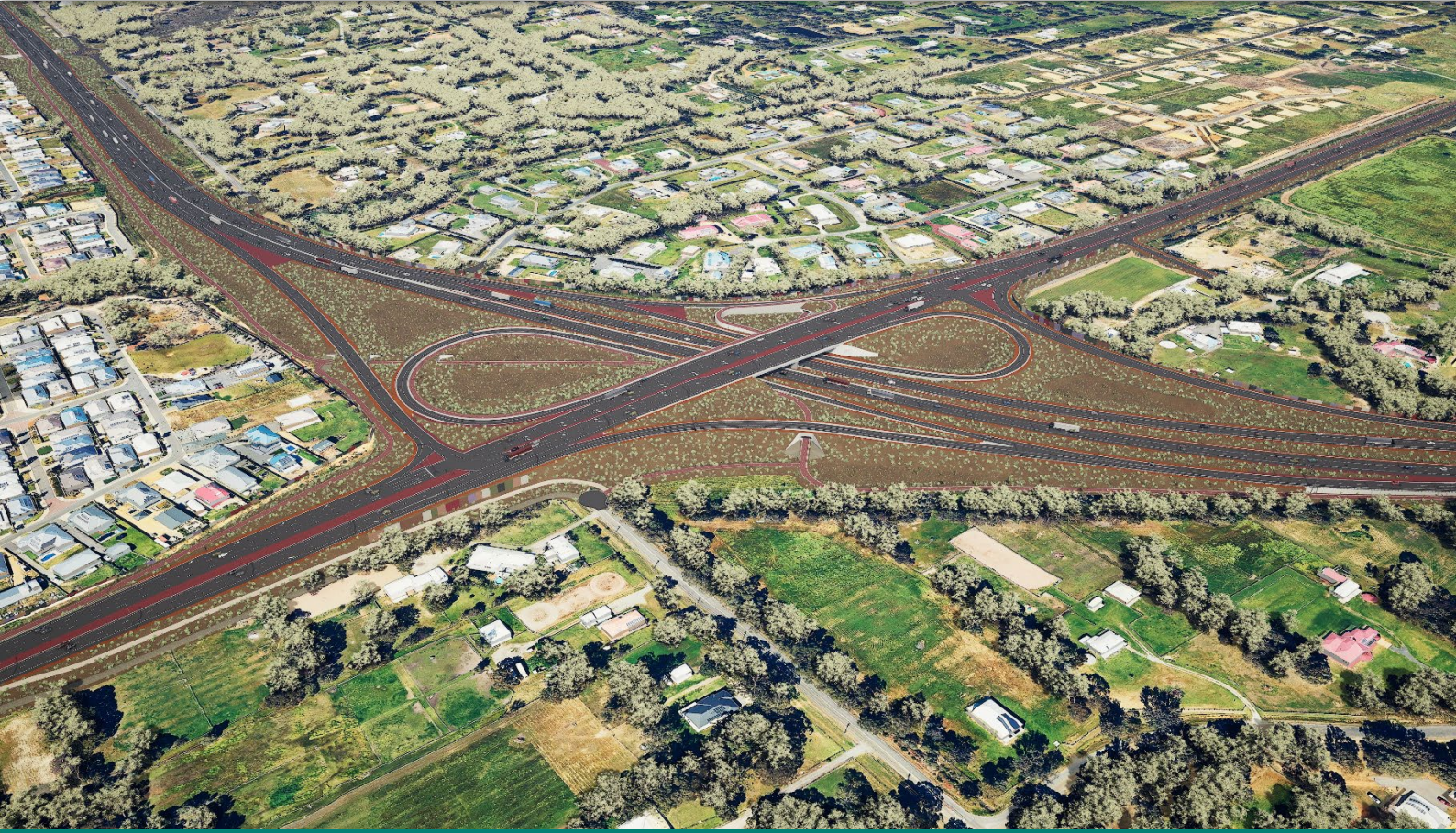




Tonkin Highway Extension and Thomas Road Upgrade

Tonkin Highway to South Western Highway

2025 Annual
Sustainability Report

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About this report

This report has been prepared by the Tonkin Extension Alliance (TEA), which comprises BMD Constructions, Georgiou Group, Civcon Civil & Project Management, BG&E and GHD, in partnership with Main Roads Western Australia (Main Roads). The report relates to the Tonkin Highway Extension from Thomas Road to South Western Highway and the duplication of a section of Thomas Road (the Project).

This report summarises the environmental, social, economic, and governance aspects of the Project which have contributed to sustainable outcomes from project inception in January 2025 to the end of November 2025. The content is based on information available at the time of reporting.

The information contained in this report reflects the Project’s status during early design and construction and is subject to change as design development progresses, approvals are finalised, and construction activities continue. Where targets, figures, modelling outcomes, or future activities are referenced, these are indicative only and based on preliminary design, technical assessments, and the best available data at the time.

Future project decisions will continue to be guided by detailed technical assessments, safety requirements, statutory approvals, and ongoing stakeholder engagement. Accordingly, outcomes described in this report should not be interpreted as fixed or guaranteed.

For feedback or enquiries regarding this report, please contact Main Roads Western Australia on 138 138 or via email at enquiries@mainroads.wa.gov.au.

Project overview

The Tonkin Highway Extension and Thomas Road Upgrade Project is a jointly funded Australian and Western Australian Government initiative transforming Perth's south-east corridor. The \$1 billion project is delivering a high-standard north–south transport link that will provide safer, more efficient travel for road users and heavy vehicles, reduce congestion, and improve connectivity between current and future residential, commercial, and employment areas. This growing region faces increasing traffic volumes and freight demand connecting the Perth metropolitan area with the South West and Wheatbelt regions.

The project includes a 14 km extension of Tonkin Highway as a four-lane dual carriageway, complemented by a Principal Shared Path for active transport. Key works feature new traffic bridges, grade-separated interchange, pedestrian and equine crossings, noise and screening mitigation, drainage infrastructure, and intelligent transport systems. A detailed map of the proposed Project works is provided in Appendix 1.

In addition, 4.5 km of Thomas Road is being duplicated, with a new grade-separated interchange at Tonkin Highway (Figure 1). The works incorporate shared paths, a signalised equine crossing, intersection upgrades, and amenity improvements.



Figure 1. Artist rendering of proposed project works at Tonkin Highway and Thomas Road

“ As an Alliance, we are committed to doing the right thing, governing the Project openly and responsibly and delivering the Project in a sustainable way that focuses on reusing materials, protects the environment and supports local employment and business engagement. ”

Peter Hopfmueller, Alliance Director

2025 key milestones

During 2025, the Project achieved several key milestones that progressed design development and early construction activities. The highlights below summarise completed work for the reporting period.

March: Preliminary works commenced along Thomas Road and the future Tonkin Highway alignment, including surveying, geotechnical investigations, and service locating.

June: Establishment of Mundijong site compound for early works in the Southern and Central sections of the Project.

July: Successful realignment of Tonkin Highway between Thomas Road and Rowley Road.

August: Removal of the existing Tonkin Highway northbound shoulder and commencement of temporary southbound lanes construction.

September: Official sod turning ceremony (Figure 2), marking the start of major earthworks and construction starting.

October: Traffic switched to temporary southbound lanes; work continued on the Thomas Road diversion between Ballak Place and Kardan Boulevard.

November: Permanent construction began, including drainage, pavement works, and major earthworks.

December: Construction of the site-based haulage track between Orton Road and Bishop Road continued.

Project timeline



2025: Design, procurement and early works

Following project award, design has progressed significantly during the year. Procurement has commenced, and early works was started mid-2025.



2026 to 2028: Final design and construction

All final designs are expected to be completed mid-2026, with permanent construction works ramping up during the same period. Procurement for the remaining major packages continues as construction progresses.



Late-2028: Project completion

Completion is expected in late-2028 with final construction works, and landscaping.



Figure 2. Sod turning milestone in September 2025

Sustainability focus areas and objectives

Sustainability priorities for the Project have been established through a formal Materiality Assessment. This process informed the key focus areas (Figure 3) most critical to delivering long-term environmental, social, and economic value. These focus areas are underpinned by a set of defined strategic objectives and measurable targets mapped against relevant United Nations Sustainability Development Goals (UNSDGs) (Appendix 2). This provides a structured framework to guide decision-making, monitor performance, and ensure the Project delivers optimal sustainability outcomes.

Our sustainability approach

Our framework guides performance across environmental, social, economic, and governance areas of the Alliance, providing structure and oversight for sustainability delivery across the Project.



Figure 3. TEA sustainability focus areas and objectives

Governance

Governance and decision making approach

The Project has established a robust sustainability governance framework that embeds sustainability into leadership, planning, design and delivery. This framework ensures that sustainability objectives, risks, and opportunities are identified, assessed, and considered in decision-making, enabling transparent, accountable, and consistent project outcomes. All TEA participants are committed to sustainable infrastructure delivery, evidenced through sustainability strategies and shared project objectives.

A dedicated Sustainability Leadership Committee, chaired by the Sustainability Lead and comprising senior representatives across key disciplines, provides strategic oversight and drives cross-functional integration. The Committee ensures sustainability considerations are embedded early across planning, design, and construction, improving operational readiness.

This governance model reinforces that sustainability is a core component of project leadership and risk management, and not a parallel or isolated workstream. It supports continuous improvement, strengthens internal capability, and ensures decisions reflect broader community expectations and long-term value creation.

Sustainable material use

The TEA governance framework has been established to guide sustainable material use across the design and construction phases. Central to this approach is the Project's commitment to reducing the use of virgin materials and maximising the use of recycled and replacement materials, consistent with the Replacement Materials Strategy, broader circular economy principles, and project objectives.

A comprehensive Replacement Materials Management Plan outlines approved material types, anticipated volumes, implementation pathways, and performance targets. This framework ensures that all material opportunities are evaluated against technical, regulatory, and supply-chain requirements prior to adoption.

By embedding these processes from project commencement and continually refining them as design matures, the Project demonstrates strong material stewardship, governance assurance, and alignment with sustainability focus areas.

Sustainable procurement

The Project uses procurement as a strategic tool to drive sustainability and industry advancement. Our processes embed environmental, social, and economic considerations into decision-making, ensuring that procurement contributes to long-term value creation.

Major packages including asphalt, concrete, pavement materials, steel reinforcement, plastic noise walls, plant hire and diesel supply are subject to sustainability requirements. These include responsible sourcing, evidence-based performance, and alignment with project objectives.

We work closely with suppliers and subcontractors from the outset, clearly communicating expectations and integrating sustainability into contracts. This approach is supported by strengthened assurance, monitoring, and reporting throughout delivery, ensuring accountability and measurable outcomes across the supply chain.

Industry advancement

The Project recognises the role of major infrastructure in advancing industry capability. TEA engages with local schools and universities (Figure 4) to create pathways for students to gain hands-on experience that can inform their chosen career path. As part of these early career development opportunities, the Project provides part-time flexible options for cadets to balance their studies, with valuable real-world experience.

By strengthening inclusive recruitment practices, and providing training that builds cultural awareness, the Project supports broader representation across roles and disciplines, actively promoting roles for women, Indigenous peoples, and culturally diverse employees within the workforce. As part of this industry advancement commitment, the project has established an internal Key Result Area framework, against which performance is measured, monitored, and reported.



Figure 4. TEA representatives at North Metro TAFE

Environment

Environmental management approach

The Project is underpinned by rigorous environmental planning, community engagement and sustainability principles, and is being delivered with a clear focus on minimising environmental impacts and enhancing local ecological values wherever practicable. Conditional environmental approvals have been obtained for the project under the *Environmental Protection Act 1986* (EP Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC). As part of our commitment to impact minimisation, the Project is implementing and exploring initiatives including:

- Minimising vegetation clearing and retaining existing trees where practicable, through design refinement, project-wide tree surveys, and the application of a project tree retention strategy, including the preservation of vegetation within drainage basins where feasible.
- Reusing native vegetation to support local wildlife, in collaboration with Kaarakin Black Cockatoo Conservation Centre (Figure 5).
- Grass tree salvage and replanting.
- Seed collection of *Morelotia australiensis* is being undertaken under a Research Collaboration Agreement with the Department of Biodiversity, Conservation and Attractions (DBCA); seed is collected, viability tested, and stored at the Western Australian Seed Centre, with germinates provided to Kings Park and Botanical Garden for inclusion in living collections, supporting future conservation and rehabilitation outcomes, subject to DBCA approval and seed viability.
- Rehabilitation incorporating engineered hard surfaces (e.g. rock-pitching), landscaping, and revegetation using native species.



Figure 5. Native vegetation donated to Kaarakin Black Cockatoo Conservation

A Project Construction Environmental Management Plan has been developed to meet all legislative requirements, outlining clear objectives, monitoring and reporting processes, and targeted sub-plans for key environmental aspects. This framework provides a consistent, risk-based approach to protecting environmental values throughout project delivery.

Water

Water is essential for building major transport infrastructure in Western Australia. As construction progresses, the Project’s water requirements may change; however, at this stage, water use is primarily associated with:

- preparing and compacting around 3.3 million cubic metres of fill material,
- controlling dust across active work areas; and
- establishing landscaping and revegetation as the Project nears completion.

To reduce pressure on local water supplies and avoid wastage, the Project is implementing a range of water-saving measures. These include using basin coverings to reduce evaporation, installing meters to monitor water

use, and trialling alternative dust suppression products to minimise the use of water carts where practical. The primary water source for construction activities is groundwater abstracted from seven licenced bores located in the Project area. To manage works with respect to conservation, reuse, and recycling of water where reasonably practicable, the Project has developed a Water Management Sub-Plan.

As the Project progresses, water demand modelling will be undertaken to inform future water efficiency opportunities. Accordingly, reporting for the current period focuses on total water consumption, sources, and the management measures implemented. Table 1 shows the waters use for the Project during this reporting period.

Table 1. Water usage project total

Source	Total for project (kL)
Scheme Water	18,985
Groundwater	29,420

Energy and carbon emissions

The Project acknowledges that construction activities contribute to emissions through fuel use, electricity consumption, and embodied energy in materials, as well as the loss of carbon sinks from vegetation clearing.

Rather than targeting energy and carbon reductions as a standalone objective, the sustainability strategy integrates these outcomes through material efficiency and circular economy principles. By prioritising the use of recycled and alternative materials, reducing reliance on virgin resources, and optimising design methodologies, the Project indirectly lowers emissions associated with material production, transport, and installation. Similarly, design optimisation and targeted native vegetation and tree retention strategies help preserve vegetation and reduce the carbon loss from clearing.

Project highlight | Hybrid power system



In August 2025, TEA advanced its decarbonisation efforts by installing a hybrid off-grid power system at the Mundijong site compound (Figure 6). The system integrates a Battery Energy Storage System (BESS), solar panels, and a diesel generator to deliver reliable, low-emission power.

The BESS enables rapid recharge from both solar photo voltaic cells and the generator through smart controls, ensuring efficient load management across site facilities. The generator operates only when battery levels are low – typically for two hours per day – maximising fuel efficiency. This innovative setup has already reduced diesel consumption by 23.5 kL, cutting emissions and lowering fuel costs.

To date, the system has supplied the compound with:

- 1,000 kWh directly from the generator,
- 6,400 kWh via the BESS, and
- 2,800 kWh from solar PV.



Figure 6. Hybrid off-grid power system at Mundijong site office

Management of energy and carbon impacts is embedded within project environmental and sustainability governance processes. Monitoring during construction includes tracking fuel and electricity use, while design decisions aim to minimise resource intensity and clearing. Initiatives such as adopting hybrid power systems for site compounds and implementing efficient haulage strategies further support reduced energy demand. Table 2 shows the energy use for the Project during this reporting period.

Table 2. Energy use project total

Source	Unit	Total for project
Diesel	kL	386
Unleaded Petrol	kL	0.12
From grid electricity	kWh	74,000
From onsite renewables	kWh	2,800

Materials and waste

Sustainable material use is a key focus area for the Project and forms a major part of our strategy to reduce environmental impacts. The Project’s approach focuses on minimising the lifecycle impacts of materials by reducing reliance on virgin resources, increasing the use of recycled and replacement products, and maximising reuse of material already available within the corridor.

Design and construction teams work together to identify opportunities to incorporate lower-impact materials while maintaining safety, quality, and durability requirements. Key applications include:

- Subbase and basecourse: recovered road base materials and crushed recycled concrete (CRC).
- Embankment and subgrade: recovered sands and recycled sand products.

- Minor structures: lower-carbon concrete mixes and recycled plastic products.

Surplus materials from nearby infrastructure works will be reused to reduce waste, conserve natural resources, and minimise haulage. To date, major materials used for construction include general fill (sand and limestone) and crushed recycled concrete, as outlined in Table 3.

Table 3. Key imported material use totals

Source	Materials	Total for project (t)
Imported raw	Sandy limestone	706,189
	Sandy clay	68,658
	Limestone (75mm)	24,957
	Crushed rock road base	19,793
	Sand	19,031
	Limestone fill material	17,786
	Overburden	16,100
	Aggregate blue metal	1,741
	Crusher dust	844
Imported recycled	Crushed recycled concrete	65,408
	Asphalt (20% RAP)	3,405

To date, the Project has implemented initiatives to reduce waste sent to landfill through the reuse of on-site and off-site materials, including:

- Two replacement materials – surplus recycled sandy clay and crushed recycled concrete, successfully incorporated into construction works.
- All excavation spoil material was reused on site as fill, eliminating spoil disposal and reducing haulage-related impacts.

- Suitable cleared vegetation was mulched and stockpiled for reuse on site, supporting soil conditioning and landscape establishment. Where practicable, vegetation was prioritised for reuse to support Black Cockatoo rehabilitation activities in collaboration with Kaarakin Black Cockatoo Conservation Centre.

Waste management practices focus on avoiding waste generation where possible, reusing and recycling materials, and diverting waste from landfill, while managing hazardous materials in accordance with regulatory requirements. Table 4 summarises the total Project generated waste that has been removed from site.

Table 4. Total generated waste removed from site

Source	Material	Total for project (t)
Waste to landfill	Asbestos	50
	Site office (municipal solid Waste)	3.1
Waste diverted from landfill	Mixed construction and demolition	352.2
	Concrete	352.5
	Steel	53.7
	Bricks and pavers	29.6
	Asphalt/ seal	14.4
	Timber	6.0
	Organics	5.4
	Tyres	3.6
	Plastic	1.7
	Comingled recycling	1.1
	Plasterboard/ gyprock	0.6
	Cardboard and paper	0.2

Project highlight | Smarter haulage, reduced impacts



The movement of approximately 3.3 million cubic metres of fill involves significant haulage activity and can present challenges where works interface with live traffic and surrounding communities. Recognising road safety as a shared priority, early collaboration with local residents, schools, businesses, bus operators and local government informed a proactive approach to managing safety, community and environmental impacts.

As a result, dedicated haulage tracks (Figure 7) were established within the alignment boundary, reducing reliance on the public road network and minimising interactions with high-pedestrian areas. This has reduced disturbance to residential areas, lowered traffic impacts, and avoided unnecessary congestion and safety risks.

Beyond these immediate benefits, the haulage track has been deliberately designed to form the foundation of the future Principal Shared Path. By repurposing temporary construction infrastructure for permanent use, the approach reduces additional earthworks, conserves materials, and delivers time and cost efficiencies.



Figure 7. Projects internal haulage track

Managing community impacts during construction

While construction of this scale brings some construction impacts, TEA is committed to managing these disruptions carefully and working closely with local communities to minimise inconvenience (Figure 8).

Construction activities for the Project are carried out in accordance with the *Environmental Protection (Noise) Regulations 1997*, which permit works between 7:00am – 7:00pm, Monday to Saturday. To minimise disruption and ensure the safety of both road users and workers, some activities are required to be completed outside these standard hours, including at night and on Sundays and public holidays. These out-of-hours works are typically required for activities that:

- involve traffic impacts that may cause delays during normal work areas;
- must be completed within tight timeframes for safety or operational reasons; or
- are weather or schedule dependent.

Managing construction noise

All out-of-hours work is subject to local government authority approval and follows strict conditions to manage noise and minimise inconvenience, recognising that some disruption to nearby residents may still occur. Impacted residents also received advance notification ahead of any out-of-hours activities.



Figure 8. TEA road management for early works

To minimise the impact on nearby residents and businesses, TEA implement a range of noise control measures, including:

- scheduling high impact activities during standard working hours where possible;
- using vehicles fitted with croakers instead of beepers;
- maintaining equipment to high standards to reduce mechanical noise emissions;
- providing advance notice to residents and businesses ahead of particularly noisy works;
- minimising vehicle movements through careful planning of deliveries and haulage routes; and
- undertaking intermittent noise monitoring to assess the effectiveness of mitigation measures and verify compliance with regulatory requirements.

Managing operational noise

Traffic noise was assessed early in project planning through detailed acoustic modelling with an acoustic consultant.

This modelling was used to predict potential traffic noise at sensitive land uses and to identify where predicted noise levels may require mitigation in accordance with *State Planning Policy 5.4 – Road and Rail Noise*. As the Project design progresses, the noise modelling and proposed treatments will be reviewed and revised if necessary.

A range of mitigation measures may be implemented to reduce traffic noise as much as reasonably practicable, including:

- engineering treatments such as road surface types, which can provide noise reduction benefits for multiple properties; or
- noise mitigation treatments located adjacent to the road or property boundaries.

Vibration management

Some machinery may generate low levels of vibration at various stages of construction. Experiencing vibration does not mean structural damage to a property will occur. The main sources of vibrations on the Project are likely to be:

- truck movements;
- earthmoving, piling and soil compaction activities; and
- use of heavy machinery.

To limit the impact of vibration on the community, the team is implementing:

- use of low-vibration or oscillating rollers near sensitive areas;
- operating rollers in vibration mode only while moving and switching off when stationary;
- running vibrating rollers parallel to properties, where possible, to reduce vibration levels;
- limiting speeds for construction vehicles and machinery on site; and
- regular maintenance of plant and machinery to minimise vibration output.

Dust management

Some construction activities such as excavation, site preparation, vehicle movements on unsealed roads, and wind on exposed surfaces or stockpiles can result in increased dust.

A range of measures are being implemented to minimise dust impacts, including:

- using water trucks and sprays to suppress dust on haul roads and work areas where possible;
- limiting vehicle speeds on site to reduce dust generation;
- postponing high risk dust activities during periods of strong winds, where feasible;
- regular surveillance and feedback response to address dust concerns raised by residents or businesses; and

- static dust monitoring at key locations along the Project corridor, with regular data reviews to guide onsite actions.

Native vegetation disturbance and clearing

Environmental approvals permit the disturbance of up to 32.6 hectares of native vegetation within the approved Project footprint, representing the maximum extent of clearing authorised for Project works (illustrated in Figure 9).

Vegetation conditions across the Project area ranges from degraded to excellent, with any disturbance managed in accordance with statutory approvals and Project protocols.

At the time of reporting, clearing activities are ongoing, and the final disturbance footprint has not yet been confirmed. As design and construction progress, opportunities to reduce vegetation disturbance below the approved extent continue to be explored where practicable through design refinement, construction staging, and access planning.

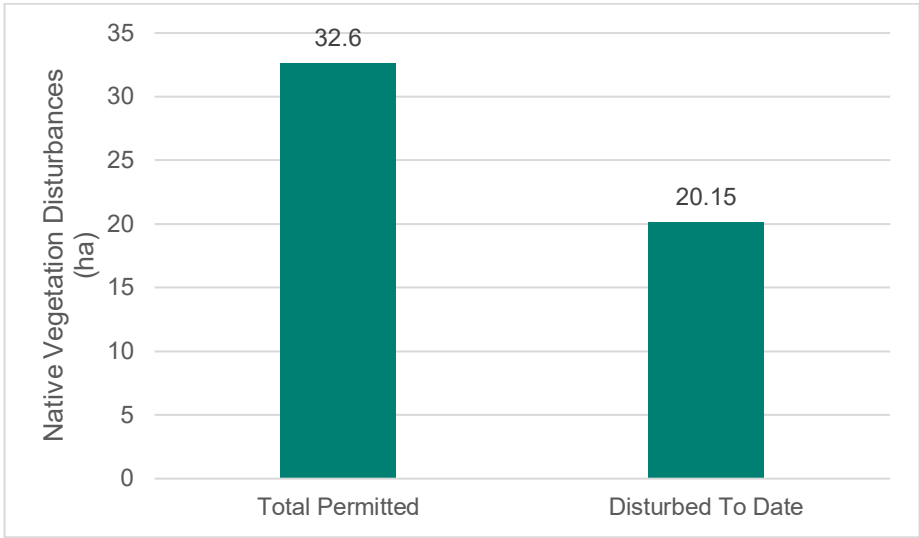


Figure 9. Native vegetation disturbance permitted versus actuals

Project highlight | Tree retention strategy



Preserving established trees has been a key focus for the Project, recognising their importance to local character, amenity, and habitat along the corridor.

During the year, TEA undertook detailed tree surveys across the Northern, Central, and Southern Zones to inform design development and identify opportunities to retain vegetation where practicable. This work was supported by collaborative workshops involving design, construction, environmental, survey, and community specialists, ensuring tree retention was considered alongside safety and constructability.

Survey work to date has identified more than 5,900 trees across the corridor, with approximately 4,359 located within the Project boundary. As design progresses, each tree within this boundary will be assessed on a case-by-case basis, considering environmental value, location, and its relationship to the evolving road alignment. Where feasible, design refinements will be explored to support retention.

Trees identified for retention have been marked onsite (Figure 10) to support construction planning, strengthening the integration of environmental considerations and supporting retention of local character valued by the community.



Figure 10. Vegetation marked for retention within the Project footprint

Social

Social context and management approach

The Project is located within a rapidly growing corridor in Perth's south-east, home to established residential communities, semi-rural properties, local businesses, equine users and recreational groups. The region continues to experience population growth and increasing transport demand and is characterised by a strong connection to local identity, bushland, and semi-rural amenity.

Given this context, the Project has focused its approach on understanding the values, interests, and concerns of the community, identifying expectations early, recognising the importance of retaining local character, and providing pathways for stakeholders to meaningfully contribute to Project outcomes, while ensuring engagement processes remain inclusive, realistic, and responsive during design and construction.

Community information sessions, social media, attendance at community events, letterbox drops, online updates, direct property engagement, and meetings with special interest working groups have supported transparent communication and provided opportunities for stakeholders to speak directly with Alliance representatives. These interactions helped shape design development during the reporting period and strengthened the Project's understanding of local priorities.

Priority areas

Engagement undertaken during development, design and construction by Main Roads and now TEA has highlighted several areas of importance to the community. These insights have helped shape engagement priorities and ensure TEA remains responsive to local expectations. Key topics raised include:

- vegetation disturbance;
- habitat considerations (particularly Black Cockatoos);
- property and accommodation works;

- visual screening and noise walls;
- construction noise, vibration, and dust;
- truck movements on local roads;
- emergency access;
- equine considerations; and
- access and connectivity in the area including traffic management staging.

TEA applies a structured approach to managing these matters, which in 2025 included:

- developing an Environmental Working Group to discuss environmental priorities, opportunities and considerations;
- One on one property meetings to understand local context and issues for property and accommodation works;
- regular attendance at the Shire of Serpentine Jarrahdale's (the Shire) Equine Working Group to discuss equine matters, including design considerations;
- regular attendance at the Shire's Local Emergency Management Committee and Bushfire Advisory Committee to discuss emergency access and response;
- regular communications around impacts on a range of platforms, including dedicated information sessions and attendance at community markets to share designs and to avoid any surprises;
- constructing a dedicated site-based haulage track to reduce trucks using local roads;
- regular Shire Working Groups to discuss project updates as well as any connectivity and access changes, including road closures and public notices;
- responding to enquiries in a timely manner; and
- monitoring progress and maintaining records.

This approach supports consistent, timely communication and contributes to maintaining community confidence across design and delivery.

Community and stakeholder engagement

An important element of the Project's approach is the delivery of engagement that allows the community and stakeholders to contribute meaningfully to Project outcomes. Engagement is guided by the Community and Stakeholder Engagement Management Plan, which provides structure for communication channels, engagement methods, governance, and stakeholder groups.

Stakeholders engaged to date include residents, landowners, equine community, environmental groups, local government authorities, emergency services, schools, businesses, utility providers, and government agencies. Engagement activities have focused on ensuring that stakeholders remain informed, that concerns are recognised and addressed, and that local knowledge is incorporated into design where appropriate.

This engagement has helped build a strong understanding of local values, priorities, and expectations. These insights guided communication and design considerations during the reporting period.

Cultural heritage

Historic (non-Aboriginal) and Aboriginal cultural heritage are key considerations for the Project and are managed in accordance with our Heritage Interpretation Management Plan and associated sub-plans, which were developed in line with legislative requirements and best-practice environmental and stakeholder engagement principles.

Aboriginal heritage

Cultural salvage has been completed across five Aboriginal heritage sites within the Project boundary (Figure 11). During development, approvals required to progress early works were obtained under Section 18 of the *Aboriginal Heritage Act 1972*, enabling works to proceed in a compliant and respectful manner.

Archaeologists were engaged throughout this process, and Traditional Owners of the Noongar community were present during and oversaw all

ground-disturbing activities. This ensured Aboriginal heritage values were appropriately identified, managed, and protected throughout Project delivery.

Historic heritage

Salvage works at Fremnells Diary focused on the recovery of bricks, fencing, and other reusable elements with local historic and place-based significance. In consultation with the Shire, these artefacts are intended to be incorporated into elements of the Project's urban and landscape design, including artwork and a dedicated heritage trail, subject to ongoing design development.

This approach supports the integration of historic values into the built environment, helping retain local identity and ensure the area's heritage continues to be acknowledged and experienced by future generations. The Project will continue working with key stakeholders to support local participation and ongoing community involvement.



Figure 11. Aboriginal artefact found during cultural salvage survey

Project highlight | Fremnells Dairy



In 2025, works commenced at 681 Hopkinson Road, the former Fremnells Dairy (Figure 12), to enable delivery of the Tonkin Highway alignment while carefully managing the site's heritage values. Recognised as a well-preserved example of early 20th-century dairying, the place holds strong community significance.

Working with the Shire, TEA assessed the site to identify structural elements and materials suitable for salvage, retention and reinterpretation in the Project's urban design. These features will inform future landscaping and a heritage interpretive sign along the Principal Shared Path, ensuring Fremnells' history remains visible to the community.

Cultural heritage considerations were embedded throughout the works, supported by Heritage Monitors and opportunities for Traditional Owners to undertake cultural salvage. Insights from this process continue to shape the Project's urban and landscape design.

As part of this work, TEA also prepared and submitted an Archival Record report for *Heritage Place No. 8482 (Fremnells Dairy), located at 681 Hopkinson Road, Cardup*.



Figure 12. Fremnells Dairy photographed during archival recording

Sustainable employment

TEA is committed to building a capable, diverse, and resilient workforce that supports long-term employment. Our approach focuses on creating meaningful employment pathways, strengthening local capability and ensuring an inclusive, healthy and productive workforce culture.

Growing local capability

We invest in developing Western Australia's construction workforce through structured training, mentoring, and targeted recruitment programs. This includes closing skill gaps, supporting entry-level roles, and creating pathways in engineering, trades and operations. TEA's Workforce Development Sub-Plan outlines a coordinated approach to training, upskilling and talent retention across the Project lifecycle.

Inclusive employment opportunities

TEA is committed to equitable and inclusive workforce participation. Key employment targets include at least:

- 15 per cent of total work hours completed by women
- 3 per cent of work hours completed by entry-level employees
- 7.5 per cent of work hours undertaken by Aboriginal people
- 1 STEM (Science, Technology, Engineering and Mathematics) education or engagement initiative per year
- 2 full time equivalent cadet and/or graduate positions engaged on the Project.

These targets are supported through active partnerships with service providers, community organisations, universities, and Aboriginal businesses.

By breaking down work packages, supporting small and medium enterprises, and ensuring fair contracting and rapid payment processes, TEA strengthens the local support chain and supports sustainable employment beyond the life of the Project.

Innovation

Material working group

The Material Working Group (MWG) was established as a collaborative forum between the TEA and Main Roads to champion sustainable and innovative material use across the Project. Its purpose is to:

- provide a forum for representatives from key disciplines across TEA and Main Roads to share knowledge and input on materials-related matters.
- collaborate on identification, assessment, and implementation of replacement materials to support sustainable outcomes.
- enable consistent information sharing and technical guidance, ensuring collective decision-making on material issues and opportunities.
- support timely resolution of issues relating to sourcing, testing, approvals, and delivery of materials; and
- enhance material outcomes by embedding sustainability and circular economy principles into design and construction.

The MWG operates as a technical advisory and coordination body for the Project. Its role is to identify and assess opportunities for sustainable and replacement materials, review design improvements, and provide input on procurement strategies to embed sustainability objectives. The MWG also resolves issues related to material availability or compliance, endorses innovative proposals through the approved governance process, and documents lessons learned to advance industry practice.

The MWG has been investigating the opportunity to incorporate Crushed Recycled Concrete (CRC) into the subbase across the Project. The Project has begun using CRC in the embankment of the Principal Shared Path, which is being utilised for internal haulage tracks, helping to reduce heavy vehicle movements on local roads (Figure 13).

Material action groups

To deliver targeted outcomes, the MWG is supported by four dedicated Material Action Groups, each focusing on a specific material stream:

- alternative sustainable materials for embankment construction
- asphalt options with recycled content
- lower-carbon concrete solutions
- recycled plastic product applications.

These sub-groups investigate technical feasibility, propose modifications to client requirements where beneficial, and follow structured approval processes to implement innovative solutions. This structure ensures that sustainability objectives are embedded across all stages – from feasibility and planning to delivery and maintenance – while advancing industry capability and shifting the business-as-usual approach.



Figure 13. CRC used in the internal haulage tracks to reduce local road heavy-vehicle movements



Appendix 2: Sustainability target framework

Focus area	Objective	Target	Timeframe	Responsibility	Progress	December 2025 update
Maximise the use of sustainable materials 	Increase the use of sustainable materials in earthworks by ensuring that a significant portion of general embankment fill is sourced from recycled or sustainable materials.	Ensure that more than 25% of general embankment fill used in the Project consists of recycled or sustainable materials by the end of construction.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	On track	The Project has commenced embankment construction as part of the permanent works.
	Identify, trial, and integrate sustainable materials into the Project.	Ensure that 100% of temporary works are constructed using recycled materials wherever feasible.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	At risk*	The Project has commenced temporary works, utilising materials such as crushed recycled concrete (CRC). Minor quantities of virgin materials have been utilised.
		Use 200,000 tonnes of crushed recycled concrete as subbase material across the Project to maximise resource recovery and reduce reliance on virgin materials.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	On track	The Project has begun using CRC for internal haulage tracks to minimise heavy vehicle traffic on local roads.
		Incorporate a total of 40 km of lower carbon reinforced concrete pipes and culverts throughout the Project to reduce embodied carbon.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	On track	The Project has commenced installing concrete pipes in several sections of the alignment.
		Incorporate a total of 1,000m of recycled plastic conduits and 150m of recycled plastic	End of construction – Late 2028	Materials and Asphalt Delivery Manager	Not started	Planning currently recycled plastic conduits and HDPE

* Targets that are at risk continue to be monitored throughout the Project. Lessons learnt sessions will be held to understand and learn if targets not achieved.

		(HDPE) drainage pipes across the Project.				drainage pipes and are progressing through the MWG.
		Install at least 2.8km of recycled plastic noise walls.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	Not started	The Project is currently assessing the feasibility of incorporating recycled plastic noise walls as a sustainable alternative.
		Reuse 45,000 tonnes of existing pavement material from Thomas Road and Tonkin Highway.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	Not started	Planning is in place for the reuse of the existing pavement material from Thomas Road and Tonkin Highway.
		Reuse 35,000 tonnes of reclaimed rail ballast.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	Not started	Planning and technical considerations are underway to assess the suitability of reclaimed rail ballast for use within construction works.
		Achieve a 99% diversion rate of construction and demolition (C&D) waste from landfill.	End of construction – Late 2028	Materials and Asphalt Delivery Manager	On track	The Project is currently achieving a 100% diversion rate from landfill for C&D waste.
		At least 20% of all procured materials for the project (measured by total dollar value) hold an Environmental Product Declaration.	End of construction – Late 2028	Materials and Asphalt Delivery Manager Procurement Manager	On track	Several of the Project's largest material procurements to date are supported by Environmental Product Declarations (EPDs), ensuring transparency and sustainability in material selection.
Improve tree retention and landscape restoration	Retain existing trees and vegetation by minimising clearing and enhancing site landscaping through	The Project aims to successfully translocate at least 130 native grass trees from within the project boundary. The relocated grass trees will be utilised in	End of construction – Late 2028	Environmental Manager	On track	The Project has identified and selected suitable grass trees for relocation to ensure their preservation and successful integration into the new landscape.

	strategic protection and revegetation.	revegetation following construction, shared with the Shire of Serpentine-Jarrahdale local community and schools.				
		Retain at least 10% of trees within the clearing boundary through proactive tree retention strategies and design optimisation to preserve native vegetation.	End of construction – Late 2028	Environmental Manager	On track	The Project has optimised the design to minimise clearing within the approved clearing boundary, preserving as much existing vegetation as possible.
		Install four dual-use culverts with fauna fencing to maintain ecological connectivity and enable safe wildlife passage.	End of construction – Late 2028	Environmental Manager	On track	The 85% design currently incorporates dual-use culverts.
Enhance heritage recognition and community value	Integrate local heritage stories and cultural elements into the urban and landscape design.	Deliver a heritage trail that uses recovered material from the former Fremnells Dairy farm, local content and Aboriginal heritage, which will be connected to the Projects interpretation trail.	End of construction – Late 2028	Community and Stakeholder Manager	On track	The Project has assessed Fremnells Dairy to identify structural elements that has been salvaged and reinterpreted within the urban design.
		Improve safety and connectivity for the local equine community.	End of construction – Late 2028	Community and Stakeholder Manager	On track	Consultations have been undertaken with the Equine Working Group to address the requirements for the signalised crossing.
		Deliver underpasses for equine use in consultation with the local equestrian community.	End of construction – Late 2028	Community and Stakeholder Manager	On track	Consultations have been undertaken with the Equine Working Group to define the requirements for the proposed underpass and ensure it meets user needs.