

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 m² 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



In situ stabilisation

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

In situ 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.

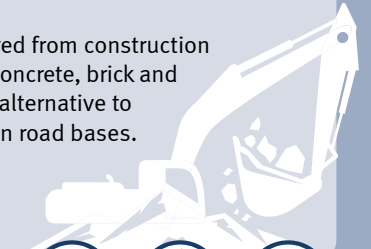


Construction and demolition waste (C&D)

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.

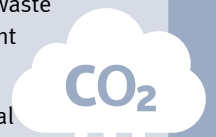


Fly ash and blast furnace slag

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:

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