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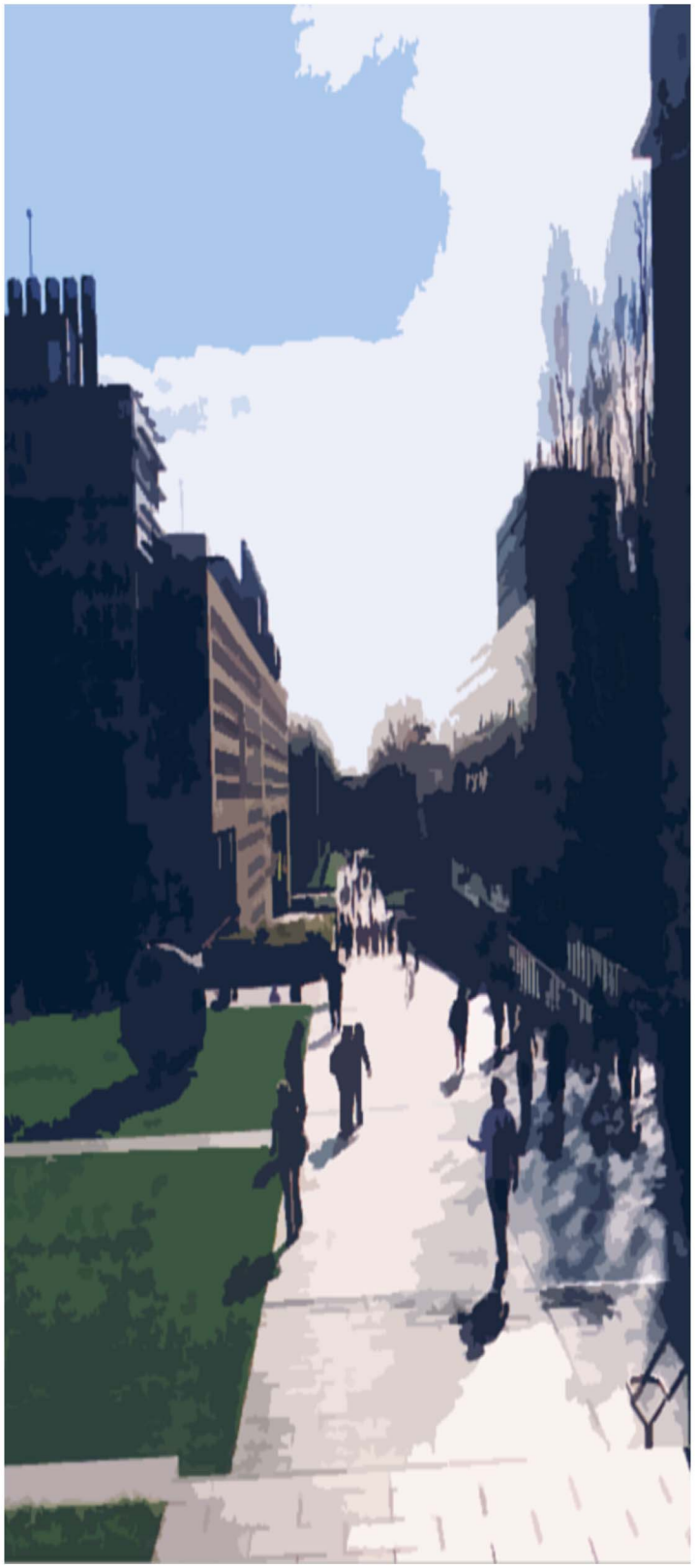


UNSW KENSINGTON CAMPUS 2020 MASTER PLAN

TRANSPORT STRATEGY

Draft 30 September 2005
Submission to Randwick Council

THE UNIVERSITY OF NEW SOUTH WALES

DEGW
planningmatters
Hill Thalis
Knox & Partners
Christopher Stapleton Consulting
Kathy Jones & Associates
People, Place & Partnerships
McLachlan Lister
Rubida Research

CAMPUS 2020
MASTER PLAN
TRANSPORTATION
STRATEGY REPORT

For the University of
New South Wales

May 2005

CHRISTOPHER STAPLETON CONSULTING Pty Ltd
3/1 THOMSON ST, DARLINGHURST, NSW 2010
Ph +61 2 9360 6788
stap@ozemail.com.au

CONTENT

TRANSPORTATION SUMMARY

1. University to adopt a sustainable transport policy reducing car dependence.

2. Parking for the University to be reduced by three percent per annum; primarily on local streets and later within the Campus; and varied with any expansion of the University.

3. The reduction in car dependence to be achieved through a combination of;
   - ❑ Reduction in parking supply
   - ❑ Public Transport upgrades
   - ❑ The location of University Accommodation
   - ❑ Parking charges
   - ❑ An interactive information system

Comments

The University is a place of excellence and leader of innovation in society.

The University is the largest single employer in the Eastern Suburbs and the largest generator for bus passengers in Sydney; it can achieve improvements by economies of scale.

The three percent figure is drawn from European experience, a small increment that is easily and often surreptitiously achieved in large Cities such as Copenhagen. It is also slightly greater than the typical growth in travel in greater Sydney and therefore represents a “no growth” policy for cars.

The local street clause is added to reassure both the residents and the staff that their needs will be met first.

The expansion clause is added to assure Council and the University that expansion will be addressed “as growth” and not disregarded.

TRANSPORTATION SUMMARY

4. University to seek agreement with Randwick Council

- ❑ To adopt the sustainable transport policy.
- ❑ To conduct an annual survey of travel to the University and meet annually to set the targets for the following year.
- ❑ To progressively introduce meters for short term parking in High Street, Anzac Parade and Day Avenue.
- ❑ To progressively introduce meters for long term on-street parking in selected surrounding streets including parts of High Street, Wansey Road and Willis Street.
- ❑ To progressively reduce the number of on-street spaces available for long term parking in all (other) primary residential streets.
- ❑ To cooperate in seeking and planning additional bus services to the Campus.
- ❑ To adopt a parking code for accommodation of Students on the campus and within 1.5km of the Campus based on existing car ownership.
- ❑ To increase the Campus parking charges for staff by 8% per year with a review in five years and possible further increase the annual fee thereafter.

Comments

The backbone of the policy is the agreement to measure the demand every year. This avoids subjectivism and focuses on the policies and cooperation.

We have outlined a (likely) scenario for On and Off Campus parking and used this to test the progressive reduction in parking supply, and hence some understanding of the way the discussion would change over the next ten years.

The streets mentioned for long and short term parking all contain sections with no residential frontage that are “available” for other uses, e.g. income for the council from parking for the University.

Interestingly, once the Council is earning an income from some/all local streets it is likely to want to keep some on-street parking for the University and hence in the longer term the University might find it can reduce on-campus parking or have some growth in the population with Council’s encouragement!

TRANSPORTATION SUMMARY

5. Surface parking within the Campus will continue to be relocated under new buildings or within structured car parks.

- New car parks to be constructed under new buildings in the Western Campus and in the Lower Campus (possibly also under new buildings) to bring the total new parking spaces to 300 spaces replacing most existing permit and reserved parking in the Lower and Western Campus.
- 100 short term parking spaces to be located in the Lower Campus over time as the main visitor parking area for the Campus.
- The possibility that, at some time in the future, and, dependent on the future growth of the University, the top deck of the existing car parks could be reused as sporting or other facilities.

Comments

The provision of additional parking spaces in the Lower and Western Campus at first appears to be at odds with the policy to reduce the total parking supply.

However parking is not evenly distributed over the Campus. The proposed new parking addresses the balance, is frugal and replaces the existing parking in the Lower Campus.

1. STATISTICS

1.1 STUDENTS

The peak accumulation of Students in attendance at any one time at the UNSW Randwick Campus in 2004 was approximately 16,755.

Statistics on Students (2004) – Ref APPENDIX 1 for Data Source and Method of Analysis

- Total number enrolled 37,292
- Total Bachelor/Diploma 24,013
- Remainder including Post Graduate 13,279
- Total Daily Attendance 26,259 *
- Peak Accumulation 16,755 *
- Arriving after peak 9,504 *
- Arrivals in the Peak Hour 11664 *

The peak accumulation of staff and students occurs at about 11:00 am.

* Estimated Number (Refer to Table 1, Appendix 2)

1.2 STAFF

The peak accumulation of Staff in attendance at any one time at the UNSW Randwick Campus in 2004 was approximately 4,695.

Statistics on Staff (2004) –Ref APPENDIX 1 for Data Source and Method of Analysis

- Total staff 5,837
- Total Academic 3,110
- Total Administration 2,727
- Total Daily Attendance 5,545 *
- Peak Accumulation 4,695 *
- Arriving after peak 850 *
- Arrivals in the Peak Hour 1811 *

* Estimated Number (Refer to Table 1, Appendix 2)

1.3 TRAVEL TASK

59% of students attending over the course of a day arrive by public transport (69% of the peak attendance), 19% walk (21% of the peak attendance). 33% of staff attending over the course of a day arrive by public transport. (With the same percentage for the peak attendance.)

Ref APPENDIX 1 for Data Source and Method of Analysis

During 2004 the peak accumulation of Staff and Students occurred on a Wednesday when the entire capacity of the parking stations was regularly set aside and used for staff parking. Figures for the peak accumulation are used to determine strategies for managing the travel demand to the University. Estimates of travel in the peak hour are provided for more general information.

Students attending the University at the time of peak accumulation are estimated to have arrived by the following mode: (Refer to Table 2, Appendix 2)

Walk	21%	3519
Bike	2%	335
Bus	31%	5194
Train & Bus	38%	6367
Car	8%	1340

Staff attending the University at the time of peak accumulation are estimated to have arrived by the following mode:

Walk	6%	263
Bike	1%	50
Bus	20%	941
Train & Bus	13%	628
Car	60%	2812

The travel mode of those arriving after the peak accumulation, consisting mostly of part - time students and staff, is different to peak accumulation. For example, it is estimated that 3,911 students arrive by car in the afternoon and evening, (~2000 at any time), a greater demand than for staff during the day.

1.4 ORIGIN OF TRIPS

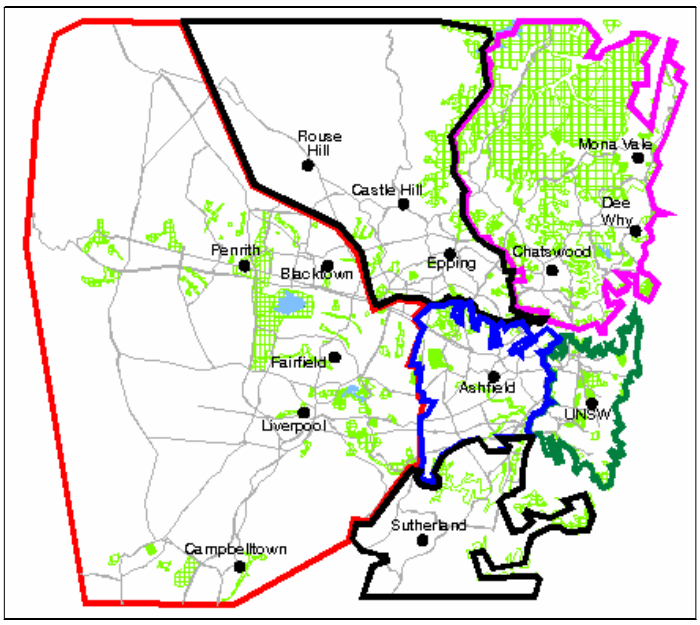
44% of students attending the University during a day live in the Eastern Suburbs; 56% do not.

Ref APPENDIX 1 for Data Source and Method of Analysis

The following distribution of the origin of trips was taken directly from University data bases.

Attending the University with Post Code in:

❑ Eastern Suburbs	Students 44.4%	Staff 48%
❑ Inner West	Students 14.3%	Staff 16.4%
❑ North	Students 14.6%	Staff 13.5%
❑ Sutherland	Students 7.3%	Staff 8.8%
❑ North West	Students 9.6%	Staff 6.4%
❑ West	Students 9.8%	Staff 6.9%



1.5 MODE OF ARRIVAL

Over 38.7% of Students live in areas that require travelling more than 800m to a station or bus routes.

Refer to APPENDIX 1 for Data Source and Method of Analysis

Refer to APPENDIX 3 for full description of Travel Mode by regions.

The following travel characteristics are drawn from Table 4(a) in Appendix 2

- For students located within 1km of the University, 4% use cars to the UNSW, 80% less than others living in the Eastern Suburbs; 77% walk.
- For students located 1 to 2km from the University, 11% use cars to the UNSW, 60% less than others living in the Eastern Suburbs; 30% walk.
- Students located 2 to 3 km from the University are three times more likely (9.5%) to use bikes than other students (3%).
- Students in the Eastern Suburbs who live near a bus route having 6 or more services per hour use buses (71.2%) fifty percent more than those who need to change buses (51%); this difference is transferred to car (19% and 31% respectively).

The following travel characteristics are drawn from Table 7 in Appendix 2

- 55.6% of students do not live in the Eastern Suburbs
- 23% of students live near a railway station, 32.6% of students do NOT live near a railway line.

The following travel characteristics are drawn from the section “Northern Suburbs Rail Accessibility Survey” in Appendix 2

- 22.1% of those living within 800m of Station use their car compared with 41.6% of those living over 800m of Station.

1.6 PARKING

1.6.1 PARKING IN LOCAL STREETS

1536 students or staff are estimated to park in the local streets surrounding the University. A further 100 vehicles are parked in local streets for the purpose of visiting the University.

Refer to APPENDIX 1 for Data Source and Method of Analysis
Refer to APPENDIX 4 for full description of parking survey.

The following travel characteristics are drawn from Table 1 in Appendix 4

- The area of local streets potentially available for parking for the University contains 2507 parking spaces.
    - 779 of these spaces are used at night, 647 are estimated to be used by residents
        - 339 of these spaces are used during the day by residents (289 in the Residential Parking Scheme Spaces and 50 in the Unrestricted spaces)
- There are 108 short term parking spaces in the area
    - 53 Spaces are located close to Randwick Shopping Centre or Kingsford shopping area and are used by shoppers; others are located close to Commercial uses and are used by commercial; 27 are located close to the University and used by visitors to the University.
- A residential parking scheme has been introduced on 587 spaces.
    - 35 spaces are probably used by residents and their visitors; (the other residents park in unrestricted spaces)
    - 228 spaces are generally used illegally by students.

- There are 1812 unrestricted parking spaces in the area:
  - 1258 are used by university students and some staff who arrive early and park close to the University thereby avoiding the parking fee.
  - 40 are used by university visitors.
  - 289 are used by residents
  - 80 are used by residential visitors
  - 95 are used by other commuter parking

- A review of spaces under Council's management: (Refer to Table 3 in Appendix 4) shows:
  - 1447 are located in residential streets with residential street frontage
  - 176 are located along kerbs with no active residential street frontage
    (1/2Barker St, 1/2Willis St and 1/2Wansey Rd)
  - 189 are located adjacent to the University
    (High St, Botany St and Day Ave).

Enforcement of the existing parking restrictions would force 228 University staff or students to seek alternative travel (or at least parking) options.

1.6.2 PARKING ON CAMPUS

The existing management system ensures the maximum number of vehicles is parked on the Campus at all times.
2728 staff and students are estimated to park on Campus during the peak period of the day.

Refer to APPENDIX 1 for Data Source and Method of Analysis
Refer to APPENDIX 4 for full description of Campus Parking Survey.

The following travel characteristics are drawn from Table 4 Appendix 2

The Campus parking supply consists of:

- Reserved Parking Spaces 275
  - Staff $404/a
- Disabled Parking Spaces 81
- Permit Parking Spaces 1891
  - Staff < $35000 Fee $ 150/a, > $35000 Fee $202/a,
  - PHD Students $150/a
  - Student $55/a (After 3:30pm parking only)
- Tickets & Permits Parking Spaces 365
  - (Not always available during mid-morning)
- Metered Parking Spaces 116
- Loading Zones 105
- Motorbike Spaces 20
- Set down Spaces 70 (not includes in further calculations)

The parking is provided in the following locations:

- Two parking stations:
  - The Barker Street parking station containing 652 Permit, 182 Metered & Permit and 52 Reserved spaces.
  - The Botany Street parking station containing 770 Permit, 183 Metered & Permit and 69 Reserved spaces

- Surface parking in the Lower Campus containing (including the 109 spaces removed for the new Law Building), 323 Permit, 71 Metered, and 86 Reserved spaces.
- Further surface parking in the Upper Campus accessed from High Street and Botany Street containing 282 spaces, and 42 spaces in the western campus accessed from Day Avenue.

Maximum Accumulation:

- The peak daily parking accumulation occurs between 10.00am and 12.00pm, referred to as the Mid Morning Peak.
- The peak demand varies, in a normally predictable manner, by day of the week.

The management of parking stations is achieved through monitoring demand: -

- The maximum number of staff parking spaces is accommodated by limiting access to metered parking in the parking stations. Public entry to metered spaces is closed down and made available for staff on a day by day basis.
- Metered parking is available to students and non permit holding staff after 12.00pm.
- Special permits are available for students to park in the permit area after 3:30pm.
- “Scratchies” are available to all Faculties for giving to visitors and others for casual parking in permit parking spaces.

1.6.3 SHORT TERM PARKING

(Refer to Table 3&4 in Appendix 4 and Tables 6 and 8 in Appendix 6)

There are 116 metered spaces on the Campus available at all times; 365 permits spaces are available in the Parking Stations after 12.00pm; and the majority of parking on the Campus is available for casual parking after 3:30pm and at weekends.

Short-term parking is required for visitors to the Campus. Apart from visitors to the faculties, administration and to the University facilities the campus contains a growing number of ancillary activities open to the public including Gym, Swimming Pool, Child Care etc.

During the majority of the day and at weekends there is ample parking for all short-term parking demand.

The parking duration varies from 10min for Child Care and drop off to classes at the swimming pool, to 1 hour and 2 hour duration for longer visits to the Gym, Swimming Pool or University.

These activities do not occur at the same time; -

- The Gym operates throughout the year and throughout the day and evening.
- The Swimming Pool operates throughout the year and throughout the day and evening; demand for lessons, requiring drop off/set down parking, is increasing.
- NIDA operates as part of the University during the day and has the occasional event in the evening and at weekends. Special classes are run during vacations requiring 2 hour parking.
- Child Care drop off and pick up occurs only for a short period in the morning and afternoon. The typical number of 5 minute parking spaces required for a child care centre is 10, however the University Child Care caters mostly for University staff who arrive at work with their children and do not necessarily

drop off by car, preferring to walk from their commuter parking spot. (Child Care staff are part of general staff and considered as part of the total staff number).

- University visitors fall into two groups, those who are strangers and will follow signs and those who know where they are going on the Campus and will try to park close to their destination. In some cases the closest parking that is available is on a local street, in particular High Street. Visitors complete with long term parking and resident's parking in all streets within 150m of the University including , Doncaster Avenue, Wansey Road and Botany Street.

The overlapping of activities results in a maximum estimated demand in the Mid Morning Peak for short term parking of 246 spaces consisting of: -

- Gym 17 spaces
- Swimming Pool 55 spaces
- University visitors 164 spaces
- NIDA 10 spaces

Of this demand 116 park in the metered parking spaces on the Campus (full capacity), approximately 30 park on-street immediately adjacent to the University, and approximately 100 park on other local streets, outside homes.

The University is currently seeking an additional 30 short term metered parking spaces in High Street.

Short-term parking on the campus is fully occupied in the Mid Morning Peak. After 12.00pm 365 metered (ticket) spaces become available in the two parking stations; 183 in Botany Street, 182 in Barker Street. The total short-term parking available On Campus in the afternoon increases to 481spaces (116+365 = 481), which is greater than the total demand. These spaces are not (or perhaps seldom) fully occupied indicating that even with spaces empty on the Campus a proportion of the demand continues to meet in local streets.

The remainder of the permit parking in the parking stations, excluding reserved parking, becomes available for general use after 3:30pm.

1.6.4 SPECIAL EVENTS

There are occasional Special Events on the Campus, such as a conference.

Major events are generally held during the vacation when parking is available.

Any event occurring during the semester that requires additional parking can usually be scheduled for a quiet day (Friday, Monday or Tuesday) when less staff parking occurs, or after 12.00pm when parking becomes available on the Campus.

For the few occasions when a special event is scheduled to occur on a Wednesday or Thursday morning the participants are advised that parking is not available on the Campus and they should use public transport; advice is given on public transport services.

Whilst the majority of participants will normally heed such advice there are still occasions when a surge of say 20 to 80 visitors seek long-term parking in the surrounding streets and compete with the students and staff and residents parking in those streets.

Putting this into perspective, even 100 extra vehicles on a peak day in the Mid Morning Peak is 8% of the typical peak daily demand.

It is recommended that a Parking Provision Plan be prepared by the University transport coordinator for all events occurring during the semester and the morning of a Wednesday or Thursday involving more than 200 attendances who are not part of the University.
This could involve notification of the lack of the provision of special events parking or allocation of parking spaces on Campus.

1.7 PUBLIC TRANSPORT SERVICES

245 Buses per hour serve the University in the peak hour of which 84 buses link the University to the Railway system at Central Station.

Refer to APPENDIX 3 for bus services map.

The University is served by 25 STA buses services, which include:

- The 891 Service runs express from Central Station to High Street
- 8 Services operate along Anzac Parade linking to the City (39X)
- 5 Services operate through Randwick linking to the City (37X)
- 7 Services operate through Randwick linking to Bondi (31X, 348,357,359)
- 2 Services operate link to the Inner Western Suburbs, (400/410, 370)
- 2 Services operate from Millers Point to Kingsford. (343,345)

The University is served by 245 buses in the peak hour.

- The 891 service operates 23 services per hour from Central
- 58 Services operate northbound along Anzac Parade
- 16 Services operate southbound along Anzac Parade
- 83 Services operate northbound through Randwick
- 26 Services operate southbound through Randwick
- The 400/410 Service operates 13 services per hour in each direction
- The 370 Service operates 6 services per hour in each direction

9,886 students and staff arrive by bus during the morning peak hour, a loading of 40 per bus. (Refer Table 6, Appendix 2)

2 ISSUES AND DIRECTIONS

2.1 LOCAL STREET MANAGEMENT

2.1.1 PARKING

Randwick City Council is planning to introduce a Residential Parking Scheme throughout Randwick.
On-street parking for the University demand (and provision) is likely to reduce from 1,636 spaces to 523 spaces in the next few years.

Refer to APPENDIX 4 for full description of parking survey.
Refer to Table 1 of APPENDIX 4 for listing of parking in local streets.

Randwick City Council is unlikely to seek to remove all University parking from local streets.

- There are 499 spaces that do not impact on residents in any way.
- There are already 322 spaces in the areas used for shopping, visiting commercial properties and these are unlikely to change.
- There are already 587 spaces allocated for a residential parking scheme allowing 2 hours for visitor parking.
- The majority of on street parking is currently unrestricted. These spaces are likely to be converted to the residential parking scheme or to provide additional landscape amenity and safety.
    - The total demand for on-street parking by residents during the day is estimated to be 339 plus 115 visitors.
    - Normal practice would allow 10% of spaces to be empty and available for new arrivals.
    - The total number of residential parking scheme spaces (587) therefore already exceeds the estimated residential plus residents' visitors demand. However, many streets are not included in the present scheme.
- A suitable landscape and safety program might replace 450 spaces.
- 603 spaces remain unallocated to any particular use and available for additional landscaping, to be empty and available for residents or to be income earning parking meters for long term and short term parking for the University.

2.1.2 TRAFFIC MANAGEMENT

Refer to Figure 1 in Appendix 5 for Diagrams.

Randwick City Council is seeking to reduce the impact of through traffic in Kensington.

Kensington

Randwick City Council is responding to requests from the residents of Kensington to remove through traffic from Eastern Avenue, Tunstall Avenue, and Day Avenue. A proportion of this traffic is seeking access to the University from Gardeners Road.

The State Government has announced the construction of south facing ramps from Gardeners Road to Southern Cross Drive; this will increase the demand from Gardeners Road to the University.

It is recommended the University endorse any plan that seeks to reduce University traffic using residential streets in Kensington – particularly, Eastern Avenue, and Tunstall Avenue.

Botany Street/High Street

The intersection of Botany Street and High Street experiences a short period of traffic congestion every morning as drivers from High Street seek to turn right into Botany Street and thence turn right into the Botany Street car park. This delays buses and creates bustle and hazard for pedestrians at this critical intersection.

It is recommended the University request that Council impose a No Right Turn from High Street to Botany Street for the period 8.30am to 9.00am.

The alternatives are; for the majority of traffic Anzac Parade/Alison Road/Botany Street, and, for regional traffic from Green Square, Todman Avenue/Anzac Parade/Barker Street /Botany Street.

2.2 PARKING IN THE LOWER CAMPUS

It is recommended the University continue with its policy to remove all long term surface parking from the Campus.

Disabled parking spaces and loading zones would continue to be located throughout the Campus.

The majority of the remaining surface parking on the Campus is located in small car parks accessed from High Street and in particular the Lower Campus accessed from Gate 2.

The issue of parking in the Lower Campus is complicated by the removal of 109 Permit spaces as part of the construction of the Law Building and the location of ancillary activities on Campus that are used by the public.

The proportion of staff located in the Lower Campus and Western Campus is small, possibly 10% of the total Campus population, and the two existing structured car parks are not conveniently located for casuals or staff working in the Lower Campus. It is important to maintain a proportion of parking in the Lower Campus.

The Lower Campus has the potential for redevelopment of faculties as well as ancillary facilities that are open to the public.

2.3 PUBLIC TRANSPORT

Refer to Appendix 2 for Travel Statistics, and also to Section 3 below.

Access by public transport to the University and in particular a connection to the heavy rail network is of major concern to the University.

21% of journeys currently made to the University have a choice of walking to the station and then making one transfer from the rail network to the bus connection. 22.1% of students and staff with this choice choose their car.

- An improvement in the connection from the railway to the University would make journeys for those living near railway stations more attractive and therefore reduce car journeys.

29.1% of journeys currently made to the University have a choice of a journey to a station that is not a convenient walk and then one transfer from the rail network to the bus. 41.6% of students and staff with this choice choose their car.

- An improvement in the link to the University would still leave the difficult link from home to the station and would still not be attractive to many car users.

Improving the connection between the heavy rail network and the University will improve the convenience of journeys for 21% of those travelling to the University. (22.1% travelling by car)

21.4% of journeys currently made to the University from the Eastern Suburbs entail waiting for a bus for less than 10 minutes. 24.7% of students and staff with this choice choose their car.

Providing access to High Frequency Buses for 30% more of the Metropolitan Area would improve the convenience of journeys for 13.3% of travel to the University.

18% of journeys currently made to the University from the Eastern Suburbs entail catching two buses and waiting once for less than 10min and then a second time for possibly more than 10 minutes. 43.3% of students and staff with this choice choose their car.

2.4 WALKING AND CYCLING

Cycling

The student travel survey (Refer Appendix 2) reports the highest proportion of Bike travel in the 2 to 3 kilometre range from the University (9.5%). This compares with 2.6% of journeys within 1 kilometre and 2.9% in the 1 to 2 kilometre range.

The 2 to 3 kilometre range includes areas of Waverley, Woollahra, Botany and the City of Sydney.

The current bike plan for Randwick (prepared in 1998, Refer to Figure 2 in Appendix 5) shows bike routes passing the University along: -

- Botany Street
- Harbourne Road,
- High Street,

These routes extend to the 2 kilometre range via (clockwise from the north): -

- Botany Street, north via Church Street to
  - Centennial Park and Paddington
  - Frenchmans Road and Waverley

There is no direct connection from High Street east towards Coogee

- Botany Street, east via Barker Street to
  - La Perouse Road and Coogee
  - Oberon Street and South Coogee

- Botany Street, south via Irvine Street to
  - Snape Street and Maroubra
  - East Gardens and Pagewood

- Harbourne Road, south to
  - Kingsford
  - Across Anzac Parade to Houston Road and Daceyville

There is no direct connection from Barker Street west to Doncaster Avenue or Houston Road.

- High Street west along Anzac Parade to
  - Doncaster Avenue and Kensington
  - Todman Avenue and Green Square

The Regional bike route form the City to Botany Bay has recently been completed and passes along Anzac Parade to Doncaster Avenue thence via Cottenham Avenue and Tresidder Avenue to Tunstall Avenue and Gardeners Road to Botany.

The current bike plan does not adequately address access to the University.

- There is no direct connection east towards Coogee or west to Lenthall Avenue and Green Square.

- The Kingsford roundabout is not bike friendly and bike routes divert from this direct connection south.

Consideration should be given to bike paths to the 3 kilometre range from the University.

Walking

Refer to Eastern Suburb Figures in Appendix 2 and see also Section 4.3.2 below.

Bus Stops create major pedestrian movement points of conflict between cars and pedestrians.

The main crossing on Anzac Parade is controlled by traffic lights.

Access from High Street is assisted by marked pedestrian crossings near Gate 1 or Gate 8, but these are not ideal and Jay-walking also occurs near Gate 9.

Major pedestrian access routes from Randwick via High Street, Kensington via Anzac Parade and Kingsford via Harbourne Road are not promoted or given any special treatment.

Walking is the preferred mode for journeys up to 2 kilometres from the University; this area extends to Queens Park, Coogee Beach and almost to East Gardens and Zetland. Consideration should be given to defined strong footpaths between these places and the University.

2.5 PARKING AFTER TWELVE

There is adequate parking available for all users on the Campus after 12:00pm. This is managed to progressively optimise the use of, and therefore income from, parking on the Campus.

The ratio between parking on and off the Campus will vary in relation to the reduction of spaces in local streets.

The Campus Parking Stations plus streets immediately adjacent to the Campus can accommodate all demands in the afternoon and at weekends.

The issue is managing the 2 to 3 hour parking in local streets required for residential visitors but used as well for University activities (e.g. Doncaster Avenue and NIDA). This is being addressed by the provision of short term parking in Anzac Parade and in the Western Campus (more convenient than Doncaster Avenue) and the residential parking scheme.

2.6 FORECASTING

The University does not operate to a plan of expansion and future student and staff numbers.

History would indicate that further expansion is likely but conversely recent developments have improved amenity and facilities within buildings rather than increase the numbers attending the University.

The extension of IT technology points the way to less rather than more need to visit the University outside lectures (Library, assignments). This is partly the reason the University is seeking to improve liveability on the Campus, incorporating more casual facilities, and a wider number and range of meeting spaces to encourage ongoing interdisciplinary meeting on Campus.

Considering a "continue as today" policy:

Using today's travel behaviour a 10% increase in parking requirements through expansion would require 273 staff and visitor parking spaces to be constructed at a cost of $3.3m plus attendant works to accommodate the additional traffic demands.

A reduction of 1,076 spaces in local streets currently used by staff and students would put further pressure on the construction of more parking at a cost in the range of $10m to $15m.

If these spaces were constructed on the Campus they would have the same fee structure. If the fees charged were greater than the existing fee, then it is understand that the Fringe Benefit Tax (FBT) might apply.

If these spaces were constructed outside the Campus or privatised and charged at market prices, FBT would apply to any difference with the fee on the Campus.

The aim of the transport strategy is to reduce car dependence and therefore eliminate the need for additional parking thereby saving upwards of $18m

3. TOWARDS A MANAGEMENT STRATEGY

3.1 SUSTAINABILITY

A 3% reduction in the parking supply per year will, over a period of 15 years, allow for the removal of all University parking on surrounding streets and at least a 5% increase in University activity. The total parking demand will reduce from 4364 to 2763 spaces by year 2020.

A 3% reduction in parking is manageable and sustainable.

- The average growth of car travel is 3% per annum. Therefore a 3% reduction to the University represents a "no growth" policy for the staff and students attending the University. (This assumes the staff and students would replace the 3% travel with more travel by car on other journeys during their day or at weekends).

The reduction of car dependency by 3 % per annum can be achieved through a combination of:

- Reduction of parking supply
- Public Transport upgrades
- The location of University Accommodation
- Parking Charges
- An interactive information system

The management structure must be flexible, responsive to change and transparent.

- The University is seeking to avoid sudden changes in fees for staff or students.
- Randwick City Council is seeking the rapid reduction in complaints from local residents and certainty in future negotiations with the University.

It is recommended the University seek an agreement with Randwick City Council for a combined target to reduce car travel by 3%/annum and to establihsh transport targets annually.

The University is in the unique position of knowing when and where travel is made to and from the University. This data can be gathered every year by a survey of 10% of staff and students, contacted by email. A pilot survey has been arranged. The data can be summarised for use in planning transport initiatives every year.

3.2 COORDINATION

Brokering an agreement between the University and Council will coordinate the efforts of both parties to:

- Increase walking and bike access through safer more defined links to the University.
- Reduce vehicular travel by increasing parking charges and reducing the availability of parking.
- Increase public transport patronage through improvements to the public transport services.
- Increase mixed-used development associated with the University and in particular University Accommodation

The Annual Travel Survey will bring transparency into the process, informing Council and the University on the annual progress of their policies.

It is recommended that the Sustainability Policy be reviewed at an annual meeting of the Council, University, and STA to set transport targets for the following year.

3.3 DISCUSSION

The recommended management strategy to reduce car dependency is a combination of strategies managed by the State Government, Randwick Council and the University.

The strategy to improve public transport involves the State Government and Randwick Council; reducing parking supply and increasing parking charges needs to be coordinated with Randwick Council; other strategies that can be adopted entirely by the University include the location of University accommodation and creating an interactive information system. These are described in Section 4.

The underlying background to this approach emerges from the current travel patterns to the University as found in the student travel data (Appendix 2). Travel patterns are a response to the given, existing, transport systems. There is a wide variation in the use of public transport and car to the University; based on the data, this is directly related to the alternatives facing each student and staff member on their journey to the University.

As many as 83% of students chose to travel by public transport to the University from some parts of Sydney, which only 64% chose public transport for trips to the University from other parts of Sydney.

Transportation planning is about providing a combination of systems that result in travellers choosing the cheapest most convenient alternative that has the least impact on others.

Increasing public transport services in areas where the current use is low will increase use, possibly to the same level as in the best areas. Improving public transport will change travel behaviour without the need for further actions such as restricting parking; some drivers will simply choose to use the new service in preference to their current use of a car. Parking can simply be removed because it is no longer used.

Increasing or introducing a parking fee also changes the balance between public transport and the use of cars. Even a small increase in fees will increase the proportion of journeys using public transport (while a fare rise would reduce the use of public transport).

Increased parking charges and improved public transport are both incentives to users – drivers will change their behaviour voluntarily and as a result there would be fewer vehicles on the local roads and less parking intrusion into local streets.

Time is also a factor in choice of mode – although the fact that 28.1% walk to the University when living 1 to 2 km from the University illustrates that the value of time varies between people in this case students in the mainstream of population behaviour. Nevertheless, the example of difference in the use of public transport on the North Shore illustrates how a different travel time has a significant impact on modal choice.

Providing a separate Right of Way for public transport with, say, a direct link between the University and Central, Redfern or Green Square; or adding a new metro or rail link, would reduce the time taken to get from the existing rail network to the University. The current 891 bus leaves Central Station every two minutes in the peak period and is reasonably reliable (but crowded and old). A new reliable Heavy Rail service might provide a 15-minute headway with an average waiting time of 7.5 minutes. Therefore the new service would need to be 5.5 minutes quicker than the existing time on the Bus to attract users. The extension of the Bondi service could not compete if a transfer was required at Central.

A metro operating with a 3 minutes headway along Anzac Parade would be more competitive, but how long would the transfer take at Central or elsewhere, and ould this be quicker than to buses in Elizabeth Street are close to the suburban platforms?

> [Metro is defined here as a railway as in Paris or London. Metro has its own Right of Way, small carriages and a lighter gauge rail line (Often confused with Light Rail Trams and why the larger train are called Heavy Rail). Metro can operate at a 90-second headway performs tighter corners and the length of the platform is defined by the number of carriages in each set (4 to 8).]

Convenience and comfort play a small part in modal choice.

Consideration of a new link to the University concentrates, as has just been discussed, on the University end of the journey. Only 23% of staff and students live near railway

lines (Refer to Tables 7 in Appendix 2). These potential users can walk to the nearest station in 1 to 8 minutes. But 40% of staff and students live in parts of Sydney that have no direct bus to the University and away from a railway station (Refer to Tables 3 and 7 in Appendix 2). These potential users need a feeder bus, lift to the station or drive to the station and park, adding about 10 to 25 minutes to their journey, just to get to the station.

Even faced with this choice some 57.2% of students still choose public transport (Refer to Northern Suburbs Rail Accessibility Survey in Appendix 2), while the remainder drive to the University.

A direct bus service through these areas operating to the University every ten minutes would reduce the difference in travel time by more than 10 to 25 minutes, better competition than a new link from Central. (The difference in time will vary. Routes on congested roads will be slower than the rail option and less or not at all competitive; typical road travel with selected priorities might also be slower overall; and some routes will be shorter than the rail option increasing their competitiveness).

This is another illustration of a persuasive measure to change travel behaviour rather than a restrictive measure.

The recommended strategy proposes a public transport strategy that will reduce car use by at least 858 vehicles; this is 7.5 years of 3% reduction per year.

The location of University accommodation also has the potential to reduce car use by 128 vehicles, one year of 3% reduction.

The increase in parking fees only needs to reduce car use by 703 vehicles, the equivalent of 6 years of 3% reduction per year.

This is a more palatable approach than relying solely on parking fees or simply the removal of parking. It is more equitable to approach the reduction of car travel in a holistic manner that addresses the different alternatives given to each traveller.

4 STRATEGIES TO REDUCE CAR DEPENDENCY

4.1 SUMMARY

The recommended management strategy to reduce car dependency is a combination of strategies managed by Council and the University. The attributes of each strategy are expanded below.

A	Reduce Parking on Local Streets. Restrictive Refer to 4.2 and 4.3	Must be achieved to satisfy Council ○ Low Cost ○ Residents satisfied ○ Students maybe forced to public transport ○ Private parking could be built ○ University Staff mostly unaffected
B	Improve walking / biking and place Image Refer to 4.3 and 4.8	Sustainable ○ Extension of Council's program ○ Funding from parking charges ○ High profile of sustainability
C	Build more parking stations Permissive	Not Sustainable - Rejected ○ High Cost ○ Against Council's sustainability Policy ○ Is needed in Lower Campus to complete no surface parking policy.
D	Increase Parking Charges. Economic Refer to 4.4	Slow increase will gradually change behaviour ○ Low increase probably acceptable ○ High increase unpopular ○ Very high increase puts pressure on students isolated from public transport.
E	Construct new public transport State Initiative Refer to 4.5	Long term and sustainable ○ High public cost ○ Outside current investment practice ○ Initial not as effective as New Public transport routes

F	Improve public transport Persuasive Refer to 4.6	Sustainable ○ Low cost ○ Requires coordinated approach from Council and University. ○ Acceptable to Staff and Students ○ Will change behaviour without pressure
G	Information System Inclusive Refer to 4.7	Mix of persuasive and social responsibility. ○ Part of ongoing program, no construction costs. ○ Achievable with increased funding within the University
H	Construct new Accommodation Rational Refer to 4.8	Short to medium term ○ Part of ongoing program, no change in funding ○ Achievable by University ○ Council can assist by reducing parking requirements

Building more parking stations is rejected and not discussed further.

4.2 PARKING

The management of on-street parking is a significant part of the process of ameliorating resident's concerns as well as reducing car dependency. (Refer to 4.2.1 below)

The recommended strategy for On-Street parking is: -

- To remove all University parking from outside homes.
- To introduce metered parking for all local streets adjacent to the University that do not have residential frontage.

A full residential parking scheme, with empty spaces, could be realised within 2 years. (See Section 5 below)

The management of Campus parking should respond to on street parking and be coordinated to reduce the parking supply in an executable and logical manner with no major changes occurring in any one year. (Refer to 4.2.2 below)

The recommended parking strategy for the Campus is: -

- To maintain the provision of Disabled Parking and Loading Zones throughout the Campus.
- To continue to remove surface parking from the Campus.
- To locate a total of 300 parking spaces under new buildings in the Lower Campus and the Western Campus.
- To concentrate 100 metered parking for visitors as surface parking accessed from Gate 2.
- To introduce metered parking available at all time of the day into the parking stations.
- To introduce parking permits for students to park on the Campus.

4.2.1 ON STREET PARKING

A plan of management for on-street parking proposes that the 2507 spaces within the area of the University to be reassigned in the long term to: -

❑ Residential Parking Scheme	955 spaces
❑ Amenities and safety	450 spaces
❑ University Street Parking – non residential	499 spaces
❑ Flexible use	603 spaces

The logic to this strategy is: -

- The 955 spaces defined for the Residential Parking Scheme meet all normal practices for the design of a Residential Parking Scheme, discussed immediately below. The Residential Parking Scheme can be increased using some Flexible spaces.

- The Amenity and Safety component is added on an assumption that the residents and Council would prefer to see some spaces not needed for residential parking given over to landscape and management to improve the amenity and safety in local streets. This is an opportunity to do this and possibly fund the program (See Section 5 for funding).
- The University street parking is included because these spaces do not directly affect residents - assuming the residents have a Residential Parking Scheme – and as a source of income to Council for funding residential amenity. These 499 spaces can be conveniently included in the total future parking requirement for the sustainable 3% reduce in demand for the University.
- The Flexible use category illustrates that 25% of the existing parking spaces are available for some 'other' use. This is the spare capacity even with a generous Residential Parking Scheme, generous and affordable Amenity and Safety plans and accommodating some University uses. Some of these 603 spaces, that are located outside resident's houses, could be empty ('No Standing' or an extension of the Residential Parking Scheme); some could be landscaped; and it is suggested in Section 5 that perhaps some could temporarily be used for long-term metered parking to increase revenue. The revenue option would need to be contained by the sustainability policy, e.g. they should not be converted for long-term parking that provides more parking than is necessary in the area.

Considering each element in more detail: -

Residential Parking Scheme

It is recommended that the University and Council reach an agreement for the provision of a Residential Parking Scheme (Permits and 2 hours limits for visitors on each local street and the reduction of long term parking in all other local streets) Section 94 Plan not withstanding.

The parking surveys (Refer to Appendix 4) identify an actual measured demand for some 339 resident vehicles to be parked on local streets during the day; the remaining residents park in driveways and garages, partly under pressure from the lack of availability of on-street parking. During the late afternoon/evening the resident demand is estimated to increase to 647 vehicles (Refer Table 2 of Appendix 4). The mid day demand will no doubt increase as the Residential Parking Scheme becomes available in more streets and as spaces are seen to be available and convenient for residents.

Of major concern to residents is the lack of visitor parking in the area. The typical demand for visitors and tradesmen to households is one space per 0.12 dwellings and the visitor demand is therefore in the vicinity of 115 vehicles at any one time.

The Residential Parking Scheme allows short term parking and will continue to accommodate short term parking for retailing, (adjacent to Randwick and Kingsford 203 spaces), and short term parking for local commercial activities (119 spaces).

These users require short-term parking and will continue to compete for spaces in the Residential Parking Scheme. The way to avoid conflict is to provide the number of spaces in a Residential Parking Scheme that will accommodate all short-term parking plus all residential parking plus 10% of empty spaces.

The provision of 10% empty spaces is a standard design procedure for car parks and indeed was used by Christopher Stapleton Consulting in advising Randwick Council on parking for the Randwick Town Centre in 2000.

The proposal for the Residential Parking Scheme is therefore a combination of all short-term parking plus resident parking plus visitor plus 10% or 81 spaces. This is still only 40% of the total capacity of the road space.

Tables 1,2 and 3 in Appendix 6 illustrate the manner in which the existing residential spaces could change use and how quickly this could be achieved.

The influence of the University in the Residential Parking Scheme depends firstly on the enforcement of a 2 hour limit to remove day time parking, and secondly on availability and charges to keep University visitors within the bounds of the University.

Visitors to the University who are staying two hours or less will have the option of: -

- Parking within a Residential Parking Scheme area and walking to the University;
- Parking in the streets close to the University defined as part of the "University parking streets" with a parking fee and a shorter walk, or
- Parking more cheaply in the University.

Most will choose the University but some visitor demand might still occur in unmetered Residential Parking Scheme spaces close to Wansey Road, but this would be no more or less than the retail parking occurring just north of Botany Street.

Amenities and safety

Landscaping at intersections and mid block in the local streets will improve amenity and safety for pedestrians.

It is recommended that the University and Council reach an agreement for the provision of an Amenity and Safety Program on local streets.

The estimated 450 spaces required for an Amenity and Safety Program is drawn from a pilot study (Appendix 7, Pilot Study for the Management of Local Streets) of an area near Barker Street that identified corners and places where an amenity/safety measures might be appropriate. A public participation program might vary this.

This reduction in parking supply could be implemented with a 3% per annum reduction within 5 years. (Refer to Appendix 6). The total cost of such measures would likely be over 1 million dollars.

University Parking on Streets

The following streets have been identified as being immediately adjacent to the University and suitable for use by the University (See Table 3 in Appendix 4).

- Anzac Parade between High Street and Barker Street (81 spaces with peak hour restrictions)
- High Street north kerb between Anzac Parade and Wansey Road (76 spaces)

  High Street south kerb between Anzac Parade and Botany Street (112 spaces, of which 36 spaces are peak hour restricted)
- Wansey Road west kerb between Alison Road and High Street (83 spaces)
- Day Avenue north kerb between Anzac Parade and Doncaster Avenue (20 spaces)
- Barker Street north kerb between Anzac Parade and Willis Street (64 spaces)
- Botany Street west kerb between High Street and Oval Lane (34 spaces, including 17 spaces with peak hour restriction)
- Willis Street west kerb between Barker Street and Oval Lane (29 spaces)

It is recommended that an agreement be made on which streets will remain for use by visitors staff and students to the University.

It is recommended that metered parking be progressively introduced in these streets in conjunction with the management of local residential streets.

It is recommended this be a mix of short term parking for visitors to the University and long term meters for students. The mix would be agreed annually.

4.2.2 REMOVAL OF SURFACE PARKING ON THE CAMPUS

Refer to Figure 3 in Appendix 5.

The removal of surface parking must be assessed in a practical manner.

Of the 803 spaces currently remaining as surface parking:

- 64 are disabled spaces that are probably in their best position.
- 59 are in small nooks and crannies on driveways that also serve loading docks. Their removal would not improve the amenity of the Campus or substantially reduce traffic at any one entrance and would be resisted, they should remain in the medium term.
- New parking stations are recommended in the Lower Campus and Western Campus to accommodate 300 permit holders during Mid Morning Peak and casual metered parking at other times.
- 100 Metered spaces are recommended for short term parking in the Lower Campus accessed from Gate 2. These spaces can be located as surface parking - in a new entry – or in parking stations.
- The remaining 280 spaces are to be relocated into the existing Parking Stations as spaces become available from the reduction in parking demand. 95 of these spaces will be metered short-term parking permanently open for use by visitors. The remaining 185 spaces will be relocated permit and reserved parking spaces.

The key elements of removing surface parking are:-

- Rearranging almost the entire parking of the Lower Campus and the Western Campus including the provision of parking under buildings in the Western Campus and Lower Campus (North) to accommodate 300 parking spaces of which between 80 and 200 spaces to be located in the Western Campus. (The reason for the range is to allow flexibility in the design of the car park under a future, as yet undesigned building. Throughout the continuing text this is simplified to one number, 100 spaces).

- The provision of significant passive/active open spaces or for new building
  - East of Gate 9 – 34 spaces removed
  - In front of the Botany Street Parking Station – 106 spaces removed
  - Between High Street and the Library Lawn at Gate 8 – 72 spaces removed

The schedule for the removal of surface parking is discussed in Section 5.

4.2.3 SHORT TERM PARKING

It is recommended that short-term parking be relocated to maximise the use of parking on the Campus.
It is recommended that Short-term parking on the Campus be provided to a level that maintains 10% of the spaces empty (available for parking turn over).

The current estimates for the total short-term parking demand for the University is the current demand of 246 plus 25 (10%) empty spaces, a total of 271 spaces.

It is assumed that whatever level of parking is provided on Campus, 30 visitors will use streets surrounding the University and 24 visitors will park in local streets (eventually as short term parking in the Residential Parking Scheme).

It is recommended that with the completion of the 100 metered spaces in the Lower Campus : -

- The total metered parking on Campus be 217 spaces.
- The use of short-term parking be reviewed annually and the distribution of the total parking supply between short-term parking and long-term parking on the University and between Campus and on-street parking be determined to satisfy the contemporary demand – allowing 10% of spaces to be empty.

4.3 LOCAL ACCESS

4.3.1 Pedestrian Access

Pedestrian activity is dominated by those arriving by bus.

The main entry is from Anzac Parade; this is closely followed by the entry at Gate 9 from High Street that is served directly by buses and provides pedestrian access from Randwick and the buses that serve Randwick. Two stops are in High Street.

The internal circulation of the Campus is to be uplifted, made more legible, safer and more active at night and with a growing number of 12-15 hour activities. The internal layout of the Campus will be "urbanised" or made more social through Hubs linked together by walkaways with better lighting and security at night. These actions should spread demand more though the day and evening. Ancillary activities are likely to increase; the University could possibly move towards being a Campus that is part of the City rather than a separate entity.

The Campus is currently served by 4 bus stops; one is on Anzac Parade, and three are on High Street t; some students also walk to additional transport stops in Randwick. These bus stops will be used at night and should be open up for surveillance and security. This may require moving the bus stops as the paths are improved in the Campus. The length of High Street requires better surveillance. (Figure 6 in Appendix 5 indicates concepts for how this could be achieved.)

A major part of this is the creation of a University walk parallel to the Mall passing through the Union area to the Library. This will become a second major east west link connecting directly to Anzac Parade creating two points of access to the University, the new link possibly being stronger than the existing Mall. (See Figure 4 in Appendix 5)

It is recommended that the dual pedestrian entry into the Campus from Anzac Parade is made legible by two pedestrian crossings, one at each end of bus stops.

Refer to Figure 6 in Appendix 5

The exact length of the bus stops and therefore distance between crossings is to be determined as part of a comprehensive plan.

Urban design is also concentrating on access from Randwick at Botany Street. This access will be defined by an icon building. There is an opportunity to make the roadway outside Gate 9 as part of the University experience. Again this would be achieved as part of a comprehensive plan for the Michael Birt gardens and a new building. There is also the opportunity to make the journey up to Randwick a progression of activities rather than a suburban experience.

The two bus stops in High Street are not well defined and do not provide any legibility within the University.

It is recommended that the urban design features such as paving and extended pedestrian crossings are introduced at the bus stops in High Street and that the axis from these stops be strengthened, signposted, and illuminated.

It is recommended that the Campus parking at Gate 8 be replaced by an activity that is activate in the evening, and facing a well illuminated bus stop in High Street.

It is recommended that the redesign of Gate 2 and its immediate surroundings include an activity open in the evening facing a bus stop in High Street.

All recommendations above refer to Figure 6 in Appendix 5

4.3.2 Bike Access

Bike access is disjointed and uncoordinated.

It is recommended that bikeways within three kilometres of the University be reviewed with the appropriate Councils with the aim of providing more direct access to the University.

The funding for local improvements in say High Street, Anzac Parade, Harbourne Street and Botany Street could be sourced from parking charges (See Section 5).

It is recommended that bike racks continue to be placed where a demand occurs at a rate of at least 80 spaces per annum for the next five years; that lockable bike cages be located near Gates 2,8 and 14, and that showers be available for cyclists arriving at University, possibly in the Gym.

4.3.3 Vehicular Access

The transport management concept includes: -

Gate 2 in High Street becomes the address for all visitors arriving by vehicle and contains the majority of short term metered parking.

Those in the know might proceed directly to the parking stations in Botany Street or Barker Street but all signage is to Gate 2.

Signs at Gates 2, 11 and 14 advise visitors that visitor parking is (or is not) available giving alternatives that might be available. The first priority for alternate parking is another car park or Gate 2, while the second option is parking on High Street.

It is recommended that with the exception of the proposed No Right Turn from High Street to Botany Street for part of the morning that no further traffic capacity management measures be considered for the University.

4.4 INCREASED PARKING CHARGES

The intention of additional parking charges is to direct parking from the surrounding streets into the Campus and to supplement the public transport strategy in reducing the total parking demand by 3% per annum.

The 3% sustainable policy for the University will, over the next 15 years, reduce the maximum parking demand for the University from 4364 spaces to 2763 spaces (Refer Table 4, Appendix 6), this includes on street parking used by those visiting, studying and working in the Campus.

The dwindling supply of parking allocated for the University will be shared by staff, students and visitors. The management strategy is discussed in Section 5.

The current staff parking changes ($202/annum for most staff or less than one dollar a day in the semester, even less for the majority of full time staff) have only a marginal impact on the choice of mode to the University. Many staff having access to a car during the day will drive to the University. Nevertheless 30% of staff do not drive to the University and choose to use public transport indicating that good public transport is offering a competitive alternative for some staff.

Students are not permitted to park within the University during the Mid Morning Peak but permits are available for use after 3:30pm. The choice for Students travelling to the

University during the day is also not determined by parking charges but by the availability of parking in the surrounding streets.

The rapid removal of all University parking on local streets would create a demand for the provision of parking for students. The contemporary approach to this might be to allow private parking stations to be built off the Campus or additional parking in the Campus. However the 3% policy for reducing car travel per annum will quickly (12 to 15 years) lead to a situation where the Parking Stations already on the Campus (plus Lower Campus) will accommodate the total parking demand.

There is no reason or economic justification to build additional car parks that will become redundant within 12 to 15 years.

The 3% policy suggests that parking should be removed gradually from the local streets – at a rate starting at about 120 vehicles per annum.

The removal of parking from local streets (see Section 4.2.1) will take 1094 parking spaces out of the total supply to the University, about 10 years of reduced 3% demand (References; from Table 3 Appendix 8; staff 200 reduced to 50, students 1336 reduced to 468 and from Table 8 Appendix 6 visitors 130 reduced to 50).

Thereafter the reduced parking demand for the University can be managed by increasing, or introducing, parking charges for students, staff and visitors.

It is recommended that the fee for all Staff and Post Graduate Permit Parking, including Reserved Parking, be increased by 8% per annum for the next five years and to be reviewed after this period.

The initial 8% over 5 years is not expected to have a major impact on the parking demand for staff and during this time the parking demand for staff will decrease as public transport is improved.

The staff parking fee in the 5 to 15 year period will be adjusted to control demand and this is the one part of the proposed parking fee structure that has been left variable. It is

likely that after 5 years the staff parking fee will need to increase at 10% or even 15% per year to achieve the 3% reduction in demand. The balance between the staff fee and the student fee will be considered annually.

The key element in maintaining the increased parking fee within the 8% annual increase will be the provision of improved public transport and other complementary strategies.

If these elements are not pursued then the parking fee will rise rapidly once the Residential Parking Scheme is completed.

It is in the interests of the University to maintain a strong presence in planning and implementing public transport in the area.

In the next five or so years the total amount of on street parking available for staff and students (during the day) will decrease as the Residential Parking Scheme and Residential Amenity and Safety Program are introduced.

It is recommended (Section 4.2.1 above) that metered parking be progressively introduced in local streets not having residents fronting the street (499 spaces in total).

Metered long-term parking must be limited until the Residential Parking Scheme is protecting the needs of the residents and any potential parking displaced by the metered parking does not result in parking spilling - back into - residential streets. Nevertheless Council should be seeking to introduce metered long-term parking as soon as possible as a means to fund the Residential Amenity and Safety Program for the area.

It is recommended that: -

- Approximately 100 long term parking meters are introduced in local streets within the next two years with an initial charge of $6/day. (No reduction for short term parking for the same fee).
- That the parking fee be increased by no more than 8% per annum until the Residential Parking Scheme is complete.

It is recommended that on completion of the Residential Parking Scheme accommodating all residential and short-term parking that: -

- Metered long-term parking and short-term parking be introduced progressively on the local streets identified as University Parking Streets
- The initial short term parking fee be $2/hour, limited to a maximum of 2 hours or 50% of the University metered parking fee, whichever is the greater.
- Thereafter the University Metered parking charge be 50% of the On- Street short-term parking fee
- Parking fees be increased by 8% per annum or more as required to limit car travel to the University by 3%. Increase to be agreed at the annual transport meeting.

It is recommended that the provision of short-term parking in the Campus and on the "University Parking Streets" be sufficient to accommodate all short term parking plus a 10% empty factor.

Over the next five years the staff parking demand will decrease as public transport is improved to a point when the total parking demand is less than the capacity of current number of spaces allocated for permit parking on the Campus (mostly in the parking stations).

At some point in the next 15 years student parking is likely to be introduced into the Campus during the day. See section 5 for implementation

It is recommended that the annual fee for the limited amount of the Campus Parking available for students be 50% of the cost of the on-street long-term parking metered charge based on 200 days of parking.

The end point of this management (possibly within 15 years) would be an agreement on the number of on-street parking spaces used by the University and the potential to reduce the parking supply on the Campus.

The key to the parking fees will be the balance between residential amenity and the needs of staff and students.

4.5 CONSTRUCTION OF NEW PUBLIC TRANSPORT

Refer to Figure 5 of Appendix 5.

It is recommended that the University work with Council to introduce a Metro or Light Rail service to Randwick and the University within 15 years.

Various rail connections have been discussed in recent documents.

The extension of the Bondi Line to Maroubra:

- Would directly serve less than ~10% of the staff and students.
- Would provide indirect connection from the remainder of the rail network, not quicker than the 891 bus.
- High cost.

The extension of the Bondi Line connecting back to Sydenham:

- Would directly serve less than ~15% of the staff and students.
- Would provide direct connection from parts (~35%) of the rail network.
- Highest cost.

Metro along Anzac Parade extending through the City via Fox Studio to Randwick (or Sydenham):

- Would directly serve 15% - 20% of the staff and students (assuming it continued through the City).
- Would provide direct connection from most parts (65%) of the rail network.
- University or Randwick would be the interchange for Maroubra.
- High cost.
- Most effective Rail option

Light Rail along Anzac Parade from the City via Fox Studio to Coogee.

- Would directly serve less than 10% of the staff and students already well served by buses.
- Would provide direct connection from most parts (65%) of the rail network.
- Slower than metro and not competitive with 891 bus.
- Would not serve Randwick.
- High cost but much lower than Metro or Heavy Rail.

Light Rail from the City to Maroubra or Randwick via Todman Avenue and Lenthall Avenue to Green Square:

- Would directly serve ~15% of the staff and students.
- Green Square Station expensive to pass through would need through ticketing.
- Would provide direct connection from parts (65%) of the rail network – some via Central or Redfern.
- Slower than Metro but competitive with 891 for many journeys (via Green Square).
- Good for new development.
- High cost but much lower than Metro or Heavy Rail.

Note that: the introduction of a wider network of bus services (see Section 4.6 below) will reduce the number of students and staff passing through Central Station.

A Metro with its smaller trains running at less headway than Heavy Rail would bring the greatest benefit for travellers to the University. A Light Rail connection to Green Square and Redfern/Central would serve more travellers to the University than the FoxStudio/Paddington/Oxford shortest route. These schemes will be discussed and developed more in the Metro Strategy.

4.6 IMPROVED PUBLIC TRANSPORT

It is recommended that Council and the University approach DIPNR and the MOT with the intention to commence a seven-year implementation plan for the introduction of additional bus services to the University and Randwick.

Research has been conducted on travel patterns and the choice of public transport or car from regions in Metropolitan Sydney.

Ten routes have been selected as an initial implementation program. Between them they are estimated to reduce the total number of car journeys and therefore reduce parking in the Mid Morning Peak by 858 spaces, or 48% of the required demand within 15 years.

- Extension of existing services
    - to Kings Cross via Double Bay - saving 123 parking spaces
    - to Watsons Bay via Bondi Beach- saving 275 parking spaces

- New Services
    - Sutherland - saving 30 parking spaces
    - Stanmore and Punchbowl - saving 56 parking spaces
    - Earlwood and Canterbury Road - saving 45 parking spaces
    - Mosman and Balgowla - saving 77 parking spaces
    - Hornsby - saving 41 parking spaces
    - Victoria Road and Ryde - saving 35 parking spaces
    - Carlingford - saving 35 parking spaces
    - Baulkham Hills - saving 57 parking spaces
    - Parramatta - saving 84 parking spaces

The number of spaces could potentially be reduced by a further 250 spaces if other connecting bus services were initiated throughout the Metropolitan area.

4.7 INFORMATION SYSTEMS

It is recommended that the University extend its information service to an interactive system

The University has a well-staffed transportation section providing information to students and coordinating buses and parking. It has a unique opportunity to source travel data and provide an integrated monitoring and information system.

It is recommended that the University set up a procedure by which students and staff living with range of a new transport services or those affected by changes to travel conditions are contacted directly by email. (Privacy would be maintained by the data base excluding the user name or address.) The email would inform them of the changes, ask for comment and follow up with either modifications to those proposals or questions if the recipients have changed travel behaviour.

Initial funding to set up the procedure is necessary, while reporting can be completed by existing staff.

4.8 NEW ACCOMMODATION

4.8.1 Benefit to travel

The University is proposing to provide accommodation for 4,500 students to live within or close to the University, mostly in the Lower Campus and close to High Street. This will make a significant difference to travel to the University.

The estimate of this impact is made assuming that those living furthest away from the Campus are usually living at home, and only those with a choice of accommodation will change their location; most of the 4500 places will replace accommodation already in the Eastern Suburbs. It would be greater if Sydney residents were accommodated on Campus.

Using existing travel behaviour it is estimated the relocation will reduce travel by car by 128 vehicles.

The change in location will reduce travel by car as well as bus, walk and cycle to the University.

4.8.2 Parking requirements for accommodation

The provision of student parking is not considered in any other parking sections of this report; it is considered a separate topic.

Given that University Accommodation is measures by as low as 20m^2 per person, and is typically 35m^2 per person, the provision of parking is an expensive and often redundant part of the cost of the accommodation.

A recent survey of University Accommodation measured the demand as approximately 1 vehicle per 20 students, possibly a little more. This still adds 8% to 10% to the cost of the building. The parking requirement for boarding houses is 1/10 beds. This would deliver an over-provision of parking. The saving in the cost of the accommodation between 1/10 and 1/20 parking spaces could house an extra 250 places.

It is recommended that the University and Council agree to the provision of 1 parking space / per 20 students for student housing on or off the Campus.

The risk that this demand will be slightly too low is balanced by the fact that in the next few years the University will be in the position to allocate parking for students within the Parking Stations, and any students trying to park off the Campus will have few options to park for long periods of time.

The benefit to affordability by lowering the provision for parking far outweighs the potential difficulties of a small additional parking demand.

5. IMPLEMENTATION

5.1 List of Recommendations

5.1.1 Traffic:

Section 3.1	The University seek an agreement with Randwick City Council for a combined target to reduce car travel by 3%/annum and to establish transport targets annually.	Combined Initiative
Section 3.1	The University gather travel data every year by a survey of 10% of staff and students, contacted by email and in annual planning transport initiatives.	University Initiative
Section 3.2	The Sustainability Policy be reviewed at an annual meeting of the Council, University, and STA to set transport targets for the following year.	University Initiative
Section 4.3.1	The dual pedestrian entry into the Campus from Anzac Parade is made legible by two pedestrian crossings, one at each end of bus stops.	University Initiative, RTA to approve
Section 4.3.1	The urban design features such as paving and extended pedestrian crossings are introduced at the bus stops at Gate 8 and Gate 2 in High Street and that the axis from these stops be strengthened, signposted and illuminated and have an activity that is open in the evening..	University Initiative, Council to approve

Section 4.3.3	With the exception of the proposed No Right Turn from High Street to Botany Street for part of the morning, no further traffic capacity management measures be considered for the University.	
5.1.2 Public Transport:		
Section 4.5	The University work with Council to introduce a Metro or Light Rail service to Randwick and the University within 15 years.	University & Council Initiative
Section 4.6	The Council and the University approach DIPNA and the MOT with the intention to commence a seven-year implementations plan for the introduction of additional bus services to the University and Randwick.	State Initiative
Parking:		
Section 1.6.4	A Parking Provision Plan be prepared by the University transport coordinator for all events occurring during the semester during a Wednesday or Thursday involving more than 200 attendances who are not part of the University. This could involve notification of the lack of the provision of special events parking or allocation of parking spaces on Campus	University Initiative
Section 2.2	The University continue with its policy to remove all long term surface parking from the Campus.	University Initiative

Section 4.2	The recommended strategy for On Street parking is: o To remove all University parking from outside homes. o To introduce metered parking for all local street adjacent to the University that do not have residential frontage.	Council Initiative
Section 4.2	The recommended parking strategy for the Campus is: - o To maintain the provision of Disabled Parking and Loading Zones throughout the Campus. o To continue to remove surface parking from the Campus. o To locate a total of 300 parking spaces under new buildings in the Lower Campus and the Western Campus. o To concentrate 100 metered parking for visitors as surface parking accessed from Gate 2. o To introduce metered parking available at all time of the day into the parking stations. o To introduce parking permits for students to park on the Campus.	University Initiative
Section 4.2.1	The University and Council reach an agreement for the provision of a Residential Parking Scheme (Permits and 2 hours limit for visitors on each local street and the reduction of long term parking in all other local streets). Section 94 Plan not withstanding.	Council Initiative
Section 4.2.1	The University and Council reach an agreement for the provision of an Amenity and Safety Program on local streets.	Council Initiative

Section 4.2.1	An agreement be made on which streets will remain for use by visitors staff and students to the University.	University Initiative
Section 4.2.1	Metered parking be progressively introduced in streets adjacent to the university in conjunction with the management of local residential streets.	Council Initiative
Section 4.2.1	The Metered parking in adjacent streets to the University be a mix of short term parking for visitors to the University and long term meters for students. The mix would be agreed annually.	University & Council Agreement
Section 4.2.3	Short-term parking be relocated to maximise use of Campus Parking. Short-term parking on the Campus be provided to a level that maintains 10% of the spaces empty (available for parking turn over).	University Initiative
Section 4.2.3	With the completion of the 100 metered spaces in the Lower Campus : - • The total metered parking on Campus be 217 spaces . • The use of short-term parking be reviewed annually and the distribution of the total parking supply between short-term parking and long-term parking on the University and between Campus and on-street parking be determined to satisfy the contemporary demand – allowing 10% of spaces to be empty.	University Initiative
Section 4.4	The fee for all Staff and Post Graduate Permit Parking, including Reserved Parking be increased by 8% per annum for the next five years and to be reviewed after this period.	University Initiative

Section 4.4	It is recommended that: - • Approximately 100 long term parking meters are introduced in local streets within the next two years with an initial charge of $6/day. (No reduction for short term parking for the same fee). • That the parking fee be increased by 8% per annum until the Residential Parking Scheme is complete.	Council Initiative
Section 4.4	It is recommended that on completion of the Residential Parking Scheme accommodating all residential and short-term parking that: - • Metered long-term parking and short-term parking be introduced progressively on the local streets identified as University Parking Streets • The initial short term parking fee be $2/hour, limited to a maximum of 2 hours or 50% of the University metered parking whichever is the greater. • The University Metered parking charge be 50% of the On- Street short-term parking • Parking fees be increased by 8% per annum or more as required to limit car travel to the University by 3% to be agreed at the annual transport meeting.	University & Council Agreement
Section 4.4	The provision of short-term parking in the Campus and on the "University Parking Streets" be sufficient to accommodate all short term parking demand plus a 10% empty factor.	University & Council Agreement
Section 4.4	The fee for the limited amount of the Campus Parking Stations available for students be 50% of the cost of the on-street long-term parking metered charge based on 200 days of parking.	University Initiative

Section 4.8.2	The University and Council agree to the provision of 1 parking space/20 students for student housing on or off the Campus.	University & Council Agreement
5.1.3 Information:		
Section 4.7	The University set up a procedure by which students and staff living with range of a new transport services or those affected by changes to travel conditions are contacted directly by email. (Privacy would be maintained by the data base excluding the user name or address.) The email would inform them of the changes, ask for comment and follow up with either modifications to those proposals or questions if the recipients have changed travel behaviour.	University Initiative
5.1.4 Bike:		
Section 4.3.2	The bikeways within three kilometres of the University be reviewed with the appropriate Councils with the aim of providing more direct access to the University.	University & Council Initiative
Section 4.3.2	The bike racks continue to be placed where a demand occurs at a rate of at least 80 spaces per annum for the next five years; that lockable bike cages be located near Gates 2,8 and 14, and that showers be available for cyclists arriving at University, possibly in the Gym.	University Initiative
Section 4.7	The bikeways within three kilometres of the University be reviewed with the appropriate Councils with the aim of providing more direct access to the University.	University

5.1.5 Council:

Section 2.1.2	The University endorse any plan that seeks to reduce University traffic using residential streets in Kensington – particularly Day Avenue, Eastern Avenue, and Tunstall Avenue.	Council Initiative
Section 2.1.2	The University seek Council to impose a No Right Turn from High Street to Botany Street for the period 8.30am to 9.00am.	Council Initiative

5.2 Managing Implementation

5.2.1 Balances

The fundamental balance to be made every year is to ensure that the 3% reduction in demand is achieved through agreement with minimal impacts on residential or University users and without establishing problems for the future. Hence there is a need to forecast the impact of a decision into the future.

Short-Term Management - 1 to 5 years

High on-street parking charges would seriously reduce student parking and the total parking demand would reduce by more than 3% and is not recommended. The recommended management process seeks to balance the gradual decrease in parking supply with enough metered parking to generate a cash flow for implementing the Residential Amenity and Safety Program.

High Campus parking charges would seriously impact on staff and apart from being unpopular would also result in reducing the total parking demand by more than 3%. This is not recommended and the gradual increase in parking fees or 8% moves the cost of parking slowly into a price that will start to influence mode choice.

The University will also be seeking to amend the Campus parking either because of new buildings or new amenities or new enrolments. These are unknown so the process notes how changes might be accommodated and establishes quite clearly for the first 5 years how any reduction in Campus parking would impact on residential streets.

The concept is that short-term parking will gradually be moved onto the Campus. The fall back is that any unanticipated increase in demand created by additional facilities will first be located on the University Streets replacing long-term parking and later located on the Campus. This becomes progressively difficult as the proportion of metered long-term parking on the University Streets is increased. (See Table 3 in Appendix 8)

The current parking comprises: -

- Staff parking
  - 2600 on Campus
  - ~ 200 on street,
- Student Parking
  - 450 students on University Streets (100 metered next year)
  - 886 on local streets
  - 0 in on-street meters
  - 0 Permits on Campus

The target scenario for five years is: -

- Staff parking
  - 2490 on Campus (– 110)
  - ~ 50 on street (– 150),
- Student Parking
  - 450 students on University Streets (300 metered)
  - 202 on local streets (– 684)
  - 300 at on local street meters (+300)
  - 39 permits on Campus (+39)

Medium-Term Management – 6 to 10 years

In the medium term the balance for Council will be income versus empty parking spaces and for the University the proportion of parking allocated to students and staff.

The reduction in Campus parking will enable all the programmed surface parking to be relocated in the parking stations during this period, although again this will put a little more pressure on local streets.

The projected figures indicate that; as a factor of income, (or the lack thereof); time, and on-street parking charges - the proportional reduction in student parking will be greater than that for staff. Nevertheless the on-street parking supply will reduce to the point that some

students will probably need to be accommodated on the Campus. The actual ratio will be measured annually and the politic of staff versus student parking will be of concern for the University. In any event parking fees for staff in the 6 to 10 period will need to have an impact on demand.

The annual increase in parking fees for staff has not been linked to metered or student parking, giving the University the opportunity to vary the proportional demand.

The balance for student parking is in the recommendation that the Campus fee for students is set at 50% of the on-street long-term metered parking fee, e.g that Council will in effect determine the fee on the Campus.

Similarly the short-term parking fee is linked by a 50% differential between on-street and on-campus parking.

Assuming that the University has followed the recommendation to increase the staff parking fee by 8% per annum in the first 5 years then increasing the fee by, say, 10% in the 5 to 10 year period will not be an excessive change for staff and will be effective.

Of course if public transport has not been improved in the meantime then there will far more pressure on the parking supply and it may be necessary to have even higher increase in parking fees to maintain the 3% reduction in demand.

The target scenario for ten years is: -

- Staff parking
  - 2260 on Campus (– 340)
  - ~ 50 on street (– 150),
- Student Parking
  - 450 students on University Streets (450 metered)
  - 10 on local streets (– 876)
  - 200 at on street meters (+200) [1]
  - 75 permits on Campus (+75)

[1] Once a trust has been built around the predictability of the process other features can be added. For example, and this is only an example, the process might include the provision of temporary parking meters in residential streets to accommodate some of the University demand. This could allow changes in the Campus to be accelerated whilst providing a greater income to Council.

Long Term Management: 10 to 15 years

The long–term management scenario sees the completion of freeing residential streets of University parking. Unfortunately this would mean closing Council's long-term parking meters and loosing the income from these meters. Council may well wish to continue with this income and spread the parking between the Campus and local streets.

The reduction in Campus parking allows the flexibility for the University to expand or for the removal of parking on the top decks of the parking stations or further reductions of parking on the local streets used for University Parking.

The target scenario for fifteen years is: -

- Staff parking
  - 2024 on Campus (– 576)
  - ~ 50 on street (– 150),
- Student Parking
  - 450 students on University Streets (450 metered)
  - 18 on local streets (– 868)
  - 0 in on-street meters (0)
  - 78 permits on Campus (+78)

5.2.2 Annual review

The table on the next page illustrates the management process that will achieve the reduction in parking for the University and the desirable residential amenity.

Process

The table below lists most topics that require to be reviewed annually.

The travel survey should be conducted in April allowing time for traffic conditions to settle for the year and time for adjustments to be made to alleviate any problems that have arisen. The Traffic Committee meeting is best held shortly thereafter, say in the first week of May every year.

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020
Management													
	Sustainability Goal	Agree					Review					Review	
	Sustainability Process	Agree					Review					Review	
	Travel Survey	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Set Annual Program	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parking													
	Target Long Term Demand	4148	4017	3890	3766	3647	3531	3419	3310	3204	3101	3002	2545
On Street													
	RPS	Enforcement	Stage 2	Achieved?	Review	Review	Review	Review	Review	Review	Review	Review	Review
	Amenity and Safety Program	Design	Stage 1	Stage 2	Stage 3	Achieved							
	University Streets	30 short term	100 meter long				Full Meters	Short/long?	Short/long?	Short/long?	Short/long?	Short/long?	Short/long?
	Long Term Parking Charge	Agree					Review	Review	Review	Review	Review	Review	Review
	Short term Parking Charge	Agree	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review
On Campus													
	Parking Stations						Metered	Short/long?	Short/long?	Short/long?	Short/long?	Short/long?	Short/long?
	Lower & Western Campus			----------Relocation with new buildings ----------									
	Upper Campus						-----Surface Pk Removed-----						
	Satff Permit Charge	Increase 8%	Increase 8%	Increase 8%	Increase 8%	Increase 8%	Review	Review	Review	Review	Review	Review	Review
	Student Parking					Commence	Review	Review	Review	Review	Review	Review	Review
	Metered Parking Charge	Agree	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review
Public Transport													
	Set 5 year plan	Agree	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review
	Implement annual target		Bus # 1	Bus # 2	Bus # 3	Bus # 4	Bus # 5	Bus # 6,7	Bus # 8,9	Bus # 10	New Targets		
Access													
	5 year plan for Bike Access	Agree	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review
	Implement Cycle Plan				Complete								
	5 year plan for Walk Access		Review	Review	Review	Review	Review	Review	Review	Review	Review	Review	Review
	Implement Walk Plan				Complete								
	Botany Road No Right Turn	Agree	Complete				Review					Review	Review
	Anzac Parade Crossings	Agree					----------Construct as required ----------						
	High Street Crossings	Agree	----------Construct as required ----------										
Accommodation													
	Set Parking Requirement	Agree					Review					Review	
	Buildings			----------Construct as required ----------									

The agenda is outlined in the Table above and it is recommended that issues that are tabled and dealt with in the first meeting be referred to Council or the University where necessary for a final meeting on the first week of June (any negotiations to be completed in the meantime).

The items to be considered are: -

Residential Parking Scheme.	For the first years confirming the agreement with adjustments for any additional residential demand that has occurred. Later confirming the residential demand.
Amenity and Safety Program	For the first years completing a design, confirming funding and completing the program.
University Street Parking	In the first year providing 30 metered short-term parking spaces in High Street. In the second year confirming the installation of 100 metered long-term parking spaces in High Street. Thereafter considering the balance between the provision of metered parking and the impact on local amenity. Council position is the arbitrator.
Long-Term Parking Charge	In the first year agreeing on the starting fee and annual increment. In 2010 and annually thereafter reviewing the annual increment.
Short-Term Parking Charge	In the first year agreeing on the starting fee and annual increment. Reviewing the fee annually.
Campus Parking Stations	In the first year agreeing on the short-term parking fee. After 2010 reviewing the distribution of long and short term parking annually.

Lower and Western Campus	In the first year agreeing on Lower Campus master Plan. Reviewing the demand as buildings are commenced ensuring in particular that the total parking requirement of 300 permit spaces and 100 metered short term spaces plus any parking for residences can be met in the remaining sites.
Upper Campus.	Reviewing the removal and relocation of surface parking with any building or amenity programs.
Staff Permit Charges	Agreement in the first year of the annual increase of 8% for 5 years. Thereafter reviewing the annual permit fees and their effect on reducing car travel annually.
Student Permit Charges	Agreement at the appropriate time on the inclusion of student parking on campus and setting of the annual fee as proportion of long-term parking fee on the surrounding streets. Thereafter reviewing the annual permit fee and effect on reducing car travel annually.
Metered Parking Charges	Agreement in the first year on the location of 30 metered spaces in High Street, setting of the annual on-street meter fee and the proportional fee for Campus Meters. Thereafter reviewing the hourly fee annually.
Public Transport	Agreement in the first year on the strategy and order of implementation. The recommended implementation target to one route introduced per year from 2006 to 2011 and two routes thereafter. Review success and next target annually.
Access - Bike Plan	Review local bike plans with Councils and draw up implementation program. Review progress and funding annually

Access – Walk Plan	Draw up footpath improvement plan with Randwick Council. Review progress and funding annually.
Traffic Management	Agree on Botany Street and implement immediately.
Pedestrian Crossings	Design and construct as required.

5.3 Removal of Parking

The detail procedure for the removal of parking from residential streets and Campus is shown in Appendix 6. The real schedule depends on the implementation plan, which need to be initiated by University and Randwick Council.

5.4 Total saving and total cost

Refer to Table 2 to 5 in Appendix 8.

The reduction of parking on and off the Campus is summarised in Section 5.1 above. A detailed analysis of the annual changes in parking supply and demand are needed to test various scenarios.

The income raised from the parking meters and permit fees (including administration costs) are in the order of $17.8m for the University and $12.1m for Council.

The reduction of University parking in Residential Streets over 15 years allows for some imaginative funding arrangements. Once the Residential Parking Scheme is in place and operating well it is profitable to install about 300 metered spaces in unused residential parking spaces. The most likely scenario is they could be installed in 4 years. In order to keep within the 3% reduction in car use they must be removed starting in year 8 through to year 15, e.g. 2020. (Refer Table 3 in Appendix 8). This scenario would raise Council's income by more than $4m in the same order as the University income. (Refer to Table 4 in Appendix 8).

The costs of parking in the University plus the amenity program for removing surface parking is in the order of $5m. Subtracting an administration fee of 30% from income and a

discounted cash flow of 8% the works could be funded by the University fees over a period of about 12 years leaving a profit of about $4.2m.

Similarly for Council the works for the Amenity and Safety Program would be in the order of $1m and for footpath and bike routes $0.5m. These could be funded by parking fees, less administration, in about 7 years raising a profit of about $13m in 15 years.

These scenarios reinforce how Council and the University can work together to create a sustainable future and fund the benefits from this cooperation.

APPENDIX 1 DATA SOURCES AND METHOD OF ANALYSIS

Appendix 1 describes the sources of data used in the transportation analysis and how this was manipulated for use in the study.

Section 1.1 STUDENTS

Source For statistics on total students and type of student, the Annual University publication "Pocket Statistics UNSW".
For estimates of total attendants and peak attendance and arrivals in the peak hour see 1.3 below and Appendix 2.

It is recommended that in future this data is sourced from the Annual Transport Survey.

Section 1.2 STAFF

Source For statistics on total staff and type of staff, the Annual University publication "Pocket Statistics UNSW".
For estimates of total attendants and peak attendance and arrivals in the peak hour see 1.3 below and Appendix 2.

It is recommended that in future this data be sourced from the Annual Transport Survey.

Sections 1.3 to 1.5 TRAVEL TASK & MODE OF TRAVEL

Source Statistics on the Peak Accumulation of students and staff were not directly available.

Appendix 1 DATA SOURCES AND METHOD OF ANALYSIS

Travel Data Base.

A database containing the street address, postcode, and method of travel to the University was available. The mode of travel could therefore be determined from geographical locations – Regions – of Sydney.

The rate of attendance from Regions was not known.

It was assumed that part time students were more likely to live further away from the University than full time students and an assumption was made on the rate of attendance from those living nearer the University being higher (1.13) than that further away (0.9).

The time of arrival was not known from the survey and hence the mode of arrival at the peak accumulation could not be determined solely from this database.

Parking Survey

A survey of parking accumulation both on and off the Campus provided an estimate of the peak accumulation of parking for students (mostly Off-Campus) and staff (mostly On-Campus). (Refer 1.4 below)

The number of cars parked was then used in conjunction with the Travel Survey Base to estimate the mode of arrival for those attending at the time of the peak accumulation and those arriving in the peak hour.

The estimates of parking demand are expected to be accurate in the range of plus or minus 15% but other figures could vary by +_ 40%.

It is recommended that in future this data be sourced from the Annual Transport Survey.

Appendix 1 DATA SOURCES AND METHOD OF ANALYSIS

Section 1.6.1 PARKING ON LOCAL STREETS

Source Parking Survey conducted by Christopher Stapleton Consulting; refer to Appendix 4 for description of Parking Survey.

Section 1.6.2 PARKING ON CAMPUS

Source The description of parking permits is selected from University Website, parking service page.

The description of parking management is reported from Helen Moustacas and is supported by the Parking Survey described in Appendix 4.

Section 1.6.3 SHORT-TERM PARKING

Source The supply is counted.

The demand for short-term parking in ancillary activities was estimated from other surveys conducted by Christopher Stapleton Consulting. The demand for the University was estimated. Since the parking is at full capacity then any small error will balance by more or less demand for other parking categories. This is not an issue in the calculations but will become evident and correctable as more short-term meters become available and the objective to provide 10% empty spaces becomes the feature that can be monitored for the provision of short – term parking.

Section 1.7 PUBLIC TRANSPORT

Source STA Schedules.

Conclusion

Planning transport to the University relies on good data and for this reason it has been recommended that a survey be conducted annually of a sample of Staff and Students (Refer to Section 3.1).

A survey of approximately 1200 students and staff will determine, with statistical significance, the proportion of travel by area, mode taken by area, number of staff and students parking both on and off the Campus. Measured annually this will show the change occurring in mode, address and the location of parking every year thereby enabling plans to be made for managing in the current year.

A pilot survey has been commenced that has consists of an email survey taken from a random sample of students and staff and is analysed automatically from the replies. The format has been successful completed. The survey is awaiting the release of email addresses from which a sample can be taken, contacted and surveyed.

APPENDIX 2 TRAVEL STATISTICS

Table 1 Enrolments and Attendance

UNSW		Attendance				
	[1]	Daily		11:00 AM		Afternoon
Total Students	37292	Proportion		Proportion		
[Incl COFA 2,198]		[2]		[2]		[3]
Bachelor/Diploma	24013	0.9	21612	0.7	15128	6484
Other - Post	13279	0.35	4648	0.35	1627	3021
			26259		**16755**	**9504**
Total Staff	5837					
Academic	3110	0.95	2955	0.8	2364	591
General	2727	0.95	2591	0.9	2332	259
			5545		**4695**	**850**
Total on Campus					**21450**	

[1] Source from "UNSW Pocket Statistics"

[2] Estimated Proportion

[3] Contains proportion estimated numbers

Table 2 Mode of Travel

Students						
Survey	Car	Bus	B & T	Walk	Bike	
Daily	20%	26%	33%	19%	2%	
11:00 AM	8%	31%	38%	21%	2%	
[1]	1340	5194	6367	3519	335	16755
Afternoon	41%	17%	24%	15%	2%	
	3911	1633	2299	1471	190	9504
Staff						
	Car	Bus	B & T	Walk	Bike	
11:00 AM	60%	20%	13%	6%	1%	
[2]	2812	941	628	263	50	4694
Afternoon	86%	6%	4%	3%	0%	
	734	55	31	25	6	851

[1] Estimated peak accumulated of students parking, details refer to the following Table 2.5.

[2] Estimated peak accumulated of staff parking, details refer to the following Table 2.7.

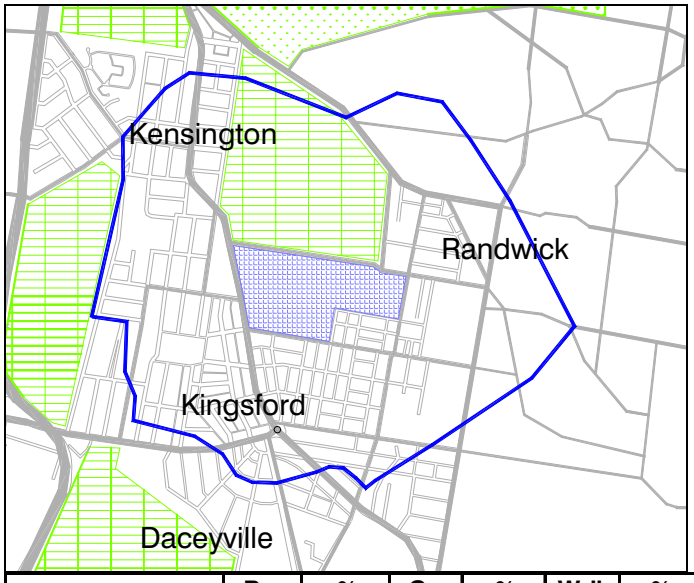
Table 3 Population Distribution:

	Students	Staff
Within 1km to uni	17.3%	6.0%
Between 1km to 2km to uni	8.9%	6.0%
High frequency bus serve in 400m	9.2%	12.0%
Low frequency bus serve in 400m	2.9%	4.8%
Less bus asscessible	6.1%	19.2%
Eastern Suburbs Total	44.4%	48.0%
Inner West Suburbs	14.3%	16.4%
Northern Suburbs	14.6%	13.5%
Southern Suburbs	7.3%	8.8%
North West Suburbs	9.6%	6.4%
Western Suburbs	9.8%	6.9%

Travel Mode By Regions:

Eastern Suburbs:

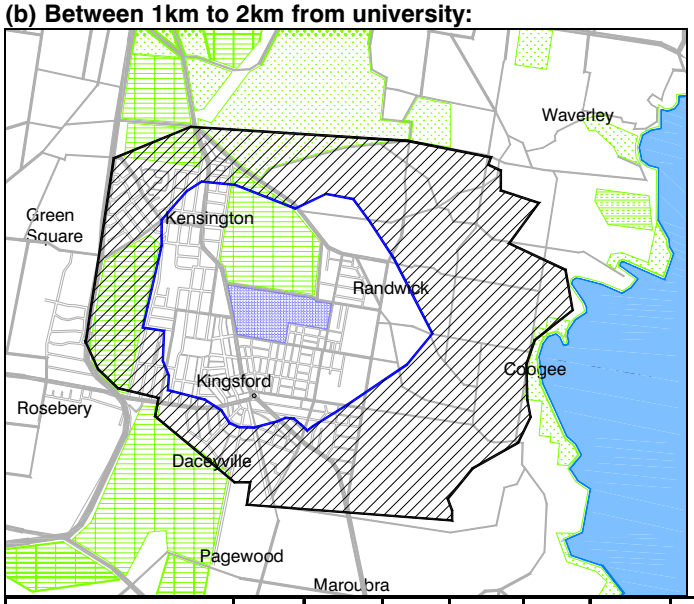
(a) Within 1km from university:



17.3% of students and 6%(estimated) of staff live within this area.

	Bus	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	890	16.2%	261	4.8%	4188	76.4%	141	2.6%	5480	17.2%
Mid Morning Trips	677	17.5%	92	2.4%	2999	77.7%	89	2.3%	3858	12.1%

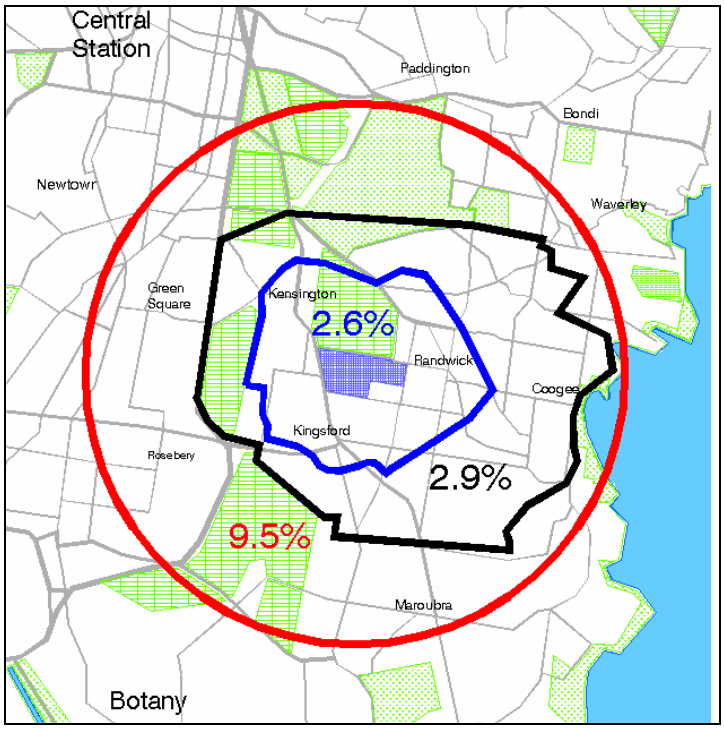
(b) Between 1km to 2km from university:



8.9% of students and 6%(estimated) of staff live within this area.

	Bus	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	1634	54.7%	430	14.4%	838	28.1%	82	2.8%	2985	9.4%
Mid Morning Trips	1253	60.2%	169	8.1%	605	29.1%	53	2.5%	2080	6.5%

(C) Students Bicycle Usage Comparison



A total of 32.3% of students live within 3km of University.

4% of them travel to University by bicycle.

Students Travel By Bike:

Within 1km area:

2.6%

Between 1km to 2km

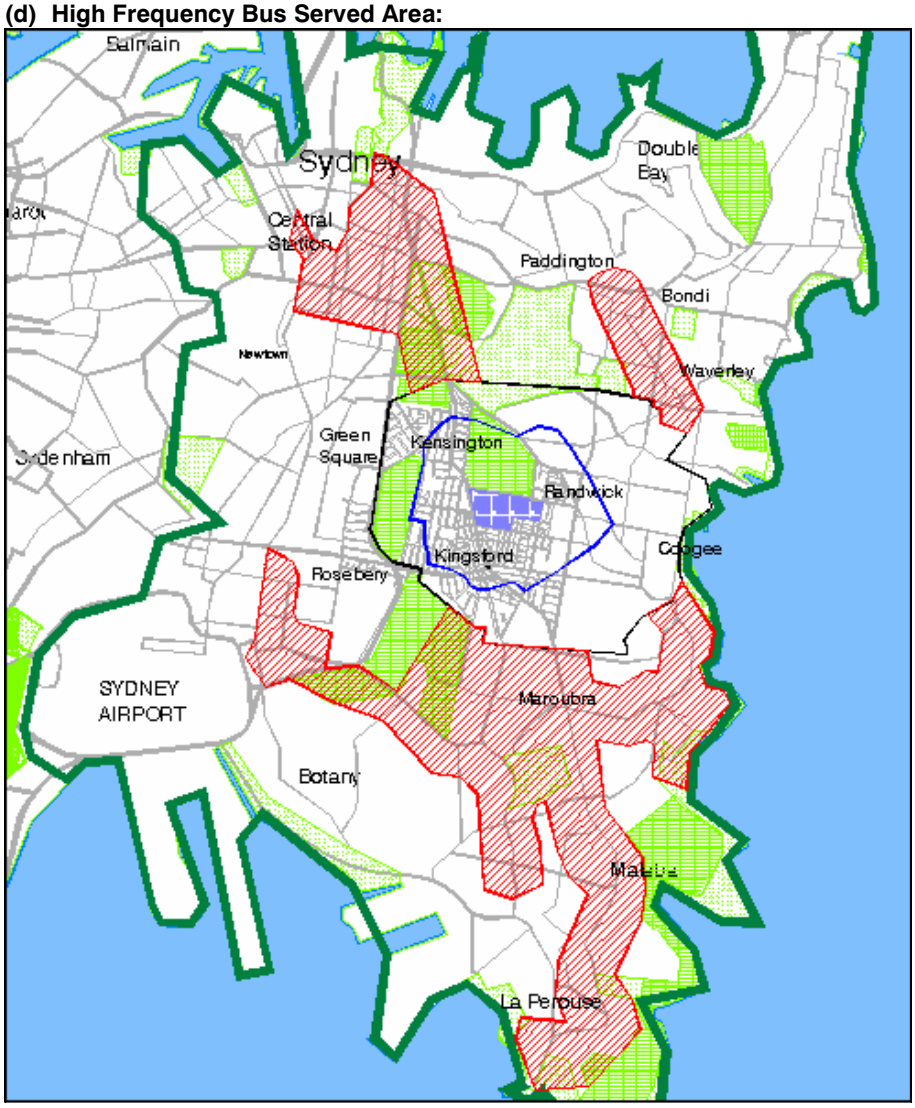
2.9%

Between 2km to 3 km

9.5%

Total Students Daily Trips by Bicycle within 3km: 350

(d) High Frequency Bus Served Area:



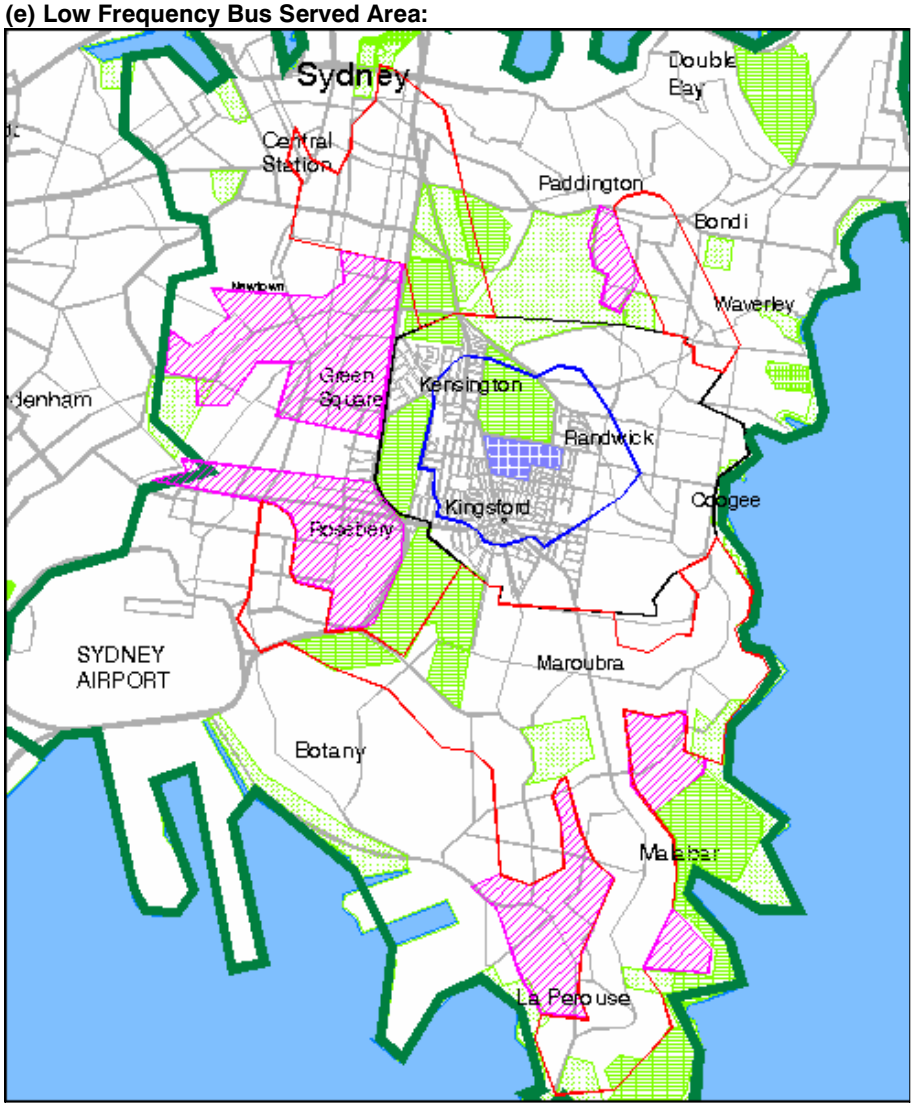
9.2% of students and 12%(estimated) of staff live within this area.

	Bus	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	2254	66.4%	839	24.7%	206	6.1%	97	2.9%	3396	10.7%
Mid Morning Trips	1751	74.8%	376	16.0%	152	6.5%	63	2.7%	2341	7.4%

* A High Frequency Bus is a bus service that operates 6 or more times per hour; a Low Frequency Bus means the bus service operates less than 6 times per hour.

* For this study, the Eastern Suburbs includes the City.

(e) Low Frequency Bus Served Area:

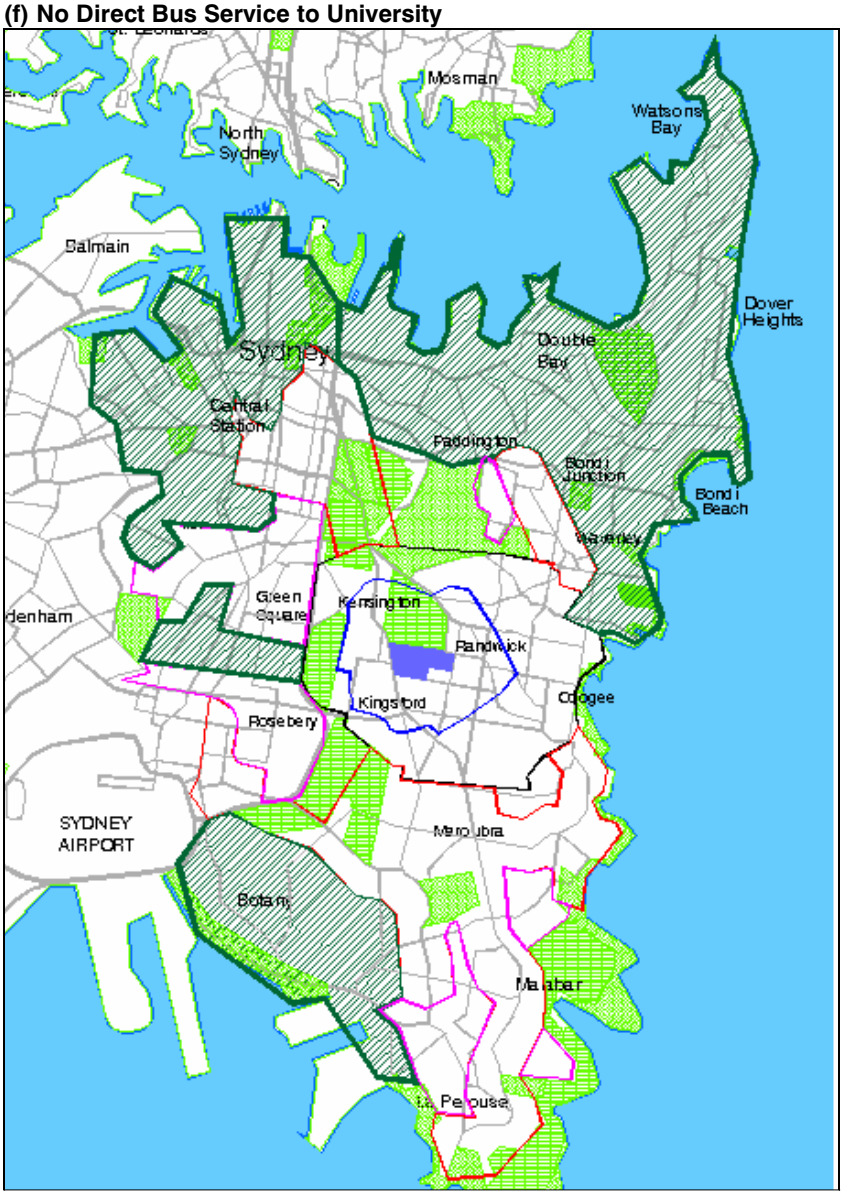


2.9% of students and 4.8%(estimated) of staff live within this area.

	Bus	%	* T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	573	50.6%	88	7.7%	432	38.1%	10	0.9%	30	2.6%	1133	3.6%
Mid Morning Trips	447	60.2%	66	8.9%	203	27.3%	7	1.0%	20	2.7%	742	2.3%

* T&B: Train & Bus, same as the following tables.

(f) No Direct Bus Service to University

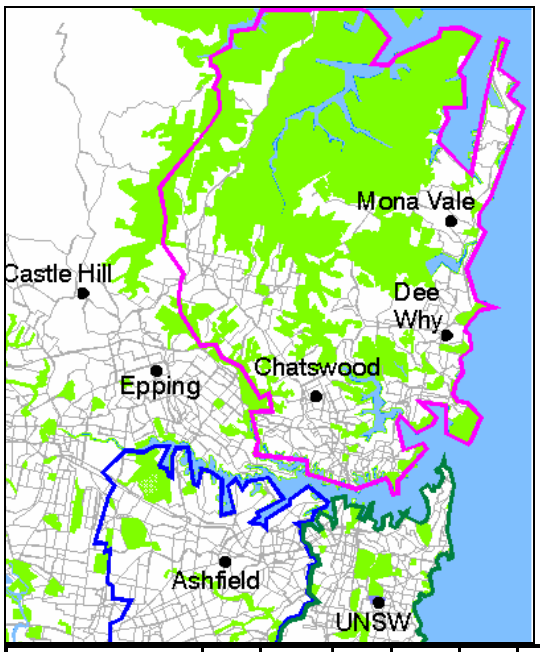


6.1% of students and 19.2%(estimated) of staff live within this area.

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	1206	41.9%	270	9.4%	1247	43.3%	26	0.9%	129	4.5%	2877	9.0%
Mid Morning Trips	963	48.8%	210	10.7%	692	35.1%	19	1.0%	88	4.4%	1972	6.2%

Metropolitan Regions

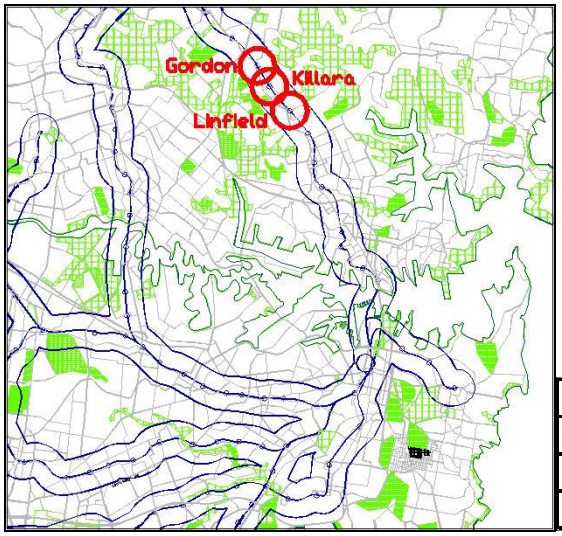
(a) Northern Suburbs:



14.6% of students and 13.5% of staff live within this area.

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	1206	41.9%	270	9.4%	1247	43.3%	26	0.9%	129	4.5%	2877	9.0%
Mid Morning Trips	963	48.8%	210	10.7%	692	35.1%	19	1.0%	88	4.4%	1972	6.2%

Northern Suburb Rail Accessibility Survey:

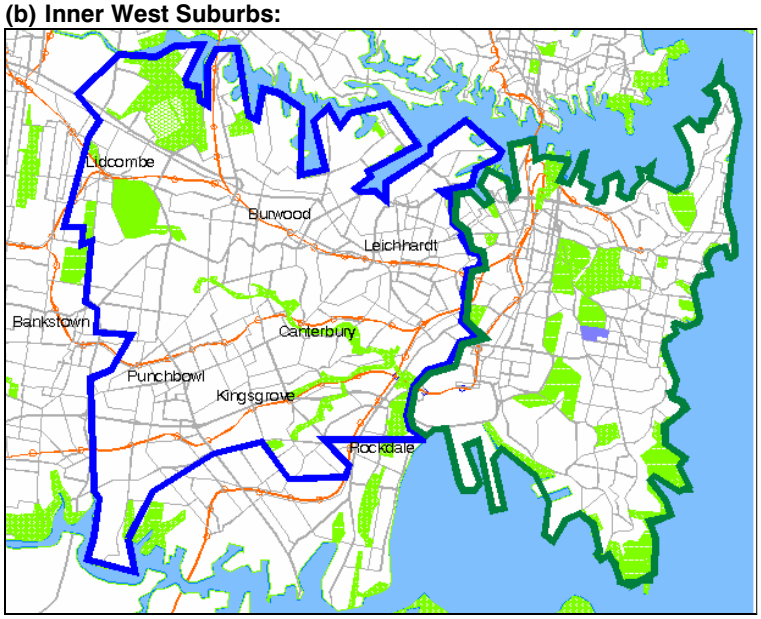


A pilot study was conducted to determine the travel mode split changes in Northern Suburbs. 3 stations (Gordon, Killara and Lindfield) are selected along the North Shore railway line.

The result is also used to estimate the travel mode changes in other regions.

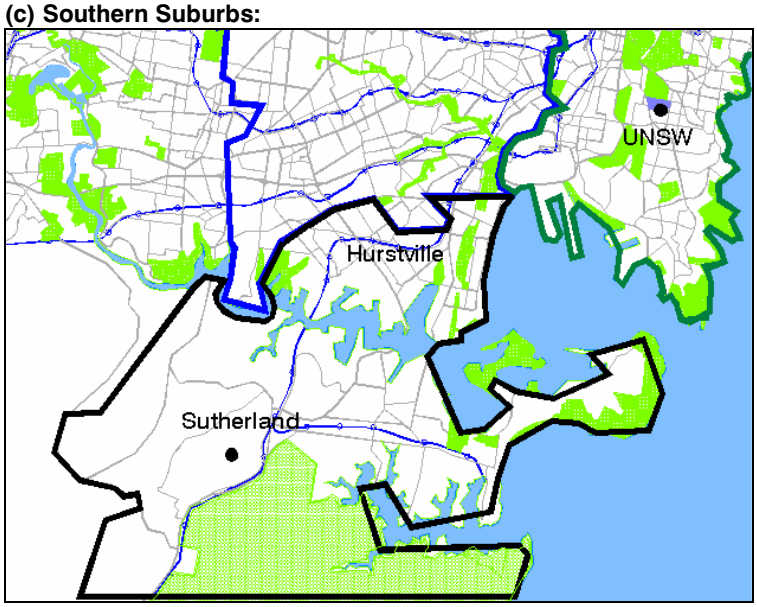
	Bus	T&B	Car
Within 800m Catchment	3.5%	74.3%	22.1%
Out of 800 Catchment	7.1%	50.1%	41.6%
Northern Suburb Avg.	11.3%	46.3%	41.8%

(b) Inner West Suburbs:



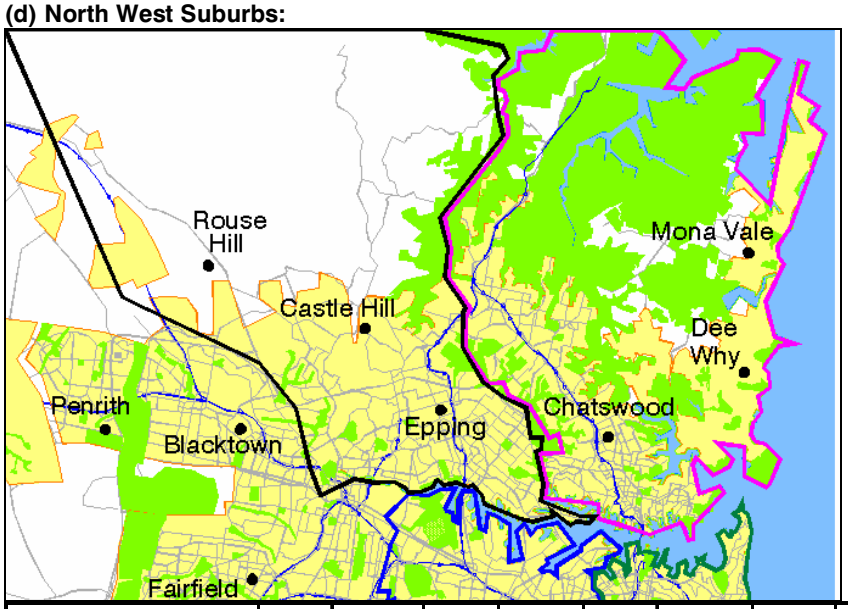
	Bus	%	T&B	%	Car	%	Bicycle	%	Sum	%Total
Daily Arrival Trips	509	11.9%	2265	53.0%	1446	33.9%	50	1.2%	4271	13.4%
Mid Morning Trips	394	13.7%	1700	59.2%	743	25.9%	34	1.2%	2872	9.0%

(c) Southern Suburbs:



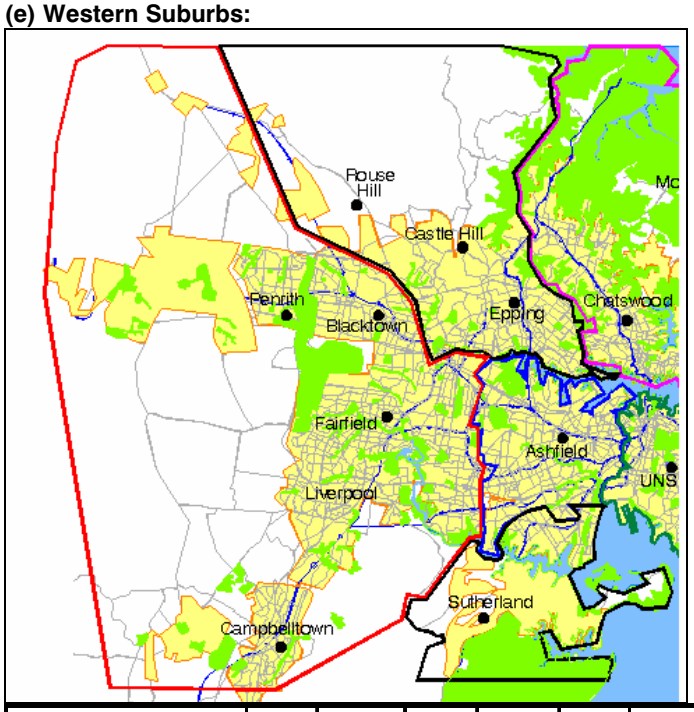
	Bus	%	T&B	%	Car	%	Sum	%Total
Daily Arrival Trips	111	5.0%	1105	49.8%	997	44.9%	2221	7.0%
Southern Suburbs	85	6.1%	830	59.6%	472	33.9%	1393	4.4%

(d) North West Suburbs:



	Bus	%	T&B	%	Car	%	Sum	%Total
Daily Arrival Trips	206	7.9%	1722	65.9%	673	25.8%	2611	8.2%
Mid Morning Trips	158	9.0%	1282	73.2%	304	17.4%	1751	5.5%

(e) Western Suburbs:



	Bus	%	T&B	%	Car	%	Sum	%Total
Daily Arrival Trips	66	2.5%	1974	74.0%	613	23.0%	2667	8.4%
Mid Morning Trips	50	2.7%	1474	80.8%	290	15.9%	1824	5.7%

Summary:

The following sets of tables detail daily, mid morning and morning peak hour travel modes.

T&B: Train & Bus; HFB: High Frequency Bus; LFB: Low Frequency Bus

1. Daily

Table 4(a) Travel Mode - Estimated Student Daily Arriving Trips:

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Travel Modes in Eastern Suburbans												
Within 1km to uni	834	16.2%	0	0.0%	196	3.8%	3984	77.4%	134	2.6%	5147	19.6%
Between 1km to 2km	1488	56.1%	0	0.0%	302	11.4%	785	29.6%	77	2.9%	2652	10.1%
2km to 3km										9.5%		
HFB Served Area	1944	71.2%	0	0.0%	516	18.9%	183	6.7%	87	3.2%	2731	10.4%
LFB Served Area	491	56.7%	77	8.9%	263	30.3%	9	1.0%	27	3.1%	867	3.3%
No Direct Bus to Uni	917	50.6%	216	11.9%	554	30.6%	20	1.1%	105	5.8%	1812	6.9%
Eastern Suburb Total	**5674**	**43.0%**	**293**	**2.2%**	**1831**	**13.9%**	**4980**	**37.7%**	**430**	**3.3%**	**13208**	**50.3%**
Travel Modes in Sydney Other Regions												
Northern Suburbs	440	12.9%	1840	53.9%	1109	32.5%	0	0.0%	24	0.7%	3414	13.0%
NorthWest Suburbs	192	8.5%	1624	71.9%	431	19.1%	0	0.0%	9	0.4%	2258	8.6%
Western Suburbs	62	2.7%	1841	80.6%	368	16.1%	0	0.0%	14	0.6%	2285	8.7%
Inner West Suburbs	454	13.5%	2084	62.0%	776	23.1%	0	0.0%	47	1.4%	3361	12.8%
Southern Suburbs	101	5.8%	1010	58.3%	615	35.5%	0	0.0%	7	0.4%	1733	6.6%
Total	**1248**	**9.6%**	**8399**	**64.4%**	**3300**	**25.3%**	**0**	**0.0%**	**101**	**0.8%**	**13051**	**49.7%**
Metro Total	**6922**	**26.4%**	**8692**	**33.1%**	**5131**	**19.5%**	**4980**	**19.0%**	**531**	**2.0%**	**26259**	**100.0%**

Table 4(b) Travel Mode - Estimated Staff Daily Arriving Trips:

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Travel Modes in Eastern Suburbans												
Within 1km to uni	56	16.8%	0	0.0%	65	19.5%	205	61.6%	7	2.1%	333	6.0%
Between 1km to 2km	146	44.0%	0	0.0%	128	38.5%	53	15.9%	5	1.6%	333	6.0%
HFB Served Area	309	46.5%	0	0.0%	323	48.6%	23	3.5%	10	1.5%	665	12.0%
LFB Served Area	82	30.7%	11	4.0%	169	63.6%	1	0.6%	3	1.1%	266	4.8%
No Direct Bus to Uni	289	27.1%	54	5.1%	692	65.0%	6	0.5%	23	2.2%	1065	19.2%
Eastern Suburb Total	**882**	**33.1%**	**65**	**2.4%**	**1378**	**51.8%**	**288**	**10.8%**	**49**	**1.8%**	**2662**	**48.0%**
Travel Modes in Sydney Other Regions												
Northern Suburbs	29	3.9%	87	11.7%	631	84.3%	0	0.0%	1	0.2%	749	13.5%
NorthWest Suburbs	14	4.1%	98	27.6%	241	68.0%	0	0.0%	1	0.3%	355	6.4%
Western Suburbs	4	1.0%	132	34.6%	245	64.1%	0	0.0%	1	0.3%	383	6.9%
Inner West Suburbs	55	6.1%	181	20.0%	669	73.6%	0	0.0%	3	0.3%	909	16.4%
Southern Suburbs	10	2.1%	95	19.4%	382	78.3%	0	0.0%	1	0.2%	488	8.8%
Total	**114**	**3.9%**	**594**	**20.6%**	**2169**	**75.2%**	**0**	**0.0%**	**7**	**0.3%**	**2883**	**52.0%**
Metro Total	**996**	**18.0%**	**659**	**11.9%**	**3546**	**64.0%**	**288**	**5.2%**	**56**	**1.0%**	**5545**	**100.0%**

Table 4(c) Travel Mode - Estimated Total Daily Arriving Trips:

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Travel Modes in Eastern Suburbans												
Within 1km to uni	890	16.2%	0	0.0%	261	4.8%	4188	76.4%	141	2.6%	5480	17.2%
Between 1km to 2km	1634	54.7%	0	0.0%	430	14.4%	838	28.1%	82	2.8%	2985	9.4%
HFB Served Area	2254	66.4%	0	0.0%	839	24.7%	206	6.1%	97	2.9%	3396	10.7%
LFB Served Area	573	50.6%	88	7.7%	432	38.1%	10	0.9%	30	2.6%	1133	3.6%
No Direct Bus to Uni	1206	41.9%	270	9.4%	1247	43.3%	26	0.9%	129	4.5%	2877	9.0%
Eastern Suburb Total	**6556**	**41.3%**	**358**	**2.3%**	**3209**	**20.2%**	**5269**	**33.2%**	**479**	**3.0%**	**15870**	**49.9%**
Travel Modes in Sydney Other Regions												
Northern Suburbs	470	11.3%	1927	46.3%	1740	41.8%	0	0.0%	25	0.6%	4162	13.1%
NorthWest Suburbs	206	7.9%	1722	65.9%	673	25.8%	0	0.0%	10	0.4%	2611	8.2%
Western Suburbs	66	2.5%	1974	74.0%	613	23.0%	0	0.0%	15	0.6%	2667	8.4%
Inner West Suburbs	509	11.9%	2265	53.0%	1446	33.9%	0	0.0%	50	1.2%	4271	13.4%
Southern Suburbs	111	5.0%	1105	49.8%	997	44.9%	0	0.0%	8	0.3%	2221	7.0%
Total	**1362**	**8.5%**	**8993**	**56.4%**	**5469**	**34.3%**	**0**	**0.0%**	**108**	**0.7%**	15934	**50.1%**
Metro Total	**7918**	**24.9%**	**9351**	**29.4%**	**8678**	**27.3%**	**5269**	**16.6%**	**587**	**1.8%**	**31804**	**100.0%**

2. Mid Morning

Table 5(a) Travel Mode - Estimated Students Mid Morning Arriving Trips:

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Travel Modes in Eastern Suburbans												
Within 1km to uni	626	17.5%	0	0.0%	51	1.4%	2815	78.7%	84	2.3%	3576	21.3%
Between 1km to 2km	1116	62.1%	0	0.0%	79	4.4%	555	30.9%	48	2.7%	1798	10.7%
HFB Served Area	1459	82.1%	0	0.0%	135	7.6%	129	7.3%	55	3.1%	1778	10.6%
LFB Served Area	369	71.4%	56	10.8%	69	13.3%	6	1.2%	17	3.3%	517	3.1%
No Direct Bus to Uni	688	64.2%	158	14.8%	145	13.5%	14	1.3%	66	6.2%	1071	6.4%
Eastern Suburb Total	**4258**	**48.7%**	**214**	**2.4%**	**479**	**5.5%**	**3519**	**40.3%**	**270**	**3.1%**	**8740**	**52.2%**
Travel Modes in Sydney Other Regions												
Northern Suburbs	330	16.6%	1348	68.0%	289	14.6%	0	0.0%	15	0.8%	1982	11.8%
NorthWest Suburbs	144	9.9%	1189	81.9%	112	7.7%	0	0.0%	6	0.4%	1451	8.7%
Western Suburbs	46	3.1%	1349	89.9%	96	6.4%	0	0.0%	9	0.6%	1500	9.0%
Inner West Suburbs	341	16.2%	1527	72.6%	203	9.7%	0	0.0%	31	1.5%	2102	12.5%
Southern Suburbs	75	7.7%	740	75.5%	161	16.4%	0	0.0%	4	0.4%	980	5.8%
Total	**936**	**11.7%**	**6153**	**76.8%**	**861**	**10.7%**	**0**	**0.0%**	**65**	**0.8%**	**8015**	**47.8%**
Metro Total	**5194**	**31.0%**	**6367**	**38.0%**	**1340**	**8.0%**	**3519**	**21.0%**	**335**	**2.0%**	**16755**	**100.0%**

Table 5(b) Travel Mode - Estimated Staff Mid Morning Arriving Trips:

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Travel Modes in Eastern Suburbans												
Within 1km to uni	51	18.1%	0	0.0%	41	14.7%	184	65.4%	5	1.8%	282	6.0%
Between 1km to 2km	137	48.5%	0	0.0%	90	32.1%	50	17.8%	5	1.6%	282	6.0%
HFB Served Area	292	51.8%	0	0.0%	241	42.7%	23	4.0%	8	1.5%	563	12.0%
LFB Served Area	78	34.5%	10	4.4%	134	59.3%	1	0.5%	3	1.3%	225	4.8%
No Direct Bus to Uni	275	30.5%	52	5.8%	547	60.7%	5	0.6%	22	2.4%	901	19.2%
Eastern Suburb Total	**832**	**36.9%**	**62**	**2.8%**	**1053**	**46.7%**	**263**	**11.7%**	**43**	**1.9%**	2253	48.0%
Travel Modes in Sydney Other Regions												
Northern Suburbs	28	4.4%	84	13.2%	521	82.2%	0	0.0%	1	0.2%	634	13.5%
NorthWest Suburbs	14	4.6%	93	31.0%	192	64.0%	0	0.0%	1	0.4%	300	6.4%
Western Suburbs	4	1.2%	125	38.7%	194	59.8%	0	0.0%	1	0.3%	324	6.9%
Inner West Suburbs	53	6.9%	173	22.5%	540	70.2%	0	0.0%	3	0.4%	770	16.4%
Southern Suburbs	10	2.5%	90	21.9%	311	75.4%	0	0.0%	1	0.2%	413	8.8%
Total	**109**	**4.5%**	**566**	**23.2%**	**1759**	**72.1%**	**0**	**0.0%**	**7**	**0.3%**	2441	52.0%
Metro Total	**941**	**20.0%**	**628**	**13.4%**	**2812**	**59.9%**	**263**	**5.6%**	**50**	**1.1%**	**4694**	**100.0%**

Table 5(c) Travel Mode - Estimated Total Mid Morning Arriving Trips:

	Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total
Travel Modes in Eastern Suburbans												
Within 1km to uni	677	17.5%	0	0.0%	92	2.4%	2999	77.7%	89	2.3%	3858	12.1%
Between 1km to 2km	1253	60.2%	0	0.0%	169	8.1%	605	29.1%	53	2.5%	2080	6.5%
HFB Served Area	1751	74.8%	0	0.0%	376	16.0%	152	6.5%	63	2.7%	2341	7.4%
LFB Served Area	447	60.2%	66	8.9%	203	27.3%	7	1.0%	20	2.7%	742	2.3%
No Direct Bus to Uni	963	48.8%	210	10.7%	692	35.1%	19	1.0%	88	4.4%	1972	6.2%
Eastern Suburb Total	**5090**	**46.3%**	**276**	**2.5%**	**1532**	**13.9%**	**3782**	**34.4%**	**313**	**2.8%**	**10993**	**51.3%**
Travel Modes in Sydney Other Regions												
Northern Suburbs	358	13.7%	1432	54.7%	810	31.0%	0	0.0%	16	0.6%	2616	8.2%
NorthWest Suburbs	158	9.0%	1282	73.2%	304	17.4%	0	0.0%	7	0.4%	1751	5.5%
Western Suburbs	50	2.7%	1474	80.8%	290	15.9%	0	0.0%	10	0.5%	1824	5.7%
Inner West Suburbs	394	13.7%	1700	59.2%	743	25.9%	0	0.0%	34	1.2%	2872	9.0%
Southern Suburbs	85	6.1%	830	59.6%	472	33.9%	0	0.0%	5	0.3%	1393	4.4%
Total	**1045**	**10.0%**	**6719**	**64.3%**	**2620**	**25.1%**	**0**	**0.0%**	**72**	**0.7%**	10456	**48.7%**
Metro Total	**6135**	**28.6%**	**6995**	**32.6%**	**4152**	**19.4%**	**3782**	**17.6%**	**385**	**1.8%**	**21449**	**100.0%**

3. Morning Peak Hour

Table 6 Travel Mode - Estimated Total Morning Peak Hour Arriving Trips:

Bus	%	T&B	%	Car	%	Walk	%	Bicycle	%	Sum	%Total Daily
4276	31.7%	5610	41.6%	1909	14.2%	1528	11.3%	153	1.1%	13476	13.0%

Table 7 Estimated Railway Catchment:

	%Regional Served by Rail	No.of Students Close to Rail	No.of Students Away from Rail
Western Suburbs	37.0%	1343	2312
North West	27.5%	970	2610
Norhthern Suburbs	25.9%	1417	4028
Southern Suburbs	55.8%	1529	1193
Inner West	62.1%	3319	2014
Total		**8577**	**12157**
	%Regional Served by Rail	**No.of Staff close to Rail**	**No.of Staff away from Rail**
Western Suburbs	37.0%	140	232
North West	27.5%	97	248
Norhthern Suburbs	25.9%	189	539
Southern Suburbs	55.8%	264	210
Inner West	62.1%	549	334
Total		**1239**	**1562**
	%Regional Served by Rail	**No.of Total close to Rail**	**No.of Total away from Rail**
Western Suburbs	37.0%	1483	2544
North West	27.5%	1067	2858
Norhthern Suburbs	25.9%	1606	4566
Southern Suburbs	55.8%	1793	1403
Inner West	62.1%	3868	2348
Total		**9816**	**13719**

APPENDIX 3 EXISTING PUBLIC TRANSPORT

Table 1 Morning Peak Hour University Bus Services

	8:00-9:00 AM	8:00-9:00 AM	Original / Destination	
Via Anzac Pde	Northbound	Southbound		
393/394/399/L94/X94/X99	32	8	La Perouse	City
395/396/397/X96/X97	14	5	Maroubra	City
391/392/X92	12	3	La Perouse	City
891		23	UNSW	City
Total	58	39		
Via Randwick				
376/377/X77	18	4	Maroubra Beach	City
374/X74	16	2	Coogee North	City
372/373/X73	29	12	Coogee	City
313/314/316/317	8	4	Eastgardens	Bondi
357/359	5	4	Eastgardens/Syndenham	Bondi
343/X43/345	7		Kingsford	City
Total	83	26		
	Eastbound	Westbound		
400/410	13	13	Burwood	Bondi
370	6	5	Leichhardt	Coogee
348 via randwick	0	2	Alexandria	Bondi
Total	**160**	**85**		

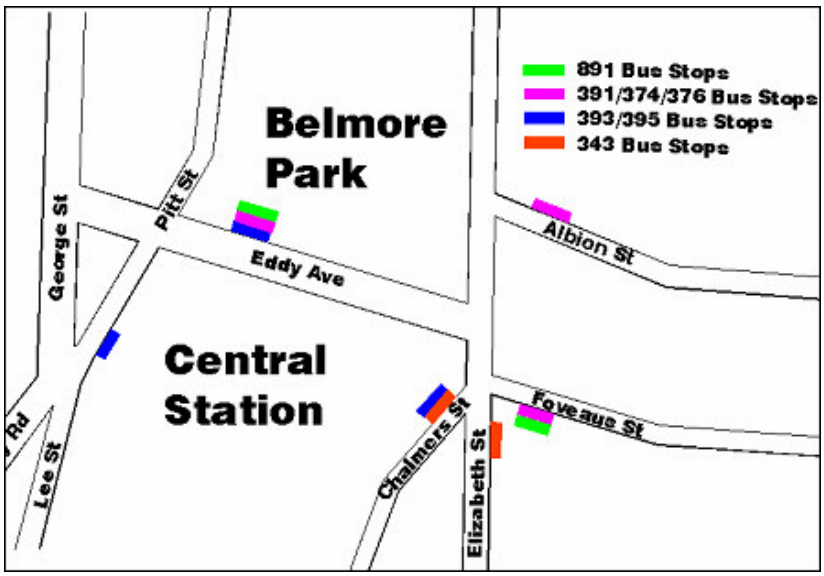
Table 2 Number of Bus links to Central Station in the morning peak hour

Link To Central Station		
Bus	**To Central Station**	**To University**
891		23
393	12	4
391	4	2
395	3	2
374	16	2
376	7	2
343	7	
Total	**49**	**35**

Figure 1 NSW University in its regional context

Figure 2 Buses serving the University

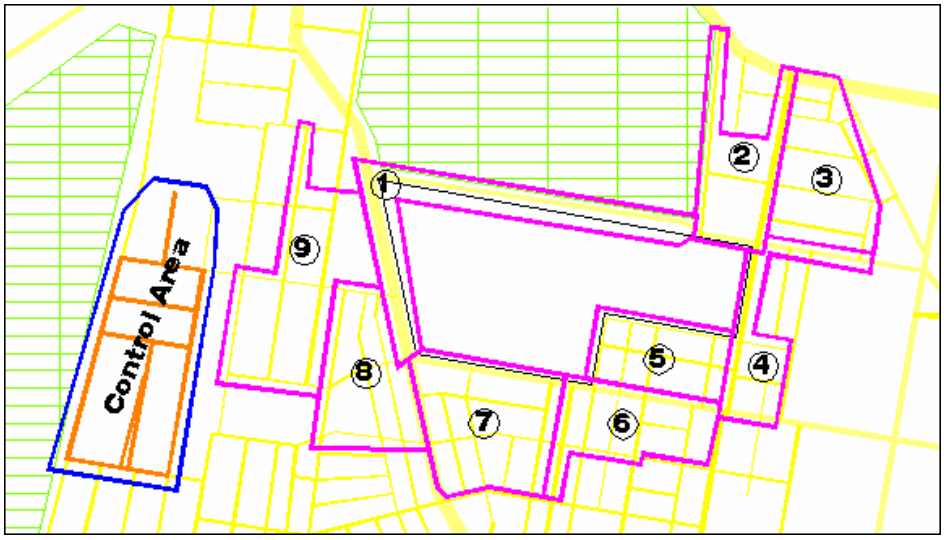
Figure 3 Bus Stops At Central Station for the University



APPENDIX 4 PARKING SURVEY

A 4.1 On-Street Parking

Survey Area:



Parking Survey Area Description:

Christopher Stapleton Consulting Pty Ltd measured the extent of continuous parking to determine the catchment area of University related parking.

Area 1: This area includes High Street and a section of Anzac Parade. The parking spaces in this area are all non-residential. It is assumed that all the parking spaces in this area are University students/staff and University visitors parking.

Area 2: This area contains part of High Street, Wansey Road, Botany Street and Arthur Street. The part of High Street within this area is mostly occupied by the bus bays and University entrance; Wansey Road has residential frontage on one side and non-residential frontage on the other. Botany Street is a busy road, not convenient for parking; Arthur Street is a totally residential street. Therefore, it is assumed that more than 70% of the total parking in Area 2 is University related.

Area 3: This area is very close to Randwick Shopping Centre and shops, so only about 20% of parking in this area is estimated to be University related parking.

Area 4: This area covers the Prince of Wales Hospital, so the majority of parking is estimated to be hospital related. With a residential parking demand also in this area, only about one third of the spaces are counted as University parking.

Area 5: This area is very close to the University but is a residential area; almost all the parking spaces have no restrictions. All the parking in this area is University parking except a small percentage of residential parking.

Area 6: This area is also a residential area, but it is a little far from University; hence it is assumed that about 70% of parking spaces are University parking.

Area 7&8: Parts of these two areas are close to Kingsford shopping area, but the remainder are definitely residential; it is assumed about 55% of parking spaces in Area 7 and 70% of spaces in Area 8 are used by the University students/staff or visitors.

Area 9: This area consists of a very high proportion of short-term residential parking spaces, and therefore it is easier for the University visitor to find a parking space here than in other areas. More than 80% of the parking spaces in this area are assumed University parking.

Table 1 Existing On Street Parking Spaces

On street parking	Area											
	1	2	3	4	5	6	7	8	9	Sum	Total	
Total supply	273	302	279	253	208	221	321	290	360		2507	
Residents Scheme Parking Supply		62	152	66		67	104	23	113		587	
Used By												
Residents Parking		10	20	10			10			50		[5]
University Students/Staff		16	0	6	0	58	23	21	104	228		[1]
University Visitors		6	6	5		6	5		5	33		
ShortTerm Parking for Res Visitors		3	9	4		3	10	2	4	35		
ShortTerm Parking for Shopper			89	21			33			143		[3]
ShortTerm Parking for Commercial		27	29	20			22			98		
Total										587		
Unrestricted Parking Supply	266	240	91	173	208	154	210	223	247		1812	
Used By												
Residents Parking	0	13	32	47	26	31	40	54	46	289		[2]
Residents Visitors		7	5	14		20	8	10	16	80		[2]
Other Commuter	0	21	14	35	0	12	13	0	0	95		
University Students/Staff	246	194	40	72	177	86	149	159	185	1308		
University Visitors	20	5		5	5	5				40		
Total										1812		
Short Term Parking Supply	7		36	14			7	44			108	
Used By												
ShortTerm Parking for Shopper	7		36					17		60		
ShortTerm Parking for Commercial				14			7			21		
University Visitors								27		27		[4]
Total										108		

Total On-Street Parking Spaces: 2,507

Estimated University Used: 1,636 (include 80 university visitors)

See notes next page.

[1] Estimated 228 of 1,298 University long term parking is currently in residential parking spaces illegally.

[2] Many Residents and Residential Visitors do not park in Resident Parking Scheme Spaces.

[3] Retail parking in Areas 3 and 7 that are close to Randwick or Kingsford shopping areas are used for the Residential Parking Scheme.

[4] Of the 108 Short Term Parking spaces, only a small number (27) are used by University Visitors

[5] Some of the Parking Permits are used during the day.

Night Time Parking Survey:

A Day Time (10:00 to 12:00 AM) parking survey was conducted in all areas and a night time survey was conducted in a Control Area where no additional day time parking occurs. This was used to estimate the number of residents and their visitors parking in the areas that are used for University parking.

The selected control area is a purely residential area and very close to the University parking areas. Therefore, the ratio of 'Number of daytime parking (residential parking) / Number of night time parking' also reflects the ratio of 'Number of daytime residential parking / Number of night time parking' in the University parking area. The survey results are shown below:

- Control area daytime parking residents plus visitors: 113
- Control area night time parking residents : 161
- Ratio: 0.7

This ratio was applied to the measured night time demand in each survey area.

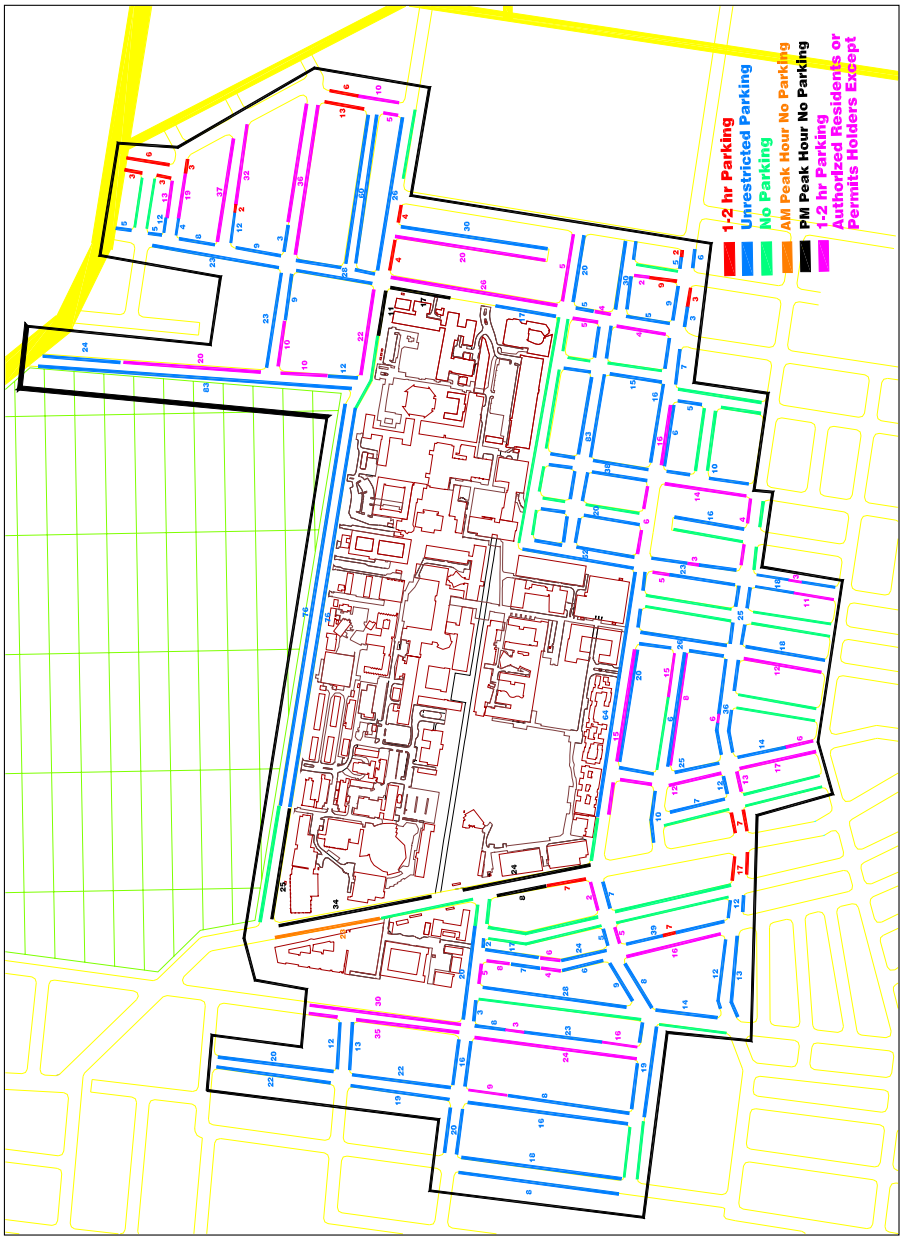
Table 2 Night Time Parking Survey Result

Area	1	2	3	4	5	6	7	8	9	Total
- Night Survey All Users	33	47	150	107	37	77	140	94	94	779
- Estimated Residential	0	47	94	107	37	77	97	94	94	647
- Esitmated Day Time Residential	0	33	66	75	26	54	68	66	66	454

The figure of 454 includes daytime residential parking and resident visitor parking.

Estimated resident visitor parking (0.12/HouseHold) is 115; therefore the daytime residential parking number is 339.

Figure 1 On-Street parking spaces



Survey Time: 7/10/2004 Thursday and 15/4/2005 Friday 10:00am to 12:00am

Figure 2 University parking streets (adjacent to University, non residential frontage)

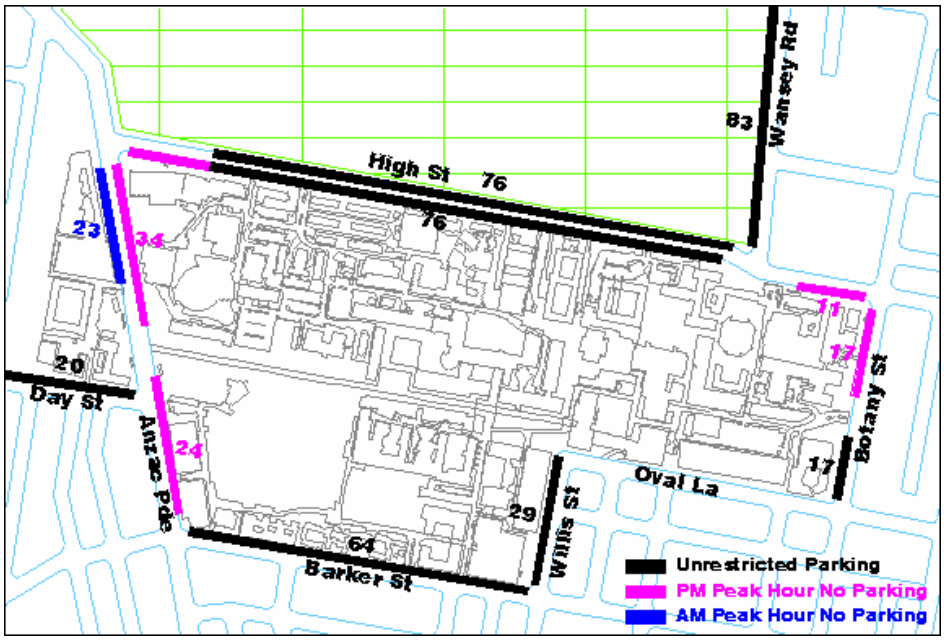


Table 3 Parking spaces adjacent to University with non-residential frontage:

	Unrestricted	Restricted	Total
High St	152	36	188
Anzac Pde		81	81
Day St	20		20
Barker St	64		64
Willis St	29		29
Botany St	17	17	34
Wansey Rd	83		83
Total	**365**	**134**	**499**

Unrestricted parking with residential frontage: 1,447

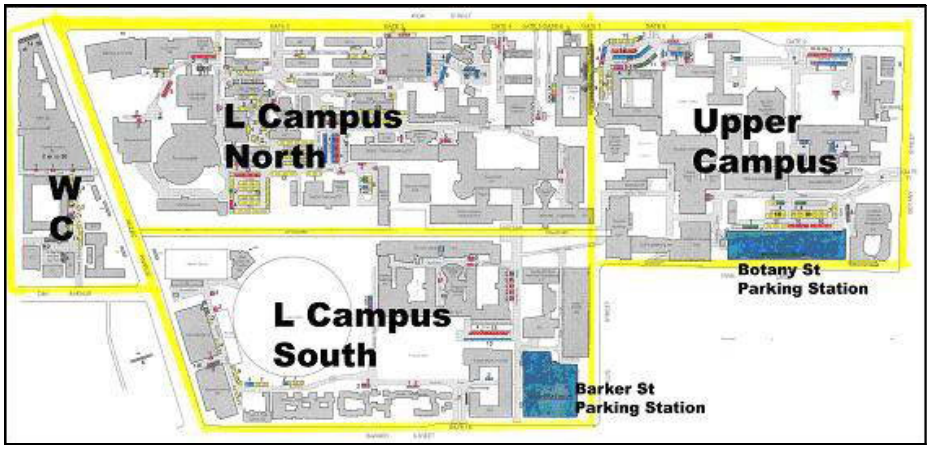
Updated Parking Spaces since last year due to the Council's Resident Parking Scheme:
(based on our survey): -

- In Area 3: 9 Short term parking spaces are converted to Unrestricted parking spaces on High Street east of Botany Street.
- In Area 4: In Barker Street, east of Botany Street, 29 Short Term parking spaces are converted to Unrestricted parking spaces.
- In Area 8: Houston Rd, 16 Unrestricted parking spaces are changed to Short Term & Residential parking along Houston Road.

A 4.2 On Campus Parking

Table 4 Existing Campus Parking

	Botany St Station	Barker St Station	Lower Campus North	Lower Campus South	Upper Campus	Western Campus	Total
Permit Parking	770	652	289	34	104	42	1891
Disabled Parking	8	9	19	7	35	3	81
Reserved Parking	69	52	63	23	68	------	275
Permit & Tickets Parking	183	182	------	------	------	------	365
2hr Metered Parking	------	------	50	21	44	1	116
Total	1030	895	421	85	251	46	2728
Loading Zones	------	------	53	16	31	5	105
Motocycle	6	14	------	------	------	------	20



Total Spaces: 2,728 (excluding Loading Zone and Motorcycle Parking)
On-Campus parking spaces include reserved parking, permit parking, metered parking, loading zones and disabled parking.

The reserved parking (275) spaces are for deans, heads of school, professors and non-academic staff of the same level only. Special permits for these spaces cost $404 per year, which can guarantee the permits holder an available space at any time.

The more general permit parking spaces are available for permit holders at any time, but they do not guaranteed an available space. The parking permits include:

- Day time parking permits:
  Available for staff and students who are employed for more than 20 hours a week, cost $150 per year for staff salary under $35,000 and $202 per year for staff salary above $35,000. Permits holders are allowed to park in any permit parking spaces all day Monday to Friday.
- After hour permit parking
  Available for all the students, staff and contractors, cost $55 per year. Permits holders are allowed to park in any permit parking spaces during 3:30 pm to 7:30 am Mon - Fri
- 24/7 permits parking
  Available only for PHD students who pay $150 per year; permits holders are allowed to park in any permit parking space at any time.
- Weekly parking permits
  Available for university staff and contractors, costing $8.50 per week; holders are allowed to parking from 7:30am to 3:30pm Monday to Friday.
- Daily parking permits ('Scratchies')
  Available for contractors, staff and visitors, but visitors must apply for the permits from the faculties. Schools may purchase day 'Scratchie' permits to be distributed at their discretion. The permits (Scratchies) cost $3.50 a day, and must be displayed on the dashboard.

Deleted: during 7:30am and 3:30pm

Ticketed and metered parking operates on a casual payment basis and is open to the public, but 365 of the 481 spaces located in the two parking stations may be closed to accommodate permit parking during some peak parking hours (e.g. Wednesday 9:00am to 12:00pm) by the campus Parking Management Plan. Only 116 spaces are open 24 hours. All these 116 spaces are located in the surface parking areas.

Existing On-Campus Surface Parking Details:

On-Campus surface parking summary (Refer to Figure 7 in Appendix 5)

Figure 3 Upper Campus surface parking spaces

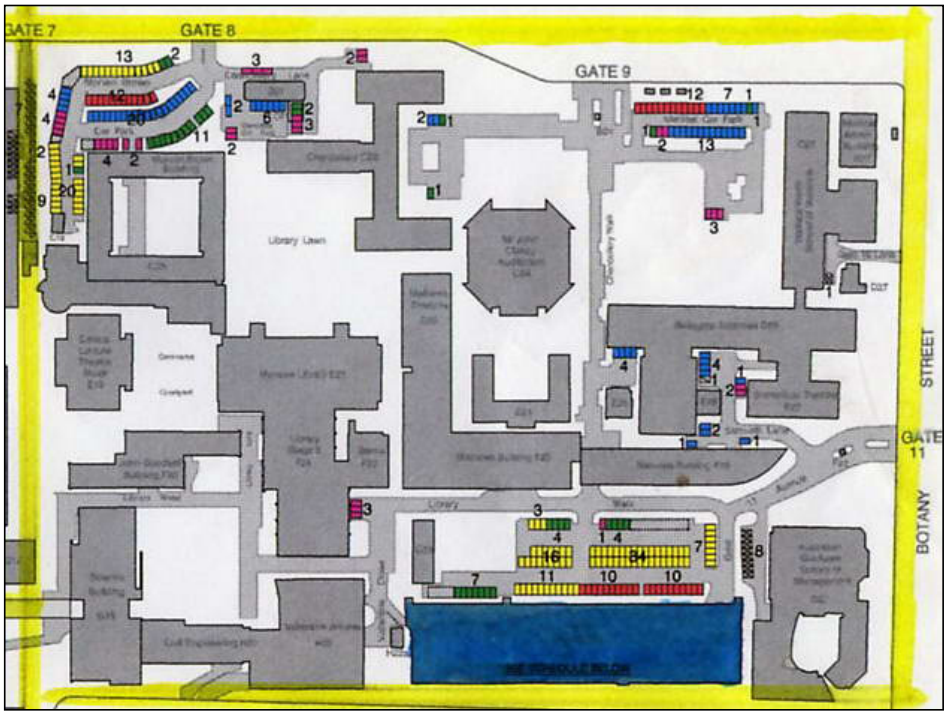


Figure 4 Western Campus surface parking spaces

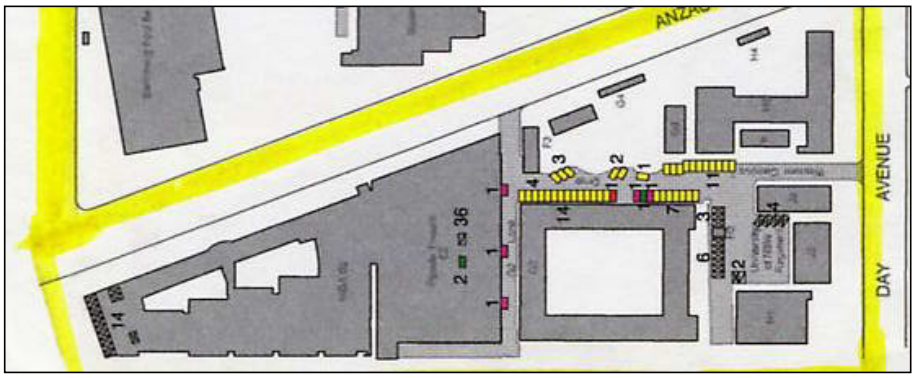


Figure 5 Lower Campus North surface parking spaces

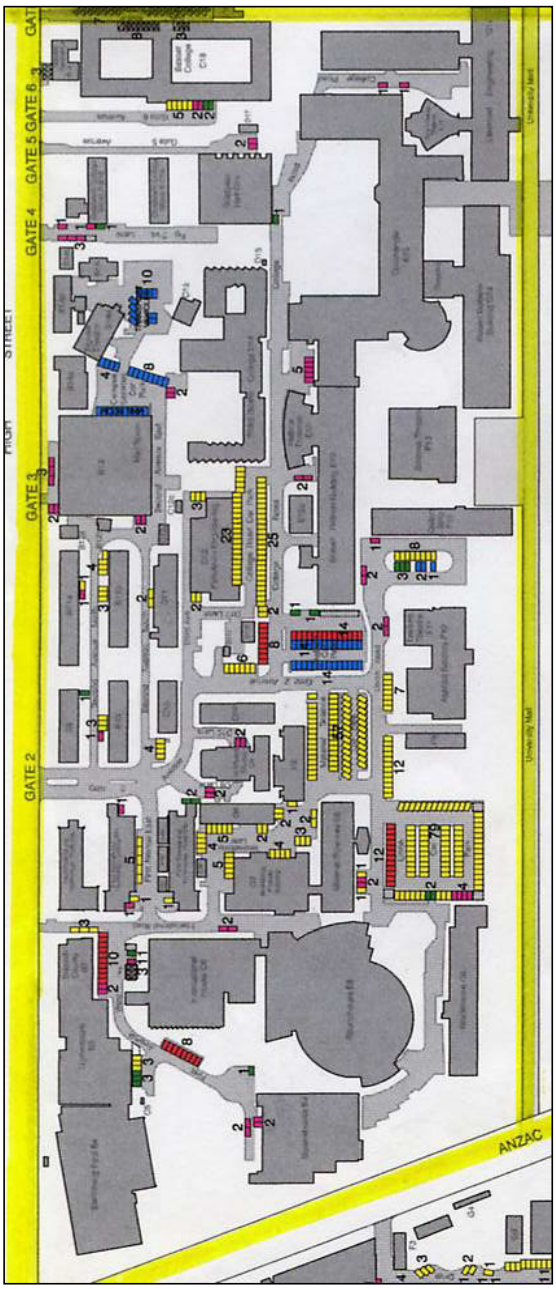
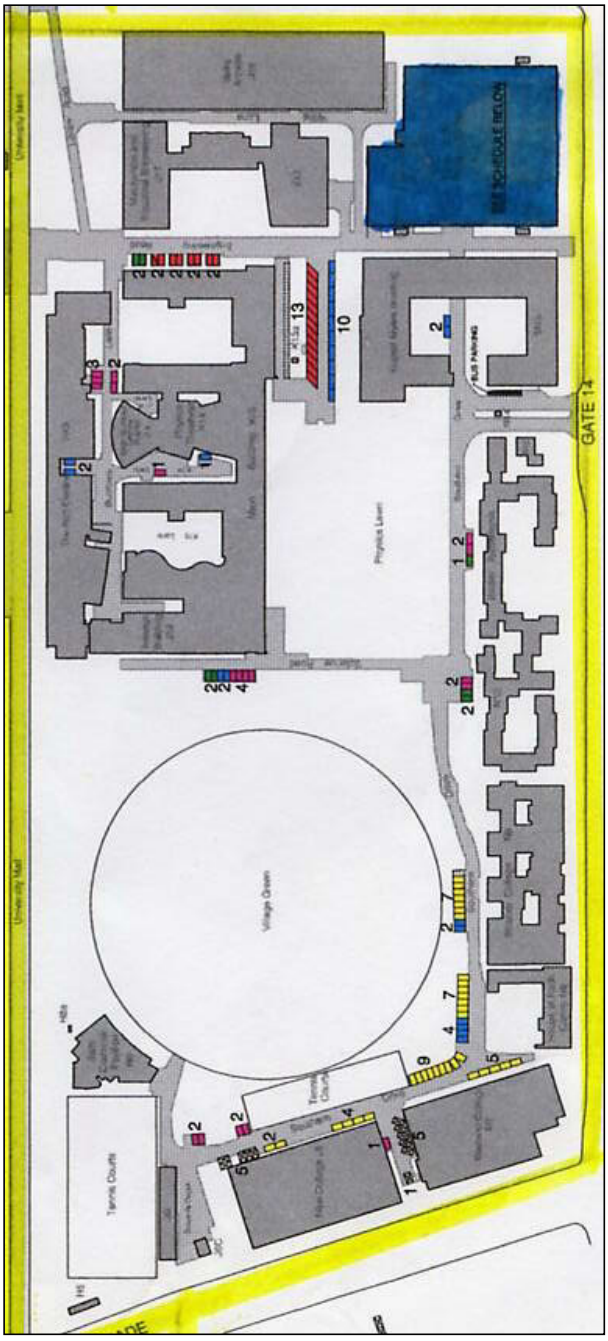


Figure 6 Lower Campus South surface parking spaces



APPENDIX 5 FIGURES

Figure 1 Traffic Management Plan

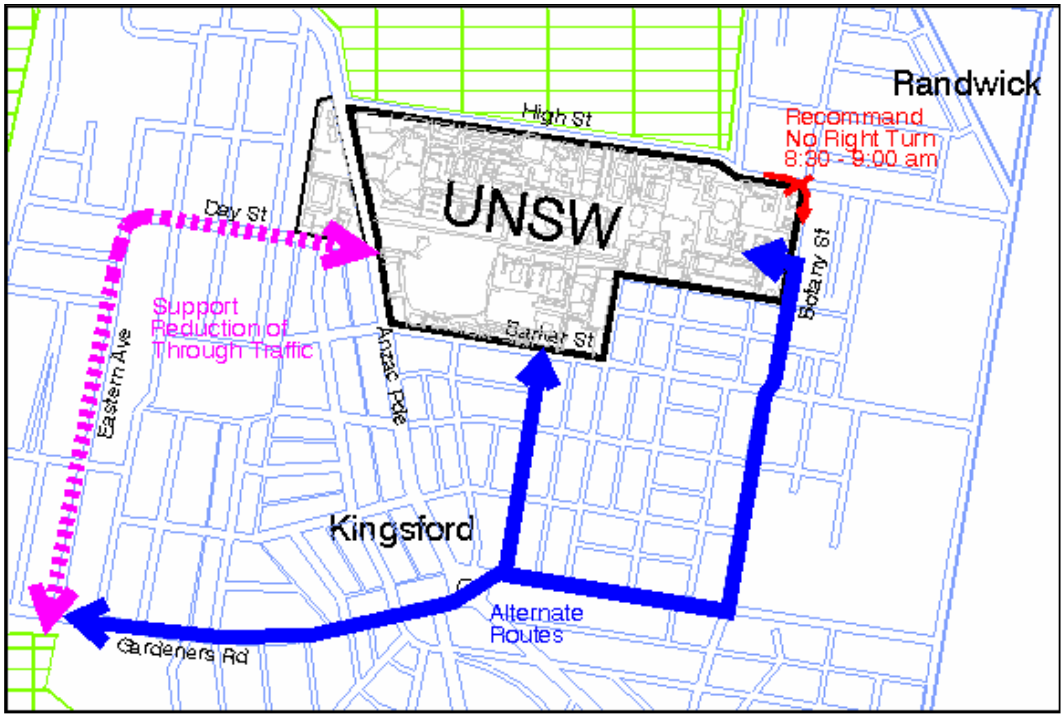


Figure 2 Randwick Area Bicycle Routes

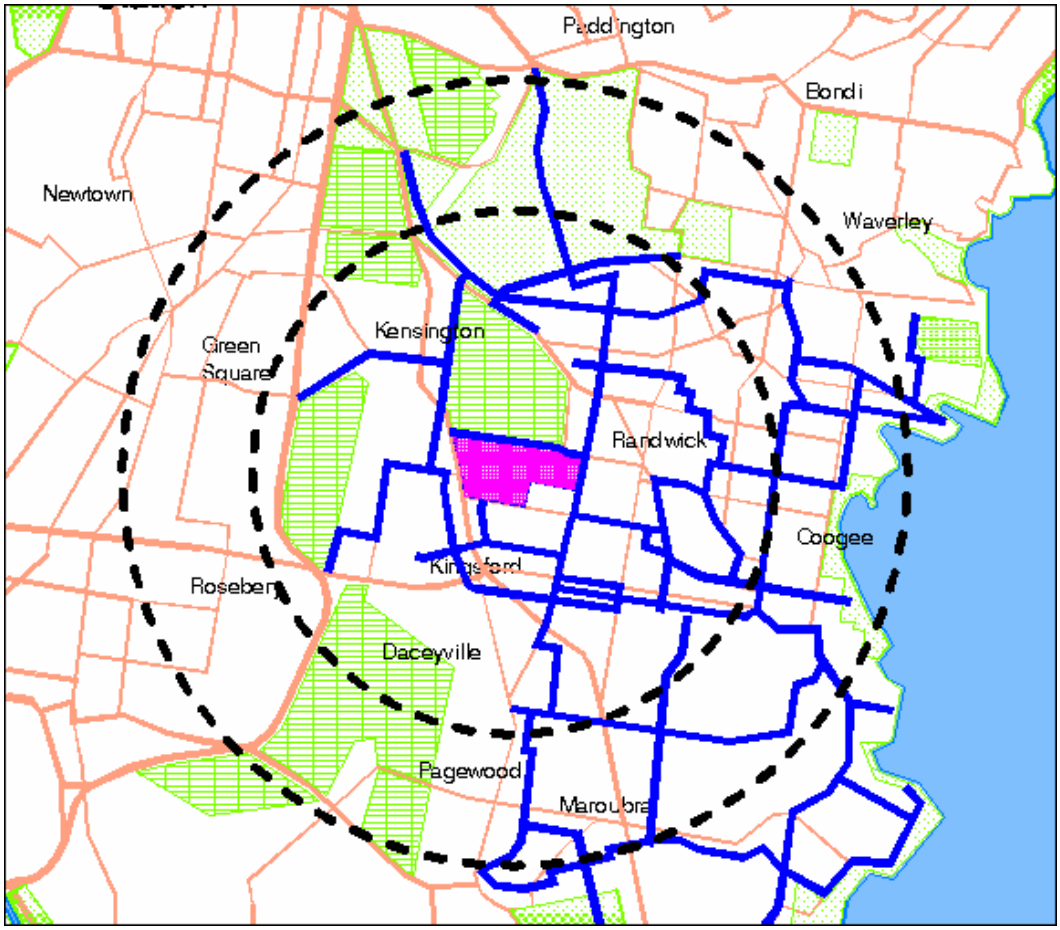
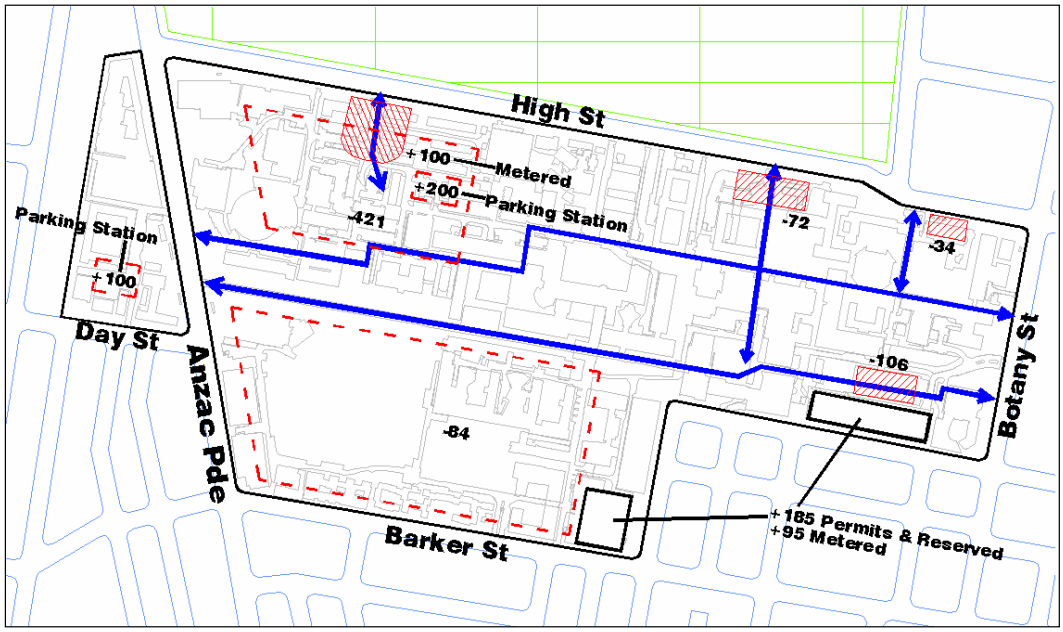


Figure 3 Removal of Surface Parking On-Campus



- figures are the main areas to be removed
+ figures are places where additional parking to be located see text for more detail

Figure 4 Local Access

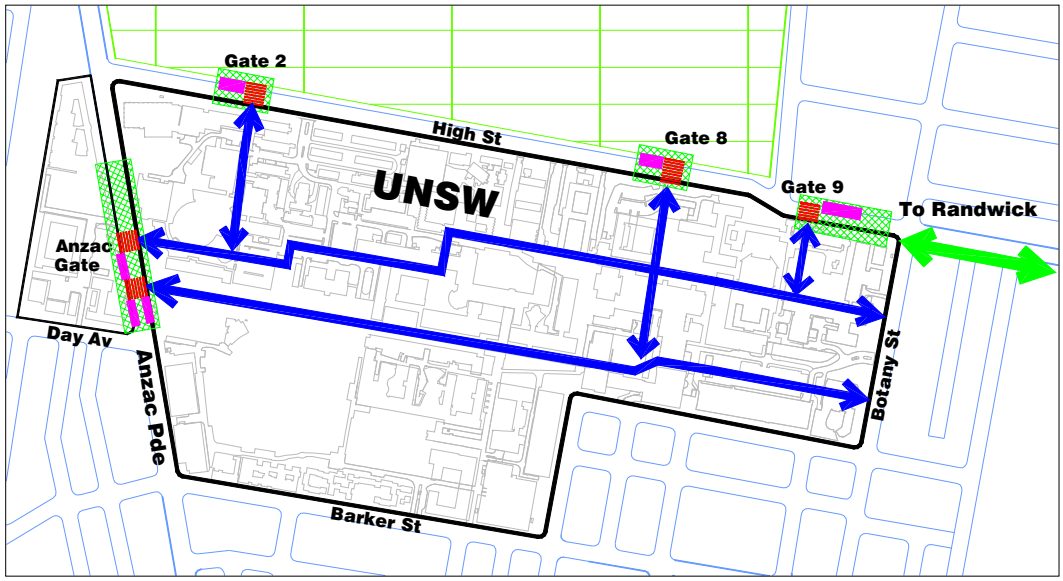


Figure 5 New Public Transport Options

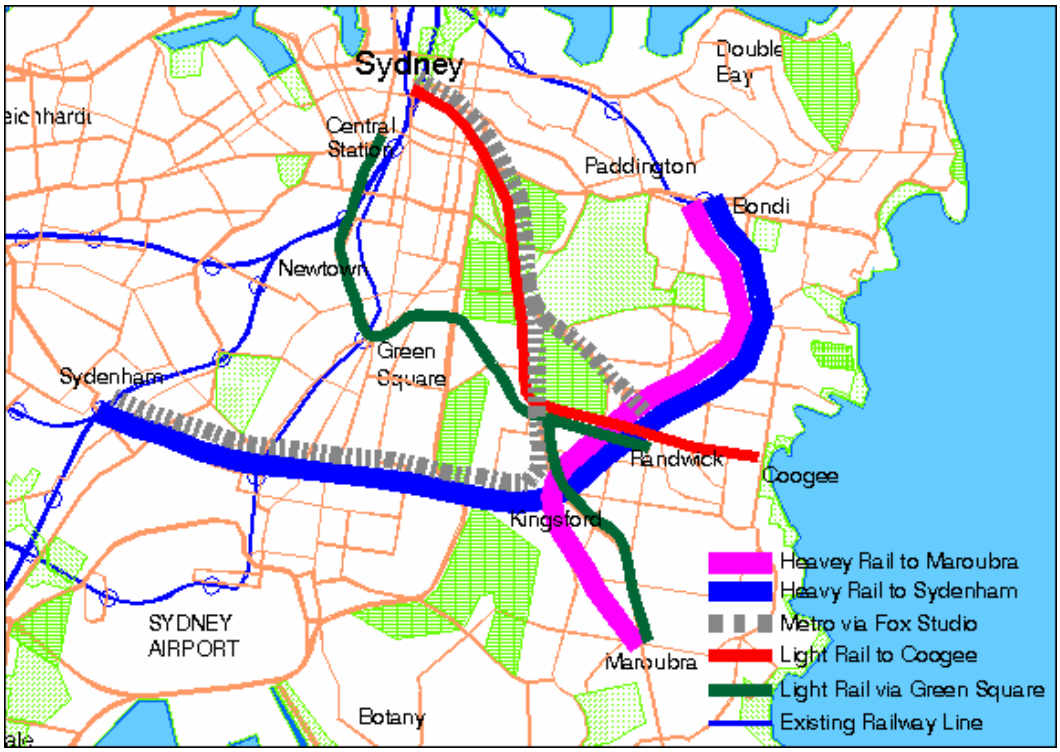


Figure 6 Entry Gates Design Details

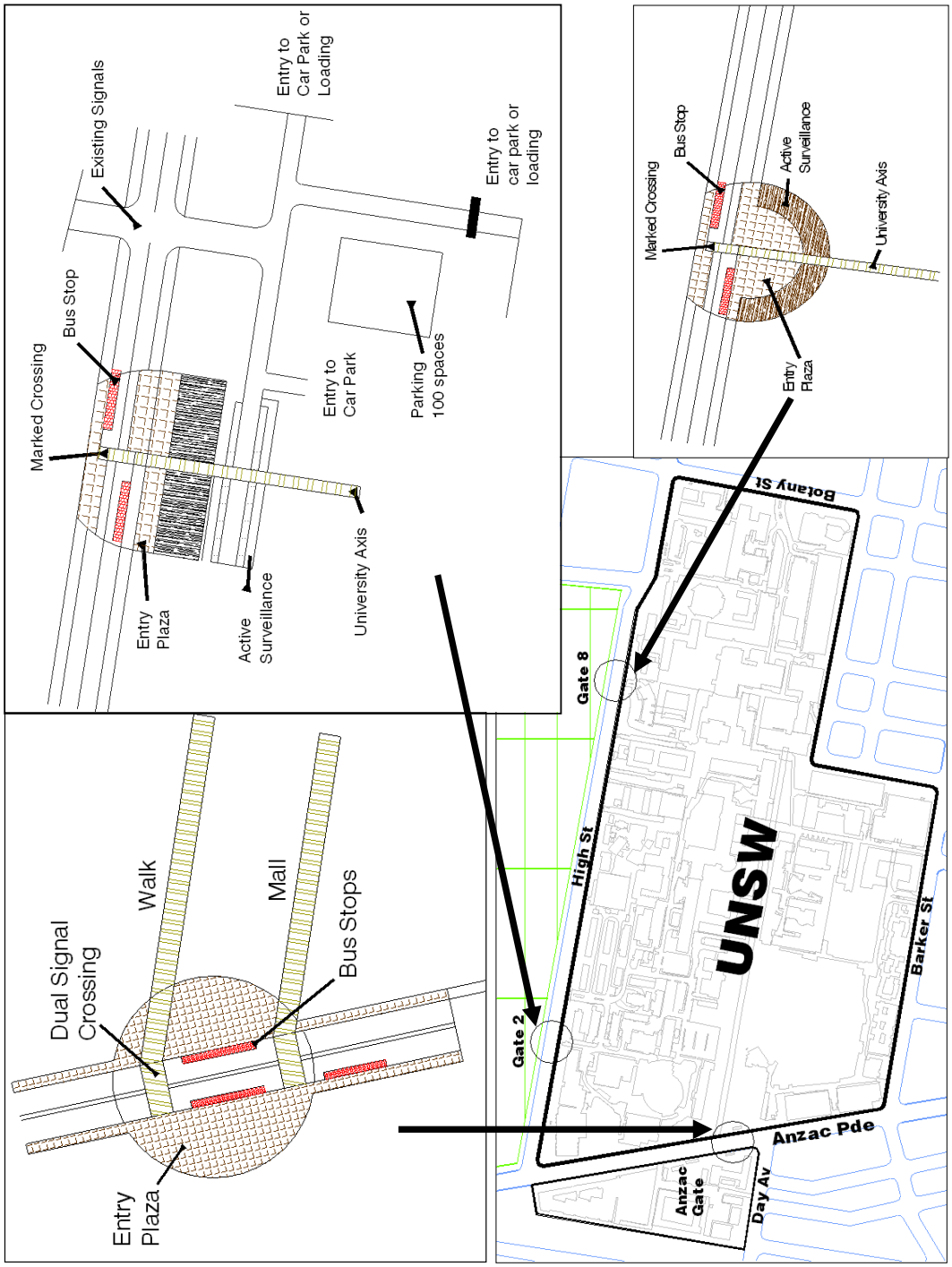
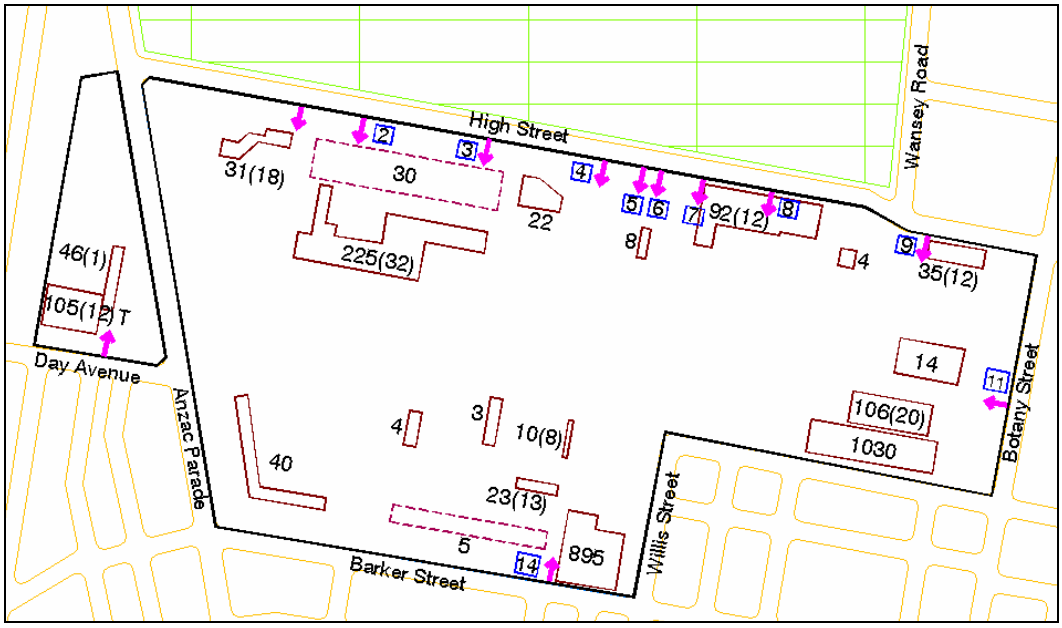


Figure 7 On Campus surface parking summary



( ) indicates number of metered parking spaces

See Figure 3 – 6 in Appendix 4 for detail

APPENDIX 6 PARKING MANAGEMENT

In the following tables, UR indicates Unrestricted Parking Spaces, RPS represents Residential Parking Scheme Spaces, and ST means Short Term Parking Spaces.

On-Street Parking Demand

Table 1 Non University Existing and Proposed Future On Street Parking Demand

Year	Residents				Res Visitor				Retail/commercial				Other Commuter				Emptry			
	UR	RSP	ST	Total	UR	RSP	ST	Total	UR	RSP	ST	Total	UR	RSP	ST	Total	UR	RSP	ST	Total
Existing	289	50	0	339	80	35	0	115	0	241	81	322	95	0	0	95	0	0	0	0
2006	73	300	0	373	0	115	0	115	0	322	0	322	87	0	0	87	0	81	0	81
2007	55	318	0	373	0	115	0	115	0	322	0	322	80	0	0	80	0	81	0	81
2008	41	332	0	373	0	115	0	115	0	322	0	322	73	0	0	73	0	81	0	81
2009	31	342	0	373	0	115	0	115	0	322	0	322	67	0	0	67	0	81	0	81
2010	23	350	0	373	0	115	0	115	0	322	0	322	62	0	0	62	0	81	0	81
2011	17	356	0	373	0	115	0	115	0	322	0	322	48	8	0	56	0	81	0	81
2012	12	361	0	373	0	115	0	115	0	322	0	322	36	16	0	52	0	81	0	81
2013	8	365	0	373	0	115	0	115	0	322	0	322	23	24	0	47	0	81	0	81
2014	4	369	0	373	0	115	0	115	0	322	0	322	12	32	0	44	0	81	0	81
2015	0	373	0	373	0	115	0	115	0	322	0	322	0	40	0	40	0	81	0	81

Table 2 University Existing and Proposed Future On-Street Parking Demand

Year	Students				Staff				Uni Visitors				On Street
	UR	RSP	ST	Total	UR	RSP	ST	Total	UR	RSP	ST	Total	Total
Existing	1108	228	0	1336	200	0	0	200	40	33	27	100	1636
2006	1245	0	0	1245	160	0	0	160	39	61	0	100	1505
2007	1150	0	0	1150	128	0	0	128	38	62	0	100	1378
2008	1052	0	0	1052	102	0	0	102	37	63	0	100	1254
2009	953	0	0	953	82	0	0	82	36	64	0	100	1135
2010	853	0	0	853	66	0	0	66	35	65	0	100	1019
2011	754	0	0	754	53	0	0	53	34	66	0	100	907
2012	656	0	0	656	42	0	0	42	33	67	0	100	798
2013	587	0	0	587	28	0	0	28	32	66	0	98	713
2014	526	0	0	526	14	0	0	14	31	67	0	98	638
2015	469	0	0	469	0	0	0	0	30	24	0	54	523

On-Street Parking Supply:

Table 3 Existing and Proposed Future On-Street Parking Supply

Year	UR	RPS	ST	Total	Landscape	Flexible
Existing	1812	587	108	2507	0	0
2006	1604	879	0	2483	24	0
2007	1451	898	0	2348.6	158	0
2008	1305	913	0	2217.8	289	0
2009	1169	924	0	2092.6	414	0
2010	1039	933	0	1972.3	450	85
2011	906	948	0	1854.1	450	203
2012	779	962	0	1741	450	316
2013	678	973	0	1651	450	406
2014	587	986	0	1573	450	484
2015	499	955	0	1453.8	450	603

University On-Street and On-Campus Parking Demand Summary

Table 4 Existing and Future University On & Off Campus parking demand

	On street										On Campus				Students	Staff	Visitor	Total
Year	Students			Staff		Uni Visitors				Sub Total	Students	Staff	Visitors	Sub Total	Sum	Sum	Sum	
	UR	RSP	Total	UR	Total	UR	RSP	ST	Total									
Existing	1108	228	1336	200	200	40	33	27	100	1636	0	2612	116	2728	1336	2812	216	4364
2006	1245	0	1245	160	160	39	61	0	100	1505	23	2589	116	2728	1268	2749	216	4233
2007	1150	0	1150	128	128	38	62	0	100	1378	53	2559	116	2728	1203	2687	216	4106
2008	1052	0	1052	102	102	37	63	0	100	1254	87	2525	116	2728	1139	2627	216	3982
2009	953	0	953	82	82	36	64	0	100	1135	126	2486	116	2728	1079	2568	216	3863
2010	853	0	853	66	66	35	65	0	100	1019	167	2445	116	2728	1020	2511	216	3747
2011	754	0	754	53	53	34	66	0	100	907	210	2402	116	2728	964	2455	216	3635
2012	656	0	656	42	42	33	67	0	100	798	254	2358	116	2728	910	2400	216	3526
2013	587	0	587	28	28	32	66	0	98	713	271	2318	118	2707	858	2346	216	3420
2014	526	0	526	14	14	31	67	0	98	638	282	2279	118	2679	808	2293	216	3317
2015	469	0	469	0	0	30	24	0	54	523	291	2242	164	2697	760	2242	218	3220
2016											245	2192	164	2601	714	2192	218	3124
2017											200	2143	164	2507	669	2143	218	3030
2018											157	2095	164	2416	626	2095	218	2939
2019											115	2048	164	2327	584	2048	218	2850
2020											73	2003	164	2240	542	2003	218	2763

On-Campus Parking Supply

Table 5 Existing and Proposed Future On-Campus Parking Supply

	Existing				Relocated		Remaining					
	Permit & Reserved	Metered	Disabled	Total	Permit & Reserved	Metered	Permit & Reserved	Metered	Flexible	Disabled	Total	Landscape
Surface Parking												
Upper Campus	172	44	35	251	-162	-44	10	0		35	45	202
Lower Campus South	57	21	7	85	-22	-6	35	15		7	57	
Western Campus	42	1	3	46	-40	-1	2	0		3	5	
Lower Campus North	352	50	19	421	-340	50	12	100		19	131	
Surface total	623	116	64	803	-564	-1	59	115		64	238	
Parking Stations												
Botany Street	1022	0	8	1030	-141	46	881	46	95	8	1030	
Barker Street	886	0	9	895	-141	46	745	46	95	9	895	
Western Campus	0	0	0	0	70	10	70	10		0	80	
Lower Campus	0	0	0	0	200	0	200	0		0	200	
Station Total	1908	0	17	1925	-12	102	1896	102	190	17	2205	
TOTAL	2531	116	81	2728	-576	101	1955	217	190	81	2443	

University Short Term Parking Demand

Table 6 University Short Term Parking Demand

Mid Morning					Evening
	10min	1 hour	2 hours	Day Total	1 - 2 hours
Gym	2	15	0	17	15
Swimming Pool	5	20	30	55	10
NIDA	5	5	0	10	200
Child Care	0	0	0	0	0
University Visitors	0	64	100	164	0
Total	12	104	130	246	225

Table 7 Individual demand calculations

Daily						
	10min	1 hour	2 hours	Day Total	Note	Evening
Gym	2	15	0	17	All Year	15
Swimming Pool	5	20	30	55	Increasing	10
NIDA	5	5	30	40	vacation	200
Child Care	10	0	0	10	PM/AM only	0
University Visitors	0	64	100	164	Fixed	0
Total	22	104	160	286		225

University Short Term Parking Supply

Table 8 Proposed University Short Term Parking Supply

Existing			
University Meters		116	
On Street Adjacent		30	
On Street Elsewhere		100	
	Total short term	246	
Proposed			
University Meters		192	**Total Campus**
Empty on Site		25	217
On Street Adjacent		30	
On Street elsewhere		24	
	Total short term	271	

Figure 1 University Parking Scheme Diagram – On-Street Parking

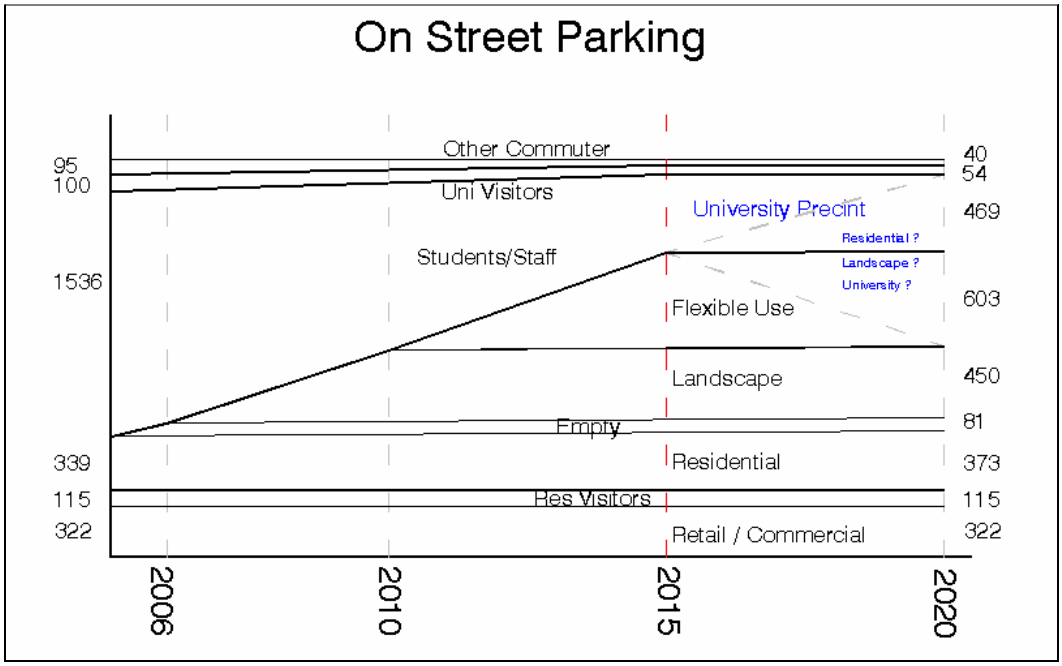


Figure 2 University Parking Scheme Diagram – University Long Term Parking

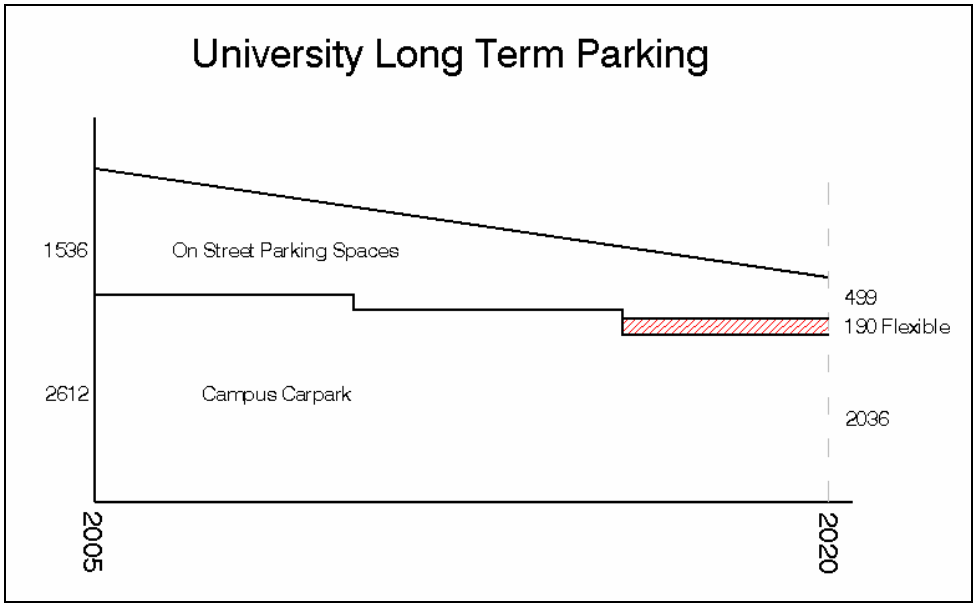
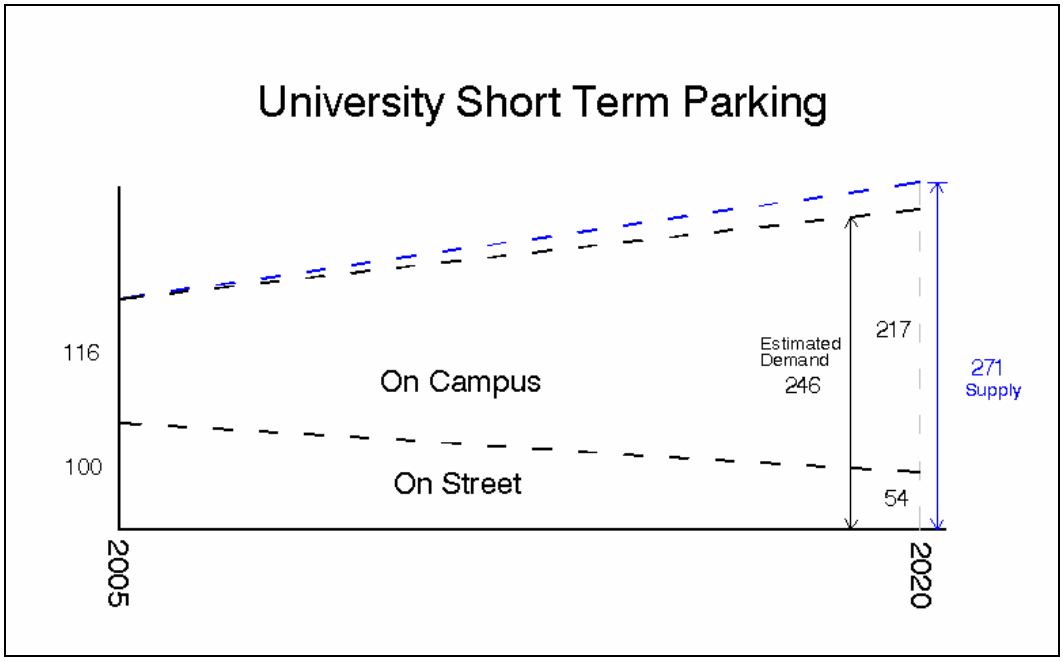
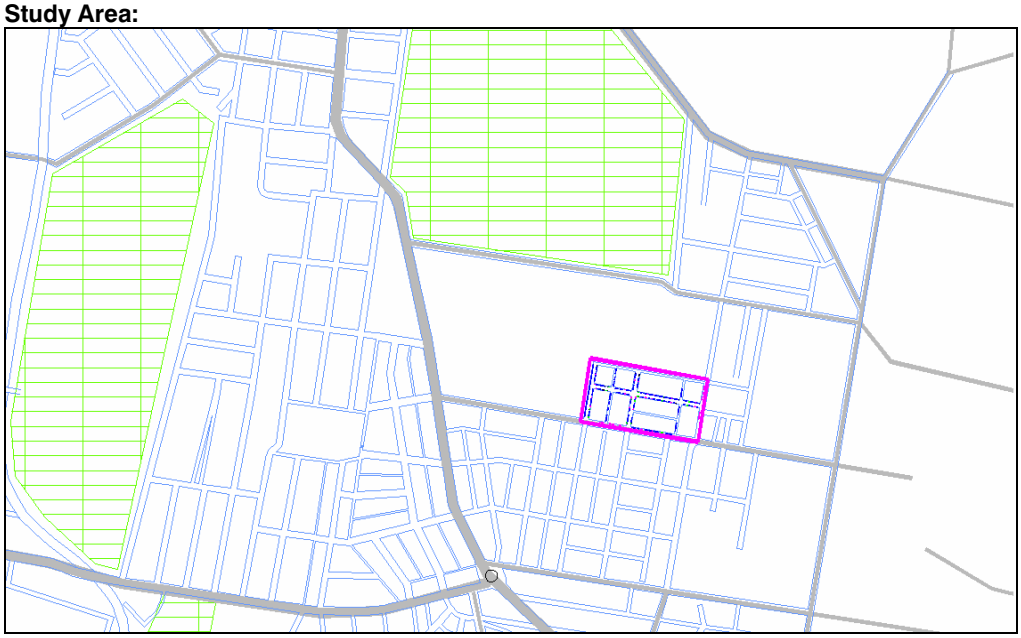


Figure 3 University Parking Scheme Diagram – University Short Term Parking

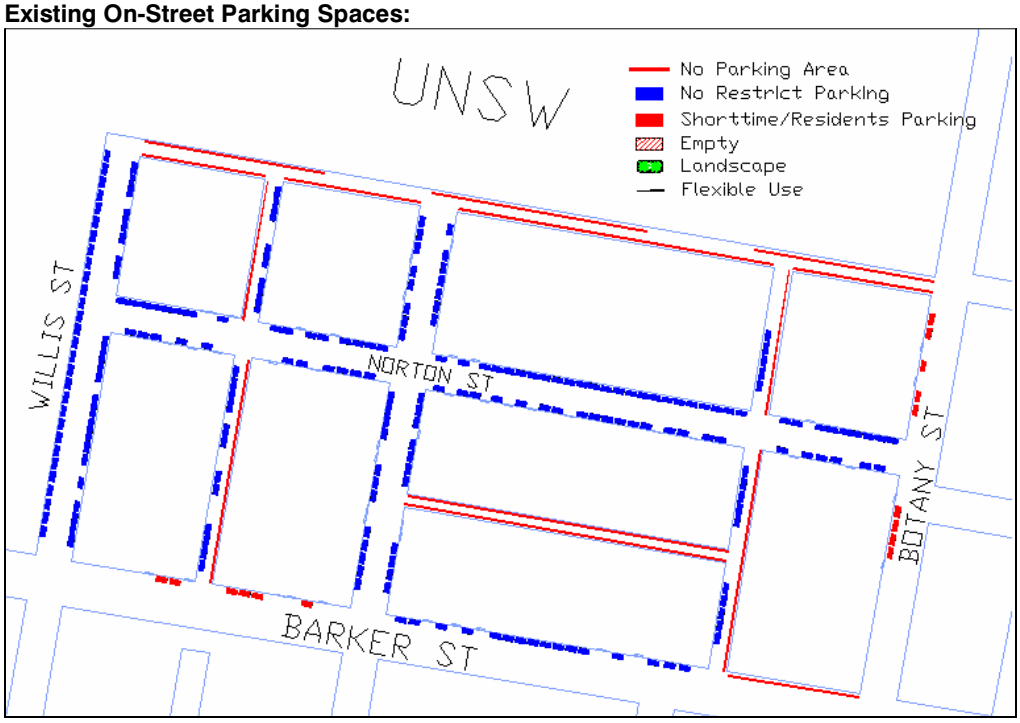


APPENDIX 7 PILOT STUDY FOR THE MANAGEMENT OF LOCAL STREETS

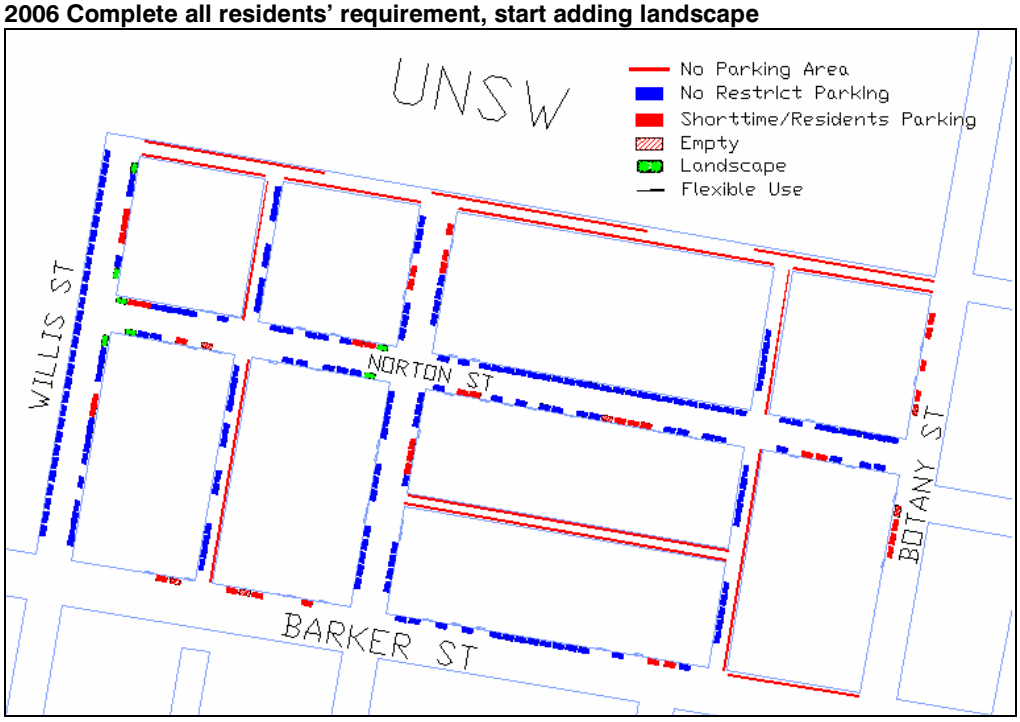
Study Area:



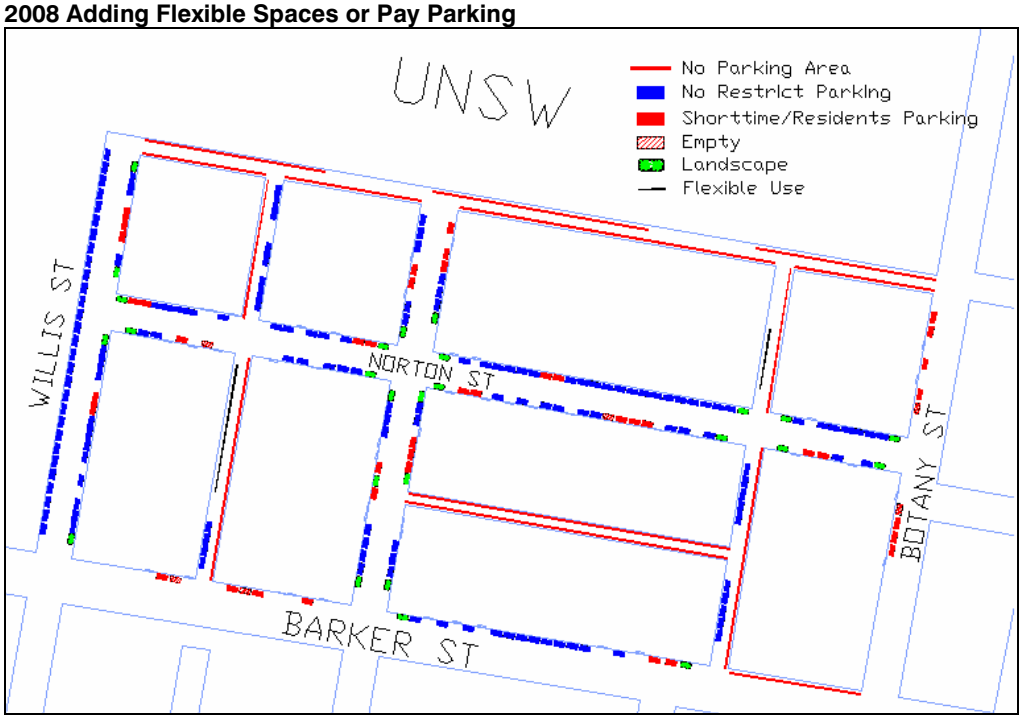
Existing On-Street Parking Spaces:



2006 Complete all residents' requirement, start adding landscape



2008 Adding Flexible Spaces or Pay Parking



2015 Finish Adding Flexible Spaces or Pay Parking, Keep reducing On-Campus Parking Spaces

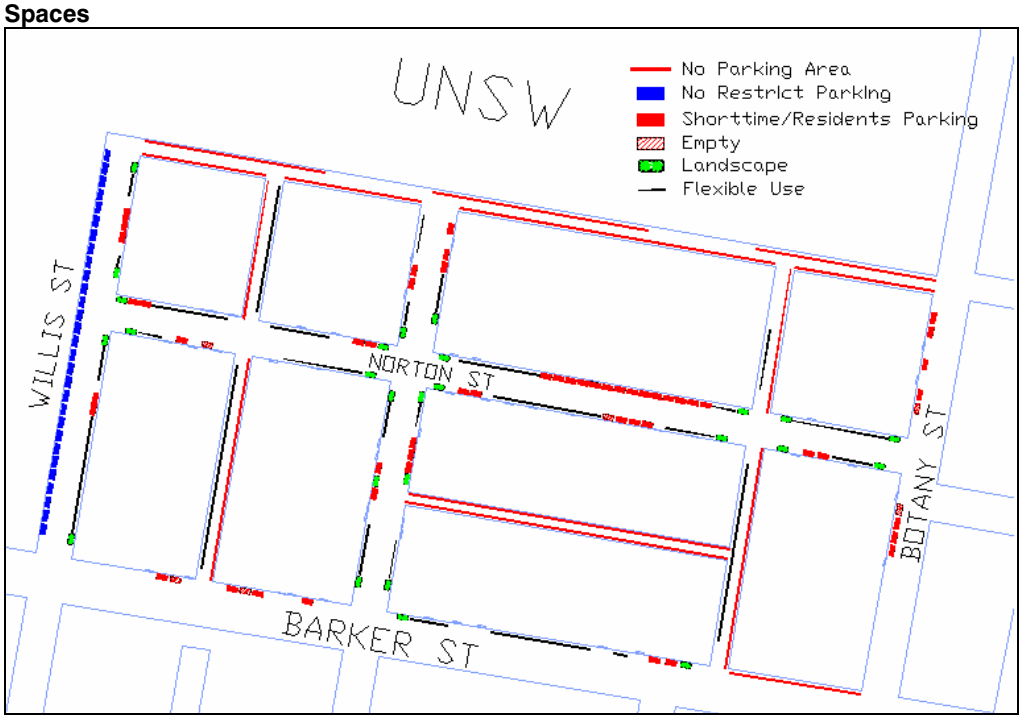


Table 1 Sample Area Implementation Table:

	No Restrict Parking			Restrict Residential Parking				Landscape	Flexible	University
Year	Student/Staff	Residential	Total	Residents	Res.Visitors	University	Empty		Use	Total
Existing	198	26	224	0	9	6	0	0	0	204
2006	181	7	188	22	9	7	6	7	0	188
2007	164	6	170	23	9	8	6	23	0	172
2008	147	5	152	24	9	9	6	26	13	156
2009	130	4	134	25	9	10	6	26	29	140
2010	113	3	116	26	9	11	6	26	45	124
2011	96	2	98	27	9	12	6	26	61	108
2012	79	1	80	28	9	13	6	26	77	92
2013	62	0	62	29	9	14	6	26	93	76
2014	45	0	45	29	9	15	6	26	109	60
2015	29	0	29	29	9	16	6	26	124	45

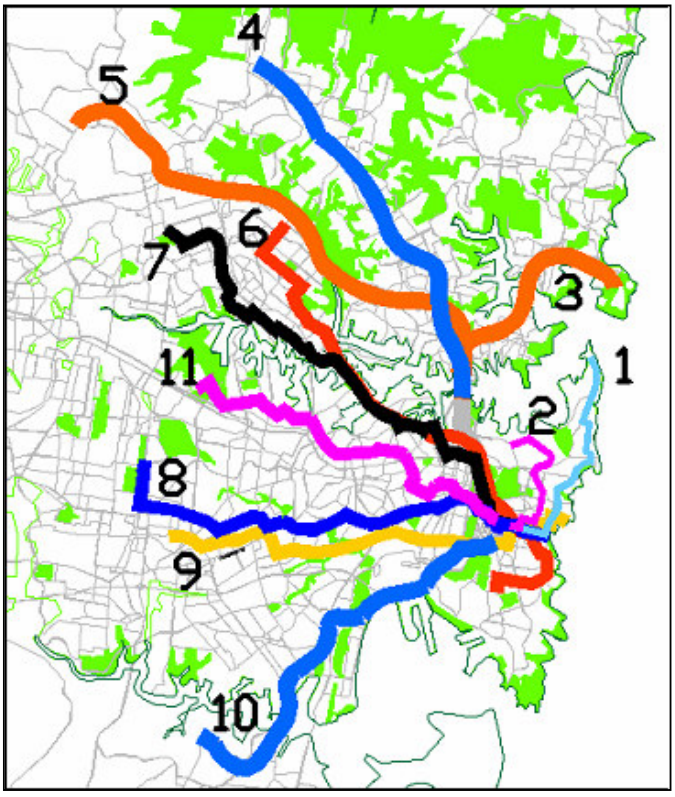
All residential needs should be satisfied, start adding landscape.

Reach maximum landscape, start adding flexible use spaces.

APPENDIX 8 STRATEGIES

Public Transport Strategies:

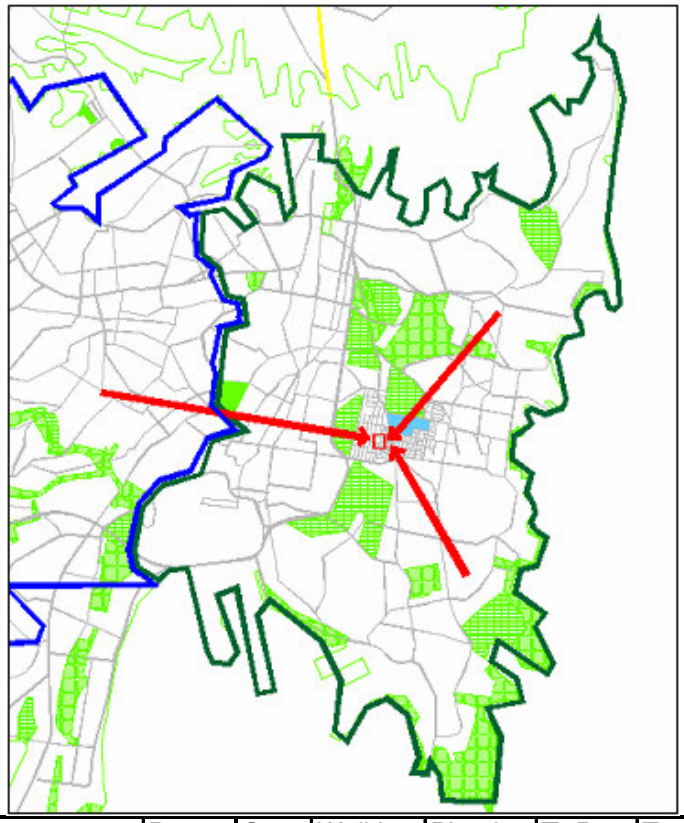
Figure 1 Proposed New or Extended Bus Routes



Strategy	Parking Space Saving	%
Bus Route 1	275	32.1%
Bus Route 2	123	14.3%
Bus Route 3	77	9.0%
Bus Route 4	41	4.8%
Bus Route 5	57	6.6%
Bus Route 6	35	4.1%
Bus Route 7	35	4.1%
Bus Route 8	56	6.5%
Bus Route 9	45	5.2%
Bus Route 10	30	3.5%
Bus Route 11	84	9.8%
Total	**858**	**100.0%**

Figure 2 New accommodation close to University

Build new accommodation with 4,500 student capacity within 1km to the university.



	Bus	Car	Walking	Bicycle	T&Bus	Total
Additional morning peak parking hour arrival trips			1403			1403
E.S. & Innerwest trips reduction	858	128		56	325	1403

Parking Spaces Saved
128

Table 1 Public Transport Implementation Scenarios:

	New	Route Number											Parking	Reduction	Accumlate
Year	Accomm.	1	2	3	4	5	6	7	8	9	10	11	Saving	Target	Balance
2006	12.50%		100%										139	131	8
2007	12.50%	100%											291	127	172
2008	12.50%												16	124	64
2009	12.50%												16	119	-39
2010	12.50%			100%		100%							150	116	-5
2011	12.50%				100%		100%						92	112	-25
2012	12.50%							100%	100%				107	109	-27
2013	12.50%									100%		100%	129	106	-4
2014											100%		46	103	-61
2015													0	100	-161
2016													0	97	-258
2017													0	94	-352
2018													0	91	-443
2019													0	89	-532
2020													0	87	-619
Total													**986**	**1605**	**-619**

61% of car trip reduction is achieved without changing travel behavior.

Other strategies will be used to take over unbalanced parking spaces.

Table 2 Scenario for parking management

Staff DEMAND	SUPPLY			Students DEMAND	SUPPLY				
Total	Campus	Removal	On Street		Campus	On Street	Uni Streets Metered	Uni Streets Not Metered	Local Street Free
2800	2600		200	1336	0	1336	0	450	886
2501	2490	0	50	991	39	952	300	150	502
2235	2260	50	50	735	75	660	450	0	210
1996	2024	42	50	545	78	468	450	0	18

Table 3 Scenario for parking management with temporary Metered parking in Flexible Spaces along Residential Streets.

Staff				Students							
DEMAND	SUPPLY			DEMAND	SUPPLY						
Total	Campus	Removal	On Street		Campus	On Street	Uni Streets Metered	Local Street Not Metered	Local Street Total	Local Street Meters	Local Street Free
2800	2600		200	1336	0	1336	0	450	886	0	886
2738	2600	0	138	1259	0	1259	100	350	809	0	809
2677	2490	110	187	1186	0	1186	100	350	736	0	736
2617	2490	0	127	1117	0	1117	200	250	667	0	667
2558	2490	0	68	1052	0	1052	200	250	602	300	302
2501	2490	0	50	991	39	952	300	150	502	300	202
2446	2440	50	50	933	44	889	300	150	439	300	139
2391	2390	50	50	879	49	830	400	50	380	250	130
2338	2340	50	50	828	52	776	400	50	326	250	76
2286	2310	30	50	780	74	706	450	0	256	200	56
2235	2260	50	50	735	75	660	450	0	210	200	10
2185	2210	50	50	692	75	617	450	0	167	150	17
2136	2160	50	50	652	74	578	450	0	128	110	18
2088	2110	50	50	614	72	543	450	0	93	90	3
2042	2066	44	50	579	74	505	450	0	55	50	5
1996	2024	42	50	545	78	468	450	0	18	0	18

Table 4 Scenario for Incomes from Long-Term Parking Meters

	Staff			Student		Income '000		
	Campus			On Street	On campus	University	Council	
	Annual Increase	Annual Charge	Daily Eqivalent				Without Flexible Meters	Temporary Meters
2005		**202**	**1.01**		**3**	**525**	**0**	**0**
2006	0.08	218	1.1	6	3	567	120	120
2007	0.08	236	1.2	6	3	587	120	120
2008	0.08	254	1.3	7	3.5	634	280	280
2009	0.08	275	1.4	7.5	3.5	684	300	750
2010	**0.1**	**302**	**1.5**	**8**	**4**	**784**	**480**	**960**
2011	0.1	333	1.7	8.5	4.5	851	510	1020
2012	0.1	366	1.8	9	4.75	921	720	1170
2013	0.1	402	2.0	10	5	994	800	1300
2014	0.1	443	2.2	11	5.5	1104	990	1430
2015	**0.15**	**509**	**2.5**	**12**	**6**	**1241**	**1080**	**1560**
2016	0.15	585	2.9	13	6.5	1391	1170	1560
2017	0.15	673	3.4	14	7	1557	1260	1568
2018	0.15	774	3.9	15	7.5	1741	1350	1620
2019	0.15	890	4.5	16	8	1958	1440	1600
2020	**0.2**	**1068**	**5.3**	**17**	**8.5**	**2294**	**1530**	**1530**
						17832	**12150**	**16588**

TABLE 5 Scenario for Funding Amenity Programs and Campus parking

	Income '000			Costs	
	University	Council		Improvement	
		Temporary Meters		University	Council
	000	000		Cost parking Plus amenity	Cost Amenity & safety
				5000	1580
2005	**525**	**0**	0%	**5032**	**1706**
2006	567	120	17%	5038	1759
2007	587	120	17%	5030	1816
2008	634	280	31%	4989	1765
2009	684	750	52%	4909	1381
2010	**784**	**960**	55%	**4753**	**820**
2011	851	1020	55%	4538	171
2012	921	1170	56%	4256	634
2013	994	1300	57%	3901	1300
2014	1104	1430	56%	3440	1430
2015	**1241**	**1560**	56%	**2847**	**1560**
2016	1391	1560	53%	2101	1560
2017	1557	1568	50%	1179	1568
2018	1741	1620	48%		1620
2019	1958	1600	45%	1958	1600
2020	**2294**	**1530**	40%	**2294**	**1530**
	17832	**16588**	48%	**4252**	**12802**