



# Australia Inland Rail Project: Border to Gowrie

**Fundamentals on Environment and Sustainability | S2 | 2024-2025**

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# Inland Rail Project

## Project Details

- Freight rail line project covering 1,600km and connecting three states
- Project proponent: **Inland Rail Pty Ltd.**, a Subsidiary of ARTC
- Budget: 2015- \$9.3bn vs. 2023- \$31.4bn
  - Funding through equity investment of the government
- 12 segments- 1,000km upgrades and 600km new track

National freight and supply chain capacity

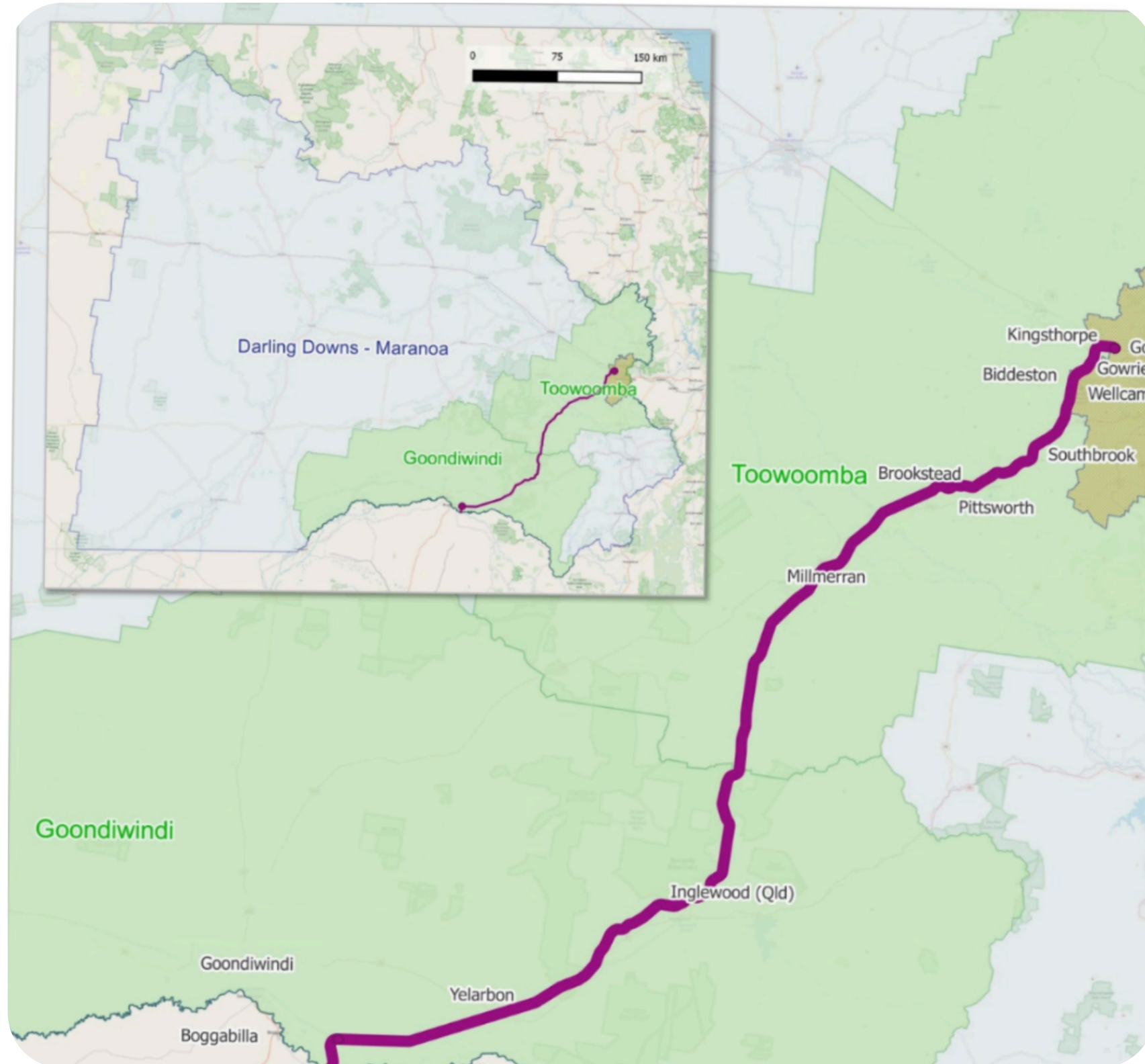
Cut travel time making rail competitive with road transport

Resilient supply networks



# Border to Gowrie

## Segment Details



- **217km - 149km new track, 68km upgrades:** Located in Queensland, crossing local government areas, such as Goondiwindi and Toowoomba
- **Significance for agricultural production:** Goal is to link small rural towns and the farming region with wider markets
- **Currently: Environmental Approvals Stage:** First draft EIS was submitted in 2021, later the Coordinator-General requested additional information. In 2024, the revised draft EIS submitted

# Impacts on **Air** of the Inland Rail

Construction Phase



All impacts were considered to have a **low** and even **negligible** impact:

- **PM<sub>10</sub> and TSP emissions** from mechanical activity
- **PM<sub>2.5</sub> emissions** from diesel combustion sources and refueling activities
- **Dust, odour and VOCs emissions** from fuel tanks at laydown areas and sewage treatment plants



Pollution from particulate matter can cause **severe health impacts** and serious **environmental impacts** (acidification of lakes and streams, nutrient depletion in soils and water bodies) (National Weather Service, n.d.)

**Mitigation/Monitoring measures are in order:** monitoring stations; optimizing earthworks; dust management sub-plan; etc.



# Impacts on **Air** of the Inland Rail

Operational Phase



## Low impact:

- **Odour** from agricultural freight train - short term and not significant
- **PM<sub>2.5</sub>, NO<sub>x</sub>, PM<sub>10</sub>, VOCs and PAHs emissions** from locomotive engine exhaust

## Conditional risk depending on future coal transport:

- Air pollution and health risks, among others, associated with coal transport

**Mitigation/Monitoring measures are in order:** monitoring stations; tunnel ventilation systems; public consultation; Coal Dust Management Plan; etc



## Positive impact - Most significant:

- **Reduction in carbon emissions and other pollutants; improved fuel efficiency**

Carbon emissions are expected to be reduced by 750,000 tonnes annually by 2050!

# Impacts on Soil of the Inland Rail



## Construction Phase

The construction phase of the Border to Gowrie (B2G) section significantly affects the soil environment particularly where the alignment passes through highly productive agricultural land

- Earthworks activities affect high-value agricultural soil prone to **compaction and erosion**
- **Topsoil stripping** presents high risk for organic **carbon depletion**. This process of removing the top layer of soil (topsoil) from a site can **reduce soil fertility** and **decreased water infiltration**
- Construction traffic causes significant **compaction on soil**. Field measurements indicate bulk density increases from 1.2 to 1.6 g/cm<sup>3</sup> in non-designated haul paths, **reducing infiltration rates and future agricultural productivity by as much as 15%**
- **Hydrocarbon and chemical contamination** has also emerged as a concern. Soil samples from machinery storage yards exceeded 800 mg/kg for total petroleum hydrocarbons, and bore construction using drilling fluids poses risks of bentonite and polymer additive migration into surrounding soils, which may **disrupt natural pH and microbial balances**, that consequently **disrupt biological systems**



# Impacts on Soil of the Inland Rail

## Operational Phase



Long-term soil-related impacts extend into the operational phase, particularly in areas where infrastructure has resulted in permanent **land conversion** and **disrupted natural drainage patterns**

- **2.8% loss of productive land** to concrete structures, and maintenance corridors
- **Ongoing soil contamination risks persist** through maintenance practices. **Herbicide leachate**, particularly glyphosate used for vegetation control, **increase bioaccumulation concerns in food crops**
- Alterations in subsurface drainage around embankments have potential to elevate local water tables, contributing to the onset of soil **salinity**. Salinization, if left unmitigated, could degrade soil structure and reduce land productivity across adjoining farming regions

### Mitigation measures in place:

- Include targeted erosion and sediment control plans, designated traffic corridors to reduce compaction, biannual soil health assessments, adaptive rehabilitation using native vegetation, strict chemical handling protocols, integrated herbicide management to minimize bioaccumulation, engineered subsurface drainage to prevent salinity, and ongoing environmental monitoring aligned with stakeholder and regulatory feedback

# Impacts on Water of the Inland Rail



Construction Phase

## **Floodplain alteration risks:**

- Over 200 km of construction disrupt hydrological regimes across Macintyre, Condamine, Bremer floodplains
- 34 bridges & 1.8 km viaduct required to manage seasonal flooding

## **Sediment mobilization and turbidity:**

- Up to 12,000 m<sup>3</sup> dispersive clay mobilized
- Turbidity levels spike by 40–60 NTU
- Impacting aquatic habitats and drinking water sources

## **Groundwater drawdown risk:**

- Tunnel dewatering may reduce aquifer levels by 1.2 m
- Threatens irrigation sustainability under prolonged drought conditions

## **Ecological & Indigenous concerns:**

- Impacts Ramsar wetlands, migratory birds & Githabul fish routes
- Noise and flow changes degrade cultural and ecological assets

## **Mitigation measures in place:**

- Include biannual updates of flood risk models, infrastructure adaptation gaps to meet rising extreme rainfall forecasts, expanded buffer zones, dynamic, data-driven management and ongoing stakeholder engagement



# Impacts on Water of the Inland Rail



Operational Phase

## **Flood behavior & infrastructure:**

- Macintyre viaduct may redirect flood flows
- Models predict +0.12m water rise during 20-year flood - above residential resilience

## **Climate crisis challenge:**

- 15% increase in extreme rainfall by 2040 lowers culvert design effectiveness
- Bremer River drainage misaligned with future projections

## **Chemical runoff risk:**

- Herbicide application near watercourses threatens quality in Condamine River
- 50m buffer below 100m riparian standards

## **Stakeholder infrastructure gaps:**

- Agricultural demands for adjustable floodgates conflict with ecological erosion risks (+30% shear stress from gated culverts)

## **Mitigation measures in place:**

- Include biannual updates of flood risk models, infrastructure adaptation gaps to meet rising extreme rainfall forecasts, expanded buffer zones, dynamic, data-driven management and ongoing stakeholder engagement

# Social and Economic Impacts of the Inland Rail



Construction and Operational Phase

## Social

Strong engagement commitments, and plans

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Noise and Vibration  
Household mitigation treatments - Specifics have been requested

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Land acquisition - estimated 20 households affected - no plans are published

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First Nations Culture and Heritage Impacts

## Economic

Enhance the competitiveness of goods → market access → economic growth

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Employment Opportunities  
Inland Rail Sustainable Procurement Policy (2020)

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Concern - loss of agricultural productive land  
Analysis - 0.22% permanent disturbance



# Conclusions



- **There are still major concerns** regarding Water and flood risk, as well as concerns regarding Soil and biodiversity. So, additional mitigation measures are needed.
- Overall the impact of the project is **positive**, especially when addressing socioeconomic and air impacts and after considering the mitigation measures that are in order.





# Thank you

Any questions?