2022 ANNUAL ROADS FORUM

WELCOME

MAYOR
BILL O’BRIEN

DR HELEN MACDONALD

MARK HENNESSEY
&
KAREN-LEE JONES
DIT REGIONAL ROADS UPDATE

Legatus Annual Roads Forum 2022

Presenters:
Karen Lee-Jones, Manager, Transport & Asset Strategy
Mark Hennessy, Principal Transport Engineer. Transport & Asset Strategy

Thursday 24 March 2022

Knet #18458123

InfrastructureSA

20-Year State Infrastructure Strategy

Priority 22 – Make Strategic Investments to improve connectivity to, between and with key Economic Precincts

Priority 23 – Improve the safety of the road network

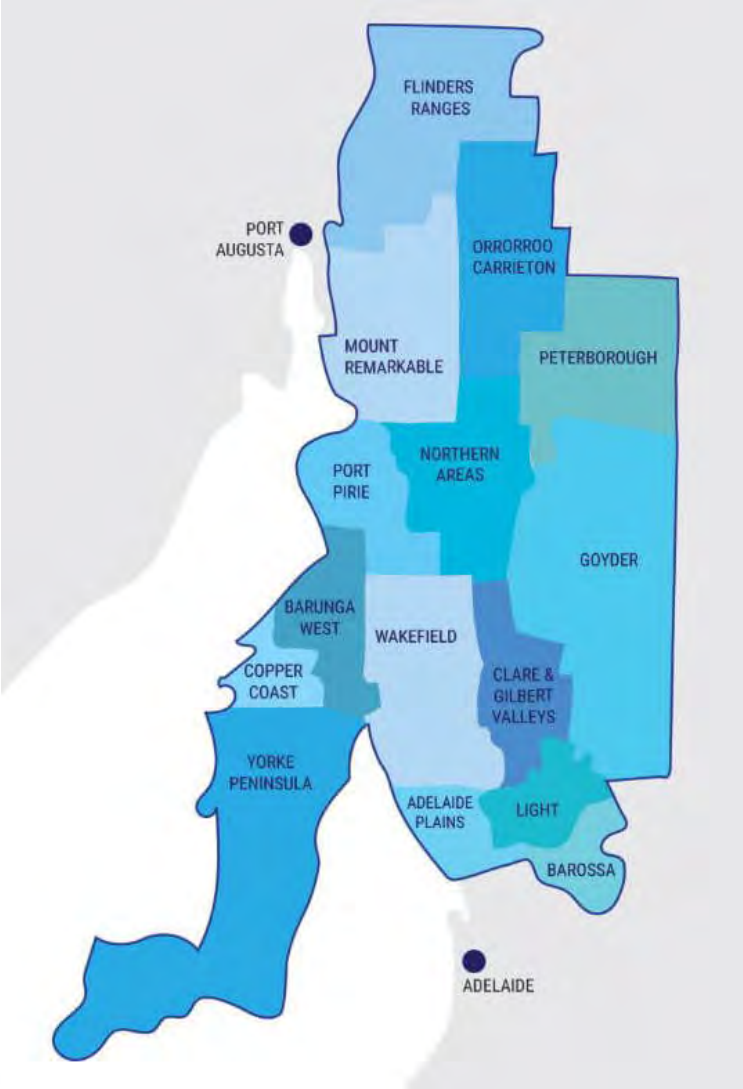
Priority 26 – Identify key economic corridors through Adelaide and the regions and plan interventions to create more efficient supply chains

Priority 27 – Improve the efficiency of freight through Adelaide

Priority 28 – Improve landside access to international gateways

Freight Transport:

Efficient, well-managed and integrated freight networks are needed to support economic growth by providing South Australian businesses with cost competitive connections to world markets.



Driving economic prosperity and supporting business growth

Regional Access Improvements

The provision of reliable and efficient freight networks that include targeted network upgrades for 'last mile' infrastructure and network expansion through improved access for High Productivity Vehicles to the road network. Including:

- Horrocks Highway
- Dublin Saleyards upgrades

Regional Productivity Improvements

Targeted upgrades to South Australian regional transport corridors. Targeted corridors include:

- Port Augusta to Perth (Eyre Highway
- Cockburn to Burra (Barrier Highway)
- Renmark to Gawler (Sturt Highway)

Joy Baluch AM Bridge Duplication

A National Land Transport Network link at Port Augusta, providing access across the Spencer Gulf for commuter, commercial and freight vehicles in the northern region of South Australia.

Vision

Zero lives lost on our roads by 2050

Ten Year Targets

Baseline 2018–2020 (3 year average)	National Road Safety Strategy Targets by 2030 for South Australia	By 2031
96 LIVES LOST	FEWER THAN 48 LIVES LOST	FEWER THAN 43 LIVES LOST
708 SERIOUS INJURIES	FEWER THAN 496 SERIOUS INJURIES	FEWER THAN 474 SERIOUS INJURIES

Road Safety Strategic Focus Areas

Road user behaviour
Supporting and enforcing safer road user behaviour

Aboriginal road safety
Reducing the over-representation of Aboriginal people in road crashes

Vehicles
Increasing the use and purchase of safer vehicles in South Australia

Older road users
Greater focus

Roads
Safer design, construction and maintenance of road infrastructure

Walking, cycling and public transport
Improving safety for people who walk and cycle and increasing public transport patronage

Regional and remote areas
Reducing the number of lives lost and serious injuries on regional and remote roads

Young drivers and riders in regional areas
Reducing their over-representation in road crashes

Workplaces
Develop a culture of road safety in South Australian workplaces

dit.sa.gov.au

Follow us on:

thinkroadsafety.sa.gov.au

SA Govt Construction Industry Briefing – 1 Sept 2021

Website:

- **dit.sa.gov.au/construction-industry-briefing-2021**

Construction Industry Briefing 2021

SA Govt Construction Industry Briefing

- Transport Infrastructure Planning Studies
  - Truro Bypass Detailed Design
  - Greater Adelaide Freight Bypass
  - Augusta Hwy duplication – Crystal Brook to Port Pirie (PW2PA)
- Transport Project Delivery
  - Major Projects
    - Joy Baluch AM Bridge duplication
    - Port Wakefield Overpass
    - Augusta Hwy duplication
  - Pavement & shoulder sealing works
    - Petersburg Road shoulder sealing
    - Horrocks Hwy and Barrier Hwy

SA Govt Construction Industry Briefing

Stimulus Package 2 – Road Safety "Use it or Lose it"

Tranche 1 - $105m $114m Completed

Jan – June 2021

Tranche 2 - $52.5m

July – Dec 2021

Tranche 3 - $52.5m

Jan – June 2022

Tranche 4 - $52.5m

July – Dec 2022

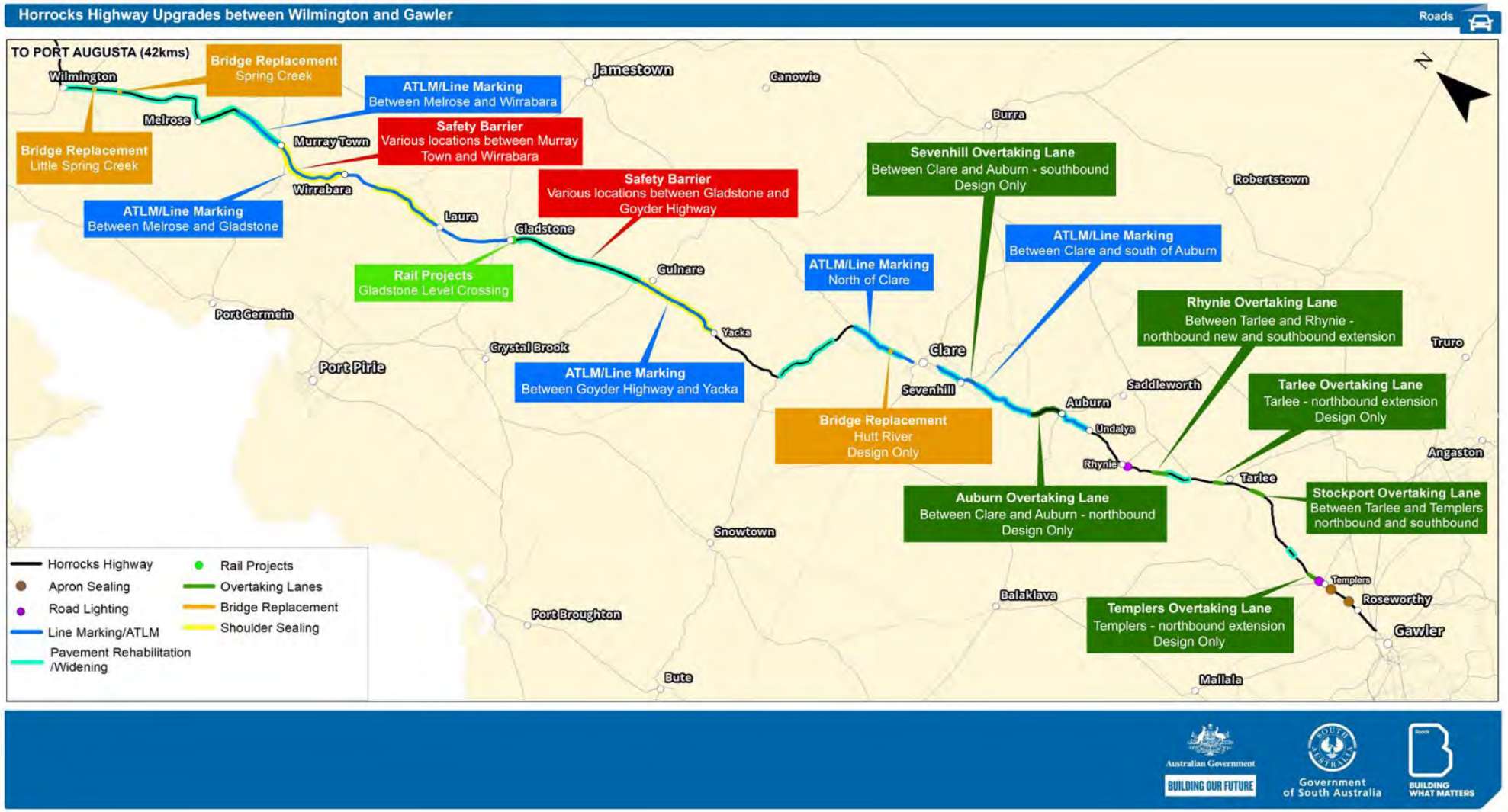
Tranche 5 - $52.5m

Jan – June 2023

$315 million

- Augusta Hwy (Collinsfield to Red Hill)
- Minlaton Rd (Minlaton to Stansbury)
- Upper Yorke Rd (Maitland to Ardrossan)
- Barrier Hwy
- Tranche 3 – Spencer Hwy (not yet commenced)

Horrocks Highway



$40m for highway safety

KATHRYN BERMINGHAM

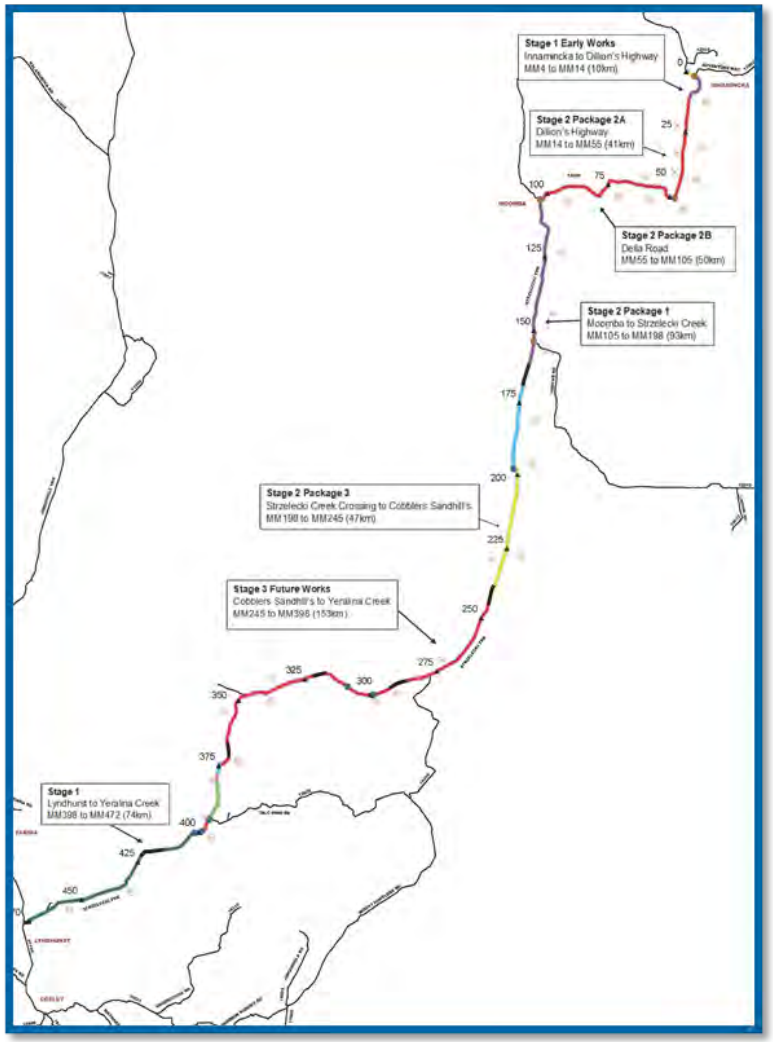
THE Horrocks Highway will undergo a further $40m in safety upgrades, including work to widen and strengthen bridges, install safety barriers and extend overtaking lanes.

The federal government has announced a funding boost for the Horrocks Highway Corridor program, which is focused on upgrading a 245km stretch of road between Wilmington and Gawler. It brings the federal contribution to $84m and total funding, including the state government's contribution, to $105m.

The new funding will be used to widen and strengthen bridges at Wakefield, Hutt and Rocky rivers, upgrade local road junctions and deliver shoulder sealing and curve widening. It will also fund audio tactile line marking, and overtaking lane extensions at Tarlee and Templars.

Government of South Australia
Department for Infrastructure and Transport

Strzelecki Track



Project	Status
Stage 1 - Innamincka to Dillions Highway (10km)	Completed
Stage 1 - Lyndhurst to Yeralina Creek (74km)	Completed
Stage 2 Package 1 - Moomba to Strzelecki Creek Crossing – (93km)	Under Construction
Stage 2 Package 2a - Dillon's Highway (41km)	Commence Q1 2022
Stage 2 Package 2b - Della Road (50km)	Commence Q3 2022
Stage 2 Package 3 - Strzelecki Creek Crossing to Cobblers Sandhill's (47km)	Commence Q1 2023
Stage 3 - Cobblers Sandhill's to Yeralina Creek (153km)	Commence Q3 2022
Total Budget	$215m

Government of South Australia
Department for Infrastructure and Transport

Strategic Freight Studies

The Strategic Freight Studies engagement seeks to explore the merit in upgrading South Australia's High Productivity Vehicle network. The engagement includes 6 individual projects delivered under 1 contract / program of works.

The SA High Productivity Vehicle network access Infrastructure Australia (IA) submission highlights the problems associated with the current network that this engagement is responding to.

South Australia High Productivity Vehicle network access

LOCATION
South Australia

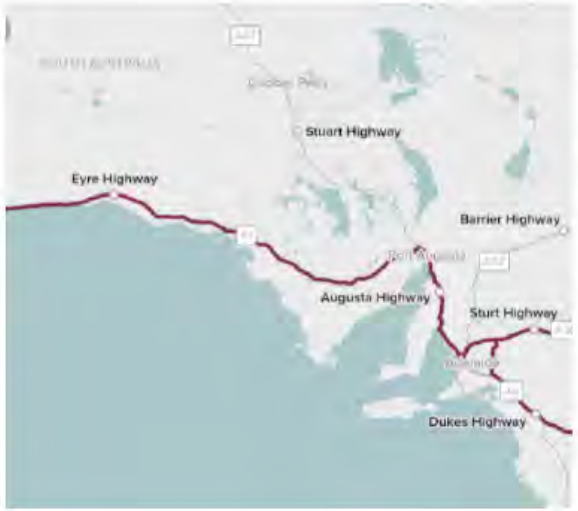
GEOGRAPHY
Small towns, rural communities and remote areas

CATEGORY
Regional Connectivity

PROBLEM/OPPORTUNITY TIMEFRAME
Medium term (5-10 years)

PROPONENT
SA Government

DATE ADDED TO THE IPL
17 February 2016



What improving the road network could mean?

- Enabling the use of the network by performance based standards **(PBS) level 4A** High Productivity Vehicles (HPVs)

	Equivalent prescriptive vehicle configuration	Network access
PBS Level 1	19m prime mover and semitrailer	General access
PBS Level 2	26m B-double	26m B-double network
PBS Level 3	36.5m Type I road train	36.5m Type I road train network
PBS Level 4	53.5m Type II road train	53.5m Type II road train network

- This is done by improving **mass limits** and **road geometry**, improving **bridge** capacities and **duplicating lanes** on the South Australian regional freight network

Potential benefits

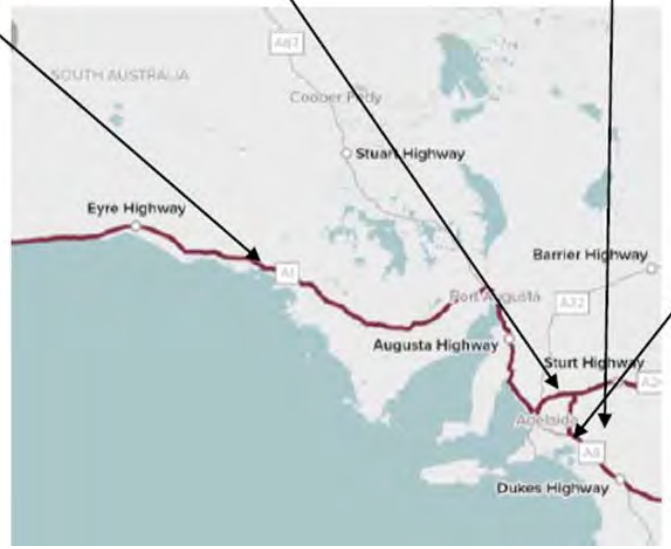
- HPVs have potential to carry over **30% more freight per vehicle**, generating a multitude of benefits.
- Fewer vehicles are required to move the same freight task, with **costs reduced** for both transport operators and end users.
- Fewer heavy vehicles on our roads, **improving safety, capacity and efficiency of transport**.
- efficiency of the South Australia regional and intrastate freight network and the interstate **supply chain connectivity** to the rest of Australia

Strategic Freight Studies

***Area Plans** have been defined as the development of the framework, vision and direction for strategic transport planning, giving regard to land use, planning for future needs for housing, jobs, infrastructure, a healthy environment and connected communities*

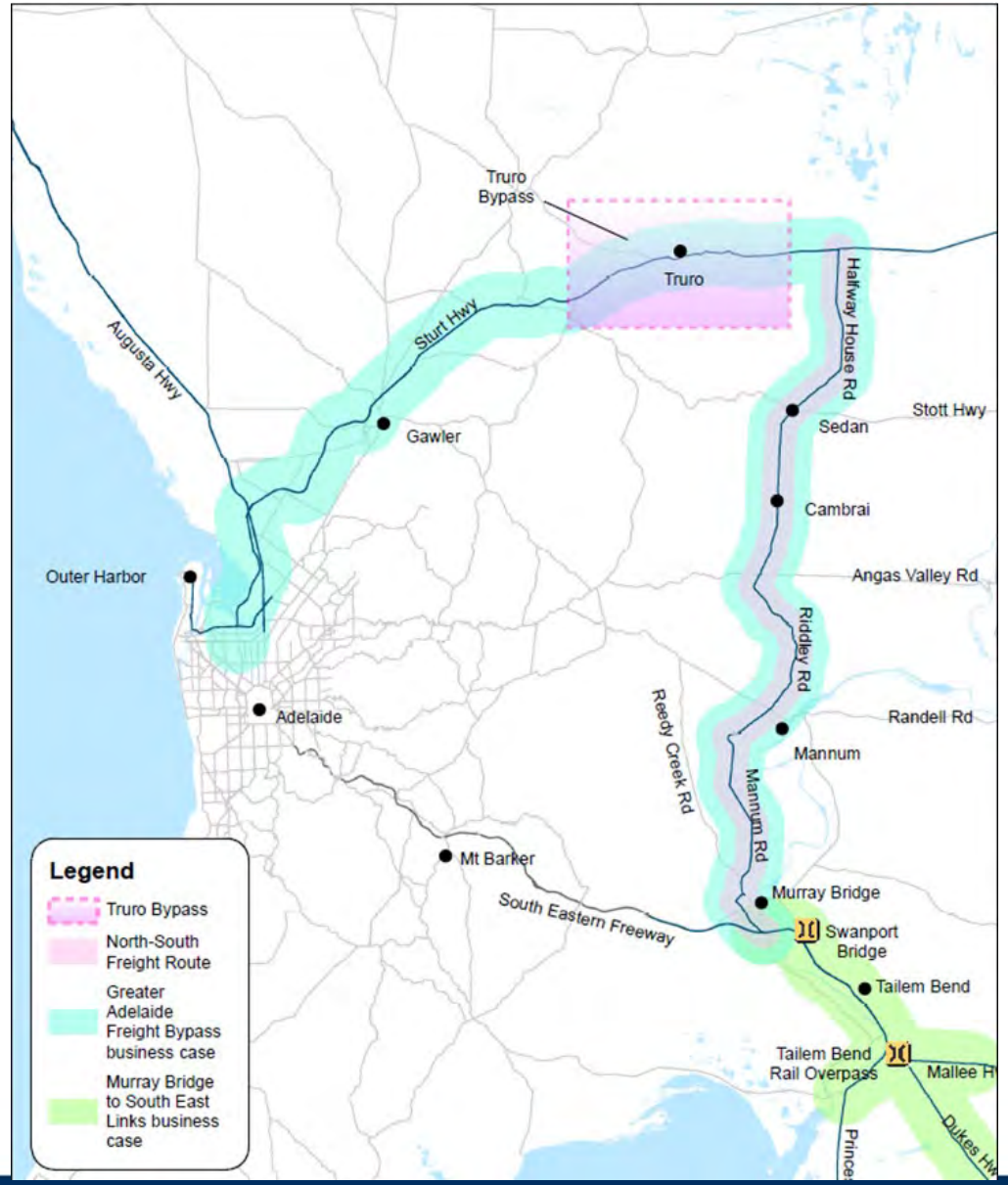
Strategic Freight Studies Program

- **Eyre Highway Upgrade Planning Study SBC**
- **Greater Adelaide Freight Bypass SBC**
- **Murray Bridge South East Links SBC**
- **Swanport Bridge SBC & FBC**
- **Eyre Peninsula Area Plan**
- **Far North Area Plan**



Strategic Freight Studies

Greater Adelaide Freight Bypass




Thank You

MICHAEL ARMAN

SLRP

Local Government Association of South Australia

Special Local Roads Program

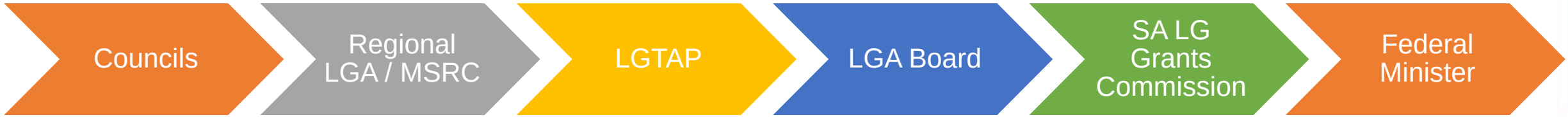
2022 Grant Round Update

Background

- Unique to South Australia and in operation since 1985
- Built on the premise that the sector as a whole benefits from councils pooling a portion of their funding
- Strategic and special local roads that otherwise exceed the capacity of an individual council
- Funding provided from
  - 15% of identified local roads component of Commonwealth Financial Assistance Grants.
  - 15% of South Australia's Supplementary Local Road Funding (in available years).
  - 15% of South Australia's allocation of Roads to Recovery

Local Government Association of South Australia

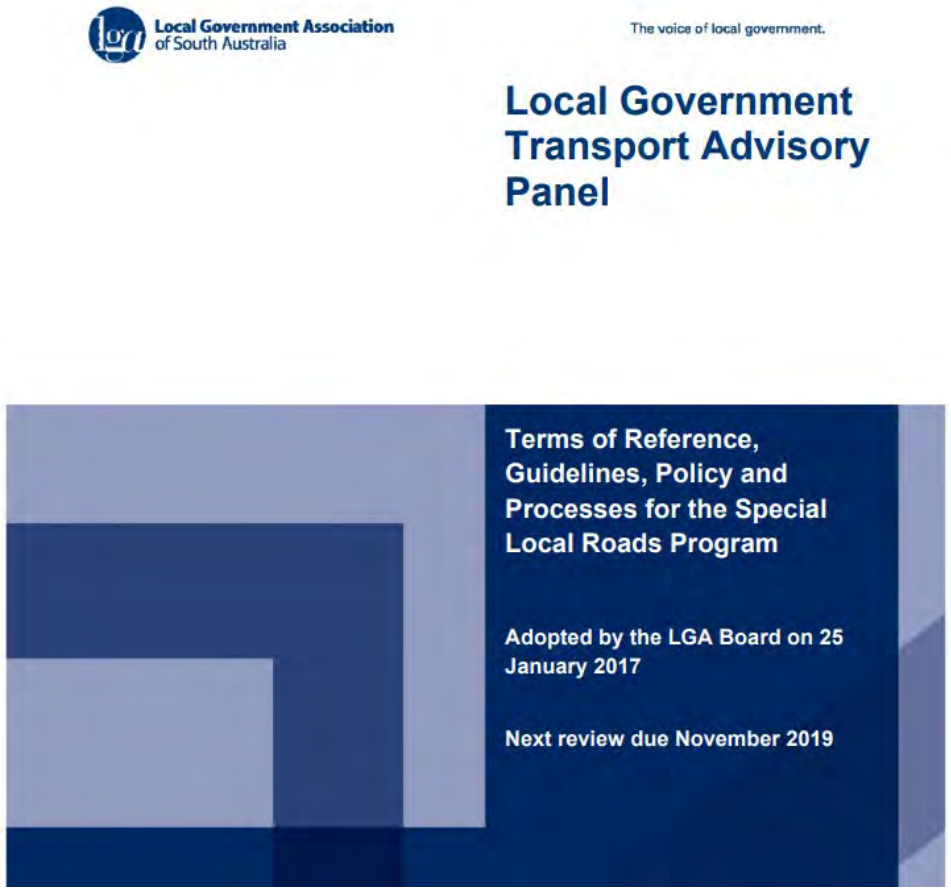
How does the SLRP operate



How does the SLRP operate

Local Government Transport Advisory Panel

- Three Members from Local Government:
  - At least one Member will be a member of the LGA Board;
  - At least one Member will be from a metropolitan Council with the required skills and experience;
  - At least one Member will be from a country Council with the required skills and experience;
- A nominee of the Minister for Local Government;
- A nominee of the Minister for Transport;
- A representative from the Commonwealth Department of Transport and Regional Services who will have an advisory role
- A Senior Officer of the Local Government Association.



Improvement opportunities

- First identified by LGTAP in 2018
- Independent review (Hudson Howells) prepared in 2020
- Feedback from applicants during 2021 grant round

What LGTAP has heard

- SLRP remains relevant and valued
- Eligible to all
- Clearer criteria
- Greater consistency in applications and evidence suppied
- Simpler form
- Improved communications and visibility
- Update policies
- Clarify processes and decision making roles

What LGTAP has done

- New LGTAP Terms of Reference
- New SLRP Policy Manual
  - SLRP Objectives
  - Guiding Principles
  - Eligibility
  - Application and assessment processes
  - Assessment Criteria
  - Operational policies – reporting, extensions, changes in scope etc
- Website update
- Migration to ‘Smarty Grants’

SLRP Objectives

Prioritise the construction and maintenance of strategic and significant local roads whose benefits exceed the boundary of the council and its community.

Support the delivery of local roads in an orderly and coordinated manner through evidence-based decisions that draw upon the best available State, Regional and Local plans.

Demonstrate accountability and transparency in the administration of the program.

Guiding Principles

- Strategic and significant
- Sector approach
- Equitable across regions
- Equal access
- Transparent
- Evidence based

Assessment Criteria

Category	Key question	Weighting
Road purpose	To what extent does the application demonstrate a strategic and significant purpose for the road?	30%
Scope of works	How well does the application outline an acceptable and achievable scope of works to support the road's desired purpose?	20%
Value for money	To what extent does the project represent value for money?	20%
Benefits of the project	To what extent does the application outline the economic, access, safety and environmental benefits of the project?	30%

Local Government Association of South Australia

2022 grant round

- Continue as you have in the past
- Apply direct to LGA via Smarty Grants
- Simpler application form
- Regional LGAs will be asked to provide referral comments

4 April – grant round opens

6 April – information session

20 May – grant round closes

June – LGTAP evaluation

21 July – LGA Board

Local Government Association of South Australia

For more information

Michael Arman
LGA Director Strategy
0436 691 123
Michael.arman@lga.sa.gov.au

https://www.lga.sa.gov.au/member-services/infrastructure-and-assets/special-local-roads-program

TONI CLARKE HEAVY VEHICLES

DR RAJIBUL KARIM

USE OF ROAD GRADE RECYLED PLASTICS OR OTHER MATERIALS FOR SUSTAINABLE ASPHALT PAVEMENTS

Recycled plastics or other materials for sustainable asphalt pavements

Dr. Rajibul Karim

Senior Lecturer, School of NBE

University of South Australia

rajibul.karim@unisa.edu.au

https://people.unisa.edu.au/Rajibul.Karim

LEGATUS group Mar 2022

Waste problem – world

- Every year world produces,
  - Over a billion ton C&DW[1]
  - Over a billion waste tyres[2]
  - Over 14 million ton glass waste[3]
  - Over 380 million ton plastic waste[4]
- Long time decomposition/Environment pollution
- Need more applications for re-use/recycling
  - Social responsibility
  - Sustainable construction practice

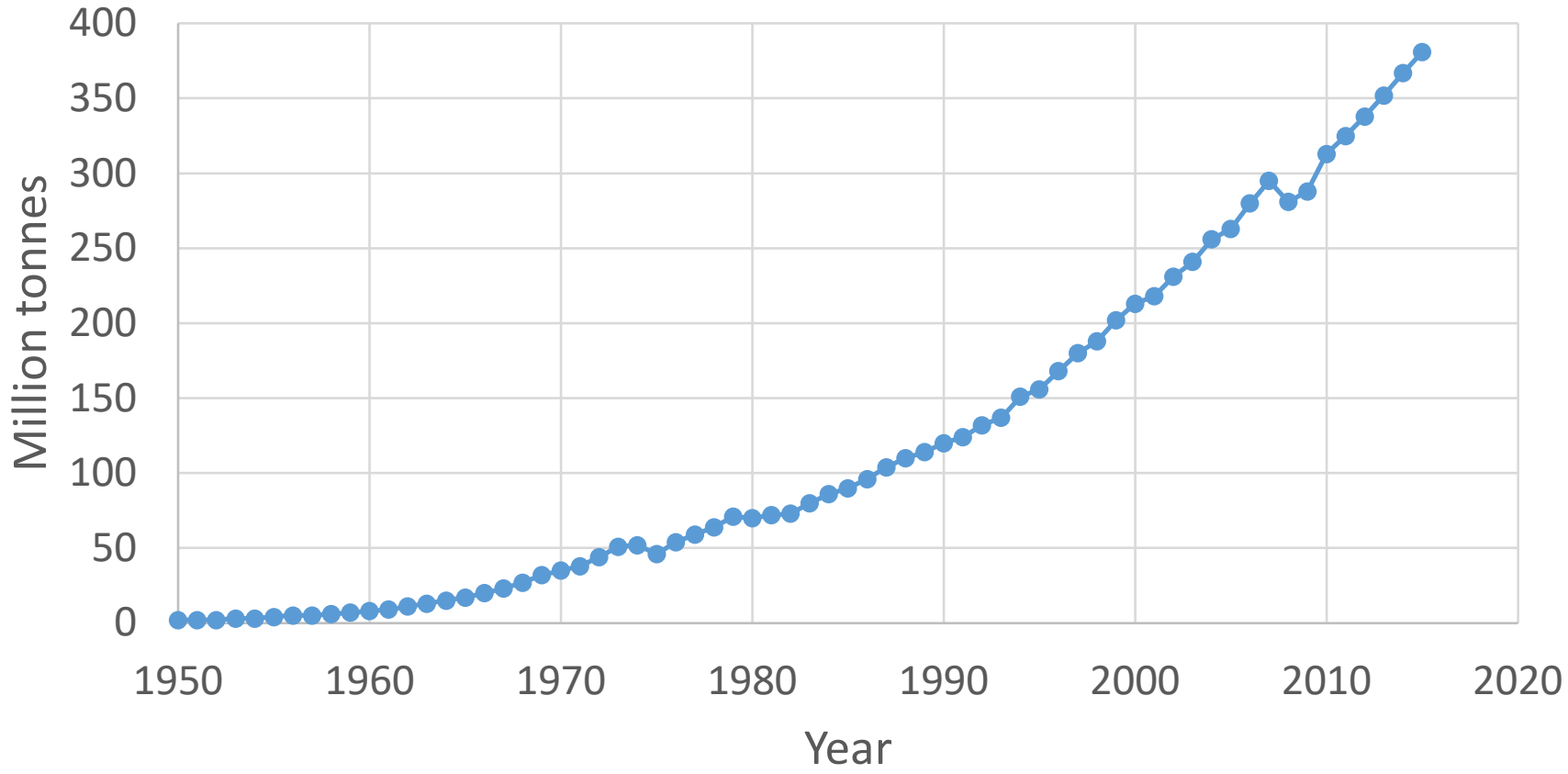
rmit.edu.au

erthewaste.com.au

Sources: 1. Naouaoui, Bouyahyaoui & Cherradi 2019, 2. Sahajwalla et al. (2011), 3. Jani, Y & Hogland, W (2014), 4. National plastic report 2021

Plastic wastes - world

Plastic production 1950 to 2015



plastic production by year

DAWE (2021). National Plastics Plan 2021, Department of Agriculture, Water and the Environment.

Plastic wastes - world

The problem

- 130,000 tonnes of plastic leaks into the marine environment each year
- By 2050, plastic will outweigh fish in oceans
- Our use of plastic is increasing and across the world will double by 2040.

DAWE (2021). National Plastics Plan 2021, Department of Agriculture, Water and the Environment.

Plastic wastes - Australia

The problem

- More than 3.4M tonnes are used every year
- ~11% are recycled
- Rest goes to landfills
- Between 2015 and 2019 use went up from 2.8 to 3.4M tonnes
- Expected to double by 2040

DAWE (2021). National Plastics Plan 2021, Department of Agriculture, Water and the Environment.

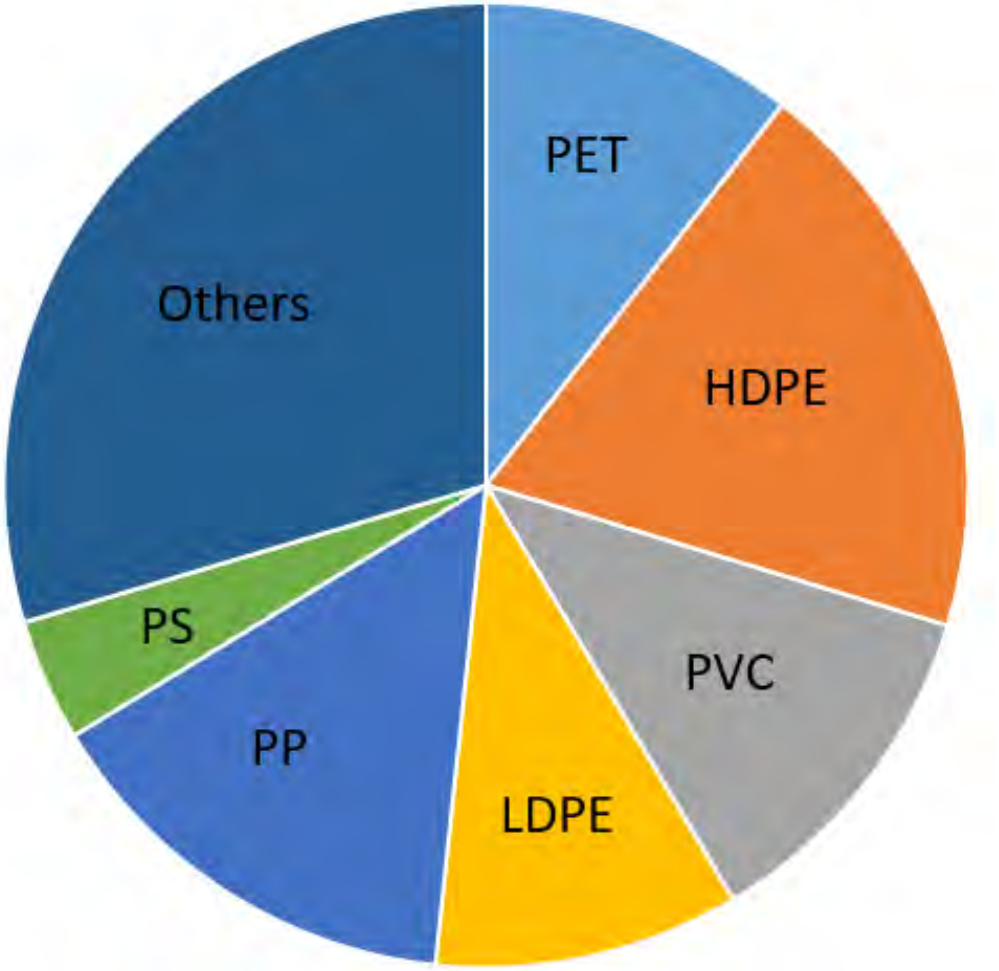
Plastic wastes - Australia

Type/resin/code

1	2	3	4	5	6	7
PET Polyethylene terephthalate	**HDPE** High-density polyethylene	**PVC** Polyvinyl chloride	**LDPE** Low density polyethylene	**PP** Polypropylene	**PS** Polystyrene	**OTHER** Other types of plastics
PET is commonly used in commercially sold water bottles, soft drink bottles, sports drink bottles and condiment bottles. 	HDPE is commonly used in milk and juice bottles, detergent bottles, shampoo bottles, grocery bags and cereal box liners. 	PVC can be flexible or rigid, and is used for plumbing pipes, clear food packaging, shrink wrap, plastic children's toys, tablecloths, vinly flooring and blister packs. 	LDPE is used for dry cleaning bags, bread bags, newspaper bags, produce bags, "paper" milk cartons and hot/cold beverage cups. 	PP is used to make yogurt containers, deli food containers, furniture, luggage and winter clothing insulation. 	PS is used for toys, rigid packaging, refrigerator trays and CD cases. Also used to form Expanded Polystyrene EPS used for take out containers, cups/plates and packing chips. 	Any plastic item not made from 1-6 plastics is lumped together as a number7 plastic and is used for things like CD's, baby bottles and headlight lens.  molygran.com/

Plastic wastes - Australia

Consumption and recycling by type

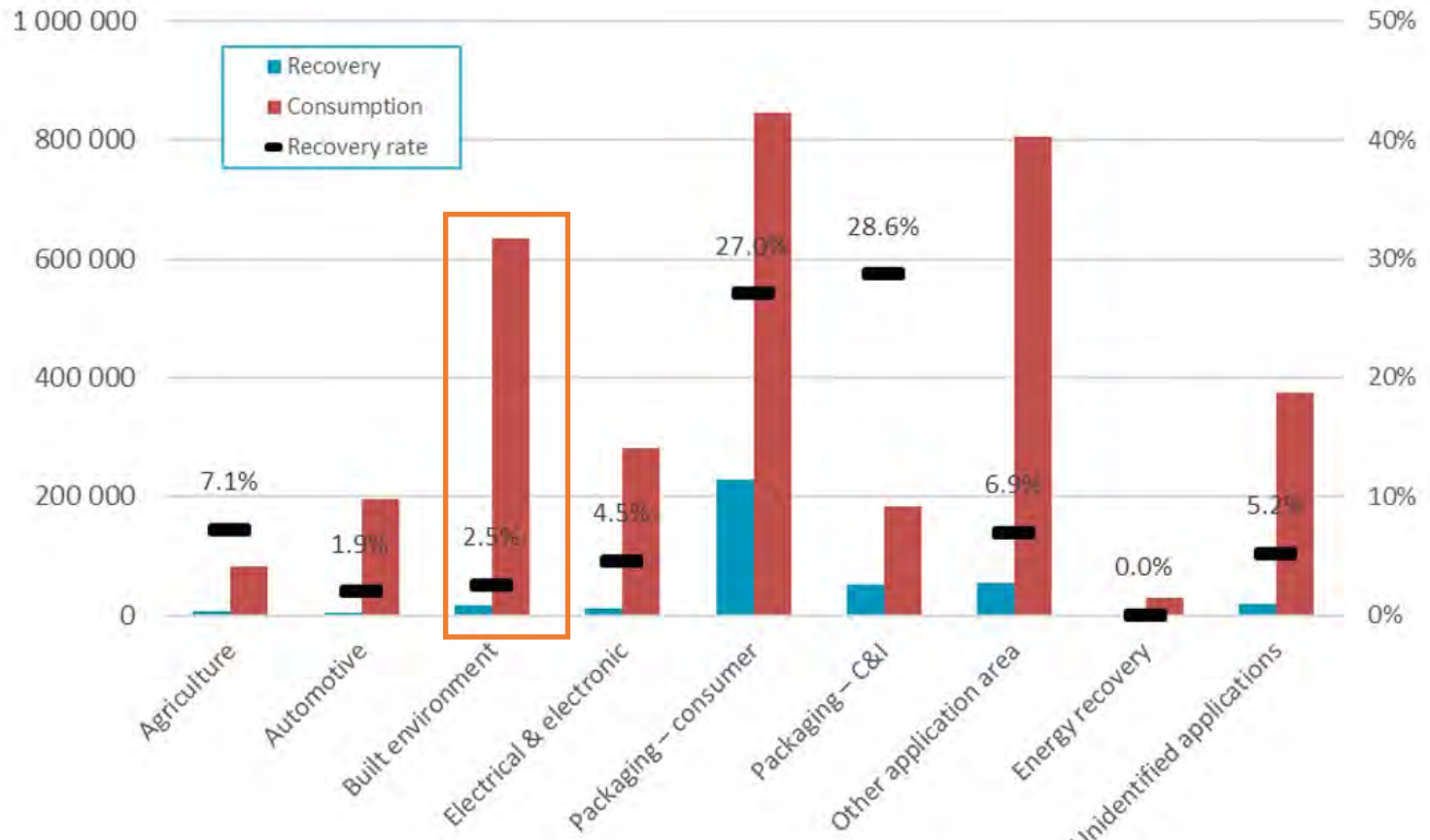


Plastic type	recycling %
PET	20%
HDPE	15%
PVC	2%
LDPE	15%
PP	8%
PS	12%
Others	8%

DAWE (2021). National Plastics Plan 2021, Department of Agriculture, Water and the Environment.

Plastic wastes - Australia

Consumption and recovery by sector

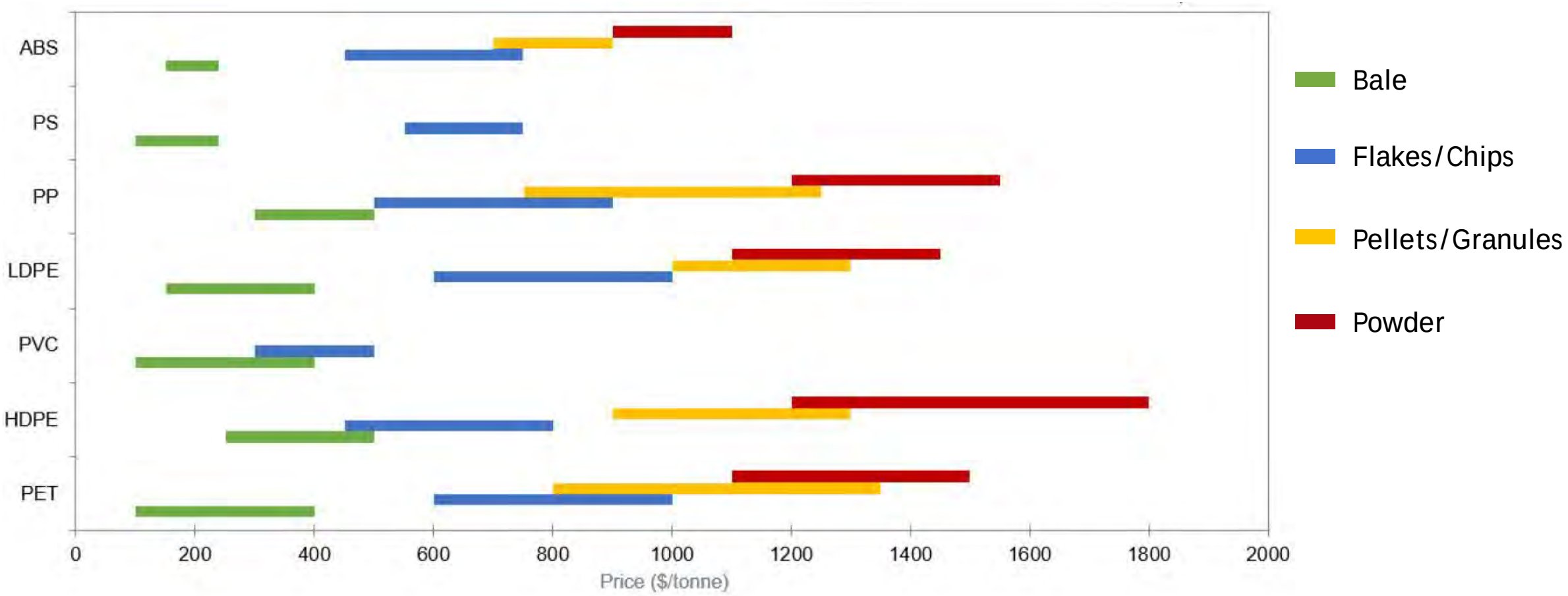


Annual plastic consumption and recovery (2018-2019)

DAWE (2021). National Plastics Plan 2021, Department of Agriculture, Water and the Environment.

Plastic wastes - Australia

Recycled plastic price in AU and NZ



DAWE (2021). National Plastics Plan 2021, Department of Agriculture, Water and the Environment.

Plastic wastes - Australia

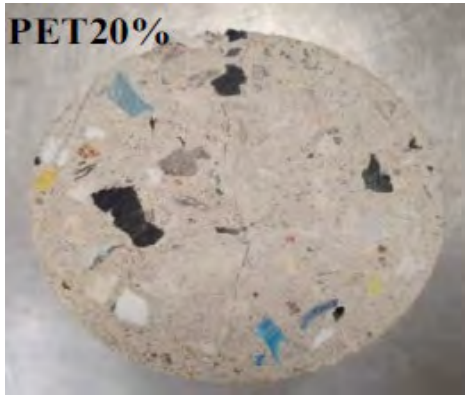
3 Major ways of recycling

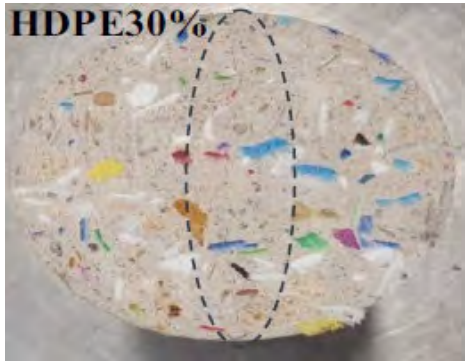
- ***Mechanically*** - grinding and/or shredding.
  - complex process
  - can be inefficient because of variability
  - rapid to execute.
- ***Chemically*** - broken down into monomers or chemically modified
- ***Thermally*** - heating to melt mould to new products.

Plastic wastes - Australia

Waste plastic in construction

- ***Replacement concrete aggregate***
  - Lightweight
  - Reduces compressive and split tensile strength
  - Negative effective reduces when used as fiber
  - Fiber improves abrasion resistance
  - Improves shrinkage and thermal insulation
  - Reduces brittleness





Abu-Saleem et al (2021) Evaluation of concrete performance with different types of recycled plastic waste for kerb application, Construction and Building Materials 293 (123477)

Plastic wastes - Australia

Waste plastic in construction

- ***Road base and subbase***
  - Improve the shear, stiffness and bearing capacity of the pavement[1]
  - PW granules + demolition wastes for road construction[2]
    - stiffness, bearing capacity and resilient modulus reduces

1. C.Y. Benson, M.V. Khire (1994) and A.K. Choudhary, J.N. Jha, K.S. Gill (2012); 2. A. Arulrajah, E. Yaghoubi, Y.C. Wong, S. Horpibulsuk (2017)

Plastic wastes - Australia

Waste plastic in construction

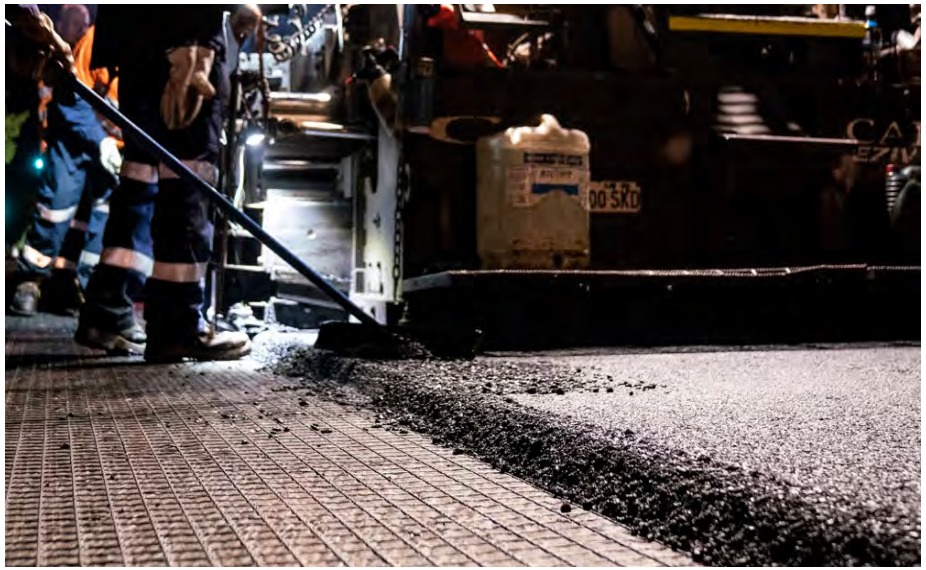
- ***Components in asphalt***
  - Wet method
    - plastic first added to hot bitumen then mixed with hot aggregates
  - Dry method
    - plastic mixed with the hot aggregate then hot bitumen added
    - much larger quantities of plastics can be recycled
  - Improves stiffness, rutting resistance, fatigue performance, moisture and temperature susceptibility
  - Increase softening point and lowers penetration value

Soheil Heydari, Ailar Hajimohammadi *, Nioushasadat Haji Seyed Javadi, Nasser Khalili (2021) The use of plastic waste in asphalt: A critical review on asphalt mix design and Marshall properties, Construction and Building Materials 309 125185 https://doi.org/10.1016/j.conbuildmat.2021.125185

Plastic wastes - Australia

Asphalt reinforcements

- Prevent and delay reflective cracking,
- Improve performance and service life and reduce maintenance
- Recycling 30 plastic bottles per m^2

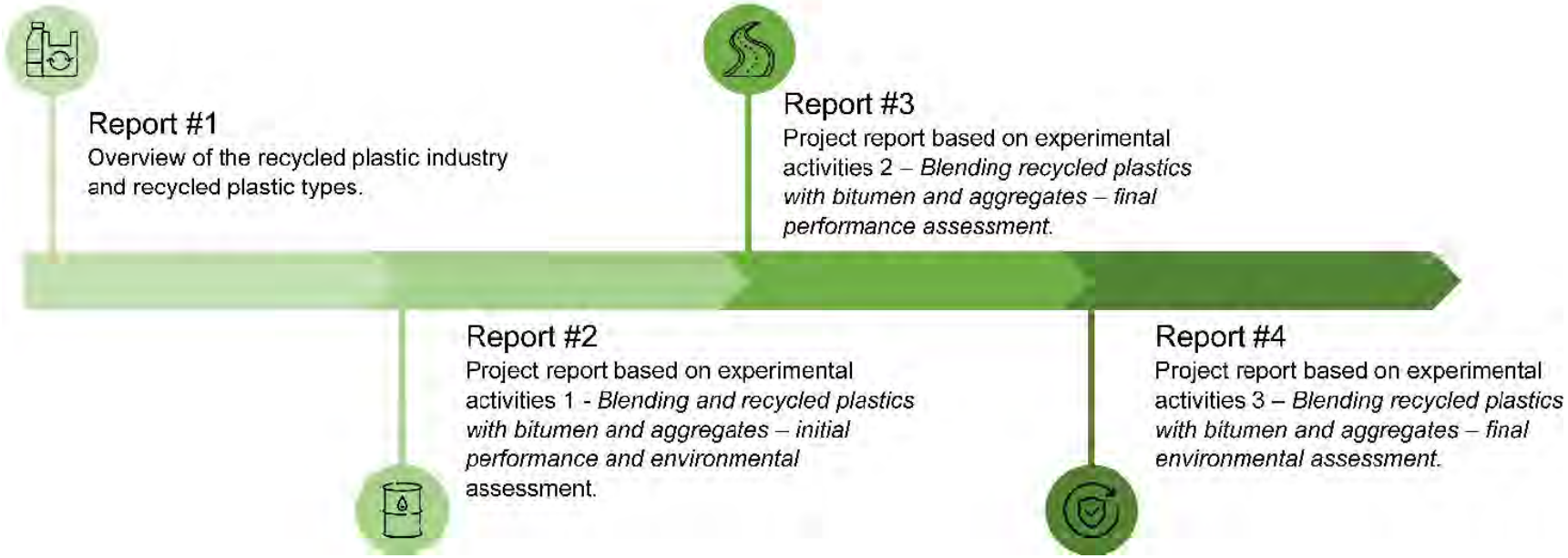


HaTelit C eco asphalt reinforcement geogrid by HUESKER; www.huesker.com.au

Recycled plastics in Asphalt

Guide to Pavement Technology Part 4E: Recycled Materials

- Does not provide any guidance
- APT6305- Use of road-grade recycled plastics for sustainable asphalt pavements



The ultimate is to identify road-grade plastics that can be used in the construction and maintenance of asphalt roads

Austroads Research Report AP-R648-21 (2021) Use of Road-grade Recycled Plastics for Sustainable Asphalt Pavements

Plastic in Asphalt

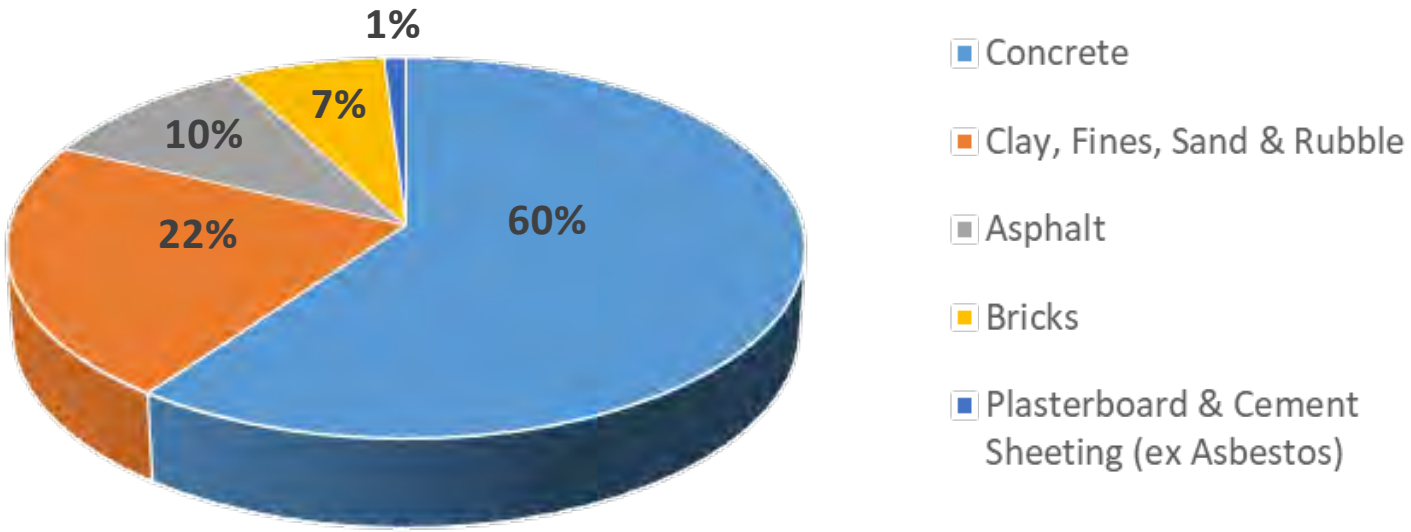
Issues needs resolving

- No clear national guidance on selection of the most suitable type of plastic
- No specifications for plastic-modified bitumen and asphalt
- Potential future issues
  - generation of microplastics
  - future recyclability
  - fuming and emissions during manufacturing and placement

Austroads Research Report AP-R648-21 (2021) Use of Road-grade Recycled Plastics for Sustainable Asphalt Pavements

C&D Waste - Australia

- 17.1 million ton of C&D wastes produced per year[1]
- 4.788 million ton (28%) of those are disposed in landfill[1]
- Increase in 5% reuse - GDP growth of up to $1 billion



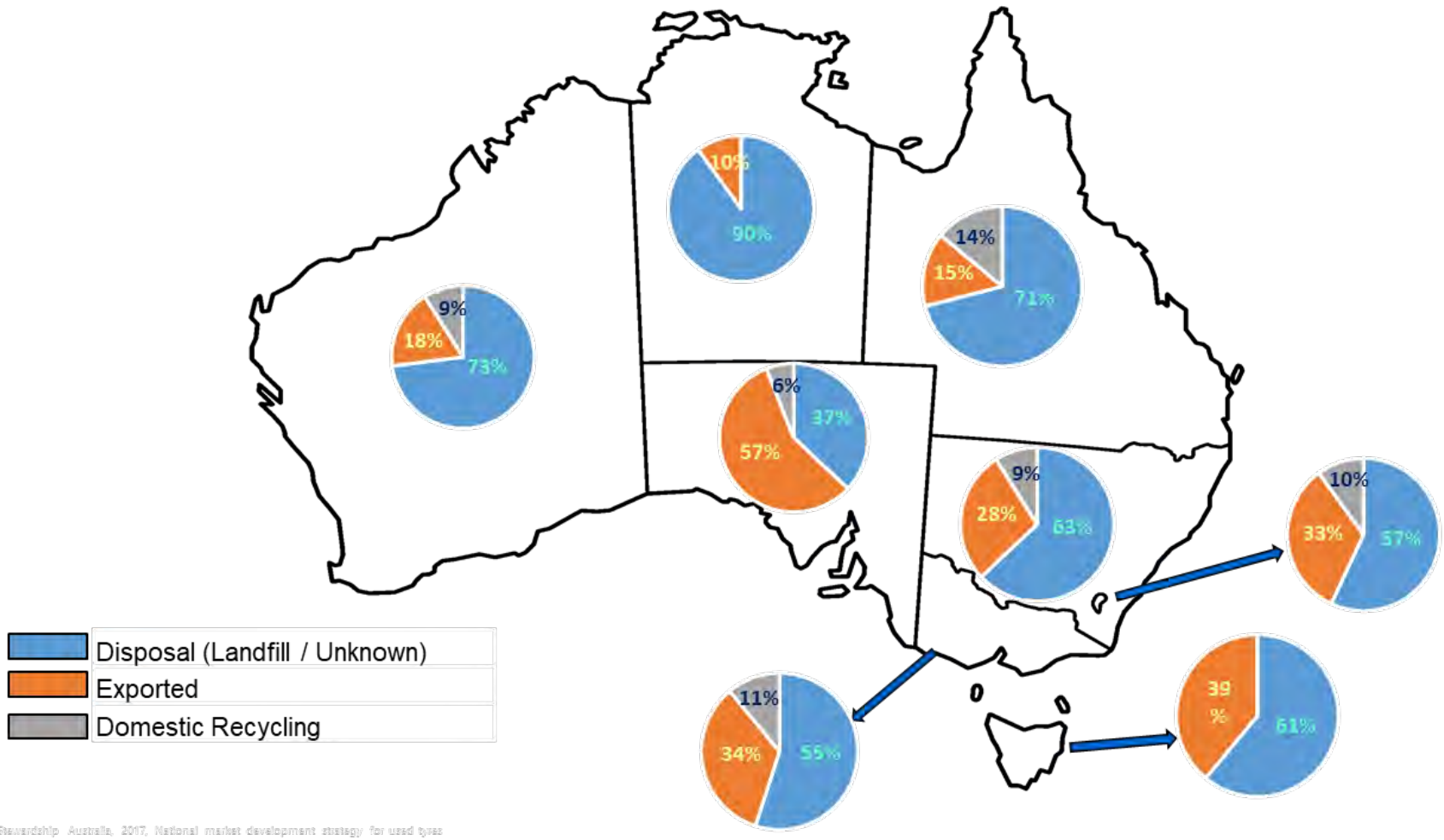
Sources: 1. National Waste Report, 2018, 2. Pickin et al. 2018

Waste tyres - Australia

- 56 million EPU are generated every year[1,2]
- Less than 10% recycled in Australia
- 43% is stockpiled or illegally dumped
- Fires in stockpiles release toxic gases
- Breeding place for mosquitoes & vermin
- Thousand+ years to decompose
- Need to find more ways to use

Sources: **1. Tyre Stewardship Australia, 2019, 2. MRA Consulting Group 2019**

Waste tyre - Australia



Tyre Stewardship Australia, 2017, National market development strategy for used tyres

Current research work

Projects

- Recycled concrete aggregates in road kerbs and their performance evaluation on expansive soils (Adelaide Kerbing Pty Ltd, Boral Construction Materials and City of Salisbury)

Momotaz, H, Rahman, MM, Karim, MR, Iqbal, A, Zhuge, Y, Ma, X & Levett, P 2022, 'A review of current design and construction practice for road kerbs and a sustainability analysis', Sustainability, vol. 14, no. 3, article no. 1230, pp. 1-22.

Current research work

Projects

- **Tyre derived aggregates in pavement subbase** (UG project supported by TyreCycle)

Karim, MR, Rahman, MM, Dawson, A, Kumar, M & Wegener, L 2020, 'Tyre-derived aggregates in pavement subbases', in CM Wang, JCM Ho & S Kitipornchai (eds), ACMSM25: Proceedings of the 25th Australasian Conference on Mechanics of Structures and Materials, Springer, Singapore, ch. 63, pp. 645-654.

Current research work

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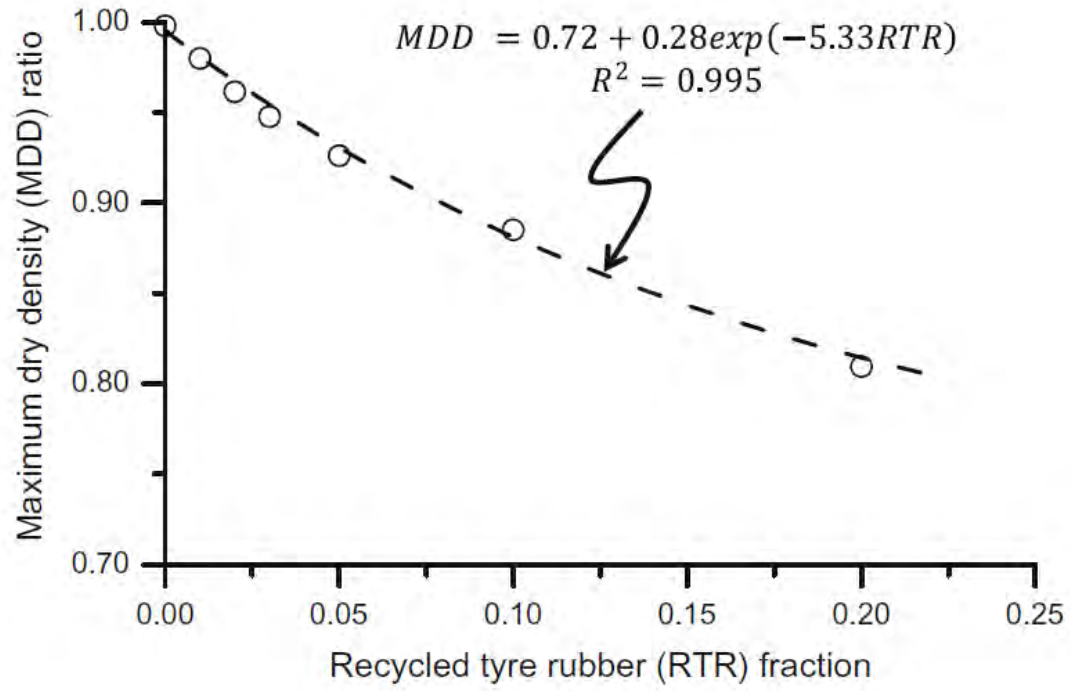
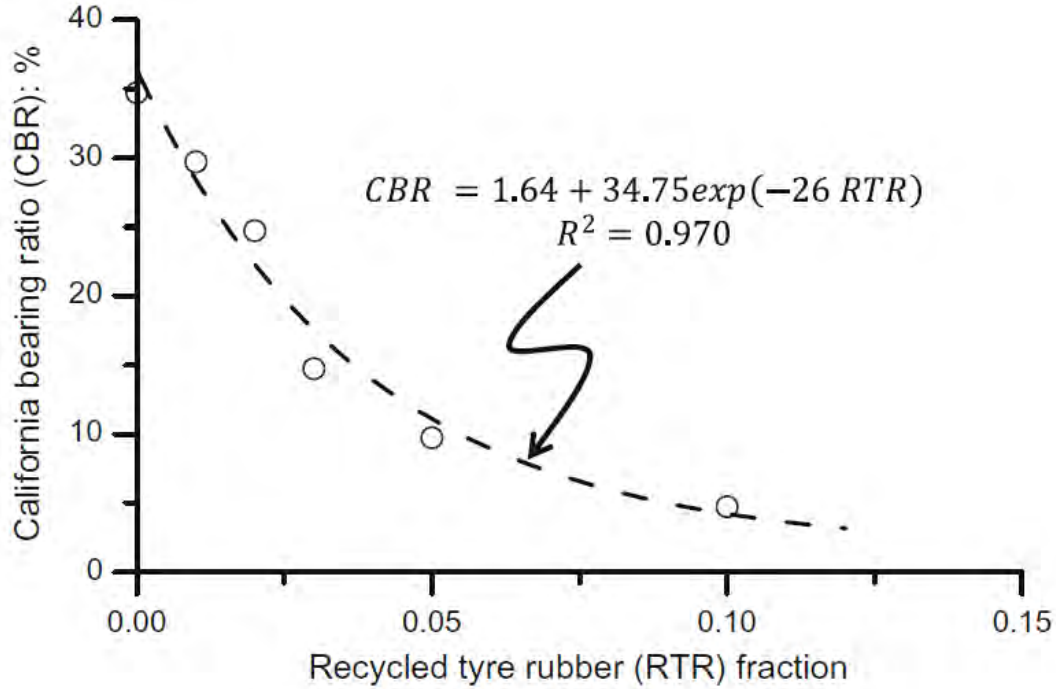




Karim, MR, Rahman, MM, Dawson, A, Kumar, M & Wegener, L 2020, 'Tyre-derived aggregates in pavement subbases', in CM Wang, JCM Ho & S Kitipornchai (eds), ACMSM25: Proceedings of the 25th Australasian Conference on Mechanics of Structures and Materials, Springer, Singapore, ch. 63, pp. 645-654.

Current research work

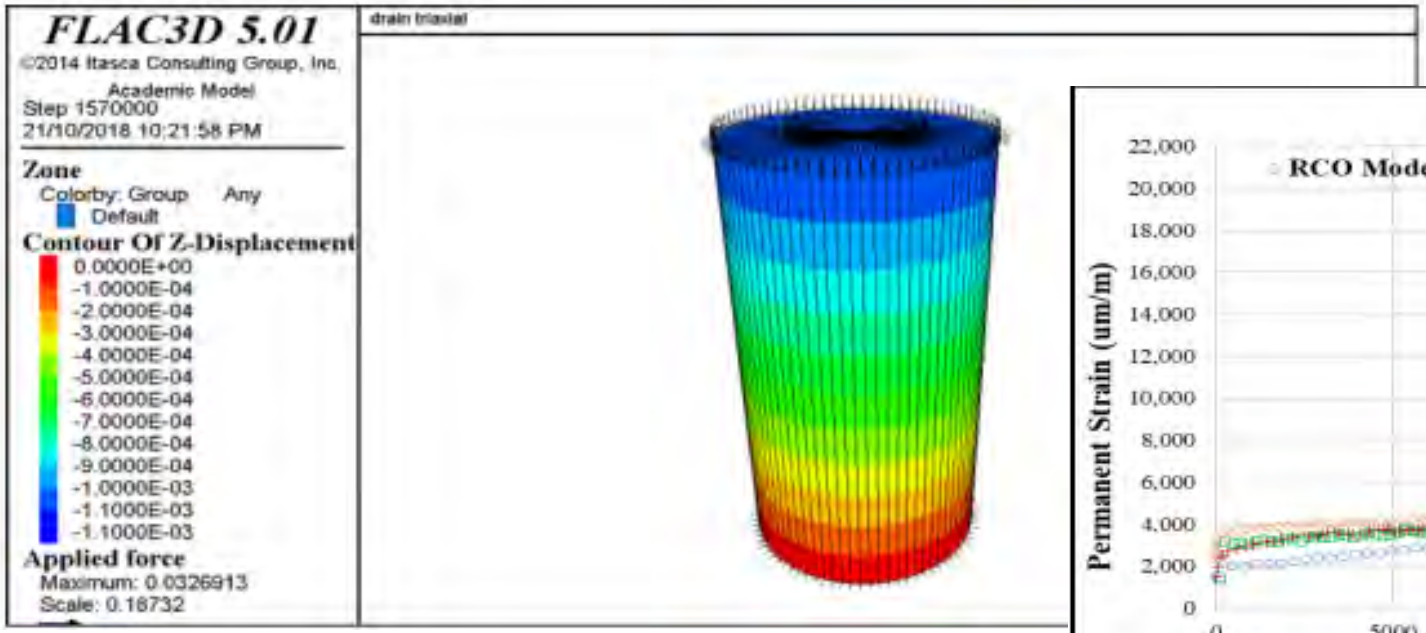
Projects

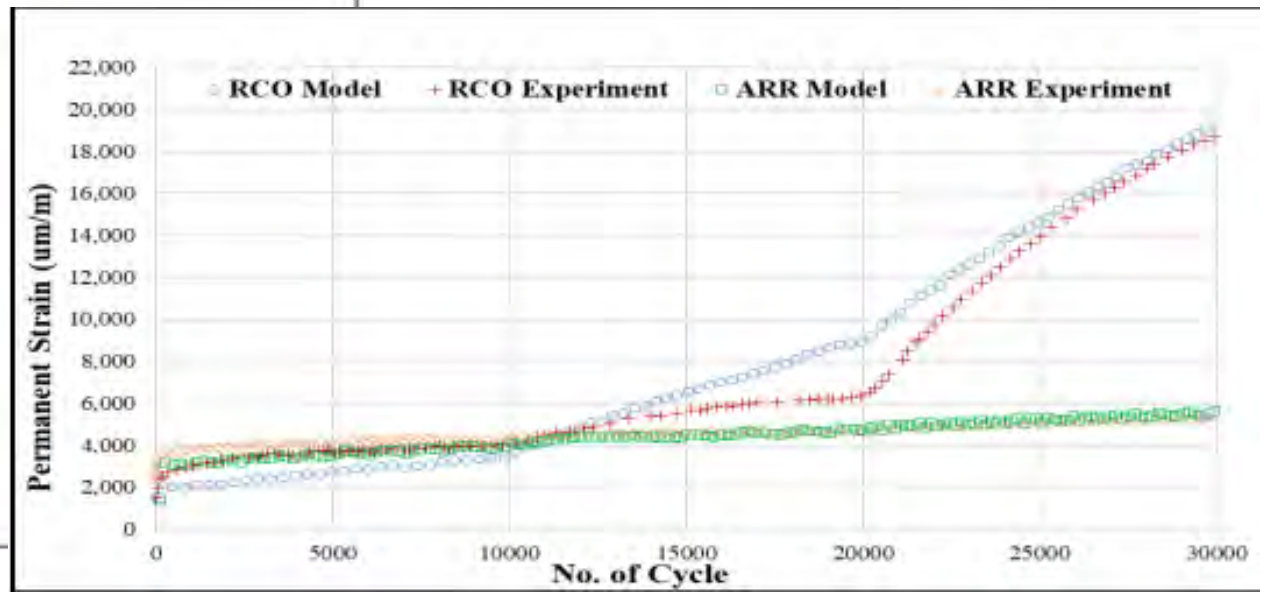
- **Recycled plastic in stabilised material** (UG project, supported by Recycling Plastics Australia Pty Ltd)
- To potentially reduce pavement cracking

Current research work

Projects

- Development of a fully mechanistic pavement design method for airfield flexible pavements (University supported PhD project)





Tolentino, R, Rahman, MM, Cameron, D & Karim, R 2019, 'Prediction of flexible pavement's unbound granular materials using elasto-plastic model SANISAND', International Airfield and Highway Pavements Conference, American Society of Civil Engineers, pp. 481-492.

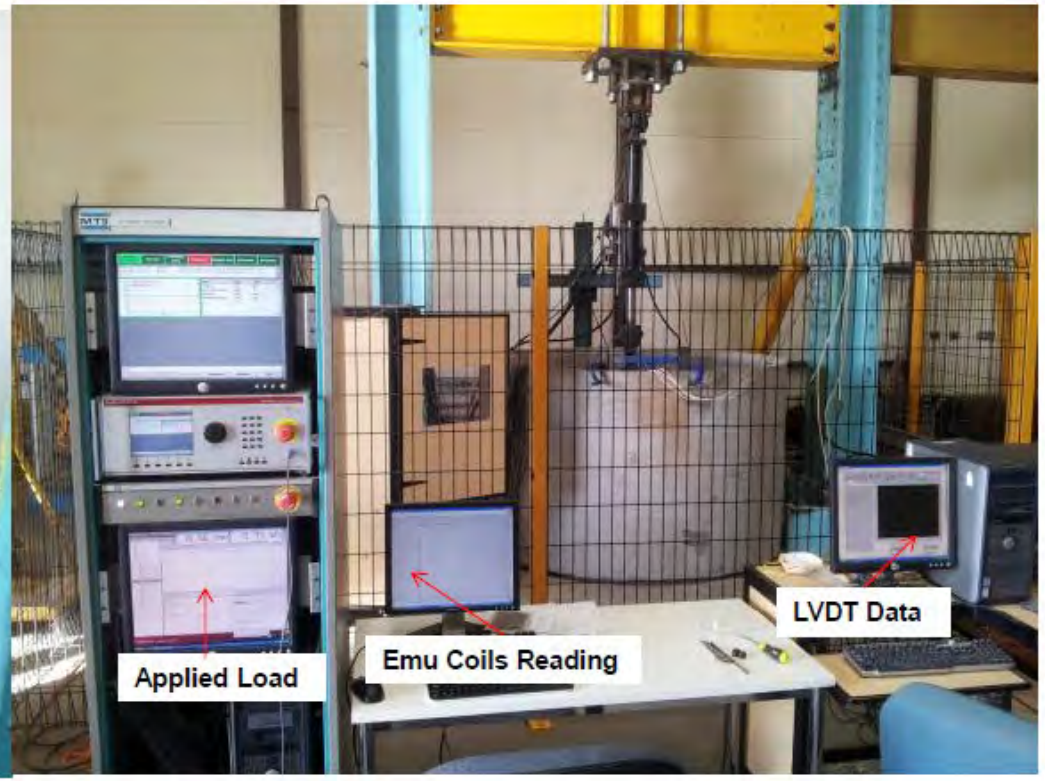
Current research work

Projects

- Geosynthetic reinforced pavement to reduce damage due to cyclic seasonal ground movement of expansive soils (with Pavement Asset Services Pty Ltd, Geofabrics Australasia Pty Ltd, City of Mitcham, City of Port Adelaide-Enfield and City of Salisbury)

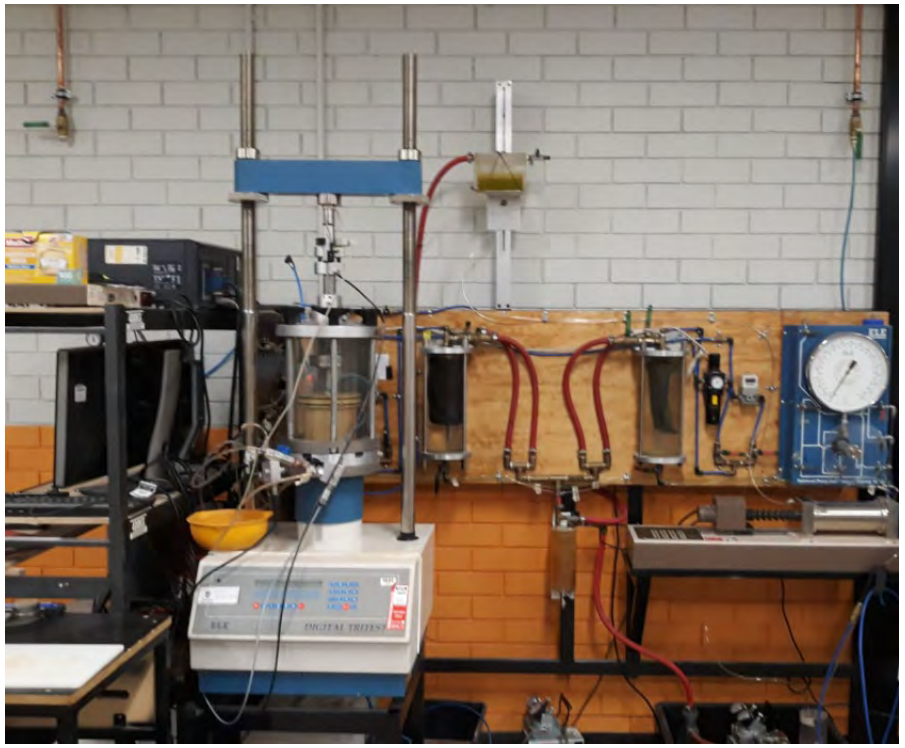
Pavement research

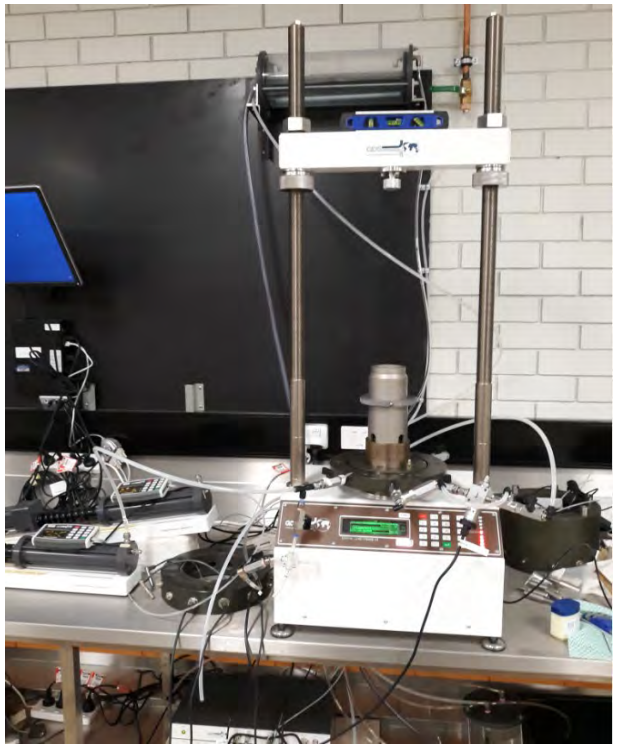
Lab photos



Pavement research

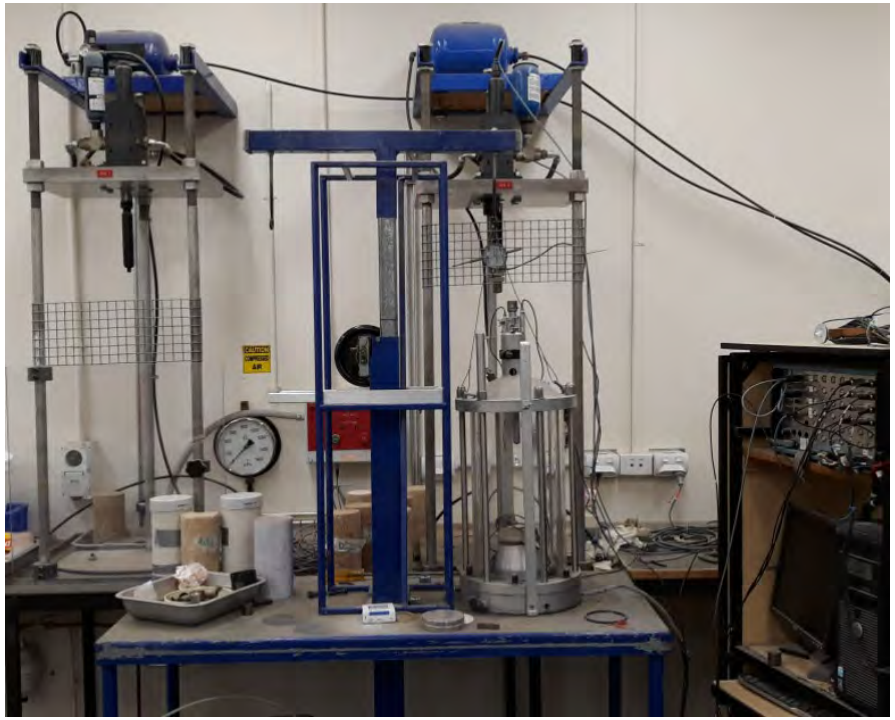
Lab photos





Pavement research

Lab photos



Geotechnical research team

- Professor Mizanur Rahman (mizanur.Rahman@unisa.edu.au)
  - Experimental geomechanics, soil liquefaction, pavement geotechnics, construction sustainability, unsaturated soil mechanics, bio inspired construction technologies
- Dr. Rajibul Karim (rajibul.karim@unisa.edu.au)
  - FEM, ground improvement, climate change and geo structure resilience, reactive soils
- Dr. Khoi Nguyen (khoi.nguyen@unisa.edu.au)
  - DEM, soil liquefaction
- Dr. Don Cameron (donald.cameron@unisa.edu.au)
  - Unsaturated soil mechanics, reactive soil, pavement geotechnics
- 1 Research associate and 10+ PhD students

rajibul.karim@unisa.edu.au

MICHELLE VERCO

MACE ENGINEERING

BRIDGES & CULVERTS ON LGA ROADS FOR THE LEGATUS GROUP

KELLY-ANNE SAFFIN

WORKING IN COLLABORATION

JOHN OLSON

WORKSHOP: 2030 LEGATUS GROUP ROAD TRANSPORT PLAN

SIMON MILLCOCK
LEGATUS GROUP CEO