

Purposely
Greener
Infrastructure



An initiative of Victoria's Big Build





What is Ecologiq?

Ecologiq is the future of reusing, recycling and repurposing waste materials on road and rail infrastructure across Victoria.

The aim of this Victorian Government initiative is to integrate recycled and reused content into every corner of Victoria's \$80 billion Big Build, by incorporating waste products wherever possible.

Ecologiq comes at a crucial time, with China's decision to restrict the import of low-quality mixed recyclables in 2018 destabilising

global recycling markets, while issues with waste stockpiles have been costly.

By 2046, Victoria is expected to generate 40 percent more waste a year than in 2017-18, highlighting the need to grow our domestic recycling capabilities and create local markets for recycled content.

Ecologiq is making the use of recycled and reused materials business as usual.

This helps Victoria innovate and grow its domestic recycling capabilities, build local markets and find new uses for recycled content.

As of June 2020, the \$80 billion Big Build has used:

 **973,000**
tonnes of recycled
crushed concrete

 **377,000+**
tonnes of crushed rock,
brick and ballast

 **155,200+**
tonnes of slag
and fly ash

 **17,000+**
tonnes of recycled
glass sand

 **156,000+**
tonnes of reclaimed
asphalt pavement

 **1.2m+**
tonnes of fill from other
construction sites and projects

Our high level priorities





Ecologia is supporting the implementation of the Recycled First Policy.

This mandatory procurement measure requires bidders on transport projects to demonstrate how they will optimise their use of recycled and reused materials.

Recycled First supports the government's circular economy strategy, Recycling Victoria, which sets out a 10-year plan to overhaul the state's recycling sector, grow domestic recycling capabilities and fuel innovation.



The Recycled First Policy

The Recycled First Policy applies to new major transport projects from March 2020 and the Department of Transport's operational and maintenance projects from 2022.

Four upgrade projects being delivered by Major Road Projects Victoria – Childs Road, Fitzsimons Lane, Hallam Road North and Lathams Road – are the first in Victoria to implement the policy, with dozens of other projects to follow.

EcologiQ works closely with project teams and contractors across Victoria's Big Build to ensure the policy requirements are effectively met. The team provides:

- detailed guidance and wrap around hands-on support during procurement and delivery
- practical support to project teams and contractors to implement procurement guidance and optimise and match project opportunities
- technical advice around using recycled and reused materials
- supply chain identification and engagement support.

There are 30+ Big Build projects that currently or will include Recycled First requirements.



Priority materials

Plastics



- Binder modifier
- Asphalt
- Noise walls
- Bollards and wheel stops
- Drainage
- Bike paths, decking, boardwalks
- Roadside furniture, bins, drinking fountains, signage and art
- Composite sleepers

Organics



- Compost, including landscape planting, wetlands creation, turf and vegetation establishment and erosion control
- Soil conditioners
- Mulch
- Geotechnical fill

Crumb rubber



- Spray sealing
- Binder modifier
- Some asphalt mixes
- Pavement markings (e.g. surface treatments)
- Miscellaneous roadside applications (e.g. speed humps)

Glass



- Asphalt
- Crushed rock supplement, sand replacement
- Footpaths and kerbs
- Drainage
- Fences

Reclaimed Asphalt Pavement (RAP)



- Asphalt
- Crushed concrete
- Crushed rock and cement-treated crushed rock replacement (pavement)
- Footpaths and kerbs
- Channels and culverts

Crushed Brick



- Pavement

Fly Ash



- In-situ stabilisation (pavement)
- Concrete
- Aggregate additive
- Noise walls and fences
- Footpaths and kerbs

Slag



- In-situ stabilisation (pavement)
- Concrete
- Aggregate additive

Ballast



- Stabling yards and sidings
- Heritage railways,
- Turnouts and access tracks

Steel



- Steel mesh and wire
- Signage
- Roadside art



Recycling in action

Ecologiq builds on the impressive work already underway across Victoria's Big Build to give new life to waste products.

The following pages include standout examples of these efforts.



AUSTRALIA'S GREENEST ROAD

Mordialloc Freeway

In a world first, noise walls along the Mordialloc Freeway will be made from 75 per cent recycled plastic collected from households across the state, as part of a drive to build Australia's greenest freeway.

The 32,000 square metres of noise walls required for the project are being made from more than 570 tonnes of plastic waste.

The panels are made from a mix of hard plastics from kerbside recycling, such as milk, juice and shampoo bottles, as well as soft plastics used in bread bags, bubble wrap and food packaging. This is equivalent to the plastic waste collected kerbside from 25,000 Victorian households in a year.

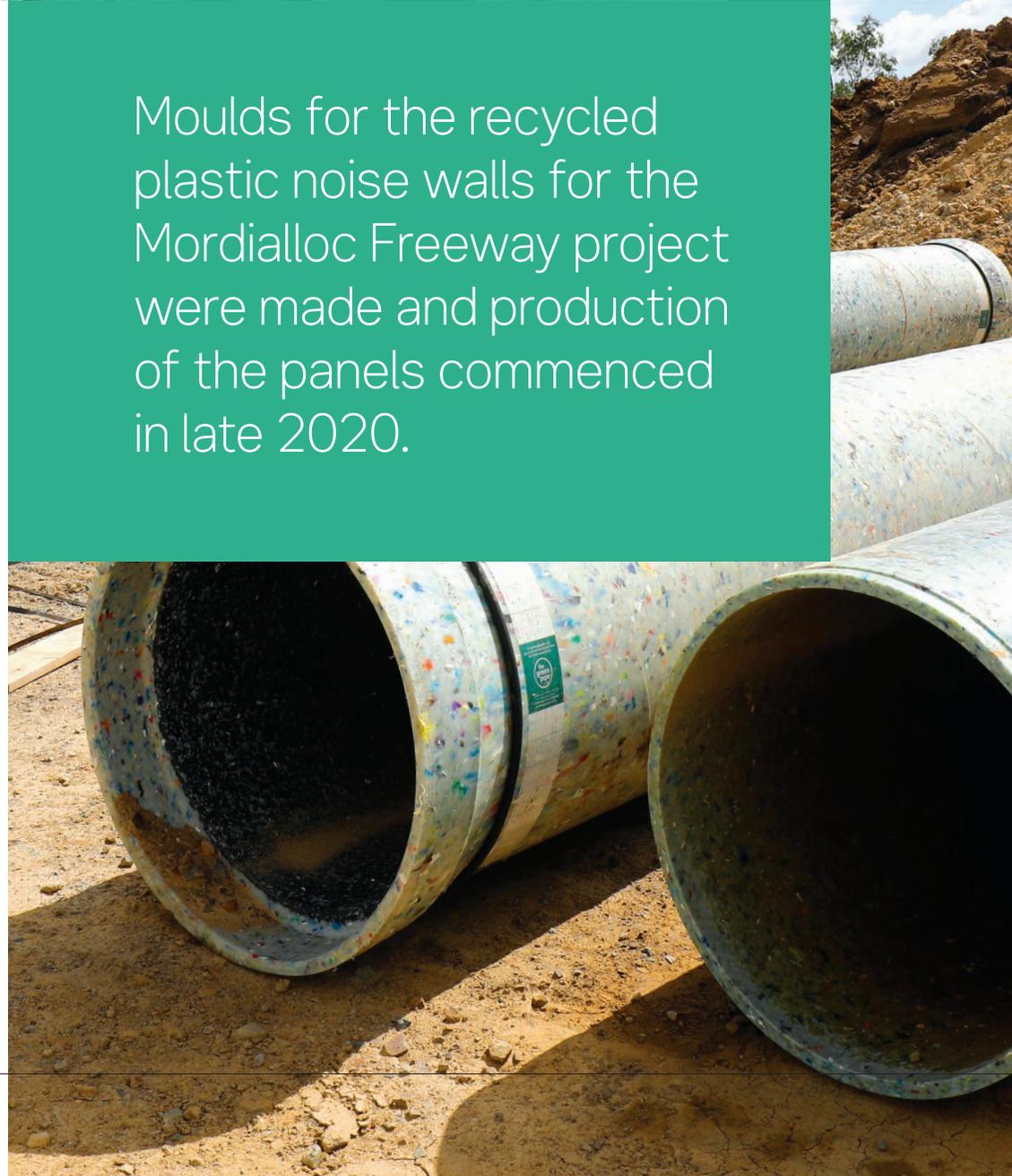
The Mordialloc Freeway project is an exceptional example of incorporating green initiatives, including 30%

reclaimed asphalt pavement, recycled glass in asphalt, recycled concrete in road base, drainage pipes made of recycled plastic and landscaping mulch made from pine pallets.

The project is also laying almost 25,000 square metres of 100% recycled geofabric drainage blankets, which is material used to remove water or control groundwater seepage from cut slopes or beneath fills.

Sustainability Victoria is also supporting this initiative through their Market Development Grant Program.

Moulds for the recycled plastic noise walls for the Mordialloc Freeway project were made and production of the panels commenced in late 2020.



SETTING AN INNOVATIVE TONE

Duncans Road, Werribee

In Melbourne's west, workers used more than 590,000 plastic bags and toner from 13,000 print cartridges to resurface a road.

The product known as Reconophalt is being trialled on Duncans Road, Werribee as part of the recently completed \$1.8 billion Western Roads Upgrade.

Around 155 tonnes of the material was used in the wearing course layer, marking one of the first

times the product has been used on a Victorian arterial road. The pavement was placed next to a standard wearing course asphalt to be compared and monitored over the next few years.

While this trial hints at exciting new possibilities, the Western Roads Upgrade has already used mammoth volumes of widely accepted recycled materials, including more than 190 million recycled glass bottles and up to 300,000 tonnes of recycled asphalt.

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Recycled sand made from crushed glass provides a significant cost saving.

PLENTY OF RECYCLABLES

Plenty Road Upgrade

Recycled glass has been used as bedding fill and backfill for drainage pipes on the Plenty Road Upgrade, while rock and concrete from construction and demolition sites has been crushed and reprocessed to be used in new pavement.

Around 13,400 tonnes of recycled material has been used, with the surface of the new road incorporating reclaimed asphalt.

HITTING A NEW STANDARD

Kororoit Creek Road, Level Crossing Removal Project

In 2019, the Kororoit Creek Road Level Crossing Removal Project used recycled glass as bedding fill for combined service routes, as well as backfill for drainage piping.

The recycled sand made from crushed glass provided a significant cost saving, diverted a significant amount of material from landfill and led to a uniform Metro Trains Melbourne specification for the application.



ON TRACK

Composite sleepers in sidings at Richmond Station and Wyndham Vale stabling yard

Metro Trains has successfully completed an 18-month trial of recycled plastic sleepers at Richmond Station. Workers installed 190 sleepers as part of maintenance work in 2019.

It marked the first time the metropolitan train network has used the innovative sleepers, which are comprised of 85% recycled plastic waste. Just one tonne of plastic waste produced 30 of the sleepers used in the trial.

V/Line also installed 120 of the sleepers as a trial during the construction of a new stabling yard entry track at Wyndham Vale in 2019.

EcologiQ is working with the Monash Institute of Rail Technology to support the development of a recycled plastic composite sleeper for use in high-speed mainline track environments.



PAVING A NEW WAY

M80 Freeway Upgrade (from Sydney Road to Edgars Road)

The upgrade of the M80 is the first freeway project in Victoria to include recycled materials in every layer of pavement.

This includes 100% recycled capping material, being brick or concrete rubble and fill from the M80 project site; a recycled crushed concrete lower subbase, cement-treated recycled crushed concrete upper

subbase and reclaimed asphalt used in the base, intermediate and wearing courses.

Recycled glass sand is also being used in Intelligent Transport Systems conduit bedding and backfill applications, while supplementary cementitious materials are being used to replace up to half of the cement needed in concrete works.



High reclaimed asphalt pavement (RAP) content asphalt is being implemented on MRPV's M80, Mordialloc and Monash projects and will result in the use of about 70,000 tonnes of extra RAP.

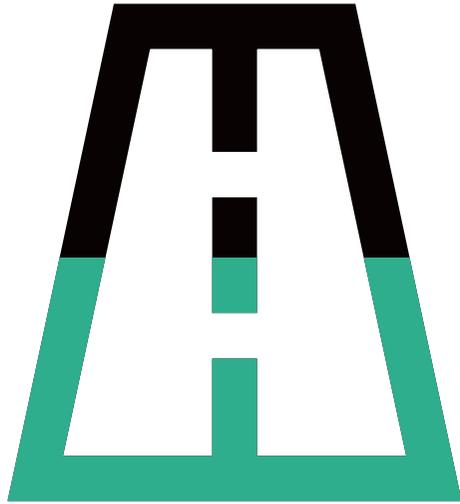
Testing in early 2021 validated the 30 per cent RAP alternative asphalt in heavy duty intermediate asphalt layers, and the results were incorporated in the updated Section 407 Dense Graded Asphalt specification with the increased allowance of reclaimed asphalt pavement.

This work was an exciting new collaboration between the Department of Transport, Australian Road Research Board, MRPV, Ecologiq and the Australian Flexible Pavement Association.



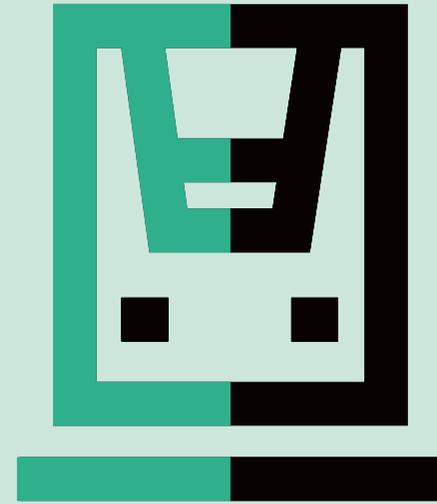
Innovations

Ecologiq is working with industry partners to further the research, development and validation of innovation applications and end markets for recycled and reused materials.



For road infrastructure, these include:

- Organics for landscaping
- Recycled plastic noise walls
- Crumb rubber in open graded and gap graded asphalt for heavily trafficked roads
- Increased plastics and crumb rubber in asphalt and ancillary infrastructure
- Recycled plastic drainage pipe under pavements
- Recycled materials in shared user paths, car parks and permeable pavements.



For rail infrastructure:

- Recycled and reused ballast
- Recycled glass fines and crushed concrete in of track formation
- Recycled plastic composite sleepers
- State-wide review and reform of rail waivers, standards and specifications
- Increased opportunities for plastics, crumb rubber and tyre derived aggregate at stations and platforms.



Purposely Greener Infrastructure

Get in touch

We encourage government project teams, contractors and rail transport operators to reach out for support to embed sustainable products, materials and initiatives in projects.

Industry can also get in touch for help connecting to opportunities and achieving compliance to standards and specifications.

Email ecologiq@roadprojects.vic.gov.au to start your journey towards greener infrastructure.

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