Provision for accommodation of Outside Broadcast Vehicles during major events has been allowed within the facility fronting Darling Drive adjacent to the proposed multi-use arena.

5.3.3 Taxis

Two drop-off and pick-up zones for taxis are proposed. The first will be located along Pyrmont Street to the west of the site. Provision for parking of up to 20 vehicles will be provided in this location to the south of Quarry Street and access to the precinct will be via a bridge connection to the upper levels of the multi-use arena facility. The second taxi bay will be located to the north of the convention centre at the location of the existing taxi drop-off bay. The northern taxi bay will also function as a V.I.P. entry for major convention events, as required.

The taxi bays located at two discrete locations adjacent to the facility will have a number of functional benefits. These include providing more direct access from each venue and improved pedestrian management through the precinct. The two locations do not provide significant differential benefits in terms of origin or destination as they both have close access to the arterial road network.

A V.I.P. entry/ Porte Cochère is proposed towards the centre of the precinct off Darling Drive.

5.3.4 Coaches

Coach parking is proposed in its present location adjacent to Darling Drive and the existing exhibition centre site. It is anticipated that parking for approximately 20 coaches will be provided in this location.

Coach drop off and set down that is currently conducted along Harbour Street adjacent to the existing Entertainment Centre will be conducted along Darling Drive adjacent to the Facility, being the only road frontage. The suitability of Pyrmont Street for coach pick up and set down was investigated; however, the geometry of the road does not permit coach turning movement at the end of Pyrmont Street without significant works.

5.3.5 Buses

It is noted that there are currently no bus routes running along Darling Drive, which will be the focus of redevelopment. The existing bus route along Pier Street will not be affected by the proposed development.

Consideration has been given to opportunities for the improvement of future bus operations in the area. It is noted that this area is currently serviced by light rail, with direct connection to Central Station, which is a major interchange for bus operations. No additional accommodation for bus operations is proposed as part of the redevelopment of the SICEEP site.

5.4 Road Network

There are no significant changes proposed to the existing road network. Minor amendments to the access arrangement off Darling Drive will necessitate reconfiguration of some lanes and turning facilities. Pyrmont Street, to the south of Quarry Street will be reconfigured to permit taxi parking and turning at the southern end. Pyrmont Street will also be reconfigured to provide connectivity (pedestrian and emergency vehicles) across Darling Drive to the Facility.

5.5 Pedestrian Management

Pedestrian management during major event scenarios is a critical consideration for the future development. The major concentrations of simultaneous event patronage are considered to be the convention facilities to the site's north and the multi-use arena to the north of Pier Street. The convention facility will maintain its existing footprint and frontage to Darling Harbour which provides pedestrian dispersal capability to the north, south and east. The western frontage of the convention centre to Darling Drive is not considered a major pedestrian egress route and will be largely confined to taxi and coach pickup/drop off.

The multi-use arena is afforded enhance pedestrian management opportunity by its dual frontages to Darling Harbour and Pyrmont. Access to the arena is provided at ground level from the east and south to Darling Harbour and from the west to Pyrmont via the high level pedestrian bridge. In particular, taxi movements have been separated from primary pedestrian and vehicle routes. This provides a number of points of egress separated from the major vehicular routes of Darling Drive and Harbour Street.

5.6 Pedestrian / Cyclist Connectivity

It is proposed to maintain the existing bicycle routes depicted in the City of Sydney Cycle Strategy and Action Plan 2007-2017 as part of the proposed development. The principal route pertaining to the SICEEP development runs along the western side of Darling Drive (on-road) for the length of the development. It is proposed to maintain this cycle route in its existing configuration. The internal spine through the precinct from Hay Street in the south along the eastern edge of the existing exhibition and entertainment facilities offers an alternative cycle route through the site, however is less amenable to commuting given the high volumes of pedestrian traffic and the lack of a dedicated cycle path.

Bicycle parking is proposed along the eastern frontage of the proposed exhibition and entertainment facilities.

There is future potential to provide enhanced pedestrian connectivity though the expansion of the Ultimo Pedestrian Network and improved connectivity to the western CBD. These are considered to be regional enhancement opportunities and the need for their implementation is not triggered by the redevelopment of the SICEEP site. The proposed bridge connection to Pyrmont Street off Darling Drive will significantly improve pedestrian connectivity to the west towards Ultimo.

The future design of the commercial precincts to the south of Pier Street will need to accommodate enhanced pedestrian connectivity; connecting the entertainment / exhibition precinct through to Hay Street, particularly to align with future City of Sydney plans to convert Hay Street to a pedestrian zone between George and Sussex Streets.

5.7 Traffic management Plan during Construction Period

A conceptual Construction Traffic Management Plan (TMP) has been developed for the reference design of the proposed SICEEP development. The conceptual TMP is attached in Appendix A. The main points are discussed below.

5.7.1 Demolition/ construction activities

The proposed convention facilities are to be based on refurbishment of the existing facilities. As such, no demolition/ major construction activities will take place for the Convention Centre site. The existing Exhibition Centre site will be demolished and will be reconstructed to accommodate proposed increased exhibition area space as well

as a new Entertainment Centre. The existing Entertainment Centre site (to the south of Pier Street) will be demolished for the future retail and residential development. The main points in relation to demolition/construction activities are listed below.

- All loading and unloading associated with construction including spoil removal must be accommodated on site;
- All Demolition and excavation activity to be provided for on-site;
- All vehicles involved in the excavation and/or demolition process and departing the site with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.
- Prior to the commencement of work, suitable measures are to be implemented to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site. Any material deposited on adjacent roads shall be removed within a reasonable time;
- All street trees adjacent to the site must be protected at all times during demolition and construction;
- All demolition/construction activities including noise management as well as tree protection/verge management shall be implemented as per relevant policies and to the satisfaction of local Council and authorities.

5.7.2 Access arrangement

Vehicular access to the Convention Centre site will be provided from Darling Drive. The Convention Centre will undergo refurbishment with no major construction/demolition activities. The vehicular access will be provided through existing service roads off Darling Drive below Pier Street.

All vehicular access for the proposed Exhibition Centre & Entertainment centre site will be provided from Darling Drive with northern access to be used as entry only access and southern access to be used as exit only access to minimise vehicular conflicts on Darling Drive. Two-way traffic movement (one lane in each direction) on Darling Drive shall be maintained at all times with minimum lane width of 3.5m. All pedestrian/cyclist access through the existing site from Darling Drive should be closed and necessary warning signs for pedestrian/cyclist delineation shall be provided.

For existing Entertainment Centre demolition site, all vehicular access to be provided from Harbour Street using single entry/exit access. Harbour Street is a one way street and as such all vehicles from the site will have left-in/left-out access arrangement.

5.7.3 Traffic control measures

The conceptual Construction Traffic Management Plan attached in Appendix A incorporates traffic control measures for the proposed development. This traffic control measures are indicative and are subject to change depending upon future staging of works as well as site specific requirements. Further Traffic Management Plans shall be developed by the PPP Proponent to the satisfaction of City of Sydney Council and Roads and Maritime Services (RMS).

5.7.4 Other Considerations

The adjacent road network carries significant traffic volumes during morning and evening peak periods. All major construction vehicle movements including loading/unloading or spoil delivery/removal shall be avoided during peak traffic periods on business days i.e. between 7am to 9am during morning peak period and after 4pm in the evening peak period.

The reference design for the proposed development has been provided however, the development will require further refinement and staging for demolition/construction activities. As such, the detailed vehicle routes and number of trucks has not been determined at this stage. The major truck movements for the proposed Exhibition Centre and Entertainment Centre will be provided from Darling Drive. Further routes to/from the site will depend upon the source of construction materials as well as spoil dispose location which will be developed by the PPP Proponent and implemented to the satisfaction of local authorities and RMS.

The PPP shall also prepare Vehicle Management Plan for vehicle usage within the site covering all construction vehicle movements.

The detailed Traffic Management Plan prepared by the PPP Proponent should also incorporate any special events in the vicinity of the site which will affect the construction activities. The Traffic Management Plan should cover any systems, processes and personnel required for such special event.

The existing public transport services should not be affected by the site construction activities.

6. Travel Mode

6.1 Introduction & Background

The parking strategy and anticipated trip generation depends on many variables. The most significant determinant is considered to be the anticipated travel mode. This section summarizes the travel mode assessment and forms the basis on which the parking strategy is formed and the anticipated trip generation is estimated.

This section incorporates previous studies undertaken for the area, various assumptions, assessments of similar sites, and guidance from policies governing future development in the area.

An assessment of the travel mode split for similar sites has been undertaken in order to determine the most appropriate travel mode split target. Details of the similar sites are listed below.

6.1.1 Adelaide Convention Centre

The convention centre in Adelaide varies from the subject site in that it is not located adjacent to and Exhibition Centre or an Entertainment Centre. However, it is within close proximity to Adelaide Casino, Parliament House and Festival Theatre. The venue has a capacity to cater for 9,500 people and 1,200 parking spaces are provided. This equates to 1 parking space for every 8 people. It should be noted that the site is adjacent to a railway station and a taxi rank, and that a free bus service is provided within Adelaide City. Adelaide City Centre is also substantially smaller than Sydney City Centre, such that the travel mode split is likely to vary significantly.

6.1.2 Brisbane Convention & Entertainment Centre

The Convention and Entertainment Centre in Brisbane is not located adjacent to an Exhibition Centre. The venue has the capacity to cater for 17,500 people (including the theatre) and 1,600 parking spaces are provided. This equates to approximately 1 space for every 8.5 people. The site is located adjacent to South Brisbane train station and is within relatively close proximity to the Ferry terminal at South Bank. The site is also serviced by taxi ranks, 6 coach bays and a bus station within relatively close proximity.

6.1.3 Melbourne Convention & Exhibition Centre

The Melbourne Convention & Exhibition Centre is not located adjacent to an Entertainment Centre. At peak loadings, the centre caters for a maximum loading of 8,000 people. There are 1,060 spaces in the centre plus 550 spaces in South Wharf adjacent to the site as well as Freeway Car park within close proximity. This equates to 1 space for every 5 people. The site is serviced by a Tram stop adjacent to the site (which transports people to major train stations) as well as a bus service from Southern Cross Station to the Convention Centre. In addition there is a taxi rank and coach pick-up / drop-off available.

The recently constructed Melbourne Convention and Exhibition Centre (MCEC) included in its parking strategy the use of parking spaces within close proximity to the site. The MCEC is considered to be the most similar site to the currently proposed development in that it is close to the CBD, is located in a general entertainment precinct and near a casino. It is therefore anticipated that the parking provision for the proposed development will be quite similar.

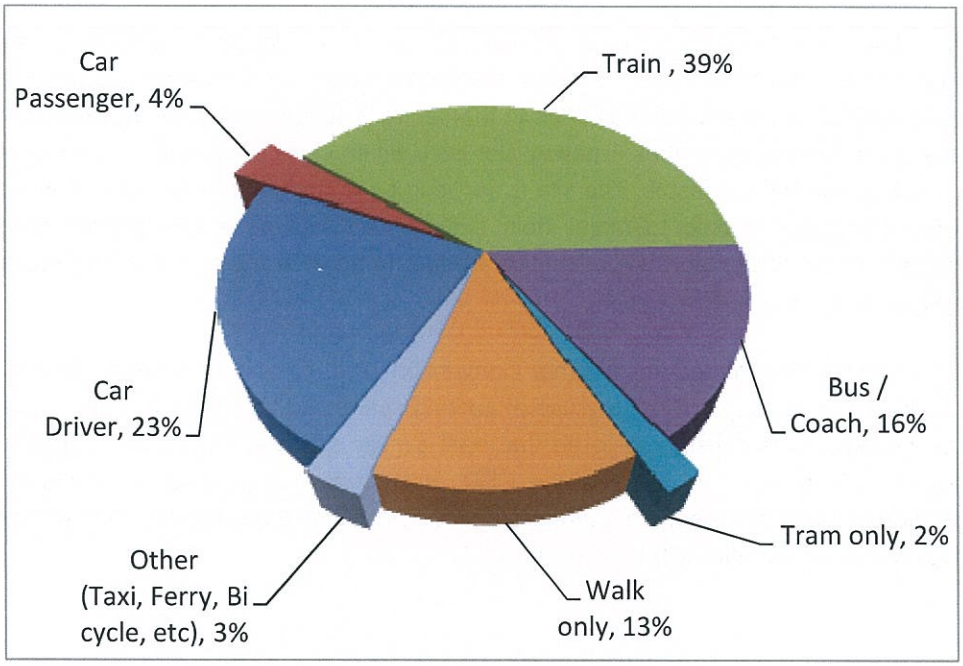
6.1.4 Sydney International Convention, Exhibition & Entertainment Centre

A detailed assessment of the travel mode and parking availability was undertaken and documented in the a Transport Management and Access Report prepared by Halcrow for the Sydney Harbour Foreshore Authority on 26 July 2011 (Halcrow Report). Details of the assessment are summarised below.

6.2 Journey to Work Data Assessment

The Halcrow report detailed an analysis of the Journey to Work (2006) data to determine the existing travel behaviour of the people working within the precinct. The results of the analysis are shown below in Figure 6.1.

Figure 6.1: Existing Travel Mode for the Precinct

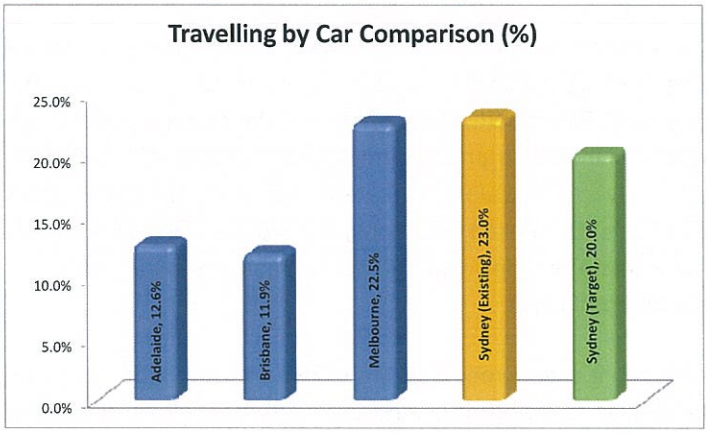


Source: Halcrow Report

The analysis revealed that there is a relatively high proportion of non-private vehicle modes used to access the site with 59% utilising public transport and 14% utilising active transport, namely walking and cycling.

Based on analysis of the parking provisions for similar sites, as well as considering their context relating to other transport infrastructure, a comparison of the proportion of people driving to these venues and to the proposed SICEEP development was undertaken. The results are summarised below in Figure 6.2.

Figure 6.2: Comparison of People Driving to Similar Venues



Source: Mott Macdonald

6.2.1 Car Reduction Target During Business Hours

Figure 6.2 above indicates two values for Sydney including the existing value of 23% and the target value of 20%. The target of 20% was initially set in the Halcrow report. The target aims to provide a reduction in the use of private vehicles as a travel mode. The reduction in car dependence reduces traffic on roads and is in line with the policies and guide lines set out to improve sustainable transport.

The target sets out an overall reduction of 3% of people driving to the venue, which may be considered marginal; however this proportionally represents a reduction in this particular mode of 13%. This is considered to be a satisfactory car reduction target and could be assisted in the future by the development of Travel Plans that outline public transport access and active travel alternatives available for each development within SICEEP.

A conservative (lower level) of traffic reduction has been adopted in the analysis contained within this report. This was done to identify an indicative 'worst case' traffic generation associated with the development. This would provide a robust assessment of the parking demand and traffic impact associated with the development. As with all assumptions included within this report the PPP proponent would be expected to make their own assessment of traffic and parking requirements.

6.2.2 Limitation of Journey to Work Data

The analysis undertaken was based on Journey to Work data and therefore resembles the travel mode for people working within the precinct. It is acknowledged that the travel mode for visitors may be different particularly given that their trips are less likely to be associated with work and therefore prefer other travel mode(s). For example, visitors to an event are less likely to travel alone and are therefore more likely to travel by car due to a reduction in costs associated with transport and / or parking. As such, the reduction target is appropriate to apply during typical business hours only (i.e. Monday to Friday between 9am and 5pm).

For the purpose of this analysis, it is assumed that the existing travel mode based on the Journey to Work data applies to day trips during the week as well as during the weekend only. The breakdown of travel mode during evenings, particularly during events, has been estimated based on several assumptions (as discussed throughout Section 6.2).

6.2.3 Travel Mode during Events (Visitor Behaviour)

Events associated with the site are generally organised to occur at the following times:

1. Typical working hours (i.e. between 8.30am and 6pm, Monday to Friday);
2. Weekday Evenings (i.e. after 6pm); or
3. Weekends (i.e. between 8.30am and 6-8pm or between 6-8pm and 10-11pm).

The breakdown of the travel mode based on the Journey to work data is more appropriate to adopt in (1) above; however during evenings and weekends it is anticipated that the travel mode will be different particularly given that the majority of visits are less likely to be work oriented and traffic on the road network is lower. The determination of an appropriate travel mode breakdown during events has been based on the Journey to Work data, and extrapolated to include several assumptions as follows:

- Larger events are usually held during weekday evenings or weekends;
- Visitors to events generally do not travel alone and are therefore more likely to travel by private vehicle and / or by coach;
- Private vehicles are preferred to public transport at night for safety reasons; and
- Major events are more likely to attract visitors from outer Sydney, interstate and from overseas, such that visitors are more likely to travel from nearby hotels via local buses, light rail, ferry or walking.

In light of the above the travel mode has been adjusted to more closely represent the likely travel mode split for visitors during evening events. The adopted travel mode split for existing visitors to evening events is shown below in Figure 6.3 and the comparison with the mode split based on the Journey to Work data is shown in Figure 6.4.

Figure 6.3: Estimated Existing Travel Mode during evening Events (%)

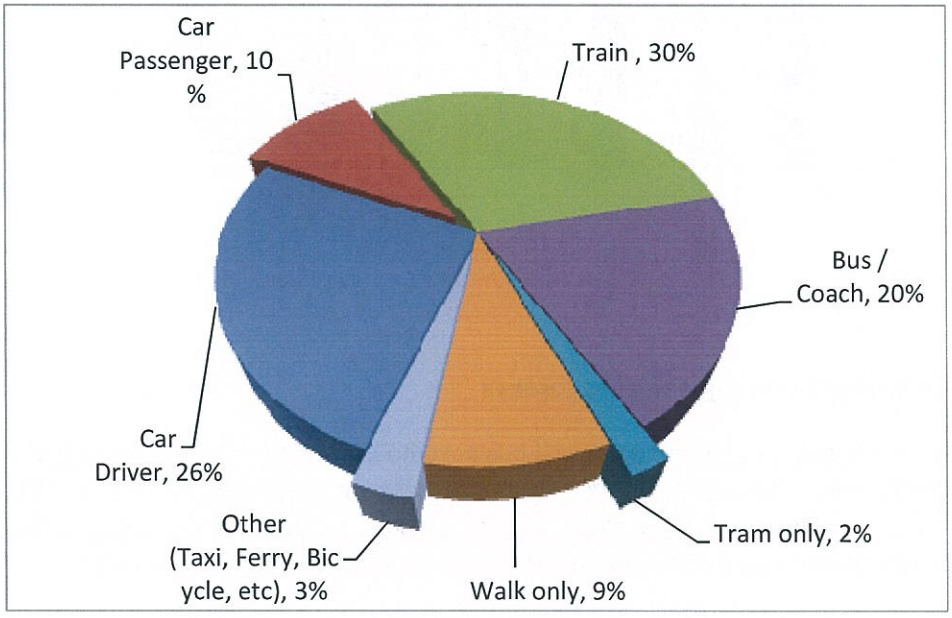
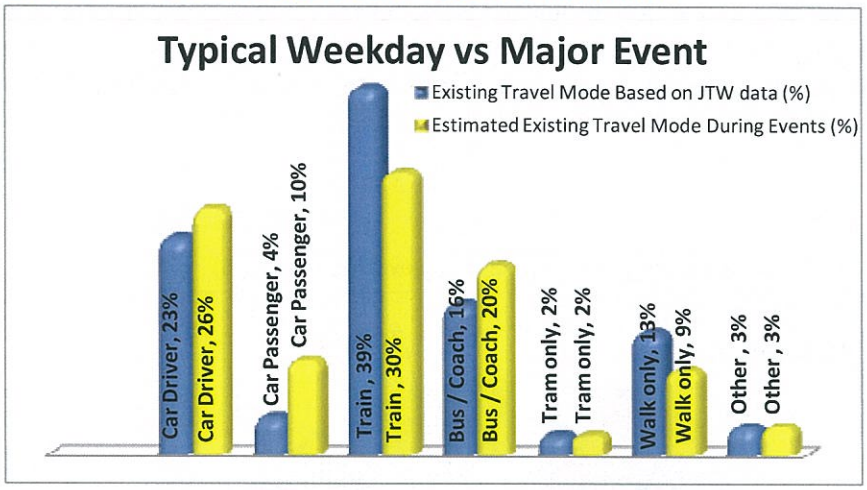


Figure 6.4: JTW Travel Mode vs evening Events Travel Mode



6.2.4 Car Reduction Target during Events

The car reduction target during typical business hours was to reduce the number of motorists driving from 23% to 20%. This represents a proportional reduction of 13%. The same reduction will be applied to the proportion of people driving during events such that the target will be to reduce the number of motorists from 26% to 22.5%.

This target has been adopted in determining the parking demand and trip generation.

7. Parking Strategy

7.1 On & Off-Site Parking Supply

The TMAP Assessment report prepared by Halcrow (dated 26 July 2011) included a summary of the parking supply and availability within a 5 minute walk of the site. The findings are summarised below in Table 7.1.

Table 7.1: Existing Parking Demand & Supply (July 2011)

Car Park	Supply	1:00 PM		6:00 PM	
		Occupied	Available	Occupied	Available
SEC	1900	926	974	1423	477
SCEC	900	800	100	600	300
World Square	557	495	62	330	227
Market City	614	546	68	364	250
Thomas Street	600	533	67	355	245
Total	**4571**	**3300**	**1271**	**3072**	**1499**

Source: Halcrow SICEC TMAP Report 2011

600 spaces in the Sydney Entertainment Centre have been reserved for the use of Darling Quarter leaving a parking supply of only 1300 spaces. The SCEC car park will be demolished as part of the redevelopment of the SICEEP precinct thereby changing the total number of spaces available.

The estimated future parking supply and demand off site is shown below in Table 7.2. The table takes into account additional car parks within 300m of the site that were not included in the Halcrow report. It is assumed that the parking occupancy for off-site parking spaces is 89% at 1pm and 59% at 6pm and that occupancy decreases later in the evening. This assumption is based on the occupancy of site as observed in the Halcrow report.

Table 7.2: Future Parking Demand & Supply

Car Park	Supply	1:00 PM		6:00 PM	
		Occupied	Available	Occupied	Available
World Square (Secure)	557	495	62	330	227
Market City (Wilson)	614	546	68	364	250
Thomas Street (Wilson)	600	533	67	355	245
Harbourside	1387	1235	152	819	568
Darling Quarter (Wilson)	600	534	66	354	246
Harris Street (Secure)	260	232	28	154	106
No 1 Dixon (Secure)	130	116	14	77	53
Capitol Square	TBC	TBC	TBC	TBC	TBC
Cinema Centre (Secure)	700	623	77	413	287
Darling Park (Wilson)	1000	890	110	590	410
234 Sussex St (Secure)	TBC	TBC	TBC	TBC	TBC
St Andrews House (Wilson)	TBC	TBC	TBC	TBC	TBC
Citigate Central (Mirvac)	630	561	69	372	258
Star City (Casino)	2500	1218	1282	912	1588
Darling Wharf	TBC	TBC	TBC	TBC	TBC
Citipark Sydney (Wilson)	TBC	TBC	TBC	TBC	TBC
Atrium (Interpark)	61	55	6	36	25
2 Market Street (Secure)	TBC	TBC	TBC	TBC	TBC
Total	**9039**	**7038**	**2001**	**4776**	**4263**

7.2 Parking Demand

The proposed development includes several activities that are anticipated to be managed to occur at different times . Nevertheless, it is anticipated that on occasion, these activities will occur simultaneously. For the purpose of assessing the peak parking demand two scenarios have been assessed including:

- Weekend Peak (a large event occurring at the Exhibition Centre on a Saturday); and
- Friday Evening (a number of events occurring at different venues).

7.2.1 Peak Parking Demand during Exhibition Centre Events

Historical records indicate that the largest event held at the exhibition centre is the International Motor Show which peaks during weekends. It is noted that this event is planned to be relocated to another venue by 2014, however, for the purpose of this assessment it still represents the worst case scenario which is likely to occur once or twice per year.

With the exception of 2009, this is an annual event attracting approximately 180,000 to 250,visitors over 10 days with the highest recorded attendance over one day (i.e. from 10am to10pm) being in the order of 25,000pax during a Saturday. Little or no competing events are held during the peak Saturday in the Entertainment and Convention Centres in order to manage traffic conditions and parking availability.

Conservatively assuming that 30,000 visitors is the upper limit expected to be attending the site during such a Saturday, it is estimated that a maximum of 6500 visitors will be attending the site at any one time. This assumption is based on spreading the total visitors over the entire day.

By adopting the 22.5% target for visitors driving to the site during events, it is anticipated that the peak parking demand on a Saturday will be in the order of 1,463 spaces (say 1,500 spaces).

Given that the very few events, if any, are anticipated to be held at the entertainment arena or convention centre during the Convention Centre's Saturday peak, it is envisaged that the parking demand of 1,500 spaces will be completely catered for on site by the 1,600 spaces provided on site.

7.2.2 Peak Parking Demand for Several Concurrent Events

The peak parking demand during the week is predominantly associated with the Entertainment Centre. Currently, the larger events associated with the Entertainment Centre are held on weekday evenings. This trend is anticipated to continue.

In order to assume a realistic worst case scenario in this assessment, it is assumed that the Convention Centre and Entertainment Centre will operate at peak on the same day, with only a small proportion of the Exhibition Centre being used. The site is anticipated to be managed such that the peak parking demand for each site will not occur simultaneously. In this scenario, it is envisaged that the peak parking demand for the Convention Centre and the Exhibition Centre are likely to occur during typical working hours (i.e. between 9am and 5pm) and that the peak parking demand for the Entertainment Centre is likely to occur after 8pm, most likely on a Friday.

The peak parking demand for each land use has been estimated below.

Table 7.3: Peak Parking Demand per Land Use

Land Use	Visitors	Visitors Driving	Peak Parking Demand
Exhibition Centre	4000	20%	800
Entertainment Centre	8000	22.5%	1800
Convention Centre	4500	20%	900

The higher proportion of drivers for the Entertainment Centre is anticipated due to the event occurring during the evening (i.e. 8pm onwards). The other two land uses are anticipated to peak during typical business hours.

In light of the above, the change in parking demand throughout the day has been estimated for each land use in order to determine the peak parking demand for the entire site during a Friday evening. The estimated numbers are shown below in Figure 7.1.

Figure 7.1: Anticipated Parking Demand

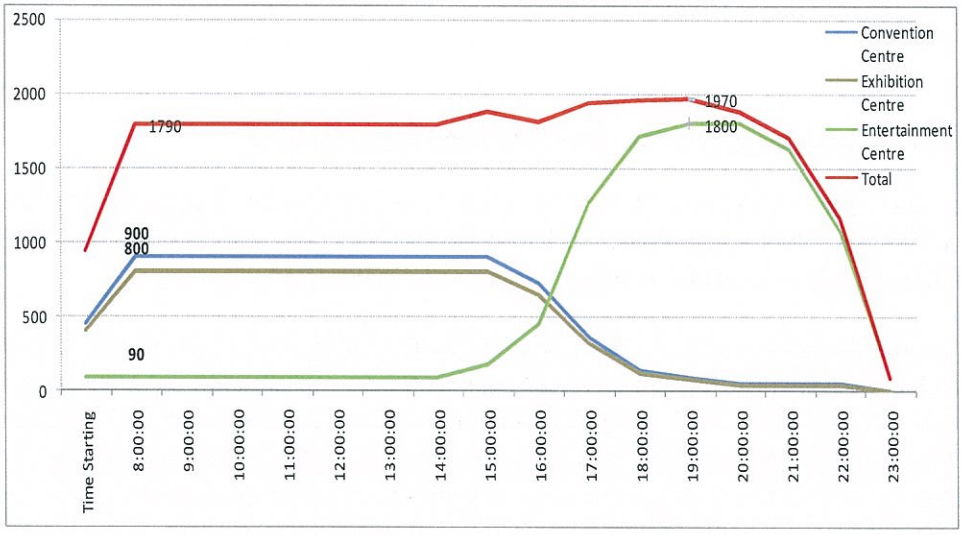


Figure 7.1 indicates that the peak parking demand (approximately 1970 parking spaces) will occur in the evening, after the typical weekday traffic peak period and is predominantly associated with the Entertainment Centre.

Based on the proposed number of parking spaces on site (1,600 spaces), it is envisaged that the proposed development will rely on approximately 200 and 400 off-site spaces during business hours and in the evening respectively.

The surveys undertaken for parking availability within close proximity to the site indicate that there are approximately 2,000 and 4,850 spaces available at 1pm and at 6pm respectively.

In light of the above, it is anticipated that the proposed development will not have any significant adverse impact on parking availability during weekdays and Weekends. It should be noted that the assessment is an observation of an estimated worst case scenario which is not anticipated to occur regularly, thereby strengthening the robustness of the parking assessment.

8. Traffic Impacts

8.1 Background

The review of existing traffic volumes on the adjacent road network suggests that the peak traffic movements on surrounding road network occur on Friday evening between 5.30pm and 6.30pm. The peak traffic volumes on Friday evening include vehicular traffic from commuters leaving their workplace as well as visitors arriving to the City to attend Friday night events. The Friday evening peak period is considered as a worst case scenario for the traffic movements in the vicinity of the site and as such, the traffic impact assessment of the proposed development has therefore been undertaken for the Friday evening peak period. During other times of weekdays and weekends traffic volumes on surrounding road network are significantly lower and as such traffic impact is expected to be less significant.

8.2 Trip Generation

There are no published Australian guidelines on the trip generation rates for these types of facilities e.g. Convention Centre, Exhibition Centre, Entertainment Centre. As such, trip generation for the proposed development has been derived from the anticipated car parking demand for each land use of the proposed development and similar developments in other major cities. The anticipated car parking demand for the development has been discussed in Section 7.2 of the report.

The trip generation rates adopted for each land use of the proposed development is detailed below including their anticipated in/out split from/to the site. The trip generation rates adopted below represent the worst case scenario.

8.2.1 The Convention Centre

The convention centre is anticipated to be utilised for a wide range of events and the nature of these events will influence the volume and brief patterns of trip making associated with them. In terms of determining the impacts of this trip generation on the adjacent road network, the worst case scenario would involve an all-day function in which delegates arrive in the morning and depart in the afternoon. The anticipated peak parking demand for the Convention Centre is 900 spaces. It is conservatively assumed that the total trip generation for the Convention Centre is 80% of the anticipated peak car parking demand. This equates to a trip generation of 720 vehicles per hour (vph) during the Friday evening peak period. The in/out split for the Convention Centre has been determined by assuming that the majority of traffic will

depart during the evening peak period. The trip generation for the evening peak period has been determined by assuming 80% outbound trips and 20% inbound trips.

The trip generation for the Convention Centre including their in / out split determined by adopting the abovementioned assumptions and summarised in Table 8.1.

Table 8.1: Anticipated Trip Generation for the Convention Centre

Land Use	Anticipated peak Parking Demand # (vph)	% Turnover	Total Trips (vph)	In/Out Split		In/Out Trips (vph)
Convention Centre	900	80%	720	In	20%	144
				Out	80%	576

8.2.2 The Exhibition Centre

The Exhibition Centre is anticipated to be utilised similar to the Convention Centre which will cater for meetings, conferences, exhibitions and special events. The worst case scenario would involve an all-day function in which delegates arrive in the morning and depart in the afternoon. The anticipated peak parking demand for the Exhibition Centre is 800vph (Refer Section 6). It is conservatively assumed that the total trip generation for the Exhibition Centre is 80% of the anticipated peak car parking demand. This equates to a trip generation of 630vph during the Friday evening peak period. The in/out split for the Convention centre has been determined by assuming that the majority of traffic will depart during the evening peak period. The trip generation for the evening peak period has been determined by assuming 80% outbound trips and 20% inbound trips. The trip generation for the Exhibition Centre including their in / out split determined by adopting the abovementioned assumptions and is summarised in Table 8.2.

Table 8.2: Anticipated Trip Generation for the Exhibition Centre

Land Use	Anticipated peak Parking Demand # (vph)	% Turnover	Total Trips (vph)	In/Out Split		In/Out Trips (vph)
Exhibition Centre	800	80%	640	In	20%	128
				Out	80%	512

8.2.3 The Entertainment Centre

The Entertainment Centre is likely to generate a much different pattern of travel to the Convention Centre and Exhibition Centre and because of the nature of the events held. The entertainment Centre may be utilised for concerts which mainly occurs during later evening hours/night time outside of the business peak periods. Nevertheless, a conservative 25% trip generation of the peak parking demand has been assumed for the evening peak period where small proportion of visitors are anticipated to travel during evening peak period. The anticipated peak parking demand for the Entertainment Centre is 1,800vph for a 25% conservative turnover, a trip generation of the Entertainment Centre is 450vph during the evening peak period. The in/out split for the Entertainment Centre has been determined by assuming that the vast majority of traffic will arrive during the late evening period and leave at night after the events. The trip generation for the evening peak period has been determined by assuming 90% inbound trips and 10% outbound trips.

The trip generation for the Entertainment Centre including their in/out split has been determined by adopting the abovementioned assumptions and is summarised in Table 8.3.

Table 8.3: Anticipated Trip Generation for the Entertainment Centre

Land Use	Anticipated peak Parking Demand # (vph)	% Turnover	Total Trips (vph)	In/Out Split		In/Out Trips (vph)
Entertainment Centre	1800	25%	450	In	90%	405
				Out	10%	45

The total trip generation and In/out split for the entire SICEEP precinct is summarised in Table 8.4.

Table 8.4: Total Trip Generation - SICEEP Precinct

Land Use	Anticipated peak Parking Demand # (vph)	Total Trips (vph)	In/Out Split	In/Out Trips (vph)
SICEEP Precinct	3500	1810	In	677
			Out	1133

The trip generation for the proposed development also depends on the on-site car parking supply within the SICEEP precinct as well as off-site car parking supply in the close proximity to the site. The proposed on-site car parking supply includes 300 car parking spaces in the North Precinct and 1,300 car parking spaces in the South Precinct. Any additional car parking demand is anticipated to be accommodated within the Off-Site Car parks in close proximity of the site. The trip generation of the proposed development has been proportionately allocated to the proposed car parking supply and summarised in Table 8.5.

Table 8.5: Allocation of Trip Generation to each car park (for Friday Evening Peak period)

Carparks	Caparking Supply	Proportion of Parking	In/Out Split	In/Out Trips (vph)
North Precinct	300	16.6%	In	112
			Out	188
South Precinct	1300	71.8%	In	486
			Out	814
Off-site carparks	210	11.6%	In	79
			Out	131
Total	**1810**	**100.0%**	**In**	**677**
			Out	**1133**

8.2.4 Trip Distribution

The trip distribution has been estimated based on the existing traffic flows in the vicinity of the site as well as the anticipated travel pattern to/from the site. For each car park access, trip distribution has been estimated based on the anticipated travel pattern to/from major roads and discussed below:

North Precinct car park (SICEEP)

The northern precinct of the SICEEP caters for 300 car parking spaces and will have direct access from Darling Drive. The trip distribution to/from the North Precinct of the site is shown in Appendix B The following assumptions included for trip distribution from North Precinct of the site.

- 30% trips anticipated to arrive from western suburbs by using M4 Western Distributor Freeway and then through Darling Drive (north) with left turn entry to the site. The same proportion of trips will leave the site using the same route;

- 10% trips anticipated to arrive from western suburbs by using Great Western Highway and then through Darling Drive (south) with right turn entry to the site. The same proportion of trips will leave the site using the same route;
- 30% trips anticipated to arrive from northern suburbs by using M4 Western Distributor Freeway and then through Darling Drive (north) with left turn entry to the site. The same proportion of trips will depart through Darling Drive (south) - Pier Street - Harbour Street route to access M4 Western Distributor Freeway;
- 20% trips anticipated to arrive from southern suburbs by using Eastern Distributor Motorway and then through Cross City Tunnel and then through Darling Drive (north) with left turn entry to the site. The same proportion of trips will depart through Darling Drive (south) - Pier Street - Harbour Street route to access M4 Western Distributor Freeway; and
- 10% trips anticipated to arrive from southern suburbs through other routes and will travel through Great Western Highway-Harris Street-Ultimo Road - Darling Drive (south) with right turn entry to the site. The same proportion of trips will leave the site using the same route.

9. Traffic Impact Assessment

9.1 AIMSUN Modelling

The traffic modelling used in the analysis has been undertaken utilising the dynamic software AIMSUN (Advanced Interactive Microscopic Simulator for Urban and Non-Urban Networks)

The modelling results are based on traffic data provided and collected at the time. Traffic patterns and volumes as well as signal operation are subject to variation at different times for a variety of reasons. It is not possible to model all these variations and for this reason this modelling is an approximation only of the actual traffic operation. For example SCATS, the traffic signal software used by RTA to manage traffic operations, has the ability to adjust signal phasing at intersections dependent on variations in demand to improve traffic operational efficiency, this has the potential to reduce delays to some traffic movements and at the same time adversely affect other traffic movements.

The program provides output inclusive of vehicle delays and queues at intersections. The vehicle delays can be correlated to a level of service utilising the HCM method which ranks both intersection & traffic movement level of service based on average vehicle delay as outlined below:

Level of Service (LOS)	
A	Excellent -- vehicles unaffected by other vehicles
B	Very Good – intersection has spare capacity
C	Good – generally intersection operating satisfactorily
D	Acceptable – intersection operating near capacity
E	Poor - at capacity and may require intersection improvements
F	Very Poor- unsatisfactory & requires intersection improvements

9.2 Methodology

The surrounding road network for the SICEEP was identified as consisting of Darling Drive from Murray Street to Quay Street, Pier Street from Darling Drive to Harbour Street and Harbour Street from Liverpool Street to Hay Street.

From this the following intersections were highlighted as key points affecting traffic movements surrounding the SICEEP:

The Intersections analysed include:

- Darling Drive with Murray Street and Union Street
- Darling Drive and Pier Street
- Darling Drive and Quay Street
- Harbour Street and Liverpool Street
- Harbour Street with Pier Street and Goulburn Street

Traffic Data Obtained:

- 24 hour daily mid block counts were taken in Harris Street and Darling Drive to reflect the traffic volume trends.
- Peak Hour counts at the intersections listed above.
- Site observations
- SCATS data

From the combination of this data an AIMSUN micro-simulation model was constructed to represent the existing traffic movements around the SICEEP site.

Friday evening peak hour from 5:30pm to 6:30pm was used as representing the network under usual high level traffic flow and would also be beneficial to illustrate impacts on traffic for future development of the SICEEP site.

It should be noted that the model needs to be validated to ensure that it is in accordance with the Paramics micro-simulation modelling – RTA manual.

9.3 Traffic Movements for SICEEP

Review of the daily traffic movements over a weekly period indicated that traffic from Monday to Thursday followed similar trends and volumes through the day. For these days the morning peak hour was between 8am and 9am and the evening peak hour was between 5pm and 6pm. The evening being the greater in volume of the two daily peak.

This trend changed on Friday with the traffic still increasing till 9am but then staying relatively constant through the day until 6pm where the traffic lulled until started to begin to peak again at 9pm until a daily high at midnight.

Weekend traffic also showed a different traffic pattern with high volume of traffic in the early morning to a low at 6am then steadily increasing during the day. Saturday traffic has the highest daily volume and the highest peaks 7pm and 11pm.