

# Appendix C

## Abbreviations and Glossary

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### Abbreviations

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Abbreviation	
AADT	Average Annual Daily Traffic
AADV	Average Annual Daily Vehicles
ABS	Australian Bureau of Statistics
AC	Asphaltic Concrete
AHC	Australian Heritage Council (now DEH)
AHD	Australian Height Datum
AEP	Annual Exceedance Probabilities
AHD	Australian Height Datum
AHC Act	<i>Australian Heritage Council Act 2003</i>
ANZECC	Australian and New Zealand Environment Conservation Council
ARI	Average Recurrence Interval
AS	Australian Standard
ASR	Acid Sulfate Rock
ASSMP	Acid Sulfate Soil Management Plan
ASS	Acid Sulfate Soils
BCR	Benefit Cost Ratio
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BoM	Bureau of Meteorology
BTCE	Bureau of Transport and Communications Economics
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CC	Capital Cost
CD	Collector District
CEMP	Construction Environmental Management Plan
CFG	Community Focus Group
CIP	Community Involvement Plan
CIA	Cumulative Impact Assessment
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> eq	Carbon dioxide equivalent
COD	Chemical Oxygen Demand
CoRTN	Calculation of Road Traffic Noise
CRG	Community Reference Group
CSIRO	Commonwealth Scientific & Industrial Research Organisation
DA	Development Application
D&C	Design and Construct
DCF	Discounted Cash Flow

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Abbreviation	
DCM	Design, Construct and Maintain
DEC	NSW Department of Environment and Conservation (formerly NSW EPA and NPWS)
DEH	Department of the Environment and Heritage (formerly AHC)
DIPNR	Department of Infrastructure, Planning and Natural Resources (formerly DLWC, DUAP and Planning NSW)
DLWC	NSW Department of Land and Water Conservation (now part of DIPNR)
DMR	Department of Mineral Resources (now part of NSW Department of Primary Industries)
DO	Dissolved Oxygen
DPI	Department of Primary Industries (formerly NSW Fisheries, State Forests NSW, and NSW Agriculture)
DUAP	NSW Department of Urban Affairs and Planning (now DIPNR)
EC	Electrical Conductivity
ECTRN	Environmental Criteria for Road Traffic Noise (DEC)
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ENCM	Environmental Noise Control Manual
ENMM	Environmental Noise Management Manual
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority (now NSW DEC)
EPBC Act	NSW <i>Environment Protection Biodiversity Conservation Act 1999</i>
EPHC	Environment Protection and Heritage Council (former NEPC)
EPI	Environmental Planning Instrument
ESD	Ecologically Sustainable Development
ESCP	Erosion and Sediment Control Plan
FM Act	NSW <i>Fisheries Management Act 1994</i>
FMA Act	NSW <i>Fisheries Management Amendment Act 1997</i>
FYRR	First Year Rate of Return
g/m <sup>2</sup>	Grams per Square Metre
GTLEP	<i>Greater Taree Local Environmental Plan 1995</i> (Greater Taree City Council 1995)
ha	Hectare
HC	Hydrocarbon
HLEP	<i>Hastings Local Environmental Plan 2001</i> (Hastings Council 2001)
HREP	<i>Hunter Regional Environment Plan 1989</i> (NSW DIPNR 1989)
HSC	Highway Service Centre
H:V	Horizontal:Vertical
ICOMOS	International Council on Monuments and Sites
INP	Industrial Noise Policy
IRR	Internal Rate of Return
kg/l	Kilograms per litre
km	Kilometre
km/h	Kilometres per hour
km <sup>2</sup>	Square Kilometre
LEP	Local Environment Plan
LALC	Local Aboriginal Land Council
LGA	Local Government Area
LOR	Level of Recording
LoS	Level of Service

Abbreviation	
LPG	Liquid Petroleum Gas
LRP	Lead Replacement Petrol
L/100 km	Litres per hundred kilometres
L/day	Litres per day
l/s	Litres per second
m	Metre
m <sup>2</sup>	Square metre
m <sup>3</sup>	Cubic metre
m/s	Metres per second
mm	Millimetre
MR538	Main Road number 538
MSDS	Material Safety Data Sheet
MVK	Million Vehicle Kilometres travelled
NAASRA	National Association of Australian State Road Authorities (now AUSTROADS)
NATROAD	National Road Freight Haulers' Association
NCREP	<i>North Coast Regional Environmental Plan 1988</i> (NSW DIPNR 1988)
NCUPS	<i>North Coast Urban Planning Strategy 1995</i> (NSW DIPNR 1995)
NEPC	National Environment Protection Council (now EPHC)
NEPM	National Environment Protection Measures
NHC	National Heritage Council
NHMRC	National Health and Medical Research Council
NO <sub>x</sub>	Nitrogen Oxides
NO <sub>2</sub>	Nitrogen Dioxide
NPV	Net Present Value
NPWS	NSW National Parks and Wildlife Service (now part of NSW DEC)
NRMA	National Roads and Motorists' Association Limited
NSW	New South Wales
O <sub>3</sub>	Ozone
OHS&R	Occupational Health, Safety and Rehabilitation
PAD	Potential Archaeological Deposit
PAH	Poly-Aromatic Hydrocarbon
PASS	Potential Acid Sulfate Soil
Pb	Lead
PER	Preliminary Environment Report
PFM	Planning Focus Meeting
PHPD	Pacific Highway Development Program
PN	Practice Note
PM <sub>10</sub>	Particulate Matter smaller than 10 micrometers in diameter.
PM <sub>2.5</sub>	Particulate Matter smaller than 2.5 micrometers in diameter.
POEO Act	<i>NSW Protection of the Environment Operations Act 1997</i>
ppm	Parts per Million
REP	Regional Environmental Plan
RCBC	Reinforced Concrete Box Culvert
RCP	Reinforced Concrete Pipe
RDG	Road Design Guidelines
RNE	Register of National Estate
ROTAP	Rare or Threatened Australian Plant

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Abbreviation	
RTA	NSW Roads and Traffic Authority
SEPP	NSW State Environmental Planning Policy
SFNSW	State Forests NSW (now part of NSW Department of Primary Industry)
SIA	Strategic Impact Assessment
SIS	Species Impact Statement
SIL	Soil Investigation Level
STP	Sewage Treatment Plant
SWMP	Soil and Water Management Plan
SWMS	Safe Work Method Statements
T44	44 Tonne (loading standard for vehicle bridges)
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TP	Total Phosphorous
TPH	Total Petroleum Hydrocarbons
TSC Act	NSW <i>Threatened Species Conservation Act 1995</i>
TSS	Total Suspended Solids
V	Speed in kilometres per hour
VIC	Visitor Information Centre
VMS	Value Management Study
VMW	Value Management Workshop
VOC	Vehicle Operating Cost
VoT	Value of Time
vpd	Vehicles per day
WHO	World Health Organisation
WIRES	Wildlife and Information Rescue Service
WMS	Works Method Statement
µm	Micrometre
µg/m <sup>3</sup>	Micrograms per cubic metre

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## Glossary

Term	Definition
AADT	Average Annual Daily Traffic volume representing the total traffic in both directions at each location, calculated from mechanically obtained axle counts.
AADV	Average Annual Daily Vehicles represents the average number of vehicles passing in both directions during a 24-hour period estimated over a period of one year.
Abutment	Supporting structure (column) at the end of a bridge or arch.
Acid sulfate soils (ASS)	Naturally acid clays, mud and other sediments usually found in swamps and estuaries. They may become extremely acidic when drained and exposed to oxygen, and may produce acidic leachate and runoff, which can pollute receiving waters and liberate toxins. ASS is classified as material, which is above the groundwater, is undergoing oxidation and has a pH of less than 4.0.
Afflux	The rise in water level immediately upstream of, and due to, an obstruction.
Aggregate	A coarse material, such as gravel, broken stone or sand, with which cement and water are mixed to form substances such as concrete and asphalt. Crushed stone is usually designated as coarse aggregate and sand as fine aggregate.
Alluvial	Pertaining to alluvium and fluvial processes.
Alluvium	Unconsolidated deposit of gravel, sand, mud etc., formed by water flowing in identifiable channels. Commonly well sorted and stratified.
Amenity	Natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence and cultural and recreational attributes.
Annual Exceedance Probability (AEP)	The chance of a flood of a given size (or larger) occurring in any one year, usually expressed as a percentage. For example, if a peak flood discharge of 500 m <sup>3</sup> /s has an AEP of 5%, it means that there is a 5% chance (i.e. a 1 in 20 chance) of a peak discharge of 500 m <sup>3</sup> /s (or larger) occurring in any one year.
Arboreal	To live in, or be connected with, trees.
Archaeological Site	A site is defined as any material evidence of past Aboriginal activity that remains within a context or place that can be reliably related to that activity. Usually a site classification requires a minimum of two detected artefacts.
ARI	Average recurrence interval refers to the average or expected period between exceedence of a flood.
Artefact	An object, normally portable, made or modified by human hand (see 'stone artefact').
Arthropod	A group of invertebrates, which have a segmented body and jointed limbs and an external skeleton (e.g. insects, spiders and crustaceans).
Avifauna	The birds, or all the kinds of birds, inhabiting a region.
Basal slope	The boundary between the bedrock slopes of Middle Brother Mountain and the Quaternary sediments of the Stewarts and Camden River Valleys
B-Double vehicle	Heavy transport vehicles that are 17.5 m to 36.5 m long, and have six or more axles in four groups. They are classified as Class 10 under the AUSTRROADS vehicle classification system.
Batter	The side slope of walls, embankments and cuttings or the degree of such slope.
Benefit Cost Ratio (BCR)	The ratio of the present value of benefits to the present value of costs of a project.
Bench	A level shelf of land interrupting a declivity (with steep slopes above and below).
Berm	A low earth fill constructed in the path of flowing water to divert its direction, or constructed to act as a counter-weight beside the road fill to reduce the risk of foundation failure.
Biodegradable	The ability of a substance to be broken down physically and/or chemically by natural biological processes, such as by being digested by bacteria or fungi.
Biological diversity (biodiversity)	The range and relative abundance of plant and animal life in a nominated area.
Biota	Animal and plant life characterising a particular region or flora and fauna collectively.

Term	Definition
Blackspot	An intersection, mid-block or short road section with a history of at least three casualty crashes over a five year period.
Box culvert	A culvert of rectangular cross section, commonly of precast concrete.
Broken-back culvert	When one or more changes of grade occur within the culvert profile.
Buffer	Something that lessens or absorbs an impact.
Bund	A wall preventing the escape of liquids into the environment.
Carbon dioxide equivalent (CO <sub>2</sub> eq)	A standard measure of total greenhouse gas emissions, which includes carbon dioxide as well as the global warming effect of greenhouse gases other than carbon dioxide (methane and nitrogen oxides), to facilitate comparisons, quantification and emissions trading.
CARTS model	Costing and Assessment of Regional Transport Systems model used for traffic modelling at a regional scale.
Cadastral	Information pertaining to lot boundaries.
Caisson	A large watertight chamber used for construction under water.
Carriageway	Portion of a road or bridge used by vehicles (inclusive of shoulders and auxiliary lanes).
Catch drain	A ditch or drain along the side of a hill to catch surface water.
CD (Collector District)	Collector Districts are the areas designed for use in census years for the collection and dissemination of Population Census data
Census	The enumeration of an entire population, usually with details being recorded on residence, age, sex, occupation, ethnic group, marital status, birth history, and relationship to head of household.
Chromatograph	An apparatus for analysing mixtures of compounds by separating them into individual components that can be identified by colour or other means.
Coffer dam	Temporary structure enclosing all or part of the construction area so that construction can proceed in dry conditions. A diversion cofferdam diverts a stream into a pipe or channel.
Conglomerate	A sedimentary rock composed of coarse-grained rock fragments, pebbles, or cobbles cemented together in a fine-grained matrix.
Conjugate fault	A fault or set of faults that are of the same age and deformation episode.
Consolidation	The gradual, slow compression of a cohesive soil due to weight acting on it, which occurs as water is driven out of the voids in the soil.
Crest vertical curve	A vertical curve having a convex shape in profile (when the road is viewed from the side).
Culvert	An enclosed channel used for the passage of surface water under a road or other embankment.
Cut	The material removed (excavated) from an embankment.
DA (Development Application)	A DA is a request for permission to carry out proposed development. Councils identify whether a DA is required and categorise the development as requiring consent, not requiring consent or prohibited development. Zoning of the site where development may occur determines which category a development proposal fits within.
dB (Decibel)	A unit used in the comparison of powers and levels of sound energy.
Demographic	Of or pertaining to population, especially in statistical terms.
Dispersion	The spatial property of being scattered about over an area or volume.
Diversion drain	A drain leading water away from a particular area.
Dogger	A person directly responsible for slinging and controlling the movement of loads by a crane if the loads are not usually at all times in full view of the crane driver.
Dual carriageway	A road with separated carriageways for traffic travelling in each direction.
Echolocation	The determination of the position of an object from the direction of an echo reflected from the object and/or the time taken for the echo to return.

Term	Definition
Ecologically Sustainable Development (ESD)	Development that maintains and improves the total quality of life. Development both now and in the future in a way that maintains the ecological processes on which life depends. Key components of ESD are intergenerational equity, maintenance of biodiversity, improved economic evaluation of environmental costs and benefits and the precautionary principle.
Ecosystem	A functional unit of energy transfer and nutrient cycling in a given place such as a forest or estuary; it includes all the relationships within the biotic community and between the biotic components of the system.
Emission	The release or discharge of a substance into the environment; generally refers to the release of gases or particulates into the air.
Ephemeral	Watercourse that flows after heavy rain, and dries up during fine weather.
Erosion	The wearing away of the land and removal of soil by running water, rain, wind, ice or other geological agents.
Eutrophication	A natural process where excess nutrients discharged to a waterway are consumed by phytoplankton such as algae and encourage algal growth. Algal blooms block sunlight. This often results in fish kills from extensive oxygen depletion.
Exudate	Non-cellular, natural raw material that is secreted by plants, either spontaneously or after wounding.
Fault	A fracture or zone of fractures in rocks of mappable size along which there has been displacement of one side relative to the other.
Fill	The material placed in an embankment.
First Year Rate of Return (FYRR)	A measure of the benefits achieved in the first full year of a scheme's operation. The FYRR is typically used to determine the best start date for a scheme.
Flag lighting	Lighting used for indication purposes only or to highlight localised conflicts.
Flocculant	A chemical that aids in the coagulation of small, suspended particles in water.
Floodplain	Valley floor flat adjacent to a stream that is flooded by the 'annual' flood (often considered to be the flood with a recurrence interval of about 1.6 years).
Frangible	Type of structure or vegetation that readily or easily gives way, breaks or uproots as a result of vehicular impact.
Geotechnical	Work relating to soil mechanics, foundation engineering, rock mechanics, engineering geology, hydrogeology and materials testing.
Geotextiles	A variety of fabrics made from recycled materials used in soil containment and stabilisation.
Grade separation	The separation of traffic so that crossing movements, that would otherwise conflict, are at different levels.
Greenhouse effect	The heating of the atmosphere by the absorption of infrared energy remitted by the Earth as it receives energy from the sun.
Groundwater	Water beneath the surface of the earth that saturates the pores and fractures of sand, gravel, and rock formations.
Habitat	The place where an organism lives, habitats are measurable and can be described by their flora and physical components.
Half diamond	A pair of on load and off load ramps connecting a major road to and from in one direction to an intersecting road.
Heterogeneity	Consisting of dissimilar constituents. In particular, spatial variation in physical attributes, such as grain-size, of a rock or sediment.
Hydraulic	Related to water and the flows and pressures within a connected water-containing system.
Hydrologic	Dealing with the properties, distribution, and circulation of water on the surface of the land, in the soil and underlying rocks and in the atmosphere
Interchange	A grade separation of two or more roads with one or more interconnecting carriageways.
In situ	In the original, actual or appropriate place

Term	Definition
Internal Rate of Return (IRR)	The discount rate at which the present value of project benefits equals the present value of project costs.
Isolated find	A single stone artefact, not located within a rock shelter, and which occurs without any associated evidence of Aboriginal occupation within a specified radius, such as 60 m (depending on which archaeological convention is used). This term is normally useful only in the context of surface archaeological survey results and subsurface testing results. Isolated finds may be constituent components of background discard, or indicative of obscured, remnant and disturbed sites.
Junction	A meeting of two roads.
Liming	Liming is the process of adding alkaline material to correct acidic soil. Materials include: wood ashes (strong and fast acting), ground dolomitic limestone (calcium magnesium carbonate), and ground calcitic limestone (calcium carbonate), which is also called lime.
Littoral	The shallow, shoreward region of a body of water sometimes inhabited by aquatic plants.
LoS	Level of Service, a qualitative analysis providing a means of determining the traffic-carrying performance of a road or any element of it under the prevailing roadway and traffic control conditions.
Luminaire	A complete lighting unit consisting of a lamp or lamps, the parts designed to distribute the light (housing), and any necessary starting components (such as ballasts and sockets).
Macroinvertebrate	Aquatic organism without a backbone (invertebrate) that can be seen with the naked eye (macro).
Macrophyte	Larger multi-celled aquatic plants (eg >10cm) with differentiation of tissue to form distinct stems and leaves/pinnules.
Median	A strip of road that separates carriageways for traffic in opposite directions.
Metalloid	An element intermediate between metals and non-metals possessing both metallic and non-metallic properties (e.g. arsenic).
Microhabitat	Localized areas within a community occupied by certain organisms because of microdifferences in moisture, light, and other conditions.
Net Present Value (NPV)	The present value of benefits less the present value of costs.
Nocturnal	Active at night.
Noise wall	A wall or barrier (noise barrier) erected to block or deflect noise.
Ozone	A type of pollution (when occurring in the lower atmosphere) produced when emissions of nitrogen oxides and hydrocarbons react in the presence of sunlight to form ozone and other oxidants.
Oxidation	The chemical process of oxygen combining with an element or compound (e.g. the oxidation of iron to form rust).
Perennial	Present at all seasons of the year.
pH	Acidity or alkalinity of soil or water. Expressed in logarithmic units either side of 7 which is neutral, <7 = acid, >7 = alkaline.
Photosynthesis	Process in which the energy of sunlight is used by organisms, especially green plants, to synthesize carbohydrates from carbon dioxide and water.
Piezometer	An instrument that measures pressure head or hydraulic pressures, often to determine elevation of a water table.
Pilecap	The uppermost portion of a pile, which acts to secure the piles in position and provides a bridge seat to receive and distribute superstructure loads.
Pit	A below ground level ('subsurface') testing location, either excavated by hand and sometimes referred to as a spade pit or shovel pit, or excavated by machine, such as with a backhoe or machine auger and sometimes referred to as a trench.
PM <sub>10</sub>	Usually airborne particulate matter less than 10µm (microns or one millionth of a metre) in diameter, a measure of dust.
PM <sub>2.5</sub>	Usually airborne particulate matter less than 2.5µm (microns or one millionth of a metre) in diameter, a measure of dust.

Term	Definition
Potential acid sulfate soil (PASS)	Defined as material below the groundwater which has not been oxidised and generally has a pH of greater than 4.0. The pH has the potential to become much lower when the soil is exposed to oxygen as a result of activities such as excavation and drainage.
Pro rata	In proportion
Pyrite	Sulphide of iron. A common ore containing about 53% sulphur and 46.7% iron. Oxidizes and reacts with water to form sulphuric acid.
Ramsar	A statutory designation adopted following an international conference, held in 1971 in Ramsar, Iran, which identifies Wetlands of International Importance especially as Wildfowl Habitat.
Relic	An antiquity that has survived from the distant past.
Rigger	A person directly in charge of: the initial work of erecting or placing in position the members of any type of structure other than scaffolding; dismantling or demolishing structures other than scaffolding; setting up cranes or hoists.
Riparian	Associated with riverbanks.
Rip-rap	A combination of large stone, cobbles and boulders used to line channels, stabilise banks, reduce runoff velocities or filter out sediment.
Scour	The action or product of a flowing liquid as it lifts and carries away the material on the sides or bottom of a waterway, conduit, or pipeline.
Scupper	An opening for drainage in a kerb, wall or parapet.
Sedimentation (or sediment) basin	Sedimentation basins are man-made depressions in the ground where runoff water is collected and stored to allow suspended solids to settle out and prevent them flowing into waterways.
Shotcrete	Mortar or concrete sprayed using compressed air onto a disturbed surface to stabilise against erosion.
Shoulder	The strip of land bordering the carriageway beyond the traffic lanes and constructed at the same level as the pavement surface. Used by traffic in emergencies.
Site integrity	The degree of post-depositional disturbance to a site.
Slip lane	An area of road for vehicles turning left or merging that is separated, at some point, from other parts of the road by a painted island or traffic island.
Sluicing	The use of water to separate pyritic particles from acid or potential acid sulfate soils.
Span	The distance between structural supports such as walls, columns, piers, beams, girders, and trusses.
Station	Distance along the road centreline in metres, measured from the starting point at the southern end of the Proposal.
Synclinal fold axis	A fold in rock layers that forms a trough-like bend. The axis of that fold is the line that links points of maximum curvature on that bend.
Quaternary	The geologic time period comprising about the last 1.65 million years.
T-intersection/T-junction	T-intersection means an intersection where two roads meet (whether or not at right angles) and one of the roads ends.
Terrestrial	Living or growing on land; not aquatic.
Toe drain	Located along the downstream toe of completed embankments, is in contact with bedrock and functions to intercept shallow seepage through the surficial soils and upward rising groundwater flow through the bedrock.
Tributaries	Rivers or streams flowing into a larger river or lake.
Turbidity	A condition in water caused by the presence of suspended matter, resulting in the scattering and absorption of light rays
Verge	Strip adjacent to and abutting the hard shoulder of a carriageway of a road - usually grassed.
Wetland	Land either permanently or temporarily covered by water. These areas are usually characterised by vegetation of a moist-soil or aquatic type.
Windrow	A long, narrow row of vegetation, debris, and some soil created during site preparation and clearing operations.
Wing wall	In bridge construction, an oblique retaining wall.