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A TRANSPORT AND ACCESSIBILITY ASSESSMENT FOR ST VINCENT'S PRIVATE HOSPITAL REDEVELOPMENT

Prepared for

St Vincent's Private Hospital Sydney

By

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Report Document Control

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1 INTRODUCTION

Report title	A transport and accessibility assessment for St Vincent's Private Hospital redevelopment
Client	St Vincent's Private Hospital Sydney (SVPHS)
Background information used for preparation of the present report	• Secretary's Environmental Assessment Requirements (SEARs) for SSD 6840 • plans of the proposed development prepared by HASSELL • results of site inspections carried out by TEF Consulting • results of intersection traffic volume counts carried out by TEF Consulting near the Darlinghurst Campus in 2008 and 2011 as an input for the St Vincent's Campus Master Plan (project not activated). • results of traffic, parking, staff and visitor surveys carried out by TEF Consulting at and near the Darlinghurst Campus in November 2011. • results of various surveys carried out by TEF Consulting at other hospitals previously • other documentation - refer to **Section 6** References of the present report.
Consultation	• St Vincent's Private Hospital Sydney • Sydney City Council's Senior Traffic Engineer Rodney King • HASSELL • Consultation with RMS and TfNSW is planned to be in parallel with SSDA assessment process

2 PROPOSED REDEVELOPMENT

2.1 Site characteristics

Site context

St Vincent's Private Hospital Sydney (**SVPHS**) is part of the St Vincent's Hospital Darlinghurst Campus (SVHDC), Victoria Street, Darlinghurst.

Refer to **Figure 1** for the site location.

Facilities

Other facilities of SVHDC

- St Vincent's Hospital (public hospital) (SVH)
- Sacred Heart Hospice (SHH)
- St Vincent's Clinic (SVC)
- St Vincent's Research Precinct (SVRP) including:
  - Garvan Institute of Medical Research (the Garvan)
  - Victor Chang Cardiac Research Institute (VCCRI)
  - St Vincent's Centre of Applied Medical Research (CAMR)
  - The Kinghorn Cancer Centre (TKCC)

2.2 Proposed redevelopment

2.2.1 Facilities

- Stage 1
  - Construction of the new East Wing
    - New facilities
      - 48 new beds (4 inpatient wards containing 36 general beds and 12 rehabilitation beds)
      - New rehabilitation gym and hydrotherapy pool
      - 11 new ambulatory care rooms
      - 2 new operating theatres

- Stage 2
  - Refurbishment of the existing SVPHS High Rise Wing (5 levels)
    - No additional traffic generating facilities
- Staging - refer to **Figure 2**.
- No additional off-street car parking is proposed as part of the redevelopment.

2.2.2 Trip and parking generation potential

- New East Wing
  - Staff (doctors, nursing and support staff) of the new inpatient wards
  - Visitors of the new inpatient wards
  - Staff of the rehabilitation gym and hydrotherapy pool
  - Staff (medical specialists, nursing and administration) of ambulatory care rooms
  - Patients of ambulatory care rooms
  - Staff for new operating theatres

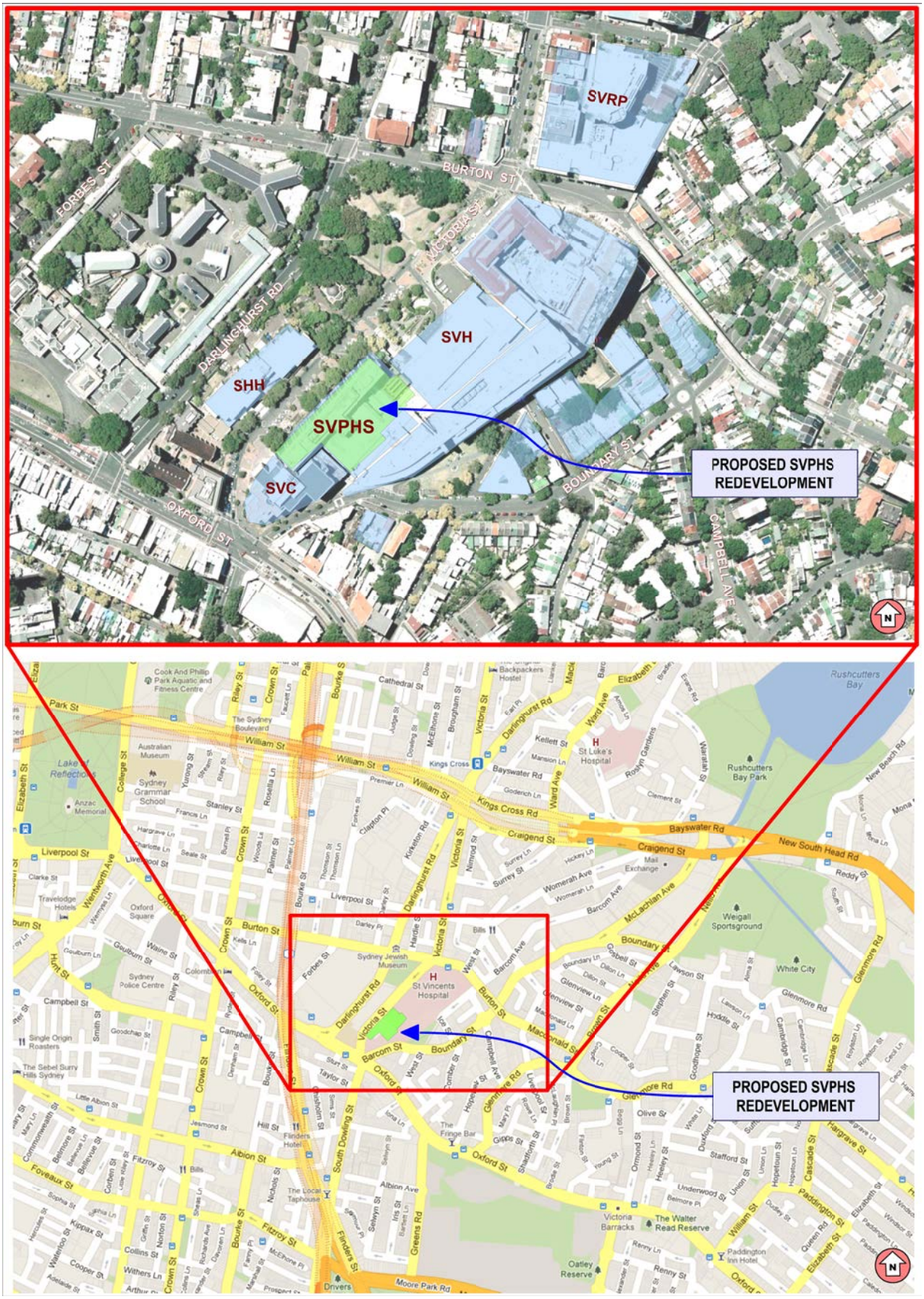

Figure 1. Site location.

Figure 2. Development staging.

2.3 Trip generation and parking demand estimation

2.3.1 Previous studies

- Traffic and parking studies of all facilities of the SVHDC in 2008-2011
  - By TEF Consulting on behalf of SVHDC for various projects.
  - The results of the surveys over the years showed high consistency levels of staff and visitor behaviour patterns. SVHDC activities are well established and their characteristics from the above surveys are regarded as applicable for the present assessment.
  - Results of these studies provided the following data for different SVHDC facilities
    - Staff accumulation patterns (from the analysis of staff rosters and physical head counts)
      - Refer to **Table 2.1**
        - Note that numbers for 14:00 represent the highest presence of staff during the nursing shift changeover, whereas 10:00 represents the typical presence levels during the morning (busiest) shift.

- Visitor accumulation patterns, factored up to account for visitors in transition between the Campus facilities
  - Refer to **Table 2.1**
- Outpatient accumulation patterns, factored up to account for visitors in transition between the Campus facilities
  - Refer to **Table 2.1**
- Travel mode splits of staff, visitors and outpatients (from questionnaire surveys)
  - Refer to **Figures 3** and **4.**
- Car parking accumulation counts in SVHDC off-street car parking areas and estimated typical parking accumulation levels both off-street and on-street.
  - Peak parking demand at or near the full capacity of all off-street car parking areas occurs daily on weekdays and continues from approximately 9 am to approximately 3 pm.
  - The modelled peak car parking demand on a typical busy day was in the order of 1,340 vehicles, including some 380 vehicles (28%) in the nearby streets and some 960 vehicles (72%) in the internal car parking areas.

Table 2.1 Existing people accumulation levels at SVHDC on a typical weekday.

Staff	10:00	D	M	A	L	N
SVH	1549	223	196	682	111	337
SVPHS	170	22	19	66	11	52
SVC	504	156	30	138	30	150
SHH	83	5	5	30	5	38
SVRP	430		129	301		
Total	2736	406	379	1217	157	577

Staff	14:00	D	M	A	L	N
SVH	1786	251	198	759	115	463
SVPHS	219	25	20	74	12	88
SVC	504	156	30	138	30	150
SHH	101	5	5	31	7	53
SVRP	430					
Total	3040	437	253	1002	164	754

visitors	10:00	14:00
SVH	41	41
SVPHS	41	68
SVC		
SHH	9	3
SVRP		
Total	91	112

outpatients	10:00	14:00
SVH	314	194
SVPHS	10	10
SVC	420	275
SHH	14	16
SVRP		
Total	758	495

Legend:

D	doctors, VMO
M	managers
A	administration, enginering, students, allied health, cleaning,
L	low car use - scientists, ambul.care, food services, area
N	nursing

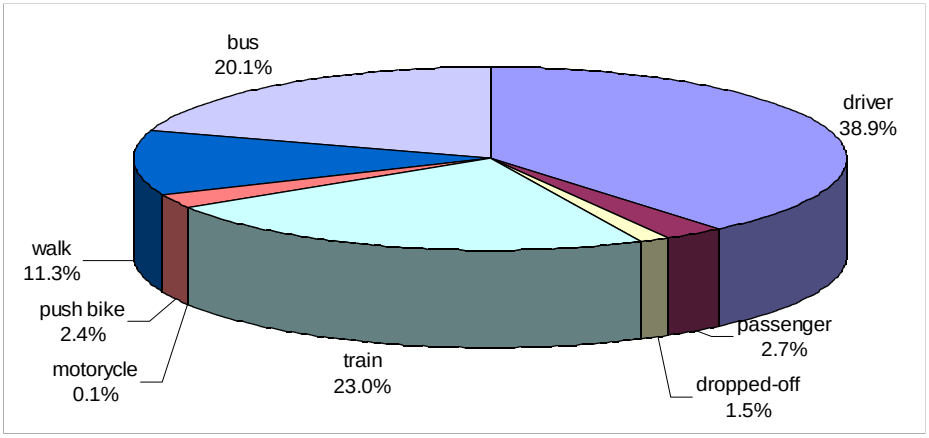

Figure 3. Travel modes of staff at SV&MHC Campus Darlinghurst.

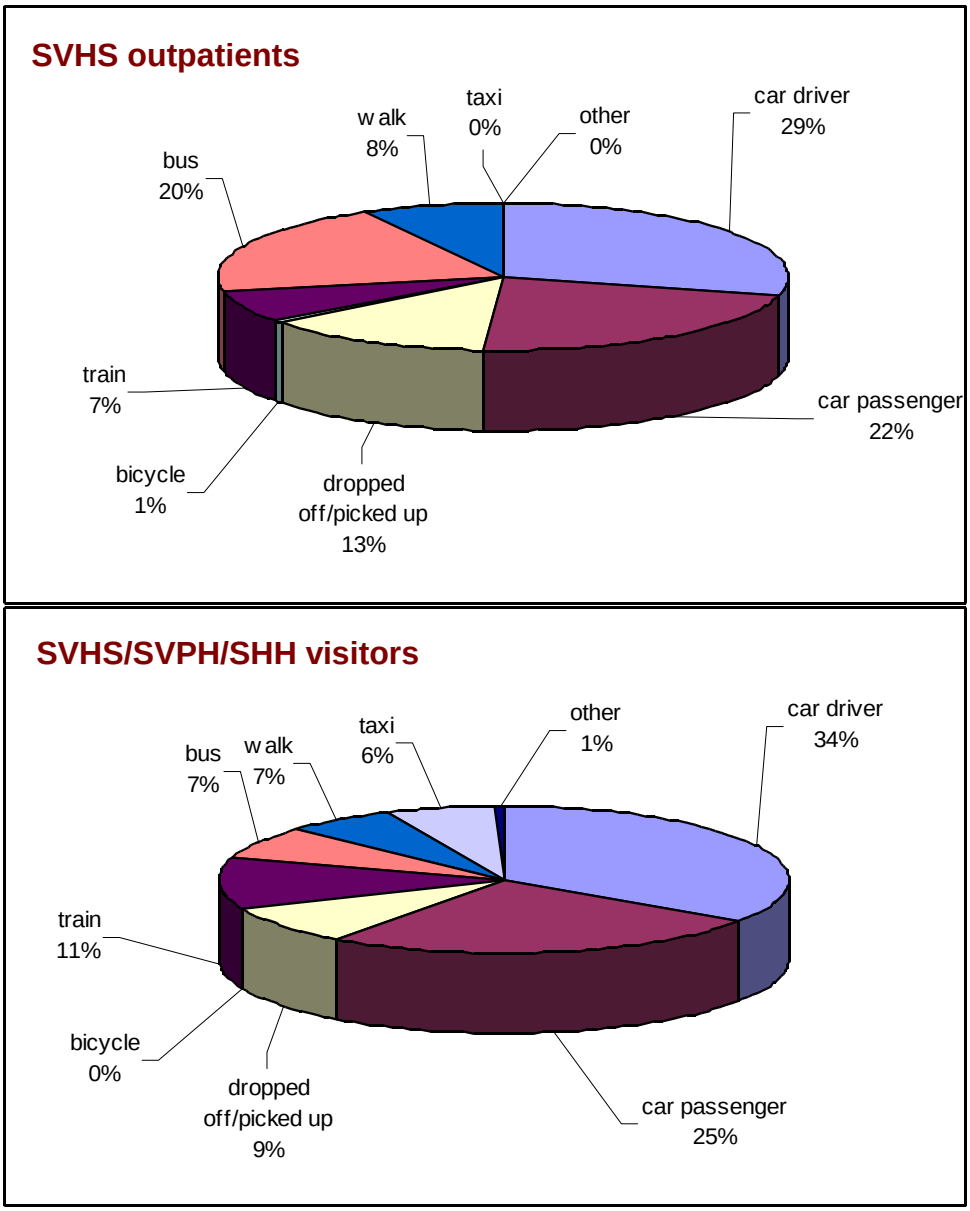

Figure 4. Travel modes of visitors and outpatients.

2.3.2 Additional staff, visitors and patients for the proposed redevelopment

- Estimated based on
  - Typical people accumulation, arrival and departure patterns of similar existing facilities at SVPHS and SVHDC, determined from surveys.
    - Including rates of the number of persons per bed, persons per 100 m² GFA or persons per consulting room, whichever is applicable.
  - Proposed floor areas, numbers of beds, consulting rooms and operating theatres at the new East Wing.
- The results are shown in **Table 2.2**.

Table 2.2 Estimated additional staff, visitors and patients on a typical weekday.

staff	10:00	D	M	A	L	N
SVPHS	60	11	5	19	3	22

staff	14:00	D	M	A	L	N
SVPHS	72	12	6	21	3	30

outpatients	10:00	14:00
SVPHS	15	15
visitors		
SVPHS	9	16

Legend:	
D	doctors, VMO
M	managers
A	administration, enginering, students, allied health, cleaning,
L	low car use - scientists, ambul.care, food services, area
N	nursing

2.3.3 Trips by additional staff, visitors and patients

- Calculated based on
  - Typical peak people accumulation of similar existing facilities at SVPHS and SVHDC during the morning shift.
    - Including rates of the number of persons per bed, persons per 100 m² GFA or persons per consulting room, whichever is applicable.
  - Proposed floor areas, numbers of beds, consulting rooms and operating theatres at the new East Wing.
  - Typical people arrival and departure patterns of similar existing facilities at SVPHS and SVHDC.
    - Arrivals and departures of staff are spread over approximately 3 hours in the morning and 4-5 hours in the afternoon.
      - Morning peak is thus of more importance
      - Staff rosters and questionnaire surveys indicate that approximately 39% of staff arrive during the morning commuter peak hour
        - Note that the morning nursing shift starts earlier, typically between 6 am and 7 am.
      - Departures during the morning commuter peak hour are approximately 10% of arrivals (night nursing shift)
    - Arrivals and departures of visitors and patients were derived from their average length of stay
      - Visitors to inpatients in wards on average stay for approximately 3.3 hours on site.
        - This translates into 0.6 trips per hour per person present on site (in and out combined)
      - Outpatients (ambulatory care) on average stay for approximately 2.1 hours on site.
        - This translates into 1.0 trips per hour per person present on site (in and out combined)

The summary of trip calculations for the morning commuter peak hour are shown in **Table 2.3**.

Table 2.3. Additional peak person accumulation and trip generation by travel mode – morning commuter peak hour.

	Number of persons on site				Number of trips, morning commuter peak hour							
					Incoming				Outgoing			
	S	V	OP	Total	S	V	OP	Total	S	V	OP	Total
bus	12	1	3	16	5	0	2	7	0	0	2	2
train	14	1	1	16	5	0	1	6	1	0	1	2
motorcycle	0	0	0	0	0	0	0	0	0	0	0	0
bicycle	1	0	0	2	1	0	0	1	0	0	0	0
walk	7	1	1	9	3	0	1	4	0	0	1	1
taxi	0	1	0	1	0	0	0	0	0	0	0	0
car driver	23	3	4	31	9	1	2	**12**	1	1	2	**4**
car passenger	2	2	3	7	1	1	2	4	0	1	2	3
dropped off	1	1	2	4	0	0	1	1	0	0	1	1

Legend: S – Staff; V – Visitors; OP - Outpatients

- It must be noted that since no additional car parking provision is proposed, estimated person accumulation and number of trips for persons travelling by car (12 trips in and 4 trips out) should be regarded as the worst case scenario.
- It is likely that travel mode shifts will occur in favour of non-car travel modes.
- The number of **additional daily trips** has been estimated conservatively from the peak hour trips, using the following assumptions.
  - Afternoon **staff** departures and arrivals mirror the morning arrivals and departures. The total daily number of trips by staff is a sum of morning arrival/departure trips and afternoon departure/arrival trips.
  - In addition, trips by the night nursing shift and miscellaneous trips add 50% to the daily totals.
  - The total daily number of visitor trips is a product of peak hour trips and the number of visiting hours (10).
  - The total daily number of outpatient trips is a product of peak hour trips and the opening hours of ambulatory care (10).
- The results of calculations are included in **Table 2.4.**

Table 2.4. Estimated additional daily trip generation by travel mode.

	Number of trips, daily							
	Incoming				Outgoing			
	S	V	OP	Total	S	V	OP	Total
bus	8	0	20	28	8	0	20	28
train	9	0	10	19	9	0	10	19
motorcycle	0	0	0	0	0	0	0	0
bicycle	2	0	0	2	2	0	0	2
walk	5	0	10	15	5	0	10	15
taxi	0	0	0	0	0	0	0	0
car driver	15	10	20	**45**	15	10	20	**45**
car passenger	2	10	20	32	2	10	20	32
dropped off	0	0	10	10	0	0	10	10

Legend: S – Staff; V – Visitors; OP - Outpatients

3 IMPACTS ON TRANSPORT SYSTEM

3.1 Pedestrian and cycle movements

- Refer to **Figure 5** for the existing footpath network.
  - Results of questionnaire surveys indicate a significant travel mode share for walking (7%-8% for outpatients and visitors and 11% for staff).
  - Footpaths are mostly level.
  - Most footpaths are not protected from adverse weather conditions.
  - There is no supportive directional signage to Kings Cross station and local bus stops.
  - Internal system of corridors provides connections between O'Brien, SVH, SVPHS and SVC buildings, thus providing comfortable weather-protected walking connections within the Campus.
  - Kings Cross train station and multiple bus stops are located within convenient walking distances (800 m for train and 400 m for bus services) from the redevelopment site.
    - Refer to **Figure 6** for walking distances to public transport.
  - Pedestrian traffic along the SVHS frontage is intensive, however it is within the capacity of the existing footpaths.
  - Additional pedestrian movements from the proposed additions to SVPHS are estimated to be between 5 and 10 per hour (the latter allowing for some redistribution from the personal car travel mode).
  - Certainly, these additional movements can be easily accommodated on the existing footpaths.
  - Pedestrian amenity is proposed to be improved by removal of barriers where possible, improvement of way finding and reduction in vehicle and pedestrian conflicts.
  - There will be no negative impacts on the pedestrian network and improvements are proposed.
  - The proposed development is supported with regard to pedestrian movements.

- Refer to **Figure 7** for the existing cycleway network.
  - There are bicycle linkages in all directions to and from SVHDC.
  - Results of questionnaire surveys indicate very low travel mode share for cycling (2.4% for staff and less than 1% for patients and visitors).
  - Additional cycle movements from the proposed additions to SVPHS are estimated to be between 2 and 5 per hour (the latter allowing for some redistribution from the personal car travel mode).
  - Certainly, these additional movements can be easily accommodated on the existing cycling network.
  - There will be no negative impacts on the cycling network.
  - The proposed development is supported with regard to cycle movements.

Figure 5. Existing footpath network and public transport stops.

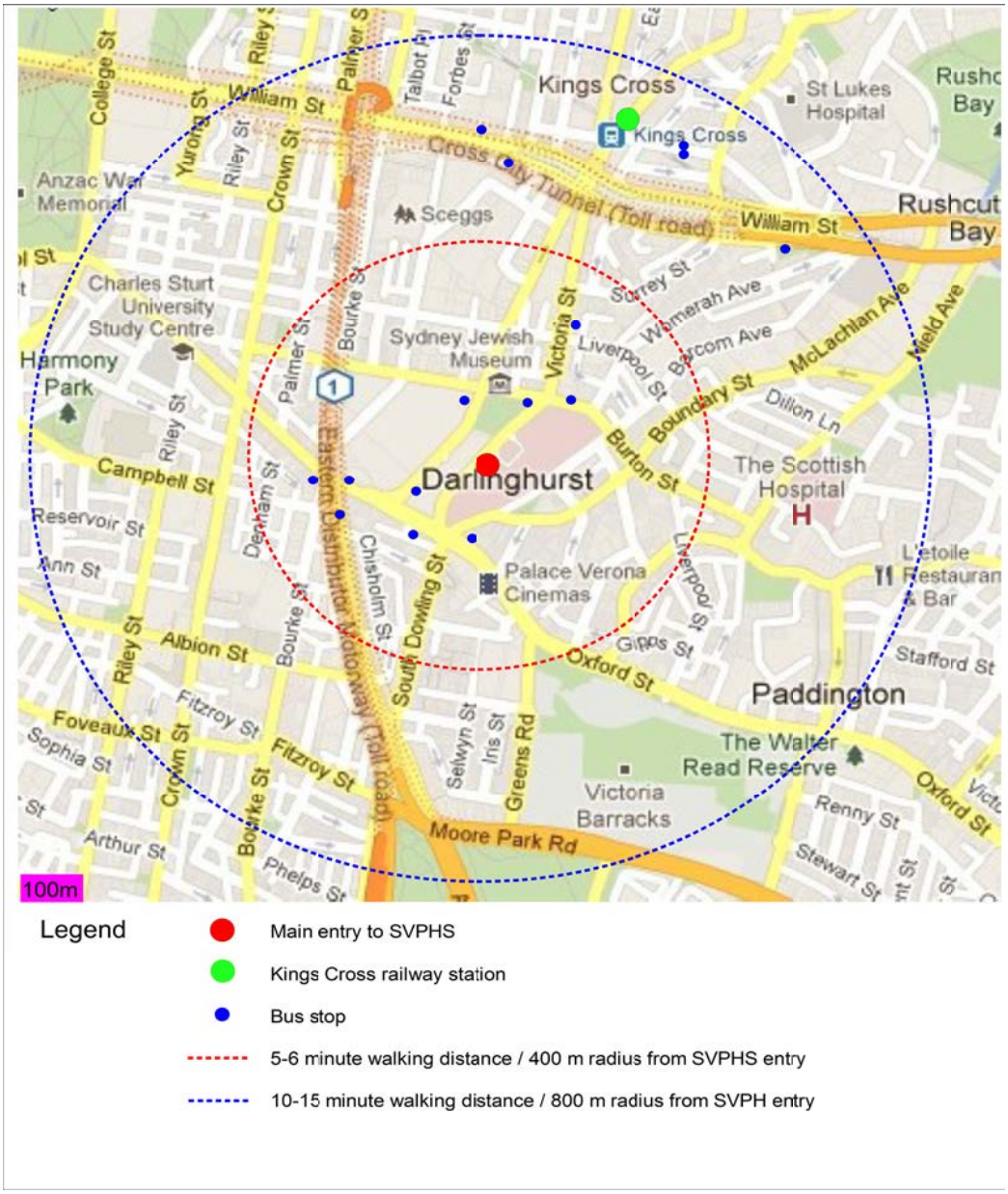

Figure 6. Public transport stops within walking distances from the site.

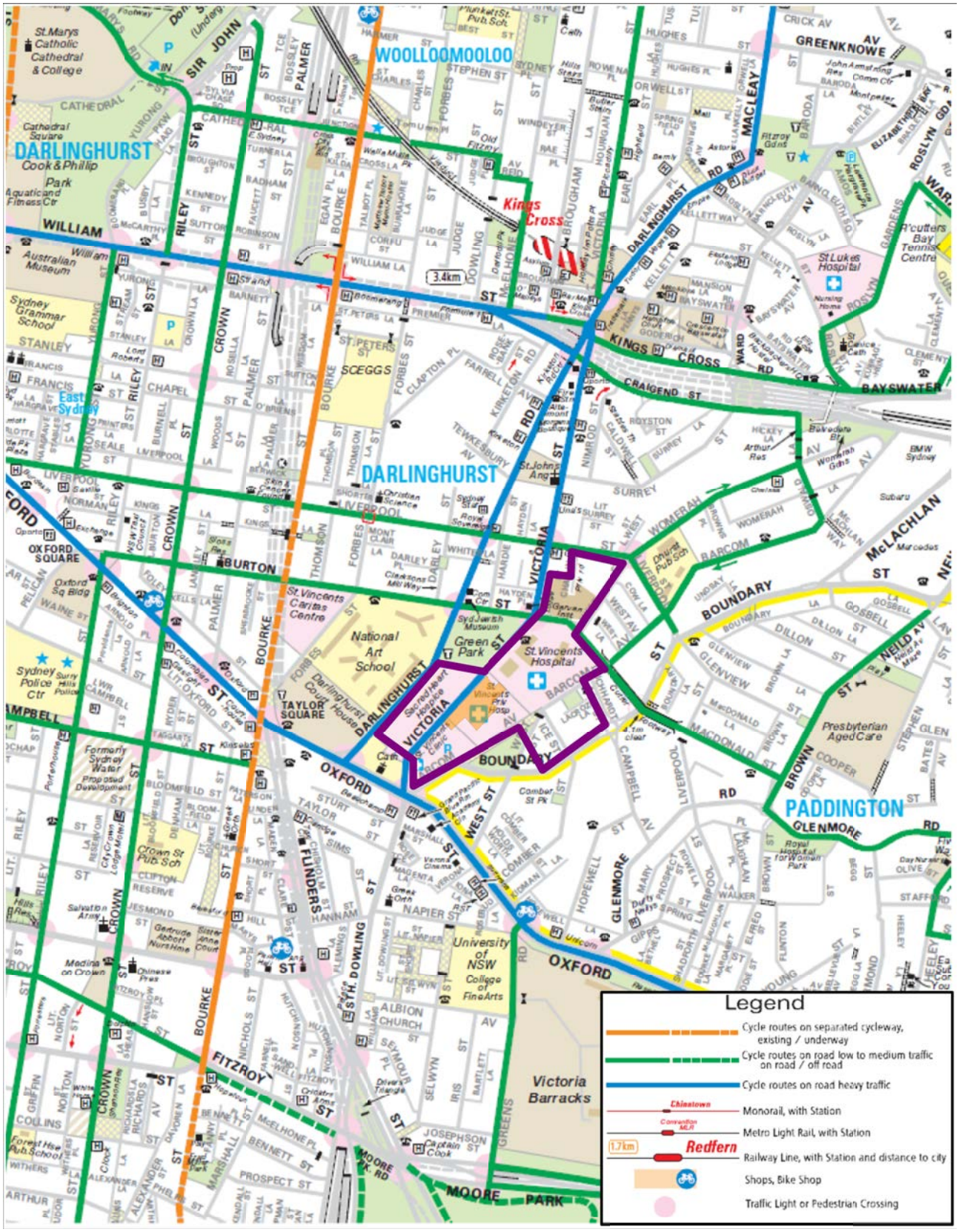

Figure 7. Existing cycleway network around the site.

3.2 Public transport

- The site is located within 800 meters of **Kings Cross train station**. (refer to **Figure 6**).
  - Kings Cross train station is serviced by the Eastern Suburbs Line
    - Waterfall – Kings Cross
      - Services operate every 3 – 6 minutes from central during AM peak and every 5 minutes during PM peak
    - Bondi Junction – Waterfall
      - Services operate every 3-7 minutes during AM peak and PM peak
  - Existing train services are more than adequate to meet the additional demand generated by the proposal, including likely modal transfers from the private car.

- Refer to **Figure 8** for location of **bus routes and stops**
- The site has good bus provision, with bus stops located within a short walking distance (approximately 250 m) from the site on Oxford Street, Darlinghurst Road, and Burton Street.
  - Bus route 311
    - Railway Square to City – Millers Point
    - AM Prepaid services when boarding from Railway Square, Taylor Square and Circular Quay
    - PM prepaid services when boarding from Pitt Street and Taylor Square
    - Services every 15 minutes during AM peak and PM peak in both directions.
  - Bus route 333
    - North Bondi to City – Circular Quay limited stops (PrePay - only)
    - Bondi - City
    - Services operate every 6 minutes during AM peak and every 12 minutes during PM peak
    - City-Bondi
    - services operate every 20 minutes during AM peak and every 8 minutes during PM peak
  - Bus route 352
    - Marrickville Metro to Bondi Junction
    - Marrickville - Bondi
    - Operates every 15-30 minutes during AM peak and every 25-30 minutes during PM peak
    - Bondi – Marrickville
    - operates every 20 minutes during AM peak and PM peak
  - Bus route 373
    - Coogee to City via Randwick
    - Coogee - City
    - Operates every 6 minutes during AM peak and every 10 minutes during PM peak

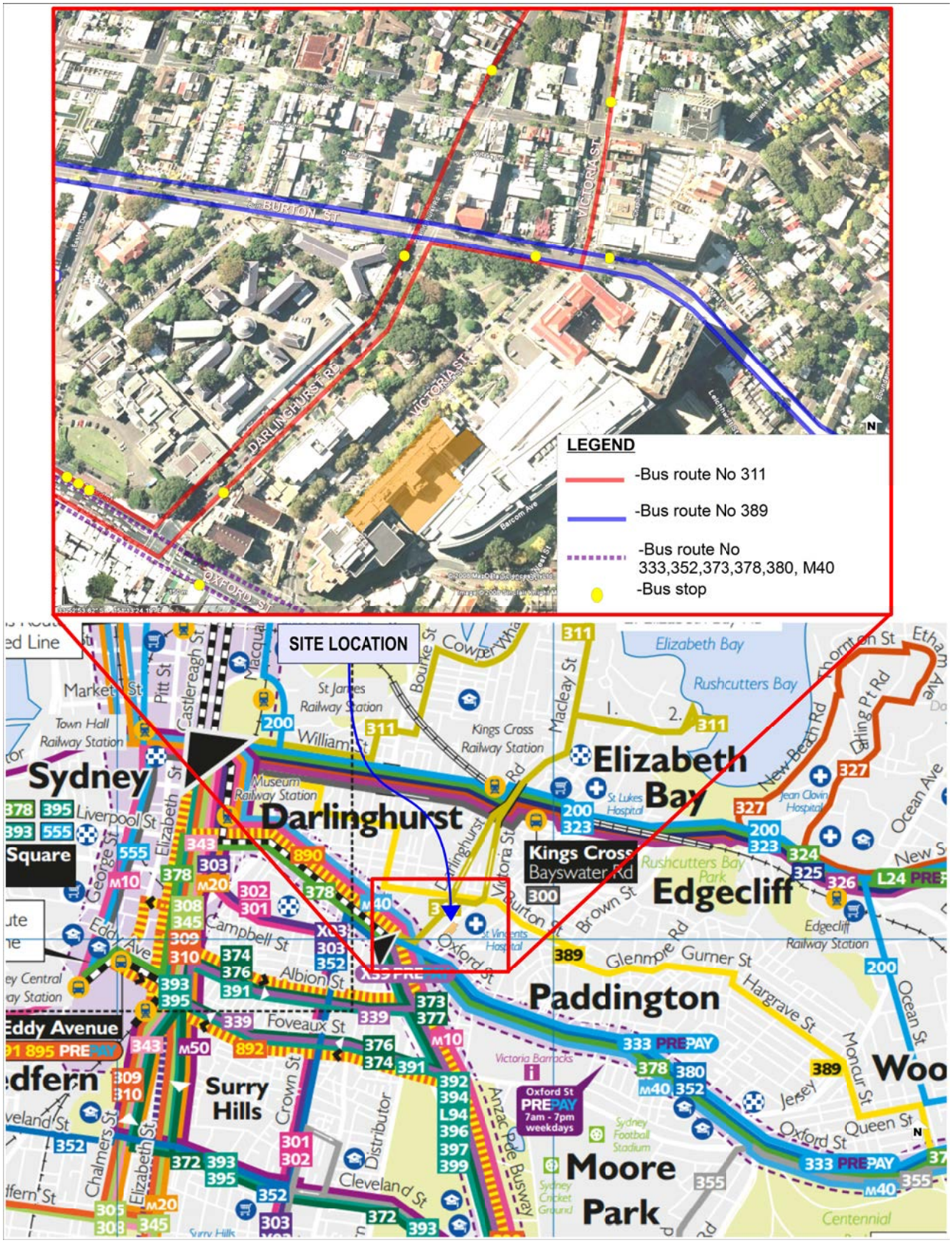

Figure 8. Bus services.

        - City – Coogee
        - operates every 15-25 minutes during AM peak and ever 8-10 minutes during PM peak.
    - Bus route 378
        - Bronte to Railway Square
        - Bronte – Railways square
        - Operates every 8 – 15 minutes during AM peak and every 10 minutes during PM peak
        - Railways Square – Bronte
        - operates every 10-15 minutes during AM peak and every 10 minutes during PM peak
    - Bus route 380
        - North Bondi to City – Circular Quay via Bondi Beach
        - North Bondi – City
        - Operates every 3-6 minutes during AM peak and every 10 minutes during PM peak
        - City – North Bondi (Pre-Pay only)
        - operates every 20 minutes during AM peak and every 8 minutes during PM peak
    - Bus route 389
        - North Bondi to City – Circular Quay
        - Operates every 8-12 minutes during AM and PM peak in both directions
    - Bus route M40
        - Bondi to Chatswood
        - Services operate approximately every 10 minutes during the peak period.

    - Additional trips by train and bus from the proposed additions to SVPHS are estimated to be between 17 and 22 per hour (the latter allowing for some redistribution from the personal car travel mode).
    - Certainly, these additional movements can be easily accommodated by the existing bus and train services.
    - There will be no negative impacts on the train or bus services..
    - The proposed development is supported with regard to public transport provision.

3.3 Street network and operation of intersections

    - Refer to **Figure 9**
        - The site is located within a dense street network with good connections in all directions
            - Main east-west links
                - Oxford Street (State Road 172)
                - William St / Kings Cross Tunnel / Edgecliff Road (State Road 173)
            - Secondary east-west links
                - Burton Street
                - Liverpool Street

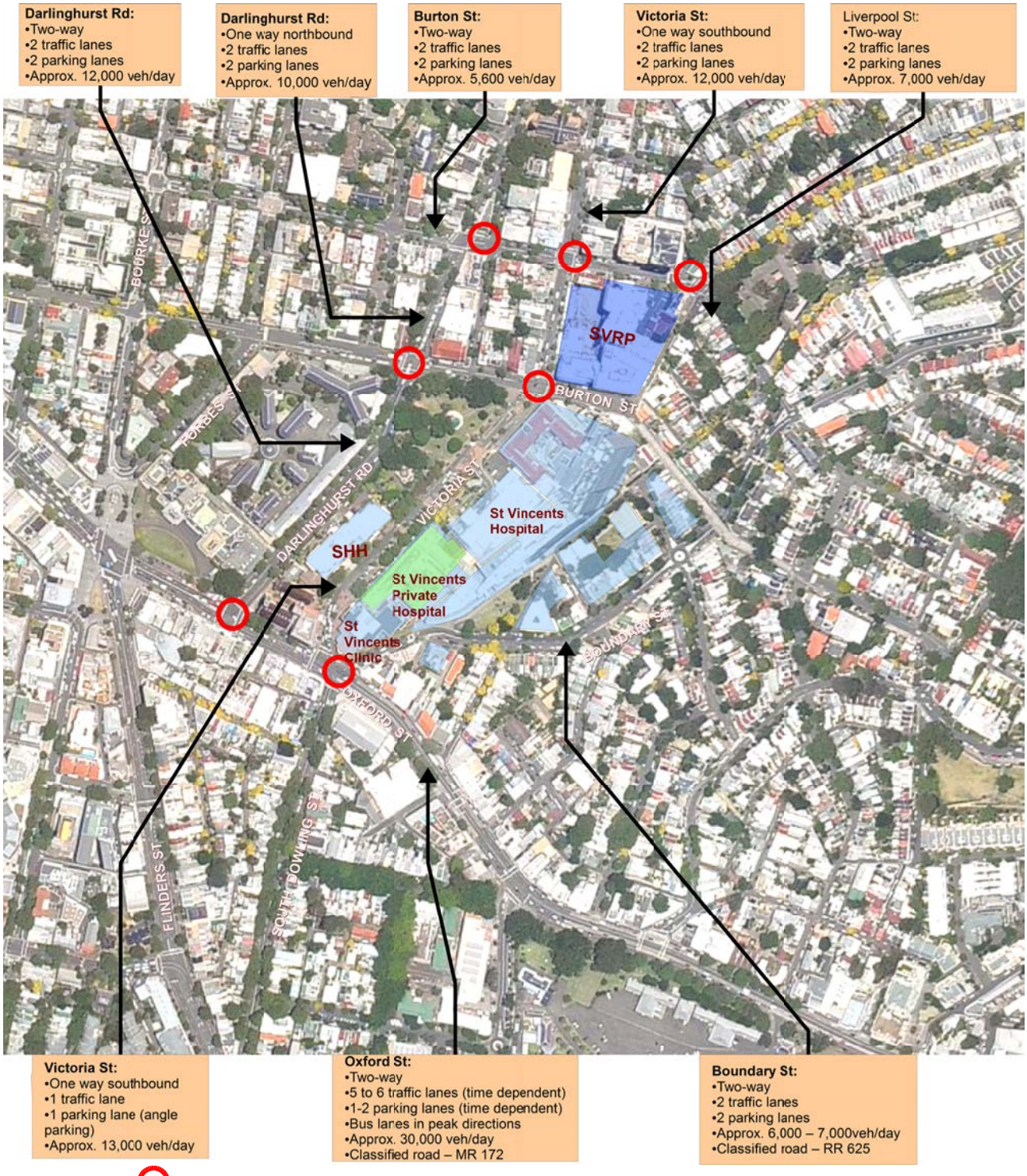

Figure 9. Characteristics of streets, intersections and access locations

- Main north-south links
  - Victoria Street / South Dowling Street
  - Darlinghurst Road
  - Barcom Avenue / Boundary Street (Regional Road 625)

- Traffic movements at nearby intersections were counted by TEF Consulting for previous projects.
  - Refer to **Figure 10**.
  - The nearest critical intersections carried the following total traffic at the time of the surveys
  - Victoria Street / Oxford Street / Barcom Avenue
    - AM Peak – 3143 veh/hour
    - PM Peak – 3657 veh/hour
  - Darlinghurst Road / Oxford Street
    - AM Peak – 2406 veh/hour
    - PM Peak – 2622 veh/hour
- Additional vehicular movements from the proposed additions to SVPHS are estimated to be between 16 trips (12 + 4 from Table 2.3) and 8 trips per hour (the latter allowing for some redistribution of travel mode splits towards non-car travel modes).
- These constitute less than 1% of traffic flows at the above intersections.
- There will be no noticeable impact on the operation of these intersections.
  - It is noted that the intersection traffic counts were conducted a few years ago.
  - It is also noted that the road network around SVHDC is well established with high levels of traffic during the peak hours.
  - The network capacity is well utilised with little room for annual growth.
  - If an assumption is made that traffic volumes on the road network around SVHDC increased since the latest TEF counts, then the relative impact of additional likely traffic generation from the SVPHS extension would be even less than that estimated above.
- SEARs require an assessment of impacts on the intersection of New South Head Road and McLachlan Avenue
  - The intersection of New South Head Road and McLachlan Avenue is located rather far from the SVPHS site.
  - Results of the questionnaire surveys of staff, visitors and patients indicated that this intersection was along the arrival or departure routes for some 3% to 13% drivers.
  - When these rates were applied to the total likely traffic generation from the proposed development, additional traffic at this intersection was calculated as one (1) vehicle per hour.
  - There will be no impact at all on the intersection of New South Head Road and McLachlan Avenue.
- There will be no negative impacts on the street network and operation of intersections.
- The proposed development is supported traffic grounds.

3.4 Car parking impacts

- Council's LEP 2012 and DCP 2012 do not contain specific car parking rates for hospital developments
  - LEP 2012 Clause 7.9 Other land uses

    (4) Health consulting rooms and medical centres

    The **maximum** number of car parking spaces for a building used for the

purposes of health consulting rooms or medical centres on any land is 2 spaces for every consulting room.

- This clause applies to 11 new ambulatory care rooms
- LEP 2012 defines the maximum number of spaces, that is nil car parking provision complies with this requirement.

- DCP 2012 Clause 3.11.4 Vehicle parking
  - (1) Where the development comprises a land use not specified in the Sydney LEP 2012, the proposed rate of car parking provision is to be justified via a Parking and Access Report.
  - The additional number of staff and visitors of the hospital component is estimated to be 51 and 9 respectively.
  - The hospital component has a potential to generate car parking demand of approximately 26 cars at peak times.
    - The above number assumes the same travel mode splits as at present, with no change to a greater proportion of non-car travel modes.
  - The total existing peak car parking demand at the SVHDC is in the order of 1,340 vehicles.
  - Additional maximum demand of 26 cars constitutes 1.7% of the total demand. This is well within hourly and daily fluctuations of the existing car parking accumulation numbers and will not have a noticeable effect on parking conditions.
  - It must be noted that, because the existing off-street car parking areas of the SVHDC operate at or near capacity during the typical busy hours, additional cars are unlikely to be accommodated.
  - This will discourage the use of cars by the additional staff and visitors of SVPHS and will encourage them to use other modes of transport, primarily train and buses.
  - No negative impact on the existing car parking conditions is expected.

3.5 Access arrangements

- It is not proposed to change the existing access arrangements for
  - pedestrians
  - emergency vehicles
  - existing car parks
  - service vehicles
    - Due to a comparatively small scale of the development, all additional deliveries and waste collection will be provided for by the existing servicing arrangements. Some delivery vehicles may be required to carry increased loads, however the number of service vehicles and their movements will not change.
- It is proposed to make amendments to the existing drop-off zone at the SVPHS building entry, however essentially this access point will continue to function as at present.

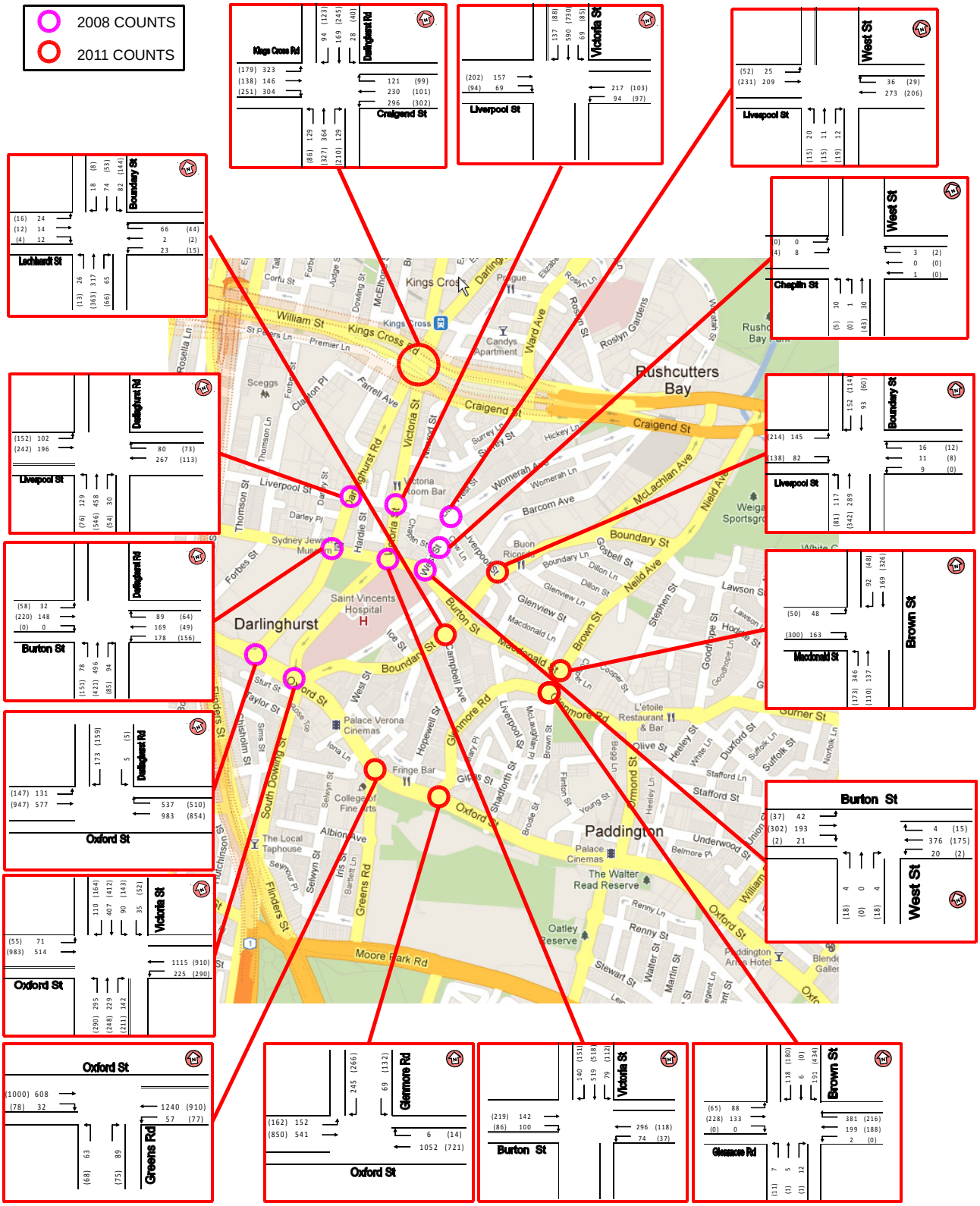

Figure 10. Traffic volumes at the intersections around the site.

3.6 Measures to promote travel choices

- Sinclair Knight Merz (SKM) has been commissioned by St Vincent's & Mater Health Sydney (now SVHDC) on behalf of the Campus Transport Strategy Working Group (CTSWG) to prepare a Transport Implementation Strategy (TIS) for St Vincent's Hospital Darlinghurst Campus (SVHDC).
- This document is currently at the final draft report stage.
    - TIS has a subtitle “Get Travel Smart - Supporting Sustainable Travel at St Vincent's Darlinghurst Campus”
    - The document proposes a wide range of measures aimed to encourage non-car travel modes.
        - Most of the above measures are designed for the implementation for the whole of the SVHDC. A selection of measures which are recommended for implementation at the SVPHS as part of the current proposal are listed below.
            - Travel information and marketing
                - Staff welcome pack with details of travel options
            - Support and encouragement for walking mode
                - Showers/Lockers (already provided)
                - Business umbrellas (available for borrowing)
            - Support and encouragement for cycling
                - Showers/Lockers (already provided)
                - Cycle purchase loans
                - Dr Bike Visits
                - Assistance for setting up a Bicycle User Group (provision of a meeting room, information distribution by intranet)
            - Public Transport
                - Route and timetable reviews/stakeholder consultation (annually)
                - Interest free season ticket loans
                - Taster Tickets (an Opal card with $20 value)

3.7 Draft Construction Traffic Management Plan

- Refer to a separate report prepared by TEF Consulting

4 CONCLUSIONS AND RECOMMENDATIONS

Proposal	New and upgraded existing facilities with • 48 new beds (4 inpatient wards containing 36 general beds and 12 rehabilitation beds) • New rehabilitation gym and hydrotherapy pool • 11 new ambulatory care rooms • 2 new operating theatres
Car parking requirements	• Council's LEP 2012 and DCP 2012 do not require additional car parking provision for medical centres (ambulatory care rooms). • The additional car parking demand from the hospital component of the proposal is likely to be very minor (1.7%) when compared with the existing SVHDC car parking accumulation. • A number of measures are proposed to encourage non-car travel modes. These measures will help reducing the above minor additional car parking demand even further.
Proposed car parking provision	None proposed.
Parking impacts	No negative impacts are expected due to a minor scale of the development compared with the existing activities at the St Vincent's Hospital Darlinghurst Campus.
Traffic impacts	Additional traffic generated as a result of the proposed redevelopment will not affect the operation of the street network.
Conclusion	The proposal is supported on traffic and parking grounds.

5 REFERENCES

- NSW Department of Planning (2005) City of Cities: a Plan for Sydney's Future
- NSW Government (2010) Metropolitan Transport Plan – Connecting the City of Cities
- NSW Government (2004) Planning guidelines for walking and cycling
- RTA (2002). Guide to traffic generating developments: Issue 2. RTA, Sydney, NSW.
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- TEF Consulting (10/2009) An assessment of traffic and parking conditions for the Garvan St Vincent's Cancer Centre - Project Application
- TEF Consulting (11/2009) An assessment of traffic and parking conditions for the St Vincent's Research Precinct Master Plan.