

15 Year Infrastructure plan for Australia

Submission by:

Australian Institute of Landscape Architects

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(The views represented in this submission are the views of practitioners and do not necessarily represent the views of their organisation.)

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1. Submission Overview

About the Australian Institute of Landscape Architects

The Australian Institute of Landscape Architects (AILA) congratulates Infrastructure Australia (IA) on the release of the Australian Infrastructure Audit (April 2015), and in particular its willingness to embrace opportunities for creating a policy and project environment that enhances productivity, quality of life and sustainability in Australia. We see this work, through the development of the 15-year Australian Infrastructure Plan, as critical in planning for Australia's future.

AILA is the growing national advocacy body representing 2,500 active and engaged landscape architects, and promoting their crucial role in shaping the world around us. Committed to designing and creating a better Australia, landscape architects have the skills and expertise to solve macro issues with innovative integrated solutions. Landscape architects contribute leadership, creativity and innovation as they strive to collaborate to achieve better health, environmental, social and economic outcomes. From citywide strategies to the redesign of local parks, landscape architects are making places and spaces more sustainable and productive. Communities are demanding more from government and landscape architects are increasingly collaborating with the public and other stakeholders to achieve project outcomes.

Landscape architects shape project outcomes in a variety of ways. They bring a critical eye to the potential opportunities and constraints of a place, site or landscape. The vegetation, soils, and watercourses often navigated by infrastructure projects are but some of the technical issues they bring expertise to. They create the conditions for nature to function and thrive, ensuring that infrastructure puts back as much as it takes from the landscape. They bring together other disciplines, in an integrated way to generate better outcomes. They are active on infrastructure development teams of all types, connecting, facilitating and navigating to help achieve shared outcomes.

Landscape architects hold, at a minimum, a university bachelor degree and potentially a master's degree. They are increasingly seen as a profession set to dominate the debates of the next century and lead policy making to deliver fantastic outcomes for cities, towns, regions and their inhabitants. The work of Australian landscape architects is increasingly being recognized on the world stage as other countries realise their unique skills in creating liveable cities, healthy active spaces and sustainable design.

AILA and Green Infrastructure

AILA fundamentally believes that both soft and hard infrastructure should be considered by the government and planned for within the 15 Year Australian Infrastructure Plan. Australia's natural infrastructure assets are key to tackling the major issues facing Australia's cities, towns and regions including; an ageing population, climbing obesity and diabetes rates, reduced fitness particularly in young children, social exclusion and the increasing importance of positive mental health, major transportation challenges, and heat related death.

The 2015 *Intergeneration Report Australia in 2055*, notes "Australian Government health expenditure is projected to increase as a proportion of GDP from 4.2 per cent in 2014-15 to 5.7 per cent of GDP in 2054-55". An ageing population is often pointed to as a reason for the rising cost of health care. Whilst it contributes to a rise in costs, approximately 80% of the increased expenditure per person relates to non-demographic factors – people seeing more doctors, having more tests and taking more medicine¹. The physical and mental health benefits of regular engagement with natural environments are well known. Creating cities that encourage people to be more active and connected with their community are essential preventative health measures and as a result can reduce escalating health care costs.

In contemporary western societies chronic disease has now overtaken infectious disease as a major cause of death². Over 60% of Australian adults are considered overweight or obese with this figure predicted to reach close to 80% by 2025³. Increased activity is one way of preventing obesity and related diseases but the priorities on how we plan and design our cities needs to shift. Research has shown the quality of a local environment can have a significant impact on activity levels. For people living in a residential environment incorporating "high levels of greenery, the likelihood of being more physically active is more than three times as high, and the likelihood of being overweight and obese is about 40% less"⁴. Landscape architects design streetscape and open space improvements that encourage people

1 Australian Government, '2015 Intergenerational Report' (Canberra, 2015)

2 Center for Active Design, 'Design + Health' website: <http://centerforactivedesign.org/data/>

3 Australian Institute of Health and Welfare, website: <http://www.aihw.gov.au/risk-factors-overweight-obesity/> and Obesity Australia 'No Time to Weight' available at <http://www.obesityaustralia.org/resources-1/no-time-to-weight-p.26> [10 August 2015]

4 Ellaway et al, 'Graffiti, Greenery, and Obesity in Adults: Secondary Analysis of European Cross Sectional Survey', *British Medical Journal*, available from <http://www.bmj.com/content/331/7517/611> [5 July 2005]

to be more active. Well-designed streets and open spaces reduce the barriers of people walking or riding, instead of using a car, by providing well connected path and cycle networks. When upgrading existing streetscapes government have the opportunity to reprioritise spaces to support healthier modes of transport that enable people to be more active.

As identified in the *Australian Infrastructure Audit*, climate change presents one of the greatest risks, if not the greatest risk to the nation's infrastructure assets. Globally, there is a transition away from single purpose 'grey infrastructure', to more multi-purpose infrastructure that mimics nature, provides critical ecosystem services and promotes healthy and active living. Embedding landscape led thinking as a key design function within all projects builds greater resiliency across built and natural systems.

Ecosystem services are the environmental services provided by healthy landscape systems from which humans benefit, such as plant pollination, air filtration, pollution treatment, storm water management and carbon sequestration.

This submission includes recommendations that respond to the major opportunities provided by a cost effective and impactful Green Infrastructure Network for both the short and medium term. Green Infrastructure is defined by AILA as "the network of natural landscape assets, which underpin and provide for the economic, socio-cultural and environmental functionality of our cities and towns⁵."

With State and Local Government primed for accelerating Green Infrastructure opportunities at the project development level, national leadership from Infrastructure Australia would catalyse greater value for federally funded infrastructure investments.

With the publication of the *Australian Infrastructure Audit*, and the upcoming planned release of the 15 Year Australian Infrastructure Plan, AILA believes the Federal Government is poised to take global leadership position and formally acknowledge our natural landscape as a key infrastructure asset for Infrastructure Australia, and one that has a tangible impact on creating a higher quality of life for Australians.

The High Line New York
© Urban Land Institute (Flickr)



5 Costanza et al, 'The Value of the world's ecosystem services and natural capital', *Nature*, vol. 387; 1997, p.253-260. Available from http://www.esd.ornl.gov/benefits_conference/nature_paper.pdf [10 August 2015]

2. Project and Policy Recommendations

AILA is excited to offer four strategic recommendations for inclusion in the 15 Year Australian Infrastructure Plan. AILA believes these recommendations are of high value and represent an opportunity for Infrastructure Australia to embed sustainability outcomes into its infrastructure investments. These four recommendations have been developed in consultation with a strategic advisory committee established by AILA, representing a range of sectors and disciplines of the profession of landscape architecture.

Specifically, these recommendations have been developed given their ability to support Infrastructure Australia's noted aspirations for the 15 Year Infrastructure Plan, including:

- Driving national prosperity;
 - Enhancing quality of life;
 - Leveraging State and Local Government and private sector capital;
 - Ensuring Federally funded infrastructure is resilient, and is designed to work with nature, and not against it;
 - Providing opportunity for greater integration between infrastructure and land-use planning; and
 - Building more integrated governance across the three levels of government to deliver more efficient and effective processes.
- Our four recommendations are outlined below, with supporting information contained in Section Three (3).

Post Office Park Boston: Before
© landscapenotes.com



Post Office Park Boston: After
© landscapenotes.com



Policy Recommendations

1. National Green Infrastructure Strategy

AILA recommends the development of a National Green Infrastructure Strategy by the Federal Government. This Strategy would recognise the fragile intersection of the built and human landscape with the natural landscape in infrastructure development, and would seek to ensure we manage this change in a planned, integrated and considered way by using Green Infrastructure as a key approach.

This Strategy will acknowledge that nature itself operates as an infrastructure, providing important ecosystem services to our communities, whether they are in urban, rural or coastal environments.

Green Infrastructure provides the opportunity to embed not only ecosystem services within our network of infrastructure investments, but also enhance human health and well-being by providing open space networks of parks, trails and corridors. Providing connections between people and nature promotes active living and improves mental health⁶. With cardiovascular disease being the leading cause of death in Australia (almost 50,000 deaths in 2011), the contribution of Green Infrastructure to slowing the rate of death from this preventable disease is potentially significant. Green Infrastructure, when planned well and integrated into our infrastructure investments, promotes passive recreation, sport and recreation. Parks and other landscapes that incorporate active living elements, such as play grounds and walking trails, directly encourage less sedentary behaviour.

Further to this, Green Infrastructure has been shown to reduce air pollution, air-borne particulates and greenhouse gas emissions. Computer simulations suggest that trees and forests in the United States removed 17.4 million tonnes of air pollution in 2010, with a value to human health of US\$6.8 billion⁷.

This idea of embedding nature into our traditional grey infrastructure system (i.e. road and rail networks and port development etc.) is not new. In addition to the health and well-being benefits discussed earlier, Green Infrastructure helps protect life against flooding, excessive heat (urban heat island impact) and other climatic variables. It supports biodiversity and provides the critical connections within and between ecosystems. Green Infrastructure is also considered a more efficient and effective means of managing stormwater, when compared with traditional grey infrastructure solutions. Green Infrastructure also provides enhanced visual amenity which is crucial for gaining the community's support for public infrastructure projects.

Overall, the Strategy would provide a framework for federal infrastructure investment to catalyse the restoration of the nation's natural landscape, which AILA considers to play a significant role in promoting prosperity, productivity and health and well-being for Australia's cities and towns.

The Strategy will provide guidance on how infrastructure projects can be a catalyst for enhanced landscape outcomes through green infrastructure investment. **The National Green Infrastructure Strategy will contain, as a minimum, the following parts:**

- Green Infrastructure Policy Statement
 - This statement will articulate the overarching position of the government with respect to its investment in infrastructure projects and how they will be used to enhance Australia's network of green infrastructure.
- Goals and Objectives
 - These goals and objectives will start to frame the elements to be implemented through the Strategy, including criteria for funding approval, scoping elements of the planning and design process, supporting policies that may be required across state and local government, collaboration between government, private and non-profit sectors, research interests and sharing of data and information.

⁶ Townsend and Weerasuriya for Beyond Blue and Deakin University, 'Beyond Blue to Green: The Benefits of Contact With Nature for Mental Health and Wellbeing' 2010

⁷ Nowak, D., Hirabayashi, S., Bodine, A., and Greenfield, E. (2014) Tree and forest effects on air quality and human health in the United States. *Environmental Pollution*, 193, 119-129

- Green Infrastructure Investment Action Areas
 - Each of the goal areas above will be further detailed and arranged into a set of specific actions, proposed timing of implementation and identification of responsible stakeholders. Key action areas may include the facilitation of a national Green Infrastructure review/audit, establishment of green infrastructure incentive programs for project development, 'State of the Australian Landscape' reports, adoption of analytical tools to advance landscape enhancement in project development and a national landscape research roadmap to innovate and push best practice.
- National Green Infrastructure Investment Criteria
 - A suite of criteria will be developed based on the Green Infrastructure Policy Statement, and used to assess requests for federal funding of infrastructure projects.
- Governance and Implementation
 - A clear framework of governance for Green Infrastructure investment will be developed, which will look to build collaboration between all three levels of government, the private sector, research institutions and non-profit groups. Arrangements (roles and responsibilities) for implementing the Strategy will be developed, as well as the process of continual monitoring and reporting against the goals and objectives of the Strategy.

AILA encourages Infrastructure Australia to implement this recommendation for a National Green Infrastructure Strategy in the medium term (2-3 years), as planning to implement the recommendation will require stakeholder engagement and detailed scoping of the terms of reference. The development of the National Green Infrastructure Strategy would be carried out in a way that is highly engaging and provides opportunities for all relevant sectors to take part in the process.

*Paddington Reservoir Gardens, joint winner of the 2009 Australia Award For Urban Design.
By Tonkin Zulaikha Greer Architects and James Maher Delaney Design. Image Courtesy of City of Sydney*



2. Minimum SITES Ratings for Federally Funded Projects

AILA is calling on the government to show leadership and commit to minimum SITES ratings for all federally funded infrastructure projects. This action would align with the outcomes sought in the National Green Infrastructure Strategy, which is to encourage the greater integration of natural and physical infrastructure.

The Sustainable Sites Initiative (SITES) rating system is the most comprehensive system globally for developing sustainable places, and provides the tools for those who influence land development and management practices, including but not limited to, road and rail development, real estate development, energy and water systems and port development. SITES was created through a collaboration of major industry and non-profit organisations, and tested around the world, including Australia⁸.

Similar to the way the Green Star rating system has been used by governments all across the country to advance green building design and construction, embracing a minimum rating level for federal infrastructure assets can reduce cost, enhance value and create employment opportunities throughout the supply chain.

SITES has been applied to a diversity of projects around the world, including small open space projects a half a hectare in size, all the way up to large industrial projects greater than 10ha in size. AILA recommends that federally funded projects adhere to a minimum SITES rating on all eligible land parcels and corridors within and adjacent to the footprint of the project where federal funds are used.

Use of the SITES rating system will further build the resilience of the infrastructure asset, as the criteria within the system responds to a range of urgent global concerns such as climate change, loss of biodiversity, and resource depletion. The system specifies benchmarks across a range of landscape attributes, including, but not limited to:

- Site Context – development location and impact on floodplain, threatened and endangered species, aquatic ecosystems and farmland.
- Pre-Design Assessment and Planning – use of an integrated design process, comprehensive stakeholder engagement and conducting pre-design site assessments.
- Water – irrigation and outdoor water use, stormwater management, flood mitigation and aquatic ecosystem restoration.
- Soil and Vegetation – soil management, native vegetation restoration, reduction in urban heat island effect and natural hazard risk reduction.
- Materials Selection – use of sustainable materials, design for adaptability and disassembly and responsible materials sourcing.
- Health and Wellbeing – protecting cultural and historic places, promoting active living and social connection, supporting local economy and providing on site food production.
- Construction – site impact management, diverting waste from landfill and verifying sustainable construction practices.
- Operations and Maintenance – reducing energy consumption, minimizing air quality impact and maximizing material recycling.
- Education and Performance Monitoring – monitor and report site performance and promoting sustainability awareness and education.

SITES is used by those who design, construct, operate, and maintain landscapes within urban, coastal and rural contexts, and includes planners, landscape architects, engineers, developers, builders and organisations creating and administering urban and rural policy.

AILA encourages Infrastructure Australia to draft a position paper that seeks to embrace a minimum SITES rating for federally funded projects. This paper would identify critical elements to implementing this policy, including the types of projects for its application and the level of federal funding to a project that would trigger the policy. This paper would also articulate the necessary clauses for inclusion in funding requests and procurement processes. This paper should be drafted in the short term (1-2 years), with assistance from AILA.

⁸ American Society of Landscape Architects, Lady Bird Johnson Wildflower Center and United States Botanic Garden, 'Sustainable Sites Initiative', See <http://www.sustainablesites.org/>

Project Recommendations

1. National Green Infrastructure Training Program

AILA recommends the development and delivery of a National Green Infrastructure Training Program for built environment practitioners such as engineers and planners as well as senior level policy makers involved in the planning, design and development of infrastructure across a diversity of asset classes.

The purpose of the training would be to accelerate the capacity building of government and industry professionals by providing knowledge, skills and tools to drive enhanced project outcomes through the integration of Green Infrastructure. This workforce development opportunity is seen as an opportunity to also create additional employment across a range of professions, as a greater demand for green infrastructure builds within the design and construction industry.

AILA would work with its members to scope and create a suite of training modules that would be tailored to asset classes (e.g. road and rail, port development, site development), key project team roles (e.g. project managers, design engineers, site surveyors) and relevant phases of development (e.g. business case, corridor planning, concept design, construction). These training modules would scale from foundational level to advanced, and include the following topics:

- Green Infrastructure Fundamentals
- Urban systems and Green Infrastructure opportunities
- Ecosystem services provision
- Physical aspects of Green Infrastructure
- Cultural components of Green Infrastructure
- Climate change adaptation and mitigation
- Integrated soil, water and vegetation management
- Integrated planning strategies for Green Infrastructure development

The training program would be delivered through partnerships with key industry associations (e. Engineers Australia, Consult Australia, Environment Institute of Australia and New Zealand), key academic institutions and other representative groups who are closely connected to practitioners in both public and private sector. The training would be delivered in major cities and key regional towns, initially underwritten by the federal government for the first 12 months, before transitioning to a pay per participant model administered by AILA and its partner organisations.

This training program could evolve to become embedded into university teaching programs to facilitate its longer term sustainability, and become a driving influence in infrastructure planning and design skills development in Australia.

AILA encourages Infrastructure Australia to implement this recommendation for a National Green Infrastructure Training Program in the short term (1-2 years), as greater awareness is the starting point for better practice and outcomes and this recommendation can scale rapidly through the proposed network of partner organisations.

2. Project Briefing Guide for Integrating Landscape through Infrastructure Development

The Project Briefing Guide will become the key national resource used to influence project briefing processes on federally funded projects. Its purpose will be to establish clear guidelines around the value of embedding landscape architects earlier into the infrastructure planning process and what their role should be. It will contain a suite of standard requirements to inform the development of project briefs and terms of reference for infrastructure projects, focusing on the pre-feasibility, feasibility and planning phases.

It will improve upon the often compliance-focused and 'minimise impact' approach of current Environmental Impact Assessments and similar regulatory processes. The Guide will provide much needed direction on scoping landscape outcomes and opportunities adequately in the early phases, ensuring that connecting landscape and people are at the heart of infrastructure planning. The requirements within the Guide will position infrastructure to help catalyse and restore landscape and place, rather than it being part of a due diligence process. This Guide will save time and money for infrastructure projects, by ensuring that projects are briefed correctly, and that the most appropriate level of investigation and analysis is undertaken at the right time.

All levels of government, professional services firms, construction companies and other stakeholders who are part of the infrastructure development supply chain will find value in using the Guide. Its use will be encouraged through formal communications from federal agencies working with state and local government.

This Guide will not be a 'how to do landscape planning guide', but rather a resource articulating the range of necessary processes that should be included in project briefs and terms of reference. Specifying these processes in project briefs will ensure rigorous and integrated landscape planning and design activities are fulfilled. These requirements will also ensure that our early analysis in pre-feasibility studies clearly picks up fundamental opportunities around enhancing landscape and place, and position human well-being at the heart of our infrastructure investments.

Additionally, at the early pre-feasibility stages of a project, major assumptions on landscape and place are not well grounded in context-based evidence, often the result of landscape architects not being embedded in project teams early. This results in lost opportunities during the business case phase to capture the full range of benefits from infrastructure development.

Clear guidance will be provided in the Guide on the role of landscape architects in infrastructure planning and development, what they offer and the value-add they contribute. Information on appointing landscape architects and the scope of their services will be provided to enable project teams to more easily establish the value proposition for having them embedded early.

It is equally important that this Guide identify the necessary requirements for embedding landscape and place into federally funded infrastructure projects that

are not necessarily construction ready, but provide an important research or analysis function. For example, this may include capacity and network studies, transportation improvement plans and key national efforts like the National Port Strategy and National Broadband Network. These studies need to ensure that adequate opportunities for capturing enhanced liveability outcomes through productive landscapes and spaces is understood and embedded.

The Guide will contain standard text that agencies from all levels of government can use to insert into briefing documents and other relevant materials used to guide infrastructure planning. AILA would maintain the Guide and continually update its contents with the support of an industry-wide advisory committee.

The Project Briefing Guide will contain as a minimum the following parts:

- Introduction and Overview
 - This section will contain a background, the purpose of the Project Briefing Guide and intended users and uses of it.
- Core Principles of Landscape Planning
 - Here, a core set of principles will be established relating to the landscape assessment processes of infrastructure planning. It will highlight critical elements such as landscape hierarchy, master planning processes, site utilisation concepts, corridor assessment practices, place creation and human-centred design.
- The role of Landscape Architects
 - In this part of the Guide there will be a clear articulation of the skills, approach and value-add of landscape architects in infrastructure planning and development. It will highlight core issues relevant to working at different scales, transforming places through integrated and collaborative process and the nesting of human, built and natural landscapes within planning and design processes.
- Pre-Feasibility and Business Case Development
 - This part of the Guide will identify the relevant opportunity for enhancing landscape outcomes and the necessary requirements in scoping studies and analysis that contributes to the early business planning of an infrastructure project.
- Planning, Design and Construction of Corridor Projects
 - Similar to the above section, clear requirements for briefing the planning, design and construction of corridor projects will be provided, enabling project managers and similar stakeholders responsible for procurement to use standardised text for developing briefs and terms of reference that embed landscape architects and their services early into the planning process.

- Planning, Design and Construction of Master planning Projects
 - Master planning projects that are non-linear (i.e. site and lot development) sometimes require different planning approaches to corridor projects. This section of the Guide will build off the previous section and provide the necessary requirements for scoping and briefing these project types.
- Other Studies and Strategies
 - This section of the Guide provides further guidance on briefing landscape requirements for other study types, such as capacity and network studies, national strategies for infrastructure sectors (e.g. port development) and similar planning requirements.
- Implementation Notes
 - The final section of the Guide will provide support on implementing it, connecting the user to supporting resources and relevant contact information.

AILA encourages Infrastructure Australia to implement this recommendation of a Project Briefing Guide for Integrating Landscape through Infrastructure Development in the short term (1-2 years), as it has the ability to influence project outcomes quickly with no major structural change to existing practices.

Submission Summary

The recommendations presented above are strategic in nature and collaborative in approach. They leverage value from existing approaches and provide further opportunities to ensure that infrastructure investments are in line with the emerging needs of Infrastructure Australia – investments that build prosperity, make the most out of existing assets, and create greater cross sector improvements.

The ability of Green Infrastructure to enhance asset resiliency, human health, and long-term economic value of infrastructure investments has been clearly identified throughout this submission. Healthcare expenditure on cardiovascular disease remains greater than any other disease group in Australia, and brings a swelling price tag greater than \$10 billion whilst the total cost of obesity (both financial and loss of wellbeing) is estimate to be \$58.2 billion⁹. By 2020, the estimated annual cost of unmitigated climate change on Australia's infrastructure is predicted to be 0.5 per cent of GDP, roughly \$9 billion¹⁰. As a nation, Australia faces a number of significant crises that only integrated Green Infrastructure solutions will help amend.

Green Infrastructure is one viable solution. For this reason, AILA strongly believes that increasing the nations investment in Green Infrastructure (as described within this submission) is a minor cost that brings significant medium and long term benefit to the liveability of Australia's urban and rural areas. We believe that embracing these recommendations within the 15 year Australian Infrastructure Plan is a responsible investment in the nation's future productivity and liveability.

⁹ *Obesity Australia 'No Time to Weight' available at <http://www.obesityaustralia.org/resources-1/no-time-to-weight> p.26 [10 August 2015]*

¹⁰ *Ross Garnaut, The Garnaut Climate Change Review, Final Report and Technical Appendices, (Canberra: The Garnaut Climate Change Review, 2008).*

3. Supporting Materials

The following additional information has been referenced to support the recommendations contained within AILA's submission. These supporting resources provide examples of the role of Landscape Architects in infrastructure development, the contribution of green infrastructure to city-building, and more detailed examples of the value of green infrastructure in project development.

Adapting to Climate Change: Green Infrastructure,

Australian Institute of Landscape Architects

Creating Places for People, An Urban Design Protocol for Australian Cities –

Australian Government et al, 2012

Landscape Architecture: A Guide for Clients –

Landscape Institute, UK

Cities Alive: Rethinking Green Infrastructure –

Arup, 2014

Frederick Law Olmsted, Green Infrastructure, and the Evolving City –

Theodore Eisenman, 2013

The Value of Green Infrastructure –

Center for Neighborhood Technology, 2010

Rooftop to Rivers: A Case Study of How Green Infrastructure is Helping Manage Urban Stormwater –

City of Portland, Oregon, 2011

Portland's Green Infrastructure: Quantifying the Health, Energy, and Community Livability Benefits –

City of Portland, Oregon, 2010

The Green Infrastructure Project –

Botanic Gardens of South Australia <http://gievidencebase.botanicgardens.sa.gov.au/contents>

Environment Impact Assessment Practice Note: Guideline for Landscape Character and Visual Impact Assessment –

NSW Transport, 2013

Beyond Blue to Green: The Benefits of Contact With Nature for Mental Health and Wellbeing –

Beyond Blue, 2010

Australian Standard 5334-2013 Climate change adaptation for settlements and infrastructure –

A risk based approach