

Project:	Lumina Parklands Priority Development Area	Office:	Brisbane, Merivale St
Project No:	304700205	Status:	Final
Client:	Economic Development Queensland	Prepared by:	Patrizia Robertson RPEQ#26198
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**PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL**

Approval no: DEV2023/1440

Date: 20 May 2024



1. Background

1.1 Parklands Priority Development Area

The Parklands Priority Development Area (PDA) is located 3 kilometres from the Southport CBD and covers an approximate area of 29-hectares. It adjoins the Gold Coast University Hospital, Griffith University, the Southport Sharks Football Club, Musgrave Park and Musgrave Hill State School as shown in Figure 1.1. Two G:Link stations are located in close proximity to the west of the PDA on Parklands Drive (Gold Coast University Hospital and Griffith University stops), which provides the area with excellent public transport accessibility to key destinations throughout the City.

The Parklands PDA was declared in February 2013 to facilitate development of the Gold Coast 2018 Commonwealth Games (GC2018) Village and Gold Coast Health and Knowledge Precinct. Development applications within the PDA are subject to assessment and approval by Economic Development Queensland (EDQ) as the statutory authority.

Figure 1.1 – Lumina Parklands Priority Development Area



Source: Queensland Globe, reproduced 11/08/23

1.2 Lumina Precinct

Within the PDA is the Lumina precinct, which is the final development stage of the Gold Coast Health and Knowledge Precinct. The Master Plan for Lumina is shown in Figure 1.2.

As indicated by the Master Plan, development within Lumina is in various stages of planning and consideration. The central core clustered around Nexus Way, Stanley Lane and Clarke Street (denoted as grey on the Master Plan) has

already been constructed. Further development within Lumina has been committed, but not yet constructed (denoted as pink) or under negotiation (denoted as yellow). Some sites are still available (denoted as blue) and future development on these sites will need to be assessed by EDQ as DAs are lodged in due course.

Figure 1.2 – Lumina Master Plan



Source: [LUM-PLAN-Opportunities-JULY2023.pdf \(luminagoldcoast.com.au\)](https://luminagoldcoast.com.au/LUM-PLAN-Opportunities-JULY2023.pdf)

1.3 Planning Approval for the Lumina Precinct

It is understood that the planning for the Lumina precinct was underpinned by a Traffic Impact Assessment, prepared by Cardno in February 2014 (referred herein as the 2014 TIA). The 2014 TIA contained a number of assumptions relating to total development yield within Lumina, forecast traffic volumes on the background road network and configuration of the external road network which was current at that point in time. Of note, the 2014 TIA confirmed the transport infrastructure which was required to support the forecast ultimate development within Lumina. These transport infrastructure requirements were delivered in advance of GC2018, and no further infrastructure improvements should be required, provided that development within Lumina remains consistent with the original planning assumptions.

A summary of the land use assumptions and resultant trip generation relevant to the original planning is provided in Figure 2.1. Based on the 2014 TIA, the total trip generation (ultimate) for the Lumina precinct was forecast to be 3,091 vehicles per hour, in both morning and afternoon peak periods.

2. Purpose of this Engagement

As the statutory authority, EDQ assesses and approves DAs within the Lumina precinct. The purpose of this engagement is to provide guidance to EDQ's DA team in the assessment of future proposals, to ensure that future development remains within the limit set by the original planning for the wider PDA. This technical note provides guidance as it specifically relates to transport impacts on the external road network.

As mentioned in Section 1.3, the original planning was underpinned by the 2014 TIA, which forecast that the Lumina precinct would generate in the order of 3,091 vehicles per hour, in both morning and afternoon peak periods. Based on this assumption, a transport infrastructure plan was developed and subsequently delivered in advance of GC2018.

Figure 2.1 – 2014 TIA Land Use Assumptions and Trip Generation

Lumina Reference	Households (dwellings)	Retail (sqm)	Data Centre (sqm)	Aged Care / Mental Health (beds)	Commercial (sqm)	Biopharmaceutical Manufacturing Facility (sqm)	Centre for Research / Research Institute (sqm)	Health and Medical (sqm)	Child Care (sqm)	AM inbound Trips	AM Outbound Trips	AM total trips	PM inbound Trips	PM Outbound Trips	PM total trips
-	140	6,027	0	0	0	0	0	0	0	141	155	296	155	141	296
-	294	820	0	0	0	0	0	0	0	23	54	76	54	23	76
-	35	0	0	0	0	0	0	0	0	3	6	9	6	3	9
-	368	0	0	0	0	0	0	0	0	29	67	96	67	29	96
-	16	0	0	0	0	0	0	0	0	1	3	4	3	1	4
-	246	442	0	0	0	0	0	0	0	29	54	83	54	29	83
-	154	0	0	0	0	0	0	0	0	12	28	40	28	12	40
1A	0	0	0	0	3,214	4,668	10,320	3,044	0	169	116	286	116	169	286
1B	0	0	0	0	3,214	4,668	10,320	3,044	0	169	116	286	116	169	286
2A	0	0	0	0	3,543	5,147	11,377	3,356	0	187	128	315	128	187	315
2B	0	0	0	0	3,429	4,980	11,009	3,247	0	181	124	305	124	181	305
2D	0	0	0	0	1,230	1,786	3,949	1,165	0	65	45	109	45	65	109
2E	0	0	0	0	2,515	3,653	8,074	2,381	0	133	91	224	91	133	224
3A-1	0	0	0	0	887	1,288	2,848	840	0	47	32	79	32	47	79
3A-2	0	0	0	0	887	1,288	2,848	840	0	47	32	79	32	47	79
3B	0	0	0	0	1,774	2,576	5,696	1,680	0	94	64	158	64	94	158
4	0	0	0	0	1,558	2,263	5,003	1,475	0	82	56	139	56	82	139
5	0	0	0	0	888	1,289	2,851	841	0	47	32	79	32	47	79
6A	0	0	0	0	1,041	1,513	3,344	986	0	55	38	93	38	55	93
6B	0	0	0	0	675	981	2,168	639	0	36	24	60	24	36	60
6C	0	0	0	0	643	934	2,065	609	0	34	23	57	23	34	57
6D	0	0	0	0	643	934	2,065	609	0	34	23	57	23	34	57
6E	0	0	0	0	675	981	2,168	639	0	36	24	60	24	36	60
8A	0	0	0	0	1,134	1,647	3,641	1,074	0	60	41	101	41	60	101
Total	1,253	7,289	0	0	27,951	40,596	89,744	26,470	0	1,711	1,380	3,091	1,380	1,711	3,091

Source: Adapted from the 2014 TIA and updated to provide consistency with the current Lumina Master Plan

Given that the 2014 TIA contained a number of assumptions relating to development profile which have changed since the original assessment, EDQ's DA team requires an understanding of the impact of already approved DAs and future potential variations in land use and yield of DAs yet to be lodged. To assist with future development assessment, it is recommended that EDQ adopt a "trip cap threshold" approach, to ensure that the conditions of the original planning are met. This approach requires that trip generation for the entire precinct should not exceed 3,091 vehicles per hour in either morning or afternoon peak period.

If the trip cap were to be exceeded, a new TIA would be required to confirm the extent of any additional traffic impact mitigation works. This TIA would need to be underpinned by new traffic counts and updated traffic modelling, given the extent of changes which have occurred since the original planning.

Recent traffic modelling commissioned by EDQ in 2022 (Lumina Parklands Priority Development Area, Traffic Modelling Review and Update, prepared by Stantec dated 4 November 2022) has confirmed that there is limited spare capacity at two key intersections on Smith Street (i.e. Village Boulevard and Parklands Drive). It is therefore expected that impact mitigation works would be required at these two locations (as a minimum) should the trip cap be exceeded.

3. Trip Calculators

To assist EDQ's DA team in understanding the impact of potential variations in land use and yield within the precinct, a bespoke trip generation calculator has been developed as part of this engagement. The trip generation calculator has two components, as follows:

- A "whole of site" (WOS) calculator, which compares the forecast trip generation of a theoretical development profile, against the trip cap threshold of 3,091 vehicles per hour at ultimate development; and
- A separate Site 1A/1B calculator to assess trip generation of various residential uses, including traditional private sale apartments, build-to-rent, social / affordable housing and student accommodation.

Assumptions relevant to each calculator is summarised in Sections 3.1 and [1].

3.1 Whole of Site Calculator

To maintain consistency with the original planning as far as practicable, the WOS calculator is based on the assumptions developed as part of the 2014 TIA. Trip generation rates are based on the NSW Roads and Traffic Authority (RTA)

“Guide to Traffic Generating Developments” with several relaxations applied in recognition of the PDAs proximity to high quality public transport and proximity to significant employment generators. Relaxations applied within the 2014 TIA and subsequently retained for the WOS calculator include:

- **Public Transport:** a 15% reduction of car trips to the RTA rate, to replicate the likely reduced parking supply in the precinct consistent with transit-oriented development objectives;
- **Multipurpose Trips for Retail Use:** the RTA Guide allows for a 25% reduction in retail trips if there is potential for multiple trip purposes to occur within a single trip (i.e. some visitors will walk to other stores within the precinct); and
- **Trip Internalisation:** assumes that 20% of the internalised residents will conduct retail, study, or employment related trips within the precinct.

The adopted trip generation rate by land use as applied within the 2014 TIA and WOS calculator are shown in Table 3.1.

Table 3.1 – Adopted Trip Generation Rates by Land Use with Modal Corrections (2014 TIA)

Land Use (unit)	Trip Generation Rate (per unit)	Public Transport Discount	Multi-Trip Discount	Trip Internalisation	Resulting Trip Generation Rate
Households (dwellings)	0.4	0.15	0.00	0.20	0.260
Retail (sqm)	0.123	0.15	0.25	0.20	0.049
Commercial (sqm)	0.02	0.15	0.00	0.20	0.013
Biopharmaceutical manufacturing facility (sqm)	0.01	0.15	0.00	0.20	0.007
Centre for research / Research Institute (sqm)	0.02	0.00	0.00	0.20	0.016
Health and Medical (sqm)	0.02	0.00	0.00	0.20	0.016

It is noted that a review of the trip generation rate for households was reviewed as part of this engagement. A unit rate of 0.4 trips per dwelling which was applied in the 2014 TIA corresponds with the standard trip rate for medium density development. It is understood that the nature of residential development now proposed within Lumina more closely aligns with high density residential development. Unit traffic generation rates for high density residential development are set out in the more recent NSW RMS “Guide to Traffic Generating Developments – Updated traffic surveys”, published August 2013 (Ref: *TDI 2013/04a*). The *TDI 2013/04a* identifies that the peak hour trips per unit ranges between 0.07 - 0.32 trips per dwelling in the morning peak and 0.06 – 0.41 trips per dwelling in the afternoon peak. The previously adopted 0.4 trips per household is on the higher end of this range and is therefore considered conservative and appropriate to retain for any future assessments.

Upon review of the DA’s which have been approved or lodged since the original planning, several additional land uses needed to be considered. These land uses included childcare, data centre, aged care and mental health facility. Trip generation assumptions for these additional land uses are set out in Table 3.2.

Table 3.2 – Adopted Trip Generation Rates by Land Use with Modal Corrections (Additional Land Uses)

Land Use (unit)	Trip Generation Rate (per unit)	Public Transport Discount	Multi-Trip Discount	Trip Internalisation
Childcare (licensed place) ^[1]	0.56 (AM Peak) 0.45 (PM Peak)	0.00	0.00	0.20
Data Centre (sqm) ^[2]	0.005	0.00	0.00	0.00
Aged Care / Mental Health Facility (beds) ^[3]	0.2	0.00	0.00	0.00

[1] Trip generation rate sourced from the NSW Roads and Maritime Services (RMS) “Validation Trip Generation Surveys Child Care Centres”, dated September 2015

[2] Trip generation rate sourced from first principles using data obtained from recent DA approvals for Data Centres within Australia

[3] Trip generation rate sourced from the RTA “Guide to Traffic Generating Developments”

3.2 Site 1A/1B calculator

A separate trip generation calculator has been developed for future DAs to be lodged on Site 1A/1B (refer Figure 1.2). It is understood that development on these land parcels are currently envisaged to accommodate a mixture of residential uses including traditional private sale apartments, build-to-rent, social / affordable housing and student accommodation.

The Site 1A/1B trip generation calculator is disaggregated by each residential use and apartment size. The trip generation rate for all residential uses are based on the standard trip rates for high density dwellings, documented within the NSW RMS “Guide to Traffic Generating Developments – Updated traffic surveys”, published August 2013 (Ref: *TDT 2013/04a*). The RMS guide indicates that the standard trip generation rate for high density dwellings is based upon surveys undertaken for developments which were:

- Close to public transport;
- Greater than 6 storeys; and
- Almost exclusively residential in nature.

It is envisaged that development on Site 1A/1B will be consistent with the above themes, and therefore, the application of the standard trip generation rate is considered acceptable in this instance noting that the adopted trip generation rates utilise the upper limit of trip rates within the Sydney Range set out within the *NSW TDT 2013/04a*, in a similar approach to that adopted for the WOS calculator.

Trip reductions have been applied for dwelling types associated with build-to-rent, social / affordable housing and student accommodation. The supporting rationale is that parking provision for these uses are typically provided at lower rates when compared with traditional private sale. The resultant trip generation is therefore also expected to be reduced, at a scale commensurate with the parking supply reduction.

Upon request by EDQ, the parking provision rate (and therefore resultant impact on unit trip generation rate) has been set as an editable field within the Site 1A/1B calculator. It is expected that these fields would be adjusted for future development proposals, depending upon the known parking supply provisions as agreed with the developers for each lot. In the interim, and to provide an initial estimate of trip generation, the assumptions as set out in Table 3.3 apply.

Note that modal corrections as referenced in Section 3.1 have not been applied to the trip generation calculator for Site 1A/1B. If required, an additional reduction factor of 35% could be applied using the editable fields provided.

Table 3.3 – Impact of Parking Supply on Trip Generation Rate by Residential Use

Land Use (all apartment sizes)	Assumed Car Parking Provision Rate (number of spaces per unit)	Trip Generation Reduction
Private sale ^[1]	1.0	0%
Build-to-Rent ^[2]	0.72	28%
Social / affordable housing ^[3]	1.0	0%
Student accommodation ^[4]	0.25	75%

[1] Trip generation rate for private sale apartments are based on the “per bedroom” rate set out in the NSW RMS “Guide to Traffic Generating Developments – Updated traffic surveys” (Ref: *TDT 2013/04a*)

[2] Assumed parking provision rate for build-to-rent has been based on recently approved DAs within SEQ. Car parking for build-to-rent is typically unbundled, which results in improved efficiency of car parking supply.

[3] Assumed parking provision rate for social / affordable housing is based on the minimum requirements set out in the QLD Government Social Housing Design Guideline

[4] Assumed parking provision rate for student accommodation is based on guidance provided by EDQ. The land use definition for off-site student accommodation in the Parklands PDA Scheme is “Hostel”.

4. Summary and Recommendations

It is recommended that EDQ adopt a “trip cap threshold” approach to assist with assessing future DAs. To ensure that the conditions of the original planning are met, a total trip cap (ultimate) of 3,091 vehicles per hour applies to traffic generation in both morning and afternoon peak periods.

If the trip cap were to be exceeded, a new TIA would be required to confirm the extent of any additional traffic impact mitigation works. This TIA would need to be underpinned by new traffic counts and updated traffic modelling, given the extent of changes which have occurred since the original planning.

Recent traffic modelling commissioned by EDQ in 2022 has confirmed that there is limited spare capacity at two key intersections on Smith Street (i.e. Village Boulevard and Parklands Drive). It is therefore expected that impact mitigation works would be required at these two locations (as a minimum) should the trip cap be exceeded.