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Traffic & Transport Assessment Addendum

Cabramatta East Planning Proposal

for

Moon Investments

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1 Introduction

1.1 Overview

Moon Investments (the Proponents) submitted a Planning Proposal on 14 August 2017 which sought to amend the Fairfield Local Environmental Plan (Fairfield LEP) to increase heights across a parcel of land known as Cabramatta East, which is generally bordered by Fisher Street to the north; Cabramatta Road to the south; existing commercial and residential sites to the east; and Broomfield Street to the west.

The Planning Proposal provides for a mixed-use development including residential, commercial, retail and other non-residential components.

1.2 Planning Proposal Background

Following its submission, the Planning Proposal was amended in July 2018 to respond to comments from Fairfield City Council (Council) relating to excluding the Fisher Street car park from the Planning Proposal, and reducing the maximum height of development of the Site.

While a report submitted to Council's Outcomes Committee on 14 August 2018 recommended no changes to the Planning Proposal, Councillors in their meeting on 25 September 2018 resolved to reduce the maximum height from 19 storeys to 15 storeys. Council officers subsequently revised the Planning Proposal to account for the Council decision and submitted the Planning Proposal to the Department of Planning, Industry & Environment (DPIE) for Gateway determination under Section 3.34 of the Environmental Planning & Assessment of 1979 (EP&A Act).

On 18 July 2019, DPIE issued a Gateway determination providing for the Planning Proposal to proceed, with Condition 1 of the determination requiring that the originally proposed height limits be reinstated for the Site. In August 2019, Council resolved to lodge a Gateway Review to revise the maximum height to 16 storeys.

On 27 April 2020, DPIE requested that the NSW Independent Planning Commission (NSW IPC) provide advice pursuant to Section 2.9(1c) of the EP&A Act regarding the Planning Proposal. Further to their review, on 22 May 2020 the NSW IPC determined that the Planning Proposal as original proposed (and per Condition 1 of the Gateway) *has planning merit and should not be altered*.

Notwithstanding, on 20 May 2021 DPIE revoked the Gateway determination; we understand that the revocation was based on the expiry of the Gateway timeframe. On 9 April 2021, Council advised that the Planning Proposal would need to be relodged and requested additional information, specifically relating to *unresolved traffic issues and ongoing Voluntary Planning Agreement (VPA) negotiations*.

The requested information from Council includes addressing *preliminary comments on the planning proposal documents* prepared on 19 March 2021 by TfNSW (TfNSW Comments), which were sought by DPIE.

It is our understanding that TfNSW was not provided with the full range documentation had the Planning Proposal proceeded to the exhibition, at which time Council would have consulted with TfNSW. Importantly therefore, up until this time there have been no discussions between TfNSW and the Proponent relating to TTA 2017, nor to our knowledge were any issues raised relating to TTA 2017 by the NSW IPC.

1.3 Traffic & Transport Assessment Addendum

The Proponents have commissioned [arc traffic + transport](#) to examine the TfNSW Comments, noting that [arc traffic + transport](#) prepared the 2017 Cabramatta East Traffic & Transport Assessment (TTA 2017) which was submitted with the original Planning Proposal.

This Traffic & Transport Assessment Addendum (TTA Addendum) provides a response to the traffic and transport related issues raised by TfNSW. In preparing this TTA Addendum, [arc traffic + transport](#) has also had the opportunity to discuss these issues with representatives of both Council and TfNSW to gain a better understanding of the key information required at this stage of the Planning Proposal assessment.

It is noted that the TfNSW Comments also request more information relating to issues outside of our area of expertise, including the proposed pedestrian link from the Site to Cabramatta Station, consultation with Sydney Trains and the VPA. These issues will be addressed by others in the Planning Proposal Project Team.

Finally, for ease of reference when discussing the 2 key sections of Cabramatta Road East adjacent to the Site, the primary Cabramatta East carriageway (running between the railway line and Hume Highway) is referenced as CRE, and the short local section of Cabramatta Road East (running between Cabramatta Road East and Broomfield Street) is referenced as CRE Local.

2 TfNSW Comments

2.1 TfNSW Comments 1 and 2

TfNSW Comments 1 and 2 state the following:

- 1. The Cabramatta East Traffic & Transport Assessment (TIA) is dated July 2017. The underlying assumptions including baseline traffic volume data is likely to be outdated. TfNSW requests the TIA is updated in order to be able to provide more current and accurate comments on the impacts of the proposal.*
- 2. TfNSW believes that the modelling undertaken in the area needs to be updated based on the current traffic volume. It also needs to model the intersections of Broomfield Street/Fisher Street and Cumberland Street/Fisher Street as well. Moreover, these two intersections should be added to the other modelled intersections in the area, and consider them as a network.*

2.1.1 Base Traffic Surveys

Broadly, Comments 1 and 2 relate to the need for new surveys and traffic modelling given that the TTA 2017 traffic modelling (the TTA 2017 Model) was based on surveys of key intersections undertaken in 2016. While it was of course anticipated that TTA 2017 would have been reviewed by TfNSW soon after the submission of the Planning Proposal, it is acknowledged that the base survey data underlying the TTA 2017 Model is therefore now 5 years old.

The question therefore is whether the average annual growth analysis included in the TTA 2017 Model appropriately reflects growth that has occurred since 2016 in the local road network.

As agreed with TfNSW and Council in our meeting on 7 May 2020¹, [arc traffic + transport](#) a comparative analysis of the traffic volumes used in the TTA 2017 Model and more recent surveys undertaken by Council in September 2020. The analysis allowed us to determine whether the 2020 base volumes inherently included in the TTA 2017 Model are significantly different to the 2020 surveyed volumes, noting TfNSW's comment in our meeting that the TTA 2017 Model volumes would ideally be within approximately 2% of the 2020 volumes to allow TfNSW to provide support for the TTA 2017 Model's base volumes.

It is noted that additional surveys at the intersection of CRE & Cumberland Street were commissioned by [arc traffic + transport](#) in May 2021 to further inform this analysis, as Council did not survey this intersection in 2020.

A detailed response to the TfNSW Comments 1 and 2 was prepared by [arc traffic + transport](#) and submitted to Council and TfNSW in May 2021; a summary of this response is provided in sections below.

2.1.3 2016 and 2020 Data Comparison

The comparison of the 2016 and 2020 data sets needs to account for the annual growth rates applied in the TTA 2017 Model to background traffic through 2031; these annual growth rates were primarily based on data outputs from TfNSW's [Sydney] Strategic Traffic Forecast Model (STFM), as well as our consultation with both Council and TfNSW officers in regard to any other potential sub-regional developments or infrastructure that might impact future road network volumes.

As such, **the volumes for comparison in this analysis are the 2016 surveyed volumes factored over 4 years by the average growth rate adopted in the TTA 2017 Model, and the 2020 surveyed volumes.**

The results of this analysis for each of the key intersections assessed in TTA 2017 are provided in Table 1 below. Positive figures (in blue) indicate that the 2020 modelled volumes assigned in the TTA 2017 Model are higher than the 2020 surveyed volumes, while negative figures (in red) indicate that the 2020 modelled volumes assigned in the TTA 2017 Model are lower than the 2020 surveyed volumes.

Table 1: Peak Hour Intersection Traffic Volume Comparison

Intersection Volume	AM Peak Hour					PM Peak Hour				
	2016	2020	Change	4 Year Growth	Model Change	2016	2020	Change	4 Year Growth	Model Change
CRE Local & Broomfield St	394	332	18.7%	394	18.7%	441	387	14.0%	441	14.0%
CRE & CRE Local	1,821	1,688	7.9%	1,924	14.0%	1,996	1,990	0.3%	2,071	4.1%
CRE & Cumberland St	1,919	1,914	0.3%	1,989	3.9%	2,142	2,188	-2.1%	2,235	2.2%
Hume Hwy & CRE	4,310	4,440	-2.9%	4,445	0.1%	4,841	4,756	1.8%	4,981	4.7%
Hume Hwy & Chadderton St & Hollywood Rd	4,053	4,179	-3.0%	4,183	0.1%	4,388	4,372	0.4%	4,553	4.1%
Hume Hwy & Lansdowne Rd	4,276	4,472	-4.4%	4,435	-0.8%	4,707	4,748	-0.9%	4,882	2.8%

With reference to Table 1, the 2020 modelled volumes inherently built into the TTA 2017 Model represent higher volumes at all of the key intersections compared to the 2020 surveyed volumes, with the only exception being the intersection of Hume Highway & Lansdown Road in the AM peak hour, where the 2020 modelled volumes assigned in the TTA 2017 Model are some 0.8% lower than the 2020 surveyed volumes, well within acceptable TfNSW modelling parameters.

It is also important to note that at the key intersections around the Site, the TTA 2017 Model volumes, adjusted for growth to 2020, are in all instances significantly higher than the 2020 surveyed volumes, in many cases even without factoring for growth over 4 years.

With regard to volumes on key links through the study area, [Table 2](#) provides the same comparative analysis; again, positive figures (in [blue](#)) indicate that the 2020 volumes assigned in the TTA 2017 Model are higher than the 2020 surveyed volumes, while negative figures (in [red](#)) indicate that the 2020 volumes assigned in the TTA 2017 Model are lower than the 2020 surveyed volumes.

Table 2: Peak Hour Key Link Traffic Volume Comparison

Two-Way Link Volumes	AM Peak Hour					PM Peak Hour				
	2016	2020	Change	4 Year Growth	Model Change	2016	2020	Change	4 Year Growth	Model Change
Broomfield St north of CRE Local	329	301	9.3%	329	9.3%	373	301	23.9%	373	23.9%
CRE Local east of Broomfield St	228	166	37.3%	228	37.3%	269	166	62.0%	269	62.0%
CRE west of CRE Local	1752	1623	7.9%	1807	11.4%	1873	1914	-2.1%	1947	1.7%
CRE east of Cumberland St	1429	1480	-3.4%	1764	19.2%	1551	1657	-6.4%	1644	-0.8%
Hume Highway north of CRE	3876	3901	-0.6%	3981	2.1%	4190	3901	7.4%	4297	10.1%
Hume Highway south of CRE	3406	3442	-1.0%	3476	1.0%	3745	3780	-0.9%	4055	7.3%

With reference to [Table 2](#), and as is the case in regard to the comparison of intersection volumes, the 2020 modelled volumes inherently built into the TTA 2017 Model represent higher traffic volumes along key links compared to the 2020 surveyed volumes, with the only exception being volumes in CRE east of Cumberland Street, where the 2020 modelled volumes assigned in the TTA 2017 Model are also approximately 0.8% lower than the 2020 surveyed volumes, again well within acceptable TfNSW modelling parameters.

It is also again the case that the 2020 volumes assigned in the TTA 2017 Model in most of the key roads around the Site are significantly higher than the 2020 surveyed volumes, in many cases even without factoring for growth over 4 years.

In summary, the TTA 2017 Model provides an excellent forecast of current (2020) volumes at the key intersections and along key links, and there is no information to suggest that the application of growth rates through to 2031 – as reported in TTA 2017 - would not also provide an excellent forecast of future base volumes.

In consequence, it is the opinion of **arc traffic + transport** that this comparative assessment – undertaken as requested by TfNSW – appropriately responds to TfNSW Comments 1 and 2, and as agreed will allow TfNSW to provide support for this aspect of the Planning Proposal assessment.

2.1.4 2020 Survey Accuracy

Notwithstanding the conclusions of the comparative assessment as requested by TfNSW, **arc traffic + transport** has sourced available data from TfNSW Count Stations in the Fairfield LGA to examine the difference between volumes in September 2020 (largely post-COVID) and September 2019 (pre-COVID) to ensure that the September 2020 surveys are appropriate for the comparison.

It is noted that it was the contention of TfNSW in our meeting on 7 May 2021 that traffic volumes had returned to pre-COVID levels by the time the September 2020 surveys were undertaken, but the analysis provided below provides an additional degree of certainty in respect to the analysis provided in [Section 3.2](#) above.

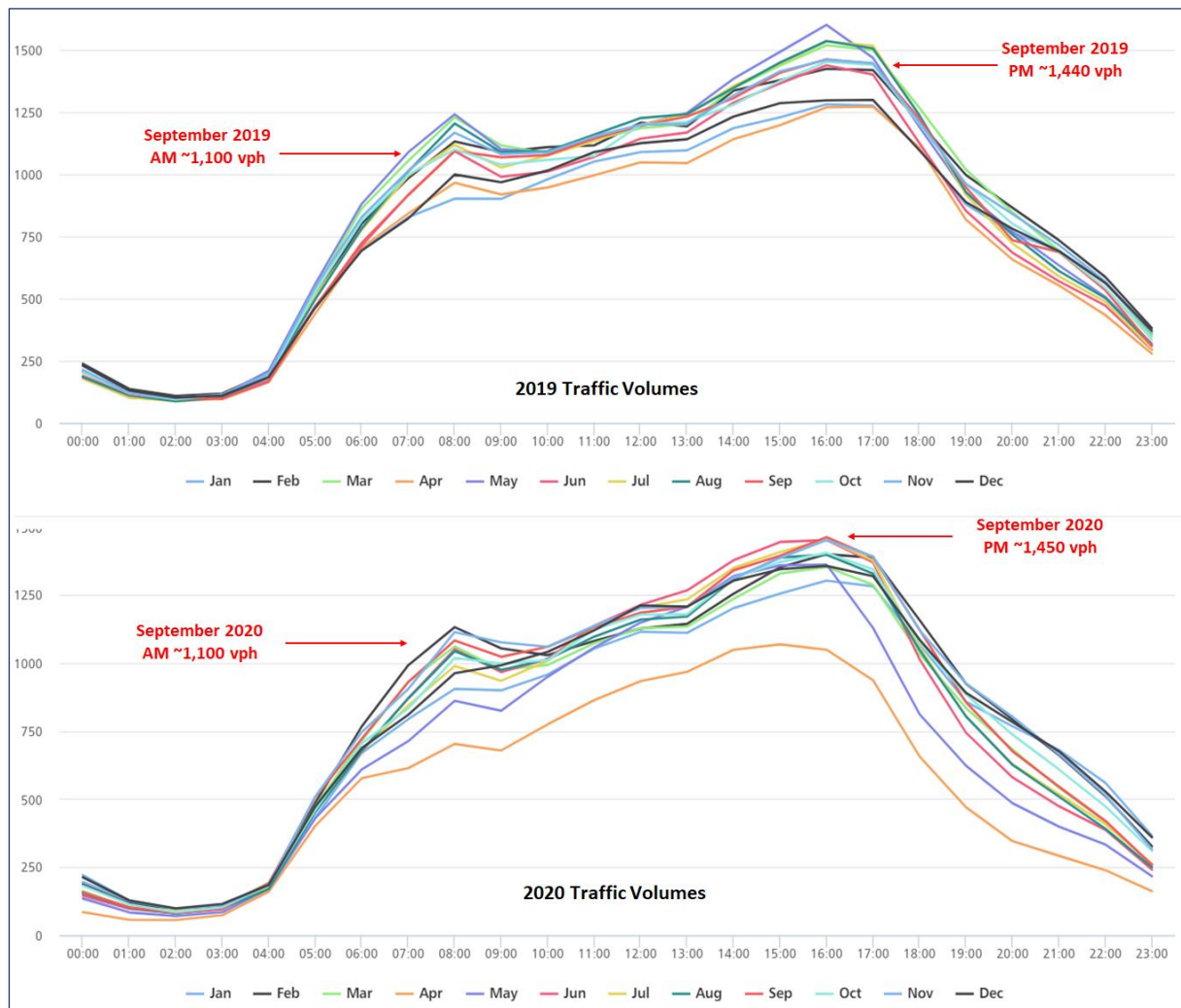
24 hour traffic volume data is available for September 2019 and September 2020 from the following Count Stations:

- Fairfield Street east of Cockburn Crescent, Fairfield East; and
- Cumberland Highway (A28) north of Carre Avenue, Canley Heights.

Fairfield Street has a similar function in the road hierarchy to both Lansdowne Road and to an extent CRE Major as an important east-west link, while Cumberland Highway serves a similar function to Hume Highway. Moreover, it is highly likely that volume trends in these roads would be representative of the same trends in the broader LGA road network.

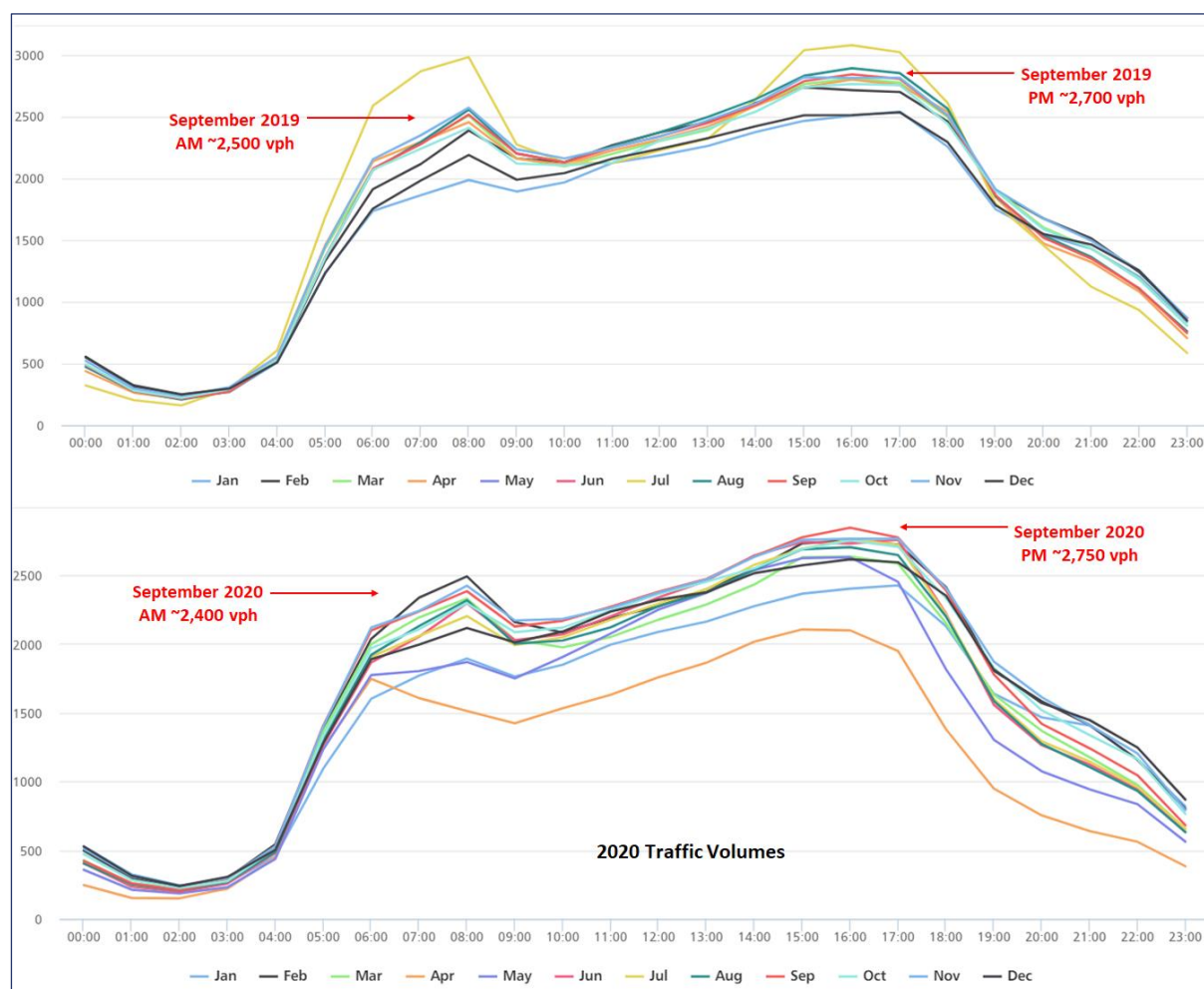
[Figure 1](#) provides a comparison of peak period volumes in Fairfield Street, and [Figure 2](#) provides a comparison of peak period volumes in Cumberland Highway, between September 2019 and September 2020.

Figure 1: Fairfield Street Peak Hour Traffic Volumes September 2019 and 2020



Source: TfNSW

Figure 2: Cumberland Highway Peak Hour Traffic Volumes September 2019 and 2020



Source: TfNSW

As shown in the figures above, traffic volumes in September 2020 had essentially returned to September 2019 pre-COVID levels in both roads, which validates the September 2020 surveys as suggested by TfNSW.

2.1.5 Assessment of Additional Intersections

A determination in regard to the intersections requiring assessment in TTA 2017 was made further to direct discussions between Council, TfNSW and **arc traffic + transport**. In this regard, an email dated 17 July 2015 from Mr James Hall (the then Senior Land Use and Strategic Planner at Roads & Maritime Services) to Council states:

RMS would raise no objection for the use of SIDRA 6 for the subject precinct (eastern side of rail line) with the following signalised intersections to be modelled:

- Liverpool Road/Chancery Road
- Liverpool Road/ Chadderton Street/Hollywood Drive
- Liverpool Road East/ Cabramatta Road East

- Cabramatta Road East/Cumberland Street
- Longfield Street/Cumberland Street
- Broomfield/John Street

All of these intersections were specifically examined in TTA 2017, and subsequently (at the request of Council) the intersections of Cumberland Street & Fisher Street, and Fisher Street & Site, were also surveyed and assessed by PDC Consultants, whose report in this regard was submitted to Council in April 2018.

TfNSW Comment 2 requests additional modelling of *the intersections of Broomfield Street/Fisher Street and Cumberland Street/Fisher Street as well*. As stated above, the Cumberland Street & Fisher Street intersection was modelled, however we now understand that this information has not been provided to TfNSW pre-exhibition.

In relation to the Fisher Street & Site intersection, even a cursory review of the forecast traffic volumes at this intersection indicate that it would operate at a good Level of Service (LOS) with minimal delays or queues. Notwithstanding, arc traffic + transport has provided additional analysis of this (and other) intersections in Section 4.

2.2 TfNSW Comment 3

TfNSW Comment 3 states the following:

3. *The planning proposal impacts should be assessed in the context of any other known developments/planning proposals in the town centre. If there are other developments and large scale planning proposals in the area in the near future, it would be ideal to consider the town centre growth in a cumulative impact study to identify and future proof transport improvements to support the growth planned for the area.*

2.2.1 Traffic Forecasting

Roads & Maritime Forecast Data and Consultation

As discussed previously, broader traffic forecasting (for the major roads in the study area) was based on STFM data provided by TfNSW. To further ensure that the TTA 2017 Model provided for a worst case assessment, arc traffic + transport also consulted with TfNSW in regard to any other sub-regional development or road network proposals that might need to be considered in the assessment.

Development across Eastern Cabramatta

The TTA 2017 Model included significant residential and commercial rezoning (and in turn dwelling/GFA uplift) across eastern Cabramatta between the railway and Hume Highway, at that time in line with Council's previous Residential Development Strategy (RDS). The TTA 2017 Model included RDS projections for approximately:

- 2,445 high density dwellings;
- 545 medium density dwellings; and
- Retail and commercial redevelopment across Precinct 4 of the Cabramatta Town Centre (in which the Site and additional commercial/retail sites lie).

More recent discussions with Council indicate that current strategies for eastern Cabramatta would only provide for some 818 primarily high density dwellings (includes those in the Planning Proposal), and no expectation of any significant increase in retail and/or commercial GFA.

This means that the TTA 2017 Model (needlessly as it transpires) included the trip generation of approximately:

- 1,627 high density dwellings;
- 545 medium density dwellings; and
- Approximately 12,000m² – 14,000m² GFA of retail and commercial floorspace.

Based on the trip rates adopted in TTA 2017 (themselves high – see Section 2.2.2) **it is estimated that the TTA 2017 Model included approximately 600 – 700 more vehicle trips per hour than will now be generated further to the development of the Site and other sites in accordance with Council's new planning strategies.** This means that all of the key intersections are expected to operate with considerably lower average delays than reported in TTA 2017; for example, and with reference to the revised traffic assessment provided in Section 4:

- TTA 2017 assigned an additional 300+ vehicle trips to the intersection of CRE Major & Cumberland Street in each peak hour; the revised traffic assessment assigns less than 100 additional vehicle trips in each peak hour.
- TTA 2017 assigned an additional 200+ vehicle trips to the intersection of Hume Highway & CRE in each peak hour; the revised traffic assessment assigns approximately 60 additional vehicle trips in each peak hour.
- TTA 2017 assigned an additional 250+ vehicle trips to the intersection of Hume Highway & Lansdowne Road in each peak hour; the revised traffic assessment assigns approximately 60 additional vehicle trips in each peak hour.

This again speaks to the robustness of the TTA 2017 analysis, and moreover the fact that the TTA 2017 Model provided a cumulative assessment of traffic significantly in excess of actual growth.

2.2.2 Trip Rates

Further to the above, the trip rates adopted in the TTA 2017 Model were in all instances significantly higher than need have been adopted, again providing for an absolute worst case analysis. On average:

- High density residential trip rates were 20 – 25% higher than TfNSW surveyed trip rates;
- Medium density residential trip rates were 30 – 40% higher than TfNSW surveyed trip rates; and

- Commercial trips rates were 30 – 40% higher than TfNSW surveyed trip rates.

Once again, this indicates the robustness of the TTA 2017 Model analysis, and again indicates that the key intersections and links will operate at a significantly better level of service than reported in TTA 2017 (as shown in the revised traffic assessment provided in [Section 4](#)).

2.3 TfNSW Comment 4

TfNSW Comment 4 states the following:

4. *The SIDRA modelling files should be provided for TfNSW's review and verification before TfNSW can provide more detailed comments with regards to the modelling results and the impact of the proposed development on the operation of the intersection of Cumberland Street and Cabramatta Road.*

2.3.1 Submission of SIDRA Files

SIDRA files for all of the key intersections were submitted to Council as appendices to TTA 2017; again, it is apparent that these were not provided to TfNSW. As such, SIDRA files of the key intersections further to the revised traffic assessment in [Section 4](#) are provided in electronic form as an appendix to TTA Addendum.

2.4 TfNSW Comments 5 and 6

TfNSW Comments 5 and 6 state the following:

5. *TCS 2499 (Cabramatta Road and Cumberland Street) – The impacts of the planning proposal at this intersection need to be considered. The signals currently operate as a single diamond but to improve traffic operation, the intersection would benefit if it were to be upgraded to operate as a double diamond with extra lanes in Cumberland Street. This could be investigated.*
6. *TCS 2944 (Cabramatta Road East and Broomfield Street) does not have a communication to the signal box. It would be good to have communication at TCS 2944 for coordinating to any other signal sites on Cabramatta Road East.*

2.4.1 Upgrade Requirements

arc traffic + transport acknowledges that if the intersection of CRE & Cumberland Street were upgraded it would very likely operate with lower delays further to the introduction of additional lanes in Cumberland Street.

However, the upgrade suggested by TfNSW has no relevance to the Planning Proposal, with TTA 2017 reporting that the intersection will continue to operate at a good LOS through 2031 (even with the Planning Proposal and the previous uplift proposed across eastern Cabramatta). Further, and as noted in [Section 2.2.2](#), TTA 2017 assigned over 300 additional vehicle trips to this intersection in each peak hour, whereas the revised traffic assessment in [Section 4](#) assigns less than 100 additional vehicle trips in each peak hour.

With regard to the provision of a communication box, it is our understanding that this would be the responsibility of TfNSW, and as such we are not aware of why this has been raised by TfNSW at this time.

2.5 TfNSW Comments 7 and 8

TfNSW Comments 7 and 8 state the following:

7. *The below layout presented in the “Internal Submission from the Council” document was not included in the traffic impact assessment report or in the planning proposal report. The proposed access layout below is not supported as it will still cause confusion to motorists, road safety and efficiency impacts. TfNSW has previously provided feedback to the proponent on various proposed layouts at this intersection.*



Based on this proposed layout and the previous proposed layouts at this intersection provided to TfNSW by the applicant, TfNSW does not support any direct vehicular access to the subject site from Cabramatta Road East (state road) as all the proposed layouts would compromise safety and cause confusion to motorists. TfNSW requests that all vehicular access to the subject site is obtained via Fisher Street or Cumberland Street via a Right of Way through the Cumberland Street car park. This aligns with the access management principles of Clause 101 of the Infrastructure SEPP 2007.

8. *Given the above access requirements, TfNSW recommends that the TIA supporting the planning proposal reflects these requirements in any assumptions made in the assessment of the traffic impacts on the road network.*

2.5.1 CRE Access

arc traffic + transport is aware of recent work investigating the potential for access into the Site from CRE in the general vicinity of the existing laneway from the existing Site car park. However, as discussed with TfNSW on 7 May 2021 this access option will not be further pursued, as there are too many constraints at the intersection, including grade, travel path and sight distance issues.

2.5.2 Staged Site Development

Notwithstanding the above, it is anticipated that the development of the Site will be undertaken in stages, and that the proposed access to the Site from Fisher Street might not be viable until the later stages of construction and occupation. As such, additional staged access arrangements have been examined by arc traffic + transport, and are detailed further in [Section 3](#) and [Section 4](#).

2.6 TfNSW Comments 12 and 13

TfNSW Comments 12 and 13 state the following

- 13. As mentioned above, it is requested that a site-specific DCP is prepared to guide the future redevelopment of the site. This should detail future parking and loading requirements for the site. All parking, loading and service vehicle requirements should be accommodated on-site by adequate resident, visitor and delivery parking bays.*
- 14. Given the site's proximity to the train station, consideration should be given to travel demand management measures that can be included in the DCP requirements. This could include consideration to appropriate maximum car parking rates to encourage the use of public and active transport and reduce reliance on private vehicles.*

2.6.1 Draft Site DCP

A Draft Site DCP has prepared in consultation with Council, and was formally submitted to Council in October 2020. Notwithstanding the potential for additional revisions before the Site DCP is finalised, arc traffic + transport would of course agree that all parking and loading areas etc would necessarily be provided in accordance with Council controls, and moreover be designed to provide full compliance with the appropriate Australian Standards.

2.6.2 Parking Rates

As detailed at length in TTA 2017, the Site DCP will adopt maximum parking rates as a means of reducing private vehicle trips and increasing public and active transport trips. These parking rates are in line with the parking rates for other precincts within the Cabramatta Town Centre as detailed in the Cabramatta Town Centre DCP (CTC DCP).

2.7 TfNSW Comments 14 and 15

TfNSW Comments 14 and 15 state the following:

- 14. The traffic impact assessment should consider person trips generated from the planning proposal and future pedestrian needs (footpaths and links, measures to corral pedestrians to appropriate crossing locations, setbacks to ensure enhanced pedestrian environment, pedestrian level of service considerations). Additional setbacks should be considered for the Cabramatta Road East frontage to provide improved pedestrian and cyclist access and amenity. The location of proposed*

pedestrian through-site links needs to be carefully considered to ensure pedestrians are directed to safe crossing locations.

15. *Pedestrian and cycleway network - TfNSW aims for separation of bikes, vehicles and pedestrians wherever possible (Sydney's Cycling Future, December 2013). Shared paths for bike riders and pedestrians will only be used where there are no other options and will be carefully designed to minimise conflict.*

2.7.1 Active Transport Considerations

The Planning Proposal provides for wider footpaths in Broomfield Street where it is anticipated the primary increase in pedestrian movements will occur, as well as designated pedestrian links through the Site designed in consultation with Council.

The broader potential for active transport trips is detailed in TTA 2017, including immediate access to the Parramatta to Liverpool Rail Trail cycleway which runs along Broomfield Street adjacent to the Site; and the short walk to the Cabramatta Town Centre (west of the railway) further to the rail bridge connection.

2.8 TfNSW Comment 16

TfNSW Comment 16 states the following:

16. *The planning proposal, DCP and supporting TIA should identify any local and regional transport infrastructure improvements needed to support the planning proposal, including any funding mechanisms/contributions for the delivery of local and regional transport infrastructure improvements.*

2.8.1 Infrastructure Upgrades

TTA 2017 determined that no significant upgrades within the local road network were required to specifically accommodate the Planning Proposal. The only intersection where potential changes were addressed was that of Hume Highway & CRE, where sensitivity testing indicated that the intersection would operate with lower average delays further to the reassignment of the existing approach lanes in CRE; however, this revised design would only be required further to the hypothetical uplift in densities across eastern Cabramatta.

The revised traffic assessment provided in [Section 4](#) further supports the conclusions of TTA 2017 in regard to road network upgrade requirements.

3 Development Staging

3.1 Overview

While all components of the Planning Proposal are anticipated to be developed over time, it is anticipated that development will occur in distinct stages. This in turn requires an assessment of proposed access points to adjacent local roads; the type of driveways that will be required to meet appropriate guidelines and standards; and of course ways to minimise potential traffic impacts.

Sections below examine the anticipated staging of development and resulting access requirements, the traffic implications of which are then assessed in [Section 4](#).

3.2 Yields

Based on the most recent information provided by the Proponents, [Table 3](#) provides a summary of the Site components of the Planning Proposal.

Table 3: Planning Proposal Staged Yields

Cabramatta East	Residential Dwellings				GLFA m ²	
	1 Bed	2 Bed	3 Bed	Total	Retail	Commercial
Stage 1	64	136	25	225	1,239	
Stage 2	16	96	19	131	1,979	484
Stage 3		81	9	90	522	
Stage 4	16	96	19	131	833	484
Total	96	409	72	577	4,573	968

With reference to [Table 3](#), it is noted that:

- The Site yields are commensurate with the Planning Proposal as previously assessed in TTA 2017;
- Gross Leasable Floor Area (GLFA) has been calculated as representing 75% of Gross Floor Area; and
- The retail and commercial floorspace is anticipated to include uses such as a tavern and a child care centre, but have been classified as retail for the assessment as it is anticipated that their peak period trip generation will not be significantly different to retail floorspaces.

3.3 Parking

The number of parking spaces provided for each stage has an important bearing on the type of access driveway required. A breakdown of parking requirements for each of the development stages is provided in [Table 4](#), with parking rates adopted from the Draft Site DCP, being:

- 0.5 spaces per 1 bedroom unit;
- 0.75 spaces per 2 bedroom unit;
- 1 space per 3 bedroom unit;
- 1 space per 25m² GLFA for retail and commercial at ground level; and
- 1 space per 40m² GLFA for retail and commercial not at ground level.

Table 4: Planning Proposal Parking Requirements

Cabramatta East	Residential Spaces				GLFA Spaces		Total
	1 Bed	2 Bed	3 Bed	Total	Retail	Commercial	
Stage 1	32	101	16	149	53		201
Stage 2	38	68	25	131	79	12	222
Stage 3		61	9	70	21		91
Stage 4	13	29	14	56	33	12	101
Total	82	260	64	405	186	24	615

With reference to Table 4, the parking requirements for the retail and commercial areas may change based on their final land use, noting that a number of potential land uses – such as restaurants and entertainment venues – have a discounted parking rate applied in the CTC DCP. It is also possible that some retail and commercial parking (particularly for Stage 3) may instead be provided as a paid contribution.

Notwithstanding, the (higher) number of spaces indicated in Table 4 provides an appropriately higher estimate for the revised traffic assessment provided in Section 4.

3.4 Staged Development of the Site

The Proponent has not secured interests in key land parcels in Stage 3 and Stage 4; at this time therefore, the following staging strategy is anticipated:

- Stages 1 & 2 to be developed together (or in close order);
- Stage 3 to be developed in the short-medium term either by the Proponent or by others; and
- Stage 4 to be development in the medium-long term either by the Proponent or by others.

3.5 Site Access

3.5.1 Stage Access Requirements

An assessment of the number and type of access driveway(s) required for each stage of Site development has been undertaken referencing Australian Standards to ensure that appropriate, safe and compliant access can be provided for all development stages, and is detailed in sections below.

3.5.2 User Classification

Section 3 of AS 2890.1 provides guidelines in regard to the provision of driveways for new developments, which are largely based on the number of parking spaces being serviced by each driveway, and the users of those parking spaces. Table 1.1 of AS 2890.1 provides a summary of the different user classifications, and is reproduced below.

Table 5: AS2890.1 User Classification

User class	Required door opening	Required aisle width	Examples of uses (Note 1)
1	Front door, first stop	Minimum for single manoeuvre entry and exit	Employee and commuter parking (generally, all-day parking)
1A	Front door, first stop	Three-point turn entry and exit into 90° parking spaces only, otherwise as for User Class 1	Residential, domestic and employee parking
2	Full opening, all doors	Minimum for single manoeuvre entry and exit	Long-term city and town centre parking, sports facilities, entertainment centres, hotels, motels, airport visitors (generally medium-term parking)
3	Full opening, all doors	Minimum for single manoeuvre entry and exit	Short-term city and town centre parking, parking stations, hospital and medical centres
3A	Full opening, all doors	Additional allowance above minimum single manoeuvre width to facilitate entry and exit	Short term, high turnover parking at shopping centres

3.5.3 Driveway Category

Table 3.1 of AS 2890.1 indicates the category of driveway(s) required for different user types based on the number of spaces served by each driveway and the location of the driveway, and is reproduced below.

Table 6: AS 2890.1 Driveway Category

Class of parking facility (see Table 1.1)	Frontage road type	Access facility category				
		Number of parking spaces (Note 1)				
		<25	25 to 100	101 to 300	301 to 600	>600
1,1A	Arterial	1	2	3	4	5
	Local	1	1	2	3	4
2	Arterial	2	2	3	4	5
	Local	1	2	3	4	4
3,3A	Arterial	2	3	4	4	5
	Local	1	2	3	4	4

3.5.5 Driveway Design

Finally, Table 3.2 of AS 2890.1 indicates the basic design profile for each driveway category, and is reproduced below.

Table 7: AS 2890.1 Driveway Category Design

Category	Entry width	Exit width	Separation of driveways
1	3.0 to 5.5	(Combined) (see Note)	N/A
2	6.0 to 9.0	(Combined) (see Note)	N/A
3	6.0	4.0 to 6.0	1 to 3
4	6.0 to 8.0	6.0 to 8.0	1 to 3
5	To be provided as an intersection, not an access driveway, see Clause 3.1.1.		

3.6 Staged Driveway Requirements

3.6.1 CRE Local Driveway

With reference to Table 4, Stages 1 & 2 would require a total of over 400 parking spaces, a high proportion of which would be retail and commercial spaces. With reference to the tables above, this means that if CRE Local Driveway was to provide access for Stages 1 & 2, it would need to be constructed as a Category 4 driveway, with separate 6.0m – 8.0m entry and exits lanes separated by a minimum of 1.0m. In total therefore, the width of CRE Local Driveway would need to provide a minimum width of 13.0m to comply with AS2890.1.

This width of driveway is simply not practical from CRE Local.

3.6.2 Broomfield Street Driveway

Access to the Site from Broomfield Street is currently provided by the existing laneway opposite Cabramatta Station (with access from the Site then provided to CRE Local). Based on the access (and parking) requirements for Stages 1, 2 & 3, it is our opinion that a Broomfield Street Driveway (Broomfield Driveway) will also be required to provide appropriate access for the Site.

Noting that it is not preferable to locate a driveway in the current laneway location if at all practicable, a suitable location for the Broomfield Drive would be just south of Fisher Street, generally in the location of the current ABC Learning site at 76 Broomfield Street. This location provides significant benefits; along with allowing the removal of the existing laneway to provide for the Site's Central Square, the Broomfield Driveway would have significant separation from the high activity areas adjacent to the Site and Cabramatta Station.

The Broomfield Driveway would therefore provide for Stage 1 & 2 retail and commercial parking and servicing, and potentially retail and commercial parking and servicing for Stage 3.

3.6.3 Driveway Design Requirements

With reference to the number of parking spaces that would in turn be accessed by each driveway:

- CRE Local Driveway would provide access to approximately 350 residential parking spaces, and generate approximately 40 – 50 vehicle trips per hour (vph) two-way in the peak periods, an appropriate/y moderate generation for a left in/left out only driveway.

While CRE Local Driveway would technically need to be designed as a Category 3 driveway (noting that there is width available for the 11.0m Category 3 driveway profile) it is very likely that a Category 2 driveway (6.0m – 9.0m total) would meet the actual trip demands of residents only. A determination in this regard could be examined as part of the future DA process.

- Broomfield Driveway would provide access to approximately 165 retail and commercial parking spaces, and generate approximately 50vph and 120vph in the AM and PM peak periods respectively (and even less if Stage 3 retail and commercial parking is paid as a contribution).

Broomfield Driveway would need to be designed as a Category 3 driveway (minimum 11.0m) to provide compliance with AS 2890.1.

- Fisher Driveway remains appropriate for access to the future residential and non-residential parking requirements of Stage 4. The driveway Category would be determined further to confirmation of the parking numbers and types required for Stage 4 development.

3.7 Site Access Summary

With reference to sections above, the revised traffic assessment detailed in Section 4 is therefore based on the following Site access arrangements:

- **Stage 1, 2 & 3 residential access to the Site will be via CRE Local Driveway.**
- **Stage 1, 2 & 3 retail and commercial access to the Site will be via Broomfield Driveway;**
and
- **Stage 4 residential and non-residential access to the Site will be via Fisher Driveway.**

These driveway locations are shown in Figure 3.

Figure 3: Proposed Site Access Driveways



4 Revised Traffic Assessment

4.1 Overview

Further to the determination of the Site's access requirements, this section provides a revised assessment of future traffic conditions given the reassignment of Site trips to the new driveways.

As discussed, a number of the potential traffic generating developments in eastern Cabramatta also assessed in TTA 2017 are no longer proposed in Council's planning strategies, and as such the trip generation of these developments previously assessed in TTA 2017 has not been included in the revised assessment.

Finally, arc traffic + transport has adopted Roads & Maritime trip generation rates for the different components of the Site rather than the worst case trips rates used in TTA 2017.

4.2 Base 2031 Traffic Volumes

As discussed in Section 2.1, arc traffic + transport recently undertook analysis of the base traffic volumes underpinning the TTA 2017 traffic assessment.

The analysis determined that the surveys used in the TTA 2017 traffic assessment had been factored (for average annual growth) in such a way that all of the key intersections in the immediate vicinity of the Site had inherently higher base volumes than the 2020 surveyed volumes. As such – and as agreed with TfNSW - it is anticipated that TfNSW will provide support for the use of the Base 2031 volumes in the near future.

The Base 2031 traffic volumes are shown in the figures below.

Figure 4: Base 2031 Local Intersections AM Peak Hour

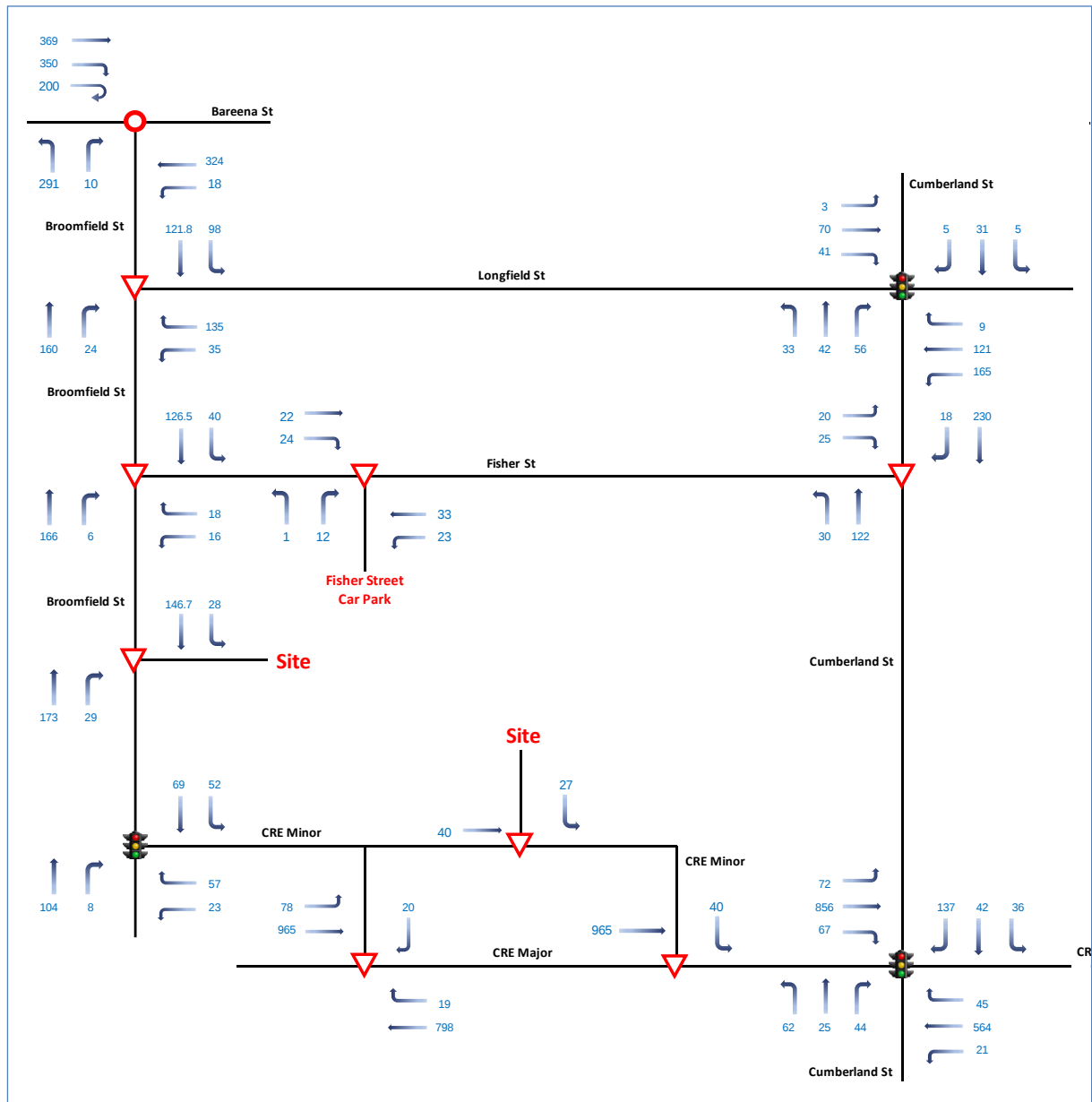


Figure 5: Base 2031 Local Intersection PM Peak Hour

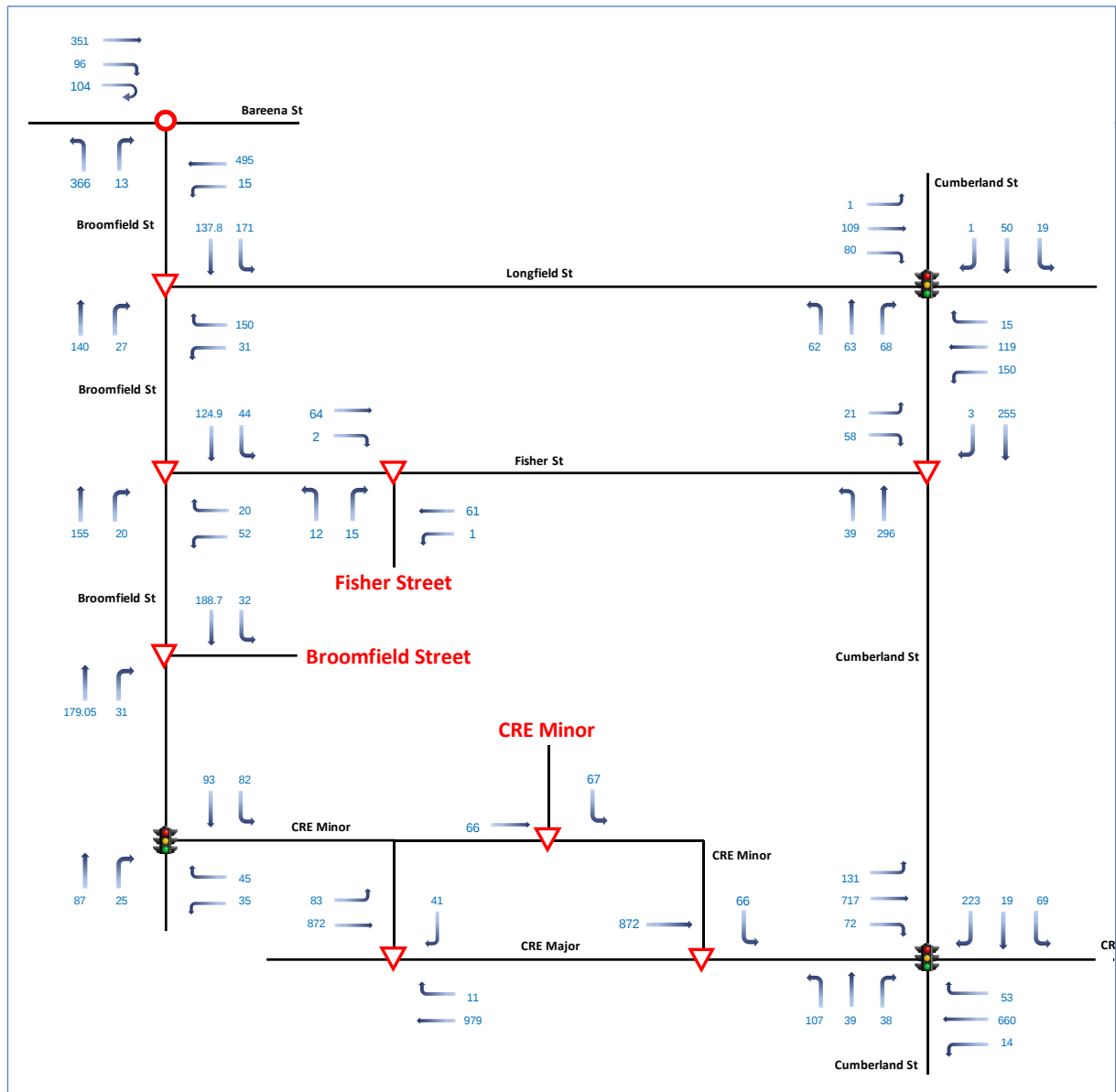
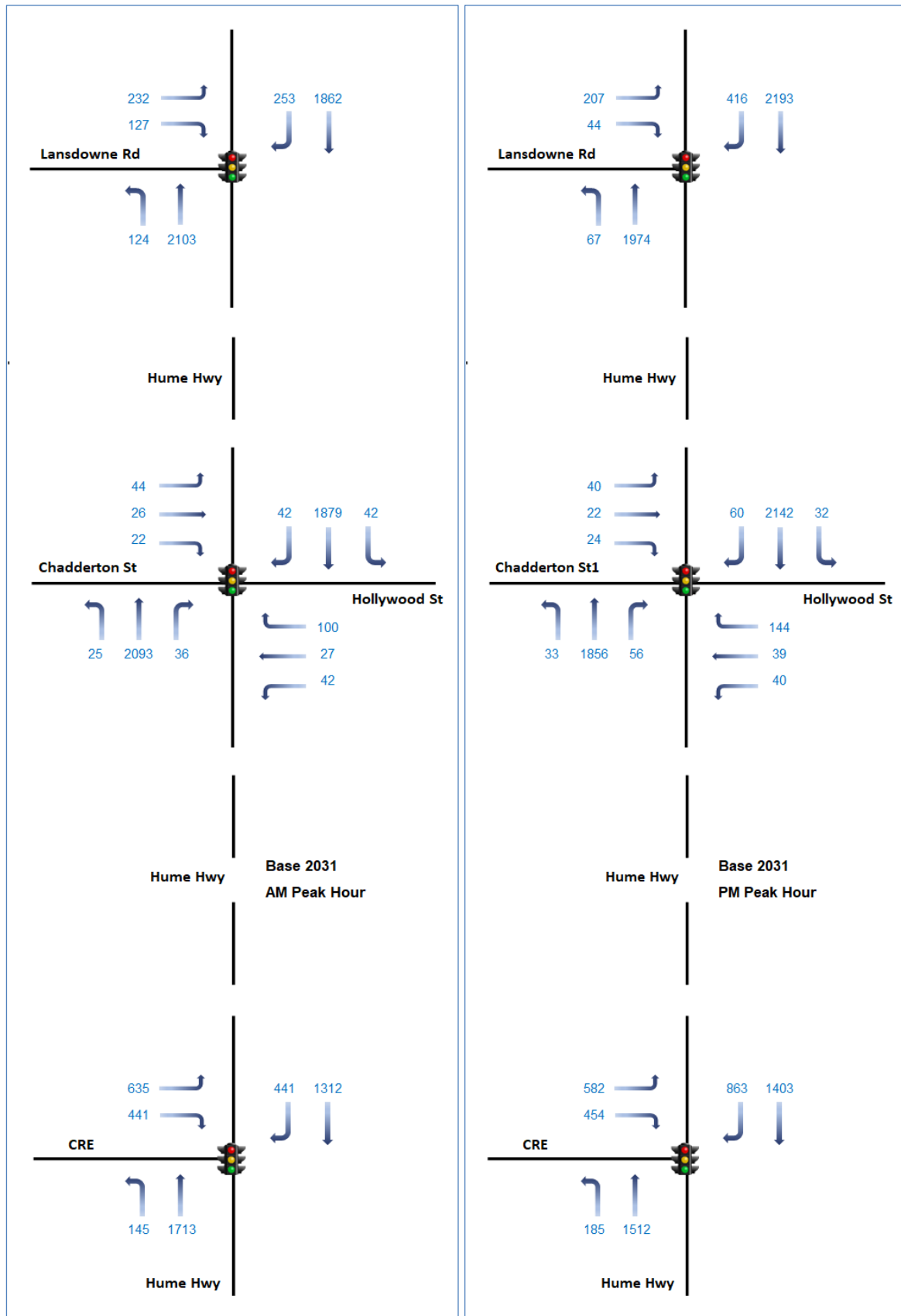


Figure 6: Base 2031 Hume Highway Intersections AM & PM Peak Hour



4.3 Site Trip Generation

4.3.1 Residential Trips

Summary trip rates for high density residential development are provided in the Roads & Maritime Guide to Traffic Generation Development Update of 2013 (GTGD Update), and include a trip rate per unit, and a trip rate per parking space. These rates are summarised below:

- **Trip rates per unit:**
 - 0.19 trips per unit in the AM peak hour; and
 - 0.15 trips per unit in the PM peak hour.
- **Trip rates per parking space:**
 - 0.15 trips per unit in the AM peak hour; and
 - 0.12 trips per unit in the PM peak hour.

As discussed, parking for the Site will be provided in accordance with the lower parking rates established in the Draft Site DCP, and as such the GTGD Update trip rates per parking spaces have been adopted for the assessment.

4.3.2 Retail Trips

The GTGD Update trip rates for retail development (shopping centres) are not applicable to the Site for a number of reasons, including the proximity to public transport, proximity to the broader Cabramatta Town Centre, and the 'local' nature of retail in this area. In this regard, it is expected that much of the retail space will be given over to local shops, restaurants and cafes, which would generate a higher proportion of walk (and public transport) trips than car trips, and there is no proposal to provide a full-line supermarket or the like.

Based on all available information - and in line with the retail trip rates used in past Cabramatta Town Centre assessments - the assessment has adopted the following retail trip rates:

- 1.0 trips per 100m² GLFA in the AM peak hour; and
- 3.0 trips per 100m² GLFA in the PM peak hour.

4.3.3 Commercial Trips

While the commercial trips rates reported in the GTGD Update for sites within close proximity to public transport and centre services are in most instances much lower than the summary commercial trip rates provided in the GTGD Update, the assessment has nonetheless adopted the summary commercial trip rates given that the exact type of commercial usage is not known at this time; these rates are:

- 1.6 trips per 100m² Gross Floor Area (GFA) in the AM peak hour; and
- 1.2 trips per 100m² GFA in the PM peak hour

4.3.5 Additional Land Uses

As discussed, the Planning Proposal indicates the potential for a number of additional land uses on-site, including a tavern, child care, medical centre and church. While the trip rates for these land uses will necessarily require further detailing in future Site DAs, the higher retail trip rates have been adopted, noting that many of these land uses would have a significantly reduced parking requirement (as per the CTC DCP) and therefore much lower vehicle trip generation potential.

4.3.6 Site Trip Generation Summary

With reference to sections above, a summary of the estimated trip generation of the Site is provided in Table 8.

Table 8: Site Trip Generation

Cabramatta East	Residential Trips		Commercial & Retail Trips		Total Trips	
	AM	PM	AM	PM	AM	PM
Stage 1	22	18	13	40	35	57
Stage 2	20	16	28	65	47	81
Stage 3	10	8	5	16	16	24
Stage 4	8	7	16	31	24	37
Total	61	49	62	151	123	200

With reference to Table 8 and the existing trip generation of the Site as reported in TTA 2017, the Planning Proposal would lead to a very moderate increase in Site trip generation, being:

- An additional 30 vehicle trips in the AM peak hour; and
- An additional 70 vehicle trips in the PM peak hour.

4.4 Additional Development in Eastern Cabramatta

4.4.1 Future Town Centre Precinct 4 Yields

As discussed, Council is not proceeding with its previous RDS which provided for significant uplift across eastern Cabramatta; rather, Council has identified the potential for some 818 high density residential dwellings in Town Centre Precinct 4 (generally bounded by Fisher Street, CRE Local and CRE Major, Cumberland Street and Broomfield Street).

With the Planning Proposal itself providing for 577 dwellings, the potential therefore exists for some 241 additional dwellings to be developed within Precinct 4.

4.4.3 Precinct 4 Additional Access

There is little if any likelihood of the additional Precinct 4 dwellings utilising either the CRE Local or Broomfield Street driveways, nor a new access driveway to CRE, CRE Local or Broomfield Street. This leaves either Fisher Street or Cumberland Street only as potential access points, well removed from the proposed CRE Local and Broomfield Street driveways.

For the revised traffic assessment, **arc traffic + transport** has assigned the trips generated by the potential additional Precinct 4 development to the Fisher Driveway, which as a worst case would therefore provide for the Council car park, Stage 4 and remaining Precinct 4 trips.

4.4.4 Trip Generation

The assessment has adopted the same trips rates for the potential additional Precinct 4 dwellings as adopted for the Planning Proposal dwellings, in turn based on the potential parking numbers for the additional dwellings. In this regard, it is estimated that the proportion of 1, 2 and 3-bedroom dwellings would be similar to in the Planning Proposal, and in turn require approximately 170 parking spaces.

As a result, it is estimated that the additional Precinct 4 dwellings would generate:

- 26 vehicle trips in the AM peak hour; and
- 21 vehicle trips in the PM peak hour.

4.5 Trip Distribution

The assessment has adopted the same distribution profiles as detailed in TTA 2017 for both the proportion of arrivals and departures for each land use in the AM and PM peak hours; and for the origin and destination of trips for each land use. We note that there is no information available to suggest that these distribution characteristics would have changed in any significant way since the preparation of TTA 2017.

4.6 Trip Assignment

With reference to sections above, the trip generation of the Site and the additional Precinct 4 dwellings has been assigned to the key local intersections; the resulting total future 2031 traffic volumes are shown in the figures below.

Figure 7: Base 2031 + Planning Proposal + Precinct 4 Local Intersections AM Peak Hour

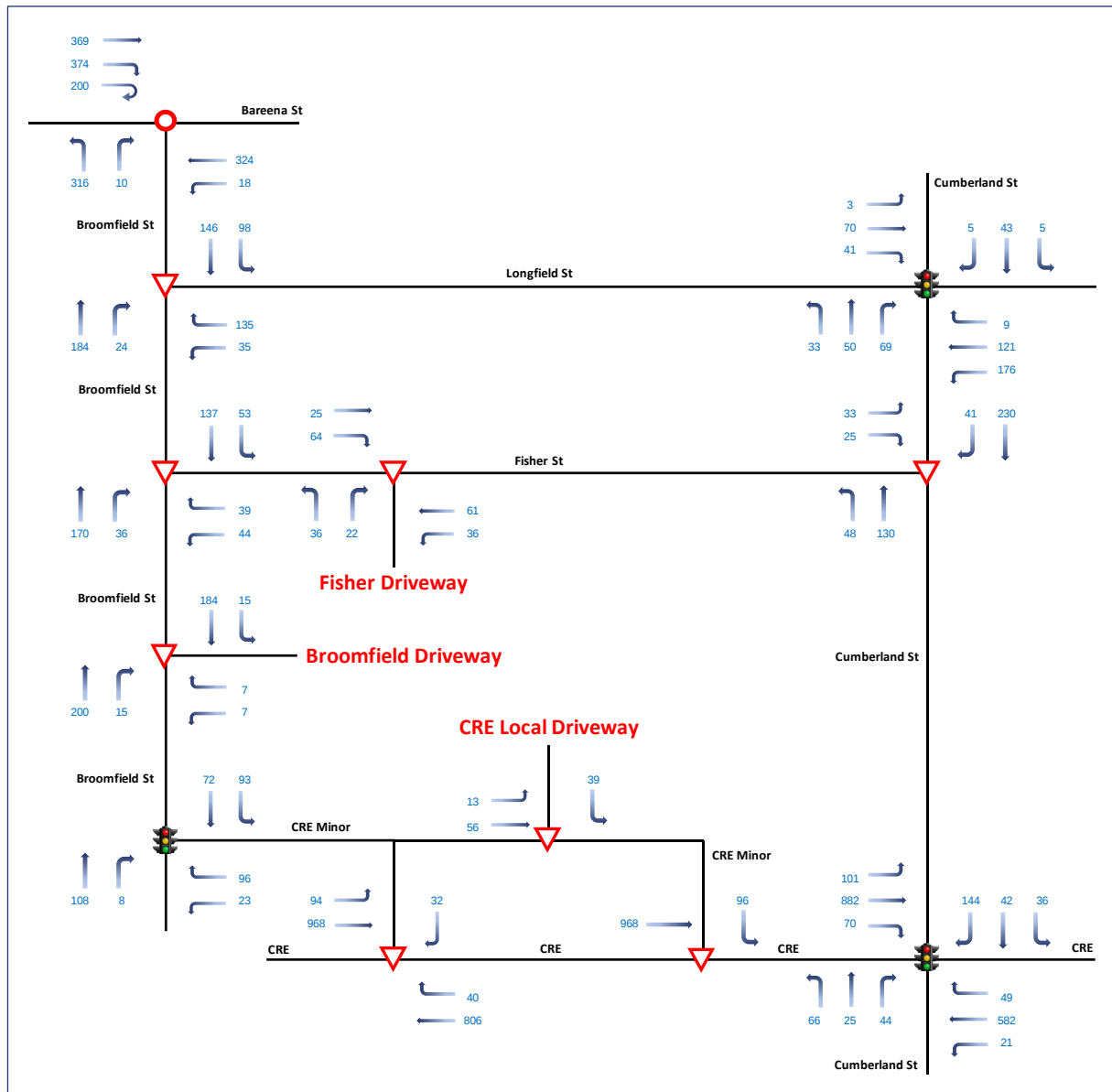


Figure 8: Base 2031 + Planning Proposal + Precinct 4 Local Intersections PM Peak Hour

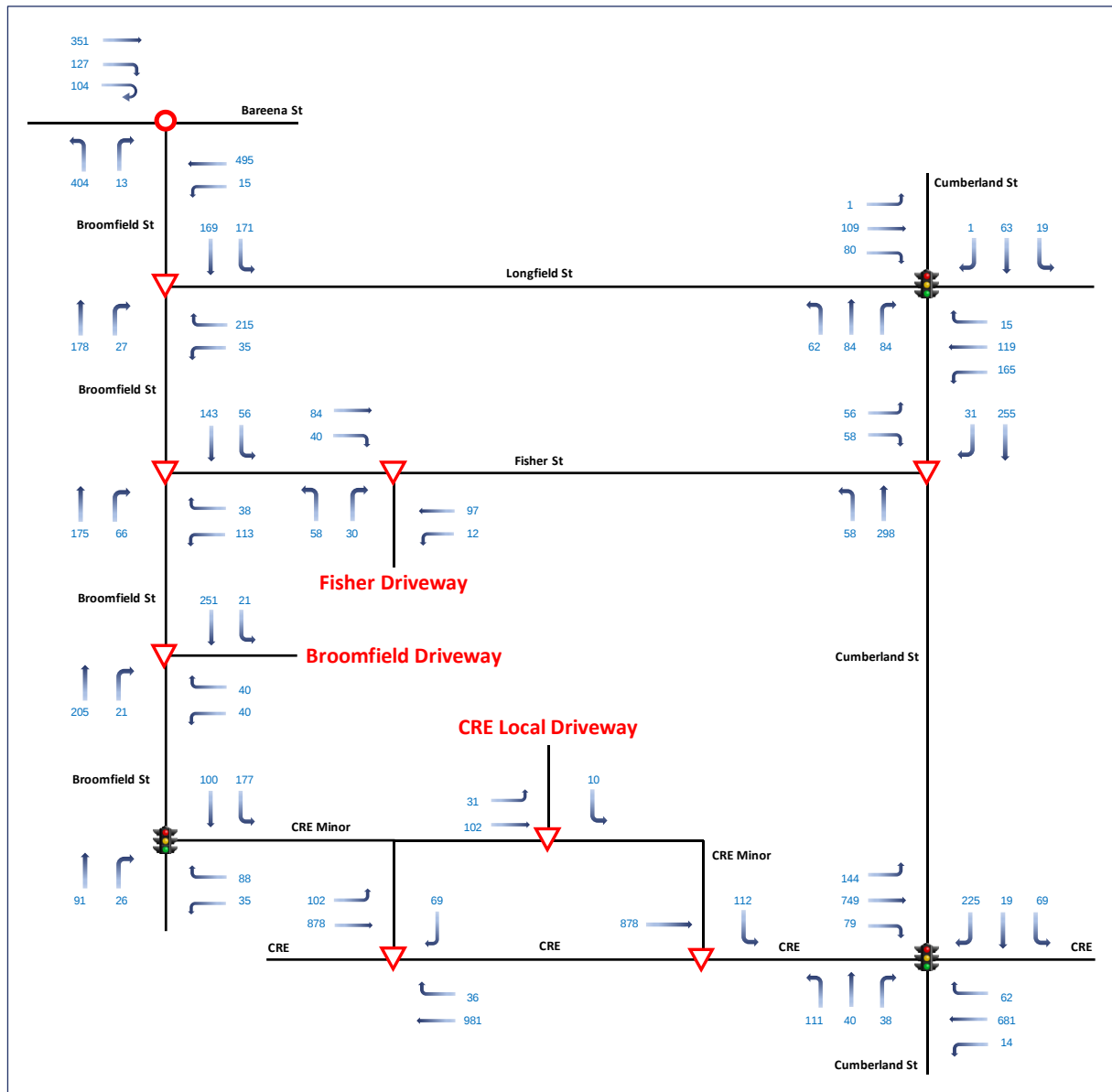
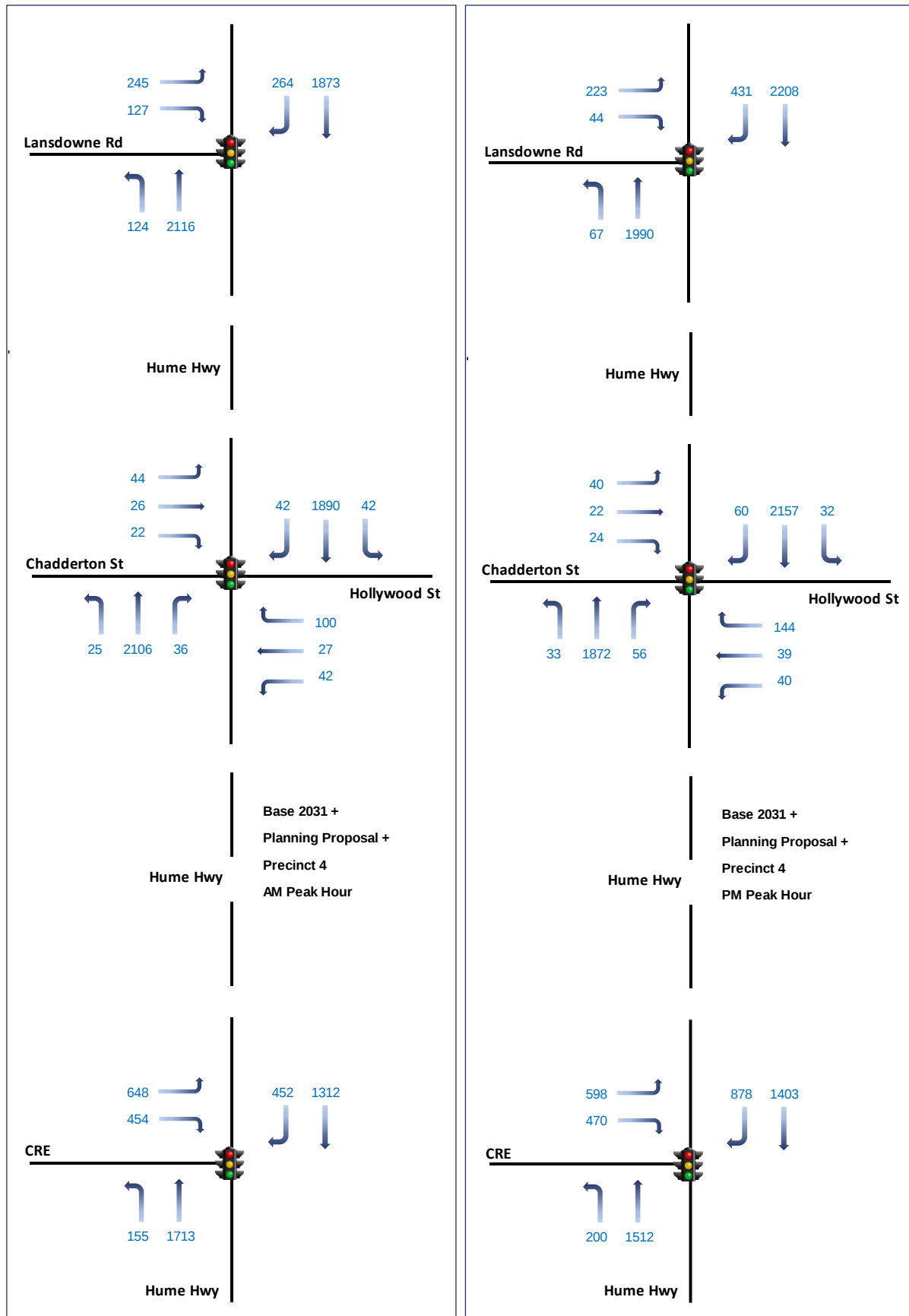


Figure 9: Base 2031 + Planning Proposal + Precinct 4 Hume Highway Intersections



4.7 Intersection Operations

4.7.1 SIDRA

The existing operation of the key intersections has been assessed using the SIDRA intersection model. SIDRA provides a number of outputs by which to measure the performance of an intersection, including:

- **Degree of Saturation:** Degree of Saturation (DOS) is defined as the ratio of demand (arrival) flow to capacity. Degrees of Saturation above 1.0 represent over-saturated conditions (demand flows exceed capacity) and degrees of saturation below 1.0 represent under-saturated conditions (demand flows are below capacity)
- **Average Vehicle Delay:** Average Vehicle Delay (AVD) represents the difference between interrupted and uninterrupted travel times through an intersection, and is measured in seconds per vehicle in this assessment. Delays include queued vehicles accelerating and decelerating from/to the intersection stop, as well as general delays to all vehicles travelling through the intersection.

With reference to the LOS criteria below, the average intersection delay for signals and roundabouts represents an average of delays to all vehicles on all approaches, while for priority intersections the average delay for the worst approach is used.

- **Level of Service:** Level of Service (LoS) is a basic performance parameter assigned to an intersection based on average delay; we note that we have assessed the intersections using the RTA parameters which use only delay in the calculation of LoS.

For signalised and roundabout intersections, LoS is based on the average delay to all vehicles, while at priority controlled intersections LoS is based on the Local approach delays.

Table 9 provides a summary of the SIDRA recommended criteria for the assessment of intersections.

Table 9: SIDRA Level of Service Criteria

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals & Roundabouts	Stop & Give Way
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

Source: SIDRA Systems

4.7.2 Intersection Operations

The tables below provide a summary of the results of the SIDRA assessment of both the Base 2031 and Base 2031 + Planning Proposal + Precinct 4 scenarios, while electronic SIDRA files area provided as an appendix to this TTA Addendum.

Table 10: Base 2031 Local Intersection Operations

Intersection	Worst Delay (s)		Worst Delay LOS		Average Delay (s)		Average Delay LOS		Degree of Saturation	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Bareena & Broomfield					6.6	6.3	A	A	0.420	0.510
Broomfield & Longfield	9.4	9.6	A	A					0.196	0.218
Broomfield & Fisher	5.8	5.9	A	A					0.097	0.100
Broomfield & CRE Minor					15.5	14.3	B	A	0.139	0.169
CRE Major & CRE Minor	25.1	22.2	B	B					0.278	0.257
CRE Major & Cumberland					15.7	17.9	B	B	0.487	0.553
Cumberland & Fisher	6.2	7.5	A	A					0.137	0.182
Cumberland & Longfield					16.4	17.4	B	B	0.180	0.231
CRE Minor & Laneway	0.1	0.2	A	A					0.022	0.046
Broomfield & Laneway	5.5	5.7	A	A					0.117	0.123
Fisher & Car Park	4.7	4.7	A	A					0.031	0.036

Table 11: Base 2031 Hume Highway Intersection Operations

Intersection	Average Delay (s)		Average Delay LOS		Degree of Saturation	
	AM	PM	AM	PM	AM	PM
Hume Hwy & Lansdowne Rd	20.1	18.3	B	B	0.741	0.806
Hume Highway & Hollywood Rd & Chadderton Rd	15.3	19.5	B	B	0.671	0.675
Hume Highway & Cabramatta Road East	27.9	37.0	B	C	0.748	0.930

Table 12: Base 2031 + Planning Proposal + Precinct 4 Local Intersection Operations

Intersection	Worst Delay (s)		Worst Delay LOS		Average Delay (s)		Average Delay LOS		Degree of Saturation	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Bareena & Broomfield					6.8	6.7	A	A	0.428	0.564
Broomfield & Longfield	9.7	10.7	A	A					0.206	0.329
Broomfield & Fisher	6.2	6.5	A	A					0.120	0.145
Broomfield & CRE Local					17.9	17.1	B	B	0.208	0.29
CRE Major & CRE Local	28.0	27.1	B	B					0.284	0.357
CRE Major & Cumberland					17.2	20.8	B	B	0.479	0.544
Cumberland & Fisher	6.4	7.9	A	A					0.153	0.194
Cumberland & Longfield					17.2	18.3	B	B	0.205	0.266
CRE Local & Site	3.5	3.5	A	A					0.038	0.073
Broomfield & Site	6.2	6.9	A	A					0.122	0.152
Fisher & Site	4.9	4.9	A	A					0.055	0.072

Table 13: Base 2031 + Planning Proposal + Precinct 4 Hume Hwy Intersection Operations

Intersection	Average Delay (s)		Average Delay LOS		Degree of Saturation	
	AM	PM	AM	PM	AM	PM
Hume Hwy & Lansdowne Rd	19.9	18.8	B	B	0.770	0.811
Hume Highway & Hollywood Rd & Chadderton Rd	20.2	24.2	B	B	0.784	0.776
Hume Highway & Cabramatta Road East	28.5	36.9	B	C	0.765	0.915

With reference to the tables above, the Planning Proposal (and Precinct 4 development) has little impact on the operation of all key intersections compared to their operations under Base 2031 conditions.

All of the key local intersections will operate at a LOS A or B, with only minor average delays and significant spare capacity. Importantly in regard to the Site driveways, the detailed SIDRA outputs indicate that there is no significant queuing in the local roads adjacent to each driveway (i.e. as a result of vehicles turning into the driveways), with a 95%ile queue for the key right turn at each being less than 1 vehicle length.

We note that at the intersection of CRE & Cumberland Street, TfNSW has installed peak period clearways on both sides of CRE, which further improves the operation of the intersection compared to the operations reported in TTA 2017, where tidal clearways only were assessed.

The key Hume Highway intersections will operate at a LOS B or C, with moderate average delays. As is the case with the intersections nearer the Site, the results of the revised traffic assessment indicate that the operation of these intersections is improved from the results reported in TTA 2017, again a factor of the significantly lower trip generation of the Site and reduced uplift across eastern Cabramatta.

4.8 Summary

In summary, all of the key intersections will operate with lower average delays than reported in TTA 2017, as a factor of lower Site trip generation, and the reduced uplift across eastern Cabramatta, both of which combine to generate hundreds of fewer trips to the road network than were assessed in TTA 2017. Moreover, the operation of all key intersections is barely affected by the additional trip generation of the Planning Proposal (and Precinct 4), further emphasising that no significant intersection or other road network upgrades are required to accommodate the Planning Proposal.

5 Conclusions & Recommendations

5.1 Conclusions

Further to a revised assessment of the traffic and transport characteristics of the Site, and the potential implications of staged development, [arc traffic + transport](#) provides the following Conclusions:

- Access driveways to CRE Local, Broomfield Street and Fisher Street will be required to ensure both compliance with Australian Standards and efficient access to each of the proposed car parks and service areas. Importantly, all available information indicates that compliant (Category) driveway designs can be provided.
- The proposed Broomfield Driveway will be located well away from the activity area adjacent to the Site and Cabramatta Station, and generate a very moderate level of traffic in the peak periods.
- As part of future detailed DA assessments, the potential exists to reduce the width of some driveways – and particularly the CRE Local Driveway - further to appropriate consideration of actual user classifications and resulting traffic demands.
- The traffic assessment has determined that all of the key local intersections will operate at a good LOS (A or B) with significantly lower delays than reported in TTA 2017, and moreover there is little difference in intersection operations in 2031 with or without the Planning Proposal. This is a factor of the reduced trip generation of the Site, and reduced uplift potential across eastern Cabramatta further to recent Council strategic planning changes.

5.2 Recommendations

Further to the Conclusions above, [arc traffic + transport](#) provides the following Recommendations to maximise the efficiency and safety of Site vehicle movements:

- That the residential and retail/commercial car parks be separated where practicable unless other Site planning considerations require them to be connected.
- That additional consideration be given to the location of service areas for all components of the Site.
- That all planning for the Site continues to be in line with the appropriate standards and guidelines.

These Recommendations will necessarily be considered in future DA assessments.