Appendix C

Guidance Note – Infrastructure Sustainability Base Case Framework

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# Purpose

The purpose of this guidance note is to provide guidance for Consultants and Project Managers on how to prepare an infrastructure sustainability base case for assessment as part of a project’s infrastructure sustainability (IS) Design and/or an As‑Built rating (infrastructure sustainability assessment). The Base Case is to include 'business as usual' technologies, processes, components and methodologies. This guidance note outlines what materials, designs and methodologies the Queensland Department of Transport and Main Roads regards as 'business as usual'. The intent is to ensure that all projects are being assessed on the same criteria.

# Background

The Queensland Government requires all government infrastructure projects over $100 million to have a sustainability assessment completed.

The Infrastructure Sustainability Council of Australia’s (ISCA) Infrastructure Sustainability Rating Scheme is an approved method to achieve this objective.

The Infrastructure Sustainability Rating Scheme requires a “Base Case” assessment for the project. The Base Case is the “estimated environmental impact of the project using business as usual technologies, over the entire infrastructure lifecycle (construction and operations phases combined”. The design from the Business Case is used to determine the Base Case. The following ISCA credits, covering both v1.2 and v2.0 of the Rating Tool are relevant to the development of a Base Case.

Table 2 – ISCA credits applicable to this Guidance Note

|  |  |  |
| --- | --- | --- |
| Resource focus | ISCA v1.2 credit | ISCA v2.0 credit |
| Energy consumption and carbon footprint | Ene-1 | Ene-1 and Ene-3 |
| Water use and in particular potable water use | Wat-1 | Wat-1 and Wat-2 |
| Material lifecycle impact | Mat-1 | Rso-6 |

The ISCA Infrastructure Sustainability Technical Manual provides information on how to prepare the Base Case proposal, and that it is to be submitted as early as possible in the Design Assessment phase. This document provides Transport and Main Road's “business as usual” assumptions and standards for the Base Case. These assumptions and standards have been developed based on:

* Legislation
* Transport and Main Roads technical specifications and standards, and
* ISCA IS Materials Guidelines.

## Base Case function (product or service provided)

The project’s primary objective is set by the Strategic Assessment of Service Requirement (SASR) Report, at Gate 1 of the Queensland Government's project assessment framework. The objectives for the Base Case must be consistent with those specified for the project.

# Resource use boundary and framework

The scope of the resource use assessment boundary is limited to the construction and operation of road and rail infrastructure projects in Queensland that are seeking IS ratings. It covers resource use for energy, water and materials, and resource impacts from the generation of greenhouse gases (GHGs) and waste.

## Resource use boundaries

A suite of project elements is presented in Table 3.1, however not all of these are necessarily required for each project. To take a systems perspective, the resources used are essentially inputs for the construction of multiple structures and works, that are specific to a project's SWTC (project components), with resource outputs being the emissions and waste generated from construction and operation of the project components.

Table 3.1 – Base case resource use boundaries

|  |  |  |
| --- | --- | --- |
| Resource Use | Project Components  (boundaries) | Resource Outputs  (impacts) |
| **Energy Use**   * Stationary and off‑road fuel usage (plant and equipment) (Scope 1) * Transport fuel from company owned vehicles (Scope 1) * Transport fuel (for delivery or removal of products) to site (only required for ENE‑1 Level 3) * Electricity (grid and renewables) for construction and temporary network operations * Operations to source construction materials where not supplied by commercial quarry.   **Water Use**   * Potable * Non‑potable   **Materials Used**   * Asphalt * Cement and Concrete * Aggregates / fill materials * Steel * Aluminium * Glass * Timber * PVC * Plastic sheet and film * Composites * Coatings and finishes | * Road, accesses, pavement for bus stops, parking or other secondary function * Road furniture including noise walls and road safety barriers * Structures, including bridges, over / under pass, reinforced walls, and retaining walls. * Underground works for example, piles and foundations * Earthworks (cut and fill) and underground works (tunnelling) * Drainage including kerbing, open drains, stormwater * Laydown areas, stockpiles * Temporary works (for example, site office, sidetracks) * Property works * Onsite processing * Early works (for example, preloading) | **Carbon / Greenhouse**  **Gas Emissions**   * Scope 1 stationary and transport fuel * Scope 2 electricity use * Scope 3 transport fuel and electricity use (this is optional and only required for ENE‑1 Level 3) * Land and vegetation clearing * Network operations (lighting and intelligent transport systems).   **Waste Disposal**  **(disposed to landfill)**   * Spoil * Inert and non‑hazardous * Office * Recycled * Contaminated soil |

### Out of scope

The following elements of the project will be excluded from the assessment boundary:

* road traffic emissions during construction. Note, road traffic during operation may be relevant to Ene‑1
* energy use and carbon / greenhouse gas emissions from industrial process and fugitive emissions as these activities are likely to be either out of scope or captured in the materials calculator
* works undertaken by others related to the project
* concrete batching offsite
* operations by public utility and plant to remove, relocate or install public utility and services, and
* maintenance operations of the existing asset during the period of construction.

## Base case design life

The Queensland Government’s Department of Transport and Main Roads’ requirements for minimum design periods include the following as per Table 3.2 below.

Table 3.2 – Minimum design life of assets

| Asset | Minimum design life |
| --- | --- |
| * Bridge structures including concrete arches, underpasses, and wildlife underpasses * Paint coating systems * Deck wearing surface * Protective treatment of permanent steel structural members * Tunnels * Above carriageway structures * Sign support structures (including cantilever signs and signs on side of bridges) * Other roadside furniture * Drainage pits * Abutment protection subject to scour | Refer to Transport and Main Roads Manual Design Criteria for Bridges and Other Structures and Bridge Scour Manual |
| * Abutment protection either not subject to scour or subject to scour. | 100 years |
| * Bridge drainage systems | 50 years |
| Difficult to maintain drainage elements, which must include:   * any culvert (existing or new) within the Upgrade road formation, and * culvert end walls that are difficult to access. | 100 years |
| * Expansion joints and rubbers in expansion joints * Drainage systems (replaceable elements only) * Steel bridge traffic barrier, safety screens and fencing * Light poles (including outreach arms) and signs on side of bridge * Gantries and cantilever structures over any portion of the roadway * Bridge bearings * Median slabs | Refer Clause 3.7.1 Design Life – New Bridges of the Transport and Main Roads Manual Design Criteria for Bridges and Other Structures. |
| * Sign faces | 10 years |
| * Fences, including fence posts, fauna fences (excluding fencing on bridges and noise fences) | 20 years |
| * ITS components | Refer to respective Transport and Main Road’s Standard Specifications |
| * Lighting (including luminaries) and electrical equipment excluding light poles, outreach arms, and foundations | 20 years |
| * Outreach arms, light poles, and foundations for light poles | 40 years |
| * Retaining walls, including reinforced soil structure walls | 100 years |
| * Noise‑attenuating structures | Refer MRTS15 “Noise Fences” |
| * Earthworks and batter treatments | 100 years |
| * Mechanical and electrical equipment | 20 years |
| * Traffic management and control systems | 20 years |
| * Buildings | 50 years |
| * Pavements | 20 to 30 years  Refer to Transport and Main Road’s Pavement Design Supplement |
| * Timber furniture for environmental works | 40 years |

## Greenhouse gas modelling

For credit ENE‑1, Transport and Main Roads will use the Transport for New South Wales Carbon Estimating and Reporting Tool (CERT) v2 for modelling and reporting on Greenhouse gas footprints for Ene‑1 credits.

## Business as usual assumptions and exclusions

The proposed department‑wide business as usual standards and assumptions for calculating a Base Case, are presented in the following Table 3.4. Each time within a resource category is numbered to enable cross referencing of assumptions or sources.

A description of the justification source, and data quantities to collect for the development of the Base Case is also provided as additional guidance for the project proponents.

Climate change risks are incorporated in hydraulic assessment and design, in accordance with the department's *Road Drainage Manual*. Otherwise climate change impacts will be considered through risk assessment processes.

Should a project use different assumptions they will be required to justify why the assumptions contained in this document are not applicable to their project or are incorrect.

Table 3.4 – Business as usual assumptions and exclusions

| Ref | Resource Category | Business As Usual (BAU)  Assumption | Business As Usual (BAU)  Source/ Justification | Data Quantities Required from Reference Design |
| --- | --- | --- | --- | --- |
| **Energy Use** | | | | |
| **Stationary and Off-road Fuel** | | | | |
| 1 | Use of generators during construction | * Generators providing electricity to site offices are operated at full load using 100% mineral diesel 12 hours per working day. * Generators providing electricity to critical site offices (for example, server sheds) are operated at full load using 100% mineral diesel 24/7. * Unless otherwise known, the fuel consumption rate will be sourced from the *Caterpillar Performance Handbook* that is valid at the time of ISCA registration. * Use of generators for both day and night works will be accounted for. Stationary fuel consumption for night works will be estimated by the project proponent. | * The operational hours of generators are provided by Transport and Main Roads projects. * Caterpillar plant and equipment (P&E) are widely used across the construction industry in Queensland. Data published in their performance handbook is based on their own field testing, computer analysis, laboratory research and experience. | * Total fuel use (kL) * Number and capacity of generators. |
| 2 | Use of plant and equipment for construction | * Generators providing electricity for plant and equipment are operated at full load using 100% mineral diesel fuel 12 hours per working day. * Unless otherwise known, the fuel consumption rate for plant and equipment will be sourced from the *Caterpillar Performance Handbook* (January 2015). | * The operational hours of generators are provided by Transport and Main Roads projects. * Caterpillar P&E are widely used across the construction industry in Queensland. * Data published in their performance handbook is based on their own field testing, computer analysis, laboratory research and experience. | * Number and types of plant and equipment for whole project. * Total fuel use (kL). |
| **Transport Fuel** | | | | |
| 3 | Use of project owned vehicles | * The number of project related vehicles used to transport staff on the project and distance travelled will be estimated by the project proponent. * Fuel use for vehicles will be unleaded or diesel. | * Given that projects will vary in size and scale, the staff and vehicles required will vary. Consultation with the work packages agreed that this estimate should be determined by project proponents. * Previous projects indicate that project vehicles typically use unleaded or diesel fuel. | * Staff numbers for the project. * Distance travelled (km) in project vehicles. * Estimate of fuel use in project vehicles for project purposes. |
| 4 | Transport of materials to site | * The current version of the IS Materials Calculator at the time of developing the base case will be used to estimate transport related fuel and carbon emissions from the delivery of materials. * Materials are imported to site by contractors and transported by roads. * Delivery trucks use diesel fuel. * Transport distance of materials to the project site will be estimated by the project proponent. | * The IS materials calculator is an approved tool for the MAT1 credit. * The largest road transport mode and size from the IS Materials calculator is BAU as it is assumed that industry will deliver materials in a cost effective and efficient manner (i.e. the least number of trips). * Distances will vary for each project. * Projects will need to estimate on a site-specific basis. | * Material types. * Material quantities (t) (see materials category). * Number and capacity of delivery trucks. * Distance travelled to site (km). |
| 5 | Transport of products to site, for example, signalling transformers, pre fab materials for buildings (for example, site office, train station) | * Products are transported to site using diesel fuelled trucks * The transport distance to deliver products to site will be estimated by the project proponent. | * Distances will vary for each project. * Projects will need to estimate on a site-specific basis. | * Types and volume of products to be delivered to site * Number and capacity of delivery trucks * Distance travelled to site (km). |
| 6 | Transport of water to site | * Water delivery trucks use diesel fuel. | * Distances will vary for each project. * Projects will need to estimate on a site‑specific basis. | * Amount of water (t) to be delivered to site. * Distance travelled to site (km). * Also see water use category (Items #10 and #11). |
| 7 | Transport of waste from project to disposal or reuse site (optional depending on credits sought by the project) | * Waste is transported off site using a 100% mineral diesel fuelled truck. * The following assumptions are made regarding transport distance for waste disposal site:   + Category A waste – if relevant, assumptions will need to be made about distance to a treatment facility, and then disposal as class C contaminated waste.   + Category C waste – assumptions will need to be made about distance to a treatment facility.   + Category B contaminated waste – distance to be estimated from the project   + Clean fill or rock, or ballast will be transported to a landfill to disposal.   + Acid Sulfate Soils will require assumptions to be made about the transport to, and treatment at, an offsite facility. Treatment is likely to be the most energy intensive component. | * The largest road transport mode and size from the IS Materials calculator is selected as it is assumed that industry will deliver materials in a cost effective and efficient manner (that is, the least number of trips). * Distances to disposal locations will need to be estimated on a project specific basis. | * Estimated tonnes of material to be disposed of for each category. |
| **Electricity** | | | | |
| 8 | Use of grid electricity for construction | * The emissions factor for all purchased electricity for construction activities is sourced from the Queensland grid using the most recent National Greenhouse Accounts (NGA) publication available at the time of developing the base case, that is, 1.13 kg CO2‑e/kWh. * No purchased electricity will be sourced from renewable energy sources. * No carbon credits from electricity grids will be accounted for throughout the project. | * This is the government approved emission factor for calculating Scope 2 GHGs for electricity as per the most recent NGA publication (August 2015). * Transport and Main Roads has adopted the same approach to sourcing Grid and Green energy, which does not involve the use of Green Energy. * Renewable energy sources (for example, from the installation of solar panels) or the purchase of GreenPower are rarely adopted in industry due to high cost and the temporary nature of the site sheds. | * Estimate of electricity requirements for relevant construction activities (kWh). |
| 9 | Use of grid electricity for operation | * The emissions factor for all purchased electricity for operational activities is sourced from the Queensland grid using the most recent NGA publication available at the time of developing the base case that is, 1.13 kg CO2‑e / kWh. * The design of stations does not include energy efficiency measures or application of renewable energy sources. * LED fittings will be used for all new operation lighting installations. | * This is the government approved emission factor for calculation of Scope 2 GHGs for electricity as per the most recent NGA publication (August 2015). * Lighting to meet Transport and Main Roads Specification (MRTS94) LED fittings are now standard for new installations. | * Estimate of electricity requirements for operation activities (kWh). |
| **Water use** | | | | |
| **Potable and non-potable** | | | | |
| 10 | Potable and non‑potable water use during construction | * 100% potable water is used for construction works in urban areas (for example, compaction and dust suppression). * Rural projects will assume 75% use of non‑potable water for construction. * Potable water is defined as ‘water that is safe for human consumption, food preparation, and food making’. * Water not approved by appropriate authorities as being safe for consumption is considered non‑potable. | * It is acknowledged that Transport and Main Roads standards approve the use of non‑potable water sources during construction however this is not readily available or used in urban areas. * The ability to use non‑potable water will vary depending on the local conditions of each project. | * Estimate of water use (kL / day or for entire project) for construction activities and site office use. * Type of water source, for example, Class A water, rainwater, manufacturing waste water, bore/ground water, river water, surface runoff, mains, tanker, recycled, and so on. |
| 11 | Potable and non‑potable water use during operation | * Construction site staff facilities include access to potable water (instant hot and chilled water). * Potable water use is supplied for drinking purposes. * Non‑potable water sources will be via the collection of rainwater and/or grey water that will be treated on site stored in tanks. * Non‑potable water use is supplied for toilet flushing, toilet cleaning, and landscape purposes. | * Where landscaping is included the operational watering regime is 5 – 10/m2 twice a week. | * Estimate of water use (for example, kL / day) and source for all operation activities. |
| **Materials** | | | | |
| 12 | All materials listed below | * The current version of the IS Materials Calculator at the time of calculating the base will be used to estimate the carbon emissions from the use of materials for the project. * Also refer to assumptions for the transportation of materials to site (Item #4). | * The IS Materials Calculator is an ISCA developed and approved tool for benchmarking. | * As noted below. |
| 13 | Hot Mix Asphalt and Recycled Asphalt Pavement (RAP) | * BAU is densely graded asphalt with a bitumen binder. * No RAP is used for asphalt. * Dense graded asphalt is business as usual on high trafficked urban highways. | * Transport and Main Roads has trialled and Type Approved RAP in a number of pavement types however as yet not mandated its use in any projects other than trial projects. * There is limited data available relating to the total volume and percentage of projects across Queensland that have used RAP in the past 5 years. * Functional requirements of specific projects and the geographic location are considered to be the two largest constraints in the broader adoption of RAP across Queensland. * Transport and Main Roads approves the use of recycled materials at varying levels depending on the requirements of the project and material available. See MRTS35, MRTS102. | * Total amount (t) and types of asphalt used for entire project. |
| 14 | Unbound Pavement (Gravel) | * BAU for unbound pavements with 14 mm seal. * BAU is for unbound pavement to contain 0% recycled aggregate. * Unbound pavement is business as usual for regional highways. * All gravel for pavements (pavement, carparks, and footpaths), track foundation, and drains will be virgin/quarried materials and imported to site. * No rock crushing equipment will be used on site as business as usual. * Also see waste transportation assumptions (Item #7). | * While some re‑use of insitu materials as fill is common, typically this material is not reprocessed into unbound pavement on site. | * Amount of unbound pavement used for entire project (t). |
| 15 | Bitumen seals | * The BAU for bitumen seals is either a single/single reseal or double/double reseal. * Polymer modified binder and crumb rubber modified binder are not business as usual for industry in Queensland at this stage. |  | * Amount of bitumen emulsion seals (m2). |
| 16 | Cement and concrete | * All concrete use will be in accordance with relevant Transport and Main Roads Technical Specifications. * All concrete is Portland cement based. * All ready mix and precast concrete contain no recycled aggregate. * All ready mix and precast concrete contain minimum cement replacement of 25% fly ash. | * Consultation with geotechnical and pavement design engineers. * Transport and Main Roads standard specifications vary depending on requirements, for example, MRTS24, 25, 26, 39, 40, 65, 70. * MRTS70 states a minimum 25% replacement of cementitious material with flyash currently considered viable due to inherent variability of such materials. * Use of synthetic or recycled concrete aggregates is not. | * Amount of concrete used for entire project (all types) (t). |
| 17 | Steel | * All reinforced and structural steel used is new (virgin) for al steel works and in accordance with relevant AS/NZS. * 0% recycled steel is considered BAU. * Steel used for rail tracks and pipes is in accordance with relevant Australian Standards and Transport and Main Roads Technical Specifications. | * Consultation with work packages. * Transport and Main Roads requirements vary based on where the steel will be used. Technical Specifications for Steel Piles (MRTS64, MRTS66), Reinforcing Steel (MRTS71, MRTS71A), Steel Girders (MRTS76), Fabrication of Structural Steelwork (MRTS78). * Strength and quality testing make recycled components difficult to use. * While recycling of steel is maximised, the proportion of recycled content in products is not well documented. | * Amount of steel used for entire project (t). |
| 18 | Aluminium | * All aluminium used for the project will be primary (new) and in accordance with relevant AS/NZS. | * Transport and Main Roads Technical Specification for *Fabrication of Aluminium Components* – MRTS79. * Strength and quality testing make recycled components difficult to use. | * Amount of aluminium used for entire project (t). |
| 19 | Glass | * All glass for the purpose of buildings and structures will be new and in accordance with relevant AS/NZS. * Transparent noise barriers built to AS/NZS will be made from new materials. | * MRTS15 Noise Barriers*.* AS/NZS 2208. * Strength and quality testing make recycled materials difficult to use. | * Amount of glass used for entire project (t). |
| 20 | Timber | * Sawn hardwood will be used for building purposes (for example, interior finishes such as flooring). * Softwood (structural pine) will be used for structural purposes. * Wooden bridge and marine maintenance / Construction will use new timber. * Timber Noise barriers will be made from new materials. | * MRTS15 *Noise Barriers.* Posts, panels, planks. Treatment, strength and consistency requirements make recycled materials difficult to use. * MRTS87 Supply of Timber Bridge Materials and Components*.* Testing for strength and quality requirements makes recycled timber difficult to use for this purpose. | * Amount of timber used for entire project (t or m3). |
| 21 | Plastic sheet and film | * No plastic sheet and film will be used. | * Plastic sheet and film are excluded because they are predominantly used in the packing industry and unlikely to apply to Transport and Main Roads projects in significant quantities. | * N/A |
| 22 | Composites | * No composite materials will be used. | * Glass fibre reinforced plastic (FRP) is typically used as an insulating material and unlikely to apply to departmental projects in significant quantities. * Cement fibreboard is typically used for external cladding and unlikely to apply to departmental projects in significant quantities. | * N/A |
| 23 | Coatings and Finishes | * Solvent based paint is considered BAU for the project. * No immersion zinc coating is applicable to Transport and Main Roads projects. | * Coatings and finishes applied to standard (MRTS88). | * Total amount of tonnes (t) of paint required for the project. |
| 24 | Water treatment chemicals | * No water treatment activities will occur on site, therefore delivery of water treatment chemicals will not be accounted for. | * Transport and Main Roads projects rarely use water treatment facilities. | * N/A |
| 25 | Embankment | * Embankment will be sourced from cut to fill earthworks where available. * Where additional embankment material is required, all imported embankment material will be virgin materials and imported to site. * Also see waste transportation assumptions (Item #7). | * Fill is sourced from in situ cuts wherever possible. Only where there is insufficient cut will fill be imported to site. | * Amount of excavated earthworks and type of cuttings (t). * Amount of imported embankment material. |
| 26 | Aggregate sand | * BAU is all sand used as aggregate is virgin material. | * Use of virgin sand is currently BAU. * Recycled sand is being explored but not allowed in specifications as yet. | * Amount of sand used for entire project (t). |
| 27 | Aggregate glass | * BAU is 0% recycled glass. Transport and Main Roads approves the use of crushed glass as aggregate (refer to Transport and Main Roads Technical Specifications MRTS05 *Unbound Pavements* and MRTS30 *Asphalt Pavements* but its use is not mandated and is not standard practice at this stage. | * Consultation with geotechnical and pavement design engineers and the work packages indicated that this is not a typical practice. | * N/A |
| 28 | Recycled crushed concrete | * BAU is 0% recycled crushed concrete as aggregate for the project. | * It is acknowledged that Transport and Main Roads approves use of recycled crushed concrete (refer to Transport and Main Roads Technical Specification MRTS05 *Unbound Pavements* however this is not standard practice at this stage. | * N/A |
| **Piping materials** | | | | |
| 29 | Reinforced concrete pipes | * Use of concrete for pipes and box culverts are considered BAU. * Typically used for ‘cross drainage’ and piped under roads. Would also be used in stormwater storage. * 0% recycled content will be used in reinforced concrete. | * Leading supplier (Rocla) indicated that they don’t produce concrete pipes with recycled content as they can’t guarantee the quality. * Transport and Main Roads Specifications indicate that precast reinforced concrete pipes and box culverts are standard practice. | * Amount of piping (t) used for entire project (t). * Transport distance (km). |
| 30 | Polyethylene (PE) | * Use of PE for drainage piping is BAU * 0% recycled content is BAU. |  | * Amount of piping (t) used for entire project (t). * Transport distance (km). |
| 31 | Polyvinyl Chloride (PVC) | * Use of PVC or drainage piping is BAU. * PVC will be used for ‘drainage off structure’ where it is hidden from direct sunlight. * PVC will be used for ‘track drainage’ and under pavement. * 0% recycled content will be used in PVC piping. | * Consultation with design engineers. * ISO 1452.2009*: Plastic piping systems for water supply and for buried and above‑ground drainage and sewerage under pressure – Unplasticized poly (vinyl Chloride) (PVC‑U).* | * Amount of piping (t) used for entire project (t). * Transport distance (km). |
| 32 | Land / vegetation clearing | * The carbon emissions from land and vegetation clearing will be estimated using the Carbon Gauge calculator. * Only carbon emissions from land and vegetation removed that is more than 0.5 ha will be accounted for. * Unless otherwise confirmed, the type of vegetation cleared will be open woodlands (vegetation Class D), heathlands (H), or grassland (I). | * The Carbon Estimate Reporting Tool has been developed by Transport for NSW (2017) and is an acceptable GHG assessment and reporting tool. * As size and location vary this needs to be determined for each project. * Consultation with ecologists to determine vegetation types. | * Amount and type of land and vegetation cleared (ha). |
| 33 | Energy use and carbon emissions  – all activities | * The energy and emission factors and calculation methodologies will be sourced from the current version of the National Greenhouse Accounts (NGA) Factors workbook at the time of calculating the base case. | * Industry must use the current National Greenhouse Accounts Factors as the current standard for calculating energy and carbon emissions. The use of the NGA is required under the NGERS Act 2007. | * Energy use (fuel and electricity). |
| **Waste** | | | | |
| 34 | Gravel and crushed rock | * For rural projects, 50% of uncontaminated excavated spoil e from the project will be disposed of in a landfill and not reused on site, on another project, or sent to a stockpiling facility. * For urban projects, 100% of uncontaminated excavated spoil (excess to cut to fill balance) from the project will be disposed of in a landfill and not reused on site, on another project, or sent to a stockpiling facility. | * As most of Transport and Main Roads operations are within the State Controlled Road reserve, there is limited physical space and opportunities for reuse of spoil. Rural projects have more flexibility for spoiling within road corridor while urban projects are highly constrained. * Consequently, the space for stockpiling is extremely limited and significant quantities of excavated spoil is expected to be landfilled as the BAU case. |  |
| 35 | Inert and non‑hazardous | * All inert and non-hazardous waste from the project will be disposed of in a landfill and not reused on site or on another project. Also refer to assumptions for waste transportation (Item #7). * Inert and non‑hazardous waste is defined as: bricks, concrete, paper, plastics, glass, metal and timber; asphalt waste; used, rejected or unwanted tyres; being material resulting from construction and/or demolition activities. | * There will be limited space or opportunities for reuse of inert waste. As such, all inert and non-hazardous waste will be landfilled as the BAU case for Transport and Main Roads projects. * *ISCA Technical Manual Version 1 and 1.2.* | * Amount of inert and non‑hazardous waste generated (t). * Amount of inert and non‑hazardous waste disposed at landfill (t). * Amount of inert and non‑hazardous waste reused / recycled (t). |
| 36 | Office | * Office waste from the project proponent’s design offices (that is, not located at the project site) is excluded. * Office waste is defined as: office or packaging waste (for example, paper, plastics, glass, metal and timber) that is generated from ‘office activities’ and not mixed with any other type of waste. This applies to site office waste generated during the construction phase of the project. | * Observations of work packages indicate that waste recycling behaviours and systems at site offices on construction projects are not as established, and BAU is to landfill office waste. * Design offices are excluded as they already have established waste recycling systems in place. | * Amount of office waste generated (t). * Amount of office waste disposed at landfill (t). * Amount of office waste reused / recycled (t). |
| 37 | Contaminated Land | * Contaminated soil excavated from site will be transported and disposed of in accordance with regulated waste regulations. This will require engagement of a regulated waste transporter and disposal fees at regulated waste disposal facility. | * The Department of Environment and Science have advised the Department of Transport and Main Roads that contaminated soil from State controlled road reserves cannot be managed under a soil disposal permit. Removal, transport and disposal is to comply with regulated waste provisions. | * Amount of contaminated soil generated from excavated activities (t). * Amount of contaminated soil disposed (t). |

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