

**Question on Notice**  
**Transport and Resources Committee**

**Director-General of Transport and Main Roads (TMR) Briefing to the  
Transport and Resources Committee on TMR issues and Annual  
Report 2019-2020**

**Asked on 8 March 2021**

The Transport and Resources Committee asked the Department of Transport and Main Roads:

**QUESTION:**

Please provide an explanation of the decrease in workforce numbers outside of South East Queensland and an increase in temporary employment from 4% in 2013 to 8% in 2019-2020 – refer to Table 5 - Workforce statistics as at 30 June 2020 on page 98 of the Annual Report.

**ANSWER:**

In 2013, under a whole-of-government direction to reduce public service numbers, the Department of Transport and Main Roads (TMR) reduced by more than 2000 full-time equivalent employees, including a significant number of temporary employees.

TMR engages temporary staff for fixed-term projects with temporary funding. The *Queensland Transport and Roads Investment Program 2021–21 to 2023–24* (QTRIP) 4-year rolling capital program outlines a record \$26.9 billion (and a 17% increase from the 2019-20 to 2022-23) in works to keep Queensland connected and to support economic recovery from COVID-19.

The QTRIP supports an average of approximately 23,600 direct jobs over the life of the program. The minimal increase in temporary employment as noted by Transport and Resources Committee is reflective of the significant expansion in the program and the resourcing challenge TMR faces to deliver this unprecedented program. I would note that TMR is on track to deliver the program while still managing its workforce within the full-time equivalent (FTE) cap.

The apparent decrease in workforce numbers outside of SEQ can be attributed to the change in definition of South East Queensland (SEQ) regions in September 2017. The revised SEQ definition includes the Sunshine Coast region. This was due to an alignment with Queensland Rail regions, to ensure consistency between the departments reporting to the Minister for Transport and Main Roads. Using the current definition of non-SEQ regions, employee numbers outside of SEQ have increased by 12 FTEs compared to 2013.

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#### **QUESTION:**

Please provide current statistics around recycled crushed glass component in road construction materials.

#### **ANSWER:**

The Department of Transport and Main Roads (TMR) has undertaken research and made changes to allow contractors to choose to use recycled glass in asphalt, unbound granular (gravel), stabilised bedding sand and backfill materials when constructing roads for TMR projects.

TMR is finding ways to use recycled crushed waste glass as a substitute for sand and aggregate in road materials. Ten to twenty per cent recycled glass aggregate (RGA), also known as recycled crushed glass, can be used in certain materials on TMR roads.

Up to ten per cent RGA can be used in asphalt bases and up to twenty per cent can be used in gravel and stabilised layers. It can also be used as bedding material and backfill sand around pipes and conduits. TMR is continuing to investigate the potential to use recycled glass in concrete.

An update to TMR's asphalt specifications, *MRTS30 Asphalt Pavements*, to allow the use of a limited amount of RGA in the manufacture of dense graded asphalt was published in July 2020. At the same time, a new specification for RGA, *MRS/MRTS36 Recycled Glass Aggregate*, was published along with other changes to related technical documents to enable its use. Prior to July 2020 TMR did not explicitly allow the use of RGA in asphalt.

In November 2020, TMR published updates to its RGA *MRTS36 Recycled Glass Aggregate* and earthworks *MRT04 General Earthworks* specifications that included changes to widen the permitted uses of RGA to include use of it in earthworks applications, including in conduit and pipe bedding, and backfill materials.

TMR is currently undertaking a demonstration project using RGA as an alternative to natural sand for conduit bedding and backfill materials on the Pacific Motorway M1 Sports Drive to Gateway Motorway Upgrade project. This project is forecast to use over 1.8 million bottles to create approximately 360 tonnes of RGA. This is the first time RGA has been used on a TMR project as bedding/backfill sand for the installation of conduits.

In April 2020, the Cross River Rail project trialled installing drainage pipes with RGA. This was the first time RGA was used as pipe bedding/backfill in Brisbane City Council's network. The Cross River Rail project is continuing to liaise with other asset owners regarding other potential uses for RGA.

TMR's current approach to the use of recycled materials, like RGA, in road pavements is to facilitate and enable their use as an alternative to conventional materials (that is, it is a choice of the contractor/supplier meaning 'the market' decides). There are many cases where contractors/suppliers can make this choice (refer to **Attachment 1** and **Attachment 2**).

In general, TMR does not mandate the use of recycled materials in road construction for various reasons. Mandating use is considered undesirable due to uncertainty of economics and cost, and supply chain capability and reliability. An alternative approach of encouraging or incentivising use is suggested if increased use is desired.

TMR has recently introduced a waste and recycling calculator tool to capture, over time, data about recycled materials uptake on TMR projects (for example, where, what and how recycled materials are used on individual projects). It will take some time for reports to come back and be consolidated to provide a detailed insight into use on projects across TMR.

TMR and the National Asset Centre of Excellence will seek to leverage off and/or collaborate with national research projects, such as Austroads work, related to recycled materials.

## Attachment 1 – Permitted uses for recycled materials on TMR projects

- The Department of Transport and Main Roads (TMR) allows the use of certain recycled materials in some road infrastructure applications. This includes use of reclaimed asphalt pavement (RAP), construction and demolition waste, recycled crushed glass, fly ash, blast furnace slag and crumb rubber materials in road pavements as well as undertaking insitu recycling of existing road pavements. Currently, TMR allows Contractors/Suppliers to choose to use recycled materials in road pavements as follows within specified limits.

Application	Recycled material								TMR Specification
	Crushed concrete	Crushed brick	Crushed glass	RAP	Crumb rubber	Fly Ash and Slag	Insitu material	Recycled plastic	
Unbound pavements	✓	✓	✓	✓	-	-	-	-	MRTS05, MRTS36
Stabilisation	✓	✓	✓	✓	-	✓	✓	-	MRTS07B, MRTS07C, MRTS08, MRTS09, MRTS10
Sprayed sealing	-	-	-	-	✓	-	-	R	MRTS11, MRTS18,
Asphalt	-	-	✓	✓	R/D	✓ (As filler)	✓	R	MRTS30, MRTS32, MRTS36, MRTS101, MRTS102, MRTS103, MRTS18, PSTS112
Concrete	R	-	R	-	-	✓	-	-	MRTS70*
Concrete Pavements	-	-	-	-	-	✓	-	-	MRTS39, MRTS40
Earthworks, drainage and backfill	✓ R	✓ R	✓ R	✓ R	-	-	✓	-	MRTS03, MRTS04
Geosynthetics	-	-	-	-	-	-	-	R	MRTS27 MRTS58 MRTS100 MRTS104
Crack & Seal/Rubblisation (Concrete pavements)	-	-	-	-	-	-	R	-	
Other (including road furniture)	-	-	-	-	-	-	-	R	

✓ = currently permitted within specified limits/uses

R = Research underway

D = Demonstration projects underway

# Recycled materials in Queensland's roads

The Department of Transport and Main Roads (TMR) is committed to the Queensland Government's new Waste Management and Resource Recovery Strategy, particularly working towards a circular economy.

While research is continuing, many projects in TMR already identify ways to reduce waste and emissions to deliver sustainable infrastructure. This factsheet provides a snapshot of how TMR is using recycled materials to provide all Queenslanders with a cost effective and reliable road network.

## Glass

**10 to 20% recycled glass**

*can be used in roads.*

TMR is finding ways to use recycled crushed glass as a substitute for sand and aggregate in road materials. Up to 10 per cent can be used in asphalt bases and up to 20 per cent in gravel bases.

TMR is investigating the use of recycled glass in concrete, as bedding and backfill sand around pipes..



## Crumb rubber

**1.1 million tyres**

*forecast to be saved from landfill by June 2021.*

Used tyres are recycled and processed into crumb rubber, which is blended into bitumen to be used in asphalt and sprayed seals.

Crumb rubber not only recycles old tyres, but can improve the longevity and performance of roads.

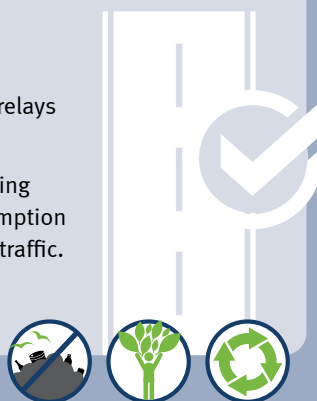


## Hot-in-place Asphalt recycling (HIPAR)

**2 million m<sup>2</sup> of pavement**  
**has been recycled**  
*using HIPAR.*

HIPAR removes, rejuvenates and relays existing asphalt in a single pass.

This results in very little waste being sent to landfill minimising consumption of new materials and impacts on traffic.

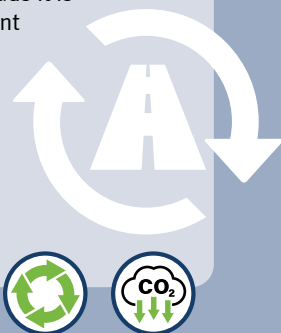


## Reclaimed Asphalt Pavement (RAP)

**Up to 40% RAP** *can be used in new asphalt.*

When asphalt is removed from existing roads it is processed into reclaimed asphalt pavement (RAP) material which can be incorporated back into new asphalt.

The use of RAP provides cost savings, reduces our reliance on raw aggregate and bitumen, and diverts waste from landfill.



Cost savings



Reducing landfill



Protecting the environment and our lifestyle



Network performance



Circular economy



Reducing emissions



**Queensland**  
Government

## Insitu stabilisation

Up to **6 000 tonnes** of **raw material** *could be saved per km of road.*

Insitu stabilisation of existing roads is undertaken by pulverising the road and mixing various stabilising agents (including cement, bitumen, fly ash and slag) which provides a strengthened rejuvenated pavement.

This results in very little waste sent to landfill without needing to consume new materials.

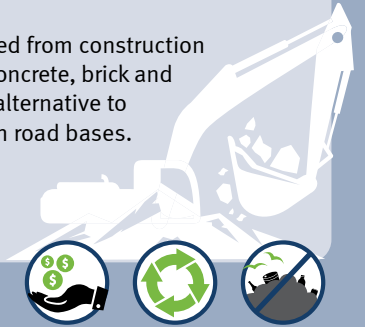


## Construction and demolition waste (C&D)

Up to **8 000 tonnes** of **waste** *diverted from landfill per kilometre of road.*

C&D waste is material recovered from construction and demolition sites such as concrete, brick and glass, and can be used as an alternative to natural aggregates and sand in road bases.

TMR is also investigating the use of C&D waste in concrete.

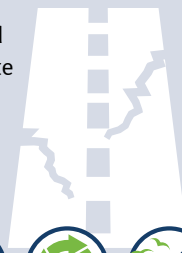


## Rubblisation

**1st trial of rubblisation** *in Queensland has been undertaken by TMR.*

Rubblisation and 'crack and seat' are used to rehabilitate and recycle existing concrete pavements.

This technique fractures the existing concrete pavement into small, interconnected pieces before a new road is constructed over the top.

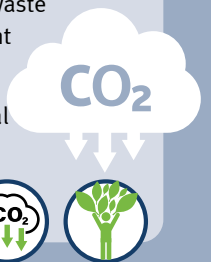


## Fly ash and blast furnace slag

Up to **70%** reduction in **greenhouse gas emissions** *from the use of fly ash.*

Fly ash and blast furnace slag are industrial wastes from coal fired power plants and steel production. These waste products can be used to replace up to 70 per cent of the cement used in pavements.

Up to 35 per cent of the cement used in structural concrete can be replaced with fly ash, up to 50 per cent with a combination of fly ash and slag, and 60 to 70 per cent with slag alone.



**TMR is continually researching innovative technologies and using recycled materials to construct sustainable resilient infrastructure which benefits the environment, community, and economy.**

## Plastics in infrastructure

TMR is investing in research to understand the opportunities for incorporating recycled plastics into road infrastructure. The research is considering long-term performance benefits for Queensland's roads as well as the safety and sustainability of the environment and the community now and in the future.

This research is being undertaken as a collaboration between National Asset Centre of Excellence (NACOE) - a joint initiative between TMR and Australian Road Research Board, and Western Australian Road Research and Innovation Program.

## Recycled materials in earthworks drainage and concrete

TMR is exploring new opportunities for the use of recycled materials in earthworks, drainage and concrete, focusing on diverting waste from landfill and supporting a circular economy.

Recycled materials such as glass, bottom ash from coal fired power plants and C&D waste have the potential to be used in these applications.



**To learn more about how TMR is using recycled materials in our roads contact:**

**E:** [tmr.techdocs@tmr.qld.gov.au](mailto:tmr.techdocs@tmr.qld.gov.au)

**W:** [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au)