2.2 The proposal

The application represents the next phase in the SFS redevelopment. It seeks consent for the detailed design, construction and operation of the new stadium as 'Stage 2' of the redevelopment, which includes:

- Construction of a new stadium with up to 45,000 seats (55,000 capacity in concert-mode), including playing pitch, grandstands, sports and stadium administration areas, food and drink kiosks, corporate facilities and all other aspects of a modern stadium;
- Operation and use of the stadium and surrounding site area for a range of sporting and entertainment events;
- Vehicular and pedestrian access and circulation arrangements, including excavation to deliver a partial basement level for storage, internal loading and servicing at the playing pitch level;
- Reinstatement of the MP1 car park following the completion of construction, including enhanced vehicle rejection facilities and direct vehicular connection to the new stadium basement level;
- Public domain improvements within the site boundary, including hard and soft landscaping, to deliver a range of publicly accessible, event and operational areas;
- Provision of new pedestrian and cycling facilities within the site;
- Signage, including building identification signage, business identification signage and a wayfinding signage strategy; and
- Extension and augmentation of physical infrastructure/ utilities for the development within the site.

The proposed development is consistent with the approved Concept Proposal pursuant to State Significant Development Consent SSD 9249.

3 Existing Conditions

A comprehensive review of the existing transport conditions in the Moore Park precinct was undertaken in support of the Stage 1, which is provided as Appendix A of this document. This existing conditions assessment covers the following items:

- Facilities at the SFS including hours of operation, events and access points
- Event traffic management arrangements
- Details of existing demand during event and non-event days
- Walking environment
- Cycling environment
- Public transport services supporting the precinct
- Vehicle access and servicing to the SFS
- Arrangements for point to point transport services
- Existing parking conditions in the precinct

4 Forecast Travel Demand

4.1 Forecast mode share

Notwithstanding the fact that the seated capacity of the proposed SFS will be no higher than the current stadium, questionnaire surveys were undertaken at five events at the SFS and SCG to understand how people travel to Moore Park, with responses gathered from over 10,000 people. These surveyed events are noted in Table 3 below.

Table 3 Surveyed events

Match	Code	Date	Start time	Crowd	Total number of responses
Waratahs vs Stormers	Rugby	Saturday 25 Feb 2018	7.30pm	11,000	2367
Sydney FC vs Western Sydney	Football (A-League)	Sunday 26 Feb 2018	6.00pm	25,000	n/a
Roosters vs Knights	NRL	Friday 16 Mar 2018	6.00pm	10,000	1465
Sydney FC vs Adelaide United	Football (A-League)	Saturday 17 Mar 2018	7.45pm	9,000	2338
Roosters vs Dragons	NRL	Sunday 29 July 2018	4.00pm	19,800	2918
Swans vs Collingwood	AFL	Saturday 4 Aug 2018	7.30pm	39,800	1857
Roosters vs Cowboys	NRL	Saturday 4 Aug	7.30pm	9,800	1241

Based on the findings of the travel behaviour surveys undertaken, as well as the likely change in transport modes associated with future transport infrastructure (e.g. light rail), future year mode share and associated travel demands to the SFS have been estimated. This has been completed for the following scenarios:

- Typical event (half venue capacity)
- Major event (full venue capacity)
- Concert mode at SFS
- Double header with concurrent start time (full event at both SCG and SFS)

The travel demands forecast are based on available capacities of various transport modes in the hour prior to the start of the event – noting that the data collection as part of this study determined that approximately 70% of people arrive in the hour prior to the start of the event. Should the start times for the double header event be staggered, the light rail mode share has the capacity to increase from that stated.

It should be noted that the transport mode share for events can vary based on a number of factors, including the type of event, start time, weather, opposition team location etc. Patrons will actively shift their mode and time of travel based on these factors. The forecast mode shares for the various event scenarios developed for this assessment are provided in Table 4.

Sydney Football Stadium Redevelopment - Forecast mode share and travel demand

Event Details	Stadium	Existing Stadium						Proposed Stadium							
	Scenario	Half Full		Peak Event		Concert		Half Full		Peak Event		Concert		Double header	
		%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
	Attendance	22,500		45,000		55,000		22,500		45,000		55,000		95,000	
Mode Choice	Driver / passenger	48.0%	10,800	34.9%	15,705	33.0%	18,150	46.0%	10,350	33.0%	14,850	31.0%	17,050	17.0%	16,150
	Dropped off in private vehicle	3.0%	675	3.0%	1,350	8.0%	4,400	3.0%	675	3.0%	1,350	8.0%	4,400	3.0%	2,850
	Taxi/Uber	13.0%	2,925	17.0%	7,650	16.0%	8,800	13.0%	2,925	17.0%	7,650	16.0%	8,800	13.0%	12,350
	Train to Central & walk	7.0%	1,575	9.0%	4,050	12.0%	6,600	5.0%	1,125	8.0%	3,600	7.0%	3,850	21.8%	20,710
	Special event Bus	8.0%	1,800	14.5%	6,525	7.0%	3,850	0.0%	-	2.5%	1,125	0.0%	-	5.0%	4,750
	Light Rail	0.0%	-	0.0%	-	0.0%	-	12.0%	2,700	16.0%	7,200	15.8%	8,690	13.5%	12,825
	Walk Only	14.5%	3,263	15.0%	6,750	17.0%	9,350	14.5%	3,263	15.0%	6,750	17.0%	9,350	18.5%	17,575
	Bus/ coach	6.3%	1,418	6.4%	2,880	6.8%	3,740	6.3%	1,418	5.3%	2,385	5.0%	2,750	8.0%	7,600
	Cycle	0.2%	45	0.2%	90	0.2%	110	0.2%	45	0.2%	90	0.2%	110	0.2%	190
Total		**100.0%**	**22,500**	**100.0%**	**45,000**	**100.0%**	**55,000**	**100.0%**	**22,500**	**100.0%**	**45,000**	**100.0%**	**55,000**	**100.0%**	**95,000**

Following consultation with City of Sydney Council, it was recommended that 'stretch' mode share targets be provided as part of the transport assessment. These stretch targets consider a greater mode shift away from private vehicle than the 'baseline' targets considered in this document. It is likely that these stretch targets may be achieved after a number of years following the introduction of the green travel plan and associated improvements to public transport accessibility in the Moore Park precinct. These stretch targets are summarised in Figure 3.

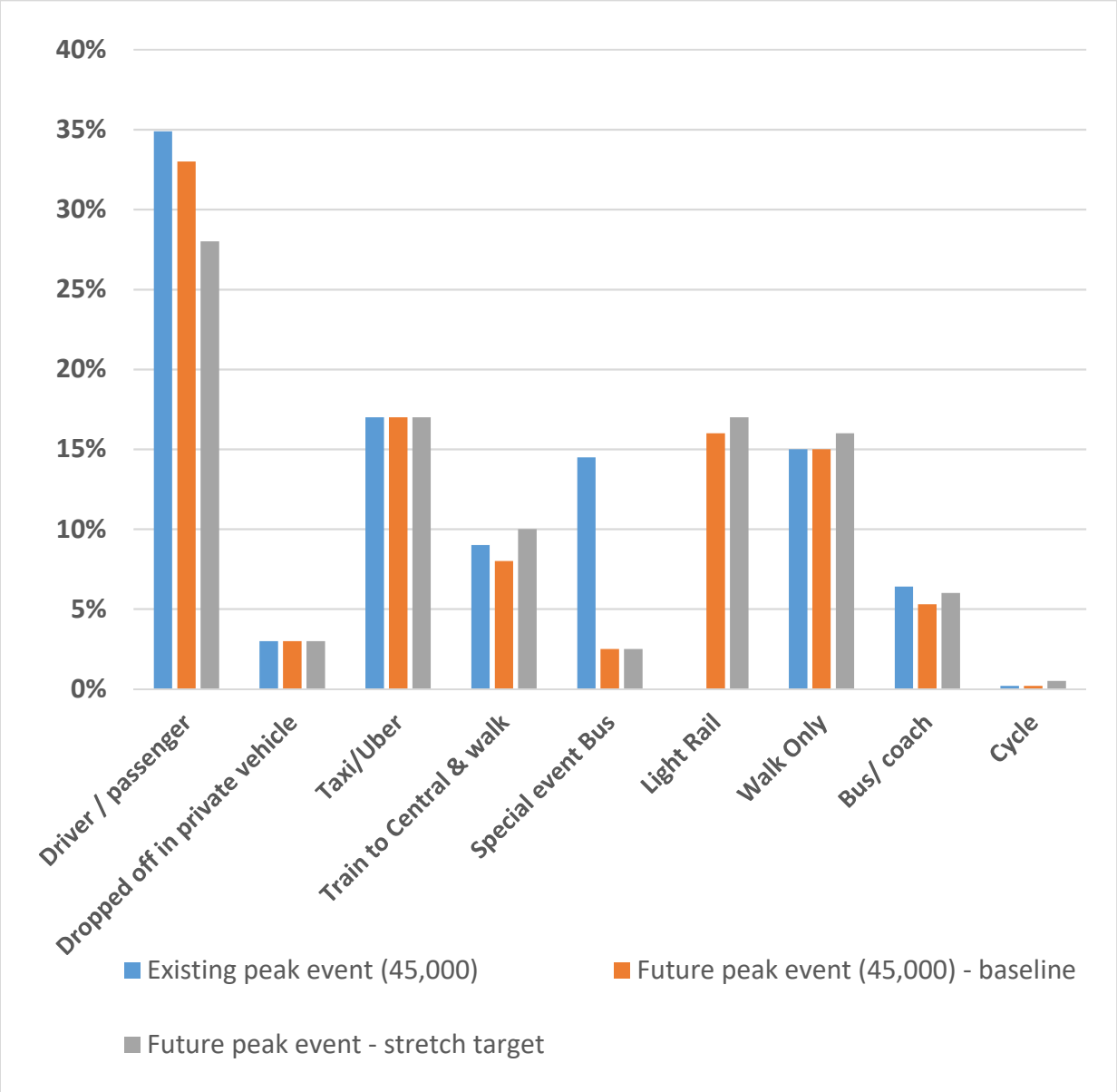

Figure 3 Stretch mode share targets

4.2 Integrated ticketing

For events with integrated ticketing at the SFS, ticket holders are able to utilise public transport at no extra cost to and from the stadium via any public transport mode. Currently the following major sporting partners have integrated ticketing arrangements for events at the SFS:

- NSW Waratahs
- Sydney FC

Sporting partners are required to negotiate terms of potential integrated ticketing arrangements directly with Transport for NSW. These discussions currently sit outside of the direct control of the Sydney Cricket Ground Trust.

Extensive consultation with Transport for NSW has been undertaken as part of this project. During this consultation it was noted that Transport for NSW are currently in discussions with key stakeholders to encourage the implementation of integrated ticketing for events in Moore Park. These discussions are ongoing and are still to be finalised at the time of writing.

4.3 Event staff

For event days at the previous SFS there were up to 1,200 staff which included stadium staff, security, police, first aid officers and precinct staff. For the proposed stadium this is forecast to increase to approximately 1,500 staff in line with the expanded food/beverage and corporate services available. Therefore the proposal does involve a small increase in the number of event day staff to support the improved food and beverage offer and better corporate facilities. However the travel period for staff does not coincide with the peak travel periods for spectators, given staff are required to arrive prior to the gates opening and leave well after the conclusion of the event. Therefore the small increase in event day staff has been considered and will not change the number of movements of people during the peak travel periods for events at the SFS.

4.4 Event numbers

The previous SFS had no restrictions on the number of sporting events that could be held each year at the venue. A limit on the total number of concerts to 6 per year with an average of 4 per year over a 5 year period applied to the former stadium. The redeveloped stadium will retain the limitation on concerts and proposes to maintain no restrictions on sporting events.

The proposal seeks to maintain the arrangements in terms of events numbers that were in place for the previous SFS. As demonstrated throughout this report, the transport network has the capacity and ability to accommodate demands for any event type. This includes a 'worst case' double header in the precinct which considers maximum capacity attendance at both the SCG and SFS. Therefore placing no limit on the number of sporting events that can be held at the future SFS will not induce any greater transport impacts at any one time when compared with limiting sporting event numbers to 52 per year. Further, this proposed arrangement is entirely consistent with that previously in place when the SFS was operational.

4.5 Green travel plan

A green travel plan has been prepared in support of this application, in accordance with the relevant Stage 1 condition. This travel plan is provided as Appendix B. The overarching aims of the stadium travel plan are to:

- Positively influence the travel behaviour of users of the venue by promoting alternative travel modes to car;
- Encourage travel by cycle, on foot and by public transport by highlighting accessibility and availability;
- Promote healthy lifestyles and a sustainable, vibrant place in which to visit and work; and
- Minimise the number of single-occupancy car trips generated by the development.

Table 5 lists the proposed measures as part of the travel plan.

An important part of any Travel Plan is the continual monitoring and review of its effectiveness. It is essential that a Travel Plan is not a one-off event, but evolves over time. Regular monitoring and reviewing will help to gauge progress and, if necessary, enable the Travel Plan to be refined and adapted in order to improve its progression. The SCG Trust will be responsible for ensuring key objectives of the strategy are kept up-to-date, focused and in line with best practice. If travel patterns or policies change significantly, then policies should be updated to reflect the current environment.

Table 5 Proposed travel plan measures

Measure	Notes	Relevant Transport Mode	Audience	
			Staff	Spectators
Staff cycle advice	Advice on cycling routes and cycling matters.	Cycling/ Walking	✓	✗
Safety training	Cycle safety training courses (provided by others) for staff to improve cycling confidence.	Cycling/ Walking	✓	✗
Staff induction	All event day staff members to be made aware of the travel plan as part of their induction process, including a tour of end of trip facilities on site and available non-car travel options	All modes	✓	✗
End of trip facilities	Provision of end of trip facilities for staff (not spectators).	Cycling/ Walking	✓	✗
Bicycle parking	On site cycle parking, the use of these spaces will be monitored and requirements reviewed based on their usage.	Cycling/ Walking	✓	✓
Wayfinding	Provision of improved static wayfinding signage in the Moore Park precinct to support pedestrian and cyclist movements to/from public transport stops.	Cycling/ Walking	✓	✓
Real time information	Provide information on public transport journey times to the SFS via links to existing journey planning websites.	Public Transport	✓	✓
Shift working	Flexible start and finish times for staff, to allow them to take advantage of off-peak fares and encourage public transport use.	Public Transport	✓	✗
Information on website	Information on public transport timetables, pedestrian and cycle routes and facilities. Advertise the parking limitations and restrictions.	All modes	✓	✓
EV charging points	Provide charging points for electric vehicles within MP1 car park	Private vehicle	✓	✓
Travel Plan Induction	Provide all new members of staff with details of the Travel Plan aims and objectives and information on sustainable ways to travel to work.	All modes	✓	✗
Spectator Information	Work with ticketing agencies to provide travel information to spectators at point of ticket purchase. Travel information could be provided by email by the ticketing agency following the purchase of match day tickets	All modes	✗	✓
Integrated ticketing	Work with TfNSW who are leading integrated ticketing for events	All modes	✓	✓

5 Walking and Cycling

5.1 Pedestrian access and circulation

The proposal significantly enhances access and movement for pedestrians in and around the Moore Park precinct. This includes connectivity through the concourse area between Moore Park Road and Driver Avenue 365 days of the year. An additional pathway is being investigated in Moore Park West which links the Driver Avenue access stairs with the path to the Tibby Cotter Bridge – promoting this route of travel to/from Central Station.

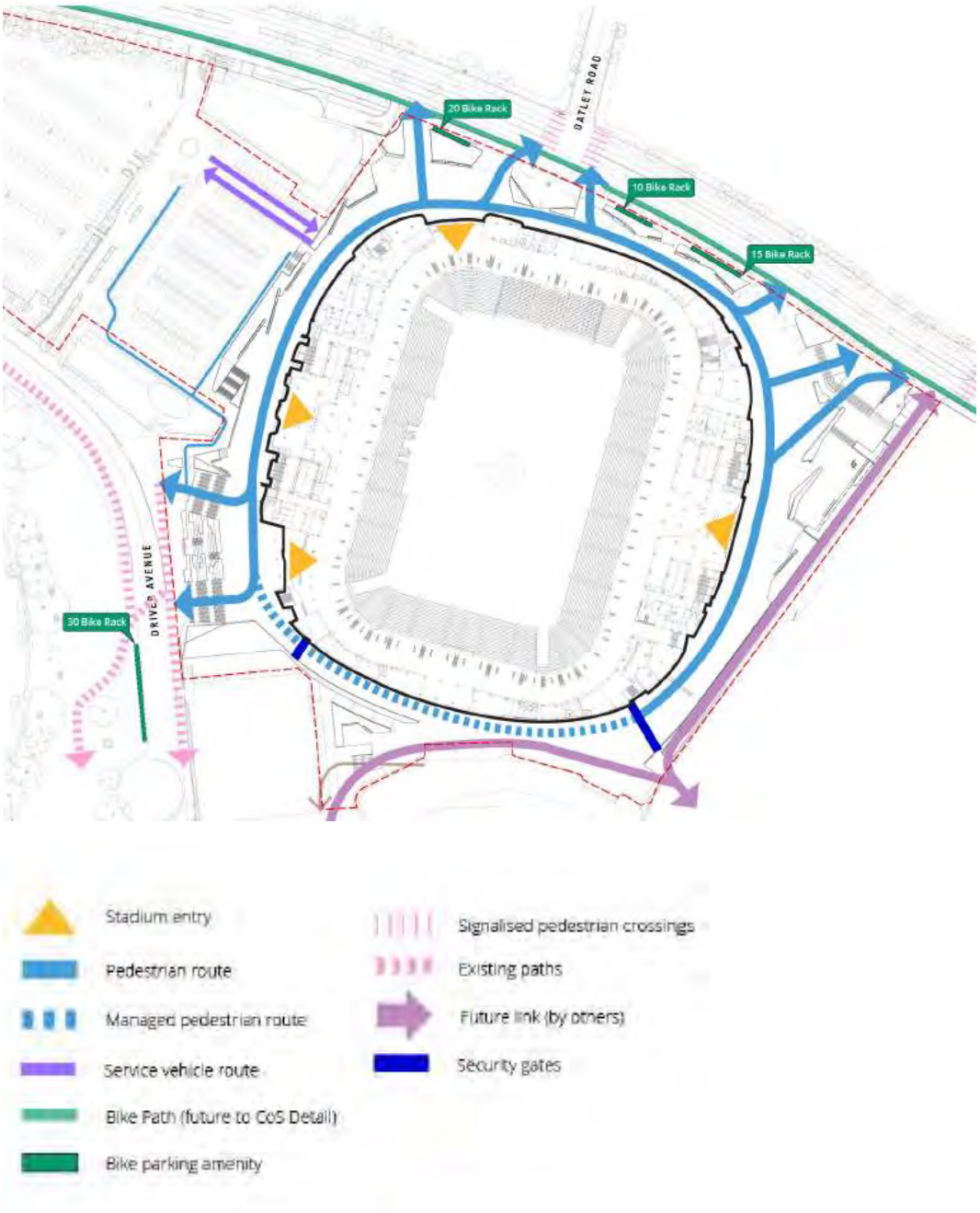

Figure 4 Pedestrian access and circulation – non event mode

5.2 Key pedestrian routes

In accordance with Condition C43(c) of the approval for SSD 9249, a pedestrian route assessment has been undertaken to identify all pedestrian routes between the nearby public transport nodes and the site. These routes are shown in Figure 5 and illustrate the key connections to the following locations:

- Central Station
- Kings Cross Station
- Enhanced Moore Park Special Event Bus Interchange
- Future Moore Park light rail stop
- Bus stops on Anzac Parade
- Bus stops on Oxford Street

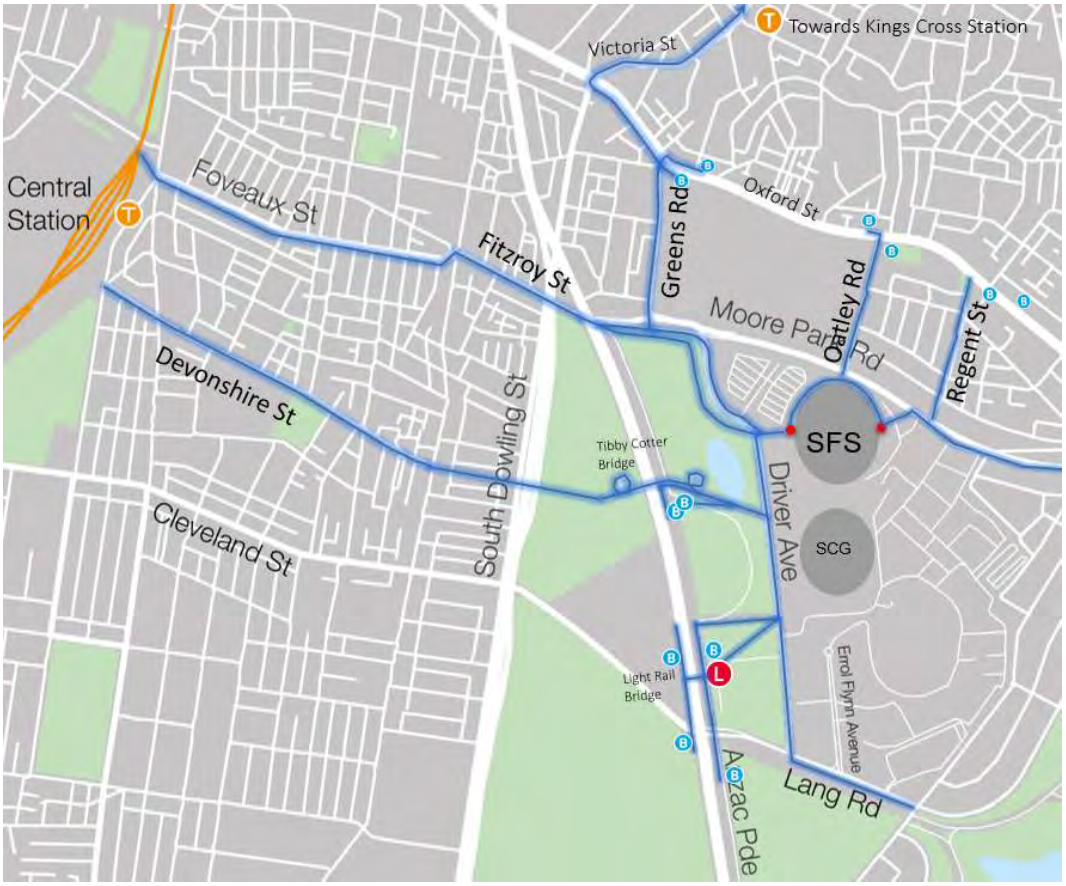

Figure 5 Key pedestrian routes

5.3 Pedestrian route capacity assessment

In accordance with Condition C43(d) of the approval for SSD 9249, an assessment of the capacity of the key pedestrian routes serving the precinct has been undertaken. This assessment considers the likely pedestrian demands generated at the end of a double header event with 95,000 people in the Moore Park precinct – based on the travel demands noted in Section 4.1 of this document. This is a theoretical worst-case scenario, as in the history of events in Moore Park no double header has exceeded an attendance of 78,000 people – and even in this circumstance the start and end times were staggered such that the peak pedestrian flows from the two venues did not coincide.

Pedestrians were assigned to each route based on observations from previous events held at the SFS, as well as likely changes to pedestrian flows resulting from future infrastructure changes such as the opening of the CBD and South East Light Rail project and increased use of Albert Tibby Cotter bridge. The assigned routes generally coincide with the shortest path of travel for pedestrians.

Fruin Level of Service (LoS) criteria has been adopted to understand the capacity of footpaths in the precinct following the conclusion of events. A capacity of 80 pedestrians / metre / minute has been adopted which sits within the LoS E range, which is considered acceptable for significant post event crowd movements which occur in the same direction. The results of the assessment are provided in Table 6 below, with the detailed assessment provided as Appendix C.

Table 6 Pedestrian route capacity assessment

Street	Pedestrian capacity / hour	Pedestrian demand (95,000 double header)	Demand / Capacity
Foveaux Street (South)	16,800	11,937	0.71
Fitzroy Street (South)	14,880	11,937	0.80
Pathway adjacent to War Memorial	16,800	11,937	0.71
Moore Park Road, west of Driver Avenue) (South)	16,800	12,317	0.73
Moore Park Road (east of Driver Avenue) (South)	15,840	1,406	0.09
Moore Park Road, east of Paddington Lane (South)	13,920	1,318	0.09
Devonshire Street (North)	14,400	5,653	0.39
Devonshire Street (South)	19,200	4,721	0.25
Light Rail Bridge Over South Dowling Street (North only)	19,200	9,320	0.49
Pathway leading up to Tibby Cotter Bridge	21,600	15,338	0.71
Greens Road (East)	8,160	1,036	0.13
Greens Road (West)	10,560	2,470	0.23
Oatley Road (East)	15,360	1,912	0.12
Oatley Road (West)	13,440	961	0.07

Street	Pedestrian capacity / hour	Pedestrian demand (95,000 double header)	Demand / Capacity
Regent Street (East)	12,960	553	0.04
Regent Street (West)	12,000	848	0.07
Driver Avenue (East)	21,600	10,735	0.50
Anzac Parade (East)	14,400	2,166	0.15
Anzac Parade (West)	14,400	679	0.05
Flinders Street (East)	13,440	2,109	0.16
Pathway leading up to light rail stop	28,800	12,825	0.45

The analysis indicates that, even under a worst-case double header scenario, footpaths in the precinct have the capacity to accommodate crowd movements. It should also be noted that, for major events at Moore Park, Transport Management Centre and NSW Police closely manage pedestrian flows at key intersections and along footpaths to minimise pedestrian interactions with vehicles. In line with current arrangements, pedestrian management during large scale events are to be controlled at intersections which are on major pedestrian routes, such as Moore Park Road and Driver Avenue (east and west) and Moore Park Road / Flinders Street.

5.4 Bicycle parking

There will be dedicated bike parking spaces for staff and patrons. The patron bicycle parking is indicated in the Sydney Football Stadium Landscape Report (prepared by ASPECT Studio).

Facilities for 150 bicycles have been provided within the public domain. These are located along Moore Park Road (45 racks for 90 bikes) to service the north west and eastern stadium entries.

Bike parking facilities are also proposed within Moore Park (30 racks for 60 bikes) to complement the existing provision. As this sits outside of the site boundary, CMPT will be consulted to confirm a suitable location. These facilities will service the south western and primary stadium entry.

Bicycle parking will be provided in accordance with Australian Standards AS2980.3 Bicycle Parking Facilities.

Bicycle Parking for permanent staff and casual employees is located adjacent the basement service road. There will be wall mounted racks for the bicycles. This arrangement is shown in Figure 6.

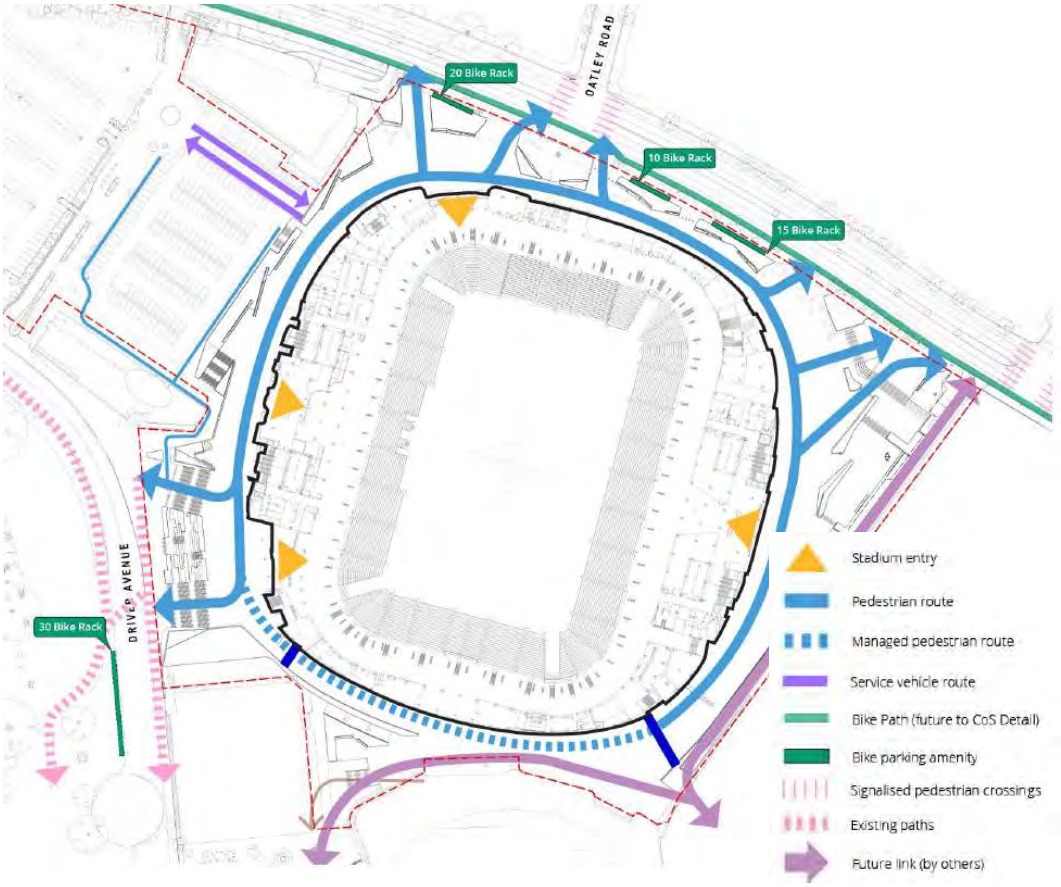

Figure 6 Bicycle parking

Source: ASPECT Studios

5.5 Moore Park Road cycleway

City of Sydney Council is planning the construction of a new cycleway for people travelling by bike from Bondi Junction to the city centre. The route includes a new two-way separated cycleway along the complete length of Moore Park Road and will connect to the existing cycleway on Bourke Street in Surry Hills and the cycleway in Centennial Park.

Figure 7 Impression of proposed cycleway along Moore Park Road
Source: City of Sydney

The proposed cycleway integrates with the SFS redevelopment via the following means:

- The cycleway design makes provision for the demands generated by the SFS by allowing pedestrians to utilise the cycleway before and after events.
- No additional vehicular access points are to be provided into the SFS across the cycleway
- Bicycle parking for visitors to the SFS will be provided along Moore Park Road in close proximity to the future cycleway
- The cycleway makes provision for retaining the existing kerbside parking on the southern side of Moore Park Road, which is proposed to be used for coach parking / ride-share as part of the future stadium operation (see Section 7.2 and 8)
- The cycleway will encourage more people to arrive to the SFS via bicycle and reduce car dependency, aligning with the objectives of the project
- During major events held at the SFS it is understood that the cycleway (in the immediate vicinity of the stadium) would be closed to allow the safe and efficient movement of people to/from the precinct

The construction of the cycleway will likely coincide with the construction phase of the new SFS. Close coordination will be required to ensure that these construction activities do not conflict with each other, similar to other concurrent construction works occurring in the Moore Park precinct (e.g. Sydney Light Rail). The contractor for the SFS construction will work closely with the contractor for the cycleway to understand whether any complementary measures can be adopted to better align the two construction projects and minimise impacts on the adjacent transport network. This will be further outlined in the detailed construction traffic and pedestrian management plan to be prepared prior to the commencement of construction for the stadium.

5.6 Road user safety

The enhancement of the walking route via Devonshire Street and its status as the preferred walking route between Central and Moore Park will reduce pedestrian demand and congestion at some key pinch points – in particular the intersection of Moore Park Road / Flinders Street / Anzac Parade. This location is currently the cause of a number of vehicle and pedestrian safety issues due to the constrained environment. Reducing the number of pedestrians through this intersection will result in significant improvements to road user safety.

The design shifts the existing stadium to the south west to create more space around the Moore Park Road entry point and providing a plaza experience. This will significantly improve pedestrian safety and efficiency at the Moore Park Road / Regent Street intersection by creating additional space for pedestrians to store and wait within the site boundary.

The introduction of formal taxi ranks in the precinct will enhance road user safety by reducing the number of vehicles circulating within local residential streets. Further, pedestrians will not have to quickly cross the road to hail a taxi as they are often required to do currently, instead walking directly from the stadium exit point to the proposed rank on the southern side of Moore Park Road.

6 Vehicle access and car parking

6.1 Loading and servicing

6.1.1 Access for service vehicles

Currently, vehicular and servicing access for the SCG extends down Paddington Lane off Moore Park Road and through the SFS site. The redeveloped SFS proposes to use Driver Avenue and the existing MP1 car park as the primary access and egress point for service vehicles to the stadium. A 360 degree service road will be provided under the general concourse under to allow full circulation of services vehicles within the stadium.

Approximately three loading bays are provided within the basement, with a further three spaces provided for outside broadcast vehicles. The loading area, including required clearance height of 4.5m, will be designed in accordance with the requirements outlined in AS2890.2 (off-street commercial vehicle facilities).

Service vehicles will enter the basement level from the MP1 Car Park. They will pass the Gate House near the entry to the car park. If the vehicle is authorized for entry it will move into the basement service road. If not, it will be rejected and will complete a 180 degree turn at the vehicle rejection roundabout and leave the car park. Service vehicles will be able to circulate on the basement service road in an anti clockwise direction.

This approach is illustrated in Figure 8.

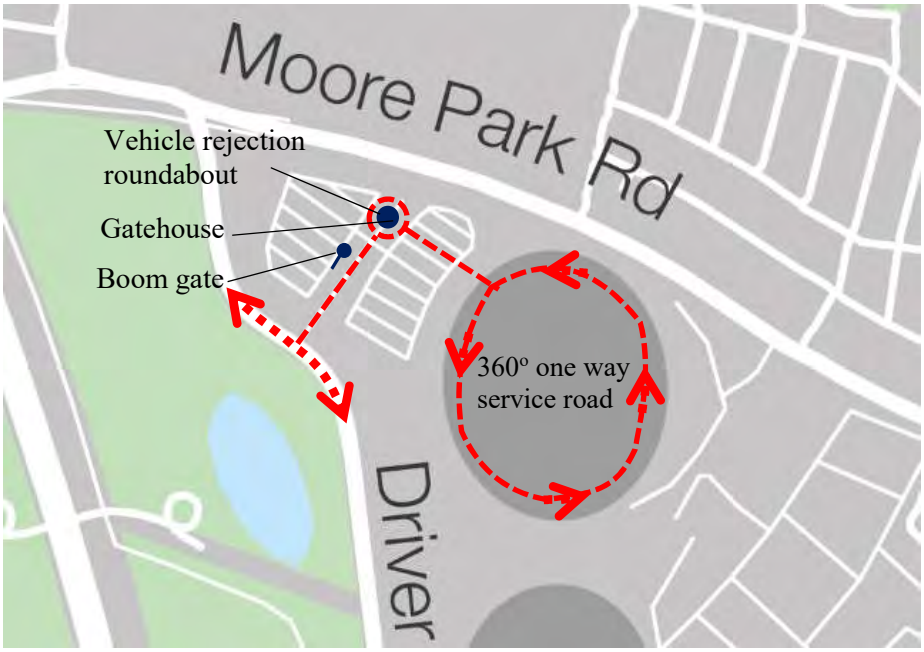

Figure 8 Proposed SFS service vehicle access

The vehicle rejection roundabout to be provided in the MP1 car park will also provide the opportunity for larger vehicles (e.g. coaches) inadvertently entering Driver Avenue to turn around and return back to Moore Park Road without impacting traffic flow. Currently these vehicles must undertake three point turns on Drive Avenue which restricts the movement of general traffic entering the precinct. In future they would be directed to enter the MP1 car park by event staff, turn around and exit back onto Driver Avenue to drop off their passengers. Drop off within the MP1 car park would be reserved for people with mobility impairments who have pre-booked (see Section 8.3 for further details).

6.1.2 Management of service vehicles

Management strategies are already in place to manage the interaction between pedestrians and vehicles on Paddington Lane, and these would remain in force in future. One of the key strategies currently in place is the restriction of service vehicle movements into the stadium immediately before, during and after events.

It is not expected the servicing task for the stadium will change significantly compared to current operations. For the proposed SFS it is envisaged that on a busy day up to 25 service vehicles will access the site for activities including:

- Kegs delivery and removal
- Waste collection
- Recycling collection including Glass
- Food delivery
- Other event related deliveries.

This number of deliveries is a small increase compared with the previous SFS (due to the enhanced corporate facilities on offer) however is still negligible in the context of existing traffic flows in the precinct. Deliveries would occur throughout the day and consist of a range of vehicles from small vans to large waste collection vehicles and beer delivery trucks.

The proposal for the new stadium includes an improved arrangement for service vehicles which allows greater accessibility and circulation within the stadium site.

6.2 Emergency vehicle access

There will be access to all sides of the stadium for Emergency Vehicles. The West, North and East sides will be accessed off the external concourse to the stadium, with the ambulances, Police and fire appliances entering off Moore Park Road. For the South side, the Fire Appliances will enter off Driver Avenue and use a ramp to access the Members Plaza. Fire Appliances will also have 2 parking bays in Paddington Lane. These spaces will be adjacent the SFS Fire Control Room and Hydrant stand. Police vehicles will access the Police Interview Room via MP1 car park.

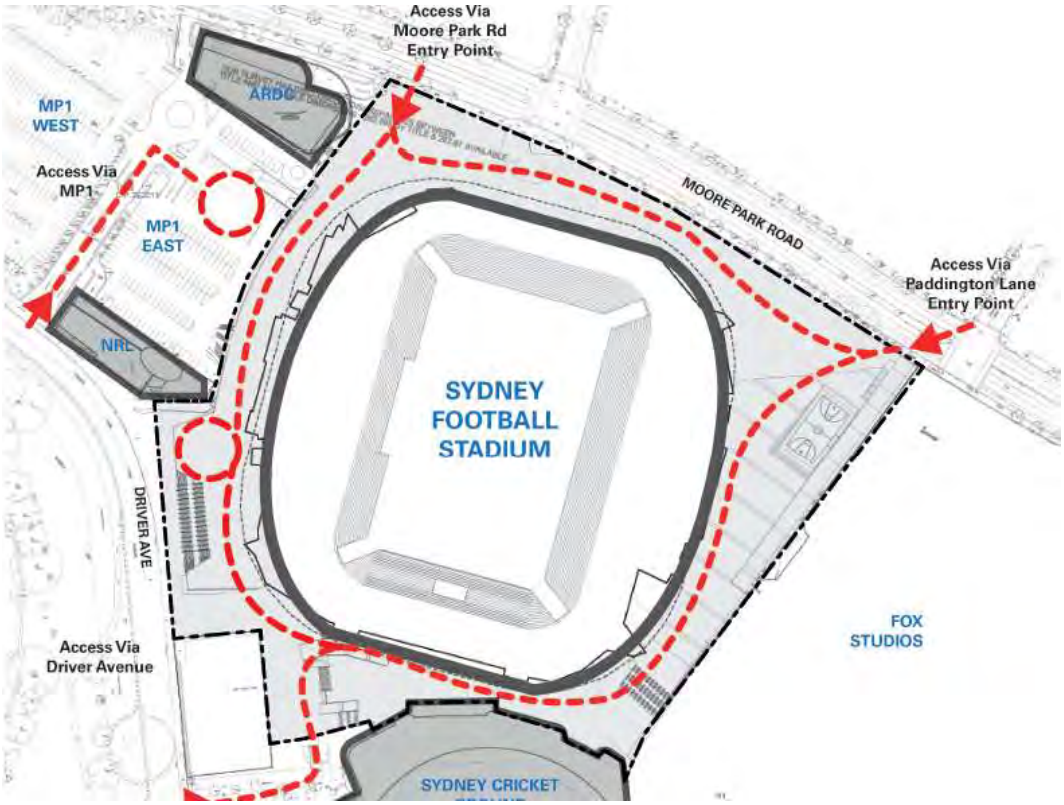

Figure 9 Emergency vehicle access

6.3 VVIP buses

Buses for VVIPs (players / officials) will enter the basement level from the MP1 Car Park. The buses will be able to circulate on the basement service road in an anti clockwise direction. Lay-bys for the buses are located adjacent to the team change areas. Buses will exit out via MP1. This arrangement is shown in Figure 10.

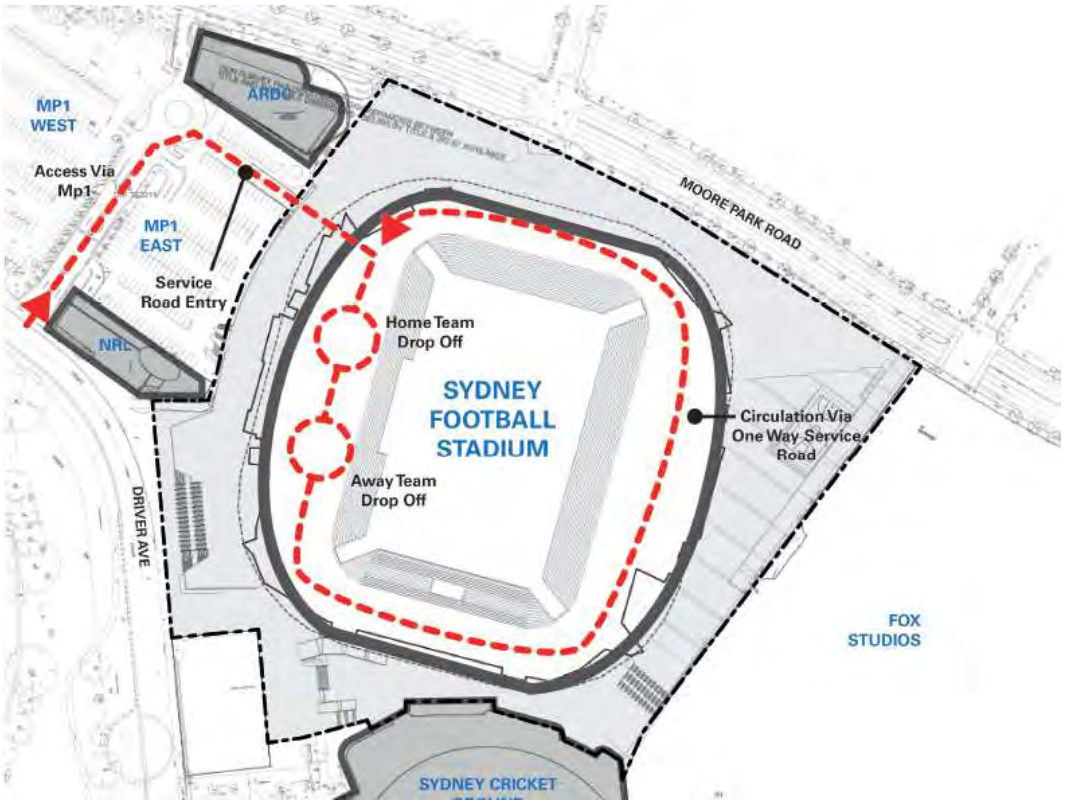

Figure 10 VVIP buses

6.4 Private vehicles

The vehicular access point to the MP1 car park will be retained in its current location on Driver Avenue adjacent to the NRL building, in accordance with condition C39 of the approvals for SSD 9249.

The design of the car parking areas and footpath will be in accordance with AS2890.1 and AS2890.6.

In accordance with Condition C40 of the approvals for SSD 9249, the following measures will be implemented to address traffic and pedestrian conflicts at the junction of Driver Avenue and the entry to MP1 car park:

- The driveway will be designed to be fully integrated with the adjoining footpath and at one continuous level. The treatment will therefore be an area which is designed for pedestrians, across which vehicles can pass slowly.
- Drivers of vehicles will be guided and encouraged to give way to pedestrians on the footpath as required by law.

- The crossing would be designed with consistent pavement material, including a delineation of vehicle paths.
- As per current arrangements, the driveway would be managed on event days to address traffic and pedestrian conflicts.
- The driveway width will be minimised based on swept path analysis of the largest design vehicle to reduce the overall crossing distance for pedestrians.

It should be noted that, following discussions with the SCGT, no incidences of injuries caused to pedestrians as a result of entering or leaving the MP1 car park have been recorded for events held at the SFS or the SCG.

The provision of the vehicle rejection roundabout within the MP1 car park will allow large vehicles (>6m in length) to avoid having to undertake a 3 point turn in Driver Avenue which can sometimes create congestion prior to the start of major events. Vehicles less than 6m in length (i.e. standard passenger vehicles) can continue to safely undertake a u-turn on Driver Avenue as per the current drop off arrangements prior to events commencing.

6.5 Road network operations

As part of the assessment of the Stage 1 development application for the project, Arup undertook SIDRA modelling to consider a 'worst case' double header scenario where both the SCG and SFS stage concurrent events to their full capacity – 95,000 people in total in the precinct. It should be noted that this is an extremely unlikely scenario, with the highest ever combined attendance for a double header in the Moore Park precinct of approximately 78,000 people in January 2017. Even in this circumstance the start and end times were staggered such that the peak vehicle flows from the two venues did not coincide.

The modelling considered the operation of key intersections in the Moore Park precinct prior to and following the conclusion of a double header. The methodology used to undertake this worst case scenario was as follows:

- Traffic surveys undertaken on Saturday 4 August 2018 were used as a base for the traffic modelling. These surveys were undertaken on the evening of the double header Roosters vs Cowboys and Swans vs Collingwood where there were 50,000 people in Moore Park precinct.
- Discussions with the Transport Management Centre have confirmed that all available car parking in the Moore Park precinct was fully occupied at the time these surveys were undertaken. Given no additional parking is proposed as part of the SFSR project, the number of vehicles driving and parking in Moore Park (and therefore traffic movements at intersections) for a double header with 95,000 people will be no different to that surveyed on 4 August 2018.
- SIDRA modelling has been undertaken to account for the increased number of drop off movements (e.g. taxi / uber/ private vehicle drop off) expected for a 95,000 capacity double header. These additional movements are based off the mode split forecasts developed in conjunction with Transport for NSW as previously shown in Table 4 of this document.

- There are forecast to be approximately 5,100 additional people picked up in the precinct by Uber, taxi or private vehicle in the 95,000 capacity double header scenario compared to that surveyed on 4 August 2018. Based on an average vehicle occupancy of 2.7 this equates to an additional 1,890 vehicles travelling through the precinct.
- As a worst case scenario, it has been assumed that events at the SFS and the SCG would conclude at the same time. It is more likely however that finish times would be staggered given the different match times of the football codes held at these venues.
- Following the conclusion of the event no vehicles are permitted to access Driver Avenue to pick up passengers. Therefore, post-match pick up occurs over a more dispersed area compared to drop off. In this context a conservative assumption of 30% of pick up movements has been assumed to occur within the immediate precinct – with the remainder occurring in the wider precinct including Paddington in the east with patrons walking from Oxford Street and Surry Hills in the west with patrons walking connecting to the designated walking route along Devonshire Street and across the Tibby Cotter Bridge.

The results of the updated SIDRA modelling are provided in the table below. These results report on the worst 30 minutes during the peak hour and indicate intersection performance at Level of Service B or C. This indicates the intersections operate with some delays however well within the thresholds of acceptable performance.

Table 7 SIDRA modelling results – double header scenario

Scenario (post event)	**4 August 2018 (50,000 people)**		**Theoretical 95,000 people in precinct**	
Performance measure	DoS	LoS	DoS	LoS
Moore Park Road & Driver Avenue	0.73	B	0.83	B
Moore Park Road & Regent Street	0.77	A	0.79	B
Anzac Parade, Cleveland Street & Lang Road	0.91	C	0.96	C
Lang Road & Driver Avenue	0.83	B	0.87	C
Moore Road Rd & Anzac Parade & Flinders St, Fitzroy St, M1	0.79	B	0.91	C

The SIDRA modelling indicates that during the most congested 30 minutes of the peak hour:

- The Anzac Parade / Lang Road / Cleveland Street and Moore Park Road / Driver Avenue intersections continue to operate at acceptable levels of service.
- The Moore Park Road / Regent Street, Driver Avenue / Lang Road and Moore Road Rd / Anzac Parade / Flinders St intersection performance are forecast to

slightly deteriorate with additional drop off movement but continue to operate at acceptable levels of service.

Notwithstanding the above analysis, the following is important to note

- Double header events are heavily managed by Transport for NSW and the Transport Management Centre, with strong communication provided prior to the match informing people to arrive earlier and leave their cars at home if possible. Therefore, the assumptions used in the SIDRA modelling are considered highly conservative.
- It is expected that the future stadium will generate less vehicle traffic during major events when compared to the existing stadium due to the improvements in public transport access provided by the Sydney Light Rail project, as well as the green travel plan measures documented in this report.
- The transport strategy developed seeks to reduce private vehicle dependence by encouraging people to arrive by walking, cycling and public transport. For this reason, no additional car parking is proposed as part of the application. Upgrading roads to accommodate demands for an event that would occur very infrequently (if ever) would be in conflict with this transport strategy.
- It is not a sustainable nor cost effective strategy to design our roads to accommodate demand under this scenario. Upgrading intersections to accommodate the potential traffic demands would reduce available space for pedestrians and other street users.
- The design of intersections in Moore Park are intended to accommodate day to day weekday traffic and traffic associated with major events, which typically range from between 10,000 people and 60,000 people. In the history of events in Moore Park no double header has exceeded an attendance of 78,000 people – and even in this circumstance the start times were slightly staggered.

6.6 Car parking

6.6.1 MP1 car park

Approximately 600 public spaces are currently provided in the MP1 car park, which is typically reserved for members and VIPs on event days. As part of the proposal, the car park will be reconfigured to accommodate access for service vehicles and VVIP buses into the new basement ring road. This reconfiguration is not however expected to result in a net loss of parking however due to the inclusion of additional parking spaces within the basement of the upgraded SFS. Therefore the proposal aligns with the intent of condition 39 of the approvals for SSD 9249

6.6.2 Precinct car parking

The minor reduction in the number of spaces to be provided within the MP1 car park represents the only change to car parking environment for events at Moore Park proposed under this application. Providing no additional car parking as part of the development proposal complements the strategy of promoting public transport, walking and cycling to access the stadium and reducing the reliance on private vehicles.

It should be recognised that the only car park under the direct control of the SCG Trust is the MP1 car park, which is primarily used for members, officials and players on event days. The remaining car parking in the precinct comes under the control of other stakeholders, including the Centennial Park and Moore Park Trust, Entertainment Quarter and Sydney Boys/Girls High School. There are no intentions in the short term by any of these stakeholders to modify event day parking arrangements.

The Moore Park Masterplan 2040 proposes the gradual removal of parking on green space in the precinct (i.e. EP2 and EP3). The strategy however acknowledges that such measures will not be implemented until supplementary parking in dispersed locations (such as the Entertainment Quarter, E.S. Marks Athletics Field, Moore Park Golf and the SCG) has been created – thereby ensuring there is no net loss of event related parking.

To confirm there is sufficient capacity in the transport network should parking not be available on the existing sites of EP2 and EP3, a mode share analysis has been undertaken which considers:

- Removal of parking in EP2 and EP3, and creation of satellite park and ride areas outside of the precinct
- Maintaining event car parking in the Entertainment Quarter, MP1 and Sydney Boys/Girls High

The forecast mode share for a range of events under this scenario is presented in Table 8. The analysis confirms that there would be sufficient capacity to accommodate the changed parking arrangements. As is the case for when ‘double header’ events are held in the precinct (i.e. concurrent events at the SCG and SFS) a significant number of people walk from the Sydney CBD, Central Station and other nearby areas. Light rail and public transport would have additional capacity to transport people to the SFS to offset the loss of parking in the event EP2 and EP3 are no longer available.

Table 8 Forecast mode share with satellite parking locations

Stadium	Proposed Stadium							
Scenario	Half Full		Peak Event		Concert		Double header	
	%	No.	%	No.	%	No.	%	No.
Attendance	22,500		45,000		55,000		95,000	
Driver / passenger (park in precinct)	41.0%	9,225	21.2%	9,540	17.3%	9,540	10.0%	9,500
Driver / passenger (satellite areas)	5.0%	1,125	10.0%	4,500	9.0%	4,950	5.5%	5,225
Dropped off in private vehicle	3.0%	675	3.0%	1,350	9.0%	4,950	3.0%	2,850
Taxi/Uber	13.0%	2,925	17.2%	7,740	17.0%	9,350	13.0%	12,350
Train to Central & walk	5.0%	1,125	8.5%	3,825	8.5%	4,675	22.2%	21,090
Special event Bus	0.0%	-	2.7%	1,215	0.0%	-	5.0%	4,750
Light Rail	12.0%	2,700	16.5%	7,425	16.5%	9,075	13.6%	12,920
Walk Only	14.5%	3,263	15.4%	6,930	17.0%	9,350	19.5%	18,525
Bus/ coach	6.3%	1,418	5.3%	2,385	5.5%	3,025	8.0%	7,600
Cycle	0.2%	45	0.2%	90	0.2%	110	0.2%	190
Total	**100.0%**	**22,500**	**100.0%**	**45,000**	**100.0%**	**55,000**	**100.0%**	**95,000**

7 Public Transport

7.1 Special event bus services

In addition to the improved level of public transport access to Moore Park offered by the Sydney Light Rail project, special event bus services will continue to operate for events at the SFS.

A new bus interchange in Moore Park has recently been delivered by the NSW Government. The project improves the public transport interchange alongside Tramway Oval by removing the current large concrete bus structures and replacement with more modern, subtle structures, closer to Anzac Parade.

The relocation of the bus loop from its current site near Driver Avenue to closer to Anzac Parade provides for safer and more delineated routes to be created for crowds dispersing from games at Moore Park. New pathways have been provided to improve access to both the bus loop and new Light Rail stop.

Figure 11 provides an overview of the future Moore Park Special Event Bus Interchange. This project is currently being delivered by others and is outside the scope of this application.

Figure 11 New Moore Park Special Event Bus Interchange

Note: Provided by others and not part of the project

7.2 Coaches

Coaches currently use the southern end of Driver Avenue on event days to drop off and pick up passengers. Coaches utilise the 90 degree parking bays on Driver Avenue (see Figure 12) and can be double stacked during major events which provide for up to 20 coach parking spaces.

Figure 12 Existing coach parking area on Driver Avenue

Via consultation with Transport for NSW and the Transport Management Centre, opportunities for increased levels of coach parking and layover in the precinct have been identified. This includes using the southern kerbside along Moore Park Road, between Driver Avenue and Oatley Road. This space currently operates as a clearway during major events and is in close proximity to the stadium access points, providing easy access for coach users. The existing clearways on Moore Park Road proposed to be used are indented parking bays which require vehicles to merge back into the continuous travel lane, and therefore provide minimal benefit to traffic flow. This location is shown in Figure 13.

Figure 13 Proposed coach parking on Moore Park Road

The Transport Management Centre, along with the Sydney Cricket Ground Trust, have advised that major events (including double headers) at the SFS generate between 25-30 coaches. Mid-sized events typically bring in between 10-15 coaches, depending on the sporting code and teams that are using the stadium. Therefore the provision of 32 coaches is considered adequate to meet the expected demand during these major events.

When additional space has been required for coaches compared to the current provision (such as major double headers), additional options for coach parking/layover that have been used by the Transport Management Centre have included the Lee Street bus interchange, Oxford Street and York Road. Use of these areas could further enhance capacity if required.

7.3 Light rail

The Moore Park light rail stop will be located on the eastern side of Anzac Parade approximately 100m north of Lang Road. The stop is an island platform and will provide a separated crossing for passengers over the light rail tracks to the east to Moore Park with a six-metre-wide path to the Moore Park forecourt. The pedestrian bridge also provides access to the western side of Anzac Parade, which will particularly benefit students and staff travelling to Sydney Boys and Girls High Schools. Disabled access will be via a gate at track level to the platform

A new 6m wide pathway will be provided within Moore Park as part of the Sydney Light Rail project to connect Driver Avenue with the new Moore Park light rail stop, as shown in Figure 14. The location of the light rail stop south of the existing event bus loop provides the opportunities for pedestrians to have an unencumbered route to the Driver Avenue entry point of the SFS. The stop will

provide connections to pedestrian paths within Moore Park and then to the section of Driver Avenue which is closed to vehicular traffic on match days.

Figure 14 Pedestrian route from light rail stop

Recent discussions with Transport for NSW have indicated that different levels of capacity will be provided depending on the type of event to be held at Moore Park (or Randwick Racecourse).

The light rail will be a key mode of travel for patrons travelling to and from the station. The services and operations of the light rail will be dictated by the size of the event. Table 9 summarises the light rail capacity under different scenarios, and indicates up to 11,000 passengers per hour can be accommodated on special events. This also demonstrates that the light rail will offer a significantly enhanced level of capacity for transport people to the SFS compared with the existing event bus arrangements, which have capacity to transport between 3,000 and 4,000 passengers per hour during peak times.

Table 9 CSELR Infrastructure Capacity

Scenario	**Light rail capacity (People per hour - one direction)**		**Event crowd size**
	Central to Moore Park (before event)	**Moore Park to Central (after event)**	
Regular	5,400	7,200	Between 5,000 and 20,000
Regular plus special event	7,200	10,800	Between 20,000 and 30,000
Major event	10,800	10,800	Greater than 30,000

8 Point to Point Transport

8.1 Taxis

8.1.1 Locations

Pre-event set down spaces for taxis are currently provided on the eastern side of Driver Avenue, both north and south of the SFS. Post-event vehicles that are picking up passengers are not allowed to enter Driver Avenue, this is to improve pedestrian safety and assist in clearing the on-site car parks. The only dedicated post event taxi pick-up area is on Errol Flynn Avenue adjacent to the Entertainment Quarter which provides for approximately eight taxis.

Arup, in conjunction with key stakeholders such as Transport for NSW and the Transport Management Centre, have developed options to provide for enhanced opportunities for taxis in the Moore Park precinct as described below.

(i) Moore Park Road eastbound

This, shown in Figure 15, involves utilising the northern kerbside area on Moore Park Road (east of Oatley Road) adjacent to Victoria Barracks. Currently this area provides for unrestricted parking, however a clearway has been implemented in the past in this section of road for major events at the SFS. This location could provide a rank to accommodate up to 20 taxis at any one time. Pedestrians would access the rank via the existing signalised pedestrian crossing at the Moore Park Road / Oatley Road intersection. Given that people would only enter taxis at the 'head' of the rank (i.e. close to Oatley Road), pedestrians will not be encouraged to diagonally cross Moore Park Road to access the taxi rank.

This proposal would not impact any dedicated resident parking in Moore Park and would allow vehicles to exit the precinct in the opposite direction (i.e. eastbound) to that of private vehicles exiting the car parking areas.

Figure 15 Proposed enhancements for taxis – Moore Park Road eastbound

(ii) Moore Park Road westbound

A kerbside area on Moore Park Road (westbound), between Oatley Road and Poate Road, has been identified for use by up to 15 taxis at any one time. This space currently operates as a clearway during events and is already informally used by taxis. No existing on-street parking would be impacted by this proposal during major events compared to existing conditions. The existing clearways on Moore Park Road proposed to be used are indented parking bays which require vehicles to merge back into the continuous travel lane, and therefore provide minimal benefit to traffic flow.

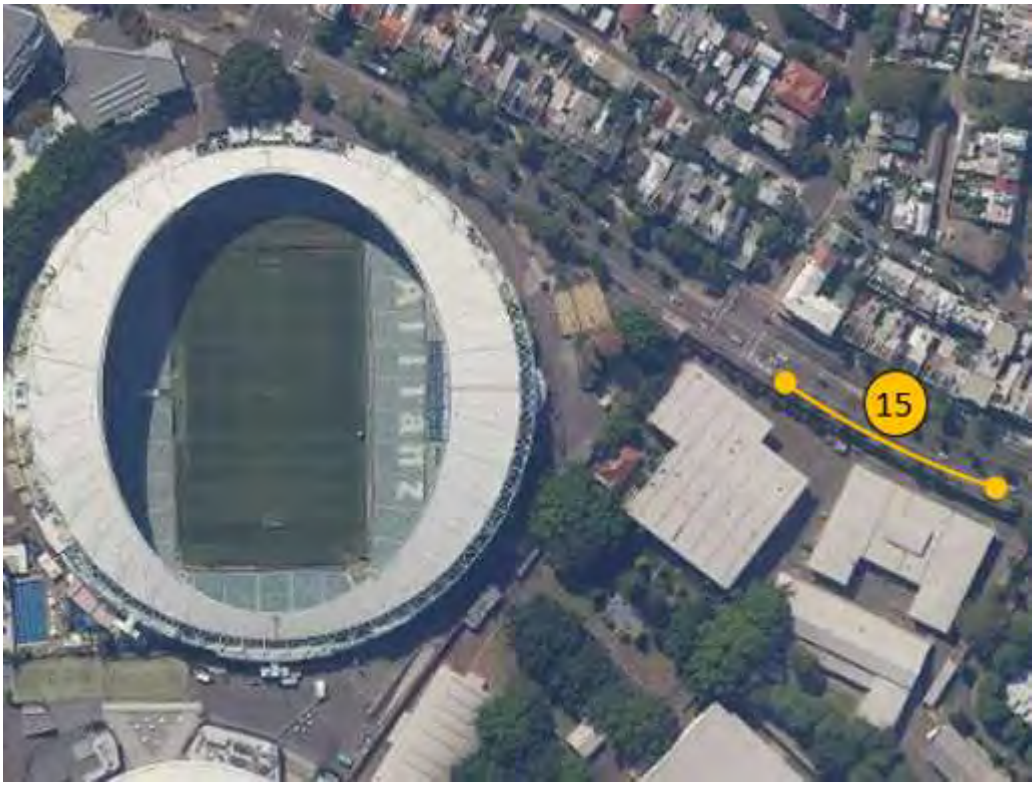

Figure 16 Proposed enhancements for taxis – Moore Park Road westbound

(iii) Lang Road

Transport Management Centre have provided advice that the northern kerb along Lang Road, between the entry to the Equestrian Centre (114-120 Lang Road) and Cook Road. The kerbside area is currently signposted as ‘no stopping’ however could be altered during major events given the flow of vehicles in the eastbound direction on Lang Road is relatively low post events – particularly after 10pm when no left turn is permitted out of Errol Flynn Boulevard.

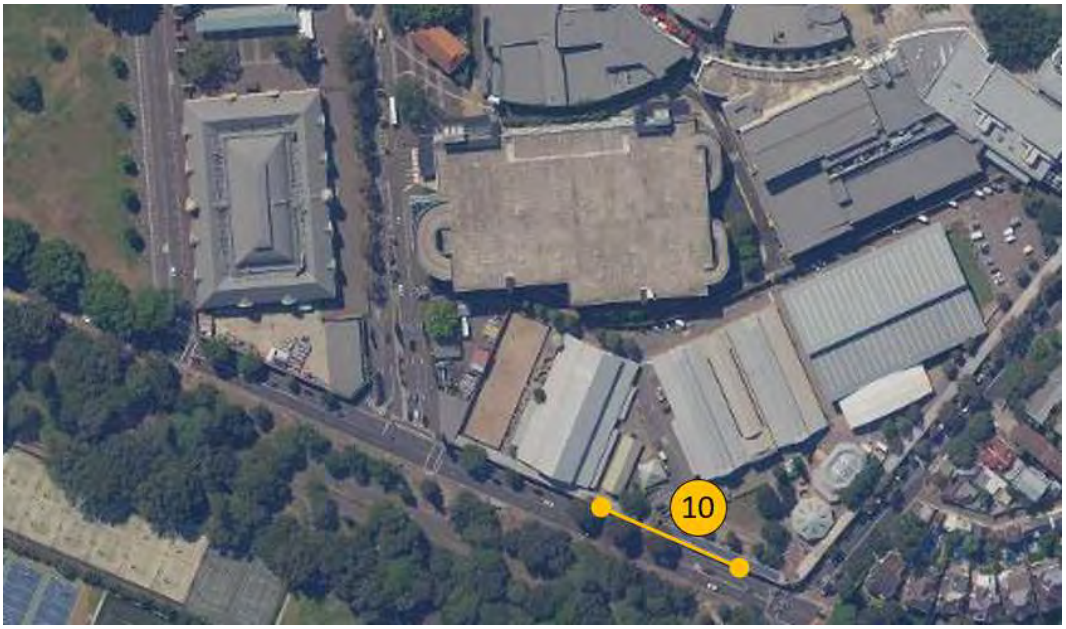

Figure 17 Proposed enhancements for taxis – Lang Road

It should be noted that not all of the identified ranks would necessarily be utilised for the same event. The areas in operation would be based on specific operational requirements such as the time of the event, the competing teams and the likely demand for taxi services. It is likely that the Moore Park Road (westbound) rank would be in operation for most events, with the Moore Park Road (eastbound) and Lang Road ranks only in operation for major events or double headers.

While the options outlined for enhanced taxi operations have in-principle support from TfNSW, a number of operational items such as queuing areas and management overlays are still to be worked through. These detailed items will be discussed during the detailed design phase of the project.

8.1.2 Capacity assessment

To determine whether the areas identified for taxis are adequate to accommodate the expected number of users, a capacity assessment has been undertaken as shown in Table 10. This demonstrates that, even in an extreme scenario of a double header with 95,000 people in the precinct, the proposed provision has capacity to accommodate the forecast demand.

Table 10 Taxi services transport capacity assessment

Capacity			Demand**	
Number of vehicle spaces available	Number of vehicles per hour*	Number of passengers per hour	Demand - 95000 double header***	Demand - 45000 peak event***
53	4240	12,296	9,880	6,120

* Based on an average vehicle dwell time of 45 seconds for post event egress
** Based on mode share and travel demand forecasts outlined in this study
*** Based on assumption that 20% of trips will originate in non-designated on-street areas in the vicinity of the SFS

8.2 Rideshare

Ride-share vehicles such as Uber and Lyft currently have no formal set down / pick up area for events at Moore Park. During drop off these vehicles utilise the existing kerbside areas on Driver Avenue along with taxis and other private vehicles. Pick up post events occurs on adjacent streets in the precinct.

As part of this project Transport for NSW and the Transport Management Centre have been consulted to understand the most suitable arrangements for rideshare vehicles servicing the future SFS. Kerbside areas (similar to taxis) are not currently an option as rideshare vehicles can not ‘rank’ or wait under the current road rules. In this context, and given the unavailability of suitable off-street parking areas, the most suitable option was agreed to be the introduction of a ‘geo-fence’ for rideshare vehicles post events.

Transport for NSW will liaise with ride-sharing companies via the Point to Point Commissioner to implement a technology driven ‘geo-fence’ in the vicinity of the Stadium. This ‘geo-fence’ will be applied to prevent users within a designated exclusion zone from hailing ridesharing services. Rideshare users will instead be directed by the relevant app to first walk outside the exclusion area before being able to order a rideshare service vehicle. This will ensure ridesharing services will not adversely impact traffic or pedestrian movements in the vicinity of the SFS during the intensive post-event egress period. This geo-fence solution has recently been introduced for events at the new Bankwest Stadium in Parramatta.

The extent of the geo-fence will be discussed with relevant stakeholders and confirmed prior to the opening of the new stadium.

8.3 Access for people with mobility impairments

The design of the proposed stadium allows for private vehicles and point to point transport vehicles to enter the MP1 car park for dropping off and picking up passengers with mobility impairments. The vehicle rejection roundabout would be utilised to allow vehicles to turn around within the MP1 car park and drop off or pick up their passengers. Lay-by areas will be provided within the MP1 car park. This arrangement is shown in Figure 18.

Access for these vehicles would be managed by staff and be pre-booked only. No access for general taxi / ride-share vehicles, or those who haven't pre-booked, would be permitted. People would pre-book with the SCG Trust and have their number plates registered prior to the event. Should they not be accredited they would be required to turn around in the MP1 car park (using the vehicle rejection roundabout) and exit the precinct.

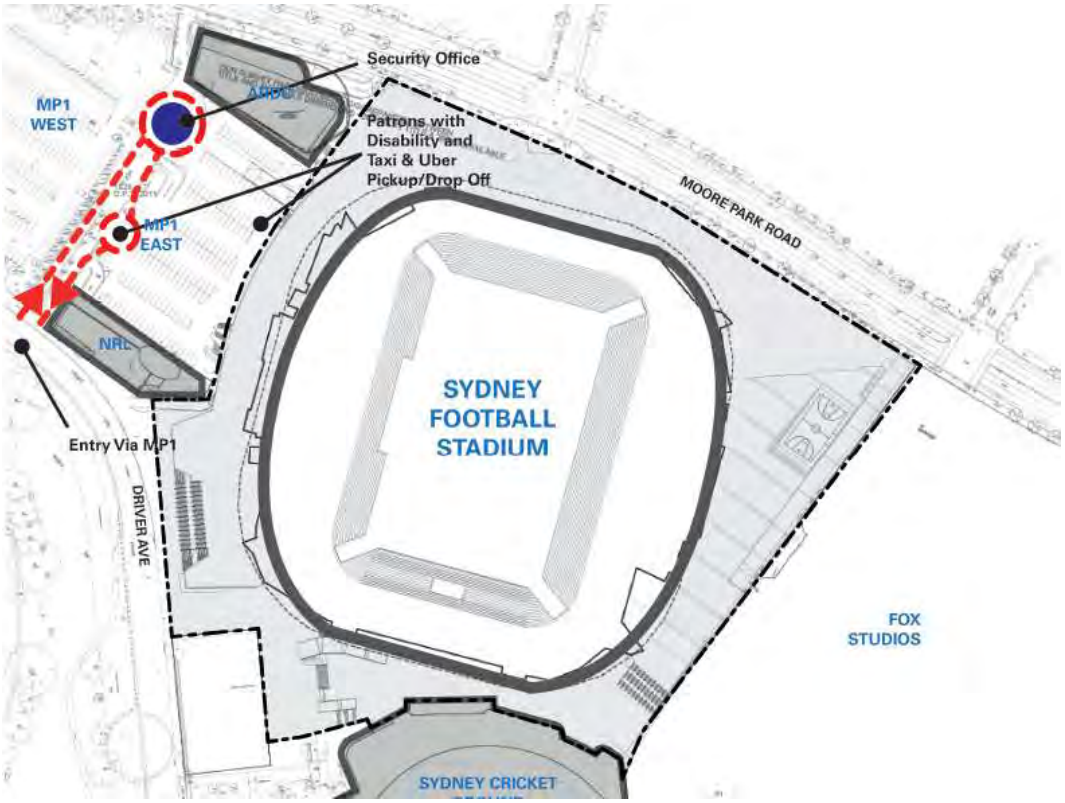

Figure 18 Point to point arrangements for people with mobility impairments

9 Event Transport Management

The existing Moore Park Precinct Event Operations Plan was developed in August 2005, and is shown in Appendix D. The existing plan details the event transport arrangements in place for two types of events in the precinct:

- Category A: Crowd size above 30,000
- Category B: Crowd size below 30,000

Since the development of the plan in 2005, there have been a number of changes to the transport environment in the precinct which include:

- The future light rail stop at Moore Park
- The new pedestrian bridges available over Anzac Parade
- New pedestrians pathways introduced in Moore Park, including the pathway to the future light rail stop
- The relocated Moore Park Special Event Bus Interchange

Based on the recommendations contained in this transport strategy supporting the redevelopment of the SFS, the following items would be included in the an amended plan:

- Taxi rank on Moore Park Road west of Oatley Road (northern kerb)
- Taxi rank on Moore Park Road between Regent Street and Poate Road (southern kerb)
- Taxi rank on Lang Road, between 114-120 Lang Road and Cook Road (northern kerb)
- Coach parking area on Moore Park Road between Regent Street and Driver Avenue (southern kerb)

The amended plan is shown in Figure 19. It is understood that Transport for NSW, in conjunction with the Moore Park Transport working group, will soon be commencing a study to update the transport strategy for the Moore Park sporting precinct.

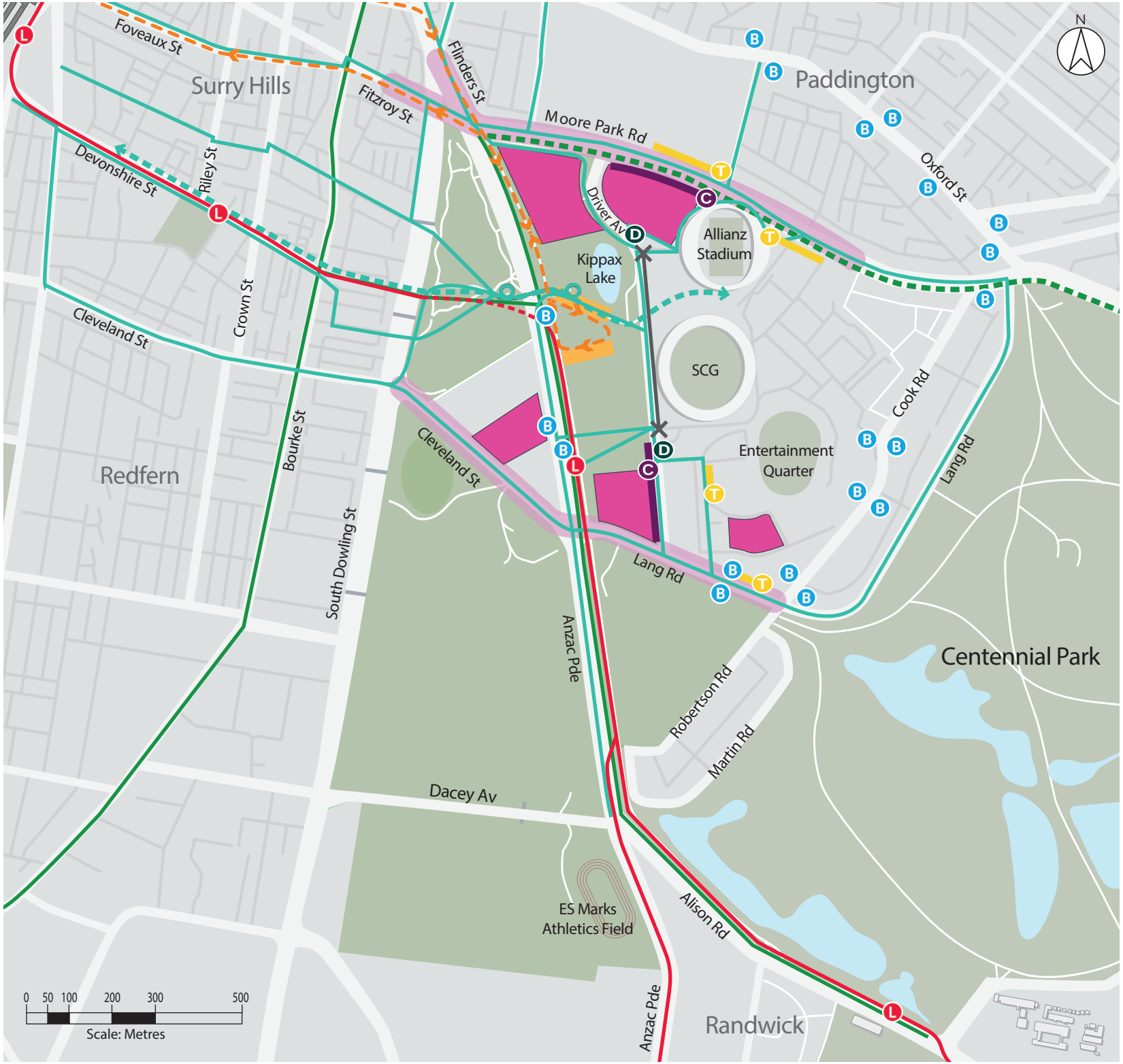

Figure 19: Amended Moore Park precinct events operations plan

10 Construction Pedestrian Traffic Management Plan

10.1 Overview

This section details a preliminary Construction Pedestrian and Traffic Management Plan (CPTMP) for the construction of the SFS. The purpose of the CPTMP is to assess the proposed access and operation of construction traffic associated with the proposed development with respect to safety and capacity. The Contractor will prepare a more detailed CPTMP with Traffic Control Plans prior to the commencement of works, detailing specific methods of safely managing construction and pedestrian traffic within the surrounding area.

10.2 Summary of construction activities

10.2.1 Construction program

It is currently envisaged construction works will commence in November 2019 and take approximately three years to complete. The various stages of construction (many of which will overlap with each other) is noted in Table 11 below. As the project is in its preliminary stages, the following timeframes are approximate and may vary once further details are known.

Table 11 Proposed Construction Works Program

Activity	Duration
Earthworks	6 months
Piling	7 months
Concrete Structure	18 months
Roof Construction	18 months
Internal Façade and Fit out	18 months
Façade	12 months
External Works	6 months

10.2.2 Work Hours

Work associated with the development will be carried out between the following hours of construction:

- Monday to Friday 7.00am and 6.00pm
- Saturday 8:00am and 1:00pm
- Sunday/ public holiday No work