: 30 June 2017 and 30 June 2018 Surface Water Channel Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$41,163,812	$22,855,871	$548,851
30 June 2018	$42,680,628	$23,176,565	$569,075
% Change	**3.68%**	**1.40%**	**3.68%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for surface water channel, and a 696m length increase in concrete kerb and channel.

3.2.8 Footpaths

Table 3-10: 30 June 2017 and 30 June 2018 Footpath Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$43,958,809	$26,334,259	$609,906
30 June 2018	$45,736,553	$26,905,255	$633,432
% Change	**4.04%**	**2.17%**	**3.86%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for footpaths, and a 938m length increase in concrete footpath. The new footpath is on Barkers Hill and access ways from Anzac to Stanley Street and Crawford to Dickson Street.

3.2.9 Traffic Facilities

Table 3-11: 30 June 2017 and 30 June 2018 Traffic Facility Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$14,158,529	$6,916,558	$240,258
30 June 2018	$7,689,889	$3,564,810	$160,291
% Change	**-45.69%**	**-48.46%**	**-33.28%**

The decreases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to the data collection and validation of the retaining walls table. In 2017 the RAMM database still contained 4,640 "Other Structures", which were assets classified as either type: river protection or river prevention. The second stage of the retaining wall data collection was to match these other structures with the newly captured retaining walls to ensure no double ups. This and the further road centreline and asset validation project currently underway, has found that these assets either no longer exist or have now been captured in the retaining wall table. Therefore these asset types have been removed from the traffic facilities table.

3.2.10 Minor Structures

Table 3-12: 30 June 2017 and 30 June 2018 Minor Structure Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$173,258	$86,629	$2,166
30 June 2018	$179,192	$89,596	$2,240
% Change	**3.42%**	**3.42%**	**3.41%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for minor structures.

3.2.11 Signs

Table 3-13: 30 June 2017 and 30 June 2018 Signs Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$1,494,281	$492,348	$122,974
30 June 2018	$1,592,206	$553,612	$120,974
% Change	**6.55%**	**12.44%**	**-1.63%**

The increases in Replacement Cost, Depreciated Replacement Cost are due to an increase in the unit rates for signs. There are now 379 new signs in the database, which is a 5.8% increase. The achieved average lives of the signs assets has increased from 12.92 to 13.67 years from the 12yrs average that is used in the valuation, this has corresponded to a decrease in the annual depreciation.

3.2.12 Railings

Table 3-14: 30 June 2017 and 30 June 2018 Railing Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$6,531,039	$1,557,853	$264,309
30 June 2018	$6,902,466	$1,514,306	$277,531
% Change	**5.69%**	**-2.80%**	**5.00%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in unit rates for railings. There is a 798m (2.4%) increase of railings in the database. The achieved average age of the railings assets has increased from 17.30yrs to 17.87yrs. Currently the average used in the valuation is 13yrs.

3.2.13 Car Parks

Table 3-15: 30 June 2017 and 30 June 2018 Car Parks Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$1,774,870	$887,435	$43,935
30 June 2018	$1,835,875	$917,938	$45,431
% Change	**3.44%**	**3.44%**	**3.41%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates.

3.2.14 Street Lights

Table 3-16: 30 June 2017 and 30 June 2018 Streetlights Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$5,528,181	$3,046,982	$300,891
30 June 2018	$5,911,811	$3,141,630	$307,143
% Change	**6.94%**	**3.11%**	**2.08%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for streetlights. There are 36 more lights on the network and a significant shift to utilising LED lights (855). With the use of LEDs the lives of these assets is 10yrs longer than normal lights.

3.2.15 Bridges and Bridge Culverts

Table 3-17: 30 June 2017 and 30 June 2018 Bridge and Bridge Culvert Results

Valuation	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
30 June 2017	$127,608,855	$45,922,472	$1,708,877
30 June 2018	$133,065,355	$46,799,937	$1,777,988
% Change	**4.28%**	**1.91%**	**4.04%**

The increases in Replacement Cost, Depreciated Replacement Cost and Annual Depreciation are due to an increase in the unit rates for bridges. There have been slight adjustments (3m) in the length of the bridge stock with the validation survey.

4. Valuation Methodology

4.1 Scope

The scope of this valuation is to determine the replacement cost, depreciated replacement cost, and annual depreciation cost associated with GDC's roading assets as at 30 June 2018. The valuation of the roading network has been completed to the appropriate component level.

The general components under which the assets have been valued are:

- Land
- Formation
- Pavement (Structure and Surfacing)
- Drainage
- Surface Water Channels
- Footpaths
- Traffic Facilities
- Minor Structures
- Signs
- Railings
- Street Lights
- Bridges and Bridge Culverts
- Car Parks

The majority of the information for valuing the above components was sourced from the Road Assessment and Maintenance Management (RAMM) database. Enhancements have needed to be made to the various tables within the database so that the valuation software would run smoothly. Where data is missing, assumptions have been made to enable the valuation to be completed. These enhancements and assumptions are discussed further in the detail sections of this report.

GDC has utilised the RAMM Administrations Asset Valuation Module (RAVM) for the majority of components for this valuation. See Table 4-1 for a summary in data confidence.

Table 4-1: Data Confidence

Asset Description	Confidence	Comments
Land	B – Reliable	The land uses an assumed reserve width where this is not available.
Formation	B – Reliable	The formation valuation uses assumed pavement extra width allowances that have been calculated based on local engineering knowledge.
Sealed Pavement Surface	A – Highly Reliable	No assumptions have been made.
Sealed Pavements	B – Reliable	The sealed pavement valuation uses assumed pavement depths and extra width allowances that have been calculated based on local engineering knowledge. 58% of pavements use the default construction date (50% of TUL) as they have no construction information.
Unsealed Pavements	B – Reliable	The unsealed pavement valuation uses assumed pavement and wearing course depths that have been calculated based on local engineering knowledge.
Drainage	B – Reliable	Some issues with the classification of bridge culverts.
Surface Water Channels	B – Reliable	97% of surface water channels use the default construction date (50% of TUL) as they have no construction information.
Footpaths	A – Highly Reliable	No assumptions have been made.

Asset Description	Confidence	Comments
Traffic Facilities	C – Uncertain	Some data provided by others. Uncertain of accuracy.
Minor Structures	B – Reliable	These assets were added in 2003 and 2011 when better data collection processes were in place. However no construction dates have been recorded.
Signs	B – Reliable	30% of signs use the default construction date (50% of TUL) as they have no installation information.
Railings	B – Reliable	5% of railings use the default construction date (50% of TUL) as they have no construction information.
Street Lights	B – Reliable	96% of streetlight poles brackets and lamps use the default construction date (50% of TUL) as they have no construction information.
Bridges and Bridge Culverts	B – Reliable	Some issues with the classification of bridge culverts (see notes on Drainage). 18% of bridges and 99% of bridge culverts use the default construction date (50% of TUL) as they have no construction information.
Car Parks	C – Uncertain	100% of car parks use the default construction date (50% of TUL) as they have no construction information.

Based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0, Table 4.3.1: Data confidence grading system.

A – Highly Reliable Data based on sound records, procedure, investigations and analysis which is properly documented and recognised as the best method of assessment.

B – Reliable Data based on sound records, procedures, investigations and analysis which is properly documented but has minor shortcomings.

C – Uncertain Data based on sound records, procedures, investigation and analysis which is incomplete or unsupported, or extrapolation from limited sample for which grade A or B data is available.

D – Very Uncertain Data based on unconfirmed verbal report and/or cursory inspection and analysis.

1.2 Network Statistics

The following statistics summarise the GDC's roading network as at 30 June 2018. This information has been obtained from the treatment length table of the RAMM database.

The lengths are calculated as the sum of the end displacement minus the start displacement (rather than the sum of the lengths). While this effectively double count the areas at intersections, it is considered to be offset by the intersection flares, which are not included.

Network statistics are based on this method to allow for direct comparison with the treatment length table, which also uses the end displacements minus the start displacements. These statistics can then be used to confirm the lengths in the Formation, Surfacing and Pavement valuations. These tables do include bridges that have their own treatment length; these are excluded when calculating formation and pavement.

Table 4-2: Network Statistics as at 30 June 2018 (by pavement type)

Pavement Type	Urban (km)	Rural (km)	Total (km)
Sealed	231.798	613.52	845.318
Unsealed	9.431	1025.906	1035.337
Major Bridges	0.304	1.123	1.427
Total	**241.533**	**1640.549**	**1882.082**

Table 4-3: Network Statistics as at 30 June 2018 (by pavement use)

	Pavement Use	Urban	Rural	Total
1	ADT < 100	24.499	1112.985	1137.484
2	ADT 100-500	121.999	431.986	553.985
3	ADT 500-2000	48.809	92.210	141.019
4	ADT 2000-4000	16.577	4.485	21.062
5	ADT 4000-10000	14.321	3.052	17.373
6	ADT 10000-20000	11.158	0.000	11.158
7	ADT > 20000	0.000	0.000	0.000
Total		**237.364**	**1644.718**	**1882.082**

Table 4-4: Network Statistics as at 30 June 2018 (by ONRC Category)

ONRC Category	Sealed	Unsealed	Major Bridges	Total
Arterial	15.767	0.000	0.048	15.815
Primary Collector	48.425	0.000	0.156	48.580
Secondary Collector	305.901	16.536	0.057	322.494
Low Volume	140.908	730.889	0.931	872.728
Access	332.324	288.558	0.233	621.114
Not Assigned	0.681	0.669	0.000	1.351
Total	**844.006**	**1036.651**	**1.424**	**1882.082**

4.2 Valuation Process

These values have been calculated to define this roading asset valuation *Optimised Replacement Cost*, *Depreciated Replacement Cost* and *Annual Depreciation*. These are defined in the Glossary (see Section 20).

4.2.1 Data Sources

The general categories under which the road components are to be valued are outlined in

Table 4-5 below.

Table 4-5: Assets to be Valued

Component	RAMM Table	Data Source
Land	Treatment Length	RAMM
Formation	Treatment Length	RAMM
Pavements		
• Sealed Pavement Structure	Treatment Length	RAMM
• Unsealed Pavement Structure	Treatment Length	RAMM
• Sealed Surfaces	Treatment Length	RAMM
Drainage	Drainage	RAMM
Surface Water Channels	Surface Water Channel	RAMM
Footpaths	Footpath	RAMM
Traffic Facilities		
• Retaining Walls	Retaining Walls	RAMM
• Other Structures	Traffic Facilities	RAMM
• Parking Meters	Traffic Facilities	RAMM
• Traffic Signals	Traffic Signals	RAMM
• Raised Pavement Markers	Markings	RAMM
Fords	Minor Structure	RAMM
Markings	NA	**Council supplied data**
Signs	Signs	RAMM
Railings	Railings	RAMM
Streetlights	Street Light	RAMM
Bridges and Bridge Culverts	Bridge	RAMM
Car Parks	Treatment Length	RAMM

4.2.2 Data Verification

The RAMM database has been checked and any issues, errors, or missing data that need to be addressed before the valuation could run were identified and passed onto the RAMM team for updating.

4.2.3 Significant Assumptions

The default construction date will be 50% of the Total Useful Life (TUL) – unless it is otherwise stated – and only used where there is no construction date contained in RAMM. Default dates are calculated as the first of January of the year that would make the asset halfway through its life.

Straight-line depreciation has been used in this valuation except where assets are deemed not to depreciate.

All assets that have been valued in RAVM have been identified as asset owner "L" (or "LA" in the signs table) for Local authority in the RAMM database.

All replacement rates, where appropriate, have included in the cost an amount for removal and disposal of the existing asset, an amount for site establishment, and an amount for the formation, supply, placement, shaping, etc., of materials.

All significant assumptions were reviewed by Council prior to the valuation and confirmed as appropriate for the purposes of running the 30 June 2018 valuation.

4.2.4 Obsolescence

Potential physical, functional and external obsolescence has been considered in terms of the Application Guidance to PBE IPSAS 17. The replacement cost of bridges and culverts is calculated as the cost of building it "today". It is assumed that modern equivalent construction techniques and materials are used but that the physical result replaces the asset as it exists. For this valuation we have assumed that all bridges and culverts will be replaced with a similar dimensioned concrete bridge/culvert.

4.2.5 Impairment

We have also considered impairment of assets as defined in PBE IPSAS 21. This new Standard does not specifically require impairment testing in a periodic revaluation of non-cash generating assets. However during the course of our valuation no assets have been identified, or been brought to our notice that we would consider to be impaired.

4.2.6 Unit Replacement Costs

For this revaluation we are utilising cost adjustment factors provided by the New Zealand Transport Agency. These factors, for the period 31 March 2017 to 31 March 2018 are as follows: Maintenance = 1.0343, Bridges = 1.0447, Reseals = 1.0283 and Construction = 1.0342 (used for all other assets). In the same period, the median property price for the Gisborne region has increased by 17.9%.

4.2.7 Total Useful Lives

All total useful life assumptions were reviewed by Council and confirmed as appropriate for the purposes of running the 30 June 2018 valuation.

4.2.8 Residual Lives

For the purposes of this valuation we have assumed that assets have no residual value except for footpaths and pavement subbase.

4.2.8.1 Footpaths

RAVM does not currently have the ability to deal with footpaths in components and does not allow them to be broken down into basecourse and surface components. To deal with this we have used the residual value field, where necessary, as the cost of the basecourse. The replacement rates for footpaths include the cost of the footpath basecourse and surface.

4.2.8.2 Pavement Subbase

50% of pavement subbase has been assumed to depreciate to allow for the reconstruction work undertaken at the time of pavement reconstruction. To account for this a residual value equivalent to 50% of the pavement subbase cost has been used.

4.2.9 Minimum Remaining Useful Lives

The Minimum Remaining Useful Life is applied to assets that are older than their useful life. It recognises that although an asset is older than its useful life it may still be in service and therefore have some value. Where an asset is older than its standard useful life, the minimum remaining useful life is added to the assets age and used in the calculation of the depreciated replacement value. The minimum remaining useful lives of assets in this valuation are included in the asset assumption tables, and in Table 4-6. Where an asset description has NA it indicates an asset type that is either deemed to not depreciate, or has a one year Total Useful Life.

Table 4-6: Minimum Remaining Useful Lives

Asset Description	Minimum Remaining Useful Life
Land	NA
Formation	NA
Pavement Surface	1
Sealed Pavement First Coats	2
Sealed Pavement Basecourse	2
Sealed Pavement Subbase	2
Unsealed Pavement Wearing Course	2
Unsealed Pavement Subbase	NA
Drainage	2
Surface Water Channels	2
Footpath	2
Traffic Facilities	2
Minor Structures	2
Signs	2
Railings	2
Street Lights	2
Bridges and Major Culverts	5
Car Parks	2

4.2.10 Restoration/Dismantling/Removal

All replacement rates include, where appropriate, an amount for removal and disposal of the existing asset, an amount for site establishment, and an amount for the formation, supply, placement, shaping, etc. of materials.

4.2.11 Activity Management Plan Review

The assumptions used in this valuation have been reviewed to ensure they are in line with current best practice and with the Council's 2018/28 Long Term Plan (LTP). Areas where the valuation differs from the 2015/25 LTP are listed below.

4.2.11.1 Activity Management Plan

A comparison between the Activity Management Plan (AMP) and this valuation has been conducted. It is believed any differences in useful life information is more a result of the AMP being at a summarised level than the detailed valuation information.

4.2.11.2 2015/25 Long Term Plan

A comparison of the useful lives between the LTP and this valuation is listed below. We are unaware of the specific reasons why some useful lives reported in the LTP differ from those assumed in this valuation.

Table 4-7: Comparison of useful lives; 2018 Valuation to 2018-28 LTP

	Valuation	2015 – 2025 LTP	AMP
Pavement Surface (seal)	5 – 20 years	1 – 20 years	1-20 years

	Valuation	2015 – 2025 LTP	AMP
Pavement Surface (unsealed)	5 years	5 years	5 years
Pavement Layers (basecourse)	40 – 100 years	75 – 100 years	75-100 years
Formation	Not Depreciated	Not Depreciated	Not Depreciated
Culverts	70 years	25 – 50 years	25 – 50 years
Footpaths	20 – 75 years	20 – 75 years	20 – 75 years
Surface Water Channels	75 years	50 years	50 years
Signs	12 years	12 years	12 years
Streetlights	15 – 25 years	15 – 25 years	15 – 25 years
Bridges	25 – 80 years	25 – 80 years	25 – 80 years
Retaining Structures	80 years	80 years	80 years
Traffic Signals	15 years	15 years	15 years
Parking Meters	15 years	25 years	25 years
Railings	10 – 15 years	10 – 15 years	10 – 15 years
Safety Projects		10 – 13 years	10 – 13 years

4.2.12 Quality Assurance Process

Quality checks, based on NZ Infrastructure Asset Valuation and Depreciation Guidelines – Version 2.0, Section 6.2.2, have been undertaken on this document by both the valuer and the reviewer.

4.2.13 Borrowing Costs during Construction Period

No borrowing costs have been included in this valuation. The Financial Reporting Standard PBE IPSAS 5 gives Public Benefit Entities the option to exclude or include borrowing costs on assets during the construction period. GDC has opted to exclude borrowing costs.

4.2.14 Asset Inspections

No asset inspections were required as part of this valuation.

5. Breakdown by Differential Rating Area

The tables below show the results for each Differential Rating Area (DRA) broken down by asset type. These tables do not include Carparks or accessways, as they are not assigned a DRA.

5.1 DRA 1

Table 5-1: Summarised valuation results for DRA 1

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciated Replacement Cost
Bridge Culvert	$126,120	$58,063	$1,837
Bridges	$11,141,368	$2,583,522	$153,314
Drainage	$167,983	$109,820	$2,399
First Coat Seals	$8,352,541	$4,441,339	$208,814
Footpath	$40,497,557	$23,609,982	$558,000
Formation	$21,781,806	$21,781,806	$0
Land	$587,646,654	$587,646,654	$0
Railings	$468,648	$110,250	$22,009
Retaining Walls	$292,733	$200,590	$3,659
Sealed Pavement Basecourse	$16,972,250	$9,078,294	$424,306
Sealed Pavement Subbase	$22,642,508	$17,661,484	$123,517
Signs	$812,820	$176,621	$62,096
Streetlights – brackets	$1,077,745	$514,096	$71,849
Streetlights – lights	$1,522,305	$829,006	$88,832
Streetlights – poles	$2,416,760	$1,231,295	$97,399
Surface Water Channels	$34,613,372	$17,774,020	$461,512
Surfacing	$21,606,023	$11,124,750	$1,289,594
Traffic Facilities	$203,390	$17,616	$17,429
Grand Total	**$772,342,583**	**$698,949,207**	**$3,586,567**

5.2 DRA 1A

Table 5-2: Summarised valuation results for DRA 1A

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciated Replacement Cost
Bridge Culvert	$117,983	$21,977	$2,173
Bridges	$446,105	$198,587	$7,938
Drainage	$923,123	$453,751	$13,184
First Coat Seals	$1,146,857	$617,001	$28,671
Footpath	$1,466,062	$1,072,359	$19,575
Formation	$6,489,624	$6,489,624	$0
Land	$148,375,268	$148,375,268	$0
Railings	$39,992	$10,280	$2,390
Retaining Walls	$137,090	$66,310	$1,714
Sealed Pavement Basecourse	$2,370,029	$1,272,641	$59,251
Sealed Pavement Subbase	$3,387,842	$2,741,819	$17,983
Signs	$51,044	$12,758	$3,900
Streetlights – brackets	$70,563	$33,970	$4,704
Streetlights – lights	$152,787	$97,607	$8,917
Streetlights – poles	$156,305	$79,147	$6,290
Surface Water Channels	$1,997,874	$1,290,147	$26,638
Surfacing	$1,614,086	$664,911	$108,958
Unsealed Pavement Subbase	$109,463	$81,654	$547
Unsealed Pavement Wearing Course	$10,176	$4,288	$2,056
Grand Total	**$169,062,273**	**$163,584,098**	**$314,889**

5.3 DRA 2

Table 5-3: Summarised valuation results for DRA 2

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciated Replacement Cost
Bridge Culvert	$491,459	$203,850	$9,212
Bridges	$6,459,565	$2,631,520	$83,638
Drainage	$5,532,227	$2,698,838	$79,013
First Coat Seals	$5,139,504	$2,847,657	$128,488
Footpath	$758,126	$420,233	$10,147
Formation	$36,550,301	$36,550,301	$0
Land	$109,714,767	$109,714,767	$0
Railings	$396,117	$80,426	$18,398
Retaining Walls	$127,813	$85,085	$1,598
Sealed Pavement Basecourse	$10,831,770	$6,017,663	$270,794
Sealed Pavement Subbase	$15,497,627	$12,478,128	$83,228
Signs	$191,855	$68,768	$14,523
Streetlights – brackets	$13,314	$6,499	$863
Streetlights – lights	$59,518	$48,310	$3,466
Streetlights – poles	$29,114	$15,216	$1,200
Surface Water Channels	$3,818,513	$2,896,145	$50,914
Surfacing	$5,239,028	$2,031,626	$415,174
Traffic Facilities	$284,370	$128,139	$11,757
Unsealed Pavement Subbase	$785,009	$627,944	$3,925
Unsealed Pavement Wearing Course	$72,974	$21,259	$10,611
Grand Total	**$201,992,970**	**$179,572,374**	**$1,196,947**

5.4 DRA 3

Table 5-4: Summarised valuation results for DRA 3

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciated Replacement Cost
Bridge Culvert	$472,338	$185,316	$7,014
Bridges	$27,000,948	$9,931,401	$346,022
Drainage	$9,341,897	$4,641,911	$133,629
First Coat Seals	$5,327,151	$2,936,451	$133,179
Footpath	$703,236	$416,804	$12,625
Formation	$69,205,524	$69,205,524	$0
Land	$20,181,584	$20,181,584	$0
Railings	$1,511,590	$385,418	$59,947
Retaining Walls	$918,399	$475,218	$11,480
Sealed Pavement Basecourse	$11,633,608	$6,429,342	$290,840
Sealed Pavement Subbase	$15,988,374	$13,042,523	$89,372
Signs	$165,101	$89,218	$12,476
Streetlights – brackets	$7,988	$3,644	$533
Streetlights – lights	$43,314	$34,907	$2,528
Streetlights – poles	$17,442	$8,584	$725
Surface Water Channels	$998,853	$549,004	$13,318
Surfacing	$4,678,843	$1,630,959	$350,227
Traffic Facilities	$75,098	$33,840	$5,272
Unsealed Pavement Subbase	$5,162,375	$4,027,110	$25,812
Unsealed Pavement Wearing Course	$479,895	$170,352	$83,688
Grand Total	**$173,913,558**	**$134,379,107**	**$1,578,685**

5.5 DRA 4

Table 5-5: Summarised valuation results for DRA 4

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciated Replacement Cost
Bridge Culvert	$1,550,050	$727,922	$33,186
Bridges	$47,880,204	$19,123,432	$625,717
Drainage	$25,854,700	$13,092,617	$370,799
First Coat Seals	$7,301,836	$3,808,126	$182,546
Footpath	$162,865	$73,306	$2,424
Formation	$174,560,869	$174,560,869	$0
Land	$19,858,247	$19,858,247	$0
Minor Structures	$131,407	$65,704	$1,643
Railings	$2,695,144	$664,404	$110,982
Retaining Walls	$1,647,141	$897,920	$20,589
Sealed Pavement Basecourse	$16,165,831	$8,434,545	$404,146
Sealed Pavement Subbase	$21,977,756	$17,667,690	$124,528
Signs	$258,019	$140,512	$19,296
Streetlights – brackets	$5,991	$2,860	$399
Streetlights – lights	$47,386	$41,682	$2,765
Streetlights – poles	$14,490	$8,118	$634
Surface Water Channels	$360,766	$203,406	$4,810
Surfacing	$6,892,678	$2,188,152	$498,609
Traffic Facilities	$588,228	$265,060	$22,549
Unsealed Pavement Subbase	$18,334,441	$14,898,808	$91,672
Unsealed Pavement Wearing Course	$1,704,370	$466,836	$236,797
Grand Total	**$347,992,420**	**$277,190,217**	**$2,754,091**

5.6 DRA 5

Table 5-6: Summarised valuation results for DRA 5

Asset Type	Replacement Cost	Depreciated Replacement Cost	Annual Depreciated Replacement Cost
Bridge Culvert	$492,273	$230,529	$10,252
Bridges	$36,886,942	$10,903,819	$497,686
Drainage	$14,033,137	$7,092,364	$201,292
First Coat Seals	$3,652,549	$1,984,905	$91,314
Footpath	$2,148,707	$1,312,571	$30,660
Formation	$104,253,922	$104,253,922	$0
Land	$5,152,740	$5,152,740	$0
Minor Structures	$47,784	$23,892	$597
Railings	$1,790,976	$263,529	$63,805
Retaining Walls	$1,310,085	$446,256	$16,373
Sealed Pavement Basecourse	$7,223,724	$3,926,565	$180,593
Sealed Pavement Subbase	$11,107,823	$9,346,695	$55,542
Signs	$113,369	$65,736	$8,684
Streetlights – brackets	$30,622	$15,947	$2,041
Streetlights – lights	$108,087	$90,309	$6,308
Streetlights – poles	$67,218	$39,681	$2,976
Surface Water Channels	$891,249	$463,843	$11,883
Surfacing	$3,848,049	$998,708	$259,738
Traffic Facilities	$2,105,542	$948,775	$47,873
Unsealed Pavement Subbase	$11,087,776	$8,749,446	$55,439
Unsealed Pavement Wearing Course	$1,030,720	$335,292	$165,862
Grand Total	**$207,383,294**	**$156,645,523**	**$1,708,919**

6. Land

This component covers all land that is identified as local authority in the RAMM treatment length table and comprises the land required to form the road corridor from boundary to boundary.

Where reserve widths were missing a standard width of 20.1 metres has been applied.

Land has been separated into groups based on geographic area.

Table 6-1 shows the total valuation results for Land.

Table 6-1: Valuation Parameters and Results for Land

Standard Replacement Cost Description	Unit	Length (m)	Quantity	Unit Cost	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
City Residential	ha	169506	331.4	$1,644,064.30	N/A	N/A	$544,878,438	$544,878,438	$0
Gisborne City CBD	ha	14839	33.6	$3,437,681.47	N/A	N/A	$115,347,579	$115,347,579	$0
Industrial Subdivision	ha	4621	11.0	$1,943,024.71	N/A	N/A	$21,466,128	$21,466,128	$0
Northern Hill Country	ha	505274	783.0	$6,309.66	N/A	N/A	$5,010,922	$5,010,922	$0
Poverty Bay Flats	ha	198585	381.3	$112,128.32	N/A	N/A	$42,741,142	$42,741,142	$0
Prime Beachfront	ha	11339	21.9	$6,725,954.13	N/A	N/A	$147,371,435	$147,371,435	$0
Southern Hill Country	ha	937692	1569.3	$7,026.18	N/A	N/A	$11,142,298	$11,142,298	$0
Tolaga Bay Flats	ha	38799	68.6	$43,303.28	N/A	N/A	$2,971,317	$2,971,317	$0
TOTAL		**1880655**	**3200**				**$890,929,260**	**$890,929,260**	**$0**

The unit cost for land has been rounded in the valuation process as land is valued in m2 in RAVM.

7. Formation

This item comprises bulk earthworks (excluding retaining structures) required to form the road corridor. It is not possible to accurately determinate the quantities involved, as much of the construction was completed on a progressive basis over the earlier part of last century when detailed records were not kept.

Formation includes all earthworks necessary to prepare the cut and fill batters and bring the road foundation up to the underside of the subbase. It also includes formation of swale drain, side drains and shoulders.

The formation is assumed not to depreciate as regular maintenance (slip clearing, etc.) will allow it to provide adequate service indefinitely.

Each rate included an allowance for:

i) Engineering fees (10%).

ii) Clearing vegetation and stripping topsoil.

iii) Bulk earthwork costs (cut-to-fill, borrow-to-fill, etc.).

iv) Preparation of subgrade (over excavation in "soft" areas).

The replacement cost for formation is calculated as the length x (width + extra) of the treatment length multiplied by the square metre rate. The extra width allows for additional shoulder, feather edge and surface water channel (SWC).

Table 7-1: Formation Extra Widths for Each Formation Type

	Rural Sealed Extra	Urban Sealed Extra	Unsealed Extra
Formation Extra Width	4 metres	4 metres	4 metres

Table 7-2 shows the total valuation results for Formation.

Table 7-2: Valuation Parameters and Results for Formation

Standard Replacement Cost Description	Unit	Length (m)	Quantity (m2)	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Urban Sealed	m²	231798	2873307	$10.23	N/A	N/A	$29,393,930	$29,393,930	$0
Rural Sealed	m²	613520	6079616	$20.29	N/A	N/A	$123,355,410	$123,355,410	$0
Unsealed	m²	1035337	8524835	$30.51	N/A	N/A	$260,092,705	$260,092,705	$0
TOTAL		**1880655**	**17477758**				**$412,842,046**	**$412,842,046**	**$0**

8. Pavement Surfacing

Pavement surfaces have been placed into groups based on surface material and pavement use for valuation purposes.

Each rate includes an allowance for:

i) Engineering fees (5%).

ii) Surfacing supply and placement based on recent contract rates.

Table 8-1 shows the key parameters used in the valuation of pavement surfaces.

Note that the capital cost of installing first coat seals have been allowed for as part of the sealed basecourse.

Table 8-1: Valuation Parameters and Results Summary for Pavement Surfacing

Standard Replacement Cost Description	Unit	Length (m)	Quantity (m2)	Unit Cost (Including Fees)	Total Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Asphaltic Concrete	m²	30430	352692	$44.35	20	$15,641,896	$8,060,441	$778,179
Single Coat (reseal)	m²	223670	1332379	$5.59	12	$7,447,999	$2,796,346	$563,868
Single Coat (second coat)	m²	42053	238246	$5.55	12	$1,322,263	$403,115	$99,263
Two Coat (reseal)	m²	351063	2342838	$5.54	12	$12,979,321	$4,903,340	$969,624
Two Coat (second coat)	m²	55820	374424	$7.39	12	$2,766,990	$1,032,077	$212,737
Slurry Seal	m²	768	12036	$5.06	5	$60,904	$23,310	$11,830
Void Fill Seal	m²	47348	294147	$4.65	12	$1,367,783	$549,759	$106,961
Rack in Seal	m²	57172	415292	$4.65	12	$1,931,107	$781,587	$149,982
Texturising Seal	m²	13292	77515	$4.65	12	$360,445	$89,131	$29,857
Single Coat (first coat)	m²	596	4527	$0.00	N/A	$0	$0	$0
Two Coat (first coat)	m²	23106	127556	$0.00	N/A	$0	$0	$0
Totals		**845318**	**5571651**			**$43,878,707**	**$18,639,106**	**$2,922,300**

The pavement surface results show that some roads surfacing are exceeding their assigned Total Useful lives (TUL). It is recommended that Council review these lives for the next valuation.

9. Sealed Pavement Layer Structure

Pavement structure includes that of the subbase and basecourse layers.

The rates allow for:

i) Engineering fees (10%)

ii) Supply, placement, shaping and compaction of layers.

Note that the capital cost of installing first coat seals has been allowed for as part of the sealed basecourse.

50% of pavement subbase has been assumed to depreciate to allow for the reconstruction work undertaken at the time of pavement reconstruction.

This layer depth information is stored in previously empty fields in the Treatment Length table that the valuation module then uses to calculate the pavement volume. Basecourse depths are stored in 'dtims_p020 (percent passing through a 2.0mm sieve)' and subbase depths are stored in 'dtims_p425 (percent passing through a 0.425mm sieve)'.

Table 9-1 contains the matrix used to estimate the structure of existing pavements.

Table 9-1: Matrix for Estimating Sealed Pavement Structure

Hierarchy	Depth Estimates (mm)	
	Basecourse Depth	Subbase Depth
Arterial	150	200
All Others	100	150

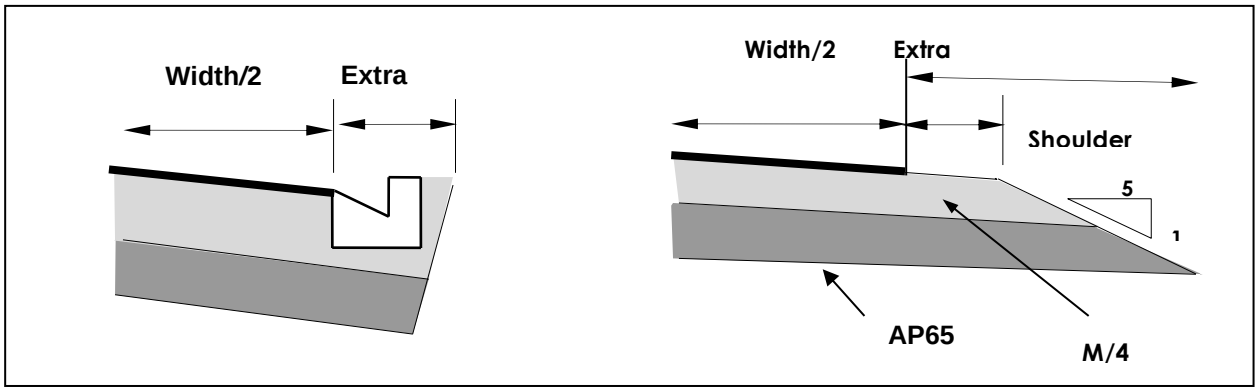
The replacement cost for pavement layers are calculated as the length x depth x (width + extra) of the treatment length multiplied by the cubic metre rate. The extra width allows for additional pavement under the shoulder and batter slopes (see Figure 9 1 and Table 9 2). Extra widths are calculated through analysis of the shoulder widths plus an allowance for the batter slopes. Basecourse extra widths are stored in the 'dtims_growth_light' field of the treatment length table and the subbase extra widths are stored in the 'dtims_growth_heavy' field. Treatment lengths are considered to have surfaced SWC if more than 40% of the total possible SWC length (twice the length of the treatment length) consists of surfaced SWC.

Table 9-2 below shows the extra allowances.

Table 9-2: Sealed Roads Extra Width Allowances

Component	Rural Sealed without KCC	Urban Sealed without KCC	Sealed with KCC
Arterial Basecourse	0.45m each side	0.45m each side	0m each side
Arterial Subbase	1.05m each side	1.05m each side	0.3m each side
Other Basecourse	0.3m each side	0.3m each side	0m each side
Other Subbase	0.75m each side	0.75m each side	0.3m each side

Figure 9-1: Effective Width for Sealed Pavement Structure Volumes



Effective Width (with KCC) Effective Width (without KCC)

Table 9-3 shows the total valuation results for sealed pavement layers.

Table 9-3: Valuation Parameters and Results Summary for Sealed Pavement Layers

Standard Replacement Cost Description	Unit	Length (m)	Quantity (m3)	Unit Cost (Including Fees)	Residual Value (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
First Coat Arterial	m^2	142,846	1,170,766	$7.39		40	2	$8,651,960	$4,808,046	$216,299
First Coat Other	m^2	702,472	4,400,885	$5.06		40	2	$22,268,479	$11,827,432	$556,712
Basecourse Arterial	m^3	142,846	194,339	$111.91		40	2	$21,748,521	$12,076,181	$543,713
Basecourse Other	m^3	702,472	480,733	$90.38		40	2	$43,448,692	$23,082,869	$1,086,217
Subbase Arterial	m^3	142,846	292,905	$84.19	$42.09	75	2	$24,659,647	$19,822,605	$164,417
Subbase Other	m^3	702,472	814,806	$80.93	$40.46	100	2	$65,942,283	$53,115,733	$329,752
TOTAL		**845,318**	**7354435**					**$186,719,581**	**$124,732,866**	**$2,897,111**

10. Unsealed Pavements Layers

Unsealed pavements are separated into wearing course and basecourse (valued as subbase) components. The estimates of basecourse depth are based on local knowledge and were provided by the GDC. Regular maintenance of the wearing course, through replacement of lost metal, ensures the basecourse layer will be unaffected by surface wear and tear and will provide a service indefinitely.

The rates allow for:
i) Engineering fees for unsealed basecourse (6%).
ii) Engineering fees for unsealed wearing course (6%).
iii) Supply, placement, shaping and compaction of layers.

GDC replenishes the required pavement structure on a cyclic programme. Table 10-1 shows the matrix developed for this calculation. This layer depth information is stored in previously empty fields in the Treatment Length table that the valuation module then uses to calculate the pavement volume. Wearing course depths are stored in 'dtims_p020 (percent passing through a 2.0mm sieve)' and basecourse depths are stored in 'dtims_p425 (percent passing through a 0.425mm sieve)'.

Table 10-1: Matrix for Estimating Unsealed Pavement Depth

	Wearing Course Depth (mm)	Subbase Depth (mm)
Unsealed Pavement Depth	50	100

Table 10-2 shows the total valuation result for unsealed pavements.

Table 10-2: Valuation Parameters and Results Summary for Unsealed Pavements

Standard Replacement Cost Description	Unit	Length (m)	Quantity (m3)	Unit Cost (Including Fees)	Residual Value (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Unsealed Wearing Course	m³	1,035,337	219,174	$15.05		5	2	$3,298,135	$998,027	$499,014
Unsealed Subbase	m³	1,035,337	438,349	$80.94	$40.47	100	2	$35,479,064	$28,384,961	$177,395
TOTAL		**1035337**	**657523**					**$38,777,200**	**$29,382,988**	**$676,409**

50% of pavement subbase has been assumed to depreciate to allow for the reconstruction work undertaken at the time of pavement reconstruction.

As unsealed wearing course is exceeding its assigned TUL, council will need to review this for the next valuation.

11. Drainage

This component covers the following drainage assets only:

- Culverts (with end areas less than 3.4m^2).
- Canvas socks.
- Sumps.
- Subsoil drains.
- Flume down batters.
- Headwalls.

NZTA classifies any culvert with an end area greater than or equal to 3.4m^2 as a bridge and as such, they are valued together with the bridge valuation.

The rates allow for:

i) Engineering fees (12%).

ii) Supply, placement and compaction of backfill.

The RAMM database has many different culvert material types that when replaced would be replaced with concrete pipe.

The replacement value for earthenware, steel, wood, aluminium, PVC, etc. have had the concrete value assigned to give a more accurate modern equivalent replacement cost.

Where culverts diameters are missing, we have assumed that they are the most common size of 300mm.

Table 11-1 shows the total valuation results for all assets.

Table 11-1: Valuation Parameters and Results Summary for Drainage Assets

Standard Replacement Cost Description	Unit	Length (m)	Quantity	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Culvert dia <600mm	m	76,799	8,151	$307.18	70	2	$23,590,963	$12,508,753	$337,014
Culvert dia 601 – 675mm	m	57	6	$401.13	70	2	$22,864	$11,432	$327
Culvert dia 676 – 750mm	m	1,929	165	$1,424.55	70	2	$2,748,242	$1,409,765	$39,261
Culvert dia 751 – 825mm	m	124	9	$1,498.75	70	2	$185,845	$92,923	$2,655
Culvert dia 826 – 900mm	m	3,284	270	$1,669.41	70	2	$5,482,509	$2,779,711	$78,322
Culvert dia 901 – 975mm	m	117	9	$1,780.69	70	2	$208,341	$113,099	$2,976
Culvert dia 976 – 1050mm	m	213	14	$2,114.57	70	2	$450,403	$225,202	$6,434
Culvert dia 1051 – 1200mm	m	2,817	223	$2,448.44	70	2	$6,897,745	$3,471,835	$98,539
Culvert dia 1201 – 1350mm	m	307	23	$2,412.67	70	2	$740,690	$383,787	$10,581
Culvert dia 1351 – 1650mm	m	1,458	117	$4,483.46	70	2	$6,538,678	$3,318,529	$93,410
Culvert dia 1651 – 1800mm	m	555	45	$5,457.57	70	2	$3,028,951	$1,514,476	$43,271
Culvert dia 1801 – 2080mm	m	269	18	$6,498.84	70	2	$1,748,188	$874,094	$24,974
Canvas Sock	Ea	92	11	$1,397.65	20	2	$15,374	$4,962	$769
Sump	Ea		3,161	$1,294.00	70	2	$4,090,334	$1,320,656	$58,433
Subsoil Drain	m	161	6	$28.92	20	2	$4,656	$1,982	$233
Manhole	Ea		97	$334.18	70	2	$32,415	$25,808	$463
Flume down batter	Ea	397	82	$815.45	25	2	$66,867	$32,286	$2,655
TOTAL		**88579.3**	**12407**				**$55,853,067**	**$28,089,300**	**$800,316**

12. Surface Water Channels

This component covers all surfaced surface water channels, such as kerb and channel, dish channel, and mountable kerb. Earth surface water channels have not been valued under this component as they are considered to be part of the road formation.

The rates allow for:

i) Engineering fees (6.5%).

ii) Supply, placement and compaction of backfill.

Table 12-1 shows the total valuation results for all assets.

Table 12-1: Valuation Parameters and Results Summary for Surface Water Channels

Standard Replacement Cost Description	Unit	Length (m)	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Dish Channel (Concrete) (DC)	m	1,731	$150.40	75	2	$260,342	$159,205	$3,471
Kerb Only (Concrete)	m	26,878	$131.02	75	2	$3,521,556	$1,984,516	$46,954
Kerb and Channel (Concrete) (KCC)	m	245,826	$154.43	75	2	$37,962,909	$20,524,781	$506,172
Mountable Kerb Only (Concrete)	m	1,360	$131.02	75	2	$178,187	$87,906	$2,376
Mountable Kerb and Channel (Concrete)	m	4,672	$154.43	75	2	$721,497	$402,329	$9,620
Other Type	m	234	$154.43	75	2	$36,137	$17,827	$482
TOTAL		**280701**				**$42,680,628**	**$23,176,565**	**$569,075**

13. Footpaths

This component includes all footpaths in the road network. Footpaths in this valuation use the residual value fields in RAMM. This is because RAVM does not currently have the ability to deal with footpaths in components. The RAVM software does not allow for footpaths to be broken down into its basecourse and surface components. To deal with this we have used the residual value field, where necessary, as the cost of the basecourse. The replacement rates for footpaths include the cost of the footpath basecourse and surface. The basecourse layers are assumed to depreciate or not depreciate as per Table 13-1 and the residual values (the cost of the basecourse) have been included to allow for this.

Table 13-1: Footpath Depreciation

Footpath Type	Depreciation
Concrete	No depreciation of basecourse
Asphalt	25% depreciation of basecourse
Sealed	25% depreciation of basecourse
Slurry Seal	50% depreciation of basecourse
Pavers	100% depreciation of basecourse

The rates allow for:

i) Engineering fees (6.5%).
ii) Formation, supply, placement, shaping and compaction of layers.

Table 13-2 shows the total valuation results for all assets.

Table 13-2: Valuation Parameters and Results Summary for Footpath Assets

Standard Replacement Cost Description	Unit	Length (km)	Quantity (m2)	Unit Cost (Including Fees)	Residual Value (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Asphaltic Concrete (Black)	m²	19.98	60417.4	$35.53	$8.59	20	2	$2,146,630	$733,874	$51,708
Concrete	m²	198.49	249711.6	$154.18		75	2	$38,500,534	$22,459,282	$513,340
Pavers	m²	9.05	34086	$142.93		75	2	$4,871,912	$3,529,951	$64,959
Seal	m²	0.13	759.8	$24.80	$5.99	20	2	$18,843	$6,006	$640
Slurry Seal	m²	0.10	300.3	$52.80	$25.52	20	2	$15,856	$8,647	$347
All Other Types	m²	0.82	2137.5	$85.51		75	2	$182,778	$167,495	$2,437
TOTAL		**228.57**	**347412.6**					**$45,736,553**	**$26,905,255**	**$633,432**

14. Traffic Facilities

This component includes retaining walls, other structures (counterfort drains, flumes, and other structures), parking meters, traffic signals, raised reflective pavement markers (RRPMs) and pavement markings.

The rates allowed for:

i) Engineering fees for edge marker posts and raised pavement markers (5%).

ii) Engineering fees for markings (5%).

iii) Supply and placement.

Table 14-1 shows the total valuation results for all assets.

Table 14-1: Valuation Parameters and Results Summary for Traffic Facility Assets

Standard Replacement Cost Description	Unit	Quantity	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Parking Meters								
PM – Electronics	ea	172	$747.08	15	2	$128,498	$11,825	$7,382
PM – M70 Body / Pole	ea	266	$579.63	15	2	$154,182	$8,025	$5,771
PM – Mechanism	ea	94	$676.20	15	2	$63,563	$3,178	$1,589
PM – Pay and Display	ea	41	$8,694.69	15	2	$356,482	$33,499	$16,750
Traffic Signals								
TS – Aspects	ea	2	$109,267.43	15	2	$218,535	$16,786	$8,393
TS – Controller	ea	2	$22,878.93	15	2	$45,758	$3,515	$1,757
Retaining Walls								
RW – Retaining Walls	m	5,317	$833.79	80	2	$4,433,261	$2,171,380	$55,412
Other Structures								
OS – Counterfort Drains	m	912	$1,288.05	70	2	$1,174,702	$587,351	$16,781
OS – Flumes	m	2,273	$321.98	20	2	$731,861	$365,930	$36,593
Other Traffic Facilities								
OTF – RRPMs	ea	3,258	$12.11	4	2	$39,454	$19,727	$9,864
OTF – Markings	LS	1	$343,594.32	N/A	N/A	$343,594	$343,594	$0
TOTAL		**12,338**				**$7,689,889**	**$3,564,810**	**$160,291**

Council have undertaken a data collection and validation exercise on the Retaining Walls assets, which are now stored and valued in the Retaining Walls table. Previously these assets were stored in the Traffic Facilities table, with limited information attached. Now that there is more complete construction, dimension and material type data attached to these assets, it is recommended that the way these assets are valued should be reviewed and that the new dataset is cross compared with the old dataset in order to ensure that all retaining walls data is complete and accurate.

Additionally, Traffic Signal assets have been moved from the Traffic Facilities table into the Traffic Signal table prior to this valuation, and are now valued in the correct table.

15. Minor Structures

This component currently only includes Concrete Fords.

The rates allow for:

i) Engineering fees for Concrete Fords (12%).

ii) Substructure formation and construction

iii) Superstructure construction.

Table 15-1: Ford Structures

Standard Replacement Cost Description	Unit	Length (m)	Quantity	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Ford – Concrete	ea	169	15	$11,946.11	80	5	$179,192	$89,596	$2,240
TOTAL		**169**	**15**				**$179,192**	**$89,596**	**$2,240**

The concrete fords are assumed to have twin culverts set under a concrete pad as a standard. However there are fords that could be of a different configuration. Future data collection could focus on the arrangement of each ford for a more accurate valuation.

Metal fords have not been valued as more needs to be known of the asset and costs in terms of maintenance as these are usually natural causeways through waterways that council have maintained for economic benefit to the region.

16. Signs

The replacement rates for posts are included in the signs rate.

The rates allow for:

i) Engineering fees (5%).

ii) Supply and placement.

Table 16-1 shows the total valuation results for all assets.

Table 16-1: Valuation Parameters and Results Summary for Sign Assets

Standard Replacement Cost Description	Unit	Quantity	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Guide	Ea	11	$247.74	12	2	$2,725	$1,569	$227
Hazard markers	Ea	806	$55.18	12	2	$44,475	$16,144	$2,989
Information General	Ea	42	$233.40	12	2	$9,803	$2,556	$617
Information Signs	Ea	141	$233.40	12	2	$32,909	$15,785	$2,670
Information Miscellaneous	Ea	11	$233.40	12	2	$2,567	$433	$139
Miscellaneous	Ea	1,868	$305.45	12	2	$570,581	$161,779	$42,721
Motorist Services	Ea	42	$233.40	12	2	$9,803	$2,295	$739
Permanent Warning	Ea	1,416	$232.56	12	2	$329,305	$139,203	$25,512
Regulatory General	Ea	1,819	$233.45	12	2	$424,646	$148,569	$32,341
Regulatory Heavy Vehicles	Ea	133	$233.32	12	2	$31,032	$19,556	$2,525
Regulatory Parking	Ea	637	$200.84	12	2	$127,935	$42,664	$10,001
Tourist	Ea	16	$247.63	12	2	$3,962	$2,112	$313
Warning Miscellaneous	Ea	15	$164.26	12	2	$2,464	$947	$179
TOTAL		**6957**				**$1,592,206**	**$553,612**	**$120,974**

17. Railings

This component covers all guard-rails and sight rails stored in the RAMM railings table.

The rates allow for:

i) Engineering fees (10%)

ii) Supply and construction.

Table 17-1 shows the total valuation results for all assets.

Table 17-1: Valuation Parameters and Results Summary for Railings Asset

Standard Replacement Cost Description	Unit	Length (m)	Quantity	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Bridge Rail	m	25016	1318	$219.00	15	2	$5,478,504	$851,153	$175,661
Guard Rail	m	2992	35	$200.13	15	2	$598,789	$430,617	$39,401
Sight Rail	m	10142	811	$65.86	10	2	$667,952	$180,252	$52,316
Steel or Aluminium	m	182	34	$218.99	15	2	$39,856	$16,894	$2,344
Timber	m	53	3	$65.86	10	2	$3,491	$435	$218
W Section Guard Rail	m	569	18	$200.13	15	2	$113,874	$34,956	$7,592
TOTAL		**38954**	**2219**				**$6,902,466**	**$1,514,306**	**$277,531**

45% of Bridge Railings have exceeded their Total Useful Life of 15 years. Council need to investigate the Total Useful Live assigned to these assets as in most cases they are designed to last the life time of the bridge they are attached to.

18. Street Lights

This component covers all the street lights that were identified in RAMM as owned by the GDC roading department.

Lights were valued as entire head and lamp units to account for the discrepancy in price between Kendelier and other brands.

In previous valuations, Street Light Brackets that had been physically replaced had not had their data updated to reflect this, and as such were being included in the valuation.

The rates allow for:

i) Engineering fees (10%).

ii) Supply and construction.

Table 18-1 below shows the total valuation results for the street lights.

Table 18-1: Valuation Parameters and Results Summary for Street Lights

Standard Replacement Cost Description	Unit	Quantity	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
Pole								
Concrete	ea	71	$1,706.62	25	2	$121,170	$61,165	$4,847
Fibreglass	ea	20	$1,312.79	15	2	$26,256	$13,128	$1,750
Steel	ea	1,730	$1,444.07	25	2	$2,498,241	$1,277,136	$99,930
Wood	ea	38	$1,312.79	20	2	$49,886	$27,841	$2,466
Unknown	ea	4	$1,444.07	25	2	$5,776	$2,773	$231
Bracket								
Unknown	ea	1,834	$657.70	15	2	$1,206,222	$577,016	$80,390
Light								
Corysal Sodium 150W	ea	138	$513.50	15	2	$70,863	$40,750	$4,713
Corysal Sodium 70W	ea		$375.15	15	2			
Gough Metal Halide 70W	ea	1	$414.96	15	2	$415	$277	$28
Gough Sodium 100W	ea	34	$375.15	15	2	$12,755	$6,077	$850
Gough Sodium 150W	ea	650	$513.45	15	2	$333,743	$160,676	$22,250
Gough Sodium 250W	ea	46	$658.34	15	2	$30,284	$14,922	$2,019
Gough Sodium 70W	ea	1,513	$375.19	15	2	$567,662	$273,021	$37,836
Kendelier Sodium 100W	ea	4	$2,237.72	15	2	$8,951	$4,177	$597
Kendelier Sodium 70W	ea	179	$2,106.15	15	2	$377,001	$175,653	$25,133
LED	ea	855	$704.78	25	2	$602,587	$507,019	$24,103
Total		**7117**				**$5,911,811**	**$3,141,630**	**$307,143**

19. Bridges and Bridge Culverts

This component includes bridges and bridge culverts with end areas greater than 3.4m^2.

The replacement cost of a bridge is calculated as the cost of building it "today". It is assumed that modern equivalent construction techniques and materials are used but that the physical result replaces the bridge as it exists. For this valuation, we have assumed that all bridges will be replaced with a similar dimensioned concrete bridge or culvert.

This year footbridges were moved from the Minor Structures table to the Bridge table.

Bridge approaches have been valued in the formation, pavement surfacing and pavement structure sections of this report. Any railings attached onto the bridges have been valued with the bridges.

The rates allow for:

i) Engineering fees for bridges and bridge culverts (12%).

ii) Substructure formation and construction.

iii) Superstructure construction.

The remaining life of a bridge or bridge culvert is dependent on a number of factors. For the purpose of this valuation we have assumed that the most predominate factor is the superstructure construction material.

Table 19-1 shows the total valuation results for bridges and bridge culverts.

Table 19-1: Valuation Parameters and Results Summary for the Bridge and Bridge Culvert Asset

Standard Replacement Cost Description	Unit	Quantity	Length (m)	Unit Cost (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
1 Lane Reinforced Concrete	m	264	7526	$11,940.17	80	5	$89,861,719	$33,210,361	$1,115,206
1 Lane Timber	m	21	932	$11,940.17	50	5	$11,128,238	$1,855,962	$181,487
2 Lane Reinforced Concrete	m	43	1124	$21,492.05	80	5	$24,157,064	$8,410,915	$293,958
Ped – Composite	m	2	32	$7,946.41	80	5	$254,285	$204,322	$3,179
Ped – Concrete	m	1	10	$7,946.41	80	5	$79,464	$24,833	$993
Ped – Timber	m	12	373	$6,952.49	50	5	$2,593,279	$764,421	$49,848
Bridge Culvert Concrete	m	48	534	$6,087.70	50	2	$3,250,223	$1,427,656	$63,674
Bridge Culvert Steel	m	21	286	$6,087.70	25	2	$1,741,082	$901,467	$69,643
TOTAL		**412**	**10816.9**				**$133,065,355**	**$46,799,937**	**$1,777,988**

20. Car Parks

This component includes car parks owned by Council, and was valued using a spreadsheet.

The Rates allow for:

i) Engineering fees for surface water channels (6.5%).

ii) Engineering fees for all other components (5%).

Table 20-1 shows the total valuation results for car parks.

The asset information associated with car parks has yet to be collected therefore we have assumed the following. These assumptions are in line with those made for the sealed pavement structure (sealed pavement with KCC not an arterial).

- Formation extra width = 4 metres.
- Basecourse depth = 100mm.
- Subbase depth = 150mm.
- Basecourse extra width = 0 metres each side.
- Subbase extra width = 0.3 metres each side.
- Surfacing is single coat seal (reseal).

Table 20-1: Car Parks Valuation Parameters and Valuation Summary

Standard Replacement Cost Description	Unit	Quantity (m2)	Unit Cost (Including Fees)	Residual Value (Including Fees)	Total Useful Life	Minimum Remaining Useful Life	Replacement Cost	Depreciated Replacement Cost	Annual Depreciation
First Coat	m2	38231	$5.01		40	2	$191,375	$95,687	$4,784
Surface	m2	38231	$5.80		12	2	$221,702	$110,851	$18,475
Basecourse	m2	38231	$16.92		40	2	$646,839	$323,420	$16,171
Subbase	m2	38231	$11.77	$5.90	75	2	$450,047	$225,024	$6,001
Formation	m2	38231	$8.52		N/A	N/A	$325,911	$162,955	$0
TOTAL		**38231**					**$1,835,875**	**$917,938**	**$45,431**

50% of pavement subbase has been assumed to depreciate to allow for the reconstruction work undertaken at the time of pavement reconstruction.

21. Recommended Improvement Actions

The following recommendations will improve the accuracy of future valuations by reducing the number of assumptions required and by ensuring that those assumptions that are used best represent the conditions in the District.

Table 21-1: Recommended Improvement Actions

Recommended Improvement Actions		Priority	Links to OAG Assessment Criteria for Asset Management*
Bridge Culvert	There is I bridge culvert without a bridge ID. Assessment as to whether this is a bridge is needed.	1	Life cycle optimised decision making
Signs	The achieved lives are exceeding the TUL currently used in the valuation. This needs to be investigated.	1	Description of assets
Retaining Walls	Now that there is more complete construction, dimension and material type data attached to these assets, it is recommended that the way these assets are valued should be reviewed and that the new dataset is cross compared with the old dataset in order to ensure that all retaining walls data is complete and accurate.	1	Description of assets
Car park Assets	Currently only surface and pavement data exists for council car parks. Further auditing needs to be undertaken to capture such assets as, lighting, parking meters, kerb and channel, that may exist.	2	Description of assets
Fords	Gather further information to value more accurately and determine whether they require inspection with the current bridge stock.	1	Description of assets
Streetlights	Use the manufacturer's guidelines to define TUL as the current guideline has been used.	1	Description of assets
Cycleway Assets	Collection of new cycleway assets have started to appear in the database e.g. Bollards and cycle racks. For the next valuation unit rates and lives need to be determined.	1	Description of assets
Footpath	Extra funding from NZTA. Could lead to footpath renewals outside AWPTs. Investigate the need for residual for basecourse.	1	Life cycle optimised decision making
Traffic Facilities	The achieved lives are higher than the total useful lives used in the valuation. It would be prudent to investigate whether asset replacement is being captured within RAMM.	1	Description of Assets

22. Completed Improvement Actions

The following recommendations have been undertaken during the year to improve the RAMM database. They are all recommendations made in the 2017 valuation.

Table 22-1: Completed Improvement Actions

Recommended Improvement Actions		Action Taken
Construction Dates	Drainage, streetlights, and surface water channels are missing almost all of their construction dates. Bridges and signs have large percentage of assets missing construction dates. Investigate other sources of construction date data. Ensure construction date data is recorded for all assets in the future.	On-going updating is occurring through inspections as part of maintenance contracts.
Missing Data	Collect and record in RAMM all missing asset data including, but not exclusive to, railings, footbridges, ADLS (large cantilever signs), retaining walls and stock underpasses.	On-going data collection is taking place with new assets being added to RAMM when identified through field visits
Sealed Surfacing Methodology	Research is required to find the appropriate total useful life break-down for these assets to be used in the next valuation. Incorporate the results of dTIMS, TSA, condition assessments, and other decision making tools into the calculation of total useful lives.	Achieved lives in RAMM used to compare with lives used in the valuation
Unsealed Pavement Layer Methodology	Research is required to find the appropriate total useful life break down for these assets to be used in the next valuation. Incorporate the results of dTIMS, TSA, condition assessments, and other decision making tools into the calculation of total useful lives	HSD data obtained for the unsealed network. This was used to assess lives.
Railings	Investigate TUL for bridge railings, these assets are usually designed to last the life of the bridge they are attached to. Currently assigned a TUL of 15 years.	Lives are based on those of the bridge. On-going investigation to access maintenance records and determine replacement

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