

**NATSPEC//  
Construction  
Information**

*Project report*



## **Use of recycled materials for roadworks in local government**

This Project report is a summary of the current use of recycled materials for roadworks in local government based on the Council responses received to date.

**CONTENTS**

- 1 Introduction..... 1**
- 1.1 Use of recycled materials for roadworks.....1
- 2 Summary of responses ..... 2**
- 2.1 Council responses from each state .....2
- 2.2 Types of recycled materials being used by councils for roadworks.....2
- 2.3 Councils using specifications for recycled materials.....3
- 2.4 Councils who want to be involved.....4

## USE OF RECYCLED MATERIALS FOR ROADWORKS IN LOCAL GOVERNMENT

### 1 INTRODUCTION

#### 1.1 Use of recycled materials for roadworks

Road authorities are responsible for improving the sustainability of road asset management. They can improve their sustainability targets by applying the principles of waste hierarchy and by reducing the waste going to the landfill. Road authorities require a continuous supply of materials for road construction and maintenance of their large network. With depleting natural resources and virgin materials, the road authorities are looking for other alternatives and are utilising recycled materials which would otherwise end up in the landfill. Road authorities are also investigating to integrate circular economy principles and waste minimisation to their day to day operations in general.

To assist the councils in achieving their sustainable targets NATSPEC is participating in an initiative with Sustainability Victoria, the Office of Projects Victoria, the Institute of Public Works Australasia, and the Civil Contractors Federation in determining opportunities to reduce our landfill.

To understand where the Councils as road authorities are in their journey of using recycled materials, letters were sent out to all the councils in Australia in the middle of March to seek their cooperation in gathering information regarding their current policies, specifications and documentation for utilizing recycled material for new roads, road maintenance and replacement.

The summary of responses is attached as a spreadsheet to this Project report.

**USE OF RECYCLED MATERIALS FOR ROADWORKS IN LOCAL GOVERNMENT**

**2 SUMMARY OF RESPONSES**

**2.1 Council responses from each state**

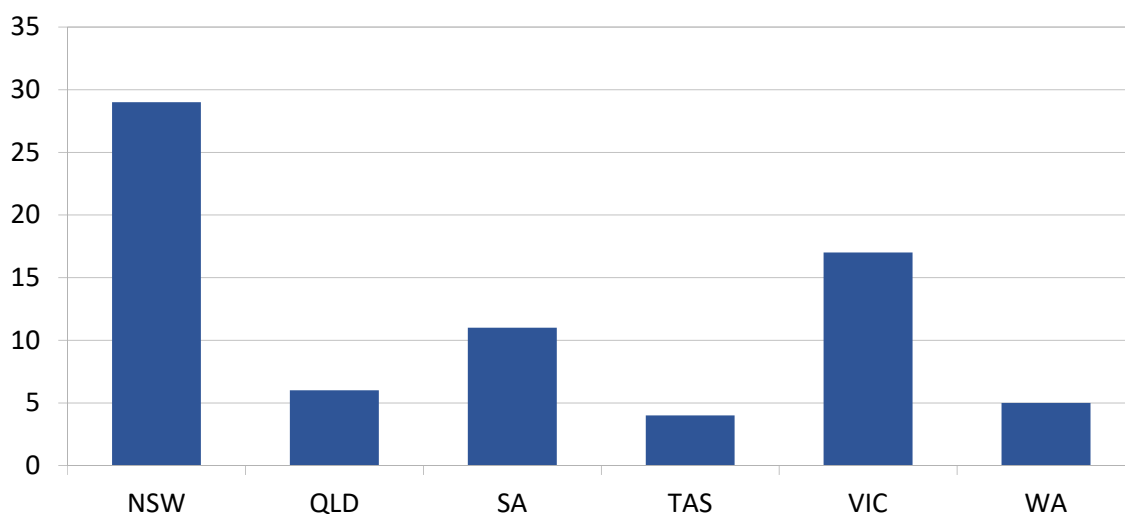
We received 73 responses overall which included feedback from most states except Northern Territory.

We received varied responses from different Councils. Some councils are leaders in using recycled materials for in-situ stabilisation, road base and subbase, crushed concrete and are more proactive than others while some do not have any policies of using recycled materials and depend only on the availability of natural resources.

Generally metro councils are more proactive and are leaders in recycling than regional or shire councils. These councils have included the use of recycled materials and sustainable construction methods in their policies, procurement strategies and tender processes.

We received the maximum number of responses from NSW, followed by VIC, South Australia, Queensland, WA and TAS.

**Local Council Responses By State**



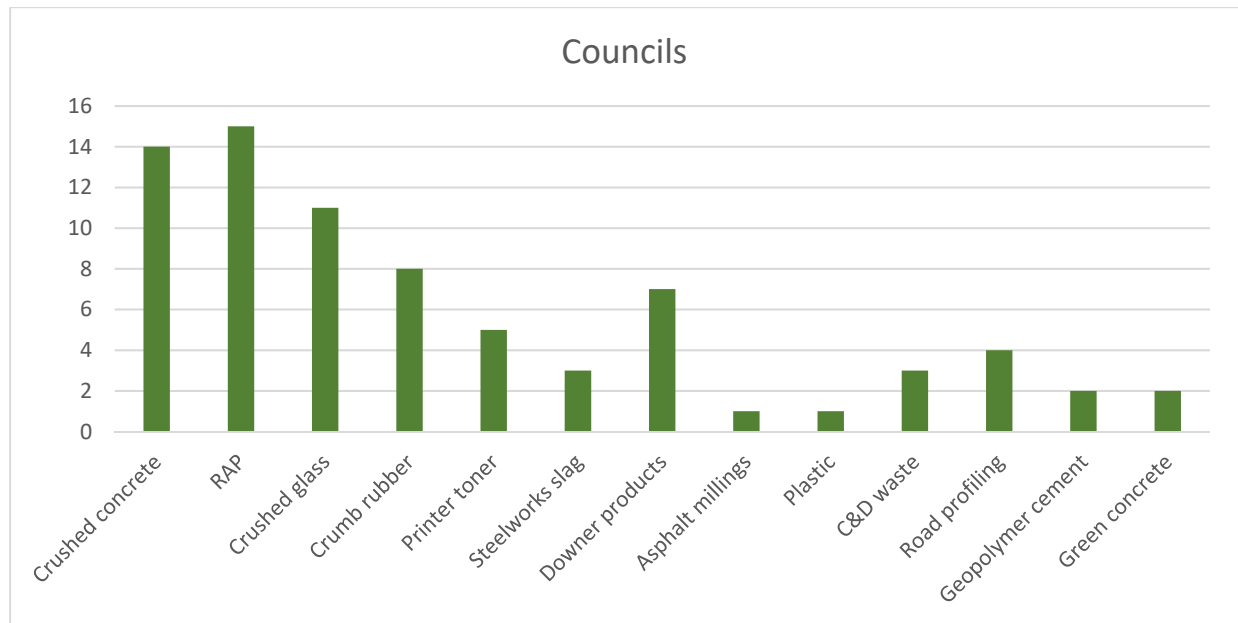
**2.2 Types of recycled materials being used by councils for roadworks**

The types of recycled materials used for road construction varied from the use of RAP, crushed concrete, geopolymer concrete, green concrete, crushed glass, crumb rubber, products provided by Downer like Reconophalt, Toner pave, plastiphalt, printer toner, road profiling, construction and demolition waste, slag and plastics etc.

Some councils have indicated that they are participating in trials and pilot projects with State road authorities, government agencies, ARRB, AAPA, Boral, Tyre Stewardship Australia and Downer on the use of various recycled products including crushed glass, crumb rubber and use of plastics.

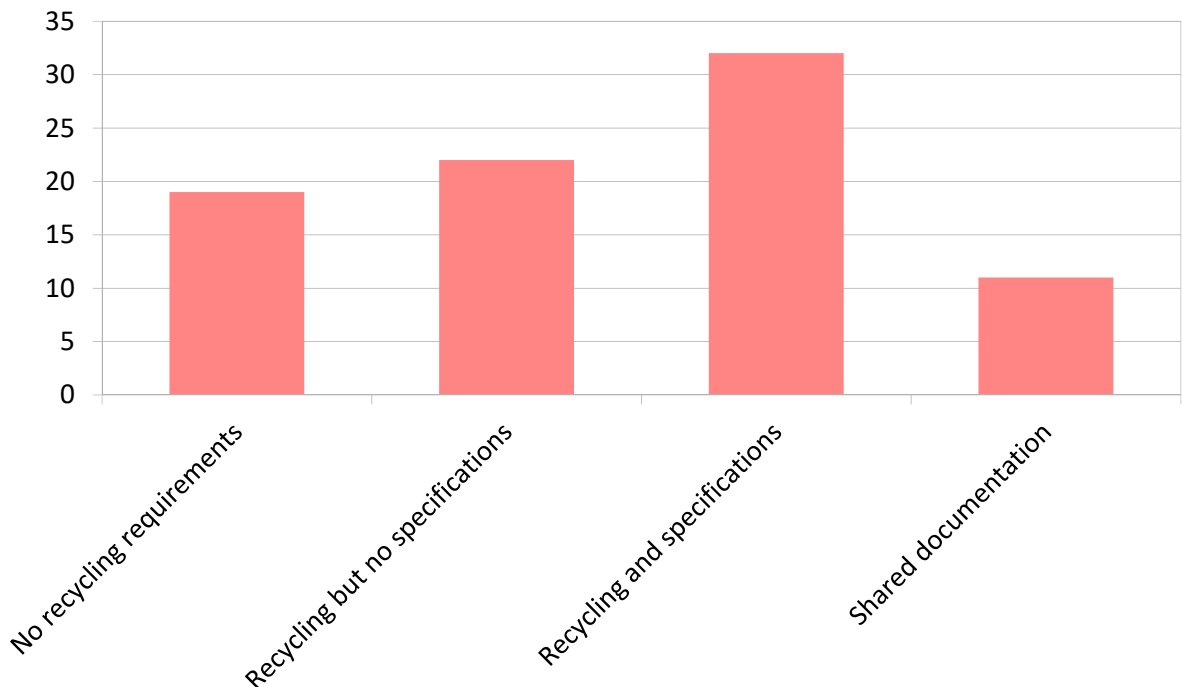
Small rural councils have indicated that they do not have volumes of recyclables to justify the cost of preparation of road making material. Councils in SA like City of Marion and City of Salisbury are leaders in the state. City of Salisbury is the first council in SA to have 70% of recycled roads.

**USE OF RECYCLED MATERIALS FOR ROADWORKS IN LOCAL GOVERNMENT**



**2.3 Councils using specifications for recycled materials**

**Recycling in Council Road Works**

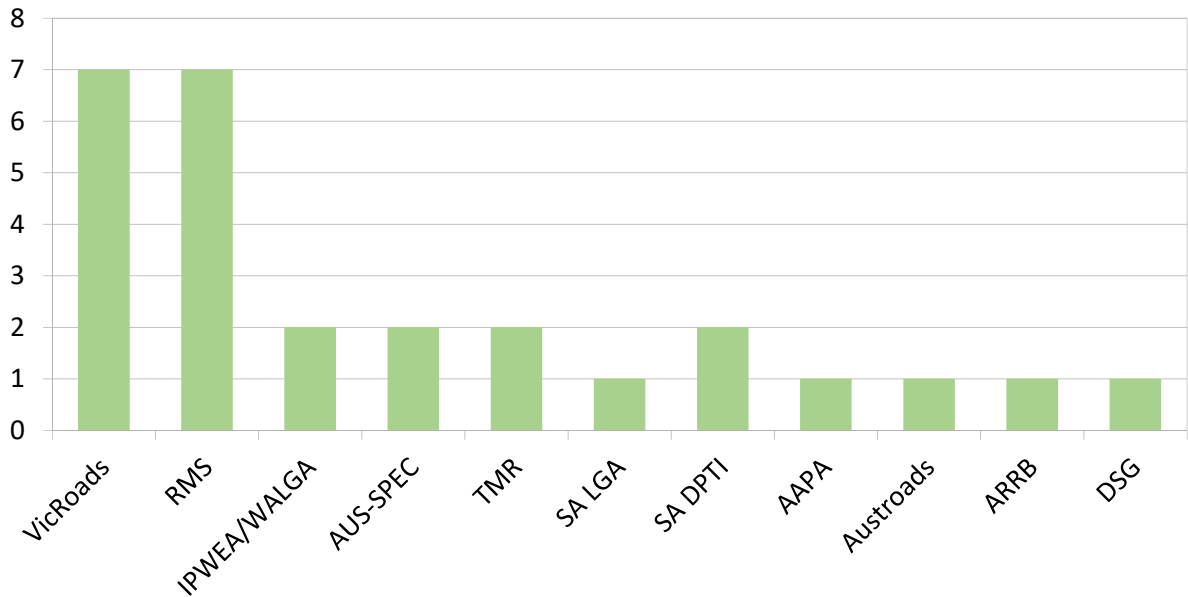


Out of the 73 responses received 32 councils are using recycled materials for roadworks, 22 councils use recycled materials but without any formal specifications 19 councils do not use any recycled materials for roadworks for various reasons. 11 Councils have shared their documentation and specifications on the use of recycled materials.

**USE OF RECYCLED MATERIALS FOR ROADWORKS IN LOCAL GOVERNMENT**

Most of the councils have mentioned that they are using State road authorities' specifications with 7 out of 15 Councils from Victoria are using VicRoads specifications followed by other available specifications from RMS NSW, TMR QLD, AUS-SPEC, WALGA etc.

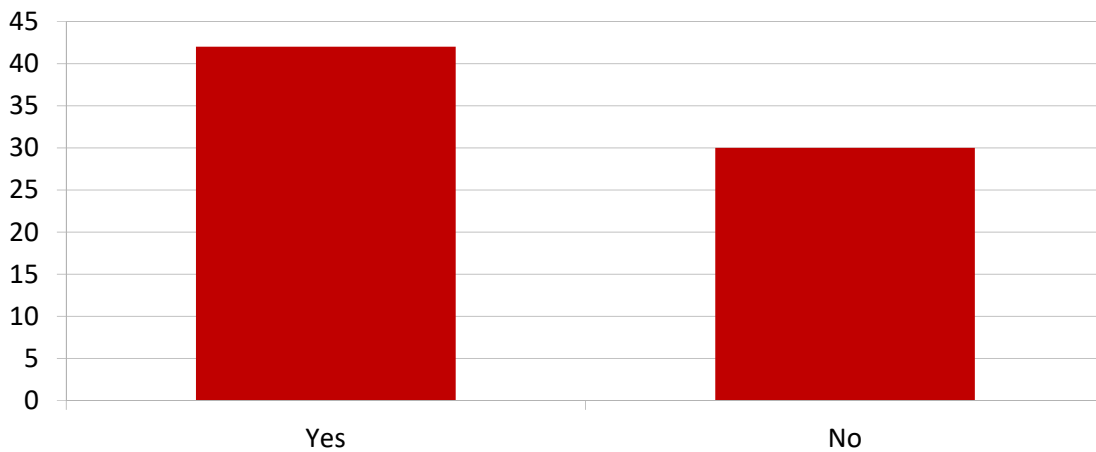
**Specifications used by Local Councils**



**2.4 Councils who want to be involved**

Out of the 73 Council response, 42 councils are very interested and would like to be kept informed about the outcome of this study.

**Councils Interested in Project**



State	Council	Response
NSW	Bayside Council	No documents to share
NSW	Berrigan Shire Council	Uses crushed concrete for roads and landfill cover • Latest crushing unsuccessful - material now stockpiled • Next crushing estimated for 2021
NSW	Bogan Shire Council	No documentation
NSW	Burwood Council	Rehabilitated Everton Road in Strathfield in 2018 • Received AustStab Award for Excellence in Pavement Recycling and Stabilisation in Local Government • Saved \$132,000 and recycled 800 tonnes material • Improved pavement longevity (at least 20 years)
NSW	Campbelltown City Council	Has recycled existing pavement since 1990 • Used stabilisation techniques for many years, about 300 projects, eliminating need to use non-renewables • Does grading test and adds 20% recycled materials to RAP • Recently recycled 20,000 m <sup>2</sup> of existing pavement for a junction with RMS
NSW	Canterbury Bankstown City Council	No specifications • Working with SSROC in investigation into use of recycled products in asphalt • SSROC contact is Cathy Dizon 02 8396 3802 • Recipient of NSW EPA grant to research glass in DGB or DGS • Intends to develop specifications re application of glass
NSW	Cowra Council	No specifications
NSW	Dungog Shire Council	No documentation
NSW	NSW EPA	EPA working with RMS and local councils to encourage uptake of recycled materials, especially glass • Received NATSPEC's letter via Inner West Council
NSW	Georges River Council	Road resheeting program specifies up to 15% RAP in wearing course and up to 30% RAP in base course • Continuing to monitor condition of these pavements as previously had problems with RAP asphalt surfaces
NSW	Gunnedah Shire Council	Concrete crushed in waste management facility • Pavement materials recycled back into pavement • Road reserve material reused as shoulder material
NSW	Hills Shire Council	Limited use of recycled materials • Uses AUS-SPEC specifications and own construction specifications
NSW	Hornsby Shire Council	Has not used recycled material in roads or drainage specifications • In last decade used recycled DGB20 and DGS40 with RMS Specification 3051 in a few specific projects
NSW	Inner West Council	Trialling toner cartridges for pavements
NSW	Kempsey Shire Council	No documentation
NSW	Lake Macquarie City Council	Used slag in pavements 1990-2013 - RMS approved at the time - but had expansion issues • RMS has withdrawn docs and council is in major law suit • Glass sand in stormwater pipe bedding trial 2018 • Crushed concrete for roadworks • Seeking to expand use in picnic shelters, bin slabs, footpaths, kerb and guttering • Green waste for pruning, mulching, blending litter in parks and gardens • Crumb rubber blocks and recycled asphalt for roads • Working with Downer for other trials • Updated Engineering Construction Guidelines for use of 10mm and 20mm RCG sand in pipe bedding, backfill for retaining walls, blend in road base and asphalt
NSW	MidCoast Council	No formal documentation • Proactively recycling materials • Works within EPA requirements • Poor pavement material from cut earthworks • Profiled road pavements • Recycled rubber in bitumen sealing • Glass recycling trials in asphalt and basecourse with RMS and IPWEA but no need for recycled glass in any projects • Processes trees and mulch to stabilise ground
NSW	Muswellbrook Shire Council	Committed to use of recycled materials wherever possible • Supports aims of circular economy
NSW	North Sydney Council	Considers use of recycled materials as part of tender process • Sample schedule attached
NSW	Randwick City Council	In-situ stabilisation • Uses Reconophalt • Use of green concrete • Geopolymer cement to replace ordinary cement
NSW	Singleton Council	No documentation

NSW	SSROC	Working with NSW EPA and WSROC to develop "recipes" for recycled materials in roads to encourage council use of recycled materials • Currently in exploratory stage but eager to develop project as fast as possible, take advantage of current willingness and momentum
NSW	Sutherland Shire Council	No specifications • Uses RMS and AUS-SPEC specifications • Conducted trial with Reconophalt in 2018
NSW	City of Sydney	Has publicly available technical specifications • Has used a number of waste materials in roads e.g. crumb rubber, glass, printer toner, road profilings, recycled concrete • Use of geopolymers on Wyndham St • Currently working on trials sites with Stephen Foster of UNSW • Has used green concrete for several years • Use of warm mix asphalt • Recycled glass for water sensitive urban design (WSUD)
NSW	Wagga Wagga City Council	Recycled materials included in waste management plan • Has used recycled materials for bedding sand • Crushed glass also used in neighbouring Lockhart Council and Coolamon Shire • Has pugmill and NATA-accredited laboratories to check material properties • Used guide posts made of rice husks - did not work very well • Plans to screen and prepare crushed concrete and rubble • Crushed glass is prime target
NSW	Wingecarribee Shire Council	No specifications or documentation • Occasionally uses slag for recycled road pavement materials, e.g. asphalt millings for gravel resheets • Does not use crushed concrete due to risk of asbestos contamination
NSW	Wollongong City Council	No specifications and would just require compliance with specifications for engineering materials e.g. RMS 3051 for road bases • Always had recycle/reuse policy • Has used coal washery reject and steelworks slags • Believes EPA exemptions for roadworks sourced materials are currently too restrictive
NSW	Woollahra Municipal Council	Planning for trial projects in council infrastructure • Participating in SSROC working group • Selecting sites to conduct trials with Downer • Use of recycled glass
NSW	Yass Valley Council	No formal policies • Uses VENM and NEM in select layer/subbase • Has not used materials like glass etc. but has vested interest
QLD	Brisbane City Council	Long history of using recycled materials in road maintenance and construction • Reference Specifications for Civil Engineering Work
QLD	Livingstone Shire Council	Uses Queensland Department of Transport and Main Roads specifications for road construction • Suggests contacting DTMR re recycled materials
QLD	North Burnett Regional Council	No documentation • Has previously used recycled road seal on gravel roads
QLD	Redland City Council	Use of reclaimed asphalt pavement in road pavement construction, maintenance and renewal • Brisbane City Council specifications S310 and S320 • TMR specifications MRTS102 and MRTS30 • RAP trials on gravel roads and road shoulder maintenance • Envisage RAP replacing over 80% of CBR60 usage • Main issue is council does not produce enough profiling material from re-seal program to keep up with demand — started to source from TMR, Council manages its asset base in a sustainable manner and is committed to exploring new methodologies to utilise other recycled materials in building and maintaining its road pavement network and in particular the use of RAP on the annual re-seal program and on the Southern Moreton Bay Islands.
QLD	Toowoomba Regional Council	Does not use recycled materials in roads
QLD	Western Downs Regional Council	No requirements for recycled materials in roads
SA	City of Adelaide	Uses RAP in accordance with DPTI's Part R27 - Supply of Asphalt • Working with Downer to trials and monitor Reconophalt, TonerPave and 100% repurposed asphalt
SA	Adelaide Hills Region Waste Management Authority	No documentation readily available • Participating in pilot sustainable procurement project with SA Local Government Authority involving data collection on council use of recycled materials • Working with other councils to apply sustainable procurement target to spending for 2019/20 financial year
SA	Adelaide Hills Council	No material or information to share but are working on a number of initiatives in this space
SA	Alexandrina Council	No standing on recycled road works at this stage



SA	City of Charles Sturt	Uses recycled material in granular pavement subbase • Uses Downer products Toner Pave and Reconophalt in asphalt • Uses RAP in asphalt surface overlay and lower layers • Recycles existing pavement materials using lime, cement or foam bitumen for pavement stabilisation
SA	Flinders Ranges Council	No documentation
SA	City of Marion	No documentation or specifications • But has "been informed" that City of Marion is leading the state in this area • Suggests meeting with General Manager City Services when Richard is next in Adelaide
SA	City of Mitcham	Recent joint research project on crumb rubber asphalt product with Tyre Stewardship Australia, Top Coat Asphalt Contractors and AAPA - video linked • Crumb rubber asphalt product in trial stage, not used in all asphalt mixes • Asphalt pavement reseal program uses 30% RAP content in the 20,000t asphalt in program • Does not use green concrete or recycled quarry products
SA	City of Onkaparinga	Uses crumb rubber, recycled asphalt, printer cartridges in road resealing and asphalt pavement construction • Annual PCW program includes road maintenance and construction projects in which can increase use of recycled materials • Current investigations into use of recycled glass in pavements • Assessing properties of existing pavements to reuse them for other elements e.g. footpaths, shared use paths • Would use DPTI specifications for this
SA	City of Salisbury	Recycled roads leader • First SA council to complete 70% recycled road • Uses toner cartridges in binder • Uses crumb rubber in spray seals binder and is investigating higher levels of crumb rubber in asphalt • Recycling concrete aggregate, reusing 30% and commencing study to reuse up to 100% • Investigating rubber in kerbs and watertable • Stabilisation rather than remove and replace • Crack sealing with recycled tyre rubber • Investigating recycled plastic roads
SA	City of Tea Tree Gully	Specifications within contractual documents covering recycled materials in road works • Has incorporated 20-75% RAP in asphalt design for many years • Has also used toner, glass and plastics in asphalt roads • Collects and reuses rubble in construction of hardstands and car parks
TAS	Central Coast Council	No documentation • Not currently specifying recycled materials for road works
TAS	Devonport City Council	No specifications of their own • Generally refer to Department of State Growth specifications • No recycled materials in roads so far
TAS	Glenorchy City Council	Trialled use of recycled concrete using VicRoads specification on two projects, currently evaluating their performance
TAS	Kingborough Council	Has recently "dabbled" in recycled materials in roads using product from Downer • Asphalt overlay trials late last year • Has some base information on their roads with this product • Another asphalt overlay trial programmed for coming weeks
VIC	Bayside City Council	Delivering road projects using recycled glass. This is on an ad-hoc basis, i.e. largely dependent on budget, and project manager awareness and knowledge of recycled products. To make our approach consistent for roads and all infrastructure projects, we are developing our Sustainable Infrastructure Policy and Guidelines and Sustainable Procurement Guidelines for Capital Works. We want to further our use of recycled materials in capital works, set standards, and reward contractors who use (and re-use) materials sustainably.
VIC	Brimbank City Council	Not currently using recycled materials in road construction • Collaborating with ARRB to trial bitumen mixes using higher recycled glass and crumb rubber content for concrete and road rehabilitation
VIC	Frankston City Council	Uses Austroads and VicRoads specifications where applicable • Plans to include plant mixes using RAP and assess ways to recycle pavement in situ for later this year • Key factors to consider are engineering properties • Preparing framework for recycled materials in roads for 2020/21 financial year, including substitutes for aggregates and granular bases, glass and C&D waste in fine aggregates, RAP with bitumen emulsion as bound base course or subbase, crumb rubber in hot mix asphalt
VIC	Gannawarra Shire Council	No "meaningful data" • Small rural council, therefore does not have volume of recyclables to justify cost of preparation of road-making material • Would require partnerships with companies like Boral or Primal, but currently cost prohibitive for them to mass produce material • As momentum builds, will be more cost effective and available for regional and small rural councils
VIC	City of Greater Bendigo	No data • Going through process with Sustainability Infrastructure Guidelines through Infrastructure Design Manual
VIC	City of Greater Dandenong	Very interested, wants to assist however possible • Has used road profiling under footpaths and crushed concrete in new roads • Trialling high recycled content asphalt mixes in resurfacing • Has relied on VicRoads and industry anecdotal evidence • Would welcome robust technical specification • Would be happy to supply past project info and take part more controlled trials

<b>VIC</b>	City of Greater Geelong	Has Infrastructure Design Manual with recycling and recycled materials info in general terms and reference to VicRoads Standard Specification 407 and Technical Note TN107 • Recycled concrete occasionally used under driveways • Biggest issue with recycled materials is ensuring quality control • Has trialled stabilising agents with in situ materials • Suggests a teleconference, declined by Richard
<b>VIC</b>	Greater Shepparton City Council	No documentation • Has used crushed concrete sourced from Shepparton Resource Recovery Centre in road subbase
<b>VIC</b>	Hepburn Shire Council	No documentation • No recycling • Keen to be involved in project
<b>VIC</b>	Hobsons Bay City Council	Actively investigating this in recent years • Yet to roll out any significant projects • Recent assessment of Roads and Drainage maintenance contract on contractor's ability to integrate sustainable practices
<b>VIC</b>	Hume City Council	No documentation • Generally uses standard VicRoads specification and would accept use of recycled materials that complies • Recently looking at how to encourage use of recycled content
<b>VIC</b>	City of Kingston	Has used large volumes of recycled material in capital projects and maintenance works • Uses environmentally friendly and recycled products in road resheeting program • 950 tonnes of Reconophalt this financial year • Environmentally friendly material encouraged in purchasing policy
<b>VIC</b>	Latrobe City Council	Currently trialling several recycled products in roads • Crushed concrete in pavement subbases using VicRoads Standard Section 820, developing modified version of standard with GHD • Looking into RAP mixes trials - would use VicRoads Section 407 • Recent 10% RAP mix trial, proposed 80-90% RAP mix trial with Downer • Early planning stages of trial asphalt mixes with glass
<b>VIC</b>	City of Melbourne	Does not use recycled materials in roads
<b>VIC</b>	Northern Grampians Shire	Currently crush all waste concrete for use as road subbase on some road projects • No specifications • Very interested in using recycled materials in road works
<b>VIC</b>	South Gippsland Shire Council	No specifications • Committed to reusing road pavement in sealed road pavement rehabilitation • Has used locally sourced crushed concrete to replace Class 3 crushed rock in car park construction and footpath bedding material
<b>VIC</b>	Strathbogie Shire Council	No documentation • Uses VicRoads standard specifications for road works, in which contractors/consultants must meet sustainability requirements • Uses recycled plastic road furniture
<b>WA</b>	Shire of Murray	No documentation • No active use of recycled material in roads • Recently used recycled concrete base material for pump track, using as guidance IPWEA/WALGA specification • Purchasing policy highlights consideration to sustainable practices
<b>WA</b>	City of Rockingham	Has used crushed concrete as base course pavement material for major road construction projects over last decade • Uses IPWEA/WALGA specification • Recycling of demolition waste
<b>WA</b>	City of Stirling	No specifications • Currently reuse profiling mix for temporary reinstatement works • Testing of cold mix asphalt with up to 100% recycled content in 2015
<b>WA</b>	City of Swan	Yes has documentation
<b>WA</b>	Shire of Toodyay	No documentation, does not use recycled materials in roads
<b>AUS</b>	Downer	Has own product specification • Developed recycled products for road maintenance and construction • TonerPave, Reconophalt, soft plastics, glass, printer toner cartridges • Trialled in many councils e.g. Craigieburn (Hume City Council), Sutherland Shire, City of Adelaide, City of Sydney • Conducting trials under EPA land exemptions