

July 2021

Valuing green infrastructure and public spaces

What is green infrastructure?

Green infrastructure is a network of green spaces, natural systems, and semi-natural systems that supports sustainable communities. This network includes waterways, bushland, tree canopy and green ground cover, parks and open spaces that are strategically planned, designed, and managed to support a good quality of life in an urban environment.

What are public spaces?

Public spaces are all places that are publicly owned or of public use, accessible and enjoyable by all free of charge and without a profit motive. These include:

- **public open spaces:** active and passive (including parks, gardens, playgrounds, public beaches, riverbanks and waterfronts, outdoor playing fields and courts, and publicly accessible bushland)
- **public facilities:** public libraries, museums, galleries, civic/community centres, showgrounds and indoor public sports facilities
- **streets:** streets, avenues and boulevards, squares and plazas, pavements, passages and lanes, and bicycle paths.

What problems are we solving?

Green infrastructure and public spaces provide social, economic, cultural and environmental benefits to the NSW community. They are also vital to the provision and maintenance of biodiversity in urban areas, mitigating urban heat island effects and increasing resilience to climate change.

These benefits are not easily quantified, documented or evidenced in government decisions compared to those associated with other types of infrastructure. This often means that green infrastructure and public spaces are deprioritised or treated in isolation by governments, presenting investment barriers and funding challenges.

What will the project deliver?

The project will develop a Sector-Specific Framework (the framework) for valuing green infrastructure and public spaces. The final product will sit as a companion to the NSW Government's [Guide to Cost-Benefit Analysis](#). It is an important step towards quantifying the benefits of green infrastructure and public spaces to ensure these benefits are integrated into capital project business cases and decision-making within government.

What will the sector-specific framework include?

The framework will provide a robust, repeatable and reliable approach to valuing green infrastructure and public spaces. It will guide practitioners in developing cost-benefit analysis for

projects where components of green infrastructure and public spaces are involved. The framework will include guidance on:

- asset categories
- common benefit types
- methods to value these benefits
- guidance on applying methods
- some parameter values
- guidance on application through benefits transfer.

Who will use the sector-specific framework?

The framework, once endorsed by NSW Treasury, will be a public document that could be used by other jurisdictions, industry and economic consultants. It will be a legacy piece of work that supports the objectives of the Premier's priorities for Greener Public Spaces and Greening our City over time. However, we expect the initial users of the Framework will be NSW Government practitioners.

What has been completed so far?

Desktop studies

The Department of Planning, Industry and Environment commissioned three desktop studies:

1. Frontier Economics (2020) *Valuing the benefits of green infrastructure for future generations*
2. Deloitte (2020) *The economic value of public spaces.*
3. Deloitte (2021) *Review of public space benefits*

These studies identified existing models or valuation methods that other jurisdictions, within Australia and internationally, are using. The studies also identified some preliminary transferable benefits and conducted a gap analysis, based on a literature review, to determine the potential for other benefits to be explored.

Stakeholder consultation

An internal working group with practitioners and subject matter experts from across the broader group of agencies associated with the department was formed. We held 6 internal workshops with working group members to share knowledge and experience of existing models or valuation methods for green infrastructure and public spaces. The working group started building an evidence bank that could be included in the sector-specific framework.

We also held meetings with experts from other NSW Government and Australian Government agencies, overseas governments and academia. This process is ongoing.

What project work is currently underway?

The following pieces of work are currently underway:

- **the Green infrastructure public spaces (GIPS) sector-specific framework**, the document that will accompany the NSW Guide to Cost-Benefit Analysis, which we expect to make this publicly available in early 2022

- **the GIPS choice modelling study**, which will generate parameter values for GIPS in urban NSW to be used in cost-benefit analysis
- **ongoing stakeholder engagement**, the team continues to engage with experts from other jurisdictions and academia to ensure all work is best practice

What is the timeframe for delivering the sector-specific framework?

We expect the final framework document to be publicly available in early 2022.

Definitions

Table 1. Key terminology

Term	Definition
Amenity value	Characteristics that influence and enhance people's appreciation of a particular area. The idea that something has worth because of the pleasant feelings it generates to those who use or view it.
Base case	The scenario against which proposals are compared, and which shows baseline projections of costs and benefits 'without' the project or program. It is generally a 'business as usual' or 'no policy change' case, that is retaining the status quo.
Benefits	Increases in social wellbeing.
Benefit transfer	A method of estimating benefit based on the use of findings of previous studies on similar projects or initiatives. Commonly used for valuing health or environmental impacts for cost-benefit analysis.
Consumer surplus	The difference between the maximum amount that consumers are willing to pay and the actual amount they pay.
Contingent valuation	A survey method to place a value on a non-market good, contingent on it being available. Willingness to pay for (or willingness to accept payment for damage to or reduction of) a good or service is treated as a proxy of the value of the good or service.
Cost-benefit analysis	An evidence-based method to appraise and evaluate initiatives. It helps government understand economic, social and environmental impacts of policies and projects.
Choice modelling	Model the decision process of an individual or segment via revealed preferences or stated preferences made in a particular context or contexts. Typically, it attempts to use discrete choice (A over B; B over A, B and C) in order to infer positions of the items (A, B and C).

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Term	Definition
Cultural services	One of the 4 categories of ecosystem services. It includes spiritual and religious values, knowledge system, sense of place, education and inspiration, recreation and aesthetic values.
Direct-use value	Obtained through a removable product in nature, such as food, fuel or recreation.
Economic valuation	The value that person places on a good or service based on the benefit that they derive from the good or service.
Ecosystem services	The benefits provided to humans through the transformations of resources (or environmental assets, including land, water, vegetation and atmosphere) into a flow of essential goods and services. Four categories of ecosystem services are: Provisioning services, Cultural services, supporting services, and Regulating services.
Existence value	Places or a resource that will never be used by current individuals, derived from the value of satisfaction from preserving a natural environment or a historic environment for future generations.
Hedonic pricing method	This approach uses the value of a surrogate good or service to measure the implicit price of a non-market good. For example, house prices can be used to provide a value of environmental attributes.
Indirect-use value	Obtained through a non-removable product in nature, such as flood control, pollination, and pest control
Marginal benefit	The benefit accruing to society from the production of an additional unit of a good or service.
Market valuation	The value of an asset that would be paid for with its market price.
Non-market valuation	The value of an asset that could not be easily valued through observed prices in the market place. These types of goods and services are typically not traded in markets. Non-market valuation includes revealed preference methods and stated preference methods.
Non-use value	Values for existence of the natural resource.
Option value	Placed on the potential future ability to use a resource, even though it is not currently used, and the likelihood of future use is very low. This reflects the willingness to preserve an option for potential future use.
Parameter value	Standard parameters to estimate costs and benefits of project of a similar nature.

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Public facilities	One of the 3 typologies of public space. It includes public libraries, museums, galleries, civic/community centres, showgrounds and indoor public sports facilities.
Public open space	One of the 3 typologies of public space. It can be active and passive space such as parks, gardens, playgrounds, public beaches, riverbanks and waterfronts, outdoor playing fields and courts, and publicly accessible bushland.
Provisioning services	One of the 4 categories of ecosystem services. It includes food, fuel, fibre, genetic resources, nutrients, fresh water.
Revealed preference	Choices that individuals have actually made (rather than what they stated that they would make).
Regulating services	One of the 4 categories of ecosystem services. It includes invasion resistance, pollination, climate regulation, disease regulation, natural hazard protection, water purification, herbivory, seed dispersal, pest regulation, erosion regulation.
Stated preference	Users' response to hypothetical situations.
Streets	One of the 3 typologies of public space. It includes streets, avenues and boulevards, squares and plazas, pavements, passages and lanes, and bicycle paths.
Supporting services	One of the 4 categories of ecosystem services. It includes primary production, provision of habitat, nutrient cycling, soil formation and retention, production of oxygen, water cycling.
Total economic value	A concept in cost-benefit analysis that refers to the value derived by people from a natural resource, a heritage resource made by humans or an infrastructure system, compared to not having it.
Tree canopy	The layer of leaves, branches, and stems of trees that covers the ground when viewed from above.
Waterways	Either constructed or natural waterbodies including rivers, creeks, ponds, lakes, wetlands, bays, and harbours where a significant part of their catchment either comes from or flows through urban areas.
Willingness to pay	The maximum amount a person or business would be willing to pay in order to consume a good or service.

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Frequently asked questions

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