

**DRAFT**

**NARARA ECOVILLAGE**

**RESIDENTIAL PLANNING PROPOSAL**

**AT**

**33 GUGANDI ROAD**

**NARARA**

**FORECAST TRAFFIC AND ACCESS  
ASSESSMENTS**

Ref. 19133r

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Prepared By

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## 1.0 INTRODUCTION

This report has been prepared as a Traffic Impact Assessment on behalf of Narara Ecovillage (NEV) to accompany a planning proposal for up to 97 residential allotments realising up to 167 dwellings to be located off Research Road via Fountains Road at Narara.

The planning proposal is seeking to change various provisions of Gosford LEP 2014 in relation to land zoned R2 Low Density Residential including to expand the range of permissible housing types and the land used which will support the Ecovillage.

By way of background, in January 2006 a Masterplanning Traffic Report prepared by B J Bradley and Associates (Bradley traffic report) for the rezoning of the Gosford Horticultural Research Station to residential uses on behalf of the DPI (Department of Primary Industries) indicated 150 allotments, yielding 150 single dwellings.

The projected post development daily and peak hour traffic generation outcomes in the Bradley traffic report, based on RMS 2002 Traffic Generation Guidelines were +1350 vehicle trips daily with up to 128 vehicle trips occurring in the Mon-Fri AM and PM peak hour.

The 2006 Bradley traffic report concluded, amongst other findings that **the proposed rezoning to permit the proposed 150 lot residential subdivision would have no adverse impacts on the Level of Service, capacity or traffic safety of Research Road, Fountains Road, Hanlan Street South, Carrington Street, Deane Street, Narara Valley Drive or Manns Road.**

With respect to the land:

*Clause 49U of GPSO sets out the requirements for subdivision and regional transport infrastructure, where the application results in the urban intensification of the 2(a) zoned land.*

*The provision of Clause 49U(3) requires that the subdivision of the land must not be granted by Council for the additional allotments proposed unless 'satisfactory arrangements' have been made to contribute to the provision of regional transport infrastructure and services.*

*The (NEV) Co-operative advise that a Memorandum of Understanding (MOU) was executed between the then Minister for Primary Industry and the then Minister for Planning on 18<sup>th</sup> August 2008 setting out the requirement for the rezoning of the site (which will enable it to be subdivided into 121 residential allotments and 5 rural residential allotments) to be subject to the payment of a regional infrastructure contribution. The MOU establishes that an amount of \$567,000 will be paid by the Minister for Primary Industry to the Minister for Planning 7 days before the settlement of the sale of the Property.*

*As such, Certification was requested from the Director General under Clause 49U of the Gosford Planning Scheme Ordinance that satisfactory arrangements have been made to contribute to the provision of regional transport infrastructure and services in relation to the lots created under the propose plan of subdivision. It is also noted that the site is not subject to a Section 94 contribution plan.*

*In response such request, by letter dated 7/4/2014 Reference: 14/04346 the DG has issued a certificate for the satisfactory arrangement for State Public Infrastructure provision in accordance with Clause 49U of Gosford LEP 2014 with respect to DA 44994/2013 and any and all subsequent development applications for the site.*

The current indicative masterplan is shown in the accompanying envirotechure plan overleaf.

This illustrates that indicatively over the three stages of the development of the ecovillage, that a maximum of 167 dwellings comprising of 77 single dwelling lots + 8 additional dwelling lots + 3 shop top housing lots and 9 multi dwelling or attached housing lots could result from the changes proposed to the planning provisions. These dwelling mix has been used to model and assess the likely impacts of the proposal for the purposes of this report.

This compares to the DPI 2006 planning proposal for 150 standard lots, all of which would be eligible to build a secondary dwelling under the provisions of GLEP 2014. By the same logic, the current zoning would imply a theoretical maximum number of 300 dwellings on the site if every lot elected to build a secondary dwelling (or “granny flat”. This is highly unlikely for the reasons outlined below.

In reality not everyone will want a secondary dwelling on their lots; sites constraints will prevent a secondary dwelling on some sites’ and on other lots provisions in the AHSEPP will require council consent for a secondary dwelling.

However, NEV believes that the R2 zoning be retained and expanded to meet the strategic objectives of NEV or to deliver the outcome outlined in The Central Coast Regional Plan 2036. As noted previously, NEV is seeking to integrate a range of activities in the village (eg. Café, shop, offices in the existing administration building some horticulture and light industry), as well as a variety of housing types. This will provide onsite employment and reduce peak hour traffic movements (see point 8 below). The final total number of dwellings will be strongly influenced by what other activities are permitted and how much flexibility will be allowed in the housing mix. This will be subject to a detailed review at the DA stage.

Stage 1 of the NEV masterplan, already approved by Central Coast City Council approved 48 residential lots accommodating 65 residential dwellings.

Stage 2 of the NEV masterplan currently, before Council, proposes 43 residential lots and 51 residential dwellings.

The planning proposal still seeks to include the following:

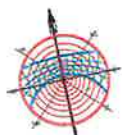
- The subject planning proposal is limited to amendments to the planning provisions in Gosford Local Environmental Plan 2014 (GLEP 2014) which apply only to the R2 Low Density Residential zoned land.
- The amendments to GLEP 2014 principally seek to expand the range of housing options (residential accommodation) available to the ecovillage. This includes to promote smaller housing lots (i.e. the minimum lot size is reduced from 550sqm to 450sqm) and a range of housing types which will provide greater housing choice and affordability to support varying household types and community needs.
- The amendments to GLEP 2014 also seek to confirm the maximum amount of floorspace that will be allocated to various non-residential land uses within the ecovillage. This is also about ensuring a range of employment opportunities and services are available within the ecovillage to support the village economy and the broader community.

| MFV Development Stage                          | RESIDENTIAL LOTS  |  |  |                                   |  |  |
|--|---|--|--|-----------------------------------|--|--|
| Type of Lot                                    | Total Number of residential lots  | Single dwelling lots (+550sqm)   | Additional Single dwelling lots (+450sqm)  | Shop top housing lots             | Multi dwelling or attached housing lots  | Estimated no. of lots w/ dual occupancies or secondary dwellings   |
| <i>notes</i>                                   | <i>(ie. includes re-subdivision and changes to layout permissible as if PP controls approved)</i> | <i>(this figure does not include dual occupancy / secondary dwellings)</i> | <i>(these lots may be created from larger lots in stage 2 with 450sqm provision)</i> | <i>residential dwelling above</i> | <i>(ie. on lots over 750sqm) (these lots may be subdivided on completion of development)</i> | <i>(the Dual OC lots may be subdivided on completion of development. Secondary Dwellings cannot be subdivided)</i> |
| Stage 1  | 45<br><i>(figure includes admin bldg, residential conversion)</i>                                 | 44   |  |                                   | 1<br><i>cluster housing, 18 no. 18.2 bedroom strata title on one lot</i>                     | 11<br><i>(75% of lots assumed to have secondary dwellings)</i>   |
| Stage 2  | 46  | 33   | 8  | 1                                 | 4<br><i>assumed 3 dwellings per lot</i>  | 22<br><i>(or 50% of lots assumed dual occ or secondary dwellings)</i>  |
| Stage 3  | 6   |  |  | 2                                 | 4<br><i>assumed 4 dwellings per lot</i>  |  |
| TOTAL LOTS                                     | 97  | 77   | 8  | 3                                 | 9  | 33   |
| % of TOTAL LOTS based on Indicative Masterplan | 100%  | 79%  | 8%   | 3%                                | 9%   | 34%  |
| Proposed distribution of lots as a %           |   | min. 75%   | max. 10%   | max. 5%                           | max. 10%   |  |

| Stage   | Business premises (m2) | Information & education facility (m2) | Neighbourhood shop (m2) |
|---|------------------------|---------------------------------------|-------------------------|
| Stage 1   |                        |                                       |                         |
| Stage 2   |                        |                                       | 138                     |
| Stage 3   |                        |                                       | 240                     |
| Admin   | 841                    |                                       |                         |
| Grafting shed   | 121                    |                                       | 113                     |
| Visitor centre  |                        | 341                                   |                         |
| Current (m2) based on Indicative Masterplan                     | 962                    | 341                                   | 490                     |
| Proposed maximum floorspace distribution within Ecovillage (m2) | 1,200                  | 550                                   | 650                     |

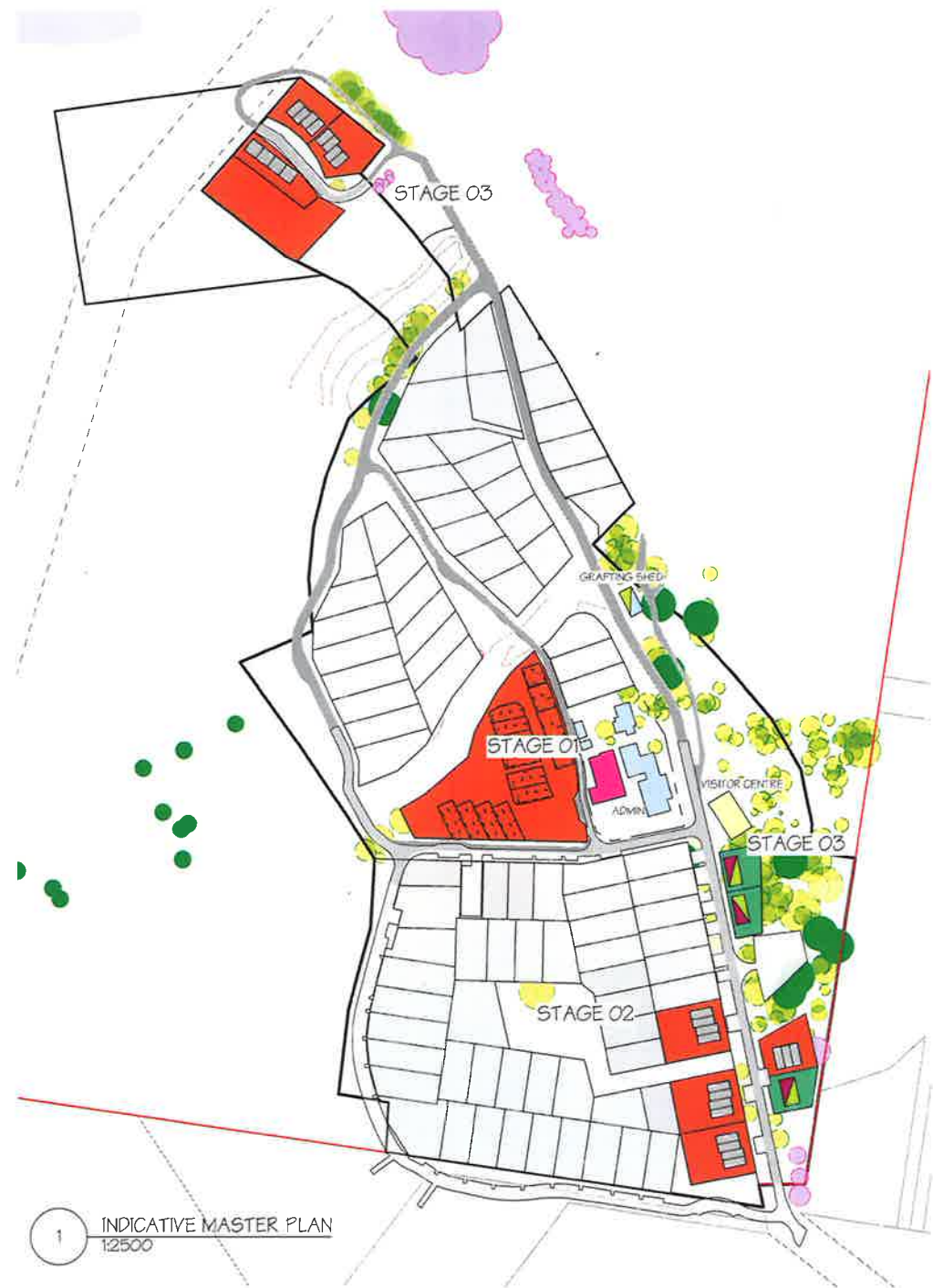
#### LEGEND:

- SINGLE DWELLING (MIN. LOT SIZE 450M2)
- SINGLE DWELLING / SECONDARY DWELLING / DUAL OCCUPANCY LOT (MIN. LOT SIZE 550M2)
- MULTI DWELLING HOUSING LOT
- SHOP TOP HOUSING LOT
- SHOP TOP HOUSING
- NEIGHBOURHOOD SHOP
- BUSINESS PREMISES
- INFORMATION & EDUCATION
- ADMIN BUILDING DWELLING CONVERSION
- DWELLING (MULTI/ATTACHED/SEMI)



DATE: 2020-07-24  
REV: 7

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ANDY MARLOW ARB #9597



1 INDICATIVE MASTER PLAN  
1:2500

**TABLE 1.1****BASE CASE vs PROPOSED WITH PLANNING PROPOSAL**

|  | <b>Lots</b> | <b>Dwellings</b> | <b>Business<br/>Premises<br/>m<sup>2</sup></b> | <b>Info and<br/>Education<br/>Facilities<br/>m<sup>2</sup></b> | <b>Neighbourhood<br/>Shops<br/>m<sup>2</sup></b> |
|--|-------------|------------------|--|--|--|
| <b>Base Case (2006)</b>                  | 94          | 147              | 150  | 350  | 400  |
| <b>With Planning<br/>Proposal (2020)</b> | 97          | 167              | 1200   | 550  | 650  |
| <b>Additional with PP</b>                | <b>+3</b>   | <b>+20</b>       | <b>+1050</b>                                   | <b>+200</b>  | <b>+250</b>                                      |

This study has been prepared in accordance with the aims and objectives of State Environmental Planning Policy Infrastructure (ISEPP) and in accordance with the guidelines and procedures for traffic generating developments as prepared by the RMS 2002.

This report also references the planning policies, LEP and DCP of Gosford and Central Coast Council.

This report considers the following matters:

- The site and adjoining road layouts;
- Vehicular access to Fountains Road, thence Manns Road;
- Public transport provisions;
- Traffic Generation; and
- Future traffic impacts.

This study is based on the indicative masterplan and the site layouts prepared by Envirotech dated July 2020.

## **2.0 SITE DETAILS**

### **2.1 Masterplan Overview**

The NEV masterplan overview envisages approximately 12 hectares R2 zoned land for residential development with another 12 hectares available for agriculture and common gardens. The remaining hectares will be native forest and bushland. A smaller housing zone is envisaged, so that the operators maximise food production, recreation and conservation. Plans also include utilising the existing structures, including two residential dwellings, a visitors' centre, offices and greenhouses, sheds, garages and workshops perfect for growing food and cottage industries.

### **2.2 Site Location**

The subject land is located 33 Gugandi Road, Narara at the northern end of Research Road north west of Manns Road.

The location of the land in the regional context is shown in **Figures 1 and 2**.

### **2.3 Site Description and Existing Development**

The proposed land is currently partially developed land including some roads, buildings (including a historic cottage) and other facilities used previously as a horticultural research station.

There are a number of existing non residential buildings and uses on site that will remain.

The land is undulating and with grassed slopes, trees and shrubs scattered throughout the site and a large dam.

### **2.4 Adjoining Development**

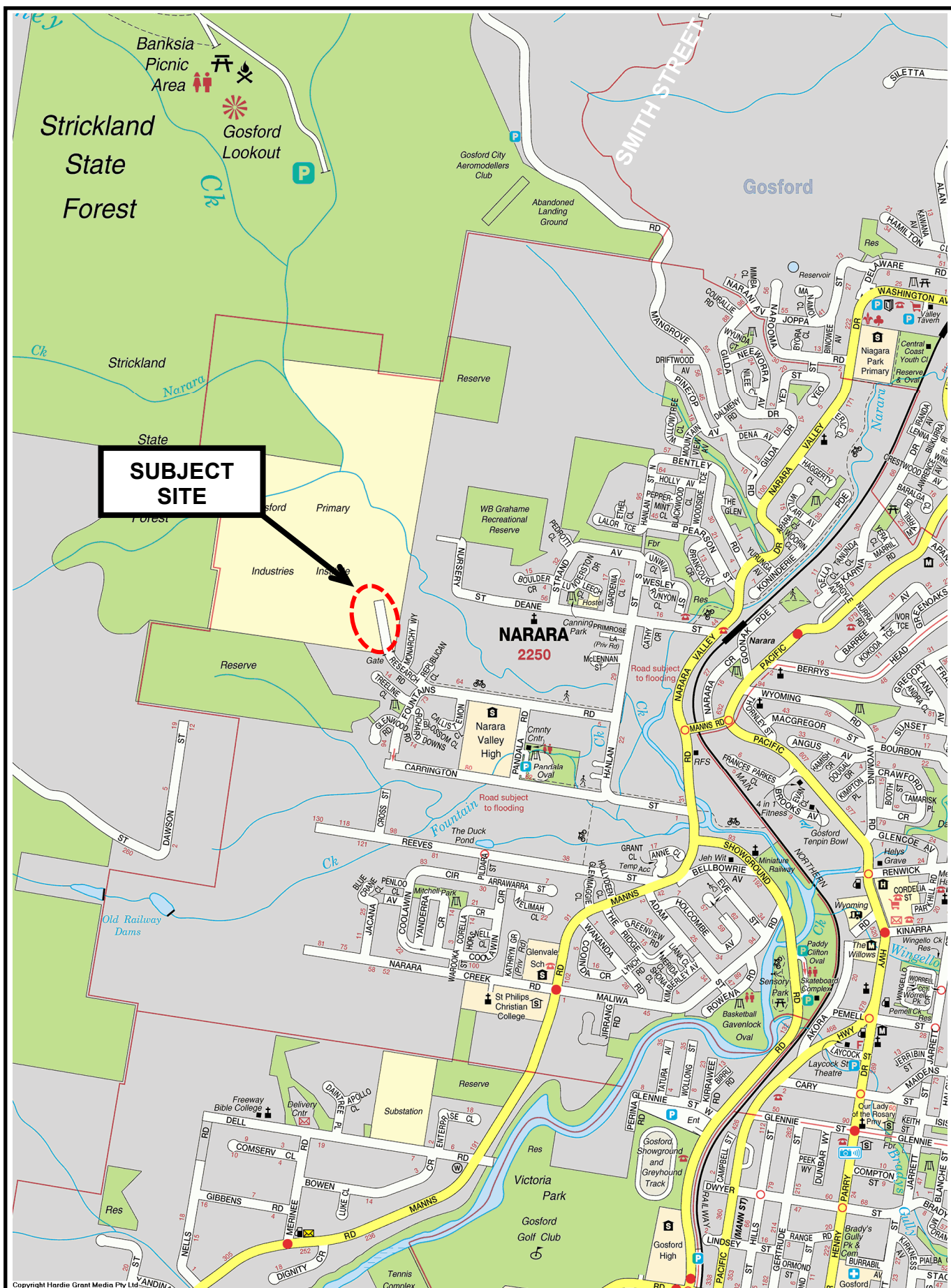
Development surrounding the site is essentially low density residential.

Narara Valley High School is located on Fountains Road approx. 800 metres from the site and is the only significant traffic generating development in the vicinity of the Narara Ecovillage site.

### **2.5 Site Access**

The site is accessed from Manns Road via Deanne or Carrington Street thence Fountains and Research Road to the site entrance. Deanne and Carrington Streets act as collector routes within the local road hierarchy whilst Fountains and Research act as local access streets. Refer **Figure 1**.





## TRANSPORT AND URBAN PLANNING

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N



NOT TO SCALE

## FIGURE 1

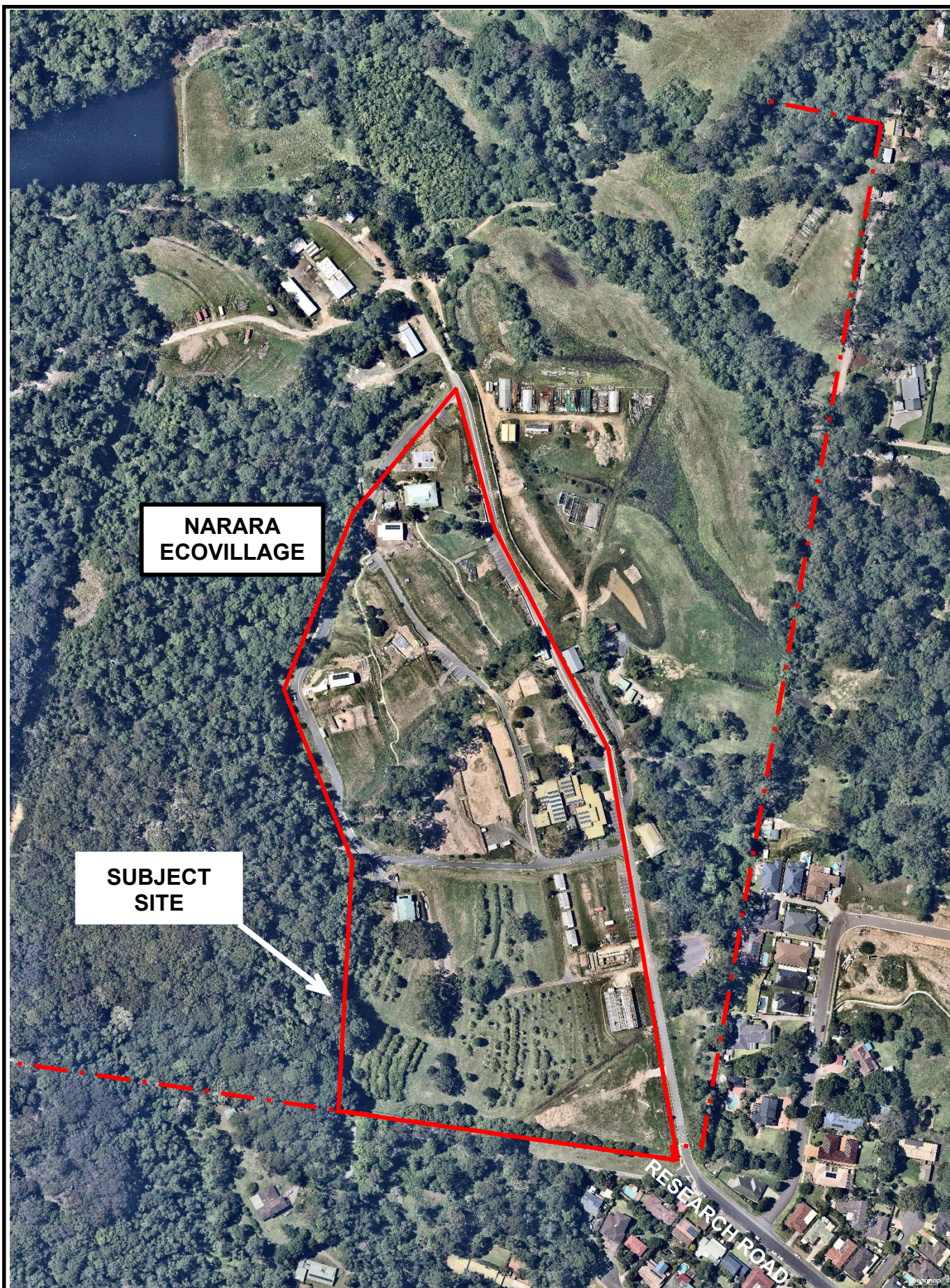
33 GUGANDI ROAD,  
NARARA

## SITE LOCATION

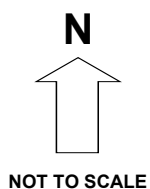
JOB NO. 19133

10.11.20





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**FIGURE 2**  
 33 GUGANDI ROAD,  
 NARARA  
**SITE**

JOB NO. 19133

10.11.2020



### **3.0 FUTURE ROAD, ACCESS AND PARKING**

#### **3.1 Overview**

The NEV green transport initiative envisages the following longer term transport targets.

Target 1 – Implement the following Green Transport initiatives

##### **Phase 1 – by end of 2019 (or 50% of occupancy\* of Stage 1)**

- a) Informal car pooling amongst members
- b) NEV shuttle bus/vehicle
- c) Expand the bulk food co-operative
- d) Bike pool and secure cycle facilities on site
- e) Electric Golf Buggies
- f) More secure bicycle spaces at Narara Station

\*Note – The issue of occupation certificate for the clusters is likely to trigger 50% occupancy, estimate early 2020

##### **Phase 2 – by end of 2020 (or ‘full’ (90%) occupancy of Stage 1)**

- g) Formal car – share scheme
- h) Improve the Dean Street pedestrian access
- i) NEV Taxi

Target 2 – Reduce total private car ownership by NEV members by 35% within 5 years.

Target 3 – NEV members to increase ownership of electric/hybrid cars, by 240% within 5 years.

Target 4 – Reduce the proportion of visitor trips to NEV that use private car (fossil fuel powered only) by 50% within 5 years.

## 4.0 THIS PROPOSAL

Narara Ecovillage is preparing a planning proposal seeking to change various provisions of Gosford LEP 2014 to provide 97 residential allotments 77 conventional plus 20 other lots, with a minimum area of 450m<sup>2</sup> dwellings and associated uses to support the Ecovillage.

The allotments will be used primarily for residential purposes with some neighbourhood shops (3) and open days and community events in the retained older research station buildings.

Current access to all residential lots will be from Research Road via a ring road, future on site car parking for residential and visitor cars will be proposed in accord with Council's DCP 2013 Part 7.

However, in the longer term and in keeping with the EcoVillage Green Transport Plan and with reduced levels of car ownership and individual car dependency, the actual number of longer term on site parking spaces may be reduced to suit actual future demands.

### 4.1 Number of Dwellings

At this time the 97 allotments proposed are envisaged to accommodate 167 residential dwellings as follows:

- 77 freestanding houses;
- 33 secondary dwelling or dual occupancy structures;
- 8 houses on larger lots subdivided to 450m<sup>2</sup>;
- 46 medium density villa/townhouse dwellings; and
- 3 x 2 bedroom shop top dwellings.

These figures represent a mix of existing approved and indicative lots / dwelling yield likely to result from the changes to the planning proposal.

**TOTAL – 167 Dwellings**

### 4.2 Road Layout

The indicative plan prepared by Envirotecture and accompanying this proposal, indicate the internal future circulating road layouts which include;

- 5.5 metre sealed to way roads with no kerb and guttering, 3.0 metre grassed verges with swale type drainage as required.
- 2.0 metre wide parallel parking bays are strategically located on the outer ring road and internal service road.
- 2.6 metre wide angled parking bays are also located strategically within the site.

The internal private road layout has been developed generally in accordance with AMCORD and Council Subdivision Guidelines where a hierarchical road network is essential to maximise road safety, residential amenity and legibility. Roads within the site will serve a distinct set of residential functions and have been designed accordingly. Most of these roads have already been constructed or are included in the Stage 2 DA. The design will convey to motorists the predominant low volume, low speed function of the existing and proposed streetscape.

Within the site the access roads, some which have already been constructed, reflect their role by their visual appearance and related physical design standards. Access roads will differ in alignment and design standard according to the volume they are intended to carry, the desirable traffic speeds and other factors.

Low speeds are desirable in lightly trafficked access roads to protect pedestrian/cyclists and allow them to share the accessway with vehicles

The aims of the proposed road system within the site are to achieve:

- Convenient and safe access to all allotments for pedestrians, vehicles and cyclists.
- Safe, logical and hierarchical linkages with existing street system.
- Appropriate access, emergency and service vehicles.
- A quality product that minimises maintenance costs.
- A convenient way for public utilities.
- An opportunity for street landscaping.
- Convenient parking for visitors.

As a guide AMCORD recommends the following standards for the various classes of roads in new low volume, low speed residential environments.

**TABLE 3.1**

**AMCORD RECOMMENDED GUIDELINES**

| <b>Road Classification</b> | <b>Recommended Pavement Width</b> | <b>Max. Flow veh/day</b> | <b>Max. Road Length</b> | <b>Max. Dwellings Served</b> |
|----------------------------|-----------------------------------|--------------------------|-------------------------|------------------------------|
| Access Place               | 3.5 – 3.7 metres                  | 300                      | 100 metres              | 30                           |
| Local Access Streets (A)   | 5.0 – 5.5 metres                  | 1000                     | 250 metres              | 100 *                        |
| Local Access Streets (B)   | 5.5 or 7.0 metres                 | 2000                     | N/A                     | 200                          |
| Collector Road             | 7.0 – 7.5 metres                  | 3000                     | N/A                     | N/A                          |

\* Indicates the 43 lot proposal

These roads should in terms of amenity and road safety afford the following environmental capacity/performance standards.

| Road Class | Road Type                        | Desirable Max. Speed (km/hr) | Desirable Max. Peak Hour Volume (veh/hr) |
|------------|----------------------------------|------------------------------|--|
| Local      | Accessway (with footpath) Street | 25                           | 100                                      |
|            | Street                           | 40                           | 200 environmental goal                   |
|            | Street                           | 50                           | 300 environmental goal                   |
| Collector  | Street                           | 50                           | 300 environmental goal                   |
|            | Street                           | 50                           | 500 maximum                              |

The development proposes a circulating access street design and carriageway width in accordance with AMCORD Guidelines, i.e. AADT <500 veh/day and carriageway width nominally 5.5m.

The proposed intersections are generally located in such a way that:

- The streets intersect at right angles;
- The landform allows clear sight distance on each of the approach legs of the intersection;
- The minor street intersects the convex side of the major street;
- The vertical grade lines at the intersection do not impose undue driving difficulties;
- The vertical grade lines at the intersection will allow for any surface drainage;
- Adequate stopping and sight distances will be provided for horizontal and vertical curves at all intersections.

### 4.3 Access

All site access to Research Road will be via the existing access provisions shown in the photos below.



Existing Entrance



East View Along Research Road

#### 4.4 On Site Car Parking

##### Overview

The NEV car parking strategy aims to realise;

Longer term -

- Reduced car dependency, including provision for car parking on designated Community Lots;
- Limitation of parking on Community Lots;

- Temporary parking for pick up and drop off to shared driveways on community property;
- Car storage under dwellings within the building footprint, on Community Lots enabled by the terrain;
- Car access from corner lots; and
- Storage of motor vehicles.

NEV seeks to implement the aims and objectives of the CMS need for a “Green Travel Plan”. This local Green Transport Policy (GTP) is the crucial strategic framework for this vision.

It is considered a reduction in future private car ownership and car use is most likely to occur when viable alternatives become available. These are listed as provisions, i.e.

- Encourage the use of public transport;
- Promote non motorised modes such as walking and cycling;
- Make provision for a community bus service, and car sharing schemes;
- Encourage the use of electric vehicles; and
- Provide pedestrian priority.

As well as target to reduce private car ownership, a target to transition to hybrid/electric car ownership is recommended as a transitional arrangement.

**Gosford City Councils DCP 2013, Part 7 indicates for single dwelling and dual occupancy housing;**

- Less than 125m<sup>2</sup> – 1 car parking space is required;
- Greater than 125m<sup>2</sup> – 2 car parking spaces is required;
- Visitor parking - 1 space per 5 dwellings is required.

For assessment purposes, we have projected the 97 lots are likely to realise up to 167 dwellings with dual occupancy houses or multi dwellings on the larger lots.

To comply with Council’s DCP requirements, 203 spaces, including visitor spaces are required if all dwellings are less than 125m<sup>2</sup> or 287 spaces are required if 50% dwellings are larger than 125m<sup>2</sup>.

To reduce future commuter and shopper car dependency/usage the NEV envisages several community buses (22 seater or similar) making regular return journeys to Narara and Gosford rail stations and shopping centre, health care and banking facilities.



## **4.5 Internal Road Safety**

Due to the high probability of pedestrians, including children walking and riding on the internal road network, a 10km/h pedestrian share zone speed limit is proposed on all internal roads, supplemented with traffic calming devices at strategic locations to manage vehicle speeds as required.

## 5.0 TRAFFIC CONDITIONS

### 5.1 Transport Network

The site is located in Research Road, to the west of Fountains Road, Narara. Fountains Road is a residential street, also providing access to Narara Valley High School. The high school generates substantial traffic flows in the before and after school periods. It links via Hanlan Street South to Deane Street and hence Narara Valley Road, and to Carrington Street, which intersects with Manns Road, which becomes Narara Valley Road to the north. Manns Road – Narara Valley Road is a sub-arterial road that travels in a north-south direction, to the west of the old Pacific Highway route.

Narara rail station is located to the east of the site, about 1.5km away.

Recent advice from the RMS traffic management centre and Council indicates that there are no current proposals to upgrade Manns Road or access intersections into the precinct at Carrington Street of Deanne Street.

### 5.2 Existing Road System

**Research Road** is a short local road that connects the Narara Ecovillage and Fountains Road, and provides access to two other residential streets, and is aligned generally east-west with kerb and guttering along both sides and has slightly undulating gradients along its length. There is kerb and guttering along both sides of Research Road. The carriageway width is approximately 11 metres. There is a concrete footpath along the southern side and there is no street lighting and the existing speed zone of Research Road is 50km/h.

**Fountains Road** is a local road that connects Carrington Street and Hanlan Street South.

Fountains Road has a straight alignment generally east west between Hanlan Street south and Research Road, and changes to a slightly curved alignment between Research Road and Carrington Street.

Fountains Road has relatively level gradients for the first few hundred metres west of Hanlan Street South along the floodway, with increasing uphill gradients west of that point to Research Road. The gradient on Fountains Road also falls generally towards Carrington Street from Research Road.

Fountains Road has kerb and guttering along its northern side only from Hanlan Street South and along the southern side as well, west from Pandala Road. There is also kerb and guttering along the both sides of Fountains Road south of Research Road, except for the western side of the one way section near Carrington Street.

The carriageway width on Fountains Road is approximately 7.6 metres between Hanlan Street South and Pandala Road, and approximately 12.7 metres along the frontage of the Narara Valley High School.

There is no linemarking along Fountains Road except for a short section of double barrier lines past the raised pedestrian crossing just west of Pandala Road, near the Narara Valley High School.

There is a concrete footpath/cycle path along the northern side of Fountains Road, between Hanlan Street South and Narara Valley High School. There are concrete footpaths along both sides of Fountains Road between Pandala Road and Research Road.

There is a school bus zone on the southern side of Fountains Road west of Pandala Road along much of the frontage of the Narara Valley High School.

There is street lighting along Fountains Road. The existing speed zoning on Fountains Road is 50km/h. there is also a 40km/h "school zone" within proximity to the Narara Valley High School.

**Hanlan Street South** is a local road that connects Carrington Street and Strand Avenue. Hanlan Street South is aligned generally north-south. Hanlan Street South does not connect with Hanlan Street North.

Hanlan Street South has a sealed width of approximately 11.0 metres between kerb faces between Deane Street and McLennan Street and reduced to approximately 6.0 metres just south of Fountains Road. There is kerb and guttering along both sides of Hanlan Street South between McLennan Street and Strand Avenue. There is also kerb and guttering along both sides of Hanlan Street South along the section designated as floodway. There is no kerb and guttering along Hanlan Street South, south of Fountains Road except for short sections on each side near Carrington Street. There is no linemarking along Hanlan Street South except for broken centrelines and edgelines along the section designated as floodway, from just south of McLennan Street to just south of Fountains Road.

The speed zone on Hanlan Street South is 50km/h.

**Carrington Street** is a local street aligned generally east-west that provides local access to residential properties west of Manns Road. Carrington Street connects Manns Road and terminates just west of Fountains Road.

Carrington Street has a generally flat gradient between Manns Road and the western boundary of the Narara Valley High School, with an uphill gradient further west of the school towards Fountains Road. The carriageway width on Carrington Street is somewhat variable, being approximately 5.6 metres wide just east of Fountains Road, and narrowing to approximately 2.6 metres over a short section just east of Fountains Road. The carriageway width is generally approximately 6.2 metres to 6.8 metres wide between the narrow section and Manns Road. There is no kerb and guttering along either side of Carrington Street for most of its length. There is a short section of kerb and guttering on the northern side just east of the Fountains Road junction, and also kerb and guttering along the northern side along the side of residential units just west of Hanlan Street South. There is also kerb and guttering along the northern side of Carrington Street between Hanlan Street South and Manns Road.

The existing speed zone on Carrington Street is 50km/h. There is also a 40km/h "school zone" within proximity of the Narara Valley High School.

There are grassed verges and open table drains along both sides of Carrington Street for most of its length. There is a concrete footpath/cycle path along the northern side of Carrington Street between Pandala Road and Manns road. This provides a suitable connection between the Narara Valley High School and Manns Road.

**Deane Street** is a local street aligned generally east-west that connects Narara Valley Drive and Nursery Street.

Deane Street has a straight alignment and a generally flat gradient between Narara Valley Drive and Hanlan Street South. The gradients increase slightly west of Hanlan Street South. The carriageway width on Deane Street is approximately 10.2 metres just west of Narara Valley Drive, and increases to approximately 11.3 metres just west of Cathy Crescent.

There is kerb and guttering along both sides of Deane Street west of the existing drainage culvert, a short distance west of Narara Valley Drive. There is kerb and guttering along the northern side of Deane Street between the drainage culvert and Narara Valley Drive. There is a paved footpath along the northern side of Deane Street between Narara Valley Drive and Hanlan Street South.

The speed zone on Deane Street is 50 km/h.

**Pandala Road** is a short local street aligned generally north-south. Pandala Road connects Carrington Street and Fountains Road.

Narara Valley High School grounds border the entire western side of Pandala Road. There is limited residential development on the eastern side of Pandala Road just north of the Narara Community Centre. There is a concrete pedestrian/cycle path along the eastern side of Pandala Road between Carrington Street and the Narara Community Centre. There is kerb and guttering along the eastern side of Pandala Road between Carrington Street and the Narara Community Centre.

There is street lighting along Pandala Road. The speed zone on Pandala Road is 50 km/h, except when the 40km/h school zone is operational.

The carriageway width varies from approximately 9.2 metres near Carrington Street, to approximately 4.7 metres on the crest just south of Fountains Road, to approximately 9.9 metres wide between kerb faces near Fountains Road.

**Manns Road** is a State Road that serves an arterial road function. Manns Road connects the Pacific Highway at West Gosford and the Pacific Highway at Narara.

Manns Road serves as an outer bypass of the Gosford CBD and generally has a single lane in each direction apart from local widening at intersections in the Narara area. The speed zone is 60km/h. There is street lighting, and a pedestrian refuge facility on Manns Road just north of Carrington Street and there are bus stops on both sides of Manns Road north of Carrington Street. Deane Street intersects Manns Road at Narara Railway Station.



Manns Road and Carrington Street Junction





Manns Road and Deanne Street Junction

**Narara Valley Drive** connects Manns Road at Narara and Washington Avenue at Niagara Park. Washington Avenue connects with Railway Crescent that provides a connection with the Pacific Highway at Lisarow. There is street lighting along Narara Valley Drive

Narara Valley Drive is aligned generally north-south and has a generally winding alignment. Gradients vary considerably along its length and has a carriageway width of approximately 14.5 metres, just north of Deane Street.

Narara Valley Drive serves a sub arterial function and provides local access connections for residential areas and businesses on the western side of the main northern railway line. The speed zone on Narara Valley Drive is 60km/h.

## 5.3 Existing Traffic Volumes

### 5.3.1 Daily

Recent 24 hour/7day traffic volumes and clarification surveys undertaken for this assessment by Austraffic and included as **Appendix 1** indicates average Monday – Friday hourly traffic flows on Research Road west of Fountain Road as follows:

**TABLE 5.1****MONDAY TO FRIDAY AVERAGE DAILY TRAFFIC FLOWS RESEARCH ROAD – SEPTEMBER 2019**

| <b>Starting Time</b> | <b>Average Weekday</b> | <b>Average Weekday</b> | <b>Two way</b> |
|----------------------|------------------------|------------------------|----------------|
| 0:00                 | 0                      | 0                      | 0              |
| 1:00                 | 0                      | 0                      | 0              |
| 2:00                 | 0                      | 0                      | 0              |
| 3:00                 | 1                      | 2                      | 3              |
| 4:00                 | 0                      | 2                      | 2              |
| 5:00                 | 4                      | 3                      | 7              |
| 6:00                 | 19                     | 13                     | 32             |
| 7:00                 | 14                     | 20                     | 34             |
| 8:00                 | 14                     | 23                     | 37*            |
| 9:00                 | 15                     | 16                     | 31             |
| 10:00                | 19                     | 18                     | 37             |
| 11:00                | 13                     | 14                     | 27             |
| 12:00                | 21                     | 15                     | 36             |
| 13:00                | 13                     | 15                     | 28             |
| 14:00                | 16                     | 20                     | 36             |
| 15:00                | 20                     | 21                     | 41*            |
| 16:00                | 22                     | 15                     | 37             |
| 17:00                | 22                     | 14                     | 36             |
| 18:00                | 15                     | 13                     | 28             |
| 19:00                | 8                      | 8                      | 16             |
| 20:00                | 7                      | 4                      | 11             |
| 21:00                | 6                      | 3                      | 9              |
| 22:00                | 2                      | 2                      | 4              |
| 23:00                | 1                      | 1                      | 2              |
| <b>Total</b>         | <b>252</b>             | <b>241</b>             | <b>493</b>     |
| <b>% Heavies</b>     | <b>18.0%</b>           | <b>11.4%</b>           | <b>8.3%</b>    |

\*Indicates peak hour

**5.3.2 Peak Hour**

Monday to Friday peak hourly flows on Research Road occurred, on average, 8-9am and 3-4pm with around 37 vehicle per hour AM and 41 vehicles per hour PM.

Importantly, these peak hourly volumes indicate mid block LoS A conditions and flows well below the environmental goals of a local access street. Refer Table 3.1

**5.3.3 Heavy Vehicles**

Heavy vehicles comprised 18% of northbound and 11.4% of southbound Monday to Friday daily volumes.

**5.3.4 85<sup>th</sup> Speeds**

The September 2019 traffic survey data shows the Monday to Friday northbound 85<sup>th</sup> speed to be around 50km/h and southbound 85<sup>th</sup> speed around 48km/h.

**5.4 Peak Hour Volumes**

Recent peak hour traffic counts on Manns Road and Carrington Street and Deanne Street indicate AM and PM peak volumes as follows:



**TABLE 5.2****PEAK HOUR VOLUMES – OCTOBER 2019**

| Time  | Manns Road        |                   | Carrington Street |                   | Deanne Street     |                   |
|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
|       | n/bound<br>veh/hr | s/bound<br>veh/hr | e/bound<br>veh/hr | w/bound<br>veh/hr | e/bound<br>veh/hr | w/bound<br>veh/hr |
| 7-8am | 618               | 1052              | 110               | 107               | 121               | 116               |
| 8-9am | 726               | 1043              | 248               | 123               | 223               | 109               |
|       |                   |                   |                   |                   |                   |                   |
| 3-4pm | 1269              | 763               | 88                | 121               | 95                | 118               |
| 4-5pm | 973               | 717               | 70                | 120               | 86                | 107               |

Manns Road carries two way peak hour volumes indicative of a major arterial route whilst Carrington Street and Deanne Street carry 2 way peak volumes indicative of subdivision collector routes which reflect their existing function in the local Narara Road hierarchy.

## 5.5 Existing Mid Block Service Levels

**TABLE 5.3****EXISTING MID-BLOCK SERVICE LEVELS**

| Location                                   | AM Peak      |              |                 | LOS | PM Peak      |              |                 | LOS |
|--|--------------|--------------|-----------------|-----|--------------|--------------|-----------------|-----|
|  | EB<br>veh/hr | WB<br>veh/hr | 2 Way<br>veh/hr |     | EB<br>veh/hr | WB<br>veh/hr | 2 Way<br>veh/hr |     |
| Research Road<br>west of Fountains<br>Road | 23           | 14           | 37              | A   | 21           | 20           | 41              | A   |
| Carrington Street<br>west of Manns<br>Road | 248          | 123          | 371             | B   | 88           | 121          | 209             | A   |
| Deanne Street<br>west of Manns<br>Road     | 223          | 109          | 331             | B   | 95           | 118          | 213             | A   |

Source:

Mid-Block service levels (LOS) per lane are derived from the RMS Guide to Traffic Generating Developments 2002 Table 4.4.

Research Road north of Fountains Road currently carries very low peak hourly traffic volumes with significant spare roadway capacity.

## 5.6 Road Safety

A review of the RMS PC crash database to mid 2019 did not reveal any recorded accidents on Research Road with vehicles to/from the subject site.

## 6.0 TRAFFIC IMPLICATIONS

### 6.1 Future Traffic Generation

Roads and Maritime Services (RMS) 2002 (Vers 2) Guidelines suggest that vehicle generation rates be calculated for both daily and peak hourly vehicle trips.

The RMS Guidelines suggests land use traffic generation rate for medium density and single dwelling houses at:

#### **Rates**

- *Weekday peak hour vehicle trips = 0.5 trips per 1 and 2 bedrooms and 0.65 trips per 3 bedroom medium density dwellings; and 0.9 trips per single dwelling;*
- *Daily vehicle trips = 5 to 6.5 trips per medium density dwelling; and*
- *Daily 9 vehicle trips per single dwelling.*

#### **Factors**

The above RMS rates are based on surveys conducted in areas where new residential subdivisions are being built. Public transport accessibility in such areas is often limited.

Importantly not all trips are external trips outside the area. As a guide, about 25% of trips are *internal* to the local precinct, involving local shopping, schools, pre-schools and local social visits. Therefore, when reviewing the impact of the traffic generated on sub-regional and regional roads, some adjustment is necessary, depending on the location of shops, pre-schools and recreational facilities.

Transport and Urban Planning has recently undertaken investigative studies of similar new outlying residential subdivisions to establish daily and peak hourly traffic generation levels. Whilst we do not expect our findings at other urban locations in the south western Sydney region to be identical in this case, we believe there are some relevant consistencies.

We have found, for example, that for newer subdivisions in middle income areas, mostly comprising young couples and young families and where public transport facilities are moderate to poor (i.e. private operated bus service only), then daily trip generation per dwelling is between 7 and 8 movements. The PM peak period is normally 0.5 to 0.65 movements per dwelling and the AM peak period represents only 7% of the daily total.

However, based on the RMS Guidelines and allowing for 94 lots from 450m<sup>2</sup> in area to larger lots (3) to house dual occupancy dwellings and 55 smaller lots to house only 1 dwelling i.e. total 167 dwellings, we would project an indicative traffic generation volumes as follows:

- 110 freestanding houses
- 8 secondary dwellings 80/20 (2/3 bed)
- 46 multi dwellings 80/20 (2/3 bed)
- +3 shop top dwellings (2 bed)

#### **TOTAL – 167 Dwellings**

## Calculation

- **Weekday peak hour vehicle trips =**  
 $110 \times 0.9 + 8 \times 0.65 + 46 \times 0.55 + 3 \times 0.5 = 136 \text{ peak hour trips};$
- **Daily vehicle trips = 1356 daily trips.**

The 2006 Bradley traffic report for the Masterplan 150 lots projected 128 (Mon – Fri) peak hour trips based on RMS 2002 Guidelines.

With all external access via Carrington Street or Deanne Street to Manns Road and based on the RMS 2002 Guidelines for post development traffic assessments, we have projected up to 136 additional peak hour trips to/from Manns Road (and +962 trips daily). This represents an increase of up to 60% veh/hr over existing during the Mon-Fri AM and PM peak hours.

The cumulative peak hour traffic generation (existing and future) on Research Road is  $41 + 136$  i.e. 177 two way peak hour trips. Refer Table 3.1 page 7 for local access streets.

This proposal represents a projected increase of +8 vehicle trips per hour over the 128 projected and previously approved in the 2006 Bradley traffic report.

## 6.2 Trip Distribution

The RMS Guidelines also suggest that a distribution of the peak hour (136 trips) arrival (27 trips) and departure (+109 trips AM) journeys be undertaken to evaluate the traffic impacts on the adjoining road system. Normally peak hour residential trips are assigned at 80% outbound and 20% inbound during the AM peak with the reciprocal assignments during the PM peak.

However, based on existing traffic assignment (i.e. from traffic counts), the majority of peak hour traffic entering and exiting the precinct is to/from a northerly direction, i.e. 60% AM and PM.

The peak hour distribution of turning traffic to and from Manns Road intersections with Carrington Street and Deanne Street will be ultimately influenced by future traffic conditions, levels of service and vehicle origins/destinations regionally.

For the purpose of distributing the projected traffic generation to the existing road network and ultimately determining the extent of any future traffic impacts on these access intersections, we have displaced the estimated traffic generation in the same proportion as traffic currently utilising Manns Road as follows.

**TABLE 6.1**  
**CARRINGTON STREET ADDITIONAL PEAK HOUR TRIPS**  
**AT MANNS ROAD (54 TRIPS)**

| Direction     | AM Peak           |                    | PM Peak           |                    |
|---------------|-------------------|--------------------|-------------------|--------------------|
|               | Arrivals (veh/hr) | Departure (veh/hr) | Arrivals (veh/hr) | Departure (veh/hr) |
| Left in       | 6                 | -                  | 21                | -                  |
| Right in      | 5                 | -                  | 22                | -                  |
| Left out      | -                 | 21                 | -                 | 6                  |
| Right out     | -                 | 22                 | -                 | 5                  |
| <b>Totals</b> | <b>11</b>         | <b>43</b>          | <b>43</b>         | <b>11</b>          |

**TABLE 6.2**

**DEANNE STREET ADDITIONAL PEAK HOUR TRIPS  
AT MANNS ROAD (82 TRIPS)**

| Direction     | AM Peak              |                       | PM Peak              |                       |
|---------------|----------------------|-----------------------|----------------------|-----------------------|
|               | Arrivals<br>(veh/hr) | Departure<br>(veh/hr) | Arrivals<br>(veh/hr) | Departure<br>(veh/hr) |
| Left in       | 8                    | -                     | 33                   | -                     |
| Right in      | 8                    | -                     | 33                   | -                     |
| Left out      | -                    | 33                    | -                    | 8                     |
| Right out     | -                    | 33                    | -                    | 8                     |
| <b>Totals</b> | <b>16</b>            | <b>66</b>             | <b>66</b>            | <b>16</b>             |

Based on an existing (left/right) departures and (left/right) arrivals assignment during the AM/PM peak hours.

The two neighbourhood shops have not been included as they are not likely to generate any external peak hour trips outside the site.

**Importantly, these 136 AM and PM peak hour trips are +8 trips more than the 128 trips forecast in the January 2006 rezoning assessments undertaken for the DPI.**

### **6.3 EcoVillage at Full Operation Traffic Conditions**

To evaluate the likely traffic impacts upon the existing road system and at adjoining Manns Road access intersections, the traffic model (SIDRA) summarised below have been re-run to include the additional AM/PM arrival and departure trips. These post development Intanal model outputs are summarised as follows:

**TABLE 6.3****MANNS ROAD AND CARRINGTON STREET – GIVE WAY SIGNS**

| Intersection                   | Peak Hour | Degree of Saturation<br>(1) | Average Delay (2)<br>(sec/vehicle) | Level of Service<br>(3) (4) | Control Type | Worst Movement                    |
|--------------------------------|-----------|-----------------------------|------------------------------------|-----------------------------|--------------|-----------------------------------|
| Existing Performance           |           |                             |                                    |                             |              |                                   |
| Manns Rd/<br>Carrington Street | AM        | 0.568                       | 2.7 (40.4)                         | N/A<br>(Worst:C)            | Priority     | Right Turn from Carrington Street |
|                                | PM        | 0.639                       | 1.9 (55.8)                         | N/A<br>(Worst:D)            |              | Right Turn from Carrington Street |
| Future Performance             |           |                             |                                    |                             |              |                                   |
| Manns Rd/<br>Carrington Street | AM        | 0.680                       | 3.3 (46.6)                         | N/A<br>(Worst:D)            | Priority     | Right turn from Carrington Street |
|                                | PM        | 0.639                       | 2.2 (61.0)                         | N/A<br>(Worst:E)            |              | Right turn from Carrington Street |

**NOTES:**

- (1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
- (2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
- (3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
- (4) N/A – intersection LoS and Major Road approach LoS values are not applicable for two way sign control since the average delay is not a good LoS measure due to zero delays associated with major road movements.

The level of service at the adjoining intersections can be assessed by means of average delay per vehicle or highest movement delay in the use of uncontrolled sites.

Based on average delay per vehicle, the following levels of service (LOS) apply:

- For Give Way and Stop Signs, the average delay per vehicle in seconds is selected from the movement with the highest average delay per vehicle, equivalent to following LOS:

|          |   |     |  |
|----------|---|-----|--|
| 0 to 14  | = | "A" | Good   |
| 15 to 28 | = | "B" | Acceptable delays and spare capacity           |
| 29 to 42 | = | "C" | Satisfactory but accident study required       |
| 43 to 56 | = | "D" | Near capacity and accident study required      |
| 57 to 70 | = | "E" | At capacity and requires other Control Mode    |
| >70      | = | "F" | Unsatisfactory and requires other Control Mode |

It should be noted that for Roundabouts, Give Way and Stop Signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

**TABLE 6.4****MANNS ROAD AND DEANNE STREET – GIVE WAY SIGNS**

| Intersection               | Peak Hour | Degree of Saturation<br>(1) | Average Delay <sup>(2)</sup><br>(sec/vehicle) | Level of Service<br>(3) (4) | Control Type | Worst Movement                |
|----------------------------|-----------|-----------------------------|---|-----------------------------|--------------|-------------------------------|
| Existing Performance       |           |                             |   |                             |              |                               |
| Manns Rd/<br>Deanne Street | AM        | 0.521                       | 2.3 (39.7)                                    | N/A<br>(Worst:C)            | Priority     | Right Turn from Deanne Street |
|                            | PM        | 0.611                       | 2.1 (52.3)                                    | N/A<br>(Worst:D)            |              | Right Turn from Deanne Street |
| Future Performance         |           |                             |   |                             |              |                               |
| Manns Rd/<br>DeanneStreet  | AM        | 0.617                       | 2.9 (41.1)                                    | N/A<br>(Worst:C)            | Priority     | Right turn from Deanne Street |
|                            | PM        | 0.598                       | 2.4 (54.7)                                    | N/A<br>(Worst:D)            |              | Right turn from Deanne Street |

**NOTES:**

- (1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
- (2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
- (3) Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
- (4) N/A – intersection LoS and Major Road approach LoS values are not applicable for two way sign control since the average delay is not a good LoS measure due to zero delays associated with major road movements.

In summary, the distribution of these additional 136 AM and PM peak hour trips to the adjoining road system and intersections is unlikely to result in any significant operational traffic impacts at these access locations, as peak hourly additional volumes are less than 1 trip per minute at each location.

Secondly, some of these future volumes are already existing as part of the Stage 1 approval.

Traffic service levels should remain relatively unchanged, average vehicle delay times may increase marginally whilst highest movement delay times on some side street exit right turn movements may increase (on average) by up to 5 seconds per vehicle.

Whilst some upgrade to the intersection controls at Manns Road may be warranted in the longer term, this warrant is primarily a result of existing traffic volumes and conditions and not a result of the (NEV) proposal in isolation.

Monies for road and infrastructure upgrades in the area (\$567,000) have been paid to the Department of Planning by the Department of Primary Industries for the lands in 2008 concurrent with the change of use and rezoning to residential.

## **6.4 Internal Road Network**

The proposed internal private road network aims to serve the majority of allotments via a loop accessway which connects back onto a primary access road, running from Research Road.

It is understood that all operational road reservations and design parameters, have been constructed in accordance with Amcord and best practice Planning and Design Guidelines for subdivisions, which aims to ensure:

- Traffic volumes and speeds on roads within the subdivision will be compatible with the functions of that road.
- The maximum length of access streets will ensure their status as a low speed/volume access place is retained.
- Access streets that form part of a pedestrian or cycle network, access links will provide suitable connectivity with adjoining access streets or open space systems so as to ensure such pedestrian and cycle networks are functionally efficient.

## 6.5 Parking

The NEV car parking strategy aims to realise;

In the longer term -

- Reduced car dependency, including provision for car parking on designated Community Lots;
- Limitation of parking on Community Lots;
- Temporary parking for pick up and drop off to shared driveways on community property;
- Car storage under dwellings within the building footprint, on Community Lots enabled by the terrain;
- Car access from corner lots; and
- Storage of motor vehicles.

NEV seeks to implement the aims and objectives of the CMS need for a “Green Travel Plan”. This local Green Transport Policy (GTP) is the crucial strategic framework for this vision.

It is considered a reduction in future private car ownership and car use is most likely to occur when viable alternatives become available. These are listed as provisions, i.e.

- Encourage the use of public transport;
- Promote non motorised modes such as walking and cycling;
- Make provision for a community bus service, and car sharing schemes;
- Encourage the use of electric vehicles; and
- Provide pedestrian priority.

As well as a target to reduce private car ownership, a target to transition towards hybrid/electric car ownership is proposed as an interim arrangement as part of the green travel plan.



## 7.0 CONCLUSIONS

This report examines the traffic accessibility and traffic generation impacts of a planning proposal to permit 97 residential lots from 450m<sup>2</sup> in area and future residential housing development up to 167 dwellings to be located at 33 Gugandi Road Narara.

The Planning Proposal seeks to change various provisions of the Gosford LEP 2014 relative to Narara Ecovillage to reflect a revised Master Plan for the Site that provides for a greater range in lot sizes and eco housing options. The Planning Proposal also seeks to allow for the inclusion of some non-residential uses within the site.

The proposed development is located west of Manns Road and enjoys existing good road and footway access to the adjoining road system and to public transport facilities.

The proposal in terms of potential traffic generation based on RMS 2002 Guidelines is a low traffic generating development, with 136 Monday-Friday AM/PM peak hour trips generated within the precinct. An assessment of the future full development proposal indicates that there is likely to be a small increase of +8 trips per hour in traffic generation above what is permitted under the existing planning and zoning (i.e. 128 Monday-Friday AM/PM peak trips during the peak hours) to/from the precinct via Research and Fountains Road and joining the existing arterial road system at Manns Road as indicated in the 2006 Bradley traffic report, also based on RMS 2002 Guidelines.

The projected 136 peak hour trips on Research Road will not exceed the environmental guidelines of a desirable 200 vehicles per hour for local streets and is only +8 more AM and PM peak hour trips projected in the 2006 Bradley traffic report (128).

Existing traffic counts indicate that up to 60% of existing traffic in Carrington Street and Deanne Street arrives/departs Manns Road to the north. However, this may also be influenced by the higher percentage of school traffic to and from the precinct and trips to the railway station.

The assessment (and traffic modelling) of the additional trips associated with the proposal indicates that traffic conditions on the access road network adjacent the site will remain satisfactory with acceptable impacts in average vehicle delays at the adjoining internal intersections from the projected increase in traffic.

Furthermore, advice from the proponents indicate that a sum of \$567,000 was paid by Department of Primary Industry (DPI) for road and infrastructure improvements to the Department of Planning in 2008. At the time of the 2006-7 rezoning of the lands from DPI Horticultural uses to residential uses.

The existing traffic conditions on the road network adjacent the site are good with a level of service A operation on Research Road and will remain at these favourable service levels post development and no additional traffic management facilities are required as a result of this proposal.

A single access ring road to/from and within the development via a new 5.5 metre wide carriageway extensions from Research Road would be acceptable and is in keeping with AMCORD guidelines for lower volume and lower speed residential streets with a 10km/h pedestrian share zone status.

The sight distances at existing intersection locations are good and meet AUSTROAD requirements for the 50km/h operating speed limits on the adjoining public roads.

Vehicles entering and leaving the precinct via Research Road and Fountains Road will cause minimal potential conflicts with existing low speed traffic using these local roads. This should result in no significant impact in terms of traffic capacity or road safety on either street.

Pedestrian and bicycle facilities will be enhanced with provision along Research Road. An opportunity exists to extend private bus services into the subdivision.

The proposal will provide on site parking in accordance with Council's Car Parking provision within the staged subdivisions for additional resident and visitor vehicles.

The future residential development in terms of parking provision meets the RMS, Council and AMCORD guidelines and on site car parking layouts are designed in accordance with AS 2890.1

In concluding the planning proposal (which would precede any future subdivisions of lands and development) is likely to comprise moderate residential traffic generating developments and will result in low additional traffic impacts on the existing public road network. The proposal should have adequate parking in accordance with Council's requirements.

It is **recommended** that Central Coast Council approve this planning proposal so that future modern developments can proceed within the newer Narara Eco-Village residential precinct with access only via Research and Fountains Road to Carrington Street or Deanne Street and thence Manns Road.