**GLEN INNES SEVERN COUNCIL** 



# INFRASTRUCTURE BACKLOG MANAGEMENT PLAN



Version Draft 1.0

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## 1. EXECUTIVE SUMMARY

Council is faced with a historical backlog of infrastructure works in an environment where funding is a significant challenge. Recent improvements in funding from sources such as the special rate variation and profits returned from the Glen Innes Aggregates business unit have provided some ability to fund additional works, however careful planning is required to maximise the effectiveness of every dollar.

The previous long term financial plan is not sufficient to cover the necessary works required to maintain the network in a satisfactory condition, particularly in the short to medium term where immediate works are required to prevent further accelerated decay of the asset base.

Council has less resources at hand than are required to bring its infrastructure to a satisfactory condition in a timely manner. This plan provides for a pathway toward restoring the various networks to an acceptable standard through short, medium and long term planning.

Community consultation was conducted for the development of the Community Strategic Plan and associated suite of documents in 2016. The overwhelming message coming from the process was that the primary desire of the community at the present time is to restore the road network to a satisfactory level of service. This plan therefore prioritises addressing the backlog of road related infrastructure, but also includes detailed planning for each asset class including the category two water and wastewater business units of Council, which operate from separate funding streams.

Council implemented a special rates variation during the previous delivery plan cycle with a particular purpose of addressing the backlog of infrastructure works, primarily in the road asset class. Rehabilitation works since then have focussed on the sealed network, and the worst of the pavement problems in that area are now restored to provide safe travel on the sealed network. The unsealed network however has not received adequate attention and has largely remained in a state of poor condition due in particular to the backlog of drainage and gravel resheeting works.

#### Management Approach

When facing a very large backlog of works various approaches can be taken, considering financial tools (strategic borrowing), methodology (full or partial rehabilitation etc.) and priority of works (e.g. gravel roads versus sealed roads).

With many variables at play, it is considered wise to adopt an approach whereby planning is undertaken in the short, medium and longer term, in line with Council's Strategic Planning requirements. To that end, the forward works program should be seen as fixed only within the context of the timeframes of those planning documents, and should be carefully reviewed annually as part of the development of the annual operational plan. This approach allows flexibility for continuous improvement in each of the areas of consideration (financial options including grant opportunities, physical methods, emergence of latent issues/constraints and changing community priorities). A medium term plan for the next four years has been developed that includes both works that can be planned with a high level of confidence, and a budget allocation for emerging projects.

This approach provides for a balance between good planning, and flexibility to allow continuous improvement year on year.

### **Financial Implications**

The implementation of this draft plan will require the redevelopment of Council's Long Term Financial Plan to accommodate increased roads capital expenditure. The total impact of that change is an increase in capital renewal spending of \$3.9M to 2027/2028, by which time the current backlog will be eliminated through the additional allocation of funds.

It should be noted that this report addresses only the expenditure side of the equation, and that further work will need to be undertaken to ensure that funding is available in the longer term.

It is recommended that capital expenditure with regard to drainage assets remain at 100% of depreciation, while water and wastewater should continue to be funded at a rate greater than depreciation, nominally 1.5 times that amount subject to further analysis by CCTV inspection.

### Roads Infrastructure Backlog

The road infrastructure backlog has been recalculated using the ARRB condition data and updated renewal costs. The total backlog is now \$16.25M, comprising the following:

Rehabilitation Method	Value
Pavement rehab	\$ 4,621,188
Subbase Rehab	\$ 3,315,330
Reseal	\$ 979,025
Gravel Re-sheet	\$ 7,067,086
Convert to gravel	\$ 266,308
Total	\$ 16,248,393

When facing a very large backlog of works various approaches can be taken, considering financial tools (strategic borrowing), methodology (full or partial rehabilitation etc.) and priority of works (e.g. gravel roads versus sealed roads).

With many variables at play, it is considered wise to adopt an approach whereby planning is undertaken in the short, medium and longer term, in line with Council's Strategic Planning requirements. To that end, this forward works program should be seen as fixed only within the context of the timeframes of those planning documents, and should be carefully reviewed annually as part of the development of the annual operational plan. This approach allows flexibility for continuous improvement in each of the areas of consideration (financial options including grant opportunities, physical methods, emergence of latent issues/constraints and changing community priorities).

A medium term plan for the next four years has been developed that includes both works that can be planned with a high level of confidence, and a budget allocation for emerging projects. This approach provides for a balance between good planning, and flexibility to allow continuous improvement year on year.

### Other Infrastructure Backlog

At this point in time it is not apparent that significant change to the management approach is needed for other asset classes. Renewal activities have been underway in water, wastewater, storm water drainage and bridge assets that is already impacting on renewal ratios in a satisfactory manner. The focus on these asset classes, particularly the underground assets, will be to gather data on the next cohort of assets to be renewed, revisiting the approach that has been successfully implemented in 2010 whereby a large number of assets were inspected by CCTV, prioritised according to condition and rehabilitated over a period of time as annual budgets permitted.

Storm water Drainage - Council has adopted a drainage charge that is utilised for these works, and based on the available data the ongoing expenditure of this funding source is sufficient to maintain the drainage network in a satisfactory overall state into the future.

The emphasis on spending in the short term will be to capture condition data of underground assets through CCTV inspection to better inform renewal activities before issues with drainage assets become problematic.

The forward plan for storm water drainage is to continue to expend the calculated depreciation charge fully each year on capital renewal activities, with the balance of the funds raised by the drainage charge to be applied to maintenance activities.

**Sewer** - The first round of CCTV completed in 2010 explored the 1930 built mains, and the urgent and major works that were identified have now been completed on those mains. Further CCTV should now be undertaken across the whole network to continue to plan the next phase of rehabilitation. It is considered at this stage that the depreciation plus a factor of 50% should continue to be expended on mains renewal each year until the network is brought to a satisfactory condition. Sewer charges should be set at a level that accommodates this expenditure in addition to any dividend that is returned to the general fund to maintain a sustainable funding regime.

*Water* - Unlike sewer and storm water drainage, CCTV cannot be used efficiently to investigate water mains due to their pressurised nature and the associated difficulty in obtaining access. It is considered at this stage that the depreciation plus a factor of 50% should be expended on mains and treatment plant renewal each year to maintain the network in a satisfactory condition. Water charges should be set at a level that accommodates this expenditure in addition to any dividend that is returned to the general fund to maintain a sustainable funding regime.

**Bridges** - Council has taken out a \$4M loan under the Local Infrastructure Renewals Scheme. This provides a subsidy on the interest charged over the life of the loan whereby Council receives regular reimbursements. Under this program 24 bridges have already been rehabilitated to an acceptable standard at a cost of just \$1,611,663 to May 2018. These works have been supplemented by external funding for major works on the Nine Mile Bridge over the Severn River, and Cam Creek bridge on Ranger's Valley Road.

Most bridges are able to be rehabilitated using in house resources, at minimal cost, however a small number of bridges will require full replacement with a new concrete structure at considerable expense. These more major works may consume the remainder of the LIRS allocation, however if further external funding is received the LIRS bridges funding may be able to be reallocated toward other backlog works within this plan.

It is proposed that bridge renewals continue to be implemented according to the current LIRS program, and that external funding be pursued as a priority for the major replacements.

## 2. INTRODUCTION

## 2.1 BACKGROUND

Community consultation was conducted for the development of the Community Strategic Plan and associated suite of documents in 2016. The overwhelming message coming from the process was that the primary desire of the community at the present time is to restore the road network to a satisfactory level of service. This plan therefore prioritises addressing the backlog of road related infrastructure, but also includes consideration of each major asset class including the category two water and wastewater business units of Council, which operate from separate funding streams.

Council has developed a good program of rehabilitation for roads over the last few years following the implementation of a special rate variation. It has demonstrated internal capacity to rehabilitate roads using a variety of techniques, minimising the cost of treatments where possible by recycling the existing pavement.

The development of this plan has been underpinned by the objective analysis of the road network by the Australian Road Research Board (ARRB) using laser profiling of sealed roads. This methodology provides precise measurement of road seal and pavement condition, and when conducted over a number of years allows for accurate determination of the road asset consumption. Laser profiling has been performed in 2008, 2016 and most recently in March 2018.

## Table 2.1. Road assets covered by this Plan

TRANSPORT ASSET CLASS	QUANTITY
Sealed local roads	307 km
Unsealed local roads	754 km
Sealed Regional roads	67 km

It is noted that these road assets comprise pavement, seal, gravel surfacing, small drains and roadside furniture but does not include bridges, which comprise an asset class in their own right.

Rehabilitation works have focused on the sealed pavements network in recent years, however the unsealed network has largely remained in a state of poor condition overall due in particular to the backlog of drainage and gravel re-sheeting works.

This plan is also supported by the water and sewer capital renewal programs that have been successfully undertaken since 2010, incorporating sewer mains condition rating using CCTV technology. It provides the current status of the network, including the most recent condition assessment of each asset. It also defines particular methodologies that have been adopted or are proposed for the management of the network.

## 3. ROADS

## 3.1 REGIONAL AND LOCAL ROADS

The aim of the road infrastructure backlog program is to improve the amenity of urban areas through the rehabilitation of streets, and to provide improved infrastructure and access for rural residents and industry through major freight links and access roads, particularly heavy vehicle routes. This infrastructure backlog management plan covers the following road assets:

TRANSPORT ASSET CLASS	QUANTITY
Sealed local roads	307 km
Unsealed local roads	754 km
Sealed Regional roads	67 km

Regional roads are adequately funded by the NSW State Government through the Block Grant and the Repair program. Expenditure of these funds each year is sufficient to restore the condition of the two regional roads within further funding required.

The primary infrastructure gap for Council is that of its local road network. Many of Council's road assets have been constructed in the past using materials and practices that are now considered substandard. That poses a challenge in terms of theoretical asset management, as we are rarely renewing "like for like", and often required to upgrade the level of service or at least upgrade the standard of works to achieve the level of service that is theoretically already in existence.

A classic example is the lack of designed subbase and base material under many of the sealed road assets. The following image shows a pavement consisting of five layers of different material, one of which is a former bitumen seal. This actual asset is very different to the theoretical asset components of bulk earthworks, subbase and base layers. Often the subbase layer is non-existent, and the base layer is so thin that it is not possible to rehabilitate the pavement using low cost pulvi-mixing due to very weak natural clay accidentally being incorporated from under the base into the pavement. The image below is of the Ilparran Road prior to rehabilitation, where 300mm of manufactured material was required to be overlayed to provide adequate pavement strength.



Council's customer research into Rural Road assets needs and satisfaction has included:

- External customer surveys;
- Internal staff surveys;
- Community requests to Council;
- Community engagement during the development of the Community Strategic Plan;
- Feedback from the Roads Consultative Committee.

## 3.2 WORKS ALREADY ADDRESSED

Council has developed a good program of rehabilitation for roads over the last few years following the implementation of a special rate variation. It has demonstrated internal capacity to rehabilitate roads using a variety of techniques, minimising the cost of treatments where possible by recycling the existing pavement. These techniques will continue to be monitored year by year for performance over time to further inform the best practice management of the road network. Additives such as bitumen emulsion, cement and lime are incorporated into various pavement layers, and annual measurement of roughness, cracking and rutting by laser techniques will provide an accurate analysis of performance over time. A sample of some backlog works that have already been addressed are shown below.

Wellingrove Road



**Grey Street** 



**Oliver Street** 



### 3.3 REMAINING BACKLOG

The existing backlog has been calculated as having a present cost of \$16.25M. The proposed capital works budget within the current long term financial plan (scenario 4 as adopted) over the next eight years totals \$15.17M. This means that the backlog is not able to be fully reduced over the remaining eight year life of the previous plan without additional funding, even if all allocated capital road funding is committed only to backlog works.



Polhill Road - to be converted to gravel



Costellos Road - gravel re-sheet

The question also remains as to how many additional roads will reach the end of their useful life during the next eight years, i.e. having nearly resolved the current backlog, will we simply be faced with a new backlog that has accumulated in the meantime.

The answer to that question is largely unknown, however there are some costs that can be forecast with accuracy.

Bitumen seal has an expected life of 15 years, and the year that bitumen seals were laid is accurately known. The minimum forward budget for those works can therefore be predicted with confidence.

Works will be prioritised according to the following criteria:

- 1. Works that are required to bring unsafe roads to a safe standard
- 2. Works that have the potential to prevent further accelerated decay of components
- 3. Works that reduce ongoing maintenance costs
- 4. Works that provide for the best cost/benefit result.

Gravel re-sheeting has the potential to affect at least the first three of these criteria, and should be the highest priority, combined with bitumen re-sealing of sealed roads where the existing seal is cracked, and the underlying pavement is in good condition. Both of these treatments should be prioritised is a very high priority.

### Unsealed roads

Unsealed roads are difficult to assess objectively for condition due to the changeable nature and the impact of maintenance activity. The following roads have been identified as being at the end of their economic life. This has been determined through subjective observation by experienced staff, with reference to the number of recurrent complaints, and the level of additional maintenance that has been required over and above the routine.

Roads highlighted in grey have either already been completed or are budgeted to be completed in the current financial year.

The annual budget allocation required to address the backlog within a four year period is contained below:

Unsealed Roads Backlog				
Year Budget Required				
2019/2020	\$	1,511,002		
2020/2021	\$	1,885,820		
2021/2022	\$	1,768,354		
2022/2023 \$ 1,723,385				
Total \$ 6,889,161				

Council has increased the expenditure on unsealed road maintenance by allocating \$1.8M to unsealed road maintenance 2018/19. In addition, the workforce has been restructured, with a particular focus on having teams of staff that have defined and routine programs of work, with a full allocation of funding to enable year round activity. A dedicated crew is allocated to the maintenance of drains on local roads, now utilising two backhoes, and addressing a lack of maintenance over many years in that area. These works will protect road gravel, and as drainage works are carried out additional gravel will be applied to restore unsealed road gravel surfaces that have been washed away over time.

## Sealed Roads:

A significant number of sealed roads were measured independently for roughness in 2008. This has provided a very useful historical snapshot of the network condition at that time, enabling a calculation of deterioration when the network was again measured in 2016, and 2018.

Segments have been analysed to determine not only the current condition, but also the type of treatment that will be required to restore the segment to acceptable condition.

Sealed roads that have deteriorated to the point that they are unsafe should be converted to gravel as a short term measure, with full rehabilitation to be carried out when other more cost effective measures have been completed across the network.

An advantage of this assessment methodology is that it enables those roads that are deteriorating more rapidly than typical roads, to be identified and managed. Physical investigation into underlying factors have been undertaken in this review of this plan, particularly regarding pavement and subgrade strength. In addition, the measured rate of deterioration for these segments will be used for calculation of depreciation in a revaluation of roads to be conducted in July 2019. In some cases these roads are failing up to 10 times faster than typical roads, and allowance will have to be made for early intervention or renewal.

The step by step process that has been adopted in the management of the sealed road network is as follows:

- The network is componentised into segments that are essentially uniform in character (i.e. age, construction dimensions and materials used). Assets are broken into seal, base (incorporates single coat seal), sub-base and bulk earthworks.
- Each segment is mapped, and sufficient data is held for each segment (length, seal width, construction year etc.) to enable financial and engineering management.
- Roughness is used as the primary measurement of pavement condition. Roughness is
  measured for all sealed road segments according to current Austroads standards and
  reported using the International Roughness Index quality controls (IRIqc) as defined by
  Austroads. To provide a meaningful number to the lay reader, roughness is converted to
  NAASRA in this document.
- Asset consumption is calculated using either the actual rate of increasing roughness or the average over typical segments (currently 1.475 points per year), whichever is the greater.
- Atypical segments (identified from anomalous roughness or rutting measurements) are investigated individually to determine the current mode of failure and the best management practice for each. The deterioration rate of these assets is calculated based on the individual asset deterioration observed.
- The above approach to pavement management relies strongly on the maintenance of a waterproof seal and the construction of a sufficiently strong pavement on a well-drained subgrade. Failure to provide these elements will be the primary cause of atypical (excessive and non-linear) deterioration rates. Bitumen seals are scheduled for renewal each 15 years.
- Seal cracking is also automatically measured as a percentage of the surface that contains cracking. Seals that have greater than 10% cracking are at end of life, and require renewal to prevent premature degradation of the underlying pavement. Cracking that is occurring on sound pavement is to be rectified through either crack sealing or full resealing according to the seal maintenance program.

Priority for funding in the medium term should be directed to bitumen seals that are in poor condition, but have a reasonable pavement underneath that needs to be protected to prevent premature loss.

	2019/2020	2020/2021	2021/2022	2022/2023
Backlog				
Reseal	\$ 297,786	\$ 661,239	\$-	\$-
Additional				
Reseals Due	\$ 92,916	\$ 393,087	\$ 144,737	\$ 290,872
Total	\$ 390,702	\$ 1,054,326	\$ 144,737	\$ 290,872

This will require the allocation of the following funds:

The levels of service offered to residents of the Local Government Area have been set in Council's asset management plan as follows:

### ALL TRANSPORT INFRASTRUCTURE

Table 3.1: Community Levels of Service					
KEY PERFORMANCE INDICATOR	COMMUNITY LEVEL OF SERVICE	PERFORMANCE MEASUREMENT PROCESS	TARGET PERFORMANCE	CURRENT PERFORMANCE	
Sustainability	Roads are managed for future generations, maintaining an agreed level of service in a financially sustainable fashion.	Roughness of sealed roads.	The average roughness reduces or is maintained year on year.	Average roughness has <b>increased</b> from <b>82</b> <b>to 90 (NAASRA)</b> for <b>rural</b> roads in the period 2008 – 2016.	
		Condition of unsealed roads at the bottom of the maintenance cycle.	Subjective feedback from the roads consultative committee indicates satisfactory performance with regard to the condition of unsealed roads. The number of complaints reduces year on year.	Average roughness has <b>increased</b> from <b>103 to 117</b> <b>(NAASRA)</b> for <b>urban</b> roads in the period 2008 – 2016.	

Scheduled maintenance is well planned.	Unsealed roads are graded by in house resources according to a defined geographic schedule that minimises travel distance between tasks. The schedule is sufficient to maintain the condition of roads at an acceptable standard until the following grade is due.	95% of roads are graded by in house resources according to the grading schedule.	Roads are graded according to a geographic schedule in 65% of cases.
Pavement materials are reused where possible.	Existing road base material is recycled when sealed pavements are rehabilitated.	Pavement design is optimised to utilise 100% of existing pavement material through thorough measurement of existing pavement depth and quality.	Pavements are recycled, however testing is not adequate to remove the risk of improper pavement design through variation in current pavement conditions within a project.
Road construction machinery is selected for efficiency of operations.	Plant options are well researched, and selected to optimise the efficiency of operations.	The most efficient plant is utilised for each task. Sufficient plant items are on hand to provide appropriate flexibility to utilise maintenance graders to perform re-sheeting operations as part of the grading schedule.	The delivery of gravel to maintenance graders has been identified for optimisation through the acquisition of more efficient delivery vehicles.

## Table 3.2: Community Levels of Service

KEY PERFORMANCE INDICATOR	COMMUNITY LEVEL OF SERVICE	PERFORMANCE MEASUREMENT PROCESS	TARGET PERFORMANCE	CURRENT PERFORMANCE
Safety	Safe accessible network.	Crash reports.	Zero reported crashes attributed to road condition.	1
		Customer Service Request 'CRS'.	<5 per month.	2.4 per month
Quality	Driveability.	Customer Service Requests in regards to pot holes, patching and repairs to transport infrastructure.	< 10 per month.	60 per month
Function	<ul> <li>Meet user requirements for:</li> <li>accessibility;</li> <li>road width;</li> <li>traffic management.</li> </ul>	Customer Service Request. Austroads technical specifications and guidelines. Customer satisfaction survey.	<20 per year. Compliance with current standards and specs.	72 per year

## Table 3.3: Technical Levels of Service

KEY PERFORMANCE INDICATOR	COMMUNITY LEVEL OF SERVICE	PERFORMANCE MEASUREMENT PROCESS	TARGET PERFORMANCE	CURRENT PERFORMANCE
Condition	Average Roughness of <b>rural</b> sealed road network (NAASRA count).	Annual independent assessment of road network using automated vehicle mounted measuring equipment.	Average Roughness of the <b>rural</b> sealed road network (NAASRA) is less than previous year or 80, whichever is the greater.	90
Condition	Average Roughness of <b>urban</b> sealed road network (NAASRA count).	Annual independent assessment of road network using automated vehicle mounted measuring equipment.	Average Roughness of the <b>urban</b> sealed road network (NAASRA) is less than previous year or 100, whichever is the greater.	117
Condition	Acceptable condition of unsealed rural roads.	Inspection. Condition of road at time of grading (subjective).	95% of unsealed roads are in acceptable travelling condition immediately prior to grading.	<30% of roads are in acceptable travelling condition at time of grading.

Cost effectiveness	Reuse of materials.	Pavement design records.	100% of rehabilitation projects are designed and pavement reuse is optimised.	Reuse of pavements occurs routinely, however rehabilitation projects are not currently investigated to a level that optimises reuse.
Safety	Provide: • clear signage; • well maintained line	Compliance inspections.	Zero compliance defects.	Zero compliance defects per year.
	<ul> <li>wein maintainted line marking;</li> <li>appropriate traffic management devices.</li> </ul>	Customer service request 'CRS'.	<10 per year.	28 customer requests per year.

## 4. DRAINAGE

### 4.1 WORKS ALREADY ADDRESSED

The following images show obvious issues within the drainage network that have now been dealt with. Council has adopted a drainage charge that is utilised for these works, and based on the available data the ongoing expenditure of this funding source is sufficient to maintain the drainage network in a satisfactory overall state into the future.

The emphasis on spending in the short term will be to capture condition data of underground assets through CCTV inspection to better inform renewal activities before issues with drainage assets become problematic.

The forward plan for stormwater drainage is to continue to expend the calculated depreciation charge fully each year on capital renewal activities, with the balance of the funds raised by the drainage charge to be applied to maintenance activities.





## 5. SEWER

Council is required to conduct the operation of the sewer business unit as a standalone function. The sewer network is old, and has been undergoing rehabilitation via a mains renewal program since 2010. The capital renewal expenditure has been greater than depreciation since that time, and a significant proportion of the network has been renewed. Much more needs to be done, however, as the network was largely constructed in 1930, and so most of the network is due for replacement.

The first round of CCTV explored the 1930 built mains, and the urgent and major works have now been completed on those mains. Further CCTV should now be undertaken across the whole network to continue to plan the next phase of rehabilitation. It is considered at this stage that the depreciation plus a factor of 50% should continue to be expended on mains renewal each year until the network is brought to a satisfactory condition. Sewer charges should be set at a level that accommodates this expenditure in addition to any dividend that is returned to the general fund to maintain a sustainable funding regime.



A sewer sludge volute dehydrator was installed as part of the renewal of the old treatment plant sludge drying beds

	Ins	spection rep	ort / Inspectio	on: 2		
Date: 11/11/2010	Asset owner's job ref.: R 041 P	Precipitation: No	Operator : ROB HARPER	Section number: 218	Sewe	
Method of inspection: Television Camera	Cleaning: cleaned					
Town/suburb: GL Location: ME Location type: Ro	EN INNES ADE STREET B ad	Asset Owner: Gle	n Innes	Upstream MH.: R 42 Downstream MH.: R 41 Section length : 53.4	R 42 I.: R 41 53.41 m	
Purpose of inspection Use of sewer: Type of sewer:	Structural exam Sewage Gravity sewer		Shape : Dia/Height:	Circular 150 mm		
Remarks :		an a				
1:216 Po	sition	Observation			Photo	
R 42	0.50	Start node, maintenar	nce hole, Nodename: R	42	218_1	
	0.79	Longitudinal fracture,	at joint, width 3mm , at 8	3 o'clock	218_2	
	0.98 Multiple or complex fracturing, width 4mm , from 12 o'clock					
	6.21	Some coarse aggrega	ate is visible , from 12 to	12 o'clock	218_4	
	8.25	Multiple or complex fr o'clock	acturing, width 5mm , fro	om 4 to 8	218_5	
	13.26	Multiple or complex fr o'clock	acturing, width 5mm , fro	om 12 to 12	218_	
	16.47	Breaking, all pieces a visibly displaced from	re present but some of t position , length of brea	hem are k 500 , at 8	218_	
	17.85	Junction open, good width 150mm, MASS	workmanship, diameter ROOTS, at 9 o'clock	150mm,	218_	
	19.13	Multiple or complex fr to 8 o'clock	acturing, width 5mm, R0	DOTS, from 3	218_9	
	20.17	Recently cut Tap root at joint, Obstruction: {	s, reduction in cross sec 5-20% , at 3 o'clock	ctional area,	218_1	
	21.25	Recently Cut interwor a Beard of roots, at jo	ven mass of mostly fine int, Obstruction: 5-20%	roots leaving , from 2 to 4	218_1	
	25.74	Multiple or complex fr o'clock	acturing, width 4mm , fro	om 12 to 12	218_1	



Example CCTV report of underground sewer main

## 6. WATER

Council is, in addition, required to conduct the operation of the water business unit as a standalone function. The water network is similarly old, and has also been undergoing rehabilitation via a mains renewal program since 2010. Significant works have been completed on the water treatment plant in Glen Innes, which was built in 1982.

The capital renewal expenditure has been greater than depreciation since 2010. The water network also was largely constructed in 1930, and so most of the network is theoretically due for replacement, however continues to function in an acceptable manner, particularly since the advent of the off stream storage and associated removal of manganese from the supply.

Unlike sewer and stormwater, CCTV cannot be used efficiently to investigate water mains due to their pressurised nature and the associated difficulty in obtaining access. It is considered at this stage that the depreciation plus a factor of 50% should be expended on mains and treatment plant renewal each year until the network is brought to a satisfactory condition. Water charges should be set at a level that accommodates this expenditure in addition to any dividend that is returned to the general fund to maintain a sustainable funding regime.



Water treatment plant clarifier before and after relining

## 7. BRIDGES

## 7.1 WORKS ALREADY COMPLETED

Council has taken out a \$4M loan under the Local Infrastructure Renewals Scheme. This provides a subsidy on the interest charged over the life of the loan whereby Council receives regular reimbursements. Under this program 24 bridges have already been rehabilitated to an acceptable standard at a cost of just \$1,611,663 to May 2018. These works have been supplemented by external funding for major works on the Nine Mile Bridge over the Severn River, and Cam Creek bridge on Ranger's Valley Road.



Cam Creek Bridge before ...

and after.

#### 7.2 FUTURE WORKS

Most bridges are able to be rehabilitated using in house resources, at minimal cost, however a small number of bridges will require full replacement with a new concrete structure at considerable expense. These more major works may consume the remainder of the LIRS allocation, however if further external funding is received the LIRS bridges funding may be able to be reallocated toward other backlog works within this plan.

Geotechnical assessment has been undertaken on these bridges to be ready for progression as funding is allocated. The assessment of the Mount Mitchell Road Bridge over the Mann River is shown below for information.



**ntegrated Practical** Solutions

Report on Geotechnical Investigation

Proposed Bridge Replacement Mann River, Mount Mitchell Road, Mount Mitchell

> Prepared for Glen Innes Severn Council

> > Project 89889.00 September 2018





#### **Document History**

#### Document details

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Sigi	nature	Date
Author	John Reland	14 September 2018
Reviewer	they	14 September 2018



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Figure 1: Looking south east towards the existing bridge.

#### 3. Regional Geology

Reference to the 1:250,000 scale Geological Survey of New South Wales Statewide geodatabase indicates that the site is underlain by the Wallangarra Volcanics which predominantly comprises ignimbrite.

#### 4. Field Work Methods

The field work was undertaken on 16 to 18 July 2018 and comprised the drilling of two boreholes (Bores 41 and 42). The bores were drilled with a truck mounted rotary drilling rig equipped with spiral flight augers and rotary equipment for drilling in soil and weathered rock and NMLC diamond coring equipment for coring of the underlying rock. Bores 41 and 42 were terminated in rock at 5.22 m and 7.54 m depth, respectively, which was the target stratum for the investigation.

Standard penetration tests were performed at selected depths in each bore. A geotechnician from DP logged the subsurface profile in each bore and took regular disturbed samples for subsequent identification purposes and photographed the rock core.

The test locations were set out by the geotechnician from existing site features. The bore surface levels were measured by level run to an arbitrary bench mark of RL100 m (Assumed Datum) on the existing bridge deck. The coordinates of each bore location were recorded with a hand held GPS which has a typical accuracy of about  $\pm 10$  m. The approximate locations of the tests are indicated on Drawing 5.1 in Appendix B.

Geotechnical Investigation, Proposed Bridge Replacement Mann River, Mount Mitchell Road, Mount Mitchell 89889.00.R.005.Rev0 September 2018

## **BOREHOLE LOG**

CLIENT: Glen Innes Severn Council PROJECT: Proposed Bridge Replacement LOCATION:

Mann River Bridge, Mount Mitchell Road, Mount Mitchell

SURFACE LEVEL: 100.0 TBM EASTING: 382373 NORTHING: 6688375 DIP/AZIMUTH: 90°/--

BORE No: 41 **PROJECT No: 89889** DATE: 17 - 18/7/2018 SHEET 1 OF 1

-	Description	Description Degree of Weathering		Fracture	Discontinuities	Sa	ampli	ng & I	In Situ Testing	
L Depth	of Strata	EW HW SSW FR Graph	Very Low Medium Very High Ex High	(m)	B - Bedding J - Joint S - Shear F - Fault	Type	Core Rec. %	RQD %	Test Results & Comments	
1	SILTY GRAVEL: Hard / dense, brown silty gravel with some clay and rootlets, dry.					D	-		30/140 refusal	
8-1 1.0 <sup>-</sup>	HORNFELS: Very high strength, slightly weathered, fractured, dark grey and brown-white, fine grained hornfels				1m: Fractures typically 5° to 35°, ro, pl and ro, st, fe at approximately 40mm to 300mm spacings	с	100	0		
86-2 1		↓ ↓       ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓				с	100	24		
26 - 13						с	100	31	PL(D) = 4.95	
					3.6m: J, 45°, ro, pl					
98 - 4 - - -		→ → → → → → → → → → → → → → → → → → →			4.3m: J, sh, ro, pl 4.5m: J, 30°, ro, pl	с	100	42		
g - 5 5.22	Bore discontinued at 5.22m, limit of				4.85m: J, 70°, ro, pl				PL(D) = 5.62	
6 6	invesigation									
6 -7 -7										
							4			
-										

RIG: Scout 3

DRILLER: GroundTest / McLeish LOGGED: Ussher TYPE OF BORING: SFA (tc-bit) to 1.0m then NMLC coring to 5.22m

CASING: 0.9m HW

WATER OBSERVATIONS: No free ground water observed whilst augering REMARKS: Location coordinates are in MGA94 Zone 56J. Handheld GPS, coordinates approximate. TBM bridge deck 100.0m, assumed datum.

	SAME	PLINO	<b>3 &amp; IN SITU TESTING</b>	LEGE	END
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
в	Bulk sample	P	Piston sample	PL(A	) Point load axial test Is(50) (MPa)
BLK	Block sample	U.	Tube sample (x mm dia.)	PL(D	Point load diametral test Is(50) (MPa
С	Core drilling	Ŵ	Water sample	DD	Pocket penetrometer (kPa)
Ď	Disturbed sample	Þ	Water seep	S	Standard penetration test
E	Environmental sample		Water level	V	Shear vane (kPa)

Douglas Partners Geotechnics | Environment | Groundwater





## 8. PLAN IMPROVEMENT AND MONITORING

## 8.1 PERFORMANCE MEASURES

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required cash flow identified in this infrastructure backlog management plan are incorporated into Council's Long Term Financial Plan and Community Strategic Plan;
- The degree to which 1-4 year detailed works programs, budgets, business plans and organisational structures take into account the 'global' works program trends provided by the infrastructure backlog management plan.

## 8.2 IMPROVEMENT PLAN

The infrastructure backlog management improvement plan generated is shown in Table 8.2.

TASK NO	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TARGET COMPLETION DATE
1	Sewer CCTV condition analysis.	TSE/Contractor	Staff/Contracted services	February 2019
2	Undertake yearly condition assessments of 100% of the roadwork network.	TSE/ARRB	Staff/Annual Road Survey	June 2019
3	Undertake an annual review of this Infrastructure Management plan.	DIS	Staff	July 2019

#### Table 8.2: Improvement Plan

## 8.3 MONITORING AND REVIEW PROCEDURES

The Plan is a living document and is to be updated annually.

This infrastructure backlog management plan will be reviewed prior to annual budget preparation and amended to recognise any changes in service levels and/or resources available to provide those services.

## APPENDICES

# APPENDIX A PLANNED TRANSPORT INFRASTRUCTURE EXPENDITURES FOR LONG-TERM FINANCIAL PLAN (LTFP SCENARIO 4)

	2019/2020		2020/2021		2021/2022		2022/2023		2023/2024		2024/2025		2025/2026		2026/2027		2027/2028
Pavement Rehab	\$-	\$	-	\$		\$	-	\$	-	\$	783,296	\$	869,100	\$	1,319,351	\$	1,399,441
Subbase Rehab	\$ 342,964	\$	-	\$	-	\$	-	\$	1,884,828	\$	578,135	\$	509,404	\$	-	\$	-
Reseal	\$ 297,786	\$	661,239	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-
Gravel Resheet	\$ 1,511,002	\$	1,885,820	\$	1,768,954	\$	1,723,385	\$	-	\$	-	\$	-	\$	-	\$	-
Convert to gravel	\$ 175,792	\$	-	\$	-	\$	-	\$	-	\$	90,516	\$	-	\$	-	\$	-
Additional Reseals Due	\$ 92,916	\$	393,087	\$	144,737	\$	290,872	\$	540,283	\$	330,358	\$	268,636	\$	16,125	\$	457,556
Allocated Capital Expenses	\$ 2,420,461	\$	2,940,146	\$	1,913,691	\$	2,014,257	\$	2,425,110	\$	1,782,305	\$	1,647,140	\$	1,335,475	\$	1,856,997
Unallocated capital expenses	\$ -	\$		\$	306,240	\$	205,674	\$	<u> </u>	\$	437,625	\$	572,791	\$	884,455	\$	362,933
Local Road Capital Renewal Budget	\$ 2,420,461	\$ 2	,940,146	\$ 2,	219,930	\$ 2	,219,930	\$ 2	2,425,110	\$ 2,	,219,930	\$ 2,	,219,930	\$ 2	,219,930	\$ 2	,219,930
Increase from LTFP scenario 4	\$ 474 647	\$	1 159 251	\$	392 396	\$	400 222	\$	573 952	\$	301 489	\$	239 752	\$	173 279	\$	173 279

## APPENDIX B PROJECTED CAPITAL WORKS PROGRAM

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Backlog Renewal Cost
		Haymarket -							
350-030	Furracabad Rd	Furracabad Ck.	953	Rural	Local	Sealed	Subbase Rehab	2019	\$ 342,964.08
210-040	Shannon Vale Rd	20m W Willowbrook entry to Mon	1,056	Rural	Local	Sealed	Subbase Rehab	2023	\$ 380,048.40
620-51	Glasson St	Church St To Walter St	210	Urban	Local	Sealed	Subbase Rehab	2023	\$ 75,593.52
589-50	West Ave	Wentworth-Bourke	213	Urban	Local	Sealed	Subbase Rehab	2023	\$ 76,719.60
260-006	Glen Legh Rd	Lorin Pk-Stn Ramp[Post]	785	Rural	Local	Sealed	Subbase Rehab	2023	\$ 282,556.08
260-008	Glen Legh Rd	Stn Ramp[Post]- 375M West	782	Rural	Local	Sealed	Subbase Rehab	2023	\$ 281,550.24
260-020	Glen Legh Rd	End Of Const Stonelegh	1,652	Rural	Local	Sealed	Subbase Rehab	2023	\$ 594,838.80
589-52	West Ave	Meade-Ferguson	191	Urban	Local	Sealed	Subbase Rehab	2023	\$ 68,689.80
260-009	Glen Legh Rd	375M West-Beardy Waters	347	Rural	Local	Sealed	Subbase Rehab	2023	\$ 124,831.08
330-46	Rodgers Rd	Blacks Rd Junction- Wilga St	151	Rural	Local	Sealed	Subbase Rehab	2024	\$ 54,507.60
420-040	Strathbogie Rd	Culvert To Rogers	1,455	Rural	Local	Sealed	Subbase Rehab	2024	\$ 523,627.20
676-52	Bourke St	Clarke-Hunter	608	Urban	Local	Sealed	Subbase Rehab	2025	\$ 219,026.16
260-004	Glen Legh Rd	Cramsie-Lorin Pk	807	Rural	Local	Sealed	Subbase Rehab	2025	\$ 290,377.80
220-006	Red Range Rd	Creek-Valhalla	1,084	Rural	Local	Sealed	Reseal	2019	\$ 33,661.31
250-020	Pinkett Rd	Lambs Valley- Mann River	1,645	Rural	Local	Sealed	Reseal	2019	\$ 38,482.70
260-030	Glen Legh Rd	Stonelegh - Corner	1,925	Rural	Local	Sealed	Reseal	2019	\$ 45,039.38
260-040	Glen Legh Rd	Corner To Past Stonehenge Rd	1,203	Rural	Local	Sealed	Reseal	2019	\$ 28,153.94
355-010	Haymarket Rd	Furracabad Rd Pipe	1,596	Rural	Local	Sealed	Reseal	2019	\$ 35,902.35
420-060	Strathbogie Rd	Clarevaulx Ck To Reddestone Ck	1,392	Rural	Local	Sealed	Reseal	2019	\$ 41,336.76
420-080	Strathbogie Rd	Top Of Red Hill To Back Plains Ck	1,601	Rural	Local	Sealed	Reseal	2019	\$ 38,913.05

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Re	Backlog Renewal Cost	
420-140	Strathbogie Rd	Wellingrove Ck To Potters Bdy	1,494	Rural	Local	Sealed	Reseal	2019	\$	36,296.67	
130-040	Bald Nob Rd	Severn River Bridge To Gwydir Hwy	1,640	Rural	Local	Sealed	Reseal	2020	\$	45,755.72	
450-010	Rangers Valley Rd	New England Highway	833	Rural	Local	Sealed	Reseal	2020	\$	26,242.24	
455-010	Yarraford Rd	Ne Hwy To End Of Patch	2,405	Rural	Local	Sealed	Reseal	2020	\$	73,603.10	
455-020	Yarraford Rd	Patch To Railway Moore St - Urban	1,932	Rural	Local	Sealed	Reseal	2020	\$	46,959.26	
495-010	Rose Valley Rd	Planzone Lang St-Wentworth	1,311	Urban	Local	Sealed	Reseal	2020	\$	30,677.40	
501-49	Dumaresq St	St O'Halloran Ave To	233	Urban	Local	Sealed	Reseal	2020	\$	7,546.90	
504-53	Gaffney Bealach	End Cul-De-Sac	148	Urban	Local	Sealed	Reseal	2020	\$	2,068.00	
512 51	Derby St Horon St		200	Ulban	Local	Sealed	Reseal	2020	ф Ф	7 112 /5	
517-48	Coronation Ave	Potter-Lawrance	220	Urban		Sealed	Reseal	2020	φ ¢	9.982.64	
517-40	Coronation Ave	Coronation Ave -	240	Ofball	LUCAI	Sealed	INESEdi	2020	Ψ	9,902.04	
548-46	Potter Pde	Abbott St	345	Urban	Local	Sealed	Reseal	2020	\$	12,412.40	
565-47	Abbott St	Wilga-Rwy X/Ing	201	Urban	Local	Sealed	Reseal	2020	\$	6,156.35	
565-48	Abbott St	Rwy X/Ing-Lang	609	Urban	Local	Sealed	Reseal	2020	\$	18,644.70	
589-53	West Ave	Ferguson-Taylor	233	Urban	Local	Sealed	Reseal	2020	\$	10,495.04	
605-50	East Ave	Wentworth-Bourke	211	Urban	Local	Sealed	Reseal	2020	\$	14,262.08	
613-46	Grey St	Mackenzie-Heron	272	Urban	Local	Sealed	Reseal	2020	\$	7,228.77	
624-46	Digby Court	Railway St To End Cul-De-Sac	135	Urban	Local	Sealed	Reseal	2020	\$	6,386.12	
661-45	Carlisle Cl	N Of Glen Legh Rd	340	Urban	Local	Sealed	Reseal	2020	\$	8,410.74	
676-44	Bourke St	Dumaresq-Derby	230	Urban	Local	Sealed	Reseal	2020	\$	7,756.93	
676-45	Bourke St	Derby-Coronation	231	Urban	Local	Sealed	Reseal	2020	\$	8,518.29	
676-47	Bourke St	Lambeth-Macquarie	189	Urban	Local	Sealed	Reseal	2020	\$	9,554.54	
676-51	Bourke St	Church-Clarke	221	Urban	Local	Sealed	Reseal	2020	\$	21,023.35	
685-47	Cramsie Cres	Heron St-North	124	Urban	Local	Sealed	Reseal	2020	\$	3,074.49	
688-45	Kildare Pl	Derby St To End Cul-De-Sac	58	Urban	Local	Sealed	Reseal	2020	\$	1,879.55	
696-49	Meade St	West-Grey	150	Urban	Local	Sealed	Reseal	2020	\$	14,850.00	

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Backlog Renewal Cost
		Veness St To End							
700-53	Scott St	Cul-De-Sac	202	Urban	Local	Sealed	Reseal	2020	\$ 10,269.36
713-50	Hunter St	George-Bourke	273	Urban	Local	Sealed	Reseal	2020	\$ 8,859.20
713-52	Hunter St	Meade-Taylor	419	Urban	Local	Sealed	Reseal	2020	\$ 18,844.07
720-49	Taylor St	West-Grey	314	Urban	Local	Sealed	Reseal	2020	\$ 21,177.59
727-52	Killarney Cl	Robinson Ave to L1 DP1009078	60	Urban	Local	Sealed	Reseal	2020	\$ 1,188.00
735-010	Cemetery Loop Rd	north from Remembrance Drive, GI	172	Urban	Local	Sealed	Reseal	2020	\$ 3,087.31
736-48	Grafton St	Macquarie St-East	115	Urban	Local	Sealed	Reseal	2020	\$ 3,728.92
821-030	Severn St	Simpson St-Lachlan St	231	Urban	Local	Sealed	Reseal	2020	\$ 6,249.34
830-010	Bourke St	Gough St To Ne Hwy	414	Urban	Local	Sealed	Reseal	2020	\$ 10,071.01
883-010	Ferguson St	Gravel-Camp St	135	Urban	Local	Sealed	Reseal	2020	\$ 3,026.93
440-190	Emmaville Rd	Mon-Severn River	1,582	Rural	Regional	Sealed	Reseal	2020	\$ 41,290.20
480-010	Wellington Vale Rd	New England Hwy To Reseal	2,278	Rural	Regional	Sealed	Reseal	2020	\$ 57,409.88
480-090	Wellington Vale Rd	Top Of Crest To Before Hiltons Rd	2,168	Rural	Regional	Sealed	Reseal	2020	\$ 54,643.93
517-53	Coronation Ave	Ferguson-Taylor	233	Urban	Regional	Sealed	Reseal	2020	\$ 13,924.28
450-090	Rangers Valley Rd	Feedlot - Causeway	1,460	Rural	Local	Sealed	Pavement rehab	2018	\$ 250,000.00
676-46	Bourke St	Coronation-Railway	199	Urban	Local	Sealed	Pavement rehab	2024	\$ 26,329.74
854-010	Post Office St	Moore St - O'Donnell St	100	Urban	Local	Sealed	Pavement rehab	2024	\$ 17,490.41
613-56	Grey St	Grafton-Rusden	714	Rural	Local	Sealed	Pavement rehab	2024	\$ 92,859.65
500-50	Mackenzie St	Grey-Church	237	Urban	Local	Sealed	Pavement rehab	2024	\$ 33,132.68
732-46a	Wullamulla St	Mossman-Blessing	114	Urban	Local	Sealed	Pavement rehab	2024	\$ 16,576.84
676-48	Bourke St	Macquarie-West	236	Urban	Local	Sealed	Pavement rehab	2024	\$ 100,356.95
704-50	Scholes Ln	S Of New Eng Motor Lodge	42	Urban	Local	Sealed	Pavement rehab	2024	\$ 6,332.31
744-50	Rusden St	Church St To Grey St	233	Rural	Local	Sealed	Pavement rehab	2024	\$ 30,322.89
512-50	Heron St	Grey-Church	232	Urban	Local	Sealed	Pavement rehab	2024	\$ 36,018.44
310-030	Maybole Rd	Past Yarrum To Hill	1,862	Rural	Local	Sealed	Pavement rehab	2024	\$ 251,397.00
350-002	Furracabad Rd	Ross/S-Bradleys L	1,113	Rural	Local	Sealed	Pavement rehab	2024	\$ 172,479.35

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Backlog Renewal Cost
676-49	Bourke St	West-Grey	202	Urban	Local	Sealed	Pavement rehab	2025	\$ 110,595.00
		Bourke St To East							
672-49	Chaffeys Ln	Ave	140	Urban	Local	Sealed	Pavement rehab	2025	\$ 12,961.10
720-46	Taylor St	Coronation Ave-Park St	225	Urban	Local	Sealed	Pavement rehab	2025	\$ 32,077.18
468-010	Deloraine Rd	Strathbogie Rd To Wells Street	344	Urban	Local	Sealed	Pavement rehab	2025	\$ 51,610.80
608-51	William St	Church St To Margaret St	228	Urban	Local	Sealed	Pavement rehab	2025	\$ 70,221.62
676-53	Bourke St	Hunter-End	408	Urban	Local	Sealed	Pavement rehab	2025	\$ 136,581.85
717-52	Veness St	Meade St To End	342	Urban	Local	Sealed	Pavement rehab	2025	\$ 90,701.02
537-52	Railway St	Meade-Ferguson	198	Urban	Local	Sealed	Pavement rehab	2025	\$ 37,601.57
696-53	Meade St	Gwydir Hwy - end cul-de-sac [East]	95	Urban	Local	Sealed	Pavement rehab	2025	\$ 9,214.66
589-51	West Ave	Bourke-Meade	232	Urban	Local	Sealed	Pavement rehab	2025	\$ 66.002.46
537-51	Railway St	Bourke-Meade	229	Urban	Local	Sealed	Pavement rehab	2025	\$ 43,461.93
286-010	East Pandora Rd	Ne Hwy - Gravel	1.136	Rural	Local	Sealed	Pavement rehab	2025	\$ 130.665.30
581-56	Macquarie St	Wullamulla-Grafton	231	Urban	Local	Sealed	Pavement rehab	2025	\$ 32,899.26
581-55	Macquarie St	Herbert-Wullamulla	312	Urban	Local	Sealed	Pavement rehab	2025	\$ 44,506,17
537-50	Railway St	Wentworth-Bourke	237	Urban	Local	Sealed	Pavement rehab	2026	\$ 45,013.85
657-51	Clarke St	Bourke-Meade	224	Urban	Local	Sealed	Pavement rehab	2026	\$ 63,146.94
824-010	Dundee St	Gough St-Causeway	120	Urban	Local	Sealed	Pavement rehab	2026	\$ 13,453.88
541-54	Mossman St	Taylor-Herbert	232	Urban	Local	Sealed	Pavement rehab	2026	\$ 33,055.30
677-51	Elizabeth St	Gwydir Hwy To Bourke St	224	Urban	Local	Sealed	Pavement rehab	2026	\$ 64,269.48
863-010	O'Donnell St	Glen Innes St To Irby St	561	Urban	Local	Sealed	Pavement rehab	2026	\$ 67,305.36
720-45	Taylor St	Derby-Coronation Ave	231	Urban	Local	Sealed	Pavement rehab	2026	\$ 46,248.40
501-48	Dumaresq St	Potter St-Lang St	425	Rural	Local	Sealed	Pavement rehab	2026	\$ 55,274.57
553-53	Park St	Ferguson St To Taylor St	221	Urban	Local	Sealed	Pavement rehab	2026	\$ 36,524.57
648-44	Wentworth St	Dumaresq-Derby	229	Urban	Local	Sealed	Pavement rehab	2026	\$ 31,518.85
696-46	Meade St	Coronation-Railway	198	Urban	Local	Sealed	Pavement rehab	2026	\$ 55,899.97
589-54	West Ave	Taylor-Herbert	232	Urban	Local	Sealed	Pavement rehab	2026	\$ 100,685.76
728-46	Herbert St	Coronation-Blessing	293	Urban	Local	Sealed	Pavement rehab	2026	\$ 39,586.73
629-51	Sommerlad Ln	Rear Of Town Hall	103	Urban	Local	Sealed	Pavement rehab	2026	\$ 25,769.00

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Backlog Renewal Cost
728-45	Herbert St	Derby-Coronation	231	Urban	Local	Sealed	Pavement rehab	2026	\$ 38,156.75
613-50co	Grey St	Wentworth-Bourke	212	Urban	Local	Sealed	Pavement rehab	2026	\$ 37,130.28
501-47	Dumaresq St	S End-Potter St	621	Rural	Local	Sealed	Pavement rehab	2026	\$ 80,718.30
512-52	Heron St	Lawrance St to Cramsie Cr	228	Urban	Local	Sealed	Pavement rehab	2026	\$ 39,854.33
287-010	Pleasant View Cr	East Pandora Rd- Cul-De-Sac	285	Rural	Local	Sealed	Pavement rehab	2026	\$ 38,450.97
824-020	Dundee St	Hwy	291	Urban	Local	Sealed	Pavement rehab	2026	\$ 36,379.13
601-48	Gas Works Rd	Lang St To End	166	Urban	Local	Sealed	Pavement rehab	2026	\$ 22,891.00
490-020	Tent Hill Rd	Bend To Gravel	1,803	Rural	Local	Sealed	Pavement rehab	2026	\$ 243,395.55
537-49	Railway St	Lang-Wentworth	202	Urban	Local	Sealed	Pavement rehab	2026	\$ 38,303.43
741-54	Higgins Rd	Shannon Vale Rd to gravel section	531	Urban	Local	Sealed	Pavement rehab	2026	\$ 66,318.50
657-50	Clarke St	Torrington-Bourke	195	Urban	Local	Sealed	Pavement rehab	2027	\$ 55,019.42
589-55	West Ave	Herbert-Wullamulla	310	Urban	Local	Sealed	Pavement rehab	2027	\$ 55,875.78
589-49	West Ave	Lang-Wentworth	230	Urban	Local	Sealed	Pavement rehab	2027	\$ 44,797.16
495-015	Rose Valley Rd	Urban Planzone- Gravel	807	Rural	Local	Sealed	Pavement rehab	2027	\$ 96,870.00
310-040	Maybole Rd	Hill To Gravel	2,410	Rural	Local	Sealed	Pavement rehab	2027	\$ 277,127.00
262-40	Lynch Rd	Glen Legh Rd To End Cul-De-Sac	285	Rural	Local	Sealed	Pavement rehab	2027	\$ 36,350.76
480-070	Wellington Vale Rd	Strachan To 1.62 Past Watsons Ck	2,485	Rural	Regional	Sealed	Pavement rehab	2027	\$ 347,846.80
270-030	Mt Mitchell Rd	Top Of Hill-Mann River	1,827	Rural	Local	Sealed	Pavement rehab	2027	\$ 246,619.35
450-130	Rangers Valley Rd	Bitumen To Emmaville Rd	235	Rural	Local	Sealed	Pavement rehab	2027	\$ 30,528.16
869-010	Hunt Pl	Off Marshall Way, Emmaville	157	Rural	Local	Sealed	Pavement rehab	2027	\$ 27,510.18
310-010	Maybole Rd	Grahams V'Ly Rd- 150M Past Ck.	1,507	Rural	Local	Sealed	Pavement rehab	2027	\$ 180,896.40
732-45	Wullamulla St	Derby-Coronation	232	Urban	Local	Sealed	Light patch and reseal	2019	\$ 10,724.73
505-56	Derby St	Wullamulla-Grafton	222	Urban	Local	Sealed	Heavy patch and reseal	2019	\$ 10,115.24
260-070	Glen Legh Rd	Bitumen-Millers	1,996	Rural	Local	Unsealed	Gravel Resheet	2018	\$ 79,836.80
260-080	Glen Legh Rd	Millers-Causeway	2,452	Rural	Local	Unsealed	Gravel Resheet	2018	\$ 98,088.40

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Backlog Renewal Cos
400.060	Topt Hill Rd	Bark Hut Ck To	270	Pural		Socied	Gravel Respect	2010	¢ 11 157 20
490-000			219	Kulai	LUCAI	Sealeu	Glaver Resileet	2019	φ 11,107.02
490-090	Tent Hill Rd	Gravel To Tenterfield Shire Boundary	491	Rural	Local	Sealed	Gravel Resheet	2019	\$ 19,640.24
170-010	Morven Rd	Dundee/Bald Nob Rd-Ramp	1.685	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 67,412.00
170-020	Morven Rd	Ramp-Ramp	1,573	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 62.933.20
170-030	Morven Rd	Ramp-Brookside	2.207	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 88,260,80
170-040	Morven Rd	Brookside-Ramp	2.047	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 81.873.20
170-050	Morven Rd	Ramp-Ramp(Yahna)	2,397	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 95,863.20
170-060	Morven Rd	Ramp-Gate	1,651	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 66,056.40
170-070	Morven Rd	Gate-Ramp	1,815	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 72,616.80
250-140	Pinkett Rd	Bitumen- Wetherspoons	1,758	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 70,320.00
250-150	Pinkett Rd	Wetherspoons- Ryans Rd	2,139	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 85,560.00
250-160	Pinkett Rd	Ryans Rd-Bitumen	2,130	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 85,204.80
250-180	Pinkett Rd	Bitumen-Henry R	2,222	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 88,864.00
250-190	Pinkett Rd	Henry R-Campions	1,741	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 69,632.80
250-200	Pinkett Rd	Campions-East Lynn	1,454	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 58,151.20
250-210	Pinkett Rd	East Lynn- Causeway	1,343	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 53,735.60
250-220	Pinkett Rd	Causeway-Gate R/H Side	2,173	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 86,931.20
250-230	Pinkett Rd	Gate-Kookabookra Rd	1,717	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 68,663.20
250-240	Pinkett Rd	Kookabookra Rd- Bdy	1,185	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 47,382.40
257-010	Pretty Valley Rd	Pretty Valley Rd- Ryans Rd	2,668	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 106,720.40
257-020	Pretty Valley Rd	Ryans Rd-Fishers Rd	2,075	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 82,999.60
257-030	Pretty Valley Rd	Fishers Rd-Mon	1,026	Rural	Local	Unsealed	Gravel Resheet	2019	\$ 41,024.00
450-115	Rangers Valley Rd	Causeway	50	Rural	Local	Sealed	Gravel Resheet	2020	\$ 2,000.00
255-010	Costellos Rd	Pinkett Rd- Mon	1,718	Rural	Local	Unsealed	Gravel Resheet	2020	\$ 68,701.60
255-020	Costellos Rd	Mon-Gate	2,018	Rural	Local	Unsealed	Gravel Resheet	2020	\$ 80,703.20
255-030	Costellos Rd	Gate -Andrews	1,446	Rural	Local	Unsealed	Gravel Resheet	2020	\$ 57,827.20

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Re	Backlog newal Cost
255-040	Costellos Rd	Andrews-Gate	1,474	Rural	Local	Unsealed	Gravel Resheet	2020	\$	58,973.20
255-050	Costellos Rd	Gate-Ramp	1,590	Rural	Local	Unsealed	Gravel Resheet	2020	\$	63,606.00
255-060	Costellos Rd	Ramp- Mt. Slow Rd	1,382	Rural	Local	Unsealed	Gravel Resheet	2020	\$	55,264.00
270-060	Mt Mitchell Rd	Gravel - Causeway	940	Rural	Local	Unsealed	Gravel Resheet	2020	\$	37,600.00
270-070	Mt Mitchell Rd	Causeway-Bridge	1,283	Rural	Local	Unsealed	Gravel Resheet	2020	\$	51,307.60
270-080	Mt Mitchell Rd	Bridge-Aqua Prk Turnoff	1,884	Rural	Local	Unsealed	Gravel Resheet	2020	\$	75,342.00
270-090	Mt Mitchell Rd	Aqua Park Rd Turnoff-Tirranna	2,414	Rural	Local	Unsealed	Gravel Resheet	2020	\$	96,545.20
270-100	Mt Mitchell Rd	Tirranna-Bdy	1,268	Rural	Local	Unsealed	Gravel Resheet	2020	\$	50,724.00
450-100	Rangers Valley Rd	Bitumen-Bloxsomes Pit	1,856	Rural	Local	Unsealed	Gravel Resheet	2020	\$	74,244.80
450-110	Rangers Valley Rd	Bloxsomes Pit- Causeway	2,174	Rural	Local	Unsealed	Gravel Resheet	2020	\$	86,971.20
450-120	Rangers Valley Rd	Causeway-Bitumen	2,341	Rural	Local	Unsealed	Gravel Resheet	2020	\$	93,648.80
210-050	Shannon Vale Rd	Mon-Mon	356	Rural	Local	Unsealed	Gravel Resheet	2020	\$	14,257.80
210-070	Shannon Vale Rd	Gravel To Donnelly's Bridge	2,052	Rural	Local	Unsealed	Gravel Resheet	2020	\$	82,090.00
210-080	Shannon Vale Rd	Donnelly's Bridge- Int. Boydells Rd	2,167	Rural	Local	Unsealed	Gravel Resheet	2020	\$	86,682.80
210-090	Shannon Vale Rd	Boydell's Rd-Mon	2,183	Rural	Local	Unsealed	Gravel Resheet	2020	\$	87,303.60
210-100	Shannon Vale Rd	Mon-Gate	1,734	Rural	Local	Unsealed	Gravel Resheet	2020	\$	69,346.80
210-110	Shannon Vale Rd	Gate-Drain	2,258	Rural	Local	Unsealed	Gravel Resheet	2020	\$	90,328.40
210-120	Shannon Vale Rd	Drain-Browns Rd	1,914	Rural	Local	Unsealed	Gravel Resheet	2020	\$	76,560.80
210-130	Shannon Vale Rd	Browns Rd-Hwy	1,038	Rural	Local	Unsealed	Gravel Resheet	2020	\$	41,532.40
150-070	Ten Mile Rd	Lockwood (1202)- Coxs Rd	2,251	Rural	Local	Unsealed	Gravel Resheet	2020	\$	90,025.20
150-080	Ten Mile Rd	Coxs Rd - Ramp	1,847	Rural	Local	Unsealed	Gravel Resheet	2020	\$	73,874.00
150-090	Ten Mile Rd	Shaws Rd - Ramp	1,439	Rural	Local	Unsealed	Gravel Resheet	2020	\$	57,568.80
150-100	Ten Mile Rd	Ramp - Pipe	1,963	Rural	Local	Unsealed	Gravel Resheet	2020	\$	78,502.40
150-110	Ten Mile Rd	Pipe - Ramp (Marrawarra)	2,107	Rural	Local	Unsealed	Gravel Resheet	2020	\$	84,288.40
442-010	Bullock Mountain Rd	Emmaville Rd To Gate	1,793	Rural	Local	Unsealed	Gravel Resheet	2021	\$	71,714.00
442-020	Bullock Mountain Rd	Gate To Causeway	2,398	Rural	Local	Unsealed	Gravel Resheet	2021	\$	95,914.00

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Backlog Renewal Co	st
440.000	Bullock Mountain		0 700	Durral	l a sal		Oracial Death ant	0004	ф 440 770 (	
442-030	R0 Dullask Mauntain	Causeway To Pipe	2,769	Rurai	Local	Unsealed	Gravel Resneet	2021	\$ 110,770.8	80
442-040	Rd	Pipe To Osprey	2,015	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 80,618.0	00
442-050	Bullock Mountain Rd	Osprey To Ramp	1,543	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 61,706.8	80
442-060	Bullock Mountain Rd	Ramp To Boolabinda	817	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 32,662.8	80
470-035	Gulf Rd	Bitumen-Ramp	2.926	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 117.020.0	00
470-040	Gulf Rd	Ramp-Top Of Hill	1.783	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 71.306.8	80
470-050	Gulf Rd	Top Of Hill-Pet Resort(Summerville)	2,300	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 92.008.4	<u>40</u>
470-060	Gulf Rd	Pet Resort(Summerville) -Mon	2,212	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 88,460.0	00
271-010	Mt Slow Rd	Mt. Mitchell Rd - Jerockie Rd	2,765	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 110,588.4	40
271-020	Mt Slow Rd	Jerockie Rd -Bridge	2,022	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 80,874.0	00
271-030	Mt Slow Rd	Bridge-Bridge	1,596	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 63,843.6	60
271-040	Mt Slow Rd	Bridge-Costellos	1,019	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 40,750.8	80
205-100	Old Grafton Rd	2nd Leather Jacket - 3rd Leather Jacket	2,285	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 91,388.0	00
205-110	Old Grafton Rd	3rd Leather Jacket - Lingralong	2,390	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 95,586.0	00
205-120	Old Grafton Rd	Lingralong - Causeway	1,747	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 69,897.2	20
205-130	Old Grafton Rd	Causeway - 4 Mile Creek	1,230	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 49,197.6	60
205-140	Old Grafton Rd	4 Mile Creek - Yards	1,819	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 72,744.4	40
205-150	Old Grafton Rd	Yards - Abbey Green	1,862	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 74,482.4	40
205-160	Old Grafton Rd	Abbey Green - Pipe	2,351	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 94,050.0	00
205-170	Old Grafton Rd	Pipe - Kintyre	1,749	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 69,977.6	60
205-180	Old Grafton Rd	Kintyre - Bridge	835	Rural	Local	Unsealed	Gravel Resheet	2021	\$ 33,392.2	20
380-030	Ilparran Rd	Bitumen-Camerons Rd	1,285	Rural	Local	Unsealed	Gravel Resheet	2022	\$ 51,410.0	00
380-040	Ilparran Rd	Camerons Rd- Illparan Ramp	2,040	Rural	Local	Unsealed	Gravel Resheet	2022	\$ 81,581.6	60
386-010	Jenkins Rd	Illparran Rd - Grid	1,879	Rural	Local	Unsealed	Gravel Resheet	2022	\$ 75,153.6	60

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	Re	Backlog newal Cost
		Cemetery-							•	
456-010	Nant Park Rd	Benbraggie	1,333	Rural	Local	Unsealed	Gravel Resheet	2022	\$	53,320.00
450.000		Benbraggie-	4 750	<b>.</b> .					•	70.000.40
456-020	Nant Park Rd	Kamaruka	1,752	Rural	Local	Unsealed	Gravel Resheet	2022	\$	70,092.40
456-030	Nant Park Rd	Kamaruka-Allison	2,048	Rural	Local	Unsealed	Gravel Resheet	2022	\$	81,932.80
490-030	Tent Hill Rd	Bitumen To Gate (# 3955)	1,568	Rural	Local	Unsealed	Gravel Resheet	2022	\$	62,727.20
490-040	Tent Hill Rd	Gate (# 3955) To Old Womans Swamp Ck	2,092	Rural	Local	Unsealed	Gravel Resheet	2022	\$	83,682.40
490-050	Tent Hill Rd	Old Womans Swamp Ck To Bark Hut Ck	1,893	Rural	Local	Unsealed	Gravel Resheet	2022	\$	75.727.60
490-070	Tent Hill Rd	Ramp To Wallaroo (# 3401)	1,300	Rural	Local	Unsealed	Gravel Resheet	2022	\$	51,997.60
490-080	Tent Hill Rd	Wallaroo (# 3401) To Bitumen	1 654	Rural	Local	Unsealed	Gravel Resheet	2022	\$	66 140 80
180-010	Yahna Rd	Gwydir Hwy-Gate	2 020	Rural	Local	Unsealed	Gravel Resheet	2022	\$	80 803 20
180-020	Yahna Rd	Gate-Mon	2 263	Rural	Local	Unsealed	Gravel Resheet	2022	\$	90,528,00
180-030	Yahna Rd	Mon-Morven Rd	1 999	Rural	Local	Unsealed	Gravel Resheet	2022	\$	79 963 20
100 000		100Km Sign-	1,000	Rului	Looal	Onseared	Claver resheet	2022	Ψ	10,000.20
240-010	Tablelands Rd	Cookes	1,521	Rural	Local	Unsealed	Gravel Resheet	2022	\$	60,838.00
240-020	Tablelands Rd	Cookes-Grid	2,021	Rural	Local	Unsealed	Gravel Resheet	2022	\$	80,828.40
240-030	Tablelands Rd	Grid-Ramp	1,682	Rural	Local	Unsealed	Gravel Resheet	2022	\$	67,276.00
240-040	Tablelands Rd	Ramp-Ramp	2,318	Rural	Local	Unsealed	Gravel Resheet	2022	\$	92,703.20
240-050	Tablelands Rd	Ramp-Kingsgate Ramp	1,328	Rural	Local	Unsealed	Gravel Resheet	2022	\$	53,122.80
240-060	Tablelands Rd	Kinsgate Ramp-Old	1.738	Rural	Local	Unsealed	Gravel Resheet	2022	\$	69.501.20
240-070	Tablelands Rd	Old Ramp-Ramp	1,394	Rural	Local	Unsealed	Gravel Resheet	2022	\$	55.773.60
240-080	Tablelands Rd	Ramp-Bridge	1 689	Rural	Local	Unsealed	Gravel Resheet	2022	\$	67 570 80
240-090	Tablelands Rd	Bridge-Intersection	1,667	Rural	Local	Unsealed	Gravel Resheet	2022	\$	66 692 00
240-100	Tablelands Rd	Intersection-Ramp	1,518	Rural	Local	Unsealed	Gravel Resheet	2022	\$	60 704 80
240-110	Tablelands Rd	Ramp-End	1,010	Rural	Local	Unsealed	Gravel Resheet	2022	\$	43 313 60
250.040		Furracabad Ck	076	Purol	Local	Socied		2010	¢	20.022.04
550-040		Furracabad Rd-	970	ruidi	LUCAI	Sealeu		2019	Φ	<i>ა</i> ⊎,∪∠3.∪4
365-010	Cherry Tree Rd	Gravel	246	Rural	Local	Sealed	Convert to gravel	2019	\$	9,844.08
430-060	Polhill Rd	Rd	2,912	Rural	Local	Sealed	Convert to gravel	2019	\$	116,476.00

Road/Seg No.	Road	Description	GIS Map Length (m)	Urban / Rural	State Class	Surface	Rehab type	Backlog Renewal Year	l Rer	Backlog newal Cost
		Bitumen To Rangers								
456-070	Nant Park Rd	Valley Rd	261	Rural	Local	Sealed	Convert to gravel	2019	\$	10,449.04
		Golf Club - Lahara								
110-54	Golf Links Rd	Rd	863	Rural	Local	Sealed	Convert to gravel	2024	\$	34,522.84
		Lahara Rd-stream								
110-56	Golf Links Rd	(culvert)	732	Rural	Local	Sealed	Convert to gravel	2024	\$	29,274.28
	Old Ben Lomond	Gravel To End								
320-050	Rd	Bitumen	668	Rural	Local	Sealed	Convert to gravel	2024	\$	26,718.76



## GLEN INNES SEVERN COUNCIL Infrastructure Backlog Management Plan

RESOLUTION NUMBER: 33.09/18	MEETING:	27 September 2018

Refer to attached document.

140 .... General Manager

25-10-2018. Date

Reference Number:	Version Number: Initial Draft Date of Effect: 18/04/18	Review Date: September 2019	Responsible Officer: DIS
Related Documents:			