Transport for NSW

Beaches Link and Gore Hill Freeway Connection

Appendix B – Parking impact assessment

November 2021

TECHNICAL NOTE

Parking Impact Assessment

GTAconsultants now Stantec

Project Name:	Beaches Link and Gore Hill Freeway Connection
Dept:	Transport Planning
Date:	5 October 2021
SUBJECT:	**Parking Impact Assessment for Beaches Link and Gore Hill Freeway Connection**
Page	1 of 63 (plus Annexure A)

Introduction and Background

As part of the environmental impact statement process for the Beaches Link and Gore Hill Freeway Connection project, it was recognised within the Department of Planning, Industry and Environment and Transport for NSW (TfNSW) that due to parking demand from the project's construction workers and the loss of existing on-street parking in the vicinity of some temporary construction support sites, there would be varying degrees of impact on the demand and supply of parking across the project's footprint.

The primary purpose of this assessment is to confirm existing parking supply and demand surrounding temporary construction support sites in the Beaches Link and Gore Hill Freeway Connection project area to inform further investigations. While this report highlights challenges and potential management measures to be applied during construction, it does not assume nor assess any management measures that the project will continue to investigate and implement. In this sense, potential impacts presented in this report reflect conservative, worst-case conditions. These worst-case conditions are highly unlikely to occur given the complementary supply and demand management measures which are proposed in the environmental impact statement and further refined in the submissions report, which would continue to be investigated through the design and construction planning process.

GTA, now Stantec (GTA) have been commissioned to study parking in the vicinity of the eleven temporary construction support sites. These sites are outlined below and shown in Figure 1 to Figure 7:

- Cammeray Golf Course (BL1)
- Flat Rock Drive (BL2)
- Punch Street (BL3)
- Dickson Avenue (BL4)
- Barton Road (BL5)
- Spit West Reserve (BL9)
- Balgowlah Golf Course (BL10)
- Kitchener Street (BL11)
- Wakehurst Parkway south (BL12)
- Wakehurst Parkway east (BL13)
- Wakehurst Parkway north (BL14).

The Gore Hill Freeway median construction support site (BL6) was not included in this assessment as it is only accessible from the motorway corridor. As such, construction workers would not be able to walk to the site from the surrounding local streets, and so it is not relevant to understand the parking supply and demand in the vicinity of this temporary construction support site.

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The Middle Harbour south cofferdam (BL7) and Middle Harbour north (BL8) construction support sites were also not included in this assessment, because as water sites they would have no parking provided. Workers would be transported by boat from Spit West Reserve construction support site (BL9) to and from the cofferdam construction support sites.

As part of this study, GTA commissioned an 18-hour (6:00am to 12:00am) parking occupancy survey in the vicinity of all temporary construction support sites, conducted at 2 hourly intervals on a weekday (Tuesday 16th February 2021). An additional parking occupancy survey was also carried out at the Spit West Reserve construction support site (BL9) on a weekend (Saturday 22nd May 2021) at the request of the Department of Planning, Industry and Environment. An inventory of the parking restrictions was also recorded. Incorporating this data into the analysis, the parking study's scope is to identify areas of existing high demand and areas of spare capacity (if any).

Figure 1 – Cammeray Golf Course construction support site (BL1) location

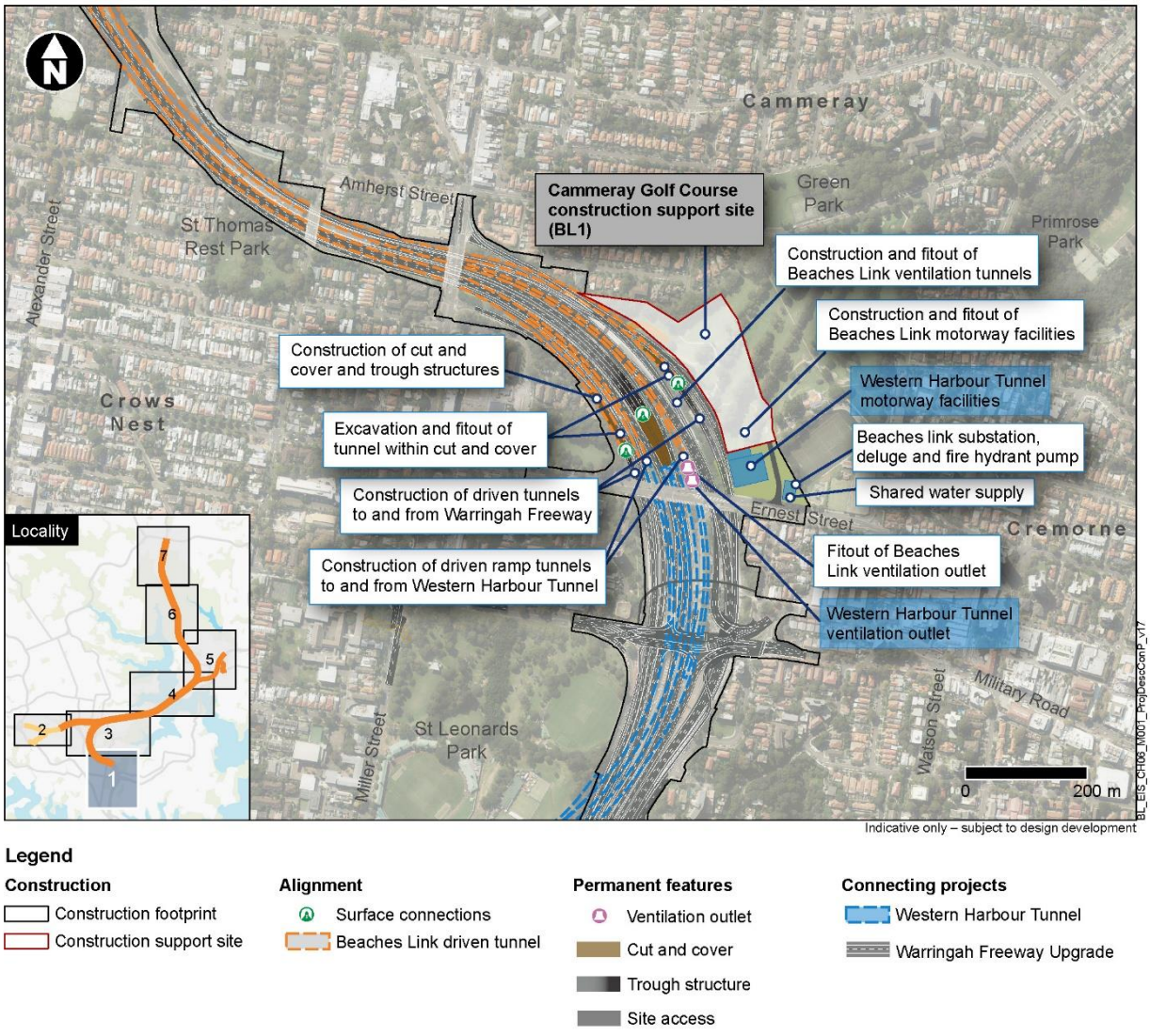


Figure 2 – Flat Rock Drive construction support site (BL2) location

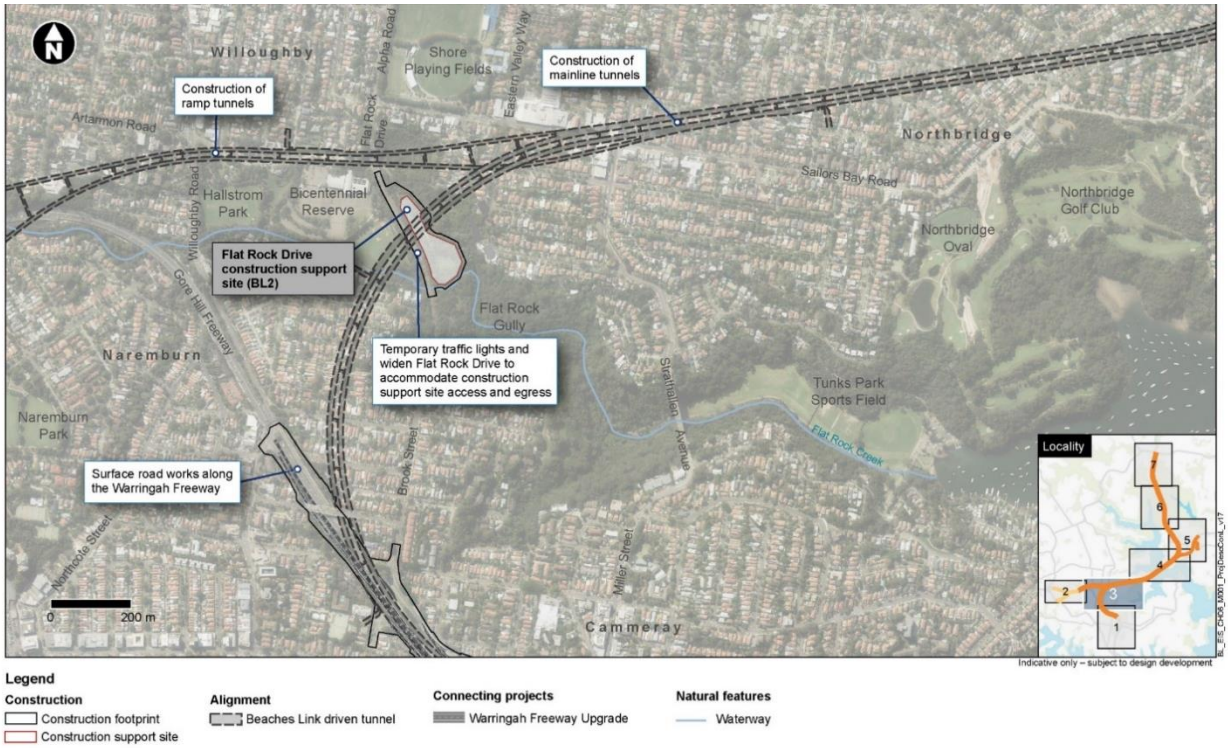


Figure 3 – Punch Street (BL3), Dickson Avenue (BL4) and Barton Road (BL5) construction support site locations

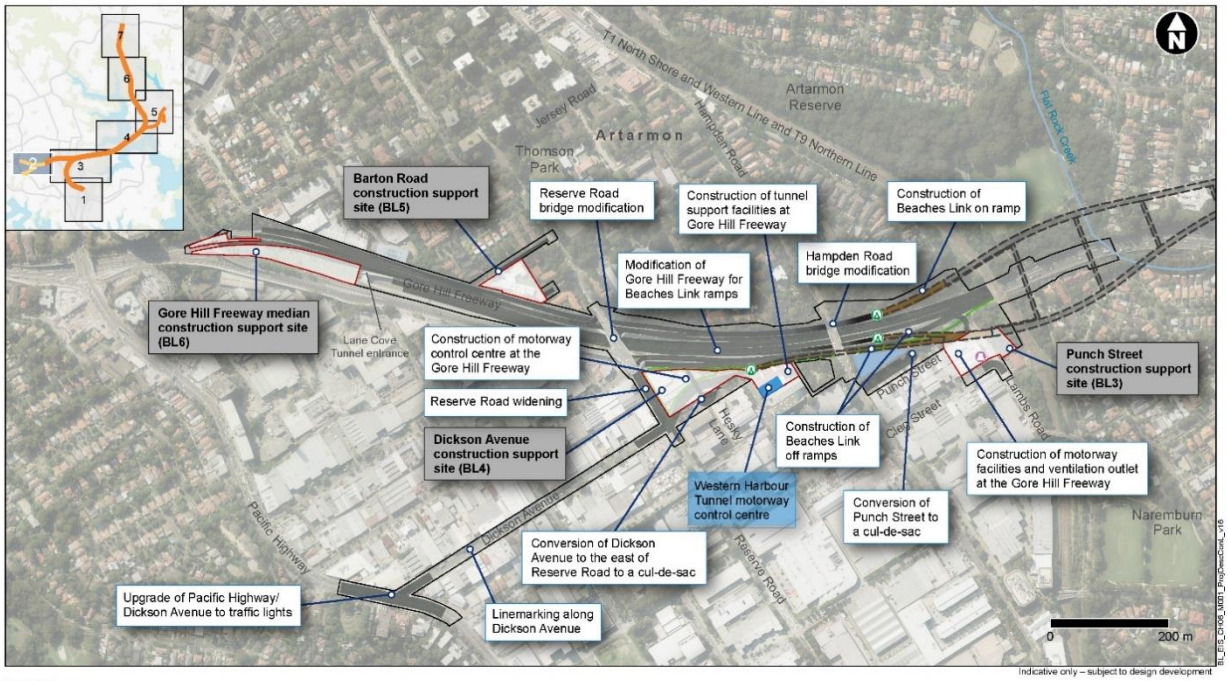


Figure 4 – Spit West Reserve construction support site (BL9) location

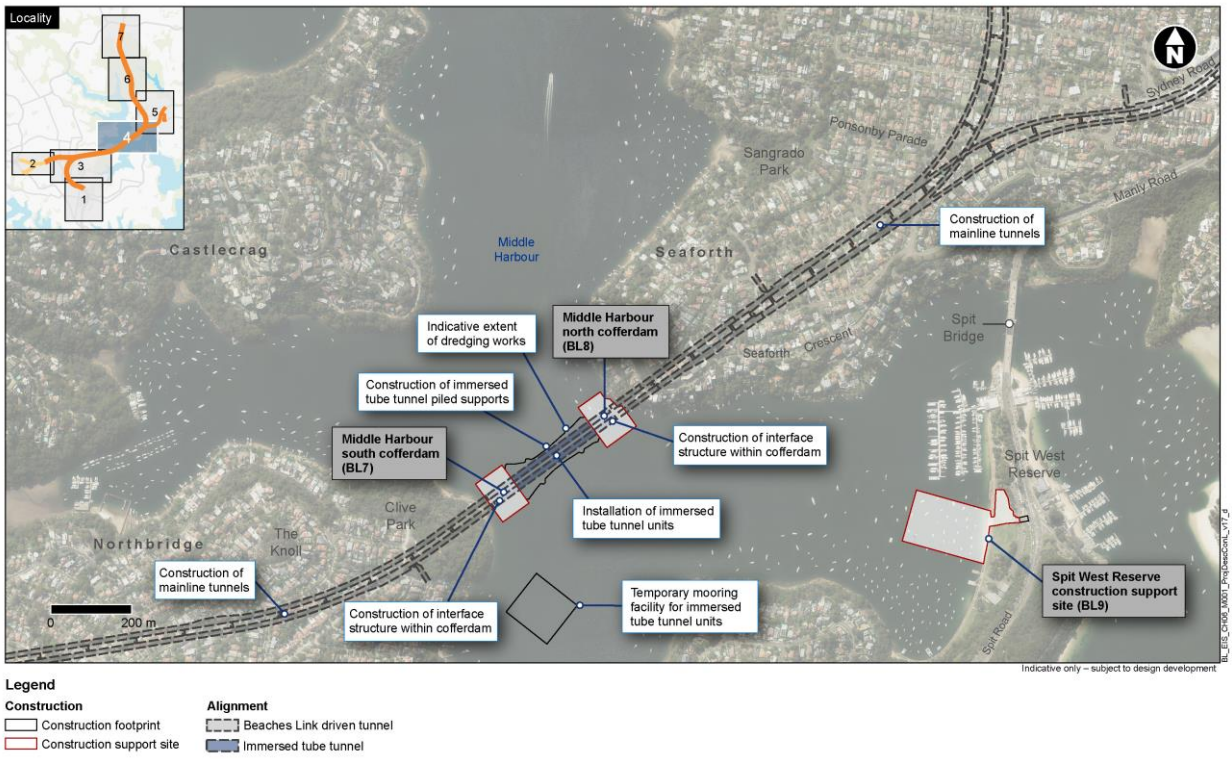
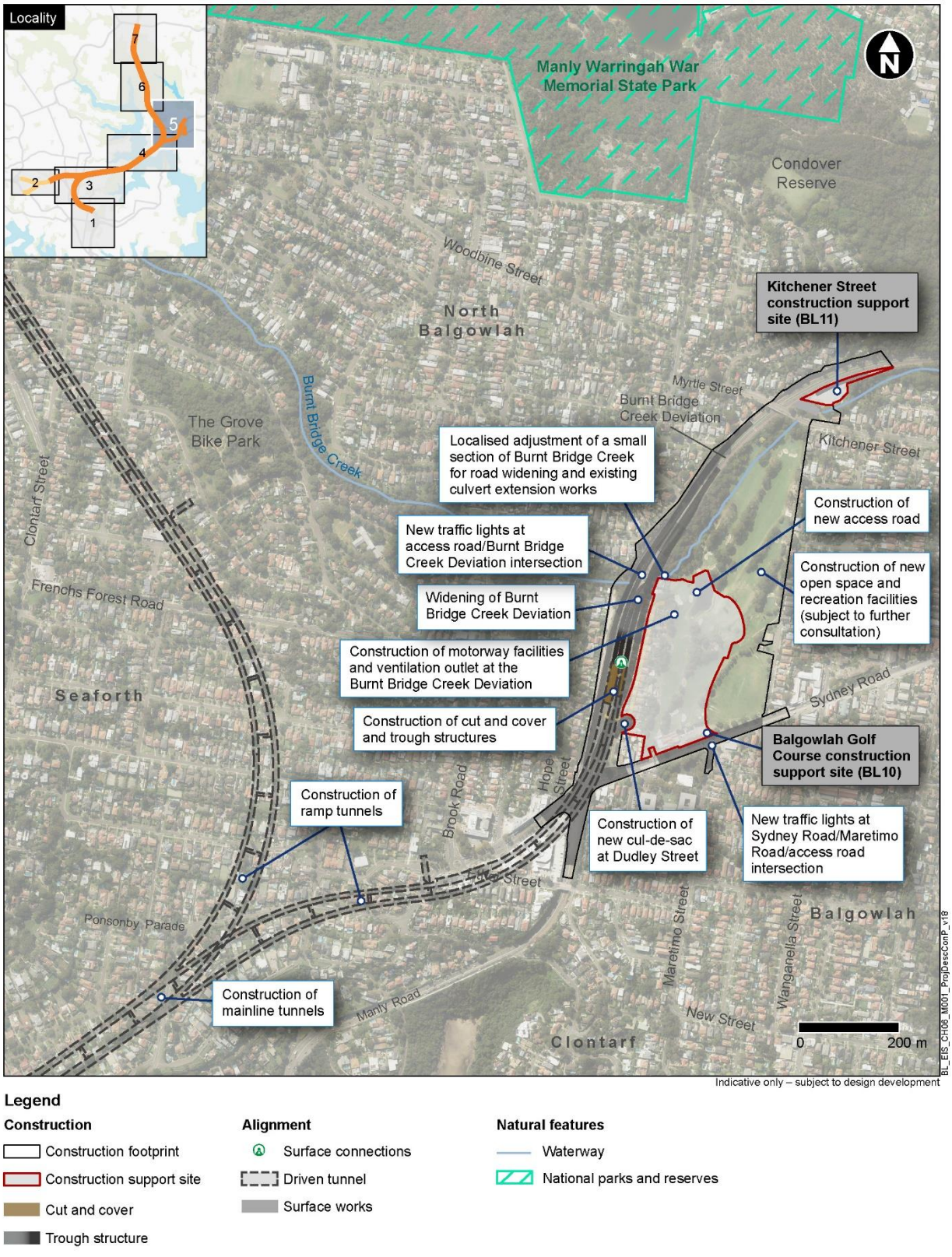


Figure 5 – Balgowlah Golf Course (BL10) and Kitchener Street (BL11) construction support site locations



Legend

Construction
- Construction footprint
- Construction support site
- Cut and cover
- Trough structure

Alignment
- Surface connections
- Driven tunnel
- Surface works

Natural features
- Waterway
- National parks and reserves

Figure 6 – Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support site locations

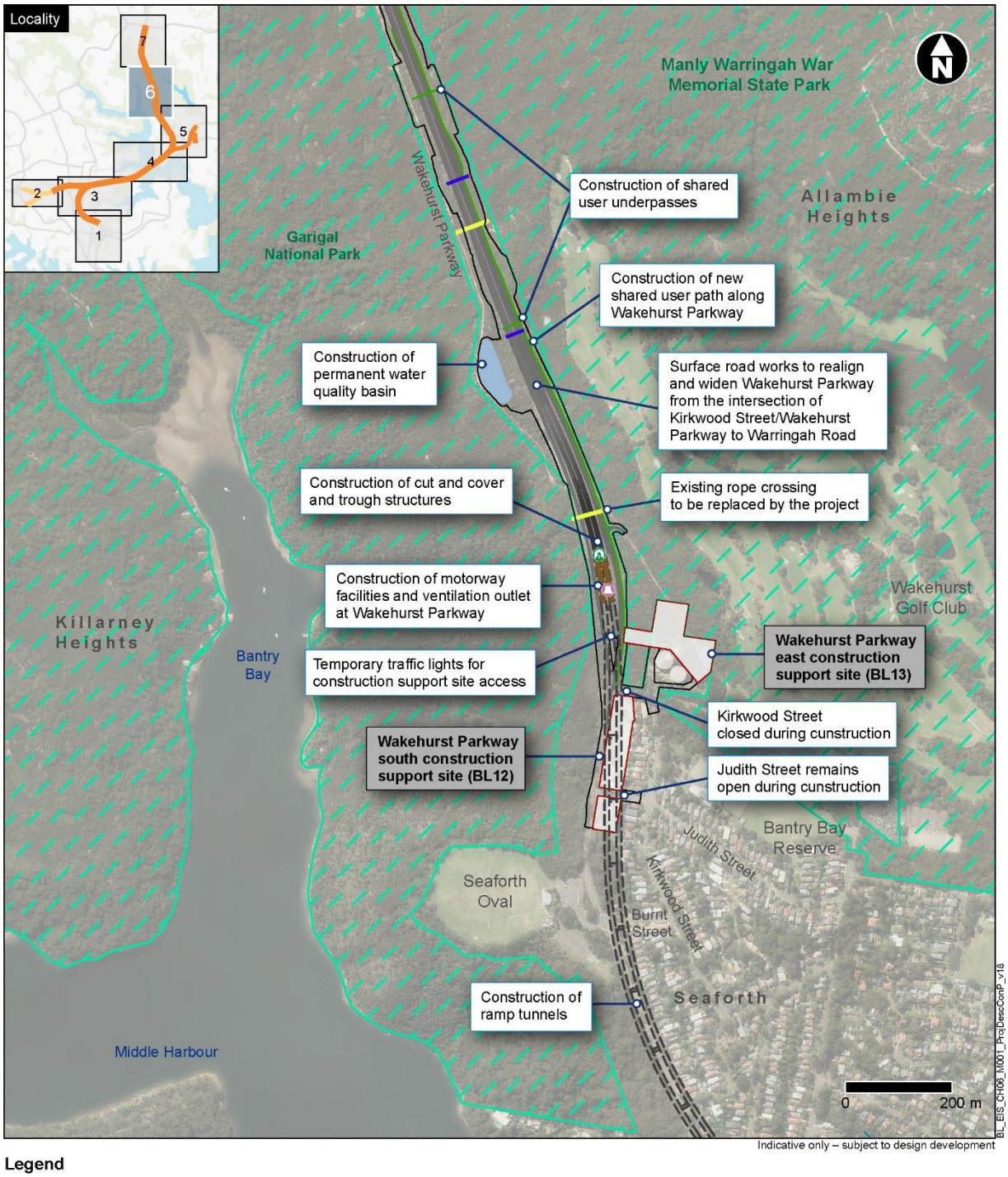
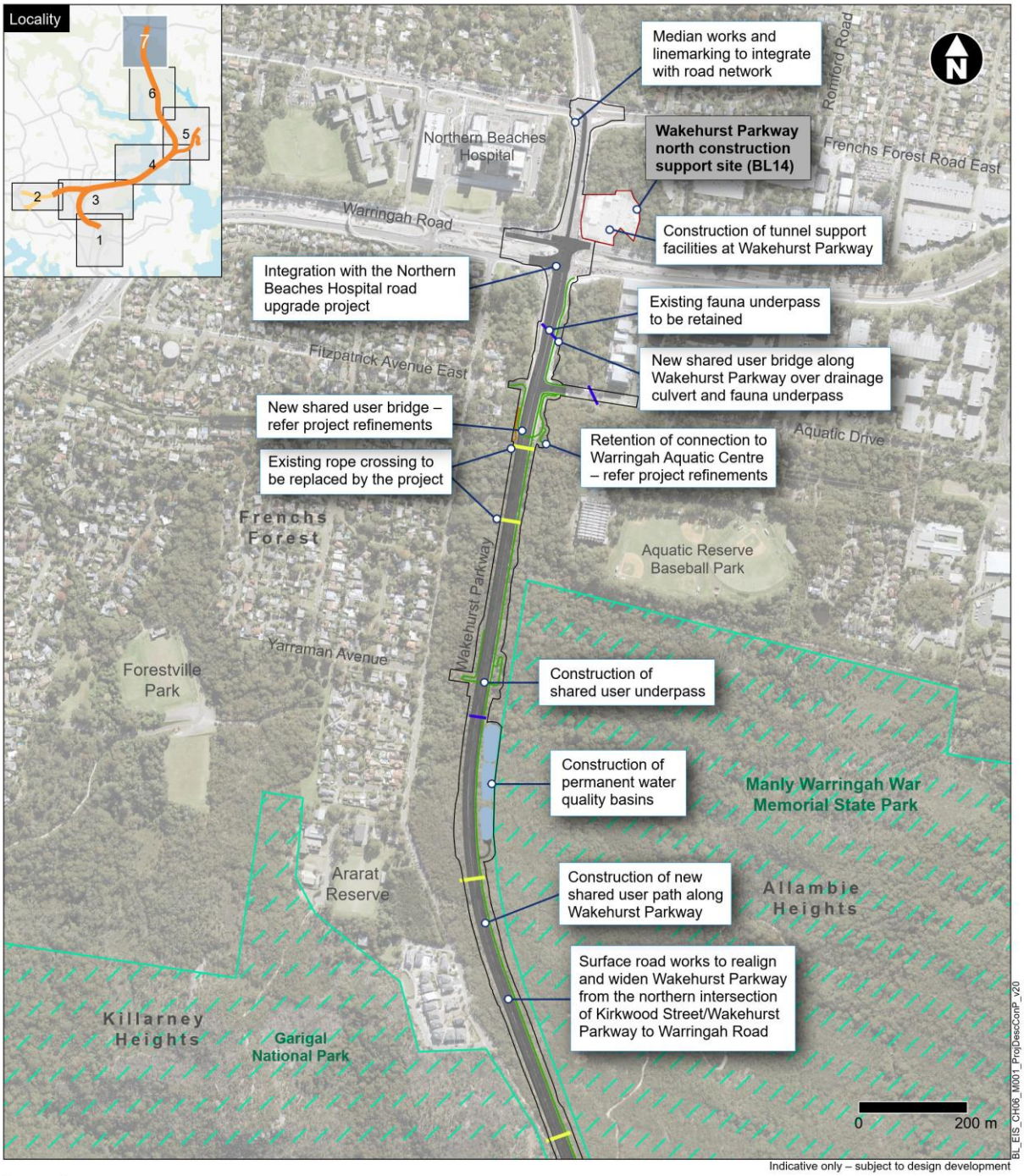


Figure 7 – Wakehurst Parkway north construction support site (BL14) location



Methodology

As documented in the environmental impact statement, standard construction hours for weekdays are 7:00am to 6:00pm, and 8:00am to 1:00pm on Saturdays. Notwithstanding some shift work, it is assumed that the majority of construction workers would be arriving at each temporary construction support site before 7:00am on weekdays. As the 18-hour survey started at 6:00am, the 8:00am occupancy count is the primary figure used for this analysis as it is expected that most construction workers would have arrived on site by then. It also represents the peak demand for (all-day) parking spaces as the majority of construction workers are expected to be at temporary construction support sites until the afternoon. There may be minor movements throughout the day, but this is seen as relatively insignificant and has not been documented.

Streets with kerbside parking restrictions at any period from 6:00am to 4:00pm (ie 'no parking', 'no stopping', 'clearway') have not been included in the analysis, as they cannot provide all-day parking to construction workers.

Streets have been classified according to their parking occupancy percentage, divided into four categories:

- **No parking available**: 8:00am occupancy N/A
- **Low capacity**: 8:00am occupancy 85%-100%
- **Moderate capacity**: 8:00am occupancy 50%-85%
- **High capacity**: 8:00am occupancy <50%.

Additionally, the analysis seeks to understand the impact of existing on-street parking losses as part of construction activities. In instances where the existing demand exceeds a street's new (reduced) capacity, this will be indicated in the occupancy maps through the colour purple:

- **Excess demand**: 8:00am occupancy >100%.

Streets have also been classified into unrestricted parking and restricted parking; for this report, restricted parking shall hereon refer to time-restricted parking with a four-hour or higher limit (e.g. 4P, 8P, 10P etc.). This is because as many of the 4P+ spaces have 'Residents Excepted' restrictions, it is important to understand the supply and demand for this type of parking, and any associated impacts. Further, in the highly unlikely worst-case scenario of construction worker spill over parking, for which there is no unrestricted parking available, existing 4P+ time-restricted parking with a significant underutilisation may have the potential to have restrictions adjusted in consultation with the relevant council, and therefore be able to accommodate overflow construction worker parking. Shorter-stay restricted parking, such as 1P or 2P, are generally implemented for parking spaces with a higher demand and turnover, and as such it would not be suitable adjust these restrictions. It should be noted that other supply and demand management measures, such as staged removal and replacement of parking, provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses and encouragement of use of public transport would be pursued before the option to potentially adjust any parking restrictions is explored. A complete breakdown of the occupancy percentage for unrestricted (6:00am to 4:00pm) and restricted (4P+) parking spaces at each temporary construction support site, across the entire 18-hour survey period, is included in Annexure A.

Further, the expected morning peak light vehicle movements generated by construction – contained in Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement – are used as a high-level and conservative proxy for construction worker parking demand. Finally, it is recognised that a constraint of this parking impact assessment is the level of detail available on the number of car parking spaces at each construction support site's on-site parking area, given the stage of the project. As noted in Chapter 8 (Construction traffic and transport) of the environmental impact statement, "the number of car parking spaces would be determined during construction planning."

As such, although there would be some allowance for parking at most of the temporary construction support sites, as shown in Chapter 6 (Construction work) of the environmental impact statement, this assessment looks at a worst-case scenario approach for each site, understanding the potential parking impact assuming that no parking would be provided on-site and that demand is not managed by other means (car-pooling, shuttle buses etc.).

Commentary has been provided regarding current supply/demand in the vicinity of each construction support site in terms of “precinct” availability (i.e. within approximately 500 metres radius), in addition to parking supply/demand within 250 metres of each site, to reflect a worker’s preference to park as close to the construction support site as possible. The headline occupancy figures only for those streets within a 250-metre walk of the main construction support site entry has been provided and can be considered the ‘priority’ or preferred parking catchment, however it is presumed that workers would park further away if necessary. As the parking surveys collected information for each street segment as a whole, it is not possible to cut the data according to an exact 250-metre line from the main access. As such, the maps and headline occupancy figures represent an approximate 250-metre walk, with a degree of variation either side.

Cammeray Golf Course construction support site (BL1)

Figure 8 – Unrestricted parking occupancy at 8AM in the vicinity of Cammeray Golf Course construction support site (BL1)

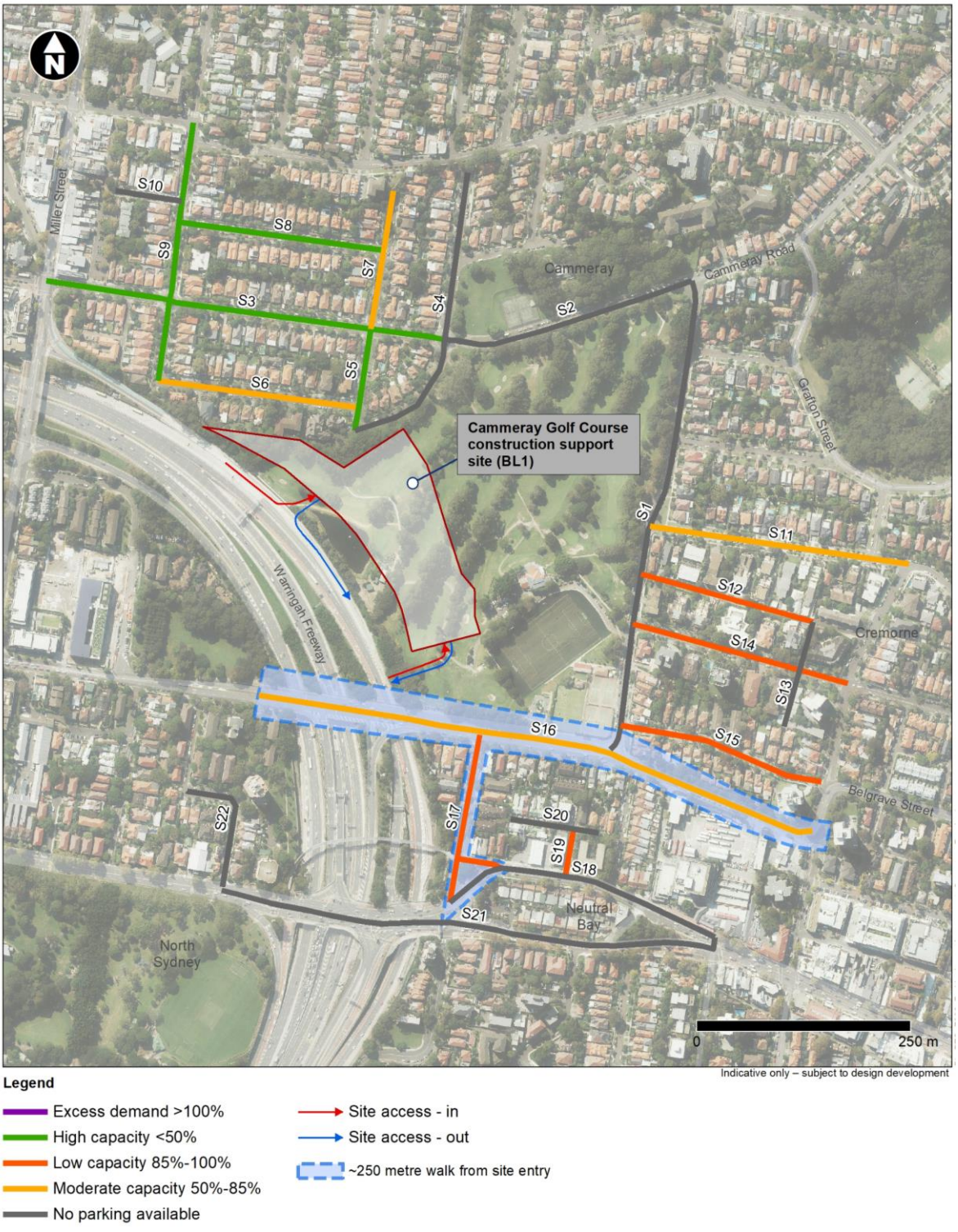


Table 1: Cammeray Golf Course construction support site (BL1) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Park Ave	N/A	N/A	N/A	N/A
S2. Cammeray Rd	N/A	N/A	N/A	N/A
S3. Amherst St	37	18	49%	19
S4. Warringa Rd	N/A	N/A	N/A	N/A
S5. Bells Ave	25	10	40%	15
S6. Morden St	43	31	72%	12
S7. Echo St	37	24	65%	13
S8. Lumsden St	7	2	29%	5
S9. Bellevue St	29	13	45%	16
S10. Raleigh St	N/A	N/A	N/A	N/A
S11. Grasmere Rd	39	31	79%	8
S12. Grasmere Ln	10	9	90%	1
S13. Como Ln	N/A	N/A	N/A	N/A
S14. Sutherland St	6	6	100%	0
S15. Oaks Ave	17	17	100%	0
S16. Ernest St	37	19	51%	18
S17. Merlin St	16	14	88%	2
S18. Military Rd (A8)	N/A	N/A	N/A	N/A
S19. Short Ln	2	2	100%	0
S20. Byrnes Ave	N/A	N/A	N/A	N/A
S21. Falcon St (A8)	N/A	N/A	N/A	N/A
S22. Moodie St	N/A	N/A	N/A	N/A

Figure 9 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Cammeray Golf Course construction support site (BL1)

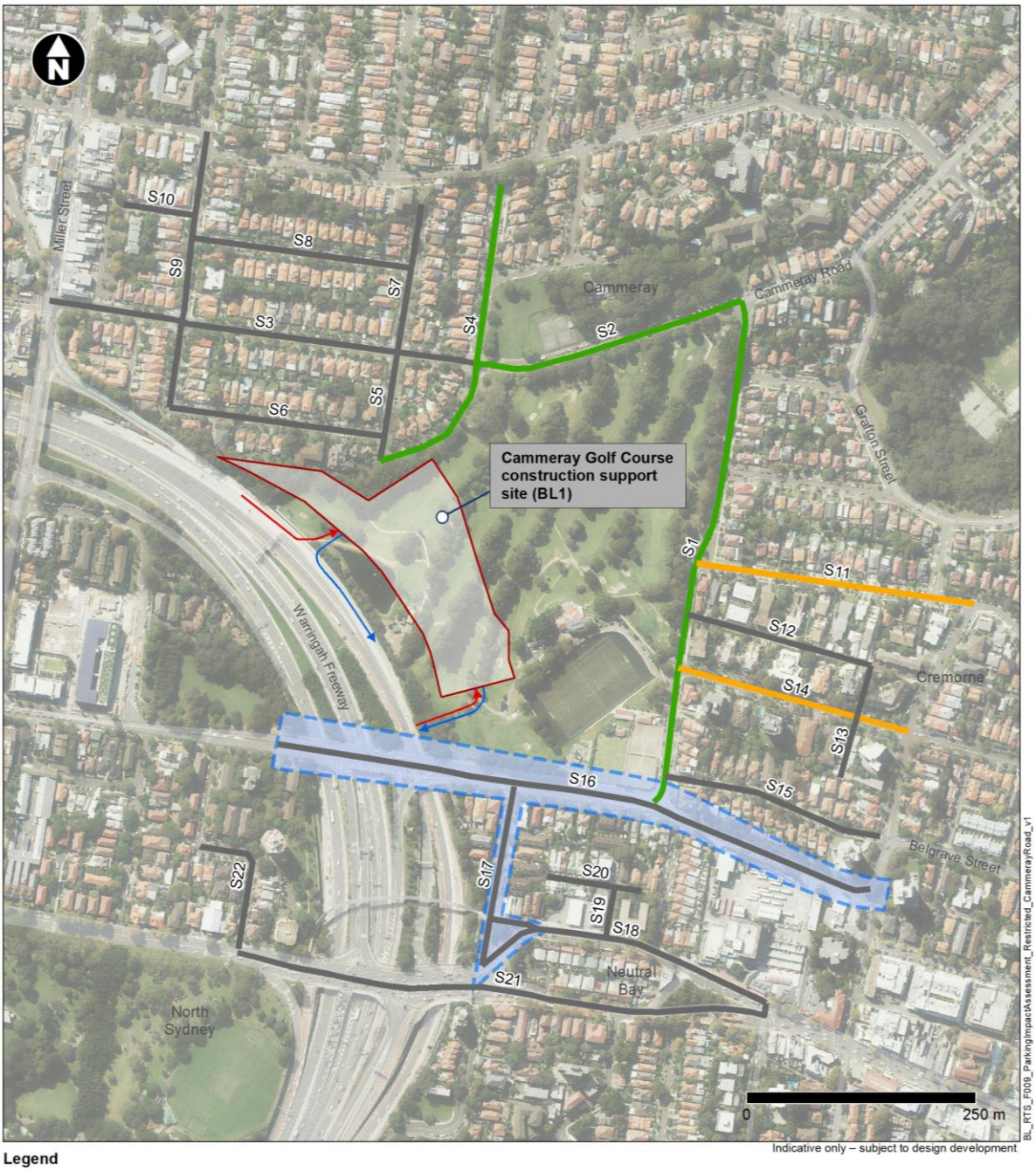


Table 2: Cammeray Golf Course construction support site (BL1) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Park Ave	118	37	31%	81
S2. Cammeray Rd	34	14	41%	20
S3. Amherst St	N/A	N/A	N/A	N/A
S4. Warringa Rd	102	33	32%	69
S5. Bells Ave	N/A	N/A	N/A	N/A
S6. Morden St	N/A	N/A	N/A	N/A
S7. Echo St	N/A	N/A	N/A	N/A
S8. Lumsden St	N/A	N/A	N/A	N/A
S9. Bellevue St	N/A	N/A	N/A	N/A
S10. Raleigh St	N/A	N/A	N/A	N/A
S11. Grasmere Rd	9	7	78%	2
S12. Grasmere Ln	N/A	N/A	N/A	N/A
S13. Como Ln	N/A	N/A	N/A	N/A
S14. Sutherland St	33	21	64%	12
S15. Oaks Ave	N/A	N/A	N/A	N/A
S16. Ernest St	N/A	N/A	N/A	N/A
S17. Merlin St	N/A	N/A	N/A	N/A
S18. Military Rd (A8)	N/A	N/A	N/A	N/A
S19. Short Ln	N/A	N/A	N/A	N/A
S20. Byrnes Ave	N/A	N/A	N/A	N/A
S21. Falcon St (A8)	N/A	N/A	N/A	N/A
S22. Moodie St	N/A	N/A	N/A	N/A

Table 3: Cammeray Golf Course construction support site (BL1) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	305	196	64%	109
Restricted (4P+)	296	112	38%	184

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

The cumulative precinct-wide unrestricted parking occupancy for Cammeray Golf Course construction support site (BL1), as summarised in Table 3, is 64% (109 available spaces), showing moderate spare capacity based on existing parking demand and supply, however, this figure is not spatially even across Cammeray Golf Course construction support site's (BL1) nearby streets. The majority of available parking is in the north-western segment of the survey area, particularly on Amherst Street (49%), Bells Avenue (40%) and Bellevue Street (45%) in Cammeray. Streets in the south-eastern segment within Cremorne have much higher occupancy percentages (refer to Table 1). In particular, Oaks Avenue (100%), Sutherland Street (100%) and Merlin Street (88%) have little to no spare capacity.

Regarding restricted parking, the precinct-wide occupancy is low (38%), with 184 spaces available. Warringa Road (32%), in particular, with 69 available spaces and 8P 8:30am to 6:00pm (Monday to Friday) Permit Holders Excepted Area 25 restrictions, is underutilised.

Current parking supply/demand within 250 metres of the construction support site

While the primary site access for vehicles is in the north-western part of the Cammeray Golf Course construction support site (BL1), this access is only accessible via the Warringah Freeway. As such, workers who may park nearby and walk to the construction support site will need to enter via the Ernest Street secondary site access at the intersection with Merlin Street. Parking at Ernest Street (S16) and Merlin Street (S17) is within 250 metres of the secondary site access point, and because of this proximity, are likely to be the preferred streets for parking. Table 4 shows the summary of parking availability at these two streets only, for which there is no restricted (4P+) parking, and only 20 unrestricted spaces available.

Table 4: Cammeray Golf Course construction support site (BL1) parking within 250 metres of the site

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	53	33	**62%**	20
Restricted (4P+)	N/A	N/A	N/A	N/A

Worst-case parking supply/demand during construction

Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement notes that "A car parking area would be provided at the Cammeray Golf Course (BL1) [construction support site]." In the absence of on-site construction worker parking or demand management strategies, as a worst-case scenario, the technical working paper's expected morning peak light vehicle movements serves as a proxy for understanding construction worker parking demand. For the Cammeray Golf Course construction support site (BL1), this figure is 99 light vehicle movements per morning. In the instance that overflow parking is required, the available spaces in the surrounding streets' unrestricted parking would provide enough spare capacity. Notwithstanding, tailored and complimentary worker parking solutions, in particular supply and demand management measures such as provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses, and encouragement of use of public transport options should still be pursued and implemented.

The technical working paper also notes that "up to 10 parking spaces on Ernest Street would be removed" and "clearways operate on Ernest Street during peak periods… [so that] any closure of the kerbside lane…would only result in loss of parking outside peak periods."

While this section of Ernest Street (west of the Warringah Freeway) was not included in this project's survey area, the parking survey data in this report can confirm the technical working paper's assertion that there is a

sufficient availability of unrestricted parking (18 spaces) on Ernest Street (east of Merlin Street) for this potentially redistributed demand.

Flat Rock Drive construction support site (BL2)

Figure 10 – Unrestricted parking occupancy at 8AM in the vicinity of Flat Rock Drive construction support site (BL2)

Table 5: Flat Rock Drive construction support site (BL2) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Small Street	N/A	N/A	N/A	N/A
S2. Tulloh St	35	18	51%	17
S3. Tulloh La	3	3	100%	0
S4. Nathan Ln	N/A	N/A	N/A	N/A
S5. Salisbury Ln	13	4	31%	9
S6. Armstrong St E	6	1	17%	5
S7. Salisbury Rd	91	34	37%	57
S8. Marlborough Rd	59	24	41%	35
S9. High St	38	27	71%	11
S10. Pendey St	17	4	24%	13
S11. Pyalla St	17	11	65%	6
S12. Sailors Bay Rd	23	17	74%	6
S13. Flat Rock Creek Car Park	20	1	5%	19
S14. Baringa Rd	5	4	80%	1
S15. Baroona Rd	5	4	80%	1
S16. Nulgarra St	14	10	71%	4
S17. Calbina Rd	71	34	48%	37
S18. Market St E & Dawson St	33	30	91%	3
S19. Adolphus St	20	9	45%	11
S20. Market St	56	26	46%	30
S21. King St	16	7	44%	9
S22. Central St	15	3	20%	12
S23. Garland Rd	93	45	48%	48

As none of the twenty-three streets within the Flat Rock Drive construction support site (BL2) survey area contained any restricted 4P+ parking supply, a restricted parking occupancy map and table are not included.

Table 6: Flat Rock Drive construction support site (BL2) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	650	316	**49%**	334
Restricted (4P+)	0	0	N/A	0

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

In the vicinity of the Flat Rock Drive construction support site (BL2), there is a precinct-wide unrestricted occupancy percentage of 49%, indicating high spare capacity (334 available spaces) based on existing supply and demand (refer to Table 6). Most of the lower-occupancy streets are to the west of Flat Rock Drive, including Salisbury Road (37%) and Garland Road (48%) (refer to Table 5). As previously stated, there is no restricted (4P+) parking supply within the survey area.

Current parking supply/demand within 250 metres of the construction support site

Primary access for pedestrians to the Flat Rock Drive construction support site (BL2) is via Flat Rock Drive, opposite the Flat Rock Baseball Diamond. The only available parking within 250 metres of this access is the Flat Rock Creek Car Park (S13), surveyed with only 5% occupancy and 19 available spaces (refer to Table 7).

Table 7: Flat Rock Drive construction support site (BL2) parking within 250 metres of the site

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	20	1	**5%**	19
Restricted (4P+)	N/A	N/A	N/A	N/A

Worst-case parking supply/demand during construction

Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement notes that "a car parking area would be provided at the…Flat Rock Drive (BL2) construction support site." In the absence of on-site construction worker parking or demand management strategies, overflow parking demand should still be considered. Considering 165 light vehicle movements per morning as a proxy to understand construction worker parking demand, there would be sufficient spare capacity in the surrounding street network in the event that some workers did park on these streets. Notwithstanding, tailored and complimentary worker parking solutions, in particular supply and demand management measures such as provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses, and encouragement of use of public transport options should still be pursued and implemented.

Punch Street construction support site (BL3)

Figure 11 – Unrestricted parking occupancy at 8AM in the vicinity of Punch Street construction support site (BL3)

Table 8: Punch Street construction support site (BL3) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Cleland Rd	55	29	53%	26
S2. Olive Ln	13	9	69%	4
S3. Parkes Rd	30	20	67%	10
S4. Punch St	85	85	100%	0
S5. Cleg St	30	26	87%	4
S6. Herbert St	N/A	N/A	N/A	N/A
S7. Lambs Rd	42	38	90%	4
S8. Chelmsford Ave	3	2	67%	1
S9. Francis St	96	87	91%	9
S10. No Name Rd	9	4	44%	5
S11. John Allen Ln	2	2	100%	0
S12. Park Rd	32	27	84%	5
S13. Station St	40	31	78%	9
S14. Brown Ln	6	6	100%	0
S15. Piper Ln	2	1	50%	1
S16. Grandview St	27	17	63%	10
S17. Frederick St	41	40	98%	1

Figure 12 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Punch Street construction support site (BL3)

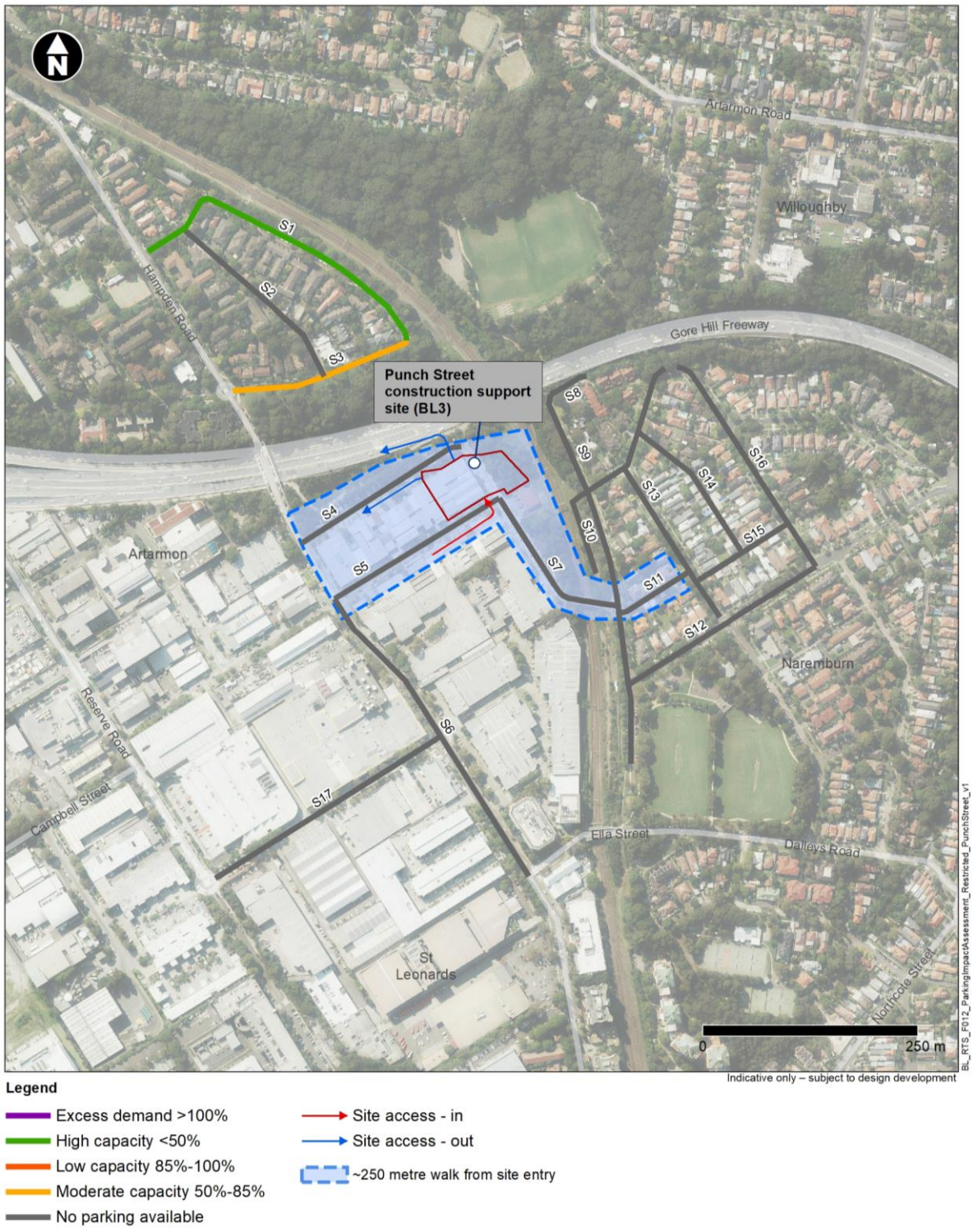


Table 9: Punch Street construction support site (BL3) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Cleland Rd	46	6	13%	40
S2. Olive Ln	N/A	N/A	N/A	N/A
S3. Parkes Rd	18	9	50%	9
S4. Punch St	N/A	N/A	N/A	N/A
S5. Cleg St	N/A	N/A	N/A	N/A
S6. Herbert St	N/A	N/A	N/A	N/A
S7. Lambs Rd	N/A	N/A	N/A	N/A
S8. Chelmsford Ave	N/A	N/A	N/A	N/A
S9. Francis St	N/A	N/A	N/A	N/A
S10. No Name Rd	N/A	N/A	N/A	N/A
S11. John Allen Ln	N/A	N/A	N/A	N/A
S12. Park Rd	N/A	N/A	N/A	N/A
S13. Station St	N/A	N/A	N/A	N/A
S14. Brown Ln	N/A	N/A	N/A	N/A
S15. Piper Ln	N/A	N/A	N/A	N/A
S16. Grandview St	N/A	N/A	N/A	N/A
S17. Frederick St	N/A	N/A	N/A	N/A

Table 10: Punch Street construction support site (BL3) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	513	424	83%	89
Restricted (4P+)	64	15	23%	49

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

The majority of parking supply in the Punch Street construction support site (BL3) survey area is unrestricted parking, however with a precinct-wide unrestricted parking occupancy of 83%, there is limited spare capacity (89 available spaces) based on existing supply and demand. Here, Cleland Street, Olive Lane and Parkes Road – all north of the Gore Hill Freeway – contain a significant portion of these available unrestricted spaces (40) (refer to Table 8).

The supply of restricted (4P+) parking is much less than unrestricted parking, however it has a low occupancy (23%), with 49 available spaces. Similar to the unrestricted parking, these spaces are on Cleland Street and Parkes Road north of the Gore Hill Freeway (Table 9).

Current parking supply/demand of the precinct (within 500 metres of the construction support site), following parking space loss

Critical to this analysis is consideration of parking space loss following establishment of the Punch Street construction support site (BL3). Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement states that "Lambs Road between Punch Street and Cleg Street would be closed…[and] adjustments to the Gore Hill Freeway shared user path… [would result] in the permanent loss of up to 25 parking spaces on Lambs Road and Punch Street."

Further, the technical working paper notes the "potential temporary removal of up to 10 parking spaces on other local roads such as Cleg Street, Dickson Avenue and Barton Road to provide suitable access to the temporary construction support sites in the Artarmon area." For the purposes of this analysis, these spaces were subtracted in proportion to each street's entire existing supply, per the calculations shown in Table 11.

Table 11: Parking loss calculation in vicinity of Punch Street construction support site (BL3)

Street	Original Supply (All Parking)[1]	% of Total	Estimated Parking Loss
Cleg St	65	30%	3 spaces
Dickson Ave	110	51%	5 spaces
Barton Rd	41	19%	2 spaces
TOTAL	**216**	**100%**	**10 spaces**

As a worst-case scenario, the decrease in parking spaces was subtracted from each street's unrestricted parking supply relevant to the Punch Street construction support site (BL3). After subtracting 15 car parking spaces from this section of Lambs Road, as well as an additional 10 spaces on Punch Street and 3 spaces on Cleg Street, the survey data indicates that these changes would have an impact on parking. Table 12 shows the three affected streets' existing parking demand in relation to their new unrestricted supply following the loss of parking spaces.

Table 12: Punch Street construction support site (BL3) unrestricted parking on affected streets (following parking space loss)

Street	Original Supply (Unrestricted)	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
S4. Punch St	85	75 (-10)	85	**113%** (+13%)	**-10**
S5. Cleg St	30	27 (-3)	26	**96%** (+9%)	1
S7. Lambs Rd	42	27 (-15)	38	**141%** (+51%)	**-11**

[1] "All Parking" refers to the entire parking supply on the given street, including unrestricted, restricted (4P+) and restricted (up to 4P) spaces. The entire parking supply figure was used in calculations so that parking loss was proportionally distributed across the three streets. For example, the Cleg Street original supply figure of 65 spans across the Punch Street (BL3) and Dickson Avenue (BL4) construction support sites, and includes 56 unrestricted spaces, 6 3P restricted spaces and 3 loading zone spaces.

Here, very high occupancy percentages prior to parking space loss means that the demand could exceed the new supply, as depicted in Figure 13 below. It should be noted, however, that the acquisition of twelve commercial properties for the project in this area would reduce parking demand in the area from former employees, customers, students and visitors that previously parked on the street.

Figure 13 – Unrestricted parking demand at 8AM in the vicinity of Punch Street construction support site (BL3) (following parking space loss)

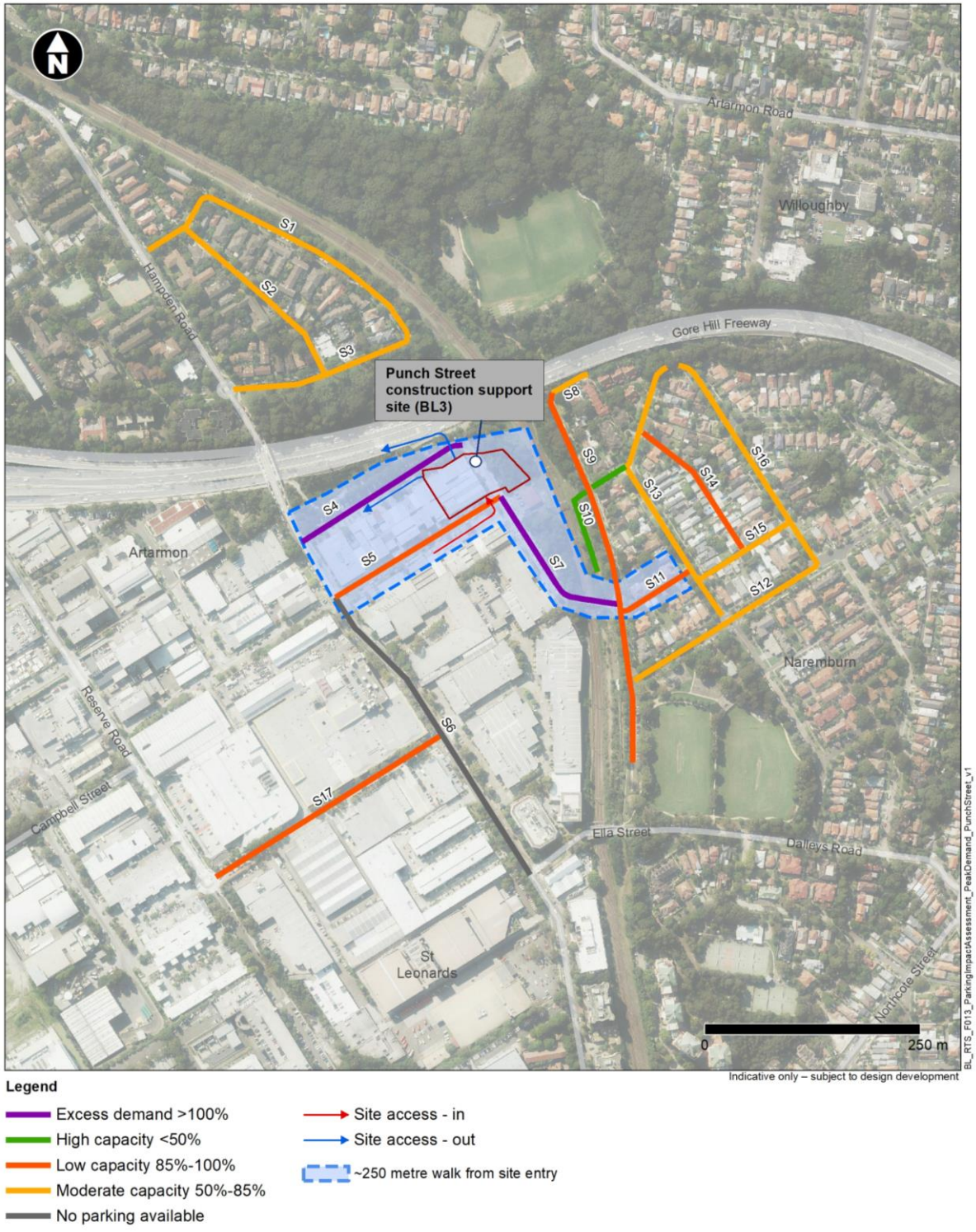


Table 13: Punch Street construction support site (BL3) cumulative available parking (following parking space loss)

Type	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
Unrestricted	485 (-28)	424	**87%** (+4%)	61
Restricted (4P+)	64	15	**23%**	49

There is sufficient capacity for the existing demand to redistribute to nearby streets, but as a result of the parking loss, Table 13 shows that the precinct-wide unrestricted parking occupancy would increase from 83% to 87%, with only 61 unrestricted spaces available. Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement expects 222 morning peak light vehicle movements at the Punch Street construction support site (BL3).

Current parking supply/demand within 250 metres of the construction support site, following parking space loss

Utilising the parking occupancy data following the expected parking space loss, there is no available parking within 250 metres of the site access on the corner of Cleg Street and Lambs Road. These streets, with close proximity to the construction support site, include Punch Street (S4), Cleg Street (S5), Lambs Road (S7) and John Allen Lane (S11). Shown in Table 14, the existing demand exceeds the parking supply following the parking space removal. There is sufficient capacity for the existing demand to redistribute to nearby streets beyond the 250 metre distance from the site, however, it can be concluded that all available parking within 250 metres would already be occupied by the time workers arrive at the site.

Table 14: Punch Street construction support site (BL3) parking within 250 metres of the site (following parking space loss)

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	131	151	**115%**	**-20**
Restricted (4P+)	N/A	N/A	N/A	N/A

Worst-case parking supply/demand during construction

The technical working paper also states that the Punch Street construction support site (BL3) would have construction worker parking on-site, yet in the case of potential overflow, there is very limited spare capacity on the surrounding street network. With a total of only 110 available spaces (unrestricted and restricted, within 500 metres of the construction support site), it is essential that tailored and complimentary worker parking solutions, in particular supply and demand management measures, such as staged removal and replacement of parking, provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Dickson Avenue construction support site (BL4)

Figure 14 – Unrestricted parking occupancy at 8AM in the vicinity of Dickson Avenue construction support site (BL4)

Table 15: Dickson Avenue construction support site (BL4) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Campbell St	34	34	100%	0
S2. Carlotta St	64	61	95%	3
S3. Hampden Rd	95	84	88%	11
S4. Thomson Ave	N/A	N/A	N/A	N/A
S5. Simpson St	7	7	100%	0
S6. Parkes Rd	19	17	89%	2
S7. Reserve Rd	N/A	N/A	N/A	N/A
S8. Lanceley Pl	34	34	100%	0
S9. Clarendon St	38	36	95%	2
S10. Curry Ln	N/A	N/A	N/A	N/A
S11. Dickson Ave	N/A	N/A	N/A	N/A
S12. Waltham St	37	28	76%	9
S13. Hesky Ln	N/A	N/A	N/A	N/A
S14. Herbert St	27	27	100%	0
S15. Cleg St	26	26	100%	0
S16. Taylor Ln	3	2	67%	1
S17. Waltham Ln	7	6	86%	1

Figure 15 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Dickson Avenue construction support site (BL4)

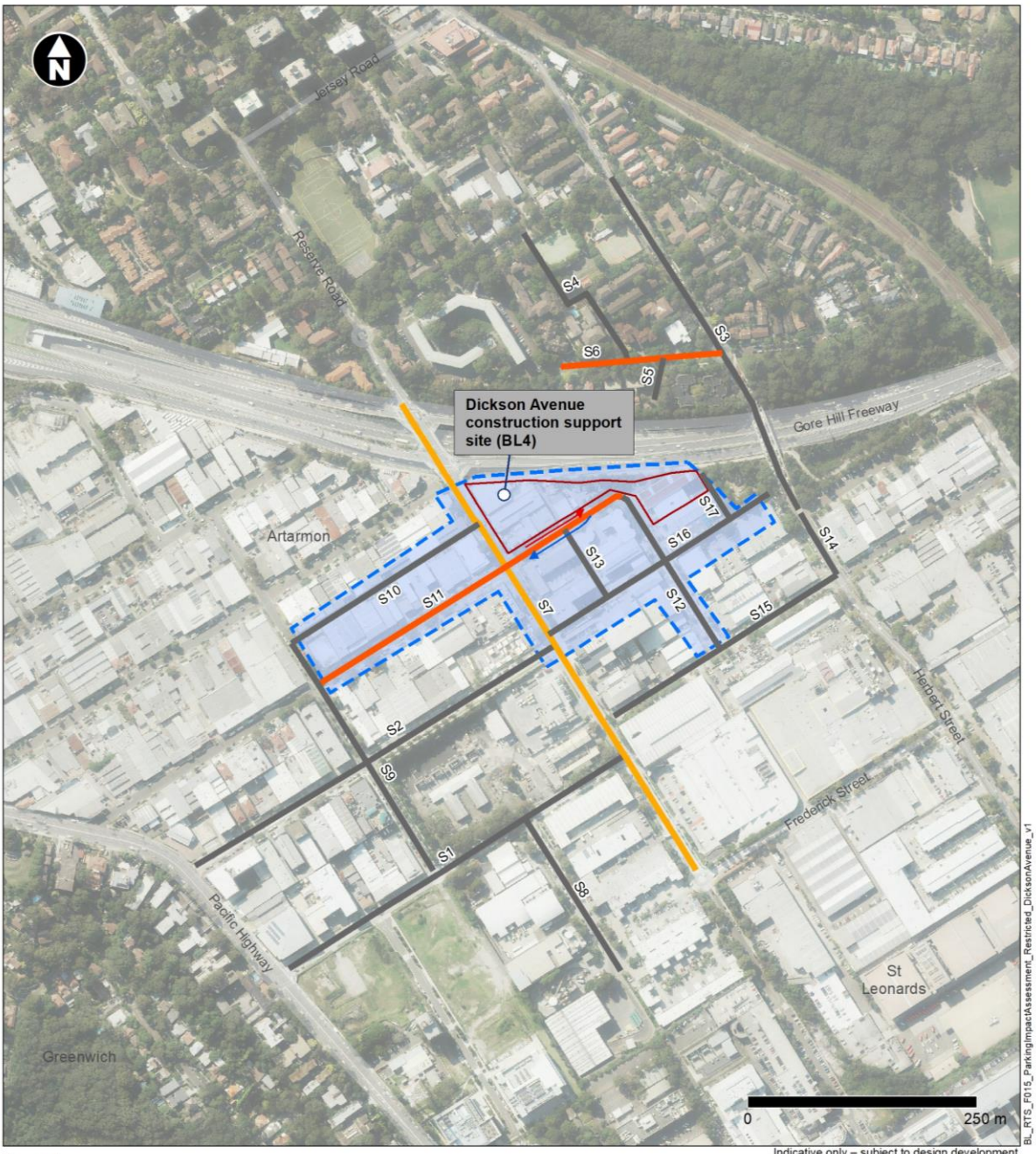


Table 16: Dickson Avenue construction support site (BL4) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Campbell St	N/A	N/A	N/A	N/A
S2. Carlotta St	N/A	N/A	N/A	N/A
S3. Hampden Rd	N/A	N/A	N/A	N/A
S4. Thomson Ave	N/A	N/A	N/A	N/A
S5. Simpson St	N/A	N/A	N/A	N/A
S6. Parkes Rd	12	11	92%	1
S7. Reserve Rd	17	10	59%	7
S8. Lanceley Pl	N/A	N/A	N/A	N/A
S9. Clarendon St	N/A	N/A	N/A	N/A
S10. Curry Ln	N/A	N/A	N/A	N/A
S11. Dickson Ave	58	51	88%	7
S12. Waltham St	N/A	N/A	N/A	N/A
S13. Hesky Ln	N/A	N/A	N/A	N/A
S14. Herbert St	N/A	N/A	N/A	N/A
S15. Cleg St	N/A	N/A	N/A	N/A
S16. Taylor Ln	N/A	N/A	N/A	N/A
S17. Waltham Ln	N/A	N/A	N/A	N/A

Table 17: Dickson Avenue construction support site (BL4) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	391	362	93%	29
Restricted (4P+)	87	72	83%	15

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

The occupancy percentage for unrestricted and restricted (4P+) parking in the vicinity of the Dickson Avenue construction support site (BL4) is very high – 93% and 83%, respectively – with a total of 44 available spaces (Table 17). The primary spare capacity is on Hampden Road (88%, 11 available spaces) and Waltham Street (76%, 9 available spaces).

Current parking supply/demand of the precinct (within 500 metres of the construction support site), following parking space loss

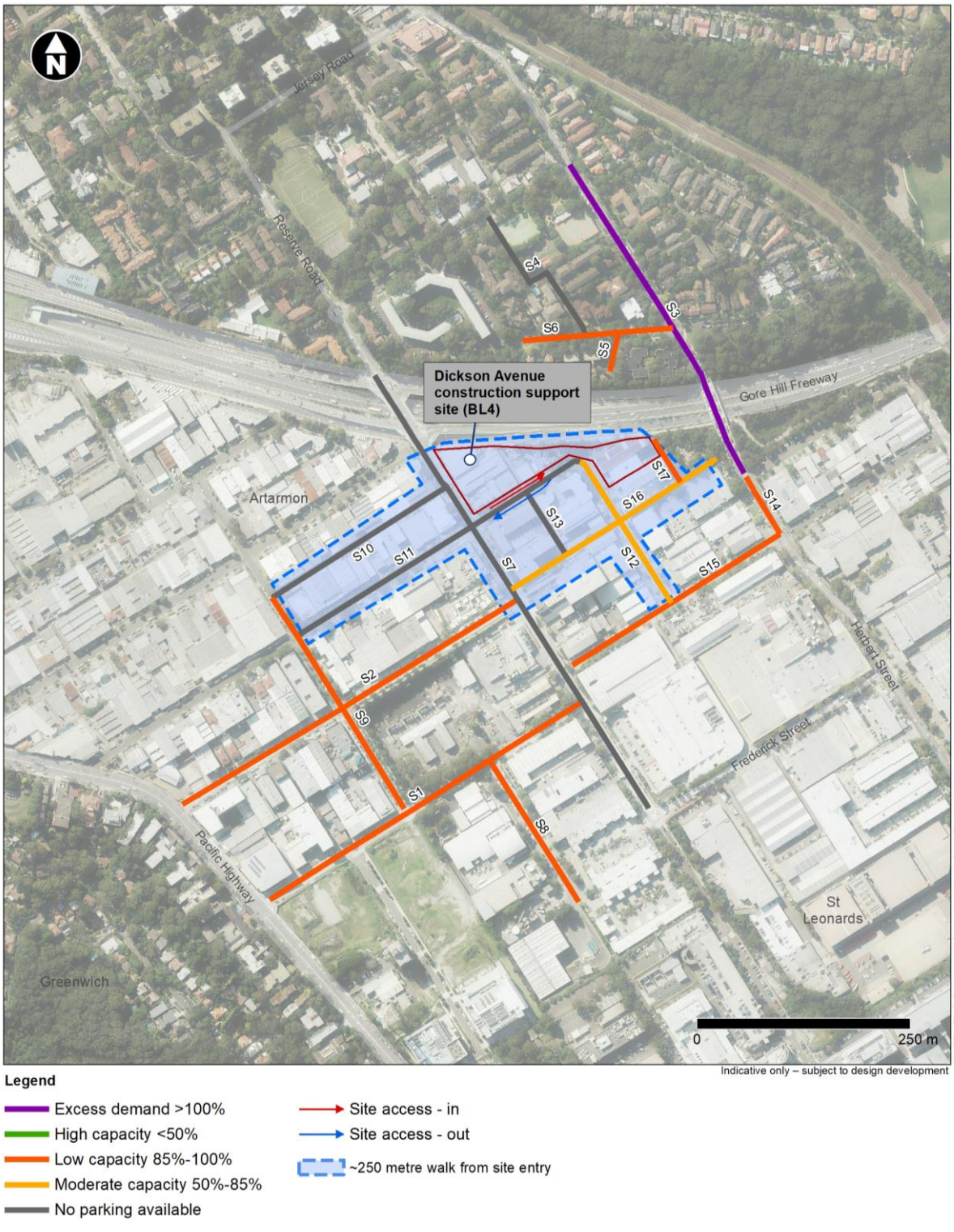
Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement states that "construction works at Artarmon Park" would require "about six on-street parking spaces on Hampden Road to be removed temporarily for the duration of construction." Additionally, the technical working paper notes the "short-term temporary removal of an additional 20 on-street parking spaces on Hampden Road during northern abutment works."

Subtracting 26 spaces from Hampden Road would mean that existing demand exceeds supply as outlined in Table 18.

Table 18: Dickson Avenue construction support site (BL4) unrestricted affected streets (following parking space loss)

Street	Original Supply (Unrestricted)	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
S3. Hampden Rd	95	69 (-26)	84	**122%** (+34%)	**-15**

Figure 16 – Unrestricted parking demand at 8AM in the vicinity of Dickson Avenue construction support site BL4 (following parking space loss)



Further, as per the calculations shown in Table 11 earlier, it has been assumed that 5 parking spaces would be removed from Dickson Avenue to provide suitable access to the temporary construction support sites in the Artarmon area.

Table 19: Dickson Avenue construction support site (BL4) restricted (4P+) affected streets (following parking space loss)

Street	Original Supply (Restricted)	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
S11. Dickson	58	53 (-5)	51	**96%** (+8%)	2

Figure 17 – Restricted (4P+) parking demand at 8AM in the vicinity of Dickson Avenue construction support site (BL4) (following parking space loss)

Table 20: Dickson Avenue construction support site (BL4) cumulative available parking (following parking space loss)

Type	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
Unrestricted	365 (-26)	362	**99%** (+6%)	3
Restricted (4P+)	82 (-5)	72	**88%** (+5%)	10

The resulting impact of parking space loss on both Hampden Road and Dickson Avenue increases the new unrestricted and restricted (4P+) parking utilisation to 99% and 88%, respectively. While the precinct has the spare capacity to cater for this redistributed parking demand, it leaves only 13 available spaces.

Current parking supply/demand within 250 metres of the construction support site, following parking space loss

Primary site access to the Dickson Avenue construction support site (BL4) is at the mid-block of Dickson Avenue, between Reserve Road and Waltham Street. Within 250 metres of this entry, parking is available at Curry Lane (S10), Dickson Avenue (S11), Waltham Street (S12), Hesky Lane (S13), Taylor Lane (S16) and Waltham Lane (S17). Following the expected loss of parking spaces, the overall occupancy for these proximate spaces is shown in Table 21 below.

In summary, there is limited parking available, for both unrestricted and restricted (4P+), within 250 metres of the Dickson Avenue construction support site (BL4) entry.

Table 21: Dickson Avenue construction support site (BL4) parking within 250 metres of the site (following parking space loss)

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	47	36	**77%**	11
Restricted (4P+)	53	51	**96%**	2

Worst-case parking supply/demand during construction

Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement states that the Dickson Avenue construction support site (BL4) would provide construction worker parking, but in the worst-case scenario that this supply is inadequate, there is no more capacity for potential construction worker spill over. It is essential that tailored and complimentary worker parking solutions, in particular supply and demand management measures, such as staged removal and replacement of parking, provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Barton Road construction support site (BL5)

Figure 18 – Unrestricted parking occupancy at 8AM in the vicinity of Barton Road construction support site (BL5)

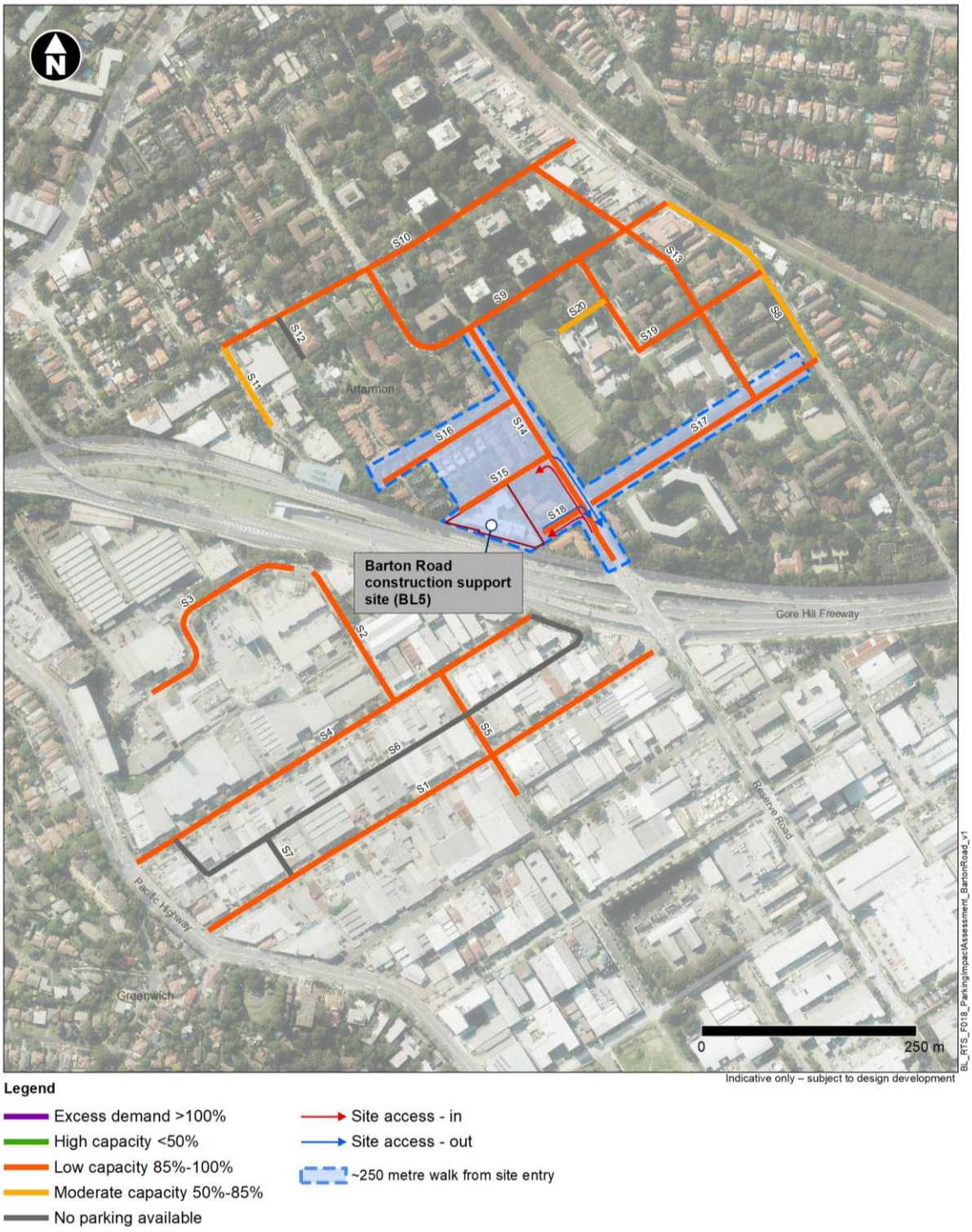


Table 22: Barton Road construction support site (BL5) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Whiting St	56	56	100%	0
S2. McLachlan Ave	17	17	100%	0
S3. Marden St	51	51	100%	0
S4. Hotham Pde	63	63	100%	0
S5. Clarendon St	10	10	100%	0
S6. Sawyer Ln	N/A	N/A	N/A	N/A
S7. Ashers Ln	N/A	N/A	N/A	N/A
S8. Hampden Rd	48	40	83%	8
S9. Jersey Rd/Buller	46	39	85%	7
S10. Broughton Rd	56	50	89%	6
S11. George Pl	21	17	81%	4
S12. White St	N/A	N/A	N/A	N/A
S13. Hampden Ln	10	10	100%	0
S14. Reserve Rd	39	36	92%	3
S15. Butchers Ln	18	16	89%	2
S16. Milner Rd	12	12	100%	0
S17. Barton Rd	27	26	96%	1
S18. Private Apartment Parking (Barton Rd)	71	64	90%	7
S19. McMillan Rd/Abbott Rd	33	32	97%	1
S20. Mathews Ln	7	5	71%	2

Figure 19 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Barton Road construction support site (BL5)

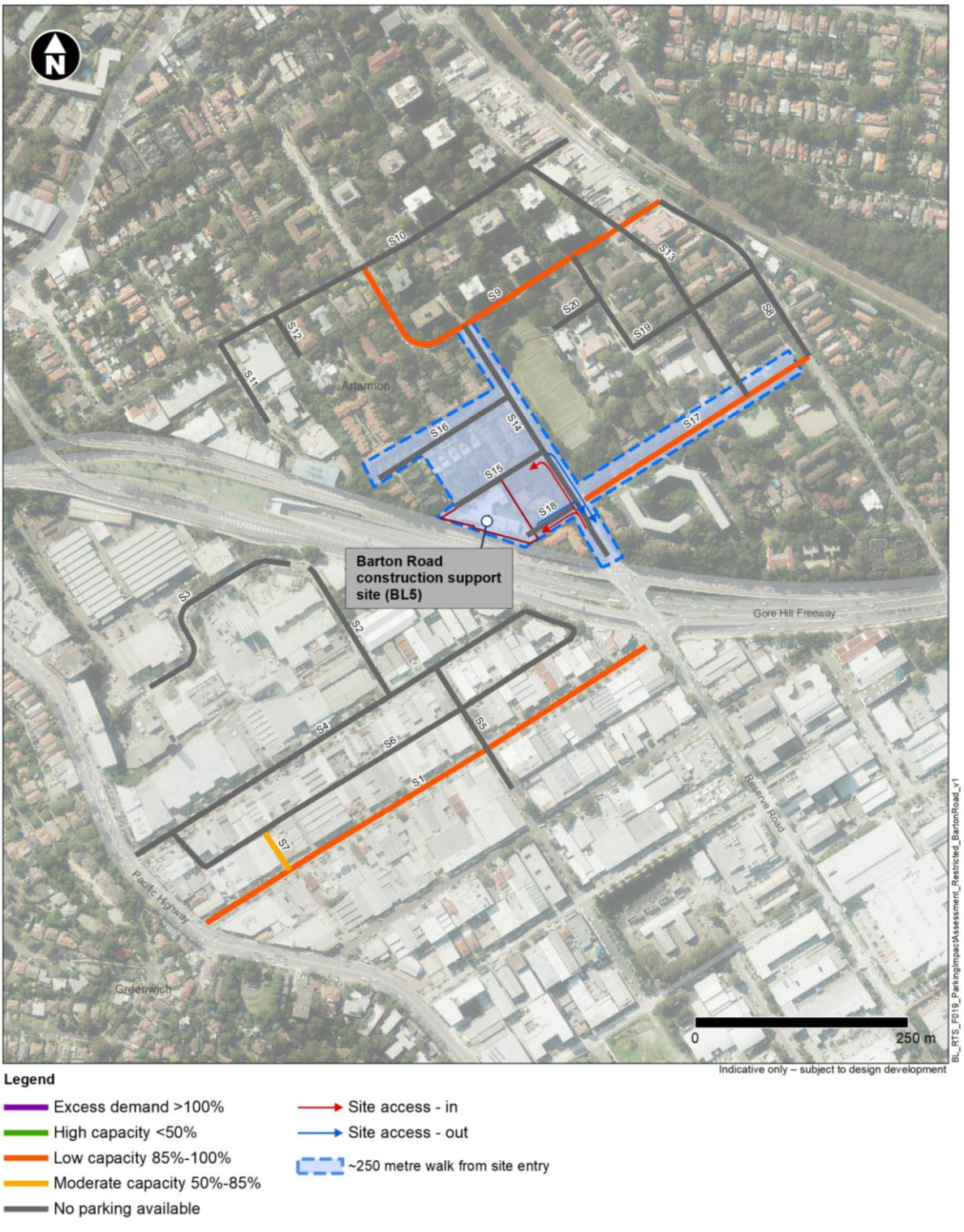


Table 23: Barton Road construction support site (BL5) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Whiting St	5	5	100%	0
S2. McLachlan Ave	N/A	N/A	N/A	N/A
S3. Marden St	N/A	N/A	N/A	N/A
S4. Hotham Pde	N/A	N/A	N/A	N/A
S5. Clarendon St	N/A	N/A	N/A	N/A
S6. Sawyer Ln	N/A	N/A	N/A	N/A
S7. Ashers Ln	N/A	N/A	N/A	N/A
S8. Hampden Rd	N/A	N/A	N/A	N/A
S9. Jersey Rd/Buller	2	2	100%	0
S10. Broughton Rd	N/A	N/A	N/A	N/A
S11. George Pl	N/A	N/A	N/A	N/A
S12. White St	N/A	N/A	N/A	N/A
S13. Hampden Ln	N/A	N/A	N/A	N/A
S14. Reserve Rd	N/A	N/A	N/A	N/A
S15. Butchers Ln	N/A	N/A	N/A	N/A
S16. Milner Rd	N/A	N/A	N/A	N/A
S17. Barton Rd	8	7	88%	1
S18. Private Apartment Parking (Barton Rd)	N/A	N/A	N/A	N/A
S19. McMillan Rd/Abbott Rd	N/A	N/A	N/A	N/A
S20. Mathews Ln	N/A	N/A	N/A	N/A

Table 24: Barton Road construction support site (BL5) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	585	544	93%	41
Restricted (4P+)	15	14	93%	1

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

The cumulative precinct-wide parking occupancy for Barton Road construction support site (BL5) is 93% for both unrestricted and restricted parking. Due to much higher unrestricted supply, this means that 41 of 42 available spaces are unrestricted (Table 24). The unrestricted parking demand is distributed evenly across the Barton Road construction support site (BL5) survey area, with no particular street containing a large volume of spare capacity.

Current parking supply/demand of the precinct (within 500 metres of the construction support site), following parking space loss

As per the calculations shown in Table 25, it has been assumed that 2 parking spaces would be removed from Barton Road, meaning there is excess demand of 1 vehicle. It is expected that this parking demand would be redistributed to the nearby spare capacity on unrestricted streets.

Table 25: Barton Road construction support site (BL5) unrestricted affected streets (following parking space loss)

Street	Original Supply (Unrestricted)	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
S17. Barton Rd	27	25 (-2)	26	**104%** (+8%)	**-1**

Figure 20 – Unrestricted parking demand at 8AM in the vicinity of Barton Road construction support site (BL5) (following parking space loss)

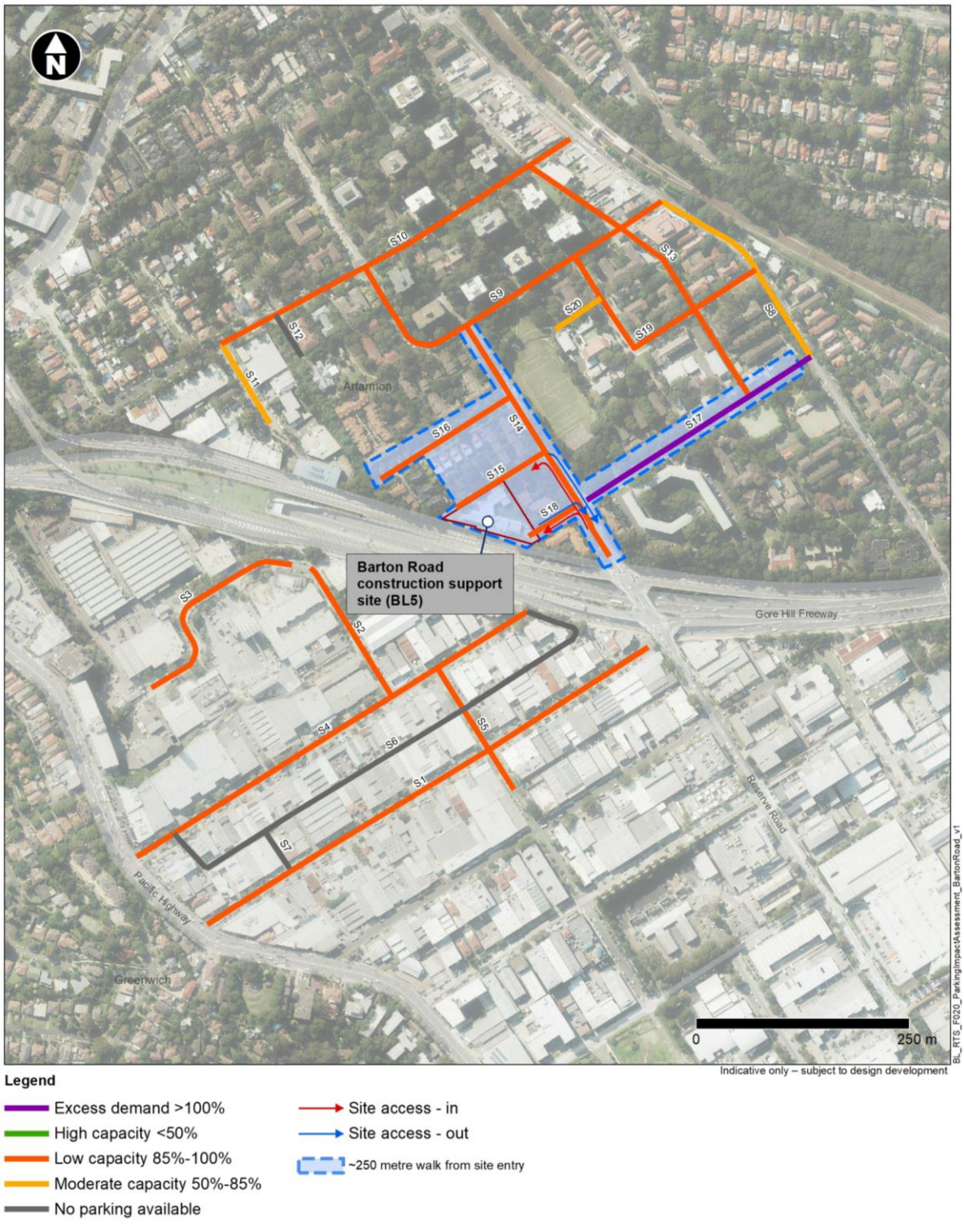


Table 26: Barton Road construction support site (BL5) cumulative available parking (following parking space loss)

Type	New Supply	8AM Occupancy	New Utilisation %	Available Spaces
Unrestricted	583 (-2)	544	**93%** (+0%)	39
Restricted (4P+)	15	14	**93%**	1

Current parking supply/demand within 250 metres of the construction support site, following parking space loss

The Barton Road construction support site (BL5) primary access is via the Barton Road cul-de-sac to the west of Reserve Road. Surveyed streets within 250 meters of this entry include Reserve Road (S14), Butchers Lane (S15), Milner Road (S16), Barton Road (S17) and the private apartment parking on Barton Road (S18). Here, occupancy is very high for both unrestricted and restricted (4P+) parking spaces, at 93% and 88%, respectively. On the surveyed day, there were 12 total spaces available (refer to Table 27).

Table 27: Barton Road construction support site (BL5) parking within 250 metres of the site (following parking space loss)

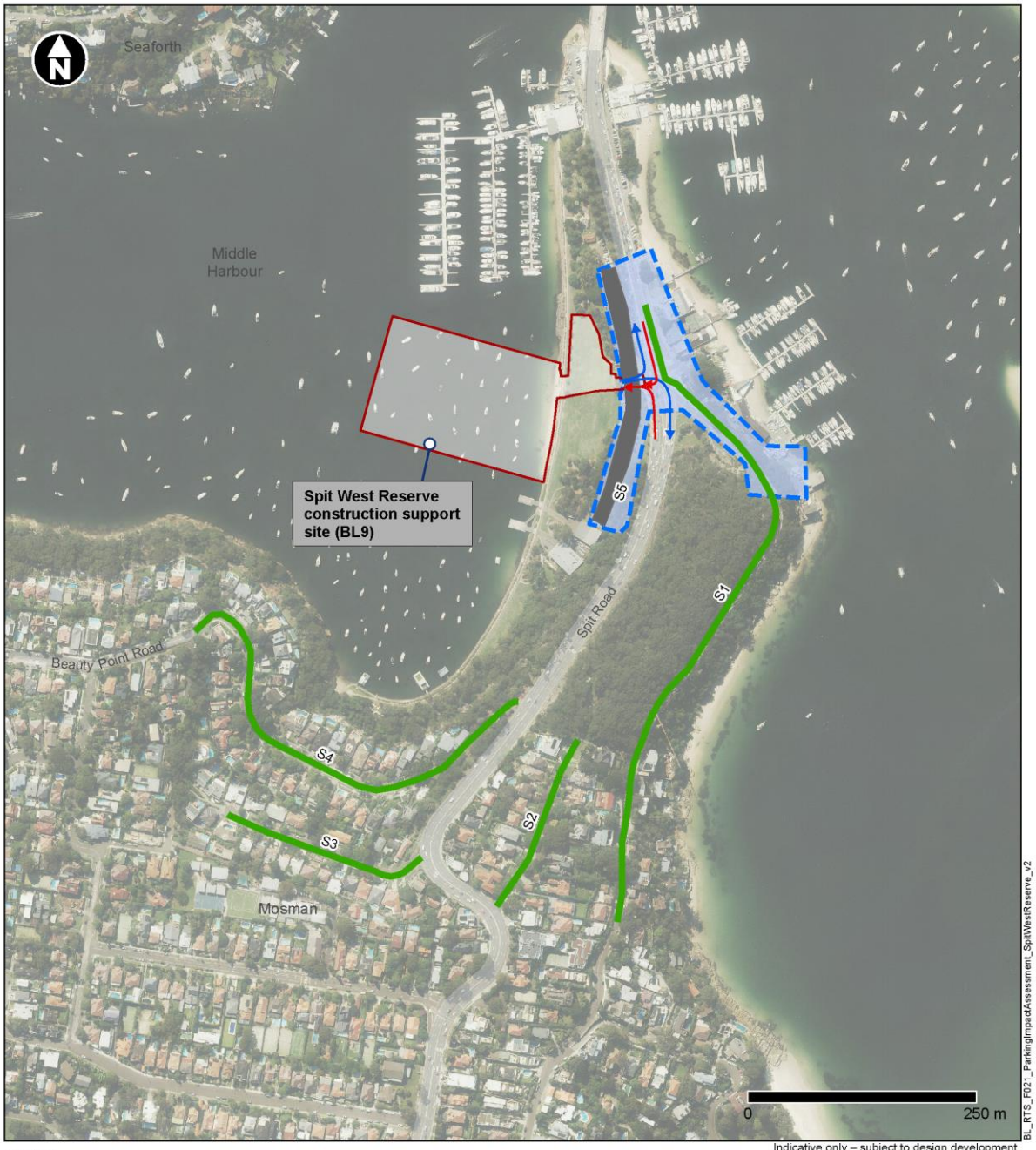
Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	165	154	**93%**	11
Restricted (4P+)	8	7	**88%**	1

Worst-case parking supply/demand during construction

While Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement states that construction worker parking would be provided on-site, consideration must be given to the estimated 45 morning peak light vehicle movements. In the event that overflow parking is required, it is likely that construction workers would be able to find a parking space, albeit with difficulty. Therefore, it is essential that tailored and complimentary worker parking solutions, in particular supply and demand management measures, such as staged removal and replacement of parking, provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Spit West Reserve construction support site (BL9)

Figure 21 – Unrestricted parking occupancy at 8AM in the vicinity of Spit West Reserve construction support site (BL9)



Legend

- Excess demand >100%
- High capacity <50%
- Low capacity 85%-100%
- Moderate capacity 50%-85%
- No parking available
- Site access - in
- Site access - out
- ~250 metre walk from site entry

Table 28: Spit West Reserve construction support site (BL9) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Parriwi Rd	92	39	**37%**	53
S2. Upper Spit Rd	51	21	**41%**	30
S3. Ida Ave	48	18	**38%**	30
S4. Pearl Bay Ave	106	42	**40%**	64
S5. Spit West Car Park	N/A	N/A	N/A	N/A

Figure 22 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Spit West Reserve construction support site (BL9)

Table 29: Spit West Reserve construction support site (BL9) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Parriwi Rd	11	4	36%	7
S2. Upper Spit Rd	N/A	N/A	N/A	N/A
S3. Ida Ave	N/A	N/A	N/A	N/A
S4. Pearl Bay Ave	N/A	N/A	N/A	N/A
S5. Spit West Car Park	193	40	21%	153

Table 30: Spit West Reserve construction support site (BL9) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	297	115	39%	182
Restricted (4P+)	204	44	22%	160

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

Parking occupancy in the vicinity of the Spit West Reserve construction support site (BL9) is low. Parking occupancy on streets with unrestricted parking is evenly distributed across the survey area, with occupancies ranging from 37% to 41%, and a total of 182 available spaces (see Table 28). 193 of 204 restricted (4P+) parking spaces are within the Spit West Car Park. Here, the restriction is 10P Ticket 8:00am to 6:00pm Monday to Sunday. As of the 2019 to 2020 financial year, Mosman Council implemented a $4.20 hourly charge and a maximum daily charge of $20.00 on weekdays.

Current parking supply/demand within 250 metres of the construction support site

The Spit West Reserve construction support site (BL9) main entry is the Spit West Car Park entry at Spit Road. Within 250 metres, there are restricted (4P+) parking spaces available at the Spit West Car Park (S5), and on Parriwi Road (S1), up to Parriwi Head.

Table 31: Spit West Reserve construction support site (BL9) parking within 250 metres of the site

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	N/A	N/A	N/A	N/A
Restricted (4P+)	204	44	22%	160

Worst-case parking supply/demand during construction

Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement states that a car parking area for "construction workers would be provided at the Balgowlah Golf Course construction support site (BL10)" and that the construction workforce at Middle Harbour south cofferdam (BL7), Middle Harbour north cofferdam (BL8), Spit West Reserve (BL9) and Kitchener Street (BL11) construction support sites would park at the Balgowlah Golf Course construction support site (BL10) on-site parking area.

Construction workers would be “transported to the sites by shuttle bus (where required)”, and only “limited parking for supervision staff” would be available at the Spit West Reserve construction support site (BL9). As such, construction worker parking for this site is not a significant concern. In the event that overflow parking is required, the available unrestricted parking spaces would provide more than sufficient capacity. Notwithstanding it is suggested that tailored and complimentary worker parking solutions, in particular demand management measures, such as car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Additional Weekend Analysis

At the request of the Department of Planning, Industry and Environment, recognising that construction activities will not be limited to the weekday and the likely increase in parking demand for recreational land use in the area on the weekend, an additional survey of the Spit West Car Park was conducted for a typical weekend.

Considering that standard construction hours are 8am to 1pm Saturday, an additional 12-hour survey was undertaken on Saturday, 22nd May 2021 from 6:00am to 6:00pm and recorded the car park’s occupancy at each hour throughout the day. With 193 spaces available, Table 32 shows the occupancy percentage and available spaces by hour. By 7:00am, Spit West Car Park is already at moderate occupancy (60%) and does not drop back to low occupancy until 6:00pm. While it maintains a consistent occupancy level throughout the daytime, there is no period of high occupancy (>85%), with the peak of 74% occupancy occurring at 10:00am.

Table 32: Spit West Reserve construction support site (BL9) Saturday survey results

Time	Occupancy	Occupancy %	Available Spaces
6AM	72	**37%**	121
7AM	117	**60%**	76
8AM	108	**55%**	85
9AM	121	**62%**	72
10AM	142	**74%**	51
11AM	133	**69%**	60
12PM	139	**72%**	54
1PM	130	**67%**	63
2PM	109	**56%**	84
3PM	117	**61%**	76
4PM	98	**51%**	95
5PM	105	**54%**	88
6PM	88	**46%**	105

Balgowlah Golf Course construction support site (BL10)

Figure 23 – Unrestricted parking occupancy at 8AM in the vicinity of Balgowlah Golf Course construction support site (BL10)

Table 33: Balgowlah Golf Course construction support site (BL10) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. West St	176	85	48%	91
S2. Upper Beach St	70	22	31%	48
S3. New St W	38	17	45%	21
S4. Seaview St	137	77	56%	60
S5. Wanganella St	160	90	56%	70
S6. Kareema St	54	16	30%	38
S7. Violet St	46	43	93%	3
S8. Audrey St	38	28	74%	10
S9. White St	3	0	0%	3
S10. Maretimo St	63	38	60%	25
S11. Plant St	33	22	67%	11
S12. Ethel St	30	15	50%	15
S13. Coral St	5	5	100%	0
S14. Whittle Ave	19	18	95%	1
S15. Kanangra Cres	12	3	25%	9
S16. Rickard St	40	22	55%	18
S17. Westlake Pl	15	8	53%	7
S18. Pickworth Ave	N/A	N/A	N/A	N/A
*S19. Dudley St**	*75*	*9*	*12%*	*66*
S20. Hope St	112	44	39%	68
S21. Kempbridge Ave	74	45	61%	29
S22. Frenchs Forest	15	11	73%	4
S23. Brook Rd	3	3	100%	0
S24. Sydney Rd	36	20	56%	16
S25. Manly Rd	N/A	N/A	N/A	N/A

*Dudley Street forms part of the construction support site footprint and thus its parking availability is not considered in analysis of future parking supply and demand.

Figure 24 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Balgowlah Golf Course construction support site (BL10)

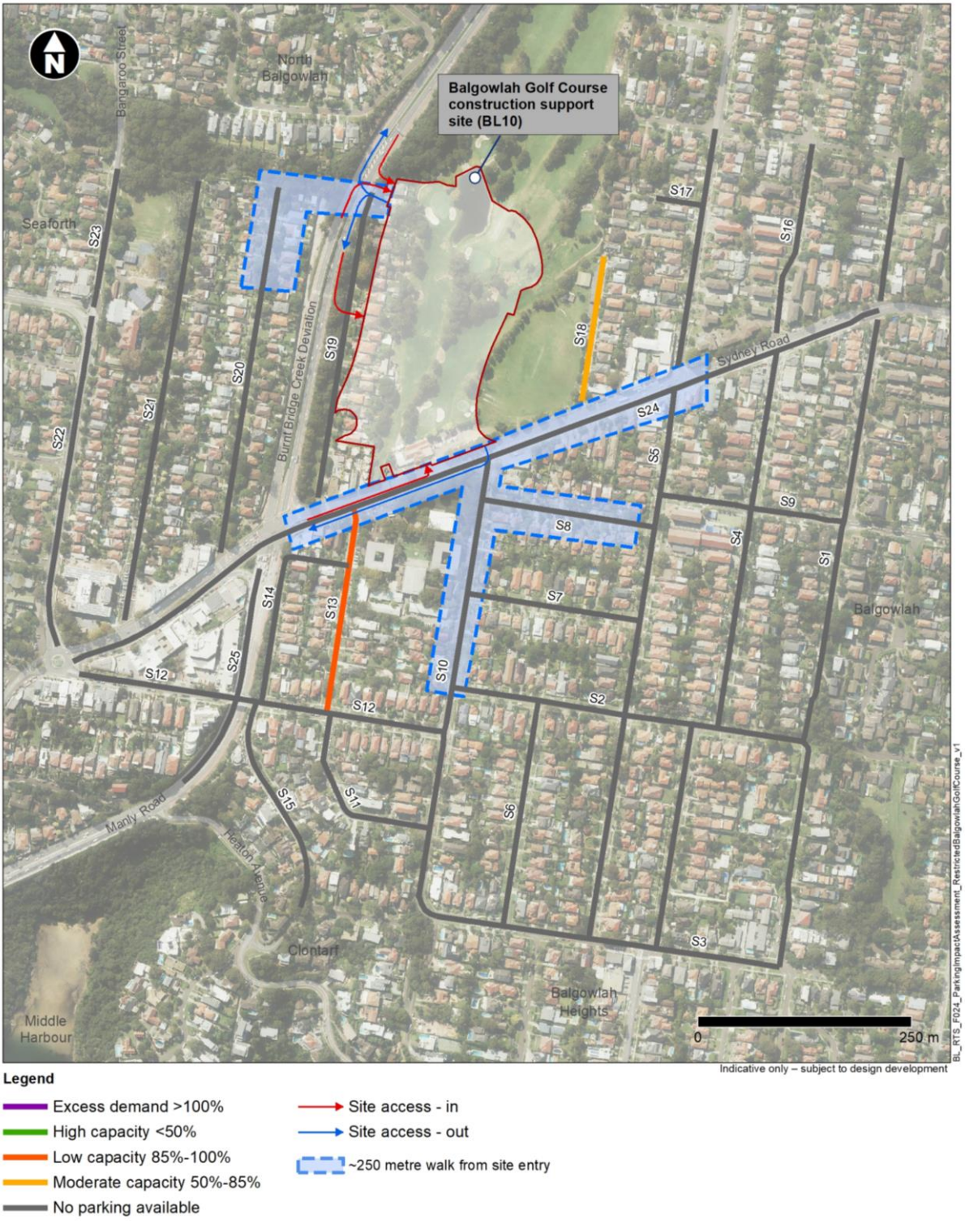


Table 34: Balgowlah Golf Course construction support site (BL10) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. West St	N/A	N/A	N/A	N/A
S2. Upper Beach St	N/A	N/A	N/A	N/A
S3. New St W	N/A	N/A	N/A	N/A
S4. Seaview St	N/A	N/A	N/A	N/A
S5. Wanganella St	N/A	N/A	N/A	N/A
S6. Kareema St	N/A	N/A	N/A	N/A
S7. Violet St	N/A	N/A	N/A	N/A
S8. Audrey St	N/A	N/A	N/A	N/A
S9. White St	N/A	N/A	N/A	N/A
S10. Maretimo St	N/A	N/A	N/A	N/A
S11. Plant St	N/A	N/A	N/A	N/A
S12. Ethel St	N/A	N/A	N/A	N/A
S13. Coral St	27	27	100%	0
S14. Whittle Ave	N/A	N/A	N/A	N/A
S15. Kanangra Cres	N/A	N/A	N/A	N/A
S16. Rickard St	N/A	N/A	N/A	N/A
S17. Westlake Pl	N/A	N/A	N/A	N/A
S18. Pickworth Ave	13	7	54%	6
S19. Dudley St	N/A	N/A	N/A	N/A
S20. Hope St	N/A	N/A	N/A	N/A
S21. Kempbridge Ave	N/A	N/A	N/A	N/A
S22. Frenchs Forest	N/A	N/A	N/A	N/A
S23. Brook Rd	N/A	N/A	N/A	N/A
S24. Sydney Rd	N/A	N/A	N/A	N/A
S25. Manly Rd	N/A	N/A	N/A	N/A

Table 35: Balgowlah Golf Course construction support site (BL10) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	1,179	632	**54%**	547
Restricted (4P+)	40	34	**85%**	6

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

Due to a high supply of unrestricted parking and only moderate precinct-wide occupancy (54%), there are 547 available spaces. Approximately half of these available spaces are largely concentrated on four streets: West Street (91), Wanganella Street (70), Hope Street (68) and Seaview Street (60) (refer to Table 33).

Current parking supply/demand within 250 metres of the construction support site

Primary site access for pedestrians at the Balgowlah Golf Course construction support site (BL10) is located at the Sydney Road – Maretimo Street intersection. Within 250 metres of this entry, surveyed streets include Sydney Road (S24) from Manly Road to Wanganella Street, Maretimo Street (S10) from Sydney Road to Upper Beach Street, and Audrey Street (S8). The northern section of Hope Street (S20) is also within 250 metres of the secondary access point at Burnt Bridge Creek Deviation. In total, occupancy was 63%, with 38 available parking spaces (refer to Table 36).

Table 36: Balgowlah Golf Course construction support site (BL10) parking within 250 metres of the site

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	103	65	**63%**	38
Restricted (4P+)	N/A	N/A	N/A	N/A

Worst-case parking supply/demand during construction

While a car parking area would be provided at the Balgowlah Golf Course construction support site (BL10), in the event that overflow parking is required, there is sufficient capacity on the local street network based on existing supply and demand. Notwithstanding it is suggested that tailored and complimentary worker parking solutions, in particular demand management measures, such as car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Kitchener Street construction support site (BL11)

Figure 25 – Unrestricted parking occupancy at 8AM in the vicinity of Kitchener Street construction support site (BL11)

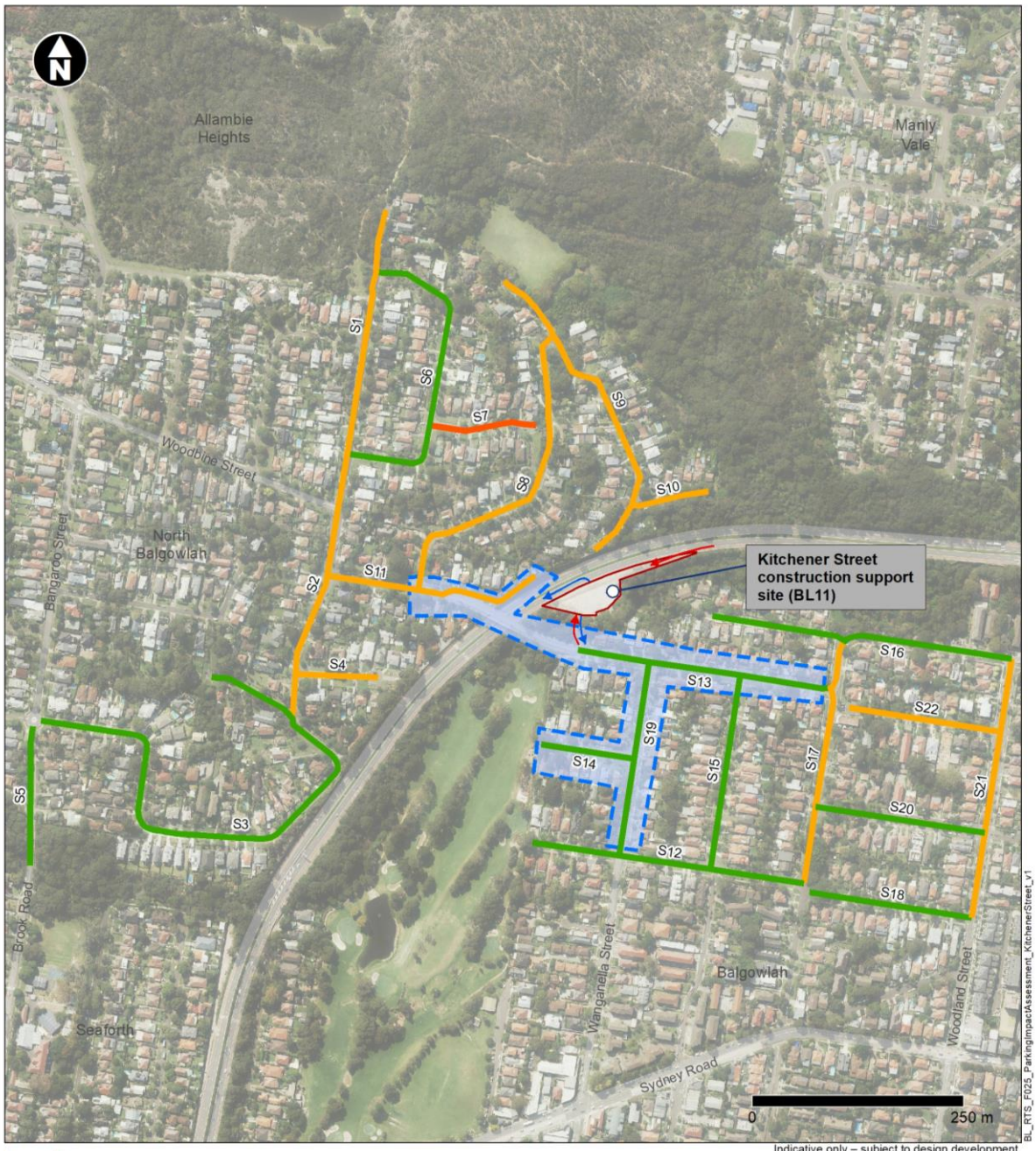


Table 37: Kitchener Street construction support site (BL11) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Water Reserve Rd	58	34	59%	24
S2. Daisy St	40	26	65%	14
S3. Serpentine Cres	116	50	43%	66
S4. Boronia St	17	10	59%	7
S5. Bangaroo St	13	3	23%	10
S6. Kimo St	58	17	29%	41
S7. Abingdon St	23	20	87%	3
S8. Abingdon St & Marlee St	63	35	56%	28
S9. Condover St	60	38	63%	22
S10. Birrima St	9	6	67%	3
S11. Myrtle St	22	16	73%	6
S12. Brighton St	64	22	34%	42
S13. Kitchener St	45	1	2%	44
S14. Paris St	18	3	17%	15
S15. Rickard St	42	19	45%	23
S16. Balgowlah Rd	59	14	24%	45
S17. West St	48	27	56%	21
S18. Lombard St	37	18	49%	19
S19. Wanganella St	48	19	40%	29
S20. Griffiths St	44	16	36%	28
S21. Woodland St N	68	38	56%	30
S22. Lodge St	38	23	61%	15

As none of the twenty-two streets within the Kitchener Street construction support site (BL11) survey area contained any restricted 4P+ parking supply, a restricted parking occupancy map and table are not included.

Table 38: Kitchener Street construction support site (BL11) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	1,076	510	**47%**	566
Restricted (4P+)	0	0	N/A	0

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

With no restricted (4P+) parking in the vicinity of the Kitchener Street construction support site (BL11), the entirety of the local on-street parking supply (1076) is unrestricted, with a low-moderate occupancy of 47% and 566 available spaces (see Table 38).

Current parking supply/demand within 250 metres of the construction support site

While the primary site access for vehicles is the Burnt Bridge Creek Deviation, access is also available for light vehicles and pedestrians on Kitchener Street. Within 250 metres of the entry, surveyed streets include Kitchener Street (S13), Paris Street (S14), Wanganella Street (S19) and Myrtle Street (S11) east of Abingdon Street. In total, occupancy was very low (27%) on these streets, with 90 available parking spaces (see Table 39 below).

Table 39: Kitchener Street construction support site (BL11) parking within 250 metres of the site

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	124	34	**27%**	90
Restricted (4P+)	N/A	N/A	N/A	N/A

Worst-case parking supply/demand during construction

As explained in the analysis for Spit West Reserve construction support site (BL9), construction workers at the Kitchener Street construction support site (BL11) are expected to park at the Balgowlah Golf Course construction support site (BL10) car parking area and take a shuttle bus to Kitchener Street construction support site (BL11), with some parking available at Kitchener Street construction support site (BL11) for supervision staff. With only 27 morning peak light vehicle movements anticipated, the local street network has sufficient spare capacity for construction workers if there was any residual spill over. Notwithstanding it is suggested that tailored and complimentary worker parking solutions, in particular demand management measures, such as car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites

Figure 26 – Unrestricted parking occupancy at 8AM in the vicinity of Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites

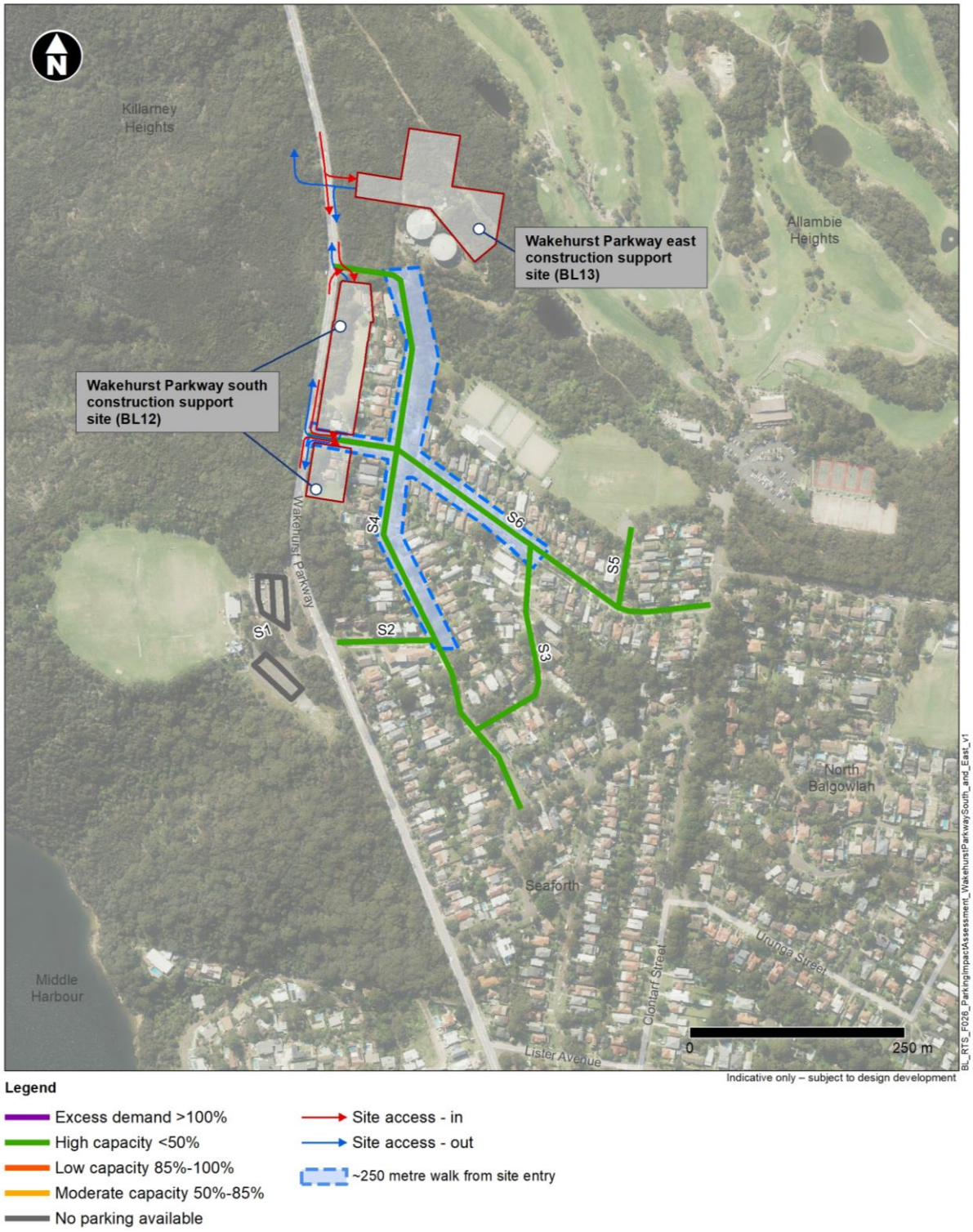


Table 40: Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Seaforth Oval Car	N/A	N/A	N/A	N/A
S2. Burnt St	9	4	**44%**	5
S3. Waterview St	59	18	**31%**	41
S4. Kirkwood St	137	38	**28%**	99
S5. Reserve St	31	10	**32%**	21
S6. Judith St	90	18	**20%**	72

Figure 27 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites

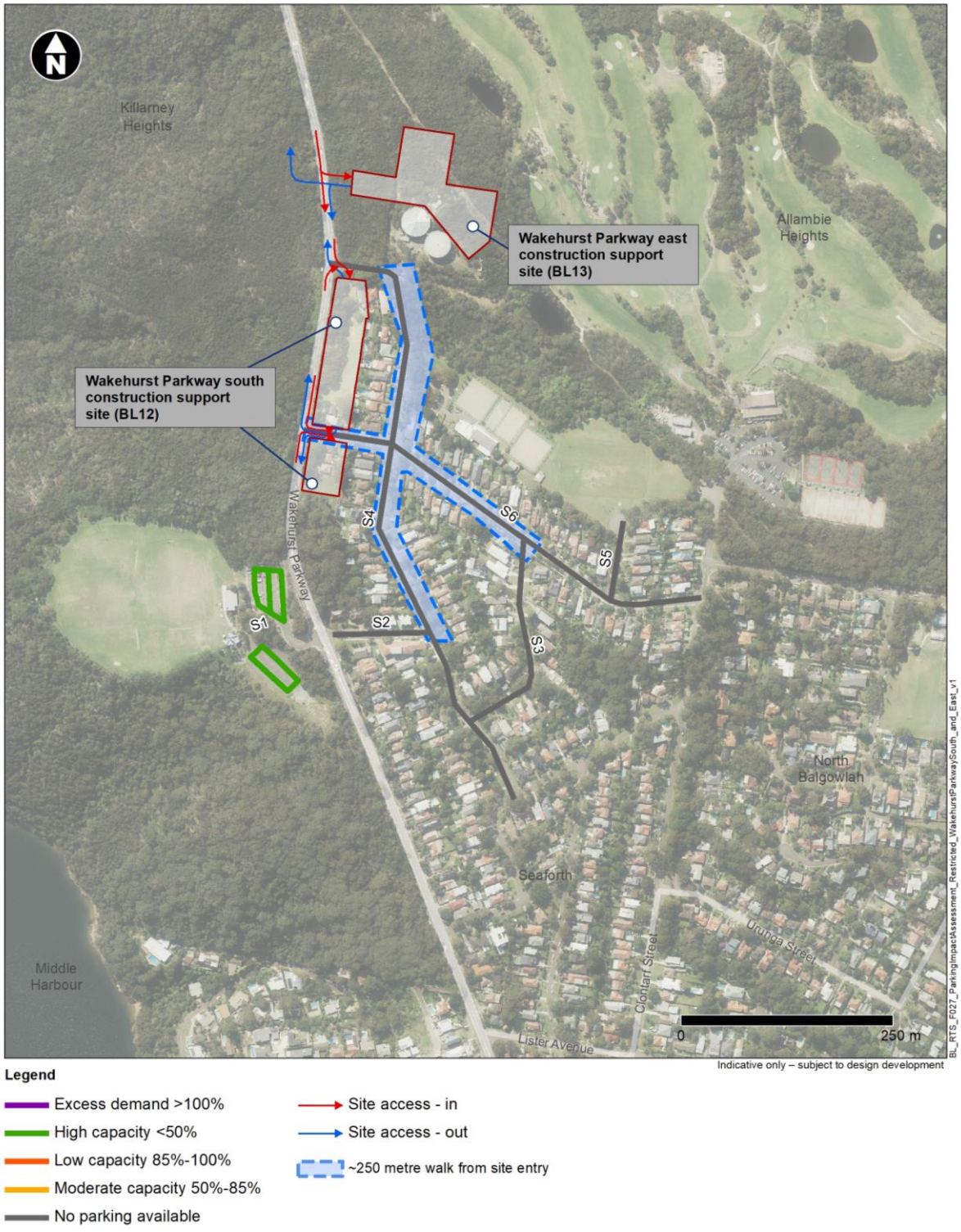


Table 41: Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Seaforth Oval Car Park	75	8	11%	67
S2. Burnt St	N/A	N/A	N/A	N/A
S3. Waterview St	N/A	N/A	N/A	N/A
S4. Kirkwood St	N/A	N/A	N/A	N/A
S5. Reserve St	N/A	N/A	N/A	N/A
S6. Judith St	N/A	N/A	N/A	N/A

Table 42: Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	326	88	**27%**	238
Restricted (4P+)	75	8	**11%**	67

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

Treated as one site for the purposes of this analysis, the existing occupancy percentages for both unrestricted and restricted (4P+) parking within the vicinity of Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites is low – 27% and 11%, respectively. The greatest number of available car parking spaces on any given street is Kirkwood Street, with 99 available spaces (Table 40).

Current parking supply/demand within 250 metres of the construction support site

The primary site access for the Wakehurst Parkway south construction support site (BL12) is at Judith Street and for Wakehurst Parkway east construction support site (BL13) is at Wakehurst Parkway. Adopting the more conservative distance of within 250 metres of the Wakehurst Parkway south construction support site (BL12) entry, surveyed streets include Kirkwood Street (S4) from Burnt Street to its northern cul-de-sac, and Judith Street (S6) from Wakehurst Parkway to Waterview Street. In total, occupancy for these streets was similar to the precinct-wide occupancy, at only 25% (see Table 43).

Table 43: Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites parking within 250m

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	146	37	**25%**	109
Restricted (4P+)	N/A	N/A	N/A	N/A

Worst-case parking supply/demand during construction

Even though car parking areas would be provided at both the Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites, the combined morning peak light vehicle movement forecast of 218 must be considered. In the worst-case scenario that there is a spill over of construction worker parking, there is sufficient unrestricted parking capacity on the local street network (238 available spaces within 500 metres of the construction support site). Notwithstanding, it is suggested that tailored and complimentary worker parking solutions, in particular supply and demand management measures, such as utilisation of cleared land within the construction footprint along the Wakehurst Parkway corridor for parking (subject to construction staging), car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Wakehurst Parkway north construction support site (BL14)

Figure 28 – Unrestricted parking occupancy at 8AM in the vicinity of Wakehurst Parkway north construction support site (BL14)

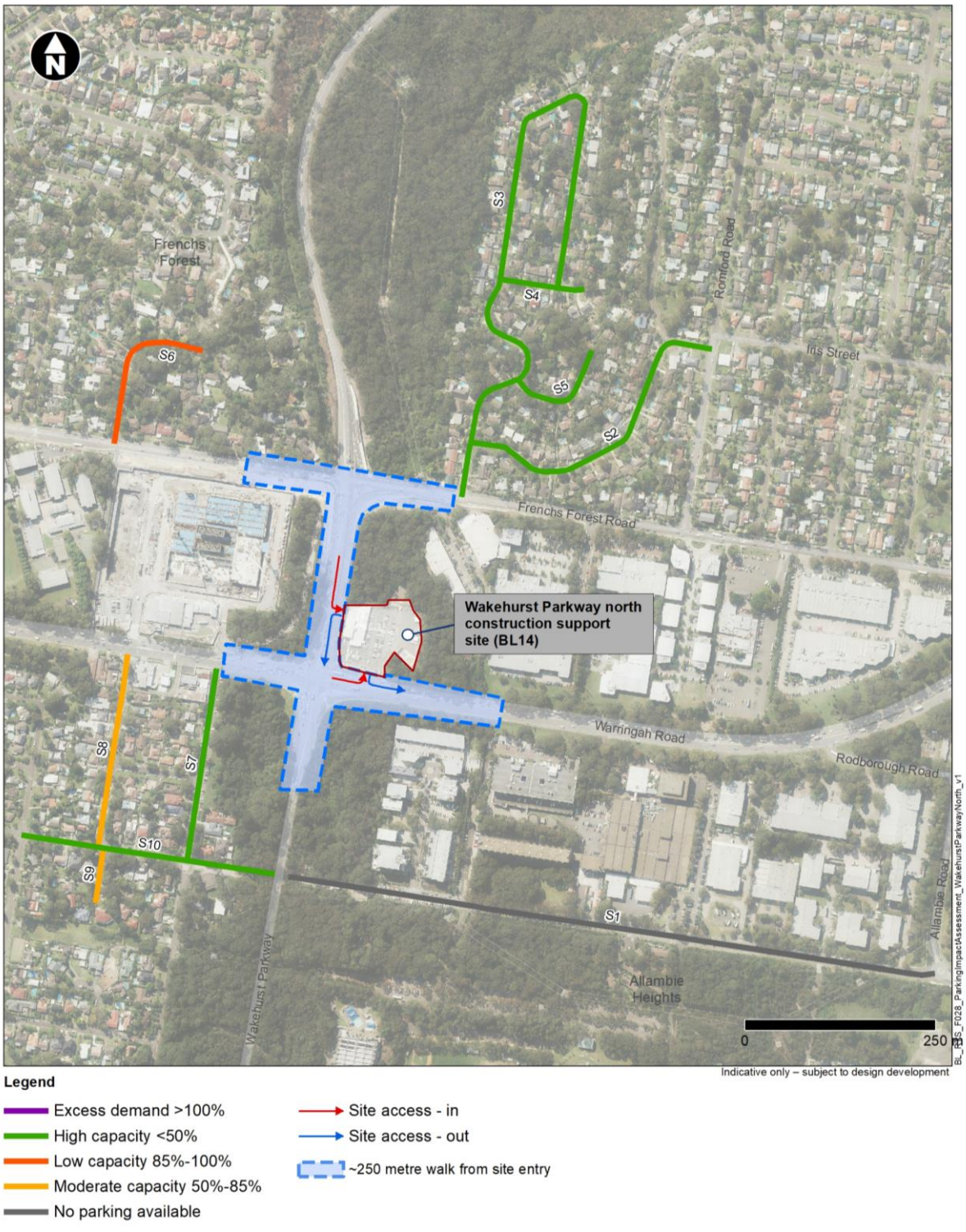


Table 44: Wakehurst Parkway north construction support site (BL14) unrestricted parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Aquatic Dr	N/A	N/A	N/A	N/A
S2. Bimbadeen Cres	78	20	26%	58
S3. Nandi Ave	173	45	26%	128
S4. Garie Pl	15	4	27%	11
S5. Newell Pl	25	7	28%	18
S6. Gladys Ave	22	19	86%	3
S7. Bantry Bay Rd	62	18	29%	44
S8. Hilmer St	25	17	68%	8
S9. Miami Pl	10	5	50%	5
S10. Fitzpatrick Ave E	44	4	9%	40

Figure 29 – Restricted (4P+) parking occupancy at 8AM in the vicinity of Wakehurst Parkway north construction support site (BL14)

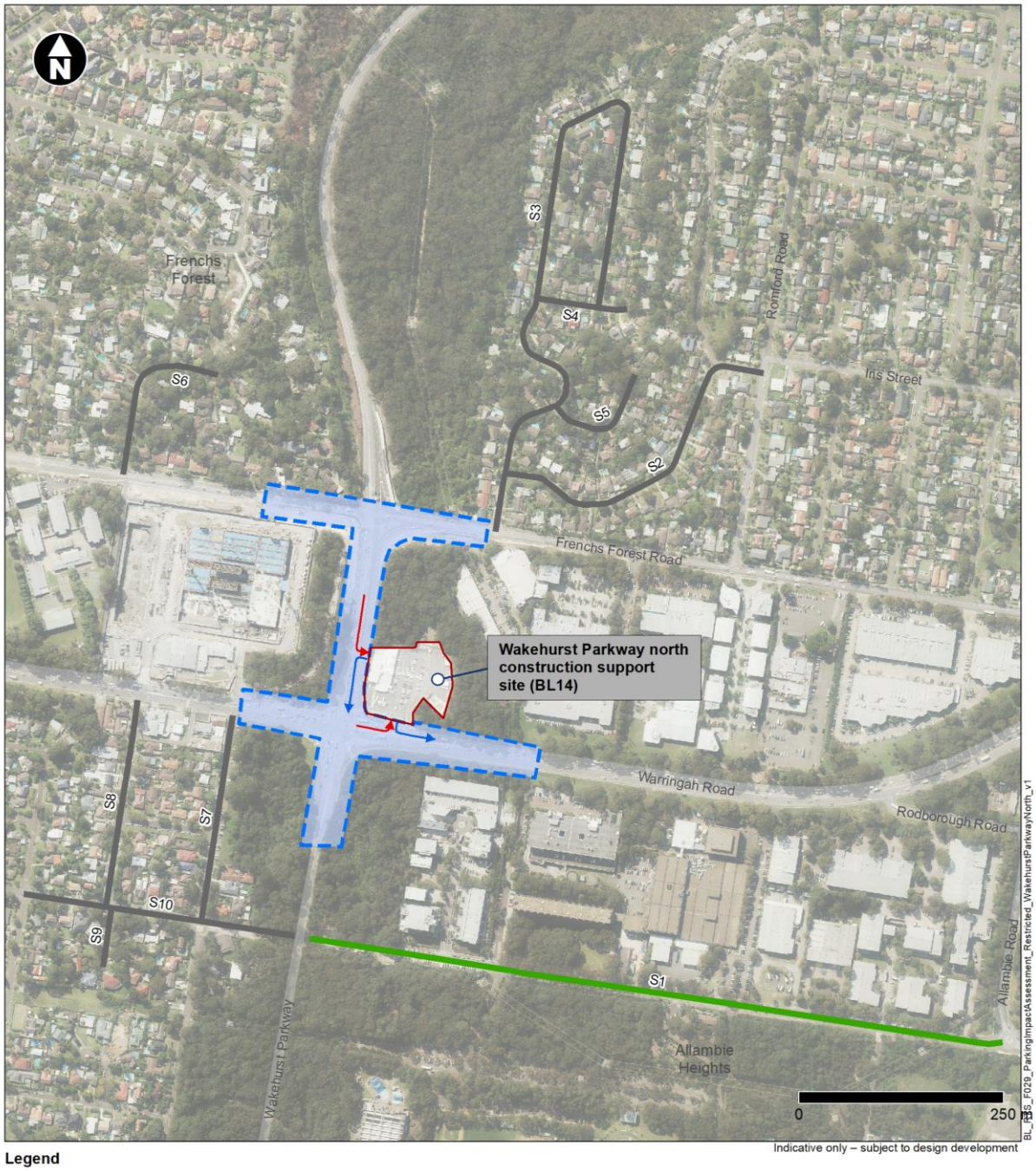


Table 45: Wakehurst Parkway north construction support site (BL14) restricted (4P+) parking (by street)

Street	Supply	8AM Occupancy	Occupancy %	Available Spaces
S1. Aquatic Dr	103	34	33%	69
S2. Bimbadeen Cres	N/A	N/A	N/A	N/A
S3. Nandi Ave	N/A	N/A	N/A	N/A
S4. Garie Pl	N/A	N/A	N/A	N/A
S5. Newell Pl	N/A	N/A	N/A	N/A
S6. Gladys Ave	N/A	N/A	N/A	N/A
S7. Bantry Bay Rd	N/A	N/A	N/A	N/A
S8. Hilmer St	N/A	N/A	N/A	N/A
S9. Miami Pl	N/A	N/A	N/A	N/A
S10. Fitzpatrick Ave E	N/A	N/A	N/A	N/A

Table 46: Wakehurst Parkway north construction support site (BL14) cumulative available parking

Type	Supply	8AM Occupancy	Occupancy %	Available Spaces
Unrestricted	454	139	31%	315
Restricted (4P+)	103	34	33%	69

Analysis

Current parking supply/demand of the precinct (within 500 metres of the construction support site)

The cumulative Wakehurst Parkway north construction support site (BL14) precinct-wide parking occupancy for unrestricted spaces is 31%, with 315 available spaces. The restricted parking on Aquatic Drive (8P 7am-7pm Everyday) has a similar occupancy of 33%, with 69 available spaces.

Current parking supply/demand within 250 metres of the construction support site

Concerning the Wakehurst Parkway north construction support site (BL14) access, construction workers walking from their parked vehicles will be able to use both the Wakehurst Parkway and Warringah Road site accesses. As such, streets within 250 metres of either these entries has been considered, but ultimately, all of the surveyed streets were beyond this distance.

Worst-case parking supply/demand during construction

Appendix F (Technical working paper: Traffic and transport) of the environmental impact statement notes that construction worker parking would be provided at the Wakehurst Parkway north construction support site (BL14), and with only 58 morning peak light vehicle movements, the potential impact of overflow parking onto the local street network is not expected to be an issue. There is sufficient spare capacity to accommodate the potential spill over of construction worker parking. Notwithstanding, it is suggested that tailored and complimentary worker parking solutions, in particular supply and demand management measures, such as

car-pooling, shuttle buses, and encouragement of use of public transport options are pursued and implemented.

Summary of Findings

The primary purpose of this assessment is to confirm existing available parking supply and demand surrounding the temporary construction support sites in the Beaches Link and Gore Hill Freeway Connection project area. While this report highlights potential challenges, it does not assume nor assess any mitigation measures that the project would continue to investigate, through further design development and construction planning phases of the project, and implement during construction. In this sense potential impacts presented in this report reflect highly unlikely, worst-case conditions.

Following review of the assessment outcomes, TfNSW has committed to minimise impacts from on- and off-street parking changes during construction, where reasonable and feasible, through a range of location-dependent and complimentary supply and demand management solutions, including staged removal and replacement of parking, provision of alternative parking arrangements (off-site contractor managed parking lots), car-pooling, shuttle buses and encouragement of use of public transport (refer to revised environmental management measure CTT11 provided in Part D of the submissions report). While this is the general approach for all temporary construction support sites, additional supply and demand management measures would be particularly essential for sites that have limited spare parking capacity in the surrounding network (as indicated in Table 47 below).

A summary of the findings from this parking impact assessment is provided in the table below.

Table 47: Parking Impact Assessment Summary

Construction support site	Parking provided on site? *	Summary of parking impacts in streets surrounding construction support sites (without implementation of complementary demand management strategies)
Cammeray Golf Course (BL1)	B	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over. Majority of capacity is beyond a 250m walk.
Flat Rock Drive (BL2)	B	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over. Majority of capacity is beyond a 250m walk.
Punch Street (BL3)	B	Loss of parking on Punch Street, Cleg Street and Lambs Road can be mitigated by spare capacity on nearby streets, but very limited capacity for potential construction worker overflow parking. Adequate supply of parking on-site and implementation of other supply and demand management measures are essential.
Dickson Avenue (BL4)	A	Large impact of parking loss on Hampden Road. It would increase unrestricted parking demand to 99% of the new supply. Further, with only 10 available spaces in the restricted (4P+) parking category, there is no capacity for potential overflow construction worker parking at unrestricted spaces *and* no potential for investigating changes to restricted parking. Adequate supply of parking on-site and implementation of other supply and demand management measures are essential.
Barton Road (BL5)	A	The street network is likely to adequately absorb redistributed demand following the loss of parking on Barton Road. There is some capacity for potential construction worker overflow parking, but not the full anticipated personnel. Adequate supply of parking on-site and implementation of other supply and demand management measures are essential
Spit West Reserve (BL9)	B	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over, yet all of this capacity is beyond a 250m walk. Spare capacity at Spit West Car Park on weekdays and weekend.

Construction support site	Parking provided on site? *	Summary of parking impacts in streets surrounding construction support sites (without implementation of complementary demand management strategies)
Balgowlah Golf Course (BL10)	A	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over. Majority of capacity is beyond a 250m walk.
Kitchener Street (BL11)	B	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over. Majority of capacity is beyond a 250m walk.
Wakehurst Parkway south (BL12)	A	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over. Around half (46%) of unrestricted parking capacity is within a 250m walk.
Wakehurst Parkway east (BL13)	B	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over. Around half (46%) of unrestricted parking capacity is within a 250m walk.
Wakehurst Parkway north (BL14)	A	Sufficient spare unrestricted parking capacity on surrounding street network for potential spill over, yet all of this capacity is beyond a 250m walk.
** Note:* *A = Car parking areas provided for construction staff and workers* *B = Car parking areas provided for site staff and limited parking for construction workers*		

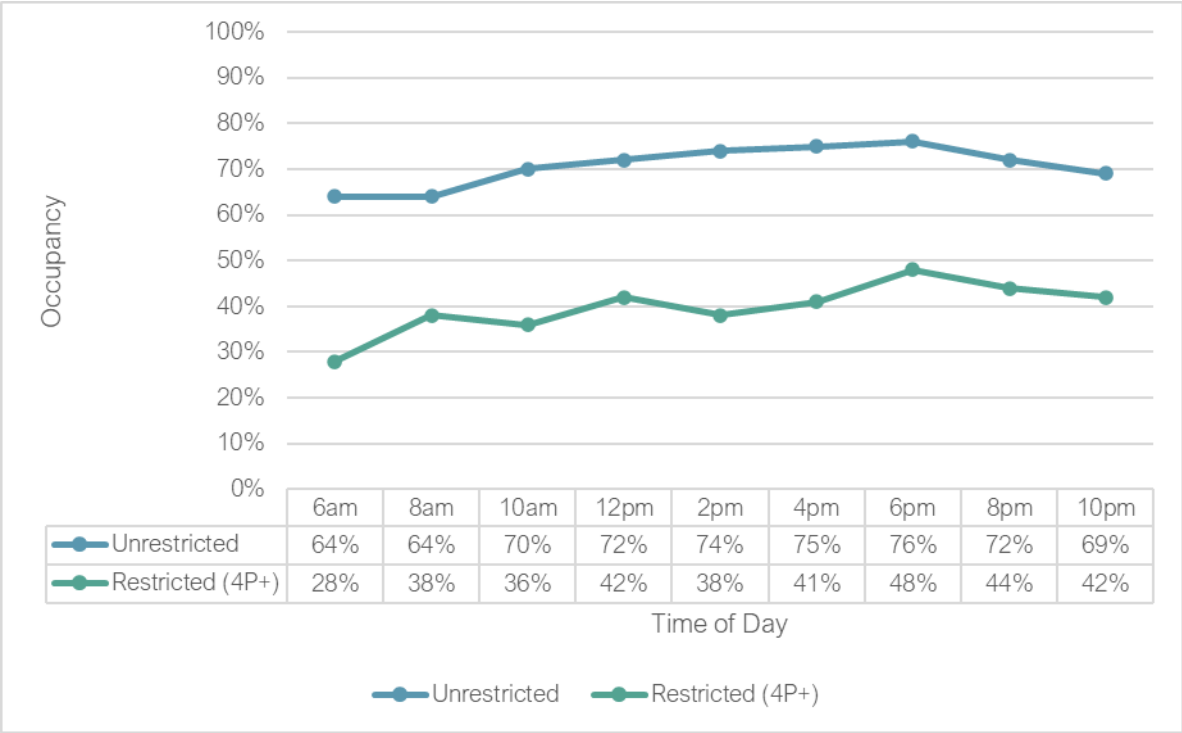
ANNEXURE A

18-Hour Occupancy Data for all construction support sites (Tuesday 16th February 2021)

12-Hour Occupancy Data for Spit West Reserve construction support site only (Saturday 22nd May 2021)

Cammeray Golf Course construction support site (BL1)

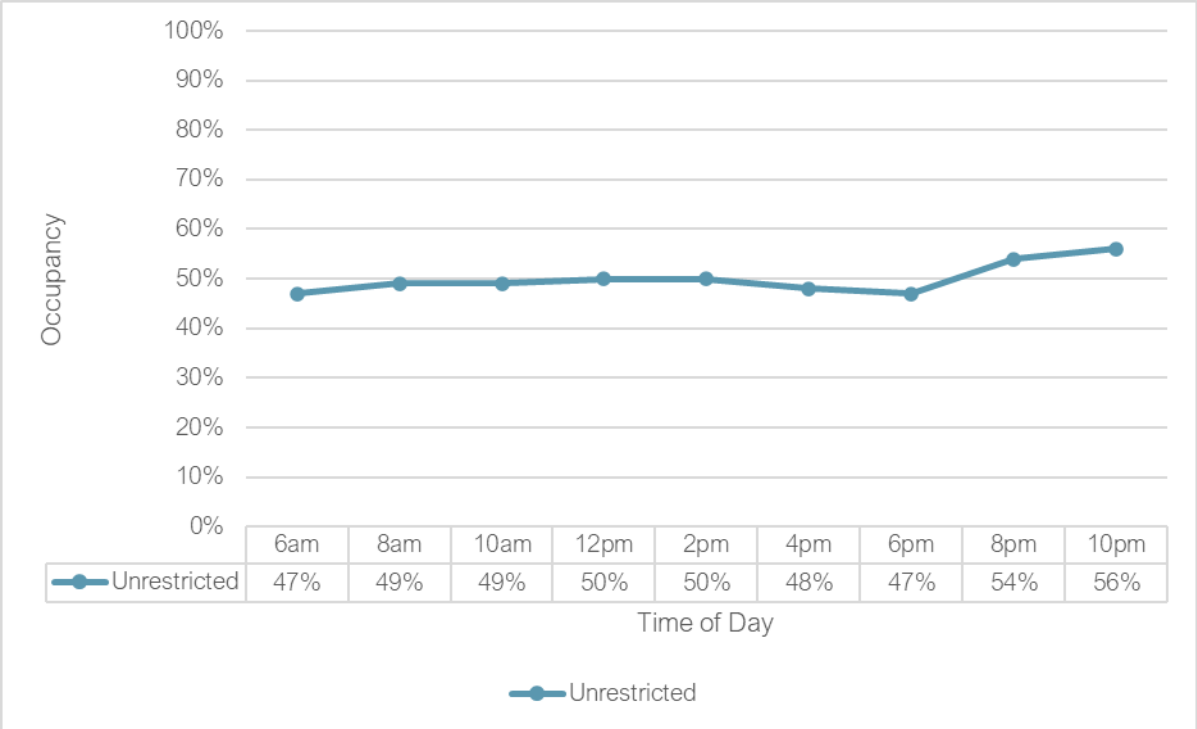
Figure 30 – Cammeray Golf Course construction support site (BL1) study area parking occupancy



	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	64%	64%	70%	72%	74%	75%	76%	72%	69%
Restricted (4P+)	28%	38%	36%	42%	38%	41%	48%	44%	42%

Flat Rock Drive construction support site (BL2)

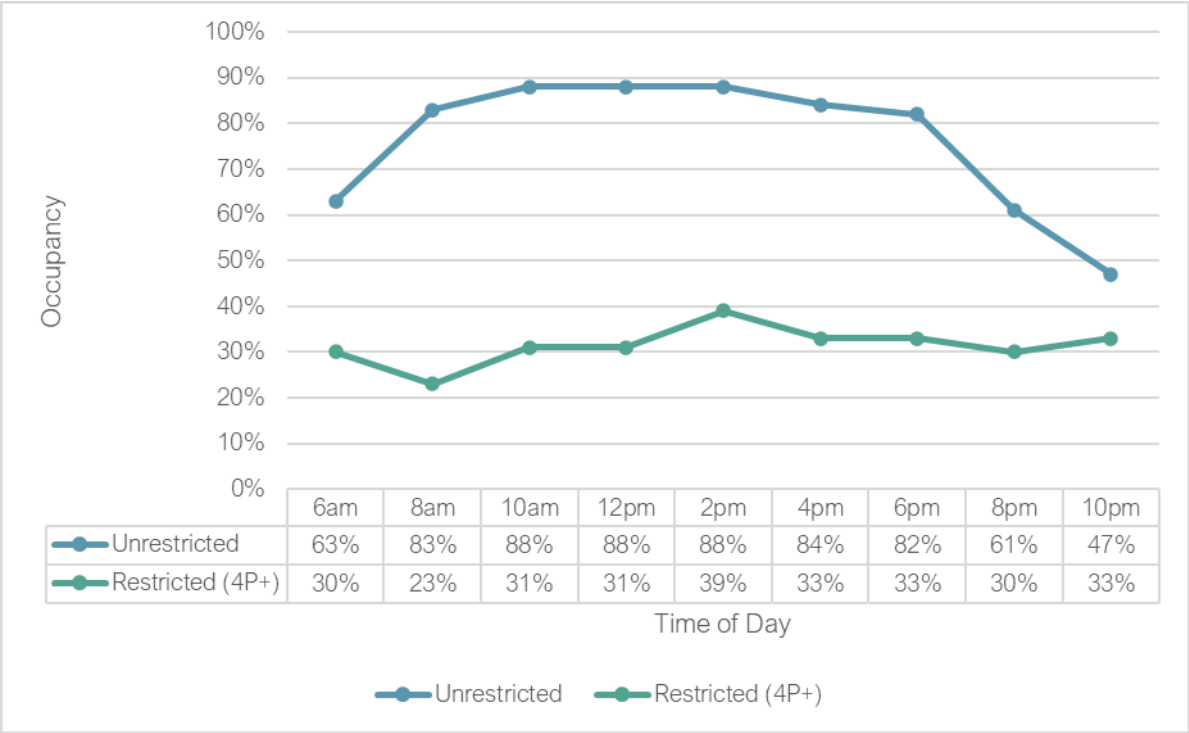
Figure 31 – Flat Rock Drive construction support site (BL2) study area parking occupancy



	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	47%	49%	49%	50%	50%	48%	47%	54%	56%

Punch Street construction support site (BL3)

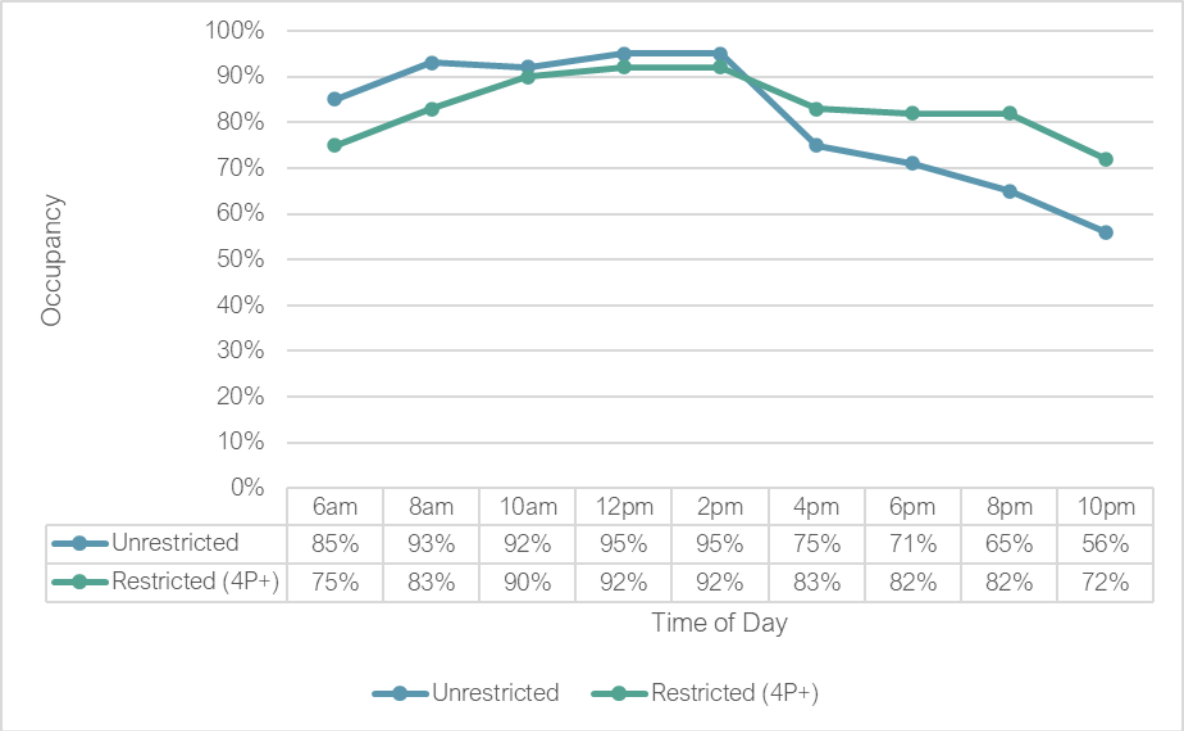
Figure 32 – Punch Street construction support site (BL3) study area parking occupancy



	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	63%	83%	88%	88%	88%	84%	82%	61%	47%
Restricted (4P+)	30%	23%	31%	31%	39%	33%	33%	30%	33%

Dickson Avenue construction support site (BL4)

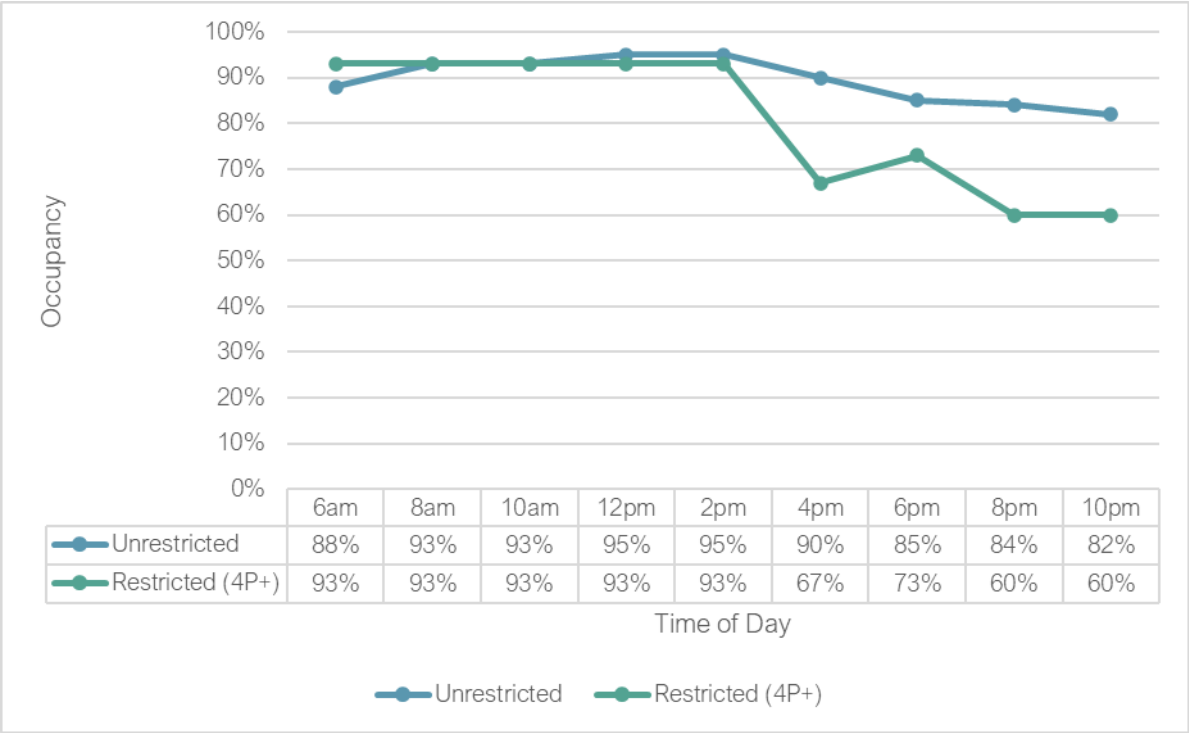
Figure 33 – Dickson Avenue construction support site (BL4) study area parking occupancy



	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	85%	93%	92%	95%	95%	75%	71%	65%	56%
Restricted (4P+)	75%	83%	90%	92%	92%	83%	82%	82%	72%

Barton Road construction support site (BL5)

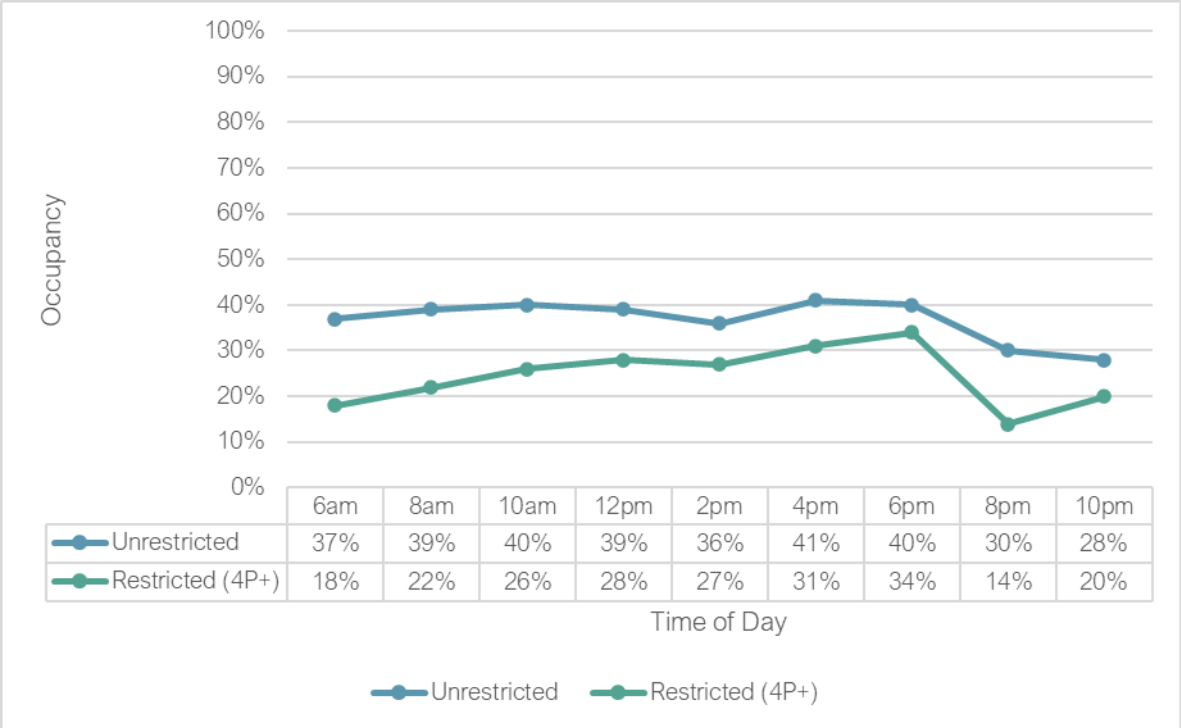
Figure 34 – Barton Road construction support site (BL5) study area parking occupancy



	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	88%	93%	93%	95%	95%	90%	85%	84%	82%
Restricted (4P+)	93%	93%	93%	93%	93%	67%	73%	60%	60%

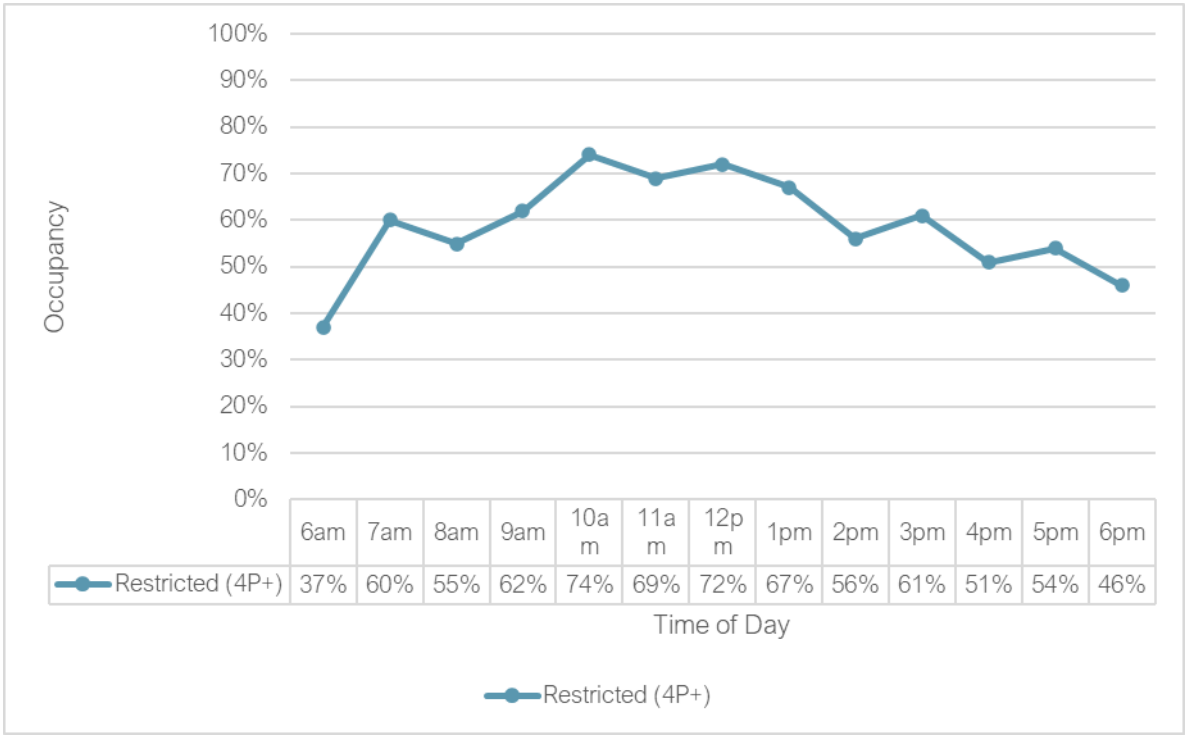
Spit West Reserve construction support site (BL9)

Figure 35 – Spit West Reserve construction support site (BL9) study area parking occupancy (weekday)



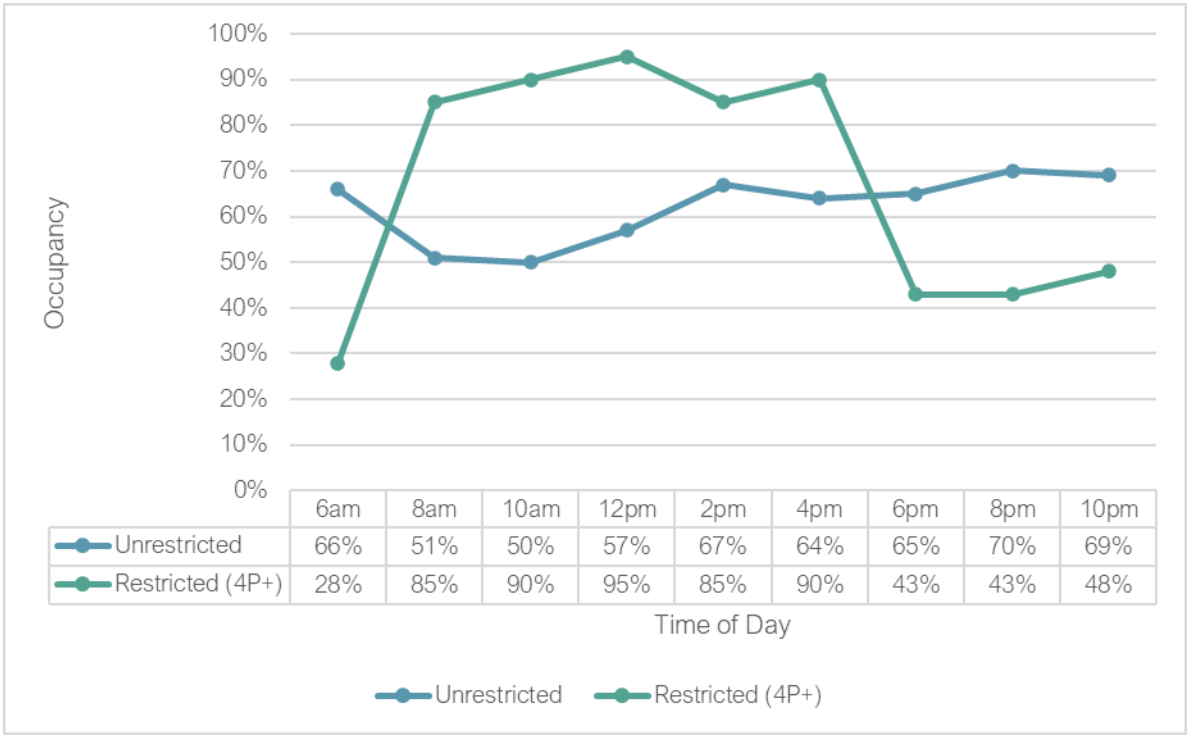
	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	37%	39%	40%	39%	36%	41%	40%	30%	28%
Restricted (4P+)	18%	22%	26%	28%	27%	31%	34%	14%	20%

Figure 36 – Spit West Reserve construction support site (BL9) study area parking occupancy (weekend)



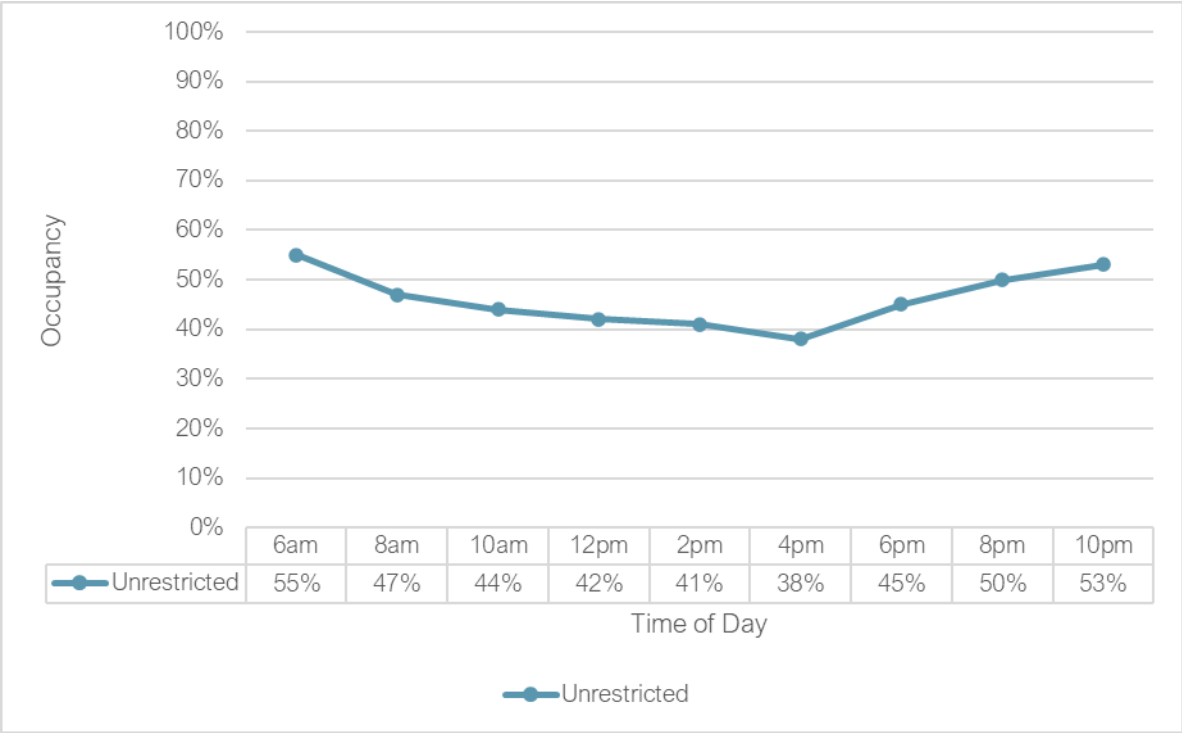
Balgowlah Golf Course construction support site (BL10)

Figure 37 – Balgowlah Golf Course construction support site (BL10) study area parking occupancy



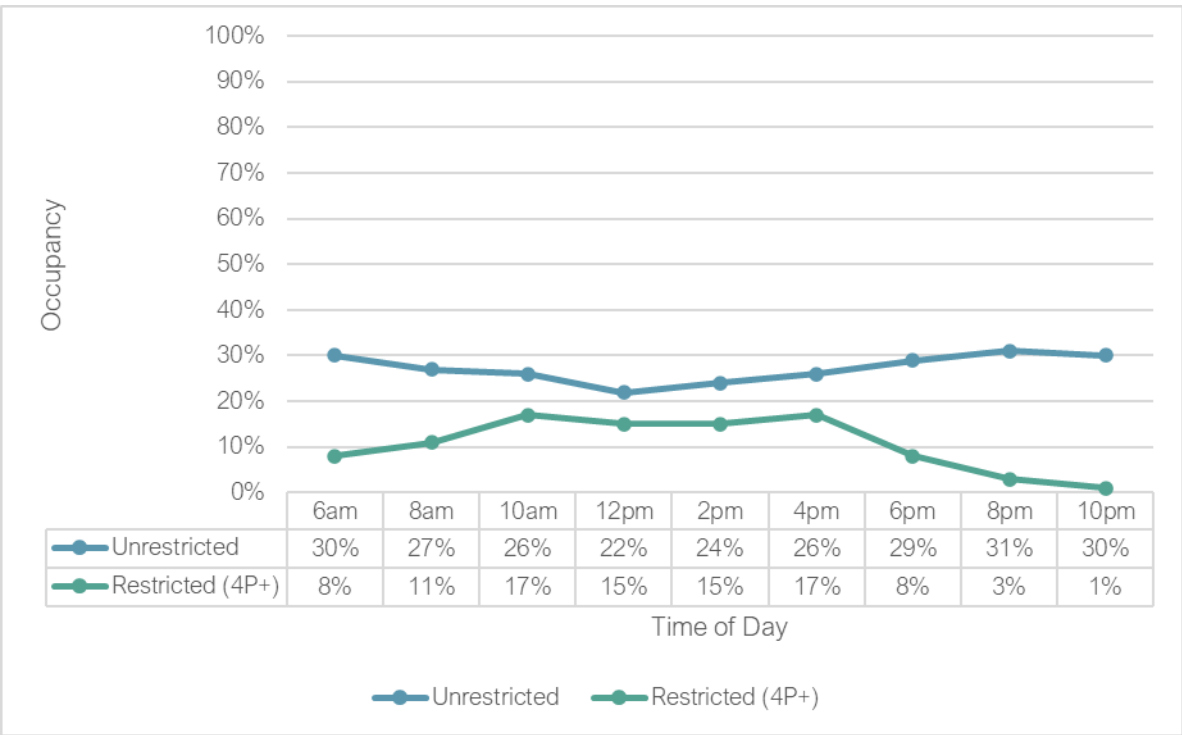
Kitchener Street construction support site (BL11)

Figure 38 – Kitchener Street construction support site (BL11) study area parking occupancy



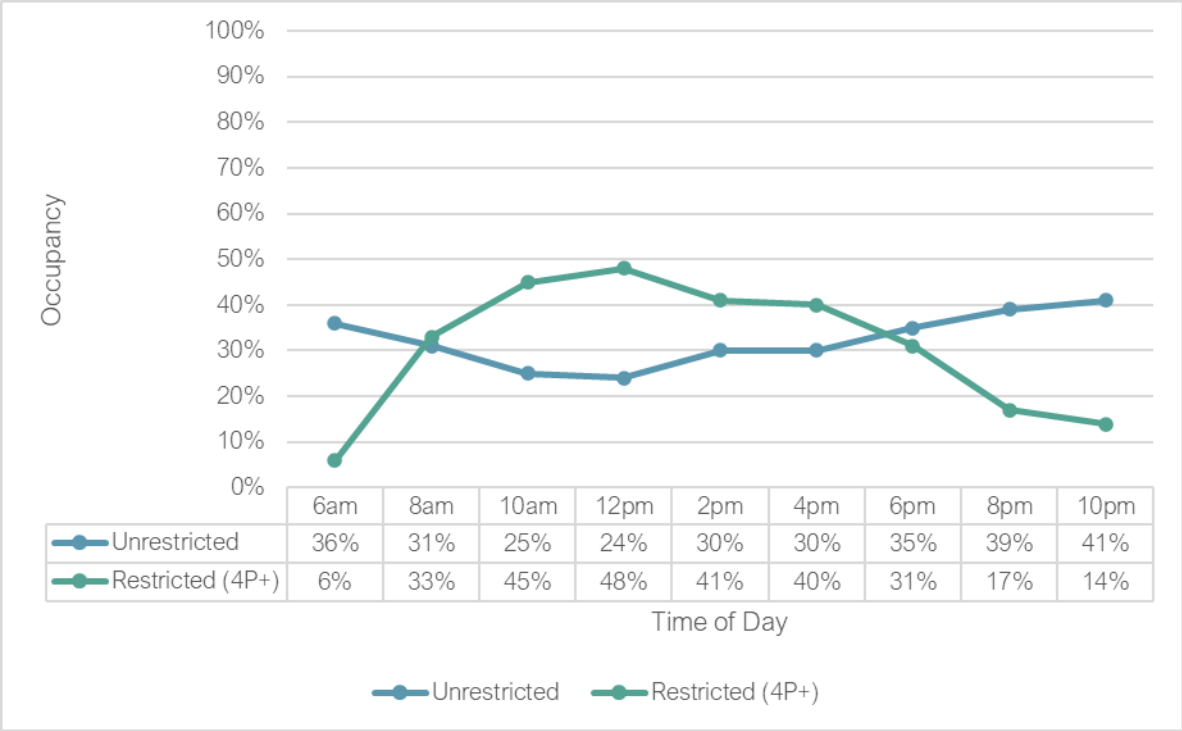
Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support sites

Figure 39 – Wakehurst Parkway south (BL12) and Wakehurst Parkway east (BL13) construction support site study area parking occupancy



Wakehurst Parkway north construction support site (BL14)

Figure 40 – Wakehurst Parkway north construction support site (BL14) study area parking occupancy



	6am	8am	10am	12pm	2pm	4pm	6pm	8pm	10pm
Unrestricted	36%	31%	25%	24%	30%	30%	35%	39%	41%
Restricted (4P+)	6%	33%	45%	48%	41%	40%	31%	17%	14%