

Prepared for
Transport for NSW
ABN: 18 804 239 602

AECOM

Sustainability Plan

Windsor Road Upgrade at Rouse Hill

12 Oct 2026
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Client: Transport for NSW

ABN: 18 804 239 602

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Glossary

Table 1 Definitions

Term	Definition
Climate change	Climate change refers to any change in climate over time, whether due to natural variability or as a result of human activity.
Resilience	Resilience is the capacity of an asset or organisation to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience.
Sustainability	Enabling, delivering and operating a transport system that meets the needs of the present whilst safeguarding the future by optimising environmental, social and economic outcomes
The Project	Upgrade of Windsor and Commercial Road in Rouse Hill

Table 2 Acronyms

Acronym	Definition
BSR	Baseline Sustainability Requirements
CMP	Carbon Management Plan
EPD	Environmental Product Declaration
FMC	Forest Management Certification
GBCA	Green Building Council of Australia
GHG	Greenhouse Gas
PMP	Project Management Plan
PVC	Polyvinyl Chloride
RAP	Recycled Asphalt Pavement
SCM	Supplementary Cementitious Material
SDG	Sustainable Design Guidelines
SP	Sustainability Plan
TfNSW	Transport for New South Wales
TVOC	Total Volatile Organic Compounds
WMMP	Waste and Materials Management Plan
WRURH	Windsor Road Upgrade at Rouse Hill

1.0 Introduction

AECOM is committed to supporting Transport for New South Wales (TfNSW) to achieve their sustainability vision to create a NSW where every journey is people and planet positive through the delivery of the Windsor Road Upgrade at Rouse Hill (WRURH) Project (the Project).

1.1 Purpose

The Sustainability Plan (SP) forms a part of the suite of documents to support the delivery of the Project Management Plan. The purpose of this SP is to guide the Project to achieve its objectives sustainably, by defining sustainability objectives and targets, and identifying and tracking the implementation of sustainability initiatives designed to achieve the objectives and targets. The SP aims to:

- Clearly define sustainability objectives and targets for the Project
- Define roles and responsibilities for effective implementation of the SP
- Provide guidance for monitoring and tracking the implementation of the sustainability initiatives
- Align with relevant TfNSW policy and strategies.
- Identify sustainability initiatives that will support the achievement of the sustainability objectives and targets for the Project.

An outline of the SP is provided below.

Section 2.0 provides an overview of the context and background of the Project

Section 3.0 offers context for the sustainability approach. It outlines its alignment with key TfNSW documents, establishes the context for the development of the Baseline Sustainability Requirements (BSRs) and outlines the Sustainable Design Guidelines (SDG) pathway to achieving a 'Bronze' rating.

Section 4.0 provides a governance framework for the Project to identify, implement and track sustainability initiatives relating to the eight focus areas. Governance targets and initiatives provide a scaffold for all other sustainability initiatives to be effectively managed throughout the lifecycle of the Project.

Section 5.0 is a Sustainability Initiatives Register mapped to the BSRs and SDGs, aligned to TfNSW's eight sustainability focus areas. It includes timing, status, responsibility and progress for these initiatives.

Section 6.0 outlines the next steps for sustainability integration on the Project.

In addition to the SP, a Carbon Management Plan (CMP) and Waste and Materials Management Plan (WMMP) will be developed to outline the roles and responsibilities for carbon/waste management and measurement.

1.2 Document hierarchy

This Sustainability Plan forms part of a suite of plans, strategies and guidelines for the governance of the WRURH project management plan, which will cascade through into development, delivery and operations. The general structure of the Project's project management system is displayed in Figure 1. This Sustainability Plan provides a basis for the inclusion of sustainability on the project, including the tracking of sustainability initiatives through the Sustainability Initiatives Register, management of carbon through the Carbon Management Plan, and management of waste and materials through the Waste and Materials Management Plan.

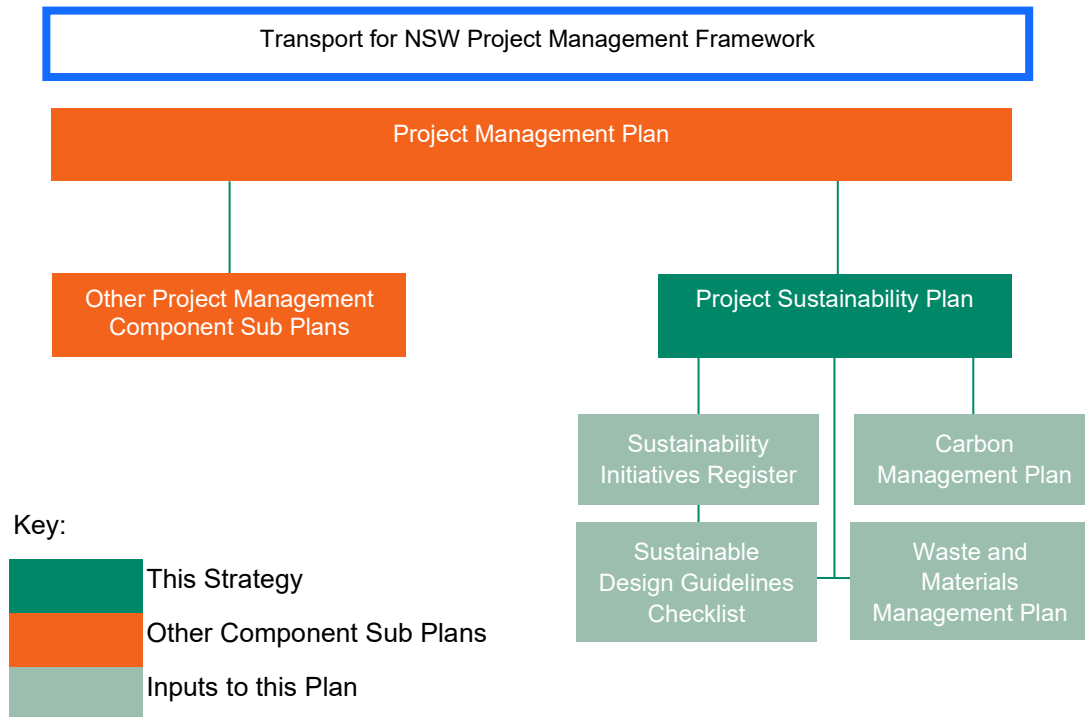


Figure 1 Structure of Project Sustainability Plan within Project Management Framework

Further detail on the Program's Project Management Framework, overarching policies and procedures, and the status of investment assurance and previous business cases is detailed in the Project Management Plan (PMP).

2.0 Project Overview

TfNSW proposes to upgrade Windsor Road and Commercial Road in Rouse Hill. The proposal is required to improve local road infrastructure in response to future traffic demand driven by the ongoing development of the North West Growth Area. The proposal seeks to improve network performance and road safety, improving travel times, supporting public transport operations, encouraging active transport, and reducing crash frequency and severity for all road users.

As part of the proposal TfNSW proposes to upgrade public transport infrastructure with the expansion of the existing bus transit way (T-way). This will extend the T-way northwards from its existing terminus at Rouse Hill Transport Interchange to the intersection of Windsor Road and Commercial Road.

The above works would be undertaken within the proposal area, as shown in Figure 2.

Key features of the proposal would include:

- Widening of Windsor Road between Mile End Road/Rouse Road and Commercial Road to provide three lanes of general traffic and a dedicated bus lane in each direction, as well as the provision of a shared path on the eastern side of Windsor Road
- Widening of Windsor Road between Commercial Road and Schofields Road to provide three general traffic lanes in each direction
- Upgrade of the signalised intersection of Windsor Road, Mile End Road and Rouse Road, including the provision of bus priority on the Windsor Road approaches
- Upgrade of the signalised intersection at Windsor Road and Commercial Road, including the provision of:
 - Bus priority right turns from Commercial Road
 - A new shared path on the southeastern corner to connect to the Rouse Hill Transport Interchange and, in future, the new Rouse Hill Hospital

- Upgrade of the existing intersection with the shopping centre on Commercial Road to improve connectivity and access to the proposed Rouse Hill Hospital (to be delivered by NSW Health). This intersection upgrade will require changes to the existing median on Commercial Road, resulting in the restriction of access to The Fiddler Pub to be left in/left out only
- Installation of traffic signals at the intersection of Commercial Road and Caddies Boulevard
- Extension to the existing T-way northwards to the intersection of Windsor Road and Commercial Road
- Construction of new and upgraded active transport connections, including the re-establishment of any footpaths or shared paths removed to facilitate construction
- Provision of a stub at the intersection of Commercial Road/Caddies Boulevard for the future connection of an extension to Greenhills Drive. The extension of Greenhills Drive and the public transport bus ways does not form part of this assessment and would be subject to future environmental assessment.

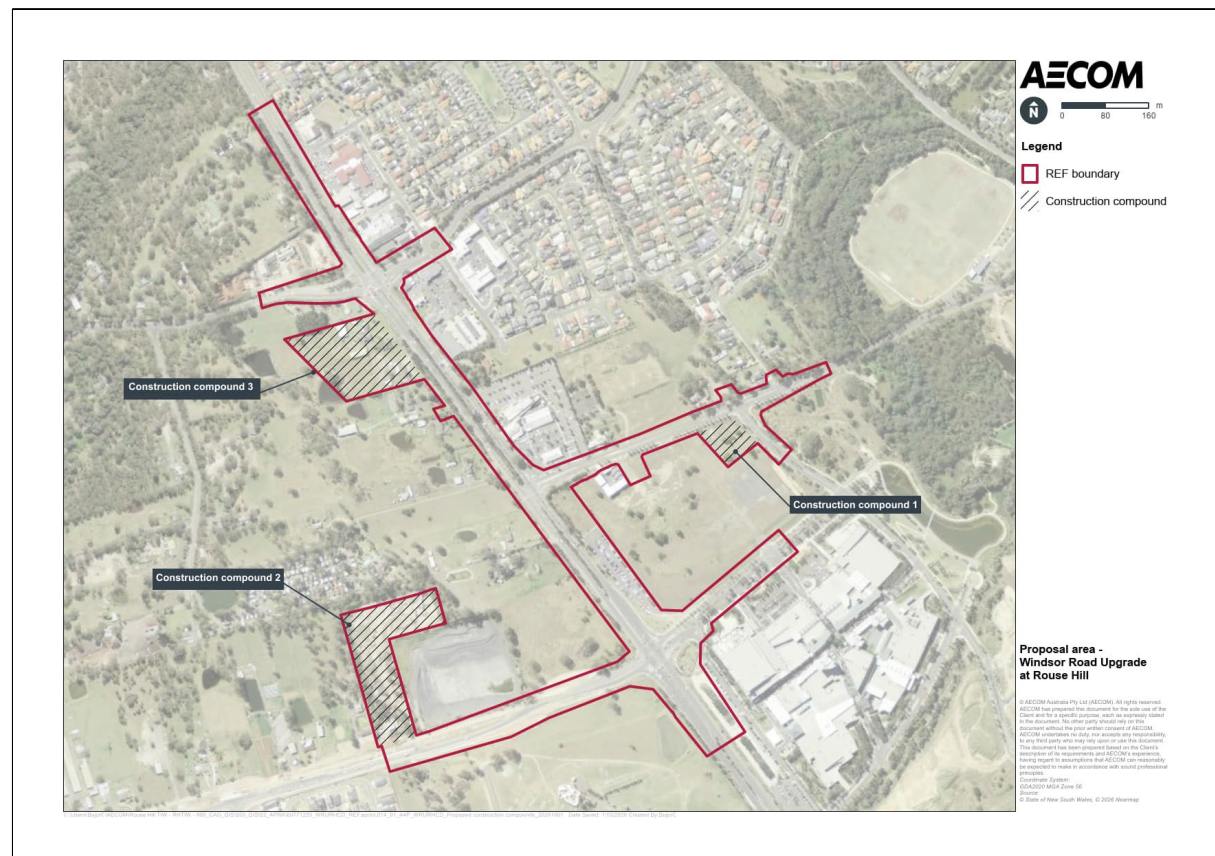


Figure 2 Proposal area

3.0 Sustainability framework

This section outlines the alignment with key TfNSW policy documents and identifies the sustainability outcomes for the project.

3.1 Policy context

TfNSW is committed to delivering successful places for communities and the approach to sustainability responds to a number of key strategic drivers. Table 3 outlines the key sustainability drivers and how they align to our sustainability focus areas set out within the TfNSW Sustainability Plan.

Table 3 TfNSW Policy Context

Transport Sustainability Plan	 Respond to climate change	 Protect and enhance biodiversity	 Improve environmental outcomes	 Procure responsibly	 Partner with communities	 Respect culture and heritage	 Align spend and impact	 Empower customers to make sustainable choices
International agreements/ federal	United Nations Sustainable Development Goals Relevant Commonwealth Government legislation							
	Paris agreement to the United Nations Framework on Climate 2015		National Waste Policy 2018			United nations Declaration on the Rights of Indigenous Peoples		
	National Climate Resilience and Adaptation Strategy							
	Climate Change Act 2022							
NSW	Relevant NSW Government legislation							
	NSW Climate Change Policy Framework		NSW Circular Economy Policy Statement 2019	NSW Procurement Policy Framework 2022				NSW Public Spaces Charter
	NSW Electric Vehicle Strategy 2021		NSW Government Resource Efficiency Policy					NSW Movement and Place Framework
	NSW Net Zero Plan Stage 1: 2020-2030				NSW Aboriginal Procurement Policy 2022			
	EPA Climate Change Policy		NSW Waste and Sustainable Materials Strategy					
	NSW Climate Change		Clean Air Strategy					

Transport Sustainability Plan	 Respond to climate change	 Protect and enhance biodiversity	 Improve environmental outcomes	 Procure responsibly	 Partner with communities	 Respect culture and heritage	 Align spend and impact	 Empower customers to make sustainable choices
	Adaptation Strategy							
Transport	Net Zero and Climate Change Policy	Transport Biodiversity Policy		Transport Procurement Policy		Reconciliation Action Plan 2022-2025		Transport Walking and Cycling Policy
	Future Energy Strategy			Transport Aboriginal Participation Strategy		Aboriginal Engagement Framework*		Active Transport Strategy
	Transport Asset Resilience Strategy							

The key TfNSW policy documents which inform this SP are:

- TfNSW Environment and Sustainability Policy (TfNSW, 2024)
- Net Zero and Climate Change Policy (TfNSW, 2023)
- TfNSW Sustainability Plan 2021 (TfNSW, 2021)
- Connecting NSW Strategy (TfNSW, 2025).

These documents, along with any new or updated TfNSW policy and strategy documents should be considered in revisions made to this strategy as the Project progresses.

TfNSW Environment and Sustainability Policy 2024

The TfNSW Environment and Sustainability Policy provides an outline of TfNSW's commitment to delivering sustainable and environmentally responsible transportation. The policy promotes the long-lasting impact of transportation infrastructure through emphasising several core principles in alignment with the Connecting NSW Strategy and the various strategic plans:

- Leadership in environmental and sustainability matters
- Environment protection and enhancement
- Net zero and energy efficiency
- Climate change risk and resilience management
- Whole of life considerations and circular economy
- Community wellbeing and inclusive outcomes
- Transparent engagement and community empowerment
- Leadership in cultural heritage and identity.

The policy applies to various agencies and their staff, emphasising a culture of environmental responsibility and accountability in transport projects to contribute to economic prosperity, social inclusion, and environmental sustainability in NSW.

Net Zero and Climate Change Policy 2023

TfNSW is committed to contributing to the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change.

This policy prescribes the principles and requirements to:

- achieve TfNSW's Net Zero emissions and climate change targets (stipulated in the policy)
- support the transport sector's transition to Net Zero
- continue creating a transport network that is resilient, responsive and optimally adapted to a changing climate.

TfNSW Sustainability Plan 2021

The TfNSW Sustainability Plan represents a consolidation of previous sustainability efforts to enhance their overall influence and bring this vision to life for the benefit of individuals, customers, and communities. The plan emphasises the integration of sustainability principles into the organisation's core thinking and actions, aiming for simplicity, consistency, transparency, and accessibility. It directs efforts towards achieving effective and efficient sustainability outcomes, encouraging innovation among its workforce and partners, and showcasing world-class achievements for replication. The plan's overarching goal is to ensure an environmentally and socially responsible transport network while prioritising economic sustainability in decision-making and enhancing resilience against future challenges. Additionally, it aligns with legislative requirements and responds to strategic and regulatory drivers, highlighting the holistic and integrated approach to sustainability across eight specific focus areas. These focus areas are presented in Figure 3.

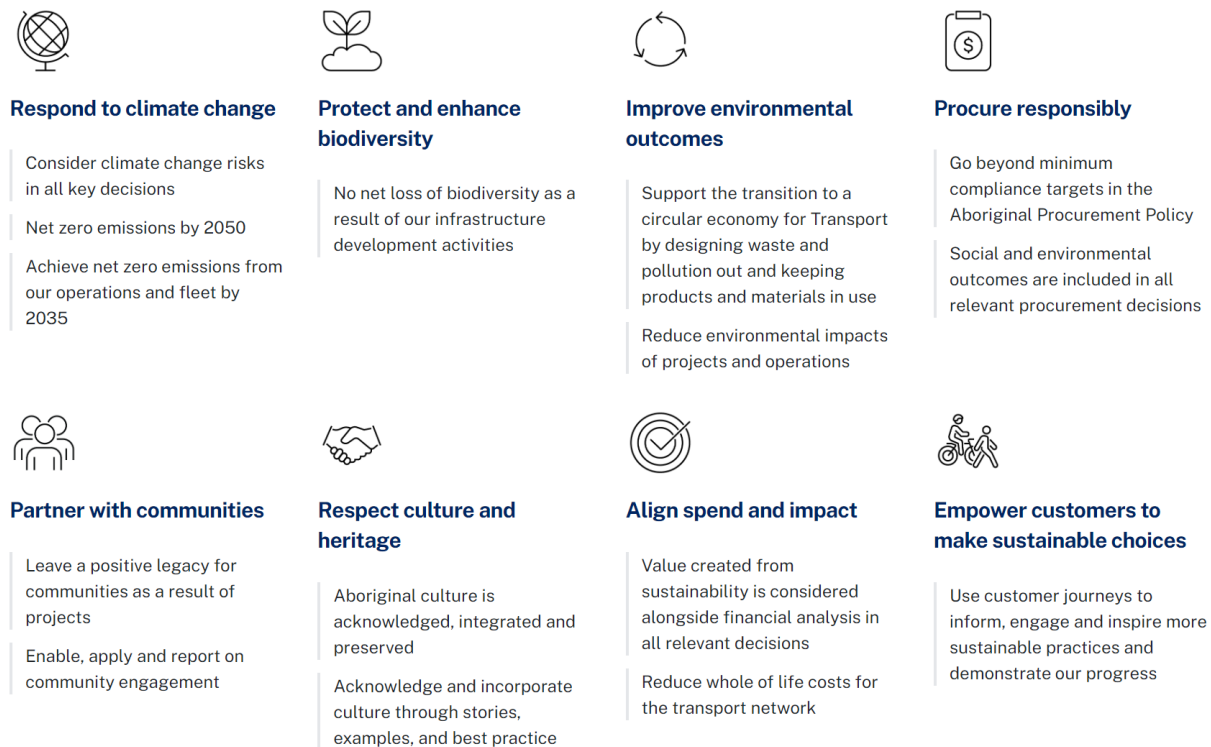


Figure 3 The eight focus areas of the TfNSW Sustainability Plan (TfNSW, 2021)

Connecting NSW Strategy 2025

The Connecting NSW Strategy outlines TfNSW's priorities to guide how and where TfNSW invests resources to ensure the coordination of efforts in the areas that will make the greatest difference for passengers, customers, and communities. There are six priority areas, including; the elimination of trauma, building reliability and resilience, transition towards net zero, reduction of transport disadvantage, design for transport mode shift, and enable whole-of-government outcomes. TfNSW has developed a list of indicators to track progress against priority areas, for example, transport sector emissions, public transport reliability, access to daily needs in the community, kilometres of cycleways and shared paths, and the gap between transport access for Aboriginal people and the remainder of the population.

3.2 Sustainability approach

This section identifies the sustainability approach for the project. These are the project's sustainability objectives and sustainability assurance pathway.

3.2.1 Sustainability design engagement

Individual design disciplines were engaged during concept through one-on-one consultation sessions to identify sustainability initiatives that could feasibly be included within the scope of the Project, as approved by TfNSW. These consultation sessions included involvement from the following design disciplines:

- Road alignment
- Flood impact
- Drainage
- Pavements
- Utilities
- Urban Design and landscape

- Environment.

The initiatives proposed by the design disciplines were then captured in the sustainability initiatives register, discussed further in Section 5.0. The agenda and minutes of each meeting is captured in Appendix C.

3.2.2 Project sustainability objectives

The project's sustainability objectives were developed based on feedback received from individual design consultation sessions and are informed by TfNSW's sustainability drivers and the Project goals.

The sustainability objectives for the Project are:

- integrate climate resilience into project design
- encourage mode shift by increasing accessibility through public transport integration and active transport connectivity
- reduce total carbon emissions across the project lifecycle
- promote circularity by reducing waste and incorporating recycled materials.

The Climate Change Risk Assessment, Carbon Management Plan, and Waste and Materials Management Plan aim to address the climate resilience, reduction of carbon and circularity objectives, respectively. The Urban Design and Connecting with Country workshops will aim to address the enhanced amenity and safety objective.

TfNSW aims to meet these sustainability objectives through achieving the Project's Baseline Sustainability Requirements (BSRs) and a 'Bronze' rating in the Sustainable Design Guidelines (SDGs).

3.2.3 Baseline Sustainability Requirements

The sustainability assurance pathway for the project is guided by TfNSW's Baseline Sustainability Requirements Version 2.1 (BSRs). These BSRs cover a range of sustainability disciplines and are developed in alignment with the sustainability focus areas within the TfNSW Sustainability Plan (TfNSW, 2021). The BSRs are both quantifiable targets and process requirements which establish the minimum sustainability standards for the Project. The AECOM Sustainability Team, in collaboration with the wider Design Team, have devised a series of sustainability initiatives to assist the Project in meeting these BSRs. The progress of implementing these sustainability initiatives has been monitored during the concept design phase and should continue to be tracked throughout the remaining design phases to ensure compliance with the BSRs. A complete list of BSRs applicable to project is provided in Appendix A. Initiatives mapped against the BSRs are provided in Appendix B.

3.2.4 Sustainable Design Guidelines

The Project is targeting a 'Bronze' rating under TfNSW's Sustainable Design Guidelines v5. The Sustainable Design Guidelines allows for sustainability assurance of TfNSW projects through the design, procurement and construction phase.

The SDG pathway to achieve a 'Bronze' rating is outlined in Table 4 below.

Table 4 SDG Checklist Pathway

Credit	Points available	Points targeted
Credit 1 – Climate change risk	N/A (mandatory)	0
Credit 2 – Biodiversity.	N/A (mandatory)	0
Credit 3 – Upfront GHG emissions	24.3	0
Credit 4 – Operational energy demand (infrastructure)	N/A (not in scope)	0
Credit 5 – Operational energy demand (buildings)	N/A (not in scope)	0
Credit 6 – Construction water and quality	13.2	0
Credit 7 – Operational water demand	N/A (not in scope)	0

Credit	Points available	Points targeted
Credit 8 – Operational water quality	13.2	9.9
Credit 9 – Resource efficiency	14.0	3.5
Credit 10 – Waste diversion and reuse	12.5	6.3
Credit 11 – Supply chain sustainability	10.3	2.6
Credit 12 – Urban design.	12.5	3.1
Credit 13 – Innovation: Exceeding credit benchmarks	10	0
Credit 14 – Innovation: Challenges		2
Credit 15 – Innovation: Environmental and social benefit.		2
Total	110	29.4
'Bronze' rating requirement	20	

Alignment of each proposed sustainability initiative to each SDG category is provided in Appendix B.

3.2.5 Sustainability risks

The table below summarises the key sustainability risks to the Project. These will be managed throughout development and delivery and lessons learnt captured to inform the approach for future projects.

Theme	Risk	Mitigations/ actions
Respond to climate change	Low inter-disciplinary collaboration resulting in inability to deliver on project sustainability objectives	- Develop sustainability plan for each package of the program and identify relevant roles and responsibilities across disciplines. - Seek senior leadership endorsement for plan.
Respond to climate change	Operational climate change adaptations not undertaken in the operations and maintenance phase resulting in increased likelihood of climate risks.	- Next steps and responsibilities outlined in the Climate Change Risk Assessment Report - High risks to be integrated into the Project risk register
Respond to climate change	Sustainability initiatives being abandoned due to value-engineering prior or during construction.	- Sustainability Plan and initiatives to be handed over to detailed design and construction team - Senior leadership to support the implementation of initiatives
Protect and enhance biodiversity	Inability to meet the TfNSW Biodiversity Policy resulting in a net loss in biodiversity for the Project.	- A Biodiversity Assessment Report has been undertaken outlining a) the vegetation/biodiversity loss of the Project and b) the offsetting required either through payment to the Conservation Fund or the planting of trees - Mitigation measures have been proposed in the Biodiversity Assessment Report to minimise the impacts of the Project on threatened biodiversity

Theme	Risk	Mitigations/ actions
Improve environmental outcomes	Construction works resulting in a reduction in air quality impacting the surrounding community.	- Construction contractor to use electric plant where feasible/available - An air quality impact screening is being undertaken
Procure responsibly	Inability to procure low carbon materials resulting in the inability to meet the Baseline Sustainability Requirements reduction of upfront greenhouse gas (BSR-07).	- Sustainability design team to consider recent relevant project examples in Sydney to set achievable minimum targets - Contractor to raise any procurement concerns early in construction to enable the consideration of alternatives
Partner with communities	Limited consideration of community needs resulting in backlash from the surrounding community.	- Feedback from the community to be considered during the public exhibition of the REF - Detailed design to consider undertaking community engagement
Respect culture and heritage	Inadequate consideration of existing Aboriginal and non-Aboriginal heritage resulting in a loss of cultural value.	- An Aboriginal archaeological assessment is being undertaken in accordance with TfNSW's Procedure for Aboriginal Cultural Heritage Consultation and Investigation, including recommended management to minimise impacts - A Statement of Heritage Impact was undertaken; three heritage items were identified with recommendations in place to minimise impacts from the Project
Align spend and impact	Inadequate consideration of whole-of-life cost and opportunities resulting in reduced value of the Project.	- Value management considered in concept design - Whole-of-life costing for sustainability initiatives should be developed during detailed design
Empower customers to make sustainable choices	Inadequate user-friendly active or public transport options resulting in a decrease in mode switch from cars to active or public transport.	- Project retaining and/or upgrading existing active and public transport infrastructure (i.e. footpaths and bus stops) - Climate Risk Assessment consideration of climate risks to active and public transport use in the future (e.g. extreme heat, extreme rainfall)

3.3 Climate risk

Recent events, including flooding, extreme heat and storms, have demonstrated the vulnerability of Sydney's transport network to climate hazards. A Climate Change Risk Assessment (CCRA) has been undertaken for the Windsor Road Upgrade at Rouse Hill (WRURH) Project (WRURHCD-AECM-0184-EN-RPT-000001).

The assessment has been completed in line with the requirements outlined in the PS211 Review of Environmental Factors (REF), Baseline Sustainability Requirements (BSR), and the CCRA Sustainable Design Guidelines (SDG) requirements. The report identifies climate effects relevant to the project and provides an assessment of the potential climate risks to the proposed works. It identifies appropriate risk management and adaptation measures to be incorporated into the design, construction and operation phases to build the resilience of the proposed works to changing climate conditions. The

assessment was also carried out in alignment with the TfNSW Climate Risk Assessment Guidelines for Projects.

Results of the risk assessment

Risks were identified across five key climate hazards: temperature-related extremes, rainfall-related extremes including flooding, storms including extreme wind and hail, drought, and bushfire including bushfire smoke. These were identified as the climate hazards of greatest relevance to the WRURH Project based on a review of historical events, current hazard mapping and future climate projections for the proposal area.

A preliminary risk assessment identified 21 climate risks (both direct and indirect). The highest risks identified were due to intense rainfall, extreme heat and storms and their impact on active transport users, drivers and emergency services. A residual risk assessment was undertaken to determine the anticipated outcomes of implementing all proposed adaptation actions. A summary of risks before and after adaptation across the assessment horizons is presented in Table 5.

Table 5 Summary of risk ratings before and after adaptation actions

Risk Rating	2030 pre adaptation	2030 post adaptation	2050 pre adaptation	2050 post adaptation	2090 pre adaptation	2090 post adaptation
Very high	0	0	0	0	0	0
High	1	0	1	0	4	2
Medium	16	11	17	14	16	16
Low	4	10	3	7	1	3

Adaptation measures were identified and evaluated for all high risks. Two outstanding high risks were identified in 2090:

- R4: Increased frequency and intensity of extreme rainfall and flash flooding events leading to direct health and safety risks for drivers and active transport users.
- R6: Increased frequency and intensity of extreme rainfall and riverine flooding events on Windsor Road (north-west of Box Hill, outside of Proposal Works) leading to network closures, resulting in limited emergency access to Rouse Hill Hospital

Drainage design constraints were identified as a barrier to mitigating R4 in 2090; this risk should be taken into consideration in future design stages. Broader network flood resilience adaptation actions were proposed to mitigate R6, however these actions are beyond the proposed works scope.

Next steps

In order to apply the findings of the CCRA, the following next steps are recommended:

- **Risk and adaptation review** – the risk assessment and adaptation actions have been developed based on the current concept design for the project and represent a snapshot in time. The adaptation actions should be reviewed at future design stages to confirm their inclusion and to ensure the project continues to respond appropriately to the identified climate risks. The outstanding high risks should be reviewed in future design stages as a priority.
- **Planned risk register** – following future design development, the residual risk register should be updated to reflect any design changes, updated climate information, and confirmation of adopted adaptation measures.
- **Monitoring and review during operations** – as some climate risks require ongoing operational controls, the climate risk assessment should be reviewed and updated at the start of future design stages and at regular intervals during construction.
- **Implementation ownership** – adaptation actions should continue to be assigned to the relevant discipline leads and operational stakeholders so that responsibilities are clearly defined through the project lifecycle.

3.4 Greenhouse gas assessment

The Greenhouse Gas (GHG) emissions from construction of the proposal were estimated using the Transport Carbon Tool (WRURHCD-AECM-0184-ER-CAL-000001). The Transport Carbon Tool includes functionality to estimate construction emissions (EN 17472:2022 lifecycle GHG emissions modules A1-A5) using asset-level GHG intensity benchmarks based on capital expenditure (CAPEX) published by Infrastructure NSW (INSW). This method has been used in-lieu of an estimated Bill of Quantities, which was not available as input to this estimate at the time of writing. The GHG estimate will be updated once the Concept Design Bill of Quantities becomes available. Key inputs into the estimate include:

- Project asset typecast: State Road
- CAPEX: \$400,000,000

Operational emissions were assessed qualitatively for the REF. Emissions sources were identified through reviews of design documentation and GHG assessments of similar projects.

Targets

The GHG targets for the project are defined by TfNSW's Baseline Sustainability Requirements (BSRs) and the TfNSW Sustainable Design Guidelines v5 (SDGs). The BSRs include specific requirements related to GHG reduction targets (see BSR-04 through 08 in Appendix A), as well as specific materials GHG reduction initiatives to support achieving the GHG reduction targets (see BSR-12 through 15 in Appendix A). Additionally, Credit 3 in the SDGs relates to a reduction in upfront GHG emissions (Table 4).

Impacts

The construction of the proposal would result in the generation of GHG emissions through:

- Vegetation removal along the proposal reducing the carbon sequestration capacity of the local environment
- The decomposition of green waste and mulch, releasing carbon dioxide
- Direct emissions of carbon dioxide, methane and nitrous oxide from the use plant and equipment emitting exhaust fumes
- Usage of electricity from fossil fuels
- Production and use of materials that have high embodied energy content such as concrete and steel.
- Use of fossil fuels to transport materials and waste
- Processing and decomposition of general waste generated during construction

The total GHG emissions for construction activities is estimated to be **62,000** tonnes of carbon dioxide equivalence (tCO₂-e). Based on the INSW Business Case estimate, a majority of construction stage emissions are likely to come from the product stage (A1-3). Given the scope of the Project, another substantial source of emissions is likely to be from land-use change (future estimate to be included in A5).

During the operation of the proposal, GHG emission sources would include:

- Maintenance of the proposal which includes infrastructure and pavement repairs, and fuel use for the operation of the plant and equipment to perform the maintenance activities
- Use of the proposal by vehicles
- Electricity usage for street furniture including, lighting, electronic signage and variable message signs.

Mitigation measures

Opportunities to reduce emissions associated with both construction and operation will be investigated and implemented throughout detailed design and construction.

Table 6 GHG emissions mitigation measures

Impact	Mitigation measures	Responsibility	Timing	Reference
Upfront carbon emissions from pavement (A1-A3)	• Maximise SCM (as far as practicable) • Maximise RAP (as far as practicable) • Maximise recycled or reused material in road base and sub base (as far as practicable) • Maximise recycled or reused material as bedding material and drainage medium (as far as practicable) • Maximise recycled materials for pavement stabilisation (as far as practicable) • Investigate the use of EME2 to reduce pavement width (if feasible) • Investigate the use of low-carbon steel reinforcing (pending materiality)	Pavement lead	Concept design	Not available
Upfront carbon emissions from other design components (A1-A3)	• Maximise SCM (as far as practicable) • Investigate the use of fibre reinforcement in drainage pits • Retain existing traffic lights and VMS where feasible	Relevant design lead	Concept design	Not available
Construction carbon emissions (A5)	• Use electric powered plant where feasible • Use temporary solar lights for construction • Use Greenpower, solar or hybrid generators to power site compounds	Construction contractor	Construction	Not available

Next steps

A detailed Carbon Management Plan (CMP) will be developed when the Concept Design Bill of Materials has been produced. Opportunities to reduce greenhouse gas emissions associated with construction and operations of the proposal will be further identified and implemented through detailed design development.

3.5 Waste and material management

The purpose of the Waste and Materials Management Plan (WMMP) (WRURHCD-AECM-0184-WM-PLN-000001) is to guide the Project to achieve its waste and materials management objectives, by defining targets, and identifying and tracking the implementation of initiatives designed to achieve the objectives and targets. The WMMP aims to:

- Clearly define objectives and targets for the Project
- Define roles and responsibilities for effective implementation of the WMMP
- Provide guidance for monitoring and tracking the implementation of the initiatives
- Align with relevant TfNSW policy and strategies.

Objectives and targets

The waste and materials management objectives and targets for the project are defined by TfNSW's Baseline Sustainability Requirements (BSRs) and the TfNSW Sustainable Design Guidelines v5 (SDGs). The BSRs include specific requirements related to waste and materials management and corresponding targets (see BSR-16 through 22 in Appendix A). Additionally, Credits 9 and 10 in the SDGs relates to waste diversion and reuse (Table 4).

Waste and materials management initiatives

Initiatives to achieve the objectives and targets detailed above are identified and tracked in the project sustainability initiatives register (Appendix B). Example initiatives include:

- Specifying minimum cement replacement material in design drawing notes, such as 40% fly ash or 70% slag as per D&C 3211.
- Specifying minimum recycled asphalt pavement (RAP) used in asphalt in design drawing notes, such as up to 40% for non-wearing courses and up to 20% for the wearing course.
- Specifying minimum recycled or reused material used in road base and subbase in design drawing notes, such as up to 100% slag or crushed concrete for unbound or bound base or subbase.

Waste projections

Projections for waste quantities on this project were not available at this stage of design, however management of likely waste were considered against the waste hierarchy, including (in order of the waste hierarchy):

- Reuse on-site;
- Reuse off-site;
- Resource recovery off-site; and
- Disposal off-site.

Contaminated waste streams were considered as a part of the WMMP. There is a moderate to high likelihood of hazardous building materials (APEC 5), as identified by the Preliminary Site Investigation. Contaminated waste strategies were developed as a part of the WMMP, including contingency planning.

Next steps

As the project advances through subsequent design stages, this plan will be progressively updated and handed forward to inform the developing design. On award of the delivery contract, the plan will be transferred to the D&C contractor, who will assume ownership and further develop it into a detailed, construction-ready waste and materials management plan. The contractor will be responsible for implementing the plan on site, monitoring performance against the established targets, and maintaining the review cycle through the construction phase.

4.0 Governance

Governance initiatives provide a framework for the Project to identify, implement and track sustainability initiatives. The objective of sustainability governance is to demonstrate leadership by embedding sustainability objectives into decision making.

4.1 Implementation of roles and responsibilities

The responsibility for ensuring sustainability outcomes extends to all members of the Project team across the project lifecycle. Whether it is ownership of targets, or promotion of benefits and outcomes, sustainability is integrated across the team and is a shared responsibility. The SP is intended to be a dynamic document and is to be reviewed and updated at the commencement of each phase of the project lifecycle. Environmental and sustainability stakeholders are encouraged to provide new and innovative ideas to continuously improve the projects sustainability outcomes. At each stage of the project lifecycle, specific actions are proposed to uphold the SP, and correspondingly, the sustainability initiatives. These actions ensure that the Project's sustainability requirements are effectively addressed and completed.

Responsible parties for individual initiatives have been identified in the sustainability initiatives register.

Responsibilities at a governance level, for implementing, monitoring and reporting on sustainability initiatives and progress towards achieving the Project's BSRs are assigned in Table 7.

Table 7 Roles and Responsibilities

Role	Responsibility
TfNSW Senior Manager Sustainability	- Recommends/ endorses all final sustainability deliverables and documentation - May attend key workshops and meetings
TfNSW Sustainability Officer and Senior Sustainability Officer	- Provides advice and guidance on the TfNSW sustainability objectives and expectations throughout design and delivery - Reviews Sustainability, Design and Construction documentation for compliance with the Contract sustainability requirements
TfNSW Environment and Sustainability Lead (ESL)	- Support and assist both TfNSW and contractor environment and sustainability personnel to achieve sustainability outcomes - Ensure sustainability-related requirements have been integrated with environmental investigations and design development
TfNSW Senior Project Manager	Provide overall leadership and ensure accountability for sustainability deliverables.
TfNSW Project Manager	Ensures accountability for sustainability within the project team
AECOM Design Manager	Provide overall leadership and guidance for sustainability during the design phase across the project team
AECOM Sustainability consultant	- Manages the day-to-day delivery of sustainability scope and deliverables - Primary responsibility for ensuring that the sustainability requirements, objectives, and target are integrated into design and delivery, in line with this SP. - Engage with the design leads at the beginning of the concept design phase of the Project to inform initiatives the Project may adopt. - Conduct monitoring and reporting at design milestones per Section 4.5.
Construction contractor Project Manager	Provide overall leadership and guidance for sustainability during the design phase across the project team

Role	Responsibility
Construction contractor Sustainability Officer	- Primary responsibility for ensuring that the sustainability requirements, objectives, and target are integrated into construction, in line with this SP. - Conduct monitoring and reporting at construction milestones per Section 4.5.

4.2 Sustainability costing

Understanding the monetary and non-monetary benefits of the project's sustainability approach is critical to demonstrating the value of environmental and social initiatives.

Sustainability costing principles can consider the whole-of-life including capital costs, operational costs, environmental and social benefit as well as benefits and risks in relation to project objectives, in line with T MU AM 01001 ST Life cycle costing.

Sustainability costing has not been undertaken in concept design, however can be considered in detailed design if life cycle costing is undertaken.

4.3 INSW requirements

General

Infrastructure NSW (INSW) sets out requirements for key sustainability considerations at each phase of the asset delivery lifecycle. This includes the consideration of identified likely social, economic or environmental impacts and benefits expected to be realised by the program/projects.

This project is currently working through the Gate 2 review for the business case and the following documents will support meeting the INSW requirements:

- The Stage 1 Carbon Management Plan (CMP) will outline the estimated enabled, operating and embodied emissions of the project and detail management actions and initiatives to reduce emissions
- The Climate Change Risk Register will consider the vulnerability of the assets to future climate change, and list mitigations to increase resilience.

Decarbonising Infrastructure Delivery

The CMP is under development and will include the project response to the Decarbonising Infrastructure Delivery Policy.

4.4 IA requirements

General

Infrastructure Australia (IA) sets out requirements for key sustainability considerations at each phase of the asset delivery lifecycle. This includes the consideration of identified likely social, economic or environmental impacts and benefits expected to be realised by the program/projects.

This project is currently working through Stage 3: Developing a business case and the following documents will support meeting the IA requirements:

- The Climate Change Risk Assessment will identify how climate change may affect the asset in the long term and how this will be accounted for in design.

Guide to assessing greenhouse gas emissions

The CMP is under development and will include the project response to the IA greenhouse gas emissions requirements.

4.5 Monitoring and Reporting

Sustainability performance reporting will be undertaken for the WRURH project to manage progress on the sustainability outcomes. Monitoring and reporting requirements are summarised below in Table 8.

Table 8 Monitoring and reporting requirements during delivery

Reporting	Description								
Internal sustainability reporting	Sustainability reporting will be undertaken internally at the project level.								
Delivery partner sustainability reporting	Sustainability performance (including sustainability data) will be reported monthly to TfNSW to track progress on sustainability deliverables. Reporting will include, but is not limited to: • Progress against the BSRs • Progress against the SDGs • Progress against emissions, as outlined below								
	<table> <tr> <td>Energy and carbon</td><td> Reported six-monthly and through TfNSW Carbon Tool submissions at key design stages: • Electricity (kWh) • Fuel (L) • Land use change • Biofuels (L) • Green electricity (kWh) • Carbon offsets (tCO₂) • Materials emissions including the following lifecycle stages: - Product stage (A1-A3) - Construction transport (A4) </td></tr> <tr> <td>Materials</td><td> Reported six-monthly and through TfNSW Carbon Tool submissions at key design stages: • Concrete (m³) - by MPa and %SCM • Steel (t) - reo, bar, mesh, slab, wire, rail, pipe, tube • Aggregates (t) - manufactured sand, crushed rock, gravel, fill, recycled crushed concrete • Asphalt (t) • Glass (t) • Aluminium (t) • Coatings and finishes (t) • Composites (t) • Procurement of recycled content, including breakdown of: - Product weight - Recycled material - Proportion of recycled content </td></tr> <tr> <td>Water</td><td> Reported at the end of construction • Total water used (ML) • Total potable water used (ML) • Total non-potable water used (ML) </td></tr> <tr> <td>Waste</td><td> Waste classification, quantity and diversion rates reported at 100% concept design stage: • Spoil (t, %) • Concrete (t, %) • Reclaimed Asphalt Pavement (t, %) </td></tr> </table>	Energy and carbon	Reported six-monthly and through TfNSW Carbon Tool submissions at key design stages: • Electricity (kWh) • Fuel (L) • Land use change • Biofuels (L) • Green electricity (kWh) • Carbon offsets (tCO₂) • Materials emissions including the following lifecycle stages: - Product stage (A1-A3) - Construction transport (A4)	Materials	Reported six-monthly and through TfNSW Carbon Tool submissions at key design stages: • Concrete (m³) - by MPa and %SCM • Steel (t) - reo, bar, mesh, slab, wire, rail, pipe, tube • Aggregates (t) - manufactured sand, crushed rock, gravel, fill, recycled crushed concrete • Asphalt (t) • Glass (t) • Aluminium (t) • Coatings and finishes (t) • Composites (t) • Procurement of recycled content, including breakdown of: - Product weight - Recycled material - Proportion of recycled content	Water	Reported at the end of construction • Total water used (ML) • Total potable water used (ML) • Total non-potable water used (ML)	Waste	Waste classification, quantity and diversion rates reported at 100% concept design stage: • Spoil (t, %) • Concrete (t, %) • Reclaimed Asphalt Pavement (t, %)
Energy and carbon	Reported six-monthly and through TfNSW Carbon Tool submissions at key design stages: • Electricity (kWh) • Fuel (L) • Land use change • Biofuels (L) • Green electricity (kWh) • Carbon offsets (tCO₂) • Materials emissions including the following lifecycle stages: - Product stage (A1-A3) - Construction transport (A4)								
Materials	Reported six-monthly and through TfNSW Carbon Tool submissions at key design stages: • Concrete (m³) - by MPa and %SCM • Steel (t) - reo, bar, mesh, slab, wire, rail, pipe, tube • Aggregates (t) - manufactured sand, crushed rock, gravel, fill, recycled crushed concrete • Asphalt (t) • Glass (t) • Aluminium (t) • Coatings and finishes (t) • Composites (t) • Procurement of recycled content, including breakdown of: - Product weight - Recycled material - Proportion of recycled content								
Water	Reported at the end of construction • Total water used (ML) • Total potable water used (ML) • Total non-potable water used (ML)								
Waste	Waste classification, quantity and diversion rates reported at 100% concept design stage: • Spoil (t, %) • Concrete (t, %) • Reclaimed Asphalt Pavement (t, %)								

Reporting	Description
	- Office waste (t, %) - Green waste (t, %) Reported through the EMF-WM-TT -0074 Waste and Resource Recovery Reporting Template during the construction phase.

5.0 Sustainability initiatives register

A Sustainability Initiatives Register was compiled utilising the BSRs, SDGs and engagement with the design team to identify sustainability initiatives and climate adaptations. The complete sustainability initiatives register, including all identified sustainability opportunities is provided in Appendix B.

The register aims to guide sustainability throughout the Project by:

- identifying feasible sustainability initiatives to support the BSRs
- identifying feasible sustainability initiatives to achieve a 'bronze' SDG rating
- assigning responsible parties for these initiatives and targets
- allocating the initiatives to relevant design stages
- detailing the status of the initiative, i.e. if it has been implemented, is in the progress of being implemented through the current and next phase of design or has not been implemented.

A comprehensive suite of sustainability initiatives has been identified, including maximising recycled content in line with TfNSW materials specifications, such as recycled content in pavement and bedding materials, and design optimisation measures such as optimising pavement profiles to reduce embodied carbon and improving drainage systems to support flood resilience. Other initiatives focus on climate resilience, biodiversity outcomes, water-sensitive urban design, and efficient resource use in construction.

6.0 Next Steps

As the Project progresses through stages of the Concept Design, the SP should be reviewed at the 80% design milestone and further into detailed design to ensure:

- The objectives, targets and any other content are fit for purpose
- Any changes to policies and legislation are accounted for
- Relevant communication and feedback from stakeholders are integrated into design
- It adequately sets out the process for implementation during different stages of the concept design.

All changes will attempt to maintain or improve the sustainability standard to avoid erosion of value or a disconnection from the objectives.

Immediate next steps include implementing the design phase actions on the Project. Throughout the design phase the following should be actioned:

- Design team to incorporate feasible and appropriate sustainability initiatives into the design
- Sustainability monitoring and reporting to be undertaken and provided to TfNSW
- Design team to engage with relevant stakeholders on implementation of sustainability initiatives

In future stages of design, this SP and the Sustainability Initiatives Register should be updated to reflect new initiatives, progression of design detail, new innovations and possible TfNSW policy changes.

Appendix A

Baseline sustainability requirements and targets

The Baseline Sustainability Requirements listed in Table 9 originate from TfNSW's Baseline Sustainability Requirements v2.1 Reporting Template.

Table 9 Baseline sustainability requirements and baseline targets

BSR ID	Baseline Sustainability Requirement	Baseline Target
BSR-01	Complete a Climate Risk Assessment screening in accordance with the TfNSW Climate Risk Assessment Guidelines	N/A
BSR-02	Undertake a detailed Climate Risk Assessment in accordance with TfNSW Climate Risk Assessment Guidelines	N/A
BSR-03	For risks that can be treated as part of the project scope, identify and treat and/or accept climate change risks through design and/or operational responses, as agreed with TfNSW	N/A
BSR-04	Implement opportunities to use renewable energy or low carbon energy during construction and operations	Where there is at least 150 square metres of available roof space and enough daytime demand for electricity to consume the majority of electricity generated, undertake a solar photovoltaic feasibility analysis in accordance with the TfNSW Solar PV Screening Tool (or equivalent assessment). If feasible and approved by TfNSW as part of the works, complete an appropriate solar photovoltaic installation.
BSR-05	Implement opportunities to use renewable energy or low carbon energy during construction and operations	A minimum of 20% of construction electricity consumption, excluding the mandatory renewable electricity percentage, must be sourced from renewable energy generated onsite and/or purchased renewable electricity such as GreenPower and/or Renewable Energy Certificates.
BSR-06	Implement opportunities to use renewable energy or low carbon energy during construction and operations	A minimum of 10% construction stage Scope 1 emissions offset using Climate Active Standard eligible offsets.
BSR-07	Reduce construction-related GHG emissions from the project baseline GHG footprint established using the Carbon Tool or other Transport approved energy and greenhouse gas modelling tool.	Reduce upfront Greenhouse Gas emissions by a minimum 5% from the project baseline GHG emission footprint established using the Transport for NSW Carbon Tool or an alternative method agreed with Transport for NSW
BSR-08	Reduce operation-related energy demand from the project baseline footprint established using a Transport approved methodology.	Reduce operational energy demand by a minimum of 5% from an operational energy demand footprint/model established using an agreed method with Transport for NSW
BSR-09	All paints, adhesives, sealants, carpets, and engineered wood products used in indoor areas that are continuously occupied or occupied for more than two hours, are low in Total Volatile Organic	N/A

BSR ID	Baseline Sustainability Requirement	Baseline Target
	Compounds (TVOC) as defined in the Green Star Buildings Rating Tool	
BSR-10	Demonstrate that opportunities to reduce potable water use during construction have been implemented.	Opportunities to minimise discharges to-water bodies (streams, rivers, lakes, estuaries and the marine environment) through beneficial reuse and discharge to land are identified, assessed for feasibility and implemented
BSR-11	Demonstrate that opportunities to reduce potable water use during operation has been implemented.	Opportunities to reduce operational water consumption are identified, assessed for feasibility and implemented
BSR-12	Implement opportunities to incorporate reused, reclaimed, or recycled materials during construction	A minimum of 25% cement replacement material, measured by mass, used in concrete.
BSR-13	Implement opportunities to incorporate reused, reclaimed, or recycled materials during construction	A minimum of 10% Recycled Asphalt Pavement (RAP) used in asphalt.
BSR-14	Implement opportunities to incorporate reused, reclaimed, or recycled materials during construction	A minimum of 10% recycled or reused material used in road base and sub base.
BSR-15	Implement opportunities to incorporate reused, reclaimed, or recycled materials during construction	A minimum of 20% recycled or reused material used as bedding material and drainage medium
BSR-16	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	A minimum 90% of inert and non-hazardous waste generated during demolition and construction reused, recycled or repurposed.
BSR-17	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	100% of useable spoil is reused, recycled or repurposed.
BSR-18	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	100% uncontaminated ballast reused, recycled or repurposed
BSR-19	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	100% uncontaminated concrete is reused, recycled, or repurposed.
BSR-20	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	100% of reclaimed asphalt pavement (RAP) is reused, recycled or repurposed

BSR ID	Baseline Sustainability Requirement	Baseline Target
BSR-21	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	100% of organic uncontaminated green waste is recovered for beneficial reuse
BSR-22	Implement opportunities to minimise waste generation, maximise waste segregation, maximise waste reuse/recycling and improve landfill diversion	A minimum of 40% of waste generated from office activities diverted from landfill.
BSR-23	All timber products must be sourced from reused/recycled timber, from plantations that have obtained Forest Management Certification (FMC) or from a Private Native Forest (PNF) meeting the following conditions: • Acceptable FMC schemes include the Program for the Endorsement of Forest Certification (PEFC), Forest Stewardship Council (FSC) and Responsible Wood Scheme. • Timber can be sourced from a Private Native Forest (PNF) with an approved Private Native Forestry Plan, as regulated under the Local Land Services Act 2013, and approved Forest Management Plan demonstrating adherence to the PNF Codes of Practice including conditions that protect habitat and biodiversity. • No timber is to be sourced from land within or adjacent to areas recovering from bushfire unless the Forest Management Plan addresses the management of potential impacts associated with forestry following bushfire, including the identification and mapping of fire refuge habitat	N/A
BSR-24	All polyvinyl chloride (PVC) is compliant with the Vinyl Council of Australia (VCA) 'Best Environmental Practice PVC v2.0' Guidelines, criteria and verification evidence requirements for best practice manufacturing of PVC products.	N/A

Appendix B

Sustainability Initiatives Register

ID	Sustainability Focus Area	Project Stage	Discipline Responsible	Sustainability Initiative	Relevant Risk IDs	Relevant BSRs	Relevant SDG	Initiative Source	Status	Progress Notes	Evidence
CA01	Respond to climate change	Design	Landscape	Ensure street trees are adequately spaced to minimise canopies touching, as per design guidelines.	B1, B3	BSR-03	SDG-01	Design input	In progress	Standard design requirement	Landscape GA - under development
CA02	Respond to climate change	Design	Civil	Trees in the median strip are being removed.	B1, B3, S1, S3	BSR-03	SDG-01	Design input	In progress	Due to alignment requirements.	Demolition plan - under development
CA03	Respond to climate change	Design	Drainage Structures	Drainage systems behind retaining walls to be specified.	D1	BSR-03	SDG-01	Design input	In progress	Standard design requirement	Retaining wall sections - under development
CA04	Respond to climate change	Design	Landscape	Specify Cumberland Plain woodland species native to the area and drought/heat tolerant.	D2, EH4	BSR-03, BSR-25	SDG-01, SDG-15	Design input	In progress	As identified through CwC engagement	Landscape planting schedule - under development
CA05	Respond to climate change	Design	Landscape	Investigate Water Sensitive Urban Design opportunities.	D2, EH2, EH4	BSR-03	SDG-01	Design input	Under investigation	Replacement of channel drains with turf swales under investigation - space constraint limitations	Landscape GA - under development
CA06	Respond to climate change	Design	Pavement	Consider designing pavement to 2050 SSP3-7.0 average temperature.	EH1	BSR-03	SDG-01	https://warrrip.com.au/wp-content/uploads/2023/01/WARRIP-Project-Conference-Paper-2016-011-In-pavement-temperature.pdf	Under investigation	To be confirmed with pavement designer	If feasible, pavement design report - under development
CA07	Respond to climate change	Design	Pavement	Investigate durable binders	EH1	BSR-03	SDG-01	Sustainability team	Under investigation	To be confirmed with pavement designer	If feasible, pavement design report - under development
CA08	Respond to climate change	Design	Civil	Install bus shelters where feasible	EH2	BSR-03	SDG-01	Design input	Under investigation	Bus shelter at hospital. Bus stop relocation outside the Mercure Hotel along southbound Windsor Rd not feasible for bus shelter - investigating options as shelter is required by TfNSW	If feasible, urban design GA - under development
CA09	Respond to climate change	Design	Landscape Civil	Investigate increasing canopy cover through reducing path width on the western side of Windsor Road and increasing property acquisition on the eastern side of Windsor Road.	EH2	BSR-03	SDG-01	Design input	Under investigation	Current design does not allow for enough verge space to provide street trees - minimum 1.5m verge required.	If feasible, landscape GA - under development
CA10	Respond to climate change	Design	Landscape Civil	Investigate incorporating bubblers near bus stops.	EH2	BSR-03	SDG-01	Design input	Under investigation	Identified in CwC engagement.	If feasible, urban design GA - under development
CA11	Respond to climate change	Design	Landscape Civil	Investigate light-coloured concrete footpaths.	EH2	BSR-03	SDG-01	Design input	Under investigation	Footpath colouring identified in CwC engagement - align with colours of Country	If feasible, urban design GA - under development
CA12	Respond to climate change	Design	Drainage	Drainage design required to account for 18% rainfall intensity climate change factor (SSP3-7.0 2030) as per ARR 2024	R1, R4	BSR-03	SDG-01	Design input	Under investigation	Drainage modelling currently being undertaken to confirm feasibility of incorporating climate change uplift for drainage. Drainage systems are constrained by downstream connections.	If feasible, drainage design report - under development
CA13	Respond to climate change	Design	Drainage	Investigate scour protection for discharge to Caddies and Second Ponds Creeks, pending flow velocities.	R2	BSR-03	SDG-01	Design input	Under investigation	Modelling to confirm flows being undertaken	If feasible, drainage design report - under development
CA14	Respond to climate change	Design	Drainage	Investigate a new GPT for discharge to Caddies Creeks, pending water quality modelling.	R3	BSR-03	SDG-01	Design input	Under investigation	Modelling to confirm flows being undertaken	If feasible, drainage design report - under development
CA15	Respond to climate change	Design	Drainage	Footpaths to be graded to allow water sheet flows into kerb drainage.	R4	BSR-03	SDG-01	Design input	In progress	Standard design requirement	Civil section drawings - under development
CA16	Respond to climate change	Design	Pavement	Investigate permeable pavement for shared paths	R4	BSR-03	SDG-01	Avoca	Under investigation	No-fines concrete is an opportunity - with filter material - can specify recycled material.	If feasible, pavement design report - under development
CA17	Respond to climate change	Design	Landscape	No limb dropping tree species to be specified in design.	S1, S3	BSR-03	SDG-01	Design input	In progress	Standard design requirement	Landscape planting schedule - under development
CA18	Respond to climate change	Detailed design	Earthing and bonding	Investigate lightning protection or surge arrestors for critical electrical systems in detailed design.	S1	BSR-03	SDG-01	Sustainability team	Address in detailed design		N/A
CA19	Respond to climate change	Design	Structures	Footing and structural design to comply with wind region AS specifications, including climate change multiplying factor.	S2	BSR-03	SDG-01	Design input	In progress	Standard design requirement	Structural design report - under development
CA20	Respond to climate change	Operations and maintenance		Regular maintenance of vegetation along the road corridor.	B1, B3, D2, S1, S3	BSR-03	SDG-01	Sustainability team	Address in O&M phase		N/A
CA21	Respond to climate change	Operations and maintenance		Develop detour routes and continuity plans, including for hospital access.	B2, EH4, R1, R4, R	BSR-03	SDG-01	Sustainability team	Address in O&M phase		N/A
CA22	Respond to climate change	Operations and maintenance		Display warning, delay and closure notifications on VMS boards.	B2, B4, D3, R1, R4	BSR-03	SDG-01	Sustainability team	Address in O&M phase		N/A
CA23	Respond to climate change	Operations and maintenance		Regular maintenance of drainage systems to reduce likelihood of blockages.	R1, R4	BSR-03	SDG-01	Sustainability team	Address in O&M phase		N/A
SI01	Respond to climate change	Design	Sustainability	Complete a Climate Risk Assessment screening in accordance with the TfNSW Climate Risk Assessment Guidelines		BSR-01	SDG-01	Requirement	In progress	Draft CCRA provided for REF submission	WRURHCD-AECM-0184-EN-REG-000001
SI02	Respond to climate change	Design	Sustainability	Undertake a detailed Climate Risk Assessment in accordance with TfNSW Climate Risk Assessment Guidelines		BSR-02	SDG-01	Requirement	In progress	Draft CCRA provided for REF submission	WRURHCD-AECM-0184-EN-REG-000001
SI03	Respond to climate change	Design	Sustainability	For risks that can be treated as part of the project scope, identify and treat and/or accept climate change risks through design and/or operational responses, as agreed with TfNSW		BSR-03	SDG-01	Requirement	In progress	Draft CCRA provided for REF submission	WRURHCD-AECM-0184-EN-REG-000001
SI04	Improve environmental outcomes	Design	Sustainability	Where there is at least 150 square metres of available roof space and enough daytime demand for electricity to consume the majority of electricity generated, undertake a solar photovoltaic feasibility analysis in accordance with the TfNSW Solar PV Screening Tool (or equivalent assessment). If feasible and approved by TfNSW as part of the works, complete an appropriate solar photovoltaic installation.		BSR-04		Requirement	Not in scope	No roof space in scope	N/A

ID	Sustainability Focus Area	Project Stage	Discipline Responsible	Sustainability Initiative	Relevant Risk IDs	Relevant BSRs	Relevant SDG	Initiative Source	Status	Progress Notes	Evidence
SI05	Improve environmental outcomes	Construction	N/A	A minimum of 20% of construction electricity consumption, excluding the mandatory renewable electricity percentage, must be sourced from renewable energy generated onsite and/or purchased renewable electricity such as GreenPower and/or Renewable Energy Certificates.		BSR-05		Requirement	Address in construction phase		N/A
SI06	Improve environmental outcomes	Construction	N/A	A minimum of 10% construction stage Scope 1 emissions offset using Climate Active Standard eligible offsets.		BSR-06		Requirement	Address in construction phase		N/A
SI07	Improve environmental outcomes	Design		Reduce upfront Greenhouse Gas emissions by a minimum 5% from the project baseline GHG emission footprint established using the Transport for NSW Carbon Tool or an alternative method agreed with Transport for NSW		BSR-07	SDG-03	Requirement	In progress	Carbon management plan in development. Vegetation removal identified to be a major constraint for carbon reduction - targeting minimum requirement.	Carbon estimate - under development WRURHCD-AECM-0184-ER-CAL-000001
SI08	Improve environmental outcomes	Design		Reduce operational energy demand by a minimum of 5% from an operational energy demand footprint/model established using an agreed method with Transport for NSW		BSR-08	SDG-04	Requirement	Not in scope	No operational energy demand as per SDG-04 requirements	N/A
SI09	Improve environmental outcomes	Design Procurement		All paints, adhesives, sealants, carpets, and engineered wood products used in indoor areas that are continuously occupied or occupied for more than two hours, are low in Total Volatile Organic Compounds (TVOC) as defined in the Green Star Buildings Rating Tool		BSR-09		Requirement	Not in scope	No indoor areas within scope	N/A
SI10	Protect and enhance biodiversity	Construction	Environment	Opportunities to minimise discharges to water bodies (streams, rivers, lakes, estuaries and the marine environment) through beneficial reuse and discharge to land are identified, assessed for feasibility and implemented		BSR-10	SDG-06	Requirement	Address in construction phase	Surface water quality impact assessment is being developed as part of the REF studies. Quantity - doesn't contribute anything significantly additional to catchment. No capture or reuse possible during construction due to poor water quality from road runoff.	N/A
SI11	Improve environmental outcomes	Design		Opportunities to reduce operational water consumption are identified, assessed for feasibility and implemented		BSR-11	SDG-07	Requirement	Not in scope	No operational water demand as per SDG-07 requirements	N/A
SI12	Improve environmental outcomes	Design	Pavement Structures Drainage Civil	A minimum of 25% cement replacement material, measured by mass, used in concrete.		BSR-12	SDG-09, SDG-03	Requirement	In progress	Concrete pavement includes footpaths and kerbing. Need to check bus laydown area - pending load. Specify up to 40% FA or 70% slag as per D&C 3211. Pits and pipes - designing to approved TINSW list. Confirm if any approved suppliers are able to incorporate SCM. Confirming minimum requirements to add to drawing notes and base GHG modelling on.	Pavement drawing notes - under development Structural drawing notes - under development Drainage drawing notes - under development Civil drawing notes - under development
SI13	Improve environmental outcomes	Design	Pavement	A minimum of 10% Recycled Asphalt Pavement (RAP) used in asphalt.		BSR-13	SDG-09, SDG-03	Requirement	In progress	Maximise as per TINSW 3153 - up to 40% for non-wearing courses (requires additional testing and approval levels) and up to 20% for the wearing course (requires additional testing and approval levels) Confirming minimum requirements to add to drawing notes and base GHG modelling on.	Pavement drawing notes - under development
SI14	Improve environmental outcomes	Design	Pavement	A minimum of 10% recycled or reused material used in road base and sub base.		BSR-14	SDG-09, SDG-03	Requirement	In progress	Maximise as per TINSW 3501 - e.g. up to 100% slag or crushed concrete for unbound or bound base or subbase. Confirming minimum requirements to add to drawing notes and base GHG modelling on.	Pavement drawing notes - under development
SI15	Improve environmental outcomes	Design	Pavement	A minimum of 20% recycled or reused material used as bedding material and drainage medium		BSR-15	SDG-09, SDG-03	Requirement	In progress	No-fines concrete is an opportunity - with filter material - can specify recycled material. Confirming minimum requirements to add to drawing notes and base GHG modelling on.	Pavement drawing notes - under development
SI16	Improve environmental outcomes	Design	Pavement	Specify a portion of recycled materials for pavement stabilisation instead of cement.			SDG-09, SDG-03	Design input	In progress	Cement treated surface - can specify FA; or Grave laltier (15% slag) used for expedient works - reduction in construction period and only need 2% by dry mass. Comply with R73.	Pavement drawing notes - under development
SI17	Improve environmental outcomes	Design	Drainage	Specify fibre reinforced pits instead of steel reinforcement.			SDG-09, SDG-03	Design input	In progress	Two pit suppliers from the approved products list offer fibre reinforced - AusPits (Fiba-Struct) and BCP (glass reinforced concrete). Investigate if we are able to specify these products in concept or detailed design; or if this initiative can be passed onto procurement	Drainage drawing notes - under development
SI18	Improve environmental outcomes	Construction		A minimum 94% of inert and non hazardous waste generated during demolition and construction reused, recycled or repurposed.		BSR-16	SDG-10	Requirement	Address in construction phase	Targeting P3 for SDG checklist. Target to be included in Waste and Materials Management Plan	WRURHCD-AECM-0184-WM-PLN-000001
SI19	Improve environmental outcomes	Construction	Civil	100% of useable spoil is reused, recycled or repurposed.		BSR-17	SDG-10	Requirement	In progress	To be incorporated on civil drawing notes Target to be included in Waste and Materials Management Plan	WRURHCD-AECM-0184-WM-PLN-000001
SI20	Improve environmental outcomes	Construction	Civil	100% uncontaminated ballast reused, recycled or repurposed		BSR-18	SDG-09	Requirement	Not in scope	No ballast in Project boundary	WRURHCD-AECM-0184-WM-PLN-000001
SI21	Improve environmental outcomes	Construction	Civil	100% uncontaminated concrete is reused, recycled, or repurposed.		BSR-19	SDG-09	Requirement	In progress	To be incorporated on civil drawing notes Target to be included in Waste and Materials Management Plan	WRURHCD-AECM-0184-WM-PLN-000001
SI22	Improve environmental outcomes	Construction	Civil	100% of reclaimed asphalt pavement (RAP) is reused, recycled or repurposed		BSR-20	SDG-09	Requirement	In progress	To be incorporated on civil drawing notes Target to be included in Waste and Materials Management Plan	WRURHCD-AECM-0184-WM-PLN-000001
SI23	Improve environmental outcomes	Construction	Civil	100% of organic uncontaminated green waste is recovered for beneficial reuse		BSR-21	SDG-09	Requirement	In progress	To be incorporated on civil drawing notes Target to be included in Waste and Materials Management Plan	WRURHCD-AECM-0184-WM-PLN-000001
SI24	Improve environmental outcomes	Construction		A minimum of 40% of waste generated from office activities diverted from landfill.		BSR-22	SDG-09	Requirement	Address in construction phase	Target to be included in Waste and Materials Management Plan	WRURHCD-AECM-0184-WM-PLN-000001

ID	Sustainability Focus Area	Project Stage	Discipline Responsible	Sustainability Initiative	Relevant Risk IDs	Relevant BSRs	Relevant SDG	Initiative Source	Status	Progress Notes	Evidence
SI25	Improve environmental outcomes	Design Procurement		All timber products must be sourced from reused/recycled timber, from plantations that have obtained Forest Management Certification (FMC) or from a Private Native Forest (PNF) meeting the following conditions: • Acceptable FMC schemes include the Program for the Endorsement of Forest Certification (PEFC), Forest Stewardship Council (FSC) and Responsible Wood Scheme. • Timber can be sourced from a Private Native Forest (PNF) with an approved Private Native Forestry Plan, as regulated under the Local Land Services Act 2013, and approved Forest Management Plan demonstrating adherence to the PNF Codes of Practice including conditions that protect habitat and biodiversity. • No timber is to be sourced from land within or adjacent to areas recovering from bushfire unless the Forest Management Plan addresses the management of potential impacts associated with forestry following bushfire, including the identification and mapping of fire refuge habitat		BSR-23	SDG-09	Requirement	Not in scope	No timber components identified at this stage of design.	N/A
SI26	Improve environmental outcomes	Design Procurement	Electrical/Lighting	All polyvinyl chloride (PVC) is compliant with the Vinyl Council of Australia (VCA) 'Best Environmental Practice PVC v2.0' Guidelines, criteria and verification evidence requirements for best practice manufacturing of PVC products.		BSR-24		Requirement	Not in scope	Confirm with electrical design if cables sheaths are PVC	If applicable, electrical drawing notes - under development
SI27	Improve environmental outcomes	Design Construction		Provide a progress report every six months from the date of execution of the contract on all baseline sustainability requirements applied to		BSR-26		Requirement	In progress	Register is evidence of BSR progress	N/A
SI28	Protect and enhance biodiversity	Construction	Environment	Compliance with the Transport Biodiversity policy with minimum requirements: - Wildlife Connectivity Strategy as required by the Transport Biodiversity policy and where landscape scale impacts on habitats are anticipated - Tree and Hollow Replacement Plan* or evidence of payment to the Transport Conservation Fund where trees and hollows are required to be replaced - Biodiversity Offset Strategy* where offsetting is required under the Transport Biodiversity Policy - Post-clearing Report as required by the Transport for NSW Biodiversity Management Guideline			SDG-02	Requirement	Address in construction phase	Planning to do field work WC 03/08 - biodiversity report will be complying to policy.	Biodiversity report - under development
SI29	Improve environmental outcomes	Design		All projects meeting the threshold to reduce operational energy GHG demand by a minimum of 5% from an operational energy demand footprint/model against NCC Section J established using an agreed method with Transport for NSW.			SDG-05	Requirement	Not in scope	No buildings in scope.	N/A
SI30	Protect and enhance biodiversity	Design	Drainage	All projects meeting the threshold to manage and minimise discharges of water during operations.			SDG-08	SDG initiative	In progress	Undertaking water quality modelling - target P4 water quality targets. Considering replacing an existing GPT to improve water quality.	Drainage design report - under development Landscape design report - under development
SI31	Procure responsibly	Procurement		There is commitment by the contractor for environment and sustainability aspects to be considered in procurement processes. Any assessments of high impact suppliers include environment and sustainability considerations as part of their evaluations.			SDG-11	SDG initiative	Address in construction phase		N/A
SI32	Procure responsibly	Procurement		A risk and opportunities assessment of relevant environmental, social and governance items of supply chain is undertaken that covers, at a minimum, the environment and human rights areas as detailed in Section 4.3 Core subjects of sustainable procurement of ISO 20400 Sustainable Procurement - Guidance. The risk and opportunities assessment is discussed and shared with Transport for NSW to identify the most suitable actions.			SDG-11	SDG initiative	Address in construction phase		N/A
SI33	Respect culture and heritage	Design	Landscape	All projects meeting the threshold to improve the project's urban environment by applying Transport urban design principles and assessments.			SDG-12	SDG initiative	In progress	Urban design engagement with TNSW – aiming to meet P2 i.e. incorporate urban design guidelines and regularly engage with Transport urban design team (having initial meeting 04/08 with Transport). Confirm in September.	Urban design report - under development
SI34	Align spend and impact	Design	All	Implementation of future proofing initiatives that lead directly to enabling Transport for NSW future sustainable strategic priorities in sustainability outcomes.			SDG-14	SDG initiative	In progress	Future proofing through: - Traffic modelling for the future (Future reference traffic projection case of 2041) - Climate resilience adaptations to ensure design lives of assets are fulfilled	Traffic modelling report - under development CCRA: WRURHCD-AECM-0184-EN-REG-000001
SI35	Improve environmental outcomes	Design	Civil	Opportunity to minimise material use e.g. reducing shoulder widths/pavement area		BSR-07	SDG-03	Previous project	In progress	Opportunity to reduce footpath width (currently proposed as 3m) on eastern side of Windsor Road to increase verge width for canopy cover.	If feasible, civil GA - under development
SI36	Improve environmental outcomes	Design	Environment	Where feasible, adjust alignment to avoid impact to existing trees and vegetation		BSR-07	SDG-02, SDG-03	Previous project	Under investigation	All median trees are being removed to accommodate additional lanes and minimum lane widths. 2D alignment being finalised - to confirm if any trees along roadside can be retained.	If feasible, civil GA - under development
SI37	Improve environmental outcomes	Design	Pavement	Consider materials resulting in reduced thickness for pavement layers e.g. EME2 course		BSR-07	SDG-03	Previous project	Under investigation	EME2 possible for non-wearing course applications of pavement as per R126. For pavement with cement treated materials below (geotech investigation shows this may be the case - TBC) - no EME2 is permitted on top of this existing material.	If feasible, pavement section drawings - under development

ID	Sustainability Focus Area	Project Stage	Discipline Responsible	Sustainability Initiative	Relevant Risk IDs	Relevant BSRs	Relevant SDG	Initiative Source	Status	Progress Notes	Evidence
SI38	Respect culture and heritage	Design	Landscape	Ensure cultural values are considered and preserved in project planning through consultation with First Nations communities.		BSR-25	SDG-15	Previous project	Under investigation	CwC engagement lead by Balarinji undertaken, with the following key themes: - oConnection back to the natural world e.g. chain of ponds - oThe Project's ability to enhance safety and amenity The following early design opportunities were raised through CwC engagement (note: feasibility is being assessed): - oTelling a story of water e.g. ripples in the design of bus shelter or retaining walls - oFootpath colour could reflect the colours of Country, and/or incorporate footprints into the path - oProviding a connection with the water of Caddies Creek - oSocial procurement opportunities – using organisations with intern programs - oInvestigate how to re-use felled trees - oProviding bubblers at bus stops - oBring through textures and colours of Country in design CwC workshop summary being developed for end of Aug; design team to determine feasibility of design opportunities	CwC Workshop report - under development Urban design report - under development
SI39	Partner with communities	Design	Civil	Shared path along the eastern side of Windsor Road and southern side of Commercial Road (retaining existing active transport connection)		BSR-25	SDG-15	Previous project	In progress		Civil GA - under development
SI40	Improve environmental outcomes	Design	Pavement	Consider alternative materials for bitumen, including combinations of bio-binders.		BSR-07	SDG-09, SDG-03	Previous project	Under investigation	Raise with TINSW sustainability/pavement team to see if there is appetite to implement a biobinder as a pilot/trial. Pavement design ok to incorporate initiative.	If feasible, pavement design report - under development
SI41	Improve environmental outcomes	Design	Civil Geotech Pavement	Maximise retaining the existing road		BSR-07	SDG-09, SDG-03	Design input	Under investigation	Pending geotech investigation. Aiming to retain existing pavement excluding the wearing course due to line marking (marking needs to be fully removed as new lane alignment marking is required) Expecting some levelling course adjustments in the existing pavement Where the road is widened, full depth asphalt consistent with existing is required.	If feasible, civil GA - under development
SI42	Improve environmental outcomes	Design	Civil Structures	Retaining existing traffic lights and VMS where feasible		BSR-07	SDG-09, SDG-03	Design input	Under investigation	Aiming to retain traffic lights on Windsor and Commercial Rd intersection.	If feasible, structural design report - under development
SI43	Improve environmental outcomes	Design	Civil Utilities	Commercial Road widened to the south to avoid utilities clashes		BSR-07	SDG-09, SDG-03	Design input	Under investigation	Where possible retain existing assets. To check in as design progresses.	Civil design report - under development
SI44	Protect and enhance biodiversity	Design	Landscape	Investigate landscaping in new median strips, buffer between road and shared path, and south-eastern corner of Windsor Rd and Commercial Rd		BSR-25	SDG-15	Design input	Under investigation	Biodiversity in median strip.	If feasible, landscape GA - under development
SI45	Improve environmental outcomes	Construction	Pavement	Investigate using warm mix asphalt.		BSR-07	SDG-09, SDG-03	Previous project	Under investigation	Feasible from a design perspective.	N/A
SI46	Improve environmental outcomes	Design	Drainage	Investigating retaining the Class 4 transverse pipe at the Windsor and Mile End Road intersection		BSR-07	SDG-09	Design input	Under investigation	Identified by drainage designer. Unable to retain pits and pipes - currently non-trafficable requiring upgrade.	If feasible, drainage design report - under development
SI47	Improve environmental outcomes	Design and procurement	Pavement	Investigating the use of low carbon steel		BSR-07	SDG-09, SDG-03	Sustainability team	Under investigation	Investigating setting an emissions limit for steel reinforcement (e.g. maximum emissions factor) - to be confirmed pending the materiality of steel in the project (i.e. if there is significant concrete pavement required for the bus laydown area)	If material, pavement drawing notes - under development
SI48	Improve environmental outcomes	Construction		Use of electric powered plant where feasible		BSR-07	SDG-09	Sustainability team	Address in construction phase		N/A
SI49	Improve environmental outcomes	Construction		Use of temporary solar lights for construction		BSR-07	SDG-09	Sustainability team	Address in construction phase		N/A
SI50	Improve environmental outcomes	Construction		Use of Greenpower, solar or hybrid generators to power site compounds		BSR-07	SDG-09	Sustainability team	Address in construction phase		N/A

Appendix C

Sustainability Engagement - Meeting Minutes

Harvey-Randev, Philippa

From: Harvey-Randev, Philippa
Sent: Thursday, 30 July 2026 5:23 PM
To: Sounness, Jesse; Roshani, Atena
Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy
Subject: RE: Windsor Rd upgrade at Rouse Hill - Sustainability/Flood

Hi Atena,

Thanks for chatting with us yesterday on Windsor Rd upgrade. See notes from our conversation as below:

- Flood study scope is limited to a desktop assessment and production of a technical memo
- Flood study reviewed is more than 10 years old and does not include any climate change considerations
- Flood study reviewed shows project area is outside of PMF footprint
- Discussed impact of flooding on Windsor Rd further north-west of the project boundary as a risk, particularly for accessing Rouse Hill Hospital
- Flagged that main risk is around flash flooding e.g. ensuring adequate drainage

As discussed, could you please link or send a copy of the flood assessment technical memo, so we are able to reference it in our climate change risk assessment?

Thank you,

Philippa Harvey-Randev
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-----Original Appointment-----

From: Harvey-Randev, Philippa
Sent: Wednesday, 29 July 2026 11:55 AM
To: Harvey-Randev, Philippa; Sounness, Jesse; Roshani, Atena
Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy
Subject: Windsor Rd upgrade at Rouse Hill - Sustainability/Flood
When: Wednesday, 29 July 2026 2:30 PM-3:00 PM (UTC+10:00) Canberra, Melbourne, Sydney.
Where: Microsoft Teams Meeting

Hi Atena,

Setting this meeting up to go through the sustainability requirements for your scope, including:

1. Review the sustainability requirements and targets relevant to your discipline
2. Identify sustainability initiatives to be considered during design in response to these targets
3. Review climate risk and adaptation actions relevant to your discipline
4. Identify any additional climate risks and adaptation actions to be considered during design

Kind regards,

Philippa Harvey-Randev

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Harvey-Randev, Philippa

From: Harvey-Randev, Philippa
Sent: Friday, 31 July 2026 9:36 AM
To: Sounness, Jesse; Ng, William
Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy
Subject: RE: Windsor Rd at Rouse Hill upgrade - Sustainability/Drainage
Attachments: Sustainable Design Guidelines - Water quality credit.pdf

Hi William,

Thanks for the chat yesterday for the Windsor Rd upgrade. See our notes and actions as below:

- Pits and pipes are pre-cast and have an approved supplier list. **Sustainability** to confirm SCM content for suppliers.
- One pit supplier has an approved product of non-recycled fibre reinforced concrete pits. **Sustainability** to further investigate.
- Undertaking MUSIC modelling for existing GPT – based on results may be replaced.
 - See sustainability credit requirements for water quality attached, particularly the below water quality targets:

Reduction targets set for these pollutants must be at least:

- Total suspended solids (TSS): 85%
- Gross pollutants: 90%
- Total nitrogen (TN): 45%
- Total phosphorous (TP): 65%
- Longitudinal drainage is being designed to a SSP3-7.0 2030 scenario (ARR 2024 guidelines used – 18% increase in rainfall intensity).
 - The drainage size is constrained by downstream drainage – modelling being undertaken to confirm impact/compatibility
 - Design aiming to leave surrounding drainage ‘no worse off’. Aim to optimise the drainage upgrades to prevent increasing downstream flows under the proposed conditions, and try to avoid upgrading the existing downstream drainage infrastructure. **Drainage** to confirm after completion of first round of modelling.
- Discharge to two creeks: Northern end of Windsor Road and eastern end of Commercial Road – confirming scour protection requirements for creek discharge given likely increase in flow
- Footpath inundation mitigated through water sheet flows across footpath - grading. Avoiding pits in grass - 1m verge between path and road

Kind regards,

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-----Original Appointment-----

From: Harvey-Randev, Philippa

Sent: Wednesday, 29 July 2026 1:44 PM

To: Harvey-Randev, Philippa; Sounness, Jesse; Ng, William

Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy

Subject: Windsor Rd at Rouse Hill upgrade - Sustainability/Drainage

When: Thursday, 30 July 2026 11:00 AM-11:30 AM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi William,

Setting this meeting up to go through the sustainability requirements for your scope, including:

1. Review the sustainability requirements and targets relevant to your discipline
2. Identify sustainability initiatives to be considered during design in response to these targets
3. Review climate risk and adaptation actions relevant to your discipline
4. Identify any additional climate risks and adaptation actions to be considered during design

Kind regards,

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Harvey-Randev, Philippa

From: Harvey-Randev, Philippa
Sent: Friday, 31 July 2026 9:16 AM
To: Tsemtsidis, Costa; Sounness, Jesse
Cc: Lee Fenwick, Timothy; Remmerswaal, Suzanna
Subject: RE: Windsor Rd upgrade at Rouse Hill - Sustainability/Pavement

Hi Costa,

Thanks for the chat today for the Rouse Hill Windsor Rd upgrade. See notes and actions as below:

- SCM content up to TfNSW standard maximums for concrete footpaths and kerbing – need to confirm surface for bus laydown area
- RAP content up to TfNSW standard maximums for wearing course and sublayers
- Recycled content up to TfNSW standard maximums for base and sub-base
- Cement alternatives for cement treated surface e.g. fly-ash. **What was the other product you had mentioned as an expedient works option?**
- Opportunity to specify recycled content in no-fines concrete and/or filter material in the kerb.
- EME2 asphalt sublayer course is an opportunity – however not permissible over cement treated materials
- Opportunity to explore a bio-binder trial along some of the pavement
- There will be wearing course replacement of the existing road in the works area (due to line marking requirements)
- Full depth asphalt pavement will be undertaken for the widened area
- **Sustainability** to confirm recycled content targets for the pavement scope and send minimum requirements for inclusion on drawing notes

Kind regards,

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-----Original Appointment-----

From: Harvey-Randev, Philippa
Sent: Wednesday, 29 July 2026 1:44 PM
To: Harvey-Randev, Philippa; Tsemtsidis, Costa; Sounness, Jesse
Cc: Lee Fenwick, Timothy; Remmerswaal, Suzanna
Subject: Windsor Rd upgrade at Rouse Hill - Sustainability/Pavement
When: Thursday, 30 July 2026 9:30 AM-10:00 AM (UTC+10:00) Canberra, Melbourne, Sydney.
Where: Microsoft Teams Meeting

Hi Costa,

Setting this meeting up to go through the sustainability requirements for your scope, including:

1. Review the sustainability requirements and targets relevant to your discipline
2. Identify sustainability initiatives to be considered during design in response to these targets
3. Review climate risk and adaptation actions relevant to your discipline
4. Identify any additional climate risks and adaptation actions to be considered during design

Kind regards,

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Harvey-Randev, Philippa

From: Harvey-Randev, Philippa
Sent: Tuesday, 4 August 2026 10:14 AM
To: Sounness, Jesse; McMahon, Jamie
Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy
Subject: RE: Windsor Rd upgrade at Rouse Hill - Sustainability/Enviro

Hi Jaimie,

Thanks for catching up with us last Friday, see our notes from the session as below:

- Field work is planned for W/C 03/08 to assess biodiversity. A biodiversity report is being developed which is compliant with the Transport policy.
- A surface water quality impact assessment is being undertaken
- There is no opportunity to capture and reuse water during construction given the scope of the project (i.e. poor quality of water from road run-off and small increase in impervious area from road widening)
- All median trees are being removed. Quantity will be captured in biodiversity report reported as hectares and vegetation class.

Please let us know if any of the above notes are inaccurate or need updating.

Cheers,

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-----Original Appointment-----

From: Harvey-Randev, Philippa
Sent: Wednesday, 29 July 2026 3:47 PM
To: Harvey-Randev, Philippa; Sounness, Jesse; McMahon, Jamie
Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy
Subject: Windsor Rd upgrade at Rouse Hill - Sustainability/Enviro
When: Friday, 31 July 2026 11:00 AM-11:30 AM (UTC+10:00) Canberra, Melbourne, Sydney.
Where: Microsoft Teams Meeting

Hi Jamie,

Putting in this time to go through our sustainability requirements relevant to the enviro scope e.g. biodiversity impacts, clearing/tree protection, water runoff quality during construction

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Harvey-Randev, Philippa

From: Harvey-Randev, Philippa
Sent: Tuesday, 4 August 2026 9:57 AM
To: Dods, Belinda; Sounness, Jesse
Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy
Subject: RE: Windsor Rd upgrade Rouse Hill - Landscape/Sustainability

Hi Belinda,

Thanks for the catch-up yesterday. See notes and actions below relating to sustainability:

- Urban design engagement with TfNSW – aiming to meet P2 i.e. incorporate urban design guidelines and regularly engage with Transport urban design team (having initial meeting 04/08 with Transport).
 - **Sustainability** to follow up in ~ month to confirm.
- Incorporating Cumberland Plain woodland species as identified through CwC engagement
- CwC engagement lead by Balaringi undertaken, with the following key themes:
 - Connection back to the natural world e.g. chain of ponds
 - The Project's ability to enhance safety and amenity
- The following early design opportunities were raised through CwC engagement (note: feasibility is being assessed):
 - Telling a story of water e.g. ripples in the design of bus shelter or retaining walls
 - Footpath colour could reflect the colours of Country, and/or incorporate footprints into the path
 - Providing a connection with the water of Caddies Creek
 - Social procurement opportunities – using organisations with intern programs
 - Investigate how to re-use felled trees
 - Providing bubblers at bus stops
 - Bring through textures and colours of Country in design
- Investigating WSUD (noting the Project footprint is constrained) – e.g. removing channel drains and replacing with turf swales
- Planting biodiverse species in the median strip. Note: no opportunity for WSUD to median strip given road grading requirements.
- Investigating increasing canopy cover through reducing path width on the western side of Windsor Road and increasing property acquisition on the eastern side of Windsor Road – verge needs to be 1.5m width for tree planting.
- Investigating urban design and landscaping opportunities for the south-east corner of Windsor and Commercial Road

See notes and actions below relating to climate resilience:

- Bushfire, drought, extreme heat and storms were discussed as key risks. No new risks identified.
- Bushfire: Canopy cover to be designed to street tree standards i.e. no canopies touching to reduce bushfire risk
- Storm: Tree species chosen will not be limb dropping
- Heat: Investigating canopy cover for footpaths noting space constraints
- Heat: investigating the upgrade of bus stops to provide shelters
- Heat: Investigating incorporating bubblers near bus stops
- Drought: Drought tolerant native species being chosen for planting

Let me know if I have missed anything or any notes are not accurate.

Cheers,

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From: Harvey-Randev, Philippa

Sent: Monday, 3 August 2026 12:01 PM

To: Harvey-Randev, Philippa; Dods, Belinda; Sounness, Jesse

Cc: Remmerswaal, Suzanna; Lee Fenwick, Timothy

Subject: Windsor Rd upgrade Rouse Hill - Landscape/Sustainability

When: Monday, 3 August 2026 4:00 PM-4:30 PM (UTC+10:00) Canberra, Melbourne, Sydney.

Where: Microsoft Teams Meeting

Hi Belinda,

Setting this meeting up to go through the sustainability requirements for your scope, including:

1. Review the sustainability requirements and targets relevant to your discipline
2. Identify sustainability initiatives to be considered during design in response to these targets
3. Review climate risk and adaptation actions relevant to your discipline
4. Identify any additional climate risks and adaptation actions to be considered during design

Kind regards,

Philippa Harvey-Randev

Sustainability Consultant

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PO Box Q410, QVB PO, Sydney, NSW, 1230
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Harvey-Randev, Philippa

From: Harvey-Randev, Philippa
Sent: Tuesday, 4 August 2026 10:04 AM
To: Sounness, Jesse; Malliah, Hari
Cc: Lee Fenwick, Timothy
Subject: RE: Windsor Rd upgrade at Rouse Hill - Sustainability/Utilities

Hi Hari,

Thanks for catching up with me last Friday, see notes from our session as below:

- Utilities undertaking clash detection to retain existing assets where possible
 - **Sustainability** to check-in as design progresses to quantify any GHG savings
- Alignment has been designed to avoid utilities clashes along Commercial Road i.e. widening Commercial Road to the south to avoid clashes on the northern side
- Where clashes are unavoidable, utilities are replaced like-for-like as directed by utilities owner or Transport. Assets potentially impacted include electrical, water and communications connections, and does not include stormwater (being upgraded or maintained as part of drainage scope).

Cheers,

Philippa Harvey-Randev
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-----Original Appointment-----

From: Harvey-Randev, Philippa
Sent: Wednesday, 29 July 2026 1:45 PM
To: Harvey-Randev, Philippa; Sounness, Jesse; Malliah, Hari
Cc: Lee Fenwick, Timothy
Subject: Windsor Rd upgrade at Rouse Hill - Sustainability/Utilities
When: Friday, 31 July 2026 11:30 AM-12:00 PM (UTC+10:00) Canberra, Melbourne, Sydney.
Where: Microsoft Teams Meeting

Hi Hari,

Setting this meeting up to go through the sustainability requirements for your scope, including:

1. Review the sustainability requirements and targets relevant to your discipline
2. Identify sustainability initiatives to be considered during design in response to these targets
3. Review climate risk and adaptation actions relevant to your discipline
4. Identify any additional climate risks and adaptation actions to be considered during design

Kind regards,

Philippa Harvey-Randev

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