ITEM NUMBER: 18.2

CONFIDENTIAL REPORT

TENDER EXEMPTION REQUEST - SUPPLY OF ASPHALT SERVICES (Report No: 275/20)

Pursuant to Section 90(2) of the Local Government Act 1999 the Report attached to this agenda and the accompanying documentation is delivered to the Council Members upon the basis that the Council consider the Report and the documents in confidence under Part 3 of the Act, specifically on the basis that Council will receive, discuss or consider:

b. **Information the disclosure of which could reasonably be expected to confer a commercial advantage on a person with whom the council is conducting, or proposing to conduct, business, or to prejudice the commercial position of the council; and would, on balance, be contrary to the public interest.**

d. **commercial information of a confidential nature (not being a trade secret) the disclosure of which could reasonably be expected to prejudice the commercial position of the person who supplied the information, or to confer a commercial advantage on a third party; and would, on balance, be contrary to the public interest.**

Recommendation – Exclusion of the Public – Section 90(3)(b and d) Order

1 That pursuant to Section 90(2) of the *Local Government Act 1999* Council hereby orders that the public be excluded from attendance at this meeting with the exception of the Chief Executive Officer and Staff in attendance at the meeting in order to consider Report No: 275/20 - Tender Exemption Request - Supply of Asphalt Services in confidence.

2. That in accordance with Section 90(3) of the *Local Government Act 1999* Council is satisfied that it is necessary that the public be excluded to consider the information contained in Report No: 275/20 - Tender Exemption Request - Supply Of Asphalt Services on the following grounds:

b. pursuant to Section 90(3)(b) of the Act, the information to be received, discussed or considered in relation to this Agenda Item is information the disclosure of which could reasonably be expected to confer a commercial advantage on a person with whom the Council is

conducting business;
proposing to conduct business;
would prejudice the commercial position of the Council

In addition, the disclosure of this information would, on balance, be contrary to the public interest. The public interest in public access to the meeting has been balanced against the public interest in the continued non-disclosure of the information. The benefit to the public at large resulting from withholding the information outweighs the benefit to it of disclosure of the information.

d. pursuant to Section 90(3)(d) of the Act, the information to be received, discussed or considered in relation to this Agenda Item is commercial information of a confidential nature (not being a trade secret) the disclosure of which could reasonably be expected

to prejudice the commercial position of the person who supplied the information,
to confer a commercial advantage on a third party being a competitor.

In addition, the disclosure of this information would, on balance, be contrary to the public interest. The public interest in public access to the meeting has been balanced against the public interest in the continued non-disclosure of the information. The benefit to the public at large resulting from withholding the information outweighs the benefit to it of disclosure of the information.

3. The Council is satisfied, the principle that the meeting be conducted in a place open to the public, has been outweighed by the need to keep the information or discussion confidential.

Item No: **18.2**

Subject: **TENDER EXEMPTION REQUEST - SUPPLY OF ASPHALT SERVICES**

Date: 22 September 2020

Written By: Project Manager

General Manager: City Assets and Services, Mr H Lacy

SUMMARY

The existing Minor Works contract and rights of renewal for the Supply of Asphalt Services with Fulton Hogan has expired. The Administration has a 2020/21 Road Reseal program to deliver this financial with a budget of $952,500.

The City of Holdfast Bay's Procurement Policy requires purchasing services or products greater than $50,000 to be tendered in the open market. If the procurement value is greater than $100,000 and an open tender is not called, a Council approval is required.

Calling an open market tender, at this time of the year will carry a risk of carry forward and may not result in increased value for money or increase the quality delivery.

Fulton Hogan has submitted a proposal to extend their expired contract. The benefits to Council include reduced rates compared with the 2019/20 rates for services as well as reduced cost for Council's coordination and administration costs. Fulton Hogan have performed extremely well and have been Council's supplier for a number of years. In Administration's view, their extension proposal represents good value for money and provides Council with a cost effective approach to deliver the 2020/21 roads program on time and within budget.

Administration is therefore seeking an exemption to award an extension of the Supply of Asphalt Services to Fulton Hogan for a 1 year period commencing 1 August 2020 as provided in Council's Procurement Policy which otherwise would require a call for open tenders. The estimated value of the proposed contract extension is $925,500.

It is Administration's intention to prepare tender documents and advertise for open market tenders for the next contract period prior to the expiry of the requested extension.

RECOMMENDATION

That Council:

1. **approve award an extension of the Supply of Asphalt Services Contract 2014 C04 for a period of 12 months commencing from 1 August 2020 to Fulton Hogan to deliver the**

products and services under the terms and conditions of their expired Contract 2014 C04 subject to the following changes:

a) include the amended schedule of rates as per Attachment 1;
b) include services and rates for recycled asphalt products to be used in selected streets as per Attachment 2;
c) include line marking services where appropriate for as per rates included in Attachment 3; and
d) extend the Defects Liability period from 26 weeks to 52 weeks.

2. authorise the Chief Executive to execute any necessary documentation to put effect to the resolution; and

3. request Administration prepare documentation for an open tender procurement process to deliver Council's Road Reconstruction, Sealing, Asphalt and Linemarking services commencing from August 2021.

RETAIN IN CONFIDENCE - Section 91(7) Order

4. that having considered Agenda Item 18.2 Report No: 275/20 - Tender Exemption Request - Supply of Asphalt Services in confidence under Section 90(2) and (3)(b and d) of the *Local Government Act 1999*, the Council, pursuant to Section 91(7) of that Act orders that the report and attachments be retained in confidence for a period of 18 months and that the Chief Executive Officer is authorised to release the documents at the conclusion of that period and that this order be reviewed every 12 months.

COMMUNITY PLAN

Placemaking: Creating lively and safe places
Environment: Using resource efficiently
Culture: Enabling high performance
Culture: Being financially accountable
Culture: Supporting excellent, efficient operations

COUNCIL POLICY

Procurement Policy - Clauses 3.2 and 3.5

STATUTORY PROVISIONS

Not Applicable.

ATTACHMENTS

Attachment 1 - Fulton Hogan Contract 2020 C04 Rates Proposal for the extension
Attachment 2 - Fulton Hogan Added Innovation Variation – Contract 2014 C04

Attachment 3 - Line Marking Rates

BACKGROUND

Council's Procurement Policy requires purchasing services or products greater than $50,000 to be tendered in the open market. If the procurement value is greater than $100,000 and an open tender is not called, Council approval is required.

In 2014, an open tender was called for the *Road Re-Seal Services – Supply and Lay Hot Mix* (Contract 2014 C04). Following tender reviews, the contract was awarded to Fulton Hogan to commence on 19 July 2014 for 3 years with 2 x 1 year extension options.

Due to the high quality work, competitive pricing and close cooperation with Holdfast Bay project staff, each of the renewal options were exercised with the contract expiry date being set at 30 June 2019. The original contract was then further extended until 30 March 2020 via a signed addendum by the then CEO.

Following the successful delivery of the 2019/20 roads capital program, a program delivery review was initiated in early March 2020 to ascertain the most cost effective means of delivering the 2020/21 Roads Capital Works program which typically commences in October.

The two (2) options were considered:

- Preparation of new specifications and call for open tenders for a new contract; and
- Extending the previous contract with Fulton Hogan with revised pricing and service mix.

Fulton Hogan submitted a new rates proposal to the Administration on 15 June 2020, however due to COVID-19 and internal staff changes, the review was not finalized.

In August 2020, with a new project manager appointed, the review recommenced to examine which of the two (2) options would deliver on quality, time and value for money standards.

Staff sought additional information from Fulton Hogan on 14 August 2020 which was submitted on 28 August 2020 and included:

- reduction in rates per ton of asphalt supply by 4. 5% on the previous year;
- offer of additional line marking services at more competitive rates than Council's existing contractor;
- offer of 2 additional recycled products; and
- extension of the defects liability period from 6 to 12 months.

Details of this revised offer are presented in Attachments 1, 2 and 3.

Refer Attachments 1, 2 and 3

The review concluded that undertaking an open tender process, contract negotiations and on-boarding a new service provider would increase the risk of the roads program being delivered

outside the optimal road capital works period (October – March) and would likely attract program delays to meet quality outcomes.

The review also identified a delivery risk that a new contractor may not be able to prioritise council's resealing program, due to other councils and the Department of Planning and Transport having secured preferred contractors during the optimal resealing period. This situation would decrease the likelihood of attracting quality suppliers and/or increase the likelihood of project carry forwards into the 2021/22 financial year.

REPORT

The program delivery review concluded that the proposal by Fulton Hogan dated 28 August 2020 offered greater certainty in quality, value for money and timely program delivery, rather than risk going out to the open tender.

Council is committed to providing best value to the community within the framework of fairness, transparency and accountability in the purchasing it undertakes. The Procurement Policy requires contracts with a forecast spend greater than $50,000 be tendered in the open market to:

- achieve cost effective services; and
- provide a fair and transparent process for calling tenders and entering into contracts in those circumstances.

By not releasing the services to the open market, a new or local service provider may miss an opportunity to perform this work.

It is possible that another company may provide competitive rates, however their quality and time efficiency would remain unsubstantiated (no past performance evidence) and a risk.

Council's Procurement Policy includes provision for Council to resolve that a contract can be awarded without open tender if it results in delivery of a superior outcome for Council.

Based on the program delivery review undertaken for this contract, Administration believes the award of a contract extension to Fulton Hogan achieves this for the following reasons:

1. Fulton Hogan were evaluated as providing value for money during an open tender process and any annual rate increase were a result of CPI.
2. Proposed rates for the contract extension are on average 4% below applied last year's rates, which further demonstrates value for money and market competitiveness.
3. Fulton Hogan has confirmed that they have capacity and willingness to prioritise the Council's Roads Capital Works program and commence delivery in October 2020
4. Fulton Hogan understand the quality, service and delivery expectations of Council. This understanding will result in reduced resourcing to control quality, impact on stakeholders and program delivery time.

BUDGET

The current roads capital works budget (which will equate to the forecast expenditure under the contract extension) is $952,500.

LIFE CYCLE COSTS

Fulton Hogan have agreed to increase their Defects Liability period from 26 weeks to 52 without increasing their rates. The additional defects period will result in lower life cycle costs due to extended defect identification time.

Attachment 1

Fulton Hogan Industries Pty Ltd
ABN: 54 000 538 689

367 South Road
Mile End South SA 5031
Telephone +61 8 8443 2000
Facsimile +61 8 8234 0135
www.fultonhogan.com

Wednesday, 15th June 2020

Attention: Mr Rajiv Mouveri

City of Holdfast Bay
PO Box 19
Brighton SA 5048

Dear Rajiv,

Re: Roll over of Contract No 2014 C04

As discussed, Fulton Hogan (FH) are keen to support the City of Holdfast through COVID-19. FH are aware of changes that are happening externally and internally in the council, and as such FH have reviewed our offering to council and we are delighted to provide what we believe are two important opportunities to support council.

First is a reduction in our current pricing structure for Hotmix as well as Profiling. FH are looking to pass on a bitumen price reduction, as well as discount on our margin.

Second, FH is aware of the resource constraints for council, and as part of our service to council FH are willing to take full ownership of the line marking delivery for council, at a cost plus 7.5% arrangement.

In regards to a pricing structure, the table below represents the reduction from the current Feb 2020 pricing, and this would be applied for Hotmix going forward (subject to rise and fall).

Schedule Item	Description	Unit	Rate Effective 29 February 2020 (excl. GST)	Decrease	Rate Effective 1 June 2020 (excl. GST)
AC10	AC10 mix up to 50mm thick	tn	$177.90	$7.40	$170.50
AC10	AC10 mix in excess of 50mm thick	tn	$172.91	$7.40	$165.51
AC7	AC7 mix up to 50mm thick	tn	$179.22	$7.40	$171.82
AC14	AC14 mix up to 50mm thick	tn	$170.46	$7.40	$163.06
AC7	AC7 mix up to 30mm thick (tennis court reseals)	tn	$211.22	$7.40	$203.82

**Adjustment is based on design binder content of 5.5%,*
**Bitumen list price of $1,200 (May 2020)*
**This is also subject to the yearly CPI increase in July.*

In regards to a pricing structure for Profiling, FH have reviewed the schedule, and the following is representation of the most highly used rate by council for all asphalt works.

Schedule Item	Description	Unit	Rate Effective 29 February 2020 (excl. GST)	Decrease	Rate Effective 1 June 2020 (excl. GST)
Local Area	40mm (maximum)	M2	$5.76	$0.50	$5.26

**This is also subject to the yearly CPI increase in July.*

In regards to line marking, FH have extensive experience with managing line marking upon completion of our scope, and as such, we are very capable of managing the existing council line marking subcontractor around notifications, timing, scoping, invoicing and QA.

FH are aware of the critical nature of line marking, and FH believe that by managing the interface with the existing line marking contractor, the risk to Council is greatly reduced.

Can I ask that you please review and consider our offer, and let me know if you need any further information. We are happy to meet the council to discuss further if required.

Yours sincerely,

Ben Muller
Divisional Manager – Surfacing
Fulton Hogan Infrastructure Services

Attachment 2

Fulton Hogan

CITY OF HOLDFAST BAY

SUPPORTING INFORMATION RELATING TO SUSTAINABLE, INNOVATIVE AND VALUE ADDED PRODUCTS AND SERVICES ON OFFER BY FULTON HOGAN

CONTRACT NO. 2014 C04

Electronic Submission: 19 August 2020

Fulton Hogan Response

Price Variations

Fulton Hogan have included 3 Schedule of Rates items for AC10 High Recycled Content Mixes:

- AC10M 30% RAP
- TyrePhalt®
- PlastiPhalt®

Please refer to the return pricing schedule for associated costs.

Further detail on these and other sustainable, innovative and value adding products and services offered by Fulton Hogan are provided in following pages of this document

Innovation

Fulton Hogan has included below a number of our innovative and value adding products and services we believe can assist the City of Holdfast Bay in delivering your **Strategic Plan: Our Place 2030** & **Open Space and Public Realm Strategy 2018-2030**

We would be pleased to further discuss these initiatives with Council project stakeholders to ensure we deliver to Council a strong infrastructure management and maintenance capability for future years.

PlastiPhalt®

- PlastiPhalt® is designed to reflect Austroads A35P criteria using recycled plastic. We have a local Adelaide-based supplier of plastic which is sourced from local Councils' yellow recycling bins and supports Fulton Hogan's commitment to the Circular Economy.

  Further to that, Fulton Hogan uses 20% RAP in PlastiPhalt® and is moving toward the use of foundry sand in this mix.
- Fulton Hogan's NATA accredited production and core reports for this mix are provided in the following pages together with the PlastiPhalt® case study.

TyrePhalt®

- TyrePhalt® is a dense graded crumb rubber asphalt mix that incorporates recycled crumbed tyres and provides great flexibility properties. We will be undertaking performance testing in the coming months to provide additional local data. This is a great product for thin surfaces on granular base.

  Our NATA accredited production and core reports for this mix are provided in the following pages.

Gap Graded Rubber

- Gap graded rubber is high performance product that is great for heavily trafficked roads.

Warm Mix Asphalt

- Warm Mix asphalt is a sustainable, lower temperature alternative to traditional hot mix. As Warm Mix is produced and placed at lower temperatures, it provides considerable energy consumption savings during production, reduced greenhouse gas emissions and a safer product for handling by asphalt crews.

  Our product brochure for Warm Mix is provided in the following pages.

RoadBotics®

- Roadbotics® solution for condition assessment of sealed road network – supporting effective, pro-active maintenance management, works prioritisation and budgeting.

  Our product brochure for Roadbotics® is provided in the following pages.

Post Surfacing Lime Placement

- Fulton Hogan are seeking a local delivery partner to undertake a possible field trial of the placement of hydrated lime or agricultural lime on the surface of a freshly laid asphalt wearing surface in the coming summer of 2020 / 21.
- We are currently researching, and undertaking laboratory trials to confirm the colour changing effects of the lime on the wearing surface, with the intention of increasing its heat reflective properties. Longevity of this treatment requires further testing before a field trial can take place.

Recycled Asphalt Product (RAP)

- Fulton Hogan process RAP to be incorporated into asphalt; for any Polymer Modified Binders (PMB) asphalts a maximum of 20% RAP is used.

  For all straight binders we consistently include 30% in the mix with rejuvenation oils to ensure the binder has C320 properties (as permitted by specification); and we are working towards the inclusion of up to 40% RAP.

- Additionally, as a partial replacement of natural sand in some of our mixes, we are working towards including locally sourced foundry sand used for castings, which is considered a waste stream product that would otherwise go to landfill. This will make up about 5% of the total product.
- Our aim is to manufacture an asphalt that has 50% recycled product and is ***fully engineered and sustainable.***

  To achieve this, we are continually focused on improving our production methodologies. As part of this strategy, we are currently working with other Councils to source a clean waste stream of glass, which will assist in reaching the 50% recycled target - once again by sourcing from local South Australian producers.

High Binder, Low Air Void Mixes

- Fulton Hogan notes that an increase in the stiffness of asphalt exposes the asphalt to the risk of cracking - either through traffic loadings or environmental factors.

  Where Council streets have low traffic volumes, the application of our High Binder, Low Air Void Mix, specifically designed and engineered by Fulton Hogan, will reduce the rate of oxidization of the asphalt - thereby reducing moisture penetration into the pavement and prolonging the durability and service life of the asphalt.

  This application will therefore deliver for Council a greater ROI for such works and reduce Whole-of-Life costs as there will be less frequent future maintenance required.

JetCool®

- Initially developed by Fulton Hogan for the aviation industry, Jetcool is a trafficable, light colored surfacing treatment to reduce environmental heat from asphalt. In a community setting, such treatments would be valued by local constituents and visitors to the City of Holdfast Bay with regard to roads, playgrounds, walking paths and the like, where the impact of summer temperatures and reflective heat can be reduced.

Value Management

Fulton Hogan will always seek to add value and apply innovative practices in the delivery of our services.

Further, our focus will always be to deliver high quality outcomes in a timely and cost effective manner while ensuring safety is our key priority in the conduct of any works program we undertake for the City of Holdfast Bay.

The capabilities and applications mentioned in our Price Variations and Innovations schedules above will provide the City of Holdfast Bay with the opportunity to improve roading infrastructure management and maintenance, improve whole of life costs, increase ROI on operating expenditure - and offer environmentally sensitive benefits in the delivery of current and future works programs.

Recycled Products

- Incorporating recycled materials into our surfacing products reduces the requirement for virgin materials and humanities drain on finite natural resources. Fulton Hogan (SA) go the next step in sourcing recycled materials from South Australia, then Australia wherever possible.

Reducing Whole of Life Asset Costs

- Whether it be Roadbotics® identifying treatments to extend an asset's serviceable lifespan; inclusion of a recycled material to delay the effects of environmental failure on a wearing surface; improved asphalt production methodologies to reduce energy needs and carbon emissions, Fulton Hogan will work with the City of Holdfast Bay to deliver value for money solutions and ensure Council's targeted infrastructure management outcomes are achieved.

Process Control

- With a focus on continuous improvement, Fulton Hogan has become a *Process Controlled Plant*, meeting DPTI requirements.

  Being process controlled is a manufacturing strategy to eliminate production inefficiencies, poor quality asphalt and enable process variability monitoring and control in the production of asphalt.

  This strategy is particularly important when using natural and recycled materials which are inherent to the production process - but have natural characteristic variability. Such variables are therefore monitored - and step changes identified and applied, to maintain productivity in the production process.

  The result is a high quality end product which meets specifications to ensure the product performs as designed.

Roadbotics® a Proactive and Pre-emptive Maintenance Management Capability

- Fulton Hogan is pleased to offer to the City of Holdfast Bay our Roadbotics® solution for condition assessment of sealed road network – supporting effective maintenance management, works prioritisation and budgeting.

Fulton Hogan

Building communities

PRICING PROPOSAL

Fulton Hogan

Building communities

Pricing Proposal

Fulton Hogan has included the following pricing table for consideration by Council. We respectfully note our pricing is subject to the below mentioned assumptions:

- Assumes all works are completed in one shift.
- Rates allow for one mobilisation each shift (multiple site locations in a single shift may incur additional floating costs)
- Due to the binder manufacturing process of PlastiPhalt L® & TyrePhalt ® binders, orders of asphalt must be 160t or greater.
- All rates are subject to rise and fall in the ex-refinery (Birkenhead, SA) cost of C320 bitumen which is currently listed at $1,355.00 per tonne as of the 1st August 2020.

Service Item	Description	Quantity	Unit	$ Rate (Ex GST)
1	Supply, Lay & Compact AC10M C320 (30% RAP)	50+	Tonne	$ 404.96
2	Supply, Lay & Compact AC10M C320 (30% RAP)	100+	Tonne	$ 273.74
3	Supply, Lay & Compact AC10M C320 (30% RAP)	200+	Tonne	$ 190.62
4	Cost increase for AC10 PlastiPhalt L® *	1	Tonne	$ 22.90
5	Cost increase for AC10 TyrePhalt ® *	1	Tonne	$ 29.40
6	Cost decrease for Warm Mix (off items 1,2,3,4,5 only)	1	Tonne	-$ 1.00
7	Provision of VMS	1	Each / Week	$ 330.00
* Due to the binder manufacturing process of PlastiPhalt L® & TyrePhalt ® binders, orders of asphalt must be 160t or greater				

Fulton Hogan

Building communities

PLASTIPHALT® & TYREPHALT® PRODUCTION AND COMPACTION REPORTS

Mile End Binder Laboratory

367 South Road , Mile End, SA 5033

Telephone: +618 8219 5810
Facsimile:
www.fultonhogan.com

Report No: BIT:DRC20B-0139
Issue No: 1

Bitumen Test Report

Client:
SA Blending
115 - 119 Churchill Road North
Dry Creek

Adelaide SA 5094
AU

Project: QA Testing - Binders

NATA ACCREDITED FOR TECHNICAL COMPETENCE

The results in this report relate only to the items / samples that were tested

Accredited for compliance with ISO/IEC 17025 - Testing. The results of tests, calibrations and/or measurements included in this document are traceable to Australian / national standards.

Approved Signatory: Kamal Sehra

NATA Accreditation No:15085
Date of Issue: 9/04/2020

Sample Details

Sample ID:	DRC20B-0139	**Date Sampled:**	06/04/2020
Client Sample ID:		**Sampled By:**	Brian Higgins
Product:	PlastiPhalt-L Binder	**Sampling Method:**	AG:PT/T101 - 06
Plant:	SA - Blending Plant	**Sampling Endorsed?:**	Yes
Batch Number:	20-089	**Stirring Time (hr):**	
Date Manufactured:	06/04/2020	**Tank ID:**	ST-1
Taken From:	Dry Creek - Blending Plant	**Truck/Tanker ID:**	
Handling Method:	AG:PT/T102	**Date Received:**	08/04/2020
Sample Volume (L):	1	**Date Tested:**	08/04/2020
Container Type:	1 litre tin	**Technician:**	Paul Brooks
Sampled From:	ST-1		
Specification:	Dry Creek - PlastiPhalt-L Binder		

Test Results

Description	Method	Result	Limits
Viscometer Make/Model	AG:PT/T111 - 2006	Brookfield LVDV-3T	
Spindle Number			
Testing Temperature (°C)		165.0	
RPM		70.0	
Average Handling Viscosity (Pa.s)		0.26	≤0.6
Mean Torsional Recovery (%)	AG:PT/T122 - 2006	6	6.0 – 21.0
Test Temperature (°C)		25.0	
Recovery Time (s)		30	
Softening Point (°C)	AS 2341.18 - 1992	64.0	62 – 74
Bath Liquid		Water	

Comments

N/A

Mile End Binder Laboratory

367 South Road , Mile End, SA 5033

Telephone: +618 8234 0800
Facsimile:
www.fultonhogan.com

Report No: BIT:DRC20B-0103
Issue No: 1

Bitumen Test Report

Client:
SA Blending
115 - 119 Churchill Road North
Dry Creek

Adelaide SA 5094
AU

Project: QA Testing - Binders

NATA ACCREDITED FOR TECHNICAL COMPETENCE

The results in this report relate only to the items / samples that were tested

Accredited for compliance with ISO/IEC 17025 - Testing. The results of tests, calibrations and/or measurements included in this document are traceable to Australian / national standards.

Approved Signatory: Kamal Sehra

NATA Accreditation No:15085
Date of Issue: 31/03/2020

Sample Details

Sample ID:	DRC20B-0103	**Date Sampled:**	27/03/2020
Client Sample ID:	43T	**Sampled By:**	Mick Kisielicki
Product:	TyrePhalt-L Binder	**Sampling Method:**	AG:PT/T101 - 06
Plant:	SA - Blending Plant	**Sampling Endorsed?:**	Yes
Batch Number:	20-079	**Stirring Time (hr):**	
Date Manufactured:	27/03/2020	**Tank ID:**	
Taken From:	Dry Creek - Blending Plant	**Truck/Tanker ID:**	
Handling Method:	AG:PT/T102	**Date Received:**	27/03/2020
Sample Volume (L):	1	**Date Tested:**	27/03/2020
Container Type:	1 litre tin	**Technician:**	Kamal Sehra
Sampled From:	ST-2		
Specification:	Dry Creek - TyrePhalt-L Binder		

Test Results

Description	Method	Result	Limits
Viscometer Make/Model	AG:PT/T111 - 2006	Brookfield LVDV-3T	
Spindle Number		SC4-31	
Testing Temperature (°C)		175.0	
RPM		20.0	
Average Handling Viscosity (Pa.s)		1.3	≤2.0
Viscometer Make/Model	AG:PT/T111 - 2006	Brookfield LVDV-3T	
Spindle Number		SC4-31	
Testing Temperature (°C)		165.0	
RPM		15.0	
Average Handling Viscosity (Pa.s)		1.6	≤2.0
Mean Torsional Recovery (%)	AG:PT/T122 - 2006	44.7	≥25
Test Temperature (°C)		25.0	
Recovery Time (s)		30	
Softening Point (°C)	AS 2341.18 - 1992	60.5	60 – 70
Bath Liquid		Water	

Comments

N/A

Mile End Laboratory

367 South Road, Mile End South, SA 5033
PO Box 158, Marleston, SA 5033
Telephone: +618 8219 5810
Facsimile: +618 8234 0135
www.fultonhogan.com

Asphalt Test Report

Report No: ASP:MED20M-0521
Issue No: 1

Client:
SA Production
367 South Road
Mile End

Adelaide SA 5031
AU

Project: QA Testing-Asphalt

Accredited for compliance with ISO/IEC 17025 - Testing. The results of tests, calibrations and/or measurements included in this document are traceable to Australian / national standards.

The results in this report relate only to the items / samples that were tested

Approved Signatory: Kamal Sehra

NATA Accreditation No:3016
Date of Issue: 21/04/2020

Sample Details

Sample ID:	MED20M-0521	**Mix Design #:**	
Date Manufactured:	06/04/2020	**Mix Temp (°C):**	188
Date Sampled:	06/04/2020	**Sampled At (T):**	89
Date Tested:	06/04/2020	**Total Tonnage (T):**	104
Production Lot:		**Sample Endorsed:**	Yes
Mix:	AC10M PlastiPhalt-L		
Plant:	Mile End - Asphalt Plant		
Site/Sampled From:	Docket No.95385		
Specification:	Mile End - AC10M-AS2150		
Sampled By:	Paul Brooks		
Sampling Method:	DPTI-MAT-TP 425		
Tested By:	Paul Brooks		

Other Test Results

Description	Method	Result	Limits
Bitumen Content (%)	AS 2891.3.3	5.5	=5.4±0.3
Solvent		R55, Turp	
Moisture and Volatiles Content (%) *			
Maximum Density (t/m³)	AS 2891.7.1	2.464	
Air Voids - 80 Cycles (%)	AS 2891.8	3.8	3.0 – 7.0
Bulk Density - 80 Cycles (t/m³)	AS 2891.9.2	2.369	
Gyratory Angle (°)	TSA-MAT-TP428	2.0	
Number of Cycles		80	

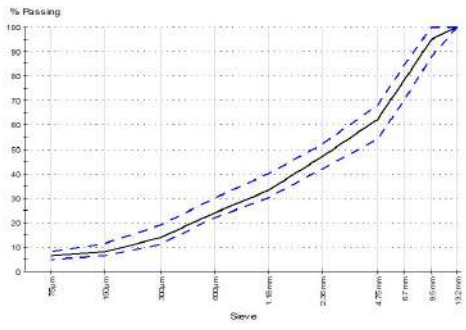
Particle Size Distribution

Method: AS 2891.3.3, AS 1141.11.1
Drying by: Oven

Note: Sample Washed

Sieve Size	% Passing	Limits
13.2mm	100	100 – 100
9.5mm	95	88 – 100
6.7mm	78	70 – 84
4.75mm	62	54 – 68
2.36mm	47	42 – 52
1.18mm	33	30 – 40
600µm	24	22 – 30
300µm	14	11 – 19
150µm	8.2	6.4 – 11.4
75µm	6.4	5.2 – 8.2

Chart



Comments

* Solvent Used: R55, Turp

Mile End Laboratory

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Report No: ASP:MED20M-0483
Issue No: 1

Asphalt Test Report

Client:
SA Production
367 South Road
Mile End

Adelaide SA 5031
AU

Project: QA Testing-Asphalt

Accredited for compliance with ISO/IEC 17025 - Testing. The results of tests, calibrations and/or measurements included in this document are traceable to Australian / national standards.

The results in this report relate only to the items / samples that were tested

Approved Signatory: Kamal Sehra

NATA Accreditation No:3016
Date of Issue: 30/03/2020

Sample Details

Sample ID:	MED20M-0483	**Mix Design #:**	
Date Manufactured:	27/03/2020	**Mix Temp (°C):**	190
Date Sampled:	27/03/2020	**Sampled At (T):**	110
Date Tested:	27/03/2020	**Total Tonnage (T):**	342
Production Lot:		**Sample Endorsed:**	Yes
Mix:	AC10 TyrePhalt-L		
Plant:	Mile End - Asphalt Plant		
Site/Sampled From:	Docket No. 95125		
Specification:	Mile End - AC10M-AS2150		
Sampled By:	Paul Brooks		
Sampling Method:	DPTI-MAT-TP 425		
Tested By:	Paul Brooks		

Other Test Results

Description	Method	Result	Limits
Bitumen Content (%)	AS 2891.3.3	5.3	=5.4±0.3
Solvent		Turps, R55	
Moisture and Volatiles Content (%) *		0.01	
Maximum Density (t/m³)	AS 2891.7.1	2.452	
Air Voids - 80 Cycles (%)	AS 2891.8	5.1	3.0 – 7.0
Bulk Density - 80 Cycles (t/m³)	AS 2891.9.2	2.326	
Gyratory Angle (°)	TSA-MAT-TP428	2.0	
Number of Cycles		80	

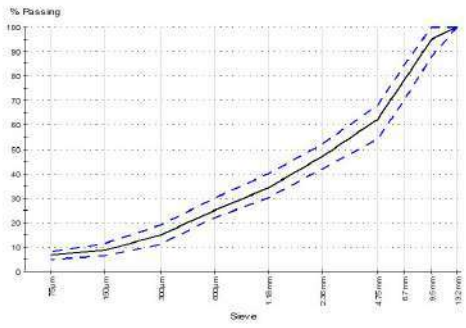
Particle Size Distribution

Method: AS 2891.3.3, AS 1141.11.1
Drying by: Hotplate

Note: Sample Washed

Sieve Size	% Passing	Limits
13.2mm	100	100 – 100
9.5mm	95	88 – 100
6.7mm	78	70 – 84
4.75mm	62	54 – 68
2.36mm	47	42 – 52
1.18mm	34	30 – 40
600µm	25	22 – 30
300µm	15	11 – 19
150µm	8.8	6.4 – 11.4
75µm	6.7	5.2 – 8.2

Chart



Comments

* Solvent Used: Turps, R55
Actual crumb rubber binder content in the mix is 5.9%

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Asphalt Core Test Report

Report No: USR:MED20M-0105
Issue No: 1

Client: SA Laying
367 South Road, Mile End, Adelaide, AU 5031

Project: City of Salisbury

Accredited for compliance with ISO/IEC 17025 - Testing. The results of tests, calibrations and/or measurements included in this document are traceable to Australian / national standards.

Accreditation No: 3016

Approved Signatory: Kamal Sehra

Date of Issue: 5/02/2020

Sample Details

Sample ID:	MED20M-0105	Date Laid:	24/01/2020
Mix Design ID:		Date Cored:	24/01/2020
Asphalt Mix:	AC10M PlastiPhalt-L	Date Tested:	24/01/2020
Location:	Byron Bay Drive	Laid By:	FH-GH
Specification:	Mile End - AC10M-AS2150	Cored By:	Brandon Penny Phillips
Laying Lot:	BBD 003	Tested By:	Brandon Penny Phillips

Result Summary

DPTI-TP061, AS2891.1.2, AS2891.9.2, AS2891.8

Average Maximum Density [t/m³]:	2.463	Upper Characteristic Air Void [%]:	6.1
Average Bulk Density [t/m³]:	2.323	Lower Characteristic Air Void [%]:	5.3
Average Core Depth [mm]:	45	Max Specification Limit [%]:	8.0
Type of Layer:	WC	Min Specification Limit [%]:	2.5
K-Factor:	0.720	% Max Density Standard Deviation [%]:	0.584
Average Air Void [%]:	5.7		

Test Results

Core ID	Chainage [m]	Offset [m]	Offset Reference	Bulk Density [t/m³]	%Max Density [%]	Air Voids [%]	Core Depth [mm]
1 WC	31	3.46	LHS	2.351	95.5	4.5	47
2 WC	45	5.97	LHS	2.310	93.8	6.2	43
3 WC	104	3.59	LHS	2.315	94.0	6.0	47
4 WC	110	3.36	LHS	2.325	94.4	5.6	47
5 WC	145	5.23	LHS	2.311	93.8	6.2	41
6 WC	179	2.42	LHS	2.325	94.4	5.6	42

Comments

Characteristic values determined using DPTI-Part RD-BP-C3 clause 9.6 (Not NATA accredited)

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Asphalt Core Test Report

Report No: USR:MED20M-0624
Issue No: 1

Client: **SA Laying**
367 South Road, Mile End, Adelaide, AU 5031

Project: **Surrey Road Reconstruction**

Accredited for compliance with ISO/IEC 17025 - Testing. The results of tests, calibrations and/or measurements included in this document are traceable to Australian / national standards.

Accreditation No: 3016

Approved Signatory: Ben Wright

Date of Issue: 5/05/2020

Sample Details

Sample ID:	MED20M-0624	**Date Laid:**	21/04/2020
Mix Design ID:		**Date Cored:**	5/05/2020
Asphalt Mix:	AC10 TyrePhalt-L	**Date Tested:**	5/05/2020
Location:	Surrey Rd, Mile End South	**Laid By:**	FH-AS
Specification:	Mile End - AC10M-AS2150	**Cored By:**	Ben Wright
Laying Lot:	Lot 003	**Tested By:**	Ben Wright

Result Summary

DPTI-TP061, AS2891.1.2, AS2891.9.2, AS2891.8

Average Maximum Density [t/m³]:	2.450	**Upper Characteristic Air Void [%]:**	6.8
Average Bulk Density [t/m³]:	2.307	**Lower Characteristic Air Void [%]:**	5.0
Average Core Depth [mm]:	39	**Max Specification Limit [%]:**	8.0
Type of Layer:	Wearing	**Min Specification Limit [%]:**	2.5
K-Factor:	0.780	**% Max Density Standard Deviation [%]:**	1.099
Average Air Void [%]:	5.9		

Test Results

Core ID	Chainage [m]	Offset [m]	Offset Reference	Bulk Density [t/m³]	%Max Density [%]	Air Voids [%]	Core Depth [mm]
1 WC	36.03	7.20	LHS Curb	2.253	92.0	8.0	45
2 WC	78.88	5.20	LHS Curb	2.301	93.9	6.1	40
3 WC	130.78	2.71	LHS Curb	2.282	93.1	6.9	40
4 WC	210.30	0.29	LHS Curb	2.345	95.7	4.3	39
5 WC	277.46	2.61	LHS Curb	2.334	95.3	4.7	36
6 WC	306.22	2.60	LHS Curb	2.310	94.3	5.7	44
7 WC	384.27	8.29	LHS Curb	2.314	94.4	5.6	32
8 WC	462.01	0.52	LHS Curb	2.314	94.4	5.6	38

Comments

Characteristic values determined using DPTI-Part RD-BP-C3 clause 9.6 (Not NATA accredited), Core 1 + 6 offset changed, Core 4 chainage changed. All changes due to traffic on site

Fulton Hogan

Building communities

PLASTIPHALT® CASE STUDY

CASE STUDY

PLASTIPHALT® MADE IN SA

The first large-scale use of PlastiPhalt® in South Australia was completed in June 2019, saving the equivalent of more than 140,000 plastic bags from landfill.

In partnership with the City of Port Adelaide Enfield, our SA team manufactured and laid approximately 110 tonnes of PlastiPhalt®.

As an additional environmental benefit, 20% Recycle Asphalt Pavement (RAP) was included into the asphalt mix to further boost the environmental sustainability credentials of this innovative product.

"The local SA team, working with our national technical teams, now have a product that meets the Austroads PMB framework. Our plastic is sourced locally in SA and is safe to profile and use in RAP for future generations; a truly innovative product keeping us at the forefront of environmental sustainability".

Andrew Virieux
SA Regional Manager

Fulton Hogan

PlastiPhalt®

Part of Fulton Hogan's eco-friendly asphalt range

About PlastiPhalt®

PlastiPhalt® is an innovative, environmentally-friendly asphalt pavement containing recycled waste plastic. Unlike other asphalts modified with recycled Plastics, PlastiPhalt® uses a specially selected polymer which is fully incorporated into the binder to make a true polymer modified binder (PMB).

Fulton Hogan has undertaken extensive research to ensure PlastiPhalt® conforms to Austroads AG:PT T-190 PMB framework. As a result, PlastiPhalt® can be designed and manufactured as an A35P equivalent binder.

Applications

To meet differing needs, two PlastiPhalt® classes have been developed: PlastiPhalt®-L for local roads and PlastiPhalt®-H for higher volume arterial and collector roads.

- PlastiPhalt®-L is developed for use in thin asphalt wearing courses placed in low volume Local Roads with lower structural capacity.
- PlastiPhalt®-H is developed for use in higher volume and structural capacity roads.
- PlastiPhalt®- can be produced using DPTI or AS2150 grading.

Fulton Hogan can provide specialist pavement expertise to determine the best class of PlastiPhalt® for your application.

> Fulton Hogan is passionate about providing sustainable asphalt solutions that benefit the environment without compromising pavement quality.

Environmental Benefits

A speciality selected waste plastic stream has been selected to be used in the production of PlastiPhalt®. PlastiPhalt® has been designed to achieve a durable, long-term asphalt pavement, whilst meeting a recognised framework. PlastiPhalt® provides the benefits of reusing a waste stream that would otherwise go to landfill.

Quality

Fulton Hogan is committed to the quality of our asphalt. PlastiPhalt® is a high quality product that can also be tested to client nominated requirements to ensure consistency and quality of the asphalt is maintained. Fulton Hogan's laboratories can supply NATA-accredited test reports upon supply of PlastiPhalt®.

Contact

For more information, please contact:

Damien Edwards
SA Technical Manager – Infrastructure Services
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Fulton Hogan

Building communities

WARM MIX PRODUCT BROCHURE

WARM MIX

Fulton Hogan

www.fultonhogan.com

Warm Mix

Fulton Hogan is one of Australasia's leading asphalt production and laying specialists, capable of producing a range of high quality asphalt products. Combining latest technology and industry research, Fulton Hogan has introduced its Warm Mix Asphalt (WMA) products to the Australian market to provide a sustainable asphalt solution for all pavement projects.

What is Warm Mix Asphalt?

Warm Mix Asphalt is a sustainable alternative to traditional Hot Mix Asphalt. Traditionally, asphalt is produced at temperatures around 160-180°C to optimise the coating of aggregate with bitumen and its laying manageability. However using latest technology, Warm Mix Asphalt is produced and laid at a lower temperature range from 110-140°C, and has the same effectiveness as traditional asphalt products.

As a result of the lower production temperatures, Warm Mix Asphalt requires less energy and therefore reduces associated greenhouse gas emissions as well as providing many other benefits. This greener asphalt alternative is new to the Australian market, but has been used extensively overseas particularly in Europe and America for over 10 years.

Benefits of Warm Mix Asphalt

International research conducted over the last decade has identified that Warm Mix Asphalt is equally as effective in creating asphalt pavements as Hot Mix Asphalt and boasts the additional environmental benefits in its production and management and increased safety for crews handling the asphalt.

By reducing the temperature that asphalt is produced there is:

- reduced energy requirements by around 30%
- reduced greenhouse gas emission by up to 30%
- 50-60% reduction in dust emissions
- increased range of transportation
- reduced "blue smoke" during loading and transportation
- safer working environment for asphalt crews through reduced fumes, heat and emissions
- improved field compaction which can facilitate an extension of the paving season.

In Australia and New Zealand, Fulton Hogan has been conducting Warm Mix Asphalt trials over the last 2 years and the results have already indicated excellent performance in service levels.

Warm Mix Asphalt is produced and laid at a temperature range from 110 - 140°C, much lower than traditional asphalt products.

Research indicates that Warm Mix Asphalt is equally as effective in creating asphalt pavements as Hot Mix Asphalt and boasts additional environmental benefits and increased safety for crews handling the asphalt.




Fulton Hogan has introduced its Warm Mix Asphalt products to the Australian market to provide a sustainable asphalt solution for all pavement projects.

Green Technology

To produce Warm Mix Asphalt, Fulton Hogan uses two different processes. One process requires a special additive while our high capacity Astec plants use a multi-nozzle system. This adds a small amount of water to the asphalt mix to create microscopic steam bubbles that foam the bitumen. This foaming helps to coat the aggregate with the bitumen at a much lower temperature than during traditional asphalt production. Regardless of the method used, both systems produce a consistent asphalt mix which has the capability to incorporate significant quantities of recycled asphalt pavements material.

Warm Mix Asphalt has been used to great benefit by Fulton Hogan as part of Origin Alliance's upgrade of the Ipswich Motorway project in south east Queensland.

The Future

Fulton Hogan recognises sustainable asphalt products are the way of the future and is committed to delivering customers the latest sustainable asphalt solutions including Warm Mix Asphalt and Recycled Asphalt Products (RAP).

As Australia's leading asphalt producer our plants are the most advanced, efficient and environmentally friendly.

Features often seen in Fulton Hogan's asphalt plants include:

- full recycling capability, allowing asphalt from older roads to be fully reconstituted creating benefits in the supply of raw products and the storage of waste
- advanced quality control technology
- state-of-the-art emission control systems, with blue smoke recycled through the plant's burners and the bitumen tanks fitted with carbon filters to eliminate odours

Fulton Hogan's commitment to research and development, combined with over 40+ asphalt plants across Australia makes us a leading asphalt supplier and the right choice for your green asphalt partner.

Fulton Hogan

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Fulton Hogan

Building communities

ROADBOTICS® CAPABILITY STATEMENT

Road Maintenance Planning

Using Objective Data to make smarter decisions

Utilising Technology in Asset Management

Fulton Hogan is renowned as a leader in asset management and project delivery. We focus on what is best for the asset while taking into consideration the dynamic needs of our customers and the community.

Fulton Hogan understands the value of identifying ongoing or endemic maintenance issues and applying whole-of-life solutions. Working with existing customers we have developed a range of electronic asset management processes that encourage integration between parties and provide a more effective management approach that focuses on extending the asset's life.

Fulton Hogan utilises best practice in all its asset management processes. We leverage off a range of technologies to formulate asset management strategies that consider whole-of-life costs and target works with the greatest cost-benefit ratio. Our team's commitment to collaborating allows us to adjust asset management programs to reflect changing customer priorities, emerging safety issues and community expectations within funding constraints.

Fulton Hogan has experience implementing and administering a range of world's best practice asset management tools and new technologies to underpin these strategies that optimise efficiencies and deliver cost benefits to our clients.

Our solutions are not typical asset management systems and we aim to provide comprehensive solutions in which the entire process is fully automated. We offer a range of services which incorporate artificial intelligence, advanced mobile equipment, high resolution cameras, GPS location and sensor technology.

Building on our strong construction and civil engineering background, Fulton Hogan provides a holistic asset management service for roads and associated pavements.

Offering complete maintenance and construction capabilities of roads, drains, bridges, roundabouts, car parks, footpaths and road shoulders, Fulton Hogan manages all aspects of the works including traffic management, linemarking and street sweeping, to deliver a seamless service for customers and the community.

Additionally, Fulton Hogan has the expertise to maintain all associated assets including stormwater drains and pits, kerb and channel, bluestone laneways and walls, street signs and furniture, street lighting and traffic signals, linemarking, toilet & picnic facilities and traffic monitoring stations.

85
YEARS' EXPERIENCE
IN MAINTINING ROADS

200+
ROAD MAINTENANCE CONTRACTS
ACROSS AUSTRALASIA

50,000
ROADS MANAGED
THROUGHOUT AUSTRALIA & NEW ZEALAND







www.fultonhogan.com.au

RoadBotics

Fulton Hogan

Fast, Objective Road Assessments

Using artificial intelligence (AI) and smartphones to help governments and engineering firms make data-driven decisions

Following years of development through Pittsburgh's Carnegie Mellon's Robotics Institute and a number of successful local trials in Australia and New Zealand, Fulton Hogan are set to change the game for road maintenance through its use of the world-leading RoadBotics road assessment system. RoadBotics empowers towns and cities to make objective, data-driven decisions about their roads and infrastructure. We automate inspections and generate actionable data about road networks.

Fulton Hogan are continuously looking at how we add value or improve our processes for collecting and analysing data. This has led us to RoadBotics, an American-based company, who take video collected by smartphones and, using advanced algorithms and machine learning, analyse the images and produce maps of road defects and condition. We are currently utilising this technology in New Zealand and Australia to objectively assess pavement conditions to help make smarter data-driven decisions.

RoadBotics has announced a ground breaking option to complement its interactive, online pavement assessment platform, RoadWay, that identifies common distresses like potholes, surface deterioration, and fatigue cracking. This first-of-its-kind functionality allows users to view these distresses in every 3 metre section of road that can be seen in conjunction with a color-coded map of their entire network.

With Individual Distress Identification on RoadWay, users can strategically plan for treatment of existing problems and proactively manage maintenance to save their town or city time and resources – not to mention clearly communicate the condition of their road network to their staff, local government officials, and residents.

"The new ability to identify distresses makes RoadWay the most robust tool our clients have to make data-driven decisions about their road network," said RoadBotics Head of Product, Matt Lucas. "This critical and actionable data gives them a more comprehensive perspective, allowing them to create efficient management plans."

RoadBotics, whose pavement assessment process is unique because it only requires a smartphone for data collection unlike pricier van scans or time-intense manual audits, can now identify 18 different distresses that fall into six categories that are critical to pavement management including potholes, surface issues, and fatigue issues.

"The ability to identify these distresses is another major advance that RoadBotics has taken to make affordable and objective infrastructure assessments a reality to every community in the world," said RoadBotics President and Co-Founder, Benjamin Schmidt, PhD.

Distress Identification was released as a part of RoadBotics' RoadWay platform in early February 2020. Monthly updates and releases to the platform are a part of RoadBotics continuous efforts for improvement, and feedback from current clients has been instrumental to the development of RoadWay since its inception. We envision applying our technology to not only improve the world's roads, but also the critical infrastructure that impacts people's lives every day.

RoadBotics

Fulton Hogan

How It Works

Step-By-Step Process

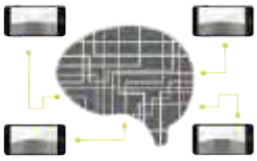
1

Send or upload a map of your road network to RoadBotics

2

Use our RoadNav and RoadSense apps to seamlessly collect image data of your road network

3



Road network images are then analyzed by our artificial intelligence

4

View your final road network's objective assessment online using RoadWay

What You Get

In addition to your RoadBotics RoadWay Assessment, you'll also receive:

Ongoing Customer Support

5-Level Rating of Road Conditions

Secure Cloud Storage of Image Data

Importable GIS and CSV Files

www.fultonhogan.com.au

RoadBotics

Fulton Hogan

Individual Distress Identification Layers

Potholes

Fatigue Cracking

Pavement Distortions

Patches/Sealant

Transverse/Longitudinal Cracking

Surface Deterioration

Category	The 18 Distresses
1. POTHOLES	1. Potholes 2. Lane Shoulder Drop-off
2. FATIGUE CRACKING	3. Alligator Cracking 4. Edge Cracking
3. PAVEMENT DISTORTIONS	5. Shoving 6. Rutting 7. Corrugation 8. Depressions 9. Bumps and Sags
4. PATCHES/SEALANT	10. Sealed Cracks 11. Hot Patches/Cold Patches
5. TRANSVERSE/LONGITUDINAL CRACKING	12. Transverse Cracking 13. Longitudinal Cracking 14. Block Cracking 15. Reflective Cracking 16. Slippage Cracking
6. SURFACE DETERIORATION	17. Raveling/Weathering 18. Bleeding

RoadBotics

Fulton Hogan

Road Distresses

Potholes

Potholes are depressions or hollows of various sizes in the road surface. Potholes occur when a small failure in the pavement is left unrepaired.

Photo Credit: Strutmasters

Raveling

Raveling is the disintegration of an asphalt road surface due to the dislodgement of the aggregate materials (gravel, sand and crushed stone). It reduces skid resistance, makes the road surface rough and exposes the layers underneath to further deterioration. It also results in loose gravel that can be dangerous for vehicles.

Photo Credit: University of Minnesota Duluth

Rutting

Rutting is a linear, surface depression formed on the road along the wheel path. Ruts, due to their shape, hold water and can cause hydroplaning leading to safety problems. Severe ruts can lock vehicles in the rutted path and create difficulties for drivers from steering out of them (e.g. when trying to switch lanes). Rutting can occur on asphalt, gravel and dirt roads.

Photo Credit: Burda on Wikipedia

Block Cracking

Block cracks are a form of interconnected cracks that occur on asphalt pavements. They are called block cracks as the patterns are rectangular, with the area they surround typically being over 1 sq ft.

Photo Credit: Colorado DOT - LaJunta Airport

Reflective Cracking

Reflective Cracking (or Reflection Cracking) is a form of distress that occurs on asphalt pavement overlays that have been laid over jointed rigid pavements or severely cracked flexible pavements.

Alligator Cracking

Alligator cracks are a form of interconnected cracks that commonly occur on asphalt pavements. They are called alligator cracks as the cracking pattern resembles the scales of an alligator.

Edge Cracking

Edge cracks are continuous cracks that are located within 2 feet of the pavement edge and typically occurs along unpaved shoulders. As cracks worsen, they start from the edge and spread towards the center. Severe edge cracks tend to look like alligator cracks, however, note that they have a crescent-shaped pattern.

Photo Credit: Arnold Asphalt

Longitudinal Cracking

Cracks formed parallel to the pavement centerline are called longitudinal cracks. Longitudinal cracks can occur on both asphalt and concrete pavements. They indicate the onset of alligator cracks (in the case of asphalt pavements) and possible structural failure.

Photo Credit: Arnold Asphalt

Transverse Cracking

Unconnected cracks that run across a pavement, perpendicular to the direction of the road are called transverse cracks. They are also known as intralaminar cracks or thermal cracks. Transverse cracks can occur on both asphalt and concrete pavements.

Photo Credit: LGAM

Slippage Cracking

Slippage cracks are crescent or half-moon shaped cracks, usually transverse to the direction of travel.

Bleeding (Flushing)

Bleeding is the movement of the asphalt binder in the asphalt pavement to its surface. A thin shiny and reflective film of asphalt binder is formed reducing skid resistance and affecting the visibility of the road. Typically the binder is almost in liquid form. Bleeding is also referred to as flushing.

Water Bleeding

Water bleeding occurs in fixed and rigid pavements when water seeps through cracks or joints to the surface. In the case of asphalt pavements, this can also occur when the asphalt surface is very porous.

Patches and Utility Cracks

A patch is an area of pavement that has been removed and replaced with new material. A patch is considered a defect no matter how well it performs.

Sealed Cracks

Sealed Cracks are locations where individual pavement cracks were filled to prevent any further damage to the road surface. The reported average performance life of crack sealant ranges from about 3-8 years.

Shoving

Shoving is the deflection and bulging of the road surface due to traffic loads. Typically, it occurs parallel to the direction of traffic.

Photo Credit: Paveman Pro

Spalling

Spalling is the cracking, breaking, chipping, or fraying of concrete slab edges at joints and cracks. This is a common distress in jointed concrete pavements. Spalling reduces pavement serviceability, and if left unrepaired, it can become hazardous to highway users.

Photo Credit: NCDOT

Scaling

Scaling is the local flaking or peeling away of the near-surface portion of hardened concrete or mortar. The aggregate is usually clearly exposed and often stands out from the concrete.

Photo Credit: CTRE and Iowa State University

Corner Breaks

A corner break is a crack near the corner of a concrete slab. “Near the corner” is defined as less than or equal to ½ of the slab length on both sides, measured from the corner of the slab.

Road Maintenance Planning

We recognise the importance of working closely and collaboratively with our customers to deliver essential infrastructure services to the communities they represent. Through the use of a diverse range of cutting-edge technologies such as RoadBotics, which uses Artificial Intelligence (AI) and machine learning, Fulton Hogan is uniquely positioned to help improve your road network condition by objectively prioritising funding across the network.

Fulton Hogan has the capability to model and provide forward works programs for Capital Works (Pavement Reconstruction and Resurfacing) and realise that many Councils already have robust processes and systems in place for this particular type of work. We are able to offer this service stand alone or as a validation option only. Fulton Hogan have further developed a fully customisable best practise tool to manage routine and preventative road infrastructure maintenance activities (pothole repairs, cracksealing and minor patching).

By combining objective pavement condition rating data, individual distress information and Council or Road Authority asset information we can capture a real overview of the road network in its current condition. By working collaboratively with council we then determine priority factors that are important to both council and the wider community.

Once the prioritasion rules are defined we have the ability to apply these to defect types and conditions which enable works programs to be developed that are specific and relevant. Fulton Hogan have included the ability to apply budget values which will then via predetermined rules flow through to prioritise works as those budgets change. This gives a fact based proactive approach to minor pavement maintenance activities. To take it a step further as the whole network is collected this data can be used to inform budget forecasting at a routine and preventative maintenance level.

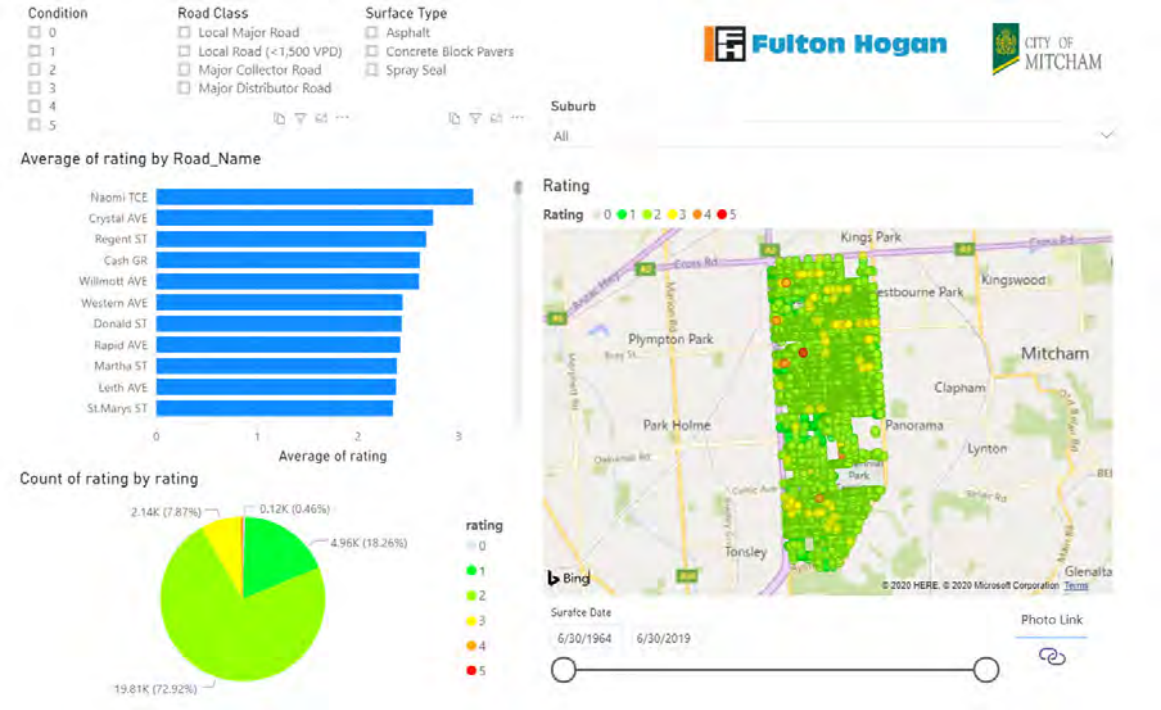
Benefits

Fulton Hogan's unique approach and extensive technological capabilities deliver the following significant benefits:

- Improved value through network inspections, work and program efficiencies, and incorporating full life costs
- Snapshot of network condition providing benchmarking and network comparison
- Full photo inventory of network taken digitally at 3 metre intervals of the network for asset identification and collection of asset inventory and condition
- Elimination of treatment duplication through improved planning
- Auditing tool for works completed (including Utility and Construction Pavement Patch Works)
- Change in pavement condition reporting (deterioration and improvements)
- Flexibility through our fully customisable system to meet Council's priorities
- Effective prioritisation of works to meet budget changes
- Improve the network standard by implementing life-cycle costing
- Evolve current processes and delivery methodology through data-driven review
- Inform the community through open reporting utilising Council websites
- System integration capabilities
- Collaborative approach incorporating Council's knowledge of the network
- Early adoption and continued access to developing technology

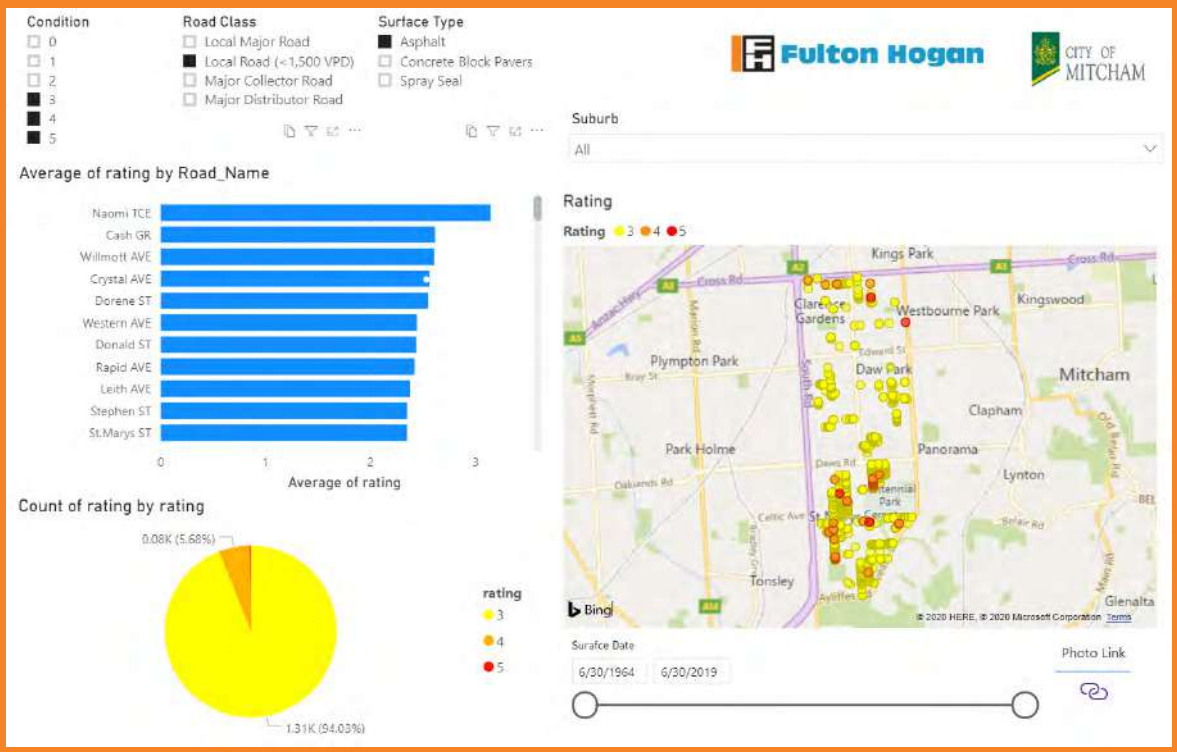
Fulton Hogan has developed an effective and innovative approach to assess Council networks using a robust, objective and technology-driven process. This means that funding allocated to all infrastructure activities from routine to preventative works is prioritised by data-driven modelling. We welcome the opportunity to discuss this state-of-the-art technology with you and demonstrate how this approach can tailor a cost-effective solution to efficiently manage & forecast budgets and provide demonstrable value to the community.

Network Condition Summary

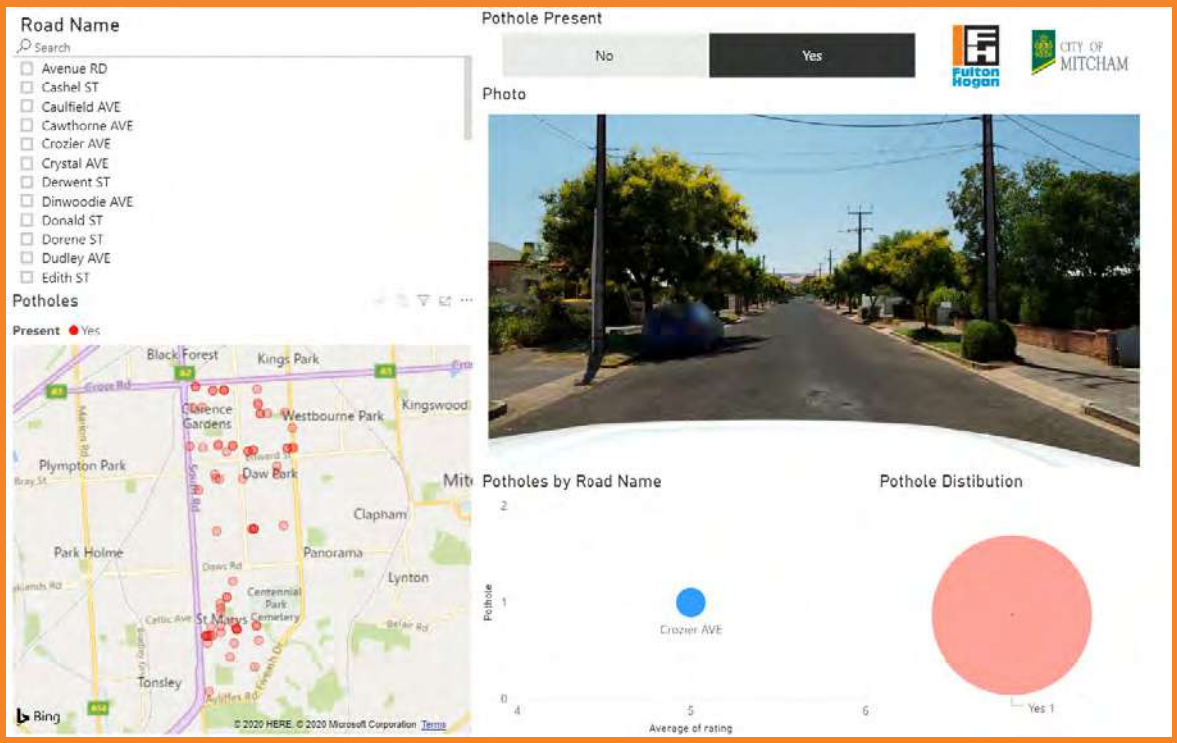


Pavement Condition data, Individual Distress and Council's asset data (to include parameters such as pavement age, segment lengths and pavement type) are combined to improve the decision-making process and give a better understanding of the network in its current state.

Dashboards can be customised to include information required by Council. This data can be filtered and sorted easily. This is not only a vital engineering tool but a valuable communication tool to stakeholders and the wider community.

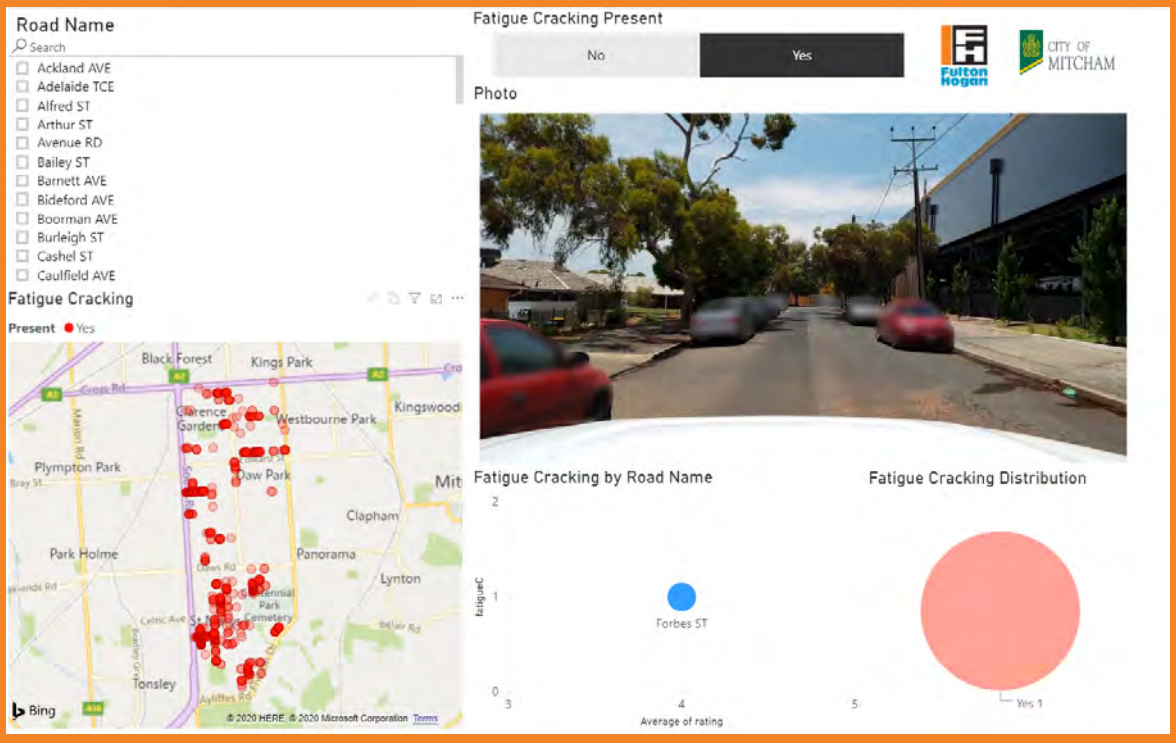


Defect Viewer

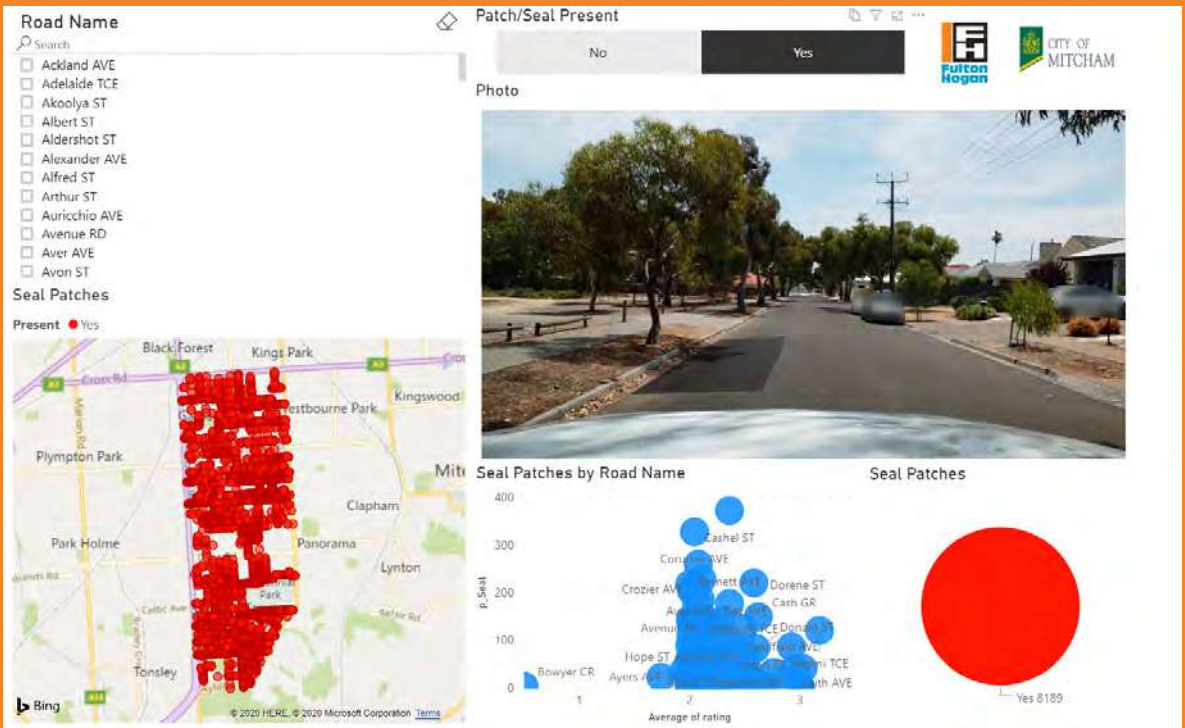


The 6 Individual Distress types (Fatigue Cracking, Surface Deterioration, Deformation, Potholes, Patches & Sealant and Transverse & Longitudinal Cracking) can be viewed spatially. This information can be reviewed in detail and broken into Surface or Pavement Defect types.

This allows a safer overall approach through our collection process and ability to complete desktop audits. This provides a complete overview of all defects and types within the road network.

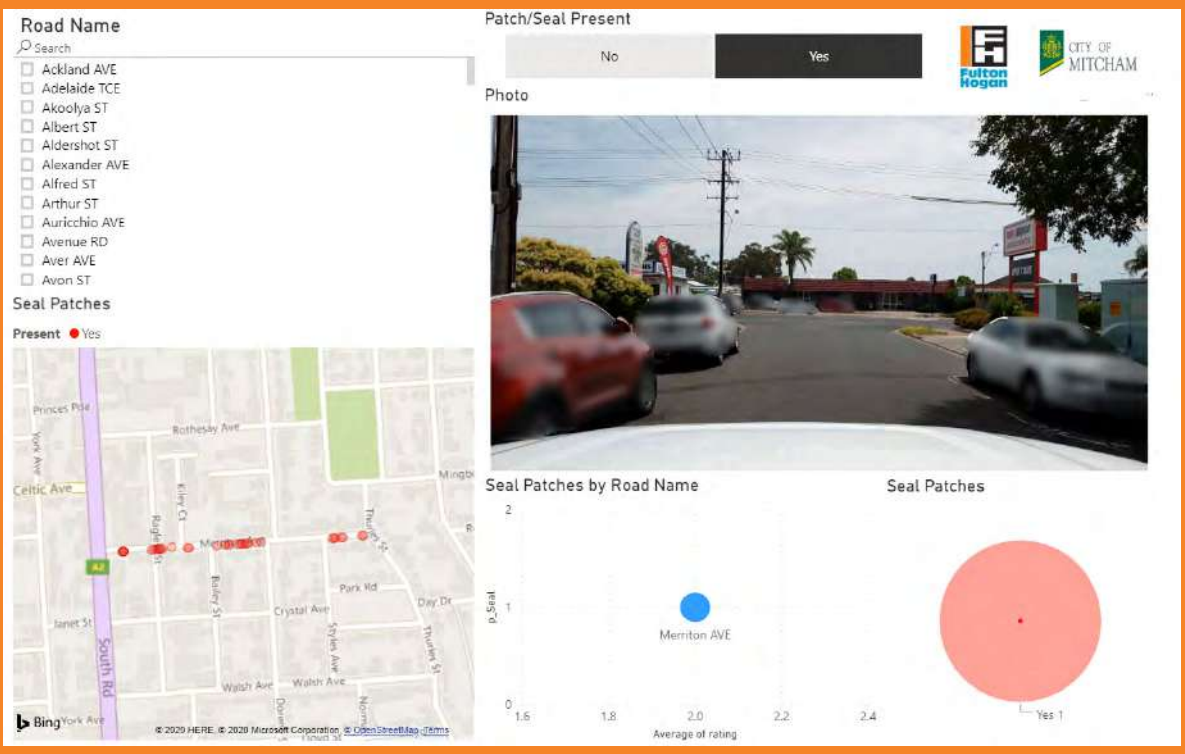


Auditing Tool - Patches

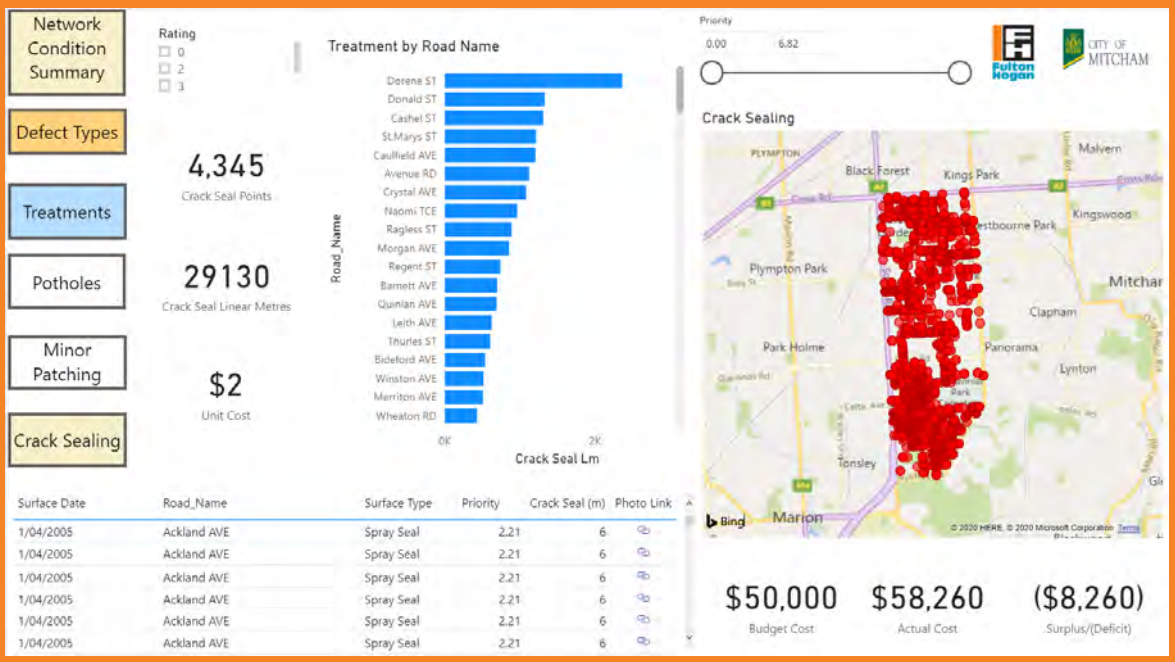


The Patches & Sealant layer becomes a powerful tool to identify completed patch, pavement reinstatement and cracksealing works.

This is important to monitor works completed by Utilities and Road Opening sites to reduce costs incurred by Council for repairing defective works.



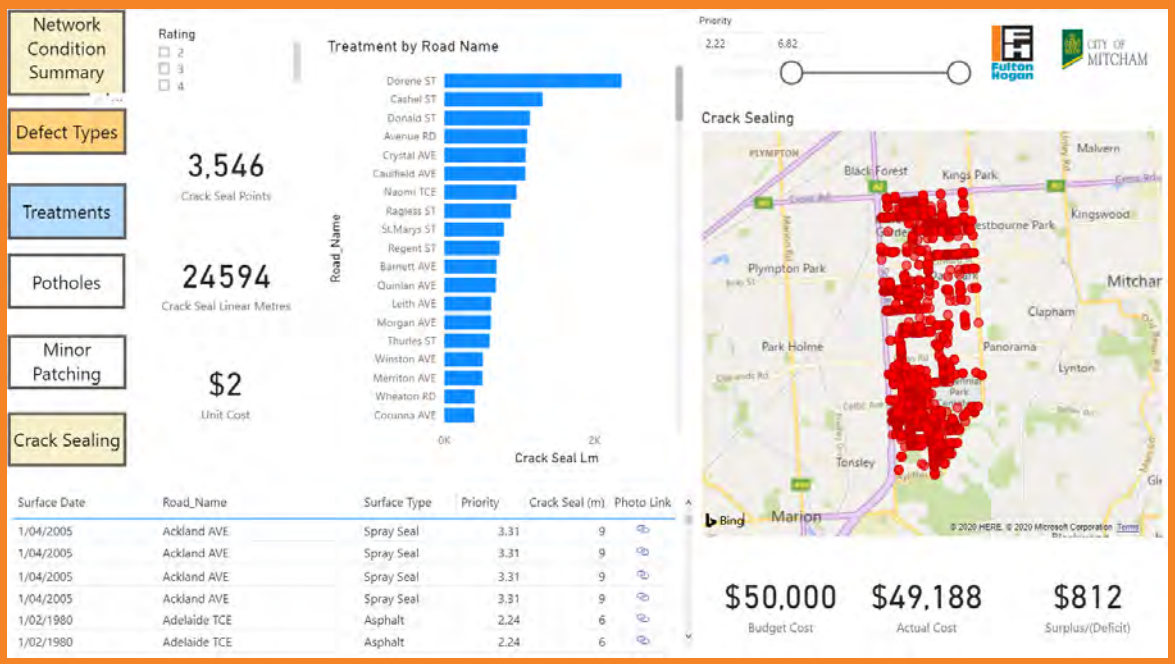
Budget Allocation to Prioritised Treatments



Surface Date	Road_Name	Surface Type	Priority	Crack Seal (m)	Photo Link
1/04/2005	Ackland AVE	Spray Seal	2.21	6	
1/04/2005	Ackland AVE	Spray Seal	2.21	6	
1/04/2005	Ackland AVE	Spray Seal	2.21	6	
1/04/2005	Ackland AVE	Spray Seal	2.21	6	
1/04/2005	Ackland AVE	Spray Seal	2.21	6	
1/04/2005	Ackland AVE	Spray Seal	2.21	6	

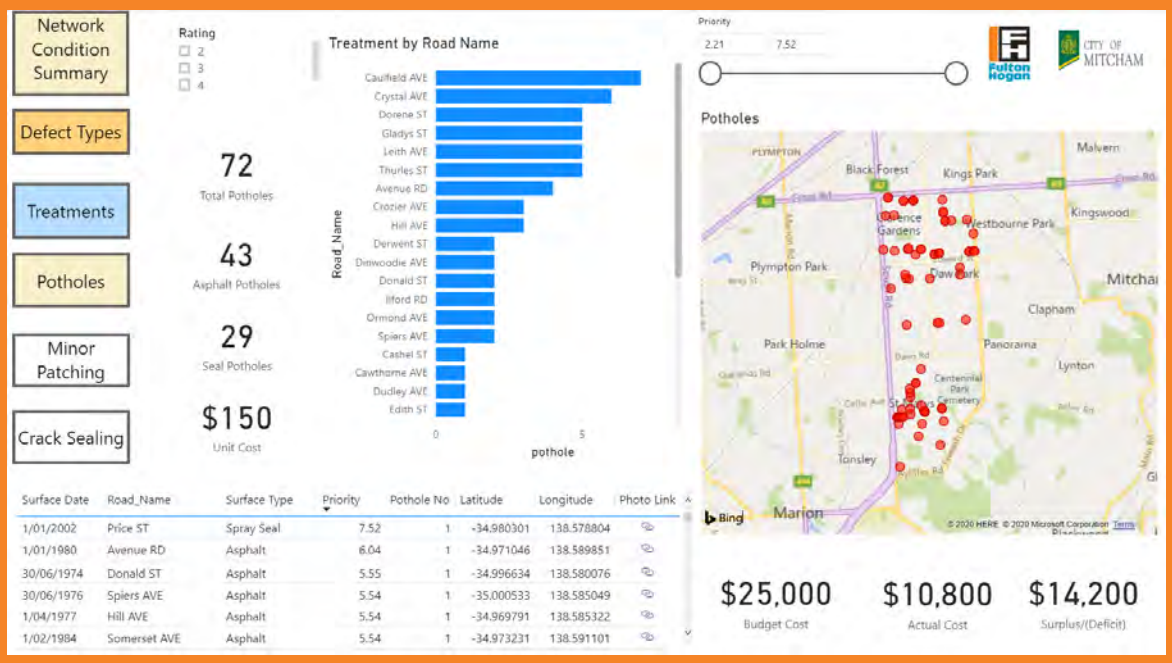
Our customised pavement maintenance modelling practices are tailored to help meet community standards and objectives. This ensures all council requirements are included from input parameters through to delivering on set objectives.

Maintenance activities and funding are prioritised objectively ensuring budget management to maximise the value of expenditure & increase the standard of the network. This can also be utilised as a budget forecasting tool.



Surface Date	Road_Name	Surface Type	Priority	Crack Seal (m)	Photo Link
1/04/2005	Ackland AVE	Spray Seal	3.31	9	
1/04/2005	Ackland AVE	Spray Seal	3.31	9	
1/04/2005	Ackland AVE	Spray Seal	3.31	9	
1/04/2005	Ackland AVE	Spray Seal	3.31	9	
1/02/1980	Adelaide TCE	Asphalt	2.24	6	
1/02/1980	Adelaide TCE	Asphalt	2.24	6	

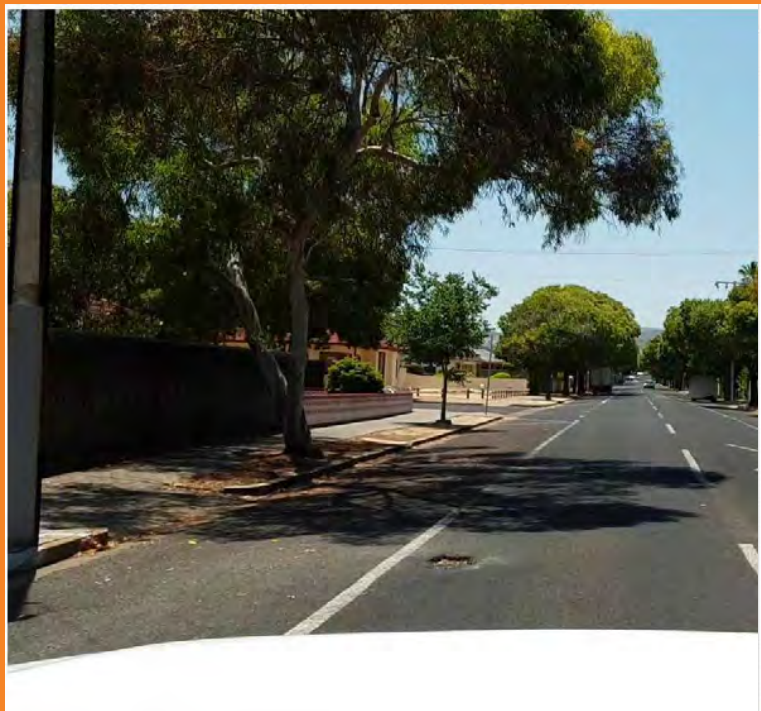
Works Program & Planner



Surface Date	Road_Name	Surface Type	Priority	Pothole No	Latitude	Longitude	Photo Link
1/01/2002	Price ST	Spray Seal	7.52	1	-34.980301	138.578804	
1/01/1980	Avenue RD	Asphalt	6.04	1	-34.971046	138.589851	
30/06/1974	Donald ST	Asphalt	5.55	1	-34.996634	138.580076	
30/06/1976	Spiers AVE	Asphalt	5.54	1	-35.000533	138.585049	
1/04/1977	Hill AVE	Asphalt	5.54	1	-34.969791	138.585322	
1/02/1984	Somerset AVE	Asphalt	5.54	1	-34.973231	138.591101	

Based on parameters work shopped and determined by Council, works are prioritised to meet set budgets. These prioritised works lists can be exported and provided to works crews.

Images are available for reference and all information can be provided as exported lists or spatially allowing smarter operational planning to maximise crew efficiencies.



Surface Date	Road_Name	Surface Type	Priority	Pothole No	Latitude	Longitude	Photo Link
1/01/2002	Price ST	Spray Seal	7.52	1	-34.980301	138.578804	
1/01/1980	Avenue RD	Asphalt	6.04	1	-34.971046	138.589851	
30/06/1974	Donald ST	Asphalt	5.55	1	-34.996634	138.580076	
30/06/1976	Spiers AVE	Asphalt	5.54	1	-35.000533	138.585049	
1/04/1977	Hill AVE	Asphalt	5.54	1	-34.969791	138.585322	
1/02/1984	Somerset AVE	Asphalt	5.54	1	-34.973231	138.591101	
1/02/1993	Gladys ST	Spray Seal	5.53	1	-34.975695	138.581072	
1/02/1999	Crozier AVE	Spray Seal	5.52	1	-34.987207	138.584603	
1/01/2002	Thurles ST	Spray Seal	5.52	1	-35.001160	138.581807	
30/06/1980	Crystal AVE	Asphalt	5.24	1	-35.002020	138.576498	
30/06/1980	Crystal AVE	Asphalt	5.24	1	-35.002003	138.576909	
30/06/2002	Winston AVE	Asphalt	5.12	1	-34.980278	138.582757	
1/01/1989	Avenue RD	Asphalt	4.53	1	-34.971254	138.585688	
1/01/1989	Avenue RD	Asphalt	4.53	1	-34.971252	138.585720	
1/01/1989	Avenue RD	Asphalt	4.53	1	-34.971185	138.586868	
30/06/1964	Dorene ST	Asphalt	4.46	1	-35.000670	138.578991	
30/06/1971	Leith AVE	Asphalt	4.45	1	-34.968114	138.577725	
30/06/1971	Leith AVE	Asphalt	4.45	1	-34.968033	138.579629	
30/06/1974	Donald ST	Asphalt	4.45	1	-34.996657	138.580078	
30/06/1976	Ilford RD	Asphalt	4.44	1	-34.967567	138.574770	
1/04/1977	Hill AVE	Asphalt	4.44	1	-34.970000	138.585306	
1/04/1977	Hill AVE	Asphalt	4.44	1	-34.967937	138.585159	
1/04/1984	Dorene ST	Asphalt	4.44	1	-35.001526	138.579067	
1/02/1993	Gladys ST	Spray Seal	4.43	1	-34.975845	138.576021	
1/02/1993	Gladys ST	Spray Seal	4.43	1	-34.975672	138.578568	
1/04/2007	Ormond AVE	Spray Seal	4.43	2	-34.979639	138.586515	
1/02/1995	Tobruk AVE	Spray Seal	4.42	1	-35.004959	138.580609	
1/02/1996	Dinwoodie AVE	Spray Seal	4.42	1	-34.970355	138.575926	
1/02/2001	Caulfield AVE	Spray Seal	4.42	1	-34.976036	138.590264	
1/01/2002	Thurles ST	Spray Seal	4.42	1	-35.000986	138.581652	
1/01/2002	Thurles ST	Spray Seal	4.42	1	-35.000959	138.581628	
1/01/2002	Thurles ST	Spray Seal	4.42	1	-35.000142	138.581117	
30/06/1969	Gladys ST	Asphalt	3.95	1	-34.975757	138.573860	
30/06/1974	The Crescent	Asphalt	3.95	1	-35.009712	138.577065	
30/06/1980	Crystal AVE	Asphalt	3.94	1	-35.002015	138.576588	

Attachment 3

QUOTE

Visa/Mastercard payments accepted - 1.5% Surcharge

ABN: 84 055 824 149 ACN: 055 824 149
PO Box 323 LONSDALE SA 5160
PHN: 08 8382 8863 FAX: 08 8382 3133
EMAIL: admin@actionlinemarking.com

Quote No.: 00030805

Date: 28/08/2020

Bill To:

Fulton Hogan Industries Pty Ltd
SA & NT Surfacing & Infrastructure
PO Box 2277
Hilton Plaza SA 5033

Customer Number: CUS5181/BMuller

CLIENT DETAILS

CONTACT: Ben Muller
Phone: 08 8139 4500
Mobile: 0447 570 152
Email: Ben.Muller@fultonhogan.com.au

DESCRIPTION	EX AMOUNT	INC AMOUNT
JOB LOCATION: Holdfast Bay Council Re-seal - Schedule of Rates		
Double Barrier Line @ $1.00/m		
Single Barrier Line @ $0.95/m		
Bicycle Lane @ $0.85/m		
Black Out @ $1.50/m		
Car Park Line 100 mm @ $1.00/m		
Centre LIne 100 mm Broken @ $0.65/m		
Centre Line 100 mm Solid @ $0.85/m		
Chevron White @ $22.00/m2		
Chevron Yellow @ $23.00/m2		
Directional Arrow @ $50.00/ea		
Edge Line 100 mm @ $0.85/m		
Fire Hydrant Line @ $10.00/ea		
Give Way Block 450 x 600 mm @ $6.00/ea		
Kerb & Median Painting 300 mm @ $5.00/m		
Supply & Install Pavement Bar @ $35.00/ea		
Pedestrian Facility - Koala, Wambat, Emu @ $22.00/m2		
Perimeter Line 100 mm @ $0.85/m		
Prohibited Area Line Solid @ $1.00/m		
Rail Xing Box Hatching @ $22.00/m2		
Restricted Area Line Broken @ $1.00/m		
RPM Instal @ $8.00/ea		
School Zone ZigZag Marking @ $66.00/ea		
Speed Hump @ $22.00/m2		
Splay & Taper White @ $22.00/m2		
Splay & Taper Yellow @ $23.00/m2		

Customer ABN: 54 000 538 689

Job Location: ANY INDUCTIONS REQUIRED - AN EXTRA CHARGE WILL BE INCURRED

Air 7000 - RAAF Base Edinburgh (Monday to Friday Day Shift)

GST Ex Total:	$0.00
GST:	$0.00
Total Inc GST:	$0.00
QUOTE TOTAL:	**$0.00**

NO GUARANTEE'S ARE GIVEN FOR PAINTED CONCRETE
NO ALLOWANCES FOR WITHOLDING OF CASH RETENTION OR BANK GUARANTEES UNLESS OTHERWISE AGREED

Thank you very much for asking Action Line Marking to quote your work.
I look forward to being able to assist you again in the future. - Scott Dornan

PLEASE NOTE:
Quotes are valid for 90 days, after which period costings will need to be re-negotiated.
Ownership of all materials is retained by Action Line Marking (SA) Pty Ltd until payment is received in full.

QUOTE

Visa/Mastercard payments accepted - 1.5% Surcharge

ABN: 84 055 824 149 ACN: 055 824 149
PO Box 323 LONSDALE SA 5160
PHN: 08 8382 8863 FAX: 08 8382 3133
EMAIL: admin@actionlinemarking.com

Quote No.: 00030805

Date: 28/08/2020

Bill To:

Fulton Hogan Industries Pty Ltd
SA & NT Surfacing & Infrastructure
PO Box 2277
Hilton Plaza SA 5033

CLIENT DETAILS

CONTACT: Ben Muller
Phone: 08 8139 4500
Mobile: 0447 570 152
Email: Ben.Muller@fultonhogan.com.au

Customer Number: CUS5181/BMuller

DESCRIPTION	EX AMOUNT	INC AMOUNT
Spotting - per man @ $85.00/hr		
Stop Bar 450 mm @ $9.90/m		
Stop Bar 600 mm @ $13.20/m		
Bicycle, DIsabled, Pedestrian Symbols @ $50.00/ea		
Rail X, Keep Clear Symbols @ $127.00/ea		
*** Mobilisation / De-mobilisation for one off jobs $85.00/ea		

Customer ABN: 54 000 538 689

Job Location: ANY INDUCTIONS REQUIRED - AN EXTRA CHARGE WILL BE INCURRED

Air 7000 - RAAF Base Edinburgh (Monday to Friday Day Shift)

GST Ex Total:	$0.00
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OWNED & OPERATED

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MEMBER