

OUR REF: 13/4767

15 December 2015

Mr Matthew White  
Project Leader UrbanGrowth NSW  
Parramatta Road Urban Renewal  
PO Box 237  
PARRAMATTA NSW 2124

Dear Matthew,

**DRAFT PARRAMATTA ROAD URBAN TRANSFORMATION STRATEGY**

At its 1 December 2015 meeting, Council considered a report on the above matter and resolved that:

*Council rejects Urban Growth's present Parramatta Road redevelopment strategy and calls on the State Government to work collaboratively with Local Councils for genuine revitalisation of Parramatta Road.*

Council also resolved to make its own submission and to include with this an alternate proposal prepared by Mark Ian Jones which was circulated at the meeting. The Jones submission makes a range of modifying suggestions for your further consideration.

In accordance with Council's resolutions, please find attached the Council's submission; the Mark Jones amending document with alternate proposal (Attachment A) and Council's Resolution (Attachment B).

Please don't hesitate to contact Council's Manager Planning Services, Marcus Rowan, on 9335 2274 with any queries.

Yours sincerely,



Tim Moore  
Director, Planning and Environmental Services

Encls.

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## ENGLISH

### IMPORTANT

This letter contains important information. If you do not understand it, please ask a relative or friend to translate it or come to Council and discuss the letter with Council's staff using the Telephone Interpreter Service.

## GREEK

### ΣΗΜΑΝΤΙΚΟ

Αυτή η επιστολή περιέχει σημαντικές πληροφορίες. Αν δεν τις καταλαβαίνετε, παρακαλείστε να ζητήσετε από ένα συγγενή ή φίλο να σας τις μεταφράσει ή να έλθετε στα γραφεία της Δημαρχίας και να συζητήσετε την επιστολή με προσωπικό της Δημαρχίας χρησιμοποιώντας την Τηλεφωνική Υπηρεσία Διερμηνέων.

## PORTUGUESE

### IMPORTANTE

Este carta contém informação importante. Se não o compreender peça a uma pessoa de família ou a um/a amigo/a para o traduzir ou venha até à Câmara Municipal (Council) para discutir o assunto através do Serviço de Intérpretes pelo Telefone (Telephone Interpreter Service).

## ARABIC

هَامَ

تحتوي هذه الرسالة معلومات هامة. فإذا لم تستوعبها يرجى أن تطلبوا من أحد أقربائكم أو أصدقائكم شرحها لكم، أو تفضلوا إلى البلدية واجلبوا الرسالة معكم لكي تناقشوها مع أحد موظفي البلدية من خلال الإستعانة بخدمة الترجمة الهاتفية.

## VIETNAMESE

### THÔNG TIN QUAN TRỌNG

Nội dung thư này gồm có các thông tin quan trọng. Nếu đọc không hiểu, xin quý vị nhờ thân nhân hay bạn bè dịch giúp hoặc đem đến Hội đồng Thành phố để thảo luận với nhân viên qua trung gian Dịch vụ Thông dịch qua Điện thoại.

## MANDARIN

### 重要资料

本信写有重要资料。如果不明白，请亲友为您翻译，或到市政府来，通过电话传译服务，与市政府工作人员讨论此信。

**Submission from Marrickville Council**  
***Draft Parramatta Road Urban Transformation Strategy***

**December 2015**

**1. SUMMARY**

Marrickville Council welcomes this opportunity to make a submission on Urban Growth NSW's *Draft Parramatta Road Urban Transformation Strategy* (the Strategy). Council understands the challenges of Sydney's growth and acknowledges the significant work that has gone into the release of the Strategy. A member of staff has contributed to the Integrated Project Team.

Parramatta Road lends itself to being a vibrant, multi-use corridor with improved transport choices, better amenity and balanced growth of housing and jobs – the vision of the Strategy.

The Strategy makes clear an intention to hand over the implementation including all further master planning, infrastructure funding, and statutory policy preparation to the Department of Planning and Environment and local councils.

The purpose of this submission is to draw attention to those matters that require refinement and further investigation as the Strategy is finalised to ensure that optimal planning outcomes can be achieved, including in those areas where Council has limited powers and resources: detailed master planning controls; implementation and staging; transport integration. We welcome further opportunities to collaborate as this body of work unfolds.

Council's position, key issues and matters for further investigation are summarised as follows:

- a. Parramatta Road's transformation is entirely dependent on reducing and better managing cars - achieved by limiting the traffic lane capacity and slowing it down. The reallocation of space for public and active transport, parking and widened footways is critical.
- b. Commitments to rapid transit and active transport need to lead the land use vision to ensure the viability of investment in jobs and housing and to promote residential amenity with acceptable noise and air quality, especially if housing directly fronts Parramatta Road.
- c. The commitment to urban amenity improvements is welcomed noting that it does not cover new community and other essential infrastructure. The uplifted value from rezoning is a source that should be considered and applied in a coordinated way, rather than trying to meet these needs through section 94 and individually negotiated voluntary planning agreements (VPA). Total costs should be determined and apportioned before uplift is capitalised as land is traded.
- d. Council will be looking for support with innovative statutory controls to ensure development outcomes that can work with fine grain subdivision and therefore have minimal impact on existing landholders. A solution that allows narrow frontage buildings and avoids lot amalgamation, supported by precinct wide parking and servicing is suggested. There are practical issues with some of the proposed built form, particularly



in relation to overshadowing and sites with a heritage interface. These issues must be properly borne out in detailed, block by block master planning.

- e. Council notes that 'decoupled car parking arrangements' are an approach suggested in the Strategy. The final Strategy and subsequent statutory controls will need to lock in this approach or it won't be achieved. The suggested parking rates should be reviewed in parallel with commitments to active and public transport.
- f. Affordable housing targets should be set and reliable mechanisms imposed to deliver them. Local government does not have access to the policy levers to properly address this issue.
- g. A staged release is recommended and it is requested that Council and residents directly affected by the Strategy should be able to input into the suggested *Short Term Implementation Plan* to determine this.

Further detailed analysis, master planning and DCP controls need to inform future statutory controls. If the Strategy, together with a Section 117 Direction acts as the only guide there will likely be poor and uncoordinated planning outcomes because the planning will be led by private planning proposals. The uncertain and divisive effect this would have on existing residents needs to be avoided.

More detailed comments for the Taverners Hill, Leichhardt and Camperdown precinct plans, including some suggested refinement to the built form controls, concludes the submission.

## 2. PARRAMATTA ROAD CORRIDOR TRANSFORMATION

In Council's opinion the Strategy has not remained true to the vision for a transformed Parramatta Road because it has not adequately addressed or included the means to address the high traffic volumes on Parramatta Road.

The independent report on WestConnex by SGS Economics & Planning (February 2015), commissioned by City of Sydney found that WestConnex would not deliver reductions for Parramatta Road. The report states, with emphasis added:

*'it appears unlikely that M4 East would draw sufficient traffic off Parramatta Road to significantly improve the local amenity and lead to significant urban renewal, over a "do nothing scenario" unless Parramatta Road capacity is reduced significantly'*.

For this reason Council considers that there should be greater commitment in the Strategy to reduce capacity by reallocating road space for public transport, cycling, landscaped footpaths and parking, to progressively reduce car demand.

This is particularly relevant in the eastern part of the Parramatta Road corridor where there is greater opportunity to make the shift to alternative modes of transport, with greater proximity to employment and the CBD.

## 3. THE TRANSPORT PLAN

The *Integrated Land Use and Transport Concept* in Chapter 4 of the Strategy provides a useful overview of transport initiatives under consideration. The *Sydney CBD to Parramatta Strategic Transport Plan* (Transport Plan) is the supporting document that refers to potential rapid transit along Parramatta Road. The Strategy shouldn't be finalised and subsequent planning work shouldn't commence until there is committed transport solution to support the planned land use changes.



Specific matters of concern with the Transport Plan are:

- It contends that WestConnex will reduce traffic on Parramatta Road although traffic scenarios do not support this. The only viable way to ensure this is with physical design constraints to refer the appropriate amount of traffic volume to WestConnex.
- The current modal split within the corridor is 66% via private vehicle and there is no target to shift this in the Transport Plan. Despite what the Plan suggests modal shift requires decisions that prioritise and fund public and active transport above cars.
- Where there are plans to investigate or progress certain public transport initiatives, these are generally statements of intended outcomes e.g. *'to provide bus priority measures where possible'* and *'Identify potential preferred light rail route...'*
- It is accepted that rapid transit would consume available road space at the interchange points. The widening to provide this is shown as a 3-5m green setback on the Leichhardt Structure Plan (*Urban Design Guidelines* pg. 25). A better fit with the urban renewal would be achieved by constraining the general traffic and reducing the Road to one general traffic lane each way, at least for those stations east of Hawthorn Canal where road widening would compete with streetscape and heritage.
- The references to considering other initiatives to promote walking and cycling with speed reductions and traffic signal phasing are strongly supported. These commitments require statutory controls to accompany land use changes. Either with reduced speeds or dedicated cycle ways, Parramatta Road (at least that much of it from Leichhardt/Stanmore to Pyrmont Bridge Road and on to the CBD) should be mapped for cyclists - it's a viable cycling distance, it's direct relatively flat.

#### **4. FUNDING FOR INFRASTRUCTURE AND SERVICES FOR A LARGER POPULATION**

The Strategy recognises the increased need for important community infrastructure such as schools, hospitals and child care facilities, transport and open space. Council looks forward to seeing the detail of an effective contributions scheme for funding this infrastructure in the final Strategy.

If the final approach relies on voluntary planning agreements (VPA), a consistent approach within each precinct, based on the estimated value of infrastructure, is required to ensure the maximum portion of value uplift from rezoning can be redirected toward infrastructure and other community and public benefits. Whatever the funding mechanism, it needs to be in place early to ensure that value uplift is not capitalised, as land is traded.

The commitment to fund important GreenWay missing links with tunnelling under Parramatta Road and Longport Street is welcomed. Marrickville, Ashfield and Leichhardt Councils' commitment to the GreenWay means that concept level design detail has been prepared and the projects scoped. Council would welcome an opportunity to discuss how there may be further cost sharing for the pathway linkages between and beyond these tunnels.

#### **5. BUILT FORM**

The approach of varied heights and density across the precincts is supported. More detail is required about what the average heights translate to for each site, on a block by block approach.

The existing street network and fine grained subdivision pattern are significant factors that underpin the history and character of inner city suburbs. The *Urban Design Guidelines* recommend the common solution of setting a variable FSR based on site area. There are known difficulties with assembling large development sites in areas with small lots and fragmented ownership. Moreover, when it can be achieved the grain and rich variation and character are often lost. It was anticipated that innovative mechanisms and urban design guidelines for these types of areas would be created, but this is not reflected in the Strategy or the Urban Design Guidelines. These mechanisms and guidelines should ensure orderly development that can:

- provide continuity of the fine grained character of these areas;
- enable narrow-site building typologies which do not require substantial land amalgamation;
- be viable and achievable for an area in a reasonable timeframe, on a block by block approach;
- allow for infill development that could integrate with and not unduly impact remaining houses;
- create reasonable equity to ensure some land is not isolated and development potential sterilised, and ensure heritage items can benefit from planning uplift; and
- achieve public domain improvements especially a widening of the existing narrow footways in Taverners Hill.

## **6. HANDLING CARS AND DENSITY**

Many cities in the world with high densities don't try to accommodate cars, at least not within a basement of each and every building. As we move to increasing densities the Strategy talks about maintaining current or higher rates of parking. The Taverners Hill precinct with heavy rail, light rail, potential rapid transit and viable walking and cycling proximity lends itself to a contemporary approach.

The Strategy proposes lowering car parking rates to enhance sustainability of the precincts and maximise active frontages and cites maximum rates in the *Parramatta Road Precinct Transport Report*.

It is pleasing to see the Strategy recognise the positive effect such an approach would have upon housing affordability and the references to a precinct approach to 'decoupled parking' are a positive step. These need to be elaborated on and committed in the statutory planning controls.

## **7. HOUSING AFFORDABILITY & CHOICE**

Housing diversity, choice and affordable supply is fundamental to urban renewal in global cities across the world. Council requests that affordable housing targets and mechanisms to achieve these are included in the Strategy in addition to general housing and employment targets, before it is finalised.

Research shows that increasing supply, without market intervention, will not achieve housing diversity, choice or affordable supply. A complex range of demand and supply drivers must be addressed to achieve housing affordability and that, if change is adopted, the effects will be long term. The needed actions are amply documented in the Report on the NSW Parliamentary Inquiry into Social, Public and Affordable Housing, and the Report on the Commonwealth Senate Economic References Committee Inquiry into Affordable Housing in



Australia. Both reports document the need for immediate action to address the escalating housing affordability crisis in Sydney and indicate that a mandatory inclusion of affordable housing (inclusionary zoning) and value uplift capture are the most workable and successful mechanisms to achieve affordable housing in the short term.

Council has repeatedly called on the State Government to provide Council with the power to mandate affordable housing targets (inclusionary zoning) through its LEP or other mechanisms, as a key strategy to address the affordable housing crisis. It has also repeatedly called on the State Government to establish meaningful affordable housing targets for Sydney and that a target of 30% of affordable housing for urban growth projects is in line with targets established in other major capital cities such as London.

To address the immediate housing and homelessness crisis would require a mandated percentage component of all residential development as affordable housing.

The background on page 24 says *'Decision making should be open to new models to deliver housing diversity, choice and affordability. This may require possible amendments to planning mechanisms or development controls. Decisions may be driven by a future Housing Diversity Policy.'* A policy will not be effective primarily because policies have no weight in development assessment and approval, and will not get over the hurdles that inhibit the supply of diverse and affordable housing.

Five "housing levers" are put forward in the Strategy, many of which are low level strategies already being pursued. On their own they are not likely to improve choice or affordability because they don't address the macroeconomic/taxation factors and market factors. Without Federal and State action on the complex range of these drivers of demand and supply, the planning mechanisms discussed in this submission are the only genuine options to ensure affordable housing supply as part of the transformation project.

## **8. HERITAGE**

A general heritage issue that has not been addressed is how heritage items will be treated in relation to adjoining development sites so they do not get doubly penalised by not sharing any of the land value uplift of adjoining sites if they are undevelopable as well as losing the amenity and value as a high quality single dwelling house when the surrounding context changes. In larger lot areas heritage items could be required to become part of an amalgamated development site and the heritage item be integrated into the development design. This is more problematic with small-lot fragmented land ownership areas such as in the Taverners Hill Precinct. To address this some form of transferable development rights mechanism could be considered.

The Leichhardt Precinct includes heritage conservation areas on both sides of Parramatta Road. It appears that the Precinct Plans involve demolition of commercial buildings in this location between Renwick Street and Balmain Road and potentially further to the east, to accommodate Rapid Transit. The option of redesigning Crystal Street / Balmain Road to provide two way north-south traffic movements may provide an alternative to widening in this location.

In the Camperdown Precinct, the area bounded by Denison, Derby Street, Parramatta Road and Australia Street is a heritage item, has recently been developed and therefore might be more appropriately removed from the Strategy drawings. The "Franks" building (2 Cardigan Lane) is a potential heritage item that needs to be considered in the structure of the Precinct Plan. New development in the existing Hordern Place industrial area needs to prevent unreasonable impacts on the Cardigan Street Heritage Conservation Area.



## 9. STRATEGY IMPLEMENTATION AND STAGING

The suggested approach of a State policy to provide strategic guidance is supported over the approach of a Section 117 Direction. With either approach Council's has significant concerns if strategic planning is privately led by ad-hoc planning proposals which will not achieve the essential precinct wide planning outcome that the Strategy talks to. This is especially an issue in the Taverners Hill precinct where land ownership is highly fragmented.

In either scenario detailed master planning of each precinct must be undertaken and DCP controls created either as part of, or before statutory controls are made to ensure appropriate building form and other controls are put in place.

The list of *Indicators for New Parramatta Road* on page 97 of the Strategy are useful and all encompassing. The critical issue is how the Strategy can ensure delivery against these with essential funding and robust planning controls.

The notion of staging implementation in accordance with the suggested *Short Term Implementation Plan* is supported so that rezonings occur in a coordinated manner. This would be least disruptive for existing land holders and could ensure that those areas closest to transport and centres are substantially redeveloped first, followed by subsequent lower priority areas in an orderly sequence.

## 10. PRECINCT REVIEWS

### 10.1 Taverners Hill

For the Taverners Hill Precinct the existing road configuration and priorities and public domain must be reconfigured to achieve urban amenity, pedestrian connectivity and safety. Close attention needs to be given to the existing hostile pedestrian experience created by the one way system to interchange with Parramatta Road. The transport analysis of the Taverners Hill area in the Transport Report is sound and the identified opportunities for the precinct are supported, namely:

- Enhancing north south pedestrian connectivity across Parramatta Road and reducing the barriers presented by the rail lines for all modes of transport.
- Introducing new north-south aligned laneways south of Parramatta Road to activate streetscapes and link new developments to public transport infrastructure.
- Focus on the precinct as a transit oriented area with low parking rates.

To realise these opportunities, future statutory controls will need to ensure the commitment to these outcomes, summarised as follows:

- The extent of space and priority dedicated to the classified road system through the area, which splits between Old Canterbury Road / Cook Street and Barker Street / Brown Street, the sweeping road curves and the lack of pedestrian crossings or signals creates a hostile pedestrian environment, not suited to increasing densities. The preferred option is to make Old Canterbury Road, Parramatta Road and Tebutt Street into a signalised cross road level intersection, allowing easier pedestrian crossing, making the 'clover-leaf' 'fly-over' road system redundant. In this arrangement the Barker/Brown/Cook/Hathern Streets and bridge over Parramatta Road could become available for pedestrian, bicycles, open space and low speed local vehicles. A secondary option would be to limit the road system to Cook Street as a two-way road;

remove Barker/Brown Streets from the road system to enable reuse for pedestrian, bicycles, open space and low speed local vehicles; and signalise intersections to enable safe pedestrian crossings and traffic management. Currently the Strategy provides no direction for such a reconfiguration of this road system.

- While there are multiple forms of public and active transport available for the precinct, the road system and rail corridors, especially west of Old Canterbury Road, severely isolates the area. If major redevelopment is to occur, better links to reduce these barriers as identified in the Parramatta Road Precinct Transport Report (Transport Report), are required, including:
  - Pedestrian crossing points on Old Canterbury Road allowing links to Lewisham Station; Petersham Park and general eastern movement,
  - under the light rail to connect directly to the GreenWay instead of just relying on the poor connection via Old Canterbury Road / Parramatta Road; and
  - north-south and east-west pedestrian/vehicle laneways to enhance permeability of the area (e.g. adjacent to the Western Railway line; Cook Street to Carrington Street; at the back of mixed use areas on Parramatta Road; and extending Barker Lane south and north);

Other general improvements to the local street pedestrian amenity are also required in this area, including development dedicating land to widen public footpath verges to an acceptable width appropriate for the street typology for pedestrian movement, street landscaping and if needed provision of on-street car parking and extra (narrow) vehicle lanes.

The location of the open space on the corner of Old Canterbury Road and Cook Street partly includes 3 new town houses that are presently being completed as well as two established houses. Open space is therefore not a feasible option here. Council already has a high number of small pocket parks. Reconfiguration of the road network could provide the opportunity for closure of Brown Street, between Cook Street and St John Street, to be combined with the adjoining vacant RMS owned land and potentially with St John Lane if vehicular access is reconfigured. This would create an area of fairly flat open space, in a quiet location, that has an established fig tree and benefits from the proximity near to the landscaped GreenWay corridor. It also provides the space for a pedestrian tunnel link that could create a direct link from this open space to the GreenWay.

On the west side of Old Canterbury Road 3-4 storeys is a more appropriate scale for the Barker Street and south side of St John Street.

If the Heritage Item at 36 Thomas Street and potential Heritage Item at No. 40A Thomas Street are to be preserved then an appropriate setting needs to be ensured. A lower height of 3 - 4 storeys is workable.

For the Lewisham Hotel at 794-796 Parramatta Road to be retained, an appropriate scale needs to be proposed for this property and adjoining properties. Accordingly, it is suggested 794-798 Parramatta Road be reduced to average 3 storeys - 4 storeys height and 786-792 Parramatta Road be reduced to average 6 storeys - 8 storeys height. This would also help address the impacts on remaining dwellings to the south.

## 10.2 Camperdown

The focus on expanding employment opportunities in the education and health sectors is a positive step which Council supports.

A key part of the Camperdown Structure Plan was to take advantage of the Johnston Creek water course and Cardigan Street/Lane linkages as a significant green corridor for active transport, enhanced greening and biodiversity. Council requests that this be included in the final Strategy. Creating such a corridor would enhance regional linkages and enable connections from small open spaces along the linear open space through to regional open spaces and linkages on Rozelle Bay. This initiative achieves many of the Strategy principles and a key opportunity identified for the whole Parramatta Road Corridor - to achieve north-south active transport movement via the Parramatta River tributaries.

The need and benefit of providing new open space directly adjacent to O'Dea Reserve is questioned. It is recommended this be removed and be replaced with an extension of the proposed new street (vehicular connection) parallel to Cardigan Lane through to the Reserve. Additionally, another new street should be provided between development and the Reserve, which is the public domain enhancement needed for the area that currently suffers from having only one street fronting O'Dea Reserve. This would create the best urban design structure for the open space, providing better public access, enhanced surveillance and improved permeability. It would also enhance active transport movement along this designated east-west route between Petersham and RPA Hospital / The University of Sydney.

The western edge of proposed development of the Horden Street industrial area with average 6 storeys - 8 storeys height will likely impact heavily on the Cardigan Street Heritage Conservation Area and amenity of the rear of properties. It is considered the strip to the west of the new north-south street being created should be reduced to average 3 storeys - 4 storeys height and adequate space be required between Cardigan Lane and the built form for a substantial tree buffer.

The area bounded by Kilner Lane, Denison Street, Cardigan Lane and the new street link (1 Denison Street and 2 Cardigan Lane) proposed as average 8 storeys - 12 storeys height is recommended to be reduced to average 6 storeys - 8 storeys height to integrate retention of the "Franks" building at 2 Cardigan Lane, rather than encouraging it's demolition and redevelopment.



# **ATTACHMENT A**

Document prepared by Mark Ian Jones,  
including the attached alternate proposal

## **RESPONSE AND PROPOSED AMENDMENTS TO COUNCIL'S DRAFT SUBMISSION TO URBAN GROWTH NSW ON THE NEW PARRAMATTA ROAD STRATEGY**

Prepared by

**Mark Ian Jones PhD BArch(Hons)**  
**15 Cook Street**  
**LEWISHAM NSW 2049**  
**0419 289 103**

### **Item 1. SUMMARY, page 297**

Page 297, Point c.

- The issue of value uplift is controversial as it strips profits away from landowners who are forced to move as a result of rezoning. This has a double edged effect. It makes it less attractive for people to sell yet compromises those who are forced to sell by adjacent development. This has the effect to stymie development. If this is Urban Growth's intention to fund infrastructure more information is required as to the details of how this would be implemented. There is also the issue of rates which increase on land value before the value uplift. Some people have been giving residents false hope that they will have a windfall as a result of rezoning. This is not necessarily so. Further the income derived by value uplift/capture is not guaranteed to fund Council works in the same way Section 94 contributions and Voluntary Planning agreements or VPA.
- Council might consider arguing against value uplift in the submission.
- Page 298, para 5, last line, substitute 'needs' with 'must'

### **Item 3. THE TRANSPORT PLAN, page 298**

- Page 298, final para, last line, substitute 'shouldn't' with 'must not'
- Page 299, 4th dot point, cycle ways would not be feasible given the likelihood that rapid transport buses will occupy kerbside lanes and as such Council might consider supporting cycle links adjacent the corridor

### **Item 5. BUILT FORM, page 299**

Marrickville Council's stated support of the varied heights and density of Urban Growth's Strategy contradicts their own Masterplan for Lewisham North set out in the DCP. Council's support of Urban Growth's Strategy directly contradicts the following aims listed in the DCP for the desired future context of the area:

- *To protect and preserve the identified period buildings within the precinct and encourage their sympathetic alteration or restoration.*
- *To protect the identified heritage items within the precinct.*
- *To maintain distinctly single storey streetscapes that exist within the precinct.*
- *To protect any significant streetscapes and/or public domain elements within the precinct including landscaping, fencing, open space, sandstone kerbing and guttering, views and vistas and prevailing subdivision patterns.*
- *To preserve the predominantly low density residential character of the precinct.*

It is suggested that Council's submission be amended to acknowledge current controls and desired future context.

- I note that Council does mention fine grained subdivision pattern, history and character in para 1 however this is contradicted by the support of rezoning (page 299, Item 5, para 1), street widening (page 300, 5th dot point) and street extensions (page 303, 3rd sub dot point).

## **Item 8. HERITAGE**

- Page 301, Item 8, para 1, the issue of transferable development rights on heritage items is potentially problematic.

## **Item 9. STRATEGY IMPLEMENTATION AND STAGING**

- Page 302, para 4, consider amending "areas closest to transport and centres be substantially developed first" to "areas along the immediate Parramatta Road corridor be substantially developed first when transport and infrastructure improvements have been completed"

### **Item 10.1 Taverners Hill**

We find that the proposal falls short in many areas that have not been addressed in Council's draft submission. As such, we ask that the following amendments be made to Council's submission:

Firstly, that Council consider adding in the following:

- When tested against SEPP65 the proposed density does not appear to meet with essential criteria as to setback, amenity, solar access and overshadowing.
- When tested against the Urban Growth Draft Urban Design Guidelines the proposed heights to the south side of Parramatta road cannot be achieved.
- That 786-792 Parramatta Road (Reece site east of Lewisham Hotel), be reduced to average 4 storeys for reasons of overshadowing of dwellings to the south whether existing or proposed - See attached shadow studies.
- That the areas shown as 3 storeys - 4 storeys on the Urban Growth density plan be removed from the strategy as the small allotments and property values make them unsustainable for redevelopment. Notwithstanding the predominately 19th century housing stock is in good condition and will retain the authenticity of the precinct.
- That an alternative proposal, as attached, be included with Council's submission as an appendix as suggested by Tim Moore Marrickville Council Director of Planning.
- There are no references to the endangered Bandicoots that live in the North Lewisham area in Council's submission. Please refer attached map from Tanya Leary, Alan Kwok, Khan Ben, Paul Ibbetson (2010) *Yuppie bandicoots of inner western Sydney - in hiding or urban renewal?* in The Natural History of Sydney Editors Daniel Lunney, Pat Hutchings, and Dieter Hochuli Publication Date: January 1, 2010 ISBN: 0-9803272-3-7

Detailed amendments:

- Page 302, 3rd dot point "north south laneways to the south of Parramatta Road". Consider deleting as there is no explanation or justification for this idea. Furthermore is unrealistic and unsustainable without compulsory acquisition of dwelling houses and destroys the existing subdivision pattern the submission speaks of earlier.
- Page 303, 3rd sub dot point, the suggestion for pedestrian/vehicular laneways between Cook Street and Carrington Street is unrealistic and unsustainable without compulsory acquisition of dwelling houses to Carrington Street and as such should be removed.
- Page 303, para 4, be removed and replaced with "All of the existing houses to the east and west of Old Canterbury Road should be removed from rezoning as the desired density can be achieved on sites along the immediate Parramatta Road corridor."
- Page 303, para 5, The 'potential Heritage item at 40A Thomas Street - Catholic Convent - could be argued more convincingly if Council intends to list and have it remain. The site could be developed along the lines of the old Paddington hospital site off Oxford Street retaining the existing building and adding modest 2 storey development within the grounds.
- Page 303, para 6, That 786-792 Parramatta Road (Reece site east of Lewisham Hotel), be reduced to average 4 storeys for reasons of overshadowing of dwellings to the south whether existing or proposed. Again, if Council intends the Lewisham Hotel to remain this could be argued more convincingly and adjacent development on the Reece site should be limited to the same scale, i.e.. 3-4 storeys. - See attached shadow studies.



I also attach copies of shadow studies of various heights on the southern side of Parramatta Road that support the assertion that heights in excess of 6 storeys are unsustainable due to significant overshadowing. We ask that these also be attached to Council's submission.

Further to the final item above we attach a copy of our alternate proposal that we have discussed with Tim Moore and Peter Failes of Marrickville Council and Matthew White of Urban Growth NSW. To summarise our alternate proposal:

- Our proposal targets obvious development opportunities on mostly commercial and industrial sites whilst acknowledging the constraints of small allotments and individual ownership.
- The precinct has been reconfigured as a linear proposal extending to west and east of the Urban Growth strategy as is more focussed on the Parramatta Road corridor.
- Density on the southern side of Parramatta Road is lower scale so as to mitigate loss of amenity to existing dwellings to the south.
- Existing dwelling houses have been removed from rezoning.
- The Taverners Hill gateway is actually to the west of the light rail overpass as Parramatta Road veers left over the canal and proceeds up the hill. As such we have located gateway buildings in this location to frame the entry to the precinct.
- Depending on unit mix and FSR the desired density sought by Urban Growth is achievable with minimum loss of existing dwellings and less impact on amenity.
- The intersection of Parramatta Road at Tebbutt Street and Old Canterbury Road is signaled to allow safer pedestrian passage and vehicular movement in a north-south direction.
- Brown Street overpass is reclaimed as a urban open space, cycle and pedestrian link across Parramatta Road.
- Lower Barker, St John and Cook Streets become local traffic streets with greater pedestrian and resident amenity.
- A pedestrian and cycle link from Lewisham Station to Leichhardt is provided through connected green spaces.
- We have included already approved sites in the proposal as these will have obvious impacts on infrastructure.

We ask that Council move to attach our proposal to its submission to Urban Growth.

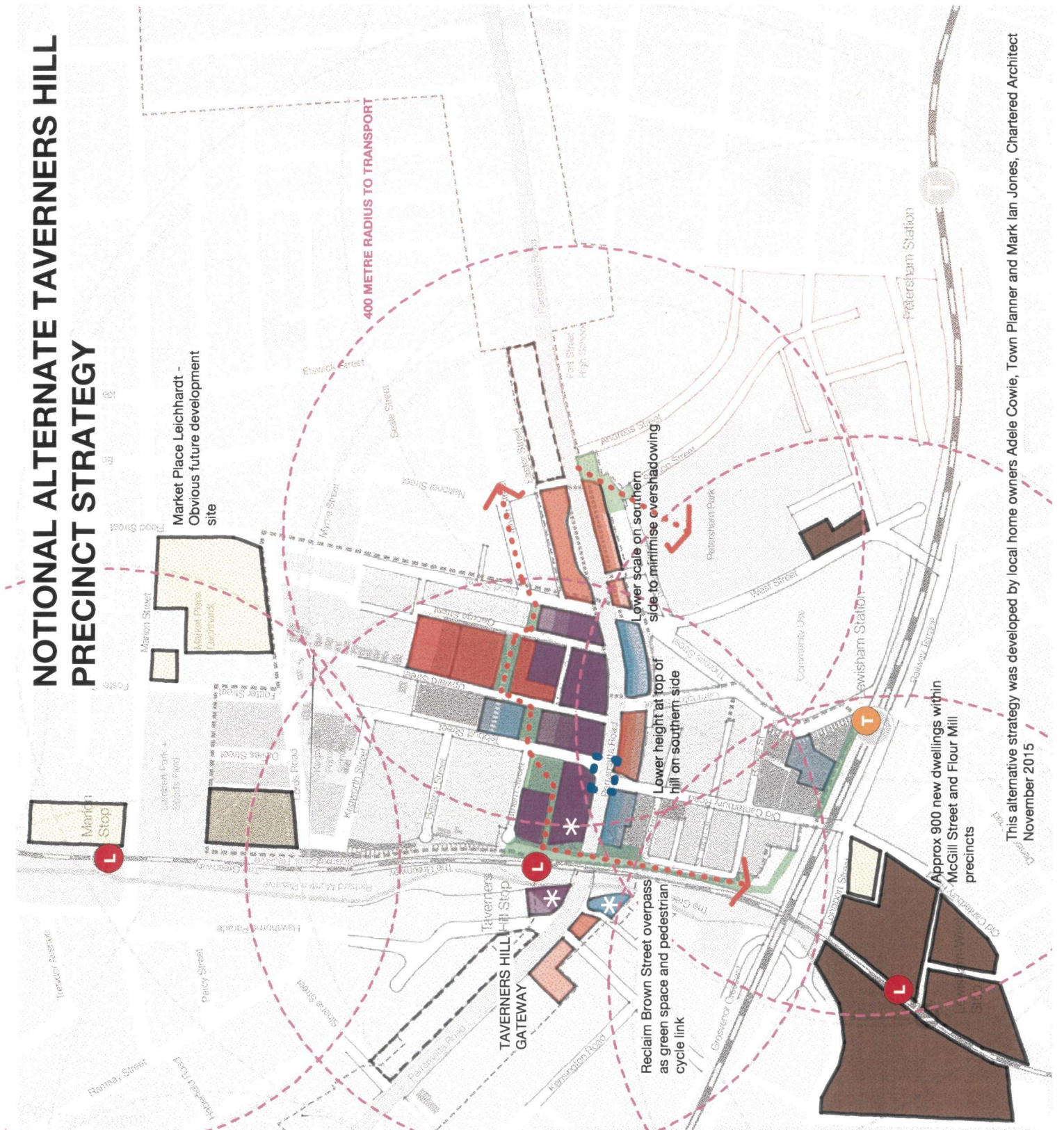


# NOTIONAL ALTERNATE TAVERNERS HILL PRECINCT STRATEGY

- REZONING LIMITED TO EXISTING COMMERCIAL & INDUSTRIAL SITES
- MAJORITY OF EXISTING DWELLINGS REMAIN AS IS WITH NO NEW ZONING
- URBAN GROWTH TARGET IS 3064 DWELLINGS BY 2050
- THIS PROPOSAL RETAINS APPROX 450 EXISTING DWELLINGS
- THIS PROPOSAL HAS THE POTENTIAL TO MEET THE REMAINING TARGET WITH REDUCED IMPACT ON EXISTING DWELLINGS BASED ON FSR OF 1.5:1 TO FSR 3.5:1

- Obvious development site
- New signalled intersection for through traffic
- Already approved development
- Approved development not included but with obvious impact on targets and infrastructure
- Proposed new pedestrian and cycle link
- Commercial/Industrial sites not included but within 400m

- Precinct Boundary
  - Parramatta Road Corridor Boundary
  - Existing Open Space
  - Proposed new green/open space
  - Proposed Urban Plaza
  - Main Road/Paramatta Road
  - Indicative Zone for Public Transport Super Stop
  - Proposed Active Transport Connections
  - Proposed Vehicular Connections
  - Rail
  - Train Station
  - Light Rail Stops
  - Max 12 storeys stepping down to 6 storeys
  - Max 6 storeys stepping down to 3 storeys
  - Max 4 storeys stepping down to 3 storeys
  - Heritage / Existing Building
  - Landmark building
  - Sensitive Precinct Edges
- \* Refer to Urban Design Guideline for more information



This alternative strategy was developed by local home owners Adele Cowie, Town Planner and Mark Ian Jones, Chartered Architect November 2015







# 8 STOREY 29m BUILT FORM SHADOWS 21 JUNE 786-792 PARRAMATTA ROAD (REECE SITE)



	Precinct Boundary
	Parramatta Road Corridor Boundary
	Existing Open Space
	Proposed Open Space
	Proposed Urban Plaza
	Main Road/Parramatta Road
	Indicative Zone for Public Transport Super Stop
	Proposed Active Transport Connections
	Proposed Vehicle Connections
	Rail
	Train Station
	Light Rail Stops
	Average 8 storeys - max 12 storeys [42m]
	Average 6 storeys - max 8 storeys [24m]
	Average 3 storeys - max 4 storeys [17m]
	Heritage / Existing Building
	Landmark Building
	Sensitive Precinct Edges

\* Refer to Urban Design Guideline for more information

0 20m





# Yuppie bandicoots of inner western Sydney – in hiding or urban renewal?

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## ABSTRACT

Long-nosed bandicoots *Perameles nasuta* were thought to have disappeared from inner western Sydney by the mid to late 1960s. This paper documents recent (2002-present) records of long-nosed bandicoots in the urban areas of inner western Sydney, including carcasses (n=7), animals live-trapped or observed by us (n=7), and reports from the public (n=35). We also surveyed for bandicoot diggings in 88 urban parks and found 12 which contained possible diggings. Most of these records are concentrated in the suburbs of Dulwich Hill, Marrickville, Lewisham, and Petersham in an area of less than 1.9 km by 1.1 km (approximately 95 ha) in the local government area (LGA) of Marrickville, but when other scattered records are included, come from an 8.5 km x 6 km area in the LGAs of Ashfield, Canada Bay, Canterbury, and Leichhardt. A pilot radio-tracking study of two adult females found that they foraged almost exclusively in urban backyards and nested by day under old buildings. One female provided enough data for home range analysis, and had a home range of 2.7 ha (MCP) or 1.47 ha (KL95%); the core home range (KL50%) was only 0.16 ha. There were no signs that either individual avoided activity during peak hour traffic, although they often did not come out to forage for a whole night, or only foraged for a few hours within a night. We suggest that this might be a form of predator avoidance behaviour since feral and domestic cats were common in the area, and/or that they are able to obtain sufficient food in the short times they are active. We also speculate on the origins of these animals.

**Key words:** long-nosed bandicoot, *Perameles nasuta*, urban, radio-tracking, home range, diggings

## Introduction

The long-nosed bandicoot *Perameles nasuta* is probably the most common and widespread bandicoot in eastern Australia, and it is one of the few bandicoot species that have not fared too badly since European settlement (Ashby *et al.* 1990, Dickman and Stodart 2008). The long-nosed bandicoot was abundant throughout the Sydney region until the 1960s (Marlow 1962). A previous resident of the inner west reports that bandicoots were common in backyards of the suburb of Dulwich Hill until around 1958 and along the Cooks River towards Rockdale until around 1964, but from that time on they became increasingly rare. By the 1970s they were thought to have disappeared from all of inner western Sydney. Long-nosed bandicoot populations still occur in the leafy suburbs north of the harbour where pockets of remnant bushland remain, and are still relatively common in suburbs that abut the larger national parks to the north of Sydney (see Figure 1). North of Sydney Harbour, long-nosed bandicoots still occur in Ku-ring-gai Chase, Garrigal, Sydney Harbour (North Head), and Lane Cove National Parks, Manly Dam, and Pittwater LGA (National Parks and Wildlife Service 2000, NPWS Wildlife Atlas records). The long-nosed bandicoot population at North Head was the second endangered population listed under the NSW *Threatened Species Conservation Act 1995* (NSW Scientific Committee 1997). Specifically, the determination was made on the basis that it is a disjunct population and one of the few surviving populations within the Sydney Region (NSW Scientific Committee 1997). The North

Head population has been estimated to be around 100 animals (NSW Scientific Committee 1997, Banks 2004). To the south of the harbour, long-nosed bandicoots are known from Royal and Heathcote National Parks and Holsworthy Army Base (National Parks and Wildlife Service 2000). These areas still maintain extensive tracts of native vegetation. Inner western Sydney on the other hand, has virtually no remnant vegetation with the exception of a few pockets along the Cooks River and the rail corridors, and most of these are either weed infested or mangroves.

To the west of Sydney, long-nosed bandicoots are known from Blue Mountains National Park, but appear to have all but disappeared from the Cumberland Plain. During four years of intensive fauna survey in western Sydney NPWS reserves, only one long-nosed bandicoot was detected from spotlighting and one by trapping, both in Agnes Banks Nature Reserve (T. Leary unpublished data). Diggings however, were observed in two other reserves – Windsor Downs and Mulgoa Nature Reserves (T. Leary unpublished data). The survey effort in western Sydney reserves included approximately 18,000 trap nights, 12,000 hair-tube nights and over 60 hours of spotlighting, so failure to detect them was not from lack of survey effort (T. Leary unpublished data). The nearest known population in western Sydney is at Yarramundi at the base of the Blue Mountains, around 3 km from Agnes Banks Nature Reserve.



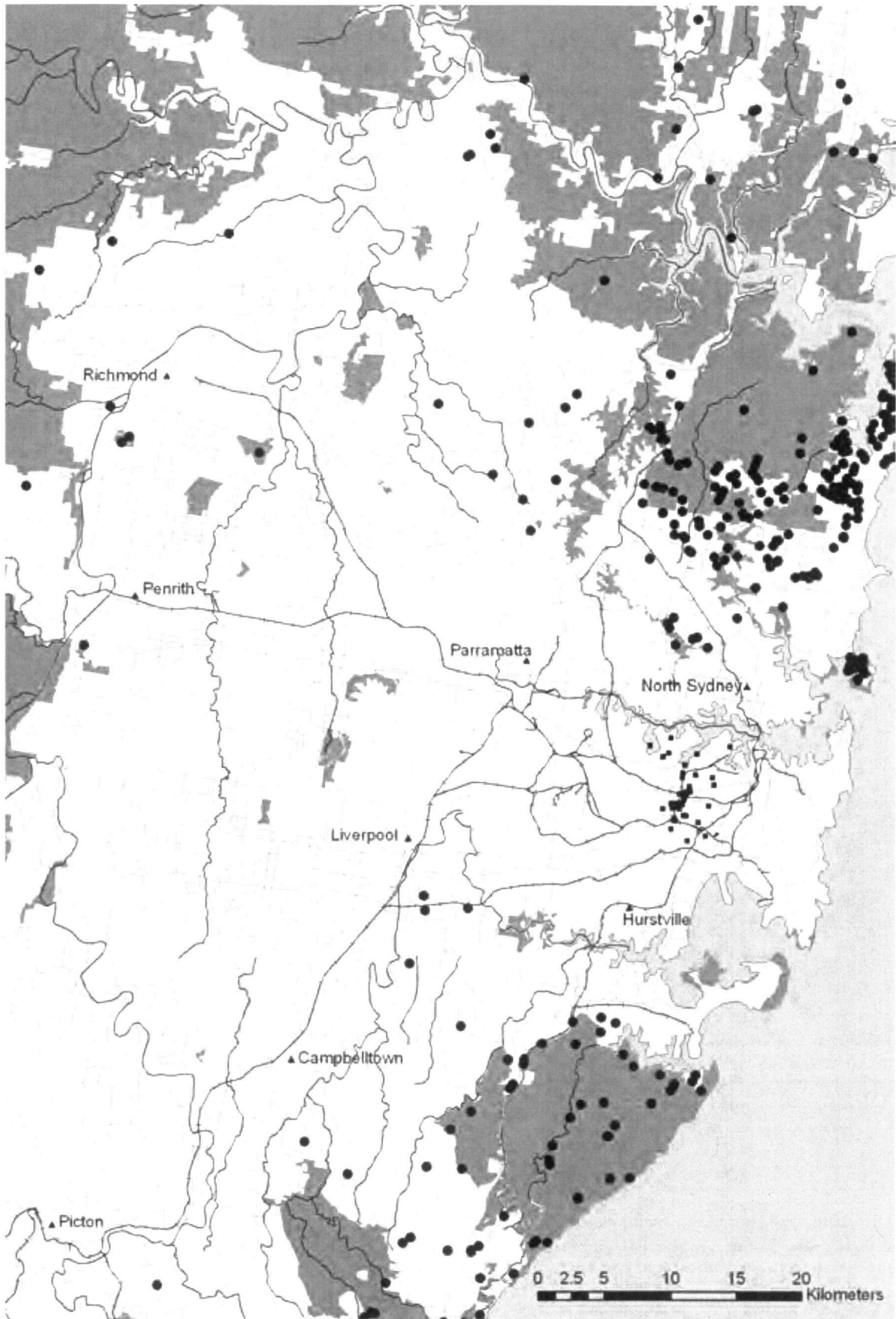


Figure 1. NPWS Wildlife Atlas records of long-nosed bandicoots around Sydney since 1988. Dark shaded areas represent protected areas. Pale grey lines represent major roads. Dark fine lines are major rivers and the lines with cross hair represents the rail line. Dots show Atlas records and squares show all records (diggings, public reports, sightings and radio-tracking) in the inner west.

We were therefore very surprised when, in October 2002, a report from a local resident resulted in the capture of an adult male long-nosed bandicoot in an urban backyard in Dulwich Hill, just off one of Sydney's major roads (New Canterbury Road). Despite removal of this individual from the backyard, fresh diggings appeared the next morning, suggesting that there was at least one other animal. We returned this bandicoot to the backyard and began investigations to try to determine the origins of these animals.

In 2003 we trapped and hair-tubed along the rail corridor at Dulwich Hill but caught only black rats *Rattus rattus* and house mice *Mus musculus*. We also issued a press release asking the public to inform us if they had any strange diggings in their backyards. On inspection, most of the initial reports from the public were found to be rat burrows (although a few we tentatively identified as possible diggings). We found no further traces of bandicoots until November 2006 when we received the first long-nosed bandicoot carcass killed by a car in Dulwich Hill. A series of dead animals turned up over the next 12 months in inner western Sydney. This paper presents the data we have to-date and describes the methods that we have used to try to determine whether or not there really is a population of bandicoots in the inner west.

## Methods

### Carcasses, public reports, and urban park survey for diggings

We collated all records (carcasses, trapped animals, public sightings, and results of a digging survey) of long-nosed bandicoot in the inner west made between 2002 and the present. This includes information forwarded from the public in response to two media releases (November 2002 and September 2007). Many of the reports from the public were of diggings, and these were difficult to confirm as the diggings were often no longer present when we inspected, and many that were still present turned out to be rat burrows. Descriptions of sightings made by residents of live animals were impossible to verify without photographs or carcasses, and many photos / carcasses that were available were of black rats. Nonetheless we have included possible sightings when we could not exclude them as rats.

In September 2007 we searched every local park and recreational area from the Cooks River to West Concord (Figure 2). The north-western boundary was chosen because we had an unconfirmed report of a small population of long-nosed bandicoots at the repatriation hospital on Major's / Yaralla Bay in the 1990s (J. Sanders, DECCW, pers. comm. 2007). We reasoned that if bandicoots had dispersed from that area, the parks, the water canal and the railway corridor would make a likely dispersal route. The southern boundary was chosen to incorporate another potential source area for animals - the Cooks River, which according to a local resident was once known to support bandicoots. We visited 88 urban parks and if they had shrub cover or other potential refuge areas (such as easy access to old buildings) they were searched on foot (a total of 50 parks) for signs of digging.

### Pilot radio-tracking study

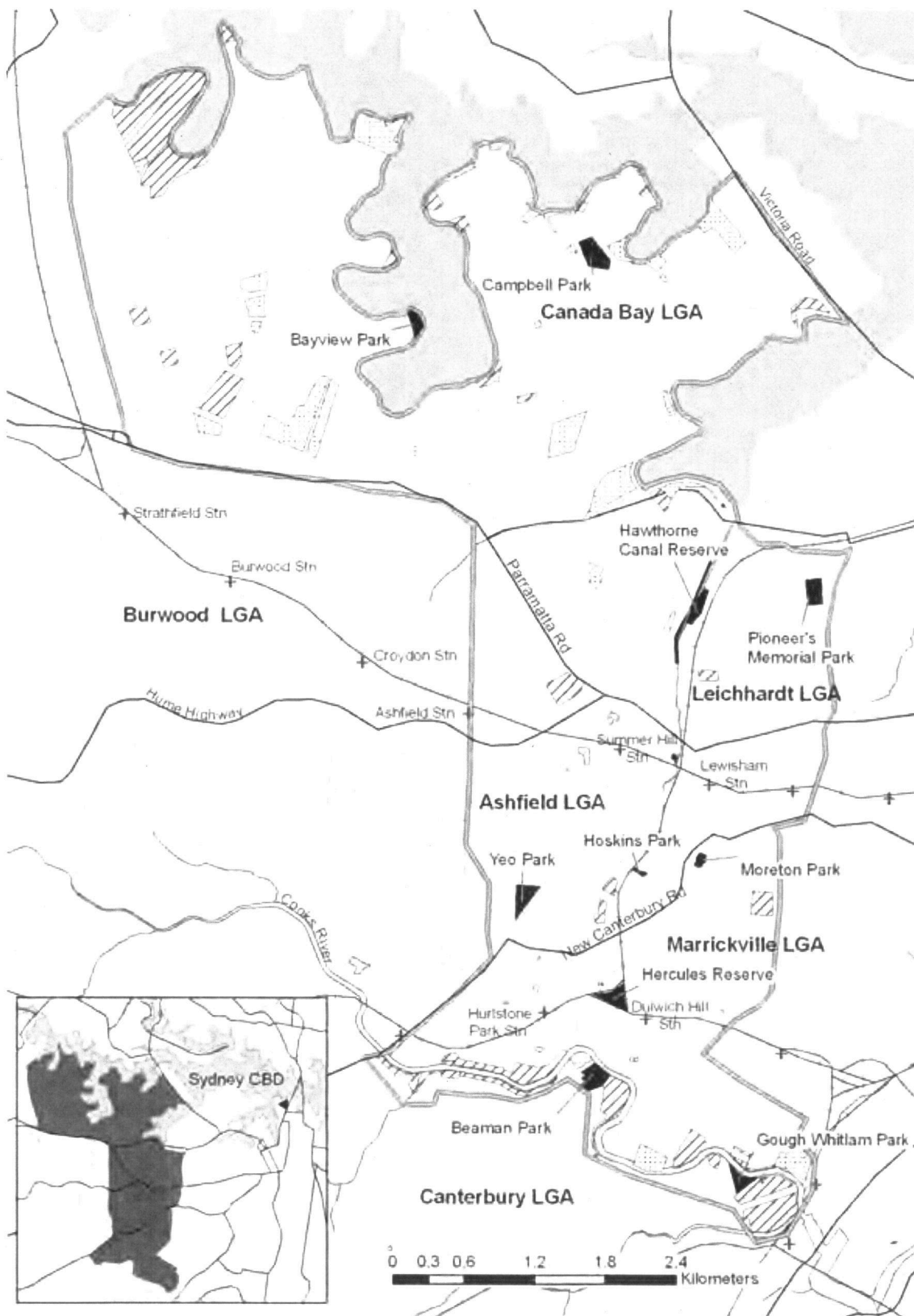
When we became aware of a small population of between four and seven animals on a church property in Lewisham, we fitted two adult females (weighing 990 g and 750 g) with tail-mounted radio-transmitters (Sirtrack two-stage transmitters, New Zealand), to gain insight into their activity and habitat use and to try to determine whether or not the rail corridor was an important foraging area. The transmitters weighed approximately 9.5 g, which represented <1% and 1.3% of the body weight of females 1 and 2 respectively and were attached using paper hypo-allergenic sports tape. Animals were tracked on foot during August and September 2007 using a Yagi three element antenna and either a TR-2 receiver (Telonics, Mesa, Arizona, USA) or an Australis 26k scanning receiver (Titley Electronics, Ballina, NSW). One animal was tracked for four nights (over a nine day period) before she dropped her transmitter, and the second female was tracked for four consecutive nights, and then intermittently for a further three nights and to her day-time nest a further eight times over the following three weeks. We obtained between five and nine fixes on these nights, and fixes were no less than one hour apart. Day-time nests were located on a total of five and 15 days for animals 1 and 2 respectively. This gave a total of 13 and 45 fixes (including the trap location) for females 1 and 2 respectively. Locations were triangulated from known points. We calculated the home range area for the single animal for which we had enough data (female 2) using both the fixed kernel method (KL) and minimum convex polygon (MCP) using Arc View 3.3 software (Environmental Systems Research Institute, Redlands, California, USA) and the Animal Movement SA Version 2 extension of ArcView (Hooge and Eichenlaub 1997). The 95%KL estimate was defined as the home range and the 50%KL was defined as the core usage area.

## Results

### Bodies, public reports and urban park survey for diggings

Figure 3 shows the locations of the live and dead bandicoots, and reports from the public. Seven live animals have been confirmed from trapping ( $n = 2$  adult + 1 sub-adult females; 2 adult males) with a further two individuals of unknown sex observed (all in the suburbs of Dulwich Hill and Lewisham). Seven dead adult/sub-adult bandicoots have been confirmed from the suburbs of Dulwich Hill (1 male + 2 decomposed of unknown sex), Lewisham (1 male + 1 female), Marrickville (1 male) and Five Dock (1 male). Two additional reports of dead bandicoots (Petersham - 1, Five Dock - 1) may represent double reporting of the carcasses we collected from these suburbs. The cause of death of the carcasses we examine were: vehicle impact (4), mauling by domestic dog in an urban backyard (1), and probably fox predation (although dogs or cats cannot be ruled out) (2). The reports from the public





**Figure 2.** Area searched for bandicoot diggings showing urban parks searched. The boundary of the search area is shown by a wide grey line. Diagonal hatching shows parks that were inspected on foot where no diggings were found. Stippled areas show those parks inspected from the vehicle and deemed not to have suitable habitat. Solid black shapes show parks in which "possible diggings" were found and are identified by name where known. Dashed grey lines show local government area boundaries. Solid black lines show major roads, grey solid lines show drainage and lines with cross hairs represent the rail line. The inset shows the search area in relation to the Sydney Central Business District (CBD).





**Figure 3.** Location of carcasses, live animals, and reports from the public. Solid circles indicate animals trapped or radio tracked (animals radio-tracked are shown by a single dot in the vicinity of the church property for simplicity). Crosses indicate bandicoot carcasses (solid crosses are confirmed records and open crosses are unconfirmed records). Squares indicate locations of diggings. Solid squares show parks where “possible” diggings were recorded by us, and open squares indicate reports of diggings from the public. The question marks indicate unconfirmed sightings reported by the general public. Dashed grey lines show local government area boundaries. Solid black lines show major roads, solid grey lines show drainage lines and lines with cross hairs are the rail line.

that appear likely to be bandicoot diggings or sightings have come mostly from the suburbs of Dulwich Hill (8), Marrickville (5), Petersham (10), Lewisham (3), Five Dock (3), and Annandale (2). There are also single reports from the suburbs of Leichhardt, Enmore, Tempe, Lilyfield and Balmain, but as the diggings were no longer present when we inspected, we were unable to confirm that these were not made by rats.

Table 1 shows the number of parks searched in each local government area. We observed pied currawongs *Strepera graculina* making "conical diggings" in loose mulch similar to bandicoot diggings. These "bandicoot-like" diggings were made if the pied currawong was successful in retrieving larvae with a single peck. Consequently we cannot say with certainty that the diggings we have observed are definitely bandicoot diggings, so we have labelled these as "possible" diggings. "Possible" diggings were recorded in 12 parks in five LGAs (Figure 2).

Collectively the reports from the public and the parks where "possible diggings" were recorded during survey cover an area of 3,209 ha (calculated as a minimum convex polygon) approximately 8.5 km by 6 km, in five LGAs. However, most of the records confirmed by live animals and carcasses (excluding the carcass at Five Dock) lie in a smaller core area of around 95 ha, (approximately 1.9 km by 1.1 km) lying within a single LGA - Marrickville.

#### Radio tracking

At the church property where the animals were trapped for radio-tracking, we discovered that at least two residents of the retirement village were leaving out food for the bandicoots. How this impacts the radio-tracking study is uncertain.

### Female 1

#### Nights 1 and 2

For the first two nights, female 1 remained in her nest, which was underneath an old hospital building on the church property. The nesting area was underneath a concrete staircase which she accessed through a crack approximately the size of half a brick. Underneath the staircase was open to a space that could be entered by us, except for the lowest step, which only had a small opening (roughly 30cm in length). The lowest step was essentially a hollow concrete rectangle and contained her nest, which was a shallow depression lined with shreds of vegetation.

#### Nights 3 to 5

On night 3 she foraged in the garden beds and lawns of the church property until 4:00am, at which time she was observed to cross the road and enter the garden of a Federation-aged house, under which she nested for the day. No radio-tracking was conducted for the next two nights.

#### Night 6 to 9

On the sixth night we were unable to find her at her last known location. After 4 hours of systematically searching the streets her signal was picked up in the yard of another Federation terrace approximately 420 m from her original location, and on the other side of the railway line. We inspected under the house the following day, and she appeared to be nesting in a crawl space that we could not access. While we were under the house the signal direction changed, indicating that she may have moved next door or into another inaccessible crawl space. Three days later the signal was still coming from that location, and we believe she dropped her transmitter in a space we could not reach. The transmitter was pulsing at 60 ppm rather than the 80 ppm that it should be pulsing at in motionless mode. We initially thought that this may have been an interference signal from an unidentified source; however the signal was no longer detected in March 2008 (when the battery would almost certainly have been flat).

In total, female 1 used three different nest sites under three buildings.

### Female 2

We tracked female 2 intermittently over a month, during which time she spent the majority of her time foraging in the church property (Figure 4). On several occasions she was active as early as 18:00, which was only half an hour after sunset. However, on some nights she either did not come out to forage or only foraged for an hour or two. This was often followed by a full night of foraging. She made three small excursions foraging in the backyards of different houses and a local park in adjacent streets (Figure 4).

Most days she nested under the same old hospital building in the church property as female 1, but in a different section. She also nested under at least three other old buildings of either Federation or 1930s age in adjacent streets. Her home range was estimated to be 2.7 ha and 1.47 ha using the MCP and 95%KL method respectively. The core usage area 50%KL was considerably smaller at 0.16 ha (Figure 4).

**Table 1.** Urban parks searched in each local government area for diggings.

Local Government Area	Parks have no suitable habitat	Parks checked but no diggings	Parks with "possible diggings"	Total number of parks checked
Ashfield	7	2	4*	13
Canada Bay	24	20	2	46
Canterbury	5	8	2	15
Leichhardt	0	1	2*	3
Marrickville	3	9	3	15

(Note: \* One park lies in two local government areas).

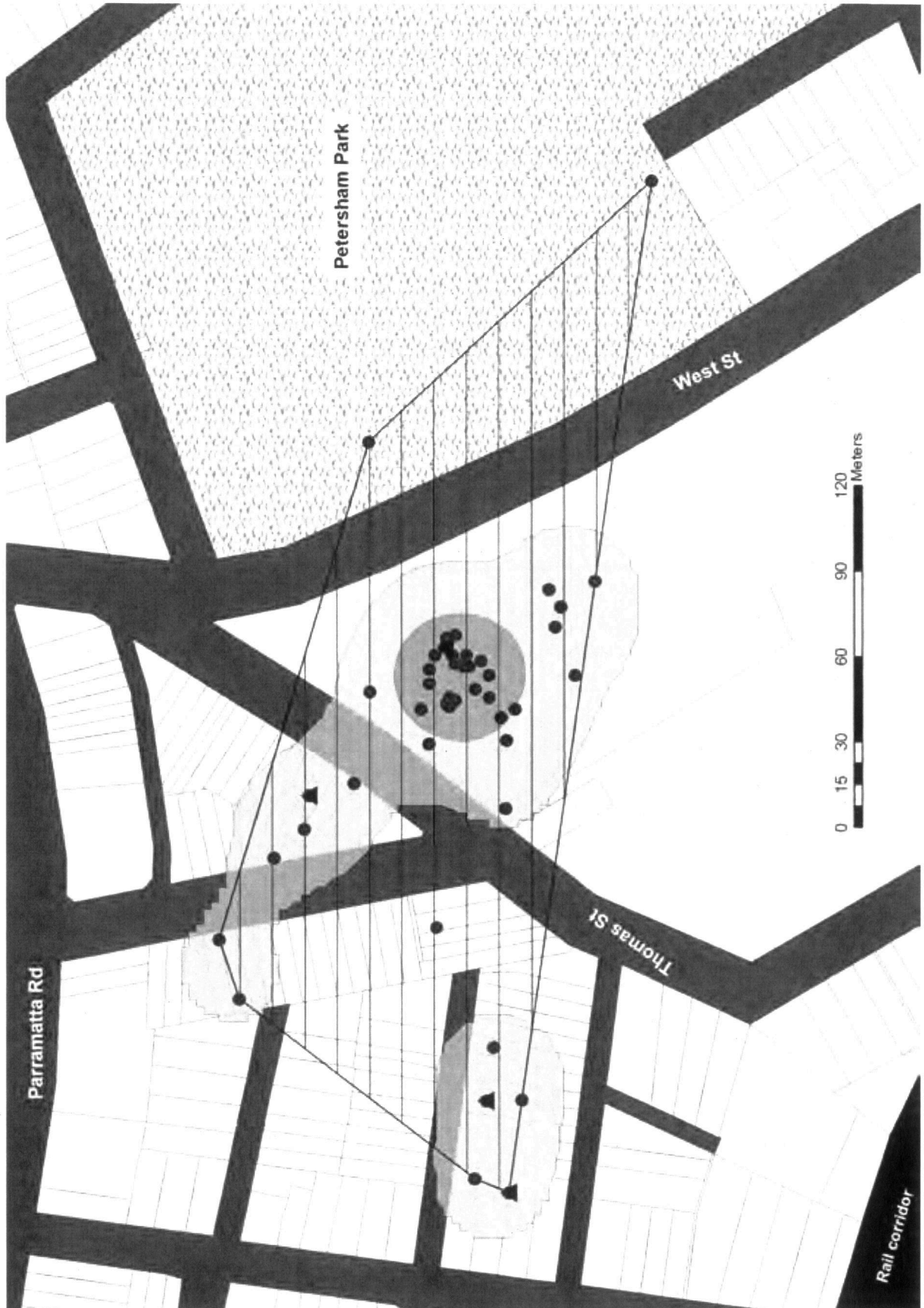


Figure 4. Radio-tracking fixes and home range of female 2. Solid circles show radio-tracking fixes of animals whilst active and triangles show nest sites. The diagonal hatched area shows home range area as a MCP. The light grey shaded area shows the KL95% and the dark grey area shows the KL50% (core use area).



We retrieved her shed transmitter from the main nest. This was the most frequently used nest and was in a crawl space, which she accessed via a small hole in the brick-work. The nesting area was in a relatively open sub-floor space, roughly 5 m wide by 10 m in length, filled with old building material and loose soil. The nest itself was underneath a piece of circular spongy-plastic-mesh, covered by loose dirt. One end of the mesh was embedded into the soil, while the other served as an entrance. A kidney-shaped scrape was dug underneath the mesh roughly 20 cm at its deepest and 25–30 cm at its longest and widest. In total she used four different nest sites during the 15 days that she was tracked to her nest.

## Discussion

Our radio-tracking study suggests that, like yuppies, these bandicoots seem to like old buildings in need of renovation. They appear to be foraging primarily in backyard gardens and urban parks, and we found no evidence from radio-tracking that these bandicoots are using areas such as the rail corridor for shelter or dispersal. We had initially hypothesised that the rail corridor would be important for nesting as they are the only places that had dense vegetative cover, which is preferentially used by bandicoots at North Head, even if comprised of introduced plant species (Chambers and Dickman 2002). Our preliminary radio-tracking data suggest that such cover may not be as important as we first thought, provided there are buildings that have external access (cracks and holes) to the sub-floor space. It also seems that they can find adequate food in urban backyards (possibly supplemented by food from local residents) and are not reliant on remnant vegetation for foraging. This is supported by the fact that all of the animals that we examined were heavy and appeared healthy (including those carcasses that we autopsied). The extensive use made of garden beds and grassed backyards by the animals radio-tracked is in keeping with microhabitat use at North Head where they preferentially and extensively used open grassed areas for foraging at night (Scott 1995, Scott *et al.* 1999).

Since the majority of the confirmed records are within 700 m of the rail corridor, its role in dispersal should not be discounted despite lack of evidence from radio-tracking and our trapping efforts. The rail corridor forms a relatively continuous strip of dense vegetation (albeit largely of weeds) which may provide a less hostile environment for dispersal, and the discovery of two dead bandicoots and signs of diggings (this study; AMBS 2007) suggest that at least some use is made of it.

The home range estimate for the single female for which we had enough data was similar (at least using the 95%KL method) to that found for long-nosed bandicoots at North Head ( $1.7 \pm 0.2$  ha) (Scott 1995, Scott *et al.* 1999). The core-use area was much smaller (0.16 ha), which may have been partly because at least two residents in the retirement village

were feeding meat to the bandicoots. Supplementary feeding often results in contraction of home ranges (Boutin 1990), although supplementary feeding of the southern brown bandicoot *Isodon obesulus* resulted in an expansion of home range (Broughton and Dickman 1991). Clearly, more animals need to be radio-tracked to determine whether the home range area and habitat use is representative of other long-nosed bandicoots within the inner west.

Since writing the first draft of this paper, the NSW Scientific Committee made the final determination listing the long-nosed bandicoot *Perameles nasuta* Geoffroy, 1804, in inner western Sydney as an endangered population (NSW Scientific Committee 2008). Under this determination, the population was defined as occurring within the Local Government Areas of Marrickville and Canada Bay, “with the likelihood that it also includes Canterbury, Ashfield and Leichhardt LGAs”. The primary reasons for this listing include the disjunct distribution of the animals in the inner west, the inferred number of mature individuals being low, and significant threats to the bandicoots resulting from existence in a highly urbanised environment (vehicle collisions, and predation by cats, dogs, and foxes).

## The origin of the inner west bandicoots and threats to the population

In total, we have confirmed seven dead animals and seven live animals. There is a number of possible explanations for the presence of these animals in the inner west. Firstly, they could represent animals dispersing from “good habitat” elsewhere into a “sink” where some animals may temporarily establish a territory (and perhaps even reproduce) before being killed (by cars, dogs, cats, foxes or rat poison). If this is true, it would suggest that the inner west long-nosed bandicoot population is not a self-sustaining population in the long-term and/ or that there is a larger population not too far away. However, we have been unable to determine the location of any source population. The nearest known populations are separated by the Georges River and Botany Bay to the south (Holsworthy Army Base – 19 km, and Royal National Park – 20 km); or separated by the Parramatta River or Sydney Harbour to the north (Lane Cove National Park – 11 km, and both North Head, Sydney Harbour National Park and Garrigal National Parks – 15 km); or are a long way west through extensive urban environments (Yarramundi – 53 km).

Yaralla / Major’s Bay, initially suggested as a possible source, did not reveal any signs of bandicoots during our searches. We did record “possible” diggings in two small parks on the Cooks River, but the area of diggings was not extensive, so it is unlikely that this is the location of a source population. Since our search we have received unconfirmed reports of diggings in Lilyfield and Balmain. We recommend that our search area be expanded to incorporate these areas, particularly Callan Park. The search area should also be expanded to include further east along the Cooks River, and further south along Wolli and



Bardwell Creeks. cursory searches of parts of Wolli Creek by the first author had yielded no signs of bandicoots and recent survey work there (Department of Environment and Climate Change 2008) found no signs of bandicoots.

The second explanation for the presence of these animals is that they are indeed part of a self-supporting population that is either newly established or a remnant population that has persisted from the 1950s in low numbers and has recently become more abundant (hence deaths of animals and diggings in backyards are more noticeable). It is clear from radio-tracking that bandicoots can find both shelter and adequate food in this area, and that most people were unaware when bandicoots were nesting under their homes, so it is possible that bandicoots could have remained undetected for many years. It is also possible that a remnant bandicoot population could have persisted at some of the industrial sites in the inner west (such as the flour mills and old warehouses) that have recently been re-developed as high density housing, and may have been pushed out as a consequence of these re-developments. For instance, the trapping of the first bandicoot in a backyard was not far from, or long after, the re-development of a flour mill complex in Dulwich Hill which lies adjacent to the rail corridor.

If long-nosed bandicoots have managed to persist in the inner west, it raises the question of why they have not been able to persist in outer western Sydney? This may relate to the differences in the scale and time frame of urban development in the two areas and the type of houses constructed. In the inner west, suburbs are characterised by a mix of different aged housing. Whole suburbs or large areas were not necessarily all developed at once, so vacant blocks may have been interspersed with houses for periods of time. In contrast, much of the outer west has been characterised by the development of entire new suburbs in a relatively short space of time. The prevalence of cement slabs and the lack of cracks or missing bricks which offer access to sub-floor spaces in the outer west may have meant that as suitable shelter (dense remnant vegetation) was lost there were no alternative sub-floor shelter opportunities available for bandicoots, unlike the inner western suburbs where sandstone footings and aging brickwork offer many opportunities for under-house access.

Another possible source for the inner west bandicoot population is that these animals have been released by a mischievous person, or inadvertently escaped from a wildlife carer. We have checked with all the major wildlife rescue and rehabilitation organisations in this area, and none report any escapes of bandicoots or in fact carers looking after bandicoots. We think that this is the least likely explanation since fourteen animals seems too many animals for a person to illegally obtain or inadvertently release, although it is theoretically possible that all of these bandicoots are offspring from a single pair.

Long-nosed bandicoots are extremely fecund. For example, at North Head around 85% of females breed each year and it has been estimated that

the 45 females could produce 197 young each six months, although juvenile mortality probably always exceeds 75% (Puddephatt and Miller 1996, Scott *et al.* 1999, Banks 2004). Juvenile bandicoots disperse widely from their mother's home range (Cockburn 1990) and long-range movements of re-introduced bandicoots have been recorded. For example, 85% of golden bandicoots *Isoodon auratus* dispersed up to 4 km within the first week of release (Christensen and Burrows 1994) and western barred bandicoots *Perameles bougainville* moved up to 4 km within one year of release (Richards 2006). It is therefore feasible that long-nosed bandicoot progeny from a single pair of animals could have dispersed over the 8.5 km x 6 km area of our records. One of the females that we radio-tracked had previously bred, but we do not know whether she bred where she was caught or elsewhere. The younger female although of adult size, had not yet bred and could have feasibly been her daughter. Residents of the church property report seeing an adult (which they presumed to be a female) with three offspring as early as Easter 2006.

Levels of mortality of animals in the inner west seem to be high (seven dead animals in a 12 month period). Unless there is a more secure source population, the prognosis for the inner west population is probably bleak. The endangered long-nosed bandicoot population at North Head sustains mortality from collision with vehicles of around 5.25 animals per six months (Banks 2004), although true adult mortality was considered double that since some animals may have crawled away from roads to die, and were consequently undetected. Long-nosed bandicoots at North Head have been found to be extremely sensitive to even small increases in mortality (e.g. 1, 4 and 6 additional deaths per annum increased the probabilities of the populations' extinction within 20 years from 10% to 15%, 24%, and 32% respectively) (Banks 2004). Mortality rates of 25% were enough to drive a population of 150 eastern barred bandicoot *Perameles gunnii* to rapid extinction at Hamilton (Minta *et al.* 1990, Clark *et al.* 1995).

There is no evidence that the inner west bandicoots are avoiding the busiest traffic periods to reduce the risk of vehicle collision – both reports from residents and our radio-tracking data show that the bandicoots are often active at or shortly after dusk in an extremely busy traffic area less than one block from Parramatta Road. Our radio-tracking data did show that on some nights the animals remained in the nest or only foraged for a few hours. This may be a predator avoidance strategy as the inner west and the church property where we radio-tracked in particular have high numbers of cats, some of which are feral. Maintaining these bandicoots may depend upon encouraging responsible pet ownership, particularly keeping cats and dogs in at night, and perhaps instigating traffic calming measures and signage to reduce the likelihood of death by vehicle impact. Banks (2004) found that increases in traffic flow and adult mortality would have a far greater impact on bandicoot persistence at North Head than would small changes in habitat area.



## Further research

Apart from what is reported here, we know nothing else about the animals living in the inner west. NSW Scientific Committee (2008) highlights the need for further research to determine the distribution of the population, and we have outlined above, additional areas that we recommend be searched for signs of bandicoots.

At present we have no idea whether there is a focal area for this population on publicly owned land, nor whether the vegetated rail corridor and water canals are of importance for foraging or dispersal. A more detailed understanding of the use of these areas is needed to determine whether measures other than those outlined above (e. g. traffic calming devices and responsible pet ownership) might be needed to ensure the conservation of the population. Given that the majority of records are on private property and the population appears to be at low density, obtaining an estimate of population size, distribution and more general habitat use is problematic. However, use of

automated digital infra-red surveillance cameras may provide some insight into the use of areas such as the rail corridor by bandicoots, having been successfully used to detect bandicoots in south-eastern Australia with scent attractants such as truffle oil (David Paull, UNSW@ADFA, pers. comm.). Use of these cameras may also aid verification of diggings in backyards and help to clarify the distribution of the population.

Lastly, we recommend that tissue samples (e.g. ear punches) be taken from any further animals located, to enable genetic studies to be undertaken. Such studies may help clarify how closely related the inner west population is to other more distant populations (e.g. the North Head endangered population) and also whether the animals are descended from a single pair.

We will continue to try to answer some of the questions raised here, and are seeking further information (including historical information) from the public about bandicoots in inner western Sydney. Any information should be forwarded to the first author.

## Acknowledgements

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from Marrickville Council for passing on additional sightings and digging reports to us, and Richard Wells for providing historical information on bandicoots in the inner west. The comments of two anonymous reviewers helped improve this paper and are gratefully acknowledged.

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# **ATTACHMENT B**

Council's Resolution

**IP1215 Item 3    SUBMISSION ON DRAFT PARRAMATTA ROAD URBAN  
TRANSFORMATION STRATEGY**

Public speakers:        Mark Ian Jones, Adele Cowie, Allyson Hecker, Kath Reynolds and  
                                 Susan McLean

**Motion:    (Woods/Ellsmore)**

THAT:

1.    the report be received and noted;
2.    Council rejects Urban Growth's present Parramatta Road redevelopment strategy and calls on the State Government to work collaboratively with Local Councils for genuine revitalisation of Parramatta Road;
3.    Council amends the draft submission as follows:
  - add the following under *Section 7 – Housing Affordability and Choice*:  
*Council has repeatedly called on the State Government to provide Council with the power to mandate affordable housing targets (inclusionary zoning) through its LEP or other mechanisms, as a key strategy to address the affordable housing crisis. It has also repeatedly called on the State Government to establish meaningful affordable housing targets for Sydney and that a target of 30% of affordable housing for urban growth projects is in line with targets established in other major capital cities such as London;*
  - delete the following sentence from Section 10.1 Taverners Hill (appearing on page 303 of the business paper): "*A much taller element could be located on Nos. 52-54 Old Canterbury Road where impacts are limited to the rail corridor*"; and
  - attach to Council's draft submission the document prepared by Mark Ian Jones and circulated at the meeting including the attached 'alternate proposal' and related drawings.

**Motion Carried**

**For Motion:**            Councillors Barbar, Brooks, Ellsmore, Gardiner, Haylen and Woods

**Against Motion:**      Councillors Hanna, Macri and Tyler

**Absent:**                 Councillor Leary



