

ecologia[®]

Purposely Greener Infrastructure

Waste Expo - MCEC October 2022

An initiative
of Victoria's
Big Build



*Munro Street, Coburg (Bell to Moreland)
level crossing removal project*



What is ecologiQ

ecologiQ is a Victorian Government initiative to optimise the use of circular materials in Victoria's major transport infrastructure projects, reduce waste and contribute to a Victorian circular economy.



The program supports the implementation of the **Recycled First Policy**.

ecologiQ's vision

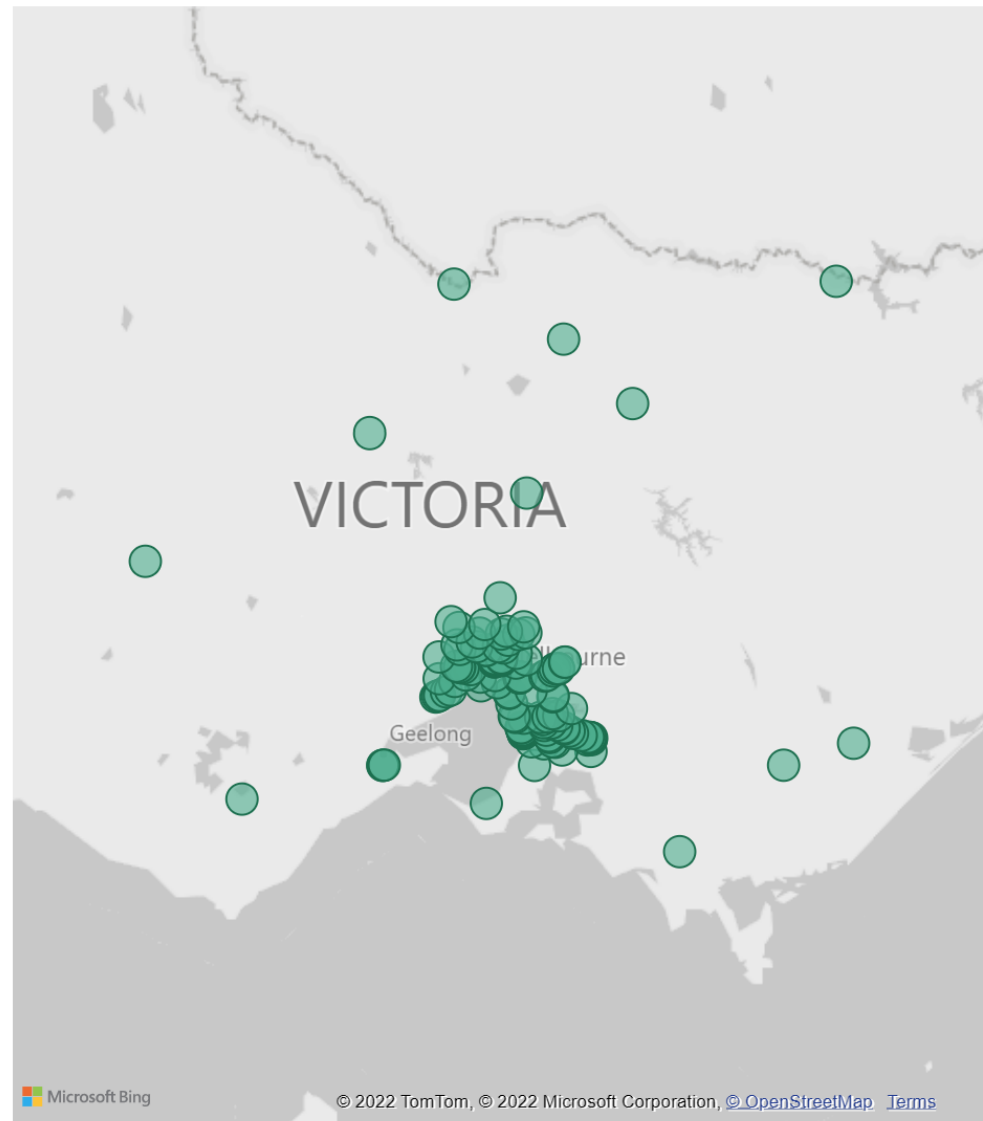
To utilise the unprecedented investment in infrastructure to be recognised as the world leader in the sustainable use of recycled and reused materials by 2025.



Total potential re-use opportunity

- > Assumes maximum allowable limits across all construction material types
- > Use charts to drill down to specific material types and replacement uses.
- > All figures shown are in Tonnes of conventional material to be replaced (not the recycled material weight)

Total demand by project location



Select Conventional Material Type (Black = Selected)

Select all	Asphalt	Ballast	Capping (Rail)	Concrete	Crushed Rock	Filter Material	Plastic	Seal
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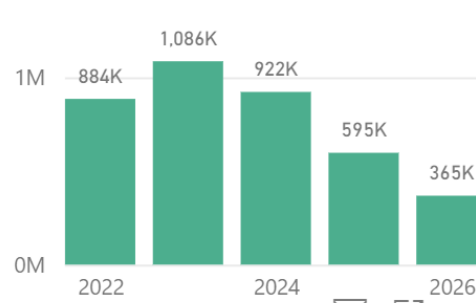
Select Recycled Material Type (Black = Selected)

Ballast	Crushed Brick	Fly Ash	Plastic	Slag/ Slag Aggregate
Crumb Rubber	Crushed Concrete	Glass Fines	Reclaimed Asphalt Pavement	Total Opportunity

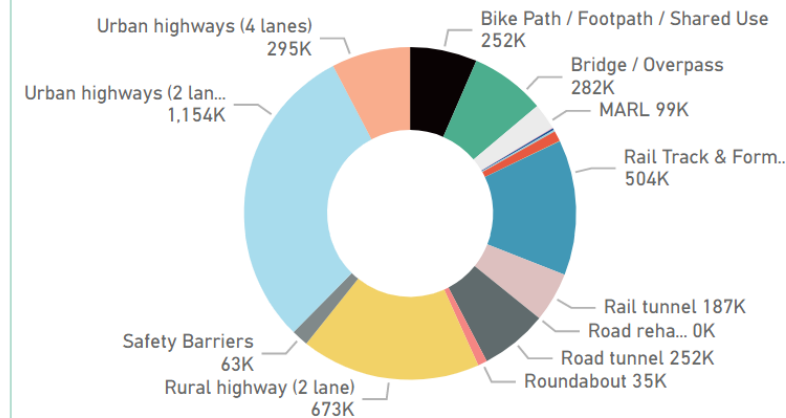
Total potential replacement (tonnes)

Recycled Material

● Total Opportun...

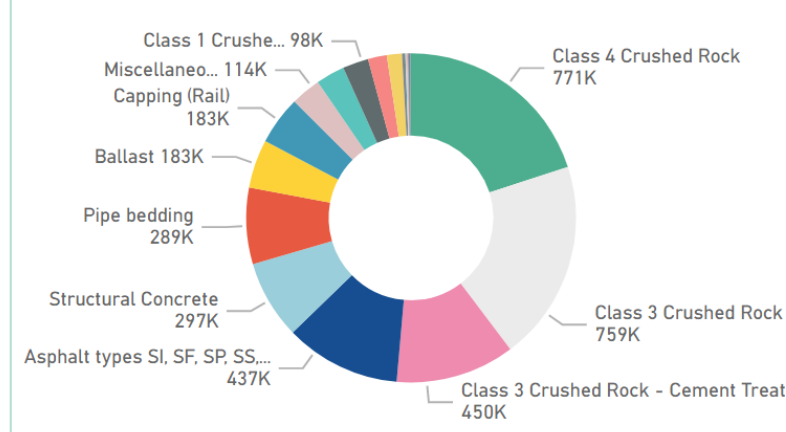


Potential replacement by structure type (tonnes)








Material_Long	Value
Class 4 Crushed Rock	770,626
Class 3 Crushed Rock	759,167
Class 3 Crushed Rock - Cement Treated	449,974
Asphalt types SI, SF, SP, SS, SG, RGG	437,359
Structural Concrete	296,832
Pipe bedding	288,885
Ballast	183,442
Capping (Rail)	183,340
Miscellaneous concrete	113,677
General Concrete Paving	108,629
Class 1 Crushed Rock	97,686
Granular Filter Material	71,187
Asphalt types L, N, H, V, HP, VP, HG, OGA, SMA	57,059
Drainage pipe - Road - Small	12,584
Drainage pipe - Rail	5,044
Total	3,851,793

Potential replacement of conventional materials (tonnes)



The waste crisis - priority waste materials

Material	Description	Usage option
 Plastic	Commercial, industrial and municipal waste	<ul style="list-style-type: none">• Asphalt• Noise walls• Bollards and wheel stops• Drainage• Bike paths, decking, boardwalks• Roadside furniture, bins, drinking fountains, signage• Composite sleepers
 Organics	Commercial and domestic food waste, green waste from landscaping and maintenance and biosolids	<ul style="list-style-type: none">• Compost, including landscape planting, wetlands creation, Mulch• Geotechnical fill
 Crumb rubber	Ground end-of-life tyres, typically truck tyres, though sources may include passenger tyres, off-road mining tyres or conveyor belts	<ul style="list-style-type: none">• Spray sealing• Some asphalt mixes• Pavement markings (e.g. surface treatments)• Miscellaneous roadside applications (e.g. speed humps)
 Glass	Crushed material from construction and demolition, manufacturing and household waste	<ul style="list-style-type: none">• Sand replacement• Asphalt• Crushed rock supplement• Concrete
 Textiles	Waste material from clothing and agricultural waste	<ul style="list-style-type: none">• Reinforcement and geotextiles• Tiles• Ancillary applications



Big Ideas from The Big Build

The Recycled First Policy

- an intentional approach

- A first in Australian history, Recycled First mandates contractors delivering major Victorian transport projects to optimise use of recycled and reused materials
- The Recycled First Policy is built into tender and contract processes
- ecologiQ is leading the policy's development and implementation across major transport projects, uniting government and industry to create a BAU approach to using recycled materials in transport



Procurement and delivery obligations

EOI

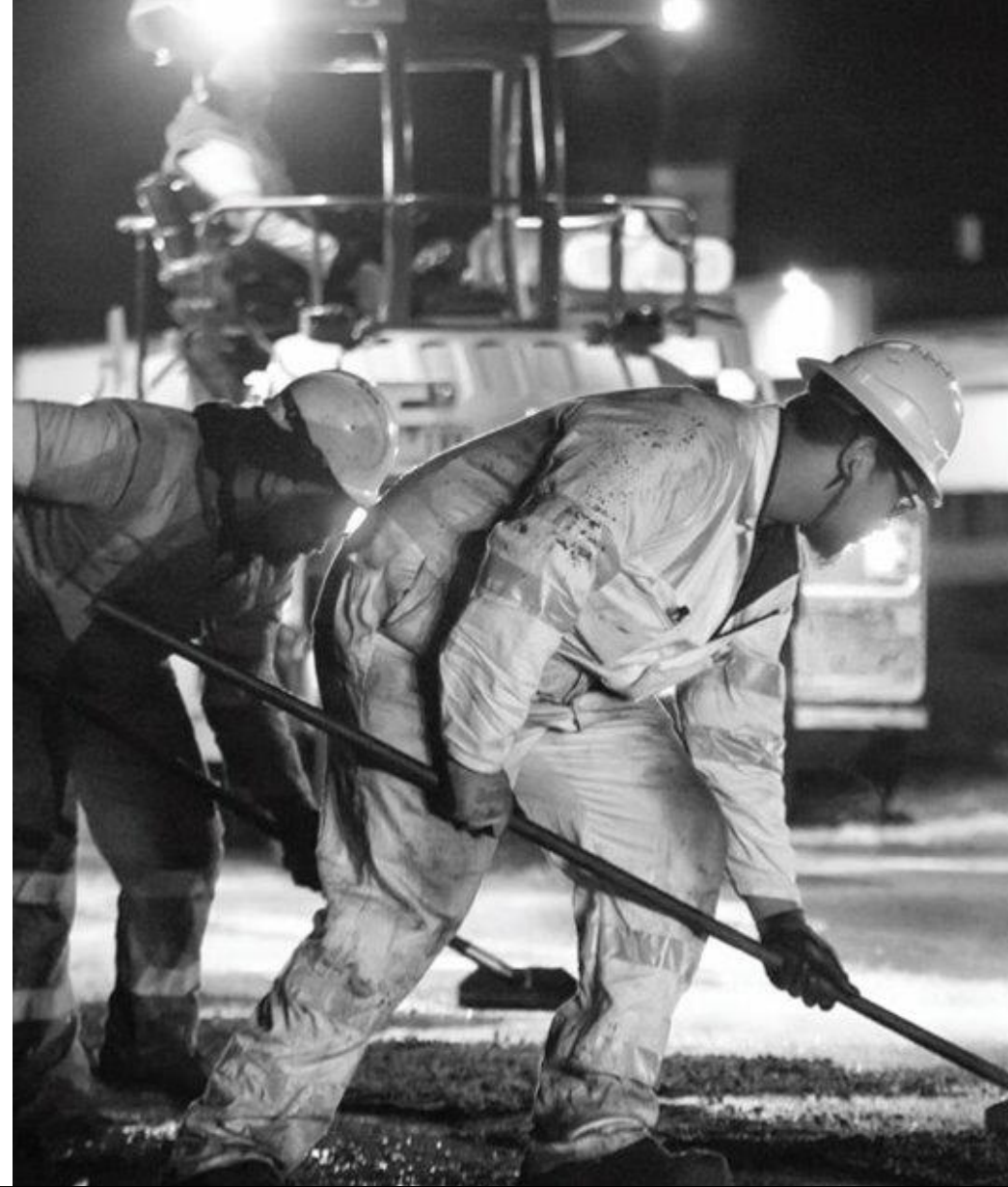
Demonstrate understanding of Recycled First principles and a high level approach to incorporating them within the tender.

RFT/RFP

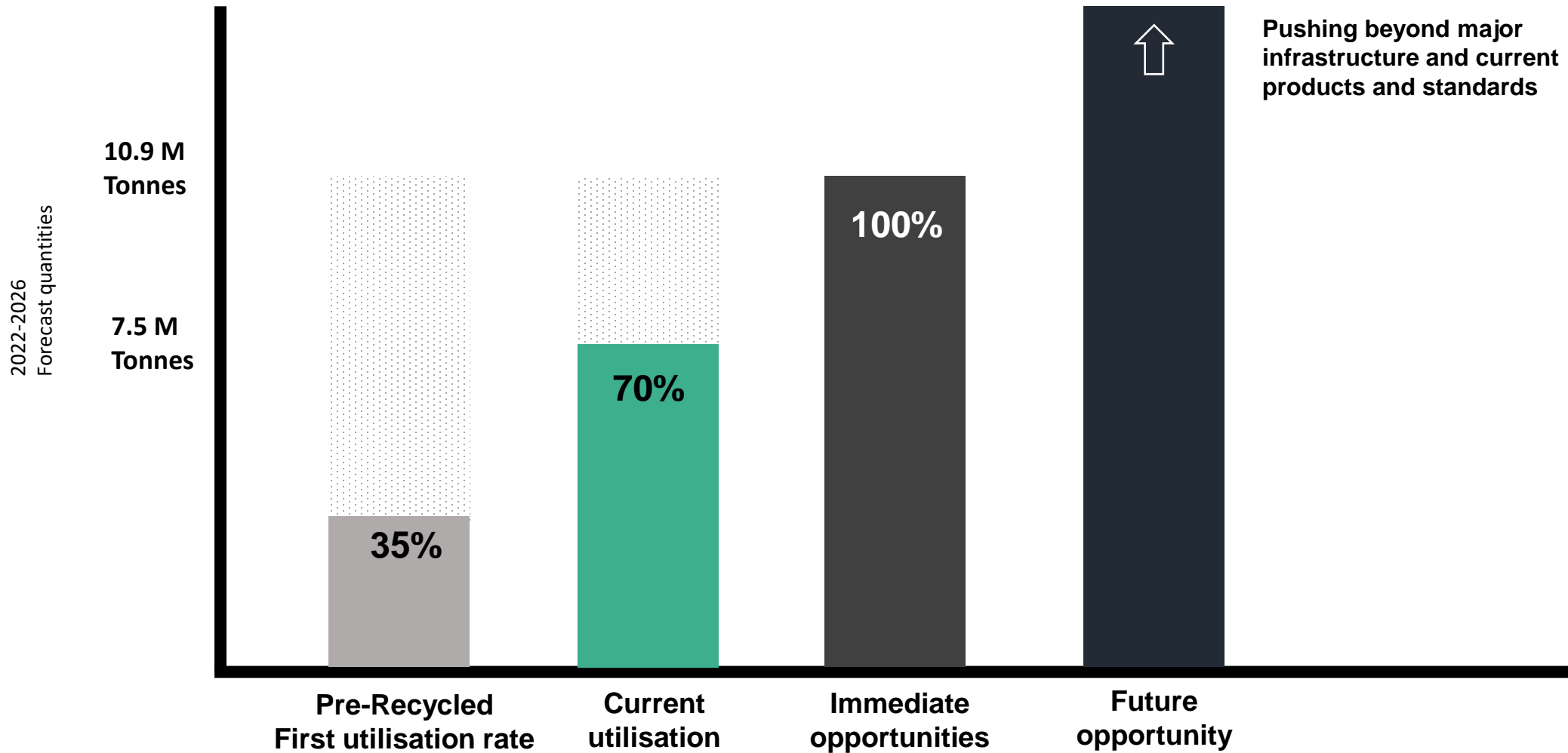
Demonstrate a detailed understanding of Recycled First and develop a Recycled First Plan that defines the tenderer's commitment and approach to using approved reused and recycled materials.

Delivery

Deliver on commitments outlined in Recycled First plan and report on quantities of reused and recycled materials used.



Utilisation of recycled products



Foundations for success – policy with intent



Optimise use of recycled and reused materials on projects

- Implement Recycled First
- Increase emerging priority waste materials
- Data, reporting and insights
- Build capability in project teams and contractors across development, procurement and delivery

Technical leadership

- Reform standards and specifications with DoT/RTOs
- Provide technical advice and guidelines for use
- Research and development of emerging products and materials
- In field trials and validations

Market development

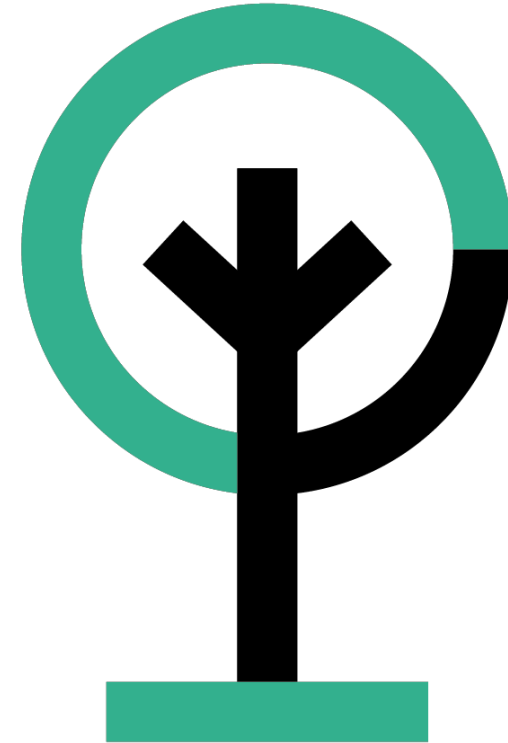
- Understand and address supply-demand barriers and opportunities
- Market development/ acceleration of end markets for emerging materials
- Industry engagement – connect suppliers, projects and contractors

Awareness and Education

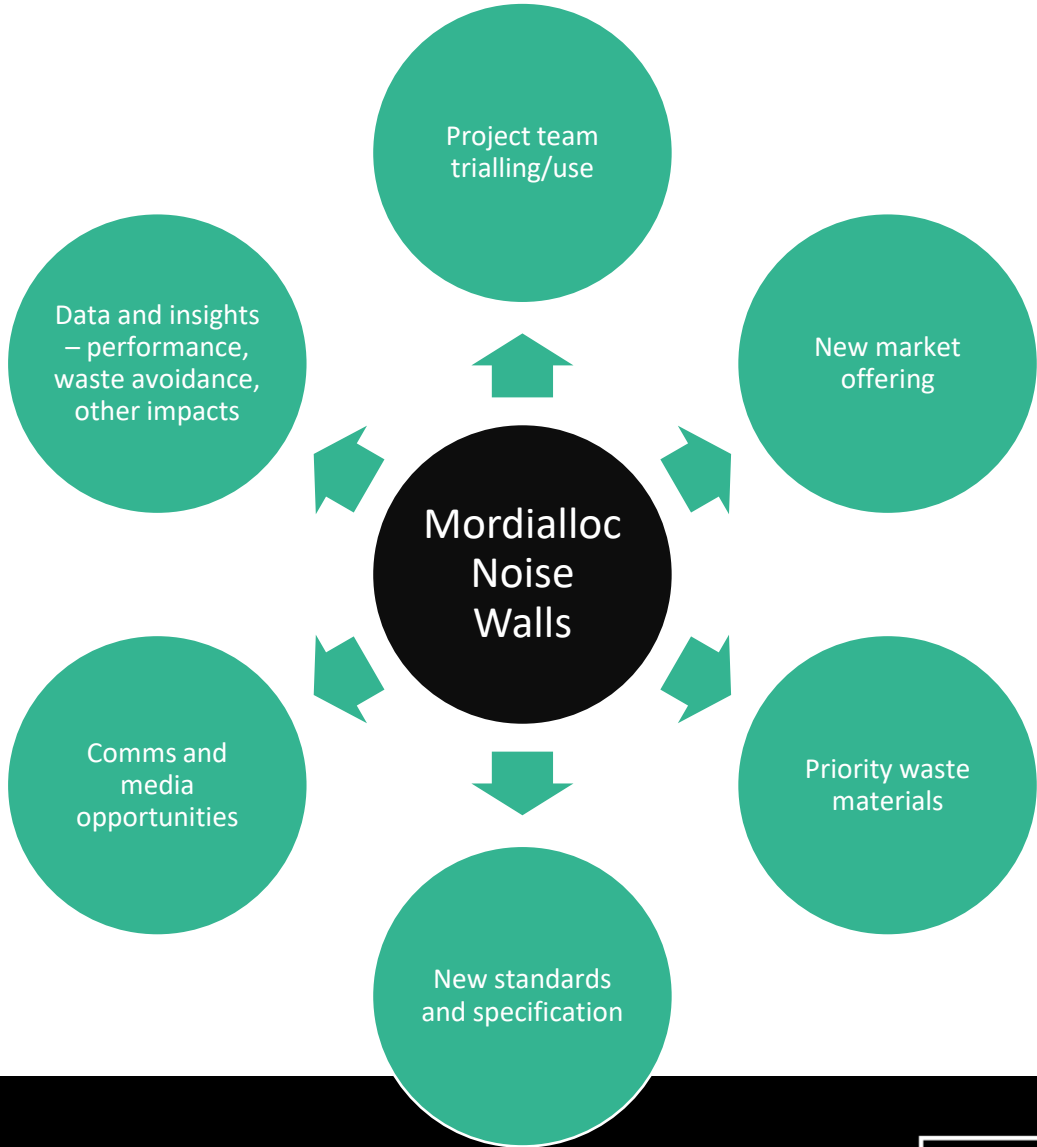
- Awareness, education, capability and capacity building
 - Build ecologiQ's brand position
 - Share learnings across Big Build
 - Drive change management

Recycled materials: challenges and barriers

- Time and cost
- Knowledge and confidence
- Alignment between stakeholders
- Legitimate and perceived risks of using R&R materials
- Standards and specifications
- Disconnect between market supply and demand



An example



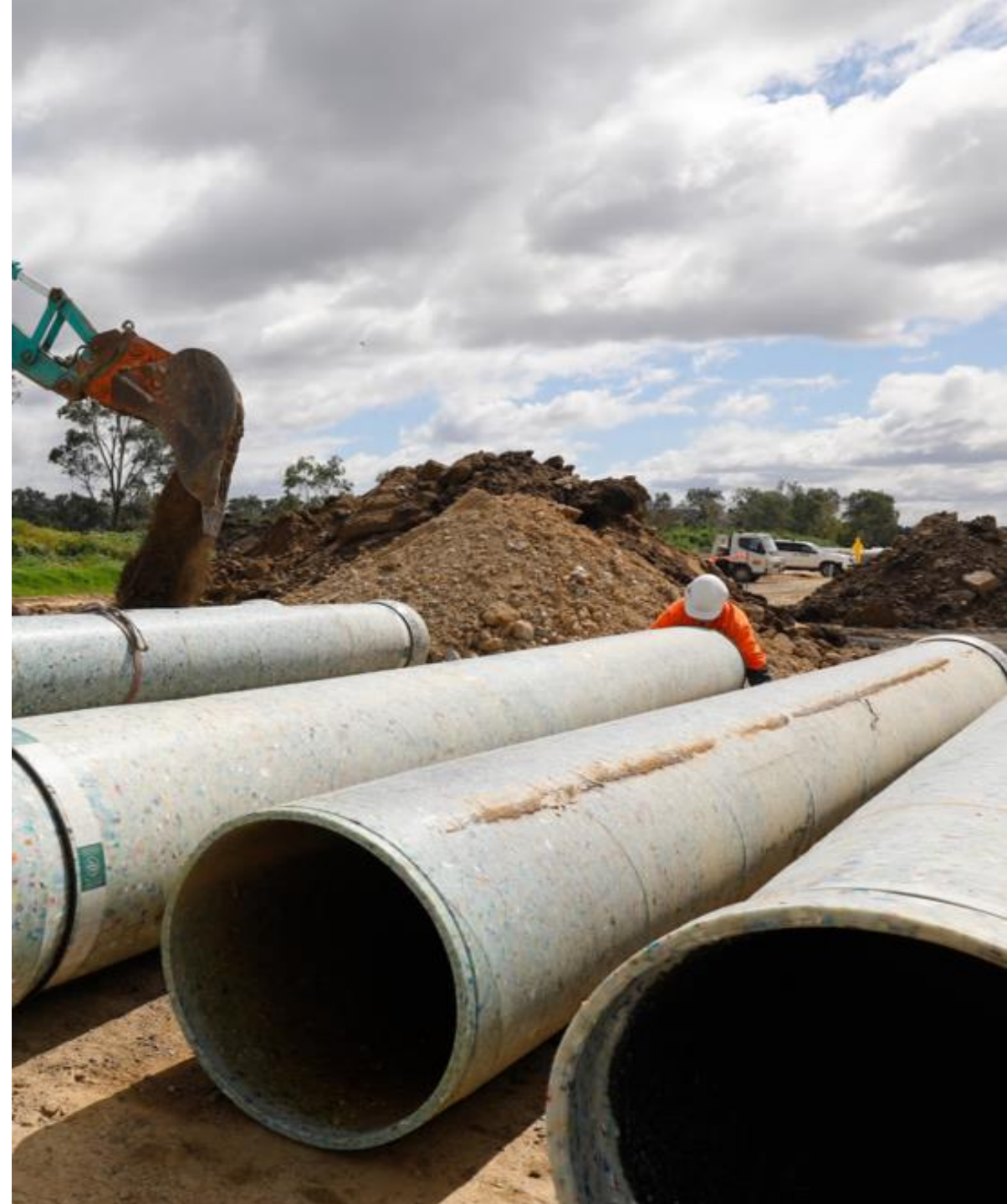
Focus on plastics

- Priority waste stream
- Versatile with broad potential for use in transport infrastructure
- Advantages vs traditional materials
 - weight, workability, cost
- Products must meet standards and specifications
- Rigorous testing and trials conducted prior to update of standards and specifications
- Correct handling and installation is crucial to long-term performance



Recycled plastic drainage pipes

- 100% recycled HDPE plastic, sourced from kerbside collection (milk, shampoo, detergent etc), damaged wheelie bins, road barriers and plastic water tanks
- Up to 600mm diameter
- Lighter weight gives advantages in manual handling onsite and transportation vs concrete pipes
- Approved for kerbside use non-trafficable pavement



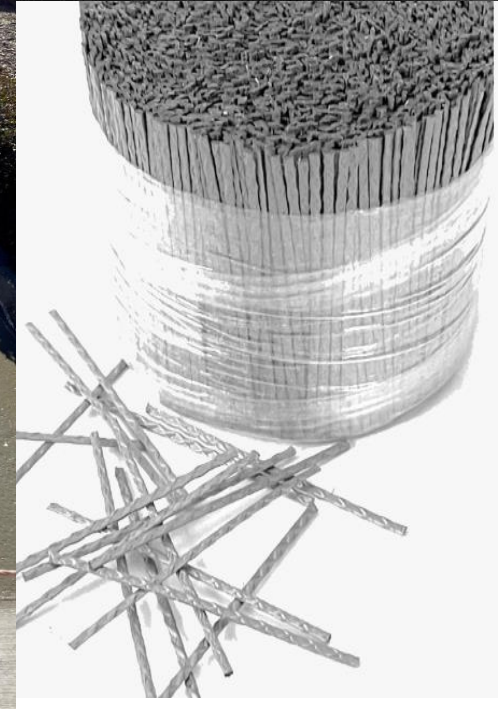
Polyrok

- Polyrok is used as a **partial replacement for aggregate** in concrete, using post-consumer soft plastic material, in footpaths, kerbing, landscaping and more.
- A one-kilometre footpath contains 875,000 plastic packages, diverted from landfill or from entering our waterways and oceans,
- If each Council in Australia committed to just one kilometre of footpath, 1,900 tonnes of Polyrok (470 million pieces of soft plastic material) would permanently become part of the communities' walkways



Emesh

- 100% recycled plastic polypropylene macro synthetic fibres replacing steel reinforcing in concrete
- Time, cost, safety benefits
- 80-90% carbon reduction vs steel, equating to about 100kg carbon reduction per m³, or half a tonne per truckload
- 50-year service life and used in 30+ local councils across Australia
- Packaged by NDIS workers, creating social value



Noise walls

Mordialloc Freeway has installed the world's first 75% recycled plastic noise wall

- 10,000 noise wall panels
- 570 tonnes of plastic waste diverted from landfill
- Mixture of hard and soft plastics
- 40+ year service life and recyclable

Other opportunities to use plastic panels

- Hoardings or gawk screens
- Alternative screening
- Elevated structures

Duratrack recycled plastic sleepers

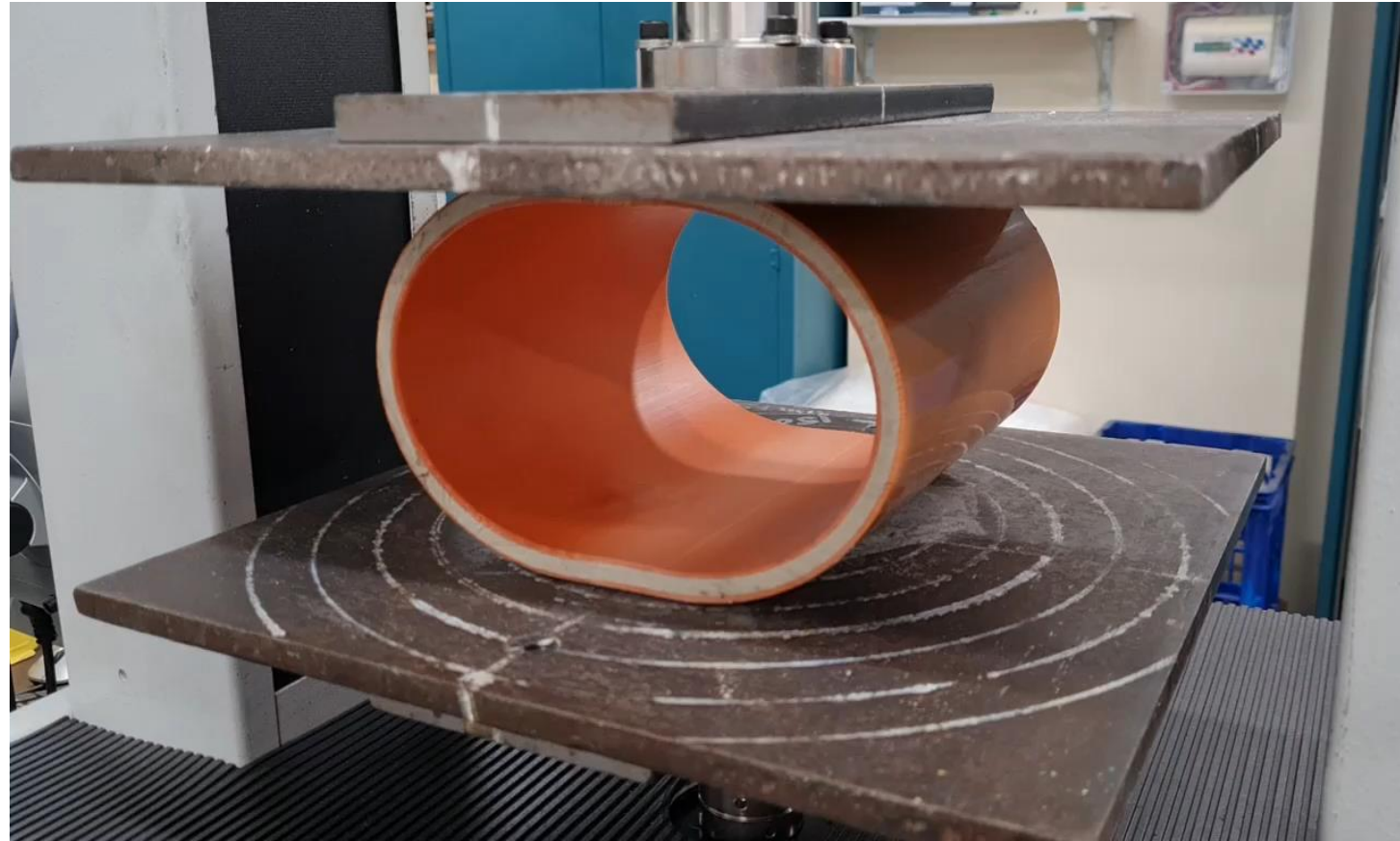
- 85% recycled plastic waste
- One tonne of plastic produces 30 sleepers
- 65 tonnes of waste plastic diverted from landfill per track km
- Type Approved for low-speed environments
- Over 1,000 sleepers installed to date as part of Rail Projects Victoria's Regional Rail Revival alone

Opportunities - ecologiQ is working with Monash Institute of Rail Technology to support development of recycled for use in high-speed mainline environments



Plastic Innovations

- Recycled Layer Conduit Pipes
- Middle core made from recycled PVC, sandwiched by outer layers of virgin plastic
- Approved by DoT for use



Glass & Polymer Concrete

- Polymer traffic islands and lane separators
- Currently used by Yarra Trams as lane separators in Melbourne's CBD
- Selected for use in StKilda Rd bicycle lane separator to meet bluestone heritage look
- Made from 80% recycled glass



Eco T-Top Bollards

- Thousands of temporary t-top bollards end up in landfill each year
- OC Connections Enterprises, a social enterprise, collected 4,000 old bollards
- Shredded and made into new bollards in Melbourne from blend of locally sourced recycled plastics and old bollards
- Crumb rubber base
- Social value- reflective strip applied by people living with a disability
- Estimate will divert up to ~100 tonnes of bollards from landfill over the first three years
- Commercial production and product launch has occurred in October (now!)
- An order for 4,200 bollards received from one contractor post ecologiQ conference



Resources

Application category	Region	Search by material keyword	Search supplier name	Clear all filters	Supplier
All	All	<input type="text" value="Search"/>	<input type="text" value="Search"/>	<input type="button" value="Clear all filters"/>	Select a map pin to display
					Website
					Products / Services
					Phone number
					Additional contact details
					Address

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[View ecologiaQ Supplier Map Terms and Conditions of use](#)

Reference Guides ...

Recycled Materials in Ancillary Infrastructure

Reference Guide – October 2020

An initiative of Victoria's Big Build



Recycled Materials in Road Infrastructure

Reference Guide – March 2020

An initiative of Victoria's Big Build



Recycled Materials in Rail Infrastructure

Reference Guide – September 2020

An initiative of Victoria's Big Build



ecologiQ's reference guides for recycled materials in road, rail and ancillary infrastructure provide a summary of current DoT, RTO and Australian standards, specifications and clauses that allow the use of recycled materials in various applications.

ecologiQ's Product and Material Trials Reference Guide can assist with new product trials.

All are available on our EcologiQ knowledge hub accessible at ecologiQ@roadprojects.vic.gov.au

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Visual Guide: Recycled and Reused Material Opportunities in Road and Rail Projects

February 2022



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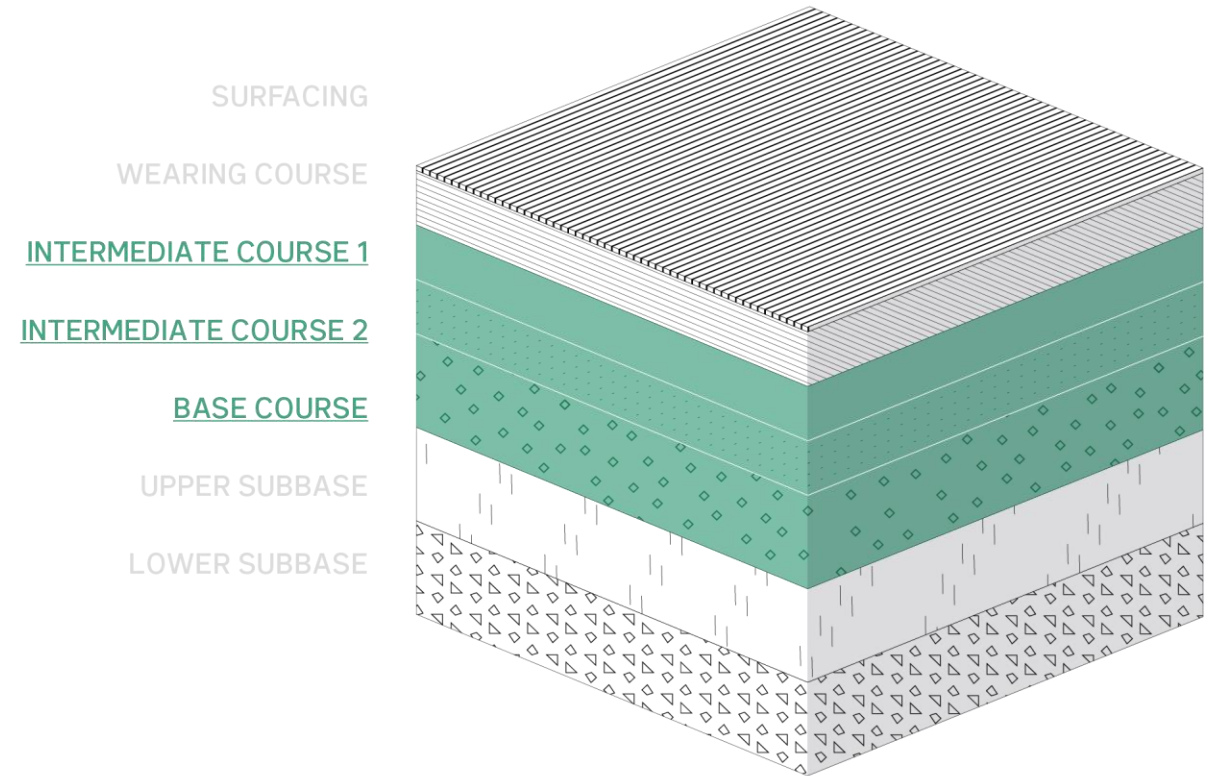


New Pavements

Asphalt Intermediate and Base Course

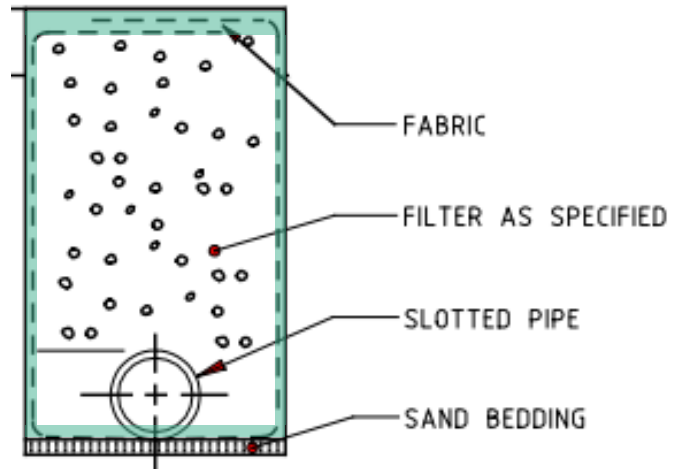
- C** Up to 40% RAP (pending asphalt type)
- A** Slag aggregate
- A** Up to 50% glass fines
- A** Fly ash (100% as filler)

C Approved and common **A** Approved but less common **I** Innovation



Geotextiles

C Recycled plastic



C Approved and common A Approved but less common I Innovation



Bike Stands

A Recycled plastic

A Recycled steel

A Site won (reuse)



Speed Humps

A Crumb rubber

A Recycled plastic

A SCMs in cement



Wheel Stops

A Recycled plastic

A Crumb rubber

A Recycled steel
(reinforcement)

A SCMs in cement



C Approved and common

A Approved but less common

I Innovation

Cladding

I Recycled plastic

I Recycled Steel

Insulation Panels

I Recycled textiles

Tiles

I Recycled crushed glass and textiles

C Approved and common

A Approved but less common

I Innovation



Tactile ground surface indicators

- C Recycled plastic
- A Crumb rubber
- A Recycled steel

Ballast

- A Site won (reuse) in low-risk areas (i.e. rail siding)

Handrail/Cladding

- C Recycled steel
- A Recycled plastic

Drainage blanket

- I Recycled Ballast
- C Slag

Stair nosing

- A Recycled rubber

Non-slip surfacing

- A Recycled crushed glass
- A Crumb rubber

Capping

- I Crushed concrete and Crushed glass mix
- I Slag

Sleepers

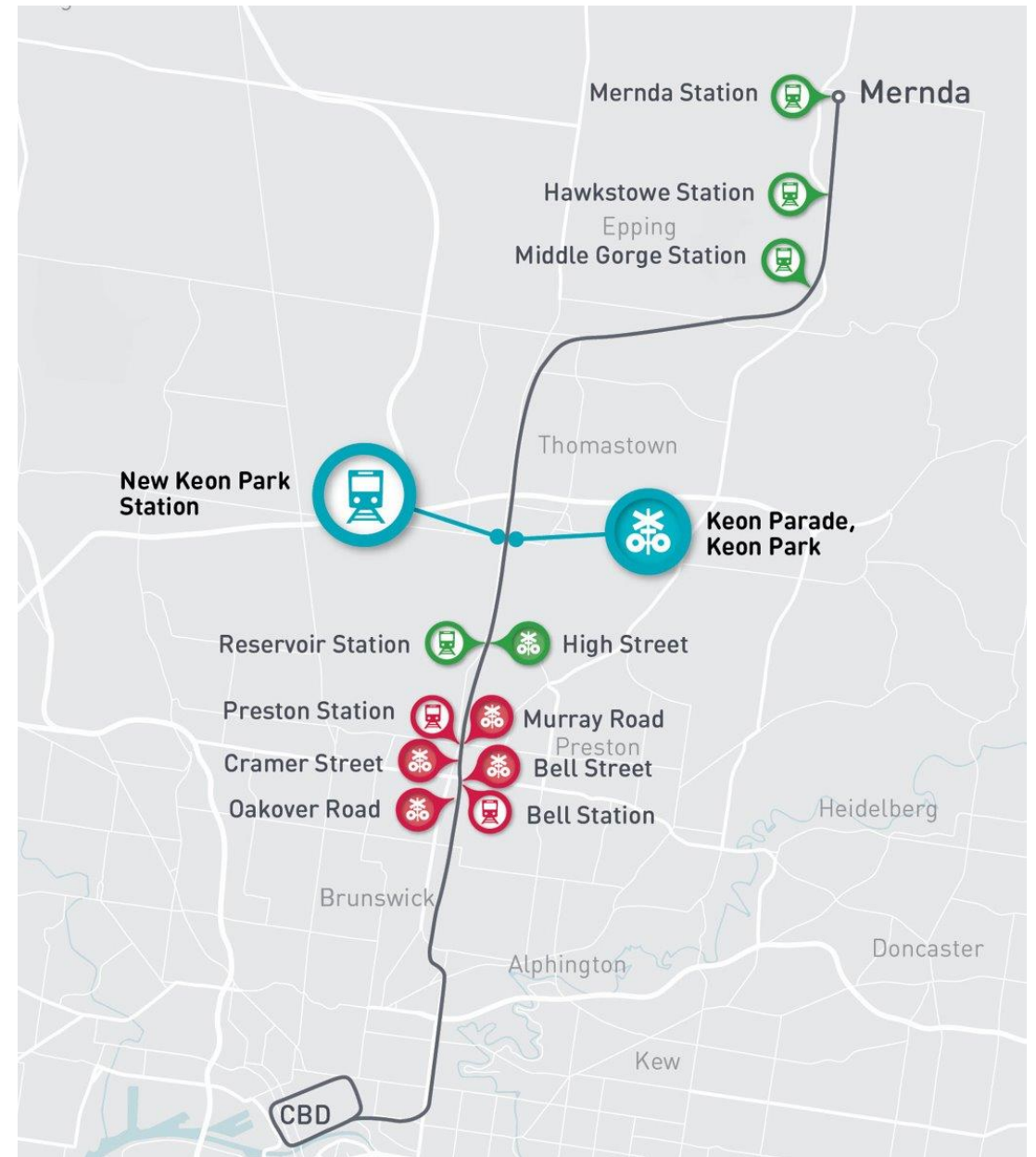
- A Reuse old sleepers
- C SCMs in concrete
- A Composite sleepers in low-risk areas (i.e. rail siding)

C Approved and common A Approved but less common I Innovation

Project Beacon

Keon Parade Level Crossing Removal Project

Identify and trial, industry changing, sustainable product solutions for the Keon Park urban realm



- Home
- + New
- Page details
- Analytics
- About Us
- Recycled materials overview
- For project teams
- Supplier map
- Case studies
- Useful resources
- Terms of use
- Contact us
- Download the Recycled PL...
- Edit

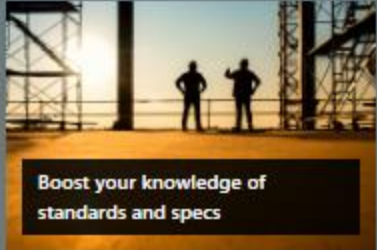
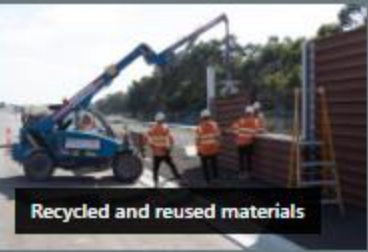


Our latest resource



Knowledge Hub

Education and awareness



1 of 5

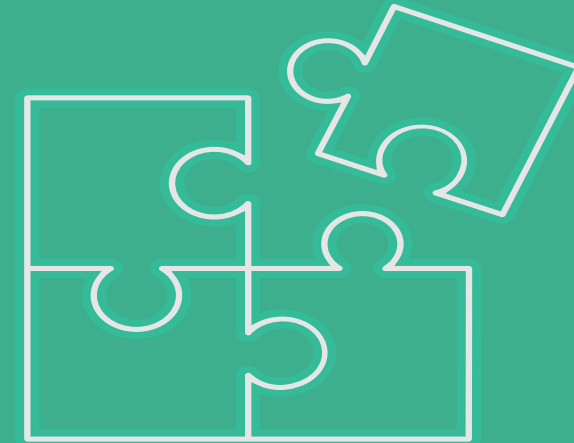
Industry news

+ Add



Big Ideas from the Big Build revisited

- **The Big Build is the Big Opportunity**
 - **commitment to circular in transport infrastructure**
- **Procurement Policy with intent**
 - **ecologiQ a driver**
- **An industry and stakeholder wide collaboration**
 - **the coalition of the willing**



Evolution with a timeline

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Website: ecologiq.vic.gov.au

