

Transport
for NSW

Guideline for landscape character and visual impact assessment

Environmental impact assessment practice note EIA-N04



About this release

Information

Reference number	EIA-N04
Title	Guideline for landscape character and visual impact assessment
Parent procedure	EIA-Practice Notes
Document version	Version 2.3
Date	8 June 2023

Location

File Name

Objective	Global Folder\RMS Global Folder\Environment\Procedures\Environmental Planning and Assessment Procedures\EIA-N04
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Approval and authorisation

Prepared by	Director, Urban Design Roads and Waterways
Approved by	Director, Planning, Policy and Assessment

Version	Date	Revision Description
1.0	24/03/2009	First issue
2.0	28/03/2013	First reissue
2.1	14/12/2018	Update reissue
2.2	21/08/2020	Update reissue as TfNSW document
2.3	8 June 2023	Update as Urban Design Roads and Waterways document

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Cover image—Windsor Bridge. This project was required to replace the old low level narrow bridge at Windsor. The work include the redesign of Thompson Square, new river viewing platforms formed from the old bridge abutments, new tree planting, a footway across the river and a creative design for the new bridge walls interpreting the historic flood levels. The bridge has been inundated several times in the short duration since it was finished and is unscathed. The landscape has also proved to be resilient and largely survived the powerful floodwaters.

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Summary points

- ▶ This practice note applies to all roads and maritime projects and concept plans for which Transport for NSW (Transport) is seeking determination or approval to proceed under Division 4, Division 5.1 and Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act). This practice note can also apply to any transport projects which require an assessment of landscape character impacts and visual impacts.
- ▶ The methodology contained in the practice note is also suitable to be used to guide corridor and network studies and inform options development and strategic concept design during a project's strategic assessment phase, and to guide preliminary environmental investigations.
- ▶ Landscape character assessment and visual impact assessment address both impact on the character and functioning of a place and the views within that place.
- ▶ Landscape character relates to the built, natural, cultural and community aspects which make a place unique.
- ▶ The purpose of landscape character and visual impact assessment is to improve design outcomes and avoid the negative impact of a proposal on a place. This is achieved by identifying and reporting on potential impact, and proposing mitigation to be fed back into the design process. It is not merely a reporting process.
- ▶ Landscape character and visual impact assessment is related to the urban design process described in *Beyond the Pavement* in that it addresses character and visual issues — two aspects of a good urban design outcome.
- ▶ Landscape Architects from the Registration Scheme for Construction Industry Contractors, experienced in landscape character and visual impact assessment and urban design, must be used to carry out assessment on proposals as part of a broader urban design investigation.
- ▶ To be meaningful, the assessment must be carried out concurrently and iteratively with the concept design process.
- ▶ Landscape character assessment is comprehensive, describes the qualities of a place and is used to inform design outcomes.

1 Introduction

1.1 The purpose of this document

This document has been prepared to guide the preparation of landscape character and visual impact assessments for road and maritime work in accordance with Beyond the Pavement. It relates to broader planning and design exercises and environmental assessment investigations which are undertaken iteratively to inform project teams about the effects of a proposal and it informs environmental approval processes defined by the *Environmental Planning and Assessment Act 1979* (EP&A Act). It sets down the terminology, process and methodology for assessment to ensure assessment is carried out consistently to a high standard, is properly integrated with other environmental and design effort and is also coordinated with the project management processes described in the Infrastructure Life Cycle Management System.

This document can also be used to assess the qualities of a place, using the landscape character assessment methodology, which is a requirement of the design process set down in Beyond the Pavement.

1.2 Audience for the document

The practice note is to be used by:

- ▶ Urban design, architecture, landscape architecture and planning professional service contractors engaged as part of multidisciplinary teams performing concept design and environment assessment for projects

- ▶ Those who will be appointing and working with the above professionals such as project managers and environmental assessment managers.

The practice note does not replace the need for professional involvement in the fields of landscape character and visual impact assessment. The Urban Design Roads and Waterways team can provide advice on the use of experts registered under the Registration Scheme for Construction Industry Contractors.

1.3 The purpose of landscape character and visual impact assessment

There are two main purposes of landscape character and visual impact assessment:

1. To inform the development of the preferred route or concept design so the proposal can avoid and minimise impact to places through which it passes. It must be commenced early in the project life cycle to achieve this goal and be integrated with the design process
2. To inform Transport, other agencies and the community about the landscape character impact and visual impact of the proposal and what avoidance, management and mitigation strategies have been and would be implemented if the proposal was approved.



Figure 1 Assessment should not be carried out in isolation from design. Design and assessment iteration leads to better design outcomes with lesser impact and fewer costly mitigation measures.

1.4 The difference between landscape character impact and visual impact

Environmental assessment for road and maritime infrastructure projects differentiates between landscape character impact assessment – the assessment of impact on the aggregate of an area’s built, natural and cultural character or sense of place and visual impact assessment – the assessment of impact on views.

Landscape character assessment helps determine the overall impact of a project on an area’s character and sense of place (what people think and feel about a

place and how society values it, whether or not they are physically present at it). Visual impact assessment helps define the day to day visual effects of a project on people’s views (what people see at a place, when they are there). The two assessments should be clear and discrete as it is likely the design responses and mitigation measures to address landscape character impact will be different to those for visual impact.

Landscape character assessment and visual impact assessment are equally important. This dual assessment helps differentiate options, improve route alignment decisions and improve design outcomes.



Figure 2 The difference between landscape character assessment and visual assessment.

Landscape character assessment sums up an area’s sense of place including all built, natural and cultural aspects, covering towns, countryside and all shades between. Visual assessment addresses people’s views of an area from their homes or other places of value in the community.

1.5 How assessment is integrated with urban design activity

Integration with an urban design approach

Urban design addresses how a project fits into an area, how it supports the local connections and how it contributes to the quality of the public domain. Beyond the Pavement describes a collaborative effort both within project teams and across the organisation to achieve this integrated engineering and urban design outcome.

Understanding landscape character and visual impact to meet our environmental impact assessment obligations shares direct commonalities with the broader Beyond the Pavement approach. By itself, landscape character and visual impact assessment measures and reports on how well the design fits into the built, natural and community landscape and how well it responds to what people see. It therefore provides important information to influence the design development of a project.



Figure 3 Landscape character and visual impact issues relate to the nine principles described in Beyond the Pavement. For a given project, the context as assessed using the methodology in this guideline will help determine the extent to which they apply to allow specific guidance to be developed.

Integration with urban design processes

For it to have greater meaning, landscape character and visual impact assessment is required to be carried out early and in parallel with other areas of environmental assessment so collectively they can iteratively feed back into the design development process — a proposal where impact has been identified early enough for it to be ‘designed out’ is inherently superior to one which needs mitigation.

The diagram on the following page shows the relationship between concept design and the landscape character and visual impact assessment tasks described in this practice note. It illustrates the iterative nature of design and assessment and how good design can avoid and minimise impact.

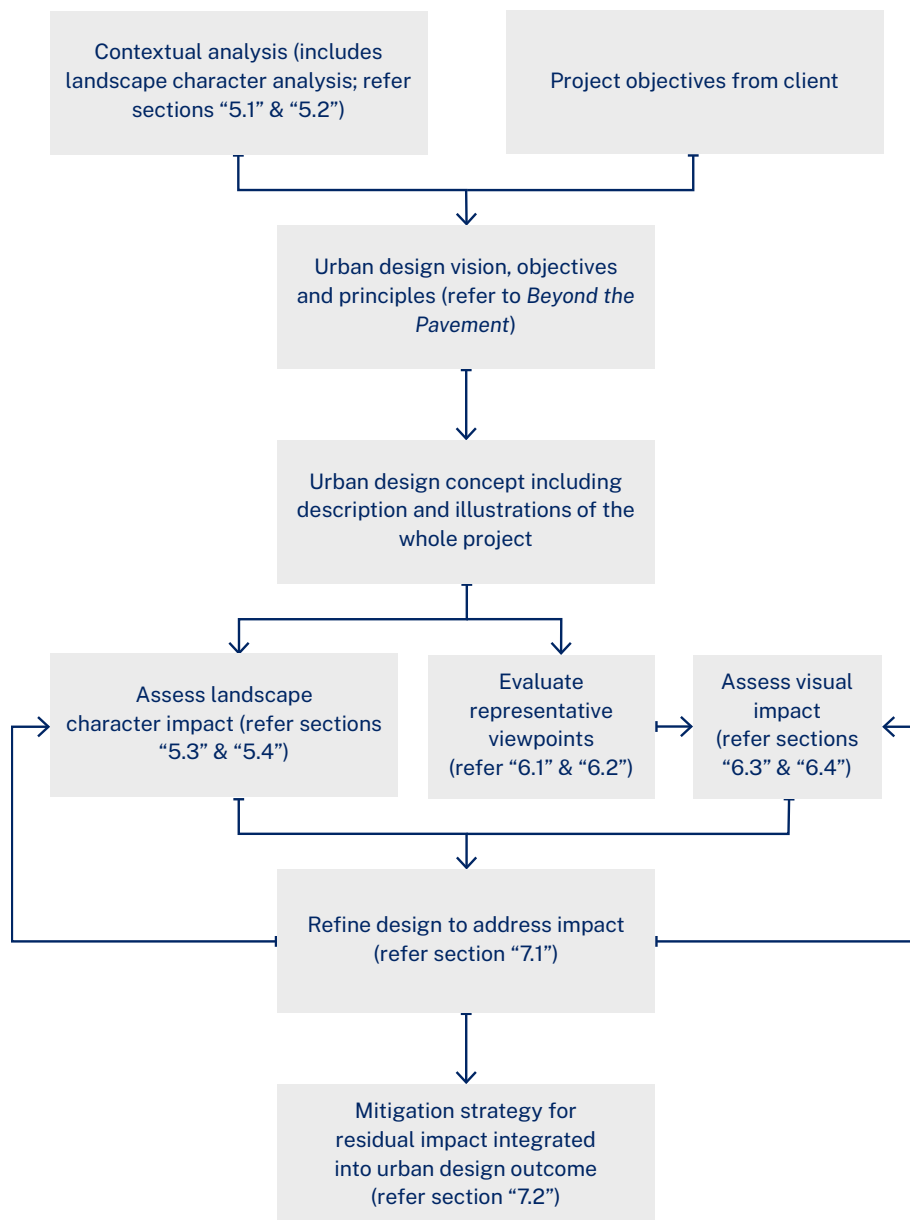


Figure 4 The relationship of assessment to project development.

The assessment tasks are not separate to the design process but should be used to continually improve a project as it develops. Consequently a single urban designer contractor, integrated into the project team, is to be engaged to carry out the landscape character and visual impact assessment as a combined task with the urban design engagement to facilitate integration and cost efficiencies. For example:

- ▶ Landscape character and visual impact assessment reports on impact, provides feedback into concept design development and sets strategies for ongoing design development
- ▶ Impacts from other aspects of the environmental assessment may be avoided or minimised through a landscape architectural response, such as using vegetation to recreate a setting and sense of separation to a heritage item whose curtilage is affected by widening, or using mounds in conjunction with planting instead of walls for noise mitigation whilst simultaneously reducing an earthworks imbalance
- ▶ The analysis of landscape character and views also informs the contextual analysis stage of the urban design process.

Standard brief templates reflect this nature of a single engagement.

2 Terminology

There can be confusion if consistent terminology is not applied. For example the words view, visual, visibility, aesthetics, character, urban design and landscape all have distinct meanings yet are often used in an interchangeable way in different studies or reports. The following list of definitions should therefore be followed in the landscape character and visual impact assessment process.

Table 1 Terminology

Term	Meaning
Aesthetics	Relating to the sense of the beautiful or science of aesthetics, ie the deduction, from nature and taste, the rules and principles of beauty.
Desired future character	A term used to capture the desirable future outcome or vision for an area as set down in planning documents or as professionally assessed and envisaged by urban designers or other built environment professionals.
EIA	Environmental impact assessment
EIAG	Environmental Impact Assessment Guidelines
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
Impact	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition.
Impact Assessment	Broadly, the process of describing and characterising the expected effects of a proposal. In the context of an EIS or REF, impact assessment will also lead to the identification of mitigation measures and safeguards which would be addressed if the proposal were approved.
Landscape	All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure.
Landscape architecture	A profession involved with the assessment, design and management of the built and natural environment.
Landscape character	The combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place.
Landscape character zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby.
Landscape character type	Multiple similar landscape character zones repeated within a larger study area, grouped to avoid repetition in their description.

Term	Meaning
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.
Place	<p>A 'Place' is an area of the landscape of any size, that has a certain unique quality relating to the natural, built, cultural or community context, with a clear identity and 'sense of place'.</p> <p>Places can exist within other places, such as town or village centres; precincts; or destinations that attract and encourage people to congregate and interact.</p>
PSC	Professional Service Contractor
REF	Review of Environmental Factors
SEARs	Secretary's Environmental Assessment Requirements, the environmental assessment requirements of the Secretary of the Department of Planning and Environment for State Significant Infrastructure projects. The SEARs for road and maritime infrastructure projects will normally include specific requirements for landscape character impact and visual impact.
Sensitivity	The sensitivity of a landscape character zone or view and its capacity to absorb change of the nature of the proposal. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measurement of impact.
Significant	In the context of EIA, after analysing the extent (type, size, scope, intensity and duration) and nature (predictability, resilience of the environment, reversibility, ability to manage/mitigate, level of public interest) of a proposal, an expected level of impact of a proposal which requires an EIS to be undertaken. The term should be avoided in landscape character and visual impact assessments if the expected level of impact is below this threshold.
Urban design	Urban design in Transport is the process and product of designing projects so they: fit sensitively with the built natural and community environment; contribute to the functioning of the community; and contribute to the quality of the public domain for the community and road users. Architects, engineers, environmental experts, landscape architects, planners and urban designers are all involved in urban design. Urban designers are generally landscape architects and architects who have extended their expertise into the field of urban design.
VEM	A Visual Envelope Map, also referred to as 'viewshed' or 'visual catchment', is the area within which a project can be seen at eye level above ground. Its extent will usually be defined by a combination of landform, vegetation and built elements.
View	The sight or prospect of a landscape or scene.
Visibility	The state or fact of being visible or seen.
Visual impact	The impact on the views from residences, workplaces and public places.

3 Level of assessment

The level of detail in the assessment should be tailored to the level of broader environmental assessment and the specific needs of the project. The project manager should contact Urban Design Roads and Waterways before commencement of Environmental Assessment to confirm the level of assessment required.

The need for a landscape character impact assessment to be completed in addition to a visual impact assessment may be determined by factors other than project

scale, such as whether the project is situated in an environmentally sensitive location, whether the proposal would cause a reduction in accessibility to a section of the community or whether the proposal was unique or innovative and therefore unable to be easily benchmarked.

As a general guide, the following table indicates the level of landscape character and visual impact assessment which correlates with environmental assessment processes throughout the project lifecycle.

Table 2 Level of landscape character and visual impact assessment in environmental assessment

Type Of Investigation/ Environmental Assessment	Level Of Landscape Character and Visual Impact Assessment Required	Examples
Strategic Investigation		
Preliminary environmental, sustainability and planning investigation (PESPI), other planning or strategic investigations undertaken outside a formal EIA process	Broad landscape character analysis (an overview of steps 5.1-5.2) to influence the design investigations and assist in identification of the relevant EIA pathway. May also include preliminary landscape character impact assessment (steps 5.1-5.4) to allow relative consideration of options.	Strategic route options investigations or corridor selection studies, strategic concept design investigations. Network and corridor studies.
Concept Design		
State Significant Infrastructure (Division 5.2 of the EP&A Act)	<p>For all State Significant Infrastructure projects a detailed landscape character and visual impact assessment (sections 5 and 6 of this guideline) should be carried out.</p> <p>The Secretary's Environmental Assessment Requirements issued for a project may require a detailed assessment of particular issues relating to landscape character and visual impact.</p> <p>The SEARs will also normally include a requirement to assess impacts during both construction and operation.</p> <p>Landscape character assessment is concerned how an area may be transformed as a result of a project. It will be hard to undertake a meaningful construction phase landscape character impact assessment and it should be avoided.</p> <p>While visual impact during construction may be hard to evaluate due to it being contingent on the actual methodology adopted by a contractor, an assessment should still be prepared incorporating as much information as possible from what is known, augmented by precedents if necessary. Safeguards should be prepared which cover situations which can't be evaluated until later in the project timeline.</p>	<p>Significant projects such as motorway proposals.</p> <p>Projects with proximity to or potential impact to environmentally sensitive areas such as a heritage bridge replacement.</p>

Type Of Investigation/ Environmental Assessment	Level Of Landscape Character and Visual Impact Assessment Required	Examples
Project Review of Environmental Factors (Division 5.1 of the EP&A Act)	For activities requiring a Project REF (may include dual carriageway upgrades, bus priority projects, major river and coastal bridges, town bypasses and interchanges) a detailed landscape character and visual impact assessment (sections 5 and 6 of this guideline) should be carried out.	Road upgrades in growth areas. Congestion management programs along a corridor. Sydney Harbour wharf upgrades. Iconic pedestrian bridge.
	For activities under Division 5.1 requiring a Project REF of a smaller scale than those described above (including but not limited to new overbridges, single carriageway upgrades, intersections and new ramps) a visual impact assessment only (section 6 of this guideline) should be carried out, tailored to match the scale and complexity of the project.	Smaller individual congestion management projects. Standard pedestrian bridge project.
Development application (Division 4 of the EP&A Act)	The proposal should be discussed with Urban Design Roads and Waterways and the project's lead environmental advisor as to the level of assessment to be undertaken.	Corporate real estate proposals, advertising signage.
Minor Works Review of Environmental Factors	For activities requiring a Minor Works REF, refer to the Minor Works REF Template (EIA-P05-G01-T05) checklist, particularly at part 3 under the headings 'Trees' and 'Landscape Character and Visual Amenity', replicated in Appendix B, to assess whether the work requires landscape character and visual impact assessment and mitigation.	Smaller congestion management projects. Maintenance projects involving potential prominent activity such as slope stabilisation or vegetation management. Variable message signs.
Delivery Readiness/Delivery		
Detailed Design and Construction	The commitments made during concept design, captured in an EIA document will need to be addressed.	Introduction of transparent noise wall panels to retain views; early planting work to establish screening.

4 Methodology

4.1 How to measure landscape character impact and visual impact

The landscape character impact and visual impact of the proposal should be separately assessed. The method to measure impact is based on the combination of the **sensitivity** of the existing area or view to change and the **magnitude** (scale, contrast, quality, distance) of the proposal on that area or view.

Sensitivity

Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. For example a pristine natural environment is likely to be more sensitive to a change of the nature of a four lane motorway than a built up industrial area. The design quality of the proposed development does not make the area less sensitive to change but instead affects the magnitude of the impact as described following.



Figure 5 Examples of sensitivity

Above, the town centre area of Wyong, where the local community relies on the proximity and ease of connection of the rail station and the commercial centre either side of the Pacific Highway, is more likely to be sensitive to a change of the order of a four-lane duplication than the highway further north where wide setbacks and the prominence of the existing road infrastructure would be largely replicated in the design. Below, the parkland/bushland setting of the Wollie Creek valley could be considered more sensitive to a change of the nature of a tunnel ventilation outlet than the Artarmon industrial area.

Magnitude

Magnitude refers to the physical scale of the project, how distant it is and the contrast it presents to the existing condition. For example a large interchange would have a very different impact on landscape character than a localised road widening in the same area. A more distant bridge would have a lesser magnitude than one nearer to

residents. A vegetated embankment facing a parkland would have less contrast than a retaining wall in the same location.

Magnitude will also need to consider cumulative impact, which is a consideration of the result of the incremental impact of the proposal when added to other past, current and known likely future activity.



Figure 6 The upgrades on the Princes Highway at Gerringong and Victoria Creek further south have very different magnitudes of impact.

As well as physical scale, magnitude considers issues of contrast with the existing area and design quality. The top alignment of the retaining wall at Gerringong reflects the adjacent landform and therefore has a lesser magnitude of impact than if it was stepped. Similarly the alignment and earthworks at Victoria Creek blend with the existing topography more than a straighter, flatter alignment.

4.2 Evaluating impact

The combination of sensitivity and magnitude will provide the rating of the landscape character impact for a project or individual character zone, or visual impact for individual viewpoints as shown in Figure 7 below. To be meaningful, the rating must also be accompanied by a description of the factors of both sensitivity and magnitude which have influenced that result.

For the purposes of assessment, the basic project concept – its location, the vertical and horizontal alignment and overall three dimensional form of the road, heights of cuttings and fill embankments, the location

and form of bridges and walls, vegetation and planting after two to three years of growth – should be assessed. A judgment must be made as to the quality and extent of the design solution in assessing magnitude and thus overall impact. Assuming the very highest quality design outcome will be achieved and therefore determining a low impact could be unrealistic and misleading. However it is equally misleading to determine impact based on the worst outcomes. A balance must be found, using the the advice in *Beyond the Pavement*, existing urban design guidelines and a standard achieved in other agreed benchmark projects to underpin the assessment.

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
		Negligible	Negligible	Negligible	Negligible

Figure 7 Landscape character and visual impact rating matrix.

Where sensitivity or magnitude can't be identified using objective measures such as existing character studies, provisions in planning statutes or relevant precedents from equivalent projects, Transport relies on the professional expertise of its urban design contractors to make assessments about sensitivity and magnitude of a proposal. Where a contractor further quantifies sensitivity and magnitude by use of characteristics such as time of exposure or number of viewers for a visual impact assessment, it should be made clear these further characteristics form part of the contractor's methodology and are not an explicit requirement. Care must be taken when using further characteristics to ensure the basic factors of sensitivity and magnitude assessment still underpin the assessment and the assessment is still able to be understood by a diverse readership.

As well as rating individual character zones and viewpoints, a conclusion to the assessment should be given which summarises the overall impact of the proposal and the broader urban design study more generally.

Implications of higher ratings

A landscape character assessment or visual impact assessment containing a predominance of high or high-moderate ratings does not automatically mean that the proposal should not be approved. However it identifies to the project team that there are issues with the proposal which need further investigation prior to concept design being finalised. Project Development Managers should consult their Environmental Representative to determine any implications that high ratings may have on planning approval pathways.

Particularly if the ratings are identified early enough in the iterative process described at "Figure 4", this allows time for alternative design solutions which avoid or reduce the impact to be explored. If design alternatives have been exhausted and the residual impact of the proposal is still elevated, it is important for the EIA documents to be clear about the overall benefits that it would provide to the community despite this impact, so that the approver of the proposal can make an informed decision.

4.3 Mitigation

The residual adverse impact identified in the assessment would then be mitigated where possible, with the mitigation measures integrated into the concept design. This provides a more transparent approach differentiating between concept design work to avoid impact and mitigation work to minimise impact. Impacts which by their nature can't be mitigated until detailed design or construction should be carried forward as safeguards or management measures in the main body of the EIA document.

A proposal which has inherently high ratings would also be likely to contain more stringent safeguards and mitigation measures which require communication to project delivery managers who will be responsible for detailed design and construction.

5 Landscape character impact assessment tasks

5.1 Understand and analyse existing landscape character and its sensitivity

Based on desktop and field analyses, the existing character of the area under investigation should be assessed. The analysis should be descriptive, illustrative and capture the qualities of the place, what makes it valued and what are the particular challenges which emerge in relation to the needs of the project. The analysis should cover the following characteristics and their combined effect, tailored to the project's location and scale:

- ▶ The geological quality of an area – whether it is rocky, alluvial, has deep or thin soils etc
- ▶ The topographical qualities of an area – whether it is hilly, rolling, flat, mountainous etc
- ▶ The natural drainage of an area – the rivers, creeks, lakes and how these affect character
- ▶ The ecological characteristics and land cover of an area – whether it is forested, wetland, scrub, grass etc and the quality and type of cover and dominant flora species
- ▶ The agricultural qualities of an area and how these contribute to character – for example dairy/cane farming, forestry, wheat, and the types of field boundaries and farm structures
- ▶ The Aboriginal and non-Aboriginal heritage and cultural qualities of the area whether they are formally designated in planning documents, including the presence of individual items and broader conservation areas or instead aren't listed but reflect local traditions around community, cultural practice, stories, prior occupancy and significant events
- ▶ The planning designations of an area relating to landscape character (including desired future character), including listing on registers of significant places, whether international, federal, state or local
- ▶ If available, the conclusions of the 'Movement and Place' assessment of the road corridor carried out prior to the commencement of the project.
- ▶ How the settlements (farms, villages towns cities) fit into their natural setting and topography
- ▶ The built form of the towns and cities, the composition of buildings, open space, civic and business areas and transport networks
- ▶ The character and quality of parks and other open space throughout the area
- ▶ The contribution of green infrastructure and vegetation including the prevalence and nature of trees, shrubs and groundcover, and the significance of individual trees or groups of trees including their contribution to canopy cover
- ▶ The main cultural and recreational elements of an area – the parks, popular walks, meeting places, community features and cultural icons
- ▶ The demographics of an area and how that extends to influence aspects of character
- ▶ The style of architecture, the materials, forms, historical mixes and design qualities
- ▶ The infrastructure environment – the scale and pattern of rail, footpaths, roads, active transport, bridges, electricity pylons, dams etc. and the style and form of boundaries, fences, walls, lighting and other associated infrastructure elements
- ▶ Major economic or industrial features such as factories, quarries, business parks etc
- ▶ The spatial qualities of an area – how enclosed or open it is, as defined by ridge lines, vegetation and built form
- ▶ Characteristics which may be harder to objectively define but still would be important in understanding how a place is valued such as sensory aspects of a place (for example its scenic quality, the prevalence of particular sounds or smells); the spiritual aspects of a place
- ▶ If relevant, how the area changes daily and seasonally – whether there is substantial night time activity, whether there are peaks which coincide with holiday periods or the dominant climatic conditions.

The analysis should be ordered so that characteristics which influence one or more other characteristics appear earlier in the text. For example geology will influence topography and soils which in turn will influence ecology.

The analysis should include a discussion of sensitivity of the areas landscape character, ie the inherent capability of the area to absorb change of the order of the proposal, and the rationale for the rating of sensitivity given.

Objective measures should extend professional judgment when describing sensitivity where possible, for example an area's listing on the UNESCO world heritage register would likely correlate with a higher level of sensitivity. Similarly, any feedback from community consultation over the life of a project should inform the assessment.

The assessment should be consistent with and coordinated with other specialist studies being prepared to support the development of the concept design and the environmental assessment. Duplication and repetition of content should be avoided and relevant information from other studies must be synthesised so as to focus on landscape character considerations.

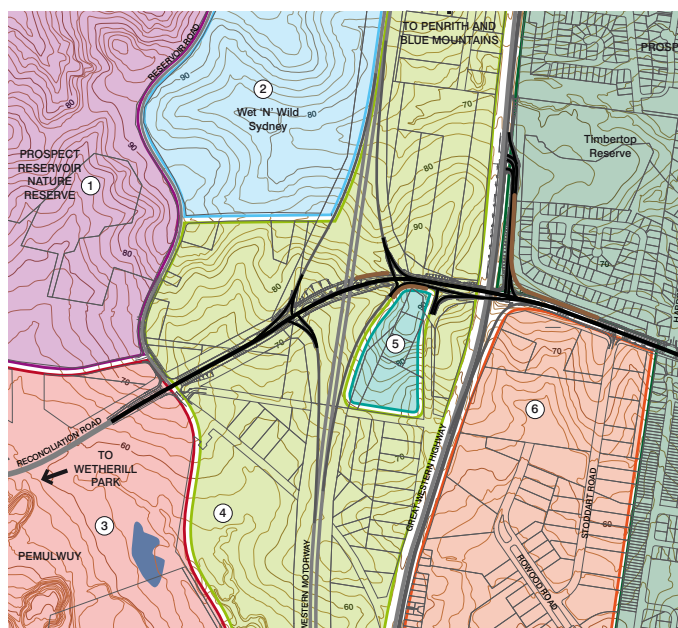
“Figure 4” on page 4 shows the landscape character assessment occurring as early as possible, so areas of high sensitivity can be considered adequately when developing the concept design response.



Figure 8 Landscape character should describe the natural setting, the human intervention and shaping of that setting — including the settlements within it — and the interaction between place and community. It applies to both rural areas and built up areas. These two aerial images show different urban and rural contexts but they are both landscape.

5.2 Identify landscape character zones

If required to enable assessment because of the size or complexity of the project, the study area should be broken down into different character zones of broadly homogenous characteristics or strongly defined spatial qualities. For example ridgelines often divide the character of the landscape, built areas have a different character to rural areas and river landscapes differ from coastal landscape types.



If they are highly sensitive or prominent, it may be desirable to treat heritage areas or items as a discrete character zone.

The purpose of dividing the area into character zones is to make the assessment process easier to understand, more accurate and context sensitive.

Where a study area contains many landscape character zones which are identical to each other but physically separate, it may be useful to describe them as instances of a single landscape character type to avoid repetition.

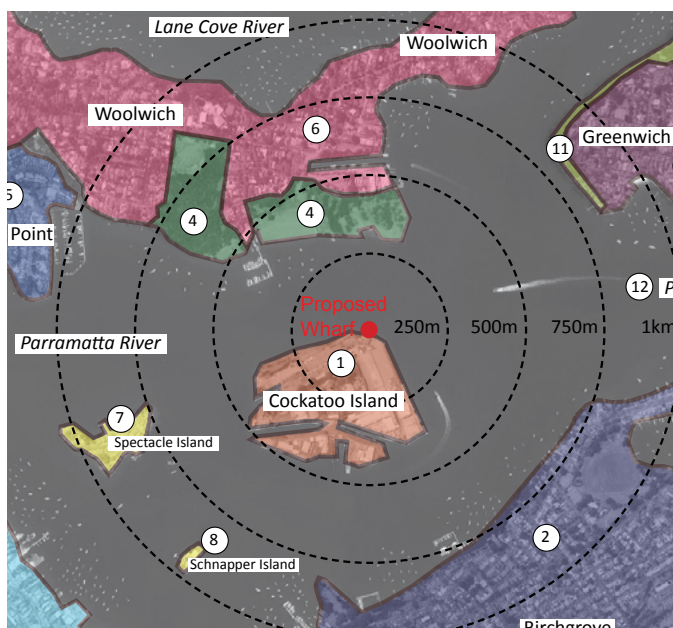


Figure 9 Areas of the landscape can be divided into character zones.

Dividing the landscape into zones (where appropriate) can help in improving the design for each zone and provide a more accurate assessment of the impact on different places.

5.3 Determine the magnitude of impact

The magnitude of impact of the proposal should be assessed for each character zone identified in the study area, using the assumptions about quality described in section 4.2. When describing the reason behind a rating, it is important to avoid merely repeating the list of elements which the proposal comprises, but rather it should be a relative assessment so the change from what presently exists can be understood.

5.4 Assess landscape character impact

The impact of the proposal on each character zone should then be assessed. Impact should be based on both the sensitivity of the character zone and magnitude of the proposal in that zone. More than just using the matrix in “Figure 7” to determine an overall rating in a character zone, a professional analysis should be provided which explains the justification for the assessment.

The impact identified in the assessment would be avoided and minimised where possible through refinement of the concept design before its finalisation as described in section 7 of this document.

As stated in section 4.2, for the purposes of assessment, the basic project concept should be assessed. Assessing landscape character impact of the basic unadorned concept design provides a more transparent approach, differentiating between concept design work to avoid impact and mitigation work to minimise impact.

LANDSCAPE CHARACTER ZONE		SENSITIVITY	MAGNITUDE	LANDSCAPE CHARACTER IMPACT
LCZ 1	EASTERN CREEK FLATS	Low <ul style="list-style-type: none"> This generally flat landform gently slopes towards Eastern Creek. The road corridor is generally open with minimal roadside planting, except at Eastern Creek, which is closely bordered by woodland. A variety of residential, commercial and agricultural properties adjoin the road corridor with varying setbacks. 	Low <ul style="list-style-type: none"> The proposed works within this zone duplicate the existing road condition, with works limited to expansion of the road corridor to the north. While the project will result in a larger road surface, the existing mixed-use semi-rural character of the landscape is expected to remain relatively similar. 	Low <ul style="list-style-type: none"> Roadside vegetation clearing will likely reveal similar landscape conditions adjoining the new road corridor boundary. The existing crash barrier located between eastbound and westbound lanes will be replaced with a landscaped median.
LCZ 2	UNDULATING RIDGE	Moderate <ul style="list-style-type: none"> This undulating landform has a strong relationship with the character of the adjoining Parklands. The road corridor provides an elevated spatial experience with open views intermittently screened by woodlands adjoining the road corridor. The corridor is predominantly bounded by agricultural properties. 	High <ul style="list-style-type: none"> The proposed works will have the greatest impact on the study area in this character zone. Localised changes in landform will alter the relationship between the road corridor and the adjoining Parklands. Stands of Cumberland Plain Woodland, an Endangered Ecological Community, will be impacted by the project. 	Moderate - High <ul style="list-style-type: none"> Revegetation along the boundary of the new project corridor will provide the opportunity to re-establish the Cumberland Plain Woodland vegetation community. Accent planting at the new Ferrers Road intersection will enhance the perception of a 'gateway' to the Urban Farm Precinct at this location.

Figure 10 Extract of a tabulated assessment of landscape character impact from The Horsley Drive Upgrade



Figure 11 It is important to assess the landscape character impact of the basic concept design rather than an assumed level of finish and design quality. In these examples, at the Eastern Distributor and the Great Western Highway at Wentworth Falls, the impact would be based on the form of the road in cutting rather than the finished architectural solution. However as these are good NSW benchmarks it would now be reasonable to assume approaches such as the unified approach to the built elements and the integration of landscape would be applied.

6 Visual impact assessment tasks

6.1 Identify the extent of visibility of the proposal

The extent of the area the proposal will be visible from should be defined. To do this a visual envelope map (VEM) should be produced, illustrating the likely visual catchment of the project. The visual catchment should be primarily related to existing landform, however a description of the obscuring effect of vegetation and buildings should be included if appropriate.



Figure 12 Examples of visual envelope maps, from the Sydney Airport North Precinct project and the Clarence River Crossing at Grafton

6.2 Identify existing viewpoints and their sensitivity to change

In consultation with the project team, a schedule of representative viewpoints within reasonable distance of the project and within the visual catchment should be developed. These should include residential properties (grouped into areas if appropriate), public buildings (eg schools, places of worship, libraries, museums, galleries), public spaces (eg parks, plazas, popular walks, meeting places), heritage items, businesses (eg hotels, restaurants, offices) and the corridor itself. If a viewpoint can't be physically accessed (eg because it is located on private property or on unsafe terrain) a view from the nearest accessible point should be taken, and this noted in the text.

Selected viewpoints should be rated as to their sensitivity to change of the order of the proposal. Visual sensitivity refers to the quality of the existing view and how sensitive the view is to the proposed change. Visual sensitivity is related to the direction of view, the composition of the view and may cross more than one character zone. While it may be also important to assess length of exposure to a particular viewpoint as a factor of sensitivity, it is important to recognise whether a view is particular to an identifiable location (such as a vista across the corridor from a resident's living room) or representative of a situation which exists across a broader length (such as the experience of a motorist along a length of corridor of a consistent treatment).

6.3 Determine the magnitude of change for each viewpoint

Magnitude refers to the form — scale, size, character — of the project and its proximity to the viewer. For example, a development situated one kilometre from the viewpoint, will have a much reduced visual effect than one 100 metres away. A four metre tall retaining wall will have a greater effect than one which is two metres tall when viewed from the same location. The consideration of overshadowing during the day and lighting at night may also be a considerations of magnitude.

The consideration of magnitude should only be based on the amount of change which can be inferred within a particular viewpoint. If it becomes necessary to discuss elements outside that viewpoint an additional viewpoint should be added.

A description of the effect of the proposal may be sufficient to explain the level of magnitude determined. It may be also be useful to mark up a photograph or use photomontages or animations to illustrate the proposed change in its setting. Illustrations must be realistic and present the likely outcome rather than the desired 'ideal' outcome. In many cases sketches portray a more flexible appearance allowing changes to occur throughout the road development process, whilst photomontages may be necessary to give surety in a particularly sensitive location. Again, the assessment should be deeper than just a description of the project elements.



Figure 13 Use of a marked up photograph and photomontage to illustrate proposed changes underpinning a determination of magnitude.

6.4 Assess visual impact

The impact of the proposal on each viewpoint or group of viewpoints should be assessed. Impact should be based on a composite of the sensitivity of the view and magnitude of the proposal in that view (see “Figure 7” for grading values).



Figure 14 Assessing the visual impact of the basic concept design.

A realistic impact should be ascribed based upon the cutting in its early stages of revegetation or with the possibility of the need for stabilisation work, rather than the assumption it will be clean exposed rock, or densely vegetated.



Figure 15 Visual impact assessment should include the effects of lighting and overshadowing.

The assessment of visual sensitivity and magnitude and the combined visual impact should be set down in a comprehensive schedule or table with descriptions and photographs to justify all analysis and conclusions.

View	Description of setting	Sensitivity of view ^[1]	
A01	Looking south towards project from north abutment of Alford's Point Bridge	H	Sensitivity of view is determined by bushland setting with little
A02	Looking south from within project from approximate Chainage 200	H	Sensitivity of view at this location is mainly from vegetation and sandstone cutting on western verge.

View	Visual Sensitivity ^[1]	Element of project visible	Nature of Impact ^[2]	Magnitude of Visual Effect ^[1]	Summary	Resultant rating of visual impact ^[1]
A01	H	Widened carriageway commencing at merge at end of bridge	A	G	Distance to works makes impact negligible at this location	G
A02	H	Widened carriageway, median barrier and barrier to shared path, potential noise barrier and associated screen	A	L	Vegetation and sandstone cutting on western verge are unaffected by proposal. Potential noise barrier in distance on western verge would increase level of	M

Figure 16 Extract of schedule of viewpoints presented at two stages: initial analysis and then impact assessment for the Alford's Point Road Southern Approach project.

7 Integrating impact assessment with project design to mitigate impacts

7.1 Refine the concept design to avoid and minimise adverse impact

Once an early understanding of the likely impact is established, feedback must be provided to the project design team so measures to avoid or minimise it can be

explored at an early enough stage to influence options assessment and concept design. *Beyond the Pavement* and associated guideline documents describe how an urban design approach can improve the project's response to impacts, whether they are direct landscape character or visual impacts or ones more closely associated with other disciplines.

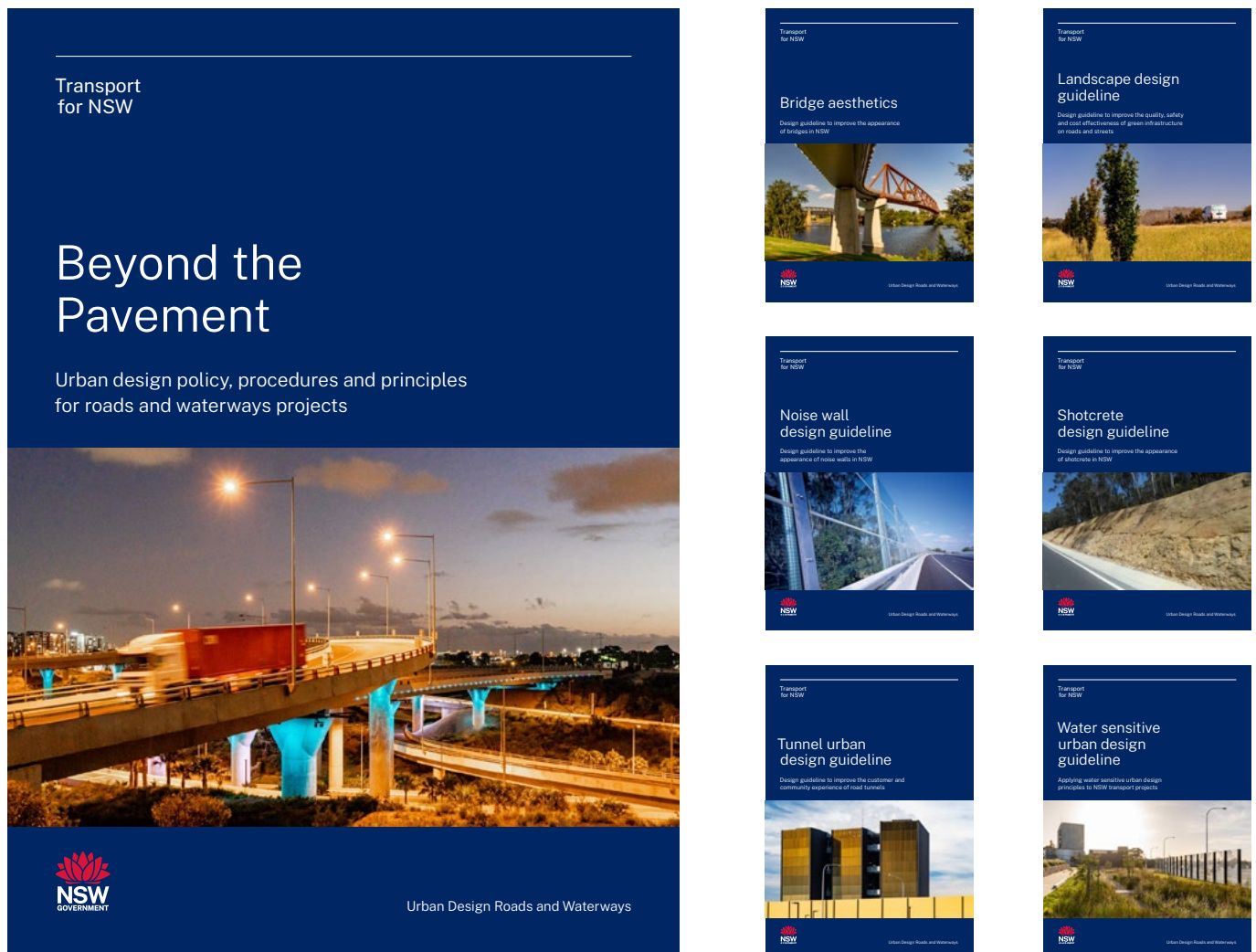


Figure 17 *Beyond the Pavement* and the associated urban design guideline documents should inform the whole design process from options to implementation.



Figure 18 The difference between avoiding and mitigating impact.

For the bypass of Albury, the road alignment at the bottom of the hill and in redundant land alongside the rail line helped avoid landscape character and visual impact. The residual noise impact and the impact of crossing the road still had to be mitigated but the mitigation measures of walls and bridges were well designed and integrated architecturally with the whole project.

7.2 Develop a strategy to manage landscape character and visual impact

In collaboration with the design team, develop a strategy and principles to mitigate landscape character and visual impact during detailed design and construction. Report on any impact already avoided or minimised in the concept design process. Refer to *Beyond the Pavement* guideline documents on landscape, shotcrete, noise walls and bridges. The mitigation measures may be adopted as safeguards and management measures in the REF or EIS or may be opportunities for investigation by detailed design teams.

A mitigation strategy can range from a series of measures to screen visual impact such as planting or mounding to particular design techniques to help integrate the proposal into its setting and make it visually attractive instead of jarring. All mitigation measures must be integrated with the overall design of the project.

If appropriate it is important to address the higher more concerning impacts explicitly in the mitigation strategy so it is clear what special efforts are being made.



Figure 19 Mitigating impact through good design.

Producing a good design outcome can turn a project with a major impact into a project which has a lesser impact or is a positive outcome. In the example on Tarban Creek Bridge above, a basic solution has been transformed by design into an outcome which is more respectful of the bridge and its setting and has helped gain community approval. For the Central Coast Highway, a methodology to retain trees which would otherwise be removed using low sandstone blocks was developed during the design phase, which was then employed where the opportunity was found during construction.



Figure 20 The value of endemic species in vegetative screening.

Native species grow quickly, are hardy, tuned to the local climate and contribute to local biodiversity. This area, seeded less than two years before this photograph was taken, is now established and quickly developing into a valuable contribution to the forest.

7.3 Combining landscape character and visual impact assessment with urban design reporting in environmental assessment documents

The concept urban design report will normally form a working paper to form part of the broader environmental assessment. Reporting on design activity provides transparency to those evaluating a proposal, the public and those responsible for taking a concept design into delivery about the rationale behind a scheme as well as the expected impact it will have. Therefore the information it contains should be structured to be consistent with the main body of the EIS or REF and other working papers.

A high degree of integration between design team and environment assessment teams is needed, together with quality document control and review. The author of the urban design report should review the summary of the urban design response, landscape character impact and visual impact contained in the main body of the EIA document to ensure there is consistency between the two documents. A report may have a diverse readership, therefore it should be written in language which is clear and free from jargon. Reports are more likely to be accessed electronically over the internet therefore they should be of optimal length and file size.

The report should present the following information and must follow the order listed:

a. An initial description of the existing situation

This will include a study methodology, the agreed project objectives and project description as found in the introductory chapters of the EIA main body and a contextual analysis of the study area incorporating the landscape character analysis described at sections 5.1 and 5.2.

For more complex projects, introductory statements should be preceded with an executive summary.

For reports forming part of an EIS, the introduction should include a list of the relevant SEARs and indicate where in the report each one is addressed.

b. A description of the proposal and its impact

The description of the proposal should commence with the overall vision, objectives and principles which underpin the subsequent way the design has progressed. The major physical design responses should then be described and illustrated, from general project-wide approaches to an increasing level of detail about individual character precincts and through to discrete elements where necessary.

Illustration including plans, cross-sections, sketches and photomontages should be used to convey the intent of the design response. Based on the needs of the project, a looser, expressive style of illustration may be more appropriate to convey intent, or a highly technical realistic photomontage may be needed particularly for more sensitive projects. Teams should be wary of focussing too much on presentation at the expense of design investigation.

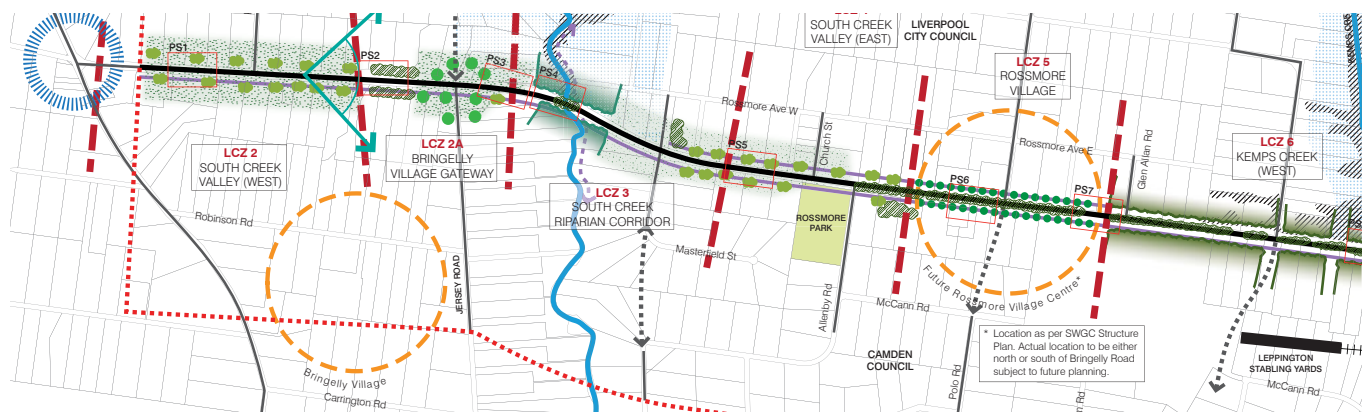


Figure 21 Extract of the concept design for Bringelly Road indicating design responses at each landscape character zone

Landscape character assessment and visual impact assessment should follow the description of the proposal in the format described at sections 5 and 6 including impacts during construction where required by SEARs.

c. Mitigation measures to be adopted should the project proceed, and concluding statements

When describing the impact mitigation strategy, the following points should be considered:

- ▶ Include a discussion of any impact already avoided or minimised through the design process
- ▶ Describe the strategy to mitigate adverse impacts. This will be treated as a series of commitments which need to be carried forward into the main body of the EIA document as safeguards or management measures for fulfillment in the project’s delivery phase
- ▶ Opportunities not related to a specific impact but nevertheless would allow the design to better reflect the physical design criteria or performance criteria described in *Beyond the Pavement* should be listed separately for later investigation by detailed design teams. They do not necessarily need to be treated as safeguards or management measures in the EIA main body

- ▶ Mitigation measures should not be a wish list but be broadly discussed and evaluated by the project team as a whole to ensure they can be achieved. If they require coordination with other agencies or private landholders then early consultation will be required to take them to a point of certainty by the time environmental assessment is finalised
- ▶ Statements which are neither properly evaluated nor binding should be avoided. For example state ‘Transport will undertake planting as early works...’ instead of ‘an early works planting program should be considered...’
- ▶ It may be beneficial to frame commitments in terms of their performance rather than as an absolute measure. For example committing to a high standard finish for a retaining wall rather than a specific material allows factors such as constructability to be considered by detailed design teams whilst maintaining the expectation set during concept design.

The following figure shows how this approach would be adopted for a project’s urban design report.

Combined urban design report/landscape character and visual impact assessment

1	Executive summary if required, introduction and contextual analysis including the landscape character analysis
2	Urban design vision, objectives and principles
3	Urban design concept (description and illustrations of the whole project)
4	Landscape character impact assessment
5	Visibility of proposal (including identification of representative viewpoints)
6	Visual impact assessment
7	Landscape character and visual impact mitigation strategy
8	Conclusion

Figure 22 Structure for combined urban design and impact assessment report

Appendix A

Assessment checklist for REF and EIS Working Papers

For preparers and reviewers of the urban design working paper incorporating landscape character and visual impact assessment, the following checklist should be of assistance:

Table 3 Table 3 Assessment checklist for REF and EIS urban design working papers

Checklist	Yes	No
Does the assessment of character portray a comprehensive impression in text and images of the character of the study area?		
Is landscape character impact distinct from visual impact?		
Are the impact assessments derived from an assessment of sensitivity and magnitude?		
Are the ratings of sensitivity and magnitude and hence overall impact reasonable and consistent?		
Has the impact assessment influenced the concept design? What design changes have been made which will help avoid the need for costly mitigation?		
Are the mitigation strategies clear, cost effective, integrated with the concept design (ie should appear as a seamless part of the project not an 'add on') and in accordance with <i>Beyond the Pavement</i> and the associated urban design guidelines?		
Is there consistency between the urban design report and the main body of the Environmental Assessment document?		
Is the report clearly written and illustrated and accessible for its intended audience?		
Is the summary of the urban design response, landscape character impact and visual impact contained in the main body of the EIA document consistent with the working paper?		

Appendix B

Visual impact checklist for routine and minor works

The following checklist should be completed by project managers or environmental officers to ascertain whether a more detailed visual assessment should be carried out for projects assessed under the *Routine and minor works procedure* (EIA-P05-1). If in doubt about the following questions consult the Urban Design Roads and Waterways team.

Table 4 Visual impact checklist for routine and minor works

Checklist	Yes	No	N/A
Is the proposal nearby to an important physical or cultural element or landscape (heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc)?			
Would the proposal obstruct or intrude upon the character or views of a valued landscape or urban area. For example local significant topography, a rural landscape park, river lake, ocean or a historic or distinctive townscape or landmark?			
Would the proposal require the removal of mature trees or other significant stands of vegetation, either native or introduced?			
Would the proposal result in large areas of shotcrete visible from the road or nearby properties?			
Would the proposal involve new noise walls or visible changes to existing noise walls?			
Would the proposal involve the removal or reuse of large areas of road corridor landscape, either verges or medians?			
Would the proposal involve significant changes to the appearance of a bridge (including piers, girders, abutments and parapets) which are visible from the road or residential areas?			
If involving lighting, would the proposal create unwanted light spillage on residential properties at night?			
Would any new structures or features being constructed result in overshadowing to adjoining properties or areas?			

Recommended actions

If any of the criteria are answered 'Yes', an attempt should be made to avoid the impact through amending the proposed design.

If avoidance is not possible, a visual impact assessment should be considered in consultation with a member of the Urban Design Section and carried out in accordance with section 6 of this document.

References

Transport Publications:

Beyond the Pavement Urban Design Policy, Procedures and Design Principles 2023

Bridge Aesthetics 2023

Shotcrete Design Guideline 2023

Noise Wall Design Guideline 2023

Water Sensitive Urban Design Guideline 2023

Landscape Guideline 2023

Tunnel Guideline 2023

Introduction to the Environmental Impact Assessment Guidelines 2013

Department of Planning and Environment, 2017 *Better Placed: An Integrated Design Policy for the Built Environment of New South Wales*

Department of Planning and Environment, 2016, *Wind Energy: Visual Assessment Bulletin for State Significant Wind Energy Development*

Landscape Institute and Institute of Environmental Management & Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment Third edition*

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Effective date: TBC (Version 2.3)

First published: 24/03/09

Review date: TBC

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www.transport.nsw.gov.au

June 2023

TfNSW 23.071 ISBN 978-1-922875-78-5

