



LEGISLATIVE ASSEMBLY
FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON ENVIRONMENT AND TRANSPORT AND CITY SERVICES

Ms Suzanne Orr MLA (Chair), Miss Candice Burch MLA (Deputy Chair)

Ms Tara Cheyne MLA, Ms Nicole Lawder MLA

Submission Cover Sheet

Nature in Our City

Submission Number: 43

Date Authorised for Publication: 8 August 2018

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services

Inquiry into “Nature in our City” - matters affecting the value of the natural environment to an urbanising Canberra

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture



June 27 2018

Context

The Standing Committee has resolved to conduct the following inquiry –

Noting the importance of the natural environment to Canberra, including the level of public support for nature and the natural environment, the growing importance of urban open spaces and bushland reserves and the benefits they bring to Canberra and opportunities for development of Blue – through water – and Green – through natural form – infrastructure in Canberra resolved to inquire into and report on the matters affecting the value of the natural environment to an urbanising Canberra, including:

- 1. The level of public support for and satisfaction with amount and quality nature and natural environment areas in Canberra, particularly in urban areas.*
- 2. The types of nature and natural environmental areas within Canberra e.g. urban open spaces or bushland reserves and the existing or potential benefits and challenges they bring to Canberra’s:*
 - a. Social amenity;*
 - b. Economic development;*
 - c. Biodiversity; and/or*
 - d. Climate resilience.*
- 3. Opportunities for Blue (water) and or Green (natural) Infrastructure in Canberra including;*
 - a. Functional requirements of proposed infrastructure;*
 - b. Cost and Maintenance considerations;*
 - c. Amenity benefits; and*
 - d. Conservation and biodiversity benefits.*
- 4. Managing the interface between the natural environment and urban areas particularly in regards to conserved environmental areas.*
- 5. Current policy or regulatory settings that impede the integration of the natural environment within optimal urban development and design.*
- 6. Any other relevant matter.*

Abstract: Ginninderry – A case study for the Inquiry

The cross border Ginninderry joint venture project (Territory and Riverview Developments) is a case study of the interplay of nature and the natural environment with urban areas in the Canberra region. The Project demonstrates emerging best practice and shows the benefits that can be derived by pro-actively addressing challenges to the delivery and sustainable management of nature and natural assets within and adjacent to urban areas.

The progressive development of Ginninderry will enable the funded restoration of some 600 hectares across the ACT and NSW, adjacent to the Murrumbidgee River, Ginninderra Creek and Ginninderra Falls that is currently used for grazing and is not accessible to the public. Urban development of adjoining land provides the funding and governance model to pay for trails, lookouts and low impact recreational use, guided by an evidence based Plan of Management.

It will over time enable the whole community to participate in the enhancement of nature and natural systems, and reap significant recreational, scientific, cultural and health and well-being benefits from the managed use of the land.

This submission:

- a. examines the process adopted at Ginninderry to identify, assess, integrate and manage valuable nature and natural assets within and adjacent to urban areas;
- b. discusses the challenges and opportunities associated with the delivery of a range of green and blue infrastructure;
- c. considers measures employed to deal with sensitive urban / natural interfaces; and
- d. demonstrates the benefits that can accrue to a community via innovative design, development, management and funding models.

Author

This submission has been prepared by Riverview Projects (ACT) Pty Limited (Riverview), Development Manager for the Ginninderry Joint Venture.

Disclaimer

The views and opinions expressed herein are those of Riverview and may not necessarily represent the view of the Participants to the Joint Venture (the Territory and Riverview Developments (ACT) Pty Limited).

Date

June 27 2018

Contact

Any enquiries in respect of this submission should be directed to Tony Carey, Strategic Adviser, Riverview Projects (ACT) Pty Limited.

Email: [REDACTED]

Phone: [REDACTED]

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture



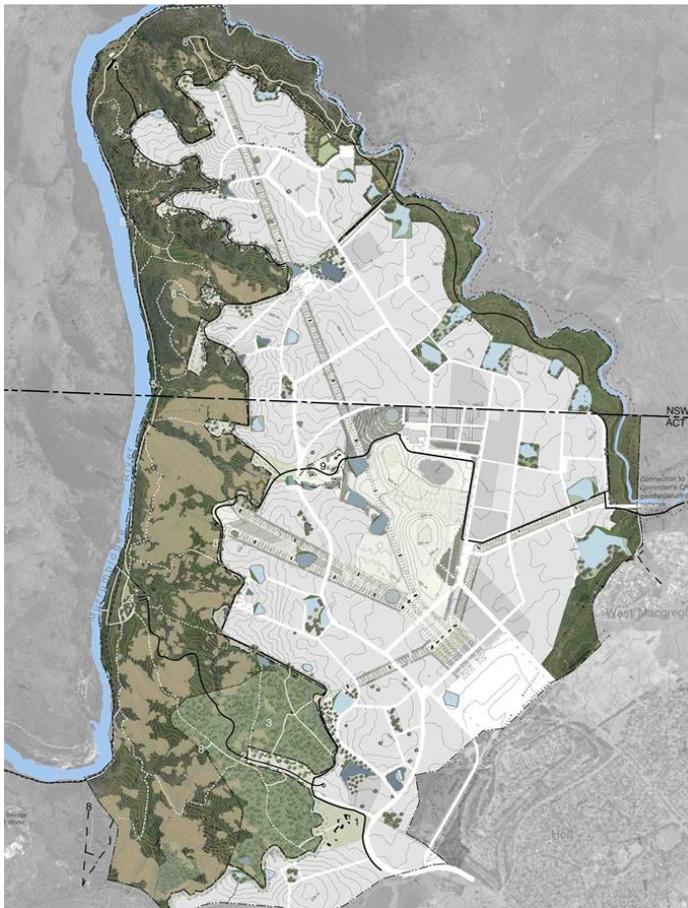
Introduction

This submission has been prepared by Riverview Projects (ACT) Pty Limited (Riverview), Development Manager for the Ginninderry Joint Venture.

Riverview would be pleased to provide further information or present to the Committee on these matters if requested to do so.

The submission generally follows the outline of the Inquiry provide by the Standing Committee.

A plan of Ginninderry, with emphasis on the Ginninderry Conservation Corridor is reproduced below.



1. Ginninderry is a Joint Venture (60% The Territory and 40% Riverview Developments (ACT) Pty Limited)
2. Ultimately 11,500 dwellings over 30 plus years
3. 6,500 ACT / 5,000 NSW (including non-controlled lands)
4. Four suburbs ... up to four schools
5. Market centre (major + minor supermarket, shops, community facilities, businesses ... about the size of Manuka).
6. Recreation, sports and community facilities
7. 596 hectares of conservation corridor along the Murrumbidgee River and Ginninderra Creek
8. Traditional blocks, townhouses, terraces and apartments.
9. Production rates of about 300 to 400 dwelling sites per year

The level of public support for and satisfaction with amount and quality nature and natural environment areas in Canberra, particularly in urban areas.

With a total area of some 1600 hectares, the majority of the Ginninderry Project Site was (prior to the formation of the Ginninderry Joint Venture) under private ownership (freehold) / leasehold in both the ACT and NSW, predominantly used for farming, and with other uses including quarrying, horse riding, landfill, egg farming and a small number of commercial uses.

There is currently no public access to the Murrumbidgee River or Ginninderra Falls (and Creek), and no active biodiversity management on the site.

With the approval of the Ginninderry urban development project, the masterplan now provides that the land will be divided roughly into about 44% for housing, streets and services, and about 56% for open space and reserves – about 700 and 900 hectares respectively. Of the 900 hectares of open space, approximately 600 hectares will be contained within the proposed cross border Ginninderry Conservation Corridor. A further 100 hectares (approx.) is within the former west Belconnen landfill site (to be developed as a key regional open space and regeneration precinct), and there are about 200 hectares of urban open space comprising a mix of parks, playing fields, ponds and wetlands.

The progressive development of Ginninderry will enable the funded restoration of some 600 hectares across the ACT and NSW, adjacent to the Murrumbidgee River, Ginninderra Creek and Ginninderra Falls that is currently used for grazing and is not accessible to the public. Urban development of adjoining land provides the funding and governance model to pay for natural ecosystem and habitat restoration, weed management, recreational trails, lookouts and low impact recreational use, guided by an evidence based Plan of Management.

It will over time enable the whole community to participate in the enhancement of nature and natural systems, and reap significant recreational, scientific, cultural and health and well-being benefits from the managed use of the land. In short the project will create a new nature park of some 600 hectares across the ACT and NSW, with active funded management to enhance its natural and community value.

The location of Ginninderry, on a “peninsular” surrounded on two sides by the Murrumbidgee River and Ginninderra Creek, is visually attractive with a strong relationship to adjoining and distant natural areas. This location affords both challenge and opportunity. This unique set of circumstances, including the structure and history of the Ginninderry Joint Venture (GJV), has enabled the project team to consider and deliver a number of “firsts” for the ACT Region with regard to nature and natural areas on the project site. A number of these “firsts” are discussed herein.

It is very evident to the project team, via our interface with buyers and other stakeholders, that the proximity of the urban parts of Ginninderry to nature is highly valued, and as noted above brings both challenge and opportunity.

Further, with ongoing media commentary on the now obvious impacts of climate change, consumers are recognising the need to work in greater harmony with the natural environment, and are demonstrating preferences for more sustainable projects, especially incorporating blue and green infrastructure and strong linkages to nature. They no longer see “business as usual” as necessarily acceptable.

Through extensive stakeholder engagement carried out leading to project commencement (and ongoing) there has been a great deal of interest in the potential impact of Ginninderry on the environment of the site and its surrounds. Given the location, scale and structure of the project, it is a great opportunity to consider and trial a number of new (and hopefully better) approaches to the definition, design, construction, care, control, use and management of natural areas, and green and blue infrastructure.

Accordingly, the project is considered an ideal case study relevant to the Inquiry.

Background to the conservation of nature and natural areas within the Ginninderry Project

The Ginninderry team undertook, over several years, an intensive series of investigations to identify and assess the intrinsic natural attributes of the whole of the project land. With that evidence base, the team has prepared a strategy for the integration, management and funding of those natural assets to create a network of urban open spaces and nature reserves within and adjacent to areas of human settlement.

The consideration of the impact of urban excess stormwater, and the opportunities to deliver enhanced treatment of stormwater via an integrated Water Sensitive Urban Design (WSUD) strategy, has been a fundamental design requirement. It has led to a new approach to green and blue infrastructure within the project, often acting as attractive multi-purpose places that provide a buffer to natural assets, with a by-product of enhanced urban amenity and cooling.

Investigation & Adaptive Design

The location and extent of proposed conservation areas at Ginninderry was determined in a collaborative manner, via an intensive series of investigations over several years. That work has provided an evidence-based boundary between urban suitable and priority conservation lands.

Once the initial boundary was determined by expert investigation, it was marked on site by star pickets installed by qualified surveyors. That marked alignment was then examined, on site, by officers from ACT Environment and ACT Parks and Conservation (for the ACT land), and in NSW by officers from the NSW Office of Environment and Heritage and Yass Valley Council. The boundary was also walked and considered by Dr David Shorthouse and the Ginninderry Bush on the Boundary group. During the course of those site walks, some of the boundary markers were repositioned to recognise additional areas considered worthy of retention in the corridor. The

amended line was then re-surveyed and became the proposed zone boundary defining the urban / conservation edge.

Those investigations continue contemporaneously with development; adjustments to the urban / conservation edge and review of edge conditions and controls are made when new data comes to hand, allowing for continuous improvement.

Recent examples of this approach were the adjustments now made (in both the ACT and NSW) to add a further (approximately) 30 hectares of proposed urban land into the corridor, accommodating the findings of a cultural heritage assessment undertaken with 8 indigenous knowledge holders. This is perhaps the first time in the region that a cultural heritage assessment of such depth and rigour has been initiated by a project of this type, enabling early and permanent protection of culturally significant sites not previously identified or visible on inspection. We expect that over the life of the project (30 to 40 years) there will be further modifications to the boundary taking into account any further unexpected finds and changing standards (eg bushfire management), enabling our philosophy of continuous improvement to the project.

Identification and Assessment

The investigation phase enabled the identification and assessment of matters of significant natural, regional and local value – environmental, heritage and cultural. The investigations contributed to consideration and drafting of amendments to the Territory Plan and the National Capital Plan for the ACT land (now concluded), and were major contributions to the evidence base for the EPBC Act assessment for the whole Ginninderry project site.

Those investigations and assessments, along with additional NSW-land specific studies, are an integral part of the Planning Proposal underpinning the request for rezoning of the NSW land, now under consideration by Yass valley Council and NSW agencies.

Integration

Informed by the library of investigations into the site (<https://ginninderry.com/planning-and-community/reports-library/>) the project team has worked with the authors of the studies and other expert advisers to determine how best to integrate the natural environment with proposed urban development. Initiatives include:

- an urban design ‘transect’ that strategically locates the most appropriate housing and types of development throughout the project site, and in particular adjacent to the priority conservation areas;
- site specific urban / conservation transition zone controls to guide the design construction and management of the urban / conservation interface;
- a collaboration with the ANU Fenner School, to not only consider ways to retain a greater proportion of exiting native mature trees, but also trialling three variations on “urban parks” (green infrastructure) to pilot alternative ways better integrate biodiversity within

urban areas. The retained mature paddock trees continue to provide habitat for a wide diversity of species, complemented by the proposed park trials and urban landscaping.

- a management and sustainable funding strategy for the conservation corridor – the Ginninderry Conservation Management Trust (green infrastructure);
- a multi-functional stormwater management and re-use strategy (blue and green infrastructure);
- the location of community assets within the urban area that relieve the conservation areas of particular biophysical impacts (e.g. dog walking areas in the urban area and a no-dogs policy in the conservation area); and
- application of a cat containment regulations to the site to eliminate cat predation on native fauna in the urban areas and conservation corridor.

Implementation / Management / Funding

Innovative planning concepts for green and blue infrastructure require innovative implementation, management and funding responses if they are to be successful and sustainable. Ginninderry is piloting new approaches to active management (and funding) of the urban adjacent conservation lands via the establishment of a cross-border conservation management trust, and is working with the Territory to develop an agreement with respect to a “stewardship” approach to urban open spaces.

There is a high degree of understandable conservatism among Territory agencies charged with management and funding of public places, more often driven by budgetary constraints. However, there is also a clear willingness to explore alternative, perhaps more sustainable methodologies to deliver measurable benefits to urban amenity, biodiversity, climate resilience and economic development.

The unique cross-border nature of the project allows us to bring new policy instruments to bear in the project that would otherwise not be considered in a business-as-usual (BAU) urban development program in the ACT. For example, ‘Natural Resource’, or ‘Environmental’ levies are policy instruments used by municipal authorities across the country to support the enhanced management of public spaces, particularly conservation reserves (Table 1). Not only do they provide resources for a higher level of management, they also contribute to community ‘buy-in’ to the management programs. The cross border nature of the project, and the willingness of Yass Valley Council and the NSW Government to apply such a scheme to the NSW part of the project promoted its extension into the ACT, potentially as a model for other existing and future urban edge communities within the Territory.

The Ginninderry approach to management and funding of the conservation corridor is discussed below.

Table 1

Council (Jurisdiction)	Environment Levy Application
Blue Mountains City Council (NSW)	\$43/household/annum raising \$1.5M/annum
Randwick City Council (NSW)	\$90/household/annum
Kuringai Council (NSW)	5% of base rates, raising \$2.6M/annum
Wingecarribee Shire Council (NSW)	\$48/household/annum raising \$1.1M/annum
Northern Beaches Council (NSW)	Raising \$950K/annum
Bellingen Shire Council (NSW)	4% increase in base rates
North Sydney Council (NSW)	
Mid Coast Council (NSW)	6% increase in base rates
Coffs Harbour City Council (NSW)	\$44/household/annum raising \$1M/annum
Moira Shire Council (Vic)	\$220.10/household/annum
Redland City Council (QLD)	\$87.2/household/annum
Noosa Shire Council (QLD)	\$66/household/annum
Gympie Regional Council (QLD)	\$35/household/annum
Sunshine Coast Council (QLD)	\$60/household/annum raising \$7.7M/annum
Mackay Regional Council (QLD)	
Logan City Council (QLD)	\$73/household/annum
Brisbane City Council (QLD)	\$22/household/annum
Toowoomba Regional Council (QLD)	\$90/household/annum
Ipswich City Council (QLD)	

The types of nature and natural environmental areas within Canberra e.g. urban open spaces or bushland reserves and the existing or potential benefits and challenges they bring to Canberra’s social amenity, economic development, biodiversity, and/or climate resilience.

The Ginninderry Conservation Corridor is to serve numerous purposes:

- Protection and management of important Aboriginal archaeological and cultural heritage sites;
- Protection of the Murrumbidgee River - as a water quality buffer (saving water treatment costs for downstream water users);

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

- Provision of recreational and education opportunities for the Canberra community – including walking and biking trails, lookouts, interpretation nodes, and aquatic recreation uses;
- Provision of 'special use' opportunities for future Ginninderry residents to help build a healthy and resilient community and promote buy-in amongst residents to the conservation programs in the corridor;
- Protection of key species and ecological communities present at the site, including Pink-tailed Worm Lizard and Box Gum Grassy Woodlands;
- Offsetting relatively minor impacts on Pink-tailed Worm Lizard in the urban area; and
- Providing opportunities for scientific research, education, indigenous employment and business development, and ecotourism opportunities (particularly at Ginninderra Falls).

The aspiration for Ginninderry is to blur the traditional line between urban areas and conservation areas. This is to be achieved via high quality place-making in the conservation corridor, consistent branding and interpretation across the interface, bringing conservation into the urban areas (e.g. the Fenner restoration trials, and cat containment), and outreach and education programs that are integrated across the urban and conservation areas. An active, hands on, community based and site specific approach.

If the project can achieve this outcome, it will be the first time in Canberra, and will add significantly to the residents' experience, influence their behaviours in the conservation corridor (as they will feel it is part of their home), and probably enhance land values in due course.

The attached paper (**annexure 1**) entitled "*Potential benefits of the sustainable management of the Ginninderry Conservation Management Corridor by a Trust*" outlines the values that people around the world place on the proximity of natural places to their homes, and why those places are so important. It reinforces the benefits of an alternative approach to governance for such spaces, founded on the principles of "stewardship".

In addition to the conservation corridor, Ginninderry is collaborating with the ANU Fenner School in trialling the integration of alternative styles of urban parks within the urban fabric. That is, the Project will provide a mix of park typologies, designed to test community acceptance, maintenance regimes and costs, and biodiversity benefits, associated with a range of park designs, ranging from traditional parks through to biota reserves (refer **annexure 2**). It is expected that this trial will provide evidence for consideration by Territory agencies that may be of benefit to the retention of other mature trees throughout urban areas within the Territory, through the implementation of alternative landscape settings, saving trees that may otherwise be removed for safety or other reasons.

Blogs from the Ginninderry website on this matter can be found at:

<https://ginninderry.com/designing-urban-open-spaces/>

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

<https://ginninderry.com/not-just-tree-home/>

Initiatives such as those described above will not only test a variety of approaches to natural and urban open spaces, but will provide tangible “lived” examples and a “living lab” platform for transparent ongoing assessment and continuous review. The long time frame for the project (30 to 40 years) is ideally suited to a process of continuous improvement.

Such pilot initiatives will however be dependent upon the active support and “buy in” by responsible Territory agencies. The draft MoU at **annexure 5** is an example of one approach to cross agency support.

The contribution of street trees and street landscaping is often overlooked and undervalued in terms of contribution to biodiversity, and more recently climate change resilience. Further, the careful selection of trees can also contribute significantly to shading of paved areas (roads and paths) which will have an increasingly important role in reducing the significant adverse impacts of urban heat islands.

The Ginninderry team has been worked closely with TCCS to improve canopy outcomes to streets, but more can be done. Our landscape team has also been working with the Fenner School and TCCS to provide public domain landscaping that can improve habitat WITHIN the urban areas for a variety of birds, animal and reptiles, to be supported by an interpretative strategy to educate new residents of the outcomes being targeted.

Finally, the project has entered into two further collaborations as described below.

The Frank Fenner Foundation’s EcoriumXChange has taken on Ginninderry as a major project to examine the human place in nature and encourage understanding of the dependence of healthy human societies on healthy ecosystems. The EcoriumXChange provides education and research opportunities to test and showcase bio-sensitive practice. This name embraces place/earth, transformation/change and conversation/exchange.

The EcoriumXChange creates space for industry, community leaders, academics, policy makers, kids and community to share ideas, practices, practical demonstrations and research to generate practices that will help the transition to a more ecologically, socially and economically sustainable society.

<http://www.fennerfoundation.org.au/ecorium-xchange/>

The Ginninderry Living Lab aims to create a data portal and research framework for Ginninderry to allow long-term research over the life of Ginninderry. Given the Ginninderry JV has a vision to create a “sustainable community of international significance in the Capital Region”, a framework for continued design, research, and evaluation is crucial to ensure this vision is met over the 40 years of development.

The long term nature of Ginninderry has significant potential for ongoing research. As the development will be built over a number of stages, there is significant potential to design, test, and evaluate what works, what doesn't work and areas to improve for future stages. To facilitate continuous improvement, the project team structure includes a specialist research committee including external experts, and a budget for research projects.

Opportunities for Blue (water) and or Green (natural) Infrastructure in Canberra including functional requirements of proposed infrastructure; cost and maintenance considerations, amenity benefits, and conservation and biodiversity benefits.

Unlike most of the ACT, Ginninderry is located on a peninsular rather than in a valley. Accordingly, stormwater flows from many smallish sub-catchments via ephemeral streams directly to the receiving waters of the Murrumbidgee River and Ginninderra Creek. Most other parts of the Territory flow into major catchments before being discharged into permanent streams or rivers.

Accordingly, the ACT typical approach of constructing major stormwater infrastructure at the low point of the catchment (eg the Gungahlin, Tuggeranong and Molonglo ponds) is not available to Ginninderry, necessitating a different solution. Further, the drivers for the stormwater strategy at Ginninderry are perhaps more broad than is normally the case. That is, protection of the environment of the river and river corridor, and the ecology within, is the primary driver, facilitated by soft and hard infrastructure, with amenity, conservation, biodiversity and economic benefits. In short, the imperative to avoid the ephemeral streams becoming permanent streams (which might adversely affect flora and fauna in the corridor and lead to erosion) requires an approach centred on stormwater harvesting and re-use, with by-products of amenity, greener, cooler places and potential long term uplift in land values (and Territory income).

The downside of this approach (ie greater irrigation of opens spaces) is an increased maintenance regime and cost.

The adopted and agreed design approach for stage 1 of the project is now the subject of review by a high level steering group chaired by TCCS and involving the project team, SLA, EPSDD and Treasury. This committee is in the process of conducting various assessments to derive a balanced view on the likely triple bottom line outcomes.

As noted elsewhere in this submission, the ACT community would appear to be comfortable with the amount of open space, but are dissatisfied with the quality and maintenance of that open space (especially the lower order parks and places in suburban areas). The Ginninderry stormwater management strategy has the potential to deliver considerable benefits to green and blue infrastructure on site, and be a test case for a broad application across existing urban areas and future greenfield sites. While there have been some examples of stormwater harvesting and

re-use elsewhere in Canberra, widespread application has been resisted by Territory agencies based on perceived recurrent costs, water quality and health concerns.

While traditional heavy engineering solutions may deliver acceptable water quality and quantity outcomes (although that is debatable) a more decentralised “softer” approach, with stormwater re-use, has the potential to deliver many other benefits of equal if not better quality and quantity outcomes.

We submit that the work of the Steering Group be recognised and elevated in Government priorities. It should include considered TBL analyses of likely outcomes, with “buy in” from all agencies, especially Treasury. Any TBL analyses must quantify the less obvious and harder to measure benefits of climate change resilience, reduction of urban heat island effects, beneficial environmental and ecological outcomes – all of which affect the health and well-being of the community, and the long-term economic benefits to the community and government.

Managing the interface between the natural environment and urban areas particularly in regards to conserved environmental areas.

Ginninderry has a long urban interface with the cross border conservation corridor.

The adjacency of the conservation lands, and the views across it, are highly valued by the Ginninderry buyers and the broader community.

The project approach to deal with both the opportunities and risks of this interface is multi-faceted, including:

- Planning
- Engineering
- Management
- Stewardship

Planning

As noted earlier, the urban design for Ginninderry is based on a transect approach to density. In simple terms, the closer to the centre the higher the density, the closer to the urban edge the lower the density.

Density_ The Transect

Three relevant criteria focusing on
density to support infrastructure / mix of
housing types / increased density
pockets to support use and infrastructure



This planning philosophy has then underpinned the character zones applied to the project area. For the full length of the urban / conservation interface, there will be a “Conservation Edge” character zone, with larger lots, controls on building materials, and higher BAL construction requirements for dwellings (refer description at **annexure 3**).

In all cases, there will be an edge road and / or a fire trail, and in most circumstances a recreational trail between any housing and the corridor. However, rather than segregating the natural spaces from the urban spaces, Ginninderry is striving to engender a sense of pride and “ownership” of the natural areas. The Trust will mount a concerted interpretive and education strategy, to equip the community with knowledge as to the intrinsic values of this land and the measures needed to “caretake” it for the benefit of generations to come.

Edge specific design guidelines (ACT) and planning controls (NSW) are to be applied (refer **annexure 4**). The intent of these guidelines and controls is to provide for sensitive and consistent treatment of the interface, preventing unlawful incursions into the corridor (eg “over the back fence” dumping), providing surveillance, avoiding direct stormwater runoff and prohibiting incompatible development close to the boundary. Specific design and landscaping controls will

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

also be established for the urban areas near to the Corridor to actively encourage locally appropriate plantings, materials and landscape treatments.

Across both jurisdictions, there are requirements to address asset protection from bushfire, resulting in Asset Protection Zones (APZs) of variable width based on slope and aspect.

The APZs are located on the urban side of the zone boundary, so as to avoid any impact on land within the corridor itself. The APZs will be managed to avoid the build-up of fuel loads, and will enable the co-location of some infrastructure (eg roads, fire trails, stormwater diversion swales, underground services). This is standard practice in both jurisdictions.

At Ginninderry however, in recognition of potential habitat areas within the corridor that are close to the boundary, no infrastructure will be allowed (including earthworks or other material disturbances) within those parts of the APZ that fall within a specified distance to defined habitat areas within the corridor.

Engineering

The adopted stormwater management strategy prevents any uncontrolled overland flows of urban stormwater into the corridor. This avoids transmission of weeds by water, and avoids uncontrolled concentrated flows into sensitive land. This is to be achieved by the construction of stormwater diversion swales and embankments directing urban stormwater to the ponds and wetlands serving each catchment. Land from which stormwater cannot be diverted to a pond will not be developed.

With the exception of stream works to enhance and stabilise existing erosion hot spots (and a sewer micro-tunnel – see below), no underground service infrastructure is planned to traverse the conservation lands. The GJV has agreed to invest in a deep micro-tunnel to transfer sewage from the site to the Lower Molonglo plant to avoid significant disturbance to the sensitive lands. This comes at considerable cost, but was deemed by the Commonwealth to be an appropriate solution to avoid adverse impact on Pink-tailed Worm-lizard habitat.

Management

The Ginninderry Conservation Management Trust is discussed in some detail in other sections of this submission. This governance approach provides for site specific, dedicated resources to be applied to management of the land, including the interface.

Stewardship

The combination of the measure noted above will engender a sense of stewardship for the conserved areas.

Planning, design, character, surveillance, engineering and management will, we believe, provide a superior suite of mechanisms to ACT BAU, avoiding material adverse impact on conserved lands, and engaging the community in the long term restoration and protection of this valued asset.

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Current policy or regulatory settings that impede the integration of the natural environment within optimal urban development and design.

There are three issues worth considering.

The first relates to the alternative management and funding approach to the Ginninderry Conservation Corridor.

From the outset of this Project, the proponents have advocated a Conservation Management Trust as the preferred vehicle for management of the Corridor. This position was founded on the fact that the Corridor is a cross border asset, with a long urban interface, containing natural features of intrinsic regional and national value that, managed well, can be of great benefit to the health and well-being of the community.

The Commonwealth, in its consideration of the whole project pursuant to the EPBC Act, has required that a Trust be established to manage the corridor. This was in consideration of the diversity of the site and its cross border nature, enabling the land to be managed by a single entity. We submit that it is a far superior model to BAU.

The fundamental position of the Project is that a Trust will engender community stewardship over the land, and by doing so engage the community in caring for nature on their doorstep.

The concept of having an independent community trust (governed by a Board including ACT and NSW, project, indigenous and community skills based representatives) has been supported by Yass Valley Council and the NSW Government and the Territory.

Final agreements are imminent with respect to the funding arrangements in each jurisdiction.

The project has advocated a sustainable funding platform comprised of contributions from project land sales (1% of all land sales to be deposited within an annuity fund that will grow over time) supplemented by an annual "membership levy" of \$100 (indexed) on all households in Ginninderry (ACT and NSW), collected via the ACT and YVC rates systems. Deloitte have modelled the costs and revenues associated with the approach and have demonstrated that it is sustainable in perpetuity. Further, it is the least cost (to government) funding mechanism available.

Ginninderry submits that a stewardship governance approach to management of natural areas adjoining urban land (ie a community trust) is a fundamental "game changer" for the management of those places in the Territory, and that an element of "user pays" funding will be beneficial.

The consideration of the Ginninderry trust model and the adoption of policy and regulation to support this approach would, in the opinion of Ginninderry, be a model for other areas in and around the ACT.

The second issue worthy of discussion is the design, maintenance and management of urban parks and open spaces.

Anecdotal evidence (via the project teams' experience in other projects and though our sales role) suggest that the majority of people in the Territory are happy with the amount of open space and parks.

Many are somewhat dissatisfied with the quality of management and maintenance of urban parks and places, which would appear to relate directly to funding.

As noted earlier, Ginninderry is trialling a number of alternative park treatments to complement the health and well-being of the community and to integrate bio-diversity into the urban fabric.

The project has adopted a Water Sensitive Urban Design (WSUD), or catchment management strategy, founded on harvesting and re-use of stormwater (fundamentally to protect and ecology of the Corridor and to manage urban excess runoff to the river in accordance with regional targets).

Both of these initiatives are challenging to some Territory agencies, particularly TCCS, as they are outside norm and introduce some degree of risk and additional cost. This is particularly the case with respect to the catchment management strategy, as officers are justifiably concerned about the cost of additional maintenance associated with higher quality (irrigated) open spaces. Yet on the other hand, other Government initiatives (especially associated with climate change and the enhanced provision of green and blue infrastructure) are encouraging of the Ginninderry approach. In short, there are conflicting priorities within government.

We submit that there needs to be a cross agency (whole of government) position taken on the expectations around natural and urban open spaces. Such a position should be universally agreed across agencies, and be supportive of the delivery and management of sustainable and attractive assets. The position should consider alternative governance opportunities (especially for urban adjacent natural places) and contemporary design and maintenance expectations (with appropriate funding) to provide quality green and blue infrastructure that is not only resilient to climate change but can have positive and measurable health and economic benefits to the community.

We would be pleased to discuss these issues and opportunities at greater length.

The Project has also been working with the ANU's Fenner School throughout the master planning stage to ensure that we achieve a high rate of retention of the existing trees in the urbanised

environment, and are currently establishing an MOU with TCCS to maintain the open space typologies being trialled within Ginninderry. A copy of the draft MOU is provided at **annexure 5**.

The final issue relates to street trees.

The clearances required by utilities for services in the verge means that verges are often unnecessarily wide to meet all respective clearances, but even then, there are restrictions on the type of tree species that may be planted. That is, while the verges are wide to accommodate services and pathways, there is little room left to plant trees that will, when mature, provide excellent shade. The provision of shady streets will, as noted earlier, become of much greater significance to the health and well-being of the community as the climate warms.

The conservative engineering standards are generally based on maintenance access, with little regard to streetscape or climate impacts. In short, trees have not been properly valued.

For Ginninderry we have negotiated some variations to the standards (see samples at **annexure 6**) that help to improve the streetscape and shade position. While these have been agreed for stage 1, there is ongoing resistance from some seeking to pull back to more conservative “engineering focussed” norms for future stages.

Further advances towards better streets could be made, for instance, if TCCS and the utilities would allow the placement of some services under roads, thus freeing up verge space for larger trees. The space below the actual road (carriageway) surface is regularly used in other jurisdictions, so why not in the ACT? It is acknowledged that under street service may, on occasion, disrupt street use for a short time, and may cost more than digging up a verge, but we submit that such disruption and cost is infrequent and minimal when properly compared with the day to day benefits living streets will provide in perpetuity.

The Territory (through other agencies including EPSDD) has and is doing work on these issues. However, and as suggested previously, there needs to be a balanced, whole of government position based upon a “complete streets” philosophy (see the planning principles for streets at Ginninderry at **annexure 7**), including the utilities in a collaborative process.

Again, we would be pleased to discuss this further and provide more information to assist.

Summary

Ginninderry will create and make accessible a very large fully funded nature park, not previously available to the ACT community.

The land to be included in that park (the Corridor) has intrinsic natural and heritage value, but is degraded and not available for public use.

Because of its scale and unique delivery model, Ginninderry presents an outstanding opportunity to pilot, monitor, review and improve thinking in design, delivery, governance, funding and stewardship. Because of this, the extent and quality of nature and natural assets available to the community will be considerably enhanced,

This submission uses Ginninderry as the platform for discussion of the benefits and challenges urban and bushland open spaces bring to Canberra’s urban areas (especially in greenfield settings) and discusses opportunities for improvements to design, delivery, community involvement and funding of its blue and green assets across the Territory.

The Ginninderry Team would be delighted to discuss this submission further with the Standing Committee.

ANNEXURE 1



Potential benefits of the sustainable management of the Ginninderry Conservation Management Corridor by a Trust.

Background

- The Ginninderry Conservation Corridor is an integral component of the Ginninderry Project.
- The Corridor recognises and protects vulnerable ecosystems and species.
- A draft Management Plan for the Corridor has been prepared, which includes the creation of a Conservation Management Trust as the management vehicle.
- Establishment of the Trust and implementation of the draft Management Plan are conditions of the EPBC approval for the Project.
- Governance of the Corridor by a Community Trust is preferred by the Project Participants. As well as providing the physical management infrastructure for the Corridor, a Community Trust can also deliver the community ownership elements that will enhance community cohesion, reputation, health and wellbeing and potentially house prices.
- The ACT Government is considering the funding options for the Ginninderry Conservation Corridor and Trust.
- A detailed financial model (prepared by Deloitte) based on the requirements of the draft Management Plan illustrates those funding options and provides comparisons with BAU management of natural areas by the Territory.
- Territory officers have asked if there is likely to be any uplift to land values within Ginninderry because of the proximity of the Corridor (reserve), and further whether the proposed higher level of management than BAU, together with a sense of community “ownership” of the Corridor, may further enhance values.
- This short paper considers those questions (ie in terms of economic benefit) and also considers other outcomes that may accrue to the community as whole as a result of the provision of well-designed, well maintained public nature spaces governed for and by the community itself.

The Value of Public Space

Throughout the developed world, there is increasing evidenced-based discussion on the social, environmental and economic value of well-designed and well-maintained public spaces. However, government budgetary constraints often limit investment in the initial capital costs and ongoing maintenance of quality spaces and places.

As all major cities become denser, even in greenfield locations such as Ginninderry, the need for well-designed and well maintained public spaces and access to nature has never been greater – for the social, environmental and economic well-being of the community.

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

This short paper lists some observations garnered from a selection of recent reports.

Why is high quality public space important?

The following extracts discuss the benefits of well-designed and well-maintained public spaces and natural environments within and adjoining urban areas.

Social

- 85% of people surveyed in the UK (CABE SPACE 2016)) felt that the quality of public space and the built environment has a direct impact on the way they feel. But having access to public space is not all that matters – just as important are the planning, design and management of that space.
 - Unfortunately, despite their importance, our public spaces are often taken for granted or neglected.
 - ... the higher the density of housing, the greater the need for well-designed, well-managed public spaces to aid liveability in that community.... research from Japan ... shows that good neighbourhood green spaces promote longer life expectancy for local people (CABE SPACE 2016)
- Access to good quality, well maintained public spaces can improve our physical and mental health by encouraging us to walk more, to play sport, or simply enjoy a green and natural environment. Open spaces are a powerful weapon in the fight against obesity and ill-health.
- Under the UN Convention on the Rights of the Child, children have the right to play, recreation and culture. Play is crucial for many aspects of children’s development, from the acquisition of social skills, experimentation and the confrontation and resolution of emotional crises, to moral understanding, cognitive skills such as language and comprehension, and of course physical skills. But increasing urbanisation has left our children with far fewer opportunities than previous generations to play freely outdoors and experience the natural environment. Good-quality public spaces ... can help to fill this gap, providing children with opportunities for fun, exercise and learning (CABE SPACE 2016).
- Public spaces are open to all, regardless of ethnic origin, age or gender, and as such they represent a democratic forum for citizens and society. When properly designed and cared for, they bring communities together, provide meeting places and foster social ties of a kind that have been disappearing in many urban areas. These spaces shape the cultural identity of an area, are part of its unique character and provide a sense of place for local communities.
 - Once again, however, quality counts: the better the design of the space in question, the better the quality of the social experience. In this regard, it has been found that big, bland spaces on housing estates fail to offer the same opportunities for social cohesion as more personal spaces.

Environmental

- There is increasing evidence that “nature” in the urban environment is good for both physical and mental health. People are an essential part of the environment; they are as real as trees, rocks or skyscrapers, and their interactions with each other and with places significantly influence their health and well-being (Lindheim and Syme 1983). Disease occurs more frequently (a) among those

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

- with fewer meaningful social relationships, (b) among those in lower hierarchical positions, and (c) among those disconnected from their biological and cultural heritage (Lindheim and Syme 1983)
- Sandifer et al (2015) reviewed more than 200 research articles that examined the relationships between ecosystem services, nature, biodiversity and psychological and physical health and other well-being parameters. They concluded that there is a 'great deal' of evidence suggesting that there are many, varied health and well-being benefits of human exposure to nature or more natural, green settings:
 - "Exercise outdoors in a natural environment improves mood and self-esteem (Barton and Pretty, 2010) and is more restorative than exercise outdoors in an urban environment (Hartig et al., 2003)."
 - "The type of green environment experienced affected the mental health benefits and **exercise associated with waterside habitats revealed the greatest positive change for both self-esteem and mood.**"
 - "Coon et al. (2011) assessed the effects on mental health of short-term outdoor (natural environment) physical activity compared with physical activity indoors. In more than half of the studies reviewed, participants' mood and attitude were significantly more positive following outdoor compared to indoor activity. Participants reported greater revitalization, self-esteem, positive engagement, vitality, energy, pleasure, and delight, as well as lower frustration, worry, confusion, depression, tension, and tiredness."

The Sandifer review highlights that while the mechanisms, the 'how', of this phenomenon remain unclear as they are not well-researched, the 'what' is very clear - that engagement in nature and more natural environments provides ample health and wellbeing benefits for communities.

The type of green space matters, and more natural settings are valued highly by the community. Some recent research has shown that various types of green space may have different impacts on the price of a particular property (Czembrowski and Kronenberg 2016). In Poland, nine categories of green space were classified: small park and small forests (smaller than 1.8 ha); medium parks and medium forests (1.8-20 ha); large parks and large forests (larger than 20 ha, except for Lagiewniki); the single largest Lagiewniki forest (over 1,300 ha); cemeteries; and allotment gardens. The analysis revealed proximity to Lagiewniki forest, small forests and large parks, as well as the percentage of greenery in a radius of a home positively influenced house price, whereas cemeteries were seen as unwelcome. The Lagiewniki forest is unique in terms of its size and renown in the city, while the large parks are also well known and widely recognized. Interestingly, neither other parks nor large and medium forests had a significant impact on property prices, which indicates that what especially counts in the case of an environmental good may be the kind of a label, reputation and presentation that a particular good has, or at least its familiarity.

A one percent increase of the distance to the Lagiewniki forest translated on average into the decrease of the price of an apartment by 3% of the average square meter price. The loss of value resulting from a one percent increase of the distance to the nearest large park was estimated at 1.5% of the average price of a square meter. The proximity of green spaces has an impact on apartment prices and this impact differs with type and size of the green space. Short distances to cemeteries are seen by buyers as an unwelcome feature (a disamenity). The greatest positive impact was exerted by the largest forest and large parks, a finding which was recognised as being consistent with many previous studies.

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Community Stewardship

Although there is less research on the topic, there is some emerging thinking that community stewardship and influence on their local environment, provides a sense of empowerment, connection, wellbeing, and enhances property values.

A survey of residents in Minneapolis-St. Paul found that those residents' attachment to their neighborhood through social ties and ties to the natural environment drives their engagement in water resource protection programs and policy development (Pradhananga and Davenport 2017). Lindheim and Syme (1983) and Kuo et al. (1998) point out that residents' participation in planning and design itself enhances health and happiness:

"People also need to connect to the future. They need the opportunity to shape situations, places, and activities that affect their lives. These connections are not passive, but require that people actively relate to one another and with the environment. Unless people can, in some way, create, manage, change, or participate in activities that affect their lives, dissatisfaction, alienation, and even illness are likely outcomes. (Lindheim 1983)". These personal well-being values and connections to management of the local environment have been reflected in house prices. An analysis of 2093 homes in Iowa indicated the presence of an effect on house prices of community-ownership of nearby natural assets. The effect of having 'neighbourhood association-owned' forest and water features was approximately 8% at the mean sale price (Bowman et. al. 2012).

Economic

In addition to those examples already cited, there is a raft of evidence of the impact of wildlife and nature reserves on house prices related to the homes' proximity to the reserve. In the United States, homes located within 800 m of a wildlife refuge and within 12 km of an urban centre have been valued, on average:

- 4-5% higher in north-east US
- 7-9% higher in south-east US and
- 3-6% higher in the California/Nevada region

All other things being equal, being in close proximity to a nature reserve increases that homes' value. Across 36 National Wildlife Refuges in the United States, the capitalised value of those refuges on neighboring homes was \$8.7M in the north-east, \$8.7M in the south-east and \$7.6M in the California/Nevada region (ranging from \$1M to \$40M for individual reserves; Taylor et al 2012). Along the eastern coast of the US the capitalized value of nature refuges, reflected in close proximity house prices, averaged \$11M across 59 reserves (Liu et al 2013).

According to the authors the 'capitalised value' provides an estimate of the increased property tax base that local communities enjoy as a result of the nature refuge and their provision of open-space amenities to nearby homeowners (Taylor et al 2012).

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Similarly in Oregon, proximity to public parks was positively related to home values, and the size of the open space was positively related to land values. Large public parks increased home sales by around 4%. The Oregon study also highlights the relationship between land value adjacent to reserves and the increased taxation revenues that accrue to the local governments – depending on the type, size and proximity of the open space (Bolitzer and Netusil 2000).

In Cedar Rapids Iowa, the estimated contribution to of conservation features/open space to house prices across six subdivisions was an uplift of 4% for houses with nearby significant conservation features (Bowman et al 2009). Northwards in British Columbia, green corridors were found to positively influence adjacent properties, and in particular, an increase in that uplift for properties that border a National Park. Narrow strips of green space, categorised as ‘small parks’, were estimated to increase each property value by \$11K, and flowing through an annual 1% tax rate, an uplift of \$75K per annum attributed to the green space (Hobden et al 2004).

A meta-analysis across 71 peer-reviewed studies concludes (Waltert and Schlapfer 2010):

“nature reserves and land cover diversity mostly, and open space and forest frequently, increase the prices of neighbouring properties”

- A good public landscape stimulates increased house prices (and therefore taxation benefits).
- Research though many developed world cities consistently shows increase in home values of anywhere from 6 to 15% due to a view of a park or adjacent open space.
- In 1990 48% of Denver residents said they would pay more to live near a greenbelt or park.
- In San Francisco, proximity to the Golden Gate Park has increased property prices to the point where an additional \$5 to 10M of property taxes have been generated for the state (CABE SPACE 2016).
- Luttik (2000) finds that water and open green space can increase residential property values in the Netherlands by 8–10% and 6–12%, respectively. Tyrvaïnen and Miettinen (2000) show that, in Finland, the price of residential housing rises by 5.9% as the distance from urban forests decreases by 1 km.
- In Switzerland rental prices were significantly positively impacted by ‘distance to views’, ‘wetlands’, ‘areas with little infrastructure’ as well as ‘nearby cultural sites’, ‘hiking trails’, and ‘bike trails’. (Schl pfer et al. 2015)

Discussion

The ACT does generally deliver ample natural places, but outside of the formal reserve system many of these spaces are not well maintained and over time become more degraded rather than rehabilitated. Even some of the nature park areas can become places of anti-social behaviour in the absence of Ranger presence, community programs, contemporary well-designed infrastructure, local community pride in the place, and showcasing and communicating the place’s natural and cultural values.

Thus, the original intrinsic values of the places can be lost.

Mulligans Flat however is an area that reverses that trend due to its high ecological value, community engagement programs, growing national reputation and the focused attention and funding directed to that reserve.

While the Ginninderry Conservation Corridor may not have the same level of physical protection that Mulligans Flat has received, the proposed management regime will deliver many of the benefits to the community that reflect in positive health and property values – a well-maintained environment, community engagement programs that connect people with nature, spaces for recreational activities, and a high quality urban design that will reflect positively on the spaces' attractiveness, visitation, community pride and ownership. The community ownership elements of the governance of the space will enhance community cohesion, reputation, health and wellbeing and potentially house prices.

In the context of the clear impact that nature spaces have on house prices, another strategic opportunity for the Ginninderry project is to consider how the look, feel, and experience of the nature reserve can be brought as deeply as possible into the urban area – physically and experientially. This could be achieved through the intersection of master planning (green corridors and nature parks, water and creek features, landscape view sight lines), an urban design with seamless integration into the nature areas, interpretation strategy and programs and active restoration and encouragement of wildlife in the urban environments.

References

Bolitzer, B. and Netusil, N.R. (2000) The impact of open spaces on property values in Portland, Oregon. *Journal of Environmental Management* 59: 185-193.

Bowman, T., Thompson, J. and Colletti, J. (2009) Valuation of open space and conservation features in residential subdivisions. *Journal of Environmental Management* 90: 321-330.

CABE SPACE London The value of Public Space 2016(?)

Czembrowski, P. and Kronenberg, J. (2016) Hedonic pricing and different urban green space types and sizes: Insights into the discussion on valuing ecosystem services. *Landscape and Urban Planning* 146: 11–19.

Hobden, D.W., Laughton, G.E., and Morgan, K.E. (2004) Green space borders – a tangible benefit? Evidence from four neighbourhoods in Surrey, British Columbia, 1980-2001.

Lindheim, R. and Syme, S.L. (1983) Environments, people and health. *Annual Review of Public Health* 4: 335-59.

Liu, X., Taylor, L.O., Hamilton, T.L. and Grigelis, P.E. (2013) Amenity values of proximity to National Wildlife Refuges: An analysis of urban residential property values. *Ecological Economics* 94: 37-43.

Luttik, J. (2000) The value of trees, water and open space as reflected by house prices in The Netherlands. *Landscape and Urban Planning* 48: 161–167

Taylor, L.O., Xiangping, L. and Hamilton, T. (2012) Amenity Values of Proximity to National Wildlife Refuges. Centre for Environment and Resource Economic Policy – North Carolina State University.

Sandifer, P.A., Sutton-Grier, A.E. and Ward, B.P. (2015) Exploring connections among nature, biodiversity, ecosystem services, and human health and well-being: Opportunities to enhance health and biodiversity conservation. *Ecosystem Services* 12 (2015) 1–15.

Schläpfera, F., Waltert, F., Segurac, L. and Kienast, F. (2015) Valuation of landscape amenities: A hedonic pricing analysis of housing rents in urban, suburban and periurban Switzerland. *Landscape and Urban Planning* 141: 24–40.

Taylor, L.O., Liu, X., Hamilton, T.L., 2012. Amenity Values of Proximity to Wildlife Refuges, Report Submitted to the U.S. Fish and Wildlife Service, April 2012. available at <http://www.fws.gov/refuges/about/pdfs/NWRSAmenityReportApril2012withCovers8.pdf> (last accessed June 7, 2013).

Tyrväinen, L. and Miettinen, A. (2000). Property prices and urban forest amenities. *Journal of Environmental Economics and Management* 39: 205–223.

Waltert, F. and Schlapfer, F. (2010) Landscape amenities and local development: A review of migration, regional economic and hedonic pricing studies. *Ecological Economics* 70: 141-152.

ANNEXURE 2

Description of treatments for public green space experiment at Ginninderry

Philip Gibbons

Fenner School of Environment and Society, The Australian National University

Philip.Gibbons@anu.edu.au

April 2018

Introduction

Researchers from the Fenner School of Environment and Society at The Australian National University have been liaising with Riverview Projects Pty Ltd and their landscape architects (Cia Landscape and Colour) about a series of greenspace treatments within stage 1 of the proposed Ginninderry development (West Belconnen) in the Australian Capital Territory.

The objective of this study is to evaluate the biodiversity, social and economic outcomes of two alternative greenspace typologies and compare this with conventional greenspace management.

The three green space typologies underpinning the field experiment are:

Treatment 1: Traditional management

Current “park-like” management typical of most urban green space (Figure 1). The ground-layer is mown several times a year, trees are managed for public safety, including removal of hazardous limbs (e.g., dead limbs), fallen branches are removed and noxious weeds may be sprayed. No planting or sowing of native plants.

Figure 1. Typical management of mature eucalypts in urban green space: large, dead branches may be trimmed, fallen branches are removed and there is regular mowing to the base.



Treatment 2: Mulching and mass-planting

Landscaping that involves extensive mulching, followed by hand-planting of native (but not endemic) ground-cover, shrub and tree tube-stock (Figure 2). These sites have the following features:

- ② An area of approximately 0.15ha (this is variable depending on location) around a mature focal eucalypt.
- ② Shrub tubestock from the list of shrub species in Table 1 will be planted in a contiguous clump at a high density across approximately one third of the site away from the drip-line of the canopy of the focal tree to provide a complex dense structure for small birds, promote competition with understorey in the immediate area so biomass at the ground level is reduced. We are happy for the landscape architects to advise on a suitable configuration of shrubs at each site. Selection of species for this treatment need not be limited to the species listed (except for the *Eucalyptus* species). However, we would like to avoid the planting of nectar-rich species (e.g., *Callistemon* spp, *Grevillea* spp.) commonly used in suburban plantings as these attract hyper-aggressive bird species (e.g. Red Wattlebird, Noisy Miner) which, in turn, reduce overall bird richness in urban areas.
- ② At least one eucalypt seedling from the list of species in Table 1 will be planted to provide the next cohort of trees for the site where there is room within the site to allow this tree to grow to maturity.
- ② The balance of the site will be planted with ground-cover species (grasses and wildflowers) from the list of species in Table 1.
- Logs (taken from eucalypts removed for urban development – preferably from the development site) will be introduced at a rate of approximately 15 lineal meters per site (with the large logs outside the drip-line of trees in case they attract people to play or sit on them).
- ② Any fallen branches will be retained.

Table 1. Indicative list of species for Treatment 2 provided by Greening Australia. The shrub and tree species are also suitable for Treatment 3. Those marked with an asterix* are prickly and therefore will not be suitable close to paths (but may be useful for discouraging access under mature trees).

<p><u>Grasses</u> <i>Themeda australis</i> - Kangaroo Grass <i>Poa labillardieri</i> - River Tussock <i>Rytidosperma pallidus</i> - Red anthered wallaby grass <i>Austrostipa scabra</i> - Corkscrew grass <i>Cympogon refractus</i> - Barbed wire grass <i>Rytidosperma caestpitosa</i> - Wallaby grass (medium to large plant)</p>
<p><u>Wildflowers</u> <i>Chrysocephalum semipapposum</i> - Clustered everlasting <i>Bulbine bulbosa</i> - Bulbine lilly <i>Dichopogon fimbriatus</i> - Chocolate lilly <i>Eryngium ovinum</i> - Blue devil * <i>Lomandra longifolia</i> - Mat rush <i>Dianella revoluta / tasmanica</i> - Blue Flat lily</p>
<p><u>Shrubs</u> <i>Acacia dealbata</i> - Silver wattle <i>Acacia buxifolia</i> - Box leaf wattle <i>Acacia implexa</i> - Lightwood <i>Acacia genistifolia</i> - Early wattle * <i>Bursaria spinosa</i> - Blackthorn * <i>Leptospermum</i> spp. - Tea tree <i>Dodonaea viscosa</i> ssp. <i>spatulata</i> - Wedge leaf hop bush</p>
<p><u>Trees</u> <i>Eucalyptus blakelyi</i> - Blakley's red gum <i>Eucalyptus melliodora</i> - Yellow Box</p>



Figure 2. Mulching and mass-planting of ground-cover plants and shrubs around a mature eucalypt on the ANU grounds (adjacent to Ursula College).

Ginninderry – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Treatment 3: Community restoration

This treatment is a modified version of best-practice ecological restoration of Critically Endangered Box- gum Grassy Woodland using a method developed by Greening Australia (Figure 3).



Figure 3. Ground-cover restoration with native species after removal of topsoil as implemented by Greening Australia at the Barrer Hill offset site adjacent to the Canberra Arboretum. This treatment is intended to minimise colonisation by exotic plant species and reduce the biomass in the ground layer.

These sites have the following features:

- ❓ An area of approximately 0.15ha (this is variable depending on location) around a focal mature eucalypt.
- ❓ Topsoil will be removed to a depth where phosphorous is below 10 mg per kg (Colwell) which needs to be established with soil testing. Soil samples (approximately 500g each) taken outside the drip lines of the existing *Eucalyptus* species will be tested by a soil laboratory to determine levels of phosphorus (Colwell), nitrogen, pH and electrical conductivity at depths of 5 cm, 10cm and 15cm at each site. Individual soil samples will be approximately 500g. Sites for soil testing will be established at the rate of approximately one per 300m².
- ❓ Topsoil should only be removed from outside the dripline of the tree and be tapered to a shallower depth near the roots. Scalping near trees should be preferably done in winter. Care should be taken to remove the soil from treatment site and not place it in a location where it will be reintroduced to the site after rain. The objective is to

remove the nutrient-enriched topsoil to give a competitive advantage to native plants that will be sown on the site.

- ☐ If there is sufficient time between scalping and seeding, then the site should be treated with a knock-down herbicide prior to seeding.
- ☐ Direct seeding of endemic native ground cover species across the whole site (species listed in Table 3) at a rate of 5-10g per m², or 7.5 to 15kg of seed per 0.15ha site.
- ☐ Shrub tubestock from the list of shrub species in Table 1 will be planted in a contiguous clump at a high density across approximately one third of the site away from the drip- line of the canopy of the focal tree to provide a complex dense structure for small birds, promote competition with understorey in the immediate area so biomass at the ground level is reduced. We are happy for the landscape architects to advise on a suitable configuration of shrubs at each site. Consideration should be given to “halo” planting around the drip line of the tree to discourage pedestrian access under the canopy. Selection of species for this treatment need not be strictly limited to the species listed in Table 1 (except for the *Eucalyptus* species). However, we would like to avoid the planting of nectar-rich species (e.g., *Callistemon* spp, *Grevillea* spp.) commonly used in suburban plantings as these attract hyper-aggressive bird species (e.g. Red Wattlebird, Noisy Miner) which, in turn, reduce overall bird richness in urban areas.
- ☐ At least one eucalypt seedling will be planted to provide the next cohort of trees for the site where there is room within the site to allow this tree to grow to maturity.
 - Logs (taken from eucalypts removed for urban development – preferably from the development site) will be introduced at a rate of approximately 15 lineal meters per site (with the large logs outside the drip-line of trees in case they attract people to play or sit on them).
- ☐ All fallen branches will be retained.

Table 2. Indicative list of species used for direct seeding of the ground layer for Treatment 3. Species can change with availability, but should be species that occur in box-gum grassy woodland.

<i>Austrostipa</i>	<i>bigeniculata</i>
<i>Austrostipa</i>	<i>scabra</i>
<i>Bothriochloa</i>	<i>macra</i>
<i>Chloris</i>	<i>truncata</i>
<i>Chrysocephalum</i>	<i>apiculatum</i>
<i>Chrysocephalum</i>	<i>semipapposum</i>
<i>Convolvulus</i>	<i>erubescens</i>
<i>Dichopogon</i>	<i>fimbriatus</i>
<i>Elymus</i>	<i>scaber</i>

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra

<i>Eryngium</i>	<i>ovinum</i>
<i>Glycine</i>	<i>tabacina</i>
<i>Microlaena</i>	<i>stipoides</i>
<i>Plantago</i>	<i>varia</i>
<i>Rytidosperma</i>	<i>carphoides</i>
<i>Rytidosperma</i>	<i>spp.</i>
<i>Themeda</i>	<i>australis</i>

ANNEXURE 3

Character Zones

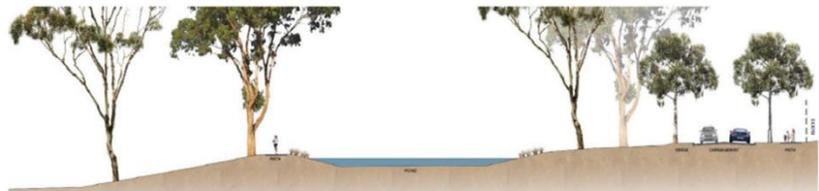
CHARACTER ZONE: CONSERVATION EDGE

CHARACTERISTICS

- With a strong interface with the conservation corridor, the character of this area will reflect a more relaxed bushland setting
- The character of streets and open space is defined partly by the requirements of the Asset Protection Zone (APZ)
- Informally placed native street trees with native grasses and groundcovers as an understorey (maximum 200mm high) within a shale mulch
- Trees within the adjoining open space are predominantly indigenous with understorey of smaller native species outside the APZ
- Adjacent open space provides for shared use paths, Bicentennial National Trail (BNT), hike, bike and fire trails

MATERIALS

- Open space:
 - + Re-use of site rock informally
 - + Over-sized, robust timber elements
- Asphalt driveways
- Asphalt shared path
- Shale rock mulch



Eucalyptus sideroxylon



Melaleuca linariifolia



Acacia pendula



Informal verge character



Informal streetscape character

ANNEXURE 4

Conservation Edge Controls

ACT Land (Ginninderry internal policy guidelines)

Urban Edge Interface Guidance Document

Proposed Development

The Ginninderry project area located to the west of the ACT straddles the ACT/NSW border, covering 1,583.3ha of land. The site is bounded by Murrumbidgee River to the west, Ginninderra Creek to the north, MacGregor to the east and Stockdill Drive to the south.

The proposal to develop the land at West Belconnen is to deliver approximately 11,500 dwellings over the next 30 to 40 years. The development will be known as 'Ginninderry'. Ginninderry will contain approximately 29 stages of urban development, 549.9ha conservation land and offset areas.

The conservation land is defined by the 'West Belconnen Conservation Corridor' line (WBCC). Several of the urban development stages will occur directly adjacent to the Conservation Lands. The purpose of this document is to provide guidance to how development within those stages is to be addressed to minimise impacting on the conservation lands.

Environmental Approvals and the Environmental Management Trust (EMT)

An approval was sought for the Ginninderry development under the Environment, Protection and Biodiversity Conservation Act 1999 (EPBC Act) due to the potential impacts the development may have on Matters of National Environmental Significance (MNES) present on the site (Golden Sun Moth, Pink-tailed Worm-Lizard, Box Gum Woodland and Natural Temperate Grasslands). Given the large portion of the site dedicated to conservation alongside other measures proposed (such as offsets), the approval from the minister was received on xxx. As part of the approval, a Program to manage the conservation land and offset areas was included which has to be adhered to as a condition of the EPBC approval. The Program outlined the management of the Conservation Lands would be carried out by an independently funded community trust known as the Environmental Management Trust (EMT).

The EMT will address issues such as conservation, fire management, recreation and Indigenous and European heritage. The EMT will be responsible for implementing protection measures within the corridor and offset areas including:

- Developing and implementing a reserve management plan (RMP) with measures including but not limited to;
 - Measures regarding the fragmentation of habitat areas
 - Weed management
 - Stock management
 - Management arrangements for walking, cycling, fishing, swimming and boating
 - Feral animal control including the imposition of a cat containment policy in the entire West Belconnen development area and prohibitions on off-leash dogs in the Conservation corridor
 - Rock and firewood collection to be prohibited, educational signage to be installed

**Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra**

- Horses will not be permitted in the reserve
- Bushfire management measures to protect the conservation values of the corridor, note that fire management within the corridor is not intended to provide protection for urban areas.
- Indicative monitoring for MNES
- Reporting (including monitoring, financial performance, measured outcomes and for unanticipated or unapproved incidents)
- Process for review, improvement, approval and incorporation of new procedures within an adaptive management framework
- Guidelines and protocols for the construction of infrastructure, for education, recreation, tourism and other activities within the conservation corridor
- Protocols for visitor management

Whilst the Conservation Lands have a clear management process to follow within the Corridor, it needs to be ensured that the urban development proposed on the opposite side of the Conservation Corridor minimises impacts where possible. Through the Estate Development Process, measures can be implemented to ensure those impacts are minimised.

Conservation / Urban Edge Interface

Development may occur outside of the identified and protected Conservation Lands, subject to a number of identified objectives, designed to manage and minimise the potential impact of development within the urban areas on the land set aside for conservation purposes.

Consideration of these objectives shall be applied to any development proposed immediately adjacent to the Conservation Reserve and should only be limited in proximity, by the potential of development to impact on the Conservation Lands.

This zone or area of potential influence is being referred to by the development team, as the "Conservation / Urban Edge Interface" and for the length of the conservation corridor varies in width from an absolute minimum of 20m to over 100m in width and beyond where a number of influencing factors dictate the extents of the Interface Area.

These objectives are to be used as the guiding principles and approach to the treatment of the interface should take into account the findings and recommendations of any existing and new findings as the development progresses.

The following issues should be considered in establishment of the extent of the Conservation / Urban Edge Interface:

**Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra**

- Development Servicing and Utility Capabilities
- Erosion and sediment control
- Stormwater runoff
- Management implications, pests, weeds, edge effects
- Bushfire and the location of Asset Protection Zones (APZ)
- Boundary encroachments
- Visual, odour, noise, air quality impacts and amenity, and
- Threats to ecological connectivity.

Objectives of the Conservation / Urban Edge Interface

Conservation / Urban Edge Interface

The objectives of this interface zone is to:

- To preserve and enhance the landscape, cultural heritage, visual and ecological values of the Murrumbidgee River and Ginninderra Creek corridors.*
- To restrict development, including buildings, alterations and vegetation clearing on the subject land, so as to minimise any adverse impact on the landscape, cultural heritage, visual and ecological values of the Murrumbidgee River and Ginninderra Creek corridors.*
- To ensure that the risk of bushfire is satisfactorily addressed in the design and siting of development.*
- To ensure that development takes into account and is appropriate to the land terrain and slopes.*

These objectives apply to the development of any land immediately adjacent to the identified Conservation Lands

Development Design Considerations

The design of any development must consider the following to the satisfaction of the project manager and consent authority:

- The development will not have any significant adverse impact on the ecological, cultural or scenic values of the Murrumbidgee River and Ginninderra Creek corridor, and the development will not:*
 - Result in any urban stormwater flows entering directly into the Conservation Corridor without first being treated in accordance with an approved Water Sensitive Urban Design Strategy for the site;*
 - Require any earthworks to extend into the Conservation Corridor except in respect of any approved Water Sensitive Urban Design facility, stream stabilisation or habitat protection or enhancement works;*
 - Require the removal of any significant existing native vegetation within the Conservation Corridor; and*
 - Directly impact on any defined habitat for threatened species within the Conservation Corridor.*
- The design will consider and provide an appropriate assessment and response to any areas or items that are of high cultural significance to the Aboriginal community that may be impacted upon by development.*
- The design will consider and provide an appropriate assessment and response to any existing native vegetation on the development site, and demonstrate that the proposed development will retain any identified significant existing native vegetation in a sustainable manner as part of the development.*
- The development will be constructed of unobtrusive non-reflective materials that are complementary in colour and hue to the natural environment of the adjacent Murrumbidgee River and Ginninderra Creek corridors.*
- The risk of bushfire has been addressed in accordance with the applicable Territory and State Bushfire Protection requirements, including the provision (if required) for an Asset Protection Zones (APZ).*
- The development will be designed and sited to respond sympathetically to the land form of which it will form a part.*
- A geotechnical report prepared by a suitably qualified person demonstrates that the land is suitable for the proposed development.*
- Any other considerations, as addressed by any site specific environmental reports*

Urban Edge Interface treatments

The following sections provide guidance on how the design of development should be approached within those stages adjacent to the conservation lands. Each stage will require a different treatment, depending on what flora or fauna is present in the adjacent conservation lands.

To ensure each potential development constraint is appropriately addressed and considered to mitigate potential impacts on the Conservation Lands, such as environmental and development servicing matters, each matter should be addressed both individually and as a whole.

For example, Stage 3 may have Box Gum Woodland and Pink-tailed Worm-Lizard present, whilst Stage 14 may only have Pink-tailed Worm-lizard present. Stage 3 will need to incorporate measures shown in both the Box Gum Woodland and Pink-tailed Worm-Lizard sections below. Indicative diagrams have been provided for clarity.

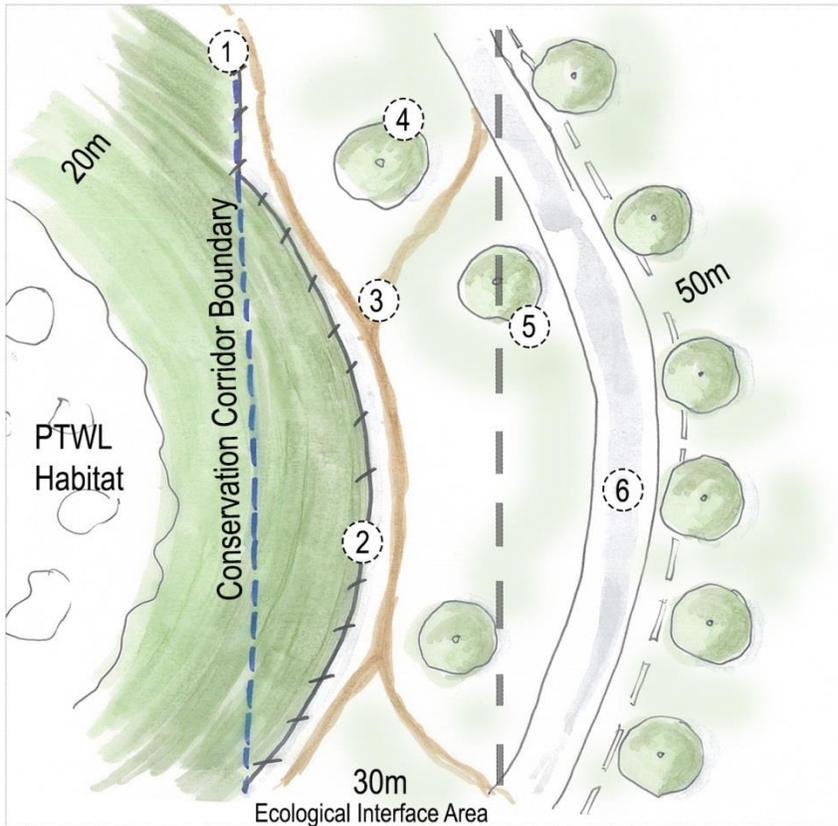
No measures have been provided for Golden Sun Moth as there is none present within the Conservation Corridor (only in offset areas).

Pink-tailed Worm-Lizard (PTWL)

Potential patches of Pink-tailed Worm-Lizard (PTWL) habitat have been identified in the Conservation Lands which are protected by the reserve. A recommended 20m buffer has been placed onto these patches of PTWL habitat, and in some cases the 20m buffer extends into the urban development area. This buffer may not be impacted upon, and will require fencing. Generally, the PTWL buffer will not extend further than the recommended Bushfire Asset Protection Zones. Limited new planting needs to occur where development is in close proximity to PTWL habitat to ensure it does not impact upon the existing habitat (rocky grasslands).

The diagram below indicates a typical arrangement where a PTWL habitat buffer protrudes into the urban development area.

PTWL Habitat | Indicative Sketch



- ① Conservation Corridor Boundary
- ② Fencing to follow outer edge of 20m buffer to PTWL habitat
- ③ Soft-surface / low impact trails where possible within 30m Ecological Interface Area
- ④ Existing native trees and vegetation to be retained where possible and managed to APZ requirements
- ⑤ Limited new planting within 50m of PTWL habitat
- ⑥ Limited hard surface infrastructure permitted within 30m Ecological Interface Area- Roads to be 20m clear of the conservation corridor boundary

Note: These indicative diagrams do not take into consideration APZs and other constraints which may pose further restrictions to the edge conditions in specific locations.

Rosenberg’s Monitor

The Rosenberg Monitor is known to be present within patches of native vegetation to the north of the Ginninderry site. The Rosenberg’s monitor is currently not a Commonwealth listed species; however it is identified as vulnerable under the NSW Threatened Species Conservation Act 1995 and was addressed as part of the Development Control Plan (DCP) for the NSW lands.

Following studies carried out by EcoLogical environmental consultants, habitat values were identified for areas present within the NSW Conservation Lands. As part of the EcoLogical work, indicative sketches were included on how to address the urban interface areas, dependant on the habitat value (low, medium high) present within the Conservation Lands. Those indicative sketches were included as part of the Parkwood DCP and need to be referenced when undertaking development adjacent to the Conservation Lands in NSW.

Bicentennial National Trail (BNT)

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra

The Bicentennial National Trail is a recreational trail which runs from Cooktown (QLD) to Healesville (Victoria). The trail is mainly used for horse riding, however also accommodates for cycling and hiking. The trail runs through various area of the ACT and cuts through sections of the Ginninderry site.

In instances where the proposed realignments are to sit adjacent to the Conservation Lands, consideration has to be made to ensure there are no impacts from the presence of horses and humans in close proximity to the conservation area.

Any proposed realignments of the BNT can utilise the following documents* (or successor) as a guide to inform design of the trail;

Horse Trail Infrastructure: Guidelines for Peri-Urban Precincts (SA) http://www.horsesa.asn.au/wp-content/uploads/2013/08/Horse_Trail_Infrastructure_A4.pdf

Design Standards for Urban Infrastructure: 20 Urban Edge Management Zones - http://www.tccs.act.gov.au/_data/assets/pdf_file/0008/396881/ds20_urbanedge.pdf

No equivalent documents exist for urban edge management in NSW, so the above documents can be used as a guide for both the ACT and NSW lands.

Bushfire Requirements

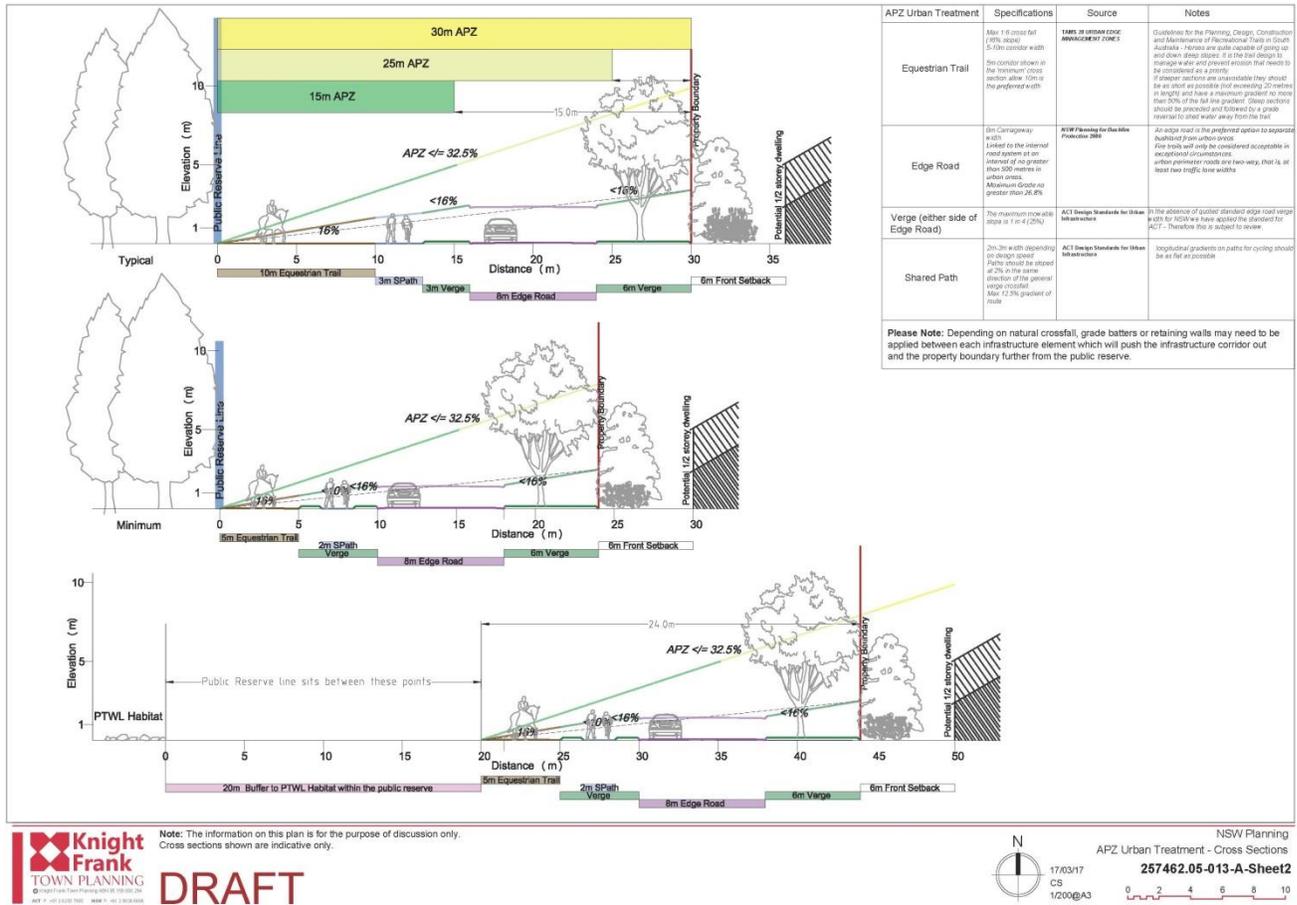
Both the ACT and NSW lands require Asset Protection Zones (APZ) to be implemented on the urban interface (development side) to ensure the threat of bushfire is minimised. Any stages adjacent to the Conservation Lands will already have APZ's identified. APZ's in the ACT are a standard 40m, whilst in NSW the widths of the APZ vary dependant on the vegetation present within the Conservation Lands.

There are restrictions on what can be placed within the APZ's. The current legislation for the ACT* – [Planning for Bushfire Risk Mitigation](#) (or successor) needs to be followed.

In NSW the current guidelines* [Planning for Bushfire Protection 2006](#) (or successor) need to be followed.

An example of what can be placed within an Asset Protection Zone is shown below.

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
 Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra



Note: The information on this plan is for the purpose of discussion only.
 Cross sections shown are indicative only.

DRAFT

NSW Planning
 APZ Urban Treatment - Cross Sections
 17/03/17
 CS
 1/200@A3
 257462.05-013-A-Sheet2
 0 2 4 6 8 10

WSUD Requirements

No water run-off from urban development in Ginninderry is to impact on the Conservation Lands.

Development in the ACT needs to take into the consideration Water Sensitive Urban Design practices and meet the requirements of the [Waterways – Water Sensitive Urban Design General Code](#) (or successor)*.

There are no specific guidelines in NSW for WSUD*, however the same practices will need to be followed for both ACT and NSW.

Landscape Design Requirements

Landscape design adjacent to the Conservation Lands needs to be ensure it poses no impacts on the reserve area by not proposing any species plant and tree species which are likely to spread though the reserve and utilise ensure no water runoff or landscape materials used will be carried through into the reserve.

**Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
Inquiry into “Nature in our City” - matters affecting the value of the natural environment to an urbanising Canberra**

**Note: All guidelines and documents referenced are current as at the date of this document (indicated in the footer). All documents should be checked for currency prior to referencing.*

ANNEXURE 5

MEMORANDUM OF UNDERSTANDING

BETWEEN

Riverview Projects (ACT) Pty Ltd

**Fenner School of Environment and Society, The Australian
National University**

**Environment, Planning and Sustainable Development
Directorate, ACT Government**

and

Transport Canberra and City Services, ACT Government

Ginninderry Urban Open Space Research Project

For the purpose of establishing research sites within urban open space in stages 1 & 2 of Ginninderry

PURPOSE

This Memorandum of Understanding (MoU) describes the proposed Ginninderry Urban Open Space Research Project, and defines the interested parties and their obligations.

1. BACKGROUND

The Fenner School of Environment and Society at The Australian National University (ANU) in collaboration with Riverview Projects (ACT), Cia Landscapes and Colour and the School of Art and Design at the University of Canberra have designed an experiment to evaluate alternative open space treatments within stages 1 and 2 of the Ginninderry development.

The objectives of the Ginninderry Urban Open Space Research Project are to examine whether urban open spaces can be designed to:

- improve biodiversity in urban developments;
- motivate deeper engagement by the community; and
- reduce maintenance costs;

all within acceptable tolerances of risk to people and property.

The broader Ginninderry project proposes the development of some 1600ha of land for a range of purposes including urban residential and nature conservation. A total of 11,500 dwellings are envisaged over a 40 year period, to be developed within a landscape that will include a 570ha Conservation Corridor and the re-purposing of a disused 107ha landfill site. Stages 1 and 2 of Ginninderry make up the first approximately 1,000 dwellings and associated urban open spaces, amenities and infrastructure. Ginninderry is being undertaken by a Joint Venture between the Territory and Riverview Developments Pty Limited. The ACT Government's Suburban Land Agency has been appointed by the Territory to oversee and manage its interests and responsibilities under the Joint Venture. Riverview Projects (ACT) is the Development Manager of the Project on behalf of the Joint Venture.

Ginninderry has been conceived and will be delivered on a fully integrated and triple bottom line basis, and will:

Be sustainable over time, socially, economically and ecologically (with a low and reducing ecological footprint).

Respond to the local and global environment.

Provide for future beneficial change to occur in design, infrastructure and regulatory mechanisms.

Be cost effective, replicable and measurable.

Act as a new model that others can follow.

The Ginninderry Project Vision is provided in Annexure C.

It is within this context that the Ginninderry Urban Open Space Research Project has been established to explore alternate forms of urban open spaces – creating a collaboration which allows government,

private industry and research entities to test different best practice treatments within a functioning community.

STEERING COMMITTEE

A steering committee will be established with membership agreed by all parties to this agreement. At least one representative should be nominated from each party. Proposed representatives are provided in Annexure A. Representatives may change over the course of the MoU. The steering committee will meet at minimum every 6 months and by exception as agreed to by all parties.

2. REVIEW OF THE MOU

The Steering Committee will review this MoU for its appropriateness, content and workability on each anniversary of the execution of the MoU or at such other time as the parties may agree. Changes can be considered at any time to this MoU but require agreement from all parties to the MoU.

3. SETTLEMENT OF DISPUTES

In the event of a dispute, controversy or claim arising out of or relating to this MoU, or the breach, termination or invalidity thereof (a “dispute”), the Parties shall use their best efforts to settle promptly such dispute through direct negotiation. Each Party shall give full and sympathetic consideration to any proposal advanced by another to settle amicably any matter for which no provision has been made or any controversy as to the interpretation or application of this MoU.

4. MEDIATION

Any dispute that is not settled within sixty (60) days from the date a Party has notified the other Parties of the nature of the dispute and of the measures that should be taken to rectify it must be referred to mediation in accordance with, and subject to, the Mediation Rules of the Institute of Arbitrators & Mediators Australia.

5. TREATMENTS & LOCATIONS

As part of this research three greenspace treatments (Table 1) will be established within “discrete urban open space areas” in stages 1 and 2 of Ginninderry. Each site has a mature eucalypt as its focal point. The three greenspace treatments are intended to be replicated at least 10 times (the current proposal is for 33 sites in total) (see maps in Annexure B).

Table 1. The three greenspace treatments proposed for this study.

Treatment	Description	Rationale
1. Traditional management (control)	Current TCCS management typical for most open space areas: <ul style="list-style-type: none"> - Ground-layer mown as per usual practice in the ACT (approximately every four weeks) - Risk from trees managed by removing hazardous limbs - Fallen branches are removed - Replacement planting as required 	This treatment is intended to represent prevailing management of urban green space within the ACT and thus capture the values and costs associated with these spaces.

Treatment	Description	Rationale
<p>2. Mulch and mass plant</p>	<ul style="list-style-type: none"> - Mulching - Hand-planting of native (but not necessarily local) ground-cover plants, shrubs and tree tube-stock, tree seedlings must be the same species as mature tree(s) on site - Shrubs and trees planted in clumps - Logs added to the site, outside the canopy of mature trees with placement also designed to discourage vehicles accessing the landscaped areas (all logs should first be inspected to ensure they are free from termites) - Risk from trees hitting infrastructure (i.e., any fixed target) managed by lopping hazardous branches or reducing the height of the tree rather than removing tree - Risk to pedestrians managed by dense planting at canopy edge ("halo" planting) rather than removing limbs - Fallen limbs left <i>in situ</i> - No mowing or weeding in the initial 4 years after establishment - All sites of this treatment should be located $\geq 100\text{m}$ from the bushland interface - A full description is provided in Annexure D 	<p>This treatments is intended to add some of the habitat features largely missing from urban open spaces, with clustered planting of trees and shrubs intended to improve habitat values for small birds and suppress weed growth with competition. The risk from falling limbs to pedestrians is managed by discouraging pedestrian movements under the canopy of trees rather than removing hazardous branches. Logs are added for habitat and as natural play equipment.</p>
<p>3. Ecological restoration</p>	<ul style="list-style-type: none"> - Removal of nutrient-enriched topsoil to a depth where available phosphorous is below 10 mg per kg (approximately 150mm depth) from outside the dripline of the tree (i.e., the objective is to remove only the nutrient-enriched soil to give a competitive advantage to native plants that will be sown on the site). Care must be taken not to add soil to the site from other sources. - Scalping depth to be tapered when approaching tree roots to maintain water flow to tree roots. - Scalping around trees should be undertaken in winter months if feasible (when use of water by trees is least). - Direct seeding with local native ground cover species (species list to be provided as part of tender) - Mass planting of local tree seedlings and shrubs in clumps - Logs added to the site outside the canopy of mature trees with placement also designed to discourage vehicles accessing the landscaped 	<p>This treatment is intended to replicate critically endangered box gum grassy woodland and thus replace all of the habitat features missing from urban open spaces. Removal of nutrient-enriched topsoil is intended to create a more competitive environment for native ground cover species, reduce weed cover and reduce overall biomass in the ground layer. Logs are added for habitat and as natural play equipment. The boundary of these sites is formalised to emphasise the importance of these sites and discourage accidental mowing.</p>

Treatment	Description	Rationale
	areas (all logs should first be inspected to ensure they are free from termites) - Risk from falling branches hitting infrastructure (i.e., any fixed target) managed by lopping hazardous branches or reducing the height of the tree rather than removing tree - Risk to pedestrians managed by dense planting at canopy edge (“halo” planting) rather than removing limbs - Fallen limbs left <i>in situ</i> - No mowing or weeding in the initial 4 years after establishment - All sites of this treatment should be located $\geq 100\text{m}$ from the bushland interface - Formalised boundary (e.g., with paths or planting) - A full description is provided in Annexure D	

6. RESEARCH TOPICS

At each site, the following research topics will be explored:

- biodiversity outcomes (birds, bats, reptiles, invertebrates, plants),
- establishment and maintenance costs (provided by Riverview Projects and TCCS),
- community attitudes and engagement (through participation in citizen science, type of activities undertaken by the community and their frequency, change in attitudes towards green space over time and relative to other communities) and
- risk associated with the retained trees (pedestrian movements and probability of limb fall) will be evaluated.

Sites will be monitored intensively for an initial 4 years after establishment with a scaled-back monitoring program involving undergraduate and postgraduate students and the community for an indeterminate period thereafter. It is the intention that all results from the research will be peer-reviewed and published with all parties to this MoU recognized for their respective contributions.

Additional research on risks associated with retaining mature trees will be completed prior to the establishment of the treatments and these data will be used as part of a communication strategy for the project and complaint resolution (as detailed in Section see below).

Performance indicators that will be used to evaluate the alternative treatments are provided in Table 2.

Table 2. Performance indicators for the treatments.

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
 Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra

Objective	Performance indicator	Method	Frequency of measurement	Who?
Improve biodiversity in urban open space	Richness and abundance of native and exotic species relative to control treatment	Counts of birds, reptiles, butterflies and plants based on observation using standardised methods; deployment of sonic recorders (for bats); discrete placement of artificial substrates (e.g., tiles) to attract small reptiles	Annual (in spring to early summer)	Researchers at ANU and collaborating research institutions; interested community members or groups
	Cost-effectiveness of improving biodiversity in alternative treatments relative to control treatment	A benefit-cost analysis of all treatments will be undertaken by calculating the amount of biodiversity divided by the cost of treatments	Based on data from annual biodiversity surveys and cost data (see below)	Researchers at ANU and collaborating research institutions
Motivate deeper engagement by the community in urban open space	Level of acceptance of alternative treatments and understanding of biodiversity by the Ginninderry community over time and relative to other communities	Questionnaire-based surveys of residents in Ginninderry through time	Annually	Researchers at ANU and/or collaborating research institutions
		Compare knowledge of biodiversity between residents of Ginninderry and comparable suburbs elsewhere	One-off	Researchers at ANU and/or collaborating research institutions
	Engagement by the community in alternative open space treatments relative to controls	Compare frequency x duration and types of engagement by the community between the alternative urban open space treatments and controls (within and without Ginninderry) through direct observation, questionnaires and participation in citizen science initiatives	Annually	Researchers at ANU and/or collaborating research institutions

Objective	Performance indicator	Method	Frequency of measurement	Who?
Reduce the cost of managing urban open space	Total establishment and maintenance costs in alternative treatments relative to control treatments (i.e., traditional management)	Estimation of establishment costs obtained from Riverview Projects and estimation of ongoing maintenance costs obtained from TCCS	At the same schedule that maintenance is undertaken	Researchers at ANU and/or collaborating research institutions to liaise with Riverview Projects and TCCS to establish the best way to record and access data
	Total time invested by the community in maintenance of alternative treatments relative to control treatment (i.e., traditional management)	Compare time spent by the community in active maintenance (e.g., weed control) between treatments via surveys of residents and weed "bins" (i.e., places where community members can place weeds they have removed)	As required	Researchers at ANU and/or collaborating research institutions
Manage trees within acceptable tolerances of risk	The risk to people and infrastructure is within acceptable tolerances (≤ 1 in 10,000) across all treatments	The risk posed by trees in each treatment will be compared using a Quantified Tree Risk Assessment (QTRA) based on empirical data collected from the site and other trees in the Canberra region	Once only, but can be repeated if necessary	Researchers at ANU and/or collaborating research institutions

7. MAINTENANCE

An agreed schedule of maintenance for the sites in the first 4 years after establishment¹ is provided in Table 2. Variations to this maintenance schedule can be made with agreement from all parties. This maintenance schedule will be reviewed 4 years after establishment of the treatments drawing on empirical data collected as part of this research.

Table 2. Agreed schedule of maintenance for the treatments in the first 4 years after establishment.

¹For the purposes of clarity, the establishment period is taken to be in line with the typical consolidation period usually applied by TCCS with respect to soft landscaping treatments.

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
 Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra

Maintenance type	Treatment 1: Traditional management (control)	Treatment 2: Mulch and mass plant	Treatment 3: Ecological restoration
Mowing	Yes (as per TCCS schedule)	No	No
Tree maintenance	Yes (focusing on removal of hazardous branches and crown reduction) as per usual practice after assessment by an AQF (Australian Qualifications Framework) Level 5 arborist	Only if tree presents an unacceptable risk (>1 in 10,000) as a result of a Quantified Tree Risk Assessment (QTRA) by an AQF Level 5 arborist.	Only if tree presents an unacceptable risk (>1 in 10,000) as a result of a Quantified Tree Risk Assessment (QTRA) by an AQF Level 5 arborist.
Tree removal	As per usual practice	Only if necessary to reduce risk to ≤ 1 in 10,000 (i.e., investigate if acceptable risk can be achieved by crown reduction or bracing the tree).	Only if necessary to reduce risk to ≤ 1 in 10,000 (i.e., investigate if acceptable risk can be achieved by crown reduction or bracing the tree).
Removal of fallen or cut branches	As per usual practice	No (the aim is to evaluate if this will enhance habitat values)	No (the aim is to evaluate if this will enhance habitat values)
Weed control	As per usual practice	This will be reviewed periodically by the Steering Committee (the aim is to encourage the community to do this although it is agreed that the appearance of significant weeds will be addressed by TCCS).	This will be reviewed periodically by the Steering Committee (the aim is to encourage the community to do this although it is agreed that the appearance of significant weeds such as Weeds of National Significance will be addressed by TCCS)
Replacement planting	As per usual practice	This will be reviewed annually by the Steering Committee. If plants fail to initially establish during the maintenance period then any replacement planting is the responsibility of Riverview Projects. If replacement planting is required post the	This will be reviewed annually by the Steering Committee. If understory cover (grasses and forbs) remains <30% in the 3 rd year after establishment then additional hand planting will be undertaken by

Maintenance type	Treatment 1: Traditional management (control)	Treatment 2: Mulch and mass plant	Treatment 3: Ecological restoration
		maintenance period then this is the responsibility of TCCS.	Riverview Projects. In the event that understorey cover remains <30% in year 4 or beyond then the site will be considered by the Steering Committee for either conversion to treatment 2 or treatment 1.
Rubbish removal	As per usual practice	Yes (as per usual management)	Yes (as per usual management)

8. COMMUNICATION STRATEGY

The objective of a communication strategy for this project is to, as much as possible, ensure that all stakeholders are aware of the objectives of the research, the rationale for the different treatments, maintenance proposed for the different treatments and the way risks to the community are managed. This information is intended to reduce complaints about the project and to help motivate stakeholders to take an active interest in urban open space.

Communication will be achieved with the following:

1. A short information sheet will be drafted by the Fenner School for agreement by all parties to the MoU that will describe the research and the rationale underpinning it. This information sheet will be:
 - a) made available to all prospective owners in stages 1 and 2 of Ginninderry via the Ginninderry website and at The Link;
 - b) provided as part of the resident's welcome pack for individuals who purchase land in stages 1 and 2 of Ginninderry;
 - c) mailed to residents of stages 1 and 2 of Ginninderry once homes have been built and ANNUALLY through the research period; and
 - d) emailed to key people in the ACT Government as identified by all parties to the MoU.
2. In addition to the information sheet noted above, sales information generated for blocks sold beyond the date of this MOU will include specific reference to the proposed research project and details of the proposed Treatment sites;
3. A briefing note about the research project will be prepared for the Minister for Transport and City Services, Minister for Housing and Suburban Development and the Minister for Planning and Land Management.
4. Interpretative signage will be installed at agreed locations throughout stages 1 & 2 of Ginninderry with a focus on Treatment 2 & 3 sites within the core urban development given these sites are likely to represent the greatest deviation from typical landscaping in urban open space and have potential to be mowed accidentally during routine maintenance.
5. Research to quantify risks to pedestrians associated with mature trees will be undertaken prior to establishment of the treatments to ensure the risk management strategies employed in the

experiment are evidence-based. The risk associated with each retained tree will be estimated using data from this research. These data will be forwarded to Urban Treescapes in TCCS.

6. Engagement through citizen science will be encouraged via development and promotion of an online app that will enable the community to enter observations from the research sites. This will be developed in collaboration with the ACT Parks and Conservation Service (e.g., using the current Canberra Nature Map platform).
7. An annual exercise with the local school will be undertaken at a sample of the treatment sites.
8. Occasional tours of sites for the public (residents of Ginninderry and elsewhere) and interested professionals will be conducted.
9. A demonstration site will be established at The Link building with appropriate interpretation.
10. Opportunities to promote the project through the media will be taken at key points throughout the project (e.g., with the establishment of the first treatments, to promote citizen science input, when key results become available).

9. DEALING WITH COMPLAINTS FROM THE PUBLIC

It is noted that complaints may be received by any of the Parties to this MOU in a variety of ways (most notably by phone, email, website portals, letter, in person or via various forms social media).

It is recognised that the accurate recording of complaints and responses (where applicable) is an important component of the Research Project and as such the Parties will seek to develop and agree a suitable format for recording the complaints to help inform analysis and if required amended management practices. In this respect it is envisaged that that the parties will agree a standard template for recording complaints which among other things will document the type and nature of the complaint.

For the duration of the Research Project (i.e. the first 4 years of maintenance after establishment) complaints will be resolved using the following strategy:

- For the purposes of complaints administration each party will nominate a single representative;
- Where a Party receives a complaint they will undertake to notify the other Parties via email within 24hrs of receiving the complaint. The notification will include the specific details of the complaint including;
 - the individual who received the complaint;
 - the individual or group who has made the complaint;
 - how the complaints was received;
 - the time of the complaint;
 - the details of the complaint and any other specific information deemed relevant (as per the agreed template);
- The Fenner School will centrally log the details of all complaints and responses for record purposes. The recording of the complaints will include a summary register and the more detailed records of the specific complaints and responses issued;
- Upon receipt of a complaint, the Fenner School and Ginninderry representatives will jointly prepare and agree an appropriate response strategy;
- Ginninderry and the Fenner School will endeavour to have agreed the response strategy within 48hours of receiving the complaint notification. The response strategy will include not only the details of the response but how the response is to be communicated (email, phone, in person etc) and by who the response is to be communicated;

- By enlarge it is expected Ginninderry and the Fenner School will jointly respond to complaints, however for complaints in relation to specific concerns about public health or safety the following process will be applied:
 - Ginninderry and the Fenner School will undertake a preliminary assessment of the health and safety risks identified;
 - If the health and safety risks are of a general nature as they relate to the retention of the biota trees (e.g. their appearance 'looks' unsafe) then an appropriate response will be developed between Ginninderry and the Fenner School;
 - If the complaint however relates to a specific concern in relation to a particular tree, branch or limb of tree with respect to its 'structural soundness' (i.e., the risk profile of the tree has changed from the original assessment) or a particular treatment zone with respect to other matters of public health or safety concerns (e.g. trip hazards, sharp objects etc) then Ginninderry will document the area of concern (most typically via photos) and refer the matter on to the Parties for further consideration (and where appropriate any proposed risk management approaches as per the agreed maintenance schedule for trees in Table 2);
 - TCCS will act as the lead Party in relation to these matters and will determine what (if any) further evaluation is deemed appropriate and if required a joint site inspection may be undertaken between the Parties to confirm any remedial action before finalising a joint response strategy and undertaking remedial works.
- Upon finalising a response strategy in accordance with the above procedure, Ginninderry will notify all Parties for their information and where appropriate the Party who initially received the complaint will action the response strategy accordingly;
- It is noted that a standard condition of any written responses will be to provide the complainant with the opportunity to make further direct contact with the ANU Fenner School to discuss any further specifics of the Research Project.

It is noted that as part of the standard agenda for the 6 monthly steering committee meetings, the ANU Fenner School will prepare a complaints report from the complaints records. The committee will consider the report and any implications for the above complaints strategy, broader stakeholder engagement or maintenance of the treatment areas.

10. SUPERVISION GUIDELINES FOR IMPLEMENTING THE PROJECT

A detailed specification of the treatments will be provided with the tender documents and this tender will include the requirement for adequate supervision of the works.

All treatment sites will be temporarily fenced during construction.

Any logs or removable rock added to treatments will be individually marked during the construction phase with a temporary sign to discourage their removal from the site.

Any issues that arise during implementation of the treatments will be circulated among the parties to the MoU for an agreed resolution.

11. DATA SHARING

**Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra**

TCCS and Riverview Projects will share sufficient information with researchers engaged on the project to estimate establishment and ongoing maintenance costs for the three treatments so these can be used in the research.

All research data collected by The ANU, University of Canberra and collaborating researchers for this project will be made available at all times to parties of the MoU unless this is not permitted as a condition of research permits issued by a Human Ethics Committee. However, research data remain the intellectual property of the research institution that generated the data and the copyright for any published research outputs are held by the authors of those outputs unless released under a data licensing agreement.

After primary research outputs are published, all data generated by researchers in this project that is not under license to other providers or is not constrained by conditions stipulated by a Human Ethics Committee will be made publicly available via a creative commons license and appropriate online data-sharing portal.

Biodiversity data collected by researchers or the community and added to Canberra Nature Map is publicly available via a creative commons license.

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra

The parties have executed this Memorandum of Understanding on the

..... day of 2018

Signed on behalf of:

**Transport Canberra and City Services,
ACT Government**

**Environment, Planning and Sustainable
Development Directorate, ACT
Government**

.....
**XX
Executive Officer**

.....
**XX
Chair**

**Fenner School of Environment and
Society, The Australian National
University**

Riverview Projects (ACT) Pty Ltd

.....
**XX
XX**

.....
**David Maxwell
Managing Director**

ANNEXURE A

Proposed Steering Committee

Organisation	Position	Name	Email	Phone
Riverview Projects (ACT) Pty Ltd	Development Manager	Steve Harding	[REDACTED]	
	Sustainability Manager	Jessica Stewart	[REDACTED]	[REDACTED] [REDACTED]
	Conservation Manager	Jason Cummings	[REDACTED]	[REDACTED]
Australian National University	Associate Professor Conservation and Landscape Ecology Fenner School of Environment and Society	Phillip Gibbons	[REDACTED]	[REDACTED]
Transport Canberra and City Services	New Asset Coordinator Urban Treescapes City Presentation City Places and Infrastructure City Services	Carma Sweet	[REDACTED]	
Transport Canberra and City Services	Development, Review and Coordination Capital Works and Development Support	Grant Thomas	[REDACTED]	
Environment, Planning and Sustainable Development Directorate	Environmental Project Officer ACT Parks and Conservation Service	Darren Le Roux	[REDACTED]	[REDACTED] [REDACTED]

ANNEXURE B

Proposed location of treatments in stages 1 and 2 of Ginninderry.

Submission to the ACT Legislative Assembly Standing Committee on the Environment and Transport and City Services
 Inquiry into "Nature in our City" - matters affecting the value of the natural environment to an urbanising Canberra



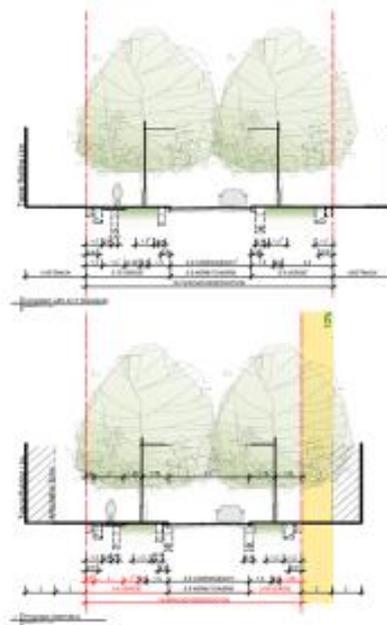
ANNEXURE 6

Ginninderry Street Cross Section Examples

Tait Waddington Street Section Comparison

Access Street A (Local Street):

- Overall Reduction in Road Reserve Width of 2m
- Medium Sized Trees (up to 15m in height) planted in reduce soil volume area and permitted to extend into articulation zone

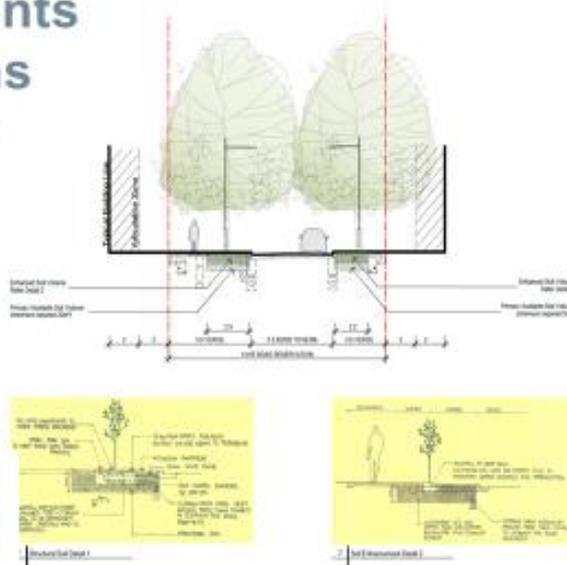


Soil Enhancements & Tree Selections

Street Tree Species - 10m and 11m Canopy Width	Height x Width
Angophora floribunda	15 x 10m
Acer palmatum	15 x 10m
Acer palmatum Green King	15 x 10m
Fraxinus excelsior Aurea	12 x 10m
Fraxinus ornus	12 x 10m
Fraxinus pennsylvanica Coronata	12 x 10m
Fraxinus pennsylvanica Orbata	10 x 10m
Fraxinus velutina	12 x 10m
Liquidambar styraciflua Tropic	12 x 10m
Platanus chinensis	10 x 10m
Syzygium australe japonicum	10 x 10m
Ulmus parvifolia Green II Aline	13 x 10m
Ulmus parvifolia Tuffii	10 x 11m
Delonix regia Green Inset	14 x 10m
Quercus macrocarpa	8 x 10m
Melia azadirachta Elm	8 x 10m
Quercus phellos	12 x 9m
Delonix regia Schemata	7 x 9m

Consulting And Horticulture Advice By

Street Tree Species - 8m and 7m Canopy Width	Height x Width
Fraxinus pennsylvanica Alinea	10 x 6m
Lagerflorhelia Redwood	8 x 6m
Melia azadirachta	10 x 6m
Prunus domestica	8 x 6m
Prunus padus	12 x 6m
Pyrus calleryana Aristocata	11 x 7m
Pyrus calleryana Red Spire	10 x 7m
Pyrus calleryana Charleston Cleveland Select	11 x 6m
Melia azadirachta Caroline	8 x 7m
Artocarpus alatus	8 x 7m
Artocarpus neriifolia	8 x 6m



ANNEXURE 7

GINNINDERRY STREETS AND PLACES THE RATIONALE SUPPORTING VARIATIONS TO TCCS STANDARDS

1.0 INTRODUCTION

Consistent with the overarching vision of Ginninderry as ***a sustainable community of international significance in the capital region***, the project should evolve as a series of distinct neighbourhoods / precincts providing housing choice, land use diversity and broad ranging affordability in housing and living.

Through our work so far we believe that streets, and the public domain more generally, will play a very significant role in urban character of Ginninderry.

With this in mind this document has been written to express the character outcomes being sought for Ginninderry, in order to provide the underlying rationale for our aspirations with respect to applicable street and public domain design standards.

The structure of this document is as follows:

- 1. General Street Principles for Ginninderry Streets;***
- 2. A description of the character precincts envisaged, detailing the elements, precinct specific street principles, and proposed variations to standards;***
- 3. Pilot initiative including variations to TCCS & Roads ACT standards for the first neighbourhood of Ginninderry.***

2.0 GENERAL PRINCIPLES FOR GINNINDERRY STREETS

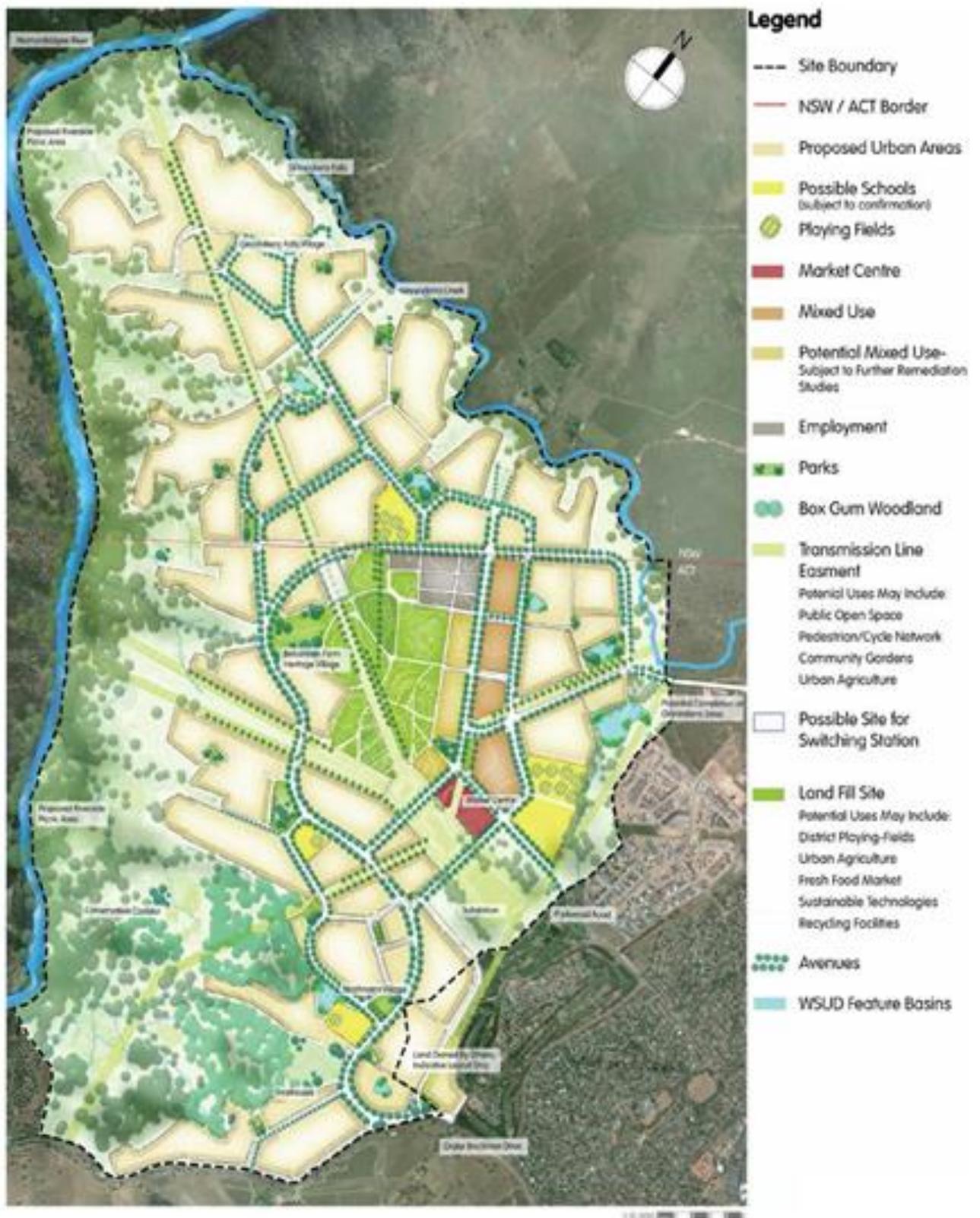
- Streets are public spaces - for people first and vehicles second. Well-designed streets assist with economic activity (in commercial areas), and land value and quality of life (in living areas):
 - There is (or should be) a user hierarchy in our streets prioritising consideration for pedestrians, cyclists, public transport users and then vehicles;
 - We will develop a logical and legible street pattern, which due to topographical considerations may not be a perfectly square or rectangular grid, but will provide some linearity and connectivity, particularly for pedestrians and cyclists accessing destinations and public transport routes;
 - Our street hierarchy will not be based solely on traffic volume, but on the street function and activity we wish to support in those streets being High street activity, mixed use activity or living street activity;
- Streets must be safe.
 - Design should provide streets where people walking, parking, shopping, cycling and driving can all cross paths safely.
 - Street design will be based on street safety principles recognising the safety of people using the street for any of its possible activities, not just driving;
 - Street geometry should be such that traffic speed is appropriate to promote the desired activities in the street.
- Streets should be attractive and shaded.

- All streets must be capable of supporting shade using large canopy trees to provide shade (summer cooling) to the street and the verge or as an alternative, particularly in High Streets, other forms of shade that support the adjacent land use and complimentary activities.
- Street tree canopies should overlap the carriageway, the verge and may extend over private land.
- Street landscaping should employ best construction practice and be passively watered.
 - All street trees and other street plantings must be planted in good quality soil within appropriate planting zones and in accordance with best practice planting methods.
 - Where practical, all street trees and street planting zones should be passively watered from street and/or verge and/or other surface runoff.
- Streets should serve WSUD and ecological functions
 - Where practical and affordable, streets should serve WSUD and other ecological functions, in a manner consistent with an overall WSUD / ecological functions strategy for the site;
- Streets should be attractive and affordable
 - While every effort should be made to minimise the capital and whole of life costs of street and verge infrastructure (including land take), streets should be designed to complement the land use, density, height and function of adjoining buildings, and provide required transit and service functions in a manner consistent with the principles above – they must be inviting, safe and comfortable places for people to be in.

3.0 CHARACTER ZONES

The Ginninderry Concept Plan provides an illustrative overview of the proposed urban development of the site. Refer below.

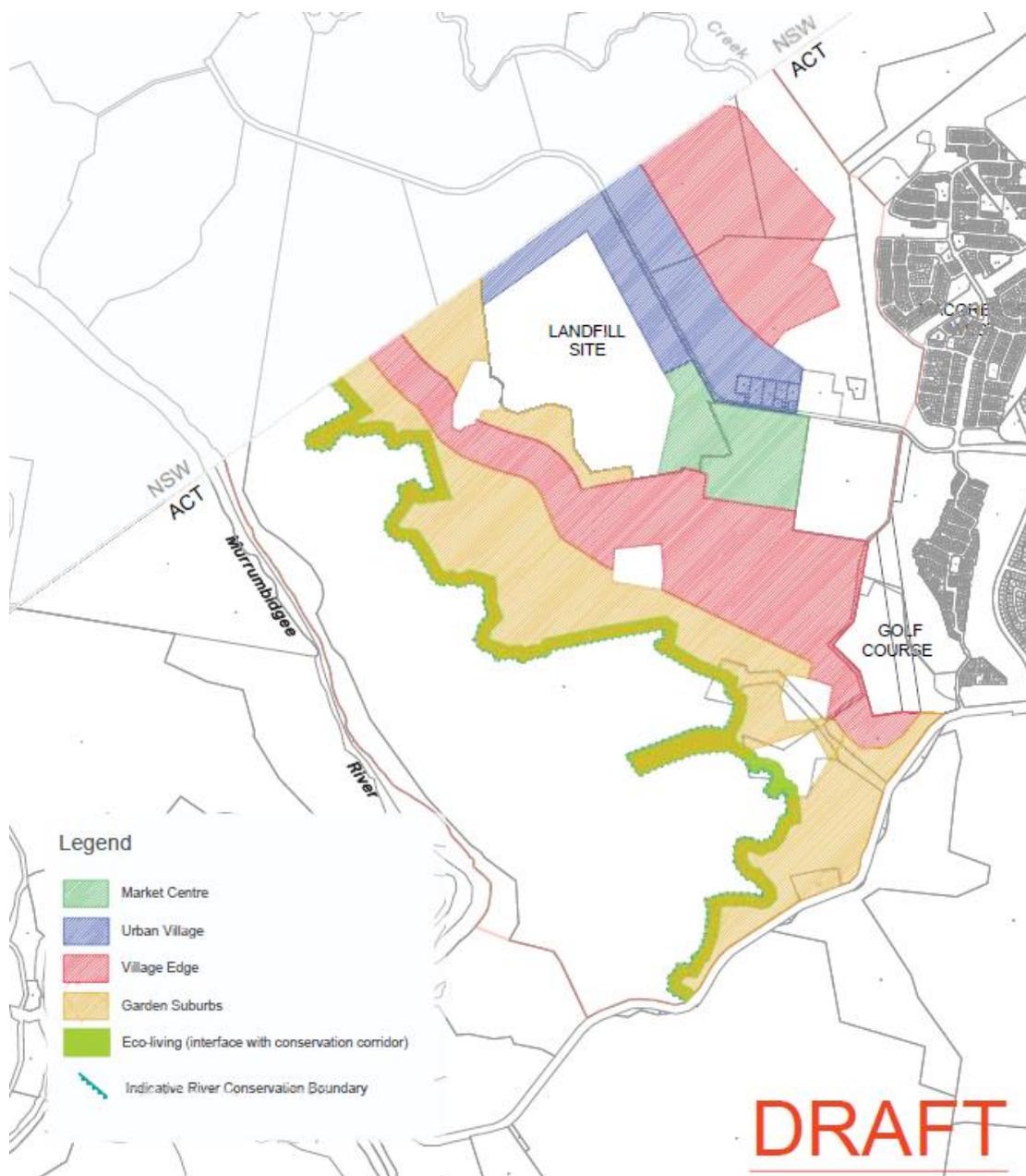
Overall Illustrative Concept Plan



In preparing the Concept Plan the Riverview team has identified a need for a wide diversity of housing types to meet to practical, social and economic needs of the current and future population (demographic) profile of the ACT.

Our research of best practice in urban development has led us to the conclusion that a transect based approach to land use and density would be ideally suited to Ginninderry. Consistent with that practice, Riverview proposes the creation of five distinct character zones across the project, reflecting the planned mix and intensity of land use, in the context of the known physical and environmental features of the land.

The Concept Plan provides an earlier indicative delineation of the Character zones (Note the description of the character zones has evolved since this earlier plan but the intent remains the same). The exact location and extent of the Precincts will be refined via the EDP process. It is likely that there will be elements of several character zones in each EDP, and that the street design and streetscape more generally will reflect the respective character zone.



The following public and private domain elements define and differentiate the Character Areas:

Public Domain (i.e. Streets):

- Verge
- Boundary
- Trees
- Street Parking

Private Domain (i.e. blocks)

- Built Form
- Setback
- Roof Form
- Front Boundary Treatment

Character Zones

Market Centre
The Market Centre will feature a town square, multi-functional spaces and buildings up to six storeys high. This will be a vibrant hub of economic and community activity for the area.

Urban Village
The Urban Village will be close to the Market Centre. It will include apartments, terrace homes, mews and single dwellings, close to cafés, restaurants and other small businesses.

Village Link
Village Link precincts will offer lower density than the Urban Village and include detached homes, townhouses and terrace homes close to parks and playgrounds.

Traditional
Traditional areas will be characterised by detached one and two storey homes on suburban blocks, generally on more undulating land.

Conservation Edge
Conservation Edge areas will provide an important transition between the residential areas and the river corridor. These areas will have more informal streets with homes incorporating building materials, colour palettes and landscaping, that complement the natural elements of the river corridor.

DISTRICT MARKET CENTRE URBAN VILLAGE VILLAGE LINK TRADITIONAL CONSERVATION EDGE NATURE

A summary of the character elements and street principles defining each zone is included at **Attachment 1**. It is noted that the first neighbourhood of Ginninderry comprises the Village Link, Traditional and Conservation Edge zones (refer illustration below).



4.0 PILOT INITIATIVE

Ginninderry has a vision to become a ***sustainable community of international significance in the capital region***. Through a collaborative approach working with key government agencies and stakeholders and in this case TCCS, it has been agreed to pilot a number of variations to existing TCCS and Roads ACT standards in line with the stated planning principles for the Ginninderry street network and aspirations for the creation of five distinct character zones across the project.

Basis for Variations

The following general references have been used for guidance in deciding the most appropriate aspects of the Ginninderry Streets. We believe that these widely recognised documents should provide TCCS with a level of comfort that these street design options are well researched and that many examples of similar streets have been built, are operational and have been successfully maintained for long periods of time in other jurisdictions.

- Complete Streets - <http://www.engicom.com.au/products/complete-streets/>
- Human Transit - <http://www.humantransit.org/>
- Great Streets, Alan B Jacobs - <http://www.amazon.com/Great-Streets-Allan-B-Jacobs/dp/0262600234>
- Liveable Neighbourhoods - <http://www.planning.wa.gov.au/650.asp>
- Landcom Design Guidelines - <http://www.landcom.com/downloads/file/forpartners/StreetDesignGuidelines.pdf>
- Link and Place - <http://www.thinkingtransport.org.au/news/2010/01/link-place-planning-study-now-available-online>
- ULDA Res 30 - http://www.ulda.qld.gov.au/01_cms/details.asp?ID=157

Working over some 24 months with the then TAMS we have used these references to determine suitable verge widths, parking arrangements, pavement widths, reserve widths, setbacks, tree planting volumes and so on, where the TAMS guidelines were not necessarily conducive to the Ginninderry situation.

In addition the Ginninderry Project team has undertaken numerous background planning studies as part of the Ginninderry rezoning and stage 1 EDP documentation. Some of the more relevant studies that relate to the proposed street principles are provided below:

- West Belconnen Integrated Sustainable Transport Plan, MR Cagney dated 23rd June 2014
- West Belconnen Technical Traffic Report, Aecom dated 24th June 2014
- West Belconnen Street Typology & Street Trees, dsb Landscape Architects memo dated 22nd September 2015 and supporting Tait Waddington Drawings PL-001 to PL-032 (documenting TAMS AA & TAMS Urban Treescapes Agreement in Principle)
- West Belconnen Laneway Study for Neighbourhood 1 (presentation), Roberts Day dated October 2015
- Best Practice Context Sensitive Street Design (presentation), Roberts Day (date unspecified)
- Draft West Belconnen Active Travel Plan (presentation), Roberts Day (date unspecified)
- West Belconnen Peer Review of Active Travel Planning and proposed Infrastructure, Civilscope dated 23rd August 2016

Copies of the above documents have previously been provided to TCCS. Additional copies can be provided upon request. Samples of the agreed street typologies for Local Access streets compared to the TCCS standards are included at Attachment 3. These street typologies serve to demonstrate the general principles as to where departures from the general street geometry standards have been applied and agreed for all street types.

General variations that have been sought and agreed with TCCS for the Stage 1 EDP and are proposed to be continued for the Stage 2 EDP to complete the first neighbourhood are:

- *Min verge widths allowing for:*
 - *Shared path widths and placement (ie with reduced offset to boundaries)*
 - *Service locations - allow for locating shared trench under paths*
 - *Street Tree Placements & Clearances – enhanced soil volumes and reduced clearances to BAU in some instances*
- *Street Hierarchy – access streets onto main boulevard/arterial road*
- *Street Geometry – kerb radii and intersection stagger etc*
- *Cycle paths - off road cycle path to main boulevard/arterial road*
- *Design & Posted Speeds – 40km/hr posted speed to local street etc*
- *Parking lane widths – 2.5m to local streets*
- *Pavement widths – reduced minor collector pavement width with indented parking*
- *Rear laneways – some lanes service more than 40 dwellings*
- *Visitor Parking – some visitor parking for compact block provided on street*

The table below provides a comparative summary of the current TCCS or Roads ACT standards where appropriate and the relevant specifications that have been adopted for the stage 1EDP and are proposed to be continued for the stage 2EDP to complete the first neighbourhood.

Item	Estate Development Code	Ginninderry Neighbourhood 1
Min verge width	Rear Lane - min 1.5m Access A - min 5.5m Access B - min 6.25m Minor Collector - min 6.25m	Rear Lane 1.25m - Does not comply Access A – 3.55 or 5.1m – Does not comply Access B - 5.1 or 5.6m – does not comply Minor Collector varies from 5.1 to 12.8m – some verges do not comply
Shared path widths	Shared path network to be provided in front of schools, shops, community facilities, multi-units, along bus routes Rear Lane – no path Access A - 1.5m wide on one side Access B - 2m path on one side Minor Collector - 2.5m path on both sides at least 1.5m from kerb Arterial roads not covered in EDC	Complies Rear Lane – complies Access A - complies Access B - Complies Minor Collector - Not all paths comply. TCCS draft Active Travel guidelines/principles applied to inform path requirements. Boulevard shared paths designed to comply with TCCS Active Travel document

Shared path locations in verge	Not a requirement of EDC. This is nominated in the TAMS design standards which leads to the minimum verge widths identified in the EDC so is related.	Ginninderry adopted typical 0.6m path offset from the boundary which complies with AustRoads, but not TAMS standards. This has the consequence of placing the shared trench under the shared path which is not typical in a suburban context. Ginninderry adopted typical 1.25m path offset to trees which complies with AustRoads, but not TAMS standards. This is supported by new TCCS method of calculating root volumes for trees.
Servicing locations	Not specified in the EDC other than to say that services locations to be endorsed by Authorities and TCCS.	Complies as Authorities and TCCS have endorsed services locations. Services locations are in accordance with TCCS standards for verges and Authority requirements.
Design Speeds	Rear Lanes 20km/hr Shared Use 20km/hr Access A 50km/hr Access B 60km/hr Minor Collector 60km/hr Major Collector 70km/hr	Rear Lanes proposed 20km/hr - complies Shared Use proposed 20km/hr - complies Access A proposed 40km/hr – Design actually complies with 50km/hr Access B proposed 40km/hr – Does not comply. Design does not comply with 60km/hr in some locations Minor Collector proposed 60km/hr – complies Major Collector – we do not have any in Neighbourhood 1 Boulevard 70km/hr (Arterials not covered in EDC)
Posted speed. (Not a EDC requirement, but is related to the design speed)	Rear Lanes 20km/hr Shared Use 20km/hr Access A 50km/hr Access B 50km/hr Minor Collector 60km/hr Major Collector Arterial 80km/hr	Rear Lanes 10km/hr Shared Use 20km/hr Access A 40km/hr Access B 40km/hr Minor Collector 40km/hr Major Collector 50km/hr Boulevard 60km/hr

Parking lane widths	2.8m	Boulevard and Collector streets have 2.8m parking bays which comply. Access streets and shared street have 2.5m which do not comply with EDC but comply with AustRoads and Australian Standards for low volume roads.
Pavement widths	Rear Lanes 5.5m Access A 5.5m Access B 7.0m Minor Collector 10.0m Major Collector 10.0m Arterial Not covered in EDC	Rear Lanes 5.5m - complies Access A 6.0m - complies Access B 7.0m - complies Minor Collector 10.0m - 7m or 8m plus indented parking. Does not comply, but this is a typical acceptable solution accepted by TCCS on all recent projects. Major Collector 10.0m - none in Stage 1 Arterial Not covered in EDC
Rear laneways	No more than 40 dwellings accessed from rear lane Maximum of 120m leg length Max 160vpd Fire hydrant spacing Streetlights to be 1.7m from kerb and to have upright kerb	Some rear lanes have more than 40 dwellings, however, these have several entry/exit locations which keeps traffic volumes in rear lanes less than 160vpd. The rear lane alignments and number and location of entry/exit points are such as to meet the requirements of ESA for fire hydrants for fire fighting. Streetlight pole locations carefully chosen to be clear of where vehicles will turn or reverse and therefore upright kerb not provided. Landscape also utilised to provide separation of cars to streetlight poles.
Kerb radii	8m radii	6m radii adopted which does not comply but allows design vehicles to navigate intersections. Tighter radius will slow traffic.
Access Streets onto arterial roads	EDC requires only collector roads come off arterial roads	Does not comply as have access streets off Boulevard.
Bus routes	Accommodate on-road cycling	Onroad cycle lanes not provided on Boulevard. 5m pavement provided in Stage 1 and dual carriageway provided in ultimate duplicated road. Dedicated offroad cycle only path provided in lieu of on-road cycle lanes as permitted in TCCS Draft Active Travel standard.

On road cycling	<p>Major collectors to have 1.5m wide on-road cycle lanes</p> <p>Arterial roads are not covered by the EDC, therefore the Boulevard cannot be compared with the EDC.</p>	<p>There are no major collector roads in Neighbourhood 1. For future stages on-road cycling on major collectors will be considered under the application of the TCCS Active Travel document.</p> <p>Dedicated cycling paths on the Boulevard and associated infrastructure including priority crossings of side streets is designed to comply with TCCS Draft Active Travel standard.</p>
Intersection stagger	40m spacing when left-right stagger	Intersection on the shared street does not comply as stagger is less than 40m.
On street parking with respect to providing only one parking within the Flexi-living blocks	Visitor parking to be provided on block.	Some visitor parking to compact blocks to be provided on public streets which is therefore non-compliant for these particular blocks.
Street trees placements / clearances	<p>R116 The selection and location of street trees is to be endorsed by TAMS. Note: TAMS will endorse the selection and location of street trees if they comply with TAMS Design Standards for Urban Infrastructure DS23-Plant Species for Urban Landscape Projects or its successor</p> <p>TAMS may consider departures</p>	1.25m from footpaths and 1.75m from kerb lines as per dsb Landscape Architects Street Typology & Street Trees memo

ATTACHMENT 1- CHARACTER ZONES

Market Centre

The Market Centre is the hub of economic and social activity. It will be generally highly engineered with a strong urban feel. It will be the interface between retail, commercial, community, educational and residential activity.

Character elements:

- One to 6 storey
- Nil to minimal building setbacks
- Extensive paving to maximise pedestrian mobility as well as gathering and seating
- Wide verges with summer shade from trees and awnings and other structures
- Active frontages – compulsory human scale awnings to retail precincts
- Market place for pop up stalls etc
- Verandas / balconies over verges
- Sheltered, safe and visible places to wait for buses
- On street car parking
- Diverse range of commercial and retail use
- Nil frontage access for vehicles but opportunity for shops servicing from frontage if necessary
- Shared lanes and alleys, incorporating people places
- Town Square and multi-functional spaces and places

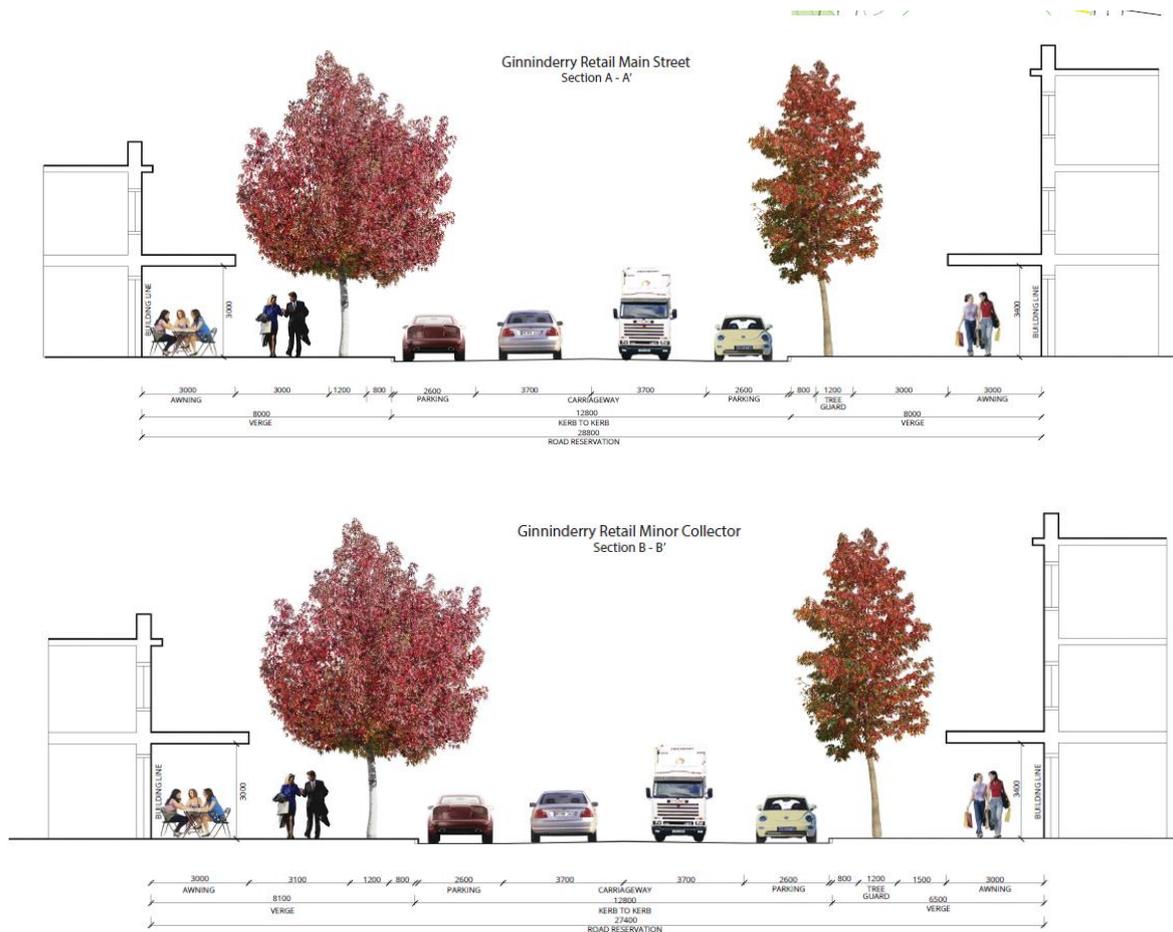
Street Principles:

- Priority consideration for pedestrians, cyclists and public transport (Complete Streets Section 1.6)
- On road (or dedicated off-road cycle paths) – *but consideration could be given to divert commuter paths around Market Street with local connections to Market Street* (ACT Strategic Cycle Network Plan, TAMS DS13)
- Wide verges generally fully paved with canopy trees, seats, bollards, lights, public art, water fountains, kids water play (Complete Streets Section 8, Complete Streets Section 3)
- Services under paved verges (Complete Streets Section 8)
- Service connection points either in ground or incorporated into building design
- Street trees and planting zones passively watered by runoff from streets, paved verges and/or awnings/buildings
- Bicycle racks – may be on verge or on protected part of carriageway
- Bus stops
- Off street parking in existing electricity easements (subject to Transgrid Approval) – shade structures if trees not allowed

Proposed Variations to standards (beyond Neighbourhood 1):

- Verge width min 6.5m and up to 8m for Main street(Complete Streets table 1.6)
- Min paved width 60% of verge up to 100%
- Shared services in conduits below paths allowed with access points at regular intervals (TBC)
- Street trees in parking zone permitted (Landcom Design Guidelines Section 2.11)
- Hydraulic services in rear lanes under pavements

Indicative Cross sections and images



Urban Village

Urban Village adjoins and is otherwise near to High Street and bus routes, and supports and is supported by High Street.

It is typically medium to high density, and may include mixed non-residential uses that are compatible with residential and supported by or supportive of residential (eg cafes, restaurants, medical and allied health services, personal services, professional offices, local shops, education, etc). These village mixed use streets are the hardest to design and activate, and may induce the most compromise to the existing standards. It is however our intention that these will be exemplar streets for mixed use activity.

Character elements

- Primarily residential land use but compatible mixed non-residential uses permitted
- Building types to include apartments, terrace homes, mews, single dwellings
- Up to 4 storeys permitted
- Nil to minimal building setbacks to all boundaries
- Extensive paving
- Moderate width verges with summer shade – mix of trees and awnings
- Shared streets where appropriate to slow/calm traffic, improve amenity for adjoining residences and improve walkability
- Pocket parks and playgrounds
- Front verandas and balconies encouraged

- Verandas / balconies over verges
- Active frontages to non-residential uses encouraged
- Sheltered, safe and visible places to wait for buses
- On street car parking
- Front fences/courtyard walls
- Provision for some ground floor units to be commercially adaptable (% TBC)
- Frontage access for vehicles discouraged
- Opportunities for private front courtyards (as principal open space) for ground floor dwellings where north facing
- Rear lanes permitted but mews dwellings encouraged for a % of blocks with lane frontage
- Discrete community “meeting places” provided for every home

Street Principles

- Generally straight streets in an interconnected grid (Liveable Neighbourhoods Element E1)
- May include some bus routes
- On road (or dedicated off-road cycle paths) on bus routes – cyclists can mix with traffic on other streets
- Verges may, near activity zones, be fully paved but generally mix of paving with trees, lawn and plantings
- Services under paved verges permitted
- Service connection points either in ground or incorporated into building design
- Street trees and planting zones passively watered by runoff from streets, paved verges and/or awnings/buildings
- On street parking permitted

Proposed Variations to standards:

- Verge width from 5.1m minimum (unless adjacent to high activity areas where verge may be wider)(Landcom Design Guidelines Section 2.12, Complete Streets Table 3.1 & Section 8).
- Min path width 60% of verge up to 100%
- Shared services in conduits below paths allowed with access points at regular intervals (TBC)
- Street trees and landscaping in parking zone permitted



- Hydraulic services in rear lanes under pavements

Village Link

Village Link adjoins Urban Village precincts, and provides urban living opportunities but at a lower density than the Urban Village. It will still be close to bus routes but will provide opportunities for modest detached homes on compact lots, as well as sections of semi-detached and attached housing commonly referred to as “semis” or “terraces”.

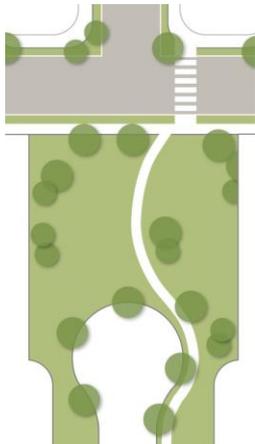
The higher density housing in this precinct will usually be adjacent to an area of parkland or other high value urban amenity.

Character elements

- Primarily residential land use excepting community, education and recreation;
- Building types to include cottages, terrace homes, semi-detached dwellings, mews and townhouses
- Up to 3 storeys permitted
- Reduced setbacks when compared to traditional suburban areas.
- Traditional verge treatments adjacent to cottage areas, but “Urban Village” precinct verge treatments adjacent to terrace housing permitted.
- Shared streets where appropriate to slow/calm traffic, improve amenity for adjoining residences and improve walkability
- Pocket parks and playgrounds
- Moderate and narrower verge widths with shared path and canopy trees
- On street car parking –parallel only
- Frontage access for vehicles permitted
- Rear lanes permitted
- Front fencing/walling mandatory
- Front verandas encouraged
- Opportunities for private front courtyards as principal open space where north facing

Street Principles

- Generally straight streets in an interconnected grid – culs-de-sac permitted provided safe and open pedestrian and cycle connectivity provided as shown or similar (Complete Streets Section 16.2)



- May include some bus routes
- On road cycle paths on bus routes and other designated routes (ACT SCNP and TAMS DS13)
- Traditional verge with street tree in verge (or in parking zone), shared path and grassing

- Services under shared paths permitted
- Street trees passively watered (where practical) by runoff from streets, footpaths and/or buildings
- Parallel parking only
- All front loaded dwellings to include at least one on site hardstand car space in addition to garage or carport with exception of compact affordable housing lots (where additional on street parking concessions may apply subject to overall carpark master plan demonstrating proximity of additional on street parking to compact dwellings and adequacy of overall remaining total visitor parking provisions).

Proposed Variations to standards:

- As per Stage 1EDP documentation

Traditional Neighbourhood

Garden Suburb Precincts may adjoin Village Edge precincts, and will be often on land further from but generally within walking and certainly cycling distance to the High Street and bus routes.

The Garden Suburb Precincts provide a contemporary take on a more traditional suburban lifestyle, characterised by detached one and two storey homes on a variety of block sizes, generally on more undulating land.

Distinct small sub precincts of Village Edge type dwellings may be located in this precinct, but only where the land is reasonably flat and where such dwellings are immediately adjacent to open space or another urban amenity.

Character elements

- Primarily residential land use
- One and 2 storey detached single dwelling homes only
- Moderate front setbacks for detached dwellings (min 4m).
- All garages and carports to be a minimum of 5m setback
- Village Link setbacks and conditions apply to approved Village Link sub precincts.
- Moderate verge widths with shared path and canopy trees
- On street car parking –parallel only
- Frontage access for vehicles permitted
- Rear lanes permitted but only to service Village Link sub precincts
- Front verandas encouraged

Street Principles

- Tree lined curvilinear and straight streets (working with topography and existing vegetation and views) (Liveable Neighbourhoods Element E1)
- May include some bus routes
- Verges with shared path, although cycling may mix with traffic
- Street trees passively watered by runoff from streets, footpaths and/or buildings
- Parallel parking only
- Deeper setbacks and on-site parking for minimum of 2 vehicles in garage/carport and on hard stand
- Posted speed limit of 40km/hr

Proposed Variations to standards:

- As per Stage 1EDP documentation

Conservation Edge

Conservation Edge is the term applied to any part of the Ginninderry site where there is a direct or indirect interface with the Conservation Corridor adjacent to the Murrumbidgee River and Ginninderra Creek Conservation Corridor.

Conservation Edge is an additional “layer” of character on top of the Precinct Character identified for the subject land, to ensure that the benefits of the Corridor interface are optimised for landowners in a manner that protects and enhances the values underpinning the Conservation Corridor itself.

Accordingly, the Principles and details in this part are in addition to those applied in the Precinct Descriptions.

Where there is any inconsistency between the Principles and Details in this part and the Principles and Details in a Precinct part, the Conservation Edge Principles will prevail.

Character elements

- More Informal Street patterns
- Where one sided roads front the Corridor – flush kerbs / castellated kerbs permissible to enable run-off to bio swales
- Frontage roads integrated with pedestrian, cycle, fire management and the BNT (equestrian trail)
- Bushfire sensitive urban, building and landscape design and materials
- Building materials and colour palettes to complement the natural elements of the Corridor
- Extensive use of passive watering and bio swales in open space / verges
- Frontage to ponds/wetlands

Street Principles

- Curvilinear – topography, vegetation and fire access dependent
- No path in verge along conservation edge interface unless as part of an interconnected pathway system
- Where streets are providing primary dwelling access and are adjoining the corridor or open space, pavements may be reduced to 5.5m with regular passing blisters
- Verge on dwelling side 5.6 m wide (assuming 2m wide path)

Road	Typical Section Number	Traffic Volume	ACT Code classification	Design Speed			Carriageway Width		Verge Width			On-street Car Parking		Kerb Type		Entrance Kerb Return		Properly Access		Street Grade		Shared Path Requirement		On road Cycling	
				Required	Proposed	Posted Speed	Required	Proposed	Required	Proposed	Required	Proposed	Required	Proposed	Required	Proposed	Required	Proposed	Required	Proposed	Maximum	Proposed	Required	Provided	Required
Road 100	9 - 11	22800 - 21200	Arterial	-	7.0 km/hr	6.0 km/hr	-	2 x 7 m lanes	-	14 m	13 m	-	Indented only	-	KG	-	-	Not permitted	No	8%	3.7%	-	2.0m on both sides	Yes	No
Road 102	6	1001 - 3,000	Minor Collector Rd	6.0 km/hr	6.0 km/hr	5.0 km/hr	10m	10m	6.25m	5.6m	5.1m	Assumed on both side of the carriageway	Parallel parking bays	Upright	KG	Min. 8m	Min. 6m	Permitted	Yes	12%	2.5%	2.5m on both sides	Yes	No	No
Road 113	4	1001 - 3,000	Minor Collector Rd and Bus Route	6.0 km/hr	6.0 km/hr	5.0 km/hr	10m	8m	6.25m	6.9m	1.5m ①	Assumed on both side of the carriageway	On Street	Upright	KG / PK	Min. 8m	Min. 6m	Permitted	No	12%	2.5%	2.5m on both sides	2.5m path on one side ⑤	No	No
Road 115	8	1001 - 3,000	Minor Collector Rd	6.0 km/hr	6.0 km/hr	5.0 km/hr	10m	8m	6.25m	12.8m	1.5m	Assumed on both side of the carriageway	Parallel parking bays and 90° bays	Upright	KG	Min. 8m	Min. 6m	Permitted	Yes	12%	12%	2.5m on both sides	2.5m / 2.0m	No	No
Road 201	7	1001 - 3,000	Minor Collector Rd	6.0 km/hr	6.0 km/hr	4.0 km/hr	10m	8m	6.25m	6m	3.55m	Assumed on both side of the carriageway	On Street one side Parallel parking one side	Upright	KG	Min. 8m	Min. 6m	Permitted	Yes	12%	3%	2.5m on both sides	2.0m on one side only ⑤	No	No
Road 104, 112 Part Road 101, 105	5	301 - 3,000	Access Street B	6.0 km/hr	4.0 km/hr	4.0 km/hr	7m	7m	6.25m	5.6m	5.1m	Assumed staggered on both sides of the carriageway	On street	Layback or Upright	KG	Min. 8m	6m	Permitted	Yes	12%	11.2%	2.0m on one side	2.0m / 1.5m	No	No
Road 114	15	301 - 3,000	Access Street B	6.0 km/hr	4.0 km/hr	4.0 km/hr	7m	11m	6.25m	5.6m	5.6m	Assumed staggered on both sides of the carriageway	On street	Layback or Upright	KG, KG, PK	Min. 8m	6m	Permitted	Yes	12%	5.5%	2.0m on one side	2.0m / 1.5m	No	No
Road 103	5	0 - 300	Access Street A	5.0 km/hr	4.0 km/hr	4.0 km/hr	5.5m	7m	5.5m	5.6m	5.1m	Assumed on one side of the carriageway	On street and indented	Layback or Upright	KG, KG, PK	Min. 8m	6m	Permitted	Yes	12%	3%	1.5m on one side	2.0m / 1.5m	No	No
Road 107 Part Road 105	1	0 - 300	Access Street A	5.0 km/hr	4.0 km/hr	4.0 km/hr	5.5m	7m	5.5m	5.0m	5.1m	Assumed on one side of the carriageway	On street and indented	Layback or Upright	KG	Min. 8m	6m	Permitted	Yes	12%	5.7%	1.5m on one side	2.0m / 1.5m	No	No
Road 109, 110 Part Road 105	2	0 - 300	Access Street A	5.0 km/hr	4.0 km/hr	4.0 km/hr	5.5m	6m	5.5m	5.1m	3.55m	Assumed on one side of the carriageway	On street	Layback or Upright	KG	Min. 8m	6m	Permitted	Yes	12%	8.1%	1.5m on one side	Yes	No	No
Part Road 105	3	0 - 300	Shared Use Access Street	2.0 km/hr	2.0 km/hr	2.0 km/hr	3.5 - 3.7m Single lane	5.5m	5.0m	5.6m	4m	Permitted only as indented spaces	Indented only	Flush or Layback	KG, FK, OI	Min. 8m	6m	Permitted	Yes	12%	3.8%	-	Paved verge	No	No
Lanes 120, 121, 124, 125(a,b,c), 126, 126a, 120, 124, 125(a,b,c), 122(a,b,c)	12	0 - 100	Rear Lane	2.0 km/hr	2.0 km/hr	1.0 km/hr	5.5m	5.5m	Min. 1.5m	1.25m	1.25m	Prohibited	Dedicated bays provided	Flush or layback	FK ③	-	-	-	-	12%	15%	-	-	-	-

NOTES

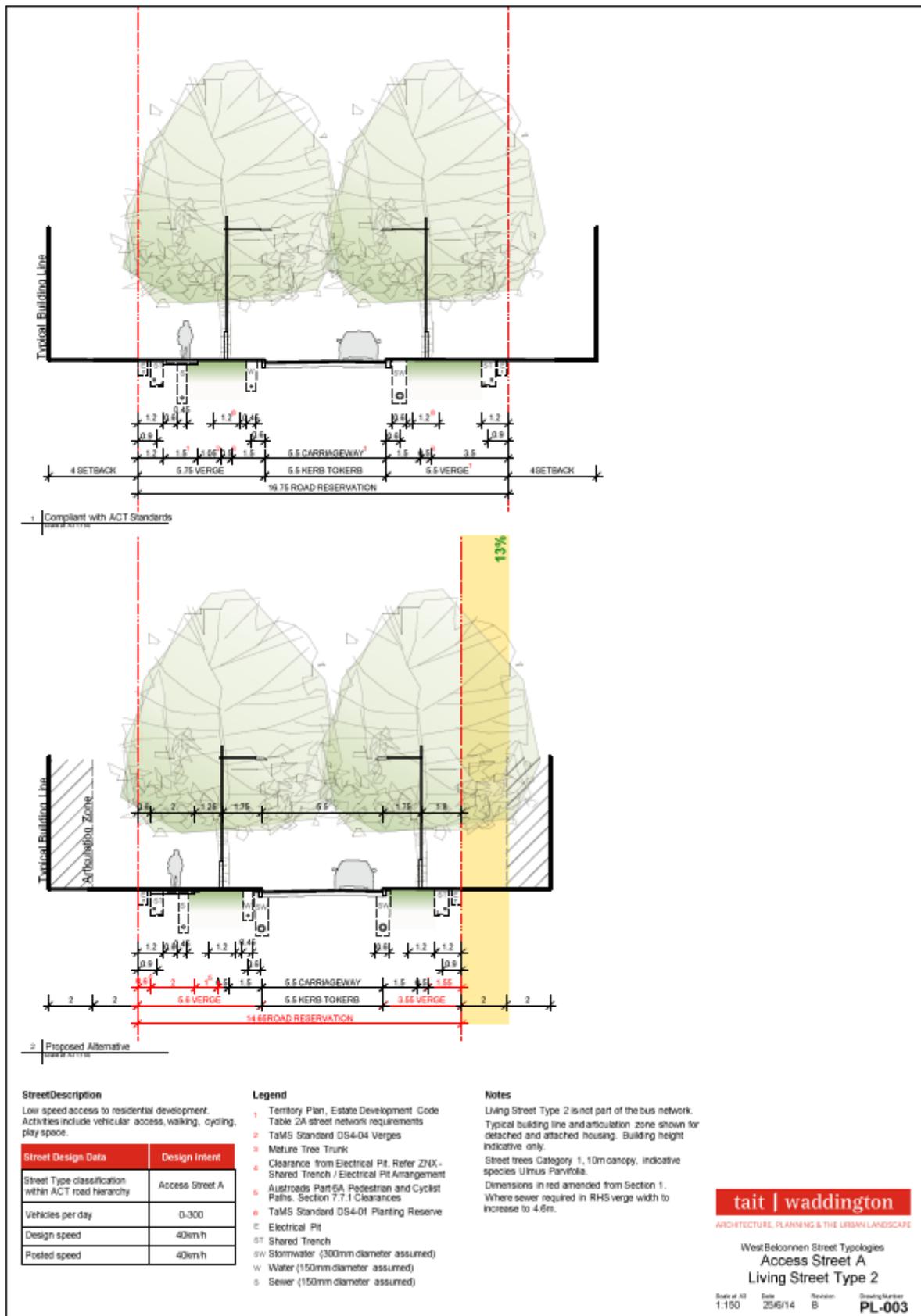
- ① VERGE WIDTH ON THE OUTSIDE OF EDGE ROADS HAS BEEN REDUCED TO 1.5m. THIS WIDTH REFLECTS THAT THESE VERGES DO NOT CONTAIN SERVICES OR STREET TREES.
- ② PATH ONE SIDE ONLY ON EDGE ROADS.
- ③ UPRIGHT KERB ADJACENT TO STREET LIGHTING.
- ④ OFFROAD CYCLE LANE PROVIDED.
- ⑤ PROVISION SHOULD BE MADE FOR A 2.0m PATH IN FUTURE STAGES.

<table border="1"> <tr> <th>DATE</th> <th>BY</th> <th>REVISION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	DATE	BY	REVISION										<p>APPROVED: [Signature]</p>	<p>KNIGHT FRANK Town Planning</p>	<p>ROBERTSDAY planning design place</p>	<p>CIA landscapes + colour</p>	<p>MACQUARIE PROJECT</p>	<p>WEST BELCONNEN STAGE 1 PLANNING</p>	<p>RIVERVIEW PROJECTS (ACT)</p>	<p>calibre CONSULTING</p>	<p>ROAD HIERARCHY AND TRAFFIC ANALYSIS PLAN - SHEET 3</p>	<p>15-002280-RHP-3+ PLAN NO: 16.3</p>
DATE	BY	REVISION																				

ATTACHMENT 3- STREET TYPOLOGIES

Local Access Street A – Comparison of Ginninderry Pilot v TCCS Standards

Submission to the ACT Legislative Assembly Standing Committee on the Environment
 Inquiry into matters affecting the value of the natural environment to an urbanising Canberra



Ginninderry Joint Venture – a case study
 Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

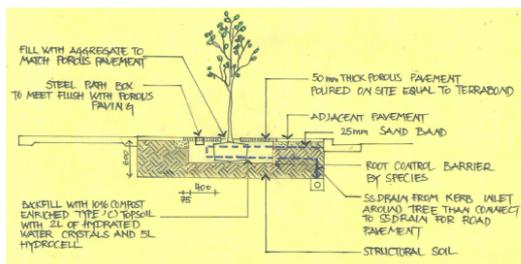
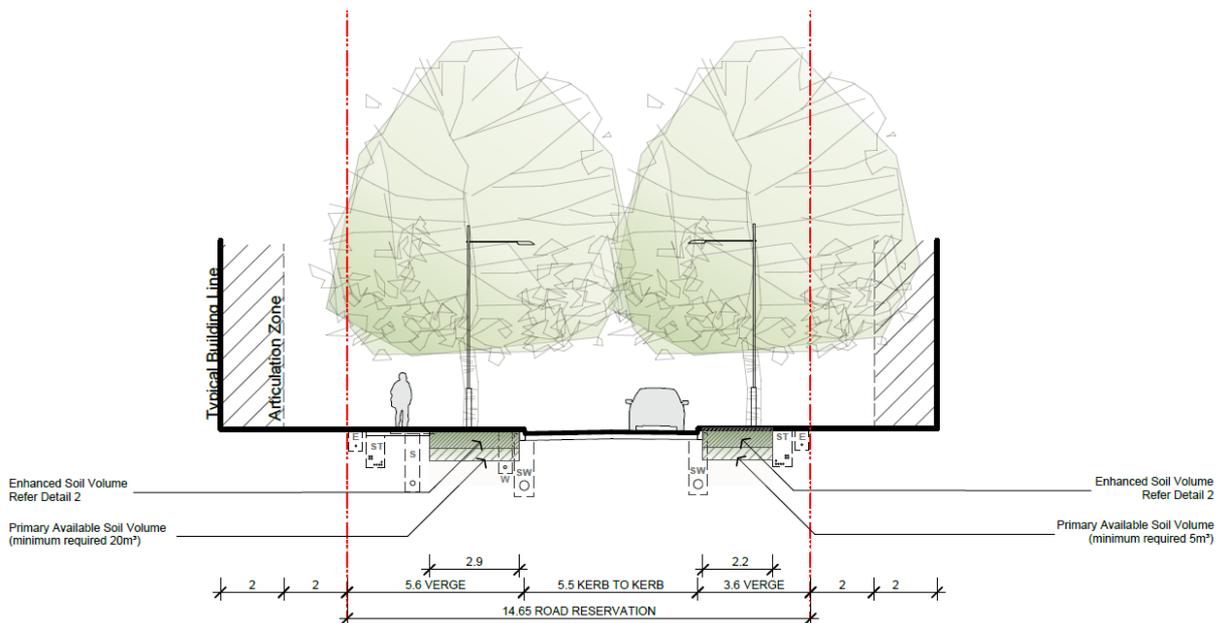
**Submission to the ACT Legislative Assembly Standing Committee on the Environment
Inquiry into matters affecting the value of the natural environment to an urbanising Canberra**

Local Access Street A – Proposed Street Tree Selections, Soil Volumes and Soil Enhancements

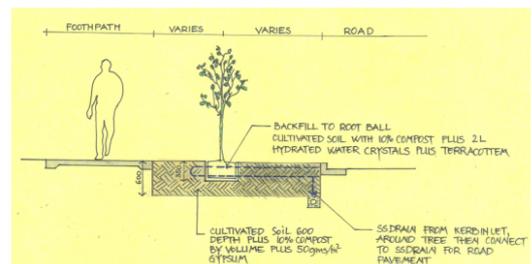
Ginninderry Joint Venture – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Submission to the ACT Legislative Assembly Standing Committee on the Environment
 Inquiry into matters affecting the value of the natural environment to an urbanising Canberra



1 | Structural Soil Detail 1



2 | Soil Enhancement Detail 2

Street Tree Species - 10m and 11m Canopy Width	Height x Width
Angophora floribunda	15 x 10m
Acer platanoides	15 x 10m
Acer platanoides Crimson King	15 x 10m
Fraxinus excelsior Aurea	12 x 10m
Fraxinus ornus	12 x 10m
Fraxinus pennsylvanica Cimmzam	12 x 10m
Fraxinus pennsylvanica Urdell	15 x 10m
Fraxinus velutina	12 x 10m
Liquidamber styraciflua Tririki	12 x 10m
Pistachia chinensis	10 x 10m
Styphnolobium japonicum	15 x 10m
Umus parvifolia Emer II Alee	13 x 10m
Umus parvifolia Todd	10 x 11m
Zelkova serrata Green Vase	14 x 10m
Gleditsia triacanthus Sunburst	9 x 10m
Melia azederach Elite	8 x 10m
Quercus phellos	12 x 9m
Zelkova serrata Schmittlow	7 x 9m

Street Tree Species - 6m and 7m Canopy Width	Height x Width
Fraxinus pennsylvanica Wasky	10 x 6m
Lagerstroemia Natchez	8 x 6m
Malus spectabilis	10 x 6m
Prunus Shirofugen	6 x 6m
Prunus padus	12 x 6m
Pyrus calleryana Aristocrat	11 x 7m
Pyrus calleryana Red Spire	10 x 7m
Pyrus calleryana Chanticleer Cleveland Select	11 x 6m
Melia azederach Caroline	8 x 7m
Arbutus andrachne	8 x 7m
Arbutus menziesii	8 x 6m

Detailing And Horticulture Advice By:



West Belconnen Street Typologies
 Living Street Type 2
 Street Trees

Scale at A3 1:150 Date 14/9/15 Revision C Drawing Number PL-022

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

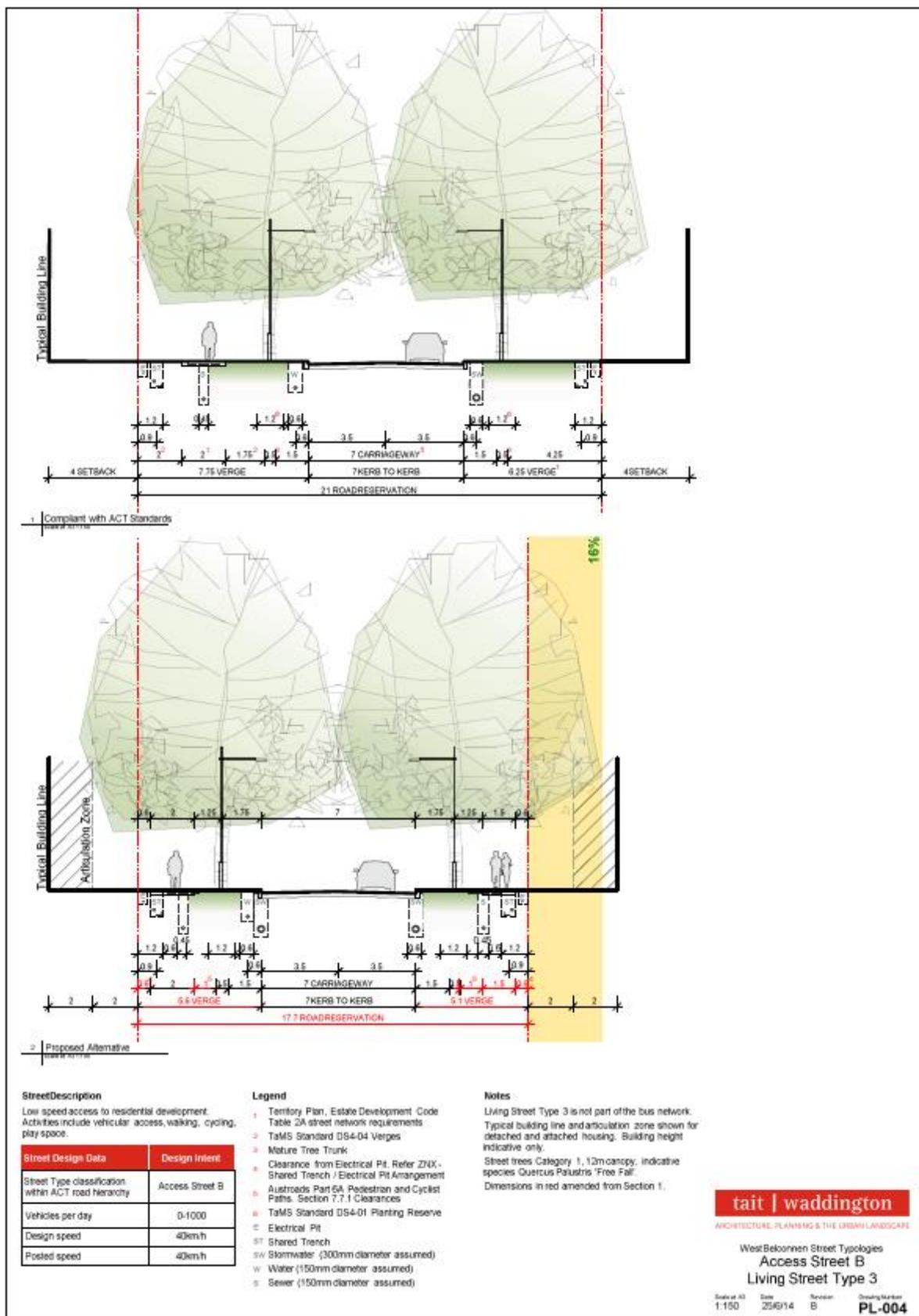
**Submission to the ACT Legislative Assembly Standing Committee on the Environment
Inquiry into matters affecting the value of the natural environment to an urbanising Canberra**

Local Access Street B – Comparison of Ginninderry Pilot v TCCS Standards

Ginninderry Joint Venture – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Submission to the ACT Legislative Assembly Standing Committee on the Environment
 Inquiry into matters affecting the value of the natural environment to an urbanising Canberra



Ginninderry Joint Venture – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

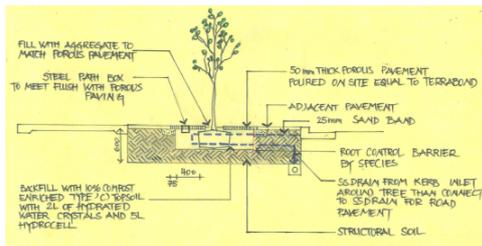
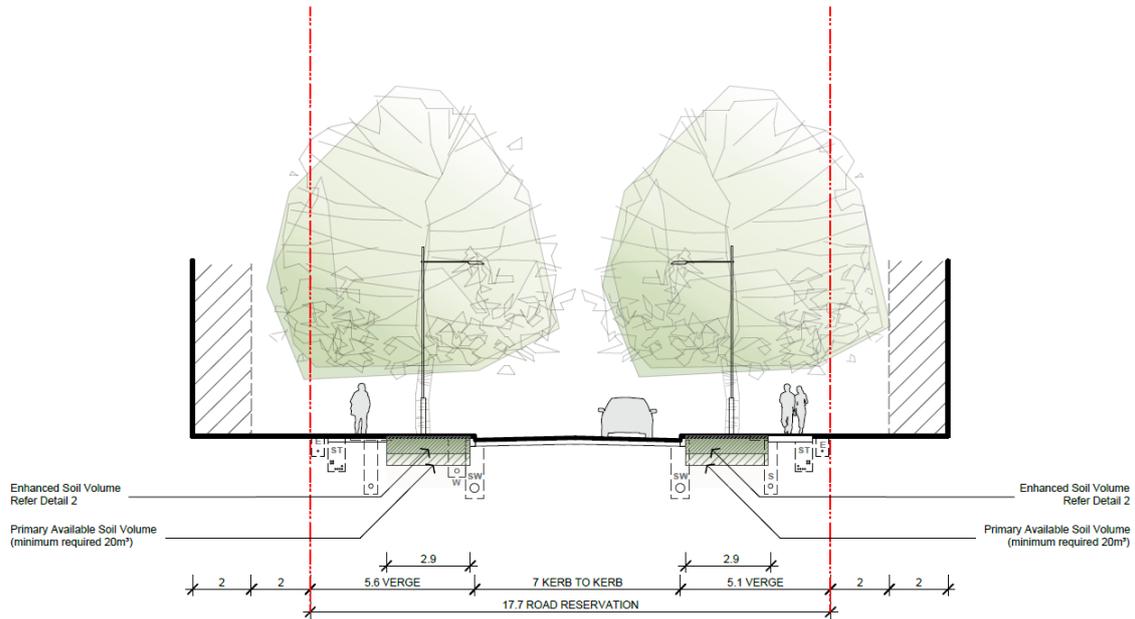
**Submission to the ACT Legislative Assembly Standing Committee on the Environment
Inquiry into matters affecting the value of the natural environment to an urbanising Canberra**

Local Access Street B – Proposed Street Tree Selections, Soil Volumes and Soil Enhancements

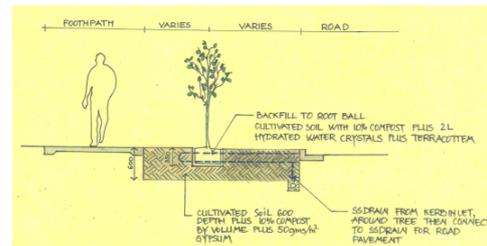
Ginninderry Joint Venture – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

Submission to the ACT Legislative Assembly Standing Committee on the Environment Inquiry into matters affecting the value of the natural environment to an urbanising Canberra



1 | Structural Soil Detail 1



2 | Soil Enhancement Detail 2

Street Tree Species - 10m and 11m Canopy Width	Height x Width
Angophora floribunda	15 x 10m
Acer platanoides	15 x 10m
Acer platanoides Crimson King	15 x 10m
Fraxinus excelsior Aurea	12 x 10m
Fraxinus ornus	12 x 10m
Fraxinus pennsylvanica Cimmzam	12 x 10m
Fraxinus pennsylvanica Urbdeil	15 x 10m
Fraxinus velutina	12 x 10m
Liquidamber styraciflua Tririki	12 x 10m
Pistachia chinensis	10 x 10m
Styphnolobium japonicum	15 x 10m
Ulmus parvifolia Emer II Aleee	13 x 11m
Ulmus parvifolia Todd	10 x 11m
Zelkova serrata Green Vase	14 x 10m
Gleditsia triacanthus Sunburst	9 x 10m
Melia azederach Elite	8 x 10m
Quercus phellos	12 x 9m
Zelkova serrata Schmidflow	7 x 9m

Detailing And Horticulture Advice By:



West Belconnen Street Typologies
Living Street Type 3
Street Trees

Scale at A3 1:150 Date 14/9/15 Revision C Drawing Number PL-023

Ginninderry Joint Venture – a case study
Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture

**Submission to the ACT Legislative Assembly Standing Committee on the Environment
Inquiry into matters affecting the value of the natural environment to an urbanising Canberra**

Ginninderry Joint Venture – a case study

Author: Riverview Projects (ACT) Pty Limited, Development Manager for the Ginninderry Joint Venture