

APPENDIX F

TRAFFIC AND TRANSPORT ASSESSMENT - GTA



505-523 George Street, Sydney
Proposed Mixed Use Development
Planning Proposal
Traffic Assessment

transportation planning, design and delivery

505-523 George Street, Sydney

Proposed Mixed Use Development Planning Proposal

Traffic Assessment

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1. Introduction

This report presents the findings of a traffic and parking assessment for a proposed mixed use development at 505-523 George Street, Sydney. This report accompanies a planning proposal to the City of Sydney Council seeking approval to amend the current height control from 150m to 260m.

The proposal involves the demolition of an existing building on the site and construction of a new 75-level tower in its place to accommodate some 588 residential apartments plus non-residential uses on the podium levels and seven basement car park levels. The proposed vehicular access will be from Kent Street consistent with existing access arrangement for the site.

This report has been prepared by GTA Consultants on behalf of Mirvac Projects Pty Ltd and CFT No. 4 Pty Ltd. It describes the proposed development and examines the traffic and parking implications of the proposed development.

The remainder of the report is set out as follows:

- Chapter 2 discusses the existing road network conditions surrounding the site
- Chapter 3 describes the proposed development
- Chapter 4 examines the traffic impacts arising from the proposed development
- Chapter 5 assesses the parking demand, and
- Chapter 6 presents the conclusions of the investigation.

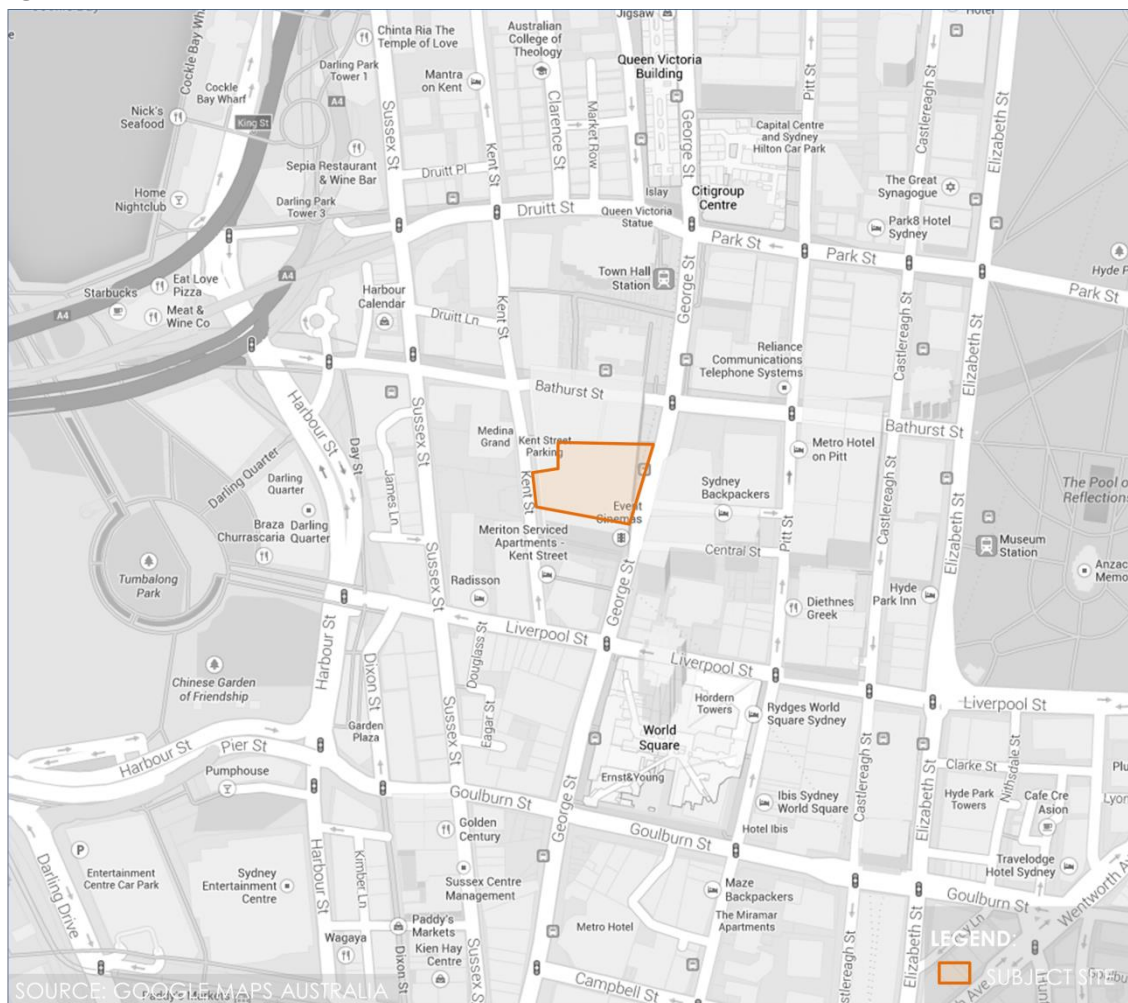
2. Existing Conditions

2.1 Site Location and Description

The subject site is located at 505-523 George Street, Sydney between Bathurst Street and Liverpool Street. The site has frontages to both George Street and Kent Street.

Figure 2.1 below indicates the location of the proposed development and the surrounding road network in the immediate vicinity of the site.

Figure 2.1: Site Location Plan



The site is currently occupied by a two level building accommodating the Event Cinema Complex which includes an amusement centre plus a number of small retail/commercial tenancies. The existing uses have the following approximate floor areas:

- cinema 9,977m²
- retail 1,536m²
- office 2,088m²

The site is located within the Sydney CBD core, and is approximately 230m walking distance to Town Hall Railway Station and approximately 900m walking distance to Central Railway Station.

Vehicular access to a limited number of on site car parking spaces and a loading dock is provided via a driveway at Kent Street.

Patrons and visitors to the cinema and other existing uses on the site predominantly rely on existing good public transport services for access to the site. Those who drive to the site typically rely on nearby paid public car parks such as the Cinema Centre Car Park at 521 Kent Street, Sydney.

2.2 Road Network

The road network in the vicinity of the site comprises:

- George Street
- Bathurst Street
- Liverpool Street
- Kent Street.

George Street is a major north-south arterial road through the area. It generally has one traffic lane and one bus lane in each direction. An additional southbound traffic lane is added to the section of George Street immediately adjacent to the site. George Street has a posted speed limit of 50km/hr. George Street connects Broadway near the southern fringe of the CBD area to Circular Quay and The Rocks to the north of the CBD area.

Bathurst Street and Liverpool Street are located to the north and south of the site respectively and provide east-west arterial routes through the city. Bathurst Street and Liverpool Street operate as a one-way pair system with Bathurst Street being one-way eastbound and Liverpool Street being one-way westbound. Bathurst Street has four lanes west of Kent Street comprising two traffic lane plus two kerbside part-time traffic lanes. East of Kent Street a fifth traffic lane is provided on Bathurst Street for right turning traffic into George Street. Liverpool Street has two traffic lanes with kerbside parking. Both Bathurst Street and Liverpool Street have a posted speed limit of 50km/hr.

Kent Street is located adjacent to the western boundary of the site and combines with Sussex Street to provide a north-south one-way pair system. Kent Street is one-way northbound and provides access to the Sydney Harbour Bridge and Anzac Bridge. In the vicinity of the site Kent Street generally provides two traffic lanes and two parking lanes.

The majority of the intersections in the vicinity of the site are controlled by traffic signals with the exception of Liverpool Street with Kent Street. In addition, there are traffic signals controlling pedestrian movements across George Street to the south of the site, at Central Street.

It is noted that City of Sydney is proposing public domain works on Central Street and Wilmot Street. Council proposes to convert Wilmot Street to allow two-way traffic flows between George Street and Pitt Street, and reverse the direction of the existing one-way traffic flow for Central Street.

As a result, the signalised intersection at Central Street with George Street would be redundant and at this location a new mid-block signalised pedestrian crossing would be available. In addition, Council also proposes to provide shared zones on both Central Street and Wilmot Street. Roads and Maritime Services (RMS) has approved the shared zones. It is expected that the works would be completed by the end of 2014. The works will result in some re-direction of traffic, but the overall traffic effects would negligible to the surrounding road network.

2.3 Traffic Flows

Intersection turning movement counts were conducted at the following two nearby intersections:

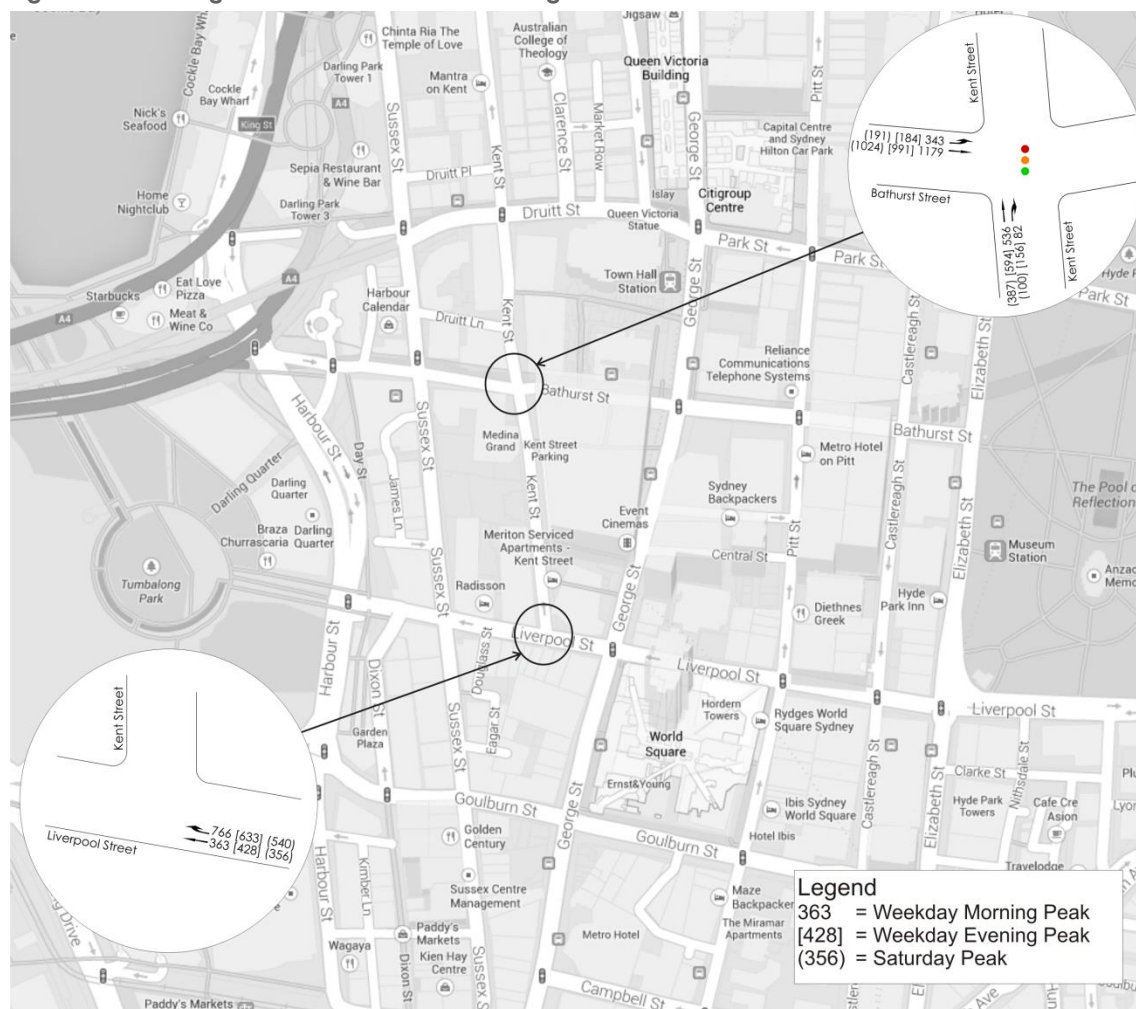
- Bathurst Street-Kent Street
- Liverpool Street-Kent Street

The counts were conducted during the following peak periods:

- Thursday (3 April 2014) evening peak period from 4:00pm to 8:00pm
- Friday (4 April 2014) morning peak period from 7:00am to 9:00am
- Saturday (5 April 2014) late morning/lunchtime peak period from 11:00am to 1:00pm.

Figure 2.2 presents the peak hour flows derived from the above traffic counts.

Figure 2.2: Existing Peak Hour Intersection Turning Movement Flows



From the survey results, Bathurst Street has a peak hour flows of some 1,175 vehicles per hour (vph). Similarly, Liverpool Street carries some 1,061 vph during the busiest peak hour while Kent Street carries some 750 vph.

These surveyed hourly flows are consistent with the expected traffic flows for roads with similar function.

2.4 Public Transport

The site is located in the centre of the Sydney CBD, adjacent to Town Hall Station. It is also in close proximity to major bus routes serving the CBD along George Street, Clarence Street, Castlereagh Street, Elizabeth Street and York Street. The main public transport modes in the vicinity of the site are rail and bus services. These transport modes are described below.

2.4.1 Rail Access

The site is located within walking distance (240m) to Town Hall Railway Station. Town Hall Railway Station provides public train services to virtually the entire Sydney metropolitan area. Town Hall Railway Station is part of the City Circle Stations serving the wider CBD area. Town Hall Railway Station offers a high frequency train service in either direction.

2.4.2 Bus Access

George Street is a major route with two-way services to the south-west, west and north-west of the Sydney metropolitan area. York Street and the terminus at the Queen Victoria Building are important for routes from the north-west and some routes from the north. The north-west routes generally use Market Street and Druitt Street whilst York Street and Clarence Street serve the northern routes. Other northern routes terminate at Wynyard Park. There are additional bus services along Elizabeth and Castlereagh Street accessing the east, south-east and south of the Sydney metropolitan area.

The site is located within 300 meters of virtually all the major bus routes serving the CBD. The site is thus highly accessible by bus.

2.5 Pedestrian Facilities

Fully formed pedestrian paths are generally available on all streets in the immediate vicinity of the site.

Controlled pedestrian crossings are available at all nearby intersections which are controlled by traffic signals. A signalised crossing is also available on George Street immediately in front of the subject site (at Central Street).

In summary, the site is located within the core of the City. In this location it is accessible on foot and by public transport. The road network around the site, although busy, generally functions satisfactorily.

The site, being located in close proximity to Town Hall Station and major bus routes serving the CBD, is highly accessible for pedestrians.

3. Development Description

3.1 The Proposed Development

The development proposal involves the demolition of an existing on site building and construction of a 78-level tower to accommodate a mixed use development with predominantly residential apartments.

The proposed development would comprise the following indicative mix of land uses:

- residential apartments – approximately 53,420m² of gross floor area (GFA) with the following apartment mix:
 - studios – 66 apartments
 - 1-bedroom units – 176 apartments
 - 2-bedroom units – 305 apartments
 - 3-bedroom units – 41 apartments
 - total – 588 apartments
- retail – approximately 10,909m² GFA
- community use – approximately 250m² GFA
- childcare centres (see below)
- total approximately 64,580m² GFA.

It is proposed to provide two childcare centres as part of the development proposal. However, at this stage the size and type of the childcare centres are not known. For the purpose of this traffic assessment, it is assumed that each childcare centre would have 65 children with 10 staff (i.e. 130 children and 20 staff in total). Childcare operators will be appointed at a later time, after which further details will be available.

The non-residential uses will be accommodated on the podium and ground floor levels while the residential apartments will be located in the upper tower levels.

The proposed development includes seven basement car parking levels with loading facilities located near the upper basement level.

3.2 Vehicle Access Arrangements

The site currently has its vehicular access off Kent Street.

It is proposed to continue to have a vehicular access off Kent Street to serve the proposed development.

Kent Street has a flat terrain and its road alignment is straight. A vehicle access on Kent Street can be appropriately designed to take advantage of the flat terrain and straight road alignment. As such, there would not be any adverse issues relating to sight lines to both pedestrians walking along the frontage footpath and passing traffic along Kent Street.

The design of the vehicle access and associated roadway connecting to the car parking and loading areas is proposed to comply with the requirements set out in the Australian Standard (AS2890.1:2004 and AS2890.2:2002) and Council's relevant design standard and guidelines.

4. Traffic Assessment

4.1 Traffic Generation Estimates

4.1.1 Existing Use

As indicated previously, the site is currently occupied by the Event Cinema complex which includes the following elements and floor areas:

- cinema – a floor area of some 9,977m²
- retail use – a floor area of some 1,536m² which includes an amusement centre
- office – a floor area of some 2,088m².

The existing cinema use generates the vast majority of patrons and, by association, vehicle movements to and from the site. The existing retail and office uses generate minimal traffic.

It is noted that the site does not currently provide on-site parking for the cinema patrons. Instead, parking for cinema patrons is available at nearby paid public car park such as the Cinema Centre Car Park at 521 Kent Street, Sydney.

4.1.2 Cinema Use Traffic Generation

It is noted that a cinema use is no longer being contemplated in the current proposed development scheme. As such, existing traffic generated by the existing cinema use would be removed altogether from the local road network.

4.1.3 Office and Retail Use Traffic Generation

The current proposed development scheme also does not include a specific office use. Instead, it is proposed to provide a community use on the site. The community use would have a gross floor area of some 250m². For the purpose of this traffic assessment, it is assumed that the proposed community use would generate development traffic and parking demand at a similar rate to that of a traditional office use.

The retail use floor area is proposed to be increased from its current 1,536m² to some 10,909m². However, traditionally retail uses in a major city centre like the Sydney CBD typically generates very low or no development traffic at all as these retail uses tend to generate custom from workers working in nearby buildings and/or residents living in nearby buildings. In addition, Sydney CBD is well served by public transport. As such, travel by private vehicles is generally not necessary.

Separately, the traffic generation potential of the proposed retail and commercial uses would be largely governed by the available parking allocated to these two uses. It is proposed to provide some 15 car parking spaces for these two uses (see Section 5). These would be allocated to tenants of the commercial and retail tenants. No additional parking is proposed for visitors to the commercial and retail businesses. At worst, these 15 spaces would generate some additional 15 vph during the peak periods.

4.1.4 Childcare Traffic Generation

Similarly, the proposed childcare centres are not expected to generate significant volume of development traffic as it is expected to draw its businesses from childcare users living and working in the vicinity of the site.

At worst, it is expected that the childcare centres would generate 17 vph during the peak periods on account of the 17 LEP 2012 required parking spaces to be provided (see Section 5).

The removal of existing development traffic arising from the cinema use would be greater than any additional traffic that would be generated by the office, retail and childcare uses. The net effect is that there would be less development traffic arising from the non-residential uses on the subject site compared with existing levels of traffic generation.

4.1.5 Residential Use

RMS has recently released a Technical Direction (TDT2013/04) providing a summary of trip generation rates for various land uses to replace the suggested trip rates in their *Guide to Traffic Generating Developments*, 2002.

A summary of the traffic generation rates for high density residential apartments in Sydney metropolitan area is presented in Table 4.1.

Table 4.1: High Density Residential Apartment Traffic Generation Rates

Surveyed Sites	Weekday Morning Peak vph per apt	Weekday Evening Peak vph per apt	Saturday Peak Period vph per apt
St Leonards†	0.14	0.07	0.31
Chatswood†	0.14	0.12	0.21
Cronulla	0.07	0.11	0.18
Rockdale	0.32	0.18	0.23
Parramatta†	0.27	0.12	0.22
Liberty Grove	0.28	0.41	0.31
Strathfield†	0.1	0.06	0.32
Pymont	0.18	0.1	0.19
Sydney Metro Average	0.19	0.15	0.25
Sites Adjacent to Public Transport	0.16	0.09	0.27

Source: RMS Technical Direction TDT2013/04

† - denotes sites within close proximity to easy access public transport services

An examination of the sites located in centres with good public transport services (i.e. heavy rail) reveals the following traffic generation rates:

- 0.16 trips per peak hour per apartment during the weekday morning peak period
- 0.09 trips per peak hour per apartment during the weekday evening peak period
- 0.27 trips per peak hour per apartment during the Saturday peak period.

Using the above traffic generation rates, the proposed 588 residential apartments would generate some 53 - 94 vph during the weekday peak period and some 159 vph during the weekend peak period.

However, none of the RMS survey sites were located within the Sydney CBD. Thus, a survey of a similar CBD site was undertaken to validate the RMS Sydney average rates.

Traffic generation surveys were conducted at the Lumiere development at 101 Bathurst Street to the immediate north of the subject site. The survey indicates it generates some 51 vph during a weekday morning peak and some 55 vph during a typical weekday evening peak period.

The traffic report that accompanied the development application for the Lumiere development assessed the traffic implications based on the following development yield:

- 447 residential apartments
- 140 serviced apartments
- 3,048m² of commercial development
- 5,331m² of retail development.

The DA traffic report estimated that the residential component would generate approximately 140 vph (based on average traffic generation rates for high density residential apartments suggested by the then RTA now RMS) plus an additional 20 vph arising from the commercial/retail uses (on account of the 19 car parking spaces allocated to the retail and commercial use). As such, the Lumiere development was expected to generate a total of 160 vph during the peak periods.

The actual traffic generation of the Lumiere development (as reported above) is some 34 per cent of the estimated development traffic. This is consistent with the expectation that developments in a major CBD centre within close proximity to public transport services and amenities within walking distance would have significantly lower traffic generation than that predicted using RMS average generation rates.

Furthermore, a separate survey of the mixed use development at 537-551 George Street (Meriton Serviced Apartments Kent Street) which contains some 431 apartments with additional retail uses on the ground indicates that this development generates similar level of development traffic to the Lumiere development (some 46 vph during the morning peak period).

Given that the proposed development on the subject site has similar number of residential apartments to that of the Lumiere development (588 apartments within the subject development proposal c.f. 586 apartments in the Lumiere development) and similar amount of car parking allocated to the commercial/retail uses, it is expected the proposed development would have similar development traffic to that surveyed for the Lumiere development.

In addition to this, an additional 17 vph is added to the weekday peak periods to account for the any additional traffic arising from the proposed childcare centres.

The expected development traffic for the proposed development at 505-523 George Street during a Saturday peak period was estimated by applying the same proportion between the RMS average weekday generation rate to the weekend traffic generation rate (presented in Table 4.1). The resultant development traffic generation is presented in Table 4.2.

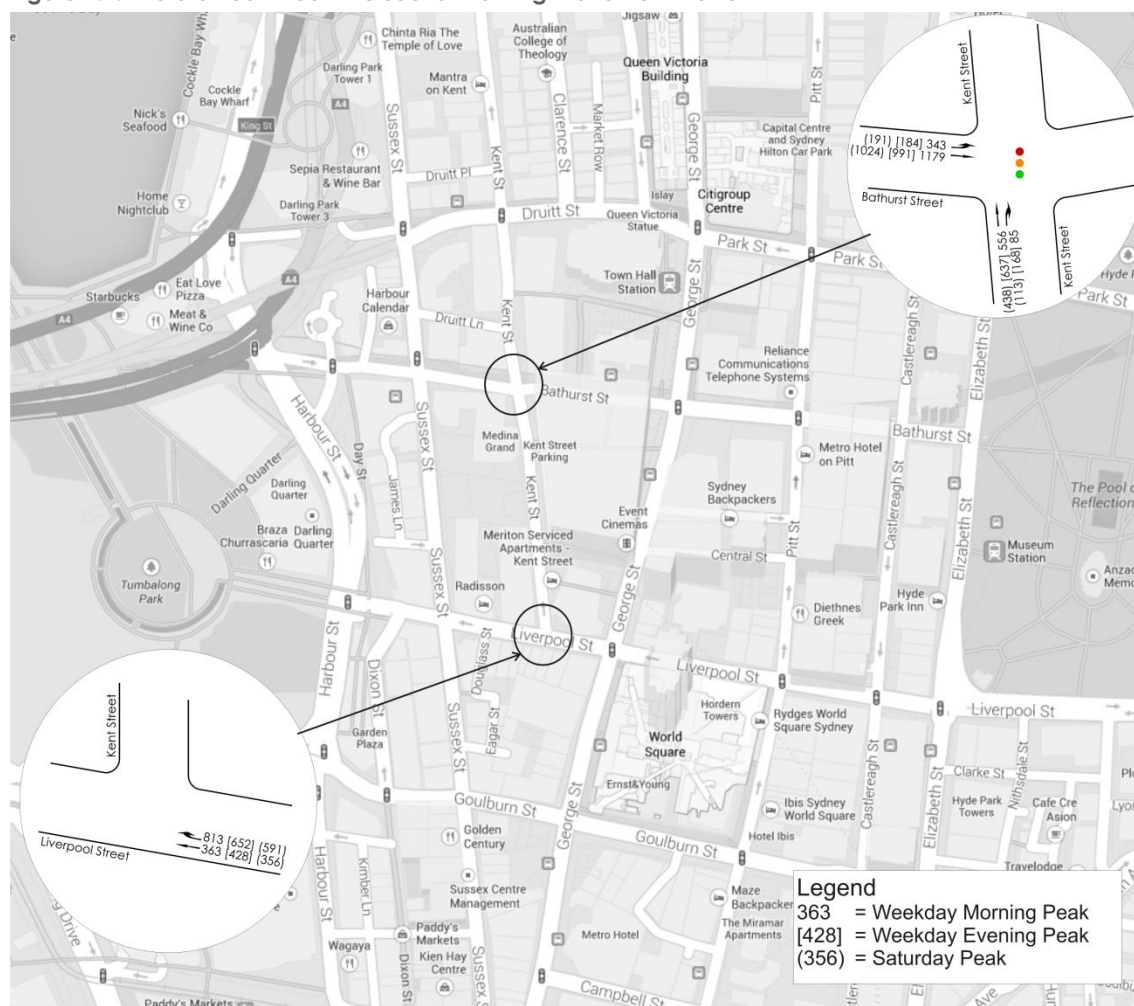
As can be seen in Table 4.2, the development is expected to generate some 72 vph during the weekday peak periods and 115 vph during the Saturday peak period.

The estimated proposed development traffic generation presented in the table above has not been discounted to take into account the expected reduction in traffic arising from the proposed removal of the existing cinema use on the site.

The estimated development traffic has been distributed to the road network based on existing traffic patterns. The resultant intersection flows are shown Figure 4.1.

Table 4.2: Estimated Peak Hour Traffic Generation of Proposed Development

Peak Periods	In	Out	Two-way
<i>Weekday Morning</i>			
- Residential/Retail/Commercial	28 vph	23 vph	51 vph
- Childcare Centre	17 vph	0 vph	17 vph
- Total	45 vph	23 vph	68 vph
<i>Weekday Evening</i>			
- Residential/Retail/Commercial	19 vph	36 vph	55 vph
- Childcare Centre	0 vph	17 vph	17 vph
- Total	19 vph	54 vph	72 vph
<i>Saturday Peak</i>			
- Residential/Retail/Commercial	51 vph	64 vph	115 vph
- Childcare Centre	0 vph	0 vph	0 vph
- Total	51 vph	64 vph	115 vph

Figure 4.1: Future Peak Hour Intersection Turning Movement Flows


4.2 Intersection Capacity Analysis

Intersection capacity analysis was conducted for the nearby intersections of Kent Street with Bathurst Street and Liverpool Street. The analysis was conducted using SIDRA 5.1 – a computer software specifically developed to assess an intersection performance under prevailing traffic conditions.

The analysis was conducted for three peak periods as follows:

- weekday morning peak period
- weekday evening peak period
- Saturday late morning peak period.

In conducting the analysis for existing conditions, signal timing acquired from RMS was entered into the SIDRA model for the Bathurst Street intersection. This signal timing was maintained in the future conditions analysis.

As indicated previously, the proposed development would see the existing cinema use removed. As such, development traffic relating to the cinema use would be removed from the road network altogether. However, the intersection analysis conducted as part of this assessment did not discount existing cinema traffic. Therefore, in reality the assessed intersections would operate better in the future than that reported below.

4.2.1 Existing Condition Analysis

The existing condition analysis was conducted using surveyed traffic flows presented in Figure 2.2. The results are presented in Table 4.3.

Table 4.3: Existing Condition Analysis Results

Intersection	Weekday Morning		Weekday Evening		Saturday Late Morning	
	Average Delays (s)	LoS	Average Delays (s)	LoS	Average Delays (s)	LoS
Bathurst Street-Kent Street	20	B	57	E	18	B
Liverpool Street-Kent Street	<10	A	24	B	<10	A

RMS uses level of service as a measure of how efficient a given intersection is operating. The level of service ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS E and F indicate the intersection is operating at or near capacity and would require intersection improvement works to maintain reasonable performance.

The analysis indicates that the two nearby intersections currently operate satisfactorily with level of service (LoS) B or better for all assessed peak periods except during the weekday evening peak period where the Bathurst Street-Kent Street intersection has a LoS E operation.

It is noted that the reported weekday evening peak period LoS E operation at Bathurst Street-Kent Street is due to largely issues downstream along Bathurst Street and Kent Street. During this peak period, Bathurst Street was surveyed to carry less than 1,200 vph and Kent Street some 800 vph. Given that Bathurst Street has three traffic lanes at its approach to the Bathurst Street intersection while Kent Street has two through lanes plus one short right turn lane at the approach to the intersection, the available capacity should be more than adequate to accommodate the surveyed volumes.

It is noted that typically major intersections within the CBD operate with LoS E or worse operation during peak periods.

4.2.2 Future Condition Analysis

Intersection analysis was repeated for future condition using the intersection flows presented in Figure 4.1. As indicated, the analysis of future conditions adopted the same signal timing (acquired from RMS) as that used in the analysis of existing conditions.

The analysis results are presented in Table 4.4.

Table 4.4: Future Condition Analysis Results

Intersection	Weekday Morning		Weekday Evening		Saturday Late Morning	
	Average Delays (s)	LoS	Average Delays (s)	LoS	Average Delays (s)	LoS
Bathurst Street-Kent Street	20	B	75	F	21	B
Liverpool Street-Kent Street	<10	A	47	D	<10	A

RMS uses level of service as a measure of how efficient a given intersection is operating. The level of service ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS E and F indicate the intersection is operating at or near capacity and would require intersection improvement works to maintain reasonable performance.

The analysis of the future condition indicates that the Bathurst Street-Kent Street intersection would operate with LoS F in the evening peak period, while the intersection would continue to operate satisfactorily in the other peak periods assessed. As indicated previously, there are a number of intersections within CBD that are operating at LoS E or worse.

As indicated previously, the analysis of the future condition assumes there would be no change to the signal timing of the intersection. However, if signal timing at the Bathurst Street intersection was to be re-allocated by two seconds from the Bathurst Street traffic phase to the Kent Street traffic phase the intersection performance would improve significantly without any adverse impacts to the traffic on Bathurst Street. The analysis results indicate the intersection would operate with LoS D if the signal timing is re-allocated as discussed.

However, this would be a matter for the TMC/RMS to decide.

In relation to the Liverpool Street intersection with Kent Street, the intersection would continue to operate satisfactorily in the future.

4.3 Proposed CBD and South East Light Rail Project

The State Government and the City of Sydney are proposing the CBD and South East Light Rail (CSELR) project. The proposal involves the construction of a new light rail network providing reliable high capacity services running north from Central to Circular Quay along George Street, west to Pyrmont and Dulwich Hill, and south east through Surry Hills to Moore Park, Randwick and Kingsford.

The principal objectives of the proposed CSELR are to improve reliability of journey travel times to and from the CBD, and support future population and economic growth by improving public transport capacity, quality and reliability.

As part of the proposal, George Street between Hunter Street and Bathurst Street would be closed to general traffic and converted to a shared pedestrian and light rail zone. Immediately in front of the subject site, George Street would continue to have one traffic lane in each direction which would be shared with the new proposed light rail running along the centre of George Street.

The proposed CSELR is expected to shift a large proportion of travel demand into the CBD by private vehicles to more sustainable transport modes.

However, this traffic assessment has not taken into account the benefits from the proposed CSELR. The assessment was conducted assuming that existing level of private vehicle usage would continue into the future.

As indicated, the proposed light rail will improve access into the CBD using public transport thereby reducing travel by private vehicles. In addition, the proposed light rail may also have the potential to re-distribute traffic circulating around the CBD area resulting in some traffic routes experiencing more congestion. Because of this, access to the CBD by private vehicles would become less attractive for motorists resulting in further reduction in travel demand by private vehicles.

For these two reasons, over time intersection performance around the CBD area would be improved. As such, the above analysis results represent a worst case traffic scenario. It is expected that performance of the majority of intersections within the CBD including these two assessed would be improved following the completion of the CSELR light rail project.

5. Parking Assessment

5.1 Parking Provision

The on-site parking requirements for the proposed development have been assessed against Sydney City Council's *Sydney Local Environmental Plan 2012* (LEP 2012) and *Sydney Development Control Plan 2012* (DCP 2012).

The LEP 2012 stipulates the following maximum parking rates for residential developments:

- studio apartments – 0.1 spaces per apartment
- 1-bed apartments – 0.3 spaces per apartment
- 2-bed apartments – 0.7 spaces per apartment
- 3-bed apartments – 1.0 space per apartment.

For commercial/office and business premises where the proposed floor space ratio for the entire development is greater than 3.5:1, the LEP 2012 stipulates the following maximum parking requirement:

$$\text{Max. Car Parking} = \frac{\text{Gross floor area of office use}}{\text{Total gross floor area of all buildings}} \times \frac{\text{Site Area}}{50}$$

In relation to retail use, LEP 2012 states that the parking provision requirement for retail uses in LEP 2012 does not apply to retail developments with more than 2,000m² GFA. Instead, Clause 7.5 of DCP 2012 indicates that a parking and access report to be provided by the applicant to address the appropriateness of any proposed parking provision for the retail use. As such, it is proposed to provide parking for the retail component using the above formula for calculating the parking requirement for an office premises. It is noted that the previous local environmental plan (LEP 2005) stipulates parking requirements for office and retail uses using the above formula.

Finally, for childcare use, LEP 2012 stipulates a maximum parking provision rate of one space plus one space for every 100m² GFA.

In addition to the above LEP 2012 maximum permissible parking spaces, DCP 2012 requires the following relevant provisions for delivery and service vehicles:

- residential and serviced apartments – 1.0 space for first 50 dwellings plus 0.5 spaces for every 50 dwellings thereafter
- commercial – 1.0 space per 3,300m²
- retail – 1.0 space per 350m² up to 2,000m² GFA then 1.0 space per 800m² GFA thereafter.

Table 5.1 presents a calculation of the LEP 2012 and DCP 2012 maximum parking provisions based on the indicative development mix discussed in Section 3.1.

Table 5.1: Parking Requirements

Development Type	No. of Units/ GFA (m ²)	Parking Rates	Required Parking
<i>LEP 2012 Requirements</i>			
Residential Use			
- Studio	66	0.1 space per apartment	6.6
- 1-Bed	176	0.3 space per apartment	52.8
- 2-Bed	305	0.7 space per apartment	213.5
- 3-Bed	41	1.0 space per apartment	41.0
- Residential Use Sub-total			313.9
Residential Uses			
- Office (Community Use)	250m ²	$\text{Max. Car Parking} = \frac{\text{Gross floor area of office/retail uses}}{\text{Total gross floor area of all buildings}} \times \frac{\text{Site Area}}{50}$	0.3
- Retail	10,909m ²	$\text{Max. Car Parking} = \frac{\text{Gross floor area of office/retail uses}}{\text{Total gross floor area of all buildings}} \times \frac{\text{Site Area}}{50}$	14.6
- Childcare Centre	1,601m ²	1.0 space + 1.0 space per 100m ² GFA	17.0
- Non-Residential Use Sub-total			31.9
LEP 2012 Total (Maximum)			346
<i>DCP 2012 Requirements (Service and Delivery Vehicles)</i>			
Residential	588	1 space for 1st 50 dwellings plus 0.5 spaces for every 50 dwellings thereafter	6.4
Other Uses			
- Office (Community Use)	250m ²	1.0 space per 3,300m ²	0.1
- Retail	10,909m ²	1.0 space per 350m ² , or part thereof, up to 2,000m ² ; then 1.0 space per 800m ² GFA thereafter	16.9
- Childcare Centre	1,831m ²	No Specific Requirements	-
DCP 2012 Total			23.4

Note: Site Area = 4,308m², Total GFA = 64,580m²

Based on the indicative development mix presented in Section 3.1, LEP 2012 permits parking up to a maximum of 346 car parking spaces. In addition, DCP 2012 requires 23 service vehicle spaces.

The proponent of the development is committed to providing on-site parking at or lower than the LEP maximum permissible parking provision i.e. 346 spaces. The provision of any car parking spaces will be subject to site constraints and meeting the car parking space design requirements set out in the Australian Standard for car parking facilities, namely AS2890.1:2004 and AS2890.6:2009.

5.2 Motorcycle and Bicycle Parking Provisions

DCP 2012 states that motorcycle parking is to be provided in all buildings that provide on-site car parking. DCP 2012 requires motorcycle parking provision at a rate equal to one motorcycle space for every 12 car parking spaces provided.

Based on LEP 2012 requirements, the proposed development would require some 346 car parking spaces to be provided. As such, 29 motorcycle spaces would be required to be provided.

The provisions for bicycle parking are stipulated under Clause 3.11.3 of DCP 2012. Table 5.2 presents an assessment of the required bicycle parking provisions in accordance with DCP2012.

Table 5.2: Bicycle Parking Requirements

Proposed Uses	Units/GFA	Residents/Employees		Visitors	
		Parking Rates	Required Spaces	Parking Rates	Required Spaces
Residential	588	1 per dwelling	588	1 per 10 dwellings	58.8
- Office (Community Use)	250m ²	1 per 150m ²	1.7	1 per 400m ²	0.6
Retail	10,909m ²	1 per 250m ²	43.6	1 per 300m ²	36.4
Childcare	1,601m ²	1 per 10 staff	2.0	2 per centre	4.0

Note: At this stage the size and type of facility for the proposed childcare centres are not known. However, it is assumed there would be two childcare centres with a total of 130 children and 20 staff.

In summary, DCP 2012 requires the following bicycle parking provision:

- 588x Class 1 bicycle spaces (individual lockers or equivalent secure storage) for residential tenants.
- 47 x Class 2 bicycle spaces (bicycle racks within a lockable communal area) for staff.
- 100 x Class 3 bicycle spaces (bicycle racks in a publicly accessible area) for visitors.

6. Summary and Conclusion

This report has been prepared to accompany a planning proposal to the City of Sydney seeking approval to amend the current height control on the site from 150m to 260m.

The existing uses on the site comprise the following elements:

- cinema – a floor area of some 9,977m²
- retail use – a floor area of some 1,536m² which includes an amusement centre
- office – a floor area of some 2,088m².

The proposed development includes the following indicative mix:

- residential apartments – approximately 53,420m² of gross floor area (GFA) with the following apartment mix:
 - studios – 66 apartments
 - 1-bedroom units – 176 apartments
 - 2-bedroom units – 305 apartments
 - 3-bedroom units – 41 apartments
 - total – 588 apartments
- retail – approximately 10,909m² GFA
- community use – approximately 250m² GFA
- childcare centres
- total approximately 64,580m² GFA.

The proposed retail use is not expected to generate any significant volume of development traffic given its location being in the Sydney CBD and its close proximity to good public transport services and other amenities.

Given that the proposed development does not include a cinema, the existing traffic arising from the cinema use would be removed from the road network. The removal of cinema traffic would be more than adequate to offset any additional development arising from the retail use (if any at all).

The traffic generation of the proposed development was estimated based on the development traffic obtained from recent traffic generation surveys of the Lumiere development (to the immediate north of the subject site).

On this basis, it was found that the proposed development would generate some 115 vph during the busiest peak period. The estimated development traffic was used to assess the traffic effects of the proposed development at two nearby intersections. As a conservative measure, the traffic assessment did not discount the estimated development traffic to take into account the removal of the development traffic as the proposed development does not include a cinema use.

Analysis of the two nearby intersections indicates that the intersections currently operate satisfactorily with LoS B or better with the exception of the Bathurst Street-Kent Street intersection. This intersection currently operates with LoS E during the weekday evening peak period.

Analysis of future traffic conditions indicate that the two intersections assessed would continue to operate satisfactorily except at the intersection of Bathurst Street with Kent Street where its level of service is expected to reduce from LoS E to LoS F during the weekday evening peak period.

However, it is also expected that reallocation of signal timing at the Bathurst Street intersection with Kent Street would improve its intersection performance.

For reasons stated in the report, the proposed light rail project is expected to provide positive benefits to the surrounding road network.

A parking assessment was conducted for the indicative development mix against the requirements set out in the Council's LEP 2012 and DCP 2012. The indicative development mix is permitted to have up to a maximum of 346 car parking spaces. In addition, DCP 2012 requires some 23 service vehicle loading spaces.

The proponent is committed to providing on-site parking not exceeding the maximum LEP 2012 parking allowance.

A vehicle access is proposed on Kent Street to serve the proposed development. A vehicle access on Kent Street is in line with existing vehicle access arrangement on the site. Given the flat terrain and straight road alignment, the driveway can be appropriately designed for sight lines, capacity to accommodate the required parking spaces and provide for safe pedestrian access on the frontage footpath.

The provisions of car parking spaces and service vehicle loading facilities are proposed to be provided in compliance with Australian Standard requirements.

Overall, the traffic and parking effects of the proposed development would be satisfactory.

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