

Green infrastructure spatial frameworks

Green infrastructure is the network of green spaces, natural systems and semi-natural systems including parks, rivers, bushland, private gardens, and street trees. This network can be strategically planned, designed, and managed to support a range of benefits for people and the environment. Well-planned green infrastructure that is integrated, multifunctional, and connected is fundamental to ensuring our communities are healthy, liveable, and sustainable.

What is a green infrastructure spatial framework?

A green infrastructure spatial framework is an interconnected, multilayered, three-dimensional network of green infrastructure.

The concept of a green infrastructure spatial framework acknowledges the ecological imperative in urban design and city planning. It reveals the importance of nature in cities and acknowledges the role of green infrastructure as the primary matrix upon which a region, city, or precinct is ordered. The primacy of green infrastructure provides a new method for contemporary urbanisation that delivers a range of benefits including providing healthy living environments, mitigating flooding, improving air and water quality, cooling the urban environment, encouraging walking and cycling, improving connections between places, and enhancing biodiversity and ecological resilience.

Green infrastructure spatial frameworks are collaborative. They are the basis for conceptual designs that inform both urban and architectural character. They are a primary consideration at the outset and throughout a design process, from vision and strategy through to concept design, construction, and maintenance.

Four fundamental grids

A green infrastructure spatial framework is a combination of four of the fundamental landscape layers (grids) which underpin the geographic and urban structure of a region, city, or precinct.

They are:

- the hydrological grid, including natural and human-made or manipulated river, creek, and water systems
- the ecological grid, including geomorphology, biodiversity, and ecological communities
- the recreational grid, including open spaces for active and passive recreation, walking and cycling networks, urban open spaces, public domain and streetscapes
- the agricultural grid, including rural, semi-rural and peri-urban landscapes, food and productive landscapes as well as those with scenic rural landscape values.

When considered in combination, these grids contribute to the characteristics of the urban design spatial framework for a region, city, or precinct, and are fundamental to urban design frameworks and master plans. They must be considered in conjunction with transport, development, and utilities projects. Within each of the identified grids there are specific strategies which can be used to ensure a healthier, more liveable built environment.

A green infrastructure spatial framework enables the unique landscapes of a region, city, or precinct to be recognised as an asset that can reinforce character, identity, and environmental resilience. Delivered alongside infrastructure and urban renewal, a green infrastructure spatial framework can serve to shape and support new and existing communities.

Strategies for better urban design using the green infrastructure spatial framework

Hydrological Grid

1 Use the network quality of the hydrological system

- The hydrological grid offers an opportunity to use water systems as an interconnected network. Connecting public open space and active transport and pathway systems along waterways creates a complex and connected layer of the green infrastructure spatial framework. Land adjacent to waterways can be used for multiple purposes including water treatment, protection of ecological communities, open space and recreation.

2 Reveal the unique character of waterscapes

- Enhance the particular character of the regional, district, or local waterways to define the landscape character and urban structure of districts, precincts and places.

3 Improve environmental quality

- Improve the water and ecological quality of waterways along the entirety of the hydrological system. Approaches including water-sensitive urban design, daylighting of waterways and stormwater re-use take a soft infrastructure approach and aid in city-wide water quality improvement while also reducing ongoing hard infrastructure requirements.
- Reduce infrastructure risk.

- Create a resilient waterway network that successfully manages flood risks, reduces peak flows and maximises infrastructure resilience in the face of rapid population growth and environmental change.

4 Reframe waterways as connectors not barriers

- Waterways often become edges to development that act as barriers between communities.
- Reframe waterways as central elements defining the urban structure of the city and use them as the glue that binds communities together.

Recreational Grid

5 Increase access to open space

- Improve connectivity to significant regional destinations, foreshores, beaches, and bays and continue to invest in the improvements of major parks and infrastructure.
- Improve the public domain and create new open space destinations as a benefit of development and infrastructure projects.
- Improve access to open space across major roads and infrastructure barriers.
- Create new open spaces as a part of urban renewal, infill and infrastructure schemes and continue to invest in revitalising existing parks for the benefit of districts and whole towns and cities.
- Improve the diversity of recreational opportunities available throughout a district, city, or region, with a particular focus on higher density areas.

6 Encourage sustainable transport connections and promote active living

- Promote and improve the pedestrian environment to increase the enjoyment of walking and cycling.
- Encourage active and healthy living through improvements in the public domain that facilitate exercise and alternative modes of transport such as walking, cycling and jogging.
- Align the open space network with longer term transport plans.
- Protect priority green corridors and create a network of walking trails, cycle paths, and open spaces along river and creek corridors.
- Enhance connectivity and legibility of recreational trails, particularly in and around high-density areas.

7 Create a high quality and active public realm

- Create vibrant, multifunctional, enduring public spaces.
- Provide a variety of dynamic spaces that are pedestrian-friendly, support street life and community activity, and are places for social interaction and recreation.
- Integrate key civic spaces or destinations with public transport opportunities and existing development.

Ecological grid

8 Conserve the natural environment

- Protect and enhance natural

resources and biodiversity by improving the quality of watercourses, creating green habitat corridors, and protecting endangered ecological communities and wetland habitats.

- Promote the wealth of social, cultural, recreational, and educational opportunities within natural, cultural, and heritage landscapes.
- Improve the ecological value of watercourses and green corridors along major and minor waterways and concrete-lined channels.

9 Adapt to climate extremes, improve air quality and increase urban

- Create resilient built environments through coordinated planning and design of green-cover strategies including street trees, green walls and roofs, canopy trees, cool pavements, and water-sensitive urban design.
- Promote green cover as integral to alleviating the effects of urban heat-island effect while providing benefits such as improved amenity, comfort, health, reduced stormwater runoff, improved air and water quality, and energy and resource efficiency.

10 Promote green skills; improve management, maintenance, and sustainable greenspace design

- Invest in local, State and national programs encouraging participation and skills training

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in environmental rehabilitation and open space, land management and maintenance, as well as voluntary community involvement in green initiatives including bush regeneration and community gardens.

- Develop local council policies to encourage local food production as a recreational opportunity for communities.
- Support the Australian Government Green Army program to rehabilitate riparian bushland and improve water quality.

How can GANSW help?

GANSW can help by providing advice on design for the green infrastructure spatial framework, and effective ways of collaborating with other agencies on green infrastructure projects.

Further information

See the GANSW website –

ga.nsw.gov.au:

- Greener Places: Establishing an urban Green Infrastructure policy for NSW (GANSW 2017) Sydney Green Grid.

Government Architect NSW

GANSW provides design leadership in architecture, urban design and landscape architecture. In this role, GANSW works across government, the private sector and the community to establish policy and practice guides for achieving good design. GANSW provides strategic advice across design, planning and development to support good policy, programs, projects and places.

Contact GANSW

GANSW makes every effort to keep its advice up to date. From time to time we will release new versions of these advisory notes. For further advice, or if you think there is information missing, please contact GANSW.

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