



Low emissions building materials

Case study – zero carbon concrete culverts

27 May 2021

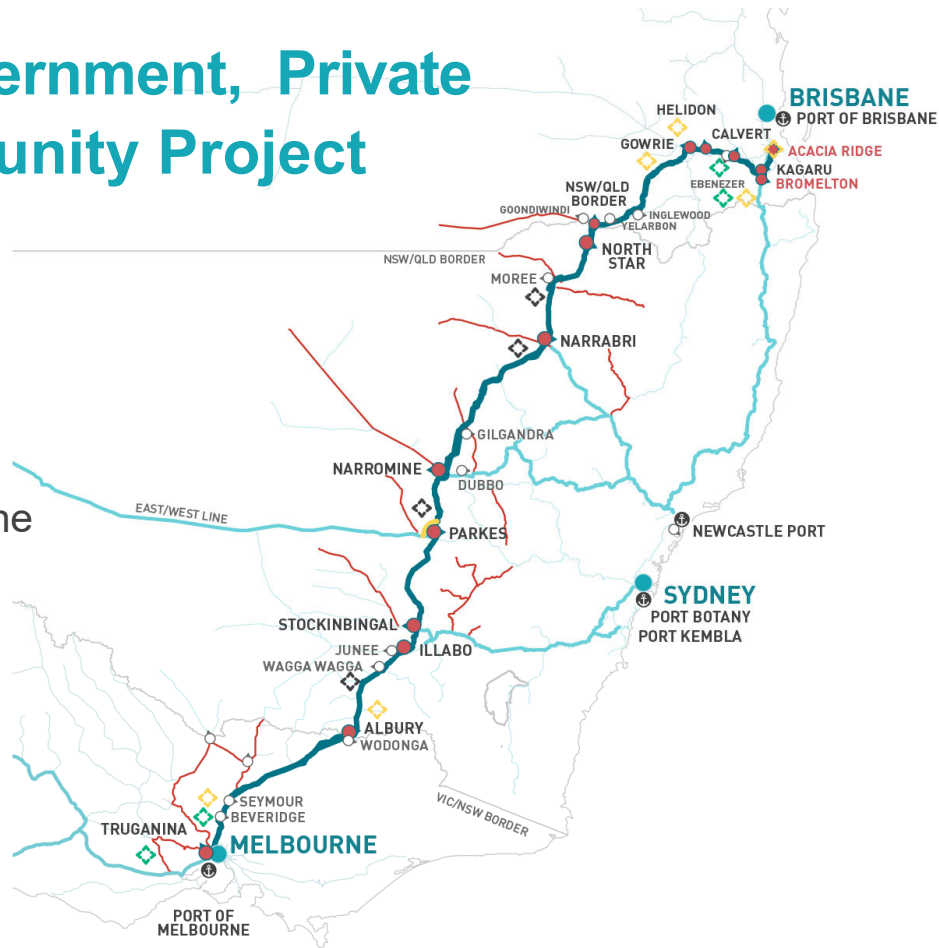
Acknowledgment of Country

Inland Rail acknowledges the Traditional Custodians of the land on which we work, and pay our respects to Elders past, present and emerging.

Inland Rail: A Government, Private Sector And Community Project



- ▶ Better connections to the country rail network
- ▶ Intermodal access along the alignment
- ▶ Port connections
- ▶ New industries



LEGEND

- Inland Rail
- Country Rail Networks
- Existing ARTC Interstate Networks
- Key Regional Towns

Critical components of the supply chain not controlled by ARTC

- Private Sector Terminals existing and in development
- Councils developing plans for new terminals
- Intermodal terminals under investigation by the federal and state governments
- Major ports
- Primary role Government
- Primary role Private Sector
- Shared Government and Private Sector

INLAND RAIL **FAST FACTS**



1,715km
of freight
rail line



3
states



36
Local
Government
Areas



Melbourne to
Brisbane in
<24 hours;
Express capability
<22 hours



98% reliability
matching that
of trucks



467,000 tonnes
of steel (equivalent
steel to build 8 Sydney
Harbour Bridges)



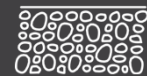
1,300,000m³
of concrete



+35,800,000m³
of cut



+36,200,000m³
of fill, with
optimised cut/fill
balance



+9,800,000 tonnes
of ballast, capping and
road base materials
from limited remote
sources



25m cutting and
embankment heights



8km of tunnels,
up to 250m below the
existing surface level

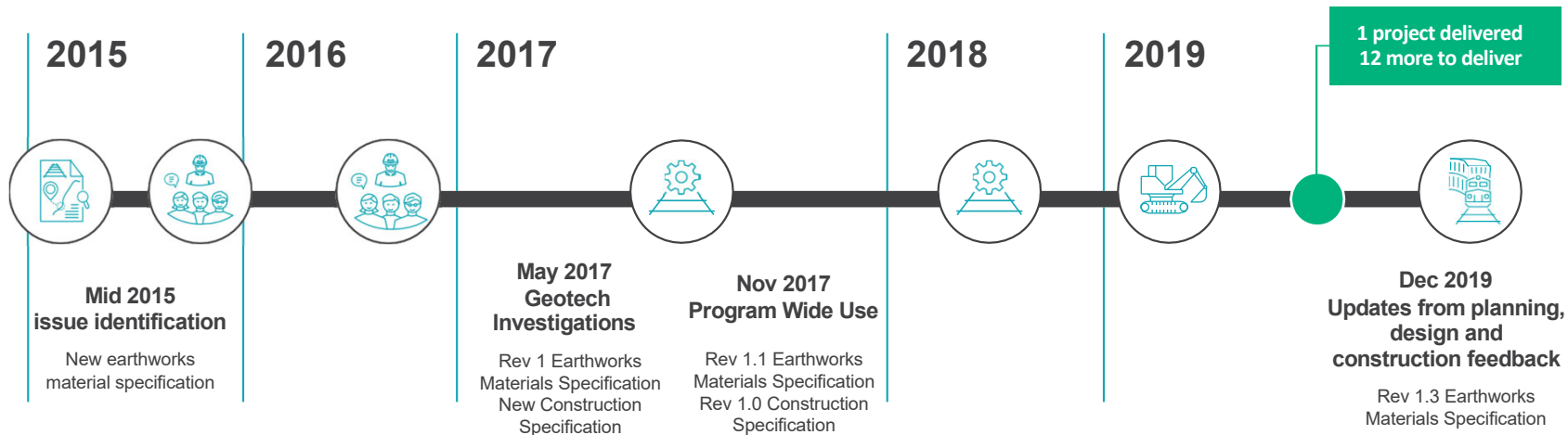
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Two examples of low or zero carbon materials:

1. General fill and our new Earthworks specification (allowing us to reuse site-won materials)
2. Carbon Neutral precast concrete culverts (purchase of new materials)
3. Key lessons learnt

New earthworks materials specification

- + Long lead time, >18 months to create and implement Program-wide
- + >3 years to test application in construction
- + Extensive stakeholder engagement >1,000 comments made and addressed



Re-use of site materials

Key benefits

- + 34% emissions reduction (15,000 tCO2-e) - Crushed rock & general fill emissions
- + 4.5% emissions reduction - Total project construction emissions
- + Traffic, social & dust impacts reductions – less material haulage
- + Materials cost savings – site won waste material reuse



Parkes to Narromine project

297,000m³ of blended ballast and ash was reincorporated into Inland Rail formation works.

Specifications or approved standards are required to define earthworks material properties for construction of railway earthworks.

Key benefits

- + Reduced social and traffic impacts from hauling materials.
- + Cost savings from using locally sourced materials.

Carbon neutral concrete culverts

- + Directly procured >22,000t
- + Supplier developed EPD
- + Offset carbon >7,000 tCO2-e
- + Joint press release

Key benefits

- + ALL subsequent tenders included EPD concrete culverts
- + Driving market competition
- + Local production – Tamworth



Lessons learnt

Good practices

- + Engage early with your systems & processes – do they exist, or need to be updated
- + Consider all materials – can we reuse, recycle, repurpose before new materials
- + Engage early with supply chain – what do you want & allow time to develop market led solutions
- + Purchasing offsets is not ideal – reduce emissions as much as possible – then offset remainder
- + Specify product with new EPD & carbon offsets, or allow flexibility to include them

Negative consequences or challenges

- + Systems & process changes take A LONG TIME – so plan for it & start as soon as possible
- + Forced the development of new organisational change management processes
- + Carbon offsets cost extra – are they included in project budgets?

**INLAND
RAIL** 

ARTC

The Australian Government is delivering
Inland Rail through the Australian Rail Track
Corporation (ARTC), in partnership with the
private sector.

THANK YOU