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Dear Diana

Sustainability Response to Comments - Kellyville and Bella Vista Ecologically Sustainable Development (ESD) Reports

This memo outlines AECOM's response to the comments made by the Government Architect NSW (GANSW) following the SDRP design review session on 24 September 2019 regarding Kellyville and Bella Vista Station Precinct SSDs. The information in this memo has been requested by APP to formulate a response to the SDRP and GANSW's comments, as part of a broader response, and is in line with previous advice provided by AECOM.

GANSW Comments

The following recommendation from the GANSW, across both Kellyville and Bella Vista SSDs, is addressed in this memo:

"Sustainability

Ongoing sustainability of the proposal is vital, to mitigate against climate change and its impacts. The temperatures in this part of Sydney will be hotter and require an appropriate response. Clarification of the following is required:

Clarify the sustainability targets proposed, including response to greater temperatures. Ensure targets are ambitious but achievable."

AECOM Response

AECOM prepared Climate and Community Resilience Assessments for both the Kellyville and Bella Vista Station Precincts. These assessments were undertaken to provide a deeper understanding of the community's exposure, sensitivity and adaptive capacity to a range of shocks and stresses with review of climate change impacts and future mitigation actions. Among other risks, the assessment addressed the impacts of extreme heat, mean temperature and possible future climate scenarios and the resultant impacts on the community.

Drawing on the findings of the Climate and Community Resilience Assessments, Climate Adaptation and Community Resilience Plans were developed for both Precincts. These Plans included recommended adaptation actions for the community to address climate risks and key community vulnerabilities, including extreme heat. Adaptations recommended to address heat included: street shading, cooling mechanisms and green infrastructure; building material selection during detailed design to address higher operating temperatures and extreme heat; outdoor recreation areas designed for extreme heat days; support for decentralised energy solutions and solar PV; including natural ventilation in design; and beyond compliance targets for NABERS and BASIX.

Following the Climate and Community Resilience Assessments, AECOM worked with the Kellyville and Bella Vista Precinct Project Team and Landcom to develop a list of sustainability targets. These targets directly contribute toward a net-zero carbon precinct and include specific responses to the urban heat island effect and increased temperatures. Minimum compliance requirements and stretch goals were identified across both Precincts.

Table 1 outlines all the sustainability targets proposed across the Precincts. The specific targets that address climate change adaptation and a response to greater temperatures include goals for: low carbon precincts; BASIX Energy targets; NABERS Energy targets; addressing climate change and

resilience risks through design; including elements that reduce the urban heat island effect; and increased tree canopy cover.

Table 1: Kellyville and Bella Vista Station Precinct Targets

Target	Minimum Requirements	Stretch Goal	Target source	Comments
Governance				
Green Star Communities precinct rating, or equivalent	5 star	6 star	SPS, SV	
Green Star Design & As Built rating for medium to high density buildings	5 star	6 star	LSR, GSC	
Environmental				
NABERS energy rating for office and retail buildings	5 star	5.5 star	SPS, CBD	Targets exceed statutory requirements. BASIX targets are expressed as a percentage reduction over NSW benchmarks.
BASIX Energy targets			SPS, BASIX SEPP	
Detached houses, semi or terrace houses and townhouses	>50	60		
Low rise (3 storey units)	>45	45		
Mid rise (4-5 storey units)	>35	45		
High rise (6 storey units or higher)	>25	40		
Low carbon precincts	50%	100% (net-zero carbon)	SV, GSC	% reduction in stationary and transport emissions, to be measured against the 2016 Sydney Metro per person average (CCAP Precinct)
Onsite renewable energy	5%	10%	GSC	% of total estimated demand
NABERS Water rating for office, hotels and retail buildings	5 star	5.5 star	SPS, CBD	Target exceeds statutory requirements
BASIX Water targets			SPS, AECOM	BASIX targets are expressed as a percentage reduction over NSW benchmarks
Residential buildings other than high-rise	60	-		
High-rise residential	40	50		
Public open space irrigation with recycled water	100%	-	AECOM	All POS irrigated with recycled water as a baseline
Operational waste diverted from landfill	60%	70%	AECOM	Based on work on other master planned precincts
Construction & demolition waste diverted from landfill	95%	-	GSC, SPS	Excludes waste that is not normally sent to landfill, e.g. hazardous waste, soil from excavation, etc.
FSC certified timber	95%	100%	SPS, GSC	
Climate change and resilience risks addressed through design	All high and extreme risks addressed	All medium and above risks addressed	GSC, SPS	
Elements that reduce urban heat island	50%	60%	GSC, SPS	Percentage area of the total project site (measured in plan view) as per GSC
Ecological improvement	10%	20%	SPS, GSC	Improvement based on comparison of pre (at the time of site purchase) and post development condition
Biodiversity enhancement	10%	20%	SPS, GSC	Improvement based on comparison of pre (at the time of site purchase) and post development condition

Target	Minimum Requirements	Stretch Goal	Target source	Comments
Tree canopy cover	40%	-	SV, GSRP	% of public space
Social				
Affordable Housing	5%	10%	SPS, GSRP	Affordable Housing managed by a community housing provider
Silver LHA accredited homes for all medium to high density dwellings	20%	-	SPS, SV	
Developers partner with Supply Chain Sustainability School	Upskill workforce	Address social issues	SPS, SV	
Economic				
Electric vehicle parking	10%	-	SPS	Measured as % of parking yield being EV charge station 'turn key' ready at development completion.
Dwellings with access to FTTP	100%	-	SPS, GSC	
Activity centres providing free Wi-Fi	100%	-	SPS, GSC	
Ensuring local job creation	Net increase	Job diversity	GSC	Job diversity is demonstrated as per GSC

Acronyms

CBD	Commercial Building Disclosure Program
GSC	Green Star – Communities
GSRP	Greater Sydney Region Plan
LSR	Landcom Sustainability Report 2018
SPS	Landcom Sustainable Places Strategy 2019
SV	Draft Kellyville sustainability vision

AECOM combined the work from the Climate and Community Risk Assessments and the sustainability targets into ESD Reports for both the Kellyville and Bella Vista Precincts. These Reports discussed key ESD focus areas for developers to investigate further, after the concept design stage, in line with the targets. The Reports included measures to address the urban heat island effect and climate change adaptations, particularly given the geographical context of the Precincts and the need to support community resilience. Initiatives outlined included: street planting and landscaping; green infrastructure and rooftop gardens; and the use of cool materials of high diffuse solar reflectivity and high emissivity values for pavement and roof surfaces.

We trust this information is of assistance to APP in preparing a response to the GANSW.

Yours faithfully

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Bella Vista Station Precinct

Ecologically Sustainable Development Report

Landcom

June 18, 2020

Quality information

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Table of Contents

1.	Executive Summary	1
2.	Introduction	2
2.1	Study Aims.....	2
2.2	Sydney Metro Northwest Places.....	2
2.3	Concept Site Description - Bella Vista Station Precinct	2
2.4	Sustainability Planning Context	3
2.4.1	Regional and local policy	3
2.4.2	Planning controls	6
2.5	Study Approach	6
3.	Ecologically Sustainable Development	7
3.1	Study Requirements	7
3.2	ESD Overview	7
3.3	Sustainability for Landcom.....	7
3.4	Stakeholder Consultation.....	8
3.5	Previous Studies.....	8
3.6	ESD Framework Themes and Indicators	9
4.	ESD Framework Assessments	10
4.1	Green Star Communities National Framework Assessment	10
4.2	Landcom Sustainable Places Strategy Assessment	21
5.	Delivery Strategy.....	30
5.1	Establishing a Governance Framework	30
5.2	Precinct Construction Staging	30
5.3	Green Star Communities	30
6.	Bella Vista Station Precinct Targets	32
7.	Focus Areas and Opportunities.....	34
7.1	Urban Heat Island Effect.....	34
7.2	Water Cycle Management	35
7.3	Sustainable Transport, Accessibility and Community Interaction	36
7.4	Precinct and Building Energy Efficiency	36
7.5	Renewable Energy	36
8.	Conclusion	37
	Appendix A – Hills Shire Council engagement	38

Figures

Figure 1: Bella Vista Station Precinct Location.....	3
Figure 2: Tree Benefits and Impacts, AECOM 2017.....	35

Tables

Table 1: Statutory BASIX energy targets	5
Table 2: Statutory BASIX water targets	5
Table 3: Green Star Communities National Framework Assessment	10
Table 4: Landcom Sustainable Places Strategy Targets	21
Table 5: Green Star Communities minimum requirements for 5 star rating	31
Table 6: Bella Vista Station Precinct Targets	32

1. Executive Summary

This report seeks to address the Secretary's Environmental assessment requirements (SEARs) for the preparation of the Environmental Impact Statement (EIS) on the Ecologically Sustainable Development (ESD) aspects of the Bella Vista Station Precinct. It details how ESD principles (as defined in clause 7(4) of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation)) will be incorporated in the design of the station Precinct, and suggestions for consideration during construction and ongoing operation of the Precinct - at this concept stage. More detail on ESD principles will be provided as part of the future detailed applications.

A framework is included to demonstrate how the proposed development will reflect best practice sustainable building principles to improve environmental performance, including energy and water efficient design and technology, and use of renewable energy at a precinct scale. The framework identifies baseline ESD targets to guide and support decision making along the development cycle and to inform next steps of the Bella Vista Station Precinct regarding the sustainability scope.

Compliance is demonstrated using the Landcom *Sustainable Places Strategy* and GBCA *Green Star Communities National Framework* principles with reference to relevant planning controls. The ESD framework assessment provided in this report aims to identify recommendations for improvement and inform specific targets to guide future planning and design development. Overall the report concludes that the proposed Bella Vista Station Precinct will provide a sustainable and liveable development based on the current Master Plan and identified targets, and it will meet the ESD planning controls and requirements for gaining project planning approval.

2. Introduction

2.1 Study Aims

AECOM has been engaged to develop an ESD Report to support the Concept State Significant Development Application (SSDA) for developable government-owned lands (DGLs) owned by Sydney Metro within the Bella Vista Station Precinct concept proposal.

The concept proposal for the Bella Vista Station Precinct is for a maximum of 3,822 dwellings, a maximum of 150,000 sqm of commercial, 14,000 sqm of retail, and provision for a community space. The Precinct also includes 4.27 ha of primary open space and 1 ha of contributory open space including new parks, as well as new streets and supporting public domain, and provision for a primary school.

The purpose of this report is to provide a robust and effective ESD assessment of the Bella Vista Station Precinct Concept Master Plan and its ability to meet the needs of the community and the environment from design and construction through to immediate and future Precinct operation.

The report assesses compliance against the proposed Secretary's environmental assessment requirements (SEARs), relevant development control plans (DCPs), State environmental planning policies (SEPPs) and ESD principles as defined in clause 7(4) of Schedule 2 of the EP&A Regulation.

2.2 Sydney Metro Northwest Places

The NSW Government and Sydney Metro have finalised the first stage of Australia's biggest public transport project with the commencement of new metro services in Sydney's northwest in May 2019.

Under the Sydney Metro Northwest (SMNW) Places program, Landcom and Sydney Metro are working collaboratively with the Department of Planning and Environment (DPE), local councils, other government organisations and key stakeholders to develop the long-term vision and delivery program to guide the redevelopment and urban renewal of surplus government owned or controlled land around new SMNW stations.

The Bella Vista and Kellyville Station Precincts form part of a network of eight station precincts being delivered under the SMNW Places program. They were identified by the NSW Government as Priority Precincts to support and drive urban renewal. The program aims to deliver vibrant and integrated precincts surrounding the new metro stations to support the forecast population growth by delivering new housing, employment opportunities and supporting infrastructure to the new metro stations.

2.3 Concept Site Description - Bella Vista Station Precinct

The Precinct spans alignment of the SMNW corridor that consists of an approximate 1.4km stretch of government owned land, extending from Celebration Drive in the south to Memorial Avenue in the north and generally bound by Old Windsor Road and existing private land holdings to the west and Elizabeth Macarthur Creek to the east (Figure 1).



Figure 1: Bella Vista Station Precinct Location

Source: www.nearmap.com

The Bella Vista Station Precinct Concept SSD Application site is located in North West Sydney in the Hills Shire local government area (LGA) and is defined as land owned by, or under the control of, Sydney Metro within the boundary of Bella Vista Station Precinct as defined by the State Significant Development Sites Map contained in Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

The site is irregular in shape and is contained within an area bound by Old Windsor Road to the west and Elizabeth Macarthur Creek to the east and is located adjacent to the alignment of the SMNW corridor between Celebration Drive in the south to Memorial Avenue in the north. The site is made up of 43 allotments and has a total area of approximately 33.79 hectares.

2.4 Sustainability Planning Context

This section provides an outline of relevant project policy and planning requirements for consideration in the context of Bella Vista Station Precinct ESD.

2.4.1 Regional and local policy

Greater Sydney Commission 'Our Greater Sydney 2056, Central City District Plan

The Greater Sydney Commission (GCC) has developed a number of sustainability objectives for the Central City District in which Bella Vista resides. These include:

- *Planning Priority C13. Protecting and improving the health and enjoyment of the District's Waterways.*
- *Planning Priority C14. Creating a Parkland City urban structure and identity, with South Creek as a defining spatial element*
- *Planning Priority C15. Protecting and enhancing bushland, biodiversity and scenic and cultural landscapes*
- *Planning Priority C16. Increasing urban tree canopy cover and delivering Green Grid connections.*
- *Planning Priority C17. Delivering high quality open space.*
- *Planning Priority C19. Reducing carbon emissions and managing energy, water and waste effectively.*
- *Planning Priority C20. Adapting to the impacts of urban and natural hazards and climate change.*

Environmental Planning and Assessment Regulation 2000 (EP&A Regulation)

For this report, the ESD principles are defined from clause 7(4) of Schedule 2 of the EP&A Regulation, being the precautionary principle, inter-generational equity, conservation of biological diversity and ecological integrity and improve valuation, pricing and incentive mechanisms. These are further defined in the EP&A Regulation as follows:

- (a) the ***precautionary principle***, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
 - i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
 - ii. an assessment of the risk-weighted consequences of various options,
- (b) ***inter-generational equity***, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,
- (c) ***conservation of biological diversity and ecological integrity***, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,
- (d) ***improved valuation, pricing and incentive mechanisms***, namely, that environmental factors should be included in the valuation of assets and services, such as:
 - i. polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
 - ii. the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
 - iii. environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

Building Sustainability Index (BASIX) SEPP

The requirements identify performance benchmarks to allow sustainability to be considered in site planning, building design and in the construction and operational phases of the development of Bella Vista Station Precinct to achieve best practice sustainability outcomes. BASIX controls are prescribed under a SEPP, which in turn is implemented under the *Environmental Planning and Assessment Act 1979* (EP&A Act). It is a statutory

requirement for all residential developments including new constructions and renovations worth \$50,000 or more in NSW.

BASIX is one of the most stringent energy and water planning tools within in Australia for residential development. BASIX is a sustainability planning instrument that sets energy and water design standards for all residential dwelling types in NSW energy and water efficient through specific design strategies for lighting, heating, cooling and ventilation.

BASIX mandates sustainability standards in residential developments by assessing the consumption of mains-supplied water, energy and thermal performance. BASIX targets were revised in June 2017. The following tables provide the current minimum statutory requirements for residential developments in Bella Vista.

Table 1: Statutory BASIX energy targets

Building Type	BASIX Target
Detached and semi-detached	50
Low-rise (3-storey units)	45
Mid-rise (4-5 storey units)	35
High-rise (6-storey units and higher)	25

Table 2: Statutory BASIX water targets

Building Type	BASIX Target
Detached and semi-detached	40
Low-rise (3-storey units)	40
Mid-rise (4-5 storey units)	40
High-rise (6-storey units and higher)	40

BASIX energy and water targets will influence overall electrical demand at the Bella Vista Station Precinct site, with an increase in BASIX targets implying decreased demand and more thermally efficient building envelopes and services required at later stages of development. This will ensure an extent of future-proofing from climate change and related temperature increases.

SEPP 65 and the Residential Apartment Design Guide

The State Environmental Planning Policy No 65 – Design Quality of Residential Apartment Development (SEPP 65) (2015) promotes better apartment design across NSW through the establishment of a consistent approach to the design and assessment of apartments and the way they are assessed by councils. SEPP 65 provides guidance on features for apartment buildings through a number of key design criteria relating to the sustainability performance of the development including:

- Bicycle and car parking
- Solar and daylight access
- Natural ventilation
- Apartment size and layout
- Universal design
- Energy efficiency
- Water management and conservation
- Waste management
- Building maintenance

The Residential Apartment Design Guide can provide guidance, in subsequent stages of the development, on overall apartment building design within the Precinct to drive sustainable design for the benefit of the residents as well as reduce energy and water demand and waste generation.

North West Rail Link (Sydney Metro) Environmental Impact Statement (1 & 2)

The existing planning conditions for the Bella Vista Station Precinct are made up of the State Significant Infrastructure (SSI) planning approval under the stations, rail infrastructure and systems planning approval. North West Rail Link EIS 2 assessed impacts for the Bella Vista station and surrounding area. These conditions are to be upheld in Bella Vista Station Precinct planning approvals and so are referenced for consistency in this report.

2.4.2 Planning controls

The Hills Development Control Plan 2012 (Hills DCP 2012)

The Hills DCP 2012 is the overarching development control document for The Hills Shire LGA. The provisions within the Hills DCP 2012 are amongst the relevant considerations for the Council when it determines applications for development of land within the LGA.

Recommendations from the approved SSDA will become the deemed DCP, so although the Hills DCP 2012 is not directly applicable in the context of the Kellyville and Bella Vista Station Precincts, it is important to consider the existing DCP measures. At this concept stage, consideration of the ESD objectives and controls within the DCP means that the opportunities for future DAs to include these objectives, if required, is optimised.

In particular, the Hills DCP 2012 includes a list of the Council's ESD Objectives, covering the precautionary principle, community involvement, water efficiency, biodiversity considerations, energy efficiency, waste avoidance and resource recovery, neighbourhood safety, economic viability and active and public transport options.

2.5 Study Approach

This report has been developed to meet the following guiding principles to enhance ESD outcomes for Bella Vista Station Precinct:

- Develop a framework to address ESD SEARs for Bella Vista Station Precinct and provide detailed discussion and recommendations to inform the project State Significant Development Application (SSDA) and guide sustainable outcomes in future planning, design, construction and operation.
- Develop an ESD framework that aligns with the principles provided in the Landcom Sustainable Places Strategy. This will include assessment in line with the GBCA *Green Star Communities National Framework* principles to align with industry best practice ESD.
- Assess the ESD performance of the HASSELL Master Plan against ESD framework indicators and provide discussion on compliance.
- Provide a set of recommendations for further consideration in future planning and design stages. This report seeks to focus on broad precinct planning considerations and to inform future planning and design development, leaving the adoption of building specific measures for future design and approval consideration.
- Consult with key stakeholders to identify ESD priorities for Bella Vista Station Precinct. Adopt stakeholder initiatives in the recommendations section of the report where absent from the reviewed Master Plan, applicable to this stage of planning and feasible for implementation in the Bella Vista Station Precinct.
- Propose a set of specific Precinct targets to guide future planning and design development and secure key ESD deliverables.

3. Ecologically Sustainable Development

3.1 Study Requirements

This section of the report aims to address the ESD study requirements as set out in the Secretary's Environmental Assessment Requirements for Stage 1 of the Bella Vista Station Precinct. The SEARs requires:

- an ESD Statement (incorporating a sustainability framework).

The ESD Statement will take into account Landcom's *Sustainable Places Strategy* and its targets.

3.2 ESD Overview

Australia's National Strategy for Ecologically Sustainable Development (1992) defines ESD as: '*using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased*'. Put simply, ESD is about the symbiotic relationship between community members and their interaction with their environment.

For the purposes of meeting ESD planning requirements, the EP&A Regulation outlines the principles of ESD. Part 3 of the *Protection of the Environment Administration Act 1991* (POEA Act) states that ESD "requires the effective integration of economic and environmental considerations in decision-making processes", and that ESD can be achieved through the implementation of the following principles:

- The precautionary principle
- Inter-generational equity
- Conservation of biological diversity and ecological integrity
- Improved valuation, pricing and incentive mechanisms

A development achieving heightened ESD outcomes needs to consider several factors in planning. The interaction between urban design and functional efficiency is important to understand, and requires collaboration between technical leads (e.g. stormwater, utilities, transport leads) and urban planners to decipher the best precinct wide design solution to adopt.

Design outcomes need to be fully considered and justified not just for their direct functionality but for their interaction with the environment, community and other design initiatives across the life of the asset. This means simply not just choosing the most sustainable design features now but anticipating how the community and the way the Precinct operates will evolve over time and how these assets will be maintained.

This ESD report sets the vision and the intent for Bella Vista Station Precinct but does not necessarily stipulate a final design solution to provide flexibility in design or technology choice. Effective governance and timing will be important to realise visions for sustainability and the governance framework made up of sustainability minimum compliance and stretch goals which are assessed by the Planning Authority, or the GBCA through Green Star ratings or through contractual requirements set out in the transaction documents between the developers and Metro/Landcom.

3.3 Sustainability for Landcom

Landcom have set the following vision as outlined in Landcom *Sustainable Places Strategy* (2018):

"We will deliver world class sustainability outcomes across our portfolio"

The *Sustainable Places Strategy* sets several goals for Landcom developments, defined by four main categories:

- Climate Resilient Places
- Healthy and Inclusive Places
- Productive Places
- Accountable and Collaborative Places

Under each category is a leadership goal, a set of targets and priorities to provide a framework to incrementally improve Landcom's portfolio performance over time.

The *Sustainable Places Strategy* was developed to provide future precinct developments with a set of goals to drive sustainable outcomes.

In accordance with the Landcom *Sustainable Places Strategy* use of 'best practice rating tools', the GBCA *Green Star Communities National Framework* guiding principles are adopted as indicators for the ESD framework assessment in this report.

3.4 Stakeholder Consultation

Collaboration brought about by the ESD process has sought to guide and influence technical disciplines through multidisciplinary collaboration through an integrative design approach. Workshops and meetings have been held to provide optimal project outcomes that meet stakeholder needs and expectations. This process has instigated refinement and clarification of the HASSELL Master Plan.

Disciplines particularly relevant to the Bella Vista Station Precinct ESD report include:

- Urban design and planning
- Landscape design
- Civil engineering, services and water management
- Bushfire and ecology
- European and indigenous heritage
- Transport and traffic
- Social planning
- Economic analysis

Whilst other disciplines are relevant, these disciplines are particularly important to developing a sustainable precinct in the context of the proposed Master Plan. These disciplines have been consulted and, where applicable, outcomes of these discussions have been included in the sustainability framework assessment in this report.

Engagement has been ongoing with The Hills Shire Council at several meetings. The meetings presented The Hills Shire Council with an opportunity to provide comment on aspects of the proposed Master Plan. Recommendations in this report have been developed to consider Council input and comments.

3.5 Previous Studies

Previous studies for the area that are relevant to the scope of this report include:

- North West Rail Link (now Sydney Metro Northwest) EIS and associated technical studies and design plans

- Rezoning proposal and supporting studies undertaken by the Department of Planning and Environment (DPE)
- Sustainability Concept Plan produced by Flux Consultants (2015)
- Bella Vista and Kellyville Concept Plan developed by Roberts Day and Urban Growth NSW (2015)

It is important to refer to these reports not only for construction impacts but also for Bella Vista Station Precinct's final design layout. The Operations, Trains and Systems (OTS) contract was awarded to NRT who is responsible for the design and construction of roadways and part of the infrastructure and public domain within the Station Precinct. NRT will leave vacant lots with removed vegetation offset and fauna managed in accordance with the EIS and NRT's Flora and Fauna Management Plan.

This ESD Report builds upon the findings of a gap analysis of previous studies that was undertaken by AECOM to assess the previous studies' relevance to the updated vision and objectives set out for the Bella Vista Station Precinct. The gap analysis assessed key ESD elements identified in the Sustainability Concept Plan produced by Flux Consultants (2015), commenting on alignment with Landcom's *Sustainable Places Strategy* (February 2018); the Precinct vision; existing policies and requirements; and current ESD drivers and trends.

3.6 ESD Framework Themes and Indicators

The following section provides an ESD framework that identifies and measures sustainability performance from the proposed development. It seeks to identify the complex interchangeable relationship between indicators that contribute to a sustainable and liveable development.

This framework has been developed to go above and beyond minimum requirements set in the SEARs, to include best practice principles outlined in the GBCA *Green Star Communities National Framework* and the Landcom *Sustainable Places Strategy*. Both frameworks have been adopted to evaluate a broad array of ESD factors and to demonstrate the ESD principles found in clause 7(4), Schedule 2 of the EP&A Regulation and Part 3 of the POEA Act have been met.

A set of indicators have been developed to assess the proposed Master Plan's ESD performance and provide recommendations to guide future planning, design, construction and operation of the Precinct.

4. ESD Framework Assessments

4.1 Green Star Communities National Framework Assessment

Table 3 outlines the integration of the GBCA Green Star Communities National Framework principles into the Master Plan development. It also recommends actions for future consideration during planning and design development. Separate to the assessment below, Landcom intends to seek Green Star – Communities certification or equivalent for the Kellyville and Bella Vista Precincts and are targeting a minimum five star rating for the development areas outside the infrastructure and roads already provided by Sydney Metro across both precincts.

Table 3: Green Star Communities National Framework Assessment

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
Enhance Liveability	Providing diverse and affordable living	<ul style="list-style-type: none"> Embedded commitment to a minimum 5% Affordable Housing target in the Master Plan. Proposed Precinct development options include a mixture of unit sizes and types to enable more affordable housing options. The urban design process tested different subdivision layouts, building configurations and terrace layouts to ensure greater diversity in urban form and dwelling types. A variety of superlot sizes is incorporated to support housing diversity and a mix of densities, with increased density towards activity centres. 	<ul style="list-style-type: none"> Investigate options to provide dwellings without car parking and visitor spaces or ‘separately titling’ car parks within apartments to give residents a choice to reduce apartment costs and the cost of car ownership. The concept proposal for the Bella Vista Station Precinct is for approximately 3,822 dwellings. Within this yield there needs to be a requirement on developers to provide a minimum 5% of Affordable Housing. Future purchaser(s) of the sites should deliver and/or enhance the targets set out in the Landcom Housing Affordability and Diversity policy.
	Creating healthy, safe and secure communities	<ul style="list-style-type: none"> Incorporates Crime Prevention through Environmental Design principles for natural surveillance, natural access controls and good definition of space and ownership. End-to-end visibility in streets and public areas to enable passive surveillance. Roads planned with adequate space for emergency vehicles. 	<ul style="list-style-type: none"> Consider provisions for further enhancement of active living within the Precinct. This may include provision of a local gymnasium or sports facilities within the proposed retail or commercial office space and/or outdoor gyms and recreational facilities in the public open space. Provide road markings and signage to clearly indicate proposed cycle and pedestrian routes and directions to Bella Vista Station and town centre.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration										
		<ul style="list-style-type: none"> Ongoing design development work to move car turning away from pedestrian plaza and improve hostile vehicle mitigation through physical barriers designed as planters. Bushfire setbacks and flood mapping built into urban design. A mixture of local roads, arterial roads, cycle and pedestrian shared paths and pedestrian paths links the proposed development and communities to Bella Vista Station and retail and commercial hub. This is detailed in Jacobs' Transport study and HASSELL's Vehicular Movement study and Clouston Associates' Public Domain and Landscape Strategy street typologies. Healthy active living encouraged through the provision of quality public open space and amenity and the emphasis on walkability within the Precinct, including a district park. The town centre has been designed to prioritise pedestrian activity with several high walkability laneways. There are also multiple parks interconnected with the Elizabeth Macarthur Creek (EMC) corridor. Adequate provision of public bicycle parking to foster cycling uptake by residents, with the following rates: 	<ul style="list-style-type: none"> Design roads and pavements to ensure safe pedestrian and cycling crossing of major streets and roads. Consider incentives for the establishment of further access to a variety of fresh foods. This may be a fresh food market or a combination, such as a fruit and vegetable store, a butcher, a fish market. Consider establishment of community medical services or similar. 										
		<table border="1"> <thead> <tr> <th data-bbox="571 936 824 967">Land use</th> <th data-bbox="824 936 1308 967">Bicycle parking rates minimum</th> </tr> </thead> <tbody> <tr> <td data-bbox="571 967 824 997">Residential</td> <td data-bbox="824 967 1308 997">1 space per 3 dwellings</td> </tr> <tr> <td data-bbox="571 997 824 1155">Retail</td> <td data-bbox="824 997 1308 1155"> Supermarkets: 1 space per 750 square metres of GFA for employees; 1 space per 1000 square metres of GFA for shoppers. </td> </tr> <tr> <td data-bbox="571 1155 824 1281">Commercial</td> <td data-bbox="824 1155 1308 1281"> Employee 1 space per 150 square metres of GFA Visitor 1 space per 750 square metres of GFA </td> </tr> <tr> <td data-bbox="571 1281 824 1310">Community Centres</td> <td data-bbox="824 1281 1308 1310">6 bicycle spaces at the community centre</td> </tr> </tbody> </table>	Land use	Bicycle parking rates minimum	Residential	1 space per 3 dwellings	Retail	Supermarkets: 1 space per 750 square metres of GFA for employees; 1 space per 1000 square metres of GFA for shoppers.	Commercial	Employee 1 space per 150 square metres of GFA Visitor 1 space per 750 square metres of GFA	Community Centres	6 bicycle spaces at the community centre	
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	Fostering inclusiveness and cohesiveness	<ul style="list-style-type: none"> Access to fresh food by residents is enabled through provision of 14,000 m² GFA retail space within the Precinct, providing the opportunity for a potential supermarket and/or grocer. Features included to promote inclusivity include the proposed active streets, a number of pocket parks and retail areas, such as the station plaza adjacent to each station connecting to the town square as part of the 'open space network'. Several meeting points are also provided to enhance community relations such as cafes, food and beverage premises. Planned mixed use between community and retail within the Town Centre (including privately-owned public space) designed to promote community interaction and wellbeing. Space for a large integrated community facility will be provided in the Precinct, adjacent to the train station. 	<ul style="list-style-type: none"> Support the community with the establishment of a community support group to address and tackle specific community issues as they arise. Ensure that Affordable Housing and private homes are not distinguishable – 'tenure blind concept'. Integrate community meeting spaces or shared spaces within residential buildings. Consider provision of pet friendly environments with appropriate fixtures and infrastructure for residents and visitors with pets to use selected community facilities. 				
	Building community adaptability	<ul style="list-style-type: none"> Commitment to Liveable Housing Australia accreditation targets for residential buildings. This ensures homes incorporate flexible and adaptable design to cater for the different needs of residents. Canopy cover (40% minimum target for the Precinct) provided in the Master Plan over paved surfaces serves as a cost-effective means of mitigating urban heat island effects and as an adaptation measure to climate change. Residential areas raised above the Probable Maximum Flood (PMF) level to enable an effective shelter in place strategy. Various climate and community resilience measures have been identified and embedded into the Master Plan (Refer to Climate 	<ul style="list-style-type: none"> Detailed design of adaptive spaces already provided around activity centres should be responsive to a range of functions including recreational and community activities. Plan for increased adoption of sustainable transport alternatives including bicycle sharing schemes, charging points for electric vehicles and parking for car share schemes. Minimise water and energy demand to reduce reliance on external services and products by incorporating on-site renewable energy generation or water harvesting/reuse. 				

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
		<p>and Community Resilience Assessment, prepared by AECOM), including:</p> <ul style="list-style-type: none"> ○ Integrating shading, cooling measures and water sensitive urban design and green infrastructure into street typology to alleviate urban heat island impacts. ○ Ensuring flood studies account for increased rainfall in line with climate projections ○ Provide flood adaptation measures at critical locations such as entries to buildings ensuring access and egress for persons with reduced mobility is maintained. <ul style="list-style-type: none"> • The Master Plan and underlying land zoning provides some flexibility to permit change of uses as the needs of the community change, such as a shift from apartment to medium density townhouses enabled in some areas to accommodate market demand and provide product diversity. • Bushfire setbacks and flood mapping built into urban design. 	<ul style="list-style-type: none"> • Build redundancy in the supply of critical services, i.e. energy, water, wastewater, transport, as a backup. This could also involve investigating a backup power supply. • Enable ‘smart hub’ office space including potential for co-working facilities within commercial areas
<p>Create opportunities for economic prosperity</p>	<p>Promote education and learning</p>	<ul style="list-style-type: none"> • A primary school is planned within the Precinct. The Department of Education (DoE) has been consulted on the provision of a school and agreed in principle for a 1-1.5ha site. • Gracelands Pre School and Giggles Early Learning Centre, Parklea Public School and Bella Vista Public School, and Glenwood High School are near the Precinct. Pedestrian links to schools are provided to facilitate access and encourage active transport. • Bella Vista Metro Station will enable direct access to higher education facilities such as Macquarie University and Western Sydney University campuses. 	<ul style="list-style-type: none"> • Provide accessible adult education classes at proposed local community centre and promote opportunities for further education and learning in surrounding precincts. • Explore opportunities to upskill the construction workforce through education or employment activities or initiatives, based on the needs of the local and regional community.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
	<p>Enhancing employment opportunities</p>	<ul style="list-style-type: none"> • Opportunities for local employment present within the proposed retail and commercial space. The economic analysis report undertaken by Ethos Urban found that the concept SSDA would generate a number of office and retail-based jobs. The Bella Vista Precinct is estimated or generate 7,510 jobs (refer to Bella Vista Economic Impact Assessment reporting by Ethos Urban). • Precinct has good regional employment transport links via Bella Vista Metro Station. • Other regional employment opportunities are present with Rouse Hill Town Centre. Local connections to Kellyville (and the Kellyville Station Precinct to the north), Norwest and Castle Hill regional employment hubs also via Sydney Metro. 	<ul style="list-style-type: none"> • Provide employment fairs/workshops at proposed local community spaces and promote both local and regional employment opportunities, such as through community notice boards either physical or online. • Ensure diversity in retail space offerings to provide a range of employment opportunities for all residents, particularly considering age diversity.
	<p>Attracting investment</p>	<ul style="list-style-type: none"> • 14,000 m² retail GFA will attract investment from wider region to Bella Vista Station Precinct. • A market analysis of the development potential of Bella Vista Station Precinct was undertaken by Ethos Urban to inform the Master Plan and to understand the viability of a metro style supermarket and other retail and commercial opportunities. 	<ul style="list-style-type: none"> • Leverage Bella Vista Metro Station to attract a diversity of retailers to grow the retail market offering and investment. • Investigate night-time activation options for the Precinct for both retail investment and community benefit.
	<p>Encouraging innovation</p>	<ul style="list-style-type: none"> • The HASSELL Bella Vista Concept Master Plan provides opportunities for innovative urban design particularly with the interface between the station and EMC corridor. 	<ul style="list-style-type: none"> • Encourage innovation in the selection of retail outlets to provide regional economic stimulus. • Encourage the selection of complementary commercial business to enhance prosperity and economic and social resilience of the Precinct. • Investigate opportunities to develop smart work hub to include business incubation and innovation programs, as well as co-working spaces.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
	Promoting efficiency and effectiveness	<ul style="list-style-type: none"> • Commitment to minimum BASIX Water and Energy targets to ensure efficient use in residential development with consequent economic savings. • Commitment to minimum NABERS Water and Energy targets for efficient resource use in commercial and retail development. • Efficiencies in customer accessibility for retail spaces through public transport links and retail space located adjacent to Bella Vista Station. 	<ul style="list-style-type: none"> • Install energy and water efficient fixtures and fittings and apply the BASIX framework for energy and water use in residential buildings, targeting BASIX Energy: Detached: 60, Low-rise: BASIX 45, Mid-rise: BASIX 45, and high rise: BASIX 40, BASIX Water 60 for all dwellings (as per Landcom’s <i>Sustainable Places Strategy</i>). • Develop a way-finding strategy to encourage commuters travelling by foot from surrounding precincts and the Sydney Metro car park to pass through the retail hub.
Foster environmental responsibility	Enhancing our natural environment	<ul style="list-style-type: none"> • Stormwater management strategy seeks to reduce flow rates and water quality impacts on EMC through WSUD elements, where feasible. Refer to the Water Cycle Management Report prepared by Wood and Grieve Engineers. • Landscape design embedded in the HASSELL Bella Vista Master Plan provides linkages to the wider Green Grid for enhanced biodiversity outcomes. The landscape report by Clouston additionally emphasises the selection of native plant species. • Proportion of tree canopy cover (40% minimum targeted for the Precinct) aligned with overarching strategic objectives from the Greater Sydney Region Plan. • Master Plan promotes preservation of mature trees and measures to support EMC ecosystem. Direct impacts are avoided where possible. 	<ul style="list-style-type: none"> • Enhance streetscape biodiversity through selection of native, low maintenance plant species. • Provide canopy cover in line with tree canopy cover targets for the Precinct. This will enhance ecological outcomes but also reduce impacts on urban heat island and microclimate. • Integrate WSUD features into streetscape to further improve stormwater quality and flows and passive irrigation. • Prioritise use of permeable paving and/or high emittance/albedo paving (for low-rise and/or open areas). • Conserve flora and fauna along EMC and corridors and actively improve EMC ecology. Where clearing of mature trees has been unavoidable and where clearing has occurred, this should be appropriately offset with vegetation retained in open space and streetscape. • Provide opportunities for community involvement in enhancing and conserving the natural environment.
	Reducing ecological footprint	<ul style="list-style-type: none"> • Opportunities for stormwater capture and reuse for irrigation are present in proposed WSUD elements. Refer to Water Cycle Management reporting by Wood and Grieve Engineers. 	<ul style="list-style-type: none"> • Provide water and energy efficient fixtures and fittings to meet BASIX and NABERS requirements.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
		<ul style="list-style-type: none"> • Master Plan identifies underground parking. This enables central waste collection and access for future consideration. • The Precinct is transit oriented with the new Metro station and a focus on connectivity and walkability, as detailed in HASSELL's Vehicular Movement study and Clouston's Public Domain and Landscape Strategy street typologies. There are proposed reduced car parking rates within the Precinct, also aimed to reduce the dependence on cars. Cycle lanes have also been identified in the Master Plan to encourage active transport. • The HASSELL Master Plan design also provides for the provision of an integrated cycle network to prioritise active transport, provide links to the Metro Station and reduce dependence on cars. • The HASSELL Design Guidelines include provisions for green roofs and the installation of solar photovoltaic (PV) systems or wind turbines on rooftops. • The HASSELL Design Guidelines also include ensuring buildings meet sustainable design principles, including energy and water efficiency, and prioritising low-embodied energy and sustainable materials. • Recycled water will be available and proximate to the site and will be reticulated during subdivision works. Refer to Water Cycle Management reporting by Wood and Grieve Engineers. • NABERS minimum 5 Star Energy and Water targeted, with 5.5 star stretch target for the Precinct underpins the Master Plan. • The BASIX targets for the Precinct underpin the Master Plan: <ul style="list-style-type: none"> ○ BASIX Energy: Detached: 50 (60 stretch); Low-rise: 45; Mid-rise: 35 (45 stretch); High rise: 25 (40 stretch) targeted. A lower target for high rise residential buildings 	<ul style="list-style-type: none"> • All public open space irrigation should be sourced with recycled water, where possible. The site is in Sydney Water's Area of Operations for recycled water infrastructure and they have been consulted by Wood and Grieve Engineers for their Water Cycle Management reporting. Ongoing consultation with Sydney Water and Council on achieving this is recommended. • Investigate further WSUD measures such as stormwater capture and reuse opportunities. • Provide end of trip and parking facilities for cyclists for people working in the Precinct and for residents. • Encourage uptake of walking and/or share bike and bike schemes and limit encroachment of Bella Vista Station parking by implementing on street parking restrictions. • Further investigate specific locations to install renewable energy systems on rooftops. The location choice will need to provide a balance between green roof space and PV installations.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
		<p>has been set based on anticipated higher energy demand for ventilation and lighting of car park areas and lifts.</p> <ul style="list-style-type: none"> ○ BASIX water: 60 target for detached, low rise and mid-rise dwellings. 	
<p>Embrace Design Excellence</p>	<p>Adopting effective planning practices</p>	<ul style="list-style-type: none"> • Bella Vista Station Precinct layout optimised during planning. The HASSELL Bella Vista design has sought to adapt the original Master Plan design to respond to Design Advisory Panel (formerly the Design Directorate Panel) feedback. HASSELL have embedded Design Excellence in the Master Plan through best practice design, external and internal reviews, workshops, optioneering and stakeholder engagement. • Design Guidelines have been developed as part of the Master Planning process that include ESD provisions to guide detailed design on the site. 	<ul style="list-style-type: none"> • Consider and integrate design excellence and ESD requirements for future development applications on the site, using the HASSELL Design Guidelines.
	<p>Encouraging integrated design</p>	<ul style="list-style-type: none"> • Central positioning of parks will provide green space and a meeting place for Precinct residents and station users. • Integrated commercial and retail space in the town centre will provide amenity and a range of flexible uses for local residents. • Building massing and form have accounted for the impact to solar access in the town centre. This is to ensure the town square has adequate access to sunlight. • The Master Planned public domain provides deep soil planting for street trees and within parks. 	<ul style="list-style-type: none"> • Prioritise timing of development construction to ensure sufficient amenities are in place and access is provided when the first residents arrive. • The integration between the built environment and green space should be optimised through the 'open space network' throughout the town centre, connecting the station plaza to the EMC.
	<p>Maintaining flexible and adaptable approaches</p>	<ul style="list-style-type: none"> • Ongoing revisions during Master Planning process by HASSELL demonstrates the flexibility in design. • The Concept Master Plan and Design Guidelines facilitate future development and encourage flexible and adaptable buildings. 	<ul style="list-style-type: none"> • Provide adaptability in design at the interface between the Precinct and current station car park site. This includes options for future tie ins with Precinct streetscape and utilities. By providing easily accessible utility connections along the western boundary this may mitigate the need for future disruption and road works.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
	<p>Creating desirable places</p>	<ul style="list-style-type: none"> Aesthetic appeal of the town centre is characterised by the provision of green infrastructure, including 40% minimum tree canopy cover targeted for the Precinct. Pedestrianised spaces enhance the safety of the community and the areas available for community meeting space. The town centre has been designed to prioritise pedestrian activity with several high walkability laneways. There are also parks interconnected with the EMC corridor. Street tree plantings proposed along town centre streets to enhance aesthetics and reduce urban heat island impacts. 	<ul style="list-style-type: none"> Seek to use sustainable materials including FSC timber in building design. This will act to soften building appearance and can substitute traditional materials including steel and concrete. Investigate opportunities to incorporate public art and other visual amenities.
	<p>Promoting accessibility</p>	<ul style="list-style-type: none"> The HASSELL design illustrates cycle/pedestrian shared paths. This includes cycleways along Florey Street separated from pedestrian areas and the road, as well as pedestrian links from the metro station to the Town Centre and the Precinct. Precinct includes extensive public transport links with Bella Vista Station (Sydney Metro) and bus stops. The design includes pedestrianised areas on retail and residential streets. The town centre has been designed to prioritise pedestrian activity with several high walkability laneways and the pedestrian-only retail street. There are also parks interconnected with the EMC corridor. The Master Plan provides a variety of site access points to the north and south. Particularly to the neighbouring Kellyville Station Precinct development. The Master Plan has considered the access for the commuter car park and the traffic control points required. 	<ul style="list-style-type: none"> Investigate pedestrian crossings across Memorial Avenue to connect the two halves of the Precinct, increase walkability and increase pedestrian safety. Seek to provide designated cycle lanes in areas of high pedestrian use to reduce bicycle and pedestrian user conflict. Indicative pedestrian bridges (outside of the SSD site boundary) provided on EMC to ensure access to the Bella Vista Station Precinct from residential development to the east. Aim to facilitate future connections to the pedestrian bridges.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
Demonstrate visionary leadership and strong governance	Establish coordinated and transparent approaches	<ul style="list-style-type: none"> HASSELL Bella Vista Master Plan has sought to respond to residential needs through integration of retail, community services and recreation. Targeting a minimum five star Green Star Communities rating or equivalent for the development areas outside the infrastructure and roads already provided by Sydney Metro across both precincts to demonstrate leadership in sustainable development. 	<ul style="list-style-type: none"> Support the community with the establishment of a community support group to address and tackle specific community issues as they arise. Seek to establish governance structures to achieve coordinated and transparent actions, including community and stakeholder engagement.
	Build a commitment to implementation	<ul style="list-style-type: none"> The HASSELL Master Plan and Urban Design report and this report demonstrate a commitment to sustainable development. Master Plan development has sought to identify and evaluate feasible options for implementation. 	<ul style="list-style-type: none"> Recommendations made in this report include those for detailed design and construction consideration. It is recommended that these are further developed in an implementation plan to identify actions, roles and responsibilities to guide future design.
	Engaging with stakeholders	<ul style="list-style-type: none"> The Hills Shire Council engaged as part of Master Plan development (feedback included in Appendix A). Other extensive stakeholder consultation has occurred throughout the Master Plan development process with RMS, DPE, other government agencies and the community. Community information session held for local (surrounding the Precinct) community members. Wood and Grieve Engineers utility servicing report has been used to inform the Master Plan, providing advice on wastewater, potable water, recycled water, electricity, gas and communications services through liaison and engagement with the relevant utility authorities. 	<ul style="list-style-type: none"> Seek to engage with neighbouring community groups and schools through planning and design development. Engage neighbouring community members to establish safe access through the site. Continued stakeholder engagement required through detailed design and SSD lodgement, in line with design excellence best practice.
	Fostering sustainable cultures and behaviours	<ul style="list-style-type: none"> This framework assessment aims to assist in guiding sustainable cultural and behavioural outcomes. Community meeting places and initiatives will assist in fostering sustainable Precinct behaviours. 	<ul style="list-style-type: none"> Consider promoting the sustainable credentials of the Precinct to educate community members and enhance uptake of community initiatives.

Theme	Principle	Master Plan Outcomes	Recommendations for Future Consideration
	<p>Encouraging and rewarding innovation</p>	<ul style="list-style-type: none"> • Innovation and enhancement of the original Master Plan has been sought through the redistribution of yield and larger parks. • Design Guidelines for the Master Plan include commitment to Design Excellence principles. 	<ul style="list-style-type: none"> • Identify innovations in design development and operation through consultation with relevant stakeholders.

4.2 Landcom Sustainable Places Strategy Assessment

Using the *Green Star Communities National Framework*, Table 3 above assesses the sustainability measures across the Bella Vista Precinct that have been identified in the Master Planning process and implemented in the plans. The recommendations for further consideration outline pathways for detailed design and developer requirements to realise the achieved ESD objectives for the Precinct.

Table 4 assess the integration of the Landcom Sustainable Places Strategy targets in the Master Plan and provides recommended considerations for future planning and design development. Only the Sustainable Places Strategy *Climate Resilient Places* and *Healthy & Inclusive Places* goals have been addressed below, as they are the most relevant at this concept stage.

Table 4: Landcom Sustainable Places Strategy Targets

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
Climate Resilient Places				
Environmental Management	To maintain and enhance a culture of high environmental performance.	<ul style="list-style-type: none"> All projects will adopt the use industry recognised rating tools at a Master Plan and built form scale, achieving not less than 'Australian Best Practice' equivalent. 	<ul style="list-style-type: none"> The GBCA <i>Green Star Communities National Framework</i> Principles have been adopted and applied to Master Plan development and guidance in this report. Targeting a minimum five star Green Star Communities rating or equivalent for the development areas outside the infrastructure and roads already provided by Sydney Metro. 	<ul style="list-style-type: none"> Ensure the GBCA <i>Green Star Communities National Framework</i> Principles are used during future detailed design.
		<ul style="list-style-type: none"> NABERS: Office, Hotel and Retail-Commitment Agreement or designed to 5 Star Energy and Water. 	<ul style="list-style-type: none"> NABERS minimum 5 Star Energy and Water targeted, with 5.5 Star stretch target. BASIX Energy: Detached: 50 (60 stretch), Low-rise: 45, Mid-rise: 35 (45 stretch); High rise: 25 (40 	<ul style="list-style-type: none"> Include the NABERS minimum 5 Star Energy and Water target in developers' requirements. Consider actions needed to reach stretch targets.

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
		<ul style="list-style-type: none"> • BASIX energy: Detached & Semi - 60, Low-rise - 45; Mid-rise - 45; High-Rise: 40. • BASIX Water: All dwellings – 60. 	<ul style="list-style-type: none"> • stretch) targeted. A lower target for high rise residential buildings has been set based on anticipated higher energy demand for ventilation and lighting of car park areas and lifts. • BASIX Water: 60 targeted for detached, low-rise and mid-rise dwellings. 	<ul style="list-style-type: none"> • Include the BASIX Energy: Detached: 50 (60 stretch), Low-rise: 45, Mid-rise: 35 (45 stretch); High rise: 25 (40 stretch); and BASIX Water: 60 targeted for detached, low-rise and mid-rise dwellings targets in developers' requirements. Consider actions to reach stretch targets.
Water	To design our precincts based on best practice water sensitive urban design principles, and actively conserve potable water.	<ul style="list-style-type: none"> • Water Sensitive Urban Design strategy for all projects, pollutant discharge loads not to exceed Nitrogen 45, Phosphorus 65, Suspended Solids 85, Gross Pollutants 90. 	<ul style="list-style-type: none"> • WSUD features proposed in HASSELL street layout for selected streets. Refer to Wood and Grieve Engineers WSUD advice in the Water Cycle Management report. 	<ul style="list-style-type: none"> • Include WSUD features within the proposed Precinct. These features should be designed and sized accordingly on modelled water quality parameters. Refer to Wood and Grieve Engineers Water Cycle Management report.
		<ul style="list-style-type: none"> • All new projects modelled to reduce mains potable water demand by 50% at the Precinct scale, against a 2016 reference case (CCAP Precinct). 	<ul style="list-style-type: none"> • Reticulated recycled water network coupled with efficient fixtures should meet >50% mains potable water demand reduction (subject to design modelling). Recycled water use can be anticipated to make up the following total water use proportions: Toilet 26%, Laundry 23%, Outdoor 40% (Your Home, 2017). 	<ul style="list-style-type: none"> • Include Landcom BASIX targets as part of developer's requirements to drive installation of water efficient building fixtures and fittings. • Demonstrate compliance against targeted Landcom BASIX water targets in design. Model anticipated water balance and efficiencies.
Energy & Emissions	To conserve energy and drive energy efficient, low	<ul style="list-style-type: none"> • All new projects modelled to reduce Greenhouse Gas (GHG) emissions at a precinct scale (transport and stationary) by 50% 	<ul style="list-style-type: none"> • Provisions to enable passive and active design measures in the Precinct have been considered in the development of the Master 	<ul style="list-style-type: none"> • Installation of rooftop PV systems. These should be modelled against anticipated energy demand to confirm a minimum of 5% of total

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
	<p>carbon, low emissions precincts for the future.</p>	<p>against a 2016 reference case (CCAP PRECINX).</p> <ul style="list-style-type: none"> 5% of predicted precinct energy demand supplied from onsite renewable energy, where site constraints permit. 	<p>Plan to enable low energy buildings.</p> <ul style="list-style-type: none"> Access to Bella Vista metro-station will significantly reduce car dependency, reducing emissions from transport. Provision in Design Guidelines for space on rooftops for sustainability elements. It is expected that on-site PV arrays would be utilised to make up >5% electricity demand annually, as per target. Building orientation designed to promote thermal efficiencies. Focus has been on reducing solar exposure of western facades. 	<p>energy demand is provided through renewable means. Include in development requirements specific provision of PV installation.</p> <ul style="list-style-type: none"> Include Landcom BASIX targets as part of developer’s requirements to drive energy and water efficient building fixtures and fittings. Ensure buildings comply with Section J requirements and SEPP 65 (Better Apartments). Central thermal plants unlikely to be suitable for residential buildings due to fluctuations in demand. Investigate opportunities to include central thermal plants/ technologies in mixed use buildings (retail and residential). Investigate opportunities to promote sustainable transport options including electrical vehicle charging stations and car and bicycle share schemes. Design for cross flow ventilation to reduce energy use associated with air conditioning. Provide passive thermal building efficiencies through orientation

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
				toward solar north or through external building shading.
Climate & Resilience	To respect, conserve and regenerate our natural environment and embed adaptation and resilience into all precincts, and expand community awareness.	<ul style="list-style-type: none"> All new projects to prepare and implement an effective Climate Change Adaptation Plan; and Community Resilience Plan with measurable outputs. <hr/> <ul style="list-style-type: none"> All new projects enhance the local habitat, biodiversity or ecological communities, compared to the site conditions pre-acquisition or pre-masterplan (Landcom Biodiversity Calculator) <hr/> <ul style="list-style-type: none"> Total project site area in plan view comprised of building or landscape elements that reduce the impacts of urban heat island effect: <ul style="list-style-type: none"> Greenfield Projects: 50% project site area 	<ul style="list-style-type: none"> HASSELL Bella Vista urban design plan and technical studies informed by existing climate change studies undertaken by Sydney Metro, NRT and Climate and Community Resilience Assessment, prepared by AECOM. <hr/> <ul style="list-style-type: none"> Bella Vista Station Precinct previously cleared by Sydney Metro NRT package. Impacts to biodiversity and offsetting have been managed in accordance with Sydney Metro plans and EIS. Landscape architects (Clouston Associates) have identified native species selection and sought to optimise biodiversity within the proposed development. <hr/> <ul style="list-style-type: none"> Precinct defined as a 'high density project' (20-50% project site area targeted). Planning development has sought to provide options to expand the green infrastructure including parks and tree canopy cover 	<ul style="list-style-type: none"> Seek to implement any further adaption measures as identified in Climate and Community Resilience Assessment, prepared by AECOM in developer requirements. <hr/> <ul style="list-style-type: none"> Seek to maximise street canopy cover (to meet the target and reduce urban heat island) and to provide shading. Prioritise low maintenance, native species selection in final landscape decisions. Combine WSUD and ecological benefits where feasible e.g. tree pits capturing stormwater runoff for irrigation. <hr/> <ul style="list-style-type: none"> Aim to provide dense canopy cover opposite west facing buildings to increase building thermal efficiency. Optimise the use of available roof space and reduce microclimate impacts through rooftop gardens.

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
		<ul style="list-style-type: none"> ○ Renewal or High Density Projects: 20-50% project site area. 	<ul style="list-style-type: none"> ● Master Plan identifies the need for Urban Heat Island reduction and mitigation strategies. 	<ul style="list-style-type: none"> ● Investigate and include cool roofs in developer requirements. ● Investigate community gardens and communal green areas provided between apartment blocks.
Waste & Materials	To drive innovation in waste reduction, and further enable the use of responsible resources	<ul style="list-style-type: none"> ● All new projects divert minimum 95% construction waste from landfill (excl. contamination or hazardous materials) ● 100% timber sourced for construction (by cost weight) is Forest Stewardship Council Certified or agreed equivalent (i.e. Australian Forestry Standards) 		<ul style="list-style-type: none"> ● Recommend for 95% waste diversion target informs developer's requirements. ● Recommend 100% FSC timber target informs developer's requirements.
Healthy & Inclusive Places				
Health, Equity & Inclusion	To create healthy, equitable, and inclusive outcomes for all members of our communities	<ul style="list-style-type: none"> ● All projects provide design, programs or events that encourage active, social and healthy eating lifestyles, achieving 90% resident reported health and wellbeing. Includes social return on investment evaluations. 	<ul style="list-style-type: none"> ● The framework included in this ESD report includes social return on investment values. ● Urban design seeks to provide healthy active places through adequate provision of green infrastructure which includes parks, playing fields and the creek corridor along EMC. Town centre is designed to prioritise pedestrian access. ● The Master Plan proposes a mix of retail and recreation services in the 	<ul style="list-style-type: none"> ● Further investigate and address community needs in precinct design in consultation with local community groups and The Hills Shire Council. ● Explore opportunities to enhance the interface between retail and the central park- this may include outdoor seating for restaurants and coffee shops. ● Consider provision of pet friendly environments with appropriate fixtures and infrastructure for

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
		<ul style="list-style-type: none"> All new projects are designed and delivered to achieve 90% resident satisfaction with public, active and sustainable transport options. 	<p>Precinct to promote interaction and community wellbeing.</p> <ul style="list-style-type: none"> Master Plan urban design incorporates transit-oriented development principles focusing on improved walkability, connectivity and provision of bicycle paths. 	<p>residents and visitors with pets to use selected community facilities.</p> <ul style="list-style-type: none"> Analyse and update regional pedestrian links surrounding the Precinct including the crossing of Old Windsor Road to improve access to surrounding community facilities and schools. Install pedestrian and cycle route signage to encourage adoption of active transport.
Community Connection	To nurture wellbeing and connection for all that live, work and recreate in our communities	<ul style="list-style-type: none"> 90% resident overall satisfaction with the integration of culture and heritage into all new projects. 	<ul style="list-style-type: none"> Community spaces identified to promote heritage values, arts and culture of local area. Master Plan highlights the need to provide a platform for public events and for the design to respond to the cultural heritage of the space. 	<ul style="list-style-type: none"> Identify opportunities to provide heritage interpretation in the retail areas and parks. Preserve and enhance local community values (including Aboriginal values) through community events and classes. Use community spaces to promote heritage values, arts and culture of local area, such as through events or exhibitions.
		<ul style="list-style-type: none"> 90% resident reported community cohesion across all new projects, by fostering the integration of community networks and facilities into our projects. 	<ul style="list-style-type: none"> HASELL's design has sought to provide public space along key pedestrian and cycle routes to enable access by all users. Community uses are strategically located in predicted high-use areas 	<ul style="list-style-type: none"> Add developer requirements around inclusion of community uses. Sizing, access and features will require discussion with The Hills Shire Council and local community groups.

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
			to facilitate activation and social interaction.	<ul style="list-style-type: none"> • Provide opportunities for local employment through hosting employment workshops/fairs at proposed community centre.
Safety & Wellbeing	To promote a culture of health, safety and wellbeing	<ul style="list-style-type: none"> • Achieve a culture of safety throughout our organisation and on all Landcom projects, striving to achieve 90% overall community safety score at our projects. 	<ul style="list-style-type: none"> • Accessibility in public space planned in urban and landscape design. This provides safe, compliant access ramp solutions to lessen the gradient of pedestrian paths through parks and activity centres. • Pedestrian cycle and vehicle route selection seeks to mitigate conflict between pedestrians, cyclists and road vehicles. • Pedestrians and cyclists are separated with designated cycle lanes in areas of high activity. • Incorporated Crime Prevention through Environmental Design principles for natural surveillance, natural access controls and good definition of space and ownership. • End to end street pedestrian visibility and passive surveillance in public areas demonstrated in the Master Plan. This is also important for safe passage at night. 	<ul style="list-style-type: none"> • Identify provision for specific recreational activities and kids play areas within the proposed park based on community needs and Clouston Associated landscape report recommendations. • Investigate any additional traffic management measures to discourage Sydney Metro car park users away from driving though the heart of the Precinct. Any reduced traffic flow will increase safety for community members within the Precinct. • Identify areas to activate at night through retail and other economic and social activity to enhance the night-time activity and safety of the Precinct.

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
Design through engagement	To optimise the quality of design and place for our communities	<ul style="list-style-type: none"> All new projects to undergo peer review through the Design Directorate, Design Advisory Panel or equivalent Design Review Panel. 	<ul style="list-style-type: none"> HASSELL Bella Vista Master Plan developed to respond to Design Advisory Panel (formerly Design Directorate Panel) feedback, as well as feedback from multiple collaborative workshops and a peer review process. 	<ul style="list-style-type: none"> Review final design against the recommendations outlined in this report to ensure uptake of initiatives.
	To drive strong engagement with our communities and stakeholders	<ul style="list-style-type: none"> All new projects to implement the Landcom Join-In Framework for stakeholder engagement. 	<ul style="list-style-type: none"> Feedback on aspects of the proposed Master Plan and ESD initiatives obtained from The Hills Shire Council (Appendix A). Ongoing informed design process included extensive stakeholder engagement (including government departments, council and community). 	<ul style="list-style-type: none"> Engage and involve local community groups in the development of public spaces and the local community centre. Support the community with the possible establishment of a local community group to identify and discuss community initiatives.
Affordability & Diversity	Deliver on Landcom's commitments for affordable, diverse and sustainable homes	<ul style="list-style-type: none"> Enable 5-10% of all new homes as Affordable Housing across our portfolio. 	<ul style="list-style-type: none"> This concept proposal has a residential gross floor area of approximately 3,822 dwellings. Within this yield is an embedded commitment to a minimum Affordable Housing target of 5% in the Master Plan. Proposed Precinct development options include a mixture of unit sizes and types to enable a variety of affordable housing options. Affordable homes are modern, comfortable, efficient and 	<ul style="list-style-type: none"> Future purchaser(s) of the sites should deliver and/or enhance the targets set out in the Landcom Housing Affordability and Diversity policy.

Indicator	Objective	Sustainable Places Strategy Target	Master Plan Outcomes	Recommendations for Future Consideration
			adaptable so that they are affordable in the life cycle.	
		<ul style="list-style-type: none"> 20% of medium to high density dwellings within all new projects achieve Liveable Housing Australia Silver Certification (or equivalent) 		<ul style="list-style-type: none"> Compliant options to be clarified further in detailed design. Include a minimum 'Design' and 'As-Built', Liveable Housing Australia Silver Certified for 20% of precinct apartments target as part of developer's requirements.
		<ul style="list-style-type: none"> Enable 10-15% diverse housing across our portfolio. 	<ul style="list-style-type: none"> The proposed Precinct development options include a mixture of unit sizes and types to enable a diversity of housing options across the Precinct. 	<ul style="list-style-type: none"> Investigate further opportunities to provide housing diversity in built form.

5. Delivery Strategy

5.1 Establishing a Governance Framework

To facilitate the delivery of sustainability initiatives outlined in the ESD frameworks, it is important for an effective governance framework and process of continual review to provide a best for project approach that delivers optimal sustainability outcomes. Key to this is the identification of stakeholders whose role will be to check for regulatory compliance and development in line with best practice principles and targets as stipulated in the Landcom *Sustainable Places Strategy*.

It is anticipated for recommendations and targets specified in this report to inform developer(s) requirements. The targets provided in Section 6 will underpin minimum sustainability performance on the project.

Many of the recommendations provided in this report, particularly those relating to building energy and water use, are not currently defined and will require consideration by developers in design development. Where this is the case, this report has sought to prescribe minimum compliance targets or recommend adoption of sustainability frameworks to ensure adoption of initiatives. This includes achieving a minimum compliance of Five Star for Green Star ratings, 'Silver' Liveable Housing Australia for 'Design' and 'As-Built' for 20% of residential apartments and BASIX and NABERS targets as specified in the Landcom *Sustainable Places Strategy*.

Green Star - Communities provides a governance framework that is transparent, accountable and adaptable and it is recommended this is adopted to inform decision making and design development. The governance category rewards projects that achieve coordinated and transparent approaches, commitment to implementation, stakeholder engagement and sustainable cultures and behaviours.

5.2 Precinct Construction Staging

Staging of construction will be important to mitigate environmental and social impacts and ensure provision of amenities when the first residents move in to the Precinct. Staging will need to ensure that core services, including to the metro station, are maintained during construction when access to areas of the Precinct will be blocked or limited. Whilst access to areas of the Precinct will be blocked during construction, it will be important to maintain access to core services including the metro station during this time.

It is recommended the Bella Vista Station Precinct is developed from south to north (from the area closest to Bella Vista station) to provide social amenities and prioritise Town Centre development.

5.3 Green Star Communities

The Green Star - Communities v1.1 tool evaluates the sustainability attributes of the planning, design and construction of large-scale development projects, at a precinct scale (GBCA, 2016). It drives and measures performance of social, environmental and economic outcomes through the following categories:

- Governance
- Liveability
- Economic Prosperity
- Environment
- Innovation.

Landcom intends to seek Green Star – Communities certification or equivalent for the Kellyville and Bella Vista Precincts and are targeting a minimum five star rating for the development areas outside the infrastructure and roads already provided by Sydney Metro across both precincts. The five star Green Star rating is representative of 'Australian Excellence' standard. Minimum category scores for five star achievement of each category are provided in Table 5.

Table 5: Green Star Communities minimum requirements for 5 star rating

Rating	Minimum Total Score	Minimum Category Score				Outcome
		GOV	LIV	ECON	ENV	
Five Star	60-74	6	4	4	6	Australian Excellence

The Green Star - Communities submission guidelines provide details of credit aims and criteria and background information and resources.

6. Bella Vista Station Precinct Targets

The following overarching minimum compliance targets have been identified as key to furthering sustainable precinct development outcomes in Bella Vista Station Precinct. These have been adapted from and are consistent with the Landcom *Sustainable Places Strategy* with some additional key targets for heightened performance.

Additional targets outlined in the Landcom *Sustainable Places Strategy* include committing to carbon neutral, water positive and net positive ecological outcomes by 2028. This is regarded as an overarching target for the Landcom portfolio and has been excluded from the main targets listed above due to uncertainty of timings and achievement for the Bella Vista Station Precinct. Despite this, many of the targets in Table 6 directly contribute towards these ambitions and a net zero carbon precinct is included as a stretch target.

Table 6: Bella Vista Station Precinct Targets

Target	Minimum Requirements	Stretch Goal	Target source	Comments
Governance				
Green Star Communities precinct rating, or equivalent	5 star	6 star	SPS, SV	
Green Star Design & As Built rating for medium to high density buildings	5 star	6 star	LSR, GSC	
Environmental				
NABERS energy rating for office and retail buildings	5 star	5.5. star	SPS, CBD	Targets exceed statutory requirements.
BASIX Energy targets			SPS, BASIX SEPP	BASIX targets are expressed as a percentage reduction over NSW benchmarks.
Detached houses, semi or terrace houses and townhouses	>50	60		
Low rise (3 storey units)	>45	45		
Mid rise (4-5 storey units)	>35	45		
High rise (6 storey units or higher)	>25	40		
Low carbon precincts	50%	100% (net-zero carbon)	SV, GSC	% reduction in stationary and transport emissions. Reduction to be measured against a 2016 reference case – the 2016 Sydney Metro per person average (CCAP Precinct)
Onsite renewable energy	5%	10%	GSC	% of total estimated demand
NABERS Water rating for office, hotels and retail buildings	5 star	5.5 star	SPS, CBD	Target exceeds statutory requirements
BASIX Water targets			SPS, AECOM	BASIX targets are expressed as a percentage reduction over NSW benchmarks
Residential buildings other than high-rise	60	-		
High-rise residential	40	50		
Public open space irrigation with recycled water	100%	-	AECOM	All POS irrigated with recycled water as a baseline
Operational waste diverted from landfill	60%	70%	AECOM	Based on work on other Master Planned precincts
Construction & demolition waste diverted from landfill	95%	-	GSC, SPS	Excludes waste that is not normally sent to landfill, e.g. hazardous waste, soil from excavation, etc.

Target	Minimum Requirements	Stretch Goal	Target source	Comments
FSC certified timber	95%	100%	SPS, GSC	
Climate change and resilience risks addressed through design	All high and extreme risks addressed	All medium and above risks addressed	GSC, SPS	
Elements that reduce urban heat island	50%	60%	GSC, SPS	Percentage area of the total project site (measured in plan view) as per GSC
Ecological improvement	10%	20%	SPS, GSC	Improvement based on comparison of pre (at the time of site purchase) and post development condition
Biodiversity enhancement	10%	20%	SPS, GSC	Improvement based on comparison of pre (at the time of site purchase) and post development condition
Tree canopy cover	40%	-	SV, GSRP	% of public space
Social				
Affordable Housing	5%	10%	SPS, GSRP	Quantum of Affordable Housing managed by a community housing provider
Silver LHA accredited homes for all medium to high density dwellings	20%	-	SPS, SV	
Developers partner with Supply Chain Sustainability School	Upskill workforce	Address social issues	SPS, SV	
Economic				
Electric vehicle parking	10%	-	SPS	Measured as % of parking yield being EV charge station 'turn key' ready at development completion
Dwellings with access to FTTP	100%	-	SPS, GSC	
Activity centres providing free Wi-Fi	100%	-	SPS, GSC	
Ensuring local job creation	Net increase	Job diversity	GSC	Job diversity is demonstrated as per GSC

Acronyms

CBD Commercial Building Disclosure Program

GSC Green Star – Communities

GSRP Greater Sydney Region Plan

LSR Landcom Sustainability Report 2018

SPS Landcom Sustainable Places Strategy

SV Draft Bella Vista sustainability

7. Focus Areas and Opportunities

This section provides an in depth look at the key ESD focus areas identified during planning for Bella Vista Station Precinct. The aim is to identify opportunities and initiatives for developers to investigate in the future - after the concept design stage.

7.1 Urban Heat Island Effect

Reducing urban heat island effect is a particular issue for Western Sydney with the number of days over 35°C having increased by 250% since 1965, compared with only a 22% increase in central Sydney (*Guide to Urban Cooling Strategies*, Low Carbon Living CRC, 2017).

Urban heat island and microclimate impacts typically occur when urban surfaces such as roads and roofs hold and reradiate heat, raising the temperature of their surroundings. Reducing urban heat island impacts is particularly important to counteract the effects of climate change and to increase the resilience of the Precinct.

Planning in the Precinct has included consideration of the need to reduce the urban heat island effect. The HASSELL Urban Design Report includes objectives to reduce the urban heat island effect through landscaped public domain and deep soil provisions, light coloured roofs and rooftop space utilisation for gardens and the use of cool and high emissivity materials. These Guidelines should be utilised by developers as they investigate sustainability initiatives after the concept design stage.

Turn Down the Heat, a strategic plan for addressing extreme heat in Western Sydney 2018-2023 coordinated by Western Sydney Regional Organisational Councils (WSROC), was released in December 2018. It is a strategy and action plan to tackle urban heat and manage its impacts on people, infrastructure, the economy and environment. The following actions in the strategy are suggested as relevant for further consideration:

- **Action 4 – Land use and design controls that prioritise resilience:** *Appropriate changes to building codes, land use, development and design controls to prioritise green space and green infrastructure.*
- **Action 7 – Adoption of Sydney’s Green Grid:** *Support greater adoption and collaboration to implement the Greater Sydney Green Grid, which promotes the creation of a network of high-quality open spaces that supports recreation, biodiversity and waterway health and connects strategic, district and local centres, public transport hubs, and residential areas.*
- **Action 9 – Recognition of blue and green infrastructure as critical infrastructure:** *Integrate construction and maintenance of blue and green infrastructure and the urban tree canopy into investment and maintenance planning. Recognise and invest in green infrastructure to the same level as hard infrastructure, to maintain the cooling capacity and other benefits of green infrastructure.*
- **Action 11 – Preventative heat response framework:** *Develop a preventative heat response framework to integrate emergency management procedures and preparation with outreach to the community service providers that interact with vulnerable populations.*
- **Action 12 – Urban heat community engagement strategy:** *Develop a regional community engagement strategy for Greater Western Sydney to raise awareness around the dangers of heatwaves, inform decision making, and help create more prepared, resilient communities.*

The Low Carbon Living CRC *Guide to Urban Cooling Strategies* 2017 provides an ‘Urban Cooling Toolkit’ and includes guidance on shading, paving and urban vegetation. It is recommended this is referred to for streetscape design.

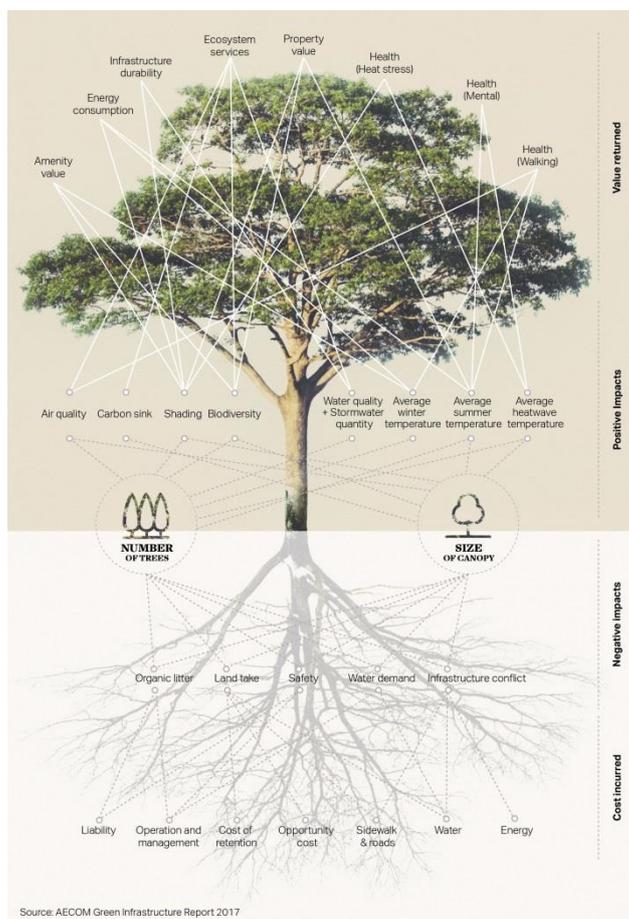


Figure 2: Tree Benefits and Impacts, AECOM 2017

The diagram above illustrates the complex relationship between the number of trees and size of canopy and the social, environmental or economic benefits and impacts. Benefits and impacts have been assessed and measures to reduce impacts and promote benefits considered in planning. These considerations include tree species selection, planting location and environmental, social and economic influence.

Proposed landscaping is necessary to provide a buffer to heat radiation and shading for neighbouring buildings, as well as providing a natural noise barrier. Street trees species, quantity and locations will need to be designed to maximise canopy cover. Species selection has been considered by Clouston Associates in their reporting and those insights should be utilised in future planning.

7.2 Water Cycle Management

Planning has sought to implement water cycle management by including measures that increase water efficiency, conserve resources and manage stormwater quality and flows. Refer to Wood and Grieve Engineers Water Cycle Management Report for further details.

Key to achieving water efficiency will be the proposed Sydney water recycled water network into the Precinct as well as meeting the operational targets for buildings i.e. BASIX Water targets for dwellings and NABERS Water targets for commercial and retail development.

Capture and treatment using WSUD measures aims to improve the quality of stormwater runoff prior to discharge. Where drainage functional requirements allow, stormwater can be diverted for the purposes of Precinct irrigation. Species selection for tree and other flora planting will also be key to alleviating the need for

intensive irrigation across the Precinct. Further details of proposed landscaping can be found in the Clouston Landscape Report.

7.3 Sustainable Transport, Accessibility and Community Interaction

Planned transport links through the corridor have sought to provide road access from neighbouring suburbs to Sydney Metro car parking and provide safe access for cyclists and pedestrians through the Precinct.

Road layout and parking options have sought to restrict street parking and prioritise adoption of sustainable alternatives. To aid the uptake of active transport it is recommended car share and cycle hire schemes are provided.

Urban design has sought to create a vibrant, liveable and accessible town centre for all ages. Planning of the parks connecting with the EMC corridor aims to enhance walkability for local residents whilst providing access for station commuters. Wide footpaths around parks and community gardens provide opportunities for central meeting places and for open front retail.

Pedestrianised retail area design provides safe and accessible meeting areas and economic opportunities for the Precinct. The Master Plan has sought to improve the pedestrian network in order to connect with the existing movement network and neighbouring destinations.

Park design has sought to provide safe access by decreasing the gradient of pathways using diagonal pathways, whilst still providing more direct Precinct access for cyclists and pedestrians around the park perimeter.

A mix of smaller and wide public spaces have been included between residential blocks to create open, secure community spaces. This is highlighted in the Bella Vista Master Plan designed by HASSELL.

7.4 Precinct and Building Energy Efficiency

Passive design measures included in Precinct planning level have aimed to reduce energy burden to achieve thermal comfort levels. Measures identified include addition of green space, maximisation of tree canopy cover, urban layout orientation and aspect ratios to minimise western solar gain and promote natural ventilation.

At a building specific level, it is expected for the developer to identify specific energy saving measures including high performing building insulation and materials, energy efficient air conditioning and installation of high energy rated appliances.

7.5 Renewable Energy

The current HASSELL Master Plan Design Guidelines have included an opportunity to maximise on-site renewable energy generation from roof mounted solar PV arrays or wind turbines.

To facilitate the provision of PV installation, sizing of these arrays should seek to meet the renewable energy target of 5% on-site generation and aim to provide redundancy in the event of a grid power outage. Further opportunities exist to investigate the feasibility and reliability of small, roof-mounted wind turbines; however, it is recommended to prioritise solar PV in the Precinct.

If renewable supply outweighs Precinct demand, it is suggested in the first instance to investigate the use of battery cells to provide Precinct renewable energy use at night and/or feeding renewable energy back in to the grid.

8. Conclusion

This report provides discussion on the implications of the Concept Plan for Bella Vista Station Precinct and its ability to meet best practice ESD principles. The assessment meets the intent of proposed SEARs, relevant SEPPs and The Hills Shire Council DCP using an assessment framework with indicators informed by the GBCA *Green Star Communities National Framework* and the Landcom *Sustainable Places Strategy*.

The assessment and subsequent discussion on relevant focus areas outlines planning considerations and justification on preferred options. The assessment also delivers a detailed set of recommendations for further planning, design and construction guidance. This includes social sustainability measures including provision of Affordable Housing and greater dwelling diversity, and environmental sustainability measures including the use of WSUD initiatives, encouraging active transport and walkability and improving biodiversity and canopy cover.

Further focus areas and opportunities have been highlighted and discussed in detail, including urban heat island effect mitigation, water cycle management and sustainable transport, accessibility and community interaction.

The identified minimum targets in Section 6 detail the overarching requirements for Bella Vista Station Precinct to underpin delivery of initiatives identified in the ESD framework assessment in Section 4.

Overall this report concludes the proposed Bella Vista Station Precinct will;

- a. Provide a sustainable and liveable development based on the HASSELL Master Plan coupled with adoption of initiatives and targets identified in this report.
- b. Meet (in conjunction with this report and referenced reports) the ESD planning controls and requirements for gaining project planning approval.

Appendix A – Hills Shire Council engagement



SUBJECT:	MEETING - LANDCOM UPDATE FOR BELLA VISTA AND KELLYVILLE PRECINCTS
DATE:	20 FEBRUARY 2019

Date: Wednesday 20/2/19
Time: 2.30pm

Attendees:
Representatives of Council, Landcom and various consultants

Minutes

1. Planning and Approval Strategy

- Landcom advised:
 - Planning and approval strategy has changed from focus around stations to entire precincts.
 - Bella Vista and Kellyville being worked on by two separate working groups.
- As per previous advice, Council is supportive of this holistic approach.

2. Open Space

- Landcom's consultant (Eltons) discussed work undertaken to inform open space provision:
 - Planning based on total population of 10,000 to 17,000.
 - A number of benchmarks considered.
 - Capacity of existing sporting fields considered.
 - Proposed provision at this stage:
 - 3 ha local parks (6-8 parks)
 - 3 ha district park
 - 2 ha creek corridor
 - 8 ha total quantum**
- Council staff commented:
 - Population likely to be closer to 17,000 to 20,000.
 - Further review of demographics and occupancy rate assumptions required.
 - The capacity of all existing sports fields and currently planned sports fields will be taken up by existing growth areas, outside of the Bella Vista and Kellyville Station Precincts. There will be no capacity remaining which can be utilised by growth within these Precincts.
 - It is anticipated that the future capacity within Caddies Creek Stage 2 would be fully taken up by the additional demand from Bella Vista and Kellyville Precincts.

3. Community Facilities

- Landcom's consultant discussed work undertaken to inform community facilities provision:

- Benchmark of 80m² per 1,000 people for library and community space.
- One facility planned for the two precincts.
- Location would be based on providing a high level of accessibility.
- Looking at considering alternative ways of providing facilities e.g. share arrangement with schools.
- Council staff commented:
 - Council has been reluctant to support community facilities in stratum due to ongoing costs.
 - Areas around the viaduct may be a possibility for locating facilities.
 - Surplus land around viaduct needed for SES. Council has sent correspondence to Landcom (via Lisa Danker).
 - Further discussions required with Council's Library Team to determine the needs and potential options for servicing growth.

4. Schools

- Landcom's consultant outlined matters relating to proposed schools:
 - One primary school planned within precincts.
 - 1-1.5 ha site, 2-3 storeys in height (consistent with advice from DEC).
 - Possible location roughly in the middle of the two stations, adjoining potential district park.
 - DEC to be consulted further with respect to location.
- Council staff commented:
 - A high school may also be required given the level of population growth.
 - Queried whether potential school site on Sanctuary Drive is still being considered and whether Landcom has been involved in discussions relating to this land with DEC.
 - Council concern regarding parking provision in recently developed government schools and potential traffic and parking implications of proposed school within the centre of the stations precincts.

5. WSUD

- Landcom's consultant advised:
 - Need for further consideration of runoff quality.
 - Planned approach is for developers to ensure runoff is no worse than current situation.
 - Issue regarding quality of connections to trunk drainage.
 - Issue regarding ownership of surplus land between roads and trunk drainage (subject of previous meetings with Sydney Water and Landcom).
- Council staff commented:
 - Significant work undertaken previously with Sydney Water – to be provided to Landcom.

6. Memorial Avenue and Balmoral Road Crossings

- Landcom discussed investigation into crossings at Memorial Avenue and Balmoral Road:
 - Crossings at these locations would improve accessibility and connection between riparian corridor.
 - Signals proposed at Memorial Avenue (not supported by RMS – preference for left-in left-out only).
 - Feasibility subject to traffic modelling.
 - RMS has provided comments on scope of modelling.
 - Expect modelling to be complete in 8-10 weeks.
 - Potential at-grade or bridge crossing at Balmoral Road.

7. Delivery Mechanism

- Landcom still considering CPs and/or VPA.
- To be decided after extent of infrastructure is known and having regard to divestment strategy.

8. Next steps

- Focus groups to be organised with relevant Council staff (open space, WSUD, libraries, traffic).
- Further discussion between DEC and Council regarding school site options being pursued and potential issues.
- Council to send through information on assumed occupancy rates and benchmarking for open space facilities.
- Council to review correspondence re: SES headquarters.
- Council to provide previous water management work.
- Council to provide comments on Balmoral Road crossing (4 way signalised intersection at Balmoral Road and Free Settlers Drive).
- Landcom to lodge SSDA after July 2019. Timing to be further discussed at subsequent meetings.

Meeting concluded 4.30pm.

